

NGTL System and Foothills Pipeline Customer Meeting

October 4, 2017



Welcome



Safety Procedure:

- In case of alarm or emergency, please proceed immediately to the ground-level exit
- Nearest stairs to ground-level exit are outside this room and directly to the left
- Muster point is located on the plus-15 level of 5th Avenue Place (425 1st Street SW)

Participating through WebEx:

- Please sign-in through WebEx application <u>including your full name and company</u>
- In response to customer requests to reduce background noise and improve audio quality, all WebEx participants will be placed on mute unmuted line unmuted line
- Prior to commenting or asking a question, please remember to take yourself off mute and identify yourself

Information provided herein is for informational purposes only and is not to be relied upon for any other purpose whatsoever. The information is based upon certain assumptions that may or may not be accurate, and therefore is subject to various risks and uncertainties. TransCanada shall not be liable for damages sustained as a result of any use or reliance on such information.



Safety Moment



Monday was a warning...

Prepare your vehicle(s) for winter

- Winterize your car
 - Check antifreeze, defroster, emergency signals, heater, lights,
 oil, tires, windshield washer fluid, and wiper blades
- Have emergency supplies in your car
 - Blanket, jumper cables, first aid kit, flashlight, ice scraper, matches and a candle, sand/gravel, small shovel and a cellular phone

Agenda



Outage Information

- STOP/MOF Enhancements
- DOP (formerly STOP) process and timing
- NrG Highway Notice process and timing

Operational Capability

- Linepack, Capability, and Outage Information
- Service Restriction Scenarios

Operational Outlook

- 2017 DOP (formerly STOP) review
- 2018 Major Outage Summary

DOP – Daily Operating Plan (single source for all planned outage information) STOP – Short Term Operational Plan (enhanced report referred to as DOP) MOF – Monthly Outage Forecast (outage table rolled into DOP and discontinued)



STOP/MOF Enhancements



NGTL/FH Customer Meeting: May 2017

Finalized requirements based on feedback: June 2017

Finalizing software modifications and testing: July - Sept 2017

Implementation: October 4, 2017

Proposed Improvements in 2017



1. Categorize by receipt, delivery, and interconnect

- Organize from receipt to delivery
- Separate Area and Local tables
- Government run inspections (GRI's) incorporated into Local table

2. Provide link to reported plant turn around activity in chart format

Available aggregate PTA data, separate receipt and delivery charts

3. All available outage information contained in one report

- Extend STOP timeline to incorporate MOF
- Provide links to all recent capability and historical flow charts

4. Provide link to report data in CSV format

Allows stakeholders to track changes according to their individual needs

Daily Operating Plan USJR Receipt Area



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Foothills Zone 9 (FHZ9)

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1878543	SEP 18, 2017	SEP 29, 2017	xxx,xxx	Potential IT Receipt Restriction USJR	Outage X - Compressor Station Maintenance
1878318	SEP 18, 2017	SEP 29, 2017	xxx,xxx	Potential IT Receipt Restriction USJR	Outage X - Pipeline Maintenance
1878271	SEP 30, 2017	OCT 04, 2017	xxx,xxx	Potential IT/FT Receipt Restriction USJR	Outage X - Compressor Station Maintenance
1878545	OCT 05, 2017	OCT 09, 2017	XXX,XXX	Potential IT Receipt Restriction USJR	Outage X - Compressor Station Maintenance
1878486	OCT 09, 2017	OCT 20, 2017	xxx,xxx	Potential IT/FT Receipt Restriction USJR	Outage X - Pipeline Maintenance
1878485	OCT 10, 2017	OCT 16, 2017	XXX,XXX	Potential IT/FT Receipt Restriction USJR	Outage X - Compressor Station Maintenance
1878692	MAY 01, 2018	MAY 30, 2018	XXX,XXX	Potential IT/FT Receipt Restriction USJR	Outage X - Pipeline Maintenance (5 days within window)
1878685	AUG 01, 2018	AUG 20, 2018	XXX, XXX	Potential IT/FT Receipt Restriction USJR	Outage X – Pipeline Modification (9 days within window)

Daily Operating Plan Local Receipt Areas and Locations



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Foothills Zone 8 (FHZ8)

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11878531	SEP 11, 2017	SEP 17, 2017	Х	X	Meter Station A	Meter Station Maintenance
11878469	SEP 13, 2017	SEP 17, 2017	Х	X	Meter Station B	Outage X - Pipeline Maintenance
11878542	SEP 15, 2017	SEP 21, 2017	Х	X	Meter Station C and Meter Station D	Outage X - Pipeline Maintenance
11878564	SEP 18, 2017	SEP 22, 2017	Х	X	Meter Station E	Government Run Inspection
11878544	SEP 19, 2017	SEP 22, 2017	Х	X	Meter Station F and Meter Station G	Outage X - Pipeline Maintenance
11878318	SEP 19, 2017	SEP 28, 2017	X	X	Meter Station H	Government Run Inspection
11878480	SEP 21, 2017	(8H)	Х	X	Meter Station I	Meter Station Maintenance
11878533	SEP 28, 2017	OCT 03, 2017	Х	X	Meter Station J	Outage X - Pipeline Maintenance
11878271	OCT 02, 2017	OCT 05, 2017	X	X	Meter Station K and Meter Station L	Outage X – Pipeline Maintenance

Daily Operating PlanWGAT Delivery Area and Foothills Zone 8 (FHZ8)



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1959031	50736,267	90714,017	12 MI	Support 1.2, C. S. S. C. Dr. M. (1970) B. (1970) B.	Proget Greener State Humanuma
136,8046	003.00.2017	00Y IR 2017	298,860	PROCES IT PARRIED REPORTED INCREMENT A. J. S. S. S. S. S. S. S. S. Confee V. Sertari A.	Also Free - Consission Solver Martiniania
(20946)	101.06,207	361.00.007	27,68	Preventa (CITT Resists Staffschise Supports J. J. E. A. S. J. J. M. St. perfor S. portiol 9	Periog - Determine states Motherines
- DETAILS	100.001.00	00T (N. 2007	294300	Policinal JUST Record Sedenter: Segrential S. J. S. B. S. J. Ph. St. certic B. certic S	Facility El-Course Selectivitations

