

An aerial photograph of a mountain valley. The mountains in the background are covered in patches of snow. The valley floor is a mix of dense green forest and cleared areas. A winding pipeline route is visible, starting from the mountains and descending into the valley. The sky is overcast with grey clouds.

Pipeline Performance Summary

2023 Annual Report

BCER

BRITISH COLUMBIA ENERGY REGULATOR

Vision, Mission and Values

Vision

A resilient energy future where B.C.'s energy resource activities are safe, environmentally leading and socially responsible.

Mission

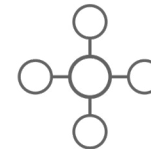
We regulate the life cycle of energy resource activities in B.C., from site planning to restoration, ensuring activities are undertaken in a manner that:



Protects public safety and the environment



Supports reconciliation with Indigenous peoples and the transition to low-carbon energy



Conserves energy resources



Fosters a sound economy and social well-being

Values

Respect is our commitment to listen, accept and value diverse perspectives.

Integrity is our commitment to the principles of fairness, trust and accountability.

Transparency is our commitment to be open and provide clear information on decisions, operations and actions.

Innovation is our commitment to learn, adapt, act and grow.

Responsiveness is our commitment to listening and timely and meaningful action.

Role of the BC Energy Regulator (BCER)

The [British Columbia Energy Regulator \(BCER\)](#) oversees the full life cycle of energy resource activities in B.C., from site planning to restoration. We ensure activities are undertaken in a manner that protects public safety and the environment, supports reconciliation with Indigenous peoples, conserves energy resources and fosters a sound economy and social well-being. Our role includes the regulatory oversight of natural gas, oil, [hydrogen, ammonia, methanol](#), aspects of [geothermal resources](#) and [carbon capture and storage](#) (CCS).

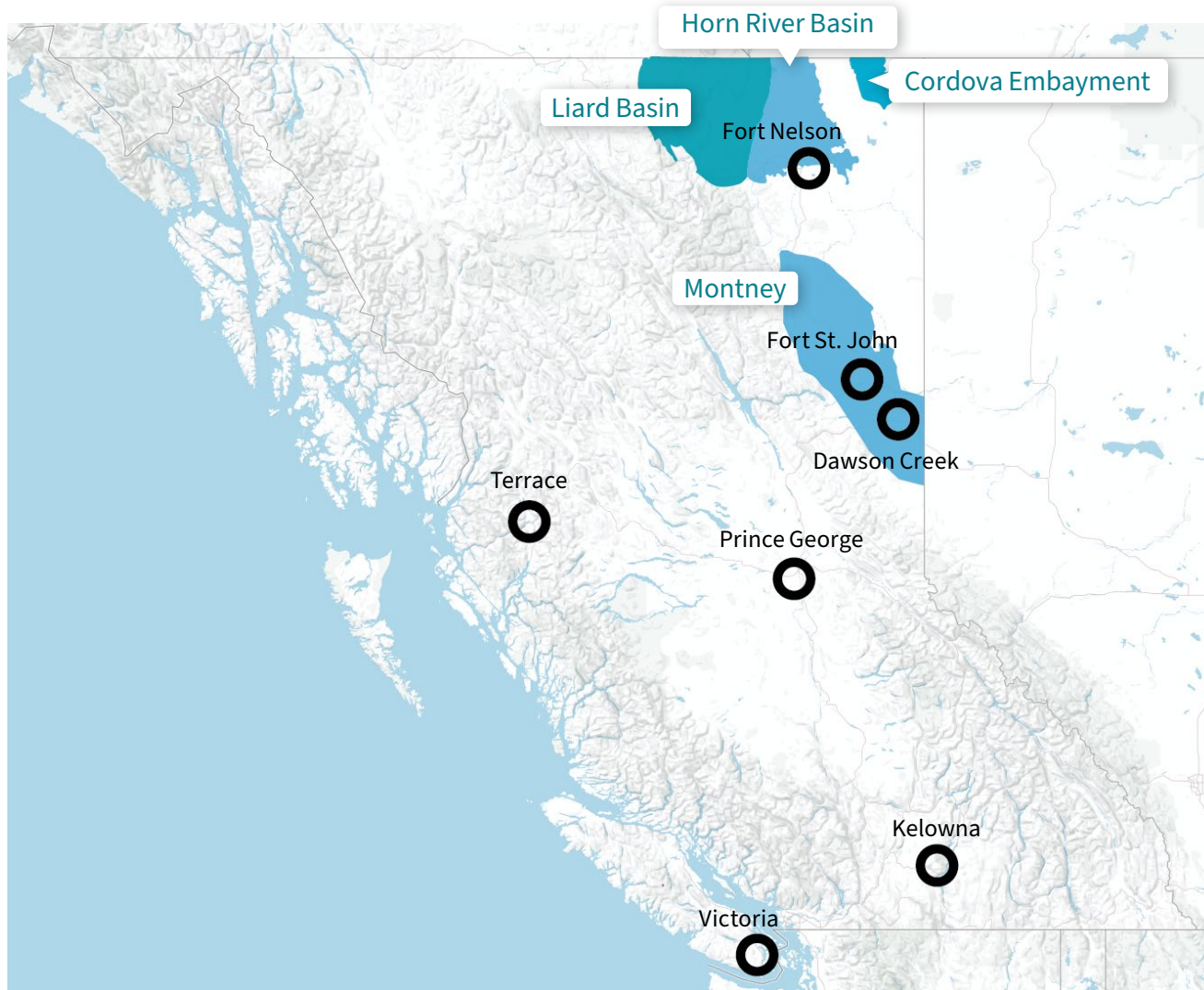
We regulate energy resources through the [Energy Resource Activities Act \(ERAA\)](#) and other associated laws related to heritage conservation, roads, land and water use, forestry, and other natural resources. We work closely with [land owners, rights holders](#), local government, industry, academia and other regulators to gather skills, knowledge and multiple perspectives to evolve our regulatory model.

