



East/South Landfill Gas Project – A Revenue Generator

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Walker Environmental Group

A Division of Walker Industries



Walker Environmental Group

Organics

- Composting
- Biosolids Management
- Renewable Energy
- Grease Trap, Organics and Used Cooking Oil Collection

Recycling and Disposal

- Environmental Projects
- Residential Drop-off
- IC&I Waste Haulage
- Waste Transfer
- Landfill Disposal (2)
- Soil Disposal and Remediation

Technical Services

- Environmental Projects
- Carbon Neutral Buildings
- Carbon Services

Niagara Environmental Campus

Biosolids

Drop-off

Compost

Admin Offices

East Landfill

Landfill Gas Plant

South Landfill



What is Landfill Gas?

- 50% Methane
- 50% CO₂
- Trace gases and particulate, especially Oxygen and Nitrogen
- Half heating value of natural gas

LFG Utilization Across Canada (IGRS)

Ontario:

- Ottawa
- Niagara
- Essex
- Moose Creek
- Mississauga

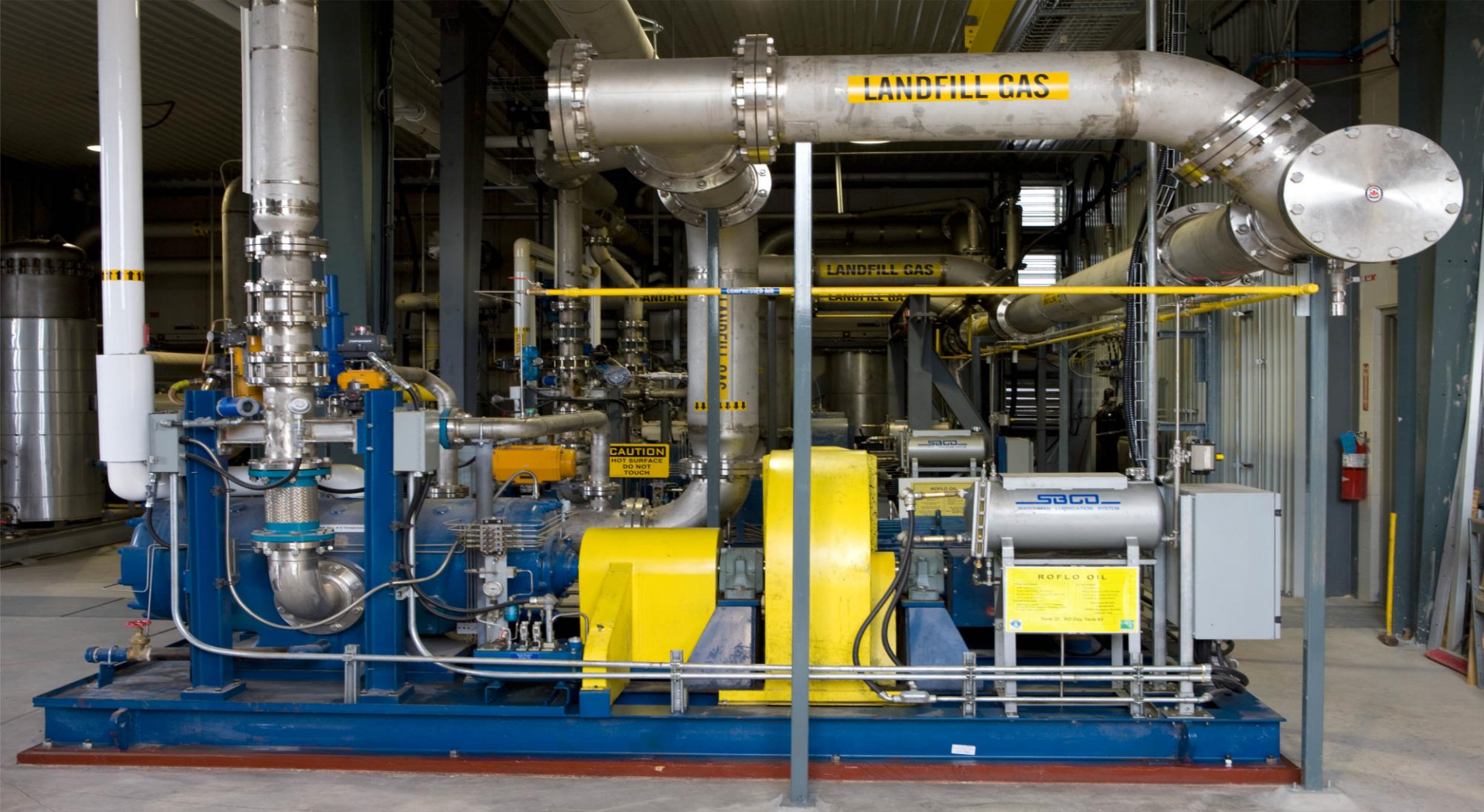
Outside Ontario:

