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Gas Giveaways II: Methane Waste on Federal Lands is Business as Usual



Arnegard, ND | Photo Credit: Tim Evanson, CC BY-SA 2.0

Every year, oil and gas companies waste billions of cubic feet of natural gas extracted from federal lands. Federal rules and statutes governing oil and gas drilling do not prohibit this waste and allow much of the lost gas to escape royalty-free. The practice of venting (releasing) and flaring (burning off) methane is a blatant waste of a valuable resource owned by American taxpayers and is a threat to near- and long-term energy security. Furthermore, methane is a potent greenhouse gas, a major accelerator of climate change, and is already imposing economic damages on taxpayers.

The U.S. Department of the Interior (DOI) manages federal lands and has a legal obligation to prevent the waste of public resources and ensure taxpayers receive a fair return from onshore oil and gas development. To protect taxpayers and the climate alike, the agency must issue a new

methane waste prevention rule for onshore oil and gas operators that eliminates waste from non-emergency (or routine) venting and flaring, while charging royalties on all wasted gas.

This report provides an overview of the best available data and illustrates the magnitude of gas



Oil and gas companies lose a significant amount of natural gas during production on federal lands each year, through venting, flaring, and leakage.

Venting is the intentional release of natural gas from operators' equipment into the atmosphere.

Leakage is the release of gases due to improperly sealed equipment, allowing gas to escape during extraction. These are sometimes called "fugitive" emissions.

Flaring is the practice of burning natural gas during oil and gas extraction rather than capturing and bringing it to market. Flaring is also used to burn gases that would otherwise present a safety problem.

Methane is the largest component of unprocessed natural gas. Reference to methane should be taken to mean reference to whole natural gas in this report.

lost on federal lands. These losses reveal how the policies guiding DOI agencies have been failing taxpayers for decades.

Key Findings:

Common venting and flaring practices are a waste of valuable taxpayer resources. Over the last 10 years, **300 billion cubic feet** of natural gas, worth an estimated value of **\$949 million**, were lost on federal lands.

These estimates are based on self-reported data from drilling operators. Independently collected emissions data suggest actual losses are significantly higher. The DOI does not collect data on the natural gas leaking from equipment that operators use (free of charge) on well sites nor gases leaking from abandoned wells, both of which are significant sources of methane waste.

In fact, more than 30 years ago, government oversight reports raised alarms at the DOI's failure to collect complete and accurate data on oil and gas production and waste. The methane waste rules in force today were promulgated in 1979.

Lost gas has a significant effect on the climate. As a greenhouse gas, methane has a global warming potential more than 80 times higher than carbon dioxide for the first twenty years that it is in the atmosphere. Climate change costs taxpayers billions of dollars in disaster aid every year, and this amount will continue to increase.

But for the oil and gas industry, this waste is just business as usual. Flaring, which accounted for 82% of all gas losses on federal land over the past decade, is now common practice for operators rushing to produce oil before the infrastructure is built to capture the comingled natural gas. Existing rules do not require this gas be captured or that the drilling

operator even pay a royalty on it.

With no incentives to catch this methane, operators leak or release billions of cubic feet of the potent gas every year. The DOI is mandated to protect valuable, taxpayer resources, and has a fiduciary responsibility to taxpayers to account for this loss. In the face of mounting climate threats, disregarding methane waste on federal lands is inexcusable.

Decades of Lost Gas

Early Concerns over Government Losses

The Government Accountability Office (GAO)¹ has raised concerns about the Interior Department’s royalty accounting and financial management systems since the 1950s.² By 1979, the GAO was urging Congress to fix the oil and gas royalty collection system.³ In the 1980s, independent reviews concluded taxpayers could be losing hundreds of millions of dollars every year thanks to under-collection of royalties on federal oil and gas.⁴

Reforms in the 1980s closed some loopholes but did not fix the underlying problems with oversight and enforcement, including the continued failure to accurately track the volume of natural gas that operators vent, flare, or otherwise lose during operations. These problems were compounded when gas production dramatically increased in the 2000s.

Royalty Revenue

Federal lands contain vast deposits of oil, natural gas, and other natural resources owned by the public. To lease federal land to produce and sell those resources, private interests agree to pay taxpayers a **royalty** – a set percentage of the value of the resources sold. Since 1920, oil and gas leases on federal land have required producers to pay a 12.5% royalty.

