

## Landfill Gas Project Update

### ISSUE

Saskatoon Light & Power (SL&P) and Water and Waste Operations (WWO) implemented the Landfill Gas (LFG) Project in April 2014. This report provides an update on its performance to date, highlights some of the challenges faced during operations, and discusses the future plans for the project.

### BACKGROUND

June 2009	City Council adopted the Energy and Greenhouse Gas Management Plan to achieve a diverse and environmentally sustainable energy system using local renewable energy supplies. Implementation of the LFG Project was identified as an action.
2010	The City of Saskatoon (City) received \$5.05 million of Government of Canada funding through the Canada-Saskatchewan Provincial-Territorial Base Fund, to implement the LFG Project which included: <ul style="list-style-type: none"><li>• Landfill Gas Collection System (LFG-Collection System); and</li><li>• Landfill Gas Power Generation Facility (LFG-Power Generation Facility).</li></ul> City Council approved implementation of the LFG Project.
2011	City Council approved the Landfill Optimization Project, which provided funding for the ongoing operation and maintenance of the Saskatoon Landfill, and help it reach its full capacity.
2013	The LFG-Collection System was commissioned by WWO and comprised of 29 vertical wells, interconnected piping, a compression and treatment facility, and an enclosed flare to collect and destroy landfill gas.
2013	City Council approved the sale of renewable electricity from the LFG-Power Generation Facility to SaskPower through the Green Options Partner Program until 2034.
2014	The LFG-Power Generation Facility was commissioned by SL&P and comprised of two 815-kilowatt gas engine generators.
2018	City Council approved a new reserve contribution to the Landfill Replacement Reserve to provide for sustainable funding to implement the Landfill Optimization Project.
2018	Two additional horizontal extraction wells were added to the LFG-Collection System to increase collected landfill gas volumes. These wells will be able to be put in service once sufficient waste is placed above them, anticipated in fall 2022. The project cost was \$325,000.
2019	An air-fuel controller was added at the LFG-Power Generation Facility to improve operation under low methane concentration percentages in the landfill gas. The project cost was \$120,000.
2020	12 additional vertical extraction wells were added to the LFG-Collection System to increase collected landfill gas volumes. The project cost was \$1,444,000.
Spring 2021	City Council approved \$4.02 Million for phase 1 of the Landfill Gas Expansion Project, which includes \$2,742,500 from the Investing in Canada Infrastructure Program.

### Future Landfill Gas Work

As the Saskatoon Landfill grows, it will continue to produce and release landfill gas into the atmosphere if it is not collected and destroyed. Future projects will be undertaken to mitigate the environmental impacts from the operation and existence of the landfill.

Expansion of the LFG-Collection System is included in the Integrated Landfill Management Plan with expansions planned to be funded from landfill tipping fee contributions to WWO reserves.

### **CURRENT STATUS**

The LFG Project achieves the following benefits:

- Reduction of emissions from the Saskatoon Landfill through the collection and destruction of landfill gas generated by the decomposition of organic waste. Landfill gas contains approximately 50% methane (CH<sub>4</sub>) which is twenty-five times more potent than carbon dioxide (CO<sub>2</sub>);
- Processing and distribution of landfill gas between all facilities;
- Combustion of landfill gas using two gas engine generators to produce electricity which is sold to SaskPower until 2034;
- Flaring of unutilized landfill gas when power generation is not possible; and
- Control of flue gas emissions from LFG Project facilities in accordance with Ministry of Environment regulations.

A summary of the LFG Project's environmental and operational performance is shown in the table below. A detailed LFG Project proforma is provided in Appendix 1.

Year	Total Gas Collected (Million SCF)	Average CH <sub>4</sub> (%)	Average Flow Rate (SCFM)	Gas Utilization (%)	Total Gas Flared (Million SCF)	Landfill Emissions Reduction (tonnes CO <sub>2</sub> e)	Total Energy Generated (GWh)
2014	193	52	438	74	50	50,193	8
2015	204	57	443	90.1	20	53,622	11
2016	213	57	422	98.0	4	55,794	12
2017	200	57	382	84.1	32	52,423	9
2018	195	56	376	78.4	42	49,946	9
2019	189	53	375	78.1	42	46,920	8
2020	204	51	387	94.9	10	47,718	11
2021	216	52	411	83.8	35	51,870	10

Preliminary engineering is underway for the Landfill Gas Expansion project that was approved by City Council in the spring of 2021. Further reporting on the project will occur once details are finalized.

