

# 2022 ENVIRONMENTAL, SOCIAL AND GOVERNANCE REPORT

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*Focusing on a Sustainable Future*



**CARDINAL**  
ENERGY LTD.



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## About this report

This report is Cardinal Energy Ltd.'s fourth Environmental, Social and Governance (ESG) report. This report outlines environmental, safety and social responsibilities that Cardinal Energy Ltd. is committed to as well as our initiatives that support this commitment. In this report, we have referenced various relevant standards and regulations for specific aspects of ESG reporting in jurisdictions in which we operate. Cardinal Energy Ltd. continues to monitor standards for annual reporting requirements and is preparing for incorporation of a mandated reporting standards. The Canadian regulators are looking at a set of rules modelled around the Task Force on Climate-Related Financial Disclosures (TCFD) recommendations, but may come with its own nuances.

This report was reviewed and approved by our executive team and Board of Directors. References to Cardinal, our, we, the Company and the Corporation used within this report refer to Cardinal Energy Ltd.

This report is intended to assist our stakeholders to better understand our commitment to operating in a responsible and sustainable manner. Additional disclosure is available from our audited financial statements and the associated Management Discussion and Analysis; Annual Information Form; Management Information Circular; and other publicly required information. All of these documents are available and can be accessed on our website at [www.cardinalenergy.ca](http://www.cardinalenergy.ca) or through SEDAR at [www.sedar.com](http://www.sedar.com).

Should there be questions regarding this report, please direct them to [info@cardinalenergy.ca](mailto:info@cardinalenergy.ca).

# GOVERNANCE



# OUR PLAN

In the face of recent global energy security concerns, Cardinal Energy Ltd. continues to be a responsible Canadian energy producer with a strong legacy of robust Environment, Social and Governance (“ESG”) performance. Cardinal is proud to be able to provide sustainable production, positive environmental performance and top tier shareholder returns as we look to the future.







Over the past 12 months, Cardinal has invested approximately \$25 million in improving our environmental footprint. Our corporate focus in 2022 was to concentrate on our balance sheet, which will give us the ability to make the right long-term ESG decisions and enable us to fund initiatives to maintain and strengthen our overall ESG performance.

CO<sub>2</sub> sequestration at our Midale asset gives us a distinct advantage in achieving top quartile ESG performance. With this head start, we will continue to focus on continual improvement across all ESG categories. We will continue to make ESG a pillar of our corporate philosophy and provide sustainable returns to our investors, continuing a legacy of responsible Canadian energy production.

**M. Scott Ratushny**  
Chief Executive Officer



## Global Energy Suppliers: Comparing Canada to Other Exporters

	CANADA	TOP 5 EXPORTING REGIONS* <sup>1</sup>
		
 <b>CRUDE OIL EXPORTS 2021<sup>1</sup></b>	3,965 k bpd	44,462 k bpd
 <b>ENVIRONMENTAL PERFORMANCE SCORE, 2022<sup>2</sup></b> (out of a possible 100 points)	<b>50.0</b>	<b>39.8<sup>†</sup></b>
 <b>DEMOCRACY SCORE, 2022<sup>3</sup></b> (out of a possible 10 points)	<b>8.88</b> Full Democracy	<b>4.22<sup>†</sup></b> Various
 <b>EFFORTS TO REDUCE GREENHOUSE GAS EMISSIONS</b>	Carbon price, methane reduction, cleantech investments	Variable

\* Asia Pacific, Middle East, Russia, Saudi Arabia, USA

<sup>†</sup> Mean average

Sources: <sup>1</sup>BP Statistical Review of World Energy, 2022 <sup>2</sup>Yale Environmental Performance Index 2022 <sup>3</sup>Economist Intelligence, Democracy Index 2022



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# CARDINAL ENERGY

In the last 10 years, we have grown production from 1,400 barrels of oil equivalent per day (boe/d) to more than 21,000 boe/d. Our production base is made up of approximately 83% crude oil, 13% natural gas and 4% natural gas liquids.

Since inception, our team has grown from 15 to 166 employees and we have built a significant portfolio of long-life, sustainable assets. Our experienced and skilled team of 66 office and 100 field employees is fully committed to continually improving our environmental, health, safety and social performance as a fundamental pillar of maintaining sustainable growth.



**66 Office Staff**



**100 Field Staff**



**41% Female in  
Calgary Office**



**+21,000 BOE/d**

## *Cardinal Energy Operations*





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# CORPORATE GOVERNANCE

Cardinal upholds its core values of accountability, trust, respect, and integrity. Our Board of Directors is responsible for the stewardship of Cardinal and has four committees: the Audit Committee; the Environment, Social and Governance Committee; the Corporate Governance and Compensation Committee; and the Reserves Committee. **The Board of Directors has direct oversight over ESG metrics and Cardinal's Executive Compensation is tied to these metrics.**



Our culture of ethical practices is ensured through our Whistleblower Policy. Managed by CanaGlobe, Cardinal's whistleblower program allows for impartial, third-party review.

More information about the mandates of each committee can be found on our website at [www.cardinalenergy.ca](http://www.cardinalenergy.ca).