We respect Indigenous values and seek learning opportunities as we co-develop new processes that we put into practice in all facets of our business and decision-making. We are focused on [advancing reconciliation and building trust](#) and apply this in our work with First Nations and Indigenous communities as partners in building B.C.'s energy resource future.

We currently have over 280 employees operating out of seven locations: Fort Nelson, Fort St. John, Dawson Creek, Terrace, Prince George, Kelowna and Victoria. The largest number of employees are in the Fort St. John office.



BCER Office Locations Throughout B.C.



We acknowledge and respect the many First Nations, each with unique cultures, languages, legal traditions and relationships to the land and water, on whose territories the BCER's work spans.

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Introduction

Purpose of Report

British Columbia's energy resource industry depends on [pipelines](#) for the distribution of products such as natural gas, water and oil. Pipelines are recognized as a safe and efficient mode of transportation and secure operation is essential to protecting public safety and the environment.

This report provides a statistical overview of pipelines regulated by the BCER in the 2023 calendar year. It includes data on types of pipelines, lengths, uses and overall pipeline incident rates. The multi-stage life cycle of a pipeline is explained and incident response protocols are outlined. It also summarizes the Integrity Management Program, a documented framework outlining the practices by which permit holders inspect and maintain pipelines to mitigate potential integrity issues.

Previous annual pipeline performance summaries can be found on the BCER's website at bc-er.ca/data-reports/reports/.

Pipeline Regulation

The BC Energy Regulator's jurisdiction extends to the majority of pipelines in British Columbia, as defined in legislation by the [Energy Resource Activities Act \(ERAA\)](#). Activities regulated by the BCER extend throughout the life cycle of a pipeline and include pre-activity consultation and notification, permitting, construction, operation, maintenance and abandonment.

Pipelines outside the BCER's jurisdiction include those crossing provincial and/or national borders and low-pressure pipelines owned by a utility company that are downstream of a city gate. City gates are facilities where high pressure natural gas from transmission lines is metered and reduced to a lower pressure for consumers and distributed through pipelines. Pipelines not under the BCER's jurisdiction are not addressed in this report.

Pipelines are regulated under the [Pipeline Regulation](#), which states they must be operated and maintained in accordance with

[CSA Z662](#) – Oil and Gas Pipeline Systems. CSA Z662 is a national standard developed and maintained by the Canadian Standards Association (CSA) and covers the design, construction, operation and maintenance of oil and gas industry pipeline systems.

