

May 2025

# OIL & GAS CHEMICALS STILL SECRET IN COLORADO

*Little Compliance  
with 2022 Law  
Designed to Prevent  
Toxic Exposures*



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**Physicians for Social Responsibility Colorado, Colorado Sierra Club, Physicians for Social Responsibility, and FracTracker Alliance thank the following for their contributions to this report: Linda Birnbaum Ph.D., D.A.B.T., A.T.S., former Director National Institute of Environmental Health Sciences; John R. Spear, Ph.D., Professor of Civil and Environmental Engineering, Colorado School of Mines; Wilma Subra, M.S., President, Subra Company and recipient of MacArthur Foundation Fellowship.**

# EXECUTIVE SUMMARY

In 2022, prompted by concerns about exposures to toxic substances, Colorado enacted a groundbreaking law banning the use of PFAS, a dangerous class of chemicals, in oil and gas wells, and requiring that all chemicals used underground in the wells be publicly disclosed on a state-run website. But this report on the law's implementation by Physicians for Social Responsibility (PSR) Colorado, Colorado Sierra Club, and FracTracker Alliance found that, as of May 1, 2025, chemical disclosures were available for only 439 of at least 1,114 oil and gas wells subject to the 2022 law, a reporting rate of just 39 percent. Of 31 companies operating the 1,114 oil and gas wells, 20 – almost 65 percent – had no chemical disclosures on the state's website. Industry giant Chevron and its subsidiaries PDC Energy and Noble Energy together operate 377, or more than half, of the 675 wells with no chemical disclosures. The 1,114 wells were spread across 13 counties (see map in Chapter 3 for locations).

**The lack of disclosure means that, based on the best available data, at least 30 million pounds of secret chemicals that were injected into more than 600 of the state's oil and gas wells operated during the first 21 months covered by the law should have been disclosed but were not.**

As a result, Coloradans may be exposed to a mystery mix of toxic chemicals which could be contributing to negative health impacts found among residents living near oil and gas extraction. The lack of chemical disclosure also makes it unclear whether companies are still using PFAS in violation of the 2022 law. In addition, it is uncertain whether the disclosures that are reported on the Colorado website include all chemicals used underground as required by the law or only chemicals used for fracking (chemicals are often used for drilling which precedes fracking as well as in other stages and methods of oil and gas extraction).

**For the level of non-disclosure identified in this report, oil and gas well operators could be liable for at least \$37 million in fines, if the well operators were responsible. The \$37 million would be enough to pay the yearly salaries of approximately 540 Colorado teachers. Chevron and its subsidiaries PDC Energy and Noble Energy could be liable for combined fines of almost \$20 million if the companies were responsible for the lack of disclosure.**

Public disclosure of oil and gas chemicals under the law depends on initial disclosure by chemical suppliers of chemical products and their ingredients used in oil and gas wells and subsequent disclosure by well operators of which products were used in underground operations in the wells. Therefore, a lack of disclosure by chemical suppliers could prevent disclosure by the operators. Lack of compliance by the state agency implementing the law, the Energy & Carbon Management Commission (ECMC), could also prevent public disclosure. The ECMC stated in a letter sent in March that “ECMC is aware that a number of regulated entities have not yet come into compliance with the requirements of C.R.S. 34-60-132,” indicating that at least some chemical suppliers or well operators are responsible for the lack of disclosure. Ultimately, the Energy & Carbon Management Commission (ECMC), led by appointees of Governor Jared Polis, is responsible for ensuring full disclosure of the oil and gas chemicals operators inject into their wells.

## RECOMMENDATIONS

In light of these findings, PSR Colorado, Colorado Sierra Club, and FracTracker Alliance recommend the following:

**1**

**The ECMC, Governor, and Colorado lawmakers should immediately investigate the reasons for the lack of compliance with the 2022 law and ensure that oil and gas chemical information is disclosed promptly.**

**2**

**If chemical suppliers or oil and gas companies have violated the 2022 law, they should be held accountable with fines and, in cases of a knowing and willful pattern of violations by well operators, loss of the ability to receive new permits to drill. Coloradans have the power to petition the ECMC to hold oil and gas companies accountable.**

**3**

**The ECMC should emphasize to oil and gas firms that they must disclose all chemicals used underground in oil and gas wells, not just fracking chemicals.**

**4**

**Localities, which have authority to regulate oil and gas production under Colorado law, should demand full chemical disclosure and institute protections to shield residents from the risk of exposure to toxic chemicals used in oil and gas production.**



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# CHAPTER 1. 2022 COLORADO LAW REQUIRES DISCLOSURE OF ALL OIL & GAS CHEMICALS

