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Executive Summary

Over the past decade, oil and gas production has grown dramatically in Texas. This has resulted in an economic boon for the state and the rest of the United States as energy costs have remained affordable. Along with this growth has come an increase in the practice of natural gas flaring, as some oil wells that produce associated gas do not have access to the systems required to capture that gas. As concerns have elevated over the waste and potential environmental impacts of this increase, this analysis was performed to evaluate the nature of potential changes to regulation and the potential impacts of those changes.

In this report, I calculated the relationship between oil production and flaring, and identified that metric as *Flaring Intensity*. By measuring the flaring intensity of nations, states, and various companies, and comparing them all to the global industry average, we now have an effective benchmark to compare performance.

By using that benchmark ratio to establish benchmark flaring volumes, I identified that some Texas producers are higher in their flaring intensity than others. I also identified some operators who are notably lower than their peers in terms of flaring levels per oil produced. As a result, I believe that Flaring Intensity is an effective metric for measuring flaring levels and performance.

As we evaluate what to do with this metric, and if/how to attempt to reduce flaring, one other point was striking. Currently, Texas flaring levels – and flaring intensity – are notably lower than the rest of the world, and strikingly lower than new production in the rest of the world. In fact, by looking at various methods to reduce flaring in Texas, many of them presented risks of actually increasing global flaring rates, as other nations and regions flare much more gas when they produce oil. Conversely, it is hard to ignore the fact that as other nations are flaring at levels four times higher than Texas that they, therefore, present much more efficient paths to global flaring reductions.

The conclusion of my analysis is that there are a number of possible options to reduce flaring, but none of them should be pursued without understanding the broader impacts to other segments of our economy and other areas of environmental impact. Also, while it appears that Flaring Intensity is a good benchmark for analyzing flaring performance, care should be taken not to view this metric in a vacuum.

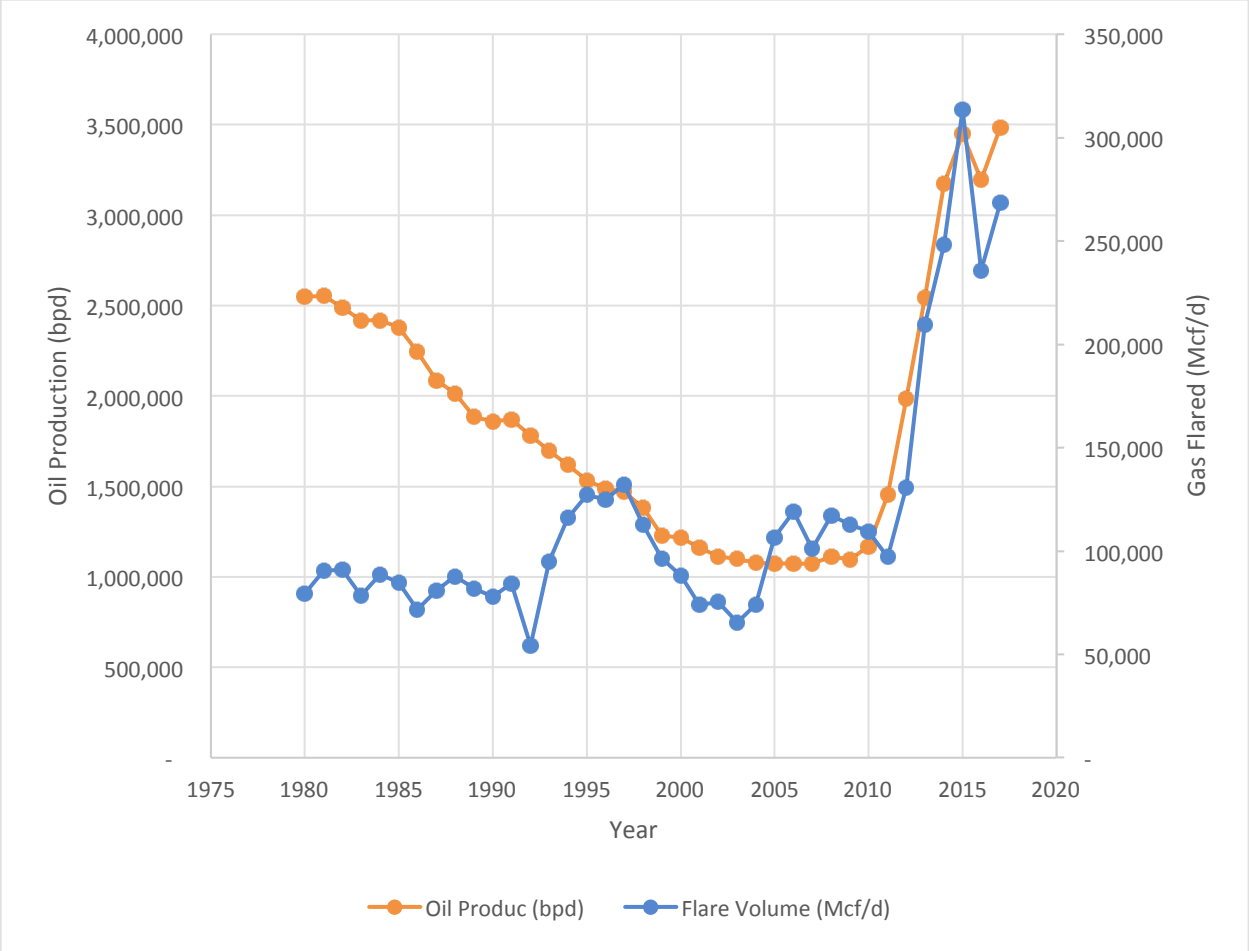
The next step is to discuss this data and the analysis in a public forum, and allow all interested parties to provide input and feedback before any official policy or regulatory changes are recommended.

