Ministry of Energy and Resources

The Oil and Gas Emissions Management Regulations 2021 Annual Emissions Report

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Letters of Transmittal

The Honourable Bronwyn Eyre
Minister of Energy and Resources

Office of the Lieutenant Governor of Saskatchewan

I respectfully submit the Annual Emissions Report for *The Oil and Gas Emissions Management Regulations*, pursuant to section 53.63 of *The Oil and Gas Conservation Act*, for the calendar year ending December 31, 2021.

The Honourable Bronwyn Eyre
Minister of Energy and Resources

Susanna Laaksonen-Craig
Deputy Minister of Energy and Resources

The Honourable Bronwyn Eyre
Minister of Energy and Resources

Dear Minister:

I respectfully submit to you the Annual Emissions Report for *The Oil and Gas Emissions Management Regulations*, for the calendar year ending December 31, 2021.

Susanna Laaksonen-Craig
Deputy Minister of Energy and Resources

Summary

The Oil and Gas Emissions Management Regulations 2021 Annual Report provides background on Saskatchewan's upstream oil and gas emissions reduction program, fulfills legislated reporting requirements and highlights emissions reduction progress for the 2021 calendar year. The 2021 calendar year is the second year of required emissions reductions under *The Oil and Gas Emissions Management Regulations* (OGEMR) and the second year of associated annual emissions reporting.

This report satisfies reporting requirements outlined in section 20(1) of OGEMR. OGEMR was created pursuant to section 53.61 of *The Oil and Gas Conservation Act* and came into force January 1, 2019. The Minister of Energy and Resources is required, through section 53.63(3) of the Act, to submit any report prepared pursuant to this section, to the Legislative Assembly of Saskatchewan.

Key Highlights for 2021

- Provincial emissions from venting and flaring at upstream oil facilities were 4.4 Mt CO_2e, which is a 6.5 Mt (60%) reduction from 2015 levels.
- Provincial emissions from venting and flaring at upstream oil facilities decreased by 0.8 Mt or 15% from 2020 levels.
- 2021 results continue to demonstrate that the upstream oil and gas emissions reduction commitment laid out in *Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy* has been met and will likely be exceeded.
- OGEMR is part of an equivalency agreement on methane emissions with the federal government of Canada. OGEMR provides flexible, results-based regulations that allows industry to achieve greater emissions reduction at a significantly lower cost than the federal equivalent.

Background

Purpose of OGEMR

OGEMR was specifically designed to achieve a 40 to 45 per cent reduction in annual greenhouse gas (GHG) emissions from venting and flaring activities in the upstream oil and gas industry from 2015 levels by 2025. To achieve this goal, a reduction of 4.5 million tonnes (Mt) of carbon dioxide equivalent (CO_2e) was targeted.

OGEMR is part of the Ministry of Energy and Resource's Methane Action Plan (MAP) and the Government of Saskatchewan's *Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy* (the Strategy).

In late 2020, Saskatchewan and Canada established an equivalency agreement regarding the reduction of methane emissions from the oil and gas sector meaning, it was determined by Environment and Climate Change Canada (ECCC) that Saskatchewan would achieve equivalent outcomes to federal methane regulation and therefore the federal requirements would not apply in Saskatchewan. This agreement was established for a 5-year timeframe and will expire December 31, 2024.

Scope

OGEMR was designed to focus on the biggest emissions reduction opportunities. In the case of the Saskatchewan oil and gas sector, this was deemed to be gas that is produced in association with oil production, also known as associated gas. There is more natural gas produced in Saskatchewan from oil wells than from dedicated gas wells. In Saskatchewan, because the natural gas industry is so localized within the province, there are limited gas collection and processing opportunities resulting in some of the produced associated gas being vented and flared. Venting gas results in methane being released to atmosphere and flaring gas results in carbon dioxide, both are considered GHG's and contribute to the data supplied in this report. To allow the consideration of both GHG's, the data is rolled up into units of carbon dioxide equivalent (CO_2e).

To calculate emissions, OGEMR applies emissions factors to industry reported volumes of vented and flared gas. Saskatchewan-specific emissions factors were developed using average associated gas compositions for different production types and geographic areas in the province which consist of varying levels of methane, and other hydrocarbon constituents. OGEMR calls these different areas "Production Classes." Emissions factors are summarized in *Table 1: Production Class Emissions Factors.*

OGEMR was designed to regulate the companies that produce most of the associated gas in the province. The more associated gas a company produces, the greater potential they have to contribute emissions through venting and flaring activities. To determine if a company is subject to the regulations, OGEMR uses associated gas production to calculate each company's potential emissions. Companies with potential emissions greater than 50,000 tonnes CO_2e on an annual basis are subject to requirements in OGEMR.

