



Cenovus Energy Inc.
Christina Lake In-situ Progress Report
Scheme 8591
2019 update

September 30, 2020

Oil & gas and financial information

Oil & gas information

The estimates of reserves were prepared effective December 31, 2019. All estimates of reserves were prepared by independent qualified reserves evaluators, based on definitions contained in the Canadian Oil and Gas Evaluation Handbook and in accordance with National Instrument 51-101 *Standards of Disclosure for Oil and Gas Activities*. Additional information with respect to pricing and additional reserves and other oil and gas information, including the material risks and uncertainties associated with reserves estimates, is contained in our AIF and Form 40-F for the year ended December 31, 2019 available on SEDAR at www.sedar.com, EDGAR at www.sec.gov and on our website at cenovus.com.

Certain natural gas volumes have been converted to barrels of oil equivalent (BOE) on the basis of one barrel (bbl) to six thousand cubic feet (Mcf). BOE may be misleading, particularly if used in isolation. A conversion ratio of one bbl to six Mcf is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent value equivalency at the well head.

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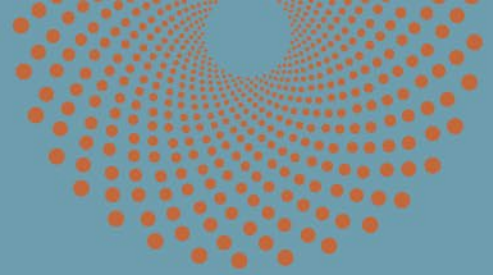
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Advisory

This presentation contains information in compliance with:

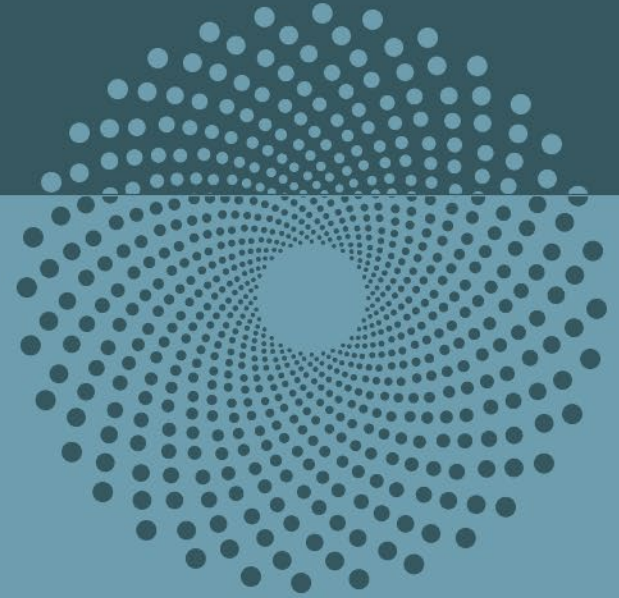
AER Directive 054 - Performance Presentations, Auditing, and Surveillance of In Situ Oil Sands Schemes

This document contains forward-looking information prepared and submitted pursuant to Alberta regulatory requirements and is not intended to be relied upon for the purpose of making investment decisions, including without limitation, to purchase, hold or sell any securities of Cenovus Energy Inc.