Introduction

Over the past ten years, oil and gas production has seen a dramatic increase in Texas. This has led to strong economic growth through new jobs, lower costs-of-living, and lower energy costs for other industries. In many instances, as new oil wells are drilled, natural gas (predominantly methane) is produced as oil is extracted. In Texas, over ninety-five percent of that gas is captured in gathering systems and sent via pipeline to gas processing facilities. However, approximately 5% of gas production originates from wells that do not have access to processing facilities, is waiting on additional processing facilities to be constructed, or the processing facilities are temporarily interrupted by outages. As a result, some gas is *flared* (burned) near the well site in a system designed specifically for that purpose.

In recent years, the total amount of flaring in Texas has increased with the increase of total oil production (*See* **Graph 1** below). When gas is burned, the byproducts are water and carbon dioxide. And while virtually all produced gas is eventually burned (to heat homes or produce electricity) producing the same byproducts, some groups have expressed concerns over the increase in flaring, and questioned what steps can be taken to minimize flaring from both a waste and an environmental impact perspective. Unfortunately, there has been little data used in discussions about flaring other than raw volumes, and as a result, public discussion around possible solutions has centered on philosophical/political beliefs as opposed to actual data.

Graph 1 – Oil Production and Flaring Volumes in Texas 1980-2017



Source: Flare Volumes: https://rrc.texas.gov/oil-gas/research-and-statistics/production-data/historical-production-data/natural-gas-production-and-well-counts-since-1935/; Oil Production: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfptx1&f=a

Natural gas flaring at wells in Texas is regulated by the Texas Railroad Commission ("TRRC"). Over the past several months I have analyzed key data sets related to flaring and produced this report to facilitate a more informed and substantive discussion around future regulatory policies. This report provides an analysis of current flaring levels, trends, and possible actions that could restrain/reduce flaring levels in the state of Texas.

Methodology

Flaring can be evaluated in multiple ways. The most common recent public discussion centers on total volumes flared. That discussion is incomplete and oversimplified, as it fails to consider other factors such as increased oil production in Texas and the amount of gas flared relative to how much oil is produced, global flaring practices and impacts from other nations, and impacts of new approaches required to expand global oil production. In fact, while Texas flaring volumes are at a high for recent history, current levels have not eclipsed the highest on record. Looking back, Texas has experienced flared and vented gas levels above current volumes. Table 1 shows the five years with the highest flaring levels prior to 2018.

Table 1 – Top Five Annual Flared Volumes in Texas Prior to 2018[1]

Year	Vented/Flared Mcf/d
1953	814,521
1955	740,274
1956	734,795
1954	699,452
1957	604,110

Reliable data suggests that Texas oil and gas operators' total flare volumes were in the 650,000 Mcf/d range in 2018.[2]

This report focuses on production and flaring data by operator in Texas. It primarily evaluates the Top 150 or so producers who reported flare volumes for the twelve-month period from Nov. 2018 through Oct. 2019 (the "Raw Data" Tab includes data for all operators). This level of granularity is important to understand the range of flaring levels, and to examine how various companies perform versus their peers. However, before examining the data at that granularity, it was important to establish benchmarks to give context to the report, and to understand the impacts of Texas activity on a larger scale. This is critical to evaluating Texas production and future policies, since reducing flaring in Texas may cause a larger environmental impact to achieve the same amount of global energy production.

[1] https://rrc.texas.gov/oil-gas/research-and-statistics/production-data/historical-production-data/natural-gas-production-and-well-counts-since-1935/

[2] EIA reports "In 2018, vented and flared natural gas in Texas reached over 0.65 Bcf/d" https://www.eia.gov/todayinenergy/detail.php?id=42195

A majority of *regular* flaring (flaring that is not a part of an upset condition or other intermittent causes) is related to gas that is produced in the development of oil (commonly referred to as "casinghead gas"). While a majority of this gas can be captured over time, it is widely accepted that some flaring is required to develop oil wells economically, as it is typically not feasible to build gathering systems in place for all wells before it is known *whether* oil wells will be drilled or *when* they will be productive. As such, gas may be flared while waiting for new gathering systems, pipelines, or processing facilities to be constructed. Since the primary cause and justification for the increase in flaring has been the increased production of oil, this report focuses on the comparison of flaring volumes to oil production. (The data set in the worksheet also reports the level of gas production versus gas flared (Percent of Production Flared or "PPF"), but this appears to be a less informative number).