## 5 BOARD MEMBERS



20% FEMALE

80% INDEPENDENT

7.6 YEARS  
AVERAGE TENURE

*Cardinal believes that good governance stems from a culture that is committed to conducting our business responsibly and with integrity*



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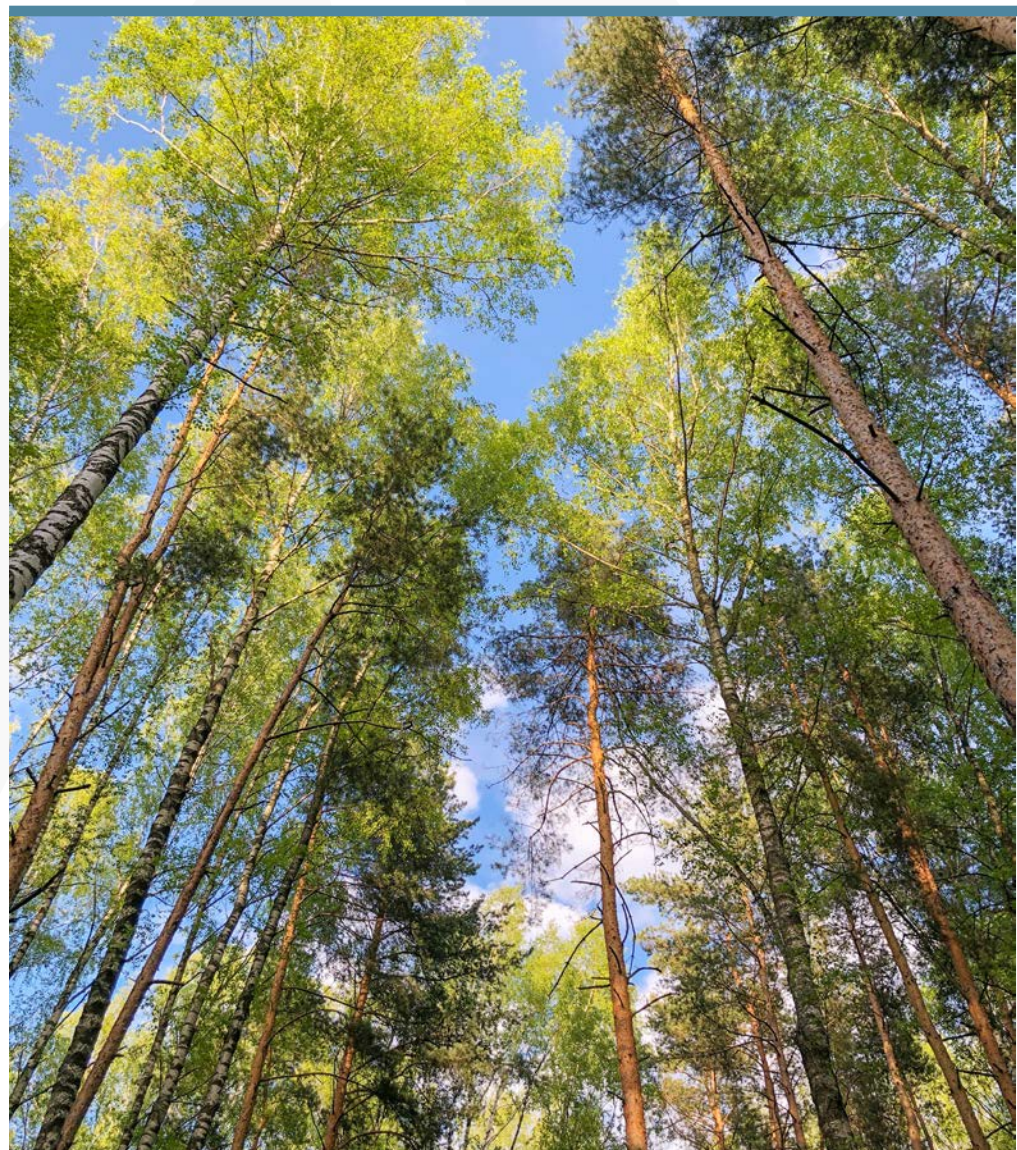
# CLIMATE RELATED RISK STRATEGY

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To date, Cardinal has taken significant steps towards sustainable growth, including, notably, the acquisition of the Midale Enhanced Oil Recovery (“EOR”) project in 2017. At our Midale asset, more CO<sub>2</sub> is sequestered annually than what is emitted directly from all of our operations. We believe we can make a positive contribution to efforts focused on meeting the world’s growing demand for energy, while also balancing our environmental footprint, emissions management and financial sustainability.

In all jurisdictions in which we operate, Cardinal is subject to both extensive regulation and taxation on our broader carbon dioxide equivalent emissions. We are currently taxed on emissions and fuel use throughout our operations. Cardinal has absorbed these incremental costs and has successfully laid the groundwork for carbon offset generation and business improvements throughout our operations that will enable our continued sustainability moving forward.

Cardinal continues to identify climate-related risks to our business, as well as distinguish the opportunities that an evolving carbon market represents. In 2022, we’ve provided an update to our evolving strategy in how we are meeting those risks and seeking to leverage those opportunities.





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## Cardinal's Climate Related Risks

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### REPUTATION

Potential for regulatory and political uncertainty to adversely impact the broader Canadian energy sector, limiting access to global capital.

#### HOW WE'RE MANAGING THE RISK

Transparent disclosure of material risks to our business. Targeting continuous improvement through effective corporate governance.

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### MARKETS

Potential for decreased demand due to dynamic market factors, lack of egress opportunity and availability of lower proved product from jurisdictions with less stringent regulatory bodies.

#### HOW WE'RE MANAGING THE RISK

Transparency in ESG reporting and investor communications, participation in public policy dialogue, continue to leverage carbon sequestration and a healthy balance sheet.

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### TECHNOLOGY

Limitations on available technology and cost effectiveness of existing technology.