Subsection 4.1 1

Introduction



Cenovus at a glance

TSX, NYSE | CVE

2020F production

Oil Sands	375 Mbbbls/d
Deep Basin	84 MBOE/d

2019 proved & probable reserves

6.9 BBOE

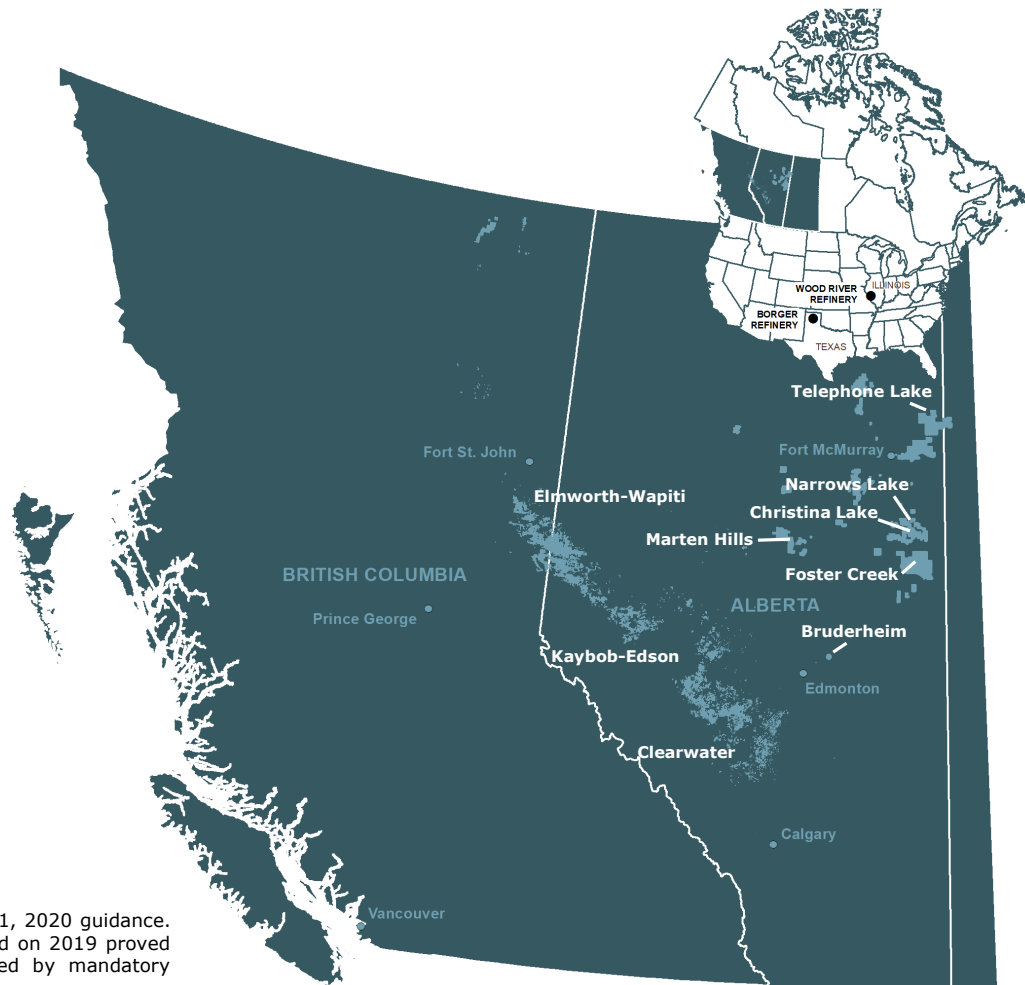
Reserve life index

42 years

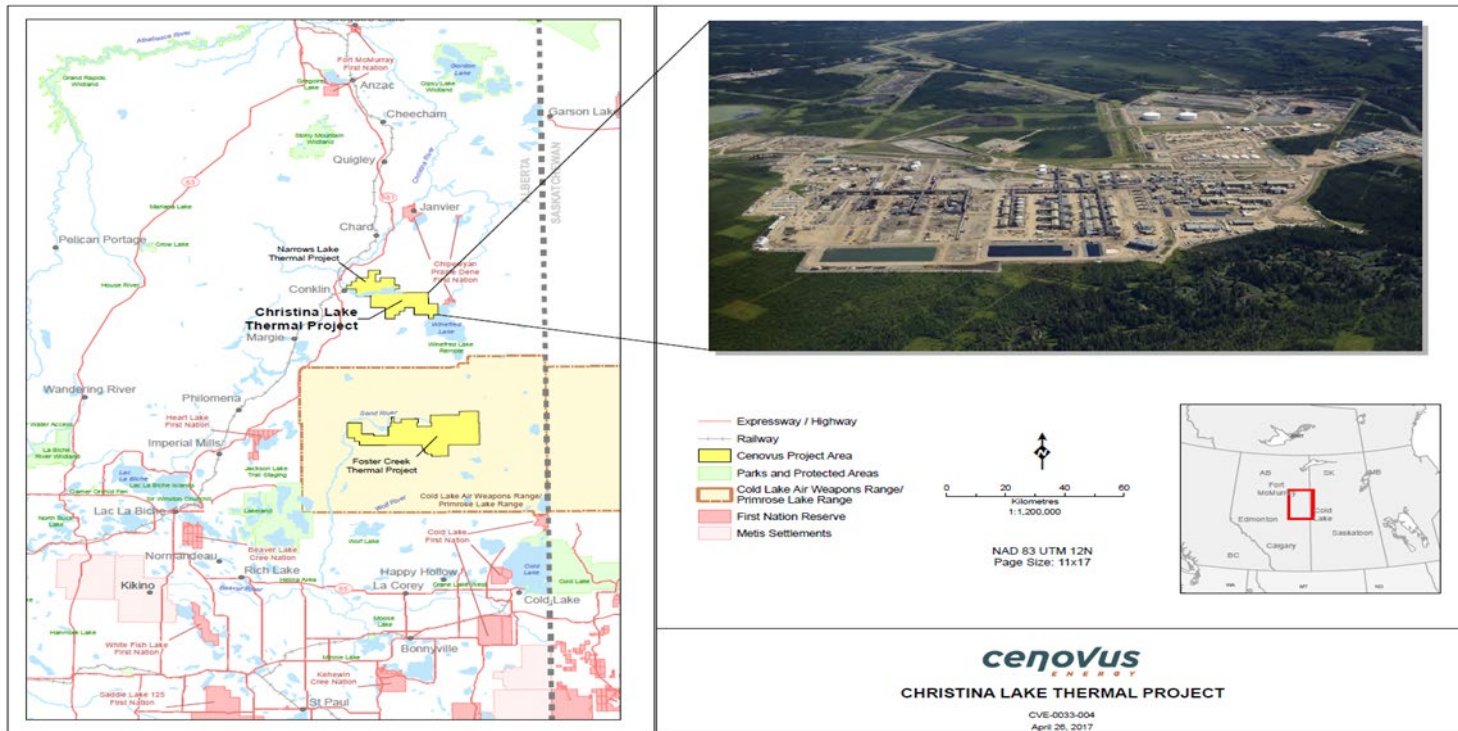
Refining capacity

248 Mbbbls/d net

Note: Values are approximate. Forecasted production based on the midpoint of April 1, 2020 guidance. 2019 proved & probable reserves as at December 31, 2019. Reserve life index based on 2019 proved plus probable reserves and 2019 production before royalties, which was impacted by mandatory curtailment. Refining capacity represents net capacity to Cenovus.



Area map

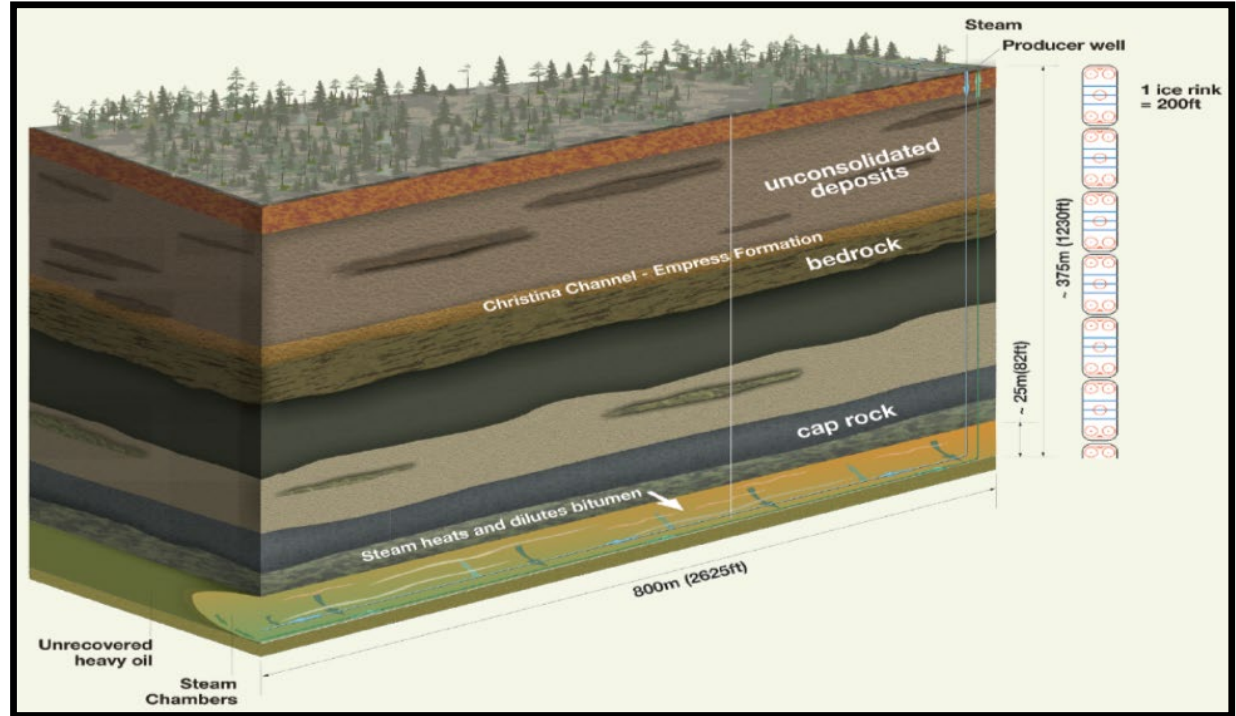


Recovery process

Christina Lake Thermal Project

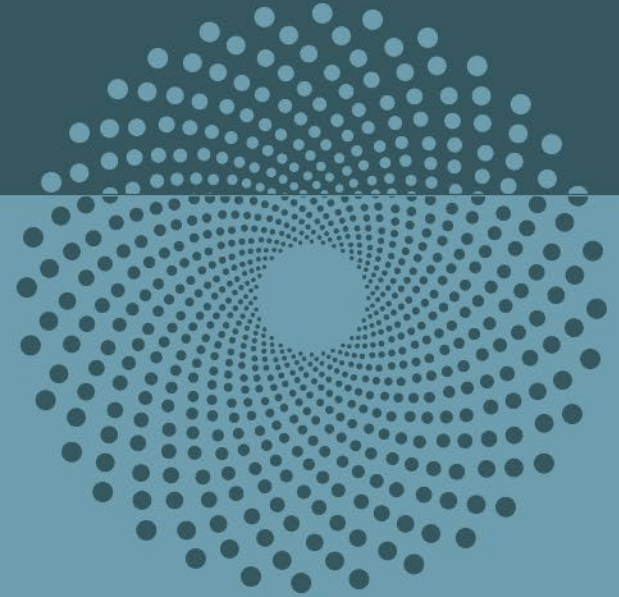
Uses the dual-horizontal well SAGD (steam-assisted gravity drainage) process to recover oil from the McMurray formation

- Two horizontal wells one above the other approximately 5 m apart
- Steam is injected into the upper well where it heats the oil and allows it to drain into the lower well
- Oil and water emulsion pumped to the surface and treated

