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EXECUTIVE SUMMARY

The 2022 Annual Plan provides NOVA Gas Transmission Ltd.'s (NGTL's) customers and other interested parties an overview of potential NGTL System facilities that could be applied for in the 2022/23 Gas Year. The 2022 Annual Plan describes NGTL's long-term outlook for receipts, deliveries, peak expected flows, proposed facilities, and design flow requirements supporting these proposed facilities. This 2022 Annual Plan is based on NGTL's June 2022 Design Forecast of receipts and deliveries.

New to this Annual Plan, are potential facilities that cover possible additional flow requirements based on expressed customer interest for incremental receipt and delivery services currently in NGTL's transportation service queue.

Since the release of the 2021 Annual Plan, NGTL has identified new facility projects. NGTL's Tolls, Tariff, Facilities and Procedures (TTFP) Committee has been notified of these facilities, and they are summarized in the December release of the 2022 *Appendix 2: Facility Status Update (NGTL 2022 Update)*.

NGTL provides commercial services under the NGTL Tariff using the combined assets of the NGTL System and the ATCO Pipelines (AP) System. NGTL follows facility planning processes to identify facilities required for the combined assets in the NGTL and AP footprints. For an overview of these processes, see the *Facilities Design Methodology* document and the *Guidelines for New Facilities* document. NGTL files facility applications with the Canada Energy Regulator (CER) for facility additions on the NGTL System within the NGTL footprint. AP files facility applications with the Alberta Utilities Commission (AUC) for facility additions on the AP System within the AP footprint.

The facilities identified in this Annual Plan were presented to the TTFP Committee on December 13, 2022. Subsequent updates to these facilities and notifications prior to filing for their applications will be presented to the TTFP as they occur. These updates, as well as any new facilities proposed after issuance of this Annual Plan, will be shown in the *2023 Facility Status Update (NGTL 2023 Update)*, which can be accessed at http://www.tccustomerexpress.com/871.html.

Table E-1 lists the 9 projects identified in this 2022 Annual Plan.

Table E-1: Proposed and Potential Facility Additions

Project Area	Proposed Facilities	Annual Plan Reference	Description	Target In-Service Date	Regulator	Capital Cost ($ Millions)
Proposed Facility for System Requirements						
North & East	Leming Loop	Section 2	Up to56 km NPS 24	2026-27	CER	270
Potential Facilities for Incremental System Flows						
Facilities for Incremental Supply						
Peace River	Mackie Compressor Station	Section 2	15 MW	2026-28	CER	210
Peace River	Groundbirch Mainline Loop (BC Section)	Section 2	25 km NPS 42	2026-28	CER	175
NGTL Facilities for Incremental Demand						
Mainline	Princess / North Lateral Control Valve	Section 2	CV	2026-28	CER	20
North & East	Oakland CS Station Unit Addition	Section 2	30 MW	2026-28	CER	170
North & East	North Lateral Loop	Section 2	25 km NPS 30	2026-28	CER	135
ATCO Facilities for Incremental Demand						
North & East	Inland Loop	Section 2	27 km NPS 24	2026-28	AUC	110
North & East	Inland Compressor Station	Section 2	15 MW	2026-28	AUC	115
North & East	Cloverbar Compressor Station Upgrades	Section 2	Upgrades	2026-28	AUC	10
					Total	**1,215**

The proposed facility for system requirements is required to meet growing aggregate delivery requirements in the Kirby area that are underpinned by existing contracts.

The need and timing for any of the potential facilities for incremental system flows are contingent on further technical analysis and final investment decisions, which in turn, require the finalization of commercial arrangements. The facilities for incremental supply would be required to meet incremental aggregate supply in the Peace River area. The facilities for incremental demand would be required to meet incremental aggregate demand, primarily in the Fort Saskatchewan area.

This 2022 Annual Plan includes the following sections:

- Executive Summary
- Chapter 1: Design Forecast

- Chapter 2: Design Flow and Mainline Facilities
- Chapter 3: Extensions, Lateral Loops and Meter Stations
- Appendix 1: Glossary of Terms
- Appendix 2: Facility Status Update
- Appendix 3: System Map (expected in March 2023)
- Appendix 4: Unit Transportation Costs

Electronic versions of the Annual Plan, the *Facilities Design Methodology* document, and the *Guidelines for New Facilities* document can be accessed at http://www.tccustomerexpress.com/871.html.

Customers and other interested parties are encouraged to communicate their suggestions, comments and questions to NGTL regarding the 2022 Annual Plan to:

- Cory Costanzo, Manager, Forecasting and Fundamentals (403) 920-7158
- Colin Cooper, Manager, Mainline Planning West (403) 920-5304
- Murray Ferraton, Manager, Customer Solutions (403) 920-5323
- Joe Zhou, Director, Capacity Management (403) 920-7227

1.0 DESIGN FORECAST

1.1 INTRODUCTION

This Annual Plan is based on the June 2022 Design Forecast of receipts and deliveries for the NGTL System. An overview of the June 2022 Design Forecast was presented at the December 13, 2022 TTFP meeting.

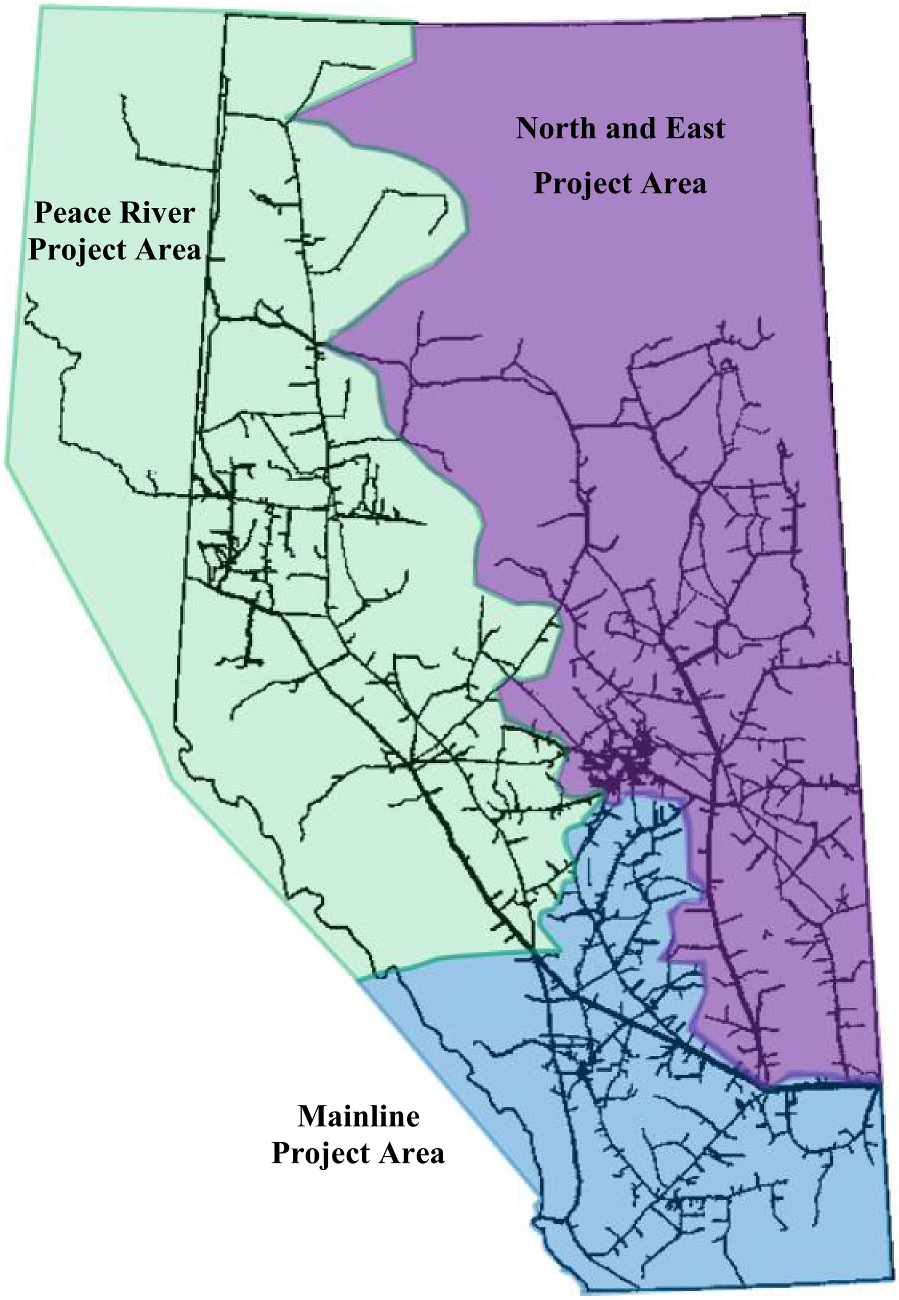
This section describes:

- economic assumptions used in developing the 2022 Design Forecast
- receipt and delivery forecasts for the NGTL System
- supply contribution, including winter withdrawal from storage facilities, used in the design process

For further information on forecasting methodology, see *Facilities Design Methodology*, Section 4.4: Design Forecast Methodology, which can be accessed at http://www.tccustomerexpress.com/871.html

In order to highlight the regional forecast differences on the NGTL System, this section references the three Project Areas as per the NGTL tariff. Figure 1-1 depicts the three Project Areas.

Figure 1-1: NGTL Project Areas



1.2 ECONOMIC ASSUMPTIONS

1.2.1 General Assumptions

The following assumptions, developed in early 2022, reflect broader trends in the North American economy and energy markets, and underlie the forecast of receipts and deliveries:

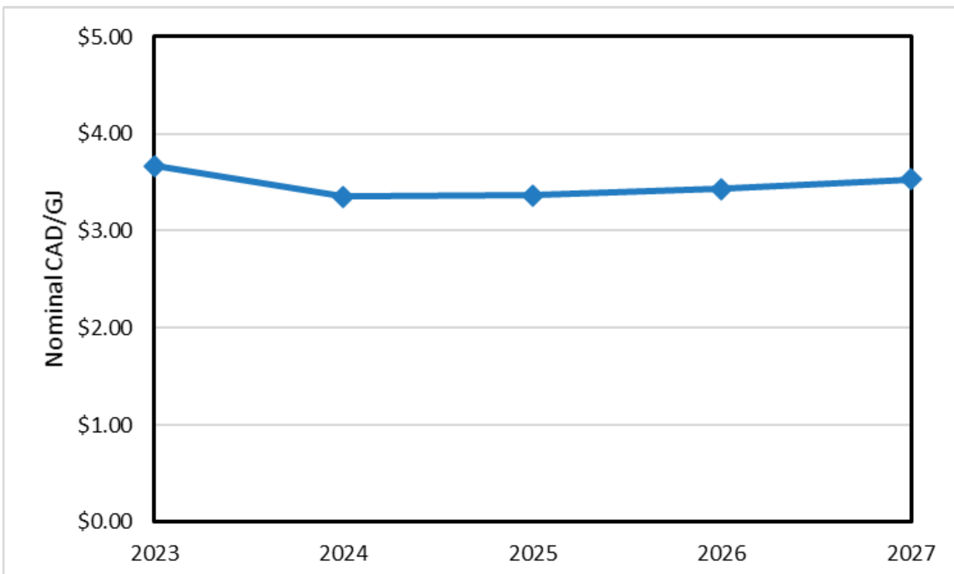
- Over the next several years, North American natural gas demand will increase, led by oilsands developments, electrical generation, industrial sectors, as well as Liquified Natural Gas (LNG) exports.
- In the US, industrial growth is concentrated in the Gulf Coast and electric generation growth is more broadly based, while the oil sands lead the growth in Western Canada.
- Environmental policies have a gradual effect at first. They create both risk and opportunity to the long-term demand for gas as they introduce incentives to use natural gas with fewer emissions and to replace natural gas with other energy sources.
- Several policy drivers at the provincial and federal level, are supporting accelerated progression in coal-to-gas conversion of electricity generation.
- LNG export projects are being developed in both the U.S. and Canada. Those in the US started exporting in 2016 and will continue to grow. Canada LNG exports are expected to begin in mid-2020s with LNG Canada.
- Associated gas supplies from oil plays and liquids rich gas plays are exerting downward influence on North American natural gas prices, and NIT continues to price below Henry Hub as traditional markets for Western Canadian supplies are challenged by short-term availability of egress capacity and gas from competing basins.
- New natural gas supply must continually be developed to maintain and/or grow the supply in the basin due to the natural declines of existing supply.
- NIT/AECO prices are expected to average around $3.50 Cdn/GJ over the next five years.
- The average annual outlooks of receipts, deliveries, and NGTL System throughput volumes reported in this section are understood to be within a range of outcomes due

to factors such as changing market conditions and the pace of WCSB supply development.

