

Landfill Gas Collection & Power Generation System – Frequently Asked Questions

Last Update: November 7, 2023

Table of Contents

1. Is landfill gas harmful to the environment?.....	2
2. Is landfill gas harmful to our health?.....	2
3. How will the Landfill Gas Collection System benefit the environment?	2
4. Does the project offer any other benefits to City residents?.....	2
5. How much power is produced through this process and what does the City do with it?	2
6. Why is the City selling the power instead of using it?.....	2
7. How does the Collection System work?	3
8. Are there any health or safety concerns associated with the project?.....	3
9. How large are the project components?.....	3

Landfill Gas Collection & Power Generation System – Frequently Asked Questions

Last Update: November 7, 2023

1. Is landfill gas harmful to the environment?

As landfill waste decomposes, a type of gas, called 'landfill gas' (LFG), is produced and emitted into the atmosphere. Landfill gas contains almost equal parts of methane and carbon dioxide. Methane is about 25 times more harmful to the environment than carbon dioxide. The larger the landfill is, the more gas is produced. While emissions decline year after year after a landfill is no longer in use, they continue to emit gas into the atmosphere for as long as 100 years.

2. Is landfill gas harmful to our health?

LFG is lighter than air and rises into the atmosphere. LFG contains methane and may contain trace amounts of hydrogen sulfide and volatile organic compounds (VOCs). It does not generally present a risk to public safety unless the gas is present in high concentrations or in a confined space. Safeguards such as gas monitors and ventilation systems are in place to minimize these hazards and protect workers at the facilities.

3. How will the Landfill Gas Collection System benefit the environment?

The facility reduces annual greenhouse gas emissions by over 50,000 tonnes per year. That's equivalent to removing over 10,000 vehicles from our roadways each year.

4. Does the project offer any other benefits to City residents?

Yes, the air quality at the Landfill will be improved and odours in the area will be reduced.

5. How much power is produced through this process and what does the City do with it?

The total electricity generated is enough to power approximately 1,200 homes each year. This electricity is sold to SaskPower generating approximately \$1.3 million in annual revenues which help pay for the project. Thereafter, all profits will go back to the City to fund additional green energy projects.

6. Why is the City selling the power instead of using it?

The Landfill Gas Collection System was one of 20 projects selected in the SaskPower Green Options Partners Program Lottery in June 2011. The program allows power producers with generator capacities between 100 kilowatts and 10 megawatts to generate and sell environmentally preferred (e.g., biogas, heat recovery, low-impact hydro, solar, and wind, etc.) electricity to SaskPower.

A 20-year economic analysis indicates it is more advantageous to sell the electricity from the Landfill Gas Collection System to SaskPower, than to interconnect with Saskatoon Light & Power's distribution system.

Landfill Gas Collection & Power Generation System – Frequently Asked Questions

Last Update: November 7, 2023

7. How does the Collection System work?

A clay cover, or 'cap' was installed over a section of the landfill. Once the cap was in place, vertical gas wells were drilled into the waste, and interconnected with underground piping. A vacuum compressor collects the gas and pipes it to a blower/flare station, where it is either piped to the power generation facility or combusted in a flare. During this process, the methane is converted to carbon dioxide, a less harmful greenhouse gas.

8. Are there any health or safety concerns associated with the project?

Local air quality at the Landfill has improved as a result of the project by capturing and thermally destructing the methane that were already occurring from the Landfill.

Exhaust is emitted from the facility when in use, however these emissions must comply with the Clean Air Act in the Province of Saskatchewan, which regulates emissions from fuel burning equipment. Air dispersion modeling has been completed as part of the Environmental Screening for the project.

Also, similar to any industrial facility that processes or uses a combustible gas, the power generation facility was designed to include combustible gas detection instruments that shut down equipment if elevated concentrations of combustible gas are detected. All equipment in the vacuum compressor building was also designed to meet Canadian Electrical Code requirements.

9. How large are the project components?

The Power Generation Facility is enclosed with fencing and is located near the SaskEnergy regulating station west of the landfill and is home to the electrical substation equipment and a 3,400 square foot industrial building.

The Gas Collection Facility is a fenced area and includes a 2,400 square foot building located at the entrance to the Landfill. The gas flare stands 40 feet high.

Landfill Gas Collection & Power Generation System – Frequently Asked Questions

Last Update: November 7, 2023

Building the Landfill Gas Collection & Power Generation Systems



**Building the City of Saskatoon
LANDFILL GAS COLLECTION SYSTEM**




LANDFILL CAPPING (2011)

A clay cover or "cap" was installed over a section of the landfill to prevent naturally occurring gases from being released into the atmosphere.

A 12 hectare area of the landfill was covered with a 450 mm (18") cap of compacted clay-like soil.

Approximately 53,000 cubic metres (69,300 cubic yards) of soil was used.

Canada  This project is jointly funded by:  


**Building the City of Saskatoon
LANDFILL GAS COLLECTION SYSTEM**

WELL DRILLING (2012)

Vertical gas collection wells were drilled through the clay cover and into the waste to collect landfill gases. The wells are connected to a vacuum compressor that draws gases from the landfill.

29 vertical wells were installed. The deepest well is 30.8 metres (101 feet).



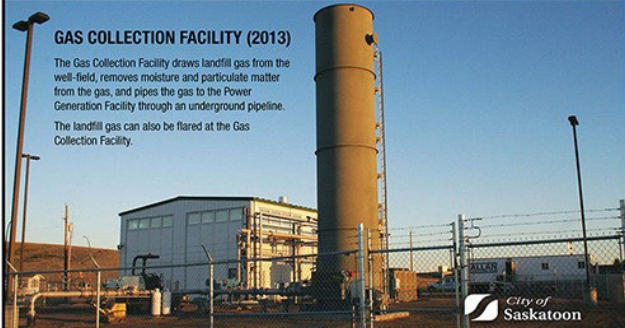




**Building the City of Saskatoon
LANDFILL GAS COLLECTION SYSTEM**

GAS COLLECTION FACILITY (2013)

The Gas Collection Facility draws landfill gas from the well-field, removes moisture and particulate matter from the gas, and pipes the gas to the Power Generation Facility through an underground pipeline.

The landfill gas can also be flared at the Gas Collection Facility.





**Building the City of Saskatoon
LANDFILL GAS COLLECTION SYSTEM**

PIPELINE INSTALLATION (2013)

A network of pipelines installed underground collect the gas and transport it to the Power Generation Facility.

Four different pipelines are in place: Utilization (for power generation), Gas Collection, Compressed Air (for operating condensate pumps), and the Well-field Foremain (for condensate disposal). Condensate is liquid that condenses out of the gas as it cools.

4,200 metres (13,800 feet) of piping was installed underground.