### **DISCUSSION/ANALYSIS**

The final cost of the LFG Project was \$13.5 million. Approximately \$5.05 million was funded by the Government of Canada, through the Canada-Saskatchewan Provincial-

Territorial Base Fund, and \$8.45 million was funded from SL&P and WWO reserves. The original financial model projected annual revenues of \$1.3 million from the sale of electricity to SaskPower, and an operating expense of approximately \$400,000, allowing for repayment of approximately \$900,000 to the reserves annually. This would have resulted in a simple payback period of about nine years.

As seen in the LFG Project proforma report in Appendix 1, the LFG Project has experienced lower than expected revenues and higher expenses. Revenues are generated through the sale of electricity to SaskPower. Over the years, revenues have fluctuated for the following factors:

- Gas volumes and methane concentration have been lower than originally predicted;
- Reoccurring SaskPower maintenance on the transmission line caused unexpected shutdowns of the generators;
- The cost of specialized generator maintenance has increased significantly, with fewer qualified contractors available in the market;
- The generators encountered numerous outages caused by different fault conditions; and
- Generator shutdowns for any of these reasons resulted in a revenue loss of approximately \$45 per hour for each generator.

Efficiencies have been incorporated into the project to improve revenues including:

- Installation of an air/fuel controller in the LFG-Power Generation Facility in 2019, to allow generator operation with lower methane levels;
- Expansion of the collection wells in the LFG-Collection System in 2020, to improve gas volumes;
- Improved coordination of facility maintenance and transmission line downtime with SaskPower;
- Reduction in contractor maintenance costs by undertaking more work internally; and
- Improvement with monitoring systems to automatically restart generators after facility trips.

### Carbon Offset Program

In 2020 the Saskatchewan Ministry of Environment started development of the Saskatchewan Greenhouse Gas Offset program and the Government of Canada is currently working on its own offset program. Landfill gas projects are one type of protocol that can be included in offset programs, but are subject to many eligibility criteria, and so projects are evaluated on a case-by-case basis depending on the protocol.

Further information on the Saskatchewan GHG Offset program was provided to City Council in August 2021.

### **FINANCIAL IMPLICATIONS**

The proforma presented in Appendix 1 shows that in 2034, approximately \$538,000 will still be owing on the original loan that funded the project. Power generation and

revenue after 2034 is dependent on obtaining new power supply contracts, allowing for further loan payments.

Beyond 2034, GHG emission reduction will remain possible as the infrastructure for landfill gas collection will still be in place. The LFG-Collection System will continue to destroy gas from the landfill and provide the associated environmental benefit.

### **ENVIRONMENTAL IMPLICATION**

The LFG-Collection System has reduced emissions from the Saskatoon Landfill by approximately 50,000 tonnes of CO<sub>2</sub>e each year, which is equivalent to removing 10,800 cars from the road annually. The LFG-Power Generation Facility has generated approximately 10 gigawatt-hours of renewable electricity each year, which is equivalent to powering 1,200 homes annually.

Community emissions associated with waste for 2019 were 144,703 tonnes CO<sub>2</sub>e, which is calculated before 46,920 tonnes of CO<sub>2</sub>e were destroyed through LFG capture (waste emissions reduced by 32%). 46,920 tonnes of CO<sub>2</sub>e from LFG capture represents 1.52% of the 2050 GHG reduction target (3,081,800 tonnes CO<sub>2</sub>e reduced over 2014 emissions). The LFG-Collection System reduced Landfill GHG emissions by about 35% since commissioning in 2014.

The LFG Project's landfill final cover and extraction systems also help reduce odours and other hazards associated with the emission of LFG coming from the landfill to surrounding areas.

### **TRIPLE BOTTOM LINE IMPLICATIONS**

A triple bottom line review was performed on this project and is included as Appendix 3. In addition to the significant environmental benefits, the project has indirect benefits in improving air quality, prevention of potential health and wellbeing implications by the reduction of GHG emissions and odours. The project has also been instrumental in creating jobs, adding significant increases in local economic output and tax revenue within the region.

The following are future considerations and potential improvements:

- The amount of gas will decrease over time with usage and increased organic waste diversion; however, the system is designed for long-term use;
- Install additional equipment to maximize power generation and allow flexibility to simultaneously burn excess gas production; and
- Sale of carbon credits is being investigated.