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	987 (1, 20)	9913,350		100	Agrica Clasic	Hor Stor Helbrids
EIE SHOW	3913.307	987-03,000			hanie	95.5 Tratricitator - Poerre hardyness
13,610	309 10, 2017	90° 21, 200°		36-19	More est floor	19'5 9 Misox Lateral - Powtre Marteneros
Local	Red	cei	pt	Ar	eas and L	ocations
			pt	Ar	eas and L	
Local	1 207 10 207		pt	Ar	eas and L	produced and other production
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1.0 Sept. 1.0 Sept. 1.0 Sept.	90 H, 200 90 H, 200 90 H, 200 90 H, 200	901 (4, 301) 901 (4, 301) 901 (4, 301) 901 (6, 301) 901 (6, 301)	pt	2 2 16-16	Section 20 Access (Section 2) Ac	PL II September 1991, John M. Caper S.
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116/14/8	00 0.00	007.00,0001	10,00	America IT Carlosin Restriction Alextic M. Monitor	WS 4" million allana Suber Harrina (sep. Hyelina Harrimana)
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(16/80)	50736,201	100 m to 1	-0.00	Deserta V Nation Reporter	
(1694)	607.00.30		ΑТ	Delivery	A MAD
10096	(675),2	-5/	ΑП	Delivery	Area
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1107946	807 (1.39)	00Y36,3082	20,000	Petanta (7 (Mispo Rathoties Supriett (5 3) and (4	Wild Rear Notice - Faulty Hadilations
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10 Tiber	900 10 317	MV III, III.7	SHARE.	Popular II Ophers Repticion Encountribut Sentin	1975 TH Eastern Alberts Scotter Plantine Look & Certiful Alberts System Review - Plantine Washinson
1101900	36C (SL 3627	000 14,3937	60,000	Polantial IV Ophore Systeman Systems IV, IV, and IV	95 of Return Auritina Hospitalisms
THE REAL PROPERTY.	30119,303	204 10, 2016	81,600	Principal of Common, reprincipal Compression (I), (I), and (I)	45 3 May Reide - Radio Halfsalore

		Beodyl: Faelfells Zane 9 (19529)	
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CATRON		- 7 O	(FHZ9)
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- 1367613			
LIENEN	001 KL 2007 - 007 KL 2017 - 60,000 (Frenchise		
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				Delivery: Lo	cal Area/Location	
Ostage ID 11876544 11876690	Loc	al D	eliv	ery A	reas and	d Locations
11070598	OCT 01, 2017	OCT 10, 2557	X	×	Neter Station C and Meter Station D	Meter Station Modification
11870481	APR 01, 2018	3UN 30, 2018	X	X	Netar Station F	Meter Station Hodification (4 days within window)
		240000000000000000000000000000000000000			47	AND THE RESIDENCE OF TH
		Receipt: Plant Terr	secound Activity		3	Delivery: Plant Turnaround Activity

Receipt: Plant Ten	maround Activity	Delivery: Plant Tamoround Activity		
Date	Flore (SPA (State)	Outo	Shine (100-m) these	
507 SE-0017 SHORT SE-0017	4.	90° S, (927 to 987 SE 2027	1,860	
NAME AND ADDRESS OF THE OWNER, AND ADDRESS O				
MP14.0%*	Diam't Tille	A D M O I I I I I		
MP18, 857 MP13, 967	- Plant Turi	narounds		
98*16.00* 58*17.00* 88*18.00*	■Plant Tur ı	narounds		
MP13,3067	Plant Turi	narounds		
60°13,002° 60°18,002°	Plant Turi	narounds		
MP 13, 1007 MP 18, 2017 MP 19, 2017 SCMP 25, 2017	Plant Turi	narounds		
60 13,000 60 18,000 540 18,000 560 50,000 540 20,000	Plant Turi	narounds		

	Delivery. West date Delivery Area (WOAT)										
		onal Capability: ical flow (Last Up									
Outage ID	Start	End	Capability/ Allowable (10 ³ m ³ /day)	Service Allowable Location/Area	Outage Description						
11878271	SEP 30, 2017	OCT 05, 2017	xx,xxx	Potential IT Delivery Restriction Segments 22 and partial 21	Outage X - Compressor Station Maintenance						
11878271	SEP 30, 2017	OCT 05, 2017	XX,XXX	Potential IT Delivery Restriction Alberta BC Border	Outage X - Compressor Station Maintenance						
11878486	OCT 08, 2017	OCT 20, 2017	XX,XXX	Potential IT Delivery Restriction Segments 22 and partial 21	Outage X - Compressor Station Maintenance						
11878486	OCT 08, 2017	OCT 20, 2017	XX,XXX	Potential IT Delivery Restriction Alberta BC Border	Outage X - Compressor Station Maintenance						
11878488	OCT 11, 2017	OCT 21, 2017	xx,xxx	Potential FT Delivery Restriction Alberta BC Border	Outage X - Pipeline Maintenance						
11878505	OCT 23, 2017	OCT 29, 2017	XX,XXX	Potential FT Delivery Restriction	Outage X - Pipeline Maintenance						

Delivery: West Gate Delivery Area (WGAT)

West Gate Delivery Area (WGAT): Alberta B.C. and Alberta Montana interconnects(Delivery locations in partial Segment 21 and Segment 22 may or may not be included depending on season)

	Receipt: Foothills Zone 8 (FHZ8)								
Outage ID	Start	End	Capability/ Allowable (10 ³ m ³ /day)	Outage Description					
11878325	AUG 16, 2017	SEP 30, 2017	XX,XXX	Outage X - Compressor Station Maintenance					
11878468	OCT 02, 2017	OCT 04, 2017	XX,XXX	Outage X - Compressor Station Maintenance					
*Capabilitie	s listed are receipt /	(takeaway) capabilit	ties from NGTL, r	not delivery to NGTL					



Daily Operating Plan EGAT Delivery Area and Foothills Zone 9 (FHZ9)



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1969007	5016,207				Cancellor Solder Perforance
138900	98.90	IIC	76	Receipt A	POS set faire ference
126,819	167.16,2617	UJ	JL	veceibt w	I Ca minute for territor
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DESOR.	007.052007	00Y IR 2017	298,800	Paceta IT Newschilderten Ingreent L. J. S. S. S. V. D. Dt. coder S. serbei S.	Also Free - Commoner Solver Martenance
127946	101.00,202	361.00.007	257,68E	Princeto 2017 Reset Salvator Septembro J. E. A. S. J. St. St. Serber B. 1956 2	Period - Desirem Sales Michigan
DENE	00116361	OCT (6, 3007	29400	Polardal JUST Recept Sections: Segrential S. J. S. A. S. J. Ph. M. sertial B. contains	Facility El-Composer Secon Nationals

