

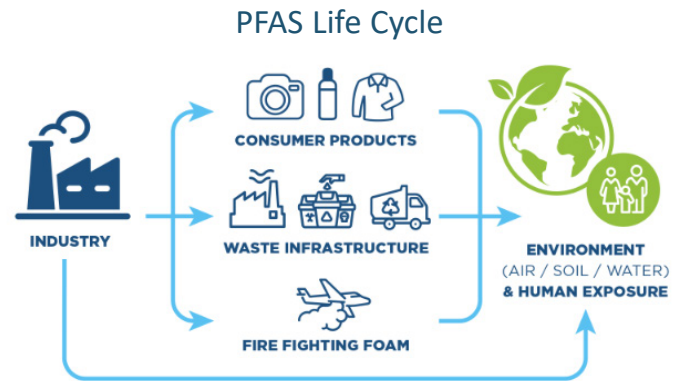
A Case Study on ESG Intentionality

3M is a multinational conglomerate well known for both its industrial products and consumer products, such as Post-it Notes and Scotch Magic Tape. Founded more than a century ago as a mining venture, 3M is now ranked 95th on the Fortune 500 list and has upwards of a \$100 billion market cap.

Even though the industrial sector has some of the highest ESG risks of any industry, 3M is often highly rated by ESG data providers. The company operates in over 70 countries, so strong risk management is especially critical, and 3M’s operating guidelines have been praised as best in practice. The company’s code of conduct is viewed as a competitive advantage, and in February 2019, the Ethisphere Institute recognized 3M for its ethics and integrity in business conduct for the sixth consecutive year. Despite garnering high marks from ESG research organizations, 3M has a history of ethical missteps that have left the company facing multi-billion-dollar lawsuits.

The Staying Power of PFAS

Developed in the 1940s by Manhattan Project scientists, PFAS (per- and polyfluoroalkyl substances) are a group of man-made chemicals that have some of the strongest molecular bonds ever developed. 3M purchased patents for the chemicals and, after an accidental splash onto a lab assistant’s shoes



Source: Water Replenishment District

revealed the chemicals’ ability to repel water and grease, developed Scotchgard. 3M sold PFAS to other companies to make Teflon, nonstick coating, outdoor gear, firefighting foams, and even greaseproof paper and pizza boxes used by fast-food restaurants.

Considered one of the company’s greatest inventions, Scotchgard fueled 3M’s success. Unfortunately, production, which took place on a 1,750-acre factory in Minnesota, produced thousands of gallons of wet waste. 3M dumped the waste at three different Minnesota sites over two decades, resulting in a 100-square-mile underground plume of PFAS-contaminated aquifers used for drinking water.

PFAS are almost impossible to get rid of as they do not break down in the natural environment. They accumulate in the body and can take years to expel. Exposure to PFAS has been linked to various health

Side Effects of PFAS Exposure

- Reproductive issues, including decreased fertility and low birth weight
- Pregnancy-induced hypertension
- Developmental problems
- Hormone disruption
- Weakened immune response
- Low sperm count and reduced sperm mobility
- Various cancers, including liver, testicular, and kidney cancer
- Reduced liver and kidney function
- High cholesterol
- Thyroid dysfunction
- Ulcerative colitis
- Tumors

Source: The Centers for Disease Control and Prevention (CDC)

complications, including cancer, high cholesterol, thyroid problems, and reproductive issues. PFAS stop cells from communicating with each other, meaning they cannot organize an immune response to fight rogue cells. Contamination has caused a public health crisis in Minnesota. Cancer rates in the area have spiked to unprecedented heights, and death records show that a child who died in the contaminated area from 2003 to 2015 was 171% more likely to have had cancer as compared to those outside of the contaminated area.

While the biggest PFAS pollution issue has been water contamination, alarming PFAS levels have been discovered in daily consumer products. FDA testing on food products has found the chemicals in meats, vegetables, and dairy products. Chocolate cake with icing was discovered to have the highest PFAS levels of the foods tested, at 250 times greater than federal guidelines for PFAS in drinking water. The FDA hypothesized that the contamination came from the greaseproof paper used for packaging the cake, rather than from the ingredients themselves. Greaseproof paper is almost ubiquitous in the fast food industry, which provides wrapping that traps heat and repels grease for handheld items such as hamburgers, fries, and pizza. While further research is needed, it is possible that the chemical contamination could be exacerbated by the reaction between the paper and heat from the food products.