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In 2022, Colorado enacted a first-in-the-nation law requiring full disclosure of oil and gas chemicals, HB22-1348 codified at C.R.S. 34-60-132. The measure required Colorado's Energy & Carbon Management Commission (ECMC) as early as December 28, 2023 to disclose on a public website the chemicals used in underground operations occurring in Colorado's oil and gas wells on or after July 31, 2023. The ECMC regulates oil and gas extraction in Colorado, among other responsibilities, and is led by five commissioners appointed by Governor Jared Polis. To facilitate the chemical disclosures under the 2022 law, companies that provide or manufacture chemical products used in oil and gas wells are required to disclose the products and the products' ingredients to the ECMC (chemical products often have multiple ingredients). Subsequently, well operators are required to disclose to the ECMC which of the products were used in underground operations at each oil and gas well site. The ECMC must then match the products used at the well site with the list of products and ingredients on file and disclose to the public the list of chemical ingredients used in underground operations at each well site. In most cases, the ECMC must make these disclosures within 150 days after an underground operation begins (underground operations are not limited to fracking but could include drilling and other activities). The exception is for an underground operation that was ongoing as of July 31, 2023. In these cases, disclosures must be made within 150 days of that date.

The 2022 law was prompted by concerns about the use of secret chemicals, known toxic chemicals, and potentially toxic chemicals in drilling and fracking oil and gas wells. These substances included per- and polyfluoroalkyl substances (PFAS), a widely used class of chemicals known for their extraordinary toxicity, negative health effects, and persistence in the environment, hence their nickname, "forever chemicals." PFAS have polluted water supplies across the nation, including in Colorado, though the source of the PFAS pollution is not always known. A 2022 report from Physicians for Social Responsibility (PSR) found that between 2011 and 2021, PFAS had been used in hydraulic fracturing ("fracking") in almost 300 oil and gas wells in Colorado and may have been used in additional wells.

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But the extent of PFAS use was obscured by gaps in chemical reporting including a provision allowing oil and gas companies to conceal the identities of chemicals used in fracking behind trade secret claims. According to PSR's report, companies used these claims to hide the identity of at least one fracking chemical in more than 12,000 oil and gas wells. These secret chemicals totaled almost 414 million pounds. PSR also found that there were no requirements in Colorado for public disclosure of chemicals used in drilling, which precedes fracking, or other stages and methods of oil and gas production. The 2022 law was designed to close these reporting gaps by requiring public disclosure of all individual chemicals used underground in oil and gas wells whether for fracking or other purposes with no exceptions for trade secrets. The law also prohibited the use of PFAS in oil and gas wells.

## CHAPTER 2. COMPLIANCE WITH 2022 LAW WOEFULLY INADEQUATE

However, this report by PSR Colorado, Colorado Sierra Club, and FracTracker Alliance utilizing data analysis by public interest organization Open-FF found that as of May 1, 2025, disclosure had fallen far short of the law's requirements. Open-FF identified the oil and gas wells that were covered by the 2022 law by consulting the nongovernmental FracFocus database. Since 2012, Colorado law has required well operators to report chemicals used for fracking each well to FracFocus along with fracking start and end dates. These dates enabled Open-FF to determine which oil and gas wells had underground operations that would have been covered by the 2022 law through December 2, 2024, accounting for the 150-day reporting period which would have required public disclosure by May 1, 2025, of chemicals used in the wells. Open-FF then compared the chemical disclosures available for these wells in FracFocus with the chemical disclosures available for the same wells on the ECMC's website. The ECMC's website should have displayed for each well all of the chemicals listed as used for fracking in FracFocus plus any additional chemicals used in each well. But even the information disclosed in FracFocus was often missing.

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**Among the major shortcomings identified on the ECMC's website were these:**

- The website disclosed chemicals used in only 439 of at least 1,114 oil and gas wells (39 percent) for which disclosure was required. In 675 of these wells, no disclosure was available. The 1,114 wells were concentrated in Weld County, home to the highest number of oil and gas wells of any county in the state. Other wells were located in Adams, Arapahoe, Delta, Elbert, Garfield, Gunnison, Jackson, LaPlata, Larimer, Las Animas, Moffat, and Rio Blanco counties. Each county except Delta, Gunnison, and Larimer had at least one well for which no disclosure was available.
- Of the 31 companies operating the 1,114 wells, 20, including industry giant Chevron, had no disclosures on ECMC's website. If the companies were responsible for lack of chemical disclosure associated with the wells, fines could exceed \$37 million. See Table 1 below.
- Trade secret chemicals in the 675 oil and gas wells for which no disclosure was available totaled an estimated 30 million pounds or more, as indicated by FracFocus disclosures, which show that trade secret chemicals were used without revealing their identities. All of these chemicals should have been disclosed on the ECMC's website but none of them were.
- Of the 675 oil and gas wells for which no disclosure was available, 377, or more than half, were operated by Chevron and its subsidiaries, PDC Energy, Inc. and Noble Energy, Inc.
- The 439 wells for which chemical disclosures were provided were operated by 11 oil and gas companies and grouped on 44 different well pads. For all of those well pads, at least one non-trade secret chemical disclosed in the FracFocus data was not disclosed on the ECMC website, implying incomplete disclosure.
- For some of the 439 wells for which chemical disclosures were provided, it was apparent that at least some trade secret chemicals were not disclosed despite the 2022 law's requirement that they be disclosed. See Table 2 below.
- The ECMC did not publish any disclosures until September 2024 – nine months late. Publication occurred following an Open Records Act request which PSR's Colorado Chapter sent earlier that month seeking the disclosures.