#### HOW WE'RE MANAGING THE RISK

Rigorous business case assessments; participation in subsidized pilot programs, employing experts. Adopt new technologies once proven.



### POLICY

Uncertainty around regulations, taxation and regulatory framework.

#### HOW WE'RE MANAGING THE RISK

Incorporation of carbon pricing analysis in reserves reporting and capital allocations.

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### PHYSICAL

Potential for changes to weather to impact Cardinal's people, assets and supply chains.

#### HOW WE'RE MANAGING THE RISK

Identification and monitoring of high risk assets, consideration of changing weather in project design, proactive supplier engagement.



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## Cardinal's Climate Related Opportunities



### MARKETS

Opportunity to obtain new investment and capital.

#### HOW WE ARE LEVERAGING THE OPPORTUNITY

Highlight Cardinal's carbon sequestration in investor communications.



### SUSTAINABILITY

Potential to improve the sustainability of Cardinal's low decline assets.

#### HOW WE ARE LEVERAGING THE OPPORTUNITY

Projects that increase gas conservation, engine efficiency, generate power and minimize water use are reducing operating costs today and in the future. Focused spending on asset retirement will improve our balance sheet.



### REVENUE

Cost reduction through efficiency improvements and potential revenue from carbon credits. Potential market premiums for climate differentiated product.

#### HOW WE ARE LEVERAGING THE OPPORTUNITY

Installation of carbon credit generating equipment to offset taxation increases. Leveraging Midale CO<sub>2</sub> injection for increased production and reduced emissions.



# HEALTH, SAFETY & ASSET INTEGRITY





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## HEALTH & SAFETY

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Cardinal strives for an injury-free workplace for all who undertake activities on our behalf. We promote a safety culture through systems, processes and continued learning to mitigate risks. Safety is a core element across the organization and is top-of-mind in everything we do, as we consider people to be our greatest asset.

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*Cardinal achieved  
zero lost-time injuries in  
each of 2020, 2021 and 2022*

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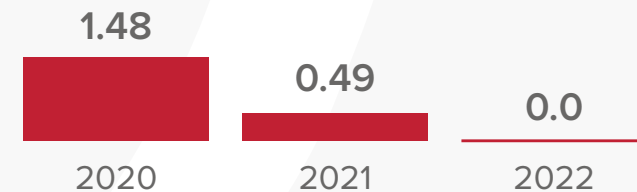
Our approach to maintaining safe and reliable operations starts with our leadership team and is embodied by rigorous health and safety programs with ongoing process and occupational safety improvements. These include formal operator competency training in Standard Operating Procedures as well as Site Specific Operating Procedures. Competency training is continually maintained to ensure that individuals are adequately prepared prior to undertaking tasks. These competencies are updated and re-evaluated when a procedure or equipment changes and/or at the appropriate interval.

Learnings from all incidents, near-misses and hazard identifications are documented and shared throughout Cardinal as part of our efforts to reduce the potential for re-occurrence. This is

evidenced by our strong safety performance over the last three years. We are extremely proud of our record of protecting those who choose to work with us.

### *Total Recordable Injury Frequency*

Per 200,000 hours-worked



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*Our employees worked over  
417,000 hours in 2022 with  
zero recordable injuries*

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We continuously plan and practice effective responses to unlikely incidents, always prioritizing worker and community safety as well as environmental protection.



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# OPERATIONAL ENHANCEMENT & ASSET INTEGRITY

Cardinal continues to prioritize investment in integrity management of our pipelines and facilities and strives to minimize or, wherever possible, substantially eliminate associated risks to the public and environment.

Cardinal invests significantly, to ensure the ongoing protection of the environment and all of our stakeholders. Examples of this are:

- Pipeline inspections conducted using internally intelligent inspection tools, to identify potential failure points before they occur. Pipelines at higher risk of failure are repaired, replaced, abandoned, or other risk mitigation measures are put in place.
- Implementation of leak detection technology to alarm operations staff of leaks and/or automatically shutdown pipelines or associated equipment to minimize spill volumes.
- Aerial surveillance and operations ground patrols are used to monitor pipeline right of ways for evidence of leaks or other hazards, particularly those near waterbodies, roadways and residents. Real-time video surveillance is utilized at our larger facilities.
- Training and competency of operations personnel in pipeline and facility maintenance activities using pipeline Standard Operating Procedures and Site Specific Operating Procedures.

Some results of Cardinal's investment in asset integrity management include:

- Pipeline incident frequency reduction from 2.6 to 1.5 incidents/1,000 km between 2019 and 2022.
- Average pipeline spill volume per incident maintained below that of industry peers between 2019 and 2022.