Permit holders are required to comply with other applicable regulations including the [Environmental Protection and Management Regulation](#), [Requirements for Consultation and Notification Regulation](#), [Pipeline Crossings Regulation](#) and [Emergency Management Regulation](#).

The BC Energy Regulator is also responsible for provincial authorizations involving the Land Act, Water Sustainability Act and the Forest Act for pipeline rights-of-way, roads, land clearing and other minor works.

The [Legislation](#) page of the BCER's website provides a list of acts and regulations governing energy resource activities in the province.

Pipeline Inventory

53,377 Kilometres

Despite an increase in the total pipeline length inventory, there was a decrease in the number of actively operating pipelines as a result of permit holders' continued efforts to appropriately deactivate and abandon older pipelines.

Pipelines transport refined and unrefined products including natural gas, sour natural gas, liquid hydrocarbons (such as crude oil), water and other gases or liquids. Over 79 per cent of the total active pipeline kilometres regulated by the BCER transport natural

gas, while approximately nine per cent carry liquid hydrocarbons. The remainder carry water or other gases or liquids. Pipeline definitions and product classifications are available in the Glossary on page 17.

PIPELINE TYPE	TOTAL	ACTIVE	DEACTIVATED	ABANDONED
SOUR NATURAL GAS	18,173	10,933	3,387	3,853
NATURAL GAS	23,563	18,498	2,041	3,024
LIQUID				
HYDROCARBONS	5,882	3,406	1,492	984
WATER	4,847	3,692	534	621
OTHER	912	533	206	173
2023 GRAND TOTAL	53,377	37,062	7,660	8,655
PIPELINE TYPE	TOTAL	ACTIVE	DEACTIVATED	ABANDONED
SOUR NATURAL GAS	18,019	11,627	3,423	2,969
NATURAL GAS	22,270	17,822	1,854	2,594
LIQUID				
HYDROCARBONS	5,848	4,065	1,019	764
WATER	4,612	3,611	508	493
OTHER	879	527	212	140
2022 GRAND TOTAL	51,628	37,652	7,016	6,960

Table 1: Total Lengths (Kilometres) of Pipelines by Type and Status, 2023 and 2022.

Table 1 comparison of 2023 to 2022:

The total length of pipelines in 2023 was 53,377 km. This is a net addition of 1,749 km of total registered pipelines over the previous year.

Active pipelines decreased by 590 km. This indicates more deactivations and abandonments than permitting, construction and activation of new lines.

Deactivated pipelines increased by 644 km.

Abandoned pipelines increased by 1,695 km. As pipelines reach the end of their service life and are fully decommissioned, the total length of abandoned pipelines will increase over time.

Pipeline Life Cycle

Multi-Stage Planning

From the development of surface maps and creation of a preliminary pipeline plan, through construction and inspections, to deactivation and final site restoration, the steps described here depict the multiple stages of a typical pipeline life cycle.

At the outset, the BC Energy Regulator's staff conduct a comprehensive review of each pipeline application for engineering standards, legal requirements and for environmental and public safety considerations. The BCER ensures proponents have conducted consultations with land owners and other rights holders on pipeline projects that will directly affect them. Previously, the BCER was responsible

for undertaking consultation with Indigenous communities, consistent with the Crown's legal duty to consult and avoid, mitigate and accommodate any impacts to Indigenous rights. The BCER now requires permit holders to engage affected First Nations on all permit applications prior to submitting an application for review.

The BCER is committed to respecting Indigenous knowledge and advancing reconciliation. If a pipeline application is approved, the BCER's staff may set permit conditions, as necessary, to protect Indigenous rights and key environmental assets, such as water, wildlife and forest values.

The BCER verifies pipelines are constructed and operated in accordance with applicable regulations and monitors the project throughout its life cycle. Should any deficiencies be identified at a site, the BCER may order the permit holder to cease activities, as necessary, until appropriate actions are performed to safely resume operations.

