

# 2017 STEWARDSHIP REPORT TO STAKEHOLDERS

SUSTAINABLE OPERATIONS THROUGH  
INNOVATION AND CONTINUOUS IMPROVEMENT



**Canadian Natural**



# Who We Are

## CANADIAN NATURAL RESOURCES LIMITED (CANADIAN NATURAL)

is a senior independent crude oil and natural gas exploration, development and production company based in Calgary, Alberta, Canada. Our strong, diversified asset base is comprised of a balanced portfolio of heavy, light and synthetic crude oil and natural gas.

Canadian Natural operates in Canada, the United Kingdom and Offshore Africa. We are committed to a long-term presence in the communities where we operate. Our activities create value by providing employment, business development opportunities, revenues to governments that contribute to spending on goods and services, and essential resources for public services, including health, safety, education and training.

At Canadian Natural, we live our mission statement:

**“To develop people to work together  
to create value for the Company’s shareholders  
by doing it right with fun and integrity.”**

### COVER PHOTO:

Horizon Oil Sands plant site, viewed from the East Tank Farm.

*by Cory Zaparyniuk*

Many of the photographs in this report were provided by Canadian Natural staff. We would like to thank Kevin Cadieux, Joanne Hogg, Ron Kosheiff, Francis Savaria and Cory Zaparyniuk for contributing to this edition of the Stewardship Report to Stakeholders.

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## Contributions to Canadian Economy



**\$975 million** → **royalties**  
**\$300 million** → **property taxes**  
**\$200 million** → **surface and mineral land leases**

## Supply Chain Spending

**\$7.46 billion** → **goods and services from 10,000+ suppliers worldwide**

## Employment Creation

**84,830 estimated full time equivalent (FTE) jobs**

Operational and capital spending by our Canadian operations supported a significant number of FTE jobs

- Direct employment = 15,700
- Indirect employment (suppliers) = 49,460
- Induced employment (economy at large) = 19,670



## Safety and Asset Integrity



**0.43 corporate**  
**Total Recordable Injury Frequency (TRIF)**  
→ **lowest in Company history**

**35% contractor TRIF reduction**  
→ **in NA E&P from 2016**

**23% decrease**  
→ **in pipeline leaks/1,000 km since 2014 (North American Exploration and Production)**

**1,309 pipelines abandoned**

## Environment



**17.9 million tonnes CO<sub>2</sub>e conserved since 2013**

**18% reduction in corporate GHG emissions intensity since 2013**

**1.5 million tonnes of CO<sub>2</sub> capture capacity**

**71% reduction in venting in our heavy oil operations since 2013**

## Community



**\$12.4 million community investment in 2017**

**\$370 million in contracts to Indigenous businesses in 2017**

**\$10 million employee training and development**

**9,973 employees working together and doing it right to safely meet global energy needs**



# Message to Stakeholders

We are pleased to take this opportunity to share with you our 2017 Stewardship Report to Stakeholders. In the pages that follow, you will find highlights that demonstrate our commitment to responsible development and performance in the areas of health and safety, asset integrity, environment, innovation and community.

Canadian Natural's long-standing mission is, *"To develop people to work together to create value for the Company's shareholders by doing it right with fun and integrity."* It is simple, common sense, it works, and it guides our commitment to responsible development. You will find it written on our business cards and in our meeting rooms, because by living this mission statement every day, our strong teams have grown our Company from a few thousand barrels of oil a day to one that now produces over a million barrels of oil equivalent a day.

This commitment to our mission is important as we navigate the changes and challenges facing Canada's oil and natural gas industry. By remaining focused on our core values that speak to **doing it right**, Canadian Natural is well-positioned to deliver resilient operations through innovation and continuous improvement, regardless of what might change around us.

Safety is a core value that underlies all our activities to reach our ultimate goal of **No Harm to People; No Safety Incidents**. In fact, our corporate Total Recordable Injury Frequency (TRIF) continued a downward trend and, in 2017, Canadian Natural recorded the lowest TRIF in company history.

Our ability to innovate and leverage technology has, and will continue to, reduce our environmental footprint. Specifically, our greenhouse gas (GHG) emissions reduction strategy is delivering improved emissions performance and we have developed a pathway to further reduce our emissions intensity.

For example, Canadian Natural has achieved a 71% reduction in venting in our Alberta heavy oil operations since 2013. We are a leader for the oil and natural gas industry in carbon capture and sequestration/storage (CCS) projects. When we recognize our carbon capture initiatives (existing and under construction), we are the third largest owner of CCS capacity in the global oil and gas sector, and our GHG emissions intensity for Oil Sands Mining and Upgrading operations is only slightly higher than the average intensity for all global crude oils — with a pathway to be below the average with further technology advances.

The value of Canada's oil and natural gas resources is very important to Canada and resource development is critical to

long-term prosperity. Not only is the industry making significant strides in reducing our environmental footprint, but we are creating hundreds of thousands of jobs for Canadians and adding significantly to government revenues. As a part of generating jobs and economic opportunities, Canadian Natural is proud to work together with stakeholders from across our operations, including over 35,000 landowners and 160 municipalities.

Canadian Natural works closely with over 75 Indigenous communities in Western Canada to maintain strong and meaningful relationships. This is an important part of our long-term commitment to these communities. We awarded more than \$370 million in contracts to Indigenous businesses and contractors in 2017, creating significant employment opportunities for Indigenous communities.

As a final note, we wish to briefly address the high-profile debate about market access for Canadian oil and natural gas products. The global challenge remains to continue delivering abundant, affordable, reliable and responsible energy to meet the world's growing energy needs. As the world's demand for energy increases, Canada's oil and natural gas will be a crucial part of the global energy mix.

Canada's resources have a strong record of safe and responsible development. Our resources are developed with world leading standards under very comprehensive regulatory oversight, and we are continuously improving. In this context, Canada can be a leader in providing the world with low carbon intensity oil and natural gas to meet the world's energy needs. We should encourage the development, export, and use of responsibly developed oil and natural gas from our country.

If Canada's oil and natural gas is to meet this global demand and also generate hundreds of thousands of Canadian jobs and support for healthcare and education, Canada needs market access for its products. Market access and achieving full value for Canada's crude oil and natural gas is critically important to our Company, to our industry, and by extension, to all of our stakeholders. We believe that the right balance can be achieved between the environment and the economy.

We are encouraged by the support industry has received from stakeholders and Canadians from across the country. We wish to thank governments and stakeholders who have continued to steadfastly support our industry and the need for market access so that we can turn Canada's abundant resources into supplying energy that the world needs.



**N. MURRAY EDWARDS**  
EXECUTIVE CHAIRMAN



**STEVE W. LAUT**  
EXECUTIVE VICE-CHAIRMAN



**TIM S. MCKAY**  
PRESIDENT

## Working Together for Canada's Long-term Energy Future

At Canadian Natural, we take pride in working hard and turning Canada's abundant resources into supplying responsible energy the world needs. This important work that is so critical to Canada's long-term prosperity is achieved only by effectively working together with stakeholders in the many communities across our operations. Our mutual goal is to ensure a sustainable Canadian crude oil and natural gas industry that can help meet the world's energy needs for decades to come. From municipal and community leaders, to innovators, academics and business partners, here are a range of voices in support of Canadian Natural, and our industry.

**Craig Copeland, Mayor, Cold Lake, AB**  
 "The City of Cold Lake maintains positive relationships with the major employers in the region and, in the case of Canadian Natural, this is an easy and natural relationship to maintain. Canadian Natural has been an excellent corporate citizen, sponsoring major facilities and events and helping us make the city a vibrant and livable community. They care about their people and the communities they live in — and it shows."

**Felix Schroder, President, Schroder Oilfield Services, and Bigstone Cree First Nation band member, AB**  
 "My vision was to train people locally so they could be successful in what they do. I've always said that if members are succeeding, then our company and our community can succeed. We've been growing our company alongside Canadian Natural by working together, solving problems together and moving forward — this is how you grow. Not only both our companies (Schroder and Canadian Natural) have benefited from working together, but also community members benefit and can succeed themselves."

**Shirley Vickers, President and CEO, B.C. Innovation Council, Vancouver, BC**  
 "As B.C.'s crown agency responsible for advancing innovation that serves industry needs and improves lives, we're committed to collaborating with organizations like Canadian Natural to solve their challenges through the application of technology. Canadian Natural is committed to investing in research, technology and innovation, which allows them to improve the way they do business, ensure sustainable operations and continuous improvement."

**Andrea Robertson, CEO & President, STARS Calgary, AB**  
 "The strong partnership we have with Canadian Natural is a testament to their commitment to building better communities. Thank you, Canadian Natural, for being an ally in our fight to save lives. By supporting STARS for the past 28 years, you have helped ensure that STARS can continue to be there for critically ill and injured patients across Western Canada."

**Cindy Amerongen, Executive Director, Northern Lights Health Foundation, Fort McMurray, AB**  
 "Canadian Natural has been a supporter of the Health Foundation since they first launched their Horizon project. They have consistently demonstrated that their operations benefit the people of the region and their support to advance healthcare services at the hospital, and in Conklin, shows a great regard for our communities."

**Garry K. Flett, President and CEO, Acden, an Athabasca Chipewyan First Nation Indigenous-owned business, AB**  
 "Working with Canadian Natural not only has a positive impact on our business but directly impacts our ownership, the ACFN."

**Aaron Buckingham, Deputy Chief, Britannia Fire Department, Lloydminster, AB**  
 "Canadian Natural was the first company to step up to the plate in our pursuit of a new environmentally friendly fire training facility. Their donation to our project has enabled us to take step one and purchase the first piece, which will immediately enhance our training experience and make it both safer and environmentally sound."

**Kathy Rodberg, Town Manager, Calmar, AB**  
 "The Town of Calmar's relationship with Canadian Natural goes back about five years now, with the abandonment of a well bore. Throughout the process, we looked at working together to develop this area, utilizing clean fill from the site for further remediation. Canadian Natural has always been very open with their plans, schedules and final intentions for the site, and our meetings have had positive outcomes, carrying out an unachievable feat in a short amount of time, with as little disruption to Town residents as possible."

# Health and Safety

At Canadian Natural, safety is a core value that underlies all our activities to reach our ultimate goal of **No harm to people; No safety incidents.**

## Safety is a Core Value

As part of being an effective and efficient operator, Canadian Natural keeps the safety of employees and contractors at the forefront of our activities.

To ensure a safe workplace, we focus on safety leadership and workforce participation. Safety as a core value is reinforced from management down to each and every employee and contractor. And our frontline driven safety culture means that everyone contributes to their own safety and the safety of others. To do this, management and supervisors spend significant time in the field to directly develop and instill our safety culture, encouraging feedback and incorporating frontline experiences and expertise.

## No Harm to People / No Safety Incidents

Our Safety Management System (SMS) is the cornerstone of efforts to protect the people, communities and environments where we work. Our SMS is designed to keep our Safety Excellence goal of **No harm to people; No safety incidents** top of mind by embedding safety in everything we do.

Comprehensive, integrated management systems for personal safety, process safety and asset integrity are in place to maintain safe and reliable operations. These management systems not only protect workers, but also the public, the environment and our equipment and facilities through robust, disciplined processes.

Our management systems are in place to support continuous performance improvement, shared learnings and regulatory compliance. Safety teams are responsible for maintaining these management systems, making sure we have processes and controls in place to operate safely. They also provide support to leadership and supervisor training, and work with employees and contractors towards an incident-free workplace.

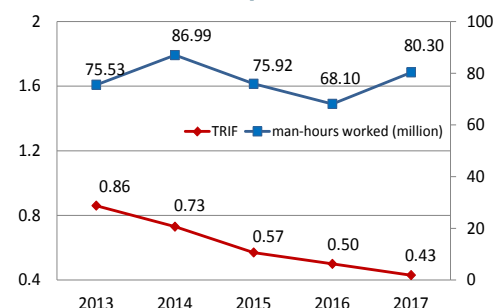
## Delivering Safety Excellence Lowest TRIF in Company History

In 2017, we continued our strong emphasis on engagement in all aspects of the SMS, reinforcing our **Four Pillars of Safety** and our safety programs. Working together to enhance safety awareness and reduce incidents continued to be a focus. With the incorporation of a significant number of new employees and assets, a considerable effort was made to integrate the SMS across our operations.

Our safety programming promotes continuous improvement through target setting and performance measurement. Our corporate Total Recordable Injury Frequency (TRIF) continues to trend downward, dropping from 0.50 in 2016 to 0.43 in 2017, despite an increase in man-hours worked. This is the lowest TRIF recorded in Company history. Improvements in safety performance in North America Exploration and Production (NA E&P) and Oil Sands Mining and Upgrading operations were achieved

in large part as a result of enhanced planning and execution of work, as well as a deeper understanding of the SMS.