*Pipeline inspection tool used to monitor pipeline integrity*

**ENVIRONMENT**





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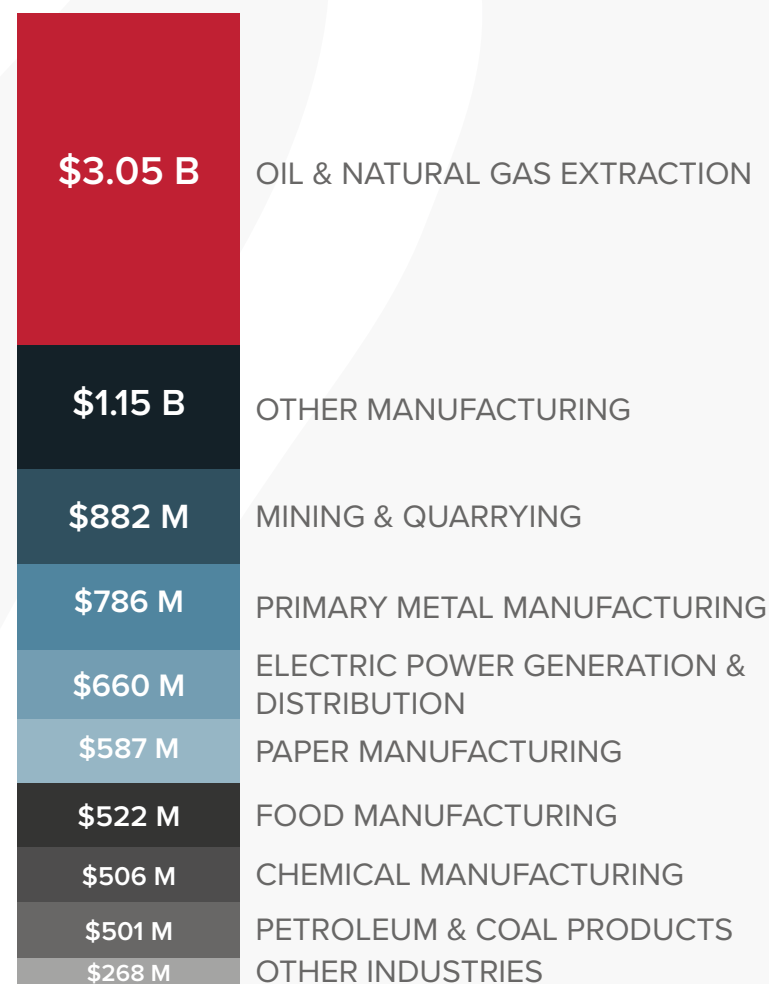
# THE ENVIRONMENT AS A STAKEHOLDER

Cardinal is proud to provide safe, reliable energy to the public and we are committed to doing so in a way that maintains a high environmental standard. We are firmly committed to operating in a responsible and sustainable manner. Our commitment requires considerations of impacts on the environment at each stage of development.

All activities are conducted safely and reliably to protect the public, minimize environmental impact, safeguard the health and well-being of employees and contractors, and protect our facilities and equipment from damage or loss.



## *Environmental Protection Spending by Industry in Canada\**



Source: Statistics Canada, Table 38-10-0130-01

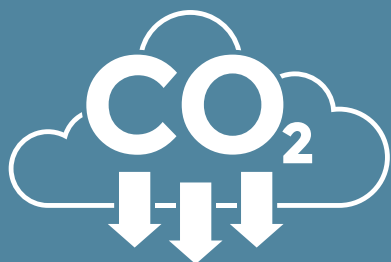
\*2019

# EMISSIONS



## Carbon Sequestration In Midale

In 2022, Cardinal continued its operation of a best-in-class carbon capture and storage project within the Midale Unit in southeastern Saskatchewan. Cardinal operates and owns the majority share of the field, where we inject CO<sub>2</sub> from a North Dakota coal gasification project and safely store the CO<sub>2</sub> deep below surface, under layers of impermeable cap rock. This injected carbon dioxide, which would otherwise be in the atmosphere contributing to climate change, serves to increase production from a stable, low decline oil reservoir.



*Over 5.4 million tonnes of CO<sub>2</sub> sequestered to date*

Approximately 292,000 tonnes of CO<sub>2</sub> was injected in the Midale Unit in 2022, a tonnage greater than the CO<sub>2</sub>e emissions Cardinal directly emitted from all of our operations (scope 1 emissions).

Cardinal continues to prioritize CO<sub>2</sub> injection as a direct strategy to mitigate climate related risks. Cardinal increased CO<sub>2</sub> injection in 2022, and continues to pursue opportunities to take advantage of our position as being one of the very few organizations that have an operating project that is approved to directly inject CO<sub>2</sub> subsurface. Cardinal also had our historically sequestered CO<sub>2</sub> volumes verified by an independent third party in 2022.

*1.25 tonnes of CO<sub>2</sub> equivalent sequestered for every tonne of CO<sub>2</sub> equivalent emitted*

From 2019 to 2022, Cardinal injected 1.25 tonnes of CO<sub>2</sub> for every tonne of CO<sub>2</sub>e that was directly emitted from our operations. The CO<sub>2</sub> injection within the Midale Unit has been shown to be an effective and safe method of CO<sub>2</sub> storage. Projects such as this are considered a key emissions reduction technology, and early demonstration and continued operation of CO<sub>2</sub> sequestration capability in the Midale Unit have been instrumental in Canada becoming a world leader in CO<sub>2</sub> sequestration technology. Since 2005 this project has injected over 5.4 million tonnes of CO<sub>2</sub>, which would have otherwise been released to the atmosphere.



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## EMISSIONS REDUCTIONS

In addition to CO<sub>2</sub> injection at Midale, Cardinal had a significant reduction in corporate vented volumes, as emission reductions from proactive device upgrades initiated in 2021 and continued through 2022 were realized. Vented emissions were 14% lower than in the prior calendar year, and corporate flared volumes were also reduced.

Cardinal secured significant provincial funding for emission reduction projects, including installation of more efficient engine control devices and variable frequency drives (VFDs), to reduce combustion emissions and scope 2 emissions, respectively. Cardinal continues to take steps to reduce methane released to the atmosphere by limiting vented emissions through proactive

leak detection and maintenance.