				Except	Local Arm/Location	
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	GEF 111, 2017	9913,350			Martina Crosk	Mor Stock-Matterieta
EIE SHOW	SF13.307	SEP-(7, 2017		29	Harriet	WS & Publiciation - Participation
EXPRIC	30710,0117	989 ZL (002)		36-19	You at You	19'5 9 Historicational - Powine Hammonia
						1975 d Nobblet Lateral - Populine Manner rece
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	1 200 00 000	cei	pt	Ar		ocations.
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CA NOW CA NAME CA NAME CA NAME CA NAME	007 14, 2007 007 14, 2007 007 14, 2007 007 14, 2007	cei	pt	10 20 30 - 30 30 - 30	reas and L	ocations 1. Spins der lande. Spins Spins 1. Spins der lande. Spins Spins 1. Spins der lande. Spins Spins 1. Spins der land. Spins Spins 1. Spins Spins der land. Spins Spins

	Delivery: Western Gale Delivery Area (WGAT)									
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108975	- 101	ист	ДΙ	Deliv	ery Area					
meses.	107.5				.,					
11,0548	OCY 96, 202	007 16, 262	0,00	Olavia II Sahary Rastroom Maria III: Mycle	Nedag, - Congress Spool Manageman					
LENGE	9778.397	00'00'00'	2,80	Handa Ji Jahan Yadhdur. Japanis II wil sata Ji	Nodeg - Corpress State Hartenine					
116/448	80 15 800	007.10, 3931	50,000	Artesta IT Delivery Restriction Alertia III Review	WS 4" micer alune leder ferma (up. Ryalis Materials					
116959	00725.207	000 N 200	30,000	Principa PT Colory Restrictors 45m/b BT BOOK	MSS (votils 3nr 7 - Pyeire Herteneys					

Foothills Zone 8 (FHZ8)

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(DAM)	878.817	BT35.397	2.00	Principal Principal Medicals	haring Commercial State Sections
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(AFRICA)	364 95, 353	204 10, 2016	61,500	Polisha (F Sanson, National)	White Nation States - Spales Healthcome
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Outop 10			opublica)		- Constanting
			н	s Zone 9	/FUZOI
	- FO	• 1 🖬 •	ш	is Zone 9	(FRZ9)
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100903					
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78481 APR 01, 2018 3,IN 30, 2018	X X	Meter Station F Meter Station	Modification (4 days within window)
Recipt Plet Times	and Activity	Delivery: Plan	Terroround Activity
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59 SESET NOT IL 2017	-	9015,007w00135,007	1,86
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		urnarounds	
MP13, 862			
Set 16,707 5 Set 20,707			
W 2, DC	. 10		
87 13, 5007	- 1		
99 O. SET WHEED, HE!			

Local Delivery Areas and Locations

Delivery: East Gate Delivery Area (EGAT)

Current OSDA Base Operational Capability: XX,XXX 103m3/d OSDA capability and historical flow (Last Updated: MM/DD/YYYY)

Current Empress/McNeill Base Operational Capability: XXX,XXX 10³m³/d

Ellipress/Pi	civein border cap	ability allu llistori	Cal HOW (Last Opt	dated. MM/DD/TTTT)	
Outage ID	Start	End	Capability/ Allowable (10³m³/day)	Service Allowable Location/Area	Outage Description
11878465	SEP 11, 2017	SEP 29, 2017	XXX,XXX	Potential IT Delivery Restriction Empress/McNeill Borders	Outage X - Compressor Station Maintenance
11878271	SEP 30, 2017	OCT 05, 2017	XXX,XXX	Potential IT Delivery Restriction LEGAT	Outage X - Compressor Station Maintenance
11878489	OCT 17, 2017	OCT 26, 2017	XXX,XXX	Potential IT Delivery Restriction OSDA	Outage X - Pipeline Modifications
11878501	JAN 09, 2018	JAN 18, 2018	XXX,XXX	Potential IT Delivery Restriction	Outage X - Pipeline Modifications

East Gate Delivery Area (EGAT): Empress, McNeill, Unity, Cold Lake, Aeco C, Warwick Southeast, Chancellor, Carbon, Severn Creek, and Crossfield interconnects, and all delivery locations in Segments 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, partial 21, 22, 23, partial 28.

- Lower East Gate Delivery Area (LEGAT): Empress, McNeill, Unity, Segments 15, 16, 17, 18, 19, 20, 23, partial 21, partial 28
- North and East Delivery Area (NEDA): Unity, Cold Lake, Warwick Southeast interconnects, and all delivery locations in Segments 10, 11, 12, 13, 14, 15, 16, 17, 23, partial 28 Oil Sands Delivery Area (OSDA): Cold Lake interconnect, and all delivery locations in Segments 10, 11, 14

Receipt: Foothills Zone 9 ((FHZ9)
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Outage ID 11878323	Start	End	Capability/ Allowable (10 ³ m³/day)	Outage Description
11878323	SEP 27, 2017	SEP 27, 2017	XX,XXX	Outage X - Pipeline Maintenance
11878323	SEP 28, 2017	SEP 28, 2017	XX,XXX	Outage X - Pipeline Maintenance
11878541	OCT 02, 2017	OCT 05, 2017	XX,XXX	Outage X - Compressor Station Maintenance
11878493	OCT 10, 2017	OCT 13, 2017	XX,XXX	Outage X - Compressor Station Maintenance
	listed are receipt (ta	keaway) canabilities	from NGTL not de	elivery to NGTI

Daily Operating PlanLocal Delivery Areas and Locations



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196900	5P 8, 311	-	District State	_	-	Lincolno Solar Restaura
126,000	98.90	IIC	76	Receipt Ar	03	sset Suler Herbrans
126/80.00	167.16,2617	U J	JL	veceibt Hi	Ca	Particulary - Policy Hotterpoo
196903	500,007	907 (4, 202	10.00	September 1, 3, 5, 4, 5, 7, 54, 50, company or services	Printer Communication	States Humanum.
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201946	1116,317	361.00.007	257,600	Previde (CFT Reside Rathster Septembr 1, 3, 5, 4, 5, 7, 24, 3), senter 8, senter 9	rectors - become	or Kato Motores
100940	00116361	00T (N. 3007	29400	Polardal JUST Recent National Segrected 1, 2, 3, 4, 1, 1, 24, 36, series 8, certain 9	Per Low EL- Con	man Selectivations