Corporate TRIF vs man-hours worked /200,000 exposure hours



## Four Pillars of Safety

Our commitment to worker safety and the foundation of our Worksite Safety Observation program is Canadian Natural's **Four Pillars of Safety** that:

1. confirms workers have received an orientation and have competency training;
2. identifies hazards and ensures adequate controls are in place;
3. follows the applicable procedure(s) for the work being completed; and
4. verifies all workers know where the **Transportation of Injured Worker & Evacuation Plan** is located, and that they know what to do if someone gets hurt.



## Frontline Driven Safety Culture

Our safety programs reflect our frontline driven culture and leadership commitment to safety as a core value, fostering participation at all levels with employees, contractors and management. Some of the programs driving performance improvement are:

### Safety Excellence Meetings

In a series of 23 meetings, senior management met with 2,915 participants, including field and offshore operations staff, supervisors and contractors. A strong focus of these meetings was provided by our 2017 safety theme, **STOP: Plan, Prepare and Execute**, to make sure workers take all necessary precautions and follow protocols to complete their tasks safely.

### Contractor Safety Excellence

Meetings between management from Canadian Natural and contractors identify action items and establish plans to achieve a common goal of improving worker safety.

These Safety Excellence meetings occur across our operations. At Canadian Natural Resources International (CNRI), we have joint Safety, Health and Environment (SHE) meetings, including an Annual Strategic Contractor SHE Action Committee meeting.

Contractor safety performance continues to improve, reducing our overall TRIF. For example, contractor TRIF at our NA E&P operations decreased by 35% in 2017 for those contractors with higher incident rates between 2015 and 2016.

### Improving Safety Behaviours

Our Worksite Safety Observations (WSOs) program remains a strong and essential hazard assessment tool, improving safety by facilitating positive safety conversations at our worksites. Our Safety Stand Down emphasizing **Focus on What's Important** in 2017 provided a meaningful setting to conduct WSOs with frontline workers, supervisors and service providers.

## Continuous Improvement in Safety Management

### A Strong Safety Culture

SMS alignment is important for our management systems to be effective and efficient. Safety teams have developed, and continue to enhance, an integrated North American SMS that represents our wide range of operations. The North American SMS allows employees to use proven and established safety methods to conduct their work, with similar procedures for investigating incidents, performing inspections and structuring safety meetings across all business units.

The integrated SMS retains key elements of the previous systems necessary for safeguarding employees of a major oil sands mining and upgrading operation and diverse conventional/thermal operations. To do this, safety teams worked together with operations personnel and incorporated the expertise of the frontline employees who use the SMS on a daily basis.

The strengths of the SMS — leadership engagement and a series of valuable safety tools — have reduced incidents and contributed to the best safety performance in our Oil Sands Mining and Upgrading operations to date. Our Safety teams continue to work together to further enhance the North American SMS.

### Training and Competency

Safety training boosts frontline accountability and leadership, supporting our injury reduction goals. In 2017, Canadian Natural invested more than \$10 million in employee and contractor education and training. This includes required safety and competency courses (job-related skills training that allows workers to complete assigned tasks safely and effectively) for field operators and offshore supervisors, representing more than 216,000 hours of required training.

Supervisor training in the WSO program, for example, prepares them for taking

0.43 corporate TRIF ↓

lowest recorded

14% TRIF reduction ↓

in NA E&P from 2016

22% TRIF reduction ↓

in Oil Sands Mining and Upgrading from 2016

63% reduction ↓

in slips, trips and falls at Horizon from 2016

a more active role so they can support and coach workers on site when observing behaviours, and identify and mitigate risks. This training was instrumental in the integration of Canadian Natural's SMS across our new operations (*see next page*).

### Marine Safety

TRIF increased slightly compared to 2016 at our offshore operations. Although the majority of injuries sustained were of low severity, we take safety seriously and improvement plans are in place to reduce incidents. We are working with our offshore contractors on Safety, Health and Environment (SHE) alignment plans, focusing on adherence to procedures and hazard awareness training, to drive accountability and improved performance. To reinforce these plans, in 2018 we will continue to implement our **Four Pillars of Safety** and the Worksite Safety Observation program across our International operations.



## Emergency Response Management

Canadian Natural's comprehensive corporate emergency management program is based on proactive risk management, from risk identification to mitigation programs across our operations. This program includes measures to prevent failures that could potentially lead to spills or leaks, and to be properly prepared for a safe and well coordinated response in the event of an incident.

Registered Emergency Response Plans were completed for all jurisdictions and all planned exercises were completed throughout 2017. We carried out 110 exercises in NA E&P, 114 at Horizon and 10 in our International operations, including two tabletop exercises in our Côte d'Ivoire (CDI) operations involving our third-party operators and regulators. One of these major exercises simulated the tactical response arrangements to a hydrocarbon spill from a remote tie-back well located approximately 12 kilometres away from Ninian Central, where all infrastructure for this field is located on the sea bed.

## Health and Wellness

Canadian Natural's *Strive* wellness program continues to enhance employee health and promote permanent healthy lifestyle changes. With a significant increase in staff during 2017, *Strive* was rolled out to our new locations to make sure all employees were aware of the program's purpose and benefits.

With a focus on increasing Company-wide engagement in *Strive*, we launched a new online platform that allows for program growth by connecting all our offices for global activities, while also providing more opportunities for local programs and targeted communications. This new platform was developed to facilitate employee participation through enhanced user experience, with an updated health risk assessment tool and easier allocation of credits towards healthcare and/or wellness expenses. The first global wellness challenge will be launched simultaneously across all locations in Canada, the UK and Africa in 2018.



Employees at Canadian Natural's Cliffdale operations.

## Management Systems Across Our Operations

In 2017, we welcomed the expertise and experience of more than 2,800 employees through a number of acquisitions, including the Athabasca Oil Sands Project (AOSP) and Peace River operations. The transition for new employees to Canadian Natural has been a collaborative process, largely focused on familiarizing them with Canadian Natural's mission statement, corporate culture and values, and how these positively impact our business on an ongoing basis.

Our teams have worked together to deploy our Safety, Asset Integrity and Environmental Management Systems across all locations, create awareness and understand how any changes from previous systems affect day-to-day activities for frontline employees. We have also incorporated business management practices that have been proven successful.

"From day one, the SMS has been well received, achieving full implementation within weeks," explains Keith Hague, Peace River Safety Lead. "The area's Leadership Team has fully engaged in training, facility inspections and the Worksite Safety Observation program, as we now focus on continuous improvement in its application and understanding."

At our AOSP operations, which include the Muskeg River and Jackpine Oil Sands Mines with approximately 2,500 employees, a major part of the

management system's integration was to clearly communicate procedures and expectations, as well as providing the necessary tools for frontline employees to do their jobs safely and efficiently.

The Environmental Management Systems (EMS) for AOSP and Horizon operations were fully integrated into a single system incorporating common elements to both, ensuring consistency in documentation, aspect identification, risk assessment and procedures. Variations in procedures of the two previous systems were identified and standardized to one EMS applicable to both operations. The integrated EMS maintains the strong components of both systems while standardizing the content into 17 procedures, accounting for all business areas and meeting ISO 14001:2015 specifications.

The commissioning of Horizon Phase 3 was included in the EMS to capture the environmental aspects of the expanded operation and to address all environmental risks associated with those operations. From this common basis, the EMS will be implemented in 2018 with staff training along with a planned audit to assess the system through a continuous improvement process. The integrated EMS forms the structure to support management planning and stewardship performance reviews to ensure regulatory compliance and performance improvement.



# Health and Safety Highlights

Priorities in 2017	Progress in 2017	Priorities in 2018
<b>Safety Management System (SMS)</b>		
<ul style="list-style-type: none"> <li>Identify improvement opportunities in each business area using SMS tools for continuous improvement.</li> <li>Complete combined (Bitumen Production and Upgrading and Utilities) Certificate of Recognition (COR) audit at Horizon.</li> <li>Integrate Safety, Health and Environment (SHE) function with Operations to continue working together on frontline safety at CNRI.</li> <li>Continue to advance data use across the company for further safety performance improvements.</li> </ul>	<ul style="list-style-type: none"> <li>Continued strong emphasis on all aspects of the SMS, focusing on the top three causes of recordable injuries.</li> <li>Completed internal audits, facility inspections and supervisor training sessions, and developed enhanced action plans embedding our continuous improvement process.</li> <li>Supported integration of the North American SMS.</li> <li>Maintained COR with the third party auditor. All action items identified have been addressed.</li> <li>SHE Action Committee meeting at our offshore operations generated focused actions driven by our frontline staff.</li> <li>Safety data is available in real time, allowing teams to target priorities to improve safety performance.</li> </ul>	<ul style="list-style-type: none"> <li>SMS action plans and audits will be created for continuous improvement within all business units.</li> <li>Coordinate 2018 COR external audit for North American operations, incorporating Oil Sands Mining and Upgrading facilities.</li> </ul>
<b>Safety Excellence</b>		
<ul style="list-style-type: none"> <li>Continue incident prevention campaigns and incident trend reviews to reduce injuries.</li> <li>Focus on worksite safety standards and contractor management at Côte d'Ivoire (CDI).</li> <li>Complete a workforce engagement survey at CNRI.</li> <li>Complete all planned Safety Excellence meetings.</li> <li>Provide support to frontline staff and operations through Energy Safety Canada's (formerly Enform) 2017 Safety Stand Down theme: <i>'Focus on What's Important'</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Lowest recorded corporate TRIF of 0.43.</li> <li>Reduced TRIF by 14% in NA E&amp;P operations, and by 22% at Oil Sands Mining and Upgrading operations from 2016.</li> <li>The 2017 Safety Excellence Theme — <i>STOP: Plan, Prepare and Execute</i> — laid the foundation to support incident reduction in NA E&amp;P and Oil Sands Mining and Upgrading operations.</li> <li>Implemented SHE improvement plans and initiated a joint initiative with the Internal Audit group to audit management performance of strategic contractors, leading to the successful completion of all regulatory inspections.</li> <li>Completed workforce engagement survey in UK and Africa, and created targeted action plans.</li> <li>Completed planned Safety Excellence meetings.</li> <li>Incorporated <i>safety stand down</i> theme into our safety dialogues.</li> </ul>	<ul style="list-style-type: none"> <li>Continue incident prevention efforts and incident trend reviews to reduce injuries.</li> <li>Continue Safety Excellence meetings program.</li> <li>Incorporate 2018 Safety Stand Down theme <i>Step Up For Young Workers</i> into our frontline safety programs.</li> <li>Implement <i>Four Pillars of Safety</i> and Worksite Safety Observation program across UK offshore operations, and develop implementation plan for Offshore Africa.</li> </ul>
<b>Contractor Safety Management</b>		
<ul style="list-style-type: none"> <li>Maintain Contractor Safety Excellence meetings to drive continuous performance improvements.</li> <li>Carry on with leadership training and coaching, overall support for our behavioural programs, and introduce the Worksite Safety Observation (WSO) program to CNRI.</li> <li>Work closely with third party operators and operations teams in CDI to reinforce safety standards.</li> <li>Implement hazard identification training in CNRI.</li> </ul>	<ul style="list-style-type: none"> <li>Held meetings with senior leaders from Canadian Natural and contractors, identified action items and developed improvement plans.</li> <li>Safety performance continues to improve. NA E&amp;P Contractor TRIF decreased by 35% for those with higher incident rates.</li> <li>Strong support for the WSO program continues across our operations as a means to reduce injuries.</li> <li>Implemented WSOs on Ninian Central.</li> <li>Continued working with CDI third-party operator on alignment to Safety, Health and Environment (SHE) plans, adherence to procedures and hazard awareness training.</li> </ul>	<ul style="list-style-type: none"> <li>Continue support for Contractor Safety Excellence meetings and WSO programs to drive continuous improvements in performance.</li> <li>Full rollout of WSO program across CNRI operations.</li> </ul>
<b>Safety Leadership</b>		
<ul style="list-style-type: none"> <li>Complete all planned senior management field visits to reinforce supervisors' safety responsibilities.</li> </ul>	<ul style="list-style-type: none"> <li>Senior leadership actively participated in Safety Excellence meetings to strengthen leadership engagement and supervisors' safety responsibilities.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain Canadian Natural senior leadership presence across field offices.</li> </ul>
<b>Emergency Response</b>		
<ul style="list-style-type: none"> <li>Continue Emergency Response Plan (ERP) training exercises with senior management.</li> <li>Conduct ERP training exercises at each division, focusing on key risk areas.</li> </ul>	<ul style="list-style-type: none"> <li>Completed all scheduled exercises across our operations, including all critical areas, with senior management actively involved during major exercises.</li> <li>Completed 234 training exercises Company-wide.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct ERP training exercises at each division, focusing on key risk areas.</li> </ul>
<b>Wellness</b>		
<ul style="list-style-type: none"> <li>Increase support and program participation.</li> <li>Conduct an employee survey to receive program feedback.</li> </ul>	<ul style="list-style-type: none"> <li>Launched new platform for enhanced employee experience and program growth.</li> <li>Rolled out <i>Strive</i> wellness program to all new Canadian field locations, which took priority over the employee survey.</li> <li><i>Strive</i> participants' benefit costs are rising at a reduced rate compared to previous years.</li> </ul>	<ul style="list-style-type: none"> <li>Focus on local planning and programming for each location to increase engagement.</li> <li>Develop targeted communications and programs to address top health risks.</li> <li>Conduct an employee survey to receive program feedback.</li> </ul>

# Asset Integrity



At Canadian Natural, we are committed to high standards of asset integrity to ensure safe, reliable, effective and efficient operations.