That royalty rate is dramatically lower than what most states charge – Texas charges up to 25%, or double. It’s also well below what we get from a barrel of oil from the Gulf of Mexico – 18.75%.

Bringing the onshore federal royalty into the modern era, in line with rates for state and offshore production, will ensure taxpayers get a fair return on our federal resources.

¹ The GAO’s name changed to the Government Accountability Office in 2004

² The GAO noted the Bureau of Land Management’s inadequate royalty accounting procedures in audit reports to the Congress on for fiscal years 1953 and 1954; see GAO, “Review of Supervision of Oil and Gas Operations and Production on Government and Indian Lands,” December 1959

³ GAO, [FGMSD-79-24](#), “Oil and Gas Royalty Collections--Serious Financial Management Problems Need Congressional Attention,” Apr 13, 1979.

⁴ Report of the Commission on Fiscal Accountability of the Nation's Energy Resources (Linowes Commission), January 21, 1982; GAO, [AFMD-82-6](#), “Oil and Gas Royalty Collections: Longstanding Problems Costing Millions, Oct. 29, 1981

Increased Venting and Flaring

Evidence of unauthorized venting and flaring appeared in the public record more than three decades ago.⁵ The problem has only gotten worse. In a 2004 report, the GAO noted that the Bureau of Land Management's (BLM) oversight and accounting of venting and flaring was still inadequate, writing:

"...although flaring and venting are generally not authorized, no oversight mechanism currently exists for routinely monitoring the amount of flaring and venting that actually takes place."⁶

As a result, the BLM and other agencies responsible for overseeing oil and gas development on federal lands and waters cannot always be assured that companies are appropriately restricting their flaring and venting.

Between 2004-2010, more studies concluded that the systems for verifying the volume and energy content of federal natural gas production reported by operators were insufficient.⁷

In 2010, the GAO estimated that 126 billion cubic feet (bcf) of natural gas was vented or flared from onshore federal leases in 2008.⁸ The agency also concluded that at least some of the losses were preventable, asserting that "... about 40 percent of natural gas estimated to be vented and flared on federal onshore leases could be economically captured with currently available control technologies."

The advent of hydraulic fracturing and horizontal drilling has made the problem of lost gas far worse. According to data reported by operators, the amount of gas lost on federal lands increased by roughly 70% between 2006 and 2012. By 2015, the amount of gas lost through venting or flaring had more than doubled from the 2012 level.

⁵ See Table III.3 in GAO, [RCED-90-99](#): "Mineral Revenues: Shortcomings in Onshore Federal Oil and Gas Production Verification." June 26, 1990

⁶ GAO, [GAO-04-809](#): "Natural Gas Flaring and Venting: Opportunities to Improve Data and Reduce Emissions." July 14, 2004, p. 22

⁷ GAO-2004, DOI-OIG, RPC-2007

⁸ GAO, [GAO-11-34](#): "Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases." Oct. 29, 2010