1.2.2 Average Natural Gas Price Forecast

TC Energy considers commodity pricing to determine the economic viability of future natural gas production. The 2022 natural gas price forecast developed by TC Energy is shown in Figure 1-2.

Figure 1-2: Average Nominal NIT Price

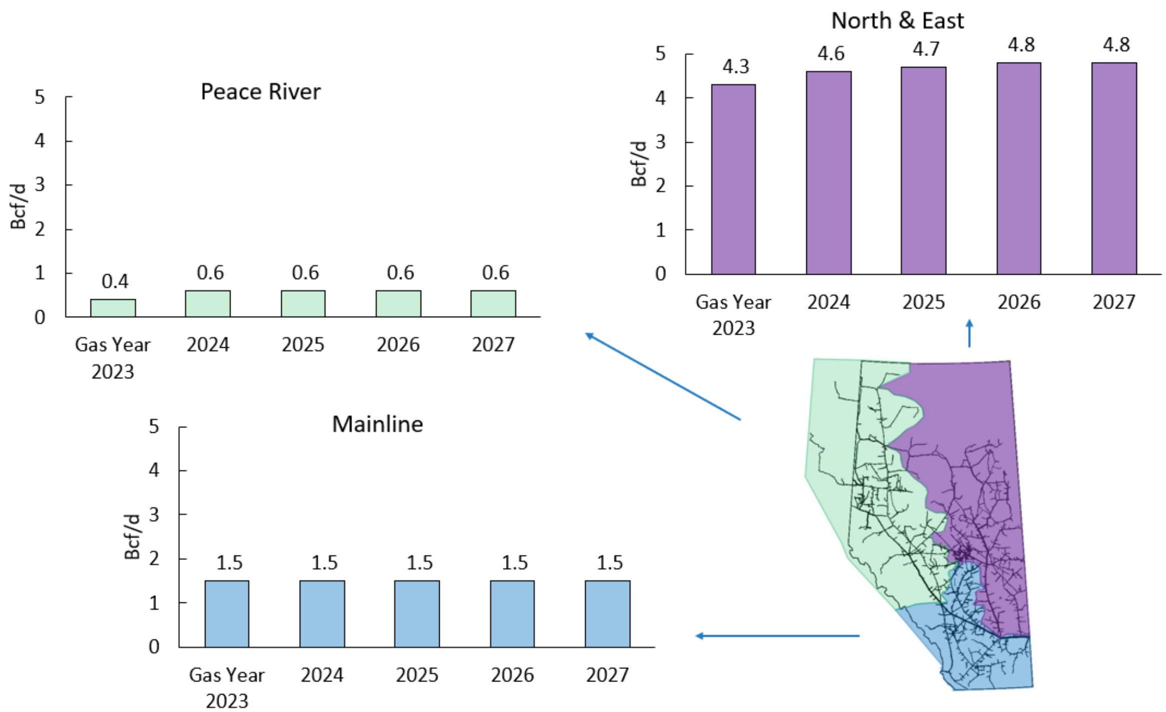


1.3 GAS DELIVERY FORECAST

Several sources of information were considered in developing the gas delivery forecast. First, operators of downstream facilities such as connecting pipelines, local distribution companies (LDCs), and industrial plants were requested to provide a forecast of their maximum, average, and minimum requirements for deliveries from the NGTL System over the next 10 years. The forecasts were analyzed and compared with historical flow patterns at NGTL Delivery Points. In cases where NGTL's analysis differed substantially from the operator's forecast, NGTL contacted the operator and either the operator's forecast was revised or NGTL adjusted its analysis. In cases where the operator did not provide a forecast, NGTL based its forecast on historical flows and growth rates for specific demand sectors.

Deliveries to intra markets on the NGTL System are forecast to rise, primarily due to demand in the oil sands sector, gas-fired electrical generation and growing petrochemical investments.

Figure 1-3: System Intra Deliveries by Project Area



1.3.1 Average Annual Delivery Forecast

Forecast deliveries are expressed as an average daily flow. The Average Annual Delivery Forecast is the aggregate forecast of deliveries for the NGTL System. The Average Annual Delivery Forecast, for Gas Years 2023 through 2027 are listed by Delivery Type in Table 1-1 and further detailed by Project Area in Table 1-2.

Table 1-1: System Average Annual Delivery Forecast by Delivery Type

Delivery Type	June 2022 Design Forecast ($10^6m^3/d$)				
	2022/23	2023/24	2024/25	2025/26	2026/27
Export	193.7	190.4	202.9	203.2	205.6
Intra System	176.9	189.0	195.2	194.8	194.9
Total System	370.7	379.4	398.1	398.0	400.5
Delivery Type	**June 2022 Design Forecast (Bcf/d)**				
	2022/23	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Export	6.8	6.7	7.2	7.2	7.3
Intra System	6.2	6.7	6.9	6.9	6.9
Total System	13.1	13.4	14.1	14.1	14.1

* Fuel is included

Note: Totals for Receipt & Delivery may not align due to rounding.

Volumes expressed as an average daily flow for each gas year, at 101.325 kPa and 15°C.

Table 1-2: Intra System Deliveries – Average Annual Delivery Forecast by Project Area

Project Area	June 2022 Design Forecast ($10^6m^3/d$)				
	2022/23	2023/24	2024/25	2025/26	2026/27
Peace River	11.5	16.7	17.3	16.6	16.6
North and East	121.6	129.2	134.1	134.7	135.1
Mainline	43.8	43.1	43.7	43.5	43.1
Total	176.9	189.0	195.2	194.8	194.9
Project Area	**June 2022 Design Forecast (Bcf/d)**				
	2022/23	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Peace River	0.4	0.6	0.6	0.6	0.6
North and East	4.3	4.6	4.7	4.8	4.8
Mainline	1.5	1.5	1.5	1.5	1.5
Total*	6.2	6.7	6.9	6.9	6.9

* Fuel is included

1.3.2 Maximum Day Delivery Forecast

Peak deliveries (Maximum Day Delivery) are also forecast for the NGTL Delivery Points and are based on historical flows.

A summary of the June 2022 Design Forecast winter and summer Maximum Day Delivery by Project Area for Intra System Deliveries is provided in Table 1-3 for winter and Table 1-4 for summer.

Table 1-3: Winter Maximum Day Intra System Delivery Forecast

Project Area	June 2022 Design Forecast ($10^6m^3/d$)				
	2022/23	2023/24	2024/25	2025/26	2026/27
Peace River	31.4	37.0	37.4	37.4	37.6
North and East	177.1	186.5	193.6	196.5	197.5
Mainline	86.7	86.8	87.3	87.5	87.5
Total	295.1	310.2	318.2	321.5	322.6
Project Area	**June 2022 Design Forecast (Bcf/d)**				
	2022/23	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Peace River	1.1	1.3	1.3	1.3	1.3
North and East	6.3	6.6	6.8	6.9	7.0
Mainline	3.1	3.1	3.1	3.1	3.1
Total	10.4	11.0	11.2	11.3	11.4

Table 1-4: Summer Maximum Day Intra System Delivery Forecast

Project Area	June 2022 Design Forecast ($10^6m^3/d$)				
	2022/23	2023/24	2024/25	2025/26	2026/27
Peace River	28.3	34.8	34.8	34.7	34.9
North and East	161.2	170.2	176.7	179.0	179.7
Mainline	65.6	65.1	65.9	65.6	65.1
Total	255.1	270.1	277.4	279.4	279.7
Project Area	**June 2022 Design Forecast (Bcf/d)**				
	2022/23	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Peace River	1.0	1.2	1.2	1.2	1.2
North and East	5.7	6.0	6.2	6.3	6.3
Mainline	2.3	2.3	2.3	2.3	2.3
Total	9.0	9.5	9.8	9.9	9.9

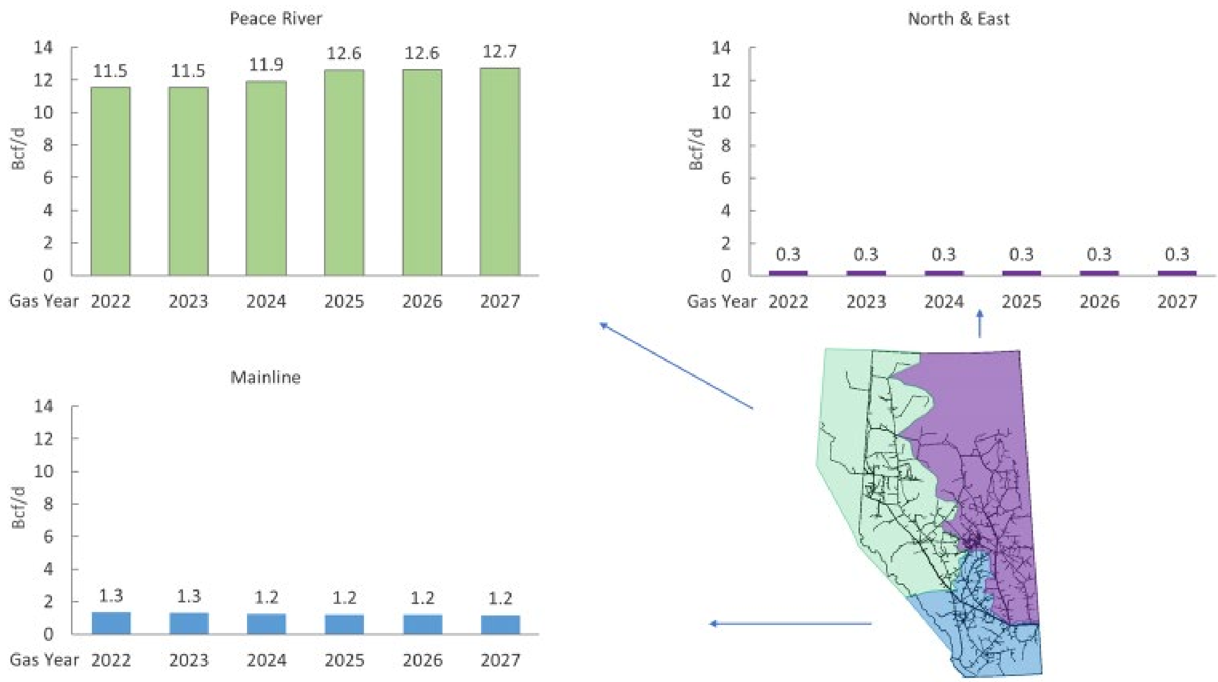
1.4 RECEIPT FORECAST

NGTL develops a Receipt Forecast on an average annual basis using information collected from several sources, including upstream information from customers, historical flows, industry publications and government agencies.

- NGTL uses activity-based forecasting methods and models to generate forecasts of future production. Factors such as gas price, liquids content in the gas, economics, total number of drilling locations available, well production profiles, pace of development, material and equipment availability, potential capital requirements, and access constraints are considered when developing a forecast of supply.
- For conventional production, there has been little to no activity in the last few years. NGTL anticipates that conventional supply will continue to decline. This production decline will be noticed mostly in the north east and east parts of the basin, which are areas outside of the Peace River Project Area.
- The decline rate of legacy gas and the more recent supply from shale and tight sandstone reservoirs varies across the basin and from year to year. Typically, the basin declines about 22% (18% to 25%) per year if left unsupported, without new wells.

Exploration activity focused on shale and tight sandstone reservoirs has resulted in increasing Montney and Deep Basin gas volumes entering the NGTL System, primarily through the Peace River Project Area. The incremental shale gas and tight sandstone gas supply is expected to more than offset existing basin production declines and will gradually increase system supply to slightly over 14.0 Bcf/d in 2025.

Figure 1-5: System Receipts by Project Area



Gas supplied from storage facilities was not included in the data presented in this section. For information pertaining to gas supply from Commercial Storage Facilities, see Section 1.6.

1.4.1 Average Receipt Forecast

The Average Receipt Forecast is the aggregate receipts forecast for the NGTL System for the 2023 through 2027 gas years. A summary of System Average Receipts by Project Area is expressed as an average daily flow and shown in Table 1-5.