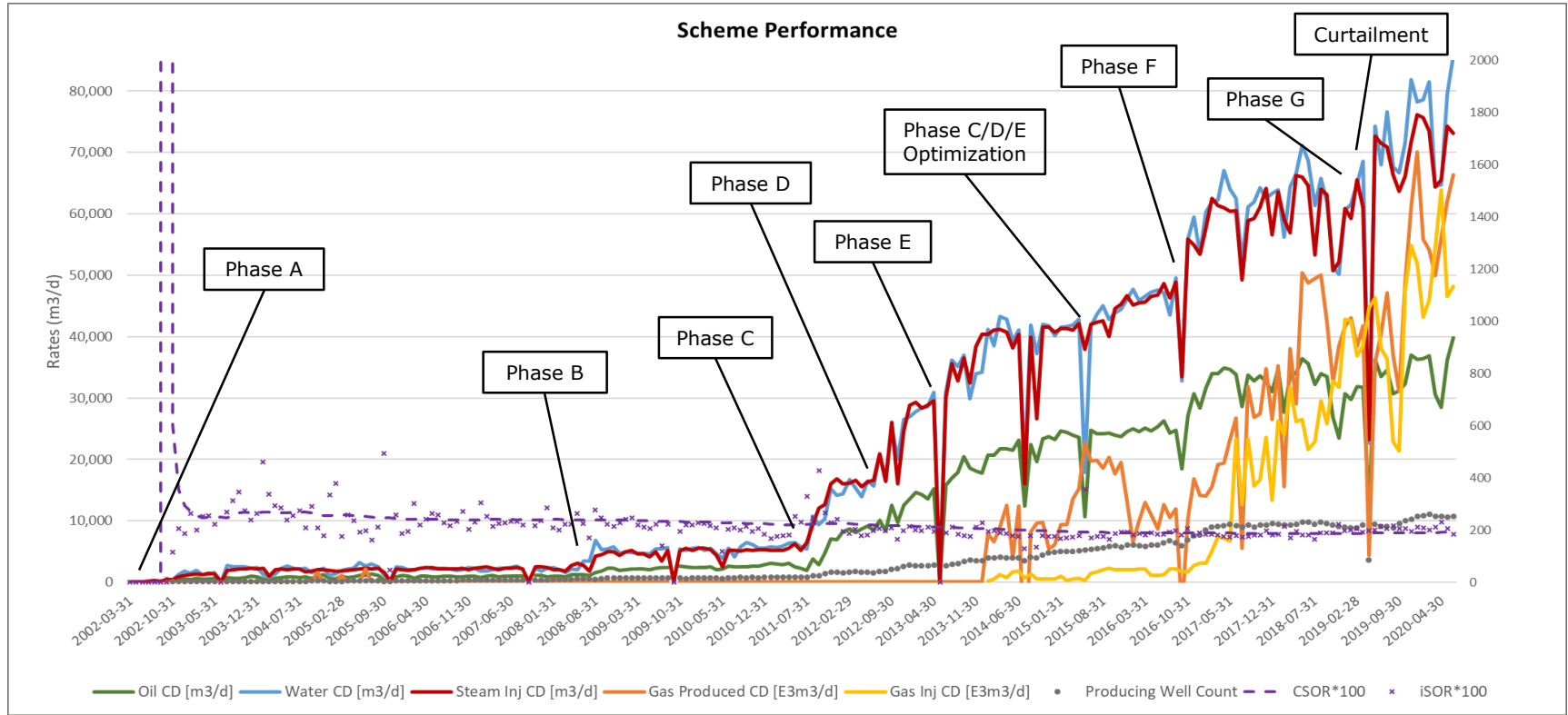


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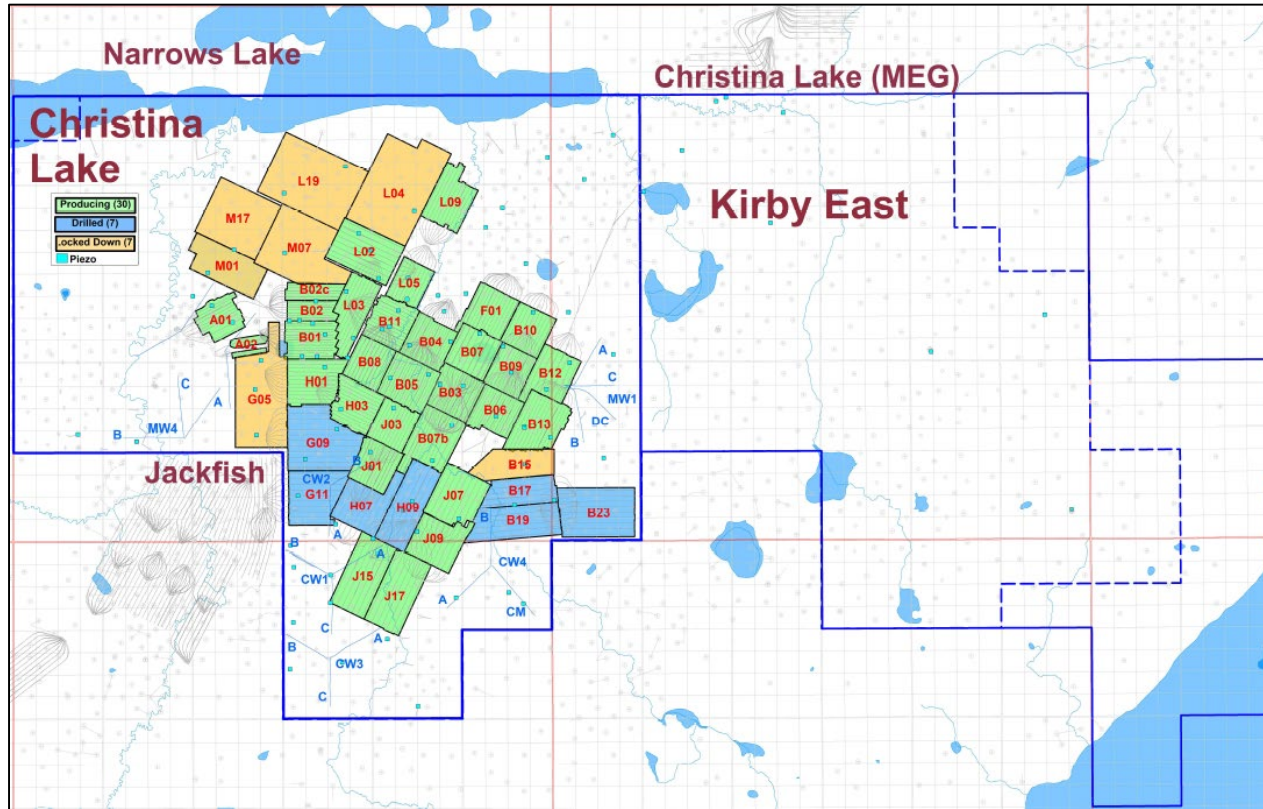
Subsurface