**Table 1.** Lack of Chemical Disclosure on State Website for at Least 675 Colorado Oil & Gas Wells Subject to C.R.S. 34-60-132 Listed by Well Operator and Minimum Fines for Non-compliance Which Could Apply to Each Well Operator if the Operator Were Responsible (as of May 1, 2025)

<b>Oil &amp; Gas Well Operator Name According to FracFocus Database</b>	<b>Number of Colorado Oil &amp; Gas Wells for Which Chemical Disclosure Was Past Due on ECMC Website</b>	<b>Total Minimum Accumulated Fine</b>
PDC Energy	220	\$11,497,400
Noble Energy, Inc.	141	\$6,379,600
Crestone Peak Resources	89	\$5,548,000
Bayswater Exploration & Production, LLC	70	\$3,842,400
EXTRACTION OIL & GAS LLC	24	\$1,109,200
Bison IV Operating LLC	20	\$1,481,000
Caerus Oil and Gas LLC	18	\$1,333,600
Chevron USA Inc.	16	\$1,396,800
Civitas North LLC	11	\$846,600
HighPoint Operating Corporation	9	\$176,400
Bonanza Creek Energy, Inc.	8	\$201,600
Laramie Energy LLC	7	\$679,000
POCO Operating	6	\$416,400
Nickel Road Operating LLC	5	\$477,000
GMT EXPLORATION	5	\$212,600
TEP Rocky Mountain LLC	4	\$392,000
Evergreen Natural Resources LLC	4	\$380,200
MDS Energy Development LLC	4	\$354,400
Prairie Operating Company	4	\$6,400
Fulcrum Energy Operating LLC	3	\$250,800
Summit Oil & Gas	2	\$101,400
NueVida Resources	2	\$52,000
Anadarko Petroleum Corporation	1	\$26,200
Anschutz Exploration Corporation	1	\$3,000
Verdad Resources LLC	1	\$2,000
<b>Total</b>	<b>675</b>	<b>\$37,166,000</b>



Table 1 shows, by well operator, that as of May 1, 2025, the number of oil and gas wells in Colorado that were subject to the chemical disclosure requirements of Colorado law C.R.S. 34-60-132 and for which no chemical disclosure was available on a public website operated by the ECMC. C.R.S. 34-60-132 requires public disclosure on the ECMC’s website of all chemicals used in underground operations occurring in Colorado’s oil and gas wells on or after July 31, 2023. Disclosure must occur within 150 days after underground operations begin or within 150 days of July 31, 2023 for underground operations ongoing as of that date. This table also shows the minimum fines that could apply to each well operator if the well operators, rather than the State of Colorado or other companies, were responsible for the delay in disclosure. Violations of Colorado’s rules for oil and gas production can be punishable by fines of at least \$200 per violation per day. Fines can be increased for more severe violations. To estimate the fines that could be assessed against each company, we noted the start date for fracking for each of the company’s wells subject to the 2022 law. The start dates are listed in the FracFocus database. Then we calculated the number of days by which the companies’ apparent failure to disclose chemicals used in fracking for each well exceeded 150 days from the fracking start date. We multiplied this exceedance in days by \$200.



Photo Credit: Phoenix Law



Photo Credit: Phoenix Law

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It is important to note that these are minimum estimated fines, in part, because we calculated the number of days chemical disclosure was past due based only on fracking start dates. We did not analyze the number of days chemical disclosure was past due for other underground operations, such as drilling, which occurred or may have occurred at the same wells. We are confident that drilling operations occurred at each of the wells we analyzed and that these operations pre-dated fracking. Chemicals are typically used in drilling and would also have to be disclosed under the 2022 law. According to a separate ECMC database, drilling at the wells analyzed in this report began at least 27 days prior to fracking, and the median start date was almost 240 days prior to fracking.<sup>1</sup> These figures mean that at least some chemical disclosure for each well in this report related to drilling would have been required much sooner than the disclosure deadlines we calculated based on fracking. Similarly, the number of days out of compliance and the associated potential fines would likely have been much larger than we calculated. Oil and gas well operators' product disclosures submitted to the ECMC contain only the products shown in FracFocus, suggesting that operators have disclosed only their fracking chemicals to the ECMC rather than all chemicals used in underground operations such as drilling. However, calculating estimated fines based on failure to disclose drilling chemicals was outside the scope of this report.