Annually, OGEMR typically regulates 30 to 40 companies who contribute the vast majority of annual emissions from venting and flaring. A company's potential emissions determine the maximum emissions they could have if all their produced gas were vented to atmosphere, however OGEMR allows only a portion of each company's produced gas to be vented and flared by setting company level annual emissions limits. These limits decrease over time to ensure Saskatchewan's 2025 reduction targets are met. Most of the associated gas produced in Saskatchewan is conserved, if collection infrastructure is available, or used for a beneficial purpose on site as a type of fuel source as summarized in *Table 2: Saskatchewan Annual Associated Gas Utilization.*

Different areas of the province present different challenges for emissions reduction such as low gas rates and limited access to gas collection infrastructure. Taking these challenges into account, OGEMR was designed to allow regulated companies the flexibility to determine where to implement emissions reduction projects to comply with their annual emissions limits. To reduce emissions, companies can convert vented gas to flare gas, tie-in vented and flared gas to conservation infrastructure or utilize vented and flared gas for a beneficial purpose on site such as generating electricity. This flexibility also translates to giving companies recognition for emissions reduction efforts that they have already undertaken.

2021 Outcomes

Provincial Emissions

Overall, in 2021 provincial emissions from venting and flaring at upstream oil facilities were 4.4 Mt CO_2e, which is a 6.5 Mt or 60% reduction from 2015 levels and a 0.8 Mt or 15% reduction from 2020 levels. 2021 provincial emissions data is summarized in *Table 3: 2021 Production Class Emissions from Flaring and Venting at Upstream Oil Facilities* and in *Table 4: Annual Provincial Emissions from Flaring and Venting at Upstream Oil Facilities.*

Multiple activities contributed to provincial emissions reduction in 2021. Primarily, reductions came from installing combustion equipment at oil wells and facilities that were routinely venting gas as well as utilizing vented gas on site as fuel for a beneficial purpose. Projects were also implemented in 2021 that expanded Saskatchewan's gas collection infrastructure enabling more flared and vented gas to be conserved. In 2021, provincial emissions from venting activities reduced by 25% from 2020 levels. Declines in associated gas production also contributed to emissions reduction.

In Saskatchewan, the combined potential emissions[1] from gas produced in association with oil in 2021 were 36,603,570 tonnes CO_2e (36.6 Mt). OGEMR set emissions limits on regulated companies, restricting GHG emissions to a maximum of 7,360,662 (7.4 Mt) tonnes CO_2e. The actual combined emissions (those that did occur) from venting and flaring at upstream oil facilities in 2021 was 4,404,444 tonnes CO_2e (4.4 Mt).

Company Level Emissions

In 2021, a total of 32 oil and gas companies had potential emissions greater than 50,000 tonnes of CO_2e and were therefore required to meet their 2021 company level emissions limit. All 32 companies had previously submitted an Emissions Reduction Plan for approval by ER which detailed their path to achieve emissions reduction targets out to 2025. The 32 companies that were subject to OGEMR represented 96 per cent of venting and flaring emissions from upstream oil facilities in 2021.

The company-level combined potential emissions, and combined actual emissions, for the 32 companies OGEMR applied to in 2021 can be seen in *Table 5: 2021 Company Level Annual Emissions*.

[1] Combined potential emissions means the maximum emissions that could occur if all the associated gas produced in Saskatchewan were vented to atmosphere.

Conclusion

Overall, Saskatchewan producers have taken early action to implement emissions reduction measures that exceed the current requirements of OGEMR. Although venting and flaring emissions in 2021 were below the 2025 target outlined in the Strategy, the Ministry of Energy and Resources and the oil and gas industry will need to continue to take steps to decrease the industry's carbon footprint as development continues. The 2021 results continue to demonstrate Saskatchewan's regulatory leadership and the innovation of the upstream oil and gas sector. Emission reductions have been achieved and will likely be exceeded in 2025.

Appendix A - Calculation Overview

Table 1: Production Class Emissions Factors

	Flared Gas Emissions Factor	Vented Gas Emissions Factor	*Combusted Gas Emissions Factor
Production Class	**EF_f (tonnes $CO_2e/10^3m^3$)**	**EF_v (tonnes $CO_2e/10^3m^3$)**	**EF_f (tonnes $CO_2e/10^3m^3$)**
Lloydminster Heavy and Non-Heavy	2.53	15.94	1.83
Kindersley Heavy	2.68	15.65	2.00
Kindersley Non-Heavy	2.91	14.45	2.30
Swift Current Heavy and Non-Heavy	2.71	14.21	2.11
Estevan Heavy and Non-Heavy	3.23	9.84	2.88