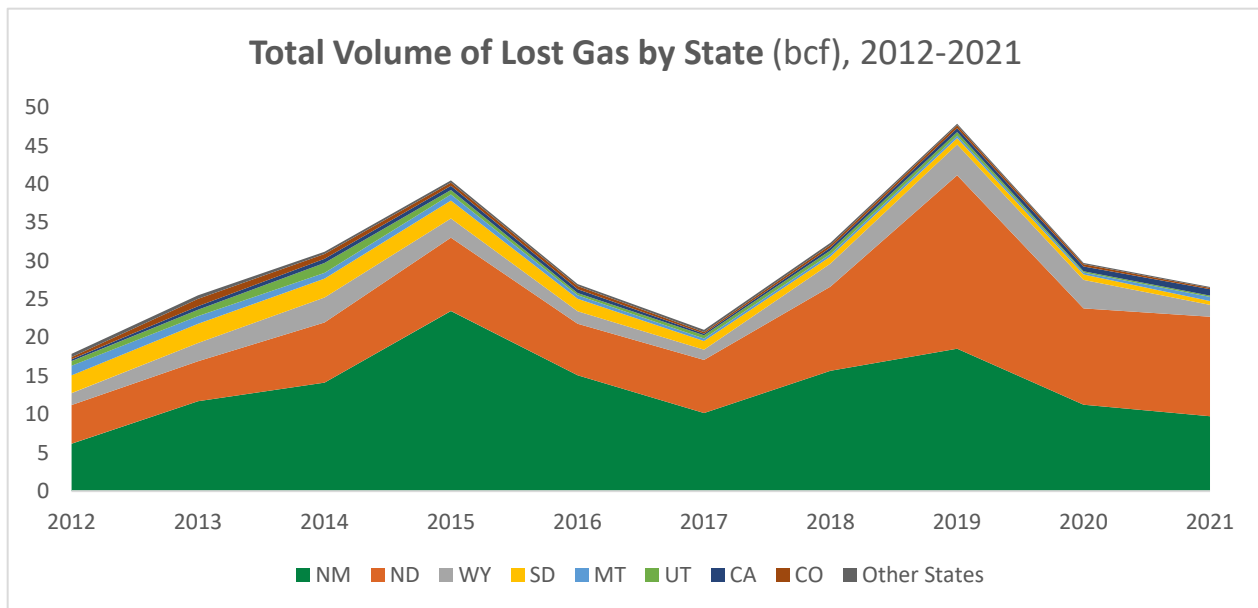
Mounting Losses

Lost Gas on Federal Lands Today

In the ten-year period FY2012-2021, operators reported venting, flaring, or losing 300 billion cubic feet (bcf) of natural gas from leases on federal lands. Using average monthly Henry Hub natural gas spot prices, this gas had an estimated value of \$949 million.⁹

If royalties had been collected at the current rate of 12.5% on all lost gas over the last decade, taxpayers would have received \$119 million. Instead, the Office of Natural Resources Revenue (ONRR) reported collecting just \$43 million in royalties on gas vented or flared over the decade, approximately one-third of the potential royalties. Taxpayers have lost at least \$76 million in potential revenue over the past decade on wasted gas. The true amount of royalties drilling operators should have paid on lost gas from FY2012-FY2021 is significantly higher, but the DOI has no way of knowing how much it has lost because its oversight rules are weak and grossly outdated.

If the DOI had collected royalties on all lost gas reported by operators at a rate of 18.75%, in line with rates for state and offshore production, taxpayers would have received \$178 million in revenue, \$135 million more than what the ONRR collected.



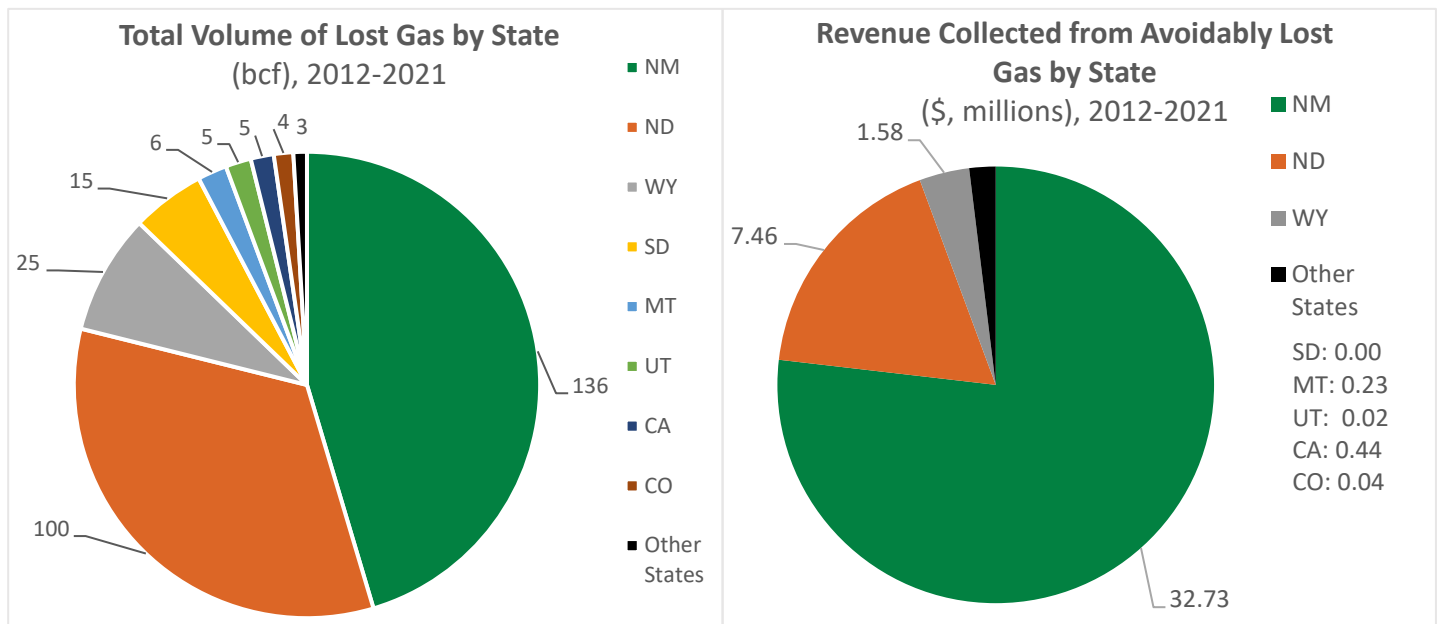
⁹ All natural gas was assumed to have a heat value of 1,037 Btu per cubic foot. Calculations used monthly average Henry Hub Natural Gas Spot Prices [obtained from the Energy Information Administration](#)