### **OTHER IMPLICATIONS**

There are no privacy, legal or social implications identified.

## **NEXT STEPS**

The Administration will bring forward reports regarding further development opportunities for expanding the LFG Project and participation in the Saskatchewan GHG Offset program at the appropriate time.

## **APPENDICES**

1. Landfill Gas Project Proforma
2. Landfill Gas Project Photographs
3. Landfill Gas Project Triple Bottom Line Review

### Report Approval

Written by: Akinniyi Akinpelu, Senior Project Management Engineer  
Oreva Oboghor, Sustainable Electricity Engineer  
Jose Cheruvallath, Metering and Sustainable Electricity Manager  
Dan Gauthier, Environmental Projects and Protection Manager

Reviewed by: Brendan Lemke, Director of Water and Waste Operations  
Trevor Bell, Director of Saskatoon Light & Power

Approved by: Angela Gardiner, General Manager, Utilities and Environment

Admin Report - Landfill Gas Project Update.docx

## Appendix 1- Landfill Gas Project Proforma

**Project Proforma (2014 to 2034)**

<b>Category</b>	<b>2014<sup>(1)</sup></b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022<sup>(2)</sup></b>	<b>2023<sup>(2)</sup></b>	<b>2024<sup>(2)</sup></b>
<b>Emissions</b>											
GHG Reduction (tonnes of CO <sub>2</sub> equivalent)	(50,193)	(53,622)	(55,317)	(52,423)	(49,946)	(46,920)	(47,718)	(51,870)	(50,700) <sup>(3)</sup>	(65,740) <sup>(4)</sup>	(64,284)
<b>Revenues</b>											
Electricity Sale	\$847,997	\$1,121,420	\$1,274,984	\$919,449	\$937,794	\$972,453	\$1,210,149	\$1,151,408	\$1,249,946	\$1,335,609	\$1,363,730
<b>Costs</b>											
Power Generation Plant Operation & Maintenance (O&M)	(\$239,125)	(\$421,426)	(\$465,123)	(\$599,843)	(\$462,289)	(\$289,028)	(\$504,931)	(\$789,982)	(\$781,031)	(\$422,790)	(\$431,159)
Collection System O&M	(\$308,215)	(\$264,888)	(\$393,708)	(\$289,978)	(\$312,546)	(\$357,312)	(\$309,662)	(\$299,170)	(\$305,154)	(\$311,257)	(\$317,482)
<b>Total</b>	<b>(\$547,340)</b>	<b>(\$686,314)</b>	<b>(\$858,831)</b>	<b>(\$889,821)</b>	<b>(\$774,835)</b>	<b>(\$646,340)</b>	<b>(\$814,593)</b>	<b>(\$1,089,152)</b>	<b>(\$1,086,184)</b>	<b>(\$734,047)</b>	<b>(\$748,641)</b>
<b>Reserve Repayment</b>											
Reserve Payment	\$300,657	\$435,106	\$416,153	\$29,628	\$162,959	\$326,113	\$395,556	\$62,256	\$163,762	\$601,562	\$615,089
Outstanding Balance	(\$8,149,342)	(\$7,714,236)	(\$7,298,083)	(\$7,268,455)	(\$7,105,495)	(\$6,779,381)	(\$6,383,825)	(\$6,321,571)	(\$6,157,809)	(\$5,556,247)	(\$4,941,158)
<b>Category (Con't)</b>											
	<b>2025<sup>(2)</sup></b>	<b>2026<sup>(2)</sup></b>	<b>2027<sup>(2)</sup></b>	<b>2028<sup>(2)</sup></b>	<b>2029<sup>(2)</sup></b>	<b>2030<sup>(2)</sup></b>	<b>2031<sup>(2)</sup></b>	<b>2032<sup>(2)</sup></b>	<b>2033<sup>(2)</sup></b>	<b>2034<sup>(2)</sup></b>	<b>Total*</b>
<b>Emissions</b>											
GHG Reduction (tonnes of CO <sub>2</sub> equivalent)	(62,829)	(61,373)	(60,039)	(58,584)	(57,128)	(55,673)	(54,217)	(52,762)	(51,306)	(17,556) <sup>(5) (6)</sup>	(1,116,259)
<b>Revenues</b>											
Electricity Sale	\$1,316,633	\$1,344,269	\$1,447,062	\$1,477,527	\$1,435,793	\$1,465,955	\$1,564,873	\$1,597,742	\$1,542,628	\$384,410	<b>\$25,977,586</b>
<b>Costs</b>											
Power Generation Plant O&M	(\$657,526)	(\$669,421)	(\$459,450)	(\$466,837)	(\$840,248)	(\$857,042)	(\$495,351)	(\$506,429)	(\$768,924)	(\$196,577)	<b>(\$11,324,532)</b>
Collection Facility O&M	(\$323,831)	(\$330,308)	(\$336,914)	(\$343,652)	(\$350,526)	(\$357,536)	(\$364,687)	(\$371,980)	(\$379,420)	(\$96,752)	<b>(\$6,724,978)</b>
<b>Total</b>	<b>(\$981,357)</b>	<b>(\$999,729)</b>	<b>(\$796,364)</b>	<b>(\$810,489)</b>	<b>(\$1,190,774)</b>	<b>(\$1,214,579)</b>	<b>(\$860,038)</b>	<b>(\$878,409)</b>	<b>(\$1,148,344)</b>	<b>(\$293,329)</b>	<b>(\$18,049,510)</b>
<b>Reserve Repayment</b>											
Reserve Payment	\$335,276	\$344,540	\$650,698	\$667,038	\$245,020	\$251,376	\$704,835	\$719,333	\$394,284	\$91,081	<b>\$7,912,320</b>
Outstanding Balance	(\$4,605,882)	(\$4,261,342)	(\$3,610,645)	(\$2,943,606)	(\$2,698,587)	(\$2,447,211)	(\$1,742,376)	(\$1,023,043)	(\$628,759)	(\$537,679)	<b>(\$537,679)</b>