## Asset Integrity Management

Canadian Natural has a proactive, risk-based approach to manage asset integrity and continuously improve the reliability of our infrastructure — including pipelines, pressure equipment and tanks. Our programs include inspections, evaluations, and monitoring and mitigation strategies to protect people, the environment and the integrity of our assets.

Our Asset Integrity Management System provides the framework to help us identify, assess and manage risk to prevent failures and accidents. It ensures compliance with regulations and drives continuous improvement through goal setting, tracking and results measurement. Asset Integrity and Operations teams receive training and support so that risks are proactively assessed, understood, mitigated and communicated.

## Significant Infrastructure

We operate one of the largest inventories of upstream process equipment within Canada, including thousands of kilometres of pipeline and registered pressure equipment.

The majority of our operations are based in Alberta, British Columbia, Saskatchewan and Manitoba. Canadian Natural Resources International (CNRI) operates in two core areas: the United Kingdom (UK) portion of the North Sea and Offshore Africa (Côte d'Ivoire, Gabon and South Africa). Our offshore facilities include:

- four platforms in the North Sea (Ninian Central, Ninian South, Ninian North and Tiffany); and

- four third-party owned and operated floating production, storage and offtake (FPSO) vessels, in the North Sea (Banff) and Offshore Africa (Baobab, Allan and Espoir Ivorian).

## Process Safety Management

At Canadian Natural, the integrity of our process equipment is an essential part of ensuring safety Company-wide. To do this, our Process Safety Management (PSM) system provides the framework to prevent and control serious incidents, such as spills or leaks that involve hazardous materials. The PSM integrates and aligns different components of our business — including technical, maintenance, operational and organizational aspects, as well as leadership and competency.

## Highlights of 2017 PSM Initiatives

- Extended the use of the Operational Risk Assessment (ORA) process to actively manage short-term process operational risks, as we integrated new operations. ORAs are designed to assess whether there is a potential process safety concern, and if needed, implement short-term mitigation controls or temporary shut-ins until a permanent solution is in place. Experienced team members oversee and coordinate the process, driving methodical analysis and focused actions when required. The ORA tool is enabling clear communications regarding risks and appropriate mitigation strategies, as well as a better understanding of roles in the presence of a process safety issue.

- Supported Horizon's largest turnaround and commissioning of new units, including pre-startup safety reviews in the Upgrading and Utilities area, process hazard evaluations on the engineered facility modifications, and investigation of process safety incidents.
- Completed risk-based inspection (RBI) plans across our operations to proactively manage asset integrity and identify improvement areas.
- Continued work to align Canadian Natural's safety processes and practices with FPSOs' management systems, including use of RBIs to identify and manage hazards to prevent failures. Ongoing work with FPSO operators includes periodic PSM assessments of vessels and audit programs.

## Focus on Continuous Improvement

We had 16 reportable hydrocarbon releases during 2017 in our offshore operations, compared to 14 in 2016. We studied the root causes of these incidents and reinforced prevention plans both internally and with FPSO operators.

We have focused on operational discipline and optimizing RBI processes to enhance PSM practices in the management systems on board the FPSOs. Reduction of hydrocarbon releases remains a priority at CNRI, as we continue to implement integrity plans for pressure equipment systems and prioritize inspections to proactively manage the integrity of our assets and prevent incidents.

At Horizon, we experienced an incident in September 2017 at the start of the turnaround involving an electrical building fire, which our on-site first responders immediately addressed and extinguished. With safety as a priority, workers were immediately cleared from the area and an individual was treated for minor injuries, returning to work shortly after. The incident was thoroughly investigated and enhanced process safety measures were implemented. During the turnaround, we applied additional measures, assessed equipment, and completed required maintenance and repair work.

## Pipeline Integrity

The foundation of Canadian Natural's comprehensive pipeline integrity management system is a proactive risk-based approach to prevent pipeline failures. We assess each pipeline based on the likelihood of failure and the potential consequences of that failure. This management system includes well-established assessment tools, mitigation activities, and spill and emergency response plans. Another element present in all aspects of our pipeline integrity management system is continuous improvement. Through program audits and incident investigation, we implement lessons learned and best practices for program enhancement.

## Strong Performance

We continued to reduce the frequency of pipeline leaks/1,000 km in North America Exploration and Production (NA E&P) operations to 1.49 from 1.60 in 2016 — an improvement trend of 23% since 2014. According to the Alberta Energy Regulator's benchmarking data for 2017, Canadian Natural's incident rate in Alberta equals our peer company average, while operating over three to five times the pipeline length of our peers.

## Proactive Pipeline Integrity Management

In 2017, we implemented an improved assessment tool for more accurate and consistent identification of higher risk

pipelines, where the consequence of failure can have a significant impact on the environment, and monitoring and mitigation strategies can be further enhanced. Our Asset Integrity team assessed all NA E&P operating pipelines with this process, and will continue with evaluations of the effectiveness of current mitigation programs in 2018.

Canadian Natural has a dedicated leak detection team focusing on improving pipeline leak detection systems, using processes and tools aligned with our Pipeline Risk Management systems. For example, they developed a procedure that was implemented in 2017 to improve the selection and installation of leak detection systems, and assessed over 1,100 systems, installing advanced technology in over 150 locations.

In 2018, this group of experts will kick off an initiative to evaluate response plans on pipelines crossing major rivers, and make improvements where required. This initiative will be conducted in conjunction with the pipeline assessment tool.

## Pipeline Water Crossing Management

For proactive evaluation of pipelines that cross water bodies and slopes, Canadian Natural's comprehensive GeoHazard Management System monitors long-term geological and environmental conditions.

Management of water and slope crossing pipelines is a focus of our work because they are relatively higher risk. In 2017, Canadian Natural experienced three pipeline leaks related to slope movement, which were immediately contained and cleaned up with no environmental impact. As part of continuously improving our GeoHazard system, a detailed program review was completed, including engagement with industry experts and peers. To that end, additional engineering analysis and mitigation requirements are being enhanced for pipelines on major river crossings. These evaluations include high-resolution digital imaging and specialized inline inspection tools as additional failure prevention measures.

**23% decrease**

in pipeline leaks/1,000 km in NA E&P since 2014

**1,100 leak detection systems**

assessed in 2017

## Focusing on Risk Management Boosts Operational Safety

Canadian Natural's leadership understands that highly effective risk management systems are essential to ensure the safety of people and the environment. Our management process provides clear guidance to all staff that certain levels of risk must be elevated to senior leadership.

**Risk Based Inspection (RBI)** processes are embedded into our management programs. RBIs focus not only on facilities and equipment condition — they also measure and rank the likelihood of failure and its consequences. Across our operations, a Corporate Risk Matrix provides alignment to understand and manage risk through a multi-disciplinary approach that includes safety, process safety, asset integrity and environmental aspects. This matrix allows us to understand risks, prioritize work and enhance our asset integrity programs to prevent and reduce failures and incidents by minimizing the exposure to those risks.



Employees at the CNRI Espoir wellhead tower.



# Asset Integrity

## Pressure Equipment Integrity

We strive to ensure our pressure equipment is maintained and operated in a safe manner to prevent incidents and safeguard people and the environment. Our systems ensure that the integrity of each piece of pressure equipment is well managed across our operations through evaluations that prioritize inspections, monitoring and maintenance plans.

Our Pressure Equipment Integrity Management Systems (PEIMS) are registered and fully compliant with the jurisdictions in which we operate.

## 2017 Pressure Equipment Highlights

- Implemented increasingly stringent inspection requirements in our NA E&P operations for critical equipment such as boilers and heaters, and provided training to integrity and operations staff.
- Worked with the Alberta Boiler Safety Association (ABSA) on its 2017 audit of the AOSP's PEIMS, and the program was renewed until 2020. Horizon's PEIMS will be audited in 2018.

## Structural Integrity

Structural Integrity programs ensure arrangements are in place to prevent significant incidents at our operational structures that support our oil and natural gas production facilities through careful design, safe operation and proper maintenance within the facilities' lifecycles. Our offshore

infrastructure is the main focus of our Structural Integrity programs, due to the operating conditions, age and location of these assets.

Structural integrity inspections and repairs involve the use of technology, such as drones or Unmanned Aerial Vehicles (UAV) and underwater Dive Support Vessels (DSV). Incorporating technology into routine structural programs has proven increasingly efficient, improving inspection safety and timelines.

## Corrosion Under Insulation Inspections

North Sea and Offshore Africa oil and natural gas facilities are subject to intense waves, highly corrosive elements and extreme operating conditions that can present significant challenges to managing infrastructure. Our robust Asset Integrity Management System ensures assets are fit for purpose over their lifetime.

To manage the threat of potential incidents due to corrosion on all our offshore platforms, the Corrosion Under Insulation (CUI) inspections program includes RBI assessments to focus on priority areas. In 2017, we initiated work to improve CUI screening techniques to reduce our stripping and thereby accelerate inspections. We completed trials of a new technology that helped identify the presence of water for enhanced screening, and this method will be used to review insulated pipework in 2018.

## Largest Turnaround in Company History

It's been almost 10 years since production at Horizon began with a capacity of 110,000 bbl/d of synthetic crude oil. Over the years, we have devoted significant resources to maintaining operational reliability while expanding plant capacity. The lessons learned by our teams have been extremely valuable, leading to the successful completion of a 52-day turnaround in 2017 — the largest man-hour (1.3 million) event to date for Canadian Natural.

During this planned maintenance shutdown, we inspected more than 200 pieces of pressure equipment and completed over 600 maintenance and repair work orders. Preparation and coordination of teams maintained the focus on the safety of workers and operations, and as a result, 2018 kicked off at Horizon with safe, steady and reliable operations.

The turnaround also included the Phase 3 expansion tie-in activities, as well as the optimization and reliability work on the fractionator tower, vacuum distillate unit and diluent recovery unit. Following the turnaround, the last unit of Phase 2 and 3 expansions was commissioned — the combined hydrotreating unit, increasing Horizon production capacity to over 250,000 barrels per day.



*Left:* Crews working steadily at the plant site during the Horizon turnaround.

*Right:* 'Matta-Lift' technology provided speed, flexibility, safety and cost efficiencies to complete work at various plant facilities.

# Asset Integrity Highlights

Priorities in 2017	Progress in 2017	Priorities in 2018
<b>Process Safety Management System (PSM)</b>		
<ul style="list-style-type: none"> <li>Process Risk Management support for the 2017 Horizon turnaround and the commissioning of major units.</li> <li>Complete risk-based inspection (RBI) plans to proactively identify improvement areas across our operations.</li> <li>Complete the implementation of the Operational Risk Assessment (ORA) process and tracking systems across NA E&amp;P and CNRI.</li> <li>Continue working with third-party FPSO operators to implement improvement plans to reduce hydrocarbon releases.</li> </ul>	<ul style="list-style-type: none"> <li>Successfully completed Horizon's largest turnaround and commissioning of units, integrating new equipment into our management systems.</li> <li>Supported pit stops at AOSP operations and integration of management systems.</li> <li>Completed pressure equipment RBIs on three facilities in our NA E&amp;P operations.</li> <li>Completed RBIs for Horizon's secondary upgrading area and initiated RBIs on the sulphur recovery unit.</li> <li>The Technical Safety Engineering group worked together with Health and Safety teams, adding a technical focus to root cause analysis for incident investigation in NA E&amp;P operations, to identify and manage risk through mitigation measures.</li> <li>With the implementation of the ORA process at Horizon, this tool is now deployed across all operations.</li> <li>Implemented terms of reference with third-party FPSO operators, to adopt and report against consistent inspection and management criteria as our operated assets.</li> </ul>	<ul style="list-style-type: none"> <li>Continue proactive RBI plans for risk assessment and management.</li> <li>Implement process to maintain accuracy of RBI information and evaluate operational changes that could change risk classification.</li> <li>Focus on reduction in hydrocarbon releases by addressing root causes and reinforcing FPSO operators' integrity programs.</li> </ul>
<b>Pipeline Integrity</b>		
<ul style="list-style-type: none"> <li>Complete annual risk assessments on all gathering systems.</li> <li>Rollout of improved Pipeline Risk Assessment Tool.</li> <li>Continuous improvement of GeoHazard Management Program.</li> <li>Complete pipeline integrity audits.</li> </ul>	<ul style="list-style-type: none"> <li>Completed risk assessments in all operating areas.</li> <li>Improved Pipeline Risk Assessment Tool was rolled out and all pipelines were assessed, resulting in increased focus on high risk pipelines.</li> <li>Increased engagement with industry experts and implemented additional requirements on major river crossings.</li> <li>Completed pipeline integrity audits and implemented action plans for improvements.</li> </ul>	<ul style="list-style-type: none"> <li>Continued focus on proactive evaluations of high risk pipelines to identify opportunities for continuous improvement.</li> </ul>
<b>Facility Integrity</b>		
<ul style="list-style-type: none"> <li>Complete 2017 risk-assessment plan.</li> <li>Continue to execute the pressure equipment inspection program, and pressure relief valve servicing program at Horizon.</li> <li>Develop and implement Integrity Management Programs for all units to be commissioned at Horizon in 2017.</li> <li>Execution of the 2017 Horizon turnaround.</li> <li>Improve mooring system reliability.</li> <li>Continue to update high-level Asset Integrity Statements bi-annually (next update to occur in 2018).</li> </ul>	<ul style="list-style-type: none"> <li>Introduced and executed enhanced inspection plans on high consequence pressure equipment in NA E&amp;P.</li> <li>Completed pressure equipment inspection and pressure relief valve servicing programs at Oil Sands Mining and Upgrading operations.</li> <li>Pressure equipment RBIs at CNRI are updated on a quarterly basis.</li> <li>Inspected and integrated all new equipment coming online for Horizon Phase 3 expansion.</li> <li>Successfully completed Horizon turnaround with a focus on safety and asset integrity.</li> <li>Successfully completed the Baobab FPSO turnaround, working together with a third-party operator.</li> <li>Completed annual mooring chain inspections in line with our continuous improvement process.</li> <li>Completed updates to Asset Integrity Statements.</li> </ul>	<ul style="list-style-type: none"> <li>Alignment of Pressure Equipment Integrity Management Systems (PEIMS) across all Canadian operations.</li> <li>Prepare for 2018 Horizon Alberta Boiler Safety Association (ABSA) audit.</li> <li>Define scope for all 2018 pit stops in Oil Sands Mining and Upgrading.</li> <li>Conduct reviews of critical pressure equipment across our operations, and the implementation of improved Corrosion Under Insulation (CUI) inspection for offshore platforms.</li> </ul>



