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CHEMICAL MAKERS' EXEMPTIONS FROM FRACKING CHEMICAL DISCLOSURE RULES

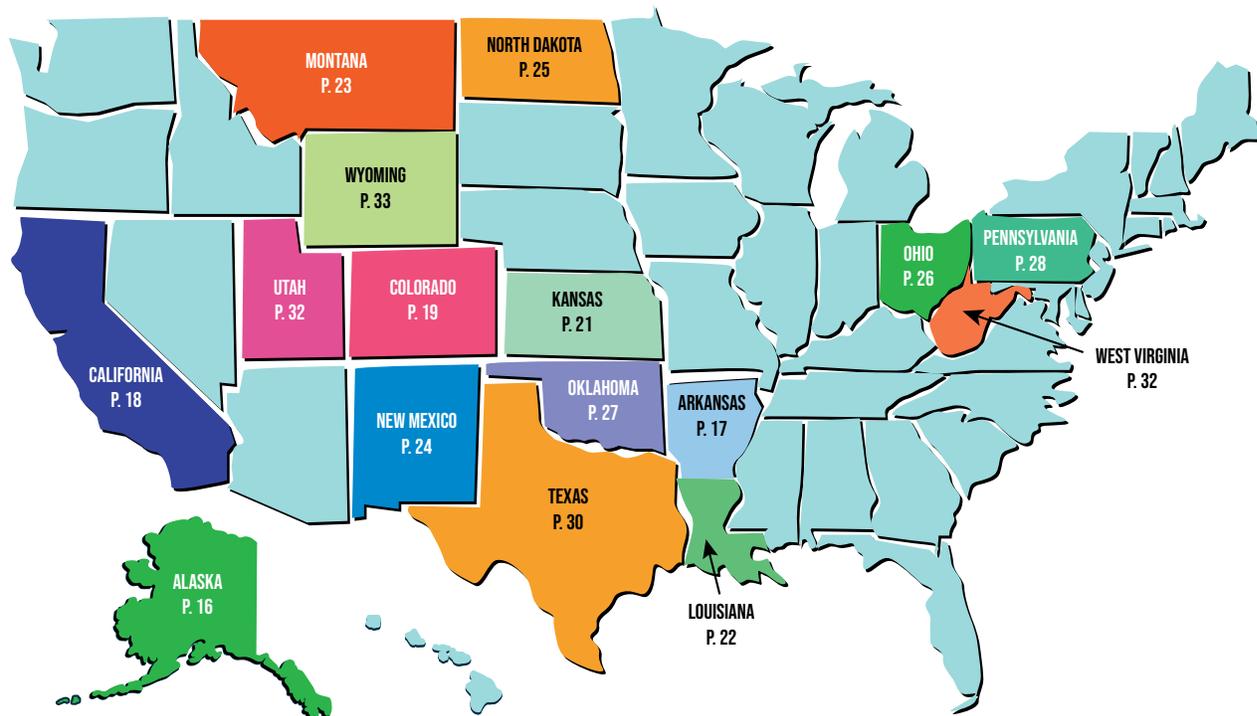
**Chemical Manufacturers Know the Most About Fracking Chemical Contents
but State Fracking Chemical Disclosure Laws Exempt the Manufacturers,
Undermining the Public's Right to Know**

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EXECUTIVE SUMMARY

In the sixteen leading oil- and gas-producing states, manufacturers of chemicals used for hydraulic fracturing (“fracking”) for oil and gas are largely exempt from requirements that they disclose to the public the chemicals that make up their products. Closing this exemption is critical to ensure that the public is fully informed about the chemicals used in oil and gas extraction and to allow first respondents, health professionals, local governments and others to identify potential health and environmental risks. This year, for the first time in the U.S., Colorado enacted a law explicitly requiring public disclosure from manufacturers of fracking chemicals and other chemicals used for oil and gas extraction. Manufacturers will be required to disclose any chemicals not disclosed by other companies in the supply chain.

Some chemicals known to be used for fracking are toxic, and EPA has found that fracking activities can pollute water supplies. Fracking chemicals may also jeopardize air, soil, plants, animals, and human health. Therefore, full disclosure is critical. Yet in some states, chemical manufacturers are explicitly exempt from disclosure requirements. In others, state rules exempt the manufacturers implicitly by requiring fracking chemical disclosure from companies further down the supply chain, such as well owners. However, if downstream companies have not been given full information by the chemical manufacturers, they will not be able to comply with disclosure requirements. This raises the concern that many chemicals, some of them potentially toxic, are not being disclosed at all.

Physicians for Social Responsibility (PSR) examined fracking chemical disclosure rules in the top dozen oil-producing states and the top dozen gas-producing states (16 total): Alaska, Arkansas, California, Colorado, Kansas, Louisiana, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia, and Wyoming. PSR found that:

- Of all the rules and regulations examined, none of the states explicitly requires disclosure of chemical information to be made by chemical manufacturers.

Most of the states require disclosure from well owners, operators, or permit holders who are not chemical manufacturers. Arkansas, North Dakota, and West Virginia also require disclosure from service providers who, in at least some cases, may be chemical manufacturers.

- California is the only state to require all chemicals used in fracking to be disclosed with no exception for trade secrets (until 2023 when Colorado will adopt a similar policy). Yet even in California, responsibility for disclosure rests on companies other than chemical manufacturers, raising questions about whether the manufacturers are sharing with those companies all of the information that must be disclosed.
- Kansas, Oklahoma, Pennsylvania, and Texas have provisions that explicitly exempt chemical manufacturers from having to share fracking chemical information with companies that are ultimately responsible for the public disclosure. Colorado recently deleted a similar provision, strengthening its public disclosure requirements. On the other hand, Louisiana and New Mexico use a legal device that limits the information manufacturers must share with companies that must ultimately make public disclosure.
- States’ rules vary on whether chemicals claimed to have trade secret protection by chemical manufacturers must be disclosed by the manufacturers to health professionals or to emergency responders in the event of a leak or spill. Most of the states do not require such disclosure. Federal rules provide some ability for health professionals and responders to obtain fracking chemical information, but this ability is limited and may not result in disclosure that is timely enough to allow for prompt patient care.

As oil and gas extraction continues at high levels throughout the United States, it is imperative that the public know the identity of all chemicals injected into oil and gas wells. Physicians for Social Responsibility recommends that the

following provisions be adopted in state and local policy:

- Full public disclosure of chemicals used in all stages of oil and gas extraction, prior to the start of extraction activities.
- Explicit requirements that chemical manufacturers publicly disclose the chemicals that comprise their

products used in oil and gas extraction.

- A ban on the use of trade secrets to conceal the identities of individual chemicals used in oil and gas extraction.

OIL AND GAS CHEMICAL DISCLOSURE: BACKGROUND

Since 2010, a total of 29 oil and gas-producing states have adopted requirements that oil and gas companies publicly disclose the chemicals used in hydraulic fracturing (“fracking”). (Fracking involves the high-pressure injection into oil and gas wells of a mix of water, sand, and chemicals to stimulate production.) While these rules provide the public with more information about fracking chemicals than before, the rules contain significant gaps that prevent full identification of these chemicals and their associated health and environmental risks. Some of these gaps, and the subject of this report, relate to the rules’ exemptions for chemical manufacturers.

Some chemicals known to be used for fracking are toxic, and EPA has found that fracking activities can pollute water supplies.¹ Fracking chemicals may also jeopardize air, soil, plants, animals, and human health.² Therefore, full disclosure is critical. States’ reliance on companies further down the supply chain to disclose fracking chemicals raises the concern that many chemicals, some of them potentially toxic, are not being disclosed at all.

Full disclosure of the chemicals used in oil and gas extraction is critical for multiple reasons. These include allowing first responders to protect themselves and safely contain spills, enabling health professionals to provide appropriate medical treatment to people who have been exposed, establishing during litigation whether pollution is the result of oil and gas activity, and assisting scientists and regulators in identifying oil and gas-related pollution. In a report released in 2020 by the Pennsylvania Office of Attorney General as part of a criminal grand jury investigation of oil and gas-related pollution in Pennsylvania, the grand jury wrote,

We want the public to know the identity of all these chemicals being released into the environment, so their effects can be studied, and so government or individual citizens can choose to protect against them if they deem it necessary. We recommend that all chemicals employed in any stage of the unconventional oil and gas process must be publicly disclosed before they can be used.³

State rules requiring disclosure of chemicals used in fracking originated as a response to concerns that the chemicals were causing pollution, particularly water pollution.⁴ During the 2000s, these concerns intensified as oil and gas companies moved into more heavily populated areas to drill so-called unconventional formations such as coalbed methane and shale.⁵ To reach the new deposits, the companies often used fracking combined with horizontal drilling.⁶ Fracking typically involves the high-pressure injection into oil and gas wells of up to millions of gallons of water mixed with sand and chemicals. This fluid creates fractures in underground rock formations or pressurizes existing fractures in order to extract oil and gas.⁷ The chemicals serve a variety of purposes including killing bacteria inside the wellbore, reducing friction during high-pressure fracking, and thickening the fluid so that the sand, suspended in the gelled fluid, can travel farther into microscopic fractures to prop them open and facilitate the flow of oil and gas.⁸ Following drilling and fracking, wastewater flows out of the well. The wastewater is comprised of some of the water, sand and chemicals injected during fracking. (The rest of the fluid remains underground.) Wastewater may also contain naturally occurring contaminants from deep underground⁹ such as carcinogenic benzene¹⁰ and radium.¹¹ Wastewater can reach volumes of millions of gallons per well.¹²

Reports that toxic substances associated with fracking and/or drilling were associated with negative health effects¹³ and contaminated groundwater and/or drinking water¹⁴ created public pressure for better disclosure of these substances. In 2010, Wyoming became the first state to require public disclosure of fracking chemicals, and as of 2017, a total of 29 states had at least some fracking chemical disclosure requirements.¹⁵ There is no federal requirement for hydraulic fracturing chemical disclosure, though proposals have been considered in Congress and the executive branch.¹⁶

The states’ fracking chemical disclosure laws and regulations are not uniform. Consequently, the rules vary in the information required to be revealed.¹⁷ However, the rules typically say that well owners or operators must provide a list of the “additives” or “products” that are injected into each

well. These additives or products are often comprised of more than one chemical.¹⁸ Many of the rules also hold that well owners or operators must disclose the chemical name, trade name, and Chemical Abstracts Service (CAS) number of the individual chemicals that comprise the additives or products.¹⁹ CAS numbers are assigned to chemicals by the American Chemical Society and are considered the best way to identify chemicals because each chemical can have multiple chemical names or trade names but only

one CAS number.²⁰ Since 2010, oil and gas companies have made fracking chemical disclosures at least 189,000 times for thousands of wells according to FracFocus, a nongovernmental group that serves as a repository for state fracking chemical disclosure information for 27 states.²¹ Some states require disclosure to FracFocus while in other states, disclosures to FracFocus are made voluntarily.²² As a result of these disclosures, the public knows much more about the types of chemicals used in hydraulic fracturing.

CHEMICAL MANUFACTURERS OFTEN EXEMPT FROM FRACKING CHEMICAL DISCLOSURE RULES

However, the rules have significant exemptions that prevent a full understanding of the chemicals used in oil and gas extraction and consequently put the public at risk. This report focuses on the most important of these exemptions: the exemption of chemical manufacturers from fracking chemical reporting requirements. To understand why this exemption is important, it is helpful to know that the use of fracking chemicals at each well site can involve several different companies situated in different parts of the supply chain. The chemical manufacturers produce the chemicals that are often in the form of additives or products. Suppliers or vendors provide the additives or products to the companies that use them at well sites. Service providers perform the fracking, and well operators or owners control production from the wells. Of these actors, the most important for public disclosure of fracking chemicals are

the chemical manufacturers, both because they hold all the information concerning what chemicals are being used and because they have some discretion over what information to pass to the other actors in the supply chain.