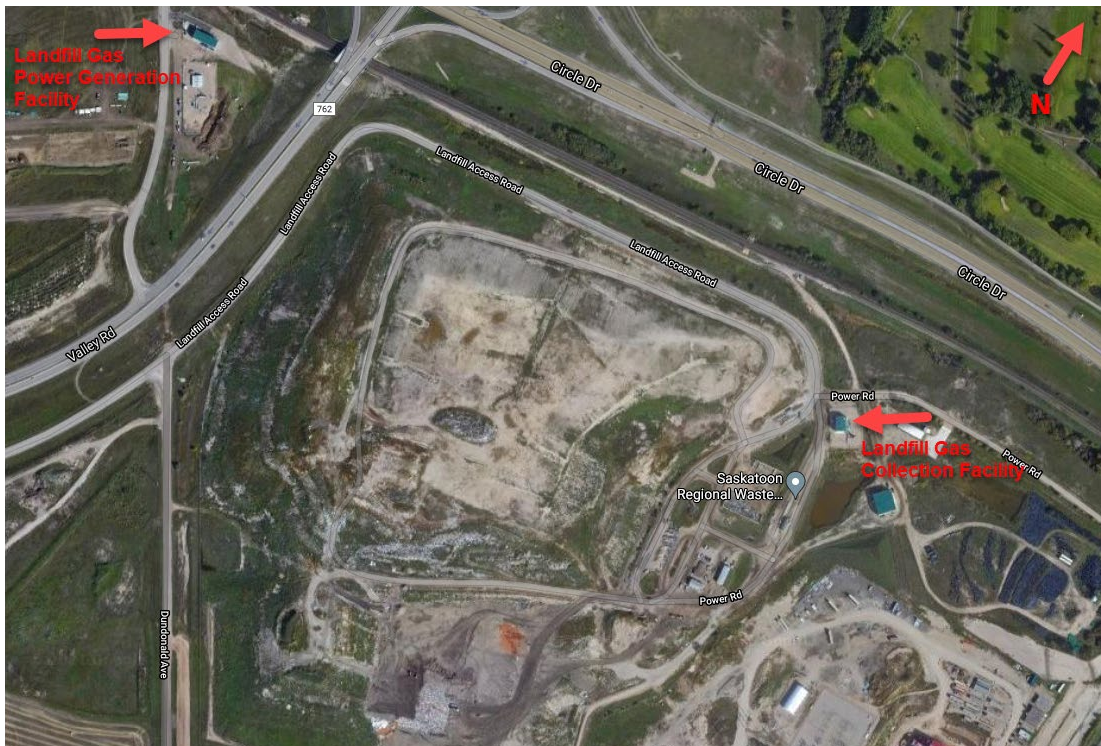
## Notes:

Proforma report aligns with SaskPower power purchase contract term (April 1, 2014 to April 1, 2034). GHG reduction is accounted for by summing up the gas destroyed in producing electricity and by flaring. Future Landfill Gas Collection System and Power Generation Facility expansions are not included as impacts to project are unknown at this time.