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<sup>1</sup> Colorado Energy & Carbon Management Commission. Downloads. GIS Data. Shapefiles (SHP). Well Surface Location Data (Updated Daily). Well Spots (API)(10 Mb). Accessed May 1, 2025, at <https://ecmc.state.co.us/data2.html#/downloads>.



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## CHAPTER 4. MANY TOXIC CHEMICALS ASSOCIATED WITH OIL AND GAS EXTRACTION

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The lack of disclosure means that Coloradans could be unknowingly exposed to harmful chemicals used in oil and gas wells. In 2016, the U.S. Environmental Protection Agency (EPA) published a study which identified 1,606 chemicals used in fracking fluid and/or found in fracking wastewater.<sup>2</sup> While the EPA found high-quality information on health effects for only 173 (11 percent) of these chemicals, that information raised serious health concerns. The EPA found that “health effects associated with chronic oral exposure [ingestion through drinking water] to these chemicals include carcinogenicity [for benzene and radium], neurotoxicity, immune system effects, changes in body weight, changes in blood chemistry, liver and kidney toxicity, and reproductive and developmental toxicity.” Oil and gas companies use chemicals in fracking for multiple reasons including reducing friction in the fracking fluid which is injected into oil and gas wells at high pressure to fracture underground formations. Prior to fracking, chemicals are also used in the drilling stage for purposes such as lubricating the drill bit.<sup>3</sup> These drilling chemicals can pose health risks, including developmental toxicity and the formation of tumors, according to EPA regulators.<sup>4</sup> A disclosure form filed with the state of Ohio, one of the few states to require disclosure of drilling chemicals, shows that in a well in Ohio, Statoil, Norway’s state oil company (since renamed Equinor), used a neurotoxic chemical, xylene, in drilling.<sup>5</sup>

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<sup>2</sup>U.S. Environmental Protection Agency. Hydraulic fracturing for oil and gas: impacts from the hydraulic fracturing water cycle on drinking water resources in the United States. Washington, DC: Office of Research and Development; 2016, at 9-1. EPA Report # 600/R-16/236F. Accessed Oct. 6, 2023, at <https://www.epa.gov/hfstudy>.

<sup>3</sup>U.S. Environmental Protection Agency. Hydraulic fracturing for oil and gas: impacts from the hydraulic fracturing water cycle on drinking water resources in the United States. Washington, DC: Office of Research and Development; 2016, at ES-3. EPA Report # 600/R-16/236F. Accessed Oct. 6, 2023, at <https://www.epa.gov/hfstudy>.

<sup>4</sup>See, e.g., U.S. Environmental Protection Agency. Focus report for chemical with EPA case number P-06-0676. Washington, DC: New Chemicals Program; 2006 (on file with PSR).

<sup>5</sup>Ohio Department of Natural Resources, Division of Oil and Gas Resources Management, Oil and Gas Well Locator, Form 8(A) for well API Number 34-111-24285. Accessed Oct. 6, 2023, at <https://gis.ohiodnr.gov/MapView/?config=oilgaswells>.

Several pieces of evidence suggest that PFAS may be among the chemicals used in oil and gas operations in Colorado to which residents could be exposed. In addition to the PFAS use in oil and gas extraction documented by PSR in our 2022 report, a paper published in 2008 in an oil and gas industry journal indicated that PFAS had been used in Colorado in an extraction technique known as enhanced oil recovery which can involve injecting chemicals underground. And a paper published in a peer-reviewed journal in 2020 found that PFAS had at least been proposed for use in multiple oil and gas extraction techniques. Data obtained from EPA by the nonprofit Public Employees for Environmental Responsibility showed in 2021 that Colorado may have more sites which “may be handling” PFAS than any other state: 21,000, of which more than 85 percent were associated with oil and gas.



Some of the disclosures made on the ECMC’s website add to the evidence that toxic chemicals have been used in oil and gas production. These chemicals include acrylamide, formaldehyde, and naphthalene. According to the New Jersey Department of Health’s Hazardous Substance Fact Sheets, a tool which allows the public to quickly access toxicity information about chemicals, acrylamide is a probable carcinogen, formaldehyde is a carcinogen and mutagen (a substance which can cause changes in a cell’s DNA, a process that can cause particular diseases such as cancer), and naphthalene is a carcinogen among other negative health impacts associated with the three substances. These chemicals were disclosed on the ECMC’s website but do not appear for the same well pads in FracFocus, meaning that these disclosures are additional to those that appear in FracFocus. This difference may show that because of the 2022 law, the public is learning about some additional chemicals used in Colorado’s oil and gas wells. On the other hand, the difference could also demonstrate that disclosure to FracFocus is incomplete unless the newly disclosed chemicals were used in underground operations distinct from fracking.