Our examination of the fracking chemical disclosure rules for the top 12 oil-producing states and top 12 gas-producing states (16 total), found that none of those states require fracking chemical disclosures from chemical manufacturers. Instead, they require disclosure from companies further down the supply chain, including service companies and well owners and operators. Some state laws explicitly provide that the companies that must ultimately make public disclosure of fracking chemicals are not responsible for information not shared with them by upstream chemical manufacturers, suppliers, or service companies.

FRACKING CHEMICALS CAN POSE SERIOUS HEALTH RISKS

The exemptions for fracking chemical disclosure for chemical manufactures are troubling in part because chemicals known to be used in fracking can pose significant health risks. It is, therefore, possible that fracking chemicals used without disclosure could also carry significant risks. In its 2016 report on fracking and drinking water, EPA identified 1,606 chemicals used in fracking fluid and/or found in wastewater. While the agency found high-quality information on health effects for only 173 of these chemicals, that information was troubling. EPA found that “health effects associated with chronic oral exposure to these chemicals include carcinogenicity, neurotoxicity, immune system effects, changes in body weight, changes in blood chemistry, liver and kidney toxicity, and reproductive and developmental toxicity.”²³ The lack of high-quality health testing data for the other 1,400-odd fracking-related chemicals identified by EPA does not necessarily mean that they are safe; it might simply mean that they have not been adequately tested.

In addition, records show that EPA regulators have often found health concerns with new chemicals that manufacturers proposed for use in drilling and/or fracking, yet have nonetheless approved these chemicals for commercial use.²⁴ The chemicals’ manufacturers often concealed the chemicals’ identities by invoking trade secret privileges as permitted by the federal Toxic Substances Control Act (TSCA).²⁵ In 2021, PSR reported that ten years earlier, EPA regulators approved for commercial use three chemicals that an unnamed manufacturer had proposed for use in oil and gas drilling and/or fracking. EPA made the decision despite its regulators’ concerns that the chemicals could degrade into PFOA-like substances.²⁶ PFOA is the most infamous of a class of chemicals known as per- and polyfluoroalkyl substances (PFAS) that are highly toxic, resistant to breaking down in the environment, and bioaccumulate in people.²⁷ One of the three chemicals went into commercial use in 2011 and was being used at least as recently as 2018.²⁸ However, PSR was unable to find documentation of the chemical’s use in oil and gas wells despite a search of the FracFocus database.

These findings highlight the possibility that chemicals used in oil and gas wells without public knowledge may be dangerous. In some cases, the chemicals could have been used as “trade secret” chemicals, in which case the public would know that a chemical had been used but not the chemical’s identity. In other cases, as suggested below, these chemicals may have been kept off the books entirely because the manufacturers did not disclose them to other companies in the fracking supply chain, making it impossible for those companies in turn to disclose their use to the public.

The use of undisclosed, potentially toxic chemicals in fracking is especially risky because evidence suggests that these chemicals could pollute the environment and negatively impact human health. EPA found in its 2016 report on fracking activities that “these activities can impact drinking water resources under some circumstances.”²⁹ The water contamination pathways include several that EPA identified as more likely to result in frequent or severe impacts. These include several that would involve fracking chemicals, such as “spills of fracking fluid that seep into groundwater” and “spills of wastewater after the fracking process is completed.”³⁰ Additional potential pathways of exposure to fracking chemicals include the intentional spreading of wastewater on roads for dust and ice suppression³¹ and air pollution when natural gas is flared at the well head³² and irrigation of crops with fracking wastewater.³³ A growing body of peer-reviewed studies of people living near oil and gas operations shows increased incidences of illnesses and other health effects including cancer, congenital heart defects, and low birth-weight babies, consistent with some of the toxic effects identified by EPA as associated with fracking chemicals or fracking wastewater.³⁴ These studies suggest that there could be a link between exposure to fracking chemicals and negative health effects, making it important for these chemicals to be publicly disclosed.

CHEMICAL MANUFACTURERS WITHHOLD INFORMATION FROM OTHER COMPANIES IN SUPPLY CHAIN

Not only are chemical manufacturers exempt from many state fracking chemical disclosure requirements, but multiple pieces of evidence show that the manufacturers often do not share all of the information about their chemicals with companies that are required to disclose the chemicals to the public. As a result, these downstream companies have no choice but to leave the public uninformed about at least some chemicals used in fracking. In 2011, the U.S. House of Representatives' Committee on Energy and Commerce minority staff issued a report on hydraulic fracturing chemicals in which they asked the 14 leading oil and gas service companies to "disclose the types and volumes of the hydraulic fracturing products they used in their fluids between 2005 and 2009 and the chemical contents of those products."³⁵ While the committee staff found, among other things, that the companies used products containing 29 chemicals that are known or possible human carcinogens, they also found that

In many instances, the oil and gas service companies were unable to provide the Committee with a complete chemical makeup of the hydraulic fracturing fluids they used. Between 2005 and 2009, the companies used 94 million gallons of 279 products that contained at least one chemical or component that the manufacturers deemed proprietary or a trade secret. Committee staff requested that these companies disclose this proprietary information. Although some companies did provide information about these proprietary fluids, in most cases the companies stated that they did not have access to proprietary information about products they purchased "off the shelf" from chemical suppliers. In these cases, the companies are injecting fluids containing chemicals that they themselves cannot identify.³⁶

In 2014, four attorneys with years of experience litigating oil and gas-related cases in Pennsylvania filed a petition with the state Commonwealth Court suggesting manufacturers

often withhold chemical identities from other companies in the supply chain. The attorneys discussed the use of Material Safety Data Sheets (MSDS) that manufacturers use to communicate the contents of fracking chemical products. The federal Occupational Safety and Health Administration (OSHA) requires chemical manufacturers to prepare MSDS (now called safety data sheets) to order to protect workers using the chemicals on the job from hazards.³⁷ "Many times," the attorneys wrote,

a vendor of a hydraulic fracturing fluid product merely re-labels product manufactured by another company without ever knowing anything about the chemical make-up of the product it has re-labeled other than what may be contained in the manufacturer's MSDS. If that MSDS does not list the full chemical content of the product the vendor obtained, the vendor has no way of discerning the full chemical make-up of the hydraulic fracturing fluid. Thus, if a service provider or vendor never had possession of the entire chemical content of hydraulic fracturing fluid, then it is impossible for the vendor or service provider to pass that information along to the operator who then cannot possibly disclose to the Department [of Environmental Protection].³⁸

The attorneys provided as support a record filed in a separate case by well operator Range Resources in which Range suggested that it was relying on Material Safety Data Sheets from manufacturers to reply to a request for the chemicals used to fracture or stimulate its wells. "The MSDS are often useful for developing some understanding of what is in a particular chemical or product," Range wrote, continuing,

However, they vary widely in terms of usefulness. Some manufacturers include very little information about the actual components of a particular product. As a result, Range is currently in the process of

seeking additional information from manufacturers that have failed to provide enough information about their products in the MSDS.³⁹

In one case, Range said that a fracking or stimulation product called “MC SS-5075” was “an Ammonium Bisulfite Solution manufactured by Multi-Chem. The MSDS describes the formula as 45-70% ammonium bisulfite by weight. Range is currently seeking information on the 30-55% missing from the formula.”⁴⁰ In another case, Range mentioned that a chemical known as “MC S-2510T,” also made by Multi-Chem, contained “Ethylene Glycol (30%-60% by weight)” and “Sodium Hydroxide (5% by weight).” Range acknowledged that “we recognize that this formula fails to account for at least 35% of the weight, so we have contacted Multi-Chem for an explanation.”⁴¹

Separately, chemical manufacturer FTS International failed to disclose all the ingredients in a product called FRW-600 used to fracture a well in Carroll County, Ohio in 2017. An MSDS sheet for the product available on the Ohio Department of Natural Resources’ website lists two chemicals that comprise, at most, 36 percent of the product: hydrotreated light distillate and ammonium acetate. The chemicals that make up at least 64 percent of the product are missing.⁴²

Researchers at Harvard University wrote in 2013 that rules for creating MSDS are unlikely to result in complete disclosure of fracking chemicals by chemical manufacturers. The researchers observed that the rules limit disclosure of chemicals “to those that have been studied for workplace exposure.” Many chemicals used in fracking might not meet this standard, they suggested, and therefore might not be disclosed in MSDS. The researchers also suggested that manufacturers might not list at least some substances in MSDS because of a federal regulation that manufacturers are not required to test a chemical to identify its hazards. Instead, manufacturers can use existing data that may not show hazards with a particular chemical. Such chemicals would not be required to be disclosed on an MSDS even if the chemical were hazardous.⁴³ These chemicals, in turn, would not be disclosed to companies in the fracking chemical

supply chain, leaving the companies unable to disclose these chemicals to the public.

A final example of how chemical manufacturers do not or may not disclose all of the chemicals used in fracking or other oil and gas extraction techniques is found in the book *Amity and Prosperity* that won the Pulitzer Prize in 2019 for general nonfiction. In the book, author Eliza Griswold focused on a woman named Stacey Haney and her neighbors, who lived near three hydraulically fractured unconventional gas wells, a drilling waste pit, and a fracking wastewater storage pond. In 2009, after drilling activity began, Haney and the neighbors suffered unexplained illnesses and the deaths of multiple animals. They suspected the illnesses and deaths were caused by air and water contamination from the gas activity.⁴⁴ In a lawsuit filed against Range Resources, the well operator that ran the drilling site, Haney sought a full list of chemicals used at the site. This list would have been important to prove that exposure to the chemicals contributed to her family’s health problems. The court ordered Range to disclose the substances, but the company said it could not comply because it did not know all of them. “Range wasn’t simply being obstructionist,” Griswold writes, “it was likely the company didn’t know, since some of the products its subcontractors used were proprietary, and their contents were secret.”⁴⁵ At least some of the secret chemical identities were held by a chemical manufacturer.⁴⁶ After years of litigation, Haney and another plaintiff accepted a confidential settlement that “left them feeling angry and defeated.”⁴⁷ “The company never provided the plaintiffs with a definitive list of all the chemicals used at the site,” Griswold wrote, and the court “refused to sanction Range for not complying” with the court order to disclose its chemicals.⁴⁸

OTHER EXEMPTIONS FURTHER DISADVANTAGE THE PUBLIC

The exemption for chemical manufacturers adds to other significant exemptions for fracking chemical disclosure that also leave the public uninformed. One widely used exemption is a feature of most state fracking disclosure rules allowing companies to withhold from the public chemicals claimed as trade secrets. Under this exemption, state rules sometimes provide that oil and gas companies must share the trade secret identities with state regulators, but the trade secrets cannot be shared with the public. According to several analyses conducted since 2016, oil and gas companies have withheld fracking chemical identities as trade secrets tens of thousands of times across thousands of oil and gas wells.⁴⁹ Often it is unclear which company is claiming the chemical as a trade secret, though Pennsylvania attorney John Smith, who has litigated against oil and gas companies for years, told nonprofit organization Partnership for Policy Integrity in 2018 that “in my experience, it’s the chemical manufacturers alone that keep the trade secrets.”⁵⁰

Another significant exemption is that most oil and gas-producing states do not require disclosure of chemicals that are used in the drilling that precedes fracking.⁵⁰ During the initial stage of drilling, companies bore deep holes in the earth; these holes typically pass directly through

groundwater. Chemicals can be injected in this stage of the process to help keep the drill bit cool and to lift rock cuttings out of the well,⁵¹ and at this point in the process, no protective structures are in place to keep those chemicals from entering groundwater. Chemicals used in the drilling stage can pose health risks, including developmental toxicity and the formation of tumors, according to EPA regulators.⁵³ A disclosure form filed with the state of Ohio, perhaps the only state to require disclosure of drilling chemicals, shows that Statoil, Norway’s state oil company since renamed Equinor, has used neurotoxic xylene in drilling.⁵⁴

Finally, most of the states PSR examined require fracking chemical disclosure only after fracking has been conducted. The exceptions are Arkansas, California, West Virginia (for some wells), and Wyoming.⁵⁵ Disclosure post-fracking means that the public could be exposed to fracking chemicals before learning these chemicals’ identities and toxicities.