Some large public companies have taken measures to phase out PFAS products. Home Depot and Lowe's, for example, have announced that they will stop selling PFAS-treated carpets and rugs, signaling that they believe the chemicals to pose a danger to consumers.

In the 1980s, PFAS were introduced into ski wax manufacturing as a slush repelling agent. Researchers have since discovered PFAS contamination in the snow and soil of ski areas in Sweden. Ski wax manufacturers now offer fluorine-free formulations, but the damage is likely already high.

Focusing on the Environment vs. Health Concerns

In 2018, Minnesota Attorney General Lori Swanson brought a state lawsuit against 3M for natural resource damage, demanding \$5 billion to clean up contamination. Before going to trial, 3M agreed to pay \$850 million in the third-largest settlement award for a natural resource damage claim (behind the Deepwater

Regulation in the U.S. vs. Europe

PFOA and PFOS are only two out of thousands of chemicals in the PFAS family. Two of the best-known compounds, they have been the attention of the majority of PFAS research and scrutiny, and thus have been phased out of production in the U.S. This phase-out has caused companies that rely on PFAS to create their products to replace them with other chemicals. In 2009, DuPont replaced PFOA with a chemical called GenX, which, like PFOA, persists indefinitely in the environment and is linked to cancer and other illnesses.

While the life cycle of PFAS is not highly regulated in the U.S., Europe has implemented significant restrictions. The Stockholm Convention on Persistent Organic Pollutants (which has not been ratified by the U.S.) is an international agreement signed by 182 countries that severely restricts the use of PFOS.

In the European Union, some countries are pushing for the adoption of a strategy to phase out most uses of PFAS compounds by 2030. Rather than approach the chemicals individually, the strategy recommends regulating them as a group. The EU believes the contamination is a matter of urgency and addressing the chemicals individually will take too long and allow for "regrettable substitutions," such as GenX.

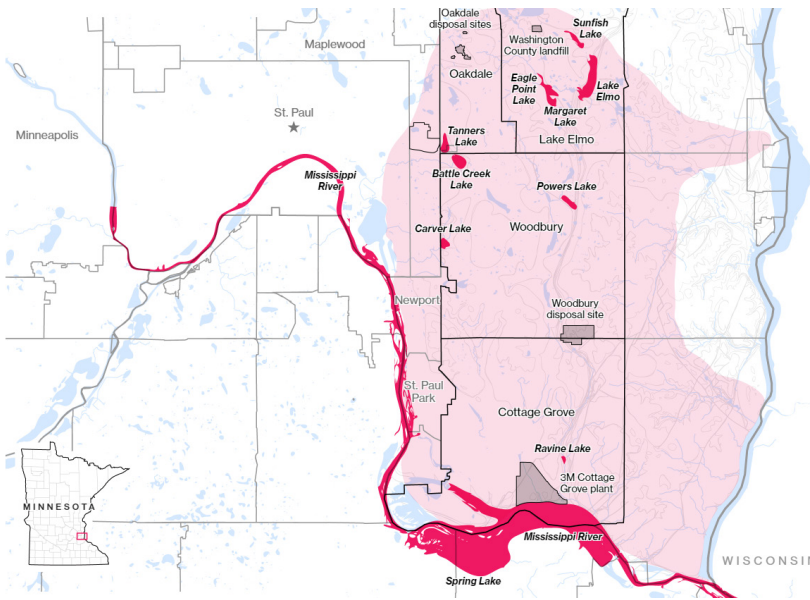
It may be some time before the U.S. passes strict laws regulating the production, disposal, and clean-up of PFAS; however, researchers have already begun work on finding solutions. Currently, the most popular method of filtering PFAS from contaminated water is carbon filtration. When passing through the filters, the chemicals stick to the carbon, allowing for the clean water to be separated. However, the spent carbon must be incinerated after filtration, which is a costly process. Researchers at Clarkson University recently partnered with the U.S. Air Force to develop plasma reactors that sever the carbon-fluorine bonds in PFAS chemicals, rendering them harmless. Once developed on a larger scale, these reactors could cut the price of filtering chemical contamination in half. Another group of scientists recently discovered that a wetland bacterium removes harmful fluorine atoms from PFAS, suggesting contaminated sites could potentially be cleaned up using bioremediation. We're hopeful that PFAS contamination can be mitigated, thanks to these developments.