In any event, considering the range of toxic and potentially-toxic chemicals which have been used, or could be used, in oil and gas extraction, it is possible that any undisclosed chemical used in extraction could be harmful, highlighting the need for full disclosure which the 2022 law guarantees. The EPA has identified multiple pathways through which people could be exposed to fracking chemicals such as spills or injection of fluids directly into groundwater,<sup>6</sup> and it is possible that people could be exposed through some of the same pathways to chemicals used for purposes other than fracking in the oil and gas extraction process such as drilling.

## CHAPTER 5. TOXIC EXPOSURES FROM OIL AND GAS EXTRACTION COULD BE LINKED TO ILLNESS

There is a potential, based on scientific evidence, that exposure to chemicals used in oil and gas wells is making Coloradans sick. A 2019 study examined 3,324 babies born in Colorado between 2005 and 2011 and found that, compared with control groups, congenital heart defects were 1.4 and 1.7 times more likely in babies born to mothers in areas of medium and high unconventional gas drilling, respectively. A retrospective study published in 2017 found that children and young adults in Colorado diagnosed with acute lymphocytic leukemia were up to four and a half times more likely to live in areas with the highest density of wells as compared to those with no wells within a 10-mile radius. Nationally, multiple peer-reviewed studies have found a link between negative health effects and living close to oil and gas wells.<sup>7</sup>

<sup>6</sup>U.S. Environmental Protection Agency. Hydraulic fracturing for oil and gas: impacts from the hydraulic fracturing water cycle on drinking water resources in the United States. Washington, DC: Office of Research and Development; 2016, at ES-3. EPA Report # 600/R-16/236F. Accessed Oct. 6, 2023, at <https://www.epa.gov/hfstudy>.

<sup>7</sup>Concerned Health Professionals of New York et al. Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking and Associated Gas and Oil Infrastructure at 61-64, 263-301. Accessed December 18, 2024, at <https://psr.org/wp-content/uploads/2023/10/fracking-compendium-9.pdf>.

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A National study of associations between hormone regulators used in fracking and birth outcomes published in 2024, found significant associations between the density of fracking wells in a county and preterm birth and low birth weight. It is unclear exactly what is causing these outcomes, but exposure to chemicals used in oil and gas operations may be a partial explanation. Without full disclosure of chemicals used in oil and gas wells, Coloradans and their health providers may be unable to determine whether there is a link between negative health impacts and exposure to particular chemicals, develop effective treatments, or to keep the public safe by working for effective regulations that prevent exposure to harmful toxics.

## **CHAPTER 6. 2022 LAW REQUIRES DISCLOSURE OF ALL CHEMICALS USED UNDERGROUND, NOT JUST FRACKING CHEMICALS**

C.R.S. 34-60-132 contains several provisions designed to guarantee full disclosure of chemicals used in oil and gas wells including accountability on the part of chemical manufacturers, an unprecedented advance in oil and gas chemical disclosure rules. As noted previously, the first step in disclosure is for oil and gas companies or chemical manufacturers to disclose to the ECMC a list of chemical products used in Colorado's oil and gas wells along with the individual chemical ingredients in each product. If a chemical manufacturer does not fully disclose the list of ingredients in a chemical product to a company further down the supply chain, the company further down the supply chain must alert the ECMC. The ECMC is then obligated to request the missing information from the manufacturer. Accountability for chemical manufacturers is critical because evidence shows that chemical manufacturers know best what chemicals are being used in oil and gas wells and often do not share all of this information with companies further down the supply chain, such as service providers which conduct fracking operations.<sup>8</sup>

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<sup>8</sup>See, e.g., United States House of Representatives Committee on Energy and Commerce, Minority Staff. Chemicals Used in Hydraulic Fracturing (April 2011), at 2, 12 (on file with PSR).

Next, when operators drill and complete an oil or gas well, they must disclose to the ECMC a list of the chemical products used underground in the well. The ECMC then matches the list of chemical products with the ingredients contained in those products, which the ECMC should already have on file. Finally, the ECMC discloses on a public website the alphabetical list of individual chemicals used in the underground operations. In this way, the public can learn the full list of chemicals injected into each oil or gas well. At the same time, by listing the individual chemicals from various products alphabetically rather than grouped together with their products, this disclosure system makes it difficult for chemical manufacturers' competitors to steal chemical formulas by learning which individual chemicals were part of which chemical products. Under the 2022 law, chemical companies could still claim as confidential the proportions or formula of the chemical ingredients used in a chemical product, but individual chemical ingredients – without their proportions – must be disclosed. This system is similar to rules which require food manufacturers to disclose individual ingredients in food products without disclosing the recipe. This disclosure system was suggested in 2014 by a panel convened by the U.S. Department of Energy and adopted in 2015 by California for disclosure of fracking and other oil and gas well “stimulation” chemicals. Colorado is the first state to apply this disclosure methodology to all chemicals used underground in oil and gas wells.