Table 1-5: System Average Receipts

Project Area	June 2022 Design Forecast ($10^6m^3/d$)				
	2022/23	2023/24	2024/25	2025/26	2026/27
Peace River	327.0	337.5	357.0	357.6	360.6
North and East	8.2	8.2	8.3	8.3	8.3
Mainline	37.2	35.4	34.5	33.9	33.3
Total	372.4	381.1	399.7	399.8	402.2
Project Area	**June 2022 Design Forecast (Bcf/d)**				
	2022/23	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Peace River	11.5	11.9	12.6	12.6	12.7
North and East	0.3	0.3	0.3	0.3	0.3
Mainline	1.3	1.2	1.2	1.20	1.2
Total	13.1	13.5	14.1	14.1	14.2

1.5 SUPPLY DEMAND BALANCE

Supply received on to the NGTL System is balanced with System deliveries (net of gas in storage). System deliveries by destination are shown in Figure 1-6, while System receipts by Project Area are shown in Figure 1-7.

Figure 1-6: System Deliveries by Destination

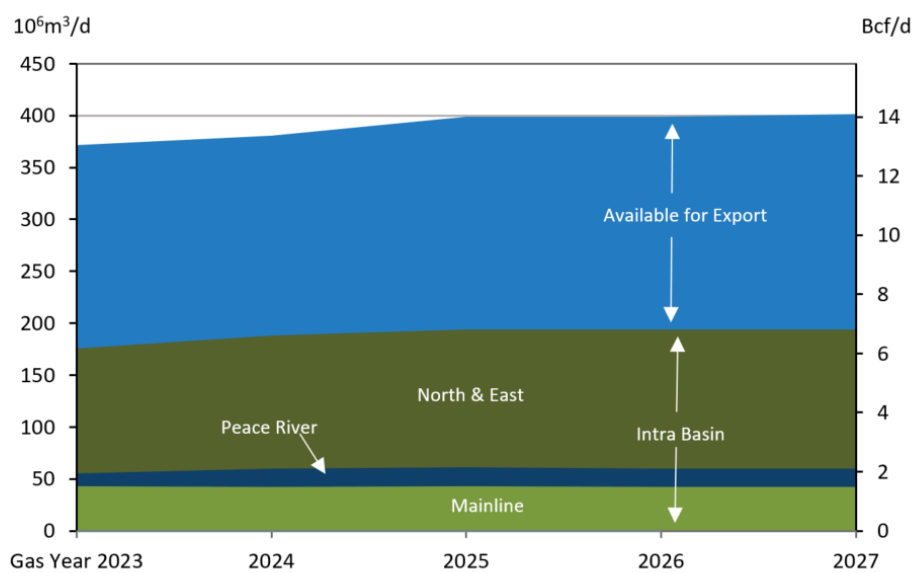
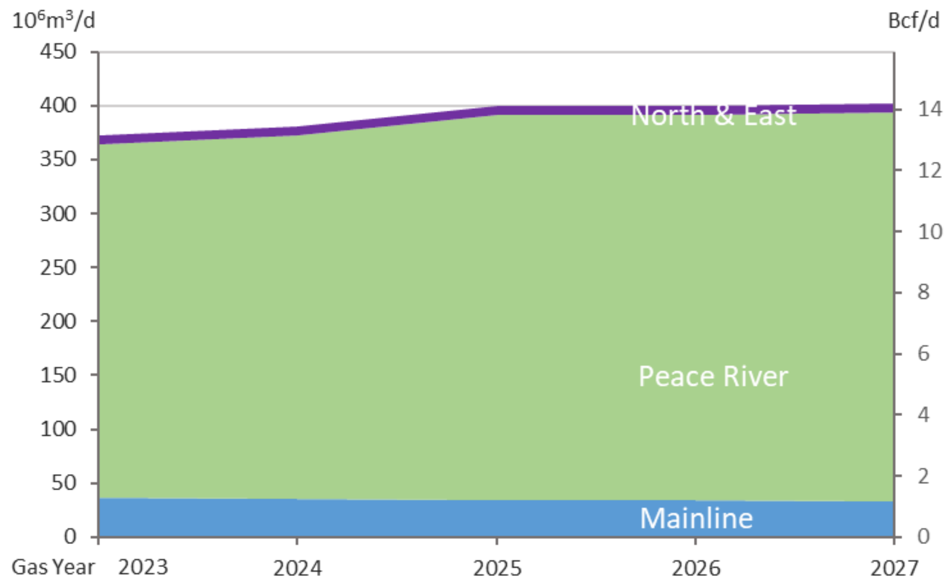


Figure 1-7: System Receipts by Project Area



The average annual outlooks of receipts, deliveries, and NGTL System throughput volumes reported in this section are understood to be within a range of outcomes due to factors such as changing market conditions and the pace of WCSB supply development.

1.6 STORAGE FACILITIES

1.6.1 Commercial Storage

There are nine commercial storage facilities connected to the NGTL System (AECO 'C', Big Eddy, Carbon, Chancellor, Crossfield East #2, January Creek, Severn Creek, Warwick Southeast and Aitken Creek Meter Stations). The total deliverability from storage facilities is significant, but actual maximum day receipts from storage are dependent on a number of factors, including market conditions, level of working gas, compression power at each storage facility, and NGTL System operations.

For design purposes, a supply contribution from storage facilities is used to meet peak day winter delivery requirements and provide for a better correlation between forecast design flow requirements and historical actual flows for the winter period. Historical withdrawals during recent winter periods for each storage facility were used to determine a reasonable expected rate of withdrawal for future winter seasons.

For the receipt meter capacity for each of the connected commercial storage facilities, see Table 1-6.

Table 1-6: Receipt Meter Capacity from Commercial Storage Facilities

Storage Facility	Receipt Meter Capacity from Commercial Storage Facilities	
	$10^6m^3/d$	Bcf/d
AECO C	40.8	1.4
Big Eddy	43.0	1.5
Aitken Creek (B.C.)	37.6	1.3
Carbon	13.6	0.5
Chancellor	28.7	1.0
Crossfield East 2	14.7	0.5
January Creek	20.2	0.7
Severn Creek	8.4	0.3
Warwick Southeast	7.6	0.3
Total	**214.8**	**7.6**

Note:
Storage is considered an interruptible supply source.
Totals have been rounded.

1.6.2 Peak Shaving Storage

The Fort Saskatchewan Salt Caverns are a peak shaving storage facility in the greater Edmonton area within the ATCO Pipeline footprint, in the North of Bens Lake Design Area of the NGTL System. Similar to commercial storage facilities, the total deliverability from the peak shaving storage facility is significant, and the actual maximum day receipt from this storage also depends on a number of factors, including market conditions, level of working gas, compression power at the storage facility and NGTL System operations.

For design purposes, a supply contribution from the peak shaving storage facility is used to meet peak day winter delivery requirements and provide for a better correlation between forecast design flow requirements and historical actual flows for the winter period. The maximum withdrawal rate and the maximum working inventory of the storage facility are used as the upper limits for the supply contribution provided.

2.0 DESIGN FLOWS AND MAINLINE FACILITIES

2.1 INTRODUCTION

This section contains the proposed natural gas transportation mainline facilities that may be applied for on the NGTL System in the 2022/23 Gas Year to meet the design flow requirements. New to this section of the Annual Plan, are potential mainline facilities that cover additional flow requirements based on the expressed interest for incremental receipt and delivery services currently in NGTL's transportation service queue. Included is information regarding facility size, routes, locations, and cost estimates.

The design flows are presented for design areas where new mainline facilities are required. Design flows are based on the June 2022 design forecast presented in Section 1, and were determined using the methodology described in *Facilities Design Methodology*, Section 3.5: Mainline Facilities Flow Determination. This document can be accessed at http://www.tccustomerexpress.com/871.html. Design charts for key areas without proposed facilities are also presented to provide an understanding of how the NGTL system is evolving.

This section includes a comparison of historical flows to the design flows. Additionally, the expected design capability is shown for the Gas Year when facilities are required in each applicable design area. Where there is a shortfall between design flow and the design capability, a facility solution has been proposed. A facility application to the regulator for construction and operation is triggered by Firm Transportation (FT) contracts in excess of design capability and submitted to ensure the facility is in place in time to meet the FT requirements. Aggregated FT contract levels are also presented to indicate commercial underpinning of the proposed facilities.

This section of the Annual Plan presents facilities grouped by common basis and purpose. The facility that serves the design flow requirements for the Kirby area is first presented, followed by the potential facilities that would serve incremental flows. The latter facilities are grouped by those that would serve incremental supply in the Peace River Project Area and those that would serve incremental demand primarily in the Fort

Saskatchewan area. Presentation of the proposed facilities in this manner is intended to improve the clarity of their requirement and commercial underpinning. Contractual underpinning for the potential facilities for incremental flow is still pending finalization. As such, these facilities are subject to change.

An overview of the design flows and proposed facility resulting from the June 2022 design forecast, as well as the potential facilities for incremental flow, were presented to the TTFP on December 13, 2022. Subsequent updates to these facilities and notifications prior to filing for their applications will be presented to the TTFP as they occur. These updates, as well as any new facilities proposed after issuance of this Annual Plan, will be shown in the *2023 Facility Status Update (NGTL 2023 Update)*, which can be accessed at http://www.tccustomerexpress.com/871.html.

This section of Annual Plan also contains commentary regarding emissions reduction, as it has the potential to impact future proposed facilities.

For a summary of the status of mainline facilities that have been proposed, applied for, under construction or placed in-service since the December 2021 Annual Plan, see *Appendix 2: Facility Status Update*.

2.2 AGGREGATE SYSTEM REQUIREMENTS

Although no additional facilities are being identified in this Annual Plan for them, aggregate system requirements are presented in this section to provide an understanding of how the NGTL system is evolving.

As described in Section 1, aggregate system demand continues to grow. From the figures provided in Table 1-1, system demand is forecast to grow from 13.1 Bcf/d to 14.1 Bcf/d from Gas Years 2023 to 2027. Also described in Section 1 is the continued aggregate supply growth and shift towards the Peace River Project Area. Increasing supply in the Peace River Area will serve to offset supply declines in other areas of the system and increase the total system supply, matching the increasing aggregate system demand. From the figures provided in Table 1-5, supply in the Peace River Area grows from 88%

of the total system supply to 89% of the total system supply from Gas Years 2022 to 2027, commensurate with an 8% increase in total system supply over the same period.

The forecasted annual average daily flowrates described in Section 1 are translated into peak day design flows which are used for system facility design. The design flows for the system therefore reflect the forecasted increases in average annual total system supply and demand. Figure 2-1 shows how the system design flows at the beginning of each Gas Year grow from 17.1 Bcf/d to 18.7 Bcf/d from 2023 to 2027. Figure 2-1 also shows the aggregate system FT-R and FT-D levels as of November 1 annually. As can be seen, the increasing design flows are supported by increasing system FT-D contract levels.