- Brandon, MB
- Winnipeg, MB



Niagara Falls, ON





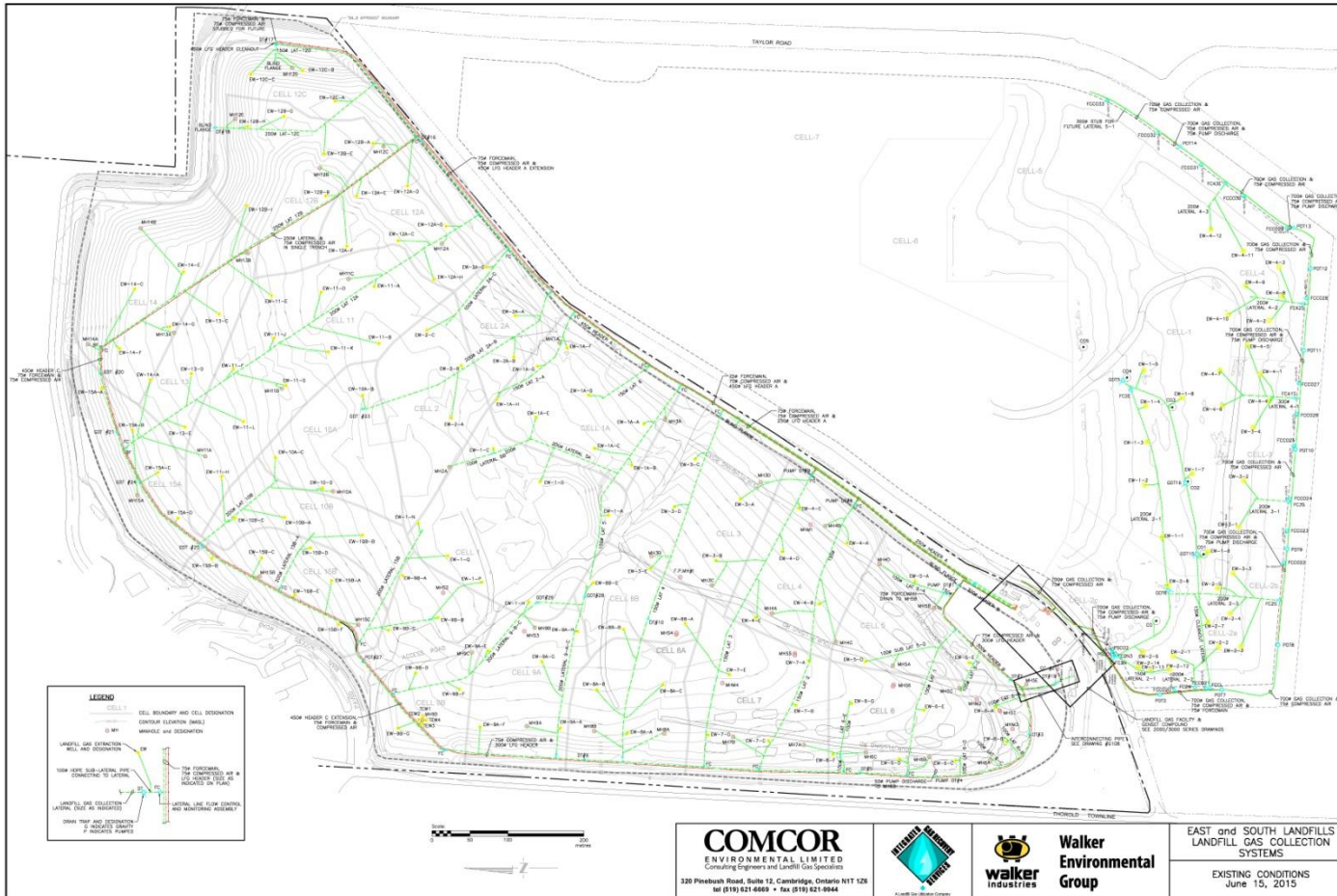
Landfill Gas Utilization

South/East Landfill - Opportunities



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The System



East Landfill

- 3565 m header pipe
- 112 well heads

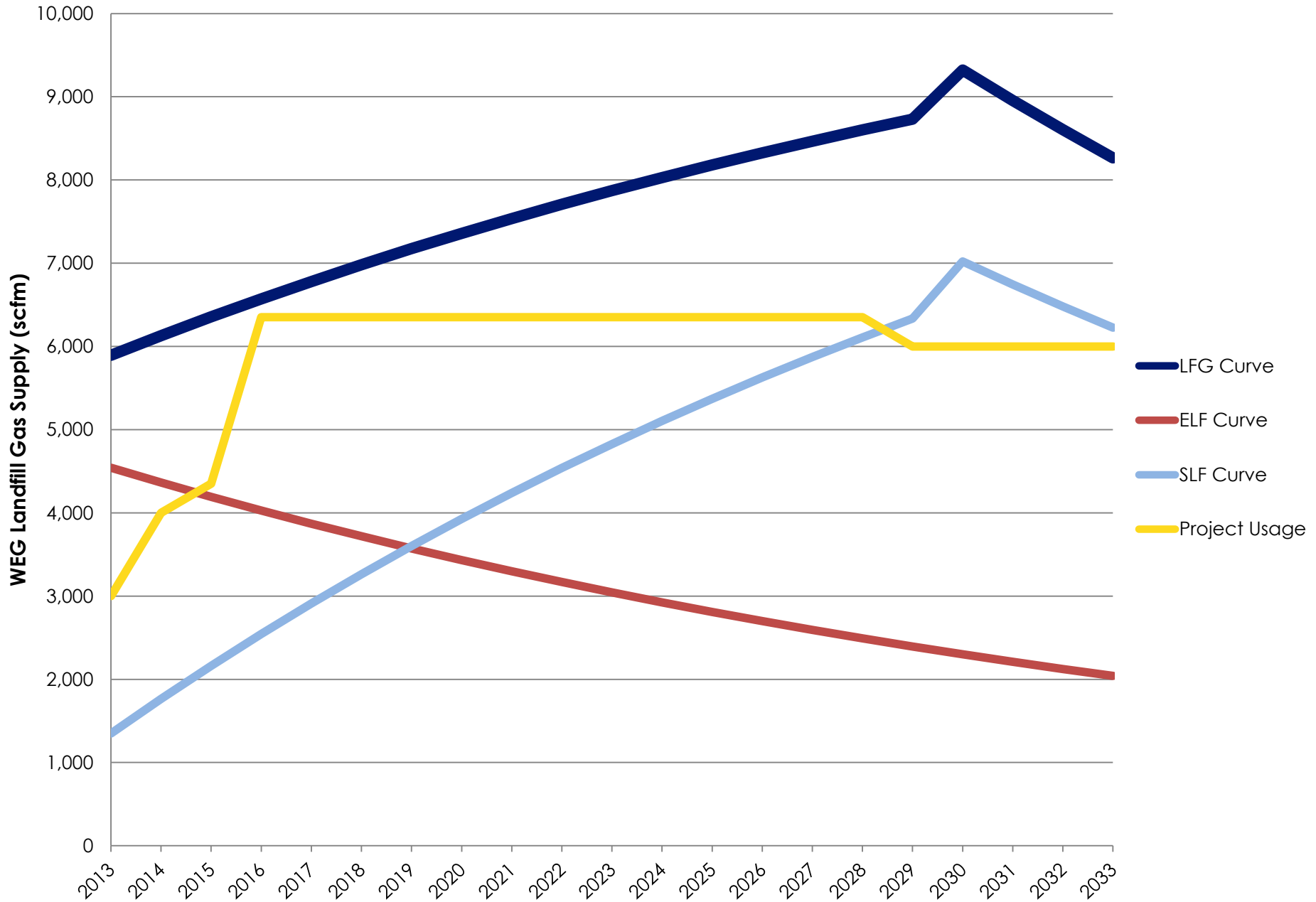
Current South Landfill

- 1382 m header pipe
- 35 well heads



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WEG Landfill Gas Curve - 20 Year Projection



Energy Production

- 1 MW FIT contract
- 12 cents/kw +/-
- 350 CFM +/-
- Siloxane treatment
- With pre-existing infrastructure and investment
 - Generates positive revenue



Pipeline to Resolute

- Two pipelines
- 2000 CFM +/-
- Displaces 60% + of NG needs (\$2-\$3m/yr sales)
- 100% recycled paper mill
- Intermittent production (Newsprint market)



ERC Credits

- 3M tonnes traded since 2007
- East only (not required by regulation)
 - Eliminated in 2016 by regulation
- Market weak at present
 - Voluntary deals. Carbon Neutral events.
- Impact of Cap & Trade in Ontario?
 - Small landfills
 - Driving voluntary LFG collection installation



Future Projects

Second Pipeline (7km)

- Multiple customers
- 5 MW of generation at remote industry with \$10M investment and pipeline contract
- Boiler fuel replacement for other customers
- Enbridge as partner (cost)
- 20 year + contract
- Cap-Ex guarantees

Pipeline Quality Gas / Vehicle Fuel

- PR value high
- Economics borderline
- Relying on RIN credits in US (problematic)
- May do demo vehicle project
 - 300 CFM
- 2x the cost of power generation
- History of equipment failures



Learnings

- Big is better – 1500 CFM and above (4-5 MW)
- 8-14 cents/kwhr to make power projects work
- Direct use should be less than 6km away (in our case government incentives for base load displacement)
- Capital intensive
- Dealing with Regulated utilities
 - Great partner, very expensive pipelines
- Customers can go out of business
 - Protections



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