

Sustainability

<http://www.pxd.com/values/sustainability>

Sustainability is a multidisciplinary focus that balances economic growth, environmental stewardship and social responsibility. Pioneer Natural Resources (Pioneer) emphasizes developing natural resources in a way that protects our communities and preserves the environment.

Complying with applicable environmental laws, regulations and policies is only the beginning of our commitment. We have a proactive compliance program to identify and correct any operational deficiencies we find. This process includes direct cooperation with appropriate government agencies. Our goal is to continue raising the bar regarding environmental performance standards on soil, water, waste and air emissions.

Pioneer's collaborative and interdisciplinary efforts are led by our dedicated and highly involved environmental and sustainable development department. The department strives to ensure our operations are sustainable through a concentrated focus on current and emerging risks, opportunities and challenges. Comprehensive scientific analysis of operational information is employed to reduce our impact on the environment and to provide cost-effective solutions. Science is also the basis of Pioneer's efforts to educate legislators, regulators and the public to inform them regarding potential government action and enhance our community relationships.

A TOP PRIORITY

Pioneer's commitment to excellence is anchored by strong **corporate governance**. The Health, Safety and Environment Committee of our board of directors provides oversight for our health, safety and environmental practices and monitors management's efforts in fostering a culture of safety and environmental protection. Accountability for and the execution of these goals is overseen by the Pioneer Corporate Environmental Committee, which is composed of executive and senior management, and key stakeholders throughout the Company.

The structure and function of our board and its committees, and their respective roles in managing the risks that we face as a company, are discussed in greater detail in the **Proxy Statement for our Annual Meeting of Stockholders**. In addition, we have **governance guidelines** and charters for each of our standing board committees.



Pioneer's mission is to deliver a highly competitive and sustainable rate of return to shareholders by responsibly finding and producing oil and gas resources to help meet the world's energy demands. Our work to produce these resources provides opportunities for growth and enrichment to our employees, our business partners and the communities in which we operate.

TCEQ honors Pioneer for pollution prevention and water conservation

In 2015 Pioneer's D.L. Hutt lease water recycling project was a Texas Commission on Environmental Quality (TCEQ) **Texas Environmental Excellence Award (TEEA) finalist** in the water conservation category.

Demonstrating Pioneer's commitment to environmental stewardship, Pioneer is taking a comprehensive approach to water conservation. For several years, Pioneer has piloted and evaluated various technologies for conserving water through reuse and has developed more efficient water transportation and storage methods.



In 2014 the TCEQ honored Pioneer as a **TEEA winner** for pollution prevention. The TCEQ selected our reduced-emissions pigging project in the West Texas Panhandle from more than 200 applications, recognizing the project's efforts to preserve and protect the environment. The project thoroughly evaluated a standard industry procedure known to release minor emissions and incorporated three innovative solutions that simultaneously reduce air emissions, recover previously lost resources and minimize the risk for spills. Pioneer is the first oil and gas company to be recognized in the TEEA pollution prevention category. The TCEQ award highlights Pioneer's commitment to protecting the environment in the communities where we operate.

Additionally, our coordinated project with the city of Bowie, Texas, in municipal water reuse was recognized as a TEEA finalist in the Water Conservation category.

[Project Overview Video: 2014 TEEA Winner, Pollution Prevention Category](#)

[TEEA Finalist Website Link](#)

Photo: Pioneer received the 2014 Texas Environmental Excellence Award for pollution prevention.

Water

<http://www.pxd.com/values/sustainability/water>

WATER CONSERVATION

Water conservation is an essential component in our operations and in our sustainable development goals. Pioneer is taking a comprehensive approach to water conservation. We continue to pilot and evaluate various technologies for water conservation, including creating more efficient water transportation and storage methods to limit water loss.

We recognize fresh water is a valuable resource, and Pioneer is committed to innovative water stewardship. While there is no immediate, economically viable solution that completely eliminates the use of fresh water in the production of oil and natural gas, we continue to optimize the ways in which we manage our water resources.