Oxfogs EF	Start	(Decadore) fool	Capability Allowable (1874/1884)	tiporal most (107m*/vine)	TOURS.	Outogo Description
210000	189.10, 2017	9910,001		- 10	Not the last and displace that the	W- Will Habelin Terrence - Pprint Hartenan
	(80 to 100)	9913,350			Martin Clair	Here Station Heritary et a
EIE SHOW	3913.301	SEP-(7, 2017			fone	953 Traticusor - Poers Nathonio
EXPOS	30710,011	989 ZL (002)	1	36-19	You at You	195 9 Missix Lateral - Plyatine Harmonera
Local	Red	cei	pt	A	eas and Lo	ocations
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18500	207 H, 202	00100.007	pt	Aı	March At Committee	PL 3 Notice Street Environ Audit Street
	1 207 15 207	00100.001 00100.001	pt	1		PT LIS Follows and Lotted - Process record and PT LIS Follows Lakes Envisor - Positive Participate PS 1 Gar His Later - Fuelto Halffoliosis
13594	207 H, 202	00100.007	pt	Aı	March At Committee	99. 15 february special provision - Proprint Mantherson 99. 15 Gard Hill Lateral - Program Mantherson 99. 15 february - Rad Lateral - Proprint Mantherson 99. 15 february - Rad Lateral - Proprint Mantherson
Lift State	90 H, 300 90 H, 300	00" (M, (K))* (00" (M, (K))* (00" (M, (K))* (00" (M, (K))*	pt	1	Notice Annual Code Code Will	97. I Anjoure Lance Lance - Andrew Restriction 97. I Gave Hill Lance - Fueline Restrictions 97.5 Compays And Lance - Popiere Restrictions 97.5 Terroring Lance - Royales Restrictions
13500 13500 13500 13500	907 15, 2007 907 15, 2007 907 14, 2007 907 14, 2007 900 14, 2007	00" (4, 301" 00" (4, 301" 00" (6, 301" 00" (6, 301"	pt	1	Nestron and Annual Chell Source() Surveyor Seet	P. Li Antonio Peri Lotto Conti Peri Nationale PI, Il Antonio Lanci Bourgo - Papiro Nationale PI, I Con etti Lanci - Papiro Nationale PI, I Somega - Red Lanci - Papiro Nationale PI, I Somega - Red Lanci - Papiro Nationale PI, I Somega - Red Lanci - Papiro Nationale PI, I Some all Lanci - Papiro Nationale
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11,6540	007 96, 2007		8,60	Ordania Fi Sahara Rastroper Alleria K. Nicile	Nedago - Corpreser Solori Manarusha

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Deliago ID	Foothills Zone 8	R (FH78)
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Parties and the parties from Control Engineer Partie (Engineer Partie) (Engineer Par										
Steam III	Mad	-	Capability/ Streets	Nersco-Albandón Lacadros Mass	Single Description					
paraner ser se, sor se, sor se, sor se, sor sed, ser branche d'Outern Series		Principal T Outron Specifics Proposed Adult Service	Policina A E # Corporar Table Nationals							
100941	98735,297	9735,207	SVAN	Proceed IT (Selection Resistants) Proceed Miller Service	Briefer Congresse Salton Renturans					
18900	973,307	007191,3927	DOME	Manta C Julies Ballider Engrey Mitel Berke	High Concess false National					
1968071	50736,201	100 m m m		Detecta 17 Salvan Radioter						
19940	907 (0.3)	-	ΑТ	Dalivani	AHOD					
100940	(675),2	-5/	ΑП	Delivery	Area					
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10540	979,87	BT36.397	17,300	Patricks of Ordinary, Replaction Suprients 6, 9, 16, 15, 15, 15, 16, 30, 20, 36 period 5 period 5.	Sering - Depose Salas Nationals					
16746	807 (1. W/F	0CT36,3002	75,600	Potentia (7 Gallium Radhiston Repriette (5 (1) and (4	WS II feliar handra - Flama HadSolone					
116960	NOV 01, 017	MV (E. 202	10.00	Associate IV Selection Systematics Singuistrational Systems	WS 36 Subart Alberts Solam Rambie Lasp # 2 - Ppatrie Hambrenco					
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-1167693	
USWM	OT 6, 307 OT 6, 307 BASIC President Commence Steen Personals

				Delivery: Le	ocal Area/Location	
Ostage ID	-16////	(Herston)	Capability/	Typical Flow	Sentre Alinerable	100000000000000000000000000000000000000
11876544 11876690	Loc	al D	eliv	ery A	reas an	d Locations
	OCT 01, 2017	OCT 10, 2617	X	×	Neter Station C and Meter Station D	Meter Station Modification
		3.N 30, 2018			Mytar Station F	Meter Station Modification (4 days within window)

Recript: Plant	Terracound Activity	Delivery: Plant Turners and Activity		
Data	Plan (SPATAN)	Date	No.	
507 SE-SEET N-2007 LA -2017		901 S. (827% SET AL 2027	1,600	
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\$6 (3.00) \$6 (3.00) \$6 (3.00) \$100 \$2.00)	Plant Tur	narounds		

	Delivery: Local Area/Location							
Outage ID	Start	(Duration) End	Capability/ Allowable (10 ³ m ³ /day)	Typical Flow (10 ³ m ³ /day)	Service Allowable Location/Area	Outage Description		
11878544	SEP 19, 2017	SEP 22, 2017	X	X	Meter Station A	Outage X - Pipeline Maintenance		
11878659	SEP 20, 2017	SEP 25, 2017	X	X	Meter Station B	Government Run Inspection		
11878598	OCT 01, 2017	OCT 10, 2017	Χ	X	Meter Station C	Meter Station Modification		
11878481	APR 01, 2018	JUN 30, 2018	X	X	Meter Station D	Meter Station Modification (4 days within window)		

Proposed Improvements in 2017



1. Categorize by receipt, delivery, and interconnect

- Organize from receipt to delivery
- Separate Area and Local tables
- Government run inspections (GRI's) incorporated into Local table

2. Provide link to reported plant turn around activity in chart format

Available aggregate PTA data, separate receipt and delivery charts

3. All available outage information contained in one report

- Extend STOP timeline to incorporate MOF
- Provide links to all recent capability and historical flow charts

4. Provide link to report data in CSV format

Allows stakeholders to track changes according to their individual needs

Daily Operating Plan Plant Turnarounds



of Internal Flow - Curried ISSE Rass (Australianal Capability 244-266 1874/18							
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Oxfogs 10	Mort	(Decahori) Nati	Capability Allowable (1874/1884)	Named Place (107/m*/vine)	Service Minerality Locality (Inter	Oxfogs Description
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1.0 Sept.	90 H, 300 90 H, 300	00100.001 00100.001	pt	Ŧ	Committee of Annual Code Code with Code with Annual Code Code with Annual Code Code Code Code Code Code Code Code	Print Appears New Johnson Court of March 1997 (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997
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	Recogt: Feetfalls Zone 9 (1925)
Name of	TANK CHARGE TO SERVICE THE SER
CATAGO	Foothills Zone 9 (FHZ9)
	FOOTHING ZONE 9 (FRZ9)
	07 K-307 07 K-307 6000 Pertition Operator Solor Personals