- (1) Values are for partial year only based on power purchase agreement term with SaskPower.
- (2) Values estimated for given year. Major maintenance work in 2021, 2022, 2025, 2026, 2029, 2030, 2033 and 2034 on the generators will reduce income and increase expenses.
- (3) GHG destruction forecast values from 2022 have been estimated in reference to the approved Landfill Gas Master Plan, the recent Landfill Gas Extraction Forecast Study (December 2021) and updated field performance and revised Waste Quantities and Qualities Post Organics Program in 2023.
- (4) In 2023, 2 new horizontal wells to extract more gases would be added, and more gases can be destroyed via a Low Flow Flaring Mechanism Project to be undertaken. This extra low flow gases would amount to more reduction in GHG only, as the 2 engines combustion capacities for power generation cannot be increased.
- (5) GHG reduction is estimated for partial year based on power purchase agreement term with SaskPower expiring on April 1, 2034. Full year is forecasted to be 69,001 tonnes CO<sub>2e</sub>.
- (6) Beyond 2034, GHG emission reduction will remain possible as the Landfill Gas Collection Facility has enough flaring capacity to continue destroying gas from the landfill and generate environmental benefits.

# Landfill Gas Project Photographs

## 1. Landfill Gas Project Location





## 2. Landfill Gas Collection System

Landfill Gas Collection Building and Flare Stack



Biogas well in landfill



Biogas pipes through landfill

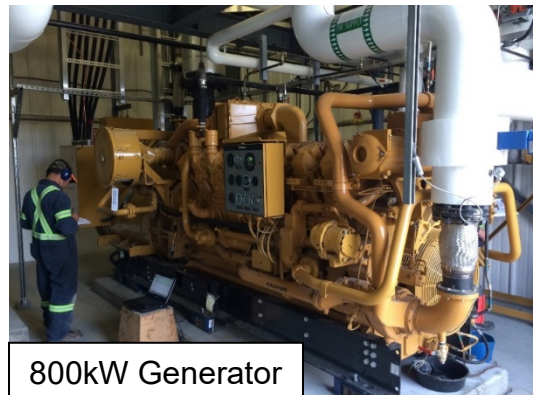


### 3. Landfill Gas Power Generation Facility

Landfill Gas Power Generation Building



Twin Generators



800kW Generator

## **Triple Bottom Line Review – Landfill Gas Project**

### **Process and Methodology**

Administration used the City of Saskatoon's Triple Bottom Line (TBL) Decision Making Tool in order to comply with *Council Policy C08-001 - Triple Bottom Line*. Further work was also carried out to align this review with recent updates to the TBL framework.

In conducting the review, the Administration relied on the expertise of the Project Team and Subject Matter Experts from the Saskatoon Light & Power, Water and Water Operations and Sustainability, as well as conducted research on industry's best practices.

This review is meant to be a high-level way to identify the initiative's environmental, social, economic, and governance outcomes, as well as to identify opportunities to achieve even greater sustainability benefits. The results are meant to support ongoing decision making, rather than be relied upon as a fixed sustainability evaluation.

### **Caveats and Limitations:**

- Some TBL areas were considered out of scope, including items that were not contingent on and/or influenced by the initiative.
- The narrow scope of the project has impacted the initiative's ability to achieve higher TBL outcomes in certain areas as they were largely unrelated: Environmental Health and Integrity Indicators related to the broader environment and community, and Social Equity and Cultural Wellbeing Indicators related to diversity, inclusion, civic participation, and recreation.

### **Results & Findings**

Overall, the results of Administration's TBL review indicate that the Landfill Gas Project increases TBL benefits. A summary of results for each TBL principle and indicator are included in the subsequent sections of this document.