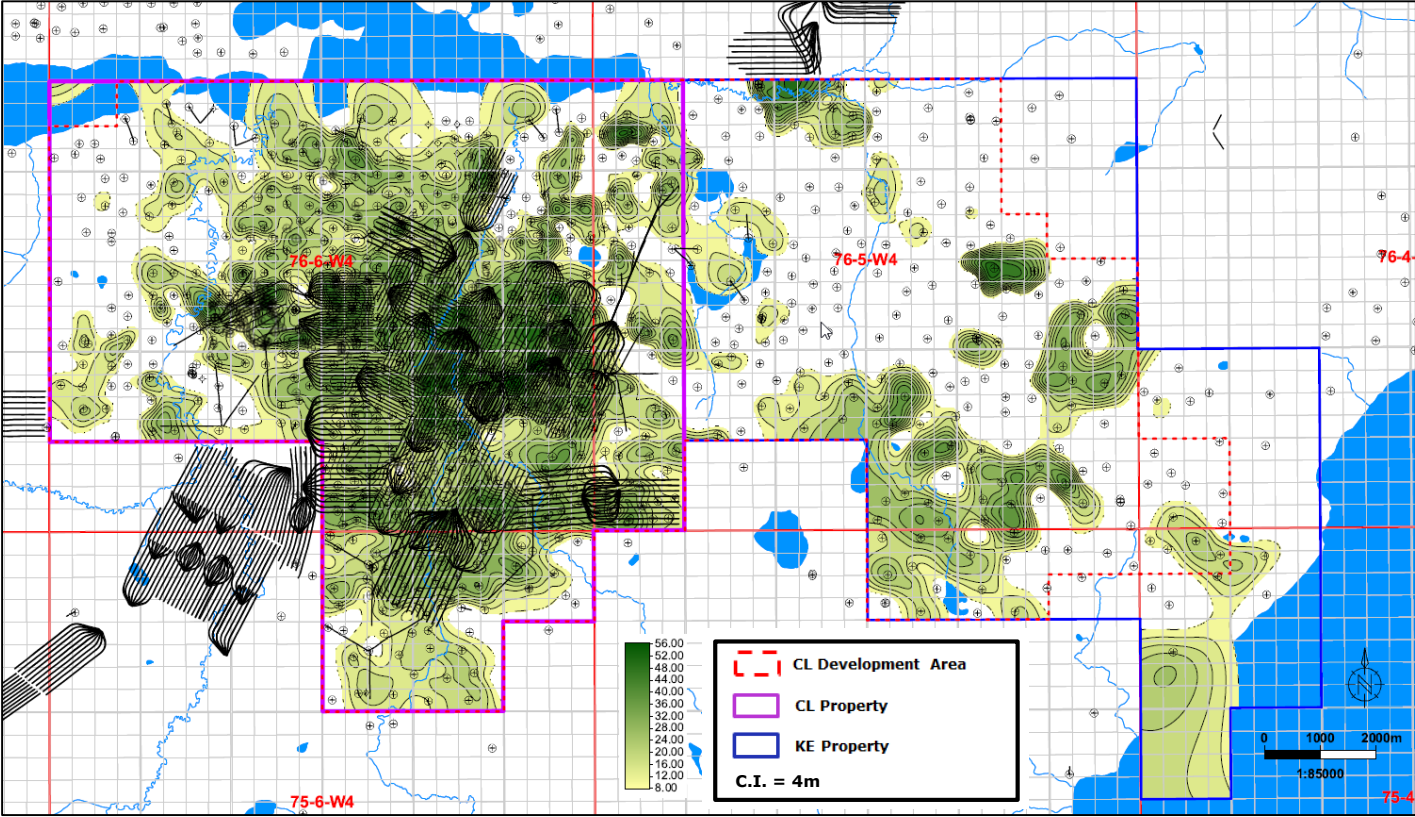
Performance: full historical



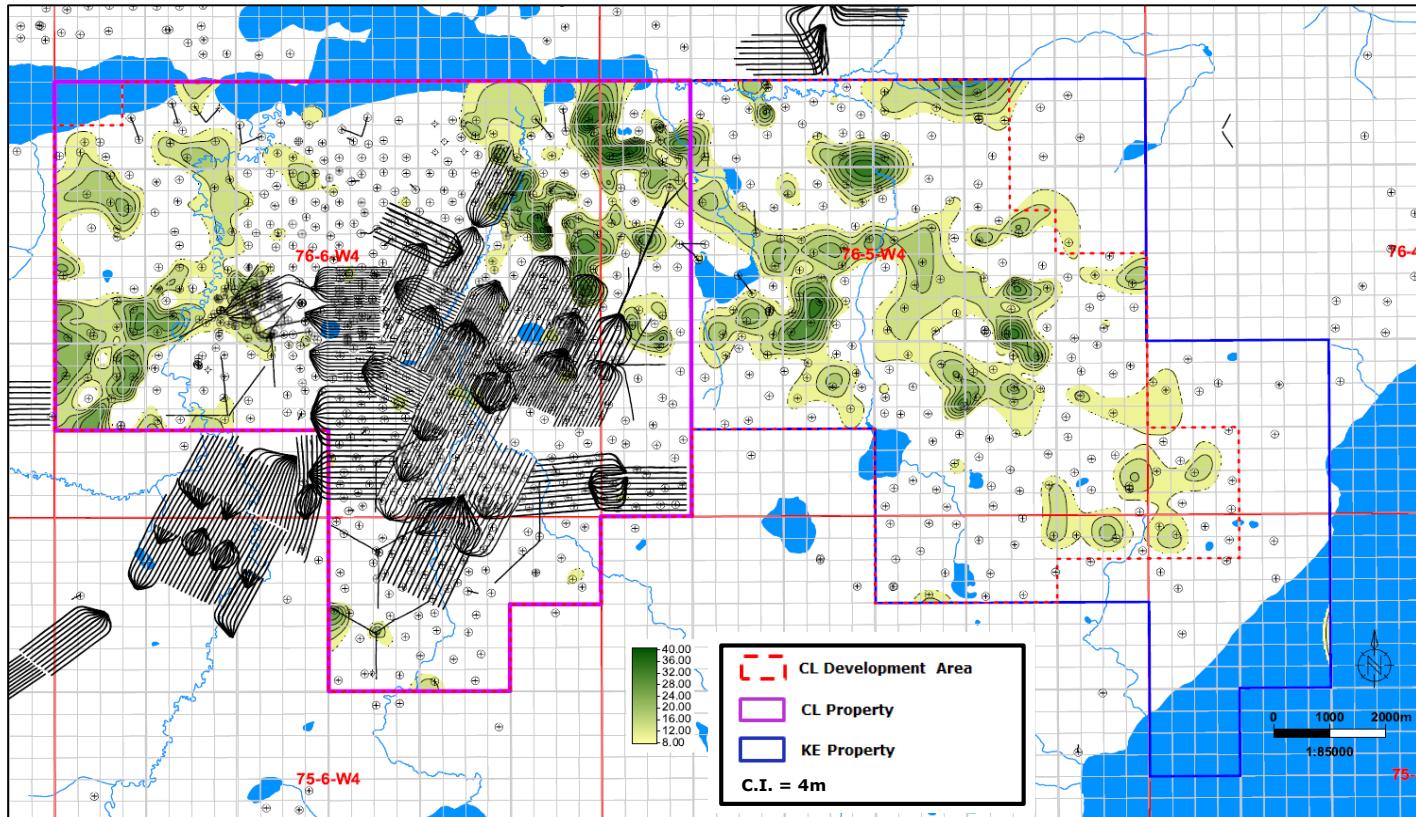
Scheme Map: Christina Lake



SAGD Pay Isopach Map (Main Zone)



SAGD Pay Isopach Map (Upper Zone)