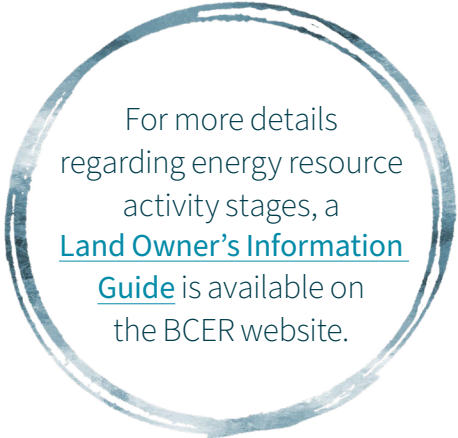
As detailed in the BCER's mandate and considering the many stages of a pipeline's life cycle, the protection of public safety and the environment is top priority. Permit holders are required to report to the BCER before, during and upon completion of their energy resource activities.



Pipelines are operated under a framework designed to help prevent spills. The pipeline Integrity Management Program (IMP) is a required part of this framework, described on page 10.

Energy Resource Activity Stages

- 1 Land Survey:** Land is measured to establish property boundaries, topography and land features and to develop surface maps.
- 2 Pipeline Plan:** A preliminary pipeline plan is prepared, utilizing survey data to propose a safe, informed and responsible route.
- 3 [Consultation and Notification](#):** Stakeholder engagement begins; the BCER engages the appropriate stakeholders and ensures consultation is appropriate and adequate. Consultation with Indigenous communities is also undertaken at this stage.
- 4 Site Assessment:** The pipeline route is determined, taking into account such matters as soil handling and conservation, aquifer protection, archaeological sites and eventual site restoration considerations.
- 5 Permit Application Submission:** [Applications](#) undergo a thorough technical screening to ensure the plans are safe and designs are compliant with regulations prior to being considered for decision.
- 6 Emergency Planning Zones (EPZs):** EPZs are established around facilities, pipelines, and wells and pre-determined [Emergency Response](#) Plans are created.
- 7 Site Preparation, Construction and Inspection:** At any point during construction, the BCER reserves the right to inspect the construction process, watching for compliance with legislation or any permit approval conditions.
- 8 Going Live:** The BCER receives notice the pipeline has been properly tested and the transporting of petroleum, natural gas, solids, water or other substances to destinations such as refineries, processing plants or shipping points, begins.
- 9 Safe Pipeline Operation:** Safety considerations begin at the initial design stage and are expected to be maintained through abandonment and final restoration.
- 10 Integrity Management Program (IMP) Overview:** During the full life cycle of the pipeline, the BCER will review a company's [IMP](#) and any incidents and repairs that may occur.
- 11 Deactivation:** The BCER evaluates deactivation requests for appropriate maintenance and monitoring measures, to prevent or minimize adverse effects while the pipeline remains idle.
- 12 Decommissioning:** The BCER reviews abandonment (removal from service) requests to ensure safety considerations and habitat and land restoration plans are fully incorporated.
- 13 [Assessment, Remediation, and Restoration](#):** Assess the presence or absence of potential contaminants, remediate if contaminated and pursuant to [Section 19](#) (1) of the Environmental Protection and Management Regulation, ensure the site surface conditions are restored to equivalent conditions as predevelopment.



For more details regarding energy resource activity stages, a [Land Owner's Information Guide](#) is available on the BCER website.

Integrity Management Program

Compliance Assurance

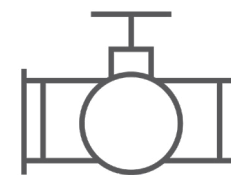
To ensure public safety, environmental protection and operational reliability, the [Pipeline Regulation](#) requires all pipeline permit holders in the province to implement an Integrity Management Program (IMP). A pipeline IMP is a preventative and documented framework, specifying the processes and practices used by pipeline permit holders to anticipate hazards and analyze and manage risks throughout the entire life cycle of pipelines. The IMP incorporates a management system approach.

Section 7 of the Pipeline Regulation states every pipeline permit holder planning, designing, constructing, operating, maintaining and abandoning pipeline infrastructure, must have an implemented IMP program. A compliance assurance protocol is available to permit holders, outlining the BCER's Compliance Assurance Integrity Management Program expectations and operating requirements expected of permit holders and providing guidance for developing, implementing and maintaining effective IMPs.