Gas Lost from Flaring

According to self-reported data, 82% of gas lost by drilling operators during the past decade was flared. Most flaring occurs at oil wells. In its analysis of ONRR data, the Bureau of Land Management found flaring of associated gas from development wells was the primary source of all oil-well flaring.¹⁰ Operators are choosing to flare gas that comes to the surface with oil rather than capture it because there is no incentive to do so. This flaring of associated gas represents clear and obvious waste.

Geographic Discrepancies

Gas waste on federal lands over the last decade was highly concentrated geographically. Of the total lost gas reported by operators, four out of every five cubic feet was from leases in New Mexico and North Dakota. Over the last decade, there were 136 bcf of gas lost in New Mexico, which could power 1.5 million homes' electricity use for a year. And 100 bcf of gas was lost in North Dakota, which would meet the electricity needs of 1 million homes for one year. Just three counties: Eddy and Lea Counties in New Mexico, and McKenzie County in North Dakota accounted for 59 percent of all lost gas on federal lands nationwide. In FY2021 alone, operators in those three counties reported losing gas worth roughly \$5 million every month.



In FY2020 and FY2021, operators in North Dakota reported more lost gas than those in New Mexico even though North Dakota's oil and gas production from federal lands is around 20% and 10% of that of New Mexico. However, the ONRR collected \$32.7 million in lost gas revenues

¹⁰ 81 FR 6619

in New Mexico, more than 4.4 times the \$7.5 million the agency collected in North Dakota over the last 10 fiscal years. This is largely due to inconsistent administration of what constitutes as “avoidably lost” gas under current rules by different BLM field offices. The BLM New Mexico Office likely had the strictest rules for determining when gas is “avoidably” or “unavoidably” lost.

Most of the reported lost gas in New Mexico and North Dakota was associated with oil-well flaring, when operators burn the gas extracted from oil wells instead of capturing it. And oil-well flaring is more acute in North Dakota than in New Mexico once the volume of lost gas is adjusted for the number of barrels of oil produced. In September 2021, operators in North Dakota reported flaring 240 cubic feet of gas for every barrel of oil produced. That flaring is equivalent to the greenhouse gas emissions released from an average car driving 33 miles. That same car would have to drive 1.4 million miles¹¹ – about 56,600 times around the earth – to release the same emissions as the amount of gas North Dakota operators flared from oil wells on federal land in FY2021 alone.

In neighboring South Dakota, oil-well flaring is even more acute if measured by flared volume per barrel of oil produced. In 2014, operators in South Dakota reported flaring 15 thousand cubic feet (mcf) of gas for every barrel of oil they produced. Over the course of the decade from FY2012 to FY2021, operators on federal land in South Dakota reported losing 15.3 bcf of natural gas, all of which was reported as coming from oil wells. During the same period, operators in the state reported capturing and selling less than 1 bcf of natural gas.

Flaring gas instead of capturing it has become the common practice. The gas lost in South Dakota had an estimated value of \$50 million, but the ONRR collected just \$2,424 in royalties on lost gas in the state over all 10 years.