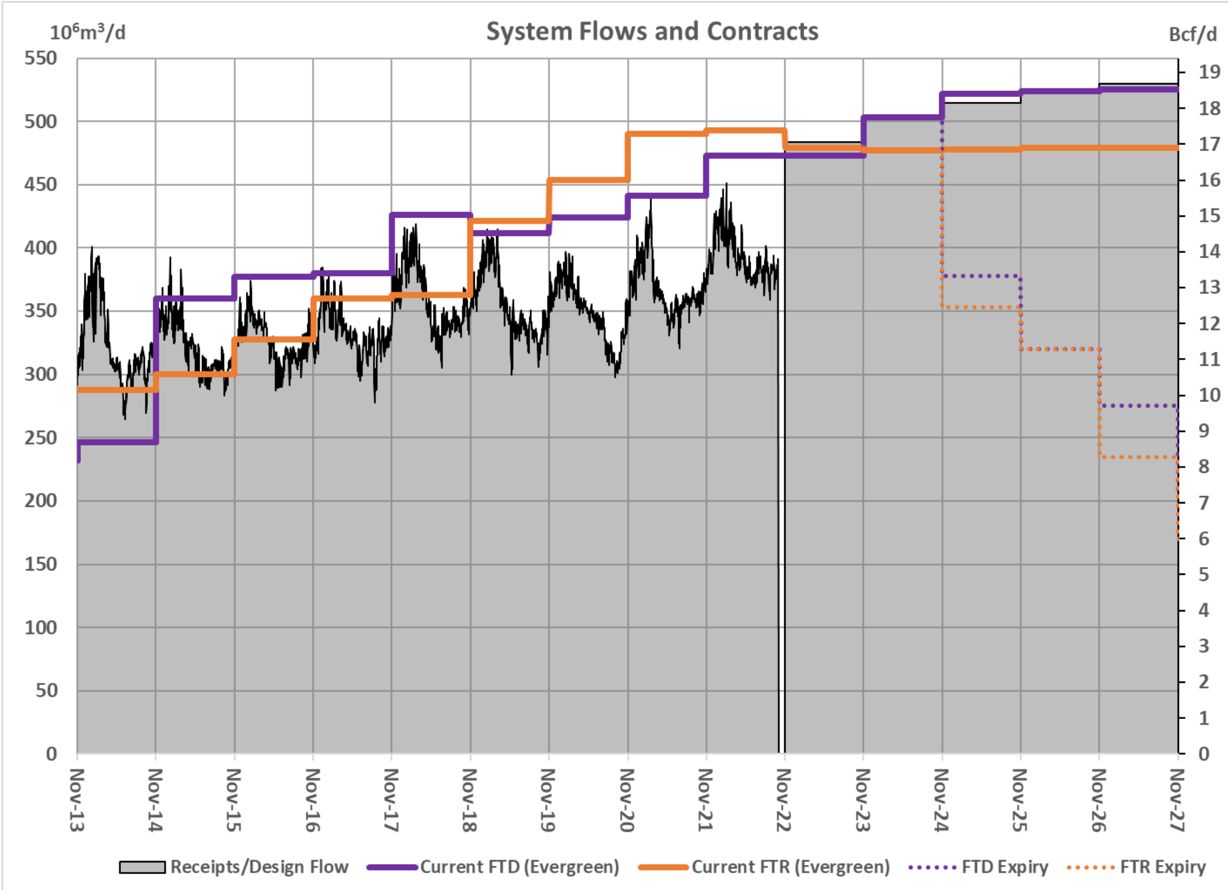
The system receipts that meet these growing system deliveries come from three sources:

1. Storage withdrawals, which have no associated FT-R and are not driving additional facilities
2. Declining receipts from unconstrained areas outside the Peace River Project Area, which have minimal associated FT-R and are not driving additional facilities
3. Growing receipts from the Peace River Project Area, where FT-R is required to commercially underpin the additional facilities they are driving

Although Figure 2-1 depicts aggregate system FT-R, the additional facilities that meet the growing aggregate system requirements are required only for the growing receipts in the Peace River Project Area. As such, it is only the FT-R in the Peace River Project Area that represents the commercial underpinning for receipts at the aggregate system level. As depicted later in Figure 2-5 in Section 2.4.1, FT-R in the Peace River Project Area exceeds the increasing receipt design flows in that particular area, thereby continuing to commercially underpin the previously proposed facilities for that area.

Figure 2-1 also depicts the hypothetical FT expiry profiles if all contracts non-renewed. Although all previously proposed facilities continue to be required and contractually underpinned, contract renewals are closely monitored to ensure this remains true. Should underpinning change, NGTL will appropriately adjust facility plans and/or repurpose capacity.

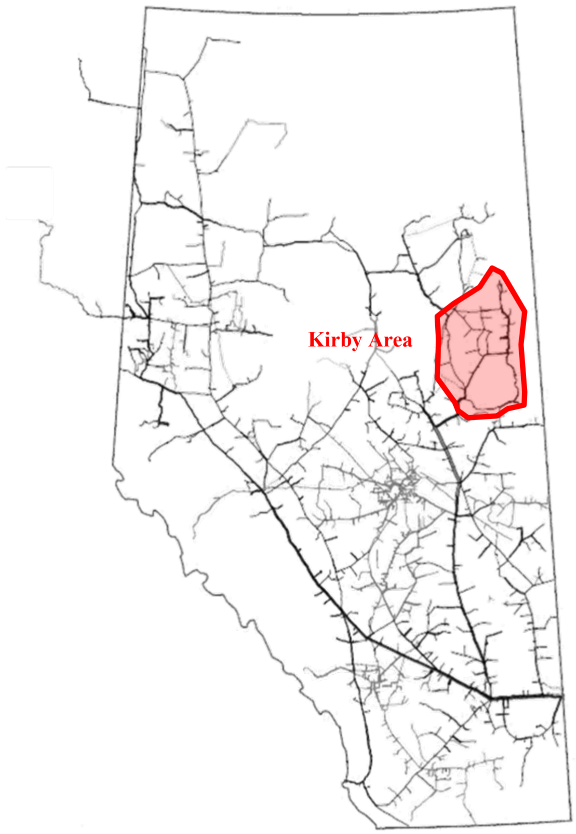
Figure 2-1: Aggregate System Flows, Design Flows, and Contracts



2.3 FACILITY FOR KIRBY AREA DEMAND

The Kirby area, shown in Figure 2-2, is located within the North and East Project Area and is a subset of the Oilsands Delivery Area. A proposed facility is required to meet the aggregate delivery requirements in the Kirby area, which is primarily for oilsands production.

Figure 2-2: Kirby Area

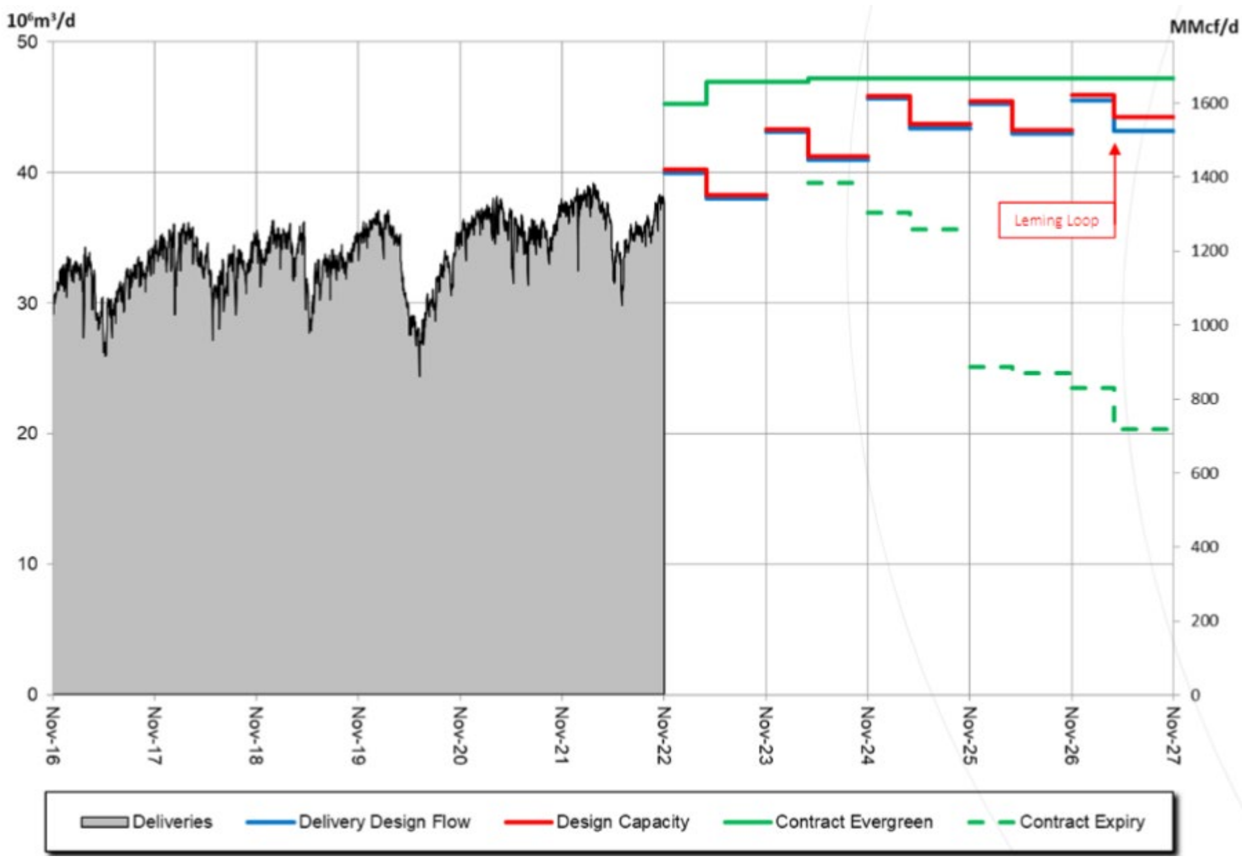


2.3.1 Design Flows - Kirby Area

The prevailing design condition for the Kirby area is the Flow-Within condition: When area deliveries are at their maximum. The continued demand growth and changing distribution of demand in the area will be accommodated by the proposed facility.

Figure 2-3 shows historical deliveries, delivery design flow, contract levels and design capability for the Kirby area. Delivery design flow rises at the start of the forecast period attributable to increasing demand driven by oilsands production. As can be seen, this increase is underpinned by existing contracts which are expected to be more utilized. Design capability also rises during the start of the forecast period as previously proposed facilities for increasing North and East Project Area capability become in-service. The design flow plateaus at the end of the forecast period, but the distribution of this demand continues to change and has a hydraulically negative impact to the area. This impact is evident in the decreasing deign capability during this period. The proposed facility is required to keep the design capability above the design flow as highlighted in red in Figure 2-3. Further details on the proposed facilities are provided in Sections 2.3.2.

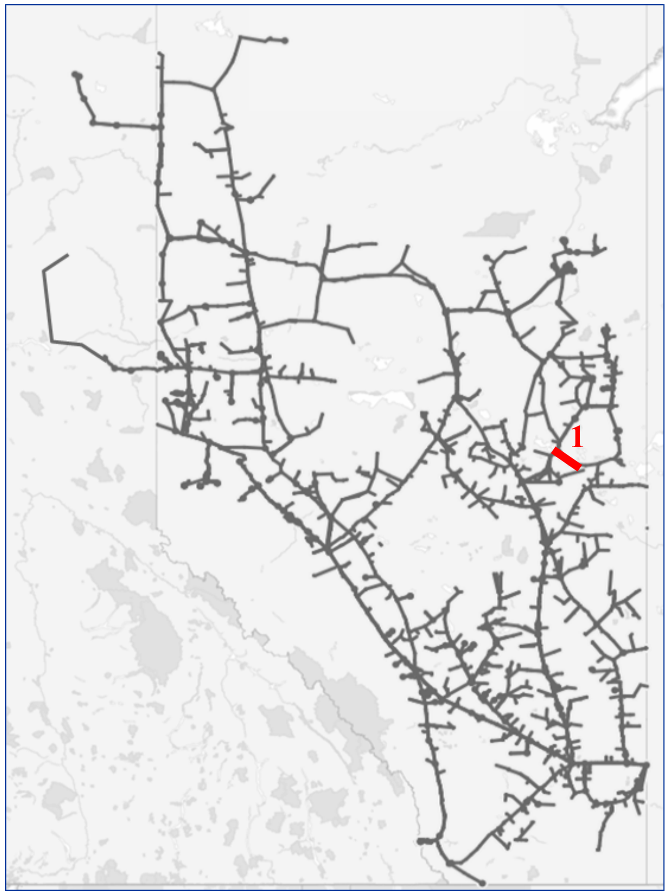
Figure 2-3: Kirby Area Design Chart



2.3.2 Proposed Facility for Kirby Area Demand

Figure 2-4 shows the location of the proposed facility required to meet Kirby area requirements resulting from the Flow-Within design condition.

Figure 2-4: Proposed Facilities for Kirby Area Demand



The application for the proposed facility is expected to be filed with the CER in Gas Year 2023 and to be in in-service in the 2026-27 timeframe. For detail on the proposed facility, see Table 2-1.