Protest signs from Erie, Colorado. Photo credit: Doug Grinbergs

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## CHAPTER 7. HOW WE FOUND A LACK OF COMPLIANCE WITH THE 2022 LAW: DETAILED METHODOLOGY

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To determine whether chemical disclosures are being made consistent with C.R.S. 34-60-132, Open-FF analyzed the FracFocus database to identify which of Colorado's oil and gas wells must disclose their chemicals under the 2022 law. For each oil and gas well in Colorado that is fracked, the well operator is required to report to FracFocus not only the fracking chemicals used but also other pieces of information including the dates when fracking began and ended. Open-FF was able to identify wells subject to the 2022 law by determining which wells had fracking operations on or after July 31, 2023 and which of these wells had fracking operations beginning at least 150 days prior to May 1, 2025, the day we conducted our analysis. The total number of these wells was 1,114. It is possible that additional oil and gas wells are subject to the law but were not included in this report because, while fracking is widely used, there may be some oil and gas wells that are not fracked. These wells would not appear in the FracFocus database and would not have been included in our analysis. Other wells subject to the law and not counted in this report could be listed in the FracFocus database with fracking operations which began fewer than 150 days prior to May 1, 2025 but with other underground operations such as drilling which began 150 days or more before May 1, 2025.

Once Open-FF identified the 1,114 oil and gas wells clearly subject to the law, the organization analyzed how many of these wells' chemicals used underground were disclosed on the ECMC's new website. The ECMC interpreted the 2022 law's requirement that the chemical disclosures be listed by "wellsite" as meaning that the disclosures would be listed by well pad, an area which often contains multiple oil and gas wells. To determine which *individual* oil and gas wells had chemical disclosures, Open-FF matched the locations of the well pads with the locations of individual wells for which chemical disclosures appeared in the FracFocus database.



Open-FF found that by May 1, 2025, chemical disclosures had been made on the ECMC's website for only 439 of the 1,114 wells for which the information should have been disclosed. (The ECMC's website contained disclosures for 103 additional wells which were posted prior to the 150-day disclosure deadline. These wells were not included in Open-FF's analysis because public disclosure of their chemicals was not yet required.) Open-FF found that there were 675 oil and gas wells with chemical disclosures that were improperly missing from the ECMC's website. Records for the same wells in the FracFocus database showed the use of trade secret fracking chemicals totaling more than 30 million pounds. All of these chemicals' identities were supposed to be disclosed on the ECMC's website without trade secret protection but none of them were. FracFocus publishes the maximum concentration in the fracking fluid of each component of the fluid in percent by mass. FracFocus also publishes the total gallons of water used in the fracking fluid. By converting the gallons of water into pounds, users can estimate the total weight of the fracking fluid and the weight in pounds of each chemical in the fluid, including the trade secret chemicals. This calculation allowed Open-FF to estimate the total weight of trade secret chemicals which should have been disclosed on the ECMC's website.

In addition, Open-FF's analysis showed that even when disclosures were made, they were sometimes incomplete. An example is the well pad listed on the state's website known as Arnold 02N-64W-24, located in Weld County. The well pad has 15 wells that were fracked in 2024, all operated by Verdad Resources LLC. Across those wells, FracFocus shows 92 individual chemical records listed as trade secrets, totaling about two million pounds. Among those 92 records, there are 12 distinct trade secret chemicals as reflected by their ingredient names, which are non-specific names that do not reveal precise chemical identities. See Table 2 below. As trade secret chemicals, these substances each lacked a Chemical Abstracts Service (CAS) number, a unique numeric identifier assigned to each chemical by the American Chemical Society. Scientists consider CAS numbers the best way to identify chemicals because chemicals can have multiple names or trade names but only one CAS number.

The generic chemical names listed in Table 2 are those of chemicals disclosed in the FracFocus database as used on oil and gas well pad Arnold 02N-64W-24, located in Weld County, Colorado. The chemicals' precise identities were withheld as trade secrets.



**Table 2.** Generic Names of Trade Secret Fracking Chemicals and the Weight of These Chemicals Used on Oil and Gas Well Pad Arnold 02N-64W-24, located in Weld County, Colorado. The weights of chemicals used are based on the best available information from FracFocus.