## **Principle: Environmental Health and Integrity**

<b>Indicator</b>	<b>TBL Outcomes</b>
Renewable Energy	<ul style="list-style-type: none"> <li>This is considered renewable energy. Landfill Gas (LFG) is a natural by product of the decomposition of organic material in the landfill. The methane collected has been used to power two generators for the generation of electricity.</li> </ul>
Conservation of Resources	<ul style="list-style-type: none"> <li>This produces energy from the natural decomposition of organic waste material that could be emitted naturally if nothing is being done, rather than from the mining of fossil fuels like coal to generate power. This will reduce dependence on fossil fuel usage.</li> </ul>
Climate Change Mitigation and Adaptation	<ul style="list-style-type: none"> <li>The system collects methane that is a more potent greenhouse gas than carbon dioxide from been emitted to the atmosphere. Extracting gas from landfill and converting it to power displaces greenhouse gases.</li> <li>This mitigates pollution risks to the community. It prevents leaching into ground water. It also prevents explosions from occurring from gas buildup.</li> </ul>
Green Buildings and Sustainable Land Use	<ul style="list-style-type: none"> <li>The building is already an existing City property, so no construction is required.</li> <li>There are gas monitors in every indoor space that shut down the plant in the event of gas release.</li> <li>Landfill gas generation will continue after the landfill has been decommissioned. There is an opportunity to reuse the existing infrastructure.</li> </ul>
Sustainable Transportation	<ul style="list-style-type: none"> <li>Not Applicable</li> </ul>
Healthy Ecosystems	<ul style="list-style-type: none"> <li>Collecting the landfill gas would prevent air pollution in Saskatoon.</li> <li>The system reduces odour at the landfill. The Montgomery neighbourhood is affected by odour, and this reduces that nuisance.</li> </ul>
Clean Air, Water, and Land	<ul style="list-style-type: none"> <li>The facility collects greenhouse gases that would have been emitted as fugitive emission from the landfill. This is mostly methane gas.</li> <li>The existing facility is situated in an underutilized property near the landfill.</li> </ul>
Waste Reduction and Diversion	<ul style="list-style-type: none"> <li>The by-product of the organic waste decomposition is landfill gas.</li> </ul>
Storm Water Management	<ul style="list-style-type: none"> <li>Not applicable</li> </ul>
Sustainable Food System	<ul style="list-style-type: none"> <li>Not applicable</li> </ul>

### **For Further / Future Consideration**

- The system currently either sends the landfill gas to the generators or to the flare. In the future a mixing valve can be installed to maximize power. This would allow flexibility in operation.
- The amount of gas will decrease over time with usage and also with diversion of organic waste away from the landfill. The effect of diversion is yet to be seen but is

necessary to allow the landfill to not fill up as fast and require a new site to be established.

**Principle: Social Equity and Cultural Wellbeing**

<b>Indicator</b>	<b>Outcomes</b>
Equity and Opportunity	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>
Diversity and Inclusion	<ul style="list-style-type: none"> <li>• The workforce for the facility follows the City's diversity policy.</li> </ul>
Heritage, Arts, and Culture	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>
Self Sufficiency and Living with Dignity	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>
Health and Wellbeing	<ul style="list-style-type: none"> <li>• This reduces odour and hazardous gases at landfill.</li> </ul>
Safety and Resiliency	<ul style="list-style-type: none"> <li>• We have citizens entering the landfill so reducing hazardous gases mitigates potential for fires and explosions.</li> <li>• The original project did not go through CPTED.</li> <li>• The City is currently working on emergency plans.</li> </ul>
Civic Participation	<ul style="list-style-type: none"> <li>• This is not applicable because it isn't a publicly accessible facility.</li> </ul>
Recreation	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>

**For Further / Future Consideration**

- If there is future expansion to the facility a CPTED review should be conducted

**Principle: Economic Benefits**

<b>Indicator</b>	<b>TBL Outcomes</b>
Innovation	<ul style="list-style-type: none"> <li>• This was a new innovation for the city in 2014.</li> </ul>
Sustainable Procurement	<ul style="list-style-type: none"> <li>• The landfill uses the City's procedures for using the diverse and indigenous suppliers.</li> </ul>
Financial Planning and Resourcing	<ul style="list-style-type: none"> <li>• There is a system in place to track and report expenses to optimize finances.</li> <li>• Life cycle costs are important for this project. There is an asset management plan in place.</li> <li>• The City considered many funding sources.</li> <li>• The City is continuously looking at ways to increase revenue and reduce operating costs.</li> <li>• The City is continuously looking at ways to increase revenue and pay off the project (reserve borrowing).</li> <li>• The City received a federal government grant for the project which made the project possible.</li> <li>• This project received a grant and is using reserve funds, with no borrowing.</li> </ul>