To that end, I established a metric that relates the amount of gas flared to the amount of oil produced, referred to herein as *flaring intensity (FI)*. This number was calculated for various regions around the globe, other parts of the US, and for the global oil and gas market. These calculations provided context to consider an appropriate metric for Texas.

The results contained in this report are given in three categories: Total Flaring Volume, Flaring Intensity, and Total Flaring Over/Under Benchmark (described below).

Data was compiled from TRRC, the Energy Information Agency (EIA), World Bank, and multiple other sources cited throughout the report. The TRRC data covered a one-year period from November 2018 to October 2019, and includes all reported oil production, associated gas production (casinghead gas), and flaring levels for that period.[3] The raw data is in spreadsheet form and can be found on the official TRRC website for Ryan Sitton, at: https://rrc.texas.gov/about-us/commissioners/sitton/news/
A note about data: TRRC data does not align perfectly with other sources such as the EIA. This is due to two primary factors. First, most projections used by groups like the EIA, OPEC, and IEA use models to anticipate real time production and inventories. The TRRC uses actual reported data from operators. As such, TRRC data can lag by as much as 12 months depending on the timing of data being reported. Second, TRRC considers oil and condensate separately, whereas most other analyses combine them.

Therefore, while the data for this period for oil production represents approximately 4,476,000 bpd and 424,000 Mcf/d flared gas, today the state of Texas today is producing closer to 5,300,000 bpd and flaring 650,000 Mcf/d.

Benchmarks

Today, the world produces approximately 101,000,000 barrels of oil per day[4], and flares 14.0 million Mcf/d.[5] This indicates that the World's *Flaring Intensity* is 0.14 Mcf/Bbl (14.0 million Mcf/101,000,000 Bbl). Using this global ratio, we can benchmark performance by country/state to identify how major oil producing regions perform.

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[3] Oil Production reported in the "Raw Data" tab for each operator is only oil production associated with a lease where flaring took place. TOTAL oil production for each operator for the period examined is reported in the "Raw Total Oil" tab and that is the oil number used to calculate Flaring Intensity and Flaring Intensity Benchmark numbers.

[4] Source: https://www.eia.gov/outlooks/steo/report/global_oil.php

[5] Source: https://www.statista.com/statistics/653611/natural-gas-flaring-at-oil-production-sites-worldwide/
(145 BCM converts to 5,120,626,674,615 cubic feet/365 = 14 million Mcf/d)

Table 2 shows the resulting benchmarks for some of the world's leading oil producing regions for 2018.

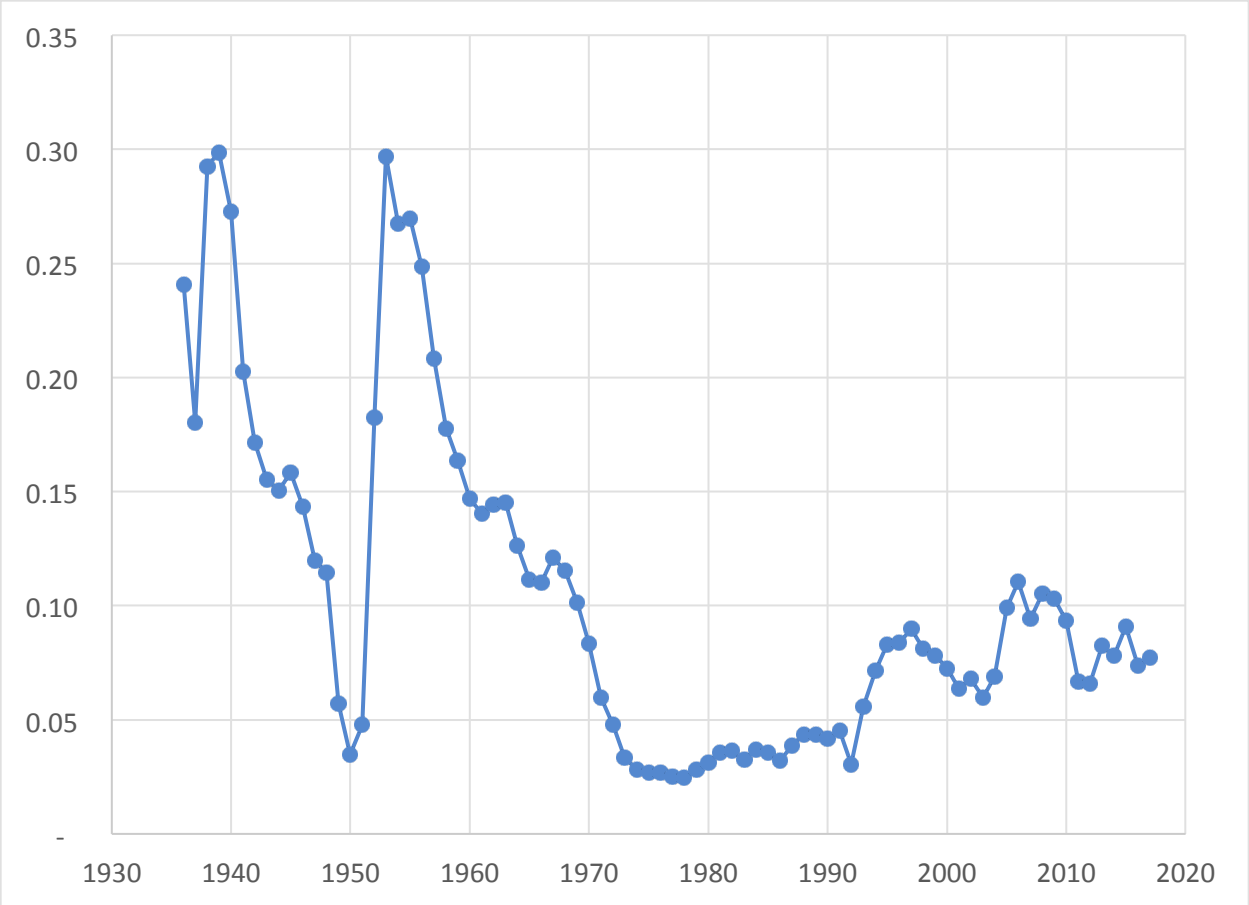
Area	Flared (Mcf/d)[6]	Oil Produced (Bbl/day)[7]	Flaring Intensity (Mcf/Bbl)
Iran	1,660,000	4,460,000	0.37
Iraq	1,700,000	4,620,000	0.37
North Dakota[8]	400,000[9]	1,260,000	0.32
Russia	2,100,000	11,440,000	0.18
United States	1,200,000	10,960,000	0.11
Texas[10]	410,000	4,410,000	0.09
Saudi Arabia	110,000	12,420,000	0.01
World	**14,000,000**	**101,000,000**	**0.14**