Ingredient Name	Mass (lbs.)
acrylamide copolymer	1,280,000
alkylbenzene sulfonate #1	68,400
alkylbenzene sulfonate #2	22,800
ammonium salt	214
ethoxylated alcohols	24,200
fatty amine salt	21,400
hydrotreated distillate	643,000
modified thiourea polymer	8,340
organic salt	2,140
oxyalkylated nonyl phenolic resin	4,410
oxyalkylated phenolic resin	1,470
Polymer	354

Because the FracFocus disclosures for the Arnold well pad contained at least 12 trade secret chemicals, and because the 2022 law requires disclosure of trade secret chemicals on the ECMC's website, there should appear in the ECMC's disclosures for the Arnold well pad at least 12 chemical identities, including CAS numbers, for chemicals that are not in the FracFocus lists of fracking chemicals for the same well pad. However, the ECMC list has only two chemicals that are not on the FracFocus lists for the Arnold well pad: Formaldehyde;2-methyloxirane;4-nonylphenol;oxirane (CAS# 63428-92-2), Formaldehyde, polymer with 4-(1,1-dimethylethyl)phenol and 2-methyloxirane (CAS# 29316-47-0). This apparent lack of disclosure raises additional concerns about compliance with the 2022 law.

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## CHAPTER 8. VIOLATIONS OF C.R.S. 34-60-132 COULD LEAD TO FINES, OTHER PENALTIES

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Violations of Colorado's oil and gas rules by oil and gas companies could lead to fines or other sanctions if the companies are responsible. However, it is unclear whether the lack of compliance with C.R.S. 34-60-132 is a result of companies failing to provide the ECMC with information in a timely manner, the ECMC failing to post the data in a timely manner, or both. On January 14, PSR Colorado asked the ECMC for an explanation of the delay via email, and in early February, PSR Colorado sent the same message via certified mail.

ECMC responded in a letter dated March 12, indicating that at least some of the lack of disclosure was due to noncompliance by chemical suppliers or operators of underground operations. "ECMC is aware that a number of regulated entities have not yet come into compliance with the requirements of C.R.S. 34-60-132," the agency wrote. "ECMC is in the process of communicating with regulated entities that are out of compliance with these requirements and will continually assess the progress made towards widespread compliance. ECMC will continue to evaluate methods to obtain compliance by those entities that remain out of compliance, including enforcement action."

While it is unclear exactly how many companies, or which companies, are out of compliance with the 2022 law, and to what extent companies have complied, figures shared in ECMC's letter, and information available through FracFocus indicate that at least some of the companies out of compliance are well operators. The ECMC wrote that "[a]s of March 10, 2025, ECMC has received required disclosures from 23 entities that sell and/or distribute chemicals and from 21 operators of downhole operations." According to data from FracFocus analyzed by Open-FF, as of March 10, 2025, there were at least 29 unique company names listed as operating wells in Colorado that would have been subject to disclosure requirements of the 2022 law due to the listing in FracFocus of fracking operations at the wells. Fracking is a type

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of downhole, or underground, operation, and the ECMC lists as “operators” on its disclosure website companies that operate oil and gas wells, indicating that ECMC was referring to well operators when it referred to “operators of downhole operations.” Therefore, if all well operators were complying with the law, the ECMC would likely have reported that it had received disclosures from at least 29 operators of downhole operations rather than 21. It is unclear why, as of March 17, 2025, only nine operators, rather than 21, were listed on ECMC’s chemical disclosure website.

If the violations of the 2022 law are due to well operators failing to submit data in a timely manner, the violations could be punishable with millions of dollars in fines. Colorado’s oil and gas rules contain a schedule of fines. The lowest level of fines are \$200 per violation per day for violations of “Paperwork or other ministerial Rules, a violation of which presents no direct risk or threat of harm to public health, safety, welfare, the environment, and wildlife resources” and have “No actual adverse impact and little or no threat of adverse impacts.” Fines can be as high as \$15,000 per violation per day for more severe violations.<sup>9</sup> Using the most conservative estimate of \$200 per violation per day, Open-FF and PSR estimated that fines due as of May 1, 2025, could be at least \$37.2 million, if the delay in chemical disclosures under the 2022 law is entirely due to well operators’ lack of compliance. This amount of money would be enough to pay the yearly salaries of about 540 teachers, according to an estimate of the average salary for teachers in Colorado by the National Education Association.<sup>10</sup> The fines may be even higher if companies not only failed to disclose fracking chemicals but also failed to disclose chemicals used in separate underground operations such as drilling which precedes fracking (see text below Table 1 above).

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<sup>9</sup>2 CCR 525.

<sup>10</sup>National Education Association. Educator Pay Data 2025. Accessed February 4, 2025, at <https://www.nea.org/resource-library/educator-pay-and-student-spending-how-does-your-state-rank> (estimating average annual teacher pay for Colorado in 2025 as \$68,647).