Details of the compliance assurance process and scope of the protocol can be viewed on the BCER's website. The [2023 Pipelines and Facilities Integrity Management Program Audit Summary](#) is also available online.

The BC Energy Regulator has been evaluating the compliance of permit holders' IMP programs to regulations and expectations since 2011, through auditing. The auditing process occurs using a standardized IMP compliance assurance process. Compliance Assurance Protocol documentation for both pipelines and facilities is available on the BCER [IMP webpage](#). Permit holders are selected for audit based on the BCER's criteria, are notified and requested to submit IMP workbooks and records for the audit. The next phase consists of audits involving systematic review of permit holders' IMP processes, records and documents, to verify compliance and generate audit findings. The final phase allows for corrective action plans and follow-ups to address any non-compliance findings identified through the audits.

Where non-compliances have been identified, permit holders are required to develop and implement corrective actions to address the deficiencies within a timeframe specified and agreed to by the BCER. Each corrective action is monitored and assessed to ensure all findings of non-compliance are fully resolved through a structured oversight process.



The BCER will continue to undertake IMP audits for all pipeline permit holders to ensure a systematic IMP is applied throughout the entire pipeline life cycle.

Incident Response and Enforcement Actions

An incident is defined as a present or imminent event or circumstance, resulting from an energy resource activity that is outside the scope of normal operations and may or may not be an emergency. Permit holders must communicate all reportable incidents to the BC Energy Regulator. Minor incidents must be reported within 24 hours, while incidents with a higher risk assessment must be reported immediately (within one hour). The BCER's [Incident Classification Matrix](#) outlines spill reporting criteria and how incident levels are assessed, determined and reported.

Any person aware spillage is occurring or believes there is the potential for spillage, can provide assistance by calling the operating company listed on the on-site signage and identifying the location of the pipeline or by calling the BCER's 24/7 emergency number at 1-877-500-BCER (2237).

The BCER responds to all incidents, establishing communication with the permit holder, confirming the incident level and assessing the permit holder's response. BCER staff further determine what remedial actions must be taken, whether a pipeline can continue to operate safely and whether compliance or enforcement actions are required.

Subsequent incident investigations allow the BCER to confirm the cause and any contributing factors and whether repairs or solutions should be broadly communicated to all other permit holders to prevent similar incidents from occurring. Inspections may also be triggered by public enquiries and incidents reported to the BCER.

When required, orders, tickets and/or penalties are issued to the permit holder. The BCER posts its enforcement actions in a timely manner on its [Compliance and Enforcement](#) webpage.



Photo: steep slope pipeline installation.

Orders - issued if a permit holder fails to comply with ERAA, associated regulations, permits or authorizations, a previous order or to deal with issues of public safety or protection of the environment.

Tickets - issued under the authority of provincial acts, including the Water Sustainability Act.

Charges - recommended to Crown counsel for prosecution and possible court conviction.

Administrative Penalties - levied in the event of a contravention of ERAA.

Pipeline Incidents and Emergency Response Programs

To coordinate and prepare for incidents in advance, permit holders must develop and maintain Emergency Response Programs (ERPs) and emergency response plans, as directed in the [Emergency Management Regulation](#) (EMR) under ERAA.

ERPs guide the creation, management and implementation of a permit holder’s emergency response plan, allowing for quick access to critical information, coordination of multiple-responder activities and identification of predetermined equipment and services available for deployment in an emergency. They equip incident responders

with hands-on training and emergency response exercises, ensuring personnel understand their incident command structure, communication methods and responsibilities in an emergency event.

The BCER reviews ERPs to ensure consistent compliance with the EMR and oversees and may participate in permit holder emergency response exercises. Should a permit holder’s emergency protocols fail to meet requirements, the BCER may utilize compliance and enforcement actions, which can include issuing orders, penalties or shutting-in a pipeline system.