Together, the exemptions for fracking and drilling chemical disclosure continue to leave the public significantly uninformed about what chemicals are being used in oil and gas wells and what chemicals might be harming people and the environment.

EPA, PENNSYLVANIA ATTORNEY GENERAL, FIRST RESPONDERS SAY DISCLOSURE IS CRITICAL

Multiple sources, from authoritative scientific sources to concerned stakeholders, contend that full disclosure of chemicals used in oil and gas extraction is critical. In 2020, the Office of Pennsylvania's Attorney General released a report based on a criminal grand jury investigation of unconventional oil and gas drilling impacts in the state. Based on testimony from over 70 households, the grand jury found that

Many of those living in close proximity to a well pad began to become chronically, and inexplicably, sick. ...Families went to their doctors for answers, but the doctors didn't know what to do. The unconventional oil and gas companies would not even identify the chemicals they were using, so that they could be studied; the companies said the compounds were "trade secrets" and "proprietary information." The absence of information created roadblocks to effective medical treatment. One family was told that doctors would discuss their hypotheses, but only if the information never left the room.⁵⁶

The grand jury concluded that

we want the public to know the identity of all these chemicals being released into the environment, so their effects can be studied, and so government or individual citizens can choose to protect against them if they deem it necessary. We recommend that all chemicals employed in any stage of the unconventional oil and gas process must be publicly disclosed before they can be used.⁵⁷

Full chemical disclosure would also help scientists and regulators identify pollution and health effects associated with oil and gas operations. The EPA found in its 2016 study that information about chemicals used in fracking was "not complete," including information about the chemicals' identities and physical, chemical, and toxicological properties. The agency noted that 70 percent of the fracking chemical disclosures that had been reported to the FracFocus database

for 39,000 wells contained at least one chemical that had been labelled a trade secret.⁵⁸ The agency concluded that

The identity and concentration of these chemicals, their transformation products, and chemicals in produced water [wastewater] would be needed to characterize how chemicals associated with hydraulic fracturing activities move through the environment and interact with the human body. Identifying chemicals in the hydraulic fracturing water cycle also informs decisions about which chemicals would be appropriate to test for when establishing pre-hydraulic fracturing baseline conditions and in the event of a suspected drinking water impact.⁵⁹

Baseline testing for particular chemicals in water is important because if subsequent testing shows that these chemical levels increase or appear for the first time after drilling or fracking, it would be apparent that the drilling or fracking caused the change. But without a baseline measurement of particular chemical levels, the discovery of these particular chemicals in water supplies after fracking could mean that the chemicals were present all along from another source and had simply been found after the drilling or fracking, though unrelated to these activities.⁶⁰ Scientists, regulators, or ordinary citizens may not think to take baseline measurements for particular chemicals if they do not know that these particular chemicals are being used.

Whether baseline testing is an issue or not, the lack of knowledge about chemicals used in fracking may leave regulators and the public unable to hold companies accountable and unable to determine whether drilling or fracking caused pollution or health impacts. In *Amity and Prosperity*, Griswold wrote about how Stacey Haney's inability to obtain the full list of oil and gas chemicals to which she and her neighbors could have been exposed may have influenced her to agree to an unsatisfying and then-confidential settlement of her lawsuit against Range Resources. (The

settlement was later disclosed as the result of a mistake in which the terms were sent to a reporter.) The total amount of the settlement was three million dollars. Range said that attorneys received 33 percent, or about one million dollars. The agreement did not say how the remaining two million dollars was split among Haney and five neighbors.⁶¹

Finally, full chemical disclosure can help protect first responders and enable them to prepare for accidents so they can better safeguard the public. In 2019, a group representing health professionals, scientists, and first responders wrote to EPA objecting to the agency's decision to keep confidential the identities of 41 chemicals proposed for use in drilling and/or fracking for which EPA regulators had identified health concerns. The group wrote that first responders

may face particularly severe risks and disadvantages due to chemical confidentiality. In the event of an emergency at a well site, they will likely be asked to rush to the scene. In these situations, 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.⁶²

First responders, regulators, scientists, and people living near oil and gas operations will continue to be disadvantaged as long as oil and gas companies and chemical manufacturers withhold the identities of chemicals used in fracking and other oil and gas extraction techniques. One of the key steps to ending this culture of secrecy is to close the exemptions for chemical manufacturers under state fracking chemical disclosure rules.

FEDERAL LAW ALLOWS STATES TO REQUIRE CHEMICAL DISCLOSURE FROM MANUFACTURERS

TSCA allows states to require public disclosure of oil and gas chemicals from chemical manufacturers. The law says that nothing in its text

nor any rule, standard of performance, risk evaluation, or scientific assessment implemented pursuant to this chapter, shall effect the right of a State or a political subdivision of a State to enforce any rule, standard of performance, risk evaluation,

scientific assessment, or any other protection for public health or the environment that...implements a reporting, monitoring, or other information obligation for the chemical substance not otherwise required by the Administrator under this chapter or required under any other Federal law...⁶³

FEDERAL LAWS REQUIRING DISCLOSURE OF TRADE SECRETS ARE INADEQUATE

State action is allowed by TSCA, and is important, because federal rules do not adequately require chemical manufacturers to publicly disclose their fracking chemicals. Nor do they mitigate all the other exemptions under state fracking chemical disclosure rules. In 2016, Congress updated TSCA to allow various entities and individuals to gain access to trade secret chemical identities under various conditions. One of these provisions enables states, local governments, and tribal governments to access trade secret chemical identities for law enforcement, provided they have taken steps to keep the identities confidential.⁶⁴ Another provision allows health professionals to access trade secret chemical identities by providing a signed statement of need attesting to certain conditions including that “1 or more individuals being diagnosed or treated have been exposed to the chemical substance or mixture concerned, or an environmental release of or exposure to the chemical substance or mixture concerned has occurred.”⁶⁵ In addition, the health professional must agree to sign a confidentiality agreement that includes a promise not to use the trade secret information for more than certain agree-upon purposes.⁶⁶ A third provision allows both first responders and health professionals to access trade secret information in emergency situations if the responders and/or health professionals “have a reasonable basis to suspect that...a medical, public health, or environmental emergency exists” among other scenarios.⁶⁷ The person who holds the trade secret may require that the responders and health professionals provide a written statement of need and agree to sign a confidentiality agreement and then submit these documents to EPA.⁶⁸ The law provides for a few additional scenarios under which trade secrets may be, or must be, disclosed.

These provisions under TSCA are a step toward better chemical disclosure, but do not sufficiently overcome the lack of accountability for chemical manufacturers under state fracking chemical disclosure rules. One major problem, as previously mentioned, is that chemical manufacturers may simply not share chemical identities with well operators or service companies whether

under trade secret protection or not. In these cases, first responders, health professionals and others might not know that there is a trade secret chemical in use whose identity they should request. In addition, there is no guarantee that disclosure will be timely. “It doesn’t guarantee that I will get the information at the time of the emergency, and it doesn’t guarantee that I can get the information before the emergency so that I can pre-plan,” Youngstown, Ohio Fire Department Battalion Chief (now retired) and hazardous materials expert, Silverio Caggiano, told nonprofit Partnership for Policy Integrity in 2019.⁶⁹

Chemical disclosure rules issued by OSHA are also not a substitute for full disclosure of fracking chemicals by the chemical manufacturers. The rules provide in part that in certain emergency situations, “the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity” and other relevant information of a trade secret chemical to a “treating physician or nurse.”⁷⁰ The manufacturer, importer, or employer may request from the physician or nurse a statement of need or confidentiality agreement when the situation permits.⁷¹ The rules also provide that in certain non-emergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose chemical information that is otherwise allowed to be withheld “to a health professional...providing medical or other occupational health services to exposed employee(s), and to employees or designated representatives....”⁷² As with the TSCA rules, people who do not know that a chemical has been used because it has not been disclosed by a chemical manufacturer might not know to request that its identity be disclosed under OSHA rules, rendering the rules meaningless. In addition, disclosure of chemical identities under the OSHA rules would occur only after a chemical had already been used, placing first responders at a disadvantage and potentially causing people to be unknowingly exposed to dangerous chemicals. A further problem is that disclosure of chemical identities and related information in an emergency situation can be made only to “a treating physician or nurse” and not to first responders or others. If a treating physician

or nurse were not immediately available, a chemical could cause harm before its identity were known. In non-emergency situations, health professionals providing medical services to those who were not exposed at work would apparently be

unable to use the OSHA rules to obtain undisclosed chemical identities. Neither the TSCA rules nor the OSHA rules are a substitute for full disclosure of fracking chemicals by chemical manufacturers prior to fracking activity.

STATE FRACKING CHEMICAL DISCLOSURE REQUIREMENTS FOR CHEMICAL MANUFACTURERS

Following is a state-by-state analysis of how chemical manufacturers are exempt from fracking chemical disclosure rules in the top dozen oil- and gas-producing states (16 total): Alaska, Arkansas, California, Colorado, Kansas, Louisiana, Montana, North Dakota, New Mexico, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia, and Wyoming. We examined the rules of each state concerning fracking chemical disclosure, and consulted state government representatives or legal experts on oil and gas issues in each state, focusing on five questions:

- *Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers?*
- *Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?*
- *Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain?*
- *Do the state's rules require chemical manufacturers to disclose fracking chemicals to health professionals upon request including chemicals withheld from the public as trade secrets?*

- *Do the state's rules require chemical manufacturers to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets?*

The laws and regulations are sometimes difficult to interpret because some require disclosure from particular actors in the supply chain such as “suppliers” or “vendors” but fail to define whether or not these terms encompass chemical manufacturers. Other rules do not reference chemical manufacturers but do not explicitly exempt them from disclosure requirements. We tried to resolve ambiguities by contacting representatives at relevant state agencies. Below, we analyze each state’s rules using the five questions about how chemical manufacturers are regulated.

STATE-BY-STATE FINDINGS

Alaska



Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** Alaska requires disclosure to be made only by the operator of the well.⁷³ Alaska's regulations state that the operator is required to provide to the Alaska Oil and Gas Conservation Commission "the chemical ingredient name of, and the Chemical Abstracts Service (CAS) registry number assigned to, each base fluid and additive used" in fracking.⁷⁴ The code defines operator as "an owner or a person authorized by an owner who is responsible for drilling, development, production, injection, disposal, storage, abandonment, and location clearance."⁷⁵ This definition does not encompass the role of chemical manufacturers.

According to a spokesperson for the Alaska Oil and Gas Conservation Commission, although the chemical disclosure requirement is directed at the operator, it requires the operator to disclose information including the CAS numbers and information specifically as provided by the chemical manufacturer.⁷⁶ Therefore, state law could be read to implicitly require that operators compile information from chemical manufacturers in order to fulfill the state's fracking chemical disclosure requirements. An important question is whether operators are able to compile this information, considering the evidence above on pages 9 to 10 that chemical manufacturers have often withheld chemical identity information. Another spokesperson at the Commission said that operators typically compile fracking chemical information from MSDS sheets.⁷⁷ As stated on pages 9 to 10 manufacturers sometimes omit chemical identities from these sheets.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking? **Yes.** The rules hold that "any information required to be filed under this section that the filing party believes to be a confidential trade secret shall be separately filed in an envelope clearly marked 'confidential' along with a list of the documents that the party believes to be wholly or partially

nondisclosable as trade secrets, and the specific legal authority and specific facts supporting nondisclosure. The commission will review the information, and will maintain it as confidential" unless certain conditions are met.⁷⁸ The broad wording of this section allowing an undefined "filing party" to claim trade secrets would enable chemical manufacturers to be a filing party.