Apart from fines, violations of Colorado’s rules can prompt a prohibition on drilling. The rules provide that whenever the ECMC or its Director “has evidence that an Operator is responsible for a pattern of violations...the Commission or the Director will issue a notice to such Operator to appear for a hearing before the Commission.” The rules further provide that “[i]f the Commission finds, after such hearing, that a knowing and willful pattern of violations exists, it may issue an order which will prohibit the issuance of any new permits to such Operator.”<sup>11</sup> Permits are required to drill new wells;<sup>12</sup> therefore, the ECMC could prohibit such drilling by prohibiting the issuance of new permits. Colorado’s oil and gas rules provide that residents may petition the Director of the ECMC to enforce violations.<sup>13</sup> Separately, local governments can regulate oil and gas production, and may be able to institute protections to shield residents from chemical risks.

## CHAPTER 9. LACK OF CHEMICAL DISCLOSURE MAY LEAVE PUBLIC DISADVANTAGED IN EMERGENCIES

Lack of full disclosure of chemicals used underground in oil and gas wells increases health risks for Coloradans, including in emergency situations. If full chemical disclosure has not been made under C.R.S. 34-60-132 and there were a chemical emergency at a well site, Colorado law and several federal rules provide some access to undisclosed chemical identities, including trade secret identities, but these laws have limitations. These measures include Colorado’s regulations for oil and gas production<sup>14</sup> which predated the 2022 law and, at the federal level, the Emergency Planning and Community Right-to-Know Act (EPCRA), rules from the Occupational Safety and Health Administration (OSHA), and the Toxic Substances Control Act (TSCA).

<sup>11</sup>2 CCR 527(B).

<sup>12</sup>2 CCR 308.

<sup>13</sup>2 CCR 524(A).

<sup>14</sup>U.S. Environmental Protection Agency. Hydraulic fracturing for oil and gas: impacts from the hydraulic fracturing water cycle on drinking water resources in the United States. Washington, DC: Office of Research and Development; 2016, at 5-27. EPA Report # 600/R-16/236F. Accessed Mar. 16, 2025, at <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990>.

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Colorado's oil and gas chemical disclosure rules which predated C.R.S. 34-60-132 provide authority to obtain chemical identities from well operators, chemical vendors, and service providers but do not clearly provide authority to obtain information from chemical manufacturers who often know best what chemicals are being used. It is, therefore, unclear whether Colorado officials would be able to compel disclosure from chemical manufacturers under the older rules. EPCRA has reporting threshold limits which make it more difficult to obtain identities of chemicals stored on-site in quantities less than 10,000 pounds, a scenario which would be likely to apply to many oil and gas chemicals.<sup>14</sup> OSHA rules apply in employment situations, but not for the general public. TSCA allows first responders and others to request and obtain the identities of confidential chemicals and then keep the identities of these substances secret, preventing the public from knowing about chemical risks.

Under these limitations, there is also no guarantee that affected people would receive the information in time to prevent harm. In 2019, a group of scientists and health professionals including one member who was both a hazardous materials expert and fire department battalion chief wrote in a letter to EPA that time is of the essence when it comes to chemical disclosure:

*hazardous materials teams and other responders depend on knowing what chemicals are present, especially during the first 30 minutes after an incident when they can best contain a spill and effectively evacuate people at risk. But if the responders do not know which, if any, chemicals are present, they may be initially and unknowingly exposed to dangerous substances. Once they determine that unknown chemicals are present, they may have no choice but to back out to protect themselves, evacuate large areas that may or may not be impacted, and watch as a spill worsens and contamination spreads.<sup>15</sup>*

Therefore, full disclosure of oil and gas chemicals as soon as possible is the best way to protect Coloradans' health. However, thus far, disclosure has fallen far short of what C.R.S. 34-60-132 requires.

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<sup>15</sup>Letter from Silverio Caggiano et al. to Charlotte Bertrand, Deputy Assistant Administrator for Programs, U.S. Environmental Protection Agency (May 2, 2019) (on file with PSR).



# RECOMMENDATIONS

In light of these findings, PSR Colorado, Colorado Sierra Club, and FracTracker Alliance recommend the following:

1

The ECMC, Governor, and Colorado lawmakers should immediately investigate the reasons for the lack of compliance with the 2022 law and ensure that oil and gas chemical information is disclosed promptly.

2

If oil and gas companies have violated the 2022 law, they should be held accountable with fines and, in cases of a knowing and willful pattern of violations, loss of the ability to receive new permits to drill. Coloradans have the power to petition the ECMC to hold oil and gas companies accountable.

3

The ECMC should emphasize to oil and gas firms that they must disclose all chemicals used underground in oil and gas wells, not just fracking chemicals.

4

Localities, which have authority to regulate oil and gas production under Colorado law, should demand full chemical disclosure and institute protections to shield residents from the risk of exposure to toxic chemicals used in oil and gas production.