In 2014 Pioneer created Pioneer Water Management, LLC (PWM), a dedicated subsidiary company focused on water conservation and providing non-fresh water supplies for use in our operations. While fresh water is currently used in Pioneer operations, several important PWM water conservation initiatives are aimed at Pioneer's goal to sustainably reduce fresh water usage. These efforts include:

- **Using brackish, non-drinkable groundwater** – Pioneer is tapping brackish groundwater aquifers when possible and is adding several new projects that will further increase our brackish water usage.
- **Recycling water** – Pioneer is utilizing clean brine technology in the Permian Basin. This technology allows our drilling and completions operations to use recycled produced water. By using previously unusable water sources, such as produced water, we are further reducing our reliance on the more valuable fresh water sources.
- **Utilizing treated industrial and municipal wastewater** – Pioneer is currently purchasing non-potable effluent water from multiple sources in Texas. Most notably, Pioneer and the city of Odessa, Texas, have entered into a contract by which Pioneer will purchase effluent municipal water from the city. Such effluent water purchases are allowing Pioneer to make productive use of a non-potable water resource.



Pioneer Water Management, LLC is utilizing lined, engineered water storage ponds for improved water conservation efforts, storage capacity and distribution efficiencies. Here, a drilling rig is behind the lined containment berm of a water storage pond.

The amount of water we use varies by the well length, completion design and the geology of the formations targeted by each well. We measure oil and gas production in barrels of oil equivalent (BOE), and in 2015 Pioneer's asset areas used 0.18 to 0.46 barrels of water per BOE expected from wells drilled that year. It's helpful to convert this number into "water intensity" – gallons of water per million British thermal units (MMBTU) of energy. This helps to compare our water usage to that of other leading power sources. For example, in 2015, we used 1.16 to 3.17 gallons of water per MMBTU. A [2010 Harvard Kennedy School study](#)

found more water is consumed in the process of producing coal (1 to 8 gal/MMBTU) and corn-based ethanol (83 to 3,805 gal/MMBTU).

We understand how vital water is to any community. A **2012 Texas Water Development Board study** performed by the University of Texas found that water used for shale gas accounts for less than one percent of all ground and surface water withdrawn statewide. Irrigation accounted for the largest portion of Texas' water usage, which is a nationwide trend. According to the **United States Department of Agriculture**, agriculture accounts for approximately 80 percent of U.S. groundwater and surface water consumption.

As our industry drills longer lateral wells and increases the number of hydraulically fractured stages in each well, water use per well increases. However, more oil and gas is recovered from these wells, reducing overall water intensity. At Pioneer, we will continue to focus on water conservation and non-fresh water sourcing.



Going above and beyond

The Colorado Oil and Gas Conservation Commission recognized Pioneer as a 2012 Outstanding Operator for an innovative pipeline project in the Raton Basin. Pioneer implemented comprehensive real-time pressure monitoring across more than 800 miles of its water gathering pipeline network. The real-time monitoring enables automated shutdown of wells when possible incidents are detected. Pioneer reduced pipeline water spills that year by more than 40 percent compared to its average rate over the prior three years.

FRACFOCUS

The safety and success of the more than 60-year-old hydraulic fracturing process, as well as the benefits and costs of developing shale plays, have received increased public interest in the last decade. Pioneer has been at the forefront of both national and state efforts to ensure a transparent, timely industry response.

To help address questions about hydraulic fracturing, Pioneer joined industry peers and regulators to create the website **FracFocus.org**, a public registry of reported chemicals used in hydraulic fracturing.

Disclosure of chemicals used in hydraulic fracturing is important. Pioneer actively supports this national initiative and complies with state regulations on reporting. We have disclosed on FracFocus.org the chemicals used in more than 3,370 wells we have drilled.