Table 2-1: Proposed Facility for Kirby Area Demand

Map Location	Applied-For Facility	Description	Target In-Service Date	Forecast Cost ($Millions)
1	Leming Loop	Up to 56 km NPS 24	2026-27	270
			Total	**270**

2.4 POTENTIAL FACILITIES FOR INCREMENTAL SYSTEM FLOWS

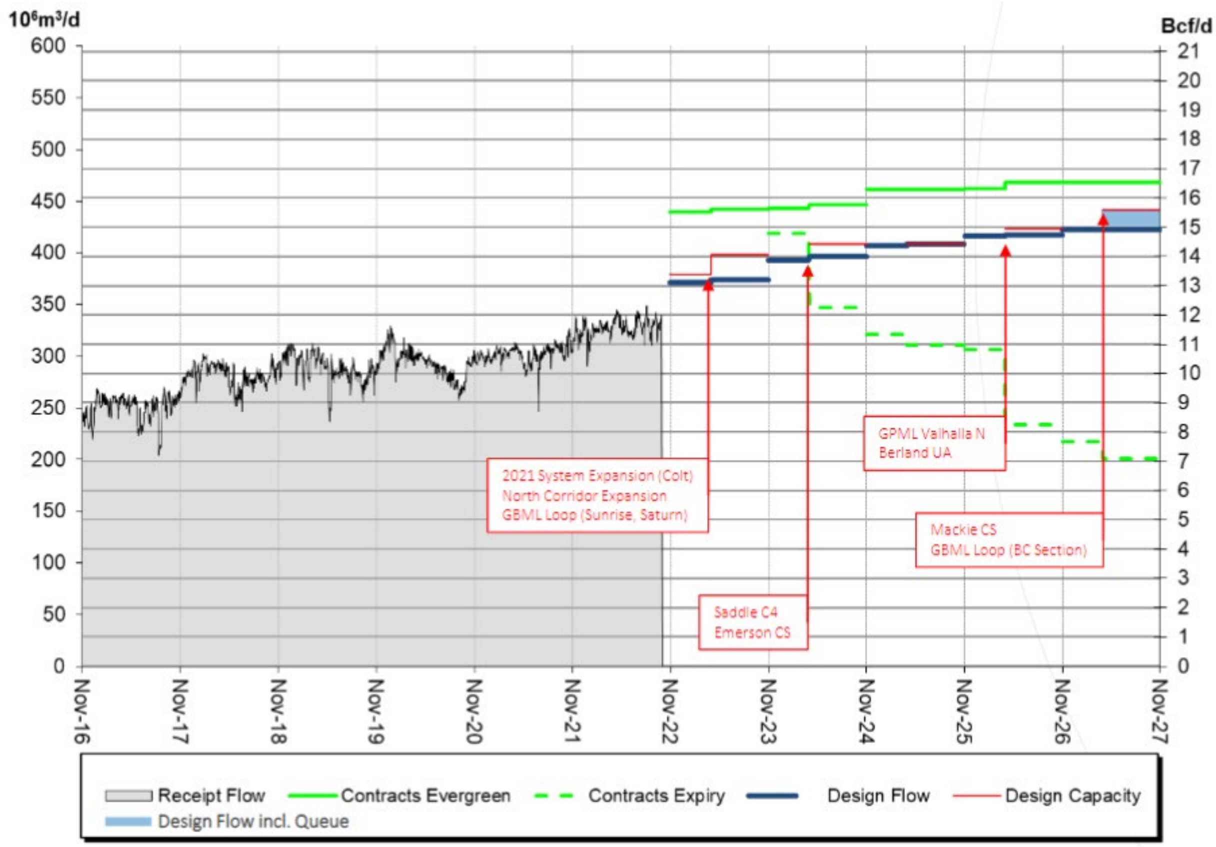
Interest has been expressed for incremental receipt and delivery service on the NGTL system. NGTL maintains a queue to track these service requests which can also be used to gauge when, where, and how much incremental system flow requirements could be above the established design flows. This section presents potential facilities that would meet an increase of ~450 mmcf/d in system flow requirements in the 2026-28 timeframe, with the incremental supply coming from the Peace River Project Area primarily in the West of Saddle Hills area, and the incremental demand primarily in the Fort Saskatchewan area. Determining the need and timing for these potential facilities is contingent on further technical analysis and on final investment decisions, which are informed by many factors including customer requirements, commercial underpinning, long-term forecast and system utilization, economic viability and impacts to long-term system competitiveness, evolving emission abatement policy, permitting timelines and stakeholders/rightsholders considerations, and investment framework.

2.4.1 Design and Incremental Flows – Peace River Project Area

Since it represents such a large portion of total system supply, the design condition for the Peace River Project Area is very interdependent with total system conditions. The prevailing design condition for the Peace River Area is therefore best represented by a Total System Flow-Within condition: When total system deliveries are at their maximum and total system receipts, a vast majority of which are from the Peace River Area, are at their peak as well. System facilities must be capable of transporting enough gas out of the Peace River Project Area to meet expected peak deliveries throughout the rest of the system.

Figure 2-5 shows historical receipts, receipt design flow, contract levels and design capability for the Peace River Project Area. Receipt design flow and capability rises throughout this forecast period, attributable to increasing supply in the area and the previously proposed facilities that enable this. The incremental supply is represented by the blue band in the summer of 2027 with their two associated potential facilities highlighted in red. Further details on these two potential facilities are provided in Section 2.4.2.

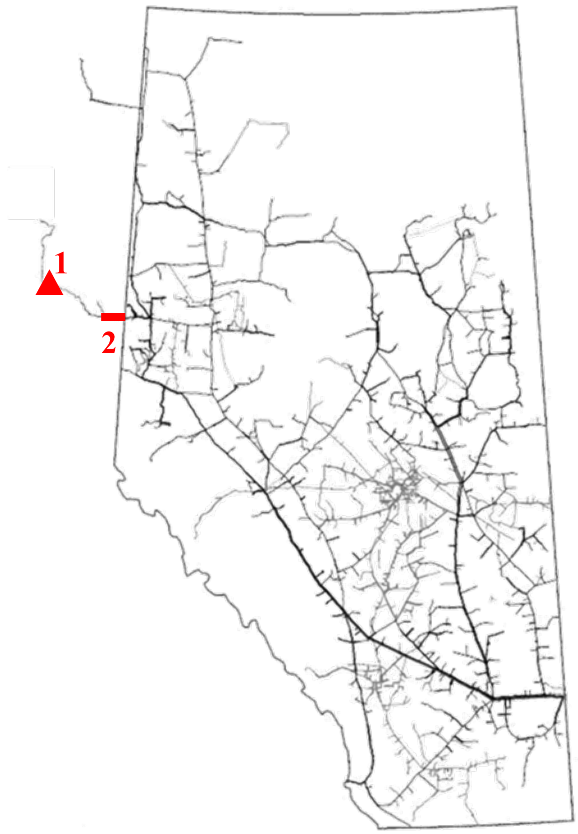
Figure 2-5: Peace River Project Area Design Chart



2.4.2 Potential Facilities for Incremental Peace River Project Area Supply

Figure 2-6 shows the locations of the potential facilities required for incremental supply. These facilities will increase the receipt capability for the Peace River Project Area, primarily in the West of Saddle Hills area.

Figure 2-6: Potential Facilities for Incremental Peace River Project Area Supply



The need and schedule for these potential facilities are contingent on further technical analysis and final investment decisions, which in turn, require the finalization of commercial arrangements. Should they proceed, applications may need to be filed with the CER as early as Gas Year 2023 in order to be in-service between late 2026-2028. For details on the potential facilities, see Table 2-2.

Table 2-2: Potential Facilities for Incremental Peace River Project Area Supply

Map Location	Proposed Facility	Description	Target In-Service Date	Forecast Cost ($Millions)
1	Mackie Compressor Station	15 MW	2026-28	210
2	Groundbirch Mainline Loop (BC Section)	25 km NPS 42	2026-28	175
			Total	**385**

2.4.3 Design and Incremental Flows – Edmonton and Central Areas

The Fort Saskatchewan area is part of the greater Edmonton area within the AP footprint. Major petrochemical and other industrial plants located in Fort Saskatchewan results in most of the area gas demand being industrial loads. As the whole of greater Edmonton is directly serviced by AP's integrated system, one part of the impact of incremental demand in Fort Saskatchewan can be seen by examining the Edmonton area.

The Central area comprises all the deliveries in central Alberta including those in the major Calgary and Edmonton demand centres and some minor interprovincial deliveries. It excludes the major export points which will be presented separately in Sections 2.5.3 and 2.5.4. Since Edmonton demand is fed by upstream facilities in the Central area, the second part of the impact of incremental demand in Fort Saskatchewan can be seen by examining the Central area.

The prevailing design condition for the Edmonton and Central areas is the Flow-Within Condition. Under this condition, deliveries in these areas are at their maximum and facilities are required to transport supply into and through these areas to satisfy demand requirements.

Figure 2-7 shows historical deliveries, delivery design flow, contract levels and design capability for the Edmonton area. Delivery design flow and capability rises throughout this forecast period, attributable to increasing residential/commercial and industrial demands in the area and the previously proposed facilities that enable this. The incremental demand is represented by the blue band in the winter of 2028 with their three associated potential facilities highlighted in red. Further details on these three potential facilities are provided in Section 2.4.4.

Figure 2-7: Edmonton Area Design Chart

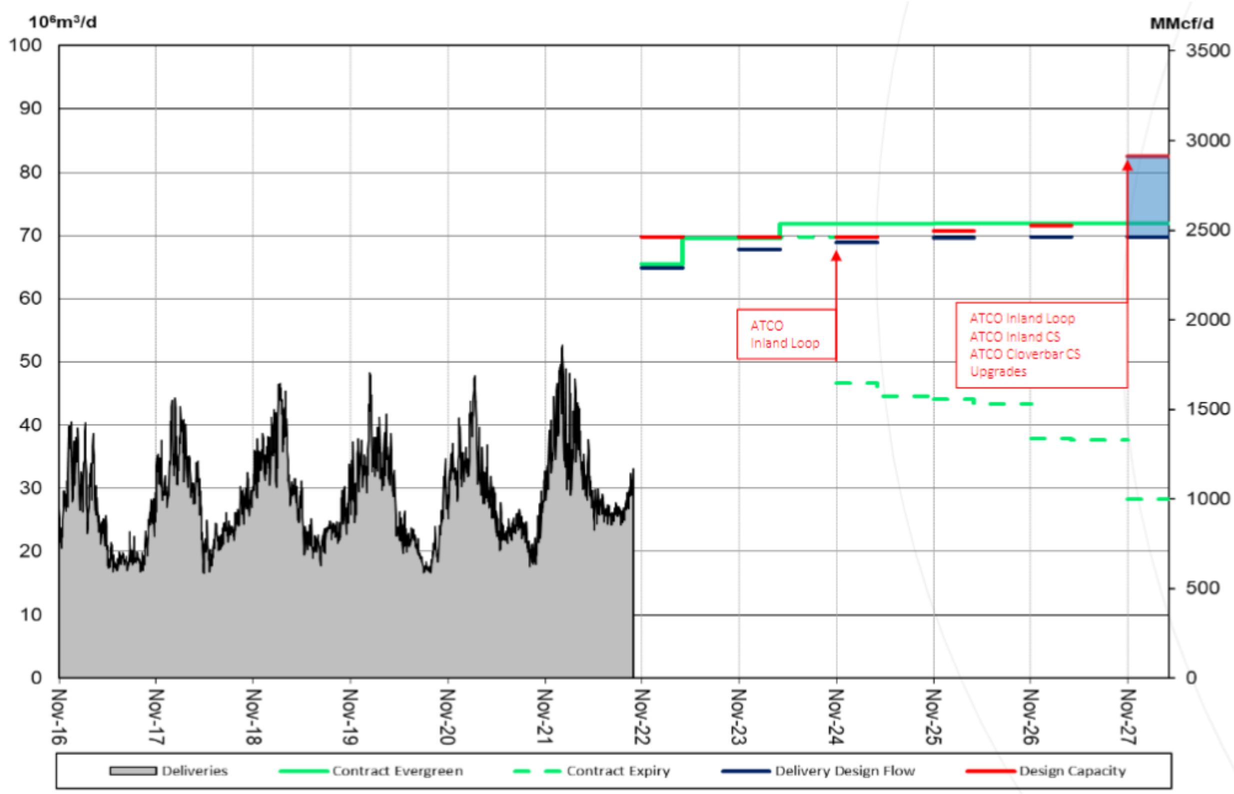
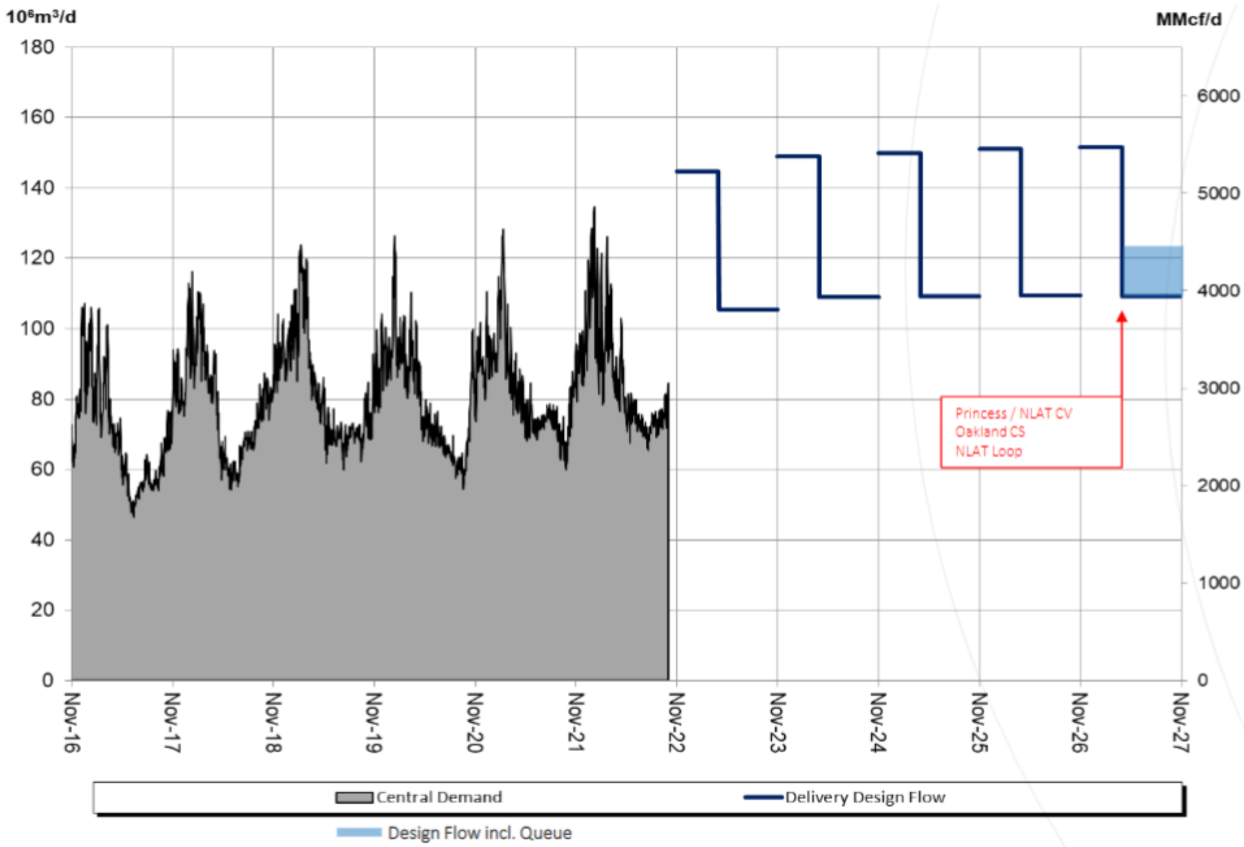