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.**

Do the state's rules require chemical manufacturers to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **Unclear.** It is unclear if such a requirement exists because such an obligation is not mentioned within the regulation. These obligations exist in some situations under the federal TSCA and OSHA rules discussed above on pages 14-15.

Do the state's rules require chemical manufacturers to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **Unclear.** It is unclear if such a requirement exists because such an obligation is not mentioned within the regulation. This obligation exists in some situations under the federal TSCA discussed above on pages 14-15.

Although Alaska's regulations do not address whether chemical manufacturers must disclose fracking chemicals to health professionals and emergency responders, one of the Code's provisions specifies that anyone can file a request for disclosure of trade secret information with the Alaska Oil and Gas Conservation Commission. The potential problem with such requests is that the review process might take too long to provide essential information in an emergency situation.

Arkansas

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **Unclear.** Arkansas requires that prior to fracking, "any person performing Hydraulic Fracturing Treatments within the State of Arkansas" must

Disclose to the Director, or his designee, and maintain separate master lists of... All Hydraulic Fracturing Fluids to be utilized during any Hydraulic Fracturing Treatment within the State of Arkansas; and...All Additives to be utilized during any Hydraulic Fracturing Treatment within the State of Arkansas; and...All Chemical Constituents and associated CAS numbers to be utilized in any Hydraulic Fracturing Treatment within the State of Arkansas...

These requirements do not apply to chemical constituents withheld as trade secrets.⁸⁰ The law further provides that, after fracking, any person performing hydraulic fracturing must provide fracking chemical information to the permit holder for each well, again with the exception of trade secrets.⁸¹ The permit holder must then make public disclosure of the specific chemicals used, except for those protected as trade secrets.⁸²

The rules for disclosure prior to fracking leave unclear whether chemical manufacturers are required to disclose fracking chemicals publicly. The person or entity performing a fracking treatment is typically a service company such as Baker Hughes, Halliburton, and Schlumberger. Baker Hughes and Halliburton have indicated that they also manufacture fracking chemicals, and other service providers may, too.⁸⁴ Therefore, if a service company were also a chemical manufacturer and the service company performed a fracking chemical treatment in Arkansas, this manufacturer/service company would be required to disclose fracking chemicals. However, there is no guarantee that even such a service provider would be able to disclose all of the chemicals that it is using. As was mentioned in the 2011 congressional investigation cited on page nine, many service companies did

not know, and could not disclose, all of the chemicals they were using for fracking. This evidence suggests that even if service companies manufacture some of the chemicals they use, they do not make them all and thus would not be in a position to publicly disclose all the substances.

The rules for disclosure after fracking also make it unclear whether chemical manufacturers would have to disclose fracking chemicals. The rules apply most directly to current permit holders who, as is described above, must make public disclosure of fracking chemicals. The Arkansas Oil and Gas Commission defines "current permit holder" as "the person required to hold the permit or to whom the permit was issued and who is the owner of the right to drill, produce and/or operate said well(s)..."⁸⁵ Entities that fit this description are unlikely to manufacture chemicals. The law also requires the person performing the fracking to provide chemical information to the permit holder. As stated in the previous paragraph, these companies may be chemical manufacturers but may or may not manufacture all of the chemicals they use and thus may not have the information they are being asked to disclose.

Even if neither the person performing the hydraulic fracturing treatment nor permit holders are chemical manufacturers, state law could be read to implicitly require that persons who conduct fracking and permit holders compile information from chemical manufacturers in order to fulfill the state's fracking chemical disclosure requirements. An important question is whether persons who conduct fracking and permit holders are compiling this information, considering the evidence above that chemical manufacturers have often withheld chemical information from service providers and well operators.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

Yes. The rules provide that "the identity of any Chemical Constituent that qualifies as a trade secret under the criteria set forth in subsection (a)(2) of 42 U.S.C. § 11042 shall be held confidential by the Director."⁸⁶ These criteria allow trade secrets to be claimed by a "person" under certain conditions

and define a person to include a “corporation.”⁸⁷ Therefore, under Arkansas’ rules, a chemical manufacturer would be able to use trade secrets to shield fracking chemicals from public disclosure.

Do the state’s rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? No.

Do the state’s rules require chemical manufacturers to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets?

Probably. According to a spokesperson with the Arkansas Oil and Gas Commission (AOGC), “it is the position of the AOGC that there are state and/or federal rules that do specifically require the disclosure of this information to health care professionals.”⁸⁸ The spokesperson cited sections of Arkansas’ code which provide that despite the ability of the permit holder and a person that performs fracking in Arkansas to declare fracking chemicals as trade secrets,

nothing...shall authorize any person to withhold information which is required by state or federal law to be provided to a health care professional, a doctor, or a nurse [italics added by PSR]. All information required by a health care professional, a doctor, or a nurse shall be supplied, immediately upon request, by the person performing the Hydraulic Fracturing Treatment, directly to the requesting health care professional, doctor, or nurse, including the percent by volume of the Chemical Constituents (and associated CAS numbers) of the total Hydraulic Fracturing Fluids and Additives.⁸⁹

It is possible that the phrase “any person” in the first sentence of the provision above encompasses chemical manufacturers. They would be required to make disclosures of chemical identities under the federal TSCA and OSHA discussed above on pages 14-15 and, perhaps, under other legal authority. Therefore, it appears that Arkansas’ rules do not shield chemical manufacturers from complying with

other requirements that they disclose fracking chemical information to health professionals.

Do the state’s rules require chemical manufacturers to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? No. The rule mentioned above does not name first responders, though as mentioned above on pages 14-15, the federal TSCA includes requirements for disclosing trade secret information to first responders.

California

Do the state’s rules require fracking chemical disclosure to the public by chemical manufacturers? No. The state provides that “the operator is responsible for compliance.”⁹⁰ The rules provide that an operator shall disclose “a complete list of the names, Chemical Abstract Service numbers, and maximum concentration, in percent by mass, of each and every chemical constituent of the well stimulation treatment fluids used.”⁹¹ The rules do not include a definition for “operator,” but the term typically does not encompass chemical manufacturers. The preamble to California’s Senate Bill No. 4 that created the requirement for public disclosure of fracking chemicals also suggests that the term does not cover chemical manufacturers. The preamble states that “The Bill would require an owner or operator of a well to record and include all data on acid treatments and well stimulation treatments, as specified.”⁹² Here, the operator is presented as similar to a well owner.

State law could provide some indirect authority over manufacturers. The law provides that “a supplier that performs any part of the stimulation or provides additives directly to the operator for a well stimulation treatment shall furnish the operator with information suitable for public disclosure needed for the operator to comply.”⁹³ Under the state’s definition, suppliers could be manufacturers who then must report chemical information to operators.⁹⁴ The state also requires disclosure of “a *complete list*” of fracking chemicals⁹⁵ (italics added by PSR), suggesting that

the operators shall not omit any chemicals from disclosure including those that might be initially withheld by chemical manufacturers. An important question, however, is whether operators and suppliers are compiling and disclosing the required information, considering the evidence that chemical manufacturers have often withheld chemical information from service providers and well operators.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

No. The rules provide that "Notwithstanding any other law or regulation, none of the following information shall be protected as a trade secret...The identities of the chemical constituents of additives, including CAS identification numbers."⁹⁶ The rules suggest that a supplier/chemical manufacturer may withhold as trade secret information the formula for a chemical additive that contains more than one chemical, but that the supplier must still disclose the individual chemicals in the mixture by providing "substitute information for public disclosure."⁹⁷ The rules say that "the substitute information shall be a list, in any order, of the chemical constituents of the additive, including CAS identification numbers."⁹⁸ California's system of disclosure echoes the recommendation of a Department of Energy advisory panel which found that fracking chemical makers could disclose individual chemical identities in a list disconnected from their chemical products, thus reducing the risk of having chemical product formulas stolen by competitors.⁹⁹

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.**

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **No.** The only entity required to disclose fracking chemicals under the rules is the operator. Relatedly, California provides that "the division [of Geologic Energy Management] shall develop a timely procedure to provide trade secret information in the following circumstances" including, with some restrictions,

"to a health professional in the event of an emergency or to diagnose or treat a patient."¹⁰⁰ The division of Geologic Energy Management is responsible for making this disclosure, and operators would be required to provide this information to the division. As mentioned previously in this section, the state may have some indirect authority over chemical manufacturers if at least some suppliers are also manufacturers. It is unclear whether suppliers encompass chemical manufacturers. Under the federal TSCA and OSHA, as discussed on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.**

The only entity required to make fracking chemical disclosure under the rules is the operator. Relatedly, California's rules provide that "the division [of Geologic Energy Management] shall develop a timely procedure to provide trade secret information" to various people including health professionals and "to an officer or employee of the division, the state, local governments..."¹⁰¹ Employees of local governments could include firefighter/Emergency Medical Technicians, who apparently would be allowed to access trade secret information.¹⁰² The division of Geologic Energy Management is responsible for making this disclosure, and operators would be required to provide this information to the division. As mentioned previously in this section, the state may have some indirect authority over chemical manufacturers if at least some suppliers are also manufacturers. It is unclear whether suppliers encompass chemical manufacturers. Under the federal TSCA, as discussed on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

Colorado

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** Colorado requires fracking chemical disclosure to be made by the operator with information provided by a vendor and service provider.¹⁰³ The rules state that

a service provider who performs any part of a Hydraulic Fracturing Treatment and a vendor who provides Hydraulic Fracturing Additives directly to the Operator for a Hydraulic Fracturing Treatment will, with the exception of information approved as a Trade Secret Chemical Product...furnish the Operator with any information needed for the Operator to complete the Chemical Disclosure Registry form and post the form on the Chemical Disclosure Registry.¹⁰⁴

The disclosure must include individual chemicals used for fracking and their CAS numbers, if available.¹⁰⁵ An operator “shall mean any person who exercises the right to control the conduct of oil and gas operations.”¹⁰⁶ A vendor “provides Hydraulic Fracturing Additives directly to the Operator for a Hydraulic Fracturing Treatment,”¹⁰⁷ and a service provider “performs any part of a Hydraulic Fracturing Treatment.”¹⁰⁸ Though chemical manufacturers are not defined in the rules, they may be intentionally omitted from these fracking chemical disclosure requirements because a previous version of the rules referred to them as separate from vendors, service providers, and operators. The previous version of the rules also established that each of these various entities were not responsible for the accuracy of the others’ information. Previous rules stated that

A vendor is not responsible for any inaccuracy in information that is provided to the vendor by a third party manufacturer of the hydraulic fracturing additives. A service provider is not responsible for any inaccuracy in information that is provided to the service provider by the vendor. An operator is not responsible for any inaccuracy in information provided to the operator by the vendor or service provider.¹⁰⁹

Similarly, the previous rules treated manufacturers as a separate entity in a separate section and provided them with further immunity from disclosure requirements that fall primarily on operators. The section stated that “a vendor, service provider, or operator is not required to...disclose chemicals that are not disclosed to it by the manufacturer, vendor, or service provider.”¹¹⁰ Because chemical

manufacturers are not named in the current fracking chemical disclosure rules and because they were referred to in the prior rules as separate entities, it is apparent that chemical manufacturers are not required to disclose fracking chemicals.

However, in June 2022, Colorado enacted legislation that will, for the first time in the U.S., explicitly require chemical manufacturers to publicly disclose fracking chemicals and other chemicals used in oil and gas wells. The law will take effect in 2023.¹¹¹

Do the state’s rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking? **Yes.** Colorado’s rules appear to allow chemical manufacturers or any “claimant” to claim that a chemical identity is a trade secret and, if the claim is approved, have that identity withheld from public disclosure.¹¹² The law referenced directly above, that will take effect in 2023, will prohibit the use of trade secrets for individual chemicals

Do the state’s rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.** As discussed above, prior versions of the rules made it impossible for an operator, service provider, or vendor to hold chemical manufacturers accountable for accurate fracking chemical disclosure. However, those sections have been deleted from the rules that took effect in January 2021, providing operators, service providers, and vendors with more incentive to hold chemical manufacturers accountable. An important question is whether operators, service providers, and vendors are compiling and disclosing the required information, considering the evidence that chemical manufacturers have often withheld chemical information from service providers and well operators.