A Policy Failure

The BLM has clear authority and, indeed, a statutory obligation “to prevent waste of oil or gas developed in the land” and to assess and collect royalties on the produced resources.¹² The massive ongoing waste of taxpayer-owned natural gas lost through venting, flaring, and leakage is evidence that the BLM is not fulfilling this obligation.

Despite attempts to change the rules for venting and flaring in recent years, the guidance in effect for operators remains the 1979 *Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases Regarding Royalty or Compensation for Oil and Gas Lost* (“NTL-4A”). Fulfilling its statutory obligation to limit waste requires the BLM to issue a new rule that replaces the NTL-4A and limits gas waste on federal lands. Any new methane waste rule **must prohibit the practice of non-emergency flaring**, the most egregious source of gas waste.

¹¹ 10,317,932 mcf [using EPA equivalency](#)

¹² 30 U.S.C. 225, 226

The NTL-4A has also been deficient in creating clear guidance on when royalties should be collected on that gas waste. This ambiguity led to an inconsistent imposition of royalties between BLM offices in different states, between BLM field offices in the same state, and within the same BLM field office from one year to the next.

In 2016, the BLM published a new rule to clarify when royalties should be charged on lost gas and set equipment and capture standards to limit overall waste. In 2018, under the Trump Administration, the BLM tried to rescind the 2016 rule and largely revert guidance to the NTL-4A's standards established more than 40 years ago.¹³ In 2020, however, separate federal district court rulings struck down both the 2016 rule and the 2018 attempt to rescind it.

The problem of gas waste on federal lands has not abated, and it remains imperative for the BLM to replace the NTL-4A guidance. As the BLM recognized in the preamble to its 2016 rule, the increase in gas waste from federal leases is largely attributable to operators flaring gas from oil wells instead of capturing it. Commonly, this flaring results from operators' rush to produce oil before establishing connections to infrastructure to capture gas, or without ensuring that the infrastructure has capacity available to take the gas.

There is nothing in federal statute that grants operators the discretion to habitually discard one publicly owned resource simply because they prefer to market another. To the contrary, this wanton flaring of natural gas exemplifies the "undue waste" the Secretary of the Interior is required to prevent. Haste to produce oil cannot justify wasting natural gas. In any new rule to limit gas waste, the BLM must clarify that operators need to plan to capture any gas that escapes during oil production. Any emissions that result from operators' poor planning or rush to produce oil before connecting to gas capture infrastructure is avoidable waste. Capturing it should be the standard.

The Inflation Reduction Act of 2022 (IRA) codifies the BLM's authority to assess a royalty on all gas produced on federal lands, including gas that is vented, flared, or negligently released. However, the IRA allows exceptions for gas that is vented or flared in an emergency, consumed on-site for beneficial use, and gas that is unavoidably lost. The language resembles what is already currently required by NTL-4A. Without clearly defining when gas is considered "unavoidably lost", the BLM will still need to create clearer guidance on when royalties should be collected on that gas waste.

In addition to establishing better guidelines for royalty assessment, the BLM should also seek to stop the widespread waste of natural gas by banning non-emergency flaring. For example, New Mexico has assessed royalties on what they deemed avoidably lost gas over the past decade under the NTL-4A. And although New Mexico collects more royalties in proportion to lost gas

¹³ See TCS' analysis on the 2018 rule for more detail: <https://taxpayer.net/energy-natural-resources/the-new-interior-methane-rule-breakdown-and-analysis/>

and flares less per barrel of oil produced compared to other states, lost gas in New Mexico still accounts for 45% of all lost gas on federal lands. To effectively curtail waste, the BLM must also take steps to prohibit the practice of non-emergency flaring.

Conclusion

Oil and gas companies waste billions of cubic feet of natural gas extracted from federal lands every year through venting, leaking, and flaring. The BLM is charged with a duty to prevent waste of oil or gas developed in the land it administers. Government data demonstrates a significant weakness in current policies regulating methane emissions on federal lands.

The natural gas wasted on federal leases every year has a market value of hundreds of millions of dollars and the potential to power significant economic activity. Depriving consumers of this gas and taxpayers of the royalties is inexcusable, especially in light of U.S. and European energy security concerns since Russia's invasion of Ukraine. Ending the ambiguity and inconsistency in assessing royalties on lost gas with clearer rules that prohibit waste will be a step towards addressing the issue of wasted gas that is not brought to market.