Texas' Flaring Intensity is already lower than the international average. However, it is instructive to examine Texas' historical performance as well to identify trends. Graph 2 below shows Texas' Flaring Intensity for the last 80 years.

It is interesting to note that while Texas' Flaring Intensity has trended up since the 1980s, the state as a whole is still well below historical levels and most of the rest of the world. Only Saudi Arabia is better in Table 2 above because most Saudi oil is produced from fields developed using large-scale water floods that produce very little associated natural gas.

[6] http://pubdocs.worldbank.org/en/887251581002821897/Revised-2014-2018-flare-volumes-estimates.pdf
[7] https://www.eia.gov/tools/faqs/faq.php?id=709&t=6
[8] Oil and Flared volumes for North Dakota taken from EIA
[9] EIA Reports that in the first 11 months of 2019, ND flared 560,000 Mcf/d (https://www.eia.gov/naturalgas/weekly/)
[10] Oil and Flared volumes for Texas taken from RRC production data.

Graph 2 – Texas Flaring Intensity by Year



Analysis Results

Table 3 below shows the top 20 flaring volumes by company in Texas during the period examined. However, as discussed, these results do not adequately inform as to the efficiency of flaring levels. In particular, it ignores the amount of oil production associated with the flaring volumes. If a producer is flaring more than others, but is producing more oil than others, then they may actually be taking greater steps to capture natural gas despite reporting larger absolute flaring volumes.

Table 3 – Top 20 Texas Operating Companies Ranked by Flare Volume

Rank	OPERATOR_NAME	Oil Production (Bpd)	Flare Volume (Mcf/d)
1	XTO ENERGY INC.	181,241	23,350
2	DIAMONDBACK E&P LLC	210,871	20,184
3	ENDEAVOR ENERGY RESOURCES L.P.	87,556	18,727
4	ENCANA OIL & GAS(USA) INC.	119,543	15,399
5	EP ENERGY E&P COMPANY, L.P.	47,575	15,360
6	APACHE CORPORATION	90,938	15,222
7	SM ENERGY COMPANY	80,293	14,475
8	SURGE OPERATING, LLC	57,884	14,377
9	JAGGED PEAK ENERGY LLC	37,808	11,586

10	COG OPERATING LLC	206,680	11,037
11	HUNT OIL COMPANY	36,847	10,088
12	MURPHY EXPL. & PROD. CO. - USA	55,543	9,691
13	PRIMEXX OPERATING CORPORATION	13,246	8,442
14	STEWARD ENERGY II, LLC	11,345	8,092
15	PIONEER NATURAL RES. USA, INC.	360,260	7,731
16	PARSLEY ENERGY OPERATIONS, LLC	96,569	7,570
17	NOBLE ENERGY INC	58,334	7,102
18	ROSEHILL OPERATING COMPANY, LLC	26,325	6,583
19	GUIDON ENERGY MGMT SERVICES LLC	12,624	6,576
20	LAREDO PETROLEUM, INC.	44,943	6,448

The next set of results is reported by Flaring Intensity in Table 4 below which provides the top 20 operators in Texas according to that metric.