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **No.** The rules provide that

Upon request by the Director, the Commission, a Relevant Local Government, Governmental Agency, an emergency responder, or a health professional, the Operator, vendor, or service provider will provide a list of the chemical constituents, including the specific identity and concentration of each constituent, contained in a Chemical Product.¹¹³

The rules further provide that “such request may be made as a result of a spill or release, a complaint from a potentially adversely Affected Person, or when necessary to protect and minimize adverse impacts to public health, safety, welfare, the environment, and wildlife resources”¹¹⁴ and that

Disclosure of the Chemical constituents contained in a Chemical Product will only be made to a health professional when requested for the purpose of diagnosis or treatment of an individual who may have been exposed to a Chemical used at an Oil and Gas Location.¹¹⁵

Chemical manufacturers are not explicitly required to make these disclosures. However, as indicated above on page 20, the rules may implicitly require operators, vendors, and service providers to comply by compiling and disclosing fracking chemical information from manufacturers. Whether the operators, vendors, and service providers could do so is uncertain. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.** As mentioned above, only operators, vendors, and service providers are required to make these disclosures. However, the rules may implicitly require operators, vendors, and service providers to comply by compiling and disclosing fracking chemical information from manufacturers. Whether the operators, vendors, and service providers could do so is uncertain. Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers

would be required to make disclosures of chemical identities to emergency responders.

Kansas

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** Kansas places the responsibility of disclosing chemical information on the operator.¹¹⁷ The section states that the operator of the hydraulic fracturing treatment must submit to the Commission “a list of each hydraulic fracturing treatment” including “each chemical constituent...and its CAS number.”¹¹⁸ The rules could be read to implicitly require that the operator compile information from chemical manufacturers in order to fulfill the state’s fracking chemical disclosure requirements. An important question is whether operators are compiling this information, considering the evidence that chemical manufacturers have often withheld chemical information from service providers and well operators.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking? **Yes.** The rules hold that “no operator shall be required to disclose any chemical constituent...that is a trade secret.”¹¹⁹ The rules further hold that “each operator reporting that a chemical constituent is a trade secret shall indicate to the commission that disclosure of the chemical constituent is being withheld pursuant to a trade secret claimed by the operator, manufacturer, supplier, or service company.”¹²⁰ Although this rule specifies that no “operator” shall be required to disclose any chemical constituent that is a trade secret, there is no prohibition on assertions of trade secrecy by chemical manufacturers.

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **Yes.** The rules say that “no operator shall be responsible for inaccurate or incomplete information provided by a manufacturer, supplier, or service company.”¹²¹

This provision means that if a chemical manufacturer (or supplier or service company) withholds chemical information from an operator, the operator has no legal incentive to persuade the chemical manufacturer to disclose its fracking chemicals so that the operator can ultimately make disclosure to the public.

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? Yes, with potential exception. According to Kansas regulations, “a manufacturer, supplier, service company, or operator shall provide the specific identity of a chemical constituent reported to be a trade secret to any health professional” provided certain conditions are met.¹²² “Health professional” is defined as “a physician, physician assistant, nurse practitioner, registered nurse, emergency medical technician, or similar individual who is licensed in that individual’s state of practice.” However, it is unclear whether chemical manufacturers would have to disclose to health professionals chemicals that are not trade secrets. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? Yes, with potential exception. Disclosure to health professionals as discussed above includes at least some emergency responders, namely emergency medical technicians. In addition, rules provide that “the manufacturer, supplier, service company, or operator shall provide the specific identity of a chemical constituent reported to be a trade secret to the director [of the conservation division of the Kansas Corporation Commission] under the following circumstances” including

within two business days after receipt of a letter from the director stating that the information is necessary to investigate a spill or contamination of fresh and usable water relating to a hydraulic fracturing treatment; or (B)

immediately following notice from the director that an emergency requiring disclosure exists.¹²³

There is no obligation for the director to share the information with first responders. In addition, it is unclear whether chemical manufacturers would have to disclose to first responders chemicals that are not trade secrets. Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

Louisiana

Do the state’s rules require fracking chemical disclosure to the public by chemical manufacturers? No. Louisiana requires chemical disclosure to be made by the operator.¹²⁴ Louisiana’s rule provides that

the operator shall, for purposes of disclosure, report.... a list of all additives used during the Hydraulic Fracture Stimulation Operation.... [including] the specific trade name and suppliers of all the additives utilized during the Hydraulic Fracture Stimulation Operation.¹²⁵

In addition, the rules require operators to disclose “a list of chemical ingredients contained in the hydraulic fracturing fluid that are subject to the requirements” for material safety data sheets (MSDS, now called safety data sheets) “and their associated CAS numbers.”¹²⁶ Trade secret chemicals do not have to be disclosed.¹²⁷ The rules do not mention chemical manufacturers. The rules could be read to implicitly require that the operator compile information from chemical manufacturers in order to fulfill the state’s fracking chemical disclosure requirements. An important question is whether operators are compiling this information, considering the evidence that chemical manufacturers have often withheld chemical information from service providers and well operators.

Do the state’s rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking? Yes. Louisiana’s rules leave open-ended who may assert a

trade secret claim. The rules say that “the entity entitled to make such a claim may withhold the specific identity of the chemical ingredient” from public disclosure.”¹²⁸

Do the state’s rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **Yes.** Not only does Louisiana omit chemical manufacturers from disclosure requirements and allow them to claim trade secrets; it also appears to limit their responsibility in another way by providing that the fracking chemicals to be disclosed are those “that are subject to the requirements of 29 CFR Section 1910.1200(g)(2) and their associated CAS numbers.”¹²⁹ This provision means that disclosure is limited to what is required on safety data sheets, and therefore operators are not responsible for compiling chemical information that is not required to be disclosed on the sheets. As manufacturers can legally omit chemical information from the sheets as discussed above on page 10, they could effectively withhold this information from public disclosure even if the information were not a trade secret.

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **No.** The rules provide no authority over chemical manufacturers. The rules state, however, that no provision “shall authorize any person to withhold information which is required by state or federal law to be provided to a health care professional, a doctor, or a nurse.”¹³⁰ Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals. Other legal authority may also require disclosure.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.** The rules do not address emergency responders, leaks, or spills. Under the federal TSCA, as

discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

Montana

Do the state’s rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** Montana’s rules state that the “owner or operator” of a well makes fracking chemical disclosure.¹³¹ The rules state that an operator “means any person who, duly authorized, is in charge of development and/or producing operations.”¹³² An owner

means the person who has the right to drill into and produce from a pool and to appropriate the oil or gas the person produced from a pool either for the person or others or for the person or for the person and others, and the term includes all persons holding that authority by or through the person with the right to drill.¹³³

These definitions do not describe chemical manufacturers. Therefore, Montana’s rules do not require fracking chemical disclosure from chemical manufacturers.

Do the state’s rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

Yes. The rules allow an owner, operator, or service company providing fracturing services for a well to request that the state withhold the identity of a chemical as a trade secret, and the state may do so if certain conditions are met.¹³⁴

These claims could originate with chemical manufacturers. In addition, service companies might be chemical manufacturers in some cases and could assert their own trade secret claims. Under Montana’s rules, a service company is “any person, other than an operator or a drilling contractor, that provides goods or services associated with oil or gas exploration and production operations.”¹³⁵ These companies could be manufacturers because chemicals are goods associated with oil or gas exploration and production operations.

Do the state’s rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by

explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.**

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **Unclear.**

The rules provide that the owner, operator, or service contractor “must also provide the chemical constituents of a trade secret product to a health professional” under certain conditions.¹³⁶ The language of the provision does not explicitly say that such an obligation applies to chemical manufacturers, but it is possible that a service contractor could be a chemical manufacturer as suggested above on page 17. Therefore, this obligation may extend to some chemical manufacturers. The obligation to provide chemicals to a health professional does not extend to chemicals that are not withheld as trade secrets but that a company did not disclose to the public. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **Unclear.** There is no specific provision requiring disclosure of fracking chemicals to emergency responders. The rules provide

that if necessary, to respond to a spill or release of a trade secret product the administrator [apparently, the administrator of the Board of Oil and Gas Conservation] may request information be provided orally or be provided directly to a laboratory or other third party performing analysis for the board.¹³⁷

“A laboratory or other third parties” are not typically emergency responders. Under the federal TSCA, as discussed above on page 14, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

New Mexico

Do the state’s rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** New Mexico’s rules require disclosure to be made by the operator.¹³⁸ An operator is defined as “a person who, duly authorized, manages a lease’s development or a producing property’s operation, or who manages a facility’s operation.”¹³⁹ The operator must make disclosure on “a then current edition of the hydraulic fluid product component information form published by FracFocus and shall include complete and correct responses disclosing all information called for by the FracFocus form.”¹⁴⁰

Do the state’s rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

Yes. The rules say that the Division of Oil and Gas “does not require the reporting or disclosure of proprietary, trade secret or confidential business information.”¹⁴¹ The rules do not limit whose trade secrets can be withheld from public disclosure.

Do the state’s rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **Yes.** Not only does New Mexico omit chemical manufacturers from disclosure requirements and allow them to claim trade secrets, it also limits their responsibility in another way by providing that the Division of Oil and Gas “does not require the reporting of information beyond the material safety data sheet data as described in 29 C.F.R. 1910.1200.” This provision means that disclosure is limited to what is required on material safety data sheets (now called safety data sheets), and therefore operators are not responsible for compiling chemical information from manufacturers that is not disclosed on the sheets. As stated above on page 10, manufacturers can legally omit chemical information from the sheets. Therefore, the manufacturers could effectively withhold this information from public disclosure even if the information were not a trade secret.

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **No.**

The rules do not mention whether or how trade secret exemptions apply when the concealed information is requested by health professionals. The rules overall do not mention an obligation by any actor within the oil and gas production supply chain to disclose to health professionals. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.**

The rules do not mention whether or how trade secrets exemptions apply when the concealed information is needed by emergency responders. The rules overall do not mention an obligation by any actor within the oil and gas production supply chain to disclose to emergency responders. Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

North Dakota

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **Maybe.** North Dakota requires disclosure to be made by the owner, operator, or service company of the well but does not refer to manufacturers.¹⁴² North Dakota's rules provide that "within sixty days after the hydraulic fracture stimulation is performed, the owner, operator, or service company shall post on the fracfocus chemical disclosure registry all elements made viewable by the fracfocus website."¹⁴³ The code defines "operator" as "the principal on the bond covering a well and such person shall be responsible for drilling, completion, and operation of the well, including plugging and reclamation of the well site."¹⁴⁴ The code does not define "owner" or "service company." Owners are likely

not chemical manufacturers. However, there is evidence, as presented above on page 17 to indicate that at least some service companies, such as Baker Hughes and Halliburton, can also be chemical manufacturers. In addition, North Dakota law could be read to implicitly require that owners, operators, and service providers compile information from chemical manufacturers in order to fulfill the state's fracking chemical disclosure requirements. An important question is whether the owners, operators, and service providers are compiling this information, considering the evidence that chemical manufacturers have often withheld chemical information from service providers and well operators.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

Yes. The rules allow fracking chemicals to be withheld as trade secrets as long as the information

derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons that can obtain economic value from its disclosure or use; and...is the subject of efforts that are reasonable under the circumstances to maintain the secrecy of the information.¹⁴⁵

This standard would allow trade secrets to be claimed by chemical manufacturers and other entities.

