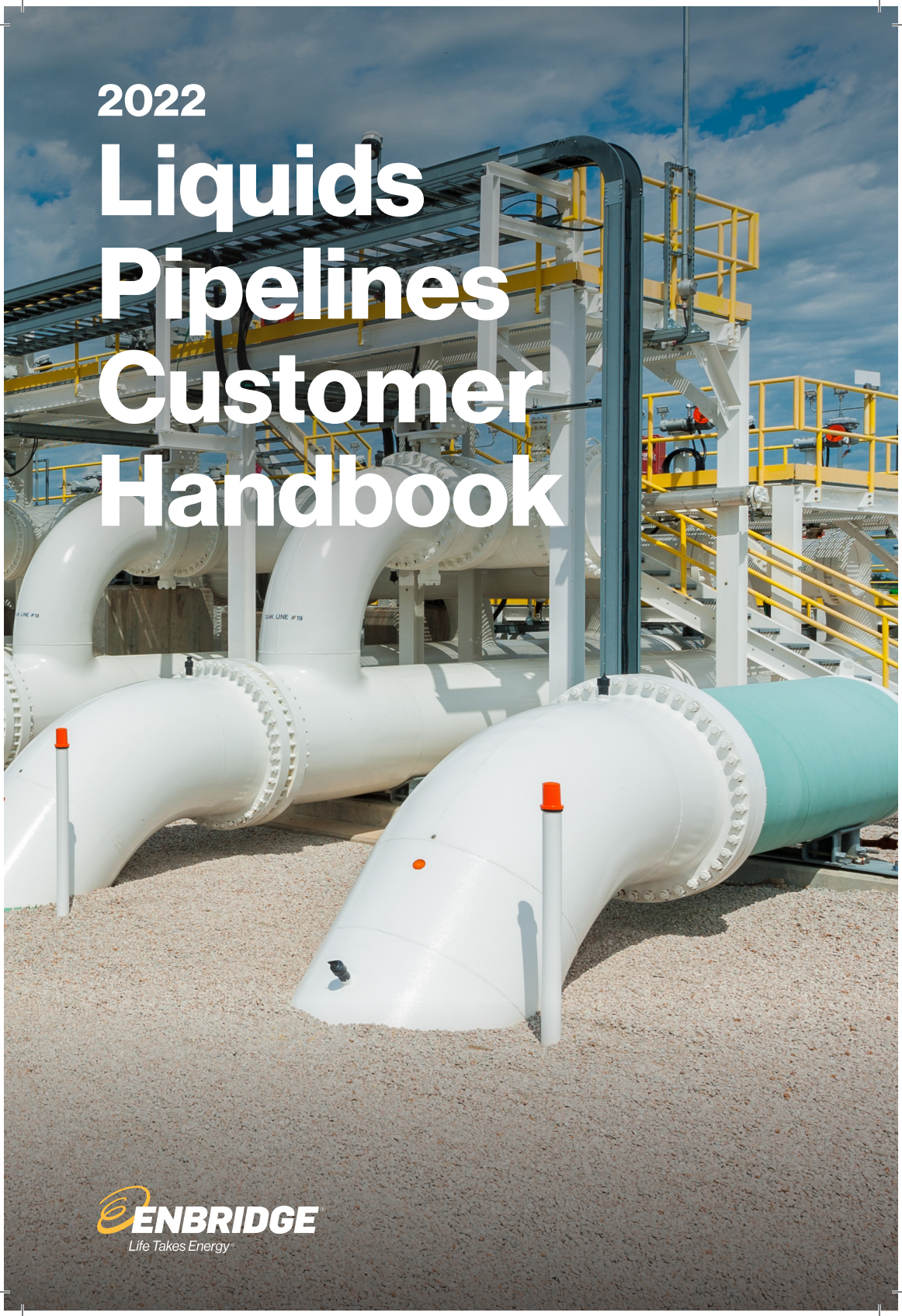
2022

Liquids Pipelines Customer Handbook



ENBRIDGE

Life Takes Energy

Forward-looking Information

This booklet includes references to forward-looking information. Although Enbridge believes these forward-looking statements are reasonable, based on the information available on the date such statements are made, they are not guarantees of future performance or outcomes.

Front and back cover:
Enbridge's Flanagan Terminal near Pontiac, IL, an important hub in our North American energy infrastructure.

Table of contents

4 **President's message**

6 **Meeting the needs of our customers**

8 **North American supply overview**

10 **The Enbridge Mainline**

- 10 Mainline System capacity
- 11 Recent expansions and capacity recovery
- 14 System optimization
- 15 Mainline tolls

16 **Oil sands infrastructure**

- 16 Existing
- 17 Development

18 **Market access**

- 18 Eastern Access
- 19 Southern Access Extension
- 20 Spearhead Pipeline
- 21 USGC Access
- 22 Sea Port Oil Terminal
- 23 Enbridge Ingleside Energy Center

24 **Express/Platte**

25 **Bakken infrastructure**

26 **Non-regulated contract terminals**

29 **Diluent access**

30 **Low-carbon development**

32 **Pipeline System Configuration**

33 **Oil Sands Regional System Configuration**

Maps

- Commodity Movement Map
- Athabasca Major Pipelines
- Major Canadian and U.S. Crude Oil Pipelines and Refineries

Life takes energy

At Enbridge, we exist to help fuel the quality of life for millions of people. We are a leading North American energy infrastructure company, connecting supply with growing markets through our liquids pipelines, natural gas pipelines, gas utilities and renewable power generation businesses.

> The Enbridge Ingleside Energy Center (EIEC) near Corpus Christi, TX, which was acquired by Enbridge in October 2021.

Life takes energy

Enbridge transports about 30% of the crude oil produced in North America and 20% of the natural gas consumed in the U.S. We operate North America's largest natural gas utility by volume; we were an early investor in renewable energy, and we have a growing offshore wind portfolio.

Liquids pipelines

Enbridge operates the world's longest and most complex crude oil and liquids transportation system—with approximately 17,800 miles (28,700 kilometers) of active crude pipeline across North America—and delivers more than 3 million barrels of crude oil and liquids, safely and reliably, every day. In 2021, we acquired North America's largest crude export terminal with capacity to move 1.6 million barrels per day (MMbpd). Additionally, we announced the development of the Open Access Wabamun Carbon Hub in central Alberta to advance safe, cost-effective, customer-focused carbon capture, transportation and storage solutions.

Natural gas pipelines

Enbridge's gas transmission and midstream pipelines cover about 75,700 miles (121,800 km) in 30 U.S. states, five Canadian provinces and offshore in the Gulf of Mexico. We transport more than 21 billion cubic feet per day (Bcf/d) of natural gas through an array of long-haul pipelines, and have about 440 Bcf of natural gas storage capacity across North America.

Gas utilities and storage

Enbridge's natural gas utility is the third largest in North America by customer count and largest in North America by volume, distributing about 4.9 Bcf/d of natural gas every day. Enbridge Gas Inc. and its affiliates serve 15 million customers in Ontario and Quebec through 3.8 million residential, commercial, institutional and industrial meter connections.

Renewable energy

Since 2002, we have committed more than C$8 billion in capital to renewable energy and power transmission projects currently in operation or under construction. Our renewable energy portfolio includes wind, solar, geothermal and waste heat recovery facilities. These projects, either operating or under construction, have the capacity to generate about 2,172 megawatts (MW) net of zero-emission energy and meet the electricity needs of about 960,000 homes.

Enbridge was named among the Thomson Reuters Top 100 Global Energy Leaders in 2018; we won the 2022 Catalyst Award for our groundbreaking initiatives in advancing opportunities for women and underrepresented groups; we've been selected to Bloomberg's Gender Equality Index four years running, most recently in 2022; and we have been ranked among Canada's Top 100 Employers 19 times, most recently in 2022.

Enbridge Inc. is headquartered in Calgary, Canada. We have a workforce of more than 12,000 people, primarily in Canada and the United States. Enbridge (ENB) is traded on the New York and Toronto stock exchanges.

Colin Gruending
Executive Vice President &
President, Liquids Pipelines,
Enbridge Inc.

Every day we add value for our broad customer base.

Our integrated system connects producers to key markets and refiners to critical feedstock, and we remain committed to our foundation—to deliver safe and reliable solutions to our customers.

In 2022, we'll continue to serve our customers by focusing on:

Safety and reliability

Our liquids system has a proven track record of delivering solutions and outstanding service, while maintaining a strong commitment to safety and operational reliability. We have delivered the Line 3 Replacement Program (L3RP), which is now in full service. This reflects our successful performance, prudent investment, team vigilance and effective health protocols throughout this project and during the pandemic.

Optimize throughput

Prior to Line 3 being replaced, we've efficiently added incremental capacity on the Mainline of 400,000 barrels per day (bpd) through optimization initiatives. In December 2021, we delivered a record Mainline volume of 3.135 MMbpd and have fully restored capacity for our customers with the completion of Line 3 (now Line 93). Line 93 has also provided the industry with much needed egress during a robust commodity price environment. In the oil sands, we've also

added capacity for producers to grow into. We stay focused on maximizing volume and operating efficiencies to increase throughput on all our assets.