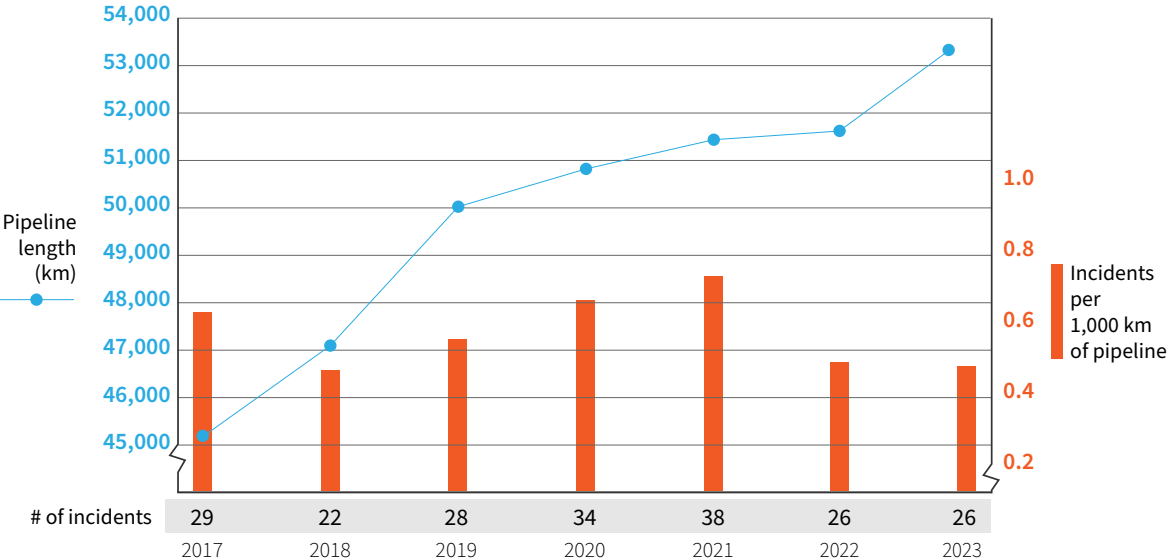
The requirements in the EMR are designed to create a framework for the protection of the public, emergency responders, property and the environment, from incidents occurring due to energy resource activities. Although emergency preparation, equipment and protocols help reduce the rate of incidents, the BCER strives to continually improve emergency management measures.

In 2023, there were 26 incidents on pipelines regulated by the BCER; however, not all led to the release of a product. Figure 1 shows an overall incident frequency of 0.49 for every 1,000 km of pipelines, a decrease from 0.50 in 2022.

As stated, not all incidents result in a spill or release of a product. In 2010, the implementation of OGAA (later ERAA) led to broader reporting criteria, meaning all incidents – including those that have the potential to affect the integrity of a pipeline but did not cause spillage – must be reported.

Additional information regarding emergency response and management, including guidelines and forms, is available on the BCER’s Emergency Response & Safety [webpage](#).

Figure 1: Year-to-Year Incident Frequency vs. Pipeline Length



The BCER conducted **1,501** pipeline inspection activities in 2023.

In 2023, there were **26** incidents on pipelines regulated by the BCER.

The BCER responds to urgent safety complaints within **30 minutes, 24/7, year-round.**

If an incident results in spillage, the following actions must be taken (Sec. 37, ERAA):

- 1. Prevent** spillage.
- 2. Promptly report** any damage or malfunction that could cause spillage.
- 3. Remedy** the cause or source of spillage if any occurs.
- 4. Contain and eliminate** the spillage.
- 5. Remediate** any affected land or body of water.
- 6. Report location and severity** of spillage and any contributing damage or malfunction.
- 7. On-call emergency officer** confirms severity and determines appropriate level of BCER response.
- 8. BCER inspectors may attend** onsite during the response, depending on the nature of the incident.
- 9. Damage repair** is conducted.

The number of reported incidents in 2023 was **0.49** for every 1,000 km of pipeline.

Site Cleanup and Remediation must be approved by the BCER, and incident causes investigated and resolved prior to pipeline operations resuming.

Post-Incident Reports must be submitted by the operator within 60 days identifying the root cause of the failure and any corrective actions required to prevent future incidents.

Releases and Spills

2023 Statistics

Of the 26 incidents on pipelines in 2023, 24 resulted in a release or spill, four more than in 2022.