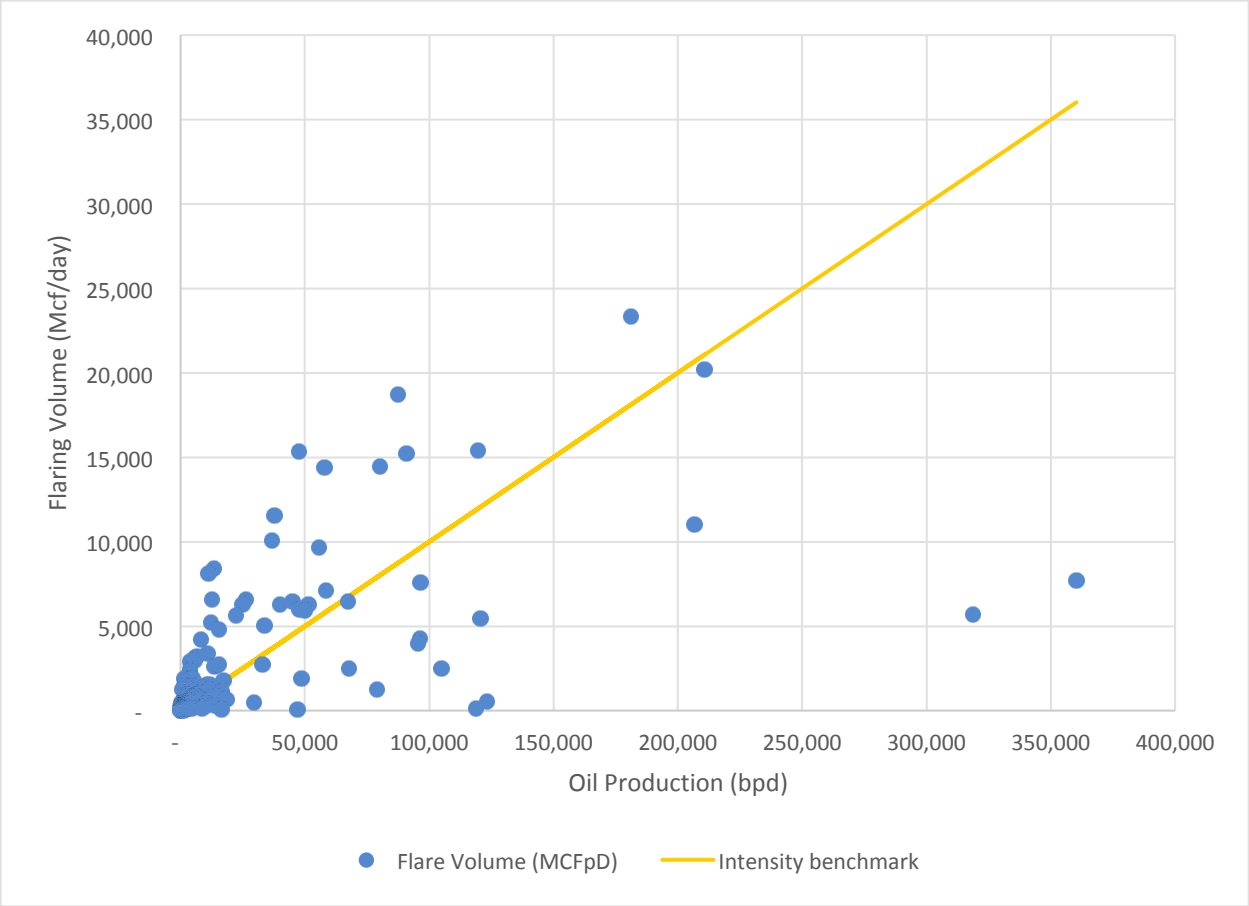
Table 4 - **Top 20 Operators by highest Flaring Intensity**

Rank	OPERATOR_NAME	Oil volume (bpd)	Flare Volume (Mcf/d)	Intensity Mcf/Bbl
1	CONTINENTAL TREND RESOURCES, INC	62	181	2.93
2	SILTSTONE RESOURCES OP II, LLC	147	417	2.83
3	MAMMOTH EXPLORATION LLC	600	1,277	2.13
4	AMAC ENERGY, L.L.C.	12	24	2.00
5	ATLANTIC OPERATING II, LLC	80	157	1.97
6	ATLANTIC RESOURCES COMPANY, LLC	150	278	1.85
7	VERDUGO-PABLO ENERGY, LLC	176	285	1.63
8	FOUR STARR PRODUCTION, LLC	48	73	1.52
9	WINDY COVE ENERGY II, LLC	277	408	1.47
10	HADAWAY CONSULT AND ENGINEER,LLC	1,487	1,908	1.28
11	FORTUNA RESOURCES DVLPMENT, LLC	152	190	1.25
12	VALPOINT OPERATING, LLC	60	69	1.16
13	BARROW-SHAVER RESOURCES CO.	250	287	1.15
14	GORDY OIL COMPANY	1,423	1,465	1.03
15	JOINT RESOURCES COMPANY	304	295	0.97
16	SILVER CREEK PERMIAN OP CO, LLC	695	545	0.78
17	U.S. ENERGY DEVELOPMENT CORP	3,931	2,894	0.74
18	RELIANCE ENERGY, INC.	193	142	0.73
19	STEWARD ENERGY II, LLC	11,345	8,092	0.71
20	THRONE PETROLEUM RESOURCES LLC	1,133	762	0.67