Methane has a global warming potential many times that of carbon dioxide, and is the primary constituent of vented natural gas, and therefore has been the target of Cardinal's vented gas reduction projects. Cardinal is also now generating regulated carbon offsets. We are proactively engaged in the developing of carbon markets, as these emerging markets develop due to consumer demand and a global desire to lower global greenhouse gas emissions.

CH<sub>4</sub>

*Material reduction  
in methane emissions  
due to targeted  
emission reduction  
projects*



*VFD installation at a Central AB site  
to reduce Scope 2 GHG emissions*



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## WATER USE

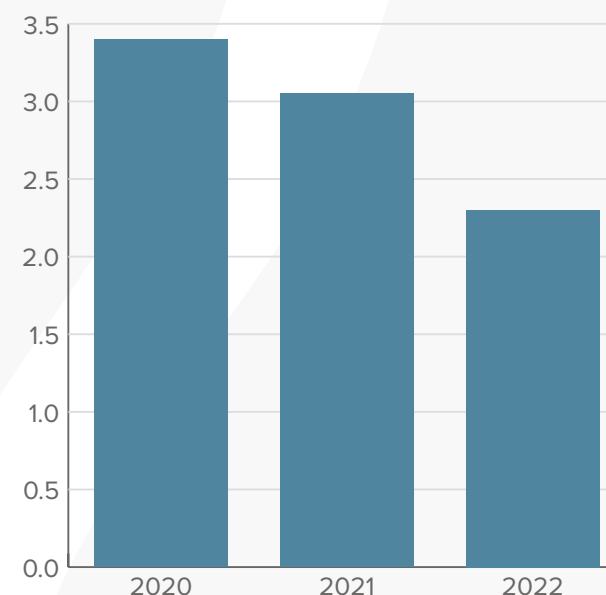
Most oil and gas production in the Western Canadian Sedimentary Basin involves associated water production, injection, disposal and various other forms of handling. Cardinal operates two legacy fields under waterflood in which we require certain amounts of fresh water to be used as “make up water”. This fresh water is utilized under license by the Government of Alberta and makes up the bulk of Cardinal’s fresh water use.

Approximately 6% of surface water allocations in Alberta are utilized by conventional oil and gas production operations. Cardinal’s fresh water allocations account for only 0.1% of all surface water allocated to conventional oil and gas in Alberta.

Cardinal used approximately 65% of its government licensed allocations in 2022 and fresh water made up less than 10% of the water that Cardinal handled through its production operations last year.

The fresh water sources we use as “make up water” are situated in an area of Alberta that is not subject to water shortages and Cardinal is committed to continually reducing our fresh water intake as a part of our ongoing ESG efforts. Cardinal has implemented capital investments and process changes that have incrementally reduced our fresh water reliance, and we were subsequently able to materially reduce our year-over-year fresh water use in 2021 and again last year.

*Cardinal Fresh Water Use Intensity  
(bbls H<sub>2</sub>O/boe production)*





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# MAINTAINING WATER QUALITY

Water quality is important not only to the well-being of the communities we operate in, but downstream users as well. To that end, Cardinal places the utmost importance on maintaining water quality in and around our operations. We do so by:

- Maintaining roadway watercourse crossings on our private road networks. Cardinal maintains upwards of 800 locations where our private roads cross a stream. Maintenance of these crossings is paramount to ensuring that downstream sedimentation is minimized and fish passage is occurring.
- Ensuring groundwater surrounding our largest facilities is continually monitored for any unintended impacts.
- Limiting the number of new developments year-to-year due to our low production declines. Subsequently, Cardinal relies less on fracing new wells, a water intensive process, than our peers do.
- Using industry best practices to abandon our wellbores, with the help of a dedicated team of experts who work to ensure groundwater is protected.

*Cardinal maintains upwards of 800 private stream crossings*





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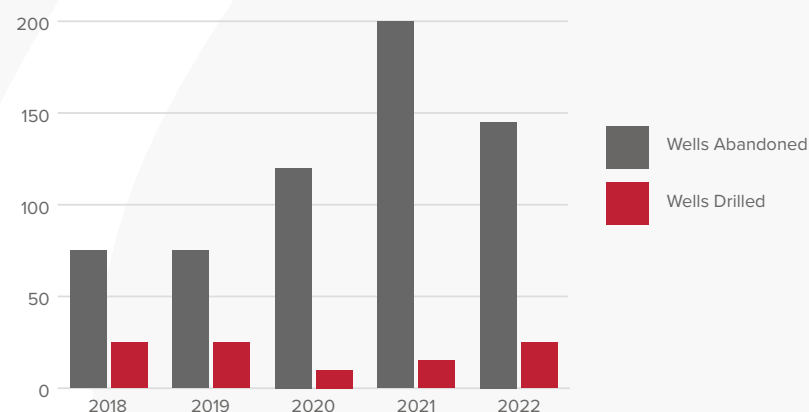
# SURFACE FOOTPRINT

Cardinal strives to be a steward of our land, water, and community. Minimizing our footprint is an ideal use of our existing resources and recognizes the important benefit of the sustainable operation philosophies that we seek to employ.

- In 2022, we drilled 26 operated wells. Only 11 new surface leases were required to support development. Each of those new surface leases were subject to pre-disturbance assessments intended to assess and mitigate any potential hazard to the environment.
- Since 2019, we have abandoned eight times more wells than we have drilled. We continue to allocate capital to development and asset retirement in a balanced way, in order to support our own sustainability.
- Long reach or multiple horizontal legs are part of our development strategy, minimizing our surface footprint in land usage and surface infrastructure.
- Wetlands, sensitive wildlife habitat, and culturally significant areas are avoided, without compromise.
- Air, surface water, groundwater, and soil surrounding our ongoing operations are monitored for impacts. When impacts are noted, we do our best to mitigate them as soon as possible.
- We interface with landowners, community and First Nations prior to development, during development, operations and again during closure activity.