For incidents involving a release or spill, Table 2 shows the highest number of releases occurred on pipelines categorized as ‘water’ and ‘liquid hydrocarbons’ both of which had seven incidents.

Adjusted for total length of pipelines, pipelines classified as ‘water’ had the highest incident frequency per 1,000 km of pipeline, with a frequency rate of 1.44 and a total of seven releases. The category ‘water’ includes fresh, produced and sour water.

In the event of a pipeline gas release or liquid spill, the BCER oversees all corrective actions to ensure safe operation is completed before operations resume.

The largest gas release in 2023 was 370 m³ of sour natural gas from a pipeline located 100 km northeast of Fort St. John. The leak occurred due to pipeline strike. While the pipeline was being isolated, road blocks and air monitoring were established as part of the emergency response.

The largest liquid release occurred 115 km northeast of Fort Nelson. The pipeline failed due to internal corrosion resulting in a release of 2,083 m³ of produced water. Initial cleanup activities have been completed and the BCER continues to monitor the spill site for cleanup of residual contamination.

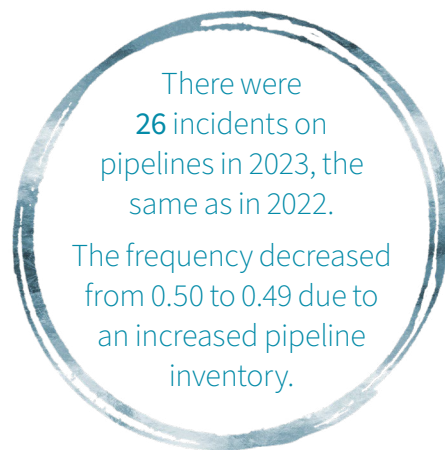
PIPELINE TYPE	# of Incidents with Release	Length of Pipeline (km)	Frequency (per 1,000 km)
SOUR NATURAL GAS	4	18,173	0.22
NATURAL GAS	5	23,563	0.21
LIQUID HYDROCARBONS	7	5,882	1.19
WATER	7	4,847	1.44
OTHER	1	912	1.10
TOTAL	24	53,377	0.45

Table 2:
Total Number of Incidents with Release per 1,000 Kilometres by Type of Pipeline in 2023

Incident Causes

Table 3 on page 16 summarizes incidents by failure cause. In 2023, metal loss (corrosion) continued to be the leading cause of pipeline incidents, contributing to 13 events. These incidents can be reduced by inspection and maintenance programs required as part of a permit holder's IMP.

The interactive web-based [BCER Incident Map](#) provides the location of pipeline incidents dating back to 2009. It includes data on pipeline spills, releases and damage to active and discontinued pipelines, including the status of incidents.



Moving Forward

The BC Energy Regulator's priority is continual improvement in safety standards and reduction of incidents to serve the public and the environment, while fostering responsible development.

As tools are developed and operationalized to elevate pipeline performance, spill preparedness, and emergency response capabilities, learnings will continue to be shared across the BCER and with stakeholders and experts throughout industry, to successfully meet the demands of a strong safety culture.



Photo:
Haisla ALP member conducting joint inspection with BCER Compliance and Enforcement team, near top of Cable Crane Hill.