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.**

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **No.**

However, under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals. In addition, under North Dakota rules,

an operator may request that the Director of the Oil and Gas Division of the North Dakota Industrial Commission keep confidential for up to six months certain information in an operator's permit. The director may disclose such information to health professionals among others "to protect the public's health, safety, and welfare."¹⁴⁶ But the director is not obligated to make the disclosure, and it is unclear that fracking chemical information would be contained in a permit.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.** However, under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders. In addition, under North Dakota rules, an operator may request that the Director of the Oil and Gas Division of the North Dakota Industrial Commission keep confidential for up to six months certain information in an operator's permit. The director may disclose such information to emergency responders among others "to protect the public's health, safety, and welfare."¹⁴⁷ But the director is not obligated to make the disclosure and it is unclear that fracking chemical information would be contained in a permit.

Ohio

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** Ohio requires fracking chemical disclosure to be made by the well owner.¹⁴⁸ The rules state in part that

the owner shall obtain the chemical information, not including any information that is designated as a trade secret...from the company that stimulated the well or supplied the chemicals. If the company that stimulated the well or supplied the chemicals provides incomplete or inaccurate chemical information, the owner shall make reasonable efforts to obtain the required information from the company or supplier.¹⁴⁹

However, the rule does not say that the well owner must obtain any missing information, and chemical manufacturers cannot be held accountable under this law for failure to disclose fracking chemicals.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

Yes. The rules appear to allow trade secret claims from various entities.

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.**

Do the state's rules require chemical manufacturers to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets?

Yes, with potential exception. Ohio's rules provide that

if a medical professional, in order to assist in the diagnosis or treatment of an individual who was affected by an incident associated with the production operations of a well, requests the exact chemical composition of each product, fluid, or substance and of each chemical component in a product, fluid, or substance that is designated as a trade secret...the person claiming the trade secret protection...shall provide to the medical professional the exact chemical composition of the product, fluid, or substance and of the chemical component in a product, fluid, or substance that is requested.¹⁵⁰

The medical professional must then "keep the information confidential and shall not disclose the information for any purpose that is not related to the diagnosis or treatment of an individual who was affected by an incident associated with the production operations of a well." However, the medical professional could disclose the information to comply with legal or professional standards.¹⁵¹ This provision appears to apply to chemical manufacturers that designate a product,

fluid, or substance as a trade secret, but it is unclear if this provision would apply in regard to a chemical not designated as a trade secret. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Do the state's rules require chemical manufacturers to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.** Ohio's rules do not mention emergency responders. Upon request, the chief of the Ohio Department of Natural Resources Division of Oil and Gas Resources Management has the right to obtain oil and gas chemical identities from well owners or others who withhold trade secret information "if the information is necessary to respond to a spill, release, or investigation." But the chief cannot share the information. Nor does the law say how quickly the information must be shared with the chief.¹⁵² In addition, companies or people who declare oil and gas chemicals to be trade secrets do not have to share these identities with the Ohio Department of Environmental Protection¹⁵³ and have to maintain information about the trade secret chemicals used in a particular well for only two years.¹⁵⁴ These rules create the potential that by the time a chief requests trade secret information, the information may no longer exist. Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

Oklahoma

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** Oklahoma requires the chemical disclosure to be made by the operator, with an exception for trade secrets.¹⁵⁵ The rules state that "the operator must submit information on the chemicals used in the hydraulic fracturing operation to the FracFocus Chemical Disclosure Registry."¹⁵⁶ The rules define "operator" as "the person who is duly authorized and in charge of the development of a lease or the operation of a producing

property."¹⁵⁷ Chemical manufacturers cannot be held accountable under this law for failure to disclose fracking chemicals.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

Yes. The rules provide that operators may submit trade secret claims to FracFocus. The rules further provide that "The submission must include the name of the supplier, service company, operator, or other person asserting the claim that the chemical information is entitled to protection as a trade secret...."¹⁵⁸ The use of the phrase "other person" would permit trade secret claims to be made by chemical manufacturers, even though manufacturers are not specified in the rules language.

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **Yes.**

The rules provide that "the operator is not responsible for inaccurate information provided to the operator by a vendor or service provider, but the operator is responsible for ensuring such information is corrected when any inaccuracy is discovered."¹⁵⁹ In a situation where a chemical manufacturer were simultaneously a vendor or service provider, the operator would not have a legal incentive to ensure that the information provided by the manufacturer were accurate. In addition, if a chemical manufacturer were a separate company and provided inaccurate information to the vendor or service provider, neither the vendor nor service provider would have a legal incentive to make sure that the manufacturer's information were accurate because the operator would have no legal obligation to hold them accountable. The result in either case is that the manufacturer would have no legal incentive to make accurate public disclosure of fracking chemicals.

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **No.** Oklahoma's rules do not mention disclosure to health

professionals. Instead, the rules say that “nothing...restricts the Commission’s [Corporation Commission of the State of Oklahoma] ability to obtain chemical information,” under a section of the rules saying that “upon request of the Conservation Division, service companies or other persons shall furnish and file reports and records showing... chemical treatment, and all other service operations on any well.”¹⁶⁰ This provision implies that the Commission itself but not health professionals could obtain trade secret chemical information from chemical manufacturers and perhaps non-trade secret information, too. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.** Oklahoma’s rules do not mention disclosure to emergency responders. As mentioned above, the Oklahoma Oil and Gas Commission can obtain trade secret-protected chemical information. Whether they use this information in order to respond to emergencies is apparently discretionary. Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

Pennsylvania

Do the state’s rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** Pennsylvania requires disclosure to be made by the well operator for both conventional and unconventional wells.¹⁶¹ There are some differences between the disclosure standards for each type of well, but chemical manufacturers are exempt under both standards. For both unconventional and conventional wells, the law defines a well operator as the person or entity listed in the permit or well registration or that otherwise performs certain work on a well.¹⁶² Unconventional wells are defined by Pennsylvania law as gas wells in particular geologic formations where the gas must be produced using

particular techniques including fracking.”¹⁶³ Conventional wells include all gas wells not covered by the previous definition and all oil wells. For unconventional wells, service providers and vendors are required to disclose chemical information to the well operator so that the well operator can ultimately make public disclosure to the FracFocus database.¹⁶⁴ Service providers are defined as those who conduct fracking for the well operator and vendors are defined as those who provide fracking chemicals directly to the operator for fracking.¹⁶⁵ Chemical manufacturers are not included in this chain of disclosure requirements, as manufacturers are separately referenced in the rules as distinct from operators, service providers, and vendors.¹⁶⁶ The rules for fracking chemical disclosure for conventional wells mention only the duty of well operators to make the disclosure and do not refer to chemical manufacturers or other companies in the supply chain.¹⁶⁷ The chemical manufacturers cannot be held accountable under these rules for failure to disclose fracking chemicals.

An attorney with the Department of Environmental Protection suggested that the state can ensure full chemical disclosure by the manufacturers through the operators. “Conventional and unconventional operators must ensure compliance with the chemical disclosure requirements...” the attorney wrote, “and must arrange with any service providers, vendors or chemical manufacturers to obtain the information required to be submitted to the Department.” An important question is whether operators are compiling this information, considering the evidence on pages 9-10 that chemical manufacturers have often withheld chemical information from companies in the fracking chemical supply chain, including Range Resources, an operator in Pennsylvania.

Do the state’s rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking? **Yes.** The rules for unconventional wells say that “a vendor, service company or operator shall not be required to disclose trade secrets or confidential proprietary information to the chemical disclosure registry.”¹⁶⁸ The rules for conventional wells state that the well operator

may designate specific portions of the stimulation record as containing a trade secret or confidential proprietary information. The Department will prevent disclosure of the designated confidential information to the extent permitted under the Right-to-Know Law.¹⁶⁹

There is evidence cited previously in this report on pages 9-11 that such trade secrets in at least some cases belong to the chemical manufacturers. The rules do not specify whose chemical trade secrets shall be exempt from disclosure requirements, suggesting that trade secrets asserted by any entity, including chemical manufacturers, would be exempt from disclosure.

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **Yes.** The rules for unconventional wells provide that

A vendor shall not be responsible for any inaccuracy in information that is provided to the vendor by a third-party manufacturer... A service provider shall not be responsible for any inaccuracy in information that is provided to the service provider by the vendor... An operator shall not be responsible for any inaccuracy in information provided to the operator by the vendor or service provider or manufacturer.¹⁷⁰

Therefore, the operator, who must ultimately make public disclosure, has no legal incentive to hold the manufacturer accountable for providing accurate fracking chemical information because the operator cannot be held accountable for the manufacturer's inaccurate information. Nor does a vendor have a legal incentive to hold the manufacturer accountable, for similar reasons. A related section eliminates similar legal incentives for the operator or other companies in the supply chain to hold manufacturers accountable for omitted chemical data. The section provides that "a vendor, service provider or operator shall not be required to do any of the following...

Disclose chemicals that are not disclosed to it by the manufacturer, vendor or service provider."¹⁷¹

The rules for conventional wells further shield chemical manufacturers from fracking chemical disclosure requirements by providing that a well operator must disclose "a list of the chemicals in the Material Safety Data Sheets, by name and chemical abstract service number, corresponding to the appropriate chemical additive."¹⁷² This provision means that disclosure is limited to what is required on the material safety data sheets (now called safety data sheets), and therefore well operators are not responsible for compiling chemical information from manufacturers that is not on the sheets. As stated above on page 10, manufacturers can legally omit chemical information from the sheets. Therefore, the manufacturers could effectively withhold this information from public disclosure even if the information were not a trade secret.

Do the state's rules require chemical manufacturers to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets?

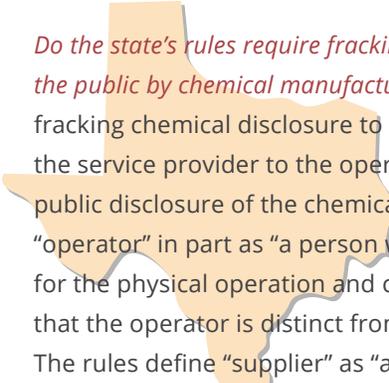
No. For unconventional wells, Pennsylvania previously required well operators, service providers and vendors but not chemical manufacturers to disclose trade secret fracking chemical information to health professionals in certain situations, but prevented the health professionals from sharing the information.¹⁷³ However, in 2016, the Pennsylvania Supreme Court struck down this provision.¹⁷⁴ It has not been replaced. The current fracking chemical disclosure rules for conventional and unconventional wells provide no specific authority for anyone to access trade secret information or any information needed to address a medical situation. With respect to trade secret information, the rules for both types of wells say that the Department of Environmental Protection "will prevent disclosure of the designated confidential information to the extent permitted under the Right-to-Know Law."¹⁷⁵ The Right-to-Know Law provides that agencies such as the Department of Environmental Protection "shall notify a third party of a request for a record if the third party provided the record and included a written statement signed by a representative

of the third party that the record contains a trade secret or confidential proprietary information.”¹⁷⁶ The third party may then respond to the request, and the agency will decide to grant or deny the request within ten business days of notice to the third party.¹⁷⁶ The law does not say what standards the agency will use to grant or deny the request. Nor does the law address a situation in which a chemical manufacturer does not designate a chemical as a trade secret and simply fails to disclose it. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Do the state's rules require chemical manufacturers to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? No. In the case of a spill or release at an unconventional well, the Department of Environmental Protection, public health officials, emergency managers, responders or “a person who may be adversely affected or aggrieved” would have the right to access “information that may be needed to respond” from well operators, service providers, and vendors, but not from chemical manufacturers.¹⁷⁸ The fracking chemical disclosure rules for conventional wells provide no specific authority for anyone to access trade secret information or any information in the event of a leak or spill. With respect to trade secret information, the rules say only that the Department of Environmental Protection “will prevent disclosure of the designated confidential information to the extent permitted under the Right-to-Know Law.”¹⁷⁹ The Right-to-Know Law provides that agencies such as the Department of Environmental Protection “shall notify a third party of a request for a record if the third party provided the record and included a written statement signed by a representative of the third party that the record contains a trade secret or confidential proprietary information.” The third party may then respond to the request, and the agency will decide to grant or deny the request within ten business days of notice to the third party.¹⁸⁰ The law does not say what standards the agency will use to grant or deny the request. Nor does the law address a situation in which a chemical manufacturer

does not designate a chemical as a trade secret and simply fails to disclose it. Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