Regional participation earns Corporate Citizen Award

Oil and Gas Investor recognized Pioneer as Best Corporate Citizen for our participation in the regional watershed monitoring system in the Raton Basin. The Apishapa Watershed and Purgatoire Watershed monitoring programs were designed to ensure that water quality meets permit standards and intended uses. Real-time data gathered from these monitoring projects measure potential effects of coal bed methane operations discharges in each watershed and provide a scientific basis to support permitting decisions and regulatory options, as well as identify water quality management solutions.

WATER PROTECTION

Pioneer designs, builds and maintains its wells to protect groundwater quality during and after wellbore construction.

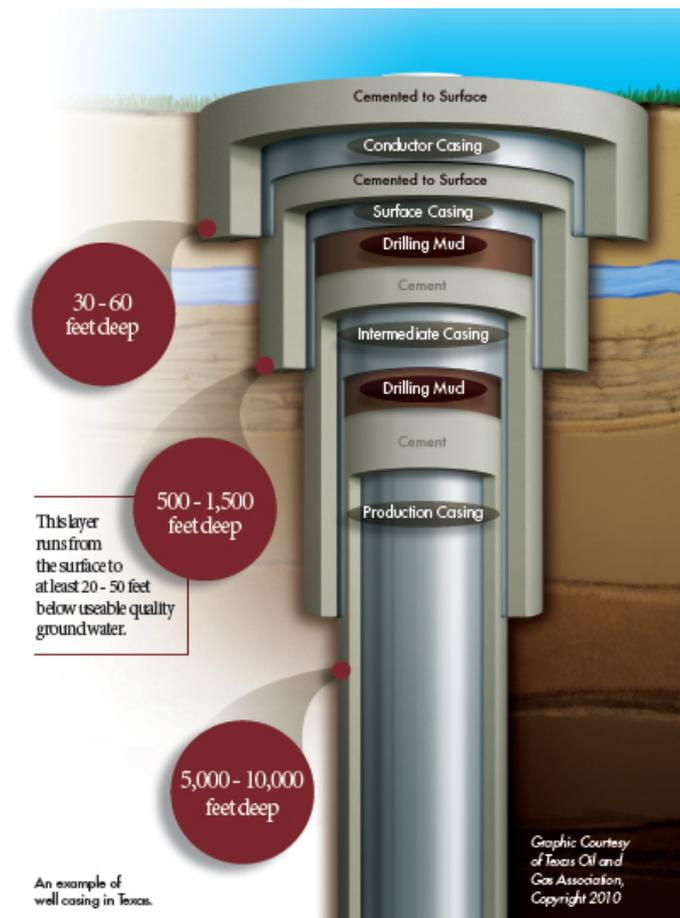
For decades, state regulators have imposed strict requirements for how oil and gas wells must be constructed. Each well must be encased in multiple layers of protective industrial-grade steel casing, which is surrounded by cement to create a secondary safeguard for underground fresh water. In 2015, we tested the surface casing integrity on 336 wells drilled.

This highly regulated safety system – and the thousands of feet of rock in between the hydrocarbon and fresh water zones – keeps oil and gas out of the fresh water and fresh water out of the oil and gas. For more than 70 years the industry has successfully drilled and produced wells using these drilling techniques.*

For additional protection, Pioneer installs pressure gauges during completions to monitor and test the space between the inner and outer well casing (annular space). In 2015, 100 percent of Pioneer's completed wells were tested in this manner.

* Source: **API Document on Hydraulic Fracturing Operations, Well Construction and Integrity Guidelines**

Image courtesy of **Oil and Gas in Texas: A Joint Association Education Message from the Texas Oil and Gas Industry.**



An example diagram of well casing in Texas is shown above. Depth ranges can vary depending on well and completion type. Those shown are not intended to represent Pioneer's operations.