Local Delivery Areas and Locations

Recept Plant Terr	second Activity	Delivery: Plant Turners and Activity		
Delis	Plan (String Column)	Date	Flow (100/m/100ed)	
587 11.0017 br087 14.0017		WE'D, (R/W) ET D, (R/	1,600	
97.0, 307 S-97 H, 927				
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687 13, 5007 987 18, 5007 588 18, 5007 6168 81, 5007	Plant Turi	narounas		

Receipt: Plant Turnard	ound Activity	Delivery: Plant Turnaro	und Activity
Date	Flow (10 ³ m³/day)	Date	Flow (10 ³ m³/day)
SEP 15, 2017	X	SEP 15, 2017 to SEP 20, 2017	χ
SEP 16, 2017	X	SEP 25, 2017 to SEP 26, 2017	Х
SEP 17, 2017	X	OCT 1, 2017	Х
SEP 18, 2017	X	OCT 5, 2017	Х
SEP 19, 2017 to SEP 20, 2017	X	NOV 3, 2017 to NOV 10, 2017	Х
SEP 21, 2017	Χ	NOV 15, 2017 to NOV 17, 2017	χ
SEP 22, 2017	X	DEC 1, 2017	Х
SEP 23, 2017 to SEP 25, 2017	X	Dec 9, 2017	Χ
SEP 27, 2017 to SEP 28, 2017	Χ	DEC 10, 2017 to DEC 20, 2017	Χ
*Includes known plant turnaround activity at the time of pub	lication	*Includes known plant turnaround activity at the time of public	cation

Proposed Improvements in 2017



1. Categorize by receipt, delivery, and interconnect

- Organize from receipt to delivery
- Separate Area and Local tables
- Government run inspections (GRI's) incorporated into Local table

2. Provide link to reported plant turn around activity in chart format

Available aggregate PTA data, separate receipt and delivery charts

3. All available outage information contained in one report

- Extend STOP timeline to incorporate MOF
- Provide links to all recent capability and historical flow charts

4. Provide link to report data in CSV format

Allows stakeholders to track changes according to their individual needs

Daily Operating Plan Links to Capability and Historical Flow Charts





	Receipt: Upstream James River Area (USJR)							
Current USJR Base Operational Capability: XXX,XXX 10 ³ m ³ /d <u>USJR capability and historical flow</u> (<i>Last Updated: MM/DD/YYYY</i>)								
Outage ID	Start	End	Capability/ Allowable (10 ³ m ³ /day)	Service Allowable Location/Area	Outage Description			
11878357	SEP 09, 2017	SEP 17, 2017	XXX,XXX	Potential IT/FT Receipt Restriction USJR	Outage X - Compressor Station Maintenance			
11878543	SEP 18, 2017	SEP 29, 2017	XXX,XXX	Potential IT Receipt Restriction USJR	Outage X - Compressor Station Maintenance			



	Delivery: West Gate Delivery Area (WGAT) Current ABC Base Operational Capability: XX,XXX 10³m³/d ABC capability and historical flow (Last Updated: MM/DD/YYYY)						
	Outage Start End Capability/ Allowable (10 ³ m ³ /day)			Allowable	Service Allowable Location/Area	Outage Description	
	11878271	SEP 30, 2017	OCT 05, 2017		Potential IT Delivery Restriction Segments 22 and partial 21	Outage X - Compressor Station Maintenance	
	11878271	SEP 30, 2017	OCT 05, 2017		Potential IT Delivery Restriction Alberta BC Border	Outage X - Compressor Station Maintenance	



Current OSDA Base Operational Capability: XX,XXX 10³m³/d OSDA capability and historical flow (Last Updated: MM/DD/YYYY)



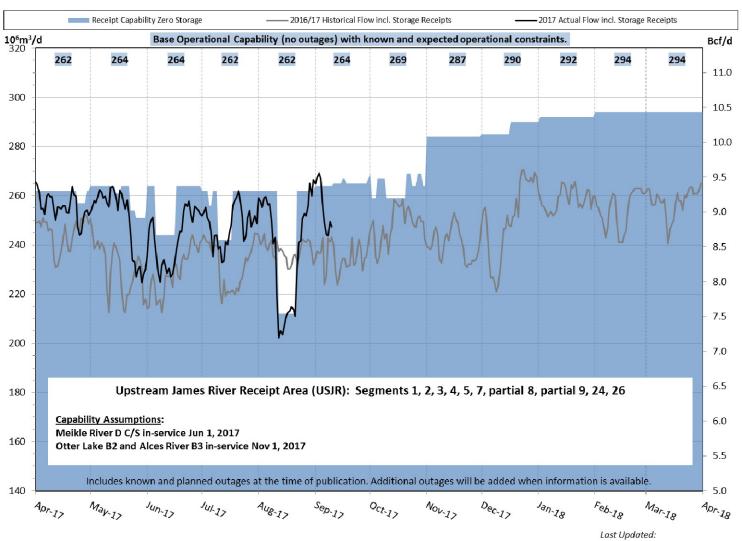
Current Empress/McNeill Base Operational Capability: XXX,XXX 10³m³/d

Outage ID	Start	End	Capability/ Allowable (10 ³ m ³ /day)	Service Allowable Location/Area	Outage Description	
11878465	SEP 11, 2017	SEP 29, 2017		Potential IT Delivery Restriction Empress/McNeill Borders	Outage X - Compressor Station Maintenance	
11878271	SEP 30, 2017	OCT 05, 2017		Potential IT Delivery Restriction Empress/McNeill Borders	Outage X - Compressor Station Maintenance	

Delivery: East Gate Delivery Area (EGAT)

Daily Operating Plan USJR Receipt Area Chart Mockup





Proposed Improvements in 2017



1. Categorize by receipt, delivery, and interconnect

- Organize from receipt to delivery
- Separate Area and Local tables
- Government run inspections (GRI's) incorporated into Local table

2. Provide link to reported plant turn around activity in chart format

Available aggregate PTA data, separate receipt and delivery charts

3. All available outage information contained in one report

- Extend STOP timeline to incorporate MOF
- Provide links to all recent capability and historical flow charts