*Combusted Gas Emissions Factors are applied to volumes of gas that are combusted in an enclosed combustor or incinerator to recognize the increased combustion efficiency

Appendix B - 2021 Emissions Data

Table 2: Saskatchewan Annual Associated Gas Utilization

Year	Produced Associated Gas (10^3m^3)	Flared (%)	Vented (%)	Conserved/Fuel Use (%)
2015	3,649,873	21.0%	16.2%	62.8%
2016	3,446,650	18.3%	13.8%	67.9%
2017	3,631,742	17.0%	14.7%	68.3%
2018	3,697,443	15.6%	13.8%	70.6%
2019	3,659,504	14.7%	12.7%	72.6%
2020	3,231,679	16.7%	7.8%	75.5%
2021	2,923,658	19.3%	6.5%	74.2%

Table 3: 2021 Production Class Emissions from Flaring and Venting at Upstream Oil Facilities

Production Class	Flared Emissions (tonnes CO_2e)	Vented Emissions (tonnes CO_2e)	Total Emissions (tonnes CO_2e)
1 - Lloydminster	197,982	1,045,202	1,243,183
2A - Kindersley Heavy	92,157	76,859	169,015
2B - Kindersley Non-Heavy	328,274	1,237,781	1,566,055
3 - Swift Current	135,883	103,433	239,316
4 - Estevan	911,702	275,172	1,186,874
Total	1,665,998	2,738,447	4,404,444

*Emissions data includes all flaring and venting emissions including companies not regulated by OGEMR

Table 4: Annual Provincial Emissions from Flaring and Venting at Upstream Oil Facilities

Year	Flared Emissions (tonnes CO_2e)	Vented Emissions (tonnes CO_2e)	Total Emissions (tonnes CO_2e)
2015	2,351,414	8,521,717	10,873,131
2016	1,908,692	6,781,460	8,690,151
2017	1,858,593	7,538,394	9,396,986
2018	1,763,475	7,330,210	9,093,685
2019	1,637,222	6,697,650	8,334,872
2020	1,602,603	3,641,254	5,243,858
2021	1,665,998	2,738,447	4,404,444

*Emissions data includes all flaring and venting emissions including companies not regulated by OGEMR

Table 5: 2021 Company Level Annual Emissions

	Combined Emissions (tonnes CO_2e)	**Combined Potential Emissions (tonnes CO_2e)**
Provincial Total	4,404,444	36,603,570
Regulated Company	**Combined Emissions (tonnes CO_2e)**	**Potential Emissions (tonnes CO_2e)**
2094495 ALBERTA CORP.	261	66,237
ALDON OILS LTD.	27,937	97,734
BAYTEX ENERGY LTD.	549,189	2,906,272
BURGESS CREEK EXPLORATION INC.	17,816	80,941
CANADIAN NATURAL RESOURCES LIMITED	329,048	1,592,424
CARDINAL ENERGY LTD.	18,562	146,121
CHRONOS RESOURCES LTD.	47,454	151,473
CRESCENT POINT ENERGY CORP.	505,580	7,556,552
FEDERATED CO-OPERATIVES LIMITED	17,514	120,501
GEAR ENERGY LTD.	61,627	250,842
HUSKY OIL OPERATIONS LIMITED	589,714	3,708,489
IPC CANADA LTD.	31,389	243,533
ISH ENERGY LTD.	32,094	661,040
LONGHORN OIL & GAS LTD.	425	131,070
MIDALE PETROLEUMS LTD.	15,763	234,544
NOVUS ENERGY INC.	74,154	331,348
PRAIRIE THUNDER RESOURCES LTD.	31,567	140,195
PROSPERA ENERGY INC.	17,203	75,175
RIDGEBACK RESOURCES INC.	65,123	641,078
RIFE RESOURCES LTD.	48,849	198,263
SATURN OIL & GAS INC.	52,065	495,089
SERAFINA ENERGY LTD.	4,002	346,897
SPUR PETROLEUM LTD.	25,368	89,333
STRATHCONA RESOURCES LTD.	33,990	618,888
SUPERB OPERATING COMPANY LTD.	53,687	313,577
SURGE ENERGY INC.	178,344	1,027,533
TAMARACK ACQUISITION CORP.	4,440	876,395
TEINE ENERGY LTD.	430,431	3,227,286
TUNDRA OIL & GAS LIMITED	29,428	794,783
VERMILION ENERGY INC.	195,846	2,523,793
WEST LAKE ENERGY CORP.	35,775	191,648
WHITECAP RESOURCES INC.	717,404	5,999,572

* Companies not regulated by *The Oil and Gas Emissions Management Regulations* are not listed but are included in the Provincial Totals