Ninian North and Ninian South platforms dot the horizon in the North Sea.



# Environment



## Environmental stewardship is incorporated throughout all phases of our projects.

From planning through to design, operation and final reclamation, careful consideration is given to reducing the footprint of our activities. To do this, we have in place comprehensive practices, while also investing in technology and innovation. Our Environmental Management System provides the structure to document environmental risks and to implement appropriate avoidance and mitigation strategies to minimize those risks for safe and stable plant operations.

To accelerate continuous performance improvement, Canadian Natural is active in several government, academia and industry collaborations. As a founding member of Canada's Oil Sands Innovation Alliance (COSIA), we are sharing technologies and finding innovative solutions to important environmental challenges for greenhouse gas (GHG) emissions, land, water and tailings.

### Leadership in GHG Emissions Reduction

Canada's crude oil and natural gas resources are safely and responsibly developed with world-leading standards under comprehensive regulatory oversight, emissions regulations and programs, carbon pricing regimes and investments in carbon capture and storage. As the world's demand for energy increases, Canada is well-positioned to be a global leader in supplying crude oil and natural gas in a lower carbon energy future.

At Canadian Natural, we believe that strong environmental policy, regulation and performance standards, together with innovation and technology, are necessary for an effective approach

to GHG emissions management. We continue to work with industry, government and other stakeholders to maintain a cost and carbon competitive oil and natural gas sector.

### GHG Management Goal and Strategy

With a strong commitment to continuously reducing GHG emissions intensity, Canadian Natural has developed a pathway to reduce emissions intensity to be below the global crude average. We have taken significant steps to reduce our GHG emissions with an integrated GHG management strategy that involves:

- integrating emissions reduction in project planning and operations;
- leveraging technology to create value and enhance performance;
- investing in research and development and supporting collaboration;
- focusing on continuous improvement to drive long-term emissions reductions;
- leading in carbon capture and sequestration/storage (CCS) projects;
- engaging proactively in policy and regulation to effectively manage climate risks and opportunities, including trading capacity and offsetting emissions; and
- considering and developing new business opportunities and trends.

### Driving GHG Reductions

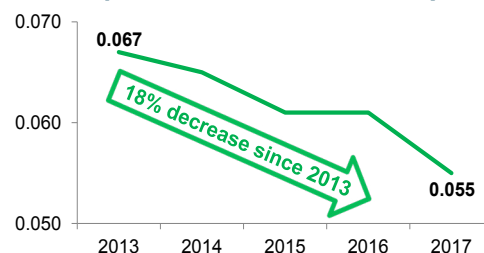
Our GHG management strategy and focus on effective and efficient operations is delivering results in emissions reductions.

- 18% reduction in corporate GHG emissions since 2013 — 10%

improvement from 2016.

- 24% decrease in Horizon's direct GHG emissions over the last five years — 10% improvement from 2016.
- When we recognize our carbon capture initiatives, our current Oil Sands Mining and Upgrading operations GHG emissions intensity is only slightly higher than the average intensity for all global crude oils, with a pathway to be below the average with further advances in technology underway.
- 71% reduction in venting at our Alberta heavy oil operations from 2013 to 2017 — 9% reduction from 2016 levels.

Corporate GHG emissions intensity



### Pathway to a Lower Carbon Energy Future

Canadian Natural has a defined pathway to drive long-term emissions reduction that includes:

**Carbon capture and sequestration/storage (CCS) initiatives** — Canadian Natural is leading the oil and natural gas industry in CCS projects, with a carbon dioxide (CO<sub>2</sub>) capture capacity of 1.5 million tonnes at our Oil Sands Mining and Upgrading operations — including CO<sub>2</sub> capture and sequestration facilities at Horizon and a 70% interest in the Quest CCS facilities at Scotford. These initiatives combined with CO<sub>2</sub>



capture at our Hays gas plant for use in enhanced oil recovery and a 50% stake in the North West Redwater Sturgeon Refinery, when fully online, will capture 2.7 million tonnes of CO<sub>2</sub>, making Canadian Natural the third largest owner of CCS capacity in the global oil and gas sector, based on data from the Global Carbon Capture and Storage Institute.

**Methane emission reduction projects** – Methane reduction is one of the most cost-effective ways to decrease GHG emissions. Solution gas conservation projects are a significant focus in our heavy oil operations. Over the last five years, we have conserved 17.9 million tonnes of carbon dioxide equivalent (CO<sub>2</sub>e) — comparable to removing 3.8 million passenger vehicles from the road over the same period. Pneumatic controller retrofit projects are underway across our operations to further reduce emissions.

**Natural gas production as a low carbon supply of energy** – Canadian Natural is the largest producer of natural gas in Canada representing 25% of our product mix. As a reliable, affordable, and lower GHG intensive energy source for power generation, natural gas delivers improved environmental performance as a clean burning hydrocarbon with less than half the carbon footprint compared to coal. Global demand for natural gas is expected to grow, continuing to be an important source of energy and a way to significantly lower global GHG emissions.

**Technology and innovation** – Read our *Advancing Innovation* section, on pages 18-19, about our innovative projects to reduce GHG emissions.

## Managing Climate Risk and Governance

Canadian Natural uses a multi-disciplinary risk management process which considers climate change risks and opportunities as part of our business evaluation. Our business strategy is influenced by incorporating knowledge of climate change risks, including current and potential policies and regulations, into decisions made

by our Management Committee. Our governance approach includes:

- Management Committee is responsible for the identification, assessment and management of climate change risks.
- Management Committee and the GHG Operations Strategy Committee provide direction and guidance to business units on climate-related risk assessment and project implementation.
- GHG Operations Strategy Committee is responsible for climate change strategy and issue prioritization, as well as overseeing our working groups that manage and coordinate GHG reduction and technology projects across the Company. This committee also assesses and provides input on current and developing GHG policy and regulation.
- Nominating, Governance and Risk Committee of the Board reviews the status of risk monitoring activities, including climate-related regulatory and operational risks, and the steps Management has taken to implement mitigating actions.
- Health, Safety, Asset Integrity and Environmental Committee of the Board is responsible for ensuring that Management has effective design and implementation of environmental risk programs, controls and reporting systems.
- Board of Directors is responsible for overseeing and ensuring that the Management Committee has appropriate and effective measures in place to manage climate-related risk.

Climate risk management also occurs at the asset level through recurring project reviews, technology reviews, and economic evaluations including forecasting GHG intensity and compliance costs, and reviewing abatement projects.

## Resiliency in a Lower Carbon Economy

As the world transitions to better, lower carbon ways of producing and

<b>18% reduction</b> ↓
in corporate GHG emissions since 2013
<b>71% reduction</b> ↓
in venting since 2013
<b>1,400 ha reclaimed</b>
across operations in 2017
<b>80% improvement</b>
in water use intensity at PAW since 2008

consuming crude oil and natural gas, Canadian Natural's large, diversified and balanced portfolio is well-positioned to be resilient in a lower carbon economy. With a portfolio that consists of long life low decline assets representing a reserve life of 50 years, we will continue to create long-term value and opportunities to drive lower GHG emissions through continuous improvement and investments in technology.

Canadian Natural reviews external scenario analyses of climate change from energy firms/agencies and on that basis developed two internal scenarios in order to assess business risk. Across the range of ambitious climate change scenarios, the expectation is that there will be substantial global production and consumption of crude oil and natural gas for decades to come. As result of Canadian Natural's GHG management strategy, our reserves face limited risk even under more ambitious climate change scenarios.

## Land

Canadian Natural develops every project with a vision and plan to proactively manage our impact on the land. We are committed to returning all our worksites to a healthy ecosystem upon completion of our activities — whether that is boreal forest, native prairie or farmed land. To do this, we

incorporate innovation, best practices and lessons learned into our land management programs.

We continue to reduce our land footprint through our area-based approach in our North American Exploration and Production (NA E&P) operations, coordinating the efforts of different groups to take sites out of service in a safe and environmentally sound manner. By grouping wells and pipelines for abandonment, facility decommissioning and reclamation activities, we are progressively reclaiming large contiguous areas of land more efficiently and cost-effectively.

At our Oil Sands Mining and Upgrading operations, progressive reclamation activities are on track. We continue to have active research and monitoring conducted to investigate the ecological performance of reclaimed areas and improve reforestation. Read about our reclamation projects in our *Advancing Innovation* section.

## Highlights of 2017 Decommissioning and Reclamation Projects:

- 604 reclamation certificates submitted and 590 received, representing 1,273 hectares (ha) of land reclaimed in NA E&P, for a total of 6,810 ha reclaimed since 2010. In Alberta, we received 442 reclamation certificates — 26% of the total reclamation certificates issued.
- 771 inactive wells and 1,309 pipelines abandoned and reclamation work initiated.
- 58 facility decommissioning projects and 48 well equipment removal projects completed.
- 331 ha reclaimed to date at Primrose/Wolf Lake (PAW). More than 600,000 trees and shrub seedlings planted.
- 735 ha progressively reclaimed to date at our Oil Sands Mining and Upgrading operations, in addition to ongoing activities on corridor lines to re-establish 1,300 ha of continuous forest at Horizon. We have planted 60,700 trees at the AOSP mines since June 2017 and the one millionth tree

will be planted at Horizon in 2018.

- 40,000 tonnes of material removed during the Murchison platform decommissioning project, and expect to recover/recycle 95%. Lessons learned are being applied to the Ninian North decommissioning project, started in 2017.

## Water

Our water management strategies focus on a strong commitment to reducing fresh water use and protecting water sources. To reduce fresh water use, we apply technologies that maximize produced water recycling and saline water use for steam generation. To protect water sources, we follow industry leading operating practices and regulations for water use, fresh water withdrawals and produced water disposal, as well as the safe operation of disposal wells. Our water management programs also involve monitoring of water sources, storage and reporting to ensure no significant effects on water sources.

## Highlights of 2017 Water Management Strategies

- Maintained high produced water recycle rates (90-99%) at Kirby South and Primrose/Wolf Lake (PAW) thermal in situ operations, where water is required for steam generation. Focus continued on fresh water use reduction (for boiler feed and utility) through enhanced steam generation and saline water use. Fresh water use intensity was improved by 80% at PAW since 2008, and by 54% at Kirby South since 2014.
- Non-saline water use intensity (bbl/BOE) at PAW decreased to 0.26 in 2017 compared to 0.32 in 2016. At Kirby South, fresh water use intensity increased slightly from 0.09 in 2016 to 0.10 in 2017.
- Produced water recycling in Oil Sands Mining and Upgrading is an ongoing focus with over 80% of the water used being recycled. We also limit fresh water withdrawals from the Athabasca River where withdrawals remain well below our annual allocation limit. Advancing tailings technologies are part of our water

management strategy (*read more on page 19*).