Mainline tolling

We're focused on the Canadian Mainline System's tolling agreement and are reengaged with stakeholders on negotiations. We're confident we'll find the right risk-reward balance with customers on the Mainline tolling framework.

Line 5

We're committed to making a safe pipeline even safer and will continue to pursue the Line 5 Great Lakes Tunnel Project in Michigan. This strategic project is an economic and energy lifeline on both sides of the border, serving critical markets and providing more stability for egress. We expect the permitting review processes to continue throughout 2022 and we'll continue to operate Line 5 safely.

Growth opportunities

Our growth strategies are efficient, executable and disciplined. We're providing more access to southern markets with the expansion of Express Pipeline, Flanagan South Pipeline (FSP) and Enbridge Houston Oil Terminal (EHOT). Our system is poised to meet the additional need for connected infrastructure.

We acquired the Enbridge Ingleside Energy Center (EIEC) from Moda, adding North America's largest energy export facility to our portfolio. EIEC advances our U.S Gulf Coast (USGC) export strategy and provides our customers with efficient export solutions from growing Permian and Eagle Ford supply.

ESG

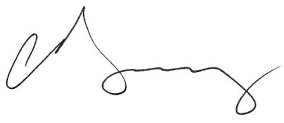
Our environmental, social and governance (ESG) goals are ambitious. We see low-carbon infrastructure as an important growth platform for our business. We are focused on both lowering our own emissions and investing in ways to help decarbonize our customers and other emitters. Carbon capture utilization and storage (CCUS) will be a big piece of that puzzle, and Enbridge is well positioned to support that buildout.

Our employees take great pride in understanding your business drivers. We're dedicated to continuing to add value for our customers by helping you meet current and growing demand for energy.

We appreciate your business and trust in our team.

Sincerely,

Colin



Providing safe and reliable solutions for our customers is our foundation.

For more than 70 years, Enbridge has grown from a single pipeline to the largest, longest and most complex petroleum pipeline system in the world; delivering over 3 MMbpd to markets in Canada and the U.S. Our relationship with our customers and commitment to our industry remain our top priorities, and we continue to deliver solutions that meet customers' needs and drive growth in our Liquids Pipelines business. Our assets and expertise are well positioned to provide value to customers by delivering infrastructure projects near supply basins, increasing available Mainline capacity and improving on market access to meet the growing needs of the industry while continuing to reduce the systems' carbon intensity. We will continue to publicly advocate for the responsible growth of the energy industry given the increasing demand for cost-effective and reliable energy on a global basis.

We are listening to the needs of our customers and looking ahead to anticipate market demands with the objective of providing transportation solutions that are cost effective, efficient and timely. In the second half of 2022, we are planning a customer satisfaction survey to gain further insight into the key drivers of our customer needs.

With six separate pipelines connecting Western Canada to the U.S. and further to Eastern Canada, we offer our customers economy, flexibility, reliability, safety and innovation in delivering their products to market.

Our focus is to continue optimizing our expansive network of assets to provide customers with additional capacity and superior service. With the completion of the L3RP, Enbridge believes that low-cost staged options to expand our Mainline capacity through highly executable solutions with proven capabilities dealing with regulatory requirements provides ample opportunity for us to continue to bring significant value to our customers. Enbridge remains committed to finding creative solutions for providing highly competitive transportation options to premium markets in North America, while also focusing on creating competitive alternatives for our customers to access international markets.

Enbridge is challenging the Michigan governor's unlawful attempt to close the Line 5 dual pipelines at the Straits of Mackinac by terminating an easement that has been in existence since 1953. We have received strong support for the continued safe operation of Line 5 at the Straits – support that is rapidly gathering momentum from all levels of government, unions, business and industry on both sides of the international border.

In all the years of change and growth, one certainty has remained; delivering safe and reliable solutions for our customers is our foundation. This is why we will continue to vigorously defend our assets from parties looking to inhibit the service we provide our customers. Further, Enbridge is committed to providing increased optionality for our customers while continuing to deliver the exceptional service our customers have come to expect from us.

> Enbridge's Superior Terminal in Superior, WI.

North American supply overview

Global demand for crude oil recovered rapidly throughout 2021 as higher COVID vaccination rates and falling case counts prompted governments to lift restrictions on mobility and travel. While the emergence of new variants, including the Omicron variant in December, led to significant new cases and the reintroduction of more targeted restrictive measures, global liquids demand by year-end approached pre-pandemic highs of ~100 MMbpd. Global supply, however, was unable to keep pace with the demand recovery in 2021. The Organization of Petroleum Exporting Countries and its allies increased oil production throughout the year (returning amounts which had been curtailed in 2020), but at a more measured pace in order to rebalance the market tighter. As a result, crude oil prices generally moved higher throughout the year, with West Texas Intermediate (WTI) ending the year at ~$77/bbl, up from ~$50/bbl at the end of 2020.

In the U.S., despite the strong prices, supply growth rates were more modest than pre-pandemic levels. Publicly traded energy companies generally restricted capital spending on new crude oil exploration and production in favor of debt repayment and return of capital to shareholders. Growth was primarily driven by private producers, as well as through more capital efficient draw-downs of previously drilled but uncompleted well inventory. Average production in the lower 48 states in 2021 was basically flat relative to 2020 at 11.2 MMbpd, although exit rate production was up almost 800 thousand barrels per day (kbpd) year over year. There were, however, notable regional differences. The Permian was one of the few basins that saw material growth year over year. Exit rate production in 2021 was close to 5 MMbpd, up from roughly 4.4 MMbpd the prior year. Meanwhile, in the Bakken, average annual oil production fell slightly from 1.2 MMbpd down to 1.1 MMbpd year over year.

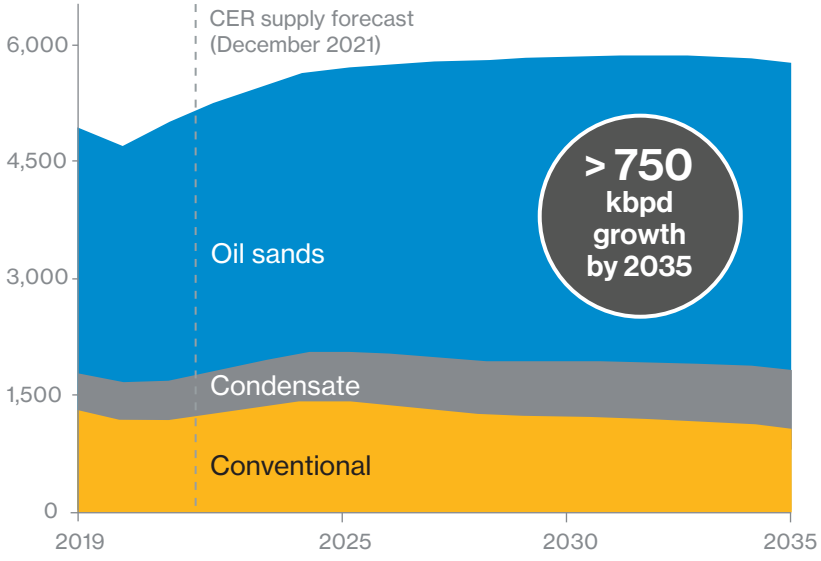
Canadian oil production levels varied significantly during 2021. Blended supply levels were seasonally strong in the winter months at both the beginning and end of the year, ultimately peaking near 5 MMbpd in December. However, a string of both planned and unplanned outages at production and upgrading facilities throughout the year caused supply to trough below 4.5 MMbpd in some months. Growth was primarily driven by debottlenecking and expansions of upgraders and oil sands facilities. Modest gains were also made in conventional oil production. The Petroleum Association of Canada and the Canadian Oilwell Drilling Contractors Association estimated roughly 5,000 wells were drilled in 2021. They expect strong commodity prices could drive up the number of wells drilled in 2022 to over 6,000.

Western Canadian Sedimentary Basin (WCSB) production has been constrained in recent years by a shortage of pipeline egress. Enbridge's L3RP came on-line in October 2021, providing an additional 370 kbpd of new egress to the U.S. Midwest and Gulf Coast markets. While this restored capacity was timely to support near term production growth, the Mainline system returned to apportionment by year-end. The need for additional crude oil transportation infrastructure remains critical to support producer investment in new supply growth. Access to low-cost, safe and efficient transportation infrastructure to premium markets via pipeline will be fundamental in supporting the Western Canadian petroleum industry.

North American supply overview (continued)

The Canada Energy Regulator (CER) forecasts WCSB supply growth in 2022 and into the next decade, led by new phases of existing in situ projects and facilitated by new egress. In order to support these growth plans and remain globally competitive, many WCSB producers are striving to reduce costs and lower emissions by improving operations and developing new technologies. North American producers are clearly demonstrating global ESG leadership with responsible development of crude oil resources.

