BIOREACTOR BENEFITS

PRESENTATION BY

JOHN PACEY

FHC, Inc.
ANAEROBIC BIOREACTOR LANDFILL
POTENTIAL GOALS AND BENEFITS

RAPID ORGANIC WASTE STABILIZATION
(almost complete within 5 to 10 years of initializing bioreactor process)

- Rapid settlement; mostly complete during landfill operation
- Increased gas unit yield, total yield and flow rate during active operational period; mostly occurs during landfill operation
- Landfill land use possible during landfill operation; remainder within 5 to 10 years of closure
ANAEROBIC BIOREACTOR LANDFILL
POTENTIAL GOALS AND BENEFITS

MAXIMIZATION OF LANDFILL GAS CAPTURE FOR ENERGY PROJECTS

- Significantly increased total gas available within relatively short time period (landfill operating period plus 5 to 10 years after closure) for energy use-provides entrepreneurial opportunities

- Significant economy of scale advantage and potential increase in total landfill gas extraction efficiency (due to high generation rate enabled over shorter generation period)

- Greatly increased greenhouse gas reduction from lessened emission and consequent fossil fuel offsets

- Revenues can help defray landfill gas system from otherwise mandated non-funded environmental costs
ANAEROBIC BIOREACTOR LANDFILL
POTENTIAL GOALS AND BENEFITS

MAXIMIZATION OF LANDFILL GAS CAPTURE FOR ENERGY PROJECTS

- Significantly increased total gas available within relatively short time period (landfill operating period plus 5 to 10 years after closure) for energy use—provides entrepreneurial opportunities

- Significant economy of scale advantage and potential increase in total landfill gas extraction efficiency (due to high generation rate enabled over shorter generation period)

- Greatly increased greenhouse gas reduction from lessened emission and consequent fossil fuel offsets

- Revenues can help defray landfill gas system from otherwise mandated non-funded environmental costs
AN AEROBIC BIOREACTOR LANDFILL
POTENTIAL GOALS AND BENEFITS

LEACHATE TREATMENT AND DISPOSAL
(almost complete stabilization within 5 to 10 years of initializing bioreactor process)

- Low cost partial or complete reduction of organic constituents in leachate
- Low cost partial removal of some salts and metal by precipitation, chemical transformation, filtration, sorption, etc.
- Retention of leachate within landfill available up to field capacity significantly reduces of eliminates off-site transport of leachate for treatment and/or disposal
AEROBIC BIOREACTOR LANDFILL
POTENTIAL GOALS AND BENEFITS

POST-CLOSURE CARE AND MAINTENANCE REDUCTION
(almost complete stabilization of gas and settlement within 1 to
3 years of closure; almost complete stabilization of leachate within
2 to 4 years of closure)

- After reaching stabilization, minimizes future environmental
  risk and liability related to gas, settlement and leachate
- After reaching stabilization, significant reduction in landfill
  operation and maintenance activities
- After reaching stabilization, significant reduction in landfill
  monitoring activities
AEROBIC BIOREACTOR LANDFILL
POTENTIAL GOALS AND BENEFITS

RAPID ORGANIC WASTE STABILIZATION
(almost complete within 1 to 3 years of initializing bioreactor process)

- Rapid settlement; mostly complete during landfill operation
- Increased gas unit yield, total yield and flow rate during active operational period; mostly occurs during landfill operation; operated to generate mostly carbon dioxide and little if any methane gas
- Landfill land use possible during landfill operation; remainder within 1 to 3 years of closure
AEROBIC BIOREACTOR LANDFILL
POTENTIAL GOALS AND BENEFITS

LEACHATE TREATMENT AND DISPOSAL
(almost complete stabilization within 2 to 4 years of initializing bioreactor process)

- Low cost partial or complete reduction of organic constituents in leachate
- Low cost partial removal of some salts and metal by precipitation, chemical transformation, filtration, sorption, etc.
- Retention of leachate within landfill available up to field capacity significantly reduces or eliminates off-site transport of leachate for treatment and/or disposal