This information, while interesting, still leaves out important context. Many of the operators with the highest Flaring Intensity still have flaring volumes well below others. As a result, moves by those operators to stem their flaring may have an insignificant result on statewide flaring totals. Instead, we must consider the total amount flared **relative to a Flaring Intensity Benchmark (FIB).** To do that, we must establish which benchmark is an appropriate baseline.

In evaluating the top 150 operators in Texas, the average flaring intensity by operator is 0.35 Mcf/Bbl[11]. However, the average Flaring Intensity on a volume basis (total flared volume over total oil production) generated by those operators is 0.10 Mcf/Bbl (411,000 Mcf/d/3,967,063 bpd). Graph 3 shows the position of operators around that average, based on their oil production and gas flaring volumes.

Graph 3 – Oil Production and Gas Flaring Volume By Operator



By examining the distribution of operators around the average, some are well below, and others are well over.

Using 0.10 Mcf/Bbl as the benchmark, we can establish a benchmark *volume* per operator based on the amount of oil that each produces. Then, by comparing their total flaring to the benchmark volume, we find the total volume over/under benchmark by operator. This is an instructive list, as it details the amount of flaring that an operator can eliminate by matching the benchmark volume.

105 operators in Texas flare above the group benchmark. The difference between their current flaring levels and the benchmarked levels is a total of 163,439 Mcf/d. Table 5 shows the top 20 operators by flared volume over the benchmark.

[11] The average Flaring Intensity ratio for all operators is .04 because most operators in Texas do not have reported flare volumes. (*See* "All Op Intensity Ranked" tab)

Table 5 - **Top 20 Operators by Volume Over Benchmark**

Rank	OPERATOR_NAME	Oil volume (b/d)	Flare Volume (Mcf/d)	Intensity Mcf/Bbl	Intensity benchmark Mcf/d	Volume O/U Benchmark (Mcf/d)
1	EP ENERGY E&P COMPANY, L.P.	47,575	15,360	0.32	4,758	10,602
2	ENDEAVOR ENERGY RESOURCES L.P.	87,556	18,727	0.21	8,756	9,971
3	SURGE OPERATING, LLC	57,884	14,377	0.25	5,788	8,589
4	JAGGED PEAK ENERGY LLC	37,808	11,586	0.31	3,781	7,805
5	PRIMEXX OPERATING CORPORATION	13,246	8,442	0.64	1,325	7,117
6	STEWARD ENERGY II, LLC	11,345	8,092	0.71	1,134	6,957
7	SM ENERGY COMPANY	80,293	14,475	0.18	8,029	6,446
8	HUNT OIL COMPANY	36,847	10,088	0.27	3,685	6,403
9	APACHE CORPORATION	90,938	15,222	0.17	9,094	6,128
10	GUIDON ENERGY MGMT SERVICES LLC	12,624	6,576	0.52	1,262	5,314
11	XTO ENERGY INC.	181,241	23,350	0.13	18,124	5,226
12	MURPHY EXPL. & PROD. CO. - USA	55,543	9,691	0.17	5,554	4,136
13	EXCO OPERATING COMPANY, LP	12,412	5,209	0.42	1,241	3,968
14	ROSEHILL OPERATING COMPANY, LLC	26,325	6,583	0.25	2,633	3,950
15	ENERGEN RESOURCES CORPORATION	24,938	6,323	0.25	2,494	3,829
16	ENCANA OIL & GAS(USA) INC.	119,543	15,399	0.13	11,954	3,444
17	MDC TEXAS OPERATOR LLC	8,239	4,241	0.51	824	3,417
18	SABLE PERMIAN RESOURCES, LLC	22,370	5,623	0.25	2,237	3,386
19	DISCOVERY NATURAL RESOURCES LLC	15,483	4,795	0.31	1,548	3,247
20	TRINITY OPERATING (USG), LLC	6,582	3,194	0.49	658	2,536

It is also important to highlight those companies who are performing significantly better than their benchmark volumes. Table 6 lists the top 20 operators with flaring volumes the furthest below their calculated benchmark.