Canadian crude oil and liquids production (kbpd)

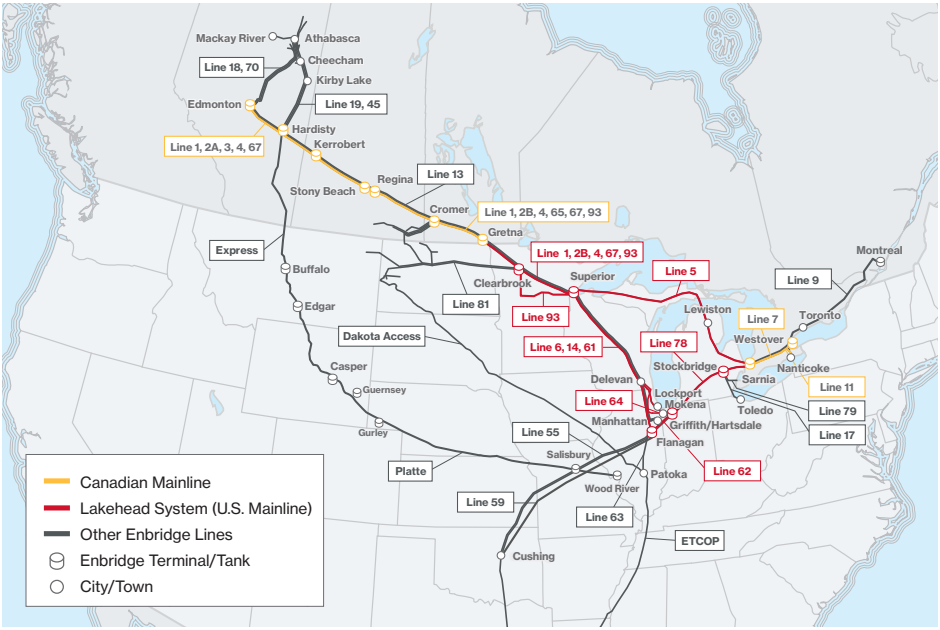


> Figure 1 – Canadian crude oil production

Source: Canada's Energy Future 2021, CER, Nov 2021

The Enbridge Mainline

Mainline system capacity



The current average annual capacity on the Mainline system is approximately 3.1 MMbpd out of Western Canada. A series of pipelines run between Edmonton, AB and Superior, WI, and four pipelines extend the system beyond Superior, providing access to markets in Minnesota, Illinois, Indiana, Ohio, Michigan and Ontario. Enbridge also has market access pipelines connected to the Mainline that serve markets in Eastern Canada, Cushing, Patoka and the USGC.

Despite the increasing challenges in permitting major infrastructure projects, between 2013 and 2021 Enbridge successfully completed system enhancements totaling approximately 1.5 MMbpd in Canada and approximately 1.85 MMbpd on the Lakehead system in the U.S. These projects have enabled production growth from the WCSB and Bakken regions to move to prime markets and have provided Enbridge with the flexibility to optimize the operations of the Mainline system to become even more safe and reliable.

Enbridge delivered a record 3.135 MMbpd ex-Gretna in December 2021 with Line 3R in service and by focusing on Mainline system optimization principles and operating efficiencies.

Mainline tankage and terminalling

In 2021, Enbridge continued making upgrades to a number of terminals across the network, with the goal of maximizing throughput and increasing the level of service provided to our customers. This year, Enbridge will continue to support customer-initiated projects, as well as explore further opportunities to optimize the terminalling assets.

Line 3 Replacement Program (L3RP)

In October 2021, L3RP was successfully completed in Minnesota and placed into service—following eight years of extensive community engagement; thorough environmental, regulatory and legal review, and repeated approvals; and the perseverance of a skilled workforce and construction teams in the face of illegal protests. Tremendous support from communities, elected leaders, Tribes, businesses and union—consistent through all stages of this project—was crucial in achieving this successful outcome.

The completion of the final 337-mile (542-km) segment in Minnesota marked the full replacement of 1,031 miles (1,660 km) of Line 3 from Hardisty, AB to Superior, WI. L3RP was the largest project in Enbridge's history, replacing the original pipeline with modern pipe, using the latest available technology throughout design and construction. L3RP restored the historical operating capacity of Line 3, enhancing flexibility and allowing for the optimization of the Mainline system.

Now that the L3RP is in-service, it is known as Line 93.

Great Lakes Tunnel Project

Enbridge continues to pursue the Line 5 Great Lakes Tunnel Project in Michigan in accordance with the tunnel agreement between Enbridge and the Mackinac Straits Corridor Authority in 2018. The 645-mile (1,038 km) Line 5 pipeline originates in Superior, WI, travels through Michigan's Upper and Lower peninsulas, and terminates in Sarnia, Ontario. Enbridge completed the engineering and design phase of the project in March 2021. When completed, the Great Lakes Tunnel will house approximately four miles of Line 5 under the Straits of Mackinac. In February 2021, Enbridge received permits for the tunnel from the Michigan Department of Environment, Great Lakes & Energy (EGLE). Enbridge is actively pursuing the remaining state and federal regulatory permits from the U.S. Army Corps of Engineers and the Michigan Public Service Commission. The permitting review processes, which are the driver of project timing, are anticipated to continue throughout 2022. Pending completion of the tunnel project, we remain vigilant on the sustained and safe operation of the Line 5 across the Straits of Mackinac.

> Construction along the Line 3 Replacement right-of-way in Minnesota, which was completed in October 2021.

The Enbridge Mainline
Recent expansions and capacity recovery (continued)

Upstream-of-Superior system enhancements

The Mainline system is well positioned to offer scalable, low-cost and highly executable expansion projects to meet the transportation needs of industry, particularly in this time of uncertainty.

Given the multi-pipeline configuration of the Mainline system, several low-cost system optimization and expansion options are available. With L3R in service, these system enhancements can be achieved by employing new crude slates and drag reducing agent (DRA) injections, as well as optimizing delivery windows across our system. These system enhancements could potentially provide incremental capacity of up to 200,000 bpd ex-WCSB.

Downstream-of-Superior system enhancements

To fully utilize the potential of the entire suite of future Mainline expansions, additional capacity from Superior to Flanagan will be required. Enbridge is currently exploring multiple options that could bring on the required capacity, ranging from building new infrastructure to utilizing existing pipeline infrastructure in that corridor.

Enbridge plans to further develop both upstream and downstream options and to engage with shippers in commercial discussions at a suitable time.

Enbridge continues to review its system configuration to maximize value to customers.

With the historical pressure to add egress out of Western Canada, Enbridge has placed a key focus on increasing pipeline capacity. Since 2015, significant progress has been made to optimize system performance and capacity out of western Canada, increasing capacity by 850,000 bpd. This includes optimizations and capacity recoveries and L3R.

The optimization process examines several factors including:

- Overall system capacity
- Expected throughput/capacity by commodity/crude slate
- Aligned maintenance with our customers
- System reliability
- Current pressure restrictions
- Product quality
- Line-fill requirements
- Facility interconnection capabilities
- Power and integrity costs
- Maximizing scheduling windows
- Drag reducing agent (DRA)

Improvements made on these factors have increased the system operating efficiency and overall throughput offered to industry. The Enbridge Mainline offers a one-of-a-kind system with optionality and flexibility to shippers across North America. This allows quick response to supply/demand disruptions via its multiple pipelines, terminal facilities and access to markets. Enbridge will continue to optimize the above factors to maximize throughput offered to industry.

Establishing toll certainty and competitiveness for our customers is a top priority for Enbridge.

The Enbridge Canadian Mainline system's tolling agreement, the Competitive Tolling Settlement (CTS), which had been in place for the past 10 years, expired on June 30, 2021. The CTS provided a U.S. dollar denominated International Joint Tariff (IJT) toll for crude oil shipments originating in Western Canada on the Enbridge Pipelines Inc. (EPI) system and delivered to Eastern Canada and the U.S. from the Lakehead System.

In November 2021, CER denied the firm service offering that was proposed.

Enbridge is currently engaged and in active collaboration with our stakeholders to reach a consensus, on a new Mainline tolling arrangement.

With the expiry of the CTS in mid-2021, and no replacement yet approved by the regulator, the Enbridge Mainline system is currently charging interim Canadian local and IJT tolls based on tolls that were in effect on June 30, 2021. These interim tolls were subsequently adjusted on October 1, 2021 with the implementation of Line 3 Replacement surcharge.

Interim tolls will be in place to bridge the time period between the CTS expiry and implementation of a new Enbridge Mainline tolling arrangement. The interim tolls will be finalized by the CER after it approves an application by Enbridge either based on a negotiated toll settlement or a cost-of-service filing.

Local rates for service on the U.S. portion of the Mainline system are not affected by the expiry of CTS and will continue to be established by Lakehead's existing tolling agreements. Enbridge submitted to the Federal Energy Regulatory Commission (FERC), a Lakehead base system cost-of-service filing establishing rates that are subject to refund effective July 1, 2021, and is currently engaged in settlement discussions with FERC and Lakehead shippers for finalization of new Lakehead base system rates.

The Regional Oil Sands system provides connectivity for oil sands customers to the Edmonton and Hardisty areas with a total annual average capacity of approximately 2.5 MMbpd.

The **Athabsca Terminal,** located north of Fort McMurray, provides operational receipt tankage for multiple products. The terminal is the initiation point for injections onto both the Athabasca Pipeline and the Wood Buffalo Pipeline. Athabasca Terminal has a total tank storage capacity of approximately 3.4 million barrels.