4. Provide link to report data in CSV format

Allows stakeholders to track changes according to their individual needs

Daily Operating Plan, DOP (formerly STOP) **HTML and CSV Format**





Outage Id	Table	Start	End	Capability	Typical Flow	Location			Description	
11878543	USJR	18-Sep-17	29-Sep-17	X		Potential IT Receipt Restriction; USJR			Outage X - Compressor Station Maintenance	
11878318	USJR	18-Sep-17	29-Sep-17	X		Potential IT Receipt Restriction; USJR		Outage X - Pipeline Maintenance		
11878271	USJR	30-Sep-17	4-Oct-17	X		Potential IT/FT Receipt Restriction; USJR		Outage X - Compressor Station Maintenance		
11878545	USJR	5-Oct-17	9-Oct-17	X		Potential IT Receipt Restriction; USJR	Receipt Restriction; USJR		Outage X - Compressor Station Maintenance	
11878486	USJR	9-Oct-17	20-Oct-17	X		Potential IT/FT Receipt Restriction; USJR	CSV F	ile	Outage X - Compressor Station Maintenance	
11878485	USJR	10-Oct-17	16-Oct-17	X		Potential IT/FT Receipt Restriction; USJR	COV THE		Outage X - Compressor Station Maintenance	
11878542	LCLR	15-Sep-17	21-Sep-17	X	X	Meter Station A			Meter Station Maintenance	
11878564	LCLR	18-Sep-17	22-Sep-17	X	X	Meter Station B			Outage X - Pipeline Maintenance	
11878544	LCLR	19-Sep-17	22-Sep-17	X	X	Meter Station C, Meter Station D			Outage X - Pipeline Maintenance	
11878318	LCLR	19-Sep-17	28-Sep-17	X	X	Meter Station E			Outage X - Pipeline Maintenance	
11878480	LCLR	21-Sep-17	(8H)	X	X	Meter Station F Meter Station G			NGTL/FH Daily Operating Plan	
11878533	LCLR	28-Sep-17	3-Oct-17	X	X			, in		
11878271	LCLR	2-Oct-17	4-Oct-17	X	X	Meter Station H, Meter Station I, Meter Station J		F	Reports	
11878271	LCLR	2-Oct-17	5-Oct-17	X	X	Meter Station K, Meter Station L, Meter Station M, Meter Station N		ation N P	Please select a report for viewing. (Formerly STOP)	
11878534	LCLR	3-Oct-17	7-Oct-17	X	X	Meter Station O			Security in a security of the form of the security of the secu	

Receipt: Upstream James River Area (USJR)

Meter Station R

Meter Station P, Meter Station Q

X

X

Current USJR Base Operational Capability: XXX,XXX 103m3/d USJR capability and historical flow (Last Updated: MM/DD/YYYY)

11878484 LCLR 3-Oct-17 9-Oct-17

11878487 LCLR 11-Oct-17 14-Oct-17

Outage ID	Start	End	Capability/ Allowable (10 ³ m ³ /day)	Service Allowable Location/Area	Outage Description	2017_09_2 2017_09_2 2017_09_2	
11878357	SEP 09, 2017	SEP 17, 2017	xxx,xxx	Potential IT/FT Receipt Restriction USJR	Outage X - Compressor Station Maintenance		
11878543	SEP 18, 2017	SEP 29, 2017	xxx,xxx	Potential IT Receipt Restriction USJR	Outage X - Compressor Station Maintenance		
11878318	SEP 18, 2017	SEP 29, 2017	xxx,xxx	Potential IT Receipt Restriction USJR	Outage X - Pipeline Maintenance		
11878271	SEP 30, 2017	OCT 04, 2017	xxx,xxx	Poter USJR HTML File	Outage X - Compressor Station Maintenance		
11878545	OCT 05, 2017	OCT 09, 2017	xxx,xxx	Potential IT Receipt Restriction USJR	Outage X - Compressor Station Maintenance		
11878486	OCT 09, 2017	OCT 20, 2017	XXX,XXX	Potential IT/FT Receipt Restriction USJR	Outage X - Pipeline Maintenance		

Report naming follows:

YYYY_MM_DD_hh_mm

2017_09_25_10_32 (HTML , CSV) 2017_09_25_10_32 (HTML , CSV) 2017_09_25_10_32 (HTML , CSV) 2017_09_25_10_32 (HTML, CSV) 25_10_32 (HTML, CSV) 25_10_30 (HTML , CSV)

2017_09_25_11_26 (HTML , CSV)

Feedback and Comments





Contact NGTL call-centre 1-403-920-PIPE (7473)

Operations Planning Activities



Day to day operational support

- Customer support
- System Design, Commercial teams, Engineering teams
- Gas Control, Field Operations, Interconnects, Nominations, etc.

Linepack Management

Purchase/sale, SD balance zone adjustment

Outage planning, scheduling, and execution

- Hydraulic Analysis and capability determination
- DOP data entry, validation, and publication
- NrG Highway notice draft, review, and publication

Get the most out of existing assets and prepare for future assets.

System Linepack and Capability



Linepack: volume of gas within the system at any point in time

- Target linepack is a fixed volume (NGTL and Atco Pipelines)
- Adjusted seasonally and for specific outages

Supply Demand imbalance affects linepack

- Receipts > Deliveries = packing; Receipts < Deliveries = drafting
 - Customer accounts (T); balance zone adjustment
 - Interconnecting operator accounts (Z); interconnect support
 - System variance managed daily; daily fuel rate adjustment
- Dynamic linepack and perpetual system optimization an illusive target

Receipt and Delivery capability is dependent on optimal linepack

- High linepack: higher operating pressure and lower receipt capability
- Low linepack: lower operating pressure and lower delivery capability

Commercial Storage and Operational Capability



Receipt Area

Storage withdrawal Interconnect receipts Field receipts

outage specific bottle necks

Delivery Area

Storage injection, IT Interconnect deliveries, IT/FT Local deliveries, IT/FT

storage **injection** increases capability storage withdrawal increases capability

Operational Capability is influenced by storage

- Operational capability always assumes zero storage injection/withdrawal
- Storage activity is highly dynamic and unpredictable from day-to-day
- Storage services (IT-S) are interruptible

Receipt Area Storage (upstream of bottlenecks)

- Injection acts as a local market which increases receipt area capability
- Withdrawal shares available IT receipt capability

Delivery Area Storage (downstream of bottlenecks)

- Withdrawal acts as a local supply which increases delivery area capability
- Injection shares available IT delivery capability

Common Service Restriction Scenario

1. FT-R not threatened - Receipt IT only



1. Receipt Area (zero/partial IT only)

share available capability: Storage withdrawal, IT Interconnect receipts, IT/FT Field receipts, IT/FT

outage specific bottle necks

Delivery Area (no restriction)

