Energy Use and Reuse

Village Creek WRF

28 July 2011

Safety

- Hazards
  - Chemicals
  - Fires
  - Severe weather
- Precautions
  - Stay with the group
  - Follow directions

Wastewater Treatment--water

- Wastewater flows initially through bar screens to remove the large debris
  - Screenings are disposed of at the landfill
- From the bar screens the wastewater flows to the Primary Clarifiers
- Then flow is directed to the Aeration Basins followed by Secondary Clarifiers
- From Secondary Clarifiers wastewater enters filters, then chlorination/dechlorination before discharge to the Trinity River

Wastewater Treatment--solids

- Solids collected from Primary Clarifiers are fed into the Digesters
- Solids collected from the Secondary Clarifiers are fed into the Digesters or the Aeration Basins
- Digesters act as giant stomachs, processing the solids (sludge) for about 28 days

Biosolids

- The solids are pumped (3% solids) from the digesters to the Biosolids Facility
  - Biosolids are processed by Renda Environmental Inc in a public/private partnership
- The solids are dewatered (25% solids) by belt press and a pH adjustment is conducted
- Biosolids are held on-site for 24 hours
- All biosolids are beneficially land applied in Tarrant and surrounding counties

Biosolids

Biosolids—Environmental Benefits

- Metal concentration limits are heavily regulated
- High water content results in less irrigation needs
- Increase in soil stability because of addition of organic (C-based) material
  - Decrease in erosion potential
- Contain inorganic nitrogen which is used by plants
- Slow release allow for multi-year benefits from a single application

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Alternative Energy

Biogas

- Plant produced methane
  - Digesters produce approximately 1mil cf of methane daily
  - Some of the gas is used for circulation “air” in the digesters
  - Majority of the gas is used to run turbines
- Landfill gas
  - Used as a supplement to plant produced gas
  - Purchased from Arlington Landfill (Renovar)

Turbines

- Biogas is pumped to two 5.2MW turbines
  - On average the turbines produce about 50% of the plant's energy needs (39.6 mil kWh in 2010)
    - Produce approximately 90% of energy requirements for aeration system
  - Electricity produced used to heat digesters and Admin building
- Landfill gas is used "top off" gas needs of turbines
- Process in place since the 60's
  - We were "green" before it was cool

Upgrades

- Heat Recovery Steam Generator
  - Replace old hot oil coils with direct to steam system
    - More cost effective and energy effective
  - Blower upgrades to aeration system
- Digester upgrades
  - Installation of linear mixers
  - Increase methane production by 30%

Upgrades--benefits

- $2 million/year in electricity cost savings
- Higher quality biosolids
- Better mixing within the digesters
- Less accumulation of indigestible material

Questions?

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