The **Cheecham Terminal**, located south of Fort McMurray, acts as a major hub, providing operational tankage to facilitate receipt of product from oil sands customers. Additionally, Cheecham Terminal provides connectivity for injections onto the Waupisoo Pipeline, Athabasca Pipeline and the Wood Buffalo Extension Pipeline. The Norlite Diluent Pipeline is also connected to Cheecham Terminal for the receipt of condensates. The total tank storage capacity of Cheecham terminal has reached approximately 3.3 million barrels.

The **Athabasca Pipeline** runs from Athabasca Terminal to the Hardisty area. The 30-inch pipeline has an average annual capacity of 570,000 bpd.

The **Wood Buffalo Pipeline** runs from Athabasca Terminal to Cheecham Terminal. The 30-inch pipeline has an average annual capacity of 550,000 bpd.

The **Wood Buffalo Pipeline Extension** runs from Cheecham to Kirby Lake where it connects to the Athabasca Pipeline Twin and delivers to the Hardisty area. The 36-inch pipeline has an average annual capacity of 800,000 bpd.

The **Athabasca Pipeline Twin** runs from Kirby Lake Terminal to the Hardisty area. The 36-inch pipeline has an average annual capacity of 800,000 bpd.

The **Waupisoo Pipeline** runs from Cheecham Terminal to the Edmonton area. The 30-inch pipeline has an annual average capacity of 550,000 bpd.

The **Woodland Pipeline**, a joint venture partnership with Imperial Oil and ExxonMobil, provides transport services from the Kearl Oil Sands Project to the Edmonton area. The 36-inch pipeline has an average annual capacity of 540,000 bpd and is expandable to 800,000 bpd.

The **Norealis Pipeline** provides terminalling and transportation services from the Cenovus Sunrise (formerly known as Husky Sunrise) Oil Sands Project to Cheecham Terminal. The 24-inch pipeline has an average annual capacity of 90,000 bpd and is expandable to 270,000 bpd.

The **Norlite Diluent Pipeline**, a joint venture partnership with Keyera Partnership, has the capability to bring diluent from the Edmonton/Fort Saskatchewan area to the oil sands region. The 24-inch pipeline has an annual average capacity of 218,000 bpd and is expandable to 465,000 bpd.

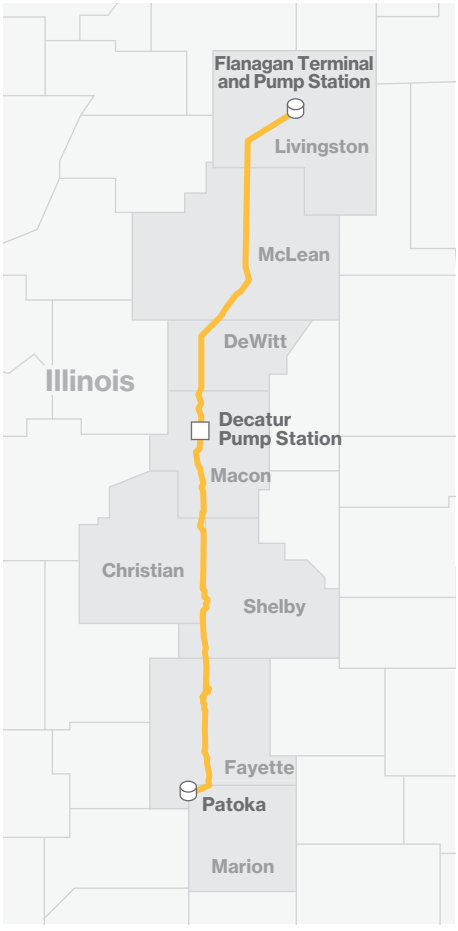
Enbridge continues to identify and develop new pipeline infrastructure and use existing capacity to ensure production growth from the region can reach Alberta market hubs in a safe, reliable and efficient manner.

With its joint venture partners, Imperial Oil Resources Limited and ExxonMobil Canada Properties, Enbridge expanded the Woodland Pipeline and Woodland Pipeline Extension capacity to 540,000 bpd in June 2021. The Woodland Capacity Expansion Project provides incremental throughput and will support long-term growth in the oil sands.

Line 9
Terminal/Tank
Enbridge Pump Station
City/Town

Eastern Access

Line 9, a 517-mile (832-km), 30-inch pipeline, transports crude oil from Sarnia, Ontario to Montreal, Quebec with an average annual capacity of 300,000 bpd. Enbridge continues to work with stakeholders to ensure safe and reliable delivery of crude oil to refineries in Eastern Canada.

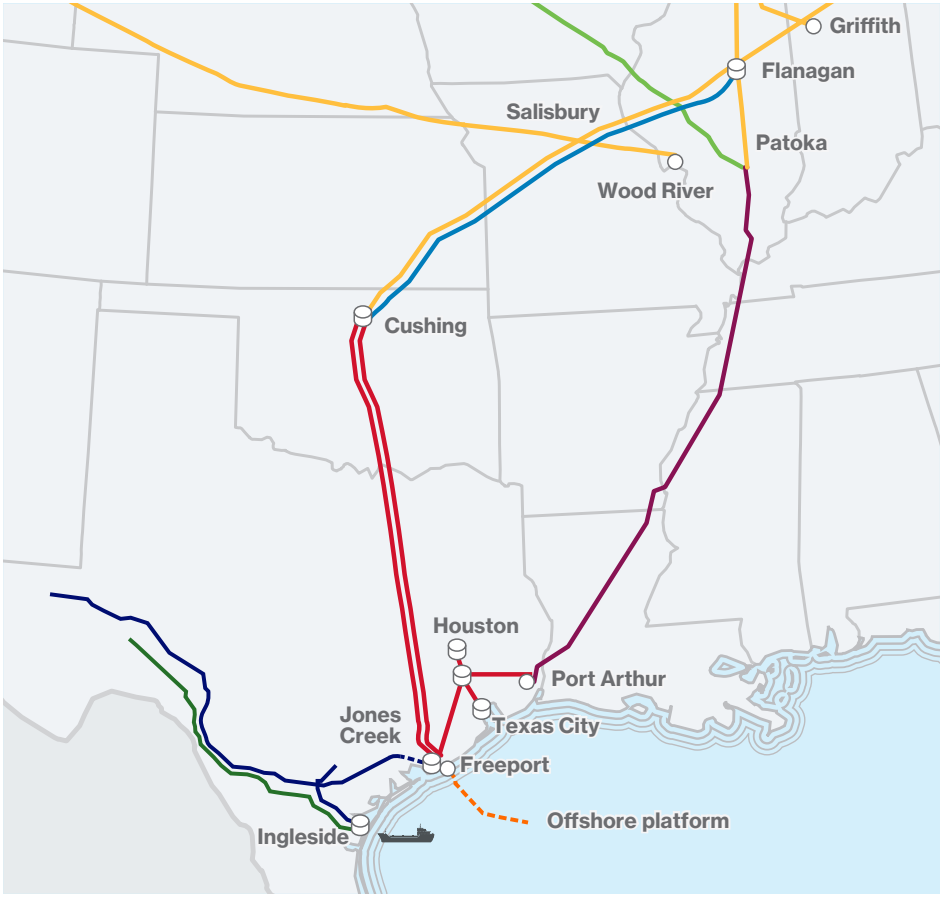


Southern Access Extension

The Southern Access Extension Pipeline (SAX), a 168-mile (270-km), 24-inch pipeline, transports crude oil from the Enbridge Flanagan Terminal near Pontiac, IL to Patoka, IL. Since its in-service date in January 2016, the pipeline has provided customers with timely, economical and reliable transportation service to the strategic Patoka hub. SAX has an average annual capacity of 300,000 bpd and has expansion capability of 100,000 bpd for incremental access to the Patoka market.

Spearhead Pipeline

The Spearhead Pipeline is a 583-mile (938-km) pipeline comprising 22-inch and 24-inch sections. It transports crude from Enbridge's Flanagan Terminal near Pontiac, IL to Cushing, OK. The capacity of the Spearhead Pipeline is 193,000 bpd with one midpoint injection location at Key Station near the Platte Salisbury Terminal, which is available for limited capacities of crude.



- Flanagan South Pipeline
- Dakota Access Pipeline
- Energy Transfer Crude Oil Pipeline
- Gray Oak Pipeline
- Seaway Pipeline System
- Cactus II Pipeline
- SPOT (proposed)
- Other Enbridge Pipelines
- Offshore Platform
- Crude export facility
- Crude Oil Storage
- City/Town

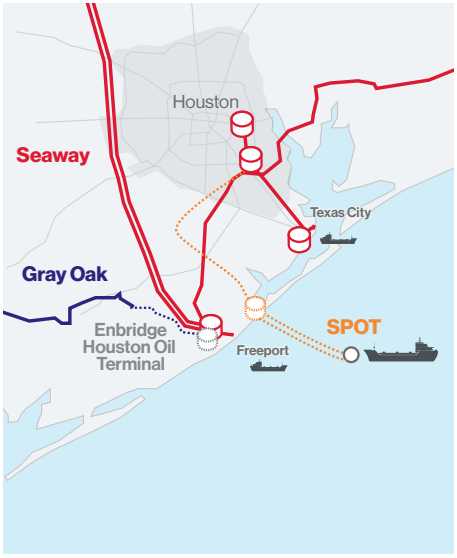
USGC Access

Together, FSP and the Seaway Pipeline System allow crude oil transported on the Enbridge Mainline system to access key USGC refining centers in Houston and Port Arthur, TX. FSP, a 593-mile (954-km), 36-inch interstate crude oil pipeline that originates at the Enbridge Flanagan Terminal in Illinois and terminates in Cushing, OK, came into service in Q4 2014. A DRA expansion was completed in concert with the L3RP coming into service, bringing the average annual capacity to 660,000 bpd.