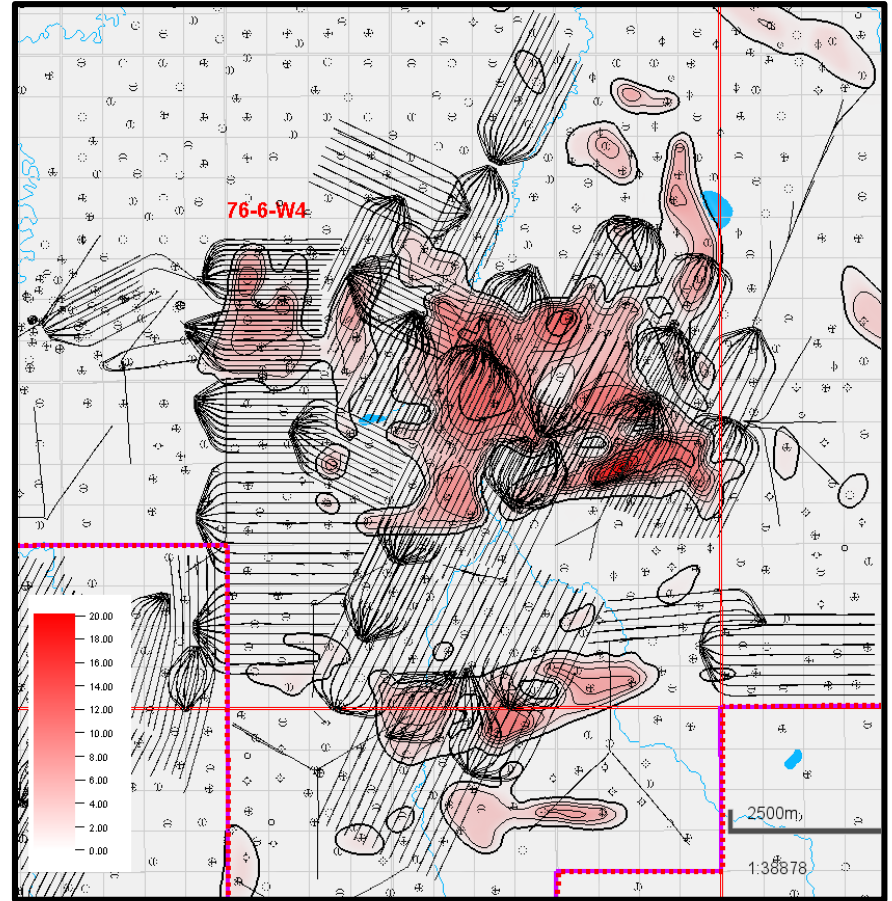


SAGD Top Gas Isopach

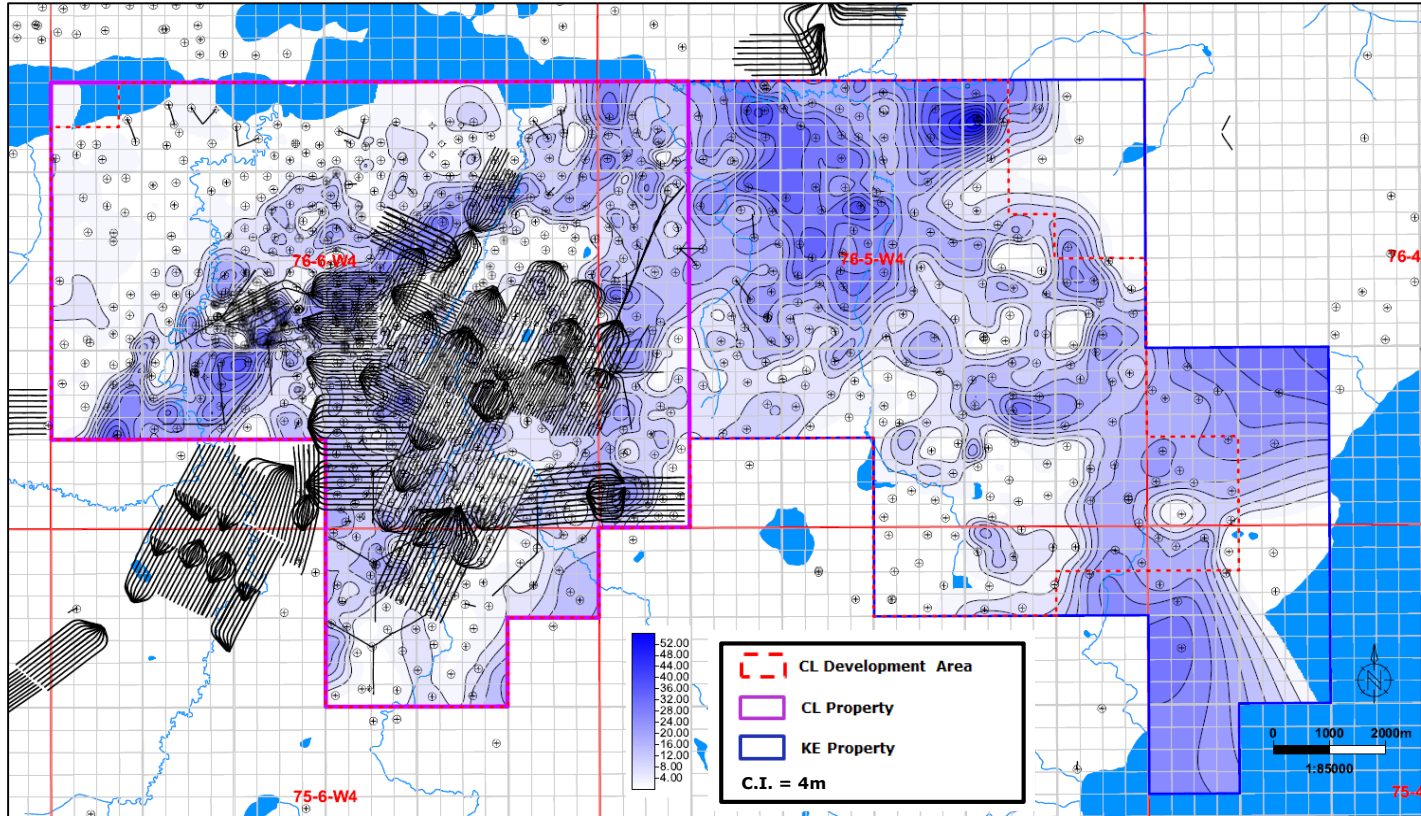
(2m contour interval)

3 main gas pockets:

- **'Sec 15'**
 - centered over Section 15
- **'11-14'**
 - centered over Section 11
- **'Southern'**
 - centered over Section 2