## *Wells Abandoned vs. Wells Drilled (Annually)*





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# ASSET RETIREMENT

Annually, Cardinal has committed to a robust asset retirement program, consisting of well abandonment, decommissioning of facilities and pipelines, as well as reclamation of disturbed land. In 2022, Cardinal executed on another significant asset retirement program with 150 wells and multiple facilities abandoned.

Cardinal was again an active participant in the federal Site Rehabilitation Program (SRP) and over the three provinces in which we operate, we leveraged those funds to execute \$28 million dollars of SRP work. Of that work, much was conducted on First Nations land, in cooperation with certified aboriginal owned businesses.

Beyond SRP, Cardinal is an industry leader in percentage of our total capital spend allocated to our asset retirement obligations, achieving 14% in 2022, and budgeted for 19% in 2023.

Within every jurisdiction where we operate, a minimum corporate spend on closure activity is mandated by the provincial regulator. Since 2020, Cardinal has demonstrated a commitment to spend three times it's mandated required spend on asset retirement and will continue to do so in 2023.

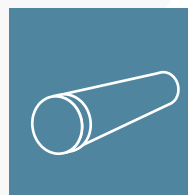
The nature of Cardinal's low decline, long-life assets helps provide sufficient funds to adequately address Cardinal's asset retirement obligations well into the future.

## *Assets Retired between 2019-2022*



545

Wells Abandoned



658

Pipeline Segments Abandoned



58

Facilities Decommissioned



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# RECLAMATION

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Reclamation is a multi-year process, which ultimately results in a reclamation certificate from the regulating body confirming the surface has been returned to its pre-disturbance condition. All areas in which Cardinal operates have stringent regulatory assessment standards that must be met before a site can be considered reclaimed and turned back over to the landowner.

In 2022, Cardinal reclaimed over 100 well sites and multiple former facility sites. As previously noted, Cardinal has been an extremely active participant in SRP funding and we were especially proud of our reclamation efforts undertaken during the program. In 2021 and 2022, Cardinal executed a reclamation program in conjunction with the Sawridge First Nation, located just outside of Slave Lake, Alberta.

The Sawridge First Nation reclamation project is a collaborative effort, utilizing equipment and knowledge from Sawridge First Nation's wholly-owned subsidiary, Sawridge Resource Development Corporation and Indian Oil and Gas Canada, to restore six former wellsites on Sawridge First Nation's land, adjacent to the Lesser Slave River.

Cardinal and the Sawridge First Nation have collaborated in a unique way, to decommission former upstream oil and gas production sites, developed by one of Cardinal's predecessors in the area. Cardinal and Sawridge installed a campsite at the first project site in 2021/2022, in order to provide band members an opportunity to enjoy traditional land use activities within the area. The other five locations that were previously abandoned as part of the project are now being restored and a plant community of berries and medicinal plants will be established in order to further food security for the nation.



*Sawridge First Nation Campsite alongside restored plant community of fly honeysuckle berries*

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*Over the past three years we  
have reclaimed over 200 wells  
and multiple facility sites*

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**COMMUNITY**

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## COMMUNITY FOCUS

Cardinal operates within many geographically diverse areas in Alberta, Saskatchewan and British Columbia. We continued our commitment to working with local stakeholders and contractors across all of our operations in 2022.

*Cardinal's focus on community investment reflects our core value of sustainable growth*

In 2022, Cardinal donated to the Midale/Cymri Fire & Rescue team to help construct a new Fire Hall to house their thirteen dedicated members, two fire trucks, one rescue truck, one command center, and one gator, servicing an area of approximately 350 square miles.

The Fire & Rescue team had been housed previously in a fire hall that was not capable of housing all equipment, did not have proper ventilation, and did not permit training exercises to take place. The new hall began construction in Spring 2022 and was completed in the Fall. The new Fire Hall will dramatically improve the ability for the Midale/Cymri Fire & Rescue team to respond to emergency situations. Cardinal received a platinum donation designation for its contribution to this project.





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## INDIGENOUS SUPPORT

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Cardinal has a role to play in addressing the challenges faced by Indigenous individuals living in remote areas, particularly in and around our core area of Slave Lake. As a meaningful way to acknowledge and promote reconciliation with First Nations on National Day for Truth and Reconciliation, Cardinal was pleased to again provide tangible support to those Indigenous communities.

In recognition of Truth and Reconciliation Day, Cardinal pledged financial assistance to The Slave Lake Homeless Coalition Society. The Society's objectives include providing access to information and services that assist individuals in building resilience, and improving wellbeing, as well as offering culturally responsive and appropriate assistance. This year's donation was part of our ongoing collaboration with the Slave Lake Homeless Coalition Society with the ultimate goal of breaking the cycle of homelessness.

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*Cardinal believes in a strong partnership with various First Nations living in and around our areas of operation*

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## PRIMARY SPONSORSHIPS

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*Our charitable giving is focused on four distinct programs, including sponsorships to Medical Mercy Canada (Support of Ukrainian families) and CUPS, our Christmas program, our matching donation program, and employee-driven support in areas where we operate. Each of these programs encourages employees to consider the needs of their community, and to give back through financial aid as well as volunteering, with a focus on making meaningful contributions to the communities in which we operate.*



Since 1989, CUPS has helped Calgarians overcome adversity and build resilience that spans generations. In 2021, CUPS was named one of Canada's Top 10 Impact Charities by Charity intelligence—for the fifth year in a row. Through integrated healthcare, education and housing, CUPS and its partners will assist adults and families in Calgary living with the adversity of poverty and traumatic events to become self-sufficient.