Storage injection Interconnect deliveries Local deliveries

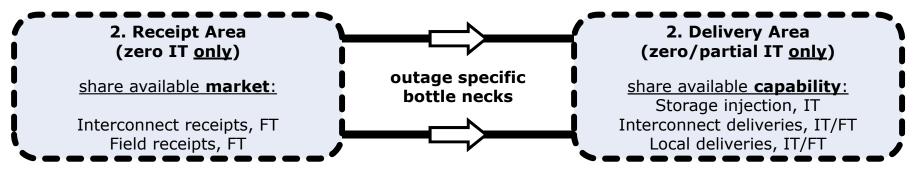
- 1. FT-R not threatened Receipt IT restriction only
 - Majority of upstream receipt IT is storage withdrawal (winter)
- 2. FT-R avoidance possible Receipt & Delivery IT restriction

Guiding principles are adherence to service priority and maximization of throughput.

Common Service Restriction Scenario







- 1. FT-R not threatened Receipt IT restriction only
- 2. FT-R avoidance possible Receipt & Delivery IT restriction
 - Majority of downstream delivery IT is storage injection (summer)
 - Firm restriction if required

Guiding principles are adherence to service priority and maximization of throughput.

Capability and Service Restriction?





Operational Information Challenges



Dynamics and uncertainty affect capability

- Supply distribution: field receipts, interconnect receipts, storage withdrawal
- Demand distribution: intra basin consumption, storage injection
- System Linepack: customer accounts

Daily storage activity affects capability

Actual capability = stated capability plus actual storage

Operational status affects communication timing

 Facility return to service always somewhat uncertain. Once return to service is confirmed NrG notice is published with service allowable effective next available cycle.

Communication further in advance requires prediction

- More conservative start/end dates longer period of service restriction
- More conservative capability assumptions lower service allowable

Balance between maximizing service allowable and providing notice, certainty, and predictability

NrG Highway Notice, NrG



Start/revise/end service restrictions

- Confirmation of area of impact and % allowable
- EGAT and WGAT % allowable confirmed following nomination windows

Standardized template style for most notices

Published as soon as information is reviewed and verified

- start/end dates, area of impact, % allowable
- Multi stakeholder review process
- Constant balance between maximizing service allowable and providing notice, certainty, and predictability

Daily Operating Plan, DOP (formerly STOP)



Operational and outage information managed within corporate data base

Outage and operational information reported internally and externally

Consultation, data entry, and management by many

- Regional planners, schedulers, and execution teams
- Operations Planning team

Published prior to close of every business day

Timing based on information completeness and accuracy

Reliance on collective knowledge, insight, and support. Many moving parts and uncertainties.

Outage Information Management?





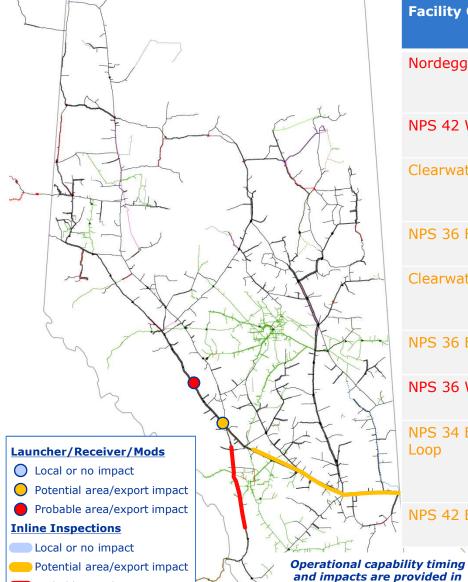
2017 Remaining Outage Highlights

DOP charts and tables

As of 2017-10-04







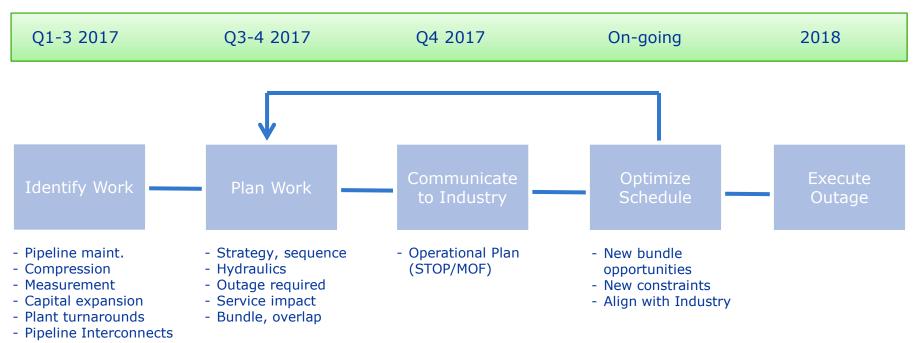
Probable area/export impact

Facility Outage	Scope	Start Date	Duration (days)	Area			
Nordegg C/S	Compressor Modifications	10-08-17	13	USJR EGAT WGAT			
NPS 42 WASML Loop	Inline Inspections	10-11-17	11	WGAT			
Clearwater C/S Unit #1	GG replacement	10-23-17	4	USJR EGAT WGAT			
NPS 36 Foothills Mainline	Inline Inspections	10-24-17	6	WGAT			
Clearwater C/S Unit #5	Compressor Modifications	10-30-17	40	USJR EGAT WGAT			
NPS 36 EASML Loop #2	Inline Inspections	11-01-17	5	EGAT			
NPS 36 WASML	Inline Inspections	11-17-17	7	WGAT			
NPS 34 EASML/CASML Loop	Inline Inspections	12-04-17	7	EGAT			
NPS 42 EASML Loop #3	Inline Inspections	12-11-17	6	EGAT			

Outage Planning Process



2018 Program Timeline:



Currently in planning phase focused on integrating all work, bundling activities, and optimize overall program

2018 Significant Outage Highlights



- Following is a sub set of known 2018 outages
 - Those for which we have enough certainty to share right now
 - Plant turn around alignment opportunities
- Based on preliminary analysis and information
 - Subject to change
- Share details of the majority 2018 outage program with customers through remainder of 2017