Horizon and Exxon Valdez oil spills). The company maintained that it had participated in no wrongdoing. After the suit was settled, the Attorney General posted a trove of 3M's internal emails and memos on a state website. The documents released demonstrate that on multiple occasions, 3M downplayed, spun, and tailored its own research to make PFAS appear safer than they were. The cover-up methods date as far back as 1961, when a 3M employee memo discussed various

methods on how to protect the company from legal action resulting from the pollution of groundwater.

3M chose to phase out some PFAS chemicals in 2000, saying that although the products were safe, the decision was based on "principals of responsible environmental management." The company's updated 2019 Sustainability Report recognizes that PFAS pose a threat to natural resources but does not discuss the human health impacts of the chemical group. The brief one-page report offers readers more information by recommending [pfasfacts.com](https://www.pfasfacts.com), a website produced by 3M itself. Despite mounting scientific research on the negative health effects of PFAS, in a testimony before a House Committee in September 2019 a 3M company representative maintained that the compounds do not cause health problems.

Waste from 3M's Headquarters

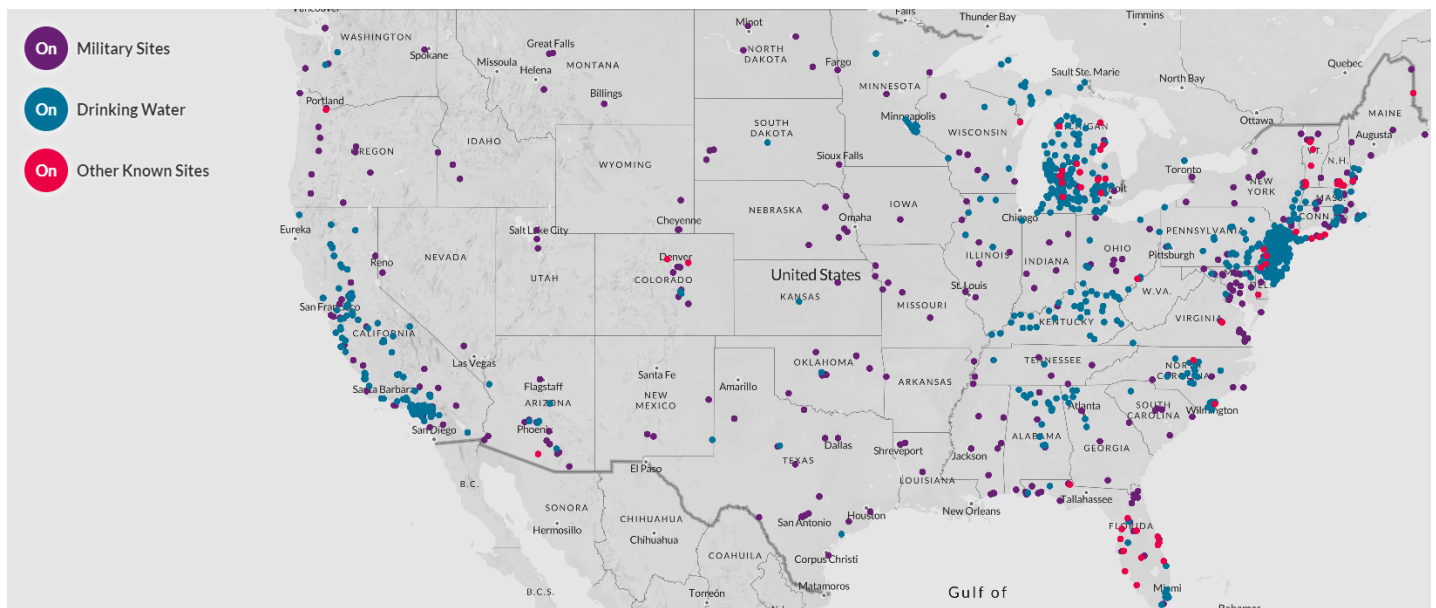


Source: Bloomberg

In its effort to fend off further government action, 3M has begun financially backing the Responsible Science Policy Coalition, a new industry lobbying group that entered the public debate in the summer of 2018. Representatives of the coalition have met with congressional offices and Environmental Protection Agency (EPA) appointees to argue that the weight of the current scientific evidence does not show that PFAS cause adverse health effects in humans at current levels of exposure, contradicting 3M's own internal documents (released by the Minnesota Attorney General) that show the company has known the chemicals were toxic

PFAS Contamination Around the U.S.