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*When making long-term contributions, Cardinal selects organizations that offer high impact programs*

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## EMPLOYEE-DRIVEN SUPPORT

As part of Cardinal's charitable donation policy, a percentage of the funding earmarked for charities is directed to support civic organizations and foundations within the communities in which we operate.

The program's goal is to help registered charities and organizations that directly benefit members of the local community, and to assist groups that would not normally attract funding. Some of the organizations that Cardinal supported in 2022 include:

- Beaverlodge 4-H
- Calgary St. Damien Elementary School Christmas Party
- Calgary Veterans Food Bank
- Chauvin Arena
- Chauvin Elks Playground
- Chauvin Tiny Tots Program
- Dr. Folkins School
- CJ Shurter School
- Cymri 4-H Beef Club
- Fairview 4-H
- Irma Fire Department – Jaws of Life
- Irma Arena
- Macklin Fire Department – Jaws of Life
- Medicine Hat St. Louis School
- Midale Firehall
- Northern Haven Women's Shelter
- Sedgewick Fire Department
- Slave Lake Hospital Auxiliary
- Slave Lake Homeless Coalition
- Slave Lake Santa's Anonymous
- Rotary Club of Slave Lake Color Run
- South Peace Art Society
- South Shore Children's Association
- Swan Hills Hospital Association
- Swan Hills FCSS
- Swan Hills Municipal Library
- Swan River First Nations
- Tilley Ag Society



*Employees are encouraged to submit funding requests that are specific to each of our operating areas*

# SUPPORTING INFORMATION

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# PERFORMANCE MEASURES

	2022 (YOY change)	2021	2020
<b>PRODUCTION</b>			
Total prod (boe/d)	21,471 ↑	19,090	18,442
<b>AIR EMISSIONS<sup>1</sup></b>			
Scope 1 GHG Emissions (10 <sup>3</sup> t CO <sub>2</sub> e)	225 -	231	160
GHG sequestered (10 <sup>3</sup> t CO <sub>2</sub> e)	292 ↑	242	188
GHG EI (10 <sup>3</sup> t CO <sub>2</sub> e/boe)	0.029 ↓	0.033	0.024
Scope 2 GHG Emissions (10 <sup>3</sup> t CO <sub>2</sub> e)	234 -	228	259
Flared gas (10 <sup>3</sup> m <sup>3</sup> )	12,025 -	12,404	7,873
Vented gas (10 <sup>3</sup> m <sup>3</sup> )	3,598 ↓	4,178	3,727
Methane emissions (10 <sup>3</sup> t CO <sub>2</sub> e)	50 ↓	66	NPR
<b>WATER</b>			
Fresh Water Intensity (bbls H <sub>2</sub> O/boe production)	2.30 ↓	3.05	3.40
<b>SPIILLS</b>			
Reportable Spills <sup>2</sup>	14 -	13	15
<b>PERSONAL SAFETY</b>			
Recordable Injuries <sup>3</sup>	0 ↓	1	3
TRIF	0 ↓	0.49	1.48
Lost Time Injuries <sup>4</sup>	0	-	-
Lost time injury frequency <sup>4</sup>	0	-	-
Fatalities <sup>4</sup>	0	-	-
<b>PEOPLE</b>			
Total Staff (incl. contractors)	206 ↑	198	190
Gender Diversity (% female)	19% -	20%	15%

- 1) Air emissions are calculated using industry standards and best practices in the associated jurisdiction for which our Operations take place (including Western Climate Initiative for British Columbia, Alberta Greenhouse Gas Quantification Methodologies under the TIER Regulation for Alberta, The Management and Reduction of Greenhouse Gases for Saskatchewan, and Environment and Climate Change Canada's National Inventory Report). Emissions quantification methodologies were revised during 2021 to align with several changes to these recognized industry standards, and in doing so were responsible for the vast majority of the apparent year-over-year emissions increase. As an example, the direct emissions increase from 2020 levels would have only been 5%, as compared to the above indicated 40%, had current emissions quantification methodology been applied in 2020. The acquisition of Venturion properties in 2021 also impacted the emissions increase in 2021.
- 2) Spills reported to a regulatory agency, as required in the jurisdiction where a spill occurs, excluding fresh water spills.
- 3) Recordable injuries include fatalities, permanent total disabilities, lost work cases, restricted work cases and medical treatment cases.
- 4) Not reported prior to 2022.



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# ASSUMPTIONS & TERMS

**Abandoned (facilities)** – The permanent removal and dismantling of all surface infrastructure

**Abandoned (pipelines)** – A pipeline that has been physically disconnected from an active pipeline system, purged of any hydrocarbon substance or salt water, filled with fresh water, air or inert gas, and physically sealed on all ends

**Abandoned (wells)** – Well abandonment requires: the plugging of any completed production zones; isolation of all porous and groundwater zones; filling the well with non-saline water, or other noncorrosive fluid; assessing to ensure its long-term integrity; and finally cutting the well casing a minimum of one meter below the surface and placing a vented cap on top of the well casing

**BOE** – Barrel of oil equivalent, the equivalent amount of energy contained in a barrel of crude oil See *Advisory*

**BOE/d** – Barrel of oil equivalent per day, the equivalent amount of energy contained in a barrel of crude oil produced per day