Table 6 – Top Texas Operators with reported flaring BELOW benchmark volume

Rank	OPERATOR_NAME	Oil volume (b/d)	Flare Volume (Mcf/d)	Intensity Mcf/Bbl	Intensity benchmark Mcf/d	Volume O/U Benchmark (Mcf/d)
1	PIONEER NATURAL RES. USA, INC.	360,260	7,731	0.02	36,026	(28,295)
2	EOG RESOURCES, INC.	318,704	5,676	0.02	31,870	(26,194)
3	BURLINGTON RESOURCES O & G CO LP	123,377	533	0.00	12,338	(11,805)
4	CHESAPEAKE OPERATING, L.L.C.	118,993	134	0.00	11,899	(11,766)

5	COG OPERATING LLC	206,680	11,037	0.05	20,668	(9,631)
6	SHELL WESTERN E&P	104,898	2,524	0.02	10,490	(7,966)
7	ANADARKO E&P ONSHORE LLC	78,924	1,264	0.02	7,892	(6,628)
8	CHEVRON U. S. A. INC.	120,767	5,477	0.05	12,077	(6,600)
9	MARATHON OIL EF LLC	95,439	3,984	0.04	9,544	(5,560)
10	OCCIDENTAL PERMIAN LTD.	96,161	4,265	0.04	9,616	(5,351)
11	DEVON ENERGY PRODUCTION CO, L.P.	47,147	37	0.00	4,715	(4,677)
12	OXY USA WTP LP	67,708	2,495	0.04	6,771	(4,276)
13	OXY USA INC.	48,566	1,857	0.04	4,857	(3,000)
14	SN EF MAVERICK, LLC	29,595	477	0.02	2,959	(2,483)
15	PARSLEY ENERGY OPERATIONS, LLC	96,569	7,570	0.08	9,657	(2,086)
16	DENBURY ONSHORE, LLC	16,373	56	0.00	1,637	(1,581)
17	FASKEN OIL AND RANCH, LTD.	18,436	653	0.04	1,844	(1,190)
18	DE3 OPERATING LLC	13,806	294	0.02	1,381	(1,087)
19	DIAMONDBACK E&P LLC	210,871	20,184	0.10	21,087	(904)
20	BASA RESOURCES, INC.	8,617	105	0.01	862	(756)

Options to Reduce Flaring

There have been a number of ideas discussed amongst trade associations, environmental groups, policy groups and the media. These have included everything from banning all flaring to requiring alternative solutions (e.g., on site lease use, compression requirements etc.).

The primary Texas policy challenge/question is this: What statewide flaring intensity is the right level? Since Texas is already lower than most other major producers in the world, what target is the appropriate target? Should the state be held to a higher standard than the rest of the world, thereby disadvantaging production investments here versus competitors around the globe? Should conservation of 5-6% of the gas molecules today be made over the cost-of-living and economic benefit Texans have and are receiving? These are the philosophical questions that must be considered as future policy and regulatory changes are considered.

In order to evaluate various options, a reduction of 200,000 Mcf/d was used as a target to consider the requirements and the impacts of changes. This would reduce Texas' current overall flaring intensity to approximately 0.06, or less than one sixth of both Iraq and Iran, and less than half of the current US flaring intensity.

To understand the impact of possible actions, I have analyzed the current situation and evaluated solutions based on the drivers of specific actions. These are contained below.

1. Wait for anticipated infrastructure

Later this year or early next year the Permian Highway pipeline is scheduled to be completed, carrying gas from the Permian basin to Houston and other areas to be processed and distributed. That pipeline is planned to transport 2.1 billion Scf/d. In addition, midstream companies continue to construct new gathering systems and processing plants to handle the exponential growth in Permian gas production. Infrastructure enhancements are critical to Texas being able to realize its energy opportunities and unfortunately opposition to energy infrastructure has delayed enhancements.

Current projections are that approximately 200,000 Mcf/d of current flaring will be reduced over the next 12 to 18 months as these systems are completed. Additional new wells will add new flares, but new development is not expected to outstrip new infrastructure, so the total flaring levels should be dropping, and flaring intensity should be reduced at the same time.

By looking at the rate of new flaring, the development of new wells, and the future completion of infrastructure, our projections are that flaring will drop by 50,000 to 150,000 Mcf/d over the next 18 months as new infrastructure is completed.

2. Shut in oil wells with the highest flaring intensity

If reducing flaring were the top priority, then the quickest way to do so would be to significantly restrict flaring exceptions. However, if a permit for flaring is removed from an operator, they will most likely be forced to shut in oil wells. Currently, estimates are that new gathering systems and infrastructure will be in place for wells in a 12 to 24-month time frame, so a timeline of 18 months is assumed in these projections.

The lowest impact to oil production would be to begin shutting down wells with the highest flaring intensity ratio. Through evaluating the flaring associated with operators with the highest flaring intensity, and totaling up the oil production required to reach a 200,000 Mcf/d reduction, the minimum oil production taken offline would be about 430,000 barrels per day.

Practically speaking, this cannot be achieved, as systems cannot be isolated so easily. Starting with the minimum 430,000 bpd, we can extrapolate a more realistic number by making assumptions as to the actual amount of oil required to shut down flaring systems totaling 200,000 Mcf/d. By reviewing actual production operations and scalability, I anticipate the actual amount of oil production shut in would be between 750,000 and 1,000,000 bpd in order to reduce flaring by 200,000 Mcf/d immediately. This is up to one-fifth of the total daily oil production in Texas. However, this would not translate into a total global reduction in that amount of flaring.