Figure 2-8 shows historical deliveries and delivery design flows for the Central area. Delivery design flow and capability rises throughout this forecast period with a major contributor being growth in the power generation sector and the previously proposed facilities that enable this. The incremental demand is represented by the blue band in the summer of 2027 with their three associated potential facilities highlighted in red. Further details on these three potential facilities are provided in Section 2.4.4

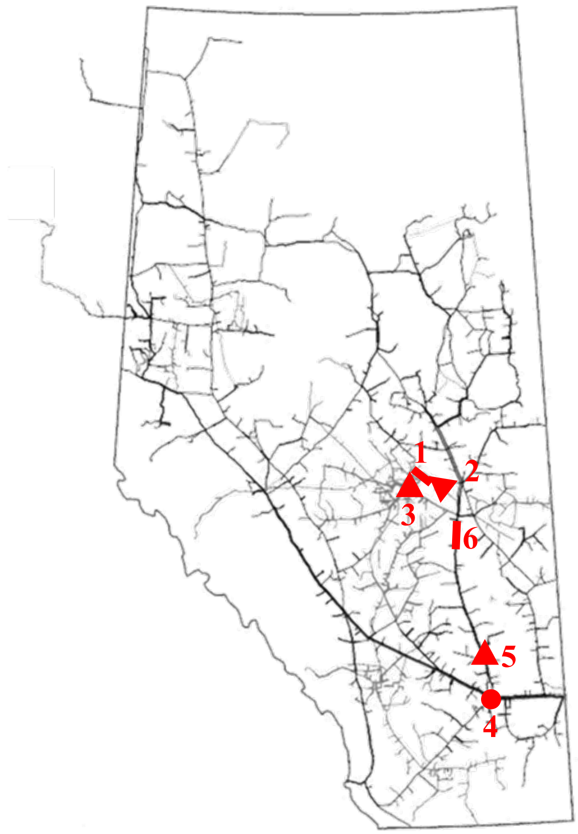
Figure 2-8: Central Area Design Chart



2.4.4 Potential Facilities for Incremental Edmonton Area Demand

Figure 2-9 shows the locations of the potential facilities required for incremental demand. These facilities will increase the capability of the NGTL system to transport incremental supply up towards Edmonton through the Central area as well as the capability of the ATCO system to transport that incremental supply into Edmonton.

Figure 2-8: Potential Facilities for Incremental Edmonton Area Demand



The need and schedule for these potential facilities are contingent on final investment decisions, which in turn, require the finalization of commercial arrangements. Should they proceed, applications may need to be filed with the AUC and CER in Gas Year 2023 in order to be in-service late 2026-2028. For details on the potential facilities, see Table 2-3.

Table 2-3: Potential Facilities for Incremental Edmonton Area Demand

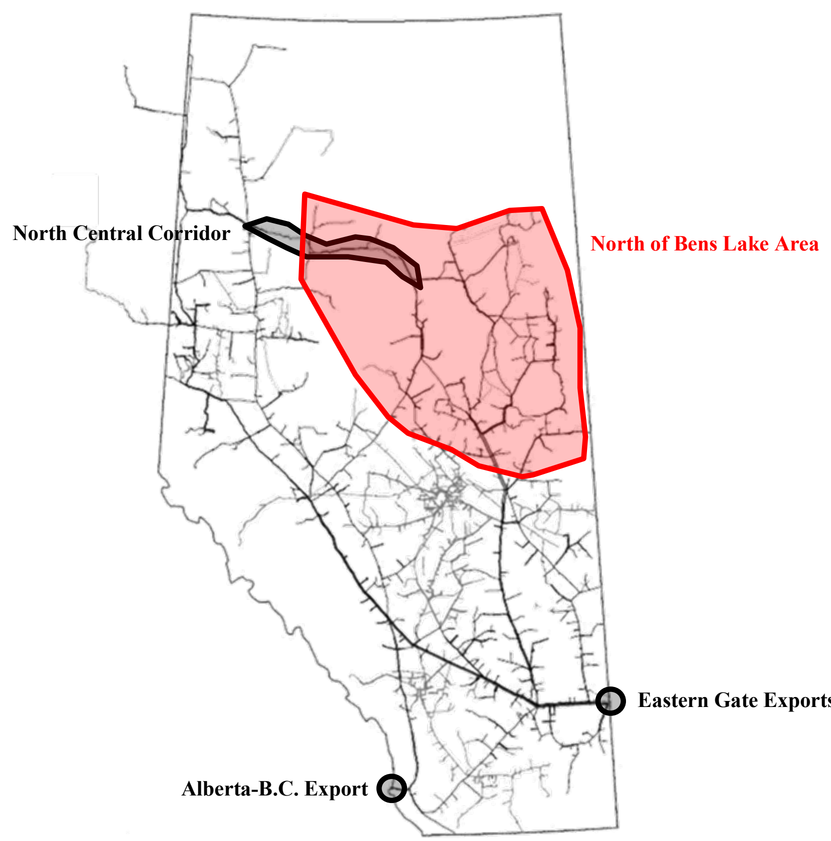
Map Location	Potential Facility	Description	Target In-Service Date	Forecast Cost ($Millions)
	ATCO Facilities			
1	Inland Loop	27 km NPS 24	2026-28	110
2	Inland Compressor Station	15 MW	2026-28	115
3	Cloverbar Compressor Station Upgrades	Upgrades	2026-28	10
			Total ATCO	**235**
	NGTL Facilities			

4	Princess / North Lateral Control Valve	CV	2026-28	20
5	Oakland CS Station Unit Addition	30 MW	2026-28	170
6	North Lateral Loop	25 km NPS 30	2026-28	135
			Total NGTL	**325**

2.5 KEY AREAS WITHOUT NEWLY PROPOSED FACILITIES

Although additional facilities in other areas are not being proposed in this Annual Plan, design charts for other areas are presented in this section. The intent is to provide an understanding of the impact of previously proposed facilities in these other areas, and relay how the NGTL system is evolving in general. Figure 2-9 shows the locations of these key areas.

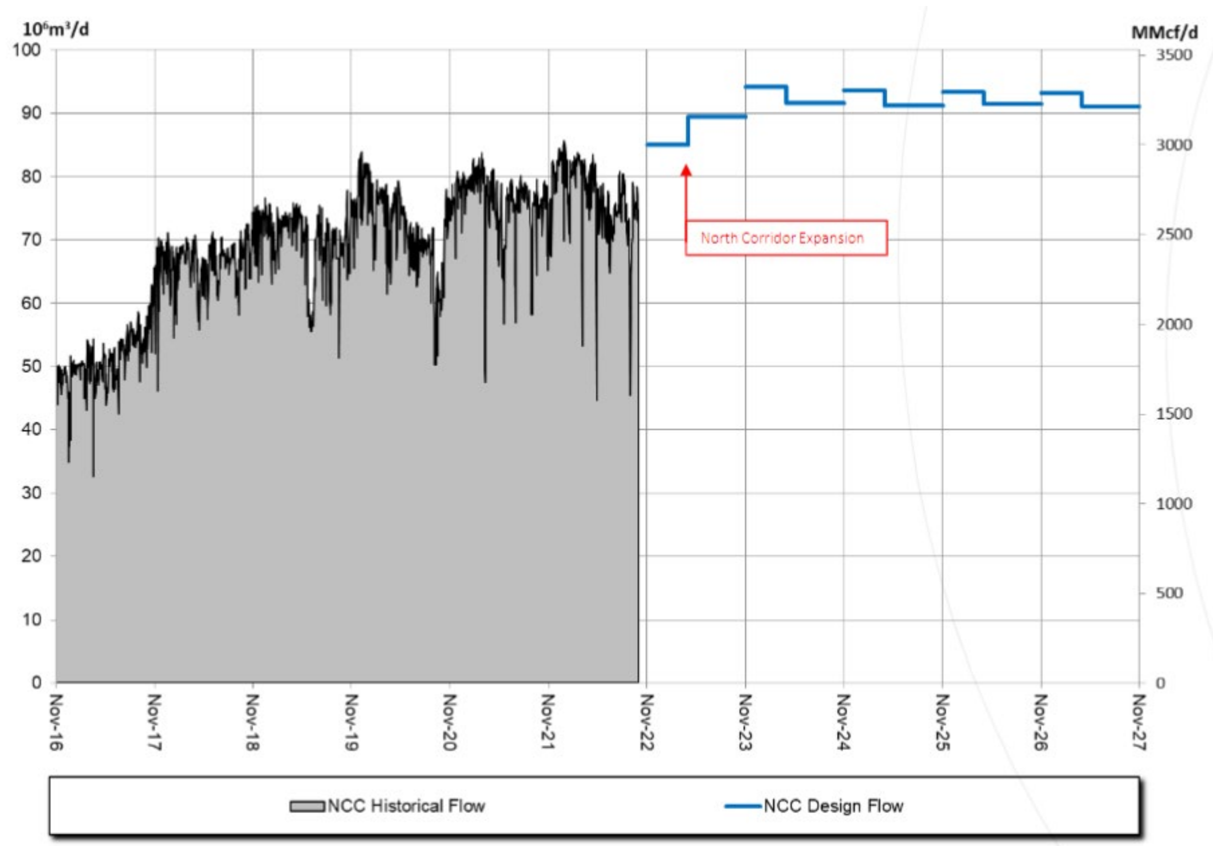
Figure 2-9: Key Areas



2.5.1 Design Flows – North Central Corridor (NCC)

The NCC is the primary corridor feeding demands in northeast Alberta, which includes major oilsands deliveries. As highlighted red in Figure 2-10, the previously planned North Corridor Expansion project will increase NCC capability to help satisfy these growing deliveries.

