

Interface and Landfill Gas

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Who is Interface?

- Global manufacturer of carpet and fabrics for the commercial, institutional, and residential interiors markets
- \$900+ million in sales
- Committed to minimizing environmental impact through quantitative and qualitative process improvements and modifications

What will Interface do with Landfill Gas?

- LFG will be purchased from a municipal owned and operated landfill (1,360 Dth/mo)
- LFG will be used selectively for process heat in manufacture
- Indirect heat transfer only, not in direct contact with people or product

Why Landfill Gas?

- First, trying to find a cost effective, environmentally conscious, energy source. This plant is located in west central Georgia, very few options available
- Second, obtain greenhouse gas credits
- Third, improve community economy and environment

When will Landfill Gas be installed at Interface?

- If all goes according to plan, the municipality will complete piping infrastructure 1st Quarter 2004
- Currently, the landfill has been piped, the flare installed and operational
- Gas contracts are being finalized

Where will Interface burn Landfill Gas?

- ❑ At the Interface Flooring Systems plant in LaGrange, GA
- ❑ The landfill is owned and operated by the City of LaGrange
- ❑ All infrastructure to the Interface plant will be owned and operated by the City of LaGrange

How did this project happen?

- Very simply, we got lucky!
- We contacted the City coincident to a project to extend landfill life.
- The City's original project included a bioreactor and retaining wall, NOT landfill gas
- Our persistence and the incremental net present value increase from LFG won the day

The details, or how a bioreactor changes landfill economics



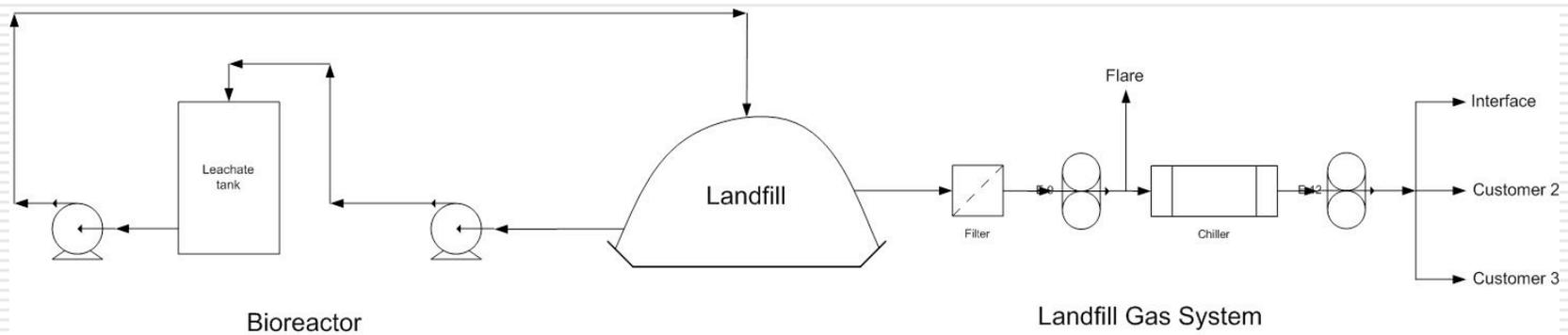
- LaGrange landfill statistics
 - 85.5 acres total
 - 38 acres, unlined, capped, areas 1 & 2
 - 47.5 acres, Subtitle D, cells 1 through 5, 2 filled, 1 active, 2 non excavated
 - 12.5 Mg NMOC, Tier 2 Air Emission Sampling Results, March 1999
 - 9+ miles from Interface

The details continued.....



- Landfill Modification Scope
 - Add bioreactors to cells 1 through 5
 - Construct wall on south and west sides for additional pile heights
 - Plumb areas 1 & 2 and cells 1 through 5 for landfill gas removal, cleaning, and transport
- Schedule
 - Flare started up 9/03
- Gas Sales
 - 3 customers, 25% each, 25% reserve

Project Schematic – Pump the Dump!



Why 3 customers and no electrical generation?

- ❑ The gas curves verified more gas than Interface could use
- ❑ The City wanted to maximize revenue hence the district scheme
- ❑ Electrical production was considered in the beginning but the interconnection was not close enough to be economically feasible

The economics from the City's perspective.....

With the permission from the City of LaGrange

	Base Case, Business as usual, close 2015	Bioreactor/LFG 15 year life extension	
Tipping Fees	\$17,373,458	\$32,701,245	
Gas Sales		\$8,321,656	30% discount at city gate
Gas System O&M		(\$1,206,390)	
1 st Phase Gas System		(\$2,004,762)	
1 st Phase Bioreactor		(\$190,476)	
1 st Phase Wall		(\$1,327,416)	
Cell 3 Gas System		(\$170,912)	
Cell 4 Construction	(\$3,196,199)	(\$3,519,565)	Includes phase 2 wall
Cell 3 Bioreactor		(\$158,757)	
Cell 4 Gas System		(\$174,426)	
Cell 5 Construction	(\$3,034,609)	(\$2,914,242)	Includes phase 3 wall
Cell 4 Bioreactor		(\$133,385)	
Cell 5 Gas System		(\$220,110)	
Cell 5 Bioreactor		(\$171,027)	
Closure	(\$2,459,630)	(\$1,173,431)	
Post Closure	(\$929,886)	(\$104,202)	
Gas pipe, compressor, chiller		(\$1,700,000)	
Total NPV	\$7,753,133	\$25,853,799	5% discount 12

The justification from Interface's perspective.....

- ❑ Retrofit costs for piping, redundant burners, controls, and installation for two hot oil heaters and one small package boiler, ~ \$60k
- ❑ Approximate gas savings, \$20k/year (indexed to city gate pricing, 30% savings)
- ❑ 3 year simple payback

CO2e Offsets



- As long as the landfill stays below 50Mg NMOC, offsets are available to LFG users
- 2004 Tier 2 tests with LANDGEM models will provide indication. We're confident we'll have them for a long time
- Creative negotiation with the City allowed Interface to contract the flare ownership

CO2e Offset Calculations

	CO2 Emissions, 2002	Landfill Offsets
LaGrange	10,331 metric tons	
California	11,901 metric tons	
Canada	711 metric tons	
Combustion		8,000 metric tons
Flare (estimate)		22,000 metric tons
Total	22,943 metric tons	30,000 metric tons

Summary

- This has been a win-win-win situation
 - Interface – cost savings and environmental credits
 - The City of LaGrange – additional revenue generator and improved landfill management
 - Community – cleaner environment, less tax dollars supporting services
- Thanks to the World Resources Institute, Vince Van Son of Alcoa, Shehnaz Atcha of the Louis Berger Group and Patrick Bowie, David Brown, and Tom Hall of the City of LaGrange. This project was improved with their input.