

Pipeline Gas Sales for Vehicle Fuel for Clean Energy Renewable Fuels and Republic Services



Clean Energy Site – Millington, TN

A high-BTU landfill gas project is operating to provide pipeline gas from the Republic Services North Shelby Landfill in Millington, Tenn. The upgrading system is owned and operated by Clean Energy Renewable Fuels (CERF) and the product gas is injected into the natural gas grid and used as pipeline gas and as vehicle fuel.

The project in Millington is the second landfill gas project between CERF and Republic Services.

The gas compression and clean-up equipment was designed, fabricated and provided by Guild Associates and includes a single stage Molecular Gate system for impurity removal.

The plant is pre-designed to expand as the gas produced by the landfill grows over time. The initial capacity is 2800 SCFM of raw gas and the plant is designed to expand to 3300 SCFM, 3800 SCFM and finally 4800 SCFM.

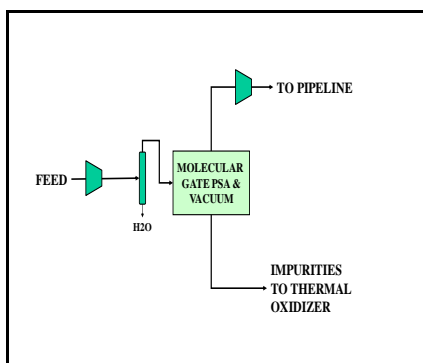
In the gas upgrading process the raw gas is compressed in Guild designed and packaged oil-flooded screw compressors. After compression the gas is sent to a single-stage Guild Molecular Gate PSA system with pipeline quality sales gas delivered at near feed pressure.

In the Molecular Gate unit the water vapor, VOC's, H₂S, siloxanes and CO₂ are removed in a single step. Heavy impurities and VOC's are non-detectable in the product and CO₂ is removed to less than 2%, to meet the pipeline requirements.

The final product is required at high pressure and the project includes product gas compression using reciprocating compressors designed and packaged by Guild.

In the Molecular Gate PSA unit the removed impurities are desorbed through vacuum pumps. The regeneration gas contains the CO₂ and heavy impurities and is routed to a thermal oxidizer.

Since the system removes H₂S and siloxanes there is no need for separate treatment for their removal, and in the Molecular Gate system, only regenerated media is used to avoid periodic media replacement.



The overall project management was provided by ET Environmental.

The Millington site now operates the 43rd Molecular Gate PSA system. To date, over 60 units have been provided including 20 units for biogas applications (landfill and digester gases).

About Guild Associates

Guild provides adsorption and catalyst systems to a variety of markets, as well as shop fabricated engineered systems. Guild Associates is the licensee of the Molecular Gate™ technology originally developed by Engelhard Corporation (now a part of the BASF Group) and has provided all systems to date.

About Clean Energy Renewable Fuels

Clean Energy (Nasdaq: CLNE) is the largest provider of natural gas fuel for transportation in North America and a global leader in the expanding natural gas vehicle fueling market. We have operations in compressed natural gas (CNG) and liquefied natural gas (LNG) vehicle fueling; construction and operation of natural gas fueling stations; compressor equipment and technology; biomethane production; and vehicle conversions. We fuel over 25,680 vehicles at 298 strategic locations across the U.S. and Canada, with a broad customer base in the refuse, transit, trucking, shuttle, taxi, airport and municipal fleet markets. For more information, visit www.cleanenergyfuels.com

About Republic Services

Republic Services, Inc. is an industry leader in the U.S. non-hazardous solid waste industry. Through its subsidiaries, Republic's collection companies, transfer stations, recycling centers and landfills focus on providing reliable environmental services and solutions for commercial, industrial, municipal and residential customers. Republic and its employees believe in protecting the planet and applying common sense solutions to customers' waste and recycling challenges. For more information, visit the Republic website at www.republicservices.com.

Contact

To learn more about Molecular Gate technology contact Michael Mitariten by phone, at 908-752-6420 or by email at mike@moleculargate.com. You can also visit us on the Internet at www.moleculargate.com.

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