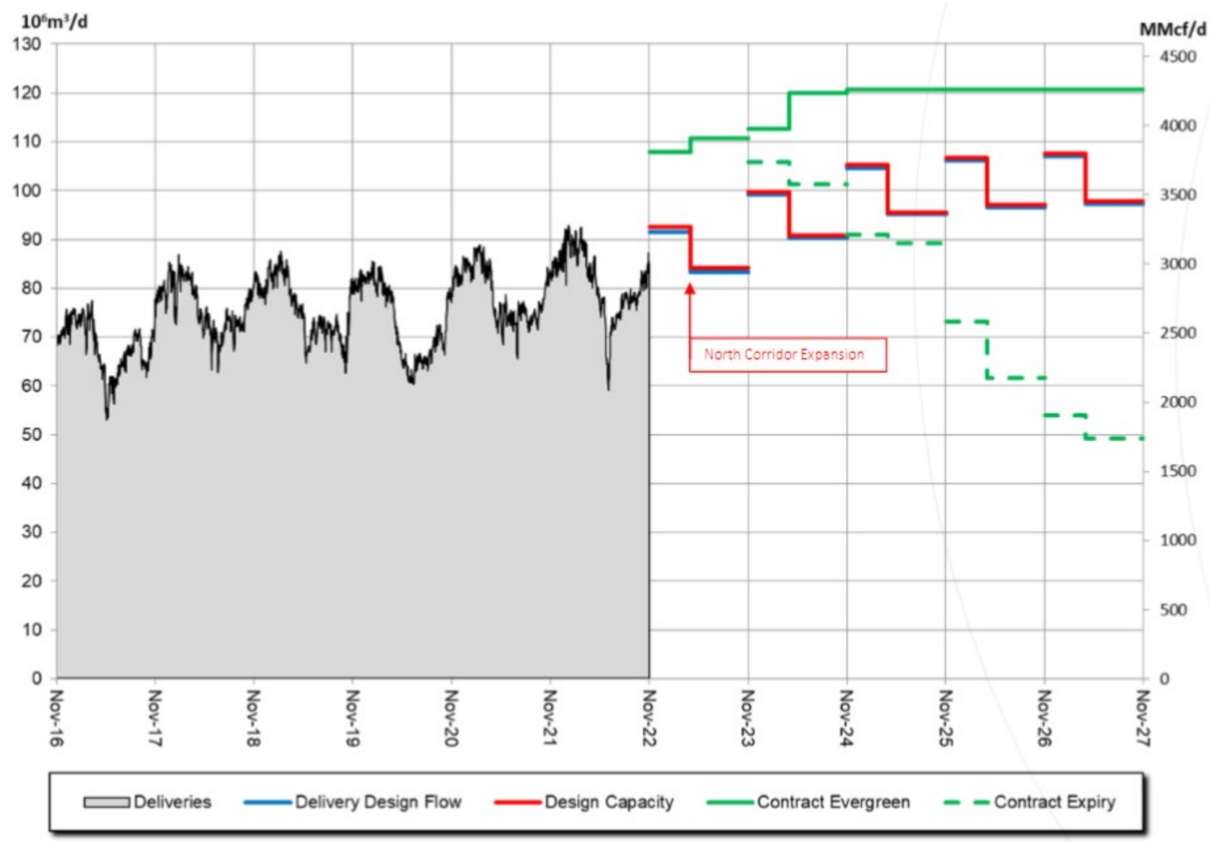
Figure 2-10: NCC Design Chart



2.5.2 Design Flows – North of Bens Lake Area

The North of Bens Lake area in northeast Alberta includes major oilsands deliveries. As highlighted red in Figure 2-11, the previously planned North Corridor Expansion project will increase NCC capability to help satisfy growing deliveries in this area. Subsequent to this project, the growth in this area is projected to subside and be met by increasing flows through other corridors besides the NCC.

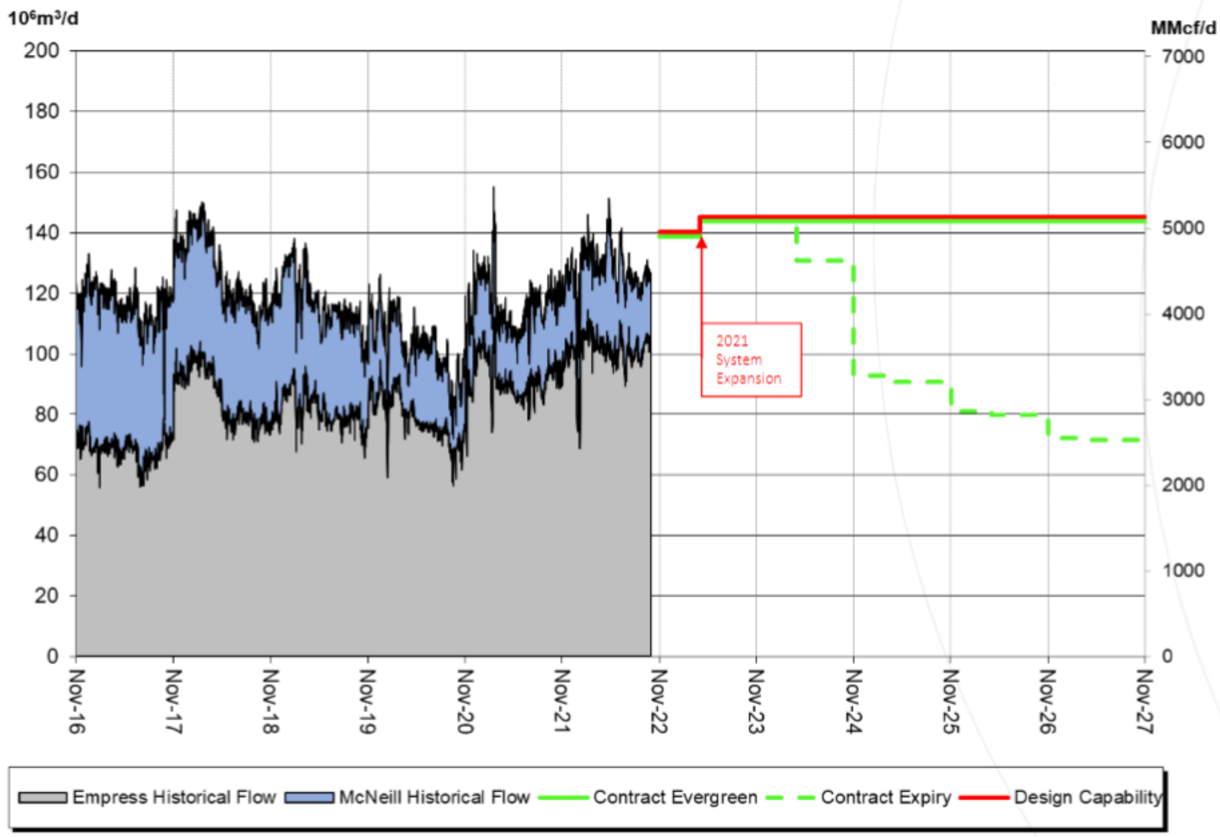
Figure 2-11: North of Bens Lake Design Chart



2.5.3 Design Capability – Eastern Gate Exports (EGAT)

EGAT exports comprises the deliveries to the Empress and McNeill export points. As highlighted red in Figure 2-12, completion of the remaining components of the previously planned 2021 NGTL System Expansion Project will increase EGAT delivery capability to meet the increase in contracted export flowrates.

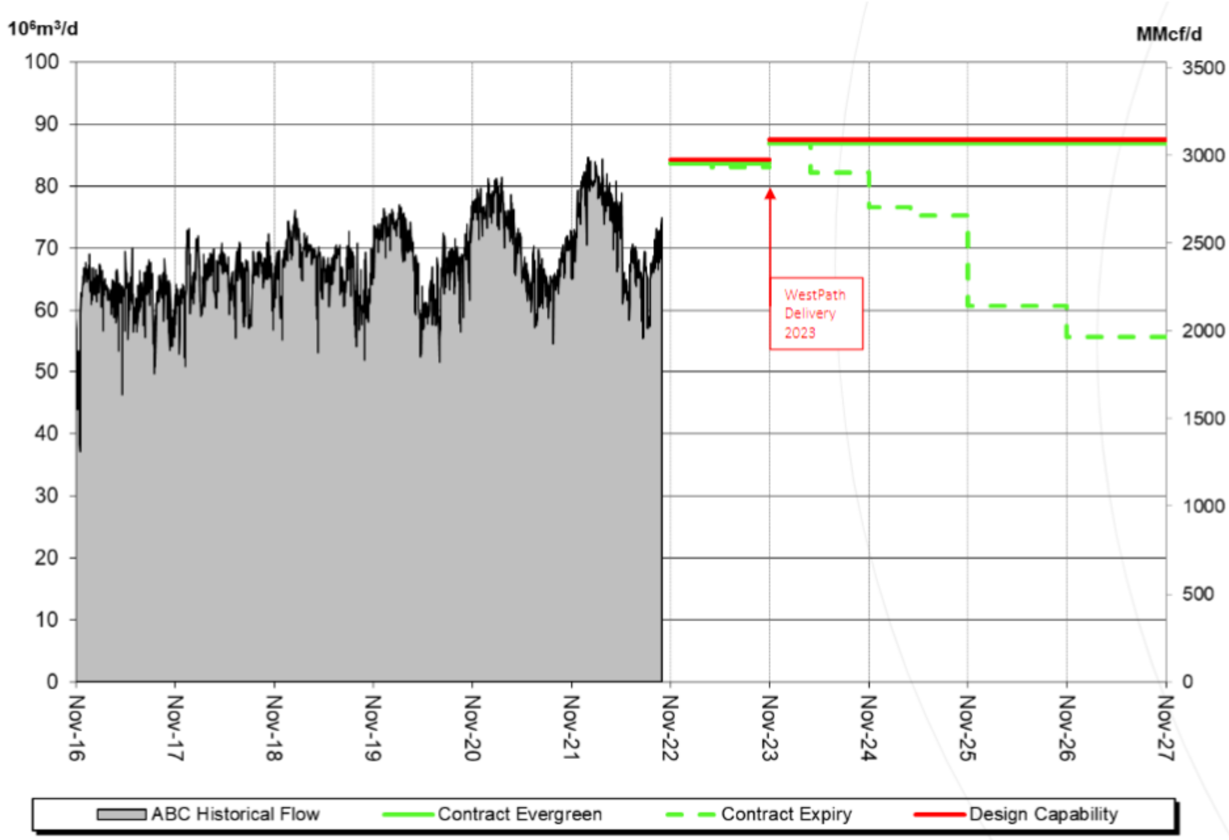
Figure 2-12: EGAT Design Chart



2.5.4 Design Capability – Alberta-British Columbia Export Point (ABC)

The ABC export point is where NGTL delivers to the Foothills B.C. system. As highlighted red in Figure 2-13, the previously planned 2023 West Path Delivery project will increase ABC export capability to meet the increasing contracted export flowrates.

Figure 2-13: ABC Design Chart



2.6 EMISSIONS REDUCTION

Environmental emissions reduction policies at the international, national, and provincial levels have the potential to drive substantial costs and increase regulatory compliance commitments for NGTL. NGTL is exploring opportunities to minimize the potential cost impact of these policies. As some of these opportunities may drive capital investment, NGTL will include emission reduction and management in its annual design process. Some examples of opportunities NGTL is currently exploring and advancing include:

- Operational Opportunities - Such as replacing or upgrading gas fired turbines so they operate more efficiently.
- Methane Emissions Reduction Opportunities – Such as enhanced Leak Detection and Repair (LDAR) programs to reduce the amount of gas released during maintenance,

or recompression skids to capture emissions from compressors for reinjection back into the gas stream.

- Electrification of Compressors - Adding or converting compressor units to be electric drive instead of gas fired.

3.0 EXTENSION FACILITIES, LATERAL LOOPS AND METER STATIONS

No additional extension facilities, lateral loops or receipt and delivery meter stations have been identified for this Annual Plan.