Texas



Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? No. Texas requires fracking chemical disclosure to be made by the supplier or the service provider to the operator who ultimately makes public disclosure of the chemicals.¹⁸¹ The rules define “operator” in part as “a person who assumes responsibility for the physical operation and control of a well,”¹⁸² showing that the operator is distinct from a chemical manufacturer. The rules define “supplier” as “a company that sells or provides an additive for use in a hydraulic fracturing treatment”¹⁸³ and therefore could be a manufacturer. A “service company” is defined as “a person that performs hydraulic fracturing treatments on a well” in Texas.¹⁸⁴ As stated above on page 16, at least some service companies have indicated they are also chemical manufacturers, including Baker Hughes and Halliburton. However, the rules separately refer to a “third party manufacturer” of fracking chemical additives as distinct from a supplier and service provider, indicating that under the rules, suppliers and service providers are not chemical manufacturers.¹⁸⁵ In any event, only the operator has legal responsibility to report the fracking chemicals publicly.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking? Yes. The supplier, service provider, or operator may withhold chemical identities as trade secrets.¹⁸⁶ These provisions do not state whose trade secret claims can be withheld. Therefore, it is apparent that these claims can belong to chemical manufacturers. One section states that

The operator of the well on which the hydraulic fracturing treatment(s) were performed must provide

the contact information, including the name, authorized representative, mailing address, and phone number of the business organization claiming entitlement to trade secret protection.¹⁸⁷

The term “business” could encompass a chemical manufacturer.

Do the state’s rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **Yes.** The rules provide that

a supplier is not responsible for any inaccuracy in information that is provided to the supplier by a third party manufacturer of the [fracking] additives. A service company is not responsible for any inaccuracy in information that is provided to the service company by the supplier. An operator is not responsible for any inaccuracy in information provided to the operator by the supplier or service company.¹⁸⁸

Therefore, the operator, who must ultimately make public disclosure, has no legal incentive to hold the supplier or service company accountable for providing accurate fracking chemical information, as the operator cannot be held accountable for inaccurate information from the supplier or service company. The service company has no similar incentive to hold the supplier accountable and the supplier has no similar incentive to hold the manufacturer accountable. In theory, the operator might have incentive to hold the manufacturer accountable for providing accurate chemical information if the manufacturer provided chemical additives directly to the operator, but this scenario seems unlikely. Manufacturers can avoid creating a legal incentive for other companies to demand accurate chemical information from them by providing their chemicals for use in fracking through a supplier.

An additional section provides that “a supplier, service company, or operator is not required to...disclose

ingredients that are not disclosed to it by the manufacturer, supplier, or service company.¹⁸⁹ This section more definitively eliminates the incentive that an operator, supplier, or service company might have to demand full disclosure of fracking chemical ingredients by a chemical manufacturer.

Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **Unlikely.** In Texas,

a supplier, service company or operator may not withhold information related to chemical ingredients used in a hydraulic fracturing treatment, including information identified as a trade secret, from any health professional or emergency responder who needs the information for diagnostic, treatment or other emergency response purposes....¹⁹⁰

It is possible that the terms “supplier” and “service company” encompass chemical manufacturers, but as mentioned previously on this page and the preceding page, the terms “supplier” and “service company” are used separately in the rules from the term “third party manufacturer,” suggesting that manufacturers are not among the entities that must make disclosure of chemicals to health professionals. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **Unlikely.** See explanation immediately above. Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

Utah

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** According to Utah's rule, "[t]he amounts and types of chemicals used in a hydraulic fracturing operation shall be reported to www.fracfocus.org within 60 days of hydraulic fracturing completion for public disclosure."¹⁹¹ The rule does not mention who has the responsibility to disclose. According to Utah's Assistant Attorney General and a spokesperson with Utah's Division of Oil, Gas and Mining, the burden to disclose falls on the operator of the well(s), not the chemical manufacturers.¹⁹²

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking? **Unclear.** The rules do not say that any companies can assert trade secret provisions, but one of the authors of the present report has found that at least some companies can assert them. In May 2022, a spokesperson with Utah's Division of Oil, Gas and Mining agreed with this conclusion.¹⁹³

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.**

Do the state's rules require chemical manufacturers to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **No.** Utah's Administrative Code does not mention disclosure to health professionals, but the State Assistant Attorney General and a spokesperson with Utah's Division of Oil, Gas and Mining said that such obligations are placed on operators, not on chemical manufacturers.¹⁹⁴ Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Do the state's rules require chemical manufacturers to disclose fracking chemicals to emergency responders upon request in

the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.** Utah's Administrative Code does not mention disclosure to emergency responders, but the State Assistant Attorney General and a spokesperson with Utah's Division of Oil, Gas and Mining said that such obligations are placed on operators, not chemical manufacturers.¹⁹⁵ Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

West Virginia

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **Unclear.** West Virginia's rules state that "the operator or its service provider shall list all the additives used in the hydraulic fracturing or stimulation process, including each additive's specific trade name, supplier, and purpose."¹⁹⁶ The rules define operator as "any owner of the right to develop, operate and produce oil and gas from a pool and to appropriate the oil and gas produced therefrom...."¹⁹⁷ Therefore, operators are likely not manufacturers. "Service provider" is not defined. However, some service providers are also apparently manufacturers. West Virginia has no explicit authority over chemical manufacturers. A spokesperson for the West Virginia Department of Environmental Protection said in an email that "in the event that there is a need for a chemical constituent to be disclosed, we have the expectation that it will be provided, as requested – regardless of who needs to provide that information."¹⁹⁸ But, as the book *Amity and Prosperity* noted, in Pennsylvania, well operator Range Resources was unable to obtain chemical identities even under a court order when at least some of those chemical identities were held by a chemical manufacturer (see page 10 of this report). And multiple service providers said that they could not provide trade secret information to congressional investigators when the trade secrets were held by manufacturers (see page 9 of this report). Therefore, it is unclear whether West Virginia would be able to access chemical information from chemical manufacturers in all cases.

Do the state's rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

Yes. The rules state that

the operator or service provider may designate the information regarding the specific identity or concentration or both of a chemical as a confidential trade secret not to be disclosed to the agency or anyone else except in the event of an investigation by the office, medical emergency, or for diagnostic or treatment purposes involving the designated chemical....¹⁹⁹

Although this rule specifies that the operator or service provider makes the trade secret designation, there is no prohibition on chemical manufacturers making the designation. In at least some cases, it is possible that an operator or service provider could claim the trade secret designation on behalf of the chemical manufacturer.

Do the state's rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.**

Do the state's rules require chemical manufacturers to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets?

Unclear. West Virginia provides that

the operator or service provider shall provide the specific identity of a chemical designated as a confidential trade secret, or both the specific identity and concentration of the chemical designated as a confidential trade secret, as needed, upon request to a health care professional in a medical emergency, or for diagnostic or treatment purposes.²⁰⁰

The rules also create obligations for those who receive this trade secret information.²⁰¹ This requirement to disclose trade secret information does not apply directly to chemical manufacturers unless a service provider is also

a manufacturer. The provision suggests that a chemical operator or service provider could obtain a trade secret from a chemical manufacturer if that action were necessary, consistent with the statement above from a spokesperson for the West Virginia Department of Environmental Protection. But courts and congressional investigators have had difficulty obtaining chemical information from operators and service providers when a manufacturer held the chemical information, suggesting that health professionals might face similar challenges. Moreover, West Virginia's rule suggests that health professionals could only require disclosure of trade secret chemicals and would lack authority to require disclosure of other chemicals that manufacturers or other companies may not have disclosed. Overall, it is unclear whether West Virginia law requires chemical manufacturers to disclose fracking chemicals to health professionals upon request. Under the federal TSCA and OSHA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to health professionals.

Are chemical manufacturers required to disclose fracking chemicals to emergency responders in the event of a leak or spill, including chemicals withheld from the public as trade secrets?

No. The rules do not include language obligating chemical manufacturers to disclose trade secret chemical identities to emergency responders. One section requires disclosure from an operator or service provider to the Division of Oil and Gas "in the event of an investigation by the office involving a chemical designated as a confidential trade secret."²⁰² But this section does not mention emergency responders. Under the federal TSCA, as discussed above on pages 14-15, chemical manufacturers would be required to make disclosures of chemical identities to emergency responders.

Wyoming

Do the state's rules require fracking chemical disclosure to the public by chemical manufacturers? **No.** Wyoming's rules require the owner or operator to provide information concerning "base stimulation fluid source" and "the chemical additives, compounds and concentrations or rates proposed to be

mixed and injected.”²⁰³ Wyoming’s rules could be read to require that an owner or operator compile information from chemical manufacturers in order to fulfill the state’s fracking chemical disclosure requirements. An important question is whether owners or operators are compiling this information, considering the evidence discussed above on page 10 that chemical manufacturers have often withheld chemical information from service providers and well operators.

Do the state’s rules allow chemical manufacturers to shield as trade secrets the identities of their chemicals used in fracking?

Yes. The rules provide that “confidentiality protection shall be provided” for “trade secrets...furnished by or obtained from any person.” A chemical manufacturer or other applicant for trade secret protection must submit a form or letter “justifying and documenting the nature and extent of the proprietary information.”²⁰⁴

Do the state’s rules otherwise shield chemical manufacturers from fracking chemical disclosure requirements, such as by

*explicitly stating that they are not responsible for sharing fracking chemical information with other companies in the supply chain? **No.***

*Are chemical manufacturers required to disclose fracking chemicals to health professionals upon request, including chemicals withheld from the public as trade secrets? **No.***

However, under federal TSCA and OSHA rules discussed above on pages 14-15, obligations exist for chemical manufacturers to disclose chemicals to health professionals upon request in some situations.

*Are chemical manufacturers required to disclose fracking chemicals to emergency responders upon request in the event of a leak or spill, including chemicals withheld from the public as trade secrets? **No.***

However, under federal TSCA rules discussed above on pages 14-15, obligations exist for chemical manufacturers to disclose chemicals to emergency responders upon request in some situations.

SUMMARY AND CONCLUSION

Our review of the fracking chemical disclosure rules in the top dozen oil-producing states and the top dozen gas-producing states (16 total): Alaska, Arkansas, California, Colorado, Kansas, Louisiana, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia, and Wyoming found that:

- Of all the rules and regulations examined, none of the states explicitly requires disclosure of chemical information to be made by chemical manufacturers. Most of the states require disclosure from well owners, operators, or permit holders who are not chemical manufacturers. Arkansas, North Dakota, and West Virginia also require disclosure from service providers who, in at least some cases, may be chemical manufacturers. However, this year, for the first time in the U.S., Colorado enacted a law explicitly requiring public disclosure from manufacturers of fracking chemicals and other chemicals used for oil and gas extraction. Manufacturers will be required to disclose any chemicals not disclosed by other companies in the supply chain.
- California is the only state to require all chemicals used in fracking to be disclosed with no exception for trade secrets (until Colorado adopts a similar provision in 2023). Yet even in California, responsibility for disclosure rests on companies other than chemical manufacturers, raising questions about whether the manufacturers are sharing with those companies all of the information that must be disclosed.
- Kansas, Oklahoma, Pennsylvania, and Texas have provisions that explicitly exempt chemical manufacturers from having to share fracking chemical information with companies that are ultimately responsible for the public disclosure. Colorado recently

deleted a similar provision, strengthening its public disclosure requirements. On the other hand, Louisiana and New Mexico use a legal device that limits the information manufacturers must share with companies that must ultimately make public disclosure.