McMurray Water Isopach Map

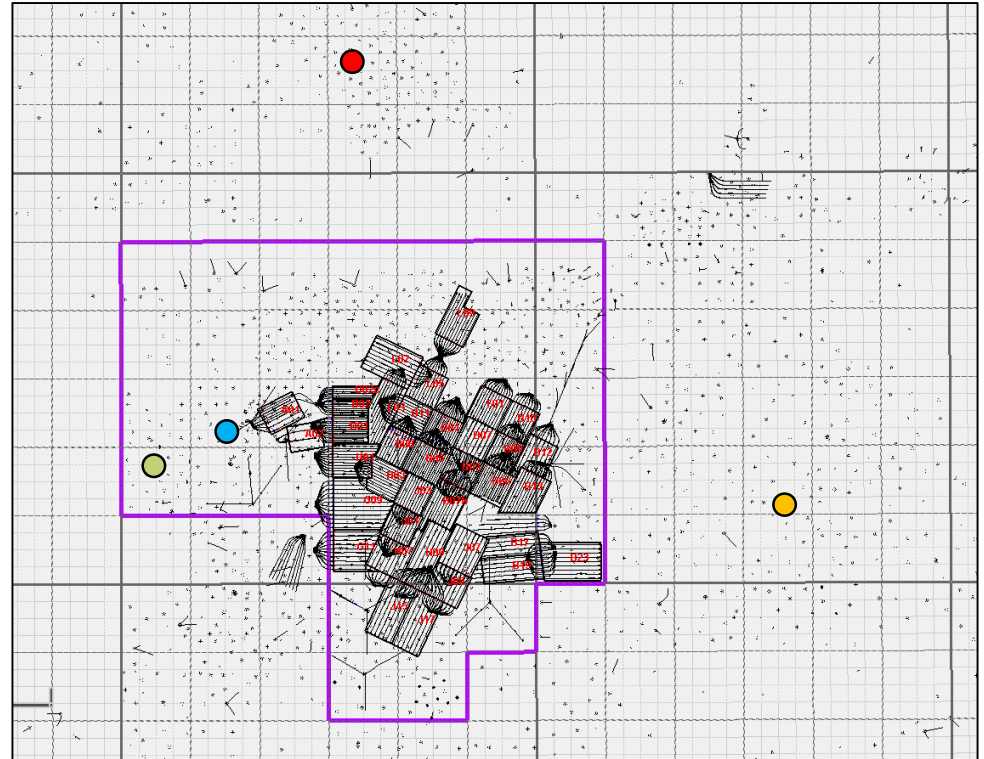


DFIT Wells

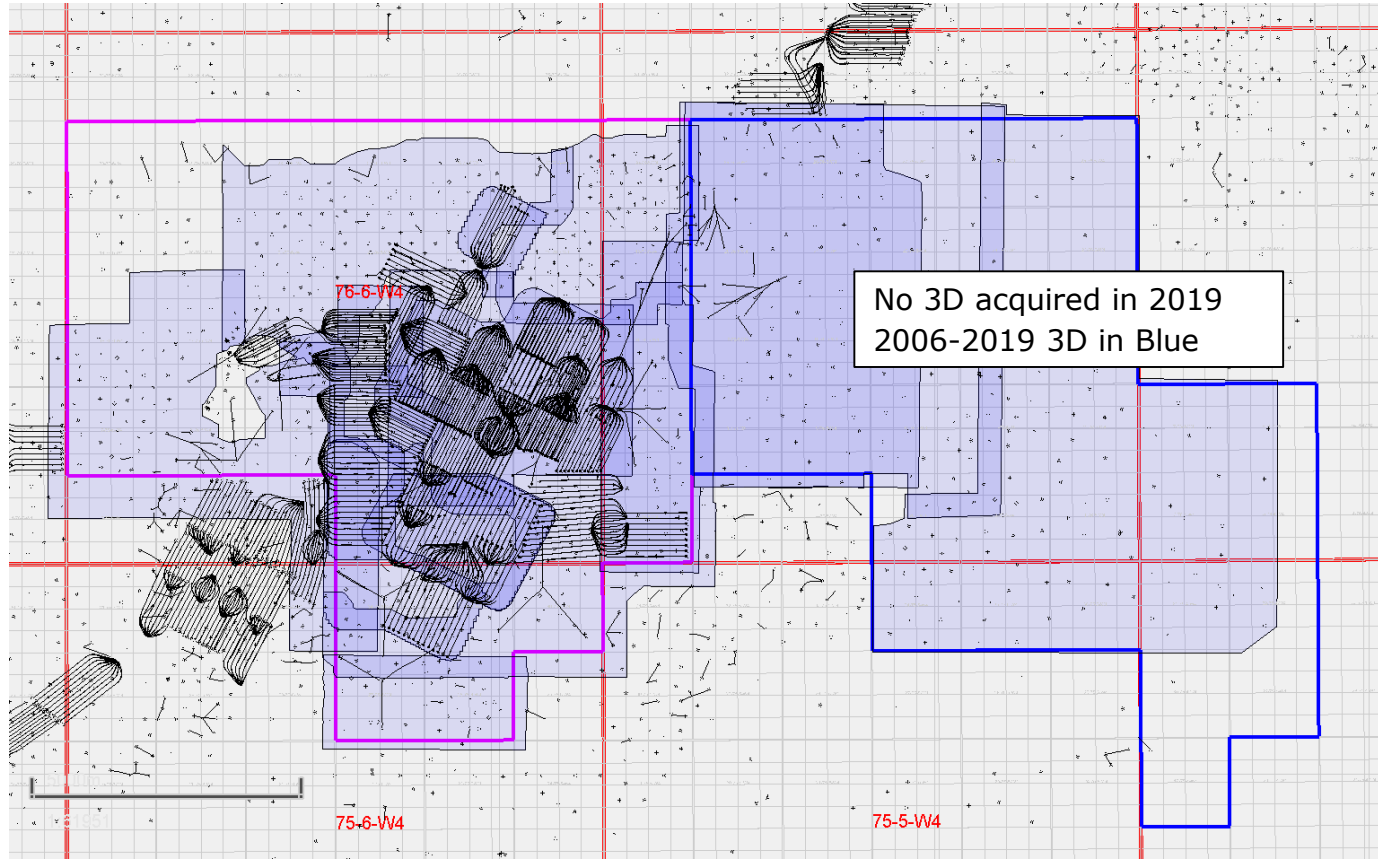
- CVE recognizes that tensile and shear failure are two possible ways for integrity to be compromised
- DFIT data gives insight about failure mechanisms and stress magnitudes.

- ● CVE FCCL 7-17-76-6w4
- ● CVE FCCL C2 HARDY 2-10-76-5
- ● CVE FCCL C11 HARDY 11-10-77-6
- ● CVE FCCL C10 LEISMER 10-7-76-6W4*

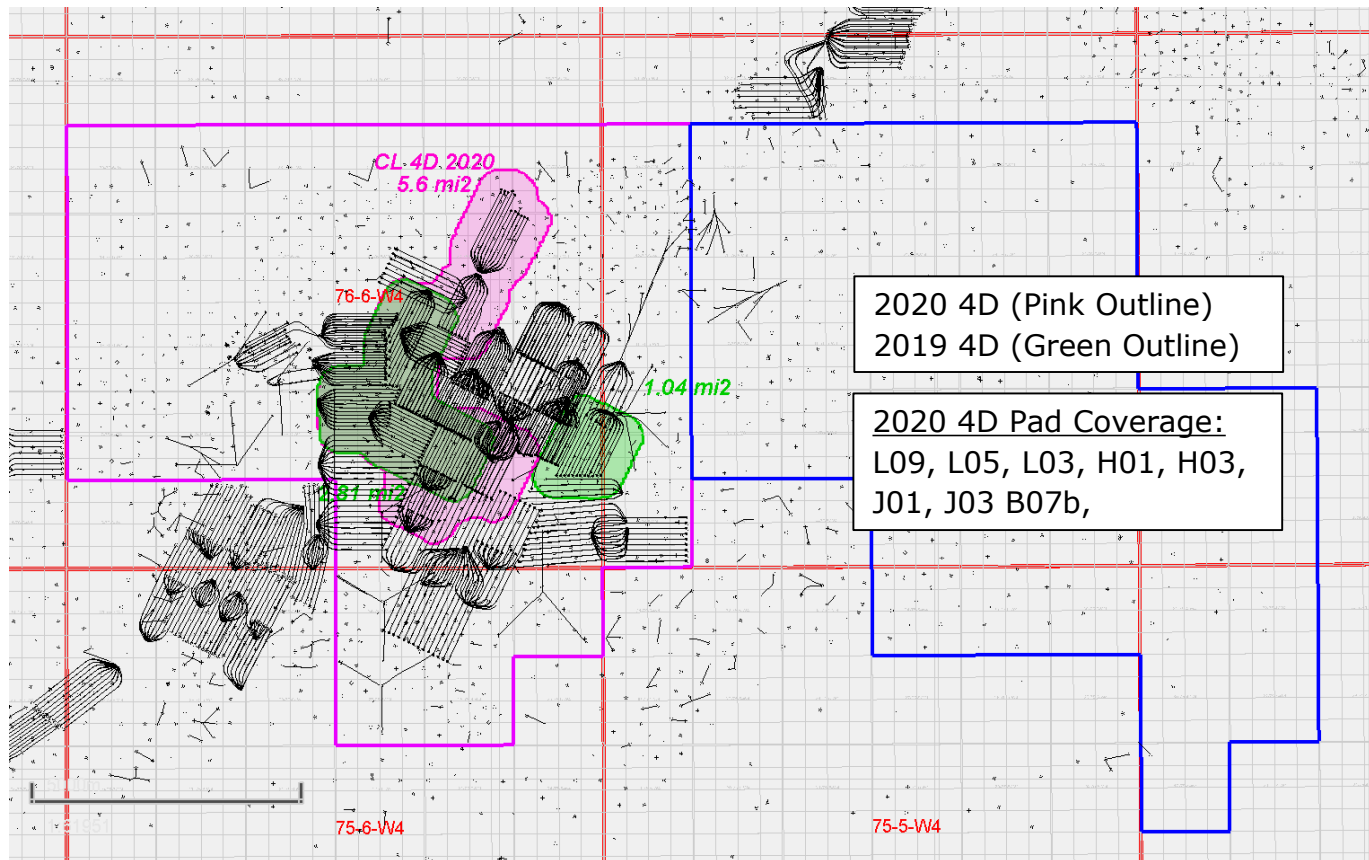
* This well was drilled in 2018. T21 is the caprock. Tested @328.25m, Closure Pressure 17.70 kPa/m