USGC Access (continued)

The Seaway Pipeline System has an annual average capacity of 950,000 bpd and consists of two 526-mile (846-km) 30-inch pipelines between Cushing, OK and the Seaway Jones Creek Terminal in Brazoria County, TX. The pipelines can deliver to the Freeport Docks, Phillips 66 Sweeny Refinery, Enterprise Crude Houston (ECHO) Terminal, Texas City Seaway Pipeline System and Docks, or continue on to Beaumont/Port Arthur where the Seaway System connects to three terminals: Sunoco Nederland, Enterprise Beaumont Marine West and Phillips 66 Beaumont.

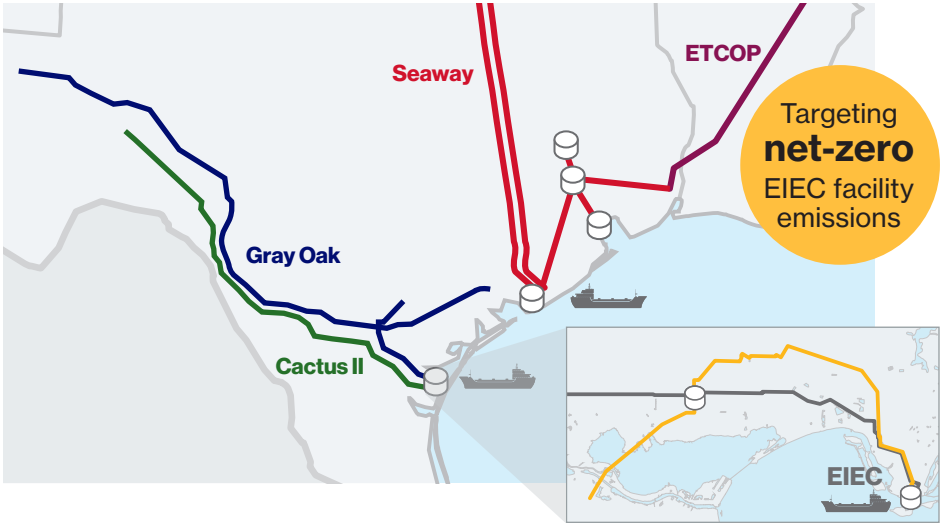
The Gray Oak pipeline is a 850-mile (1,368-km) pipeline with an average annual capacity of 900,000 bpd stretching from the Permian basin to the USGC. It connects production in the Permian and Eagle Ford Basins to market centers in Corpus Christi and Sweeny, TX. The first stage of the project came into service in November 2019. An open season conducted in 2020 resulted in an expansion and a new destination in Victoria County, TX, which is expected to be in service by mid-2022.



Sea Port Oil Terminal (SPOT)

Enbridge, through the Seaway Pipeline System, has ownership in two existing docks, that are fully capable of importing and exporting crude oil on the Gulf coast at Freeport and Texas City. Freeport has a draft of 42 feet and can load at 20,000 barrels per hour and Texas City has a draft of 45 feet and can load at 35,000 barrels per hour. In addition, Enbridge has negotiated an option to purchase an equity interest in Enterprise's SPOT. SPOT will provide direct loading capabilities into very large crude carriers (VLCC), which will provide a more efficient export solution.

With a design loading rate of 85,000 barrels per hour, SPOT will be able to load a VLCC in 24 hours. SPOT is expected to receive permits in 2022 with an estimated in-service date of 2024.



Enbridge Ingleside Energy Center (EIEC)

In October 2021, Enbridge acquired North America's premier, VLCC capable, crude oil export terminal. Enbridge also acquired a 20% interest in the Cactus II pipeline system. The acquisition of the Ingleside Energy Center (renamed EIEC) near Corpus Christi, TX provides the most cost-effective and efficient export solution for our customers. EIEC has 3.0 MMbpd of incoming pipeline connectivity, providing our customers direct access to the Permian and Eagle Ford supply basins. The U.S. Army Corps of Engineers is currently executing an expansion of the ship channel, which upon completion (expected Q2 2022) will enable EIEC to load a VLCC up to 1.6 million barrels of crude oil. The facility is also well positioned to participate in the future energy transition through a number of low-carbon intensity projects.

EIEC currently has export capacity of up to 1.6 MMbpd with permitted expansion of up to 1.9 MMbpd. EIEC has a number of growth projects that are currently under development, including the following:

- A permitted crude oil storage expansion of 5.5 million barrels
- A permitted dock expansion
- Liquefied petroleum gas (LPG) and purity product exports
- Low-carbon projects such as hydrogen and ammonia production and export and carbon capture and sequestration projects

Enbridge is currently advancing the development and execution of a 60-MW solar power facility at EIEC, further enhancing the position of EIEC in the market as a net-zero emissions facility.

Express/Platte

The Express Pipeline delivers crude oil from Hardisty, AB to Casper, WY. In 2021 the capacity of the Express Pipeline was expanded to 310,000 bpd with the installation of DRA injection skids, pump stations optimization and further optimization efforts. Deliveries can be made in Montana, WY, and to a connecting facility servicing Utah.

Express Pipeline also interconnects with Platte Pipeline, which transports both WCSB and domestic production into PADD II. The ratio of WCSB to light domestic throughput influences Platte Pipeline System capacity; however, average annual capacity is approximately 164,000 bpd between Casper and Guernsey, WY and 145,000 bpd between Guernsey, WY and Wood River, IL.

Along this route, deliveries can be made in Wyoming and Illinois and on to connecting facilities servicing Colorado, Kansas and Oklahoma.

The Platte to Spearhead Connection went into service in April 2018; allowing Express-Platte barrels to access Cushing from Platte's Salisbury Terminal via the Spearhead Pipeline.

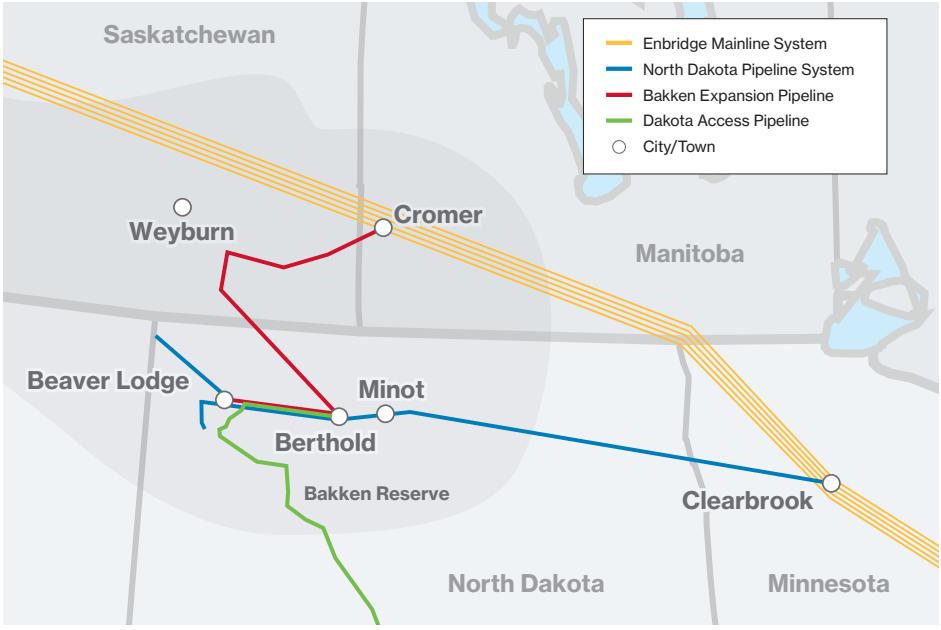
Enbridge, through enhancements and optimizations on the Express Pipeline and/or the Platte Pipeline, are pursuing a joint toll offering to provide firm service of up to 60,000 bpd to the USGC. This project is targeted to be in service by the first half of 2024.

Enbridge's extensive infrastructure in the Bakken region makes it ideally situated to accommodate both current and planned growth.

Enbridge's extensive infrastructure in the Bakken region makes it ideally situated to accommodate both current and planned growth.

The North Dakota System, including the Bakken Expansion Pipeline, gathers crude oil from points in North Dakota for delivery to the Enbridge Mainline, which in turn provides access to multiple refineries in the U.S. Midwest, Gulf Coast and eastern Canada. The current annual average system capacity out of the North Dakota Bakken is approximately 360,000 bpd.

In February 2017, Enbridge and Marathon finalized an agreement to acquire a 49% equity interest in the holding company that owns 75% of the Bakken Pipeline System. The Bakken Pipeline System consists of both the Dakota Access Pipeline, which delivers Bakken production to the Patoka, IL hub and the Energy Transfer Crude Oil Pipeline, which provides access to the USGC market. Enbridge is evaluating synergies between its existing network and the Bakken Pipeline System to provide increased optionality and enhanced market access for producers and shippers in the Bakken region.