In the face of increasing and tangible climate threats, federal climate policies and common sense should dictate increased urgency for the BLM to limit the waste of natural gas. As a greenhouse gas, methane has a global warming potential 80 times higher than carbon dioxide for the first 20 years it is in the atmosphere. According to a report released by the GAO in 2022, "about 60 percent of total global methane emissions come from human activities, of which fossil fuel production, including natural gas, accounts for about 34 percent."¹⁴ The costs of climate change are mounting for taxpayers and the impacts are being felt across the country. The BLM must take action to help alleviate the growing costs of climate change by curtailing the waste of taxpayer-owned natural gas from oil and gas leases on federal lands.

Appendix: Concerns with Data

Self-Reported Data Likely Underestimates the Magnitude of the Issue

Companies operating on federal lands are required to file reports monthly to the ONRR. The reports include the volumes of oil and natural gas the companies produce and their disposition – e.g. how much was sold, sent to a processing facility, used on lease, injected into a well, vented, flared, etc. These reports are the only data the DOI collects on how much gas is lost from oil and gas drilling on federal lands.

Government auditors like the GAO have criticized how agencies track oil and gas production on federal lands and collect royalties on it for decades. The BLM has long required operators to report the volume of gas vented and flared during operations, but that data is often unverified and insufficient. In a 1990 report, for example, the GAO stated, "...we continue to believe that because BLM does not ensure that oil

¹⁴ GAO, [GAO-22-104759](#), "Federal Actions Needed to Address Methane Emissions from Oil and Gas Development," Apr 20, 2022.

and gas production is accurately reported for the computation of royalties, the industry is essentially operating on an honor system.”¹⁵

Estimates of lost gas from self-reported data likely underestimate total gas losses from federal lands for several reasons. There is little or no incentive for operators to estimate the volume of lost gas accurately, and little oversight by the DOI to check if they have. During the covered period, operators were not required to check for leaks or detect fugitive emissions, even as leaks and fugitive losses are common throughout the oil and gas production process.¹⁶ Abandoned or poorly sealed wells are also significant sources of lost gas, and the DOI does not collect data on these losses either. New rules issued by the Environmental Protection Agency (EPA) may institute stronger leak detection requirements for all oil and gas operators.

Inaccuracies in the Data We Have

There are also inconsistencies within governmental data on lost gas. For example, the GAO, using EPA data, estimated that the true amount of gas vented or flared on federal land in 2008 was 126 bcf.¹⁷ Data collected by the ONRR, however, indicate just 15 bcf was lost in 2008, capturing roughly 12% of what the GAO estimated. Similarly, in 2019, the BLM estimated 150 bcf of gas was lost on federal lands.¹⁸ In contrast, the ONRR data captures less than a third of that total, with just 43 bcf reported by operators.

Studies using satellite imagery to measure flaring also indicate that actual volumes lost are much greater than the available data suggests. For example, in 2015, operators reported flaring 28.9 bcf of natural gas to the State of New Mexico.¹⁹ But satellite data indicate operators actually flared 42.4 bcf of gas in New Mexico in 2015, 46% more than what was reported.²⁰

The lack of data about lost gas on federal leases and inconsistency of available data contributes to our inability to effectively understand and solve this issue.

¹⁵ GAO, [RCED-90-99](#), “Mineral Revenues: Shortcomings in Onshore Federal Oil and Gas Production Verification.” June 26, 1990

¹⁶ Considerable amounts of the greenhouse gas methane leak from the U.S. oil and natural gas supply chain. See: Alvarez et al. “[Assessment of methane emissions from the U.S. oil and gas supply chain](#),” *Science*, July 13, 2018.

¹⁷ GAO, [GAO-11-34](#), “Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases,” Oct 29, 2010.

¹⁸ The White House Office of Domestic Climate Policy, “[U.S. Methane Emissions Reduction Action Plan](#),” November 2021.

¹⁹ OGOR-B data largely agree with the data the State of New Mexico collects from operators. EMNRD, C-115 volumes, flaring only

²⁰ VIIRS Nightfire data, collected by the Earth Observation Group (EOG) at the Colorado School of Mines, reported by SkyTruth – <https://skytruth.org/2022/01/monthly-methane-flaring-summary-data-now-available-in-alerts/>

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