Air

<http://www.pxd.com/values/sustainability/air>

OPERATIONAL EMISSIONS REDUCTION

Pioneer's team of air quality experts, an interdisciplinary group of corporate and operations personnel, works to achieve compliance with all applicable federal and state requirements, addresses issues surrounding air quality permitting and develops strategies to reduce emissions. Additionally, Pioneer's air quality team interprets new and upcoming federal and state air quality rules in order to foster dialogue with regulators, industry peers and trade groups and facilitate understanding of how these changes can impact the oil and gas industry.



Pioneer has initiated a program including advanced emissions measurements to better understand emissions from our field operations and their impact on air quality and to identify opportunities for emissions reductions through best practices and technological solutions. For example, Pioneer has participated in studies with other industry participants and the Environmental Defense Fund, led by the Cockrell School of Engineering at [the University of Texas](#), to measure methane emissions.

Operational improvements have contributed to a reduction in our direct greenhouse gas (GHG) emissions that are reportable to the [Environmental Protection Agency](#) (EPA). Pioneer reported 0.97 million metric tonnes of GHG emissions (CO₂ equivalent) to the EPA in 2015. Based on this value, our 2015 GHG emissions intensity was 8.2 metric tonnes of CO₂ equivalent per 1,000 barrels of gross oil-equivalent production (CO₂ equivalent/MBOE). EPA emissions reporting requirements do not cover all of Pioneer's equipment or activities, and we are working to better identify and measure other sources as well.

Part of our success in reducing emissions has come from improved well completion activities that control or capture flowback emissions (i.e. performing "green completions"). Ahead of 2012 EPA regulations, Pioneer began designing solutions to capture flowback emissions from gas well completions in our Eagle Ford Shale asset and our since-divested Barnett Asset. We have gone beyond the EPA requirements by recovering or combusting emissions from condensate tanks during the completion phase for Eagle Ford Shale gas wells. Our operations teams are also controlling or capturing emissions from oil well completions in the Eagle Ford Shale and Permian Basin.

In 2011 Pioneer proactively implemented a leak detection and repair (LDAR) program for our Colorado operations, with well sites, compressor stations and natural gas pipelines being systematically surveyed. Pioneer has since implemented LDAR methods across all of Pioneer's operations to monitor facilities for fugitive emissions. The LDAR program utilizes audio, visual, and olfactory (AVO) inspections as a standard part of facility inspections performed by lease operators. In addition, Pioneer employs a team of thermographers who use optical gas imaging (OGI) cameras and remote methane leak detectors (RMLD) to conduct surveys at our facilities, such as well sites, tank batteries, compressors, pipelines, and midstream facilities.

OGI cameras utilize infrared sensors to allow our thermographers to visualize emissions that are not visible to the naked eye. Several manufacturers currently produce OGI cameras, but Pioneer currently utilizes cameras manufactured by FLIR®. As of December 31, 2015, Pioneer owned 9 FLIR® cameras and 2 RMLDs, and during the year our team of thermographers conducted OGI surveys at more than 13,350 locations (e.g. wellheads, tank batteries, compressor stations). An additional 130 miles of pipeline was inspected in length. Facilities are currently prioritized for surveys based upon the potential for fugitive emissions to occur.

Our Colorado operations LDAR program has been further developed to meet the specific requirements of the 2014 Colorado Regulation 7 requirements. Colorado's Regulation 7 requires oil and gas producers to inspect and repair hydrocarbon leaks from components at all existing and newly constructed well production facilities and compressor stations, followed by ongoing, regular inspections dedicated to leak detection, repair and reporting.

In addition to our standard LDAR program, Pioneer is testing continuous emissions monitoring systems in the Permian Basin. Continuous emissions monitoring may help us to better direct our LDAR program and quickly locate unexpected emissions.