**CO<sub>2</sub>e** – Carbon dioxide equivalent, the number of metric tons of CO<sub>2</sub> emissions with the same global warming potential as one metric ton of another greenhouse gas

**Direct emissions (Scope 1 GHG Emissions)** – Are from sources that are owned and operated by Cardinal, such as fuel for engines and heaters, flares, methane venting from pneumatics and fugitive emissions

**Emissions Intensity (EI)** – How many tonnes of carbon dioxide equivalent (CO<sub>2</sub>e) are released to produce a barrel of oil equivalent (t CO<sub>2</sub>e/boe)

**Flare** – Gas that is combusted in a flare or incinerator at upstream oil and gas operations

**Fugitive** – Unintentional releases of hydrocarbons to the atmosphere

**GHG** – Greenhouse gas, gases in the atmosphere that trap heat

**Horizontal well** – A type of directional drilling technique where an oil or gas well is advanced at an angle of at least eighty degrees to a vertical wellbore

**Indirect emissions (Scope 2 GHG Emissions)** – Are GHG emissions related to sources of purchased electricity or heat

**Lost time injury frequency (LTIF)** – Number of lost time injuries that occurred during the reporting periods (most commonly per 1 million hours worked)

**Mandated closure spend** – The amount of money that a provincial regulator, (eg. Alberta Energy Regulator) mandates industry spend on closing oil and gas sites annually, including decommissioning and reclaiming wells, pipelines and facilities

**Sequester** – The process of capturing and storing atmospheric carbon dioxide as a means of reducing its presence in the atmosphere and mitigating global climate change

**Site Rehabilitation Program (SRP)** – A federal government stimulus program initiated in 2020 that provided grants to oilfield service contractors to perform well, pipeline and oil and gas closure and reclamation work on behalf of licensees

**Total Recordable Injury Frequency (TRIF)** – Total recordable injuries per 200,000 hours worked

**Variable Frequency Drive (VFD)** – A type of motor controller that drives an electric motor by varying the frequency and voltage of its power supply

**Vent** – Uncombusted gas that is released to the atmosphere at upstream oil and gas operations



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# ADVISORIES

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We have taken care to ensure the information in this report is accurate. However, this report includes aspirational goals and estimates, which will differ from actual results, and is for informational purposes only. We disclaim any liability whatsoever for errors or omissions. Further, some information in this report may have been disclosed previously in other Cardinal public disclosure, and such disclosure is not intended in any way to be qualified, amended, modified or supplemented by information herein.

Material may be used within this report to describe issues for voluntary sustainability reporting that are considered to have the potential to significantly affect sustainability performance in our view and may be important in the eyes of internal or external stakeholders. However, material for the purposes of this report should not be read as equating to any use of the word in other Cardinal public reporting or filings. With this report, we hope to increase your knowledge of Cardinal and our operations. However, this report does not provide investment advice, and readers are responsible for making their own financial and investment decisions.

There is no single standard system that applies across companies for compiling and calculating the quantity of GHG, nitrogen oxide, sulphur dioxide emissions and other sustainability metrics attributable to our operations. Accordingly, such information may not be comparable with similar information reported by other companies. Our emission statistics are derived from various internal reporting systems that are generally different from those applicable to the financial information presented in our consolidated financial statements and are, in particular, subject to less sophisticated internal documentation as well as preparation and review requirements, including the general internal control environment. We may change our policies for calculating these emissions and other sustainability metrics in the future without prior notice.

In this report, Cardinal has used a number of oil and gas metrics which do not have standardized meanings and therefore may be calculated differently from the metrics presented by other oil and gas companies. Boe means barrels of oil equivalent. The term Boe may be misleading, particularly if used in isolation. The conversion ratio of six thousand cubic feet per barrel (6 Mcf: 1 Bbl) of natural gas to barrels of oil equivalent is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent a value equivalency at the wellhead. Given that the value ratio based on the current price of crude oil as compared to natural

gas is significantly different from the energy equivalency of 6:1, utilizing a conversion on a 6:1 basis may be misleading as an indication of value.

This report contains forward-looking statements and forward-looking information (collectively, forward-looking statements") related to future, not past events and circumstances – including those which may relate to our strategies, focus, goals, ambitions, aims, targets, plans, objectives, operations, results and financial performance. The use of any of the words "will", "may", "anticipate", "expect", "objective", "believe", "plans", "intends", "potential", "continue", "guidance", and similar expressions are intended to identify those forward-looking statements.

Forward-looking statements involve risk and uncertainty because they relate to events and depend on circumstances that will or may occur in the future including, without limitation, those risks considered under "Risk Factors" in Cardinal's Annual Information Form and which may be outside of our control. Readers are cautioned that the assumptions used in the preparation of such information, although considered reasonable at the time of preparation, may prove to be imprecise and, as such, undue reliance should not be placed on forward-looking statements. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, levels of activity, performance or achievement since such expectations are inherently subject to significant business, economic, competitive, political and social uncertainties and contingencies. Many factors could cause our actual results to differ materially from those expressed or implied in any forward-looking statements made by, or on our behalf, in this report.

We have included the forward-looking statements in this report in order to provide readers with a more complete perspective on our future operations and such information may not be appropriate for other purposes. Cardinal disclaims any intention or obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

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The internal projections, expectations or beliefs are based on Cardinal's capital budget which is subject to change in light of ongoing results, prevailing economic circumstances, commodity prices and industry conditions and regulations. Accordingly, readers are cautioned that events or circumstances could cause results to differ materially from those predicted.