Enbridge has established a significant presence in contract storage in recent years, largely driven by increasing production of Western Canadian crude oil.

Currently, Enbridge is operating, or has under construction, contract storage at the following locations:

Hardisty

Hardisty, AB is the most important crude oil storage hub in Canada. Enbridge operates approximately 3 million barrels of salt cavern storage at Hardisty Caverns and 7.5 million barrels of above ground storage at Hardisty Contract Terminal, with both facilities well connected, providing customers with the much-needed optionality they require. Both are currently completely subscribed. Enbridge is evaluating additional service options and growth opportunities to maximize value.

Location	Storage capacity in operation or under construction (million barrels)
Hardisty, AB	10.5
Cushing, OK	26
Ingleside, TX	15.6
Other	9.1
Total	**61.2**

Cushing

Cushing, OK is one of the most important crude oil storage hubs in the world and the location of the settlement of the NYMEX WTI contract. In Q1 2021, Enbridge acquired a facility that includes 34 tanks with a total of approximately 6.6 million barrels of storage at Cushing from Blueknight Energy Partners, L.P. The acquisition, at a price more competitive than building new storage, further strengthens Enbridge's top-tier position as a leader in the Cushing storage complex. For our customers, this means expanded storage capabilities and connections in Cushing which brings more optionality, flexibility and value.

Ingleside

The EIEC is situated on a 925-acre site and is the leading crude export terminal in the USGC. EIEC's highly advantaged outer harbor location with direct connectivity to low-cost Permian and Eagle Ford supply, combined with VLCC capability and rapid loading rates, position it as one of the most competitive export facilities globally. The terminal currently has 15.6 million barrels of storage and 1.5 MMbpd of export capacity. EIEC is permitted for 21 million barrels of storage and exports up to 1.9 million MMbpd. Along with the crude and LPG expansion plans, Enbridge is also evaluating renewable and low-carbon growth opportunities at the terminal.

Non-regulated contract terminals (continued)

St. James

As part of the transaction with MODA, Enbridge also acquired a 50% ownership interest in a brownfield terminal opportunity in St. James. The terminal has access to offshore and Canadian production and local area refiners. Enbridge is evaluating liquids, low-carbon and renewable projects for this site.

Houston Oil Terminal

Enbridge is developing a new terminal in the Houston area that will be fully integrated into the Seaway system with access to all existing delivery points and could have future connectivity to both SPOT and Gray Oak. The location supports up to 15 million barrels of tankage and plans to be in service by 2024.

Other

The oil sands have various operational contract tanks throughout the system totaling more than 7 million barrels.

Additionally, Enbridge has contract storage locations throughout the North Dakota Classic system, 480,000 barrels of leased storage at Platte Pipeline's Casper, WY facility, and 400,000 barrels of storage at Patoka, IL with a large footprint for future development. Enbridge continues to actively consider and develop future opportunities to add merchant storage across our network.

> A tank terminal facility along Enbridge's Express/Platte Pipeline in Casper, WY.

> Enbridge employees at the Athabasca Terminal near Fort McMurray, AB.

The Southern Lights Pipeline transports diluent supply from various sources through the U.S. Midwest to Western Canada's heavy oil production regions.

Southern Lights

Originating from Manhattan, IL, Southern Lights sources its diluent from the USGC, mid-continent and Midwest refineries via interconnections to existing crude and refined products pipelines and delivers it to Western Canada's crude oil hubs. Southern Lights receives product from three connecting carriers at the Manhattan Terminal in Illinois – BP, Enterprise and Explorer pipelines.

At the terminus of the system in Edmonton, AB, Southern Lights has direct delivery connections to the CRW pool, Keyera, Gibson, Pembina, Plains and Access pipelines. Currently, there is also a direct delivery connection to the Enbridge Mainline at Hardisty, AB, and to Plains at Kerrobert, SK.

The annual average capacity of Southern Lights is 180,000 bpd, of which 162,000 bpd is secured by long-term contracts. As referenced in the oil sands infrastructure development section, the Norlite Project is a key component of Enbridge's overall diluent strategy, extending diluent delivery into the oil sands region.

Enbridge's scale and capabilities position us to meaningfully support industry in meeting net-zero ambitions.

Innovation within the energy industry is required to achieve long-term climate goals. Our assets and capabilities will be essential to enabling, transporting and storing low-carbon energy. Our dedicated low-carbon development team is actively pursuing and developing strategic CCUS and hydrogen opportunities across North America.

We are committed to extending into the low-carbon value chain by focusing on new technology and growth opportunities while maintaining our capital allocation discipline. Our strategic partnerships, execution capabilities, existing assets and customer relationships position us for success.

CCUS is essential to meeting global climate and carbon emission reductions objectives. We are actively pursuing carbon hub opportunities across North America to establish a solid footprint in the CCUS space. Enbridge recently announced development of the Open Access Wabamun Carbon Hub, which can safely and reliably sequester carbon dioxide for industrial emitters in the greater Edmonton area of Alberta.

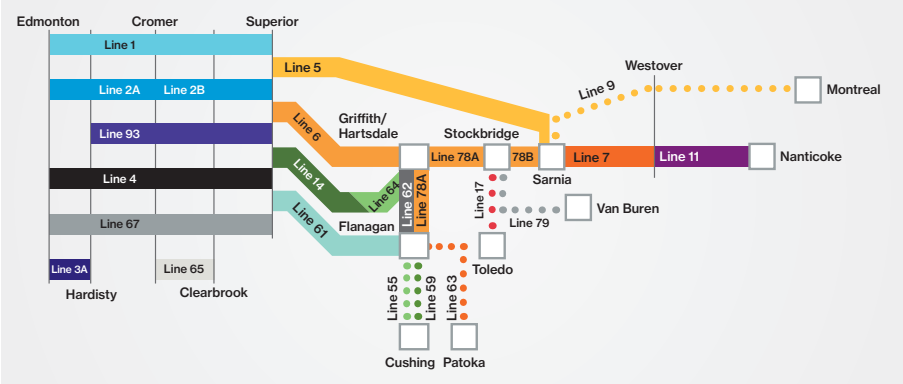
The hub represents a unique collaboration among a broad range of industries, including downstream oil and gas, power generation and cement manufacturing, as well as local Indigenous groups.

Growth in clean hydrogen production will play an important role to help decarbonize a broad range of hard-to-abate sectors, including mobility, industrial processing, heavy transport, power generation and steel production. It can also be used to provide electricity and heat, and can be blended with natural gas to help decarbonize existing natural gas grids. Enbridge is actively pursuing hydrogen opportunities and evaluating options to use our large network of existing assets to support the production and transportation of clean hydrogen.

> Enbridge's Alberta Solar One solar energy farm near Burdett, AB.

Pipeline system configuration

Q1 2022



Line 1
37,600 m3/d
(237 kbpd)
18"/20" – 1,767 km
(1,098 mi)
- NGL
- Refined products
- Light

Line 2A
70,300 m³/d
(442 kbpd)
24" – 966 km
(600 mi)
- Condensates
- Light
- Heavy

Line 2B
70,300 m³/d
(442 kbpd)
24"/26" – 808 km
(502 mi)
- Light

Line 3A
62,000 m³/d
(390 kbpd)
34" – 170 km
(106 mi)
- Light
- Condensate

Line 93
120,830 m³/d
(760 kbpd)
36" – 1,719 km
(1,068 mi)
- Light
- Heavy

Line 4
126,500 m3/d
(796 kbpd)
36"/48" – 1,770 km
(1,100 mi)
- Heavy
- Medium
(Ex-Clearbrook)
- Light
(Ex-Clearbrook)

Line 5
85,900 m³/d
(540 kbpd)
30" – 1,038 km
(645 mi)
- NGL
- Light

Line 6
106,000 m³/d
(667 kbpd)
34" – 748 km (465 mi)
- Light
- Medium
- Heavy

Line 7
28,600 m³/d
(180 kbpd)
20" – 193 km
(120 mi)
- Light
- Medium
- Heavy

Line 78A
90,600 m³/d
(570 kbpd)
36" – 425 km (264 mi)
- Light
- Medium
- Heavy

Line 78B
79,500 m³/d
(500 kbpd)
30"/36" – 175 km
(109 mi)
- Light
- Medium
- Heavy

Line 65
29,500 m³/d
(186 kbpd)
20" – 504 km
(313 mi)
- Light
- Medium

Line 11
18,600 m³/d
(117 kbpd)
16"/20" – 76 km
(47 mi)
- Light
- Medium
- Heavy

Line 62
26,400 m³/d
(166 kbpd)
22" – 121 km (75 mi)
- Light
- Medium

Line 14/64
54,600 m³/d
(343 kbpd)
24" – 784 km
(487 mi)
- Light
- Medium

Line 61
190,800 m³/d
(1,200 kbpd)
42" – 744 km
(462 mi)
- Light
- Medium
- Heavy

Line 67
127,200 m³/d
(800 kbpd)
36" – 1,790 km
(1,112 mi)
- Heavy

Not part of the Enbridge Mainline system

Line 9
47,700 m³/d
(300 kbpd)
30" – 832 km (517 mi)
- Light
- Medium
- Heavy

Line 17
16,000 m³/d
(100 kbpd)
16" – 142 km (88 mi)
- Light
- Medium
- Heavy

Line 55
30,700 m³/d
(193 kbpd)
22"/24" – 938 km
(583 mi)
- Light
- Medium
- Heavy