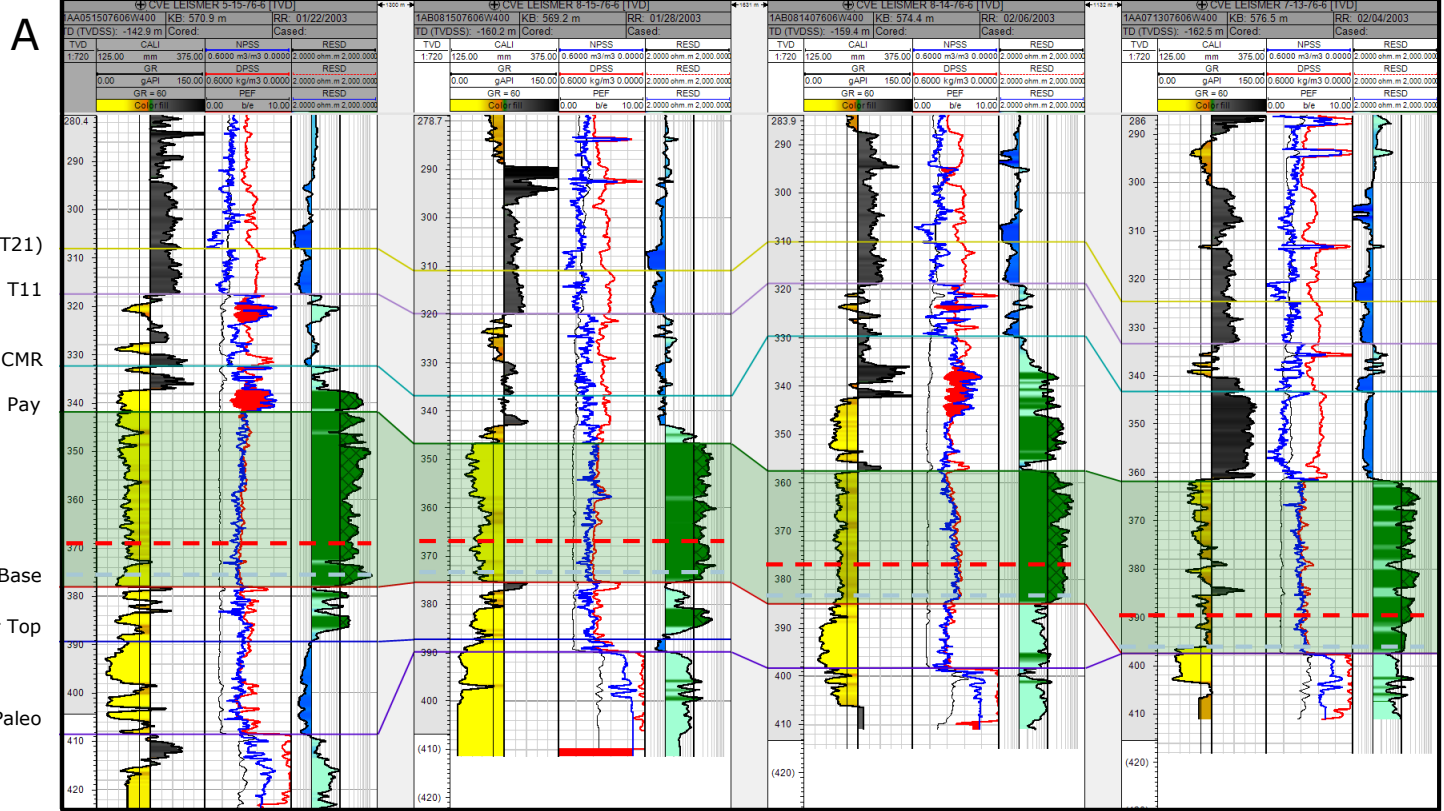
3D Seismic within Project Area



4D Seismic within Project Area

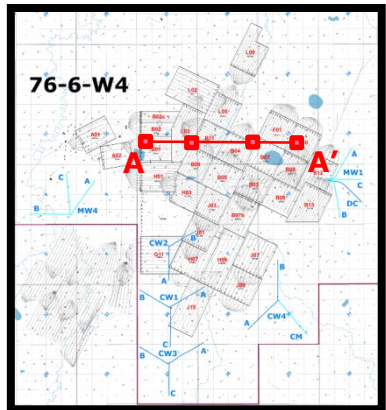


Cross-section (structural): north



A'

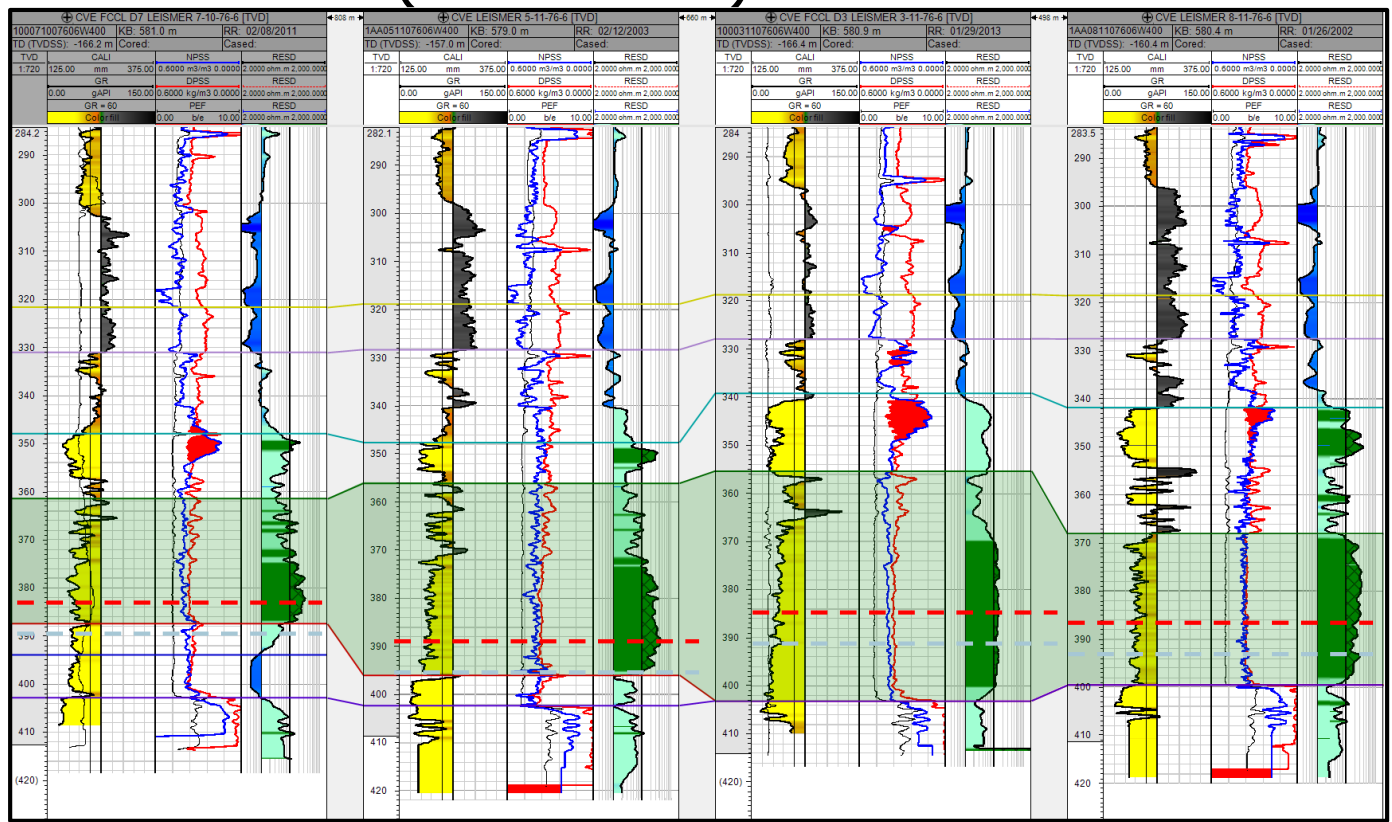
Injector Level (est.) - - - - -
 Producer Level (est.) - - - - -