	<ul style="list-style-type: none"> <li>The City is investigating the sale of carbon credits.</li> </ul>
Affordability for Users	<ul style="list-style-type: none"> <li>The project is still in the process of paying off the loan in order to have positive revenue for city.</li> </ul>
Support the Local Economy	<ul style="list-style-type: none"> <li>City employees are needed for maintenance and operating of the generator and the landfill facility.</li> <li>There have been groups interested in coming for tours during conferences.</li> </ul>
Asset Management	<ul style="list-style-type: none"> <li>Workers are trying to prevent stranded assets through planning processes.</li> <li>It is possible to use heat from the system. This would help to provide more value and benefits.</li> <li>The system is designed for long term use and the City is trying to keep the system operational as long as possible.</li> <li></li> </ul>
Skills and Training	<ul style="list-style-type: none"> <li>The project provides city jobs, includes training on engines.</li> <li>The University of Saskatchewan provides data. Students have gone on field trips to facility.</li> </ul>
Labour Rights and Employment	<ul style="list-style-type: none"> <li>OH&amp;S is critical to the work and activities on the project.</li> <li>This project helps reduce exposure to hazardous gas.</li> <li>This project provides some maintenance and operating jobs. Upgrading of knowledge is also necessary.</li> </ul>

- Other Notes**
- A detailed budget / financial analysis is included in the body of the report.

**Principle: Good Governance**

Indicator	TBL Outcomes
Ethical and Democratic Governance	<ul style="list-style-type: none"> <li>This project aligns with the City's strategic plan and follows city policies. The facility is permitted to operate by the provincial government and the operating requirements follows the federal and provincial reporting regulations.</li> <li>The operation and expansion of this facility is an action from the City's Low Emissions Community Plan.</li> <li>Decisions are been made among stakeholders across departments and top management with the final approval from Council.</li> <li>All decision-making processes align with the City's values and workplace transformation strategy.</li> </ul>
Effective Service Delivery	<ul style="list-style-type: none"> <li>There are workplace transformation strategies to monitor, audit and update policies and procedures.</li> <li>The facility operations and project follow the corporate risk management model which is based on ISO 31000 Risk Management Standard for continuous improvement.</li> </ul>

	<ul style="list-style-type: none"> <li>The green power generated as a result of the existing infrastructure is been supplied to SaskPower's grid as clean electricity.</li> </ul>
Education, Communication, Engagement, Capacity Building	<ul style="list-style-type: none"> <li>Employees from Water and Waste Operations, Saskatoon Light &amp; Power and Sustainability divisions are engaged as part of the facility operations.</li> <li>There were community engagements during the conceptual stage of the existing project.</li> <li>There is consistent communication among internal stakeholders by holding regular quarterly meetings, while the external stakeholders are been informed on the operations by submitting annual reports and operations plans.</li> <li>LFG employees have received training and updating their knowledge. There is also an opportunity for employees across the organization to develop their skills by joining the LFG on-call support team.</li> <li>The existing facility is currently operated solely by the City but there is collaborative decision making with subject matter experts on safety and specialized operational areas which develops internal capacity.</li> </ul>
Monitoring, Reporting and Compliance	<ul style="list-style-type: none"> <li>There is a system in place for conducting real time inspections to monitor and track performance in order to optimize the process.</li> <li>The operation utilizes standard project management methodology in executing projects and preparing reports</li> <li>The operation adheres to and is in compliance with the specified reporting parameters from the provincial and federal regulatory authorities.</li> <li>LFG employees are member of the Solid Waste Organization of North America, where research and industry best practices are been shared and applied to operations.</li> <li>The LFG operation follows the city's reporting incident system that tracks accidents and provide recommendation to forestall future occurrences.</li> </ul>
Agility and Adaptiveness	<ul style="list-style-type: none"> <li>The LFG facility is a 24-hour operation therefore there is an afterhours on-call support schedule to keep operations functioning and responding to alarms.</li> <li>The City is looking at ways to continuously improve. The LFG is in a strategically position to align with federal programs and provincial policies.</li> <li>The City has plans for unexpected events to mitigate them.</li> <li>The City is able to do modelling on emissions from the generator. Workers are looking at ways to remain compliant to regulations and use the best options.</li> </ul>
Roles, Responsibilities and Rewards	<ul style="list-style-type: none"> <li>The City should be promoting this environmental beneficial project by showing CO2 emission reductions and more.</li> </ul>