Line 59
104,900 m³/d
(660 kbpd)
36" – 954 km
(593 mi)
- Light
- Medium
- Heavy

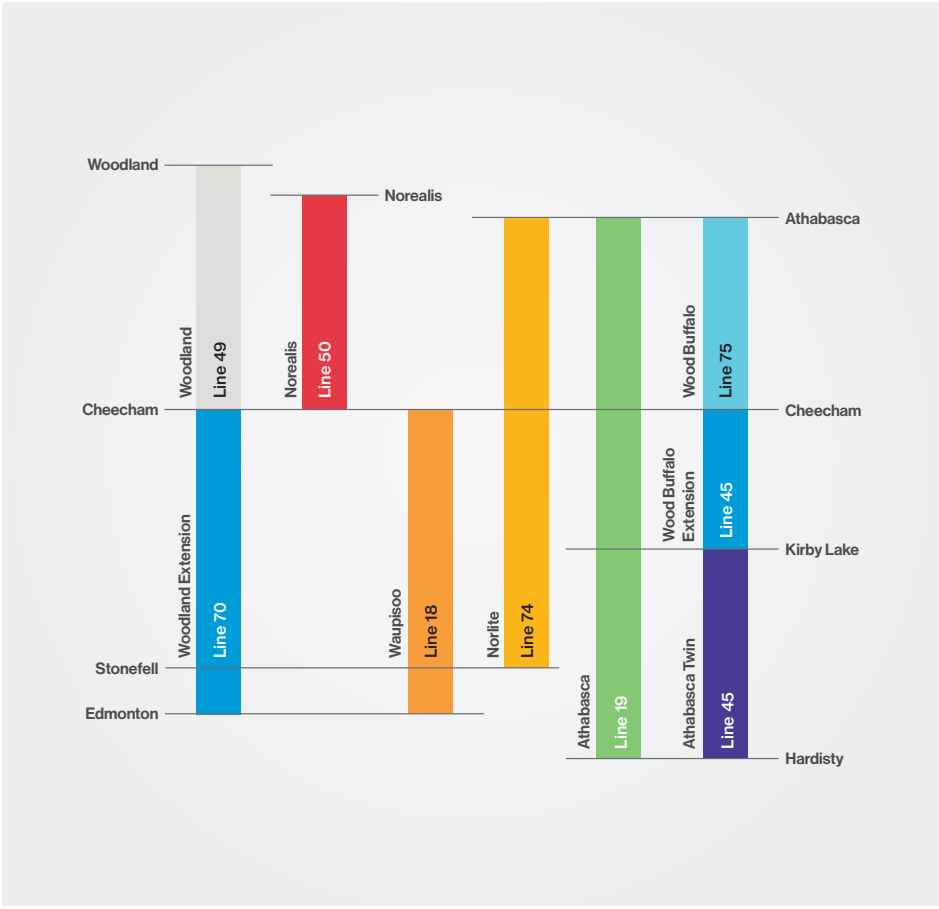
Line 79
12,700 m³/d
(80 kbpd)
20"/16" – 98 km
(61 mi)
- Light
- Medium
- Heavy

Line 63
47,700 m³/d
(300 kbpd)
24" – 270 km (168 mi)
- Light
- Medium
- Heavy

NOTE: Capacities provided are average annual capacities and do not include current restrictions.

Oil Sands Regional System configuration

Q1 2022



Line 18 – Waupisoo Pipeline
550 kbpd
30" – 380 km (236 mi)

Line 75 – Wood Buffalo Pipeline
550 kbpd
30" – 96 km (59 mi)

Line 19 – Athabasca Pipeline
570 kbpd
30" – 542 km (337 mi)

Line 45 – Athabasca Pipeline Twin
800 kbpd
36" – 347 km (215 mi)

Line 45 – Wood Buffalo Extension
800 kbpd
36" – 107 km (66 mi)

Line 74 – Norlite Diluent Pipeline
218 kbpd (expandable to 465 kbpd)
24" – 447 km (278 mi)

Line 49 – Woodland Pipeline
540 kbpd (expandable to 800 kbpd)
36" – 138 km (86 mi)

Line 70 – Woodland Extension
540 kbpd (expandable to 800 kbpd)
36" – 387 km (240 mi)

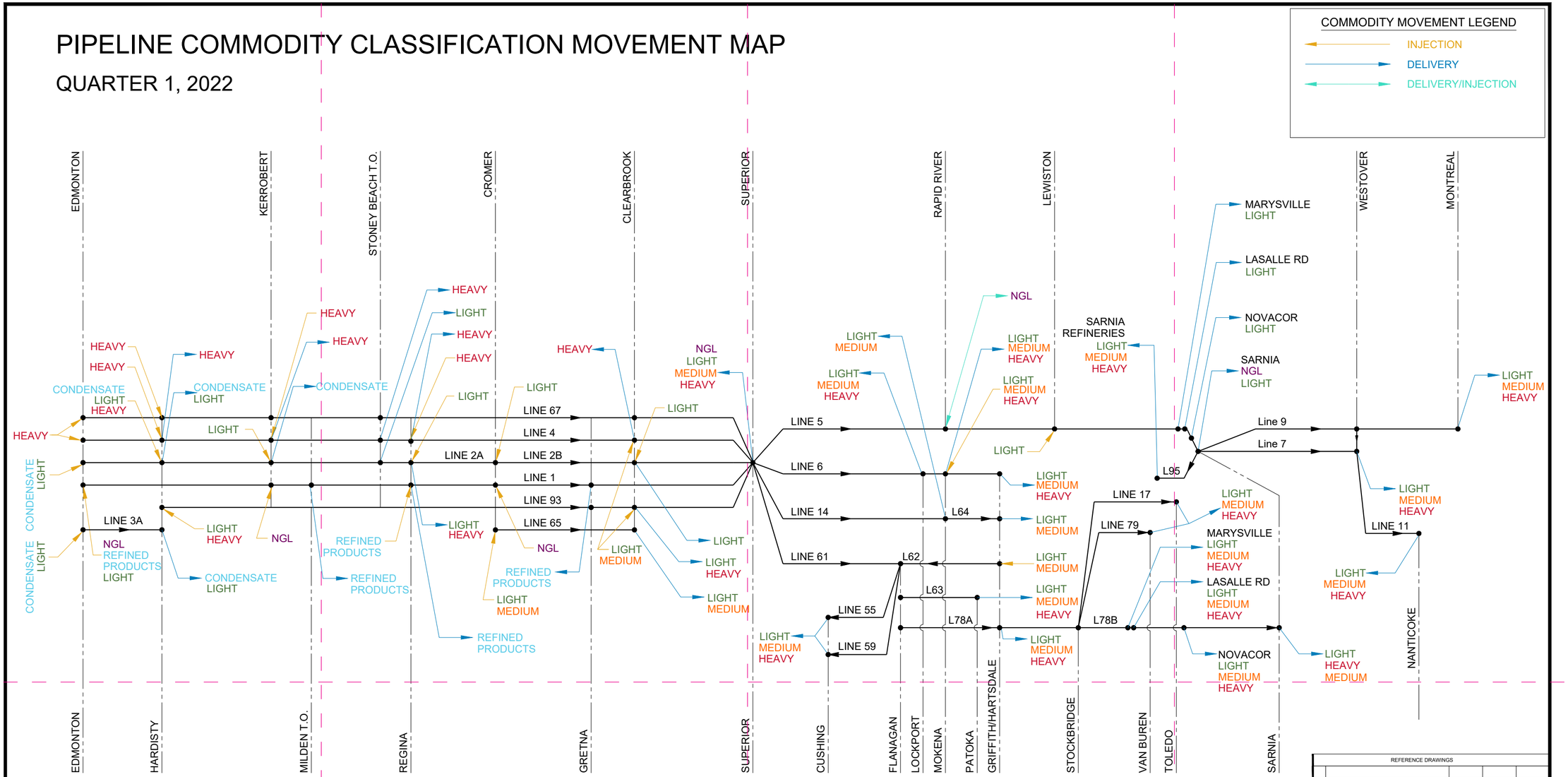
Line 50 – Norealis Pipeline
90 kbpd (expandable to 270 kbpd)
24" – 113 km (70 mi)

ENBRIDGE
Life Takes Energy

NOTE: Capacities provided are average annual capacities and do not include current restrictions.