This brings us to the question; from where would this oil get replaced? If the world average is used to produce the replacement oil, then approximately 140,000 Mcf/d will be flared somewhere else around the world to account for Texas' drop in production. This would mean that while Texas has reduced flaring substantially, the world's flaring level is virtually unchanged, or may even increase (because Texas' Flaring Intensity is lower than almost everywhere else).

Next we must evaluate the impacts of this change. Removing 1% of the world's oil production for a year would certainly have a supply and price impact. Domestically the consequences of this move would be

much more dramatic. Historical precedent suggests that oil prices in the United States would climb by approximately $25 per barrel, pushing gasoline prices up by approximately $1 per gallon, a roughly 50% increase over today's gasoline prices. While one might anticipate that this would be temporary, as infrastructure is built out, this would still have a chilling affect on new development. In other words, if policy establishes reduced flaring as a future requirement, then future oil wells will be delayed while infrastructure is built, meaning that future production levels are also at risk.

3. OPEC and buyers could further restrict/place requirements on Iraqi and Iranian oil production

If the priority is to reduce the world's flaring, and not simply Texas flaring, then forcing those with the highest flaring intensity to cut back is the easiest gain. At a flaring intensity of 0.37, Iraq and Iran can reduce 200,000 Mcf/d of flared volumes by cutting much less oil production than Texas. In fact, it would only require a 540,000 bpd reduction. And this assumes that all of their production is at the same flaring intensity. If we instead assume that their production is a range, like Texas, it could require as little as 100,000 bpd drop in oil production. Notably less than the drop required in Texas.

Restricting Iranian and Iraqi production could be accomplished in a number of ways. The largest purchaser of oil from these two countries is China, followed by India. These countries could simply require less flaring as a stipulation to buying the crude, which would be an easy control despite lack of regulatory oversight.

OPEC could also drive this. Saudi Arabia has the lowest Flaring Intensity of all major global oil producers, thanks to the geology of its large scale water flood fields (low gas), and large investments into gas capture infrastructure. If OPEC and its member countries begin to set standards for flaring intensity, then this would drive the largest global reduction in flaring with minimal impact to global oil supply.

4. RRC could establish a benchmark in regulation

In the analyses here, we have used the Texas average ratio of 0.10 Mcf/Bbl as the flaring intensity benchmark. This, or another benchmark **like percent of production flared (PPF)**, could be adopted in regulation, requiring operators to adhere to a standard as they plan and develop new wells (i.e., flaring exceptions would not be granted to companies whose performance was above benchmark levels). If given time to achieve adherence to this standard, then the short-term impact could be minimal.

The bigger risk to balancing resource conservation and Texas' economic benefits is in the long term. It is possible that requiring adherence to a benchmark slows development in Texas, which would potentially increase overseas oil production growth (or other U.S. production). In doing so, flaring intensity levels would likely bring higher volumes of flaring, while simultaneously reducing Texas' energy development, and the U.S.' energy security, stability, and broader economic growth. Careful consideration must be given to all of the ramifications if the TRRC were to develop a flaring benchmark requirement.

Conclusion

Total gross flaring volumes in Texas will likely continue to increase as oil volumes increase (I believe the rate of oil production growth will slow over the next 12-18 months), while regulators, industry, and the public look for beneficial policies to reduce flaring levels without decimating the economic benefits of energy production or pushing environmental problems overseas. While there are a number of options to reduce flaring, this data and analysis indicates that looking at Texas in isolation presents notable risks.

With flaring intensity levels in Texas already lower than most parts of the world, and lower than historical levels, a forced reduction could cause a disproportionate increase in flaring in other parts of the world, and have a chilling effect on Texas energy development with no quantifiable benefit to Texans or the world. This would negatively impact jobs and the economy not just in Texas, but nationwide.

Whatever steps are taken should be done with consideration of national and international implications, to ensure that the true objectives of total flaring reductions are achieved, and negative impacts for Texas energy development or the environment are not created.

Finally, it is also noteworthy that many Texas operators have taken voluntary steps to reduce their flaring volumes and they should be commended for that action.

Next Steps

We have already taken the first necessary step to address flaring volume increases, which was to meaningfully assess current flaring in Texas, globally, and put the data into context. Going forward, I will take two additional steps regarding flaring.

The next step will be a public discussion hosted by myself, and other Commissioners if they choose to participate, which will include testimony (and any written materials or presentations) from interested parties including industry and environmental groups at a minimum. At this meeting I would like to discuss the analysis contained in this report and explore any suggested modifications or feedback regarding how we evaluate flaring data. I will also be looking forward to discussing innovative solutions that anyone might have for how best to reduce flaring in Texas. We will announce a date and time for this discussion in the coming weeks after visiting with stakeholders regarding their availability.

Additionally, this report will be updated and published quarterly, and I will track flaring intensity as new infrastructure comes online. This will inform regulators, operators and the public as to the nature of future flaring activities, and which companies are most aggressively reducing flaring.

It is an honor to serve as your Railroad Commissioner.

Ryan Sitton
Railroad Commissioner
State of Texas