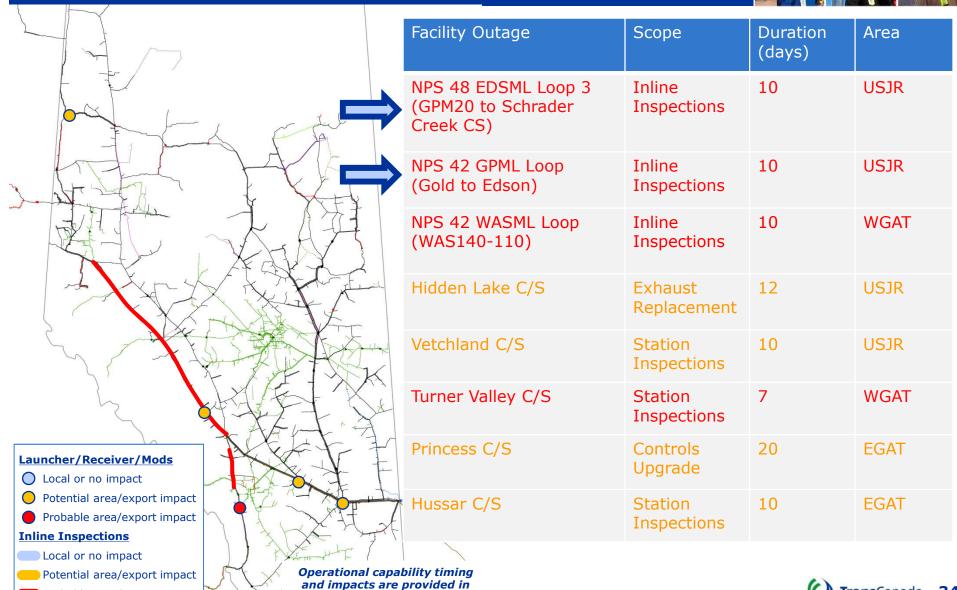
2017/2018 Pipeline Integrity Programs 2017 2018 20 Launcher/Receiver Pairs 20-25 Launcher/Receiver Pairs 30 Unconventional ILI 30-35 Unconventional ILI 77 Conventional ILI 55-65 Conventional ILI 530 Post ILI Digs/Repairs 400-500 Post ILI Digs/Repairs Operational capability timing Launcher/Receiver/Mods and impacts are provided in O Local or no impact DOP charts and tables Potential area/export impact Probable area/export impact **Inline Inspections** Local or no impact Potential area/export impact Probable area/export impact

2018 Known Significant Outage Highlights As of 2017-10-04

DOP charts and tables

Probable area/export impact





Inline Inspection (ILI) 101



- Launcher/Receiver **Installation**
- Above ground facilities to introduce in-line inspection tools or cleaning tools into the line
- Typically 2 sites: Launch & Receive



Inline Inspection (ILI) 101





- Using launcher; the inline inspection tool is inserted into the pipeline
- **Line cleaning occurs** prior to running smart tool
- Tools are propelled by natural gas flow
- **Different inspection** technologies onboard the smart tool to identify defects in the pipeline
- **Unconventional ILI** include tethers and free**swims**

Inline Inspection (ILI) 101

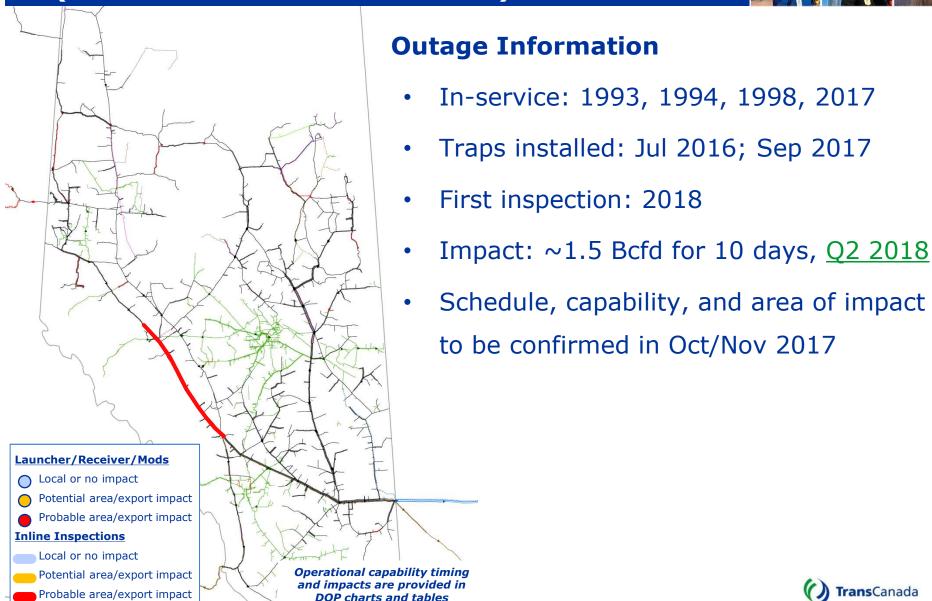


- Validation of results and remediation of reported features occurs following ILI data analysis
- Can include: evaluation and recoating, sleeving, or cut-out and replacement
- Depending on the nature of the reported feature, pressure restrictions can be imposed to manage the feature until remediation occurs



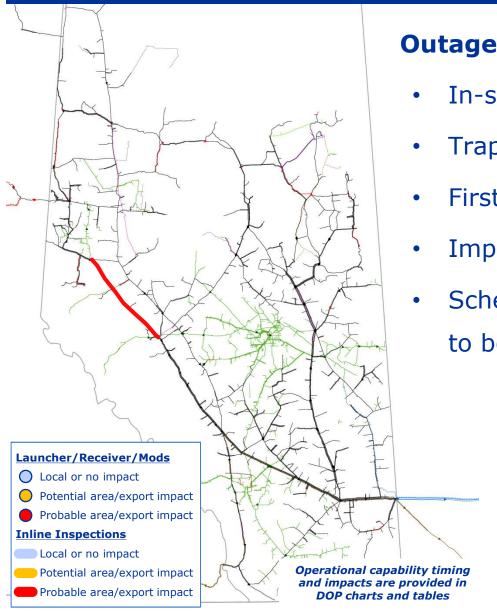
NPS 48 – Edson ML Loop 3 ILI (GPM20 to Schrader Creek CS)





NPS 42 – Grande Prairie ML Loop ILI (Gold Creek to Edson)





Outage Information

- In-service: 1994, 1998, 2012
- Traps installed: Sep 2017
- First inspection: 2018
- Impact: ~1.0 Bcfd for 10 days, Q2 2018
- Schedule, capability, and area of impact to be confirmed in Oct/Nov 2017

Outage Program Highlights?





Closing Remarks



- Questions and feedback on the new DOP report contact NGTL call-centre 1-403-920-PIPE (7473)
- Stay tuned for further communications regarding the details related to the 2018 outage program