PIPELINE COMMODITY CLASSIFICATION MOVEMENT MAP

QUARTER 1, 2022

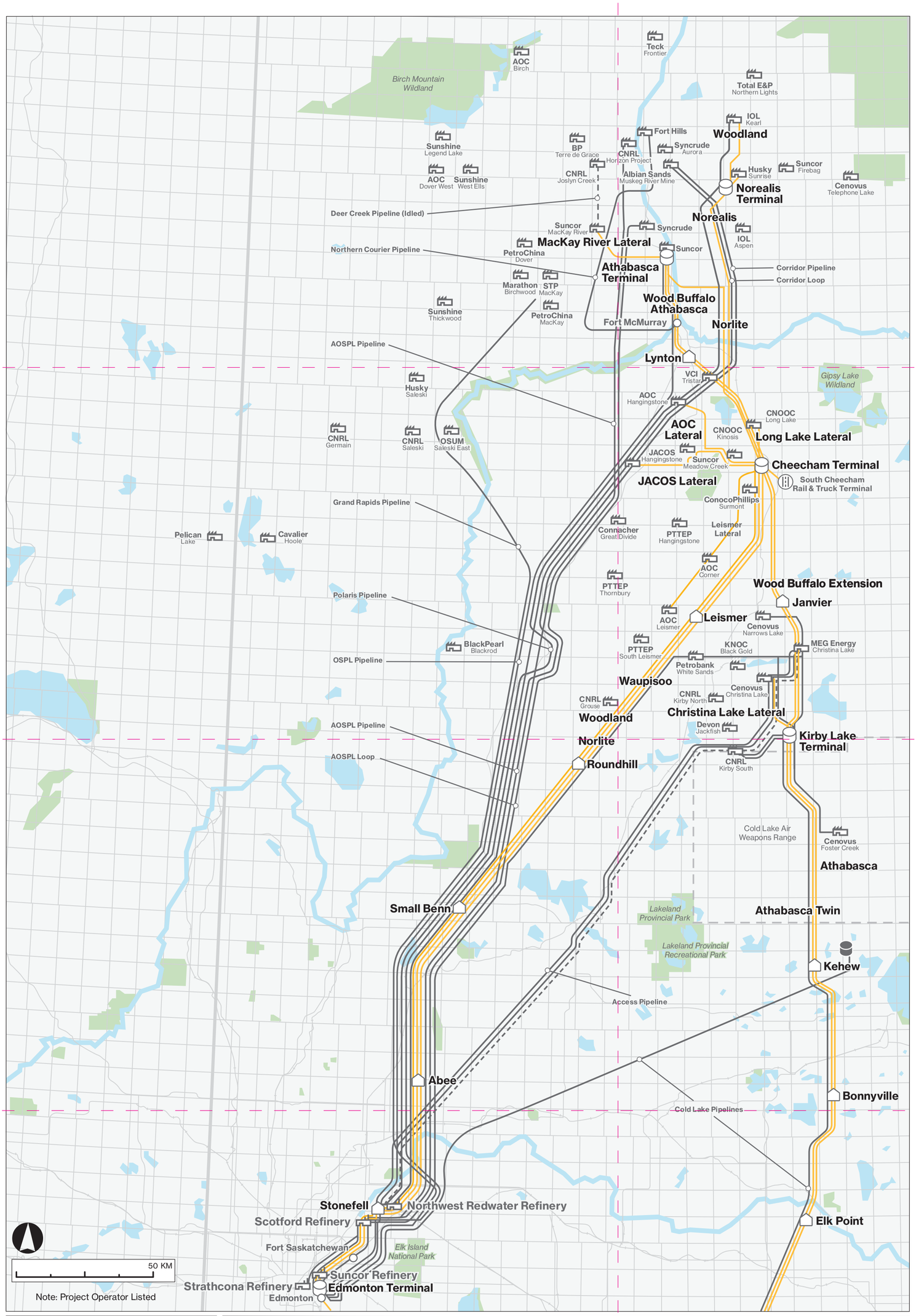


REFERENCE DRAWINGS				
2	AS BUILT AFE 20005598 IDR 1898 REDLINE MARKUP DATE: 2022-01-20	2022-01-20 MS	ENB	ENB
1	AS BUILT AFE 20005598 IDR 1898 REDLINE MARKUP DATE: 2021-11-30	2021-11-30 MS	ENB	ENB
REV NO	REVISION DESCRIPTION	DATE BY	CHK	APPR

ENBRIDGE

ENBRIDGE PIPELINES INC.
COMMODITY CLASSIFICATION MOVEMENT MAP

BY: MS	CHK: ENB	ENG.: ENB	ENB APPR: ENB
DATE: 2021-11-30		SCALE: NTS	STATUS: AS BUILDING
DWG NO.: D-0-0.0-100358-0			REV NO: 1.A



ENBRIDGE
Life Takes Energy

ATHABASCA REGION

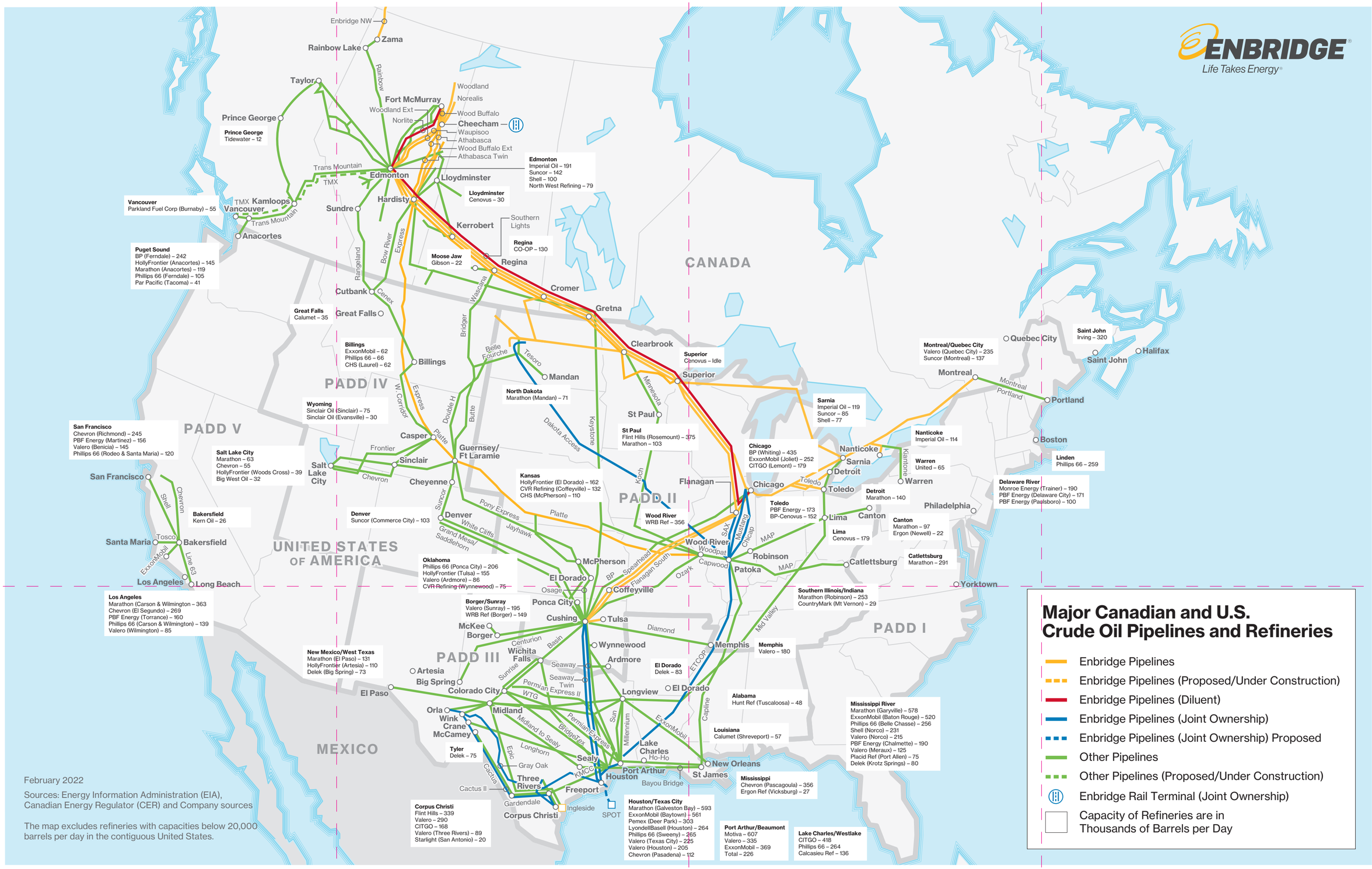
Major Pipelines

Enbridge Pipelines
- In-Service
- Under Construction

Other Pipelines
- In-Service
- Idled

- Enbridge Station
- Enbridge Tankage
- Other Tankage
- Processing Facility
- Refinery

- Rail Facility
- Railway
- Highways
- Parks



February 2022

Sources: Energy Information Administration (EIA), Canadian Energy Regulator (CER) and Company sources

The map excludes refineries with capacities below 20,000 barrels per day in the contiguous United States.

Major Canadian and U.S. Crude Oil Pipelines and Refineries

- Enbridge Pipelines
- Enbridge Pipelines (Proposed/Under Construction)
- Enbridge Pipelines (Diluent)
- Enbridge Pipelines (Joint Ownership)
- Enbridge Pipelines (Joint Ownership) Proposed
- Other Pipelines
- Other Pipelines (Proposed/Under Construction)
- Enbridge Rail Terminal (Joint Ownership)
- Capacity of Refineries are in Thousands of Barrels per Day

Enbridge Pipelines Inc.
200, 425 – 1st Street S.W.
Calgary, Alberta, Canada T2P 3L8

Telephone: 403-231-3900
enbridge.com/customerhandbook

Enbridge Liquids Pipelines Customer Handbook

February 2022