Direct access for scientific analysis

Pioneer participated in studies led by the University of Texas to measure methane emissions, along with Environmental Defense Fund and other industry participants. Pioneer provided direct access to production sites and equipment, and assisted in the design of safe sampling protocols. The participation of Pioneer and other producers made safe measurements of methane emissions directly at the source possible, facilitating scientific analysis where little empirical data previously existed. Findings from the study may inform how methane emissions are measured, monitored and managed.

FLEET VEHICLE EMISSIONS REDUCTION

Since 2008 our half-ton pickup manufacturer's fuel economy improvements have led to a 25 percent improvement in overall miles per gallon. Additionally, the average vehicle fleet age in the U.S. is 11.5 years; however, Pioneer's average vehicle age is only about three years. This assures that our vehicles are equipped with the latest technology available to reduce our vehicular air emissions.

Pioneer has tested a new aluminum truck platform, which trims 700 pounds of gross vehicle weight, while maintaining equal or greater performance. Testing has proven successful by increasing savings in both fuel and overall vehicle costs. Pioneer plans to start purchasing the aluminum frame vehicles to meet our fleet demands.



Our fleet vehicles are equipped with the latest technology available to reduce air emissions.

Additionally, we are putting measures in place to reduce the number of overall miles driven and improve fleet efficiencies, which will reduce our fleet air emissions. Three core components include:

- **Truck Connectivity/Mobility** – In 2015 more than 450 fleet trucks were equipped with a mobile WiFi hotspot. This remote access reduces the need to return to field offices for administrative tasks, which reduces our vehicular fuel consumption and air emissions.
- **Integrated Private Lease Roads** – Our private lease roads have been integrated with public roads within our routing systems. This allows us to build custom routes and monitor vehicular movement on all roads that we travel.
- **Fleet Idle Time Reduction** – We use GPS technology to monitor and reduce the amount of time our vehicles spend idling in the field. By minimizing idle time, we reduce fleet emissions and fuel costs, as well as extending the overall lifecycle of our fleet vehicles.



Fewer vehicle emissions with CNG

Pioneer has made great strides in promoting the commercial use of natural gas vehicles. To date, the company has two compressed natural gas (CNG) fleet fueling stations and 176 CNG-equipped fleet vehicles to run on bi-fuel engines that use natural gas from Pioneer's own production. Each natural gas vehicle on the road reduces greenhouse gas emissions and fueling costs, while increasing operating efficiencies.

Surface

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WELL PAD FOOTPRINT

Pioneer works with regulators and landowners to minimize surface impacts from our operations. One of our key initiatives to reduce our surface footprint is drilling multiple wellbores from a single location. In 2015 we drilled from more than 109 locations utilizing multiple wellbores in our key operating areas.



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Respect, responsibility and doing things the right way

Since 2013 Pioneer has hosted environmental enforcement workshops in the Permian Basin and in South Texas to advance employee and local law enforcement officer education on issues related to oilfield waste. Attendees have learned about proper oilfield waste management in training sessions and six-hour workshops. The collaborative education between the enforcement agencies and an oil and gas company is the first of its kind in Texas. Law enforcement has commended Pioneer on the commitment and standard of performance in environmental compliance within our communities.

SPILL PREVENTION

We believe that spills in our operations are preventable, and we train employees through Pioneer's comprehensive environmental courses on how to prevent spills. Our engineers design and build facilities with spill prevention in mind, to protect the environment in those instances when spills occur. We invest in containment equipment, perform regular inspections and periodically update our spill response plans to comply with regulations. We work diligently to prevent spills, to respond quickly and to remediate impacted areas. We investigate all spills to determine cause and corrective actions. We track the number and volume of spills and disclose agency-reportable spills according to regulation. In 2015 we had 327 oil/condensate spills of more than 1 barrel (42 gallons), totaling 2,657 barrels. This represents 0.0225 barrels (0.94 gallons) of oil spilled per thousand barrels of oil equivalent produced, based on gross production.



We work diligently to prevent spills, respond quickly, remediate impacted areas and investigate all spills.