## Biodiversity and Wildlife

Our Environmental Management System includes specific criteria to ensure biodiversity is considered and managed in all phases of our projects. We assess our impact and incorporate long-term biodiversity and reclamation planning into our programs to maintain the regional characteristics and biodiversity of each ecosystem, and reduce impacts on wildlife movement. Regular wildlife, aquatic and reclamation monitoring, as well as research into wildlife re-establishment, biodiversity and species at risk, provide us with up-to-date data that is incorporated into our management and mitigation programs.

## Highlights of 2017 Biodiversity and Wildlife Programs

- Ongoing work with industry and governments on boreal caribou conservation and habitat restoration, including project-specific mitigation measures to manage habitat (for caribou and other wildlife), reduced footprint planning, research on accelerated reclamation techniques and population enhancement measures.
- Working closely with the Alberta government and regulator to support and develop the Roadway Watercourse Crossings Remediation Directive. We are providing road inventory and stream crossing assessment, as well as remedial work, contributing to a complete information dataset that will be used to remediate fish habitat and save threatened fish populations.
- Wildlife management programs help minimize wildlife habituation at our operations, including rigorous onsite waste management and ongoing employee and contractor training on policies for bear awareness and proper waste segregation/disposal.
- Floating deterrent units were added in the centre of Horizon's pond to increase sound coverage to deter birds from the area and enhance bird protection.

Priorities in 2017	Progress in 2017	Priorities in 2018
<b>Environmental Management System (EMS)</b>		
<ul style="list-style-type: none"> <li>Manage continuous improvement in air emissions, water use and land activities.</li> <li>Continue reducing reportable incidents through increased awareness and enhanced reporting standards.</li> </ul>	<ul style="list-style-type: none"> <li>Integrated EMS core manual for Oil Sands Mining and Upgrading operations and environmental aspect risk rankings.</li> <li>Completed ISO 14001:2004 recertification for UK operations and developed plan to upgrade systems to ISO 14001:2015.</li> <li>Achieved lowest number of oil spills in the last five years at CNRI.</li> <li>Implemented new maintenance program to reduce spills, with an increased focus on small spills and incidents at our Oil Sands Mining and Upgrading operations.</li> </ul>	<ul style="list-style-type: none"> <li>Complete implementation of Oil Sands Mining and Upgrading EMS and conduct internal EMS audit.</li> <li>Implement ISO 14001:2015 Environmental Standard in UK operations.</li> <li>Analyze spills and other incidents to determine reduction measures.</li> </ul>
<b>Regulatory</b>		
<ul style="list-style-type: none"> <li>Improve data collection and incident management system to maintain high compliance rates Company-wide.</li> <li>Submit Ninian North platform decommissioning program to regulator and initiate public consultation.</li> </ul>	<ul style="list-style-type: none"> <li>Maintained compliance performance above industry average in Alberta and B.C.</li> <li>Reviewed environmental aspects/risk analysis for Oil Sands Mining and Upgrading operations for continuous performance improvement.</li> <li>Completed five regulatory environmental inspections at CNRI with no environmental enforcement actions issued.</li> <li>Received approval for Ninian North decommissioning program.</li> </ul>	<ul style="list-style-type: none"> <li>Continue to improve incident management system and maintain environmental compliance.</li> <li>Complete abandonment activities at Ninian North to achieve hydrocarbon free status.</li> </ul>
<b>Reducing Emissions</b>		
<ul style="list-style-type: none"> <li>Reduce methane emissions and improve data systems to help identify further emission reduction opportunities.</li> <li>Capture CO<sub>2</sub> from Horizon's hydrogen plant and sequester into the tailings pond.</li> <li>Monitor efficiencies during Horizon plant expansions to reduce GHG emissions.</li> </ul>	<ul style="list-style-type: none"> <li>10% reduction in corporate GHG emissions intensity from 2016.</li> <li>17.9 MM tonnes of CO<sub>2</sub>e conserved since 2013 through solution gas conservation projects.</li> <li>71% reduction in venting from heavy oil operations since 2013.</li> <li>1.5 million tonnes of CO<sub>2</sub> capture capacity at Oil Sands Mining and Upgrading.</li> <li>10% GHG emissions intensity reduction at Horizon from 2016.</li> </ul>	<ul style="list-style-type: none"> <li>Continue supporting GHG reduction projects.</li> <li>Improve coordination on air emissions reporting across operating areas to ensure accuracy and consistency.</li> </ul>
<b>Water Use</b>		
<ul style="list-style-type: none"> <li>Maintain high recycle rates across Thermal and Horizon operations.</li> <li>Continue water intake reductions from the Athabasca River.</li> <li>Assess water use improvements with non-segregated tailings (NST) production at Horizon.</li> </ul>	<ul style="list-style-type: none"> <li>Maintained high produced water recycle rates (90-99%) at Kirby South and Primrose/Wolf Lake (PAW).</li> <li>80% improvement in fresh water use intensity at PAW since 2008.</li> <li>Recycled over 80% of produced water in Oil Sands Mining and Upgrading.</li> <li>Continued implementing operational efficiencies and research work to increase water recycling across our operations.</li> <li>Horizon's regulated annual water withdrawal allocation was lowered, aiming to reduce total water allocation by 36% in two years.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain high recycle rates across our thermal and Oil Sands Mining and Upgrading operations.</li> <li>Outline long-term research program to address regulatory requirements for end pit lakes and continue to reduce fluid fine tailings (FFT) through process improvements.</li> </ul>
<b>Abandonment and Reclamation</b>		
<ul style="list-style-type: none"> <li>Continue integrated abandonment and reclamation programs in Alberta and northeast B.C.</li> <li>Continue reclamation on previous year's abandonment and reclamation programs.</li> <li>Complete Murchison platform jacket removal/recycling; advance abandonment of subsea wells.</li> </ul>	<ul style="list-style-type: none"> <li>604 reclamation certificates submitted, and 590 received (NA E&amp;P).</li> <li>771 inactive wells and 1,309 pipelines abandoned, and 58 facilities decommissioned (NA E&amp;P).</li> <li>Removed Murchison platform jacket and subsea flowlines, and expect to recycle 95% of materials.</li> <li>Initiated safe decommissioning activities at Ninian North platform, with completion of well plugging.</li> </ul>	<ul style="list-style-type: none"> <li>Advance area-based abandonment and progressive reclamation programs to reduce our footprint.</li> <li>Complete Murchison decommissioning with abandonment of remote subsea well.</li> <li>Complete conductor recovery and cleaning of topsides on Ninian North.</li> </ul>
<b>Biodiversity and Wildlife Management</b>		
<ul style="list-style-type: none"> <li>Increase tailings pond coverage with floating radar controlled deterrents (a first in the oil sands).</li> <li>Continue focus on programs to prevent wildlife habituation at our operations.</li> <li>Incorporate results of wildlife monitoring into mitigation program and assess wildlife population changes.</li> </ul>	<ul style="list-style-type: none"> <li>Installed floating deterrent units, increasing radar coverage.</li> <li>Initiated integration of waste management practices across Oil Sands Mining and Upgrading operations.</li> <li>Wildlife monitoring has reduced interactions with bears, coyotes, etc. through the identification of animal activities and avoidance.</li> </ul>	<ul style="list-style-type: none"> <li>Continue integration of reclamation, wildlife and bird deterrent management for Oil Sands Mining and Upgrading operations.</li> </ul>
<b>Research and Development</b>		
<ul style="list-style-type: none"> <li>Complete region specific framework for risk assessments on native prairie sites.</li> <li>Field revegetation trial in Non-Segregated Tailings (NST) to determine whole plant effects.</li> </ul>	<ul style="list-style-type: none"> <li>Continued to work with the AER on a regional framework for risk assessment of native prairie sites.</li> <li>Conducting experimental design with 20 native boreal forest plant species to compensate for NST nutrients deficiency.</li> </ul>	<ul style="list-style-type: none"> <li>Continue biodiversity, tailings and reclamation research at Oil Sands Mining and Upgrading operations.</li> </ul>
<b>Collaborative Work</b>		
<ul style="list-style-type: none"> <li>Continue collaborating with COSIA to accelerate the pace of environmental performance improvement.</li> <li>Work with government, regulators and peers to develop and implement policies and guidelines to enhance industry's environmental performance.</li> </ul>	<ul style="list-style-type: none"> <li>Led 14 partnered and 19 single participant projects, and participated in another 14 projects at COSIA. Research shared to date: \$44 million GHG technology, \$69 million tailings technology, \$70 million water technology, and \$20 million reclamation technology.</li> <li>Ongoing participation in policy and regulations development, including GHG and methane reduction regulations, Tailings Management Framework and caribou management.</li> </ul>	<ul style="list-style-type: none"> <li>Continue collaborating with COSIA to accelerate the pace of environmental performance improvement.</li> <li>Work with government, regulators and peers to develop and implement policies and guidelines to enhance industry's environmental performance.</li> </ul>



# Advancing Innovation



Horizon CO<sub>2</sub> recovery complex

## Canadian Natural's investments in technology and innovation lead to more effective, efficient and sustainable operations.

Supporting Research and Development (R&D) while developing and adopting innovative technology are key drivers of continuous improvement. This allows us to increase resource recovery, improve environmental performance, and achieve operational and cost efficiencies. Canadian Natural has been the leading R&D investor for the crude oil and natural gas sector in Canada for a number of years.

We are working on a range of technologies in different stages, from discovery and design to development and commercialization, many of them in collaboration or partnership with industry, academia and government. Our investments focus on tailings and land management, reducing water use and GHG emissions, while increasing productivity.

### Steam Efficiencies Reduce GHGs

At our Kirby South thermal operations, we apply day-to-day operational efficiencies to reduce the amount of natural gas used for steam generation. By reinjecting produced gas into the formation to increase recovery and compensate for pressure loss, we can partially offset steam demand and reduce sulphur dioxide and CO<sub>2</sub> emissions.

We are also employing vacuum insulated tubing to reduce energy (steam) losses while maintaining production volumes (lower steam-to-oil-ratio), and plan to incorporate this technology at the Kirby North thermal project, targeting reduction of steam consumption by 25% during the warm-up phase and 10% for the

subsequent years of steam assisted gravity drainage operation.

### Collaborative Work

Through Canada's Oil Sands Innovation Alliance (COSIA), Canadian Natural, along with other producers, is sharing research, information and technologies in an unprecedented collaboration effort to improve performance. Projects we lead at COSIA include:

#### Area Fugitive Emissions Measurement

Canadian Natural is working to enhance the accuracy of GHG emissions measurements from the oil sands region, and to allow the implementation of more effective strategies to reduce those emissions. The project involves many partners in developing a holistic system of advanced sensors (using laser and fiber optic technology) and computer models that will deliver commercially proven technologies, guidelines for measurement and more accurate emissions profiles.

#### Natural Gas Decarbonization

Technologies from around the world are being evaluated against a set of environmental and economic criteria, looking for solutions to convert natural gas into a hydrogen rich fuel that produces less CO<sub>2</sub> emissions, and yields a valuable co-product that can be used to offset costs.

#### Advancing Understanding of Oil Sands Reclamation

The Oil Sands Vegetation Cooperative (OSVC) enables collaborative harvesting and banking of native boreal forest seeds

for use in revegetation and research, to ensure an abundant supply of native plants for reclamation. Companies collect native boreal forest seeds that are sent to nurseries, where they are cleaned and stored and then grown when required.



OSVC research - *Alnus* fruit

The Genomics Enhanced Reclamation Index (GERI) Stockpile project, in collaboration with the Canadian Forest Service and the University of Alberta, is helping us understand how soils may change while they are stockpiled to determine how best to manage them in land reclamation activities. Reclaiming upland forest ecosystems is a focus for both mining and in situ oil sands operations.

Industry is also researching the viability of pit lakes for treating process affected water, sequestering tailings and ecologically sustainable landscape components, as part of oil sands mine closure plans. We are using mesocosms as an experimental model that replicates natural ecosystems, to balance controlled laboratory conditions with the advantages of field studies. The first study was initiated in 2017, with 30 in-ground walled aquatic mesocosms where oil sands materials are added.

## Advancing Tailings Management Technologies

Comprehensive land use planning is an essential part of our operations that considers the end of mine life so that we can manage environmental closure programs and obligations, and apply progressive reclamation activities. Canadian Natural has taken significant steps to manage tailings, minimize our environmental footprint and advance reclamation as quickly as possible.

Taking lab concepts through the pilot stage and on to commercialization, Canadian Natural has invested more than \$3.5 billion in tailings research, technologies and project construction. Our tailings management strategies align with regulatory requirements based on two key principles: 1) creating landforms that fit within the local landscape, and 2) supporting productive wetlands and boreal forest habitat. Tailings management focuses on dewatering tailings (increasing the release of water for recycling), and improving tailings consolidation, to ultimately accelerate the reclamation process.

