Modern Landfill Technology and Conditions

Implications for PPCP Management

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April 25, 2008
Landfill Disposal of PPCPs
February 2007, the Office of National Drug Policy issued for the first time guidelines for proper disposal of pharmaceuticals

- Take unused or expired prescription drugs out of their original containers and throw them in the trash.
- Mixing prescription drugs with an undesirable substance, such as used coffee grounds or kitty litter, and putting them in impermeable, nondescript containers, such as empty cans or sealable bags, will further ensure the drugs are not diverted.
- Flush prescription drugs down the toilet only if the label or accompanying patient information specifically instructs doing so.
- Take advantage of community pharmaceutical take-back programs that allow the public to bring unused drugs to a central location for proper disposal.
Anaerobic Bioreactor

Gas Collection to Generate Energy

Groundwater Monitoring

Leachate / Liquids Addition

Gas Collection

Liquids Storage

Bioreactor Program
Liquid Distribution Methods - Horizontal Distribution Lines for low solids liquids
Liquid Addition
Methods

Working face application of High Solids liquids
SRRMF
Cumulative Gas Flow per Foot of Slotted Screen

Phase 1 - Control Area
Phase 2 - Recirculation Area
Phase 3 - Recirculation
SRRMF BOD & COD Concentrations vs. Time
Control and Recirculation

- BOD Conc. (mg/L) - Recirculation
- BOD Conc. (mg/L) - Control
- COD Conc. (mg/L) - Recirculation
- COD Conc. (mg/L) - control
SRRMF
Manganese Concentrations vs. Time
Control vs. Recirculation

Manganese Conc. (mg/L) - Recirculation
Manganese Conc. (mg/L) - Control
Gas Extraction Well Installation

Non-Recirculation Area

Recirculation Area

EW-29 (20 Feet)

EW-22 (20 Feet)
Modern Landfill Technology Findings

- Faster transition out of acid phase by composting the organic wastes
- Raises the mass temperature changing the degradation kinetics.
- Promotes faster onset of methane generation
- Increases liquid residence time
- On-site liquids management = reduced reliance on POTWs
Landfill Fate of EDCs or PPCPs

- Attenuation within the waste mass
- Decomposition or degradation in the waste mass
- Leached from the waste mass:
  - Recirculation
  - Onsite treatment plant
  - Off-site treatment plant
- Carried with LFG to gas collection system
Data Needs and Future Considerations

• Landfill leachate characterization for various operating technologies
• Evaluation of the fate of PPCPs and EDCs in the landfill environment
• Policy development and disposal guidelines
• Enhance consumer education regarding disposal
Questions