For a summary of the status of facilities that have been proposed, applied for, under construction or placed in-service since the 2021 Annual Plan, see *Appendix 2: 2022 Facility Status Update*.

Planned Meter Stations

Meter station projects are identified and planned to meet customer requests for service on an ongoing basis throughout the year. As new meter station projects are identified the TTFP will be informed and the new meter station projects will be included in the *2023 Facility Status Update (NGTL 2023 Update)*, which can be accessed at http://www.tccustomerexpress.com/871.html

Appendix 1: Glossary of Terms

The following definitions are provided to help the reader understand the Annual Plan. The definitions are not intended to be precise or exhaustive and have been simplified for ease of reference. These definitions should not be relied on to interpret NGTL's Gas Transportation Tariff or any Service Agreement. Capitalized terms not defined here are defined in NGTL's Gas Transportation Tariff.

Allowance for Funds Used During Construction (AFUDC)

The capitalization of financing costs incurred during construction of new facilities before the facilities are included in rate base.

Annual Plan

A document outlining NGTL's planned facility additions and major modifications.

Average Annual Delivery

The average day delivery determined for the period of one Gas Year. All forecast years are assumed to have 365 days.

Average Day Delivery

The average day delivery over a given period, determined by summing the total volumes delivered divided by the number of days in that period. It is determined for either a Delivery Point or an aggregation of Delivery Points.

Average Receipt Forecast

The forecast of average flows expected to be received onto the NGTL System at each receipt point.

Coincidental

Occurring at the same time.

Delivery Meter Station

A facility that measures gas volumes leaving the NGTL System.

Delivery Point

The point where gas might be delivered to customer by company under a Schedule of Service, which shall include but not be limited to Group 1 Delivery Point, Group 2 Delivery Point, Group 3 Delivery Point, Extraction Delivery Point and Storage Delivery Point.

Delivery Design Area

The NGTL System is divided into five delivery design areas used to facilitate delivery service within or between Delivery Design Areas:

- Northwest Alberta and Northeast BC Delivery Area
- Northeast Delivery Area
- Southwest Delivery Area
- Southeast Delivery Area
- Edmonton and Area Delivery Area

Demand Coincidence Factor

A factor applied to adjust the system maximum and minimum day deliveries in a design area to a value more indicative of the expected actual peak day deliveries.

Design Area

The NGTL System is divided into three project areas – Peace River Project Area, North and East Project Area and Mainline Project Area. These project areas are subdivided into design and sub design areas. This subdivision allows the system to be modelled in a way that best reflects the pattern of flows in each area of the system.

Design Capability

The maximum volume of gas that can be transported in a pipeline system considering design assumptions. Usually presented as a percentage of design flow requirements.

Design Flows

Forecast of Peak Expected Flow required to be transported in a pipeline system considering design assumptions.

Design Forecast

Forecast of the most current projection of receipts and deliveries over a five-year design horizon.

Expansion Facilities

Facilities that will expand the existing NGTL System to/from the point of customer connection, including any pipeline loop of the existing system, metering and associated connection piping and system compression.

Extension Facilities

Facilities that connect new or incremental supply or markets to the NGTL System.

Firm Transportation

Service offered to customers to receive gas onto the NGTL System at Receipt Points or deliver gas off the NGTL System at Delivery Points with a high degree of reliability.

Flow-Through Design Condition

For the purposes of facility design, a condition for a specified area when deliveries are at their minimum and receipts are at their maximum in that area.

Flow-Within Design Condition

For the purposes of facility design, a condition for a specified area when deliveries are at their maximum and receipts are at their minimum in that area.

Gas Year

A period beginning at 800 hours (08:00) Mountain Standard Time on the first day of November in any year and ending at 800 (08:00) Mountain Standard Time on the first day of November of the next year.

Interruptible Transportation

Service offered to customers to receive gas onto the NGTL System at Receipt Points or deliver gas off the NGTL System at Delivery Points, provided capacity exists in the facilities, that is not required to provide firm transportation.

Lateral

A section of pipe that connects one or more Receipt or Delivery Points to the mainline.

Liquified Natural Gas (LNG)

Natural gas that has been cooled down to liquid form for ease of transport.

Loop

The paralleling of an existing pipeline by another pipeline.

Mainline

A section of pipe, identified through application of the mainline system design assumptions, necessary to meet the aggregate requirements of all customers.

Maximum Day Delivery

The forecast maximum volume, included in the design, to be delivered to a Delivery Point.

Maximum Operating Pressure

The maximum operating pressure at which a pipeline is operated.

Minimum Day Delivery

The forecast minimum volume, included in the design, to be delivered to a Delivery Point.

NPS

Nominal pipe size, in inches.

Non-coincidental

Non-simultaneous occurrence.

Peak Expected Flow

The peak flow expected to occur at a point or points on the NGTL System. For a design area or sub design area, this is the coincidental peak of the aggregate flow. For a single receipt point, it is equivalent to field deliverability.

Project Area

For design purposes, the NGTL System is divided into three project areas – Peace River Project Area, North and East Project Area and Mainline Project Area.

Dividing the system this way allows the system to be modelled in a way that best reflects the pattern of flows in each area of the system.

Receipt Meter Station

A facility that measures gas volumes entering the NGTL System.

Receipt Point

The point on the NGTL System at which gas may be received from customer by company under a Schedule of Service.

Storage Facility

Any commercial facility where gas is stored, that is connected to the NGTL System, and that is available to all customers.

Summer Season

The period starting April 1 and ending on October 31 of any calendar year.

System Average Receipts

The forecast of aggregate average receipts at all Receipt Points.

Transportation Design Process

The process that includes qualifying a customer's applications for service, designing additions to the system, sourcing all required facilities and installing facilities to meet firm transportation requests.

Winter Season

The period starting November 1 of any year and ending on March 31 of the following year.

Appendix 2: 2022 Facility Status Update

The Facility Status Update (NGTL 2022 Update) is available as an Adobe Acrobat PDF or MS Excel version with sort and search functionality. It is maintained as a separate document(s) which can be accessed at http://www.tccustomerexpress.com/871.html

Appendix 3: System Map

The System Map, including the 2022 Annual Plan facilities, is expected to be available in March 2023 and can be accessed at http://www.tccustomerexpress.com/ngtl-2022-annual-plan.html.

Appendix 4: Unit Transportation Cost Data

This expanded Appendix 4 is being provided pursuant to Order TG-001-2020 through which the Canada Energy Regulator (CER) directed NGTL to extend its narrative accompanying unit cost of transportation data that the National Energy Board initially directed NGTL to provide as part of its Annual Plan in Order TG-004-2018.

Specifically, the CER directed NGTL to extend the narrative to include the following:

a) A commentary on whether NGTL considers the trend in unit transportation costs to be a reasonable proxy for the general trend in transportation tolls for the same period. If not, NGTL must explain the reasons for the divergence. The Commission encourages NGTL, where appropriate to use scenarios to illustrate the influence of market forces on pipeline transportation costs; and
b) NGTL's views on the future competitiveness of its tolls and its perspective on emerging market factors that might affect the long-term viability of NGTL and the competitiveness of the WCSB.

This Appendix 4 provides unit transportation cost data for three historical years and the five forecast years covered in the 2022 Annual Plan.

Unit Transportation Cost Data
(2020 to 2027)

	2020	2021	2022	2023	2024	2025	2026	2027
A: Revenue Requirement ($ millions)	2,534 [1]	2,694[1]	2,974 [2]	3,307 [3]	3,562 [4]	3,647 [4]	3,709 [4]	3,861 [4]
B: Throughput [5] (10^9m^3)	122	131	138 [2]	142 [3]	143 [6]	144 [6]	144 [6]	146 [6]
C: A/B Unit Cost ($ million/10^9m^3)	20.8	20.6	21.6	23.3	24.9	25.3	25.8	26.4

Sources:
1. NGTL Quarterly Surveillance Reports for the period ending December 31.
2. NGTL 2022 Final Rates Application.
3. NGTL 2023 Interim Rates Application.
4. Based on an illustrative escalation of NGTL's 2022 Revenue Requirement and forecast capital additions using simplified assumptions for cost escalations and in-service dates.
5. Based on the sum of all NGTL deliveries excluding storage injections.
6. Based on NGTL's Design Forecast prepared in June 2022.

NGTL views the forecast unit transportation costs to be a reasonable proxy for the general trend in system average transportation tolls for the 5-year period covered in this Annual Plan. There may, however, be some divergence over time due to uncertainty associated with a multitude of factors, market outcomes and capacity scenarios that can influence future transportation costs and/or tolls, including the following:

- WCSB supply/demand changes and the related change in system capacity requirements;
- Location of supply relative to system demand, which influences extent of facilities required;
- Capacity expansion cost (e.g., depending on system requirements at the time, expansion costs could be higher or lower for an equivalent volume of firm contracts);
- Firm contracting levels (e.g., can influence system capacity requirements, and billing determinants for tolls);
- Supply/Demand characteristics (e.g., base vs. peak loads, which influence pipeline transportation costs);
- Government policy (e.g., can impact costs, firm contract levels or both, and relatedly, pipeline transportation costs);
- Environmental/Social considerations (e.g., concerns over wildlife impacts or landowner considerations and associated cost impacts);
- Technology improvements (e.g., efficiency gains leading to cost reductions);
- Services development (e.g., new services that attract and retain volumes to the system providing a net benefit to the system);
- Repurposing facilities (e.g., change in utilization in response to changes in requirements).

The WCSB is one of the largest supply basins in North America and provides access to vast relatively low-cost reserves, with an estimated resource of 1,110 Tcf,[1] which represents 21% of the total North American gas resource. Production of this resource is particularly economic due to the liquids uplift that producers realize, especially for wells drilled in the Montney formation. Connecting to this supply allows NGTL and its customers to maintain access to diverse intra-basin and downstream markets in order to compete with other basins and to compete for market share within the basin.

NGTL regularly assesses the competitiveness of its tolls and the WCSB's competitive access to downstream markets, inclusive of transportation costs. In addition to pipeline transportation toll levels, competitive access to downstream markets is influenced by many other factors including NGTL's multiple service offerings, flexibility of supply and demand options, and the reliability of supply, among others. NGTL notes that customers have subscribed for the full export capacity currently available on the NGTL System as well as for expansion projects to serve both intra-system and downstream demand. This demand for transportation on the NGTL System demonstrates the near-term and longer-term competitiveness of the NGTL System and the WCSB.

The upward trend in unit transportation cost shown above reflects that new facilities need to be added over time in order to maintain the connectivity between the WCSB and the various markets served by NGTL, which is essential to maintaining the long-term viability of the NGTL System and the competitiveness of the WCSB. This includes facilities required to connect the supply which continues a westward migration resulting in increased distance between supply and

[1] Canada's Energy Future 2020, Reference Case [CER, December 2020]

markets. In addition, as new facilities typically cost more than older facilities, periods of larger-scale facility additions frequently coincide with periods of an increased trend in unit transportation cost. As part of its active management of costs, NGTL assesses the long-term needs of proposed facilities, which ensures facilities being added are required over the long term to continue meeting the needs of NGTL System customers in the most efficient manner.

Future tolls are also dependent on contracting decisions of customers, which may deviate from the forecast throughput data used in the unit cost data provided above. For example, actual contract levels in future years will depend on individual customer renewal decisions over the period, which may in turn be impacted by a range of factors. Overall, however, NGTL expects continued robust demand for natural gas and transportation services on the NGTL System. Natural gas is an essential commodity in the integrated North American economy, used as a fuel for heating and generation of electricity, as well as a feedstock for industrial processes. In addition, North American gas is increasingly exported to global markets via LNG with a large-scale project currently being developed in western Canada. Emerging factors that could impact long-term demand include climate policies – such as carbon pricing, clean fuel standards, and incentives for renewable energy. These factors may create both opportunities and challenges for gas demand, but their impact is expected to be gradual. Natural gas remains an efficient energy source with the lowest carbon intensity among fossil fuels and is expected to play a key role in implementing environmental policies in the various markets served by the NGTL System. Challenges, however, may result from policies that disproportionately impact domestic gas supply compared to competing gas supply. NGTL will continue to incorporate new information into its assessment of long-term supply and demand outlook, and proactively manage the NGTL System in order to support its long-term viability and the competitiveness of both the NGTL System and the WCSB.