To do this, at Horizon we proactively manage the fines before they become fluid tailings by using a Non-Segregating Tailings (NST) process that includes cyclones, to separate coarse sand, and thickeners, to capture and remove water from the fines in the tailings streams, as well as the injection of CO<sub>2</sub> into the tailings stream.

At the AOSP mines, Canadian Natural is continuing the work on centrifugation technologies at the Jackpine Mine (with four centrifuges that separate water out of the fine tailings), as well as the Atmospheric Fines Drying (AFD) technology that uses a chemical to help settle out solids in the fluid fine tailings (FFT) and composite tailings at the Muskeg River Mine. These technologies are combined with the use of thickeners at both AOSP mines.

## Environmental Benefits

Through these tailings processes, we recycle water across our Oil Sands

Mining and Upgrading operations for re-use in the bitumen extraction process, reducing the tailings footprint. 2017 highlights include:

- further decreased fines going to the tailings pond as a result of selective lower fines mining practices; the Mature Fines Reduction Mine Plan at Horizon, and the Continued Resources Optimization practice at the AOSP operations. Conventional tailings capture between 55 and 60% of the fines; Horizon and AOSP's fines capture is now over 70%;
- continued GHG emissions reduction through warm process water recycling across our Oil Sands Mining and Upgrading operations (as water does not need to be re-heated), and through CO<sub>2</sub> injection in the tailings from Horizon's new capture plant.

## Tailings Research

With ongoing research being an important piece of our tailings management strategy, Canadian Natural built and commissioned the Applied Process Innovation Centre (APIC) at the Horizon site in 2015. The APIC provides a dedicated work space and resources for scientists and engineers to investigate and accelerate the application of technologies to commercial scale, and facilitates collaboration with other industry members directly and through COSIA. At the APIC, we are continually searching for breakthroughs.

We continue to test the viability of technologies to produce trafficable tailings, reduce our environmental footprint and increase bitumen recovery. Through our NST Enhancement Project we have been evaluating technology options that will increase fines capture and that could be deployed whenever we produce off-spec tailings.

In 2017, one NST tailings line was adapted to enhanced NST, with results indicating a fines capture of 80% or greater can be achievable for an off-spec product. Also, a scale test was

completed at Horizon on the In Pit Extraction Process (IPEP), and we will be running a larger scale pilot in 2018 to continue testing this technology. We also initiated research and engineering of NST reclamation with the University of Alberta to determine plant growth in the NST.

At the AOSP operations, the Tailings Consolidation Casing Experimental Project is looking at the long-term consolidation of fines treated through centrifugation. We also initiated work for field trials of new technologies starting in the summer of 2018, including the Filter Press and Filter Bags technologies.

The Filter Press project combines chemically treating FFT with a flocculant or coagulant that causes the solids to clump together, and then mechanically pressing it between large metal plates lined with filter materials. The resulting clay fines cake is dense and strong enough to be shipped directly into a reclamation area. The Filter Bags involve a similar chemical process, with the treated material being placed into a geotextile bag to allow for fines filtering, dewatering and consolidation within the bag.

## Creating Value From Waste

Canadian Natural and Titanium Corporation are working together on the front-end engineering design for the potential deployment of the first commercial scale prototype of Titanium's patented CVW™ (Creating Value from Waste) technology. CVW™ is a suite of tailings technologies applying a secondary stage of treatment before the waste from froth treatment enters the tailings pond.

This process reduces emissions, accelerates tailings remediation and recovers valuable bitumen, solvents and minerals from tailings streams. For example, metals such as titanium and zircon can be recovered and sold.

*More information on these and other projects is available in the 'Advancing Innovation' section on our [website](#).*



# Working Together with Communities

Fort Chipewyan Métis Local 125 and McMurray Métis Local 1935 members with Canadian Natural staff during a site tour.



**Canadian Natural works with local communities and stakeholders to build long-term relationships based on shared value and mutual respect.**

As members of the community, Canadian Natural's teams continue to focus on improving the way we do business, to be more effective and efficient in support of a long-term, sustainable industry. Working together with stakeholders to create shared value has become even more important in these times of rapid change and challenges for the oil and natural gas industry.

We work with a broad group of stakeholders from across our operations, including over 35,000 landowners, 160 municipalities and 75 Indigenous communities in Western Canada, as well as industry, governments, regulators and non-governmental groups, to identify opportunities for community investment, education and training, employment and business development.

## Engaging Stakeholders

Our teams work hard to build and maintain positive relationships and open communications with stakeholders. Our field-based stakeholder and community relations advisors and area landmen, who live and work in the communities where we operate, connect regularly with stakeholders to provide updates and address concerns, and integrate community needs into our projects. Some of the topics addressed in 2017 near our major operating sites included job opportunities for local residents, business opportunities for suppliers, community investment programs,

emissions management (including GHG and methane regulations), and potential impacts such as noise and road access.

## Highlights of our 2017 Stakeholder Engagements:

- As part of the Athabasca Oil Sands Project (AOSP) acquisition, we strengthened our stakeholder relations team with new members and successfully transitioned all agreements with Indigenous communities.
- Engaged with communities regarding more than 148 projects and development plans.
- Met regularly with municipalities and landowners to discuss activity levels and work together on industry challenges.
- Participated in or supported more than 500 community activities and events, including Indigenous celebrations and gatherings.

## Working with Indigenous Communities

We meet regularly with Elders and community members from our Indigenous neighbours to discuss issues that matter. Learning about traditional cultures, wildlife and how the landscape has changed over the years is part of our long-term commitment to these communities to further enhance our practices. Meetings in 2017 included:

- Tours of Horizon with Fort McKay First Nation, Athabasca Chipewyan

First Nation and Mikisew Cree First Nation, and individual tours with Registered Fur Management Area (RFMA) holders (trappers) from the Fort McKay Community. Also, a tour of the AOSP operations with Fort Chipewyan Métis Local 125 and McMurray Métis Local 1935, including stops at Jackpine Lake and the mine lookout. Tours focused on reclamation and environmental stewardship, as well as project updates.

- Fort McKay Elders blessed tree planting at our AOSP mines. Canadian Natural and the Fort McKay Community Advisory Group developed and implemented a traditional planting protocol to address the spiritual component of reclamation. A private Smudge Ceremony to bless the trees was followed by a Tobacco Blessing, while planting the seedlings on site last spring. This is an example of community members sharing their traditions, knowledge and protocols with Canadian Natural to improve reclamation practices.
- Understanding Indigenous history and celebrating traditions and cultural diversity at celebrations and gatherings plays a significant role in developing long lasting relationships. These events are great opportunities to support many of our stakeholders and be a part of broad reaching and deeply meaningful gatherings. For example, we participated in the Annual B.C. Elders Gathering, and the first National Elders Gathering, which was attended by more than 4,000



elders from across Canada. We attended and supported the Peace River Pow Wow and Gathering, and Treaty Days at Fort McKay, Fort Chipewyan and Cold Lake First Nations. We partnered with community members and contractors to barbecue hundreds of meals for the Woodland Cree First Nation Treaty Days and the Duncan's First Nations Treaty Days in the Peace River region, and during the annual end of year event at the Cold Lake LeGoff School, close to our thermal operations. We also supported the ongoing efforts of the Athabasca Tribal Council (ATC), which represents the interests of more than 5,000 Cree and Dene people from five northeast Alberta First Nations: Athabasca Chipewyan First Nation, Chipewyan Prairie First Nation, Fort McKay First Nation, Fort McMurray First Nation and Mikisew Cree First Nation.

## Participating in Stakeholder Synergy Groups

We meet regularly with local governments, rural counties and municipalities, landowners, regulators and industry to identify and discuss community concerns, e.g. industry activity levels, safety, taxes, road use and compliance. Some synergy groups we participate in are the Vulcan Areas Public and Petroleum Association (VAPPA), West Central Stakeholder Association, Calumet Synergy Group, Lakeland Industry and Community Association (LICA) and Beaver River Watershed Alliance.

## Investing in Communities

Canadian Natural's teams work together with our local stakeholders to understand their priorities, so we can focus on projects that have a direct impact on their quality of life and well-being, promoting long-term local growth and prosperity. In this way, we can help local grassroots efforts that get right to the heart of the issues in the communities we care about.

In 2017, Canadian Natural's community investments totaled \$12.4 million including corporate sponsorships and donations, employee giving and corporate matching, in-kind donations and funding for community-based development projects. Our community investment programs mainly focus on health and wellness, education and training, social programs, cultural events, and traditional practices.

## Significant Community Investments

- \$3.2 million donated to STARS as part of our long-term support for life-saving care in the communities.
- \$2 million over five years to the Calgary-based **RESOLVE** campaign to find long-term solutions to homelessness.
- \$625,000 in 2017 to the Northern Lights Health Foundation to support renovations of the Continuing Care Unit in the Northern Lights Regional Health Centre in Fort McMurray, and the Community Clinic in Conklin.

Canadian Natural continues to support health and wellness initiatives, including our recent donation to the Hub Family Resource Centre in Fort McMurray that went to ongoing efforts to assist those who continue to experience effects from the wildfire in 2016. We also partnered with Calgary's Fresh Start Recovery Centre to fund five years of their recovery treatment program for Indigenous men. Our long-term commitments include organizations such as the Canadian Women's Foundation and the Sheldon Kennedy Child Advocacy Centre in Calgary, the Child Development Centre in Fort St. John, the Olive Tree in Lloydminster and Cornerstone in Aberdeen.

## Employees Making a Difference

Employees across Canadian Natural continue to show their leadership and generosity volunteering their time and skills, organizing fundraisers and contributing to individuals and families

**\$12.4 million**

invested in communities

**\$370 million**

in contracts with  
Indigenous businesses

in the areas where they live and work. Canadian Natural's management takes pride in supporting these efforts.

In 2017:

- \$2.2 million was donated to the United Way through employee donations and corporate matching.
- More than \$180,000 was raised to support over 30 local organizations across our operations through our Field Matching donation program, providing direct funding to local agencies identified each year by our field-based staff. Recipients included the Fort St. John Hospital Foundation, Ronald McDonald House and the Stollery Children's Hospital in Western Canada, as well as Archway and MacMillan Cancer Support in the UK.
- Over 900 employees throughout the company volunteered their time to raise money and support local agencies, including 22,000 sandwiches made for the Calgary Drop-In and Rehab Centre.

In addition to our year-round support to a range of organizations, our best efforts are made every year to help Christmas wishes come true for the most vulnerable members of the communities. Our teams work with neighbouring communities to support and donate much needed hampers, holiday treats and presents. From Western Canada to our UK operations, our employees continue to support a significant number of families, seniors and food banks.

# Working Together with Communities

## Safety Beyond Our Worksites

We are proud to work with local first responders to help provide a safe environment and a safety net in the areas we live and work. For example, our donation to the Britannia Fire Department in Lloydminster will go towards a new training facility in response to environmental regulations in Saskatchewan. We contributed towards a fire truck to the Macklin and District Volunteer Fire Department, and contributed towards the Lloydminster Rescue Squad purchase of an underwater remotely operated vehicle. We also donated funds received for scrap metal recycling to Hilda & Community Association to assist the victims of the wildfires, and supported the Fox Valley Volunteer Fire Department fundraiser dinner held for injured and fallen firefighters.

## Supporting Education and Training

Canadian Natural supports education and training programs designed to train and employ local people in the oil and natural gas industry.

In 2017, we hired 329 university and college students for summer/co-operative work terms, and supported another 106 students through our Canadian Natural Building Futures Scholarship that aids students enrolled in industry-related disciplines, including Indigenous scholarships. We continued our scholarship commitments to the Lakeland College (through our St. Albert office), the Robert Gordon University and University of Aberdeen (providing financial support, mentorship and work placement opportunities), and to the Northeast British Columbia Stay in School program for Treaty 8 First Nations.

## Highlights of 2017 Investments in Education and Training

- \$7 million over five years to the University of Calgary's **Canadian Natural Resources Limited Engineering Complex**, which officially

opened in 2016.

- \$460,000 funding over five years to the APPLE Schools nutrition program for many vulnerable school populations in northeast Alberta, as well as the expansion of the program into Northeast British Columbia.
- Supported Truth and Reconciliation Training for Keyano College leaders in Fort McMurray, to support local reconciliation through the post-secondary learning process.
- Continued our partnership with **Careers: the Next Generation** and offered internships to another eight high school students at our Grand Prairie and Fairview, Alberta field operations.
- Horizon's Apprenticeship Program to date has a total of nine graduates (six heavy equipment technicians and three electricians).
- Our staff also volunteered at the Northern Lights School District's Science Olympics in Lac La Biche and Cold Lake.



**Tiny Homes** project, in partnership with NEAAI, at Whitefish Lake First Nation.

## Supporting Trades and Employment Opportunities

Apprenticeship training is an important way to help prepare individuals for a career in the trades. Over the past five years, Canadian Natural has been supporting the work of Northeast Alberta Apprenticeship Initiative (NEAAI) and their mission to develop a skilled workforce in Alberta. Building on a strong alliance

with Indigenous, industry, academic and government leaders through the NEAAI in partnership with the Tribal Chiefs Employment & Training Services Association (TCETSA) **Tiny Homes** project, we have been working to provide apprenticeship opportunities locally while contributing toward meeting local housing needs.