Table 3: Classification of Pipeline Failures

INCIDENT CAUSE	DEFINITION	2023	2022	2021	2020	2019
METAL LOSS	WALL THICKNESS REDUCTION DUE TO CORROSION OR OTHER CAUSES	13	8	11	19	16
PIPELINE/EQUIPMENT FAILURE						
CRACKING IN PIPE	MECHANICALLY DRIVEN OR ENVIRONMENTALLY ASSISTED CRACKING OF THE PIPE	1	2	3	0	2
PIPE FITTINGS/JOINT FAILURE	FAILURE IN VALVE, WELD, FLANGE, ETC.	5	5	4	2	4
TOTAL PIPELINE/EQUIPMENT FAILURE		6	7	7	2	6
EXTERNAL INTERFERENCE						
THIRD PARTY INTERFERENCE	INTERFERENCE BY SOMEONE OTHER THAN OPERATING COMPANY OR ITS EMPLOYEES/CONTRACTORS	1	1	2	1	3
COMPANY	INTERFERENCE BY OPERATING COMPANY OR ITS EMPLOYEES/CONTRACTORS	1	3	4	3	1
VANDALISM	INTERFERENCE CAUSED WILLFULLY BY SOMEONE THROUGH ATTEMPTED THEFT OF SERVICE FLUID	0	0	1	0	0
TOTAL EXTERNAL INTERFERENCE		2	4	7	4	4
OTHER CAUSES						
MATERIAL MANUFACTURING OR CONSTRUCTION	DEFECTS IN THE FITTING, CONSTRUCTION, OR COMPONENTS	2	1	0	1	0
GEOTECHNICAL FAILURE	LOSS OF INTEGRITY DUE TO GEOTECHNICAL EFFECT, FOR EXAMPLE, SLOPE MOVEMENT OR WEATHER	1	1	10	3	1
IMPROPER OPERATION	DECISION ERROR MADE BY OPERATING COMPANY DURING SERVICE	2	4	2	4	1
OVERPRESSURE	FAILURE CAUSED DUE TO OVERPRESSURE OF PIPE	0	1	1	1	0
TOTAL OTHER CAUSES		5	7	13	9	2
TOTAL INCIDENTS		26	26	38	34	28
TOTAL LENGTH OF PIPELINE (KMS)		53,377	51,628	51,454	50,813	50,047
FREQUENCY (PER 1,000 KMS)		0.49	0.50	0.74	0.67	0.56

Glossary

Pipeline: pipelines regulated by the BCER are defined in [ERAA](#) (except in Section 9) as piping through which any of the following is conveyed or transported:

- Petroleum or natural gas.
- Water produced in relation to the production of petroleum or natural gas or conveyed to or from a facility for disposal into a pool or storage reservoir.
- Solids.
- Substances prescribed under Section 133(2)(v) of the [Petroleum and Natural Gas Act](#).
- Other prescribed substances.

The scope of the definition also includes installations and facilities associated with the piping, but does not include:

- Piping used to transmit natural gas at less than 700 kilopascals (kPa) to consumers by a gas utility as defined in the [Gas Utility Act](#).
- A well head.
- Anything else that is prescribed.

Abandoned Pipeline: pipelines removed from service and not maintained for a later return to service.

Active Pipeline: pipelines actively used for the transport of fluids related to energy resource operations and piping that has been suspended from service for less than 18 months but not formally deactivated.

Deactivated Pipeline: pipelines removed from service but maintained for a later return to service.

Crude Oil and Sour Crude Oil: Crude oil is the raw, unprocessed oil from a well. Crude oil is sent to refineries to be converted (refined) into petroleum products used as fuel.

m³: a measure of volume - cubic metres: 1m x 1m x 1m: 1,000 litres.

Natural Gas: includes natural gas, sweet gas and fuel gas. Consisting mostly of methane, natural gas is a colourless, odourless, flammable gaseous hydrocarbon. Mercaptans (organic components of hydrocarbons with sulphur) are added to natural gas for consumer use, allowing for detection of natural gas leaks by the ‘rotten egg’ smell.

Other: miscellaneous gases and liquids such as oil emulsion and effluent.

Pipeline Permit: a permit that includes permission to construct, maintain and operate a pipeline.

Reportable Incident: for the purpose of this report, a present or imminent event or circumstance, resulting from an energy

resource activity that is outside the scope of normal operations and may or may not be an emergency.

Shut-In: the isolation or closure of a well zone, a pipeline or a facility. For example, the temporary shut-in of a well allows for the analysis of such factors as a well’s productive capacity, pressure and permeability.

Sour Natural Gas: natural gas with a hydrogen sulphide (H₂S) partial pressure greater than 0.3 kilopascals.

Spill: as defined in ERAA; petroleum, natural gas, oil, solids or other substances escaping, leaking or spilling from a pipeline, well, shot hole, flow line or facility (or any source apparently associated with any of those substances).

Water: fresh water, produced water and sour water. Produced water is water that comes out of an oil and gas well during the production process. Produced water is often re-injected underground for safe disposal or treated for reuse or discharge.



BRITISH COLUMBIA **ENERGY** REGULATOR

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and is updated annually.