PFAS contamination is not contained to areas around 3M's headquarters. Decades long use of fire-fighting foams containing the chemicals have created problems at military bases, airports, and fire stations across the entire U.S. The Department of Defense has already spent more than \$2.2 billion cleaning up PFAS, and this number is expected to continue rising.



Source: The Environmental Working Group (does not include Alaska & Hawaii)

since the 1970s. This strategy by 3M is reminiscent of the tobacco industry's use of lobbying in the 1990s to attack the EPA's findings on secondhand smoke.

Although the 2000 phase out has helped PFAS levels decline, 3M's problems have not gone away. Lawsuits against the company are mounting. It has been sued over PFAS contamination by individuals, towns, water districts, and states. Most recently, the government of Guam has filed a lawsuit alleging that chemical agents produced by 3M have polluted the territory's drinking water and natural resources and created a public health issue, continuing the ever-increasing string of fire-fighting foam-related lawsuits.

Mounting Legal & Policy Risks

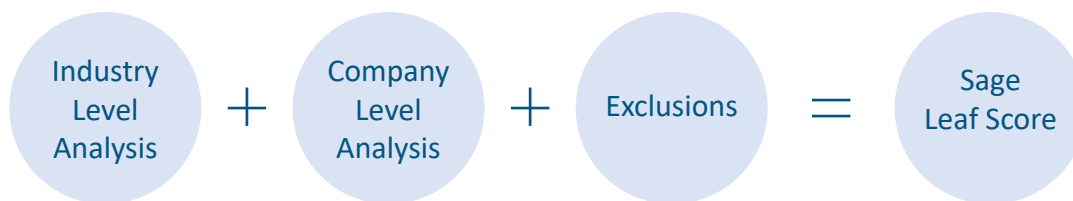
3M also continues to face regulatory risk. The EPA has long been inactive regarding PFAS, it has recently introduced a PFAS Action Plan to address emerging environmental and health concerns. The EPA is currently debating whether to designate PFAS as hazardous substances under the Superfund law. This classification would allow for the agency to allocate federal funding and resources for cleaning up PFAS contamination sites. Although helpful, this decision would transfer the financial burden of PFAS onto municipalities and citizens, rather than seeking remediation from the corporations that gained millions in profits while manufacturing of the chemicals.

Although 3M is highly ranked by some ESG data providers, Sage believes that it should be approached with caution. The company's environmental and social management of PFAS makes us question if its governance structure is truly one that promotes ethical conduct. In addition, the company's participation in lobbying and alleged contradiction/fabrication of scientific research is alarming and telling of its intentionality, which is a key factor in Sage's ESG investment process. It's not enough for a company recovering from an ESG failure to implement policies that mitigate that risk going forward. It must take responsibility for subsequent effects and also demonstrate that it is intentionally building a better business through solid ESG management.

As adoption of ESG continues to grow, investment strategies will continue to seek out products that offer performance and align with individuals' values. Companies that fail to mitigate risk and expose themselves to the possibility of a slow-burning problem, like PFAS, will not meet these expectations. Because of this, Sage gives 3M an ESG Leaf Score of 1 on a scale of 5. We recognize that 3M has undeniable areas of strength, but its areas of ESG weakness present risk that Sage finds incompatible with our investment strategies.

Sage ESG Leaf Score Methodology

No two companies are alike. This is exceptionally apparent from an ESG perspective, where the challenge lies not only in assessing the differences between companies, but also in the differences across industries. Although a company may be a leader among its peer group, the industry in which it operates may expose it to risks that cannot be mitigated through company management. By combining an ESG macro industry risk analysis with a company-level sustainability evaluation, the Sage Leaf Score bridges this gap, enabling investors to quickly assess companies across industries. Our Sage Leaf Score, which is based on a 1 to 5 scale (with 5 leaves representing ESG leaders), makes it easy for investors to compare a company in, for example, the energy industry to a company in the technology industry, and to understand that all 5-leaf companies are leaders based on their individual company management and the level of industry risk that they face.



[For more information on Sage's Leaf Score, click here.](#)

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