- States' rules vary on whether chemicals claimed to have trade secret protection by chemical manufacturers must be disclosed by the manufacturers to health professionals or to emergency responders in the event of a leak or spill. Most of the states do not require such disclosure. Federal rules provide some ability for health professionals and responders to obtain fracking chemical information, but this ability is limited and may not result in disclosure that is timely enough to allow for prompt patient care.

As oil and gas extraction continues at high levels throughout the United States, it is imperative that the public know the identity of all chemicals injected into oil and gas wells. Physicians for Social Responsibility recommends that the following provisions be adopted in state and local policy:

- Full public disclosure of chemicals used in all stages of oil and gas extraction, prior to the start of extraction activities.
- Explicit requirements that chemical manufacturers publicly disclose the chemicals that comprise their products used in oil and gas extraction.
- A ban on the use of trade secrets to conceal the identities of individual chemicals used in oil and gas extraction.

ENDNOTES

¹ 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, at ES-3, ES-4, 9-1 (2016). Accessed Aug. 30, 2021 at <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990>.

² See, e.g., Dusty Horwitt. Fracking with Forever Chemicals. Physicians for Social Responsibility (July 2021), at 15. Accessed June 21, 2022 at <https://www.psr.org/wp-content/uploads/2021/07/fracking-with-forever-chemicals.pdf> (quoting toxicologist David Brown as saying that PFAS chemicals used in fracking could become airborne through flaring at the wellhead or inside people's homes if the chemicals are present in water and volatilize). 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 (2016), at 5-38. Accessed Aug. 30, 2021 at <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990> (reporting that following a spill of fracking fluid in Oklahoma, "contaminated soil was removed by the operator"). Karl Oetjen et al. Simulation of a hydraulic fracturing wastewater surface spill on agricultural soil. *Science of the Total Environment*, 645, 229-234 (2018). doi:10.1016/j.scitotenv.2018.07.043 (reporting that following simulated spills of fracking wastewater into soil "copper, lead, and iron were mobilized [in the soil] at environmentally relevant concentrations.... Importantly, a significant decrease in the water infiltration rate of the soil was observed, leading to the point where water was unable to percolate through due to increasing salinity, potentially having a severe impact on crop production.") Office of Attorney General. Commonwealth of Pennsylvania. Report 1 of the Forty-Third Statewide Investigating Grand Jury Focusing on the impacts of, and government oversight of, the unconventional oil and gas industry in Pennsylvania activity (June 22, 2020), at 4-5. Accessed May 2, 2022 at <https://www.attorneygeneral.gov/wp-content/uploads/2020/06/FINAL-fracking-report-w.responses-with-page-number-V2.pdf> (reporting that "Many of those living in close proximity to a well pad began to become chronically, and inexplicably, sick. Pets died; farm animals that lived outside started miscarrying, or giving birth to deformed offspring...."). Concerned Health Professionals of New York and Physicians for Social Responsibility. *Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction)*, Sixth Edition (2019), 155-180. Accessed Oct. 17, 2020 at <https://www.psr.org/wp-content/uploads/2019/06/compendium-6.pdf> (compiling the substantial and growing number of scientific studies that have found serious health effects associated with oil and gas drilling).

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¹²⁴ La. Admin Code. tit. 43, § XIX.118C.1.

¹²⁵ La. Admin Code. tit. 43, § XIX.118C.1.

¹²⁶ La. Admin Code. tit. 43, § XIX.118C.1(d).

¹²⁷ La. Admin Code. tit. 43, § XIX.118C.2(a-b).

¹²⁸ La. Admin Code. tit. 43, § XIX.118C.2.a.

¹²⁹ La. Admin Code. tit. 43, § XIX.118C.1.d.

¹³⁰ La. Admin Code. tit. 43, § XIX.118C.3.

¹³¹ Mont. Admin. R. 36.22.1015(1-2).

¹³² Mont. Admin. R. 36.22.302. Definitions (52).

¹³³ Mont. Admin. R. 36.22.302. Definitions (53).

¹³⁴ Mont. Code Ann. 82-10-603, 82-10-604.

¹³⁵ Mont. Admin. R. 36.22.302. Definitions (67).

- ¹³⁶ Mont. Admin. R. 36.22.1016(3-4). On April 29, 2022, author Dusty Horwitt left a message with the Montana Board of Oil and Gas Conservation to clarify this rule, but did not receive a response.
- ¹³⁷ Mont. Admin. R. 36.22.1016(2).
- ¹³⁸ N.M. Admin. Code § 19.15.16.19(B).
- ¹³⁹ N.M. Admin. Code § 19.15.2.7(O)(5).
- ¹⁴⁰ N.M. Admin. Code § 19.15.16.19(B).
- ¹⁴¹ N.M. Admin. Code § 19.15.16.19(B)(1-2).
- ¹⁴² N.D. Admin. Code 43-02-03-27.1(h) and 43-02-03-27.2(j).
- ¹⁴³ N.D. Admin. Code 43-02-03-27.1(h) and 43-02-03-27.2(j).
- ¹⁴⁴ N.D. Admin. Code 43-02-03-01(37).
- ¹⁴⁵ N.D. Admin. Code 44-04-18.4.
- ¹⁴⁶ N.D. Admin. Code 43-02-03-31.
- ¹⁴⁷ N.D. Admin. Code 43-02-03-31.
- ¹⁴⁸ Ohio Rev. Code § 1509.10(A)(10)(b).
- ¹⁴⁹ Ohio Rev. Code § 1509.10(A)(10)(a-b), (F-G).
- ¹⁵⁰ Ohio Rev. Code § 1509.10(H)(1).
- ¹⁵¹ Ohio Rev. Code § 1509.10(H)(2).
- ¹⁵² Ohio Rev. Code § 1509.10(J)(2).
- ¹⁵³ Ohio Rev. Code § 1509.10(I)(1).
- ¹⁵⁴ Ohio Rev. Code § 1509.10(J)(2).
- ¹⁵⁵ Okla. Admin. Code § 165:10-3-10(c)(1)(2)(4).
- ¹⁵⁶ Okla. Admin. Code § 165:10-3-10(c).
- ¹⁵⁷ Okla. Admin. Code § 165:10-1-2. Definitions: operator.
- ¹⁵⁸ Okla. Admin. Code § 165:10-3-10(c)(4).
- ¹⁵⁹ Okla. Admin. Code § 165:10-3-10(c)(3).
- ¹⁶⁰ Okla. Admin. Code § 165:10-3-10(c)(5)(referencing Okla. Admin. Code § 165:10-1-6(g)).
- ¹⁶¹ 58 Pa.C.S. § 3222(b.1)(1)(iii), § 3222.1(b)(2) and Pa. Rules Title 25 § 78a.122(b) (unconventional wells) and 58 Pa.C.S. § 3222(b.1)(1)(iii) and Pa. Rules Title 25 § 78.122(b)(6) (conventional wells).
- ¹⁶² 58 Pa.C.S. § 3203, Definitions, “Well operator” (unconventional wells). Pa. Rules Title 25 § 78.1, Definitions, “Well operator or operator” (conventional wells).
- ¹⁶³ 58 Pa.C.S. § 3203. Definitions, “Unconventional Formation” and “Unconventional Well.”
- ¹⁶⁴ 58 Pa.C.S. § 3222.1(b)(1).
- ¹⁶⁵ 58 Pa.C.S. § 3222.1(b)(1).
- ¹⁶⁶ 58 Pa.C.S. § 3222.1(b)(7, 9) and 58 Pa.C.S. § 3222.1(c)(1).
- ¹⁶⁷ Pa. Rules Title 25 § 78.122(b)(6).
- ¹⁶⁸ 58 Pa.C.S. § 3222.1(d)(1).
- ¹⁶⁹ Pa. Rules Title 25 § 78.122(c).
- ¹⁷⁰ 58 Pa.C.S. § 3222.1(b)(7-9).
- ¹⁷¹ 58 Pa.C.S. § 3222.1(c), (c)(1).
- ¹⁷² 25 Pa. Code § 78.122(b)(6)(iii).
- ¹⁷³ 58 Pa.C.S. § 3222.1(b)(10-11).
- ¹⁷⁴ *Robinson Twp. v. Commonwealth*, 147 A.3d 536, 575-576 (Pa. 2016).
- ¹⁷⁵ Pa. Rules Title 25 § 78.122(c). Pa. Rules Title 25 § 78a.122(c).
- ¹⁷⁶ 65 P.S. § 67.101 (P.L. 6, No. 3 § 707 (b) (2008). Accessed May 1, 2022 at https://www.openrecords.pa.gov/Documents/RTKL/PA_Right-To-Know_Law.pdf?pdf=20220418.
- ¹⁷⁷ P.L. 6, No. 3 § 707(b) (Feb. 14, 2008).
- ¹⁷⁸ 58 Pa.C.S. § 3222.1(d)(2)(ii-iii) (unconventional wells).
- ¹⁷⁹ Pa. Rules Title 25 § 78.122(c).
- ¹⁸⁰ P.L. 6, No. 3 § 707(b) (Feb. 14, 2008).
- ¹⁸¹ 16 Tex. Admin. Code § 3.29(c).
- ¹⁸² Tex. Nat. Res. Code § 89.002(a)(2).
- ¹⁸³ 16 Tex. Admin. Code § 3.29(a)(23).

¹⁸⁴ 16 Tex. Admin. Code § 3.29(a)(22).

¹⁸⁵ 16 Tex. Admin. Code § 3.29(c)(3).

¹⁸⁶ 16 Tex. Admin. Code § 3.29(c)(1)(b) and (c)(2)(C).

¹⁸⁷ 16 Tex. Admin. Code § 3.29(c)(2)(C).

¹⁸⁸ 16 Tex. Admin. Code § 3.29(c)(2)(C)(3).

¹⁸⁹ 16 Tex. Admin. Code § 3.29(d).

¹⁹⁰ 16 Tex. Admin. Code § 3.29(c)(4).

¹⁹¹ Utah Admin. Code r. 649-3-39(1.1).

¹⁹² Telephone conversation with Steven Alder, Utah's Assistant Attorney General, (Aug. 2019). Electronic mail communication from Division of Oil, Gas and Mining spokesperson to Dusty Horwitt (May 2, 2022).

¹⁹³ Dusty Horwitt. Hydraulic Fracturing Chemical Disclosure: Can the Public Know What's Going Into Oil and Natural Gas Wells?, chapter in Environmental Issues Concerning Hydraulic Fracturing, Vol. 1 (Elsevier: 2017), at 86. Electronic mail communication from Division of Oil, Gas and Mining spokesperson to Dusty Horwitt (May 2, 2022).

¹⁹⁴ Telephone conversation between Meilen Teklemichael and Steven Alder, Utah's Assistant Attorney General (Aug. 2019). Electronic mail communication from Division of Oil, Gas and Mining spokesperson to Dusty Horwitt (May 2, 2022)

¹⁹⁵ Telephone conversation between Meilen Teklemichael and Steven Alder, Utah's Assistant Attorney General (Aug. 2019).

¹⁹⁶ W. Va. Code R. § 35-8-10(1)(a-b).

¹⁹⁷ W. Va. Code §22C-9-2.

¹⁹⁸ Electronic mail communication from West Virginia Department of Environmental Protection spokesperson to Eliza Marris, researcher at Physicians for Social Responsibility (Aug. 2021).

¹⁹⁹ W. Va. Code R. § 35-8-10.1.a

²⁰⁰ W. Va. Code R. § 35-8-10.1.e.

²⁰¹ W. Va. Code R. § 35-8-10.1.e.

²⁰² W. Va. Code R. § 35-8-10.1.d.

²⁰³ WYO. ADMIN. CODE OIL GEN Ch. 3 § 45(d).

²⁰⁴ WYO. ADMIN. CODE OIL GEN Ch. 3 § 45(f).



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