## Promoting Local Business Development

Business development within the areas where we operate fosters sustainable communities and builds local capacity. Canadian Natural works together with local and regional companies to provide opportunities for the procurement of goods and services for our operations, and to increase social and economic participation. Hiring qualified local employees and suppliers adds mutual value for the communities where we operate and our Company.

We work closely with more than 75 Indigenous communities near our operations in Western Canada to enhance business and to assist in the pre-qualification process. Canadian Natural awarded more than \$370 million in contracts to Indigenous businesses and contractors in 2017. We continue to work with Indigenous companies to enhance local business development and identify opportunities for economic participation in our oil and natural gas developments.

We remain an active member of the Northeastern Alberta Aboriginal Business Association (NAABA), the Region One Aboriginal Business Association (ROABA), the Atoske Action Group (AAG) and the Grande Prairie Aboriginal Circle of Services (GPACOS).

We also work with local Chambers of Commerce in order to maximize opportunities for economic participation in operating communities. Our participation in these groups is an important way to stay connected with communities and service providers, and also relay key issues back to all levels of government.

## Working With Locally-Owned Indigenous Businesses

At Canadian Natural, we are proud of working with local companies that share our same values. We have been in the Wabasca-Desmerais area for 22 years, and work with many Bigstone Cree Nation (BCN) businesses that are a vital source of community-based skills training, investment and prosperity. They have supported the development of seasonal workers into a skilled workforce prepared to work on day-to-day operations, from well maintenance to facility and pipeline construction. Eric

Auger & Sons Contracting, for example, started in the logging business back in the 70's, and transitioned to oil and natural gas to be able to thrive, stay in their communities and continue to create local employment. Schroder Oilfield Services is another important employer in the region, sharing with others a mission to develop people, focusing on training and employing BCN band members.

At our Kirby South thermal operations, the breadth and depth of expertise and

services offered by local contractors working with us during construction and operations development is extensive. Crude Energy Services Inc., for example, is a majority First Nation owned field services and fabrication company with a big sense of community.

"The employment we provide supports 70 families. I have always measured Crude Energy's success by the number of families our employment supports," says President Peter Mahowich, a Beaver Lake Cree Nation band member.

Priorities in 2017	Progress in 2017	Priorities in 2018
<b>Engaging Stakeholders</b>		
<ul style="list-style-type: none"> <li>Continue to improve community engagement with operating communities through action plans for all districts.</li> <li>Strengthen relationships with local stakeholders through continued engagement.</li> </ul>	<ul style="list-style-type: none"> <li>Completed review of district plans for all operating areas and set action plans for 2018.</li> <li>Continued to improve stakeholder engagement tracking by area, to better support the communities.</li> <li>Engaged regularly with stakeholders across our operating areas, and met face-to-face with all new stakeholders in connection to the Athabasca Oil Sands Project (AOSP) acquisition.</li> <li>Continued to work with government, municipalities, non-governmental groups and community members to maintain efficient and sustainable operations that support positive impacts in the communities.</li> </ul>	<ul style="list-style-type: none"> <li>Continue to strengthen relationships with local stakeholders through continued engagement and communications.</li> <li>Implement district plans together, with enhanced tracking and reporting on community activities.</li> <li>Work with project teams to meet consultation requirements.</li> <li>Continue work with stakeholders to support reasonable and effective implementation of policies and regulations.</li> </ul>
<b>Community Investment</b>		
<ul style="list-style-type: none"> <li>Invest in priority funding areas: education, health and wellness, sports and recreation, social and cultural programs.</li> </ul>	<ul style="list-style-type: none"> <li>\$12.4 million in community investments.</li> <li>\$2.2 million donated to the United Way through employee donations and corporate matching.</li> <li>Long-term commitments to health and wellness, education and training, and social programs, including the University of Calgary, STARS, Northern Lights Regional Health Centre, RESOLVE Campaign, and the APPLE School Foundation.</li> </ul>	<ul style="list-style-type: none"> <li>Invest in priority funding areas: education, health and wellness, sports and recreation, social and cultural programs.</li> </ul>
<b>Education and Training</b>		
<ul style="list-style-type: none"> <li>Support education and training initiatives aligned with future employment opportunities in the oil and natural gas industry.</li> </ul>	<ul style="list-style-type: none"> <li>Invested in education and training programs that support local employment, including in-house apprenticeships and the Northeast Alberta Apprenticeship Initiative (NEAAI) in partnership with Tiny Homes.</li> <li>106 students in our operating areas, including Indigenous communities, received Canadian Natural Building Futures Scholarships to support their career goals.</li> <li>Provided career path and employment opportunity information to communities we work with.</li> </ul>	<ul style="list-style-type: none"> <li>Support education and training initiatives aligned with future employment opportunities in the oil and natural gas industry.</li> </ul>
<b>Business Development</b>		
<ul style="list-style-type: none"> <li>Enhance the opportunities for economic participation by Indigenous communities in our operations.</li> </ul>	<ul style="list-style-type: none"> <li>Over \$370 million in contracts awarded to Indigenous businesses and contractors.</li> <li>As a result of the AOSP acquisition, and successful transition of agreements with Indigenous communities, we increased the number of Indigenous communities we work with from 55 to 75.</li> <li>Continued to enhance tracking and reporting by operating area, including new Indigenous businesses and contractors, increasing knowledge and sourcing from local businesses.</li> </ul>	<ul style="list-style-type: none"> <li>Enhance the opportunities for economic participation by Indigenous communities in our operations, building capacity among local Indigenous-owned companies and individual entrepreneurs.</li> </ul>



# Performance Data

2017 performance data includes Athabasca Oil Sands Project (AOSP) operations (acquired in 2017) from June 1 onward. North American Exploration and Production includes Peace River Complex, and Oil Sands Mining and Upgrading includes AOSP mines (bitumen production).

## EMPLOYMENT DISTRIBUTION OF CANADIAN NATURAL EMPLOYEES

Number of employees	2014	2015	2016	2017
North America Exploration and Production	4,751	4,513	4,210	4,496
Oil Sands Mining and Upgrading	2,486	2,651	2,667	5,097
International Exploration and Production	420	404	393	380
TOTAL	7,657	7,568	7,270	9,973

Exposure hours (millions) — based on a 12-hour shift	2014	2015	2016	2017
North America Exploration and Production	59.14	40.70	34.83	42.18
Oil Sands Mining and Upgrading	23.08	29.44	28.98	34.05
International Exploration and Production	4.77	5.78	4.29	3.90
TOTAL	86.99	75.92	68.10	80.13

## SAFETY

Total Recordable Injury Frequency (TRIF) per 200,000 hours worked (employees and contractors)	2014	2015	2016	2017
North America Exploration and Production	0.61	0.44	0.44	0.38
Oil Sands Mining and Upgrading	0.81	0.57	0.49	0.38
International Exploration and Production	1.84	1.45	1.12	1.33
Corporate	0.73	0.57	0.50	0.43

Lost Time Incident (LTI) frequency per 200,000 exposure hours	2014	2015	2016	2017
Corporate	0.11	0.05	0.06	0.06

LTI is an injury incident where a worker is unable to return to work the next scheduled day.

Fatalities – Employees	2014	2015	2016	2017
North America Exploration and Production	0	0	0	0
Oil Sands Mining and Upgrading	1	0	0	0
International Exploration and Production	0	0	0	0

Fatalities – Contractors	2014	2015	2016	2017
North America Exploration and Production	0	0	0	0
Oil Sands Mining and Upgrading	0	0	0	0
International Exploration and Production	0	0	0	0

Regulatory inspections compliance (% satisfactory)	2014	2015	2016	2017
Alberta	87.4	83.6	84.7	84.2
British Columbia	88.2	81.5	89.7	86.0

## AIR AND GHG EMISSIONS

The Company's GHG emission estimates are prepared internally using reported production volumes and generic emission factors. Only a portion of the direct GHG emissions have been verified externally. Direct GHG emissions reporting is based on operational control, excluding non-operated emissions.

Direct GHG emissions from fuel consumption (million tonnes CO <sub>2</sub> e)	2014	2015	2016	2017
North America Exploration and Production	7.65	7.44	8.70	9.43
Oil Sands Mining and Upgrading	2.27	2.31	2.16	3.38
International Exploration and Production	1.12	1.21	1.17	1.04

Self-generated electricity. Includes GHG emissions generated from operated cogeneration plants.

Indirect GHG emissions (million tonnes CO <sub>2</sub> e) <sup>1</sup>	2014	2015	2016	2017
North America Exploration and Production				
Electricity consumption (TWh)	2.26	2.46	2.44	2.63
Indirect GHG emissions	1.52	1.47	1.50	1.69
Oil Sands Mining and Upgrading <sup>2</sup>				
Electricity consumption (TWh)	0.24	0.40	0.45	1.07
Electricity Indirect GHG emissions	0.18	0.30	0.29	0.30
Steam Imports (PJ)	-	-	-	11.06
Steam indirect GHG emissions	-	-	-	0.70
Total indirect GHG emissions	-	-	-	1.00

(1) Purchased electricity.

(2) Includes AOSP electricity, which is mostly sourced and steam imported from a third-party cogeneration plant.

Direct GHG emissions (million tonnes CO <sub>2</sub> e) <sup>1</sup>	2014	2015	2016	2017
North America Exploration and Production	14.14	13.75	12.84	13.30
Oil Sands Mining and Upgrading	3.69	3.92	3.91	5.79
International Exploration and Production	1.61	2.11	2.03	1.79

(1) Includes total direct emissions from combustion, flaring, formation CO<sub>2</sub>, and other venting and fugitive leaks from equipment.

## EMISSIONS INTENSITY

Direct GHG emissions intensity (tonnes CO <sub>2</sub> e/BOE) <sup>1</sup>	2014	2015	2016	2017
North America Exploration and Production	0.060	0.056	0.057	0.058
Oil Sands Mining and Upgrading <sup>2</sup>	0.084	0.080	0.079	0.044
International Exploration and Production	0.094	0.082	0.067	0.067
Corporate	0.065	0.061	0.061	0.055

(1) Includes total direct emissions from combustion, flaring, formation CO<sub>2</sub>, and other venting and fugitive leaks from equipment.

(2) Combined emissions intensity of Horizon's synthetic crude oil and AOSP's bitumen production.

## FLARING AND VENTING

Total natural gas flared (10 <sup>3</sup> m <sup>3</sup> )	2014	2015	2016	2017
North America Exploration and Production	132,917	81,947	95,217	100,504
Oil Sands Mining and Upgrading <sup>1</sup>	32,942	46,238	27,267	24,536
International Exploration and Production	188,073	354,775	296,339	292,458

(1) Flaring at Oil Sands Mining and Upgrading operations is associated with turnaround downtimes.

Total natural gas vented (10 <sup>3</sup> m <sup>3</sup> )	2014	2015	2016	2017
North America Exploration and Production	259,283	190,301	126,898	109,093

NOx emissions (tonnes)	2014	2015	2016	2017
North America Exploration and Production	46,178 <sup>1</sup>	52,288 <sup>1</sup>	56,231 <sup>1</sup>	54,086
Oil Sands Mining and Upgrading	4,696	5,954	6,662	12,189
International Exploration and Production <sup>2</sup>	2,186	2,349	2,732	2,118

(1) Increase in emissions due to natural gas asset acquisitions.

(2) UK only.

SOx emissions (tonnes)	2014	2015	2016	2017
North America Exploration and Production	5,567	5,633	5,994	6,639
Oil Sands Mining and Upgrading	2,993	3,968	3,409	2,419
International Exploration and Production <sup>1</sup>	260	210	246	149

(1) UK only.

## LAND

Facility decommissioning, North America Exploration and Production	2014	2015	2016	2017
Number of facilities removed	25	32	17	58
Number of site remediations projects completed and ready for reclamation	6	12	12	4
Number of ongoing remediation projects	204	172	131	217

# Performance Data

Well abandonment and reclamation	2014	2015	2016	2017
North America Exploration and Production				
Number of active operated wells	42,279	52,149 <sup>1</sup>	50,736	53,013 <sup>1</sup>
Number of inactive operated wells <sup>2</sup>	16,459	18,480	21,433	23,292
Number of wells abandoned	545	519	406	771
Number of reclamation certificates submitted	337	357	604	604
Hectares reclaimed (reclamation certifications received) <sup>3</sup>	760	477	2,329	1,273
Oil Sands Mining and Upgrading				
Hectares reclaimed	30	68	78	125

(1) Increase in active operated wells as a result of asset acquisitions.

(2) We use the Alberta Energy Regulator definition for inactive well sites.

(3) We have reclaimed 6,810 hectares since 2010.

## WATER

Total water withdrawal from source (m³), North America Exploration and Production	2014	2015	2016	2017
Fresh water total	5,419,975	6,594,280	7,786,485	10,256,752
Surface water	NR	2,531,127	3,619,139	5,702,291
Ground water	NR	4,063,153	4,167,346 <sup>1</sup>	4,554,461
Saline water	10,582,587	8,108,546	8,574,991 <sup>1</sup>	7,695,305
Produced water recycled <sup>2</sup>	21,596,165	26,863,473	28,872,346	34,755,269

NR = Not Reported (new breakdown initiated in 2015 to improve reporting and address the Global Reporting Initiative (GRI) standards).

(1) 2016 increase in fresh ground and saline water volumes partly due to new reporting requirements in British Columbia.

(2) For major thermal (Kirby South and Primrose/Wolf Lake) and polymer flood (Pelican Lake) operations only. The produced water recycled calculation used is produced water minus produced water disposed.

Total water withdrawal by source (m³), Oil Sands Mining/Upgrading	2014	2015	2016	2017
Fresh water total <sup>1</sup>	21,409,907	22,762,481	17,837,887	68,940,136
Surface water	21,409,907	22,762,481	17,837,887	63,412,147
Ground water	-	-	-	5,527,989
Saline water <sup>2</sup>	797,719	1,147,240	986,002	284,965

(1) 2017 data are water withdrawals from the Athabasca River and all other surface water sources for Horizon and AOSP mines. Reported data for previous years are water withdrawals from the Athabasca River for Horizon. Fresh water withdrawals remain well below authorized withdrawal limits.

(2) Includes water used in AOSP's production process, and Horizon's saline water which is a byproduct of our mining operations and used for depressurization.

Total water discharge (tonnes), International Exploration and Production	2014	2015	2016	2017
North Sea	20,609,657	18,633,813	21,231,547	19,010,686
Offshore Africa	1,841,600	1,703,342	1,622,168	1,644,372

Oil in water content (mg/l), International Exploration and Production	2014	2015	2016	2017
North Sea <sup>1</sup>	15.81	15.56	16.65	16.67
Offshore Africa	13.47	11.57	14.29	11.03

(1) Oil in water content remains well below regulatory requirement of <30 mg/l.

## SPILLS

Number of reportable spills <sup>1</sup>	2014	2015	2016	2017
North America Exploration and Production	376	273	241	270
Oil Sands Mining and Upgrading	84 <sup>2</sup>	39	42	102 <sup>2</sup>
International Exploration and Production	16	12	14	10

(1) Reported to regulatory agencies, according to jurisdictional requirements, including oil, produced water and refined products.

(2) Includes AOSP mines. Majority of spills are from tailings lines, consisting of water, sand, silt, and trace oil – in contained areas.



Volume spilled (m³) <sup>1</sup>	2014	2015	2016	2017
North America Exploration and Production	3,151	1,459	1,998	2,122
Oil Sands Mining and Upgrading	3,690	20,111 <sup>2</sup>	2,749	9,239 <sup>3</sup>
International Exploration and Production	0.33	11.78	0.79	1.29

(1) Reported to regulatory agencies, according to jurisdictional requirements, including oil, produced water and refined products.

(2) One fresh water release accounted for most of the volume (18,760 m³); this release was effectively contained and pumped back into our bitumen extraction process.

(3) Includes AOSP mines. Majority of spills are from tailings lines (low risk spills, consisting of water, sand, silt and trace oil) and occurred in contained areas on our sites, which were immediately cleaned up without any adverse environmental impacts.

Number of spills and leaks/production (MMBOE)	2014	2015	2016	2017
North America Exploration and Production	1.60	1.10	1.06	1.18
Oil Sands Mining and Upgrading	2.07	0.85	0.92	0.86 <sup>1</sup>
International Exploration and Production	0.94	0.47	0.46	0.37

(1) Includes AOSP mines. Majority are from tailings lines and consisted of water, sand, silt, and trace oil – in contained areas.

Volume spilled or leaked/production (m³/MMBOE)	2014	2015	2016	2017
North America Exploration and Production	13.4	5.9	8.8	9.3
Oil Sands Mining and Upgrading	91.0	440.6 <sup>2</sup>	60.0	77.6 <sup>1</sup>
International Exploration and Production	0.02	0.5	0.03	0.05

(1) Includes AOSP mines. Majority of spills are from tailings lines (low risk spills, consisting of water, sand, silt and trace oil) and occurred in contained areas on our sites, which were immediately cleaned up without any adverse environmental impacts.

(2) Includes fresh water release of 18,760 m³ that was effectively contained and pumped back into our bitumen extraction process.

Number of leaks/1,000 km pipeline	2014	2015	2016	2017
North America Exploration and Production	1.94	1.79	1.60	1.49

## WASTE

Weight of waste (tonnes)	2014	2015	2016	2017
North America Exploration and Production				
<i>Hazardous waste</i> - Off-site disposal (third-party)	50,258	56,945	61,727	55,419
<i>Non-hazardous waste</i>	925,169	1,754,612 <sup>1</sup>	1,778,053	2,303,230
On-site disposal (owned)	NR	812,456	1,048,639	1,582,999
Off-site disposal (third-party)	NR	942,156	729,414	720,231
Oil Sands Mining and Upgrading				
<i>Hazardous waste</i> - Off-site disposal (third-party)	947	165	82	153
<i>Hazardous waste recycled</i>	-	380	1,236	5,958
<i>Non-hazardous waste</i>	10,898	20,668	21,426	15,527
On-site disposal (owned)	NR	18,035	14,280 <sup>1</sup>	10,662
Off-site disposal (third-party)	NR	543	368	2,450
<i>Non-hazardous waste recycled</i>	-	7,200	8,260	22,042
International Exploration and Production <sup>2</sup>				
<i>Hazardous waste</i>	599	814	55	94
<i>Hazardous waste recycled</i>	272	268	70	31
<i>Non-hazardous waste</i>	408	1,530	254	437
<i>Scrap metal recycled (Murchison decommissioning project)</i>	-	3,576	8,628	15,500
<i>Other non-hazardous waste recycled</i>	886	706	788	670

NR = not reported (new breakdown initiated in 2015 to improve reporting and better address GRI standards).

Numbers include fluid and solid waste based on a conversion of all volumes to tonnes.

Waste information focuses on oilfield waste. Oil Sands Mining and Upgrading operations data also includes domestic waste (generated by human habitation), which goes to landfills (small quantities).

Hazardous waste includes streams such as tank clean out fluids and sludge, wastewater treatment and solids, filter cake, spent lubricating oil and filters and other substances.

Non-hazardous waste includes oilfield waste such as hydrocarbon and salt impacted soils, drilling waste and produced sand.

Hazardous and non-hazardous waste numbers from 2014 to 2016 have been restated to remove the recyclables. Waste sent to recycling facilities, includes empty containers, lube oil, batteries, filters, tires, scrap metal and other miscellaneous recyclables.

(1) Restated due to corrections.

(2) All CNRI waste is disposed of/treated at third-party facilities. Ninian South has a dedicated drill cuttings re-injection well, therefore no drilling waste is sent to shore.

**Our 2017 Report to Stakeholders includes consolidated social, economic and environmental disclosures from the Global Reporting Initiative (GRI) Sustainability Reporting Standards and the Oil and Gas Sector Supplement. For additional GRI disclosures, a GRI content index and more information on sustainability reporting, please refer to the Corporate Responsibility section of our website.**

**We welcome your comments and suggestions on this report.  
Canadian Natural produces a separate Annual Report, which is also available online.**



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### **Forward Looking Statements**

Certain statements relating to Canadian Natural Resources Limited (the "Company") in this document or documents incorporated herein by reference constitute forward-looking statements or information (collectively referred to herein as "forward-looking statements") within the meaning of applicable securities legislation. Forward-looking statements can be identified by the words "believe", "anticipate", "expect", "plan", "estimate", "target", "continue", "could", "intend", "may", "potential", "predict", "should", "will", "objective", "project", "forecast", "goal", "guidance", "outlook", "effort", "seeks", "schedule", "proposed" or expressions of a similar nature suggesting future outcome or statements regarding an outlook. Disclosure related to expected future commodity pricing, forecast or anticipated production volumes, royalties, production expenses, capital expenditures, income tax expenses and other guidance provided throughout the Company's Management's Discussion and Analysis ("MD&A") of the financial condition and results of operations of the Company, constitute forward-looking statements. Disclosure of plans relating to and expected results of existing and future developments, including but not limited to the Horizon Oil Sands ("Horizon") operations and future expansions, the Athabasca Oil Sands Project ("AOSP"), Primrose thermal projects, the Pelican Lake water and polymer flood project, the Kirby Thermal Oil Sands Project, the cost and timing of construction and future operations of the North West Redwater bitumen upgrader and refinery, construction by third parties of new or expansion of existing pipeline capacity or other means of transportation of bitumen, crude oil, natural gas or synthetic crude oil ("SCO") that the Company may be reliant upon to transport its products to market, development and deployment of technology and technological innovations and the assumption of operations at processing facilities also constitute forward-looking statements. This forward-looking information is based on annual budgets and multi-year forecasts, and is reviewed and revised throughout the year as necessary in the context of targeted financial ratios, project returns, product pricing expectations and balance in project risk and time horizons. These statements are not guarantees of future performance and are subject to certain risks. The reader should not place undue reliance on these forward-looking statements as there can be no assurances that the plans, initiatives or expectations upon which they are based will occur.

In addition, statements relating to "reserves" are deemed to be forward-looking statements as they involve the implied assessment based on certain estimates and assumptions that the reserves described can be profitably produced in the future. There are numerous uncertainties inherent in estimating quantities of proved and proved plus probable crude oil, natural gas and natural gas liquids ("NGLs") reserves and in projecting future rates of production and the timing of development expenditures. The total amount or timing of actual future production may vary significantly from reserve and production estimates.

The forward-looking statements are based on current expectations, estimates and projections about the Company and the industry in which the Company operates, which speak only as of the date such statements were made or as of the date of the report or document in which they are contained, and are subject to known and unknown risks and uncertainties that could cause the actual results, performance or achievements of the Company to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Such risks and uncertainties include, among others: general economic and business conditions which will, among other things, impact demand for and market prices of the Company's products; volatility of and assumptions regarding crude oil and natural gas prices; fluctuations in currency and interest rates; assumptions on which the Company's current guidance is based; economic conditions in the countries and regions in which the Company conducts business; political uncertainty, including actions of or against terrorists, insurgent groups or other conflict including conflict between states; industry capacity; ability of the Company to implement its business strategy, including exploration and development activities; impact of competition; the Company's defense of lawsuits; availability and cost of seismic, drilling and other equipment; ability of the Company and its subsidiaries to complete capital programs; the Company's and its subsidiaries' ability to secure adequate transportation for its products; unexpected disruptions or delays in the resumption of the mining, extracting or upgrading of the Company's bitumen products; potential delays or changes in plans with respect to exploration or development projects or capital expenditures; ability of the Company to attract the necessary labour required to build its thermal and oil sands mining projects; operating hazards and other difficulties inherent in the exploration for and production and sale of crude oil and natural gas and in mining, extracting or upgrading the Company's bitumen products; availability and cost of financing; the Company's and its subsidiaries' success of exploration and development activities and its ability to replace and expand crude oil and natural gas reserves; timing and success of integrating the business and operations of acquired companies and assets; production levels; imprecision of reserve estimates and estimates of recoverable quantities of crude oil, natural gas and NGLs not currently classified as proved; actions by governmental authorities; government regulations and the expenditures required to comply with them (especially safety and environmental laws and regulations and the impact of climate change initiatives on capital expenditures and production expenses); asset retirement obligations; the adequacy of the Company's provision for taxes; and other circumstances affecting revenues and expenses.

The Company's operations have been, and in the future may be, affected by political developments and by national, federal, provincial and local laws and regulations such as restrictions on production, changes in taxes, royalties and other amounts payable to governments or governmental agencies, price or gathering rate controls and environmental protection regulations. Should one or more of these risks or uncertainties materialize, or should any of the Company's assumptions prove incorrect, actual results may vary in material respects from those projected in the forward-looking statements. The impact of any one factor on a particular forward-looking statement is not determinable with certainty as such factors are dependent upon other factors, and the Company's course of action would depend upon its assessment of the future considering all information then available.

Readers are cautioned that the foregoing list of factors is not exhaustive. Unpredictable or unknown factors not discussed in the Company's MD&A could also have material adverse effects on forward-looking statements. Although the Company believes that the expectations conveyed by the forward-looking statements are reasonable based on information available to it on the date such forward-looking statements are made, no assurances can be given as to future results, levels of activity and achievements. All subsequent forward-looking statements, whether written or oral, attributable to the Company or persons acting on its behalf are expressly qualified in their entirety by these cautionary statements. Except as required by applicable law, the Company assumes no obligation to update forward-looking statements, whether as a result of new information, future events or other factors, or the foregoing factors affecting this information, should circumstances or the Company's estimates or opinions change.