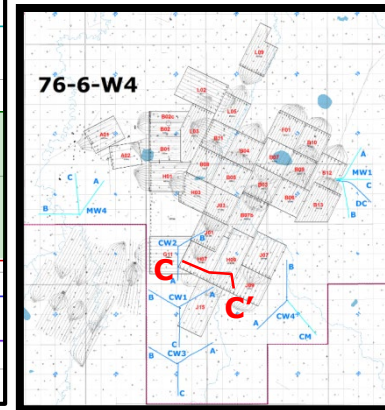
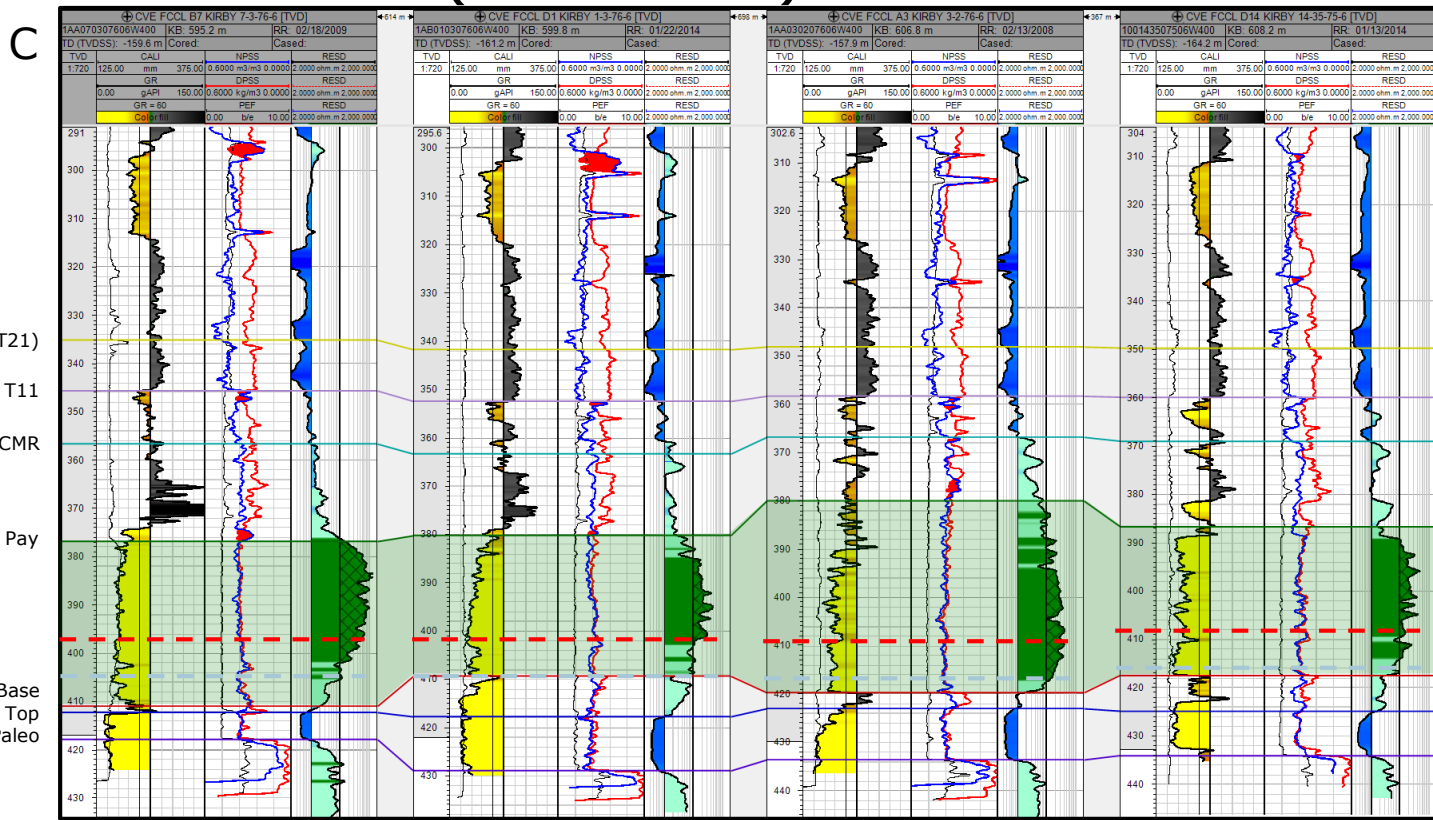
Cross-section (structural): mid

B

B'



Cross-section (structural): south



OBIP Volumes

- Project Area OBIP
 - 755 MMm³
- Development Area OBIP
 - 746 MMm³
- Combined Active Well Patterns OBIP
 - 166 MMm³
- Cumulative % Recovery
 - 49%

Reservoir properties

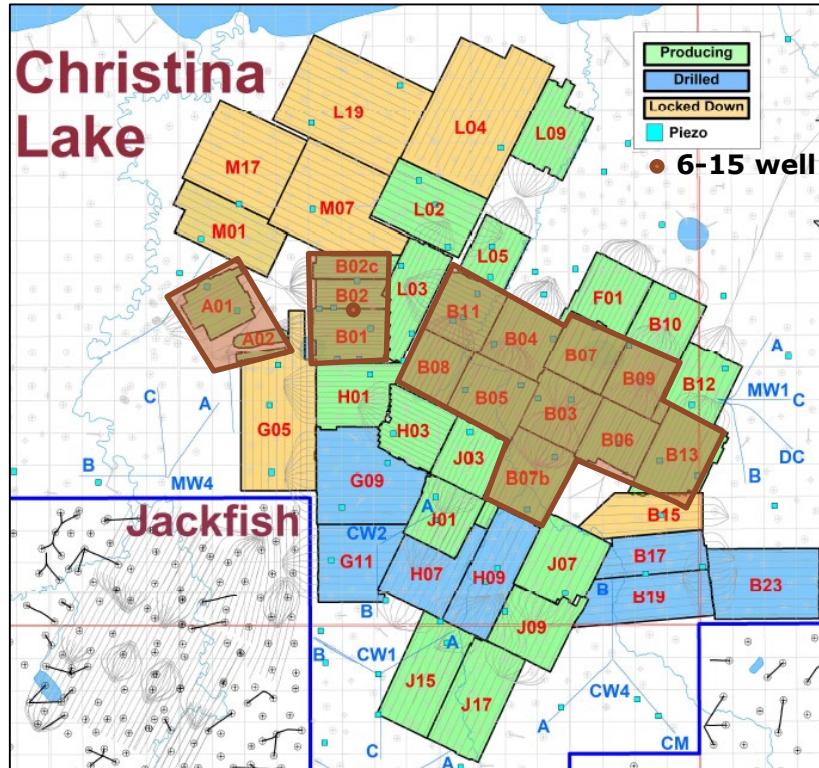
Reservoir Characteristics	Christina Lake Project Area	Kirby East Project Area	Approved Development Area
Reservoir Depth (m subsea)	170 - 245	170 - 245	170 - 245
Average SAGD Pay Thickness (m)	Up to 45+	Up to 25+	Up to 35+
Porosity (%)	31%	29%	30%
Horizontal Permeability (D)	Up to 10	Up to 8	Up to 10
Vertical Permeability (D)	Up to 7	Up to 6	Up to 7
Oil Saturation (%)	~80%	~75%	~80%
Water Saturation (%)	~20%	~25%	~20%
Original Reservoir Pressure (kPa)	~2500	~2500	~2500
Original Reservoir Temperature (°C)	12°C	12°C	12°C

POIP and RF per pad

Pad	Area (m2)	Height (m)	Porosity (%)	So (%)	POIP (Mm3)	Cum Oil (Mm3) to Dec 31, 2019	Recovery % POIP	Estimated Ultimate Recovery (m3)	Ultimate Recovery as % of POIP
A01 PAD	514,091	26	33%	77%	3,275	2,386	72.8%	2,470	75.4%
A02 PAD	174,295	31	32%	84%	1,385	542	39.1%	799	57.7%
B01 PAD	644,033	38	32%	80%	6,166	4,228	68.6%	4,485	72.7%
B02 PAD	329,864	43	32%	83%	3,752	2,939	78.3%	3,226	86.0%
B02C PAD	320,629	29	33%	83%	2,530	1,806	71.4%	1,896	74.9%
B03 PAD	677,534	41	32%	83%	7,043	5,548	78.8%	5,899	83.8%
B04 PAD	652,375	41	31%	82%	6,780	5,782	85.3%	5,932	87.5%
B05 PAD	731,534	47	31%	79%	8,443	5,991	71.0%	6,672	79.0%
B06 PAD	605,198	37	31%	77%	5,348	4,398	82.2%	4,620	86.4%
B07 PAD	642,341	46	30%	81%	7,093	5,430	76.6%	5,748	81.0%
B07B PAD	884,240	29	32%	78%	6,330	2,691	42.5%	3,965	62.6%
B08 PAD	568,267	34	33%	84%	5,497	3,627	66.0%	3,983	72.5%
B09 PAD	558,380	44	31%	86%	6,408	4,136	64.5%	4,797	74.9%
B10 PAD	595,522	37	31%	80%	5,489	1,468	26.7%	2,655	48.4%
B11 PAD	640,668	36	31%	82%	5,847	4,345	74.3%	4,432	75.8%
B13 PAD	836,206	26	31%	81%	5,521	2,216	40.1%	3,586	64.9%
F01 PAD	700,230	31	30%	79%	5,003	2,938	58.7%	3,824	76.4%
H01 PAD	773,342	28	33%	82%	5,996	2,472	41.2%	4,291	71.6%
H03 PAD	658,249	29	34%	83%	5,243	2,408	45.9%	3,638	69.4%
J01 PAD	600,387	22	32%	78%	3,414	1,160	34.0%	2,277	66.7%
J03 PAD	561,300	41	33%	82%	6,157	3,647	59.2%	4,698	76.3%
J07 PAD	848,871	24	32%	81%	5,295	66	1.3%	4,128	78.0%
J09 PAD	758,451	27	32%	83%	5,305	330	6.2%	3,932	74.1%
J15 PAD	991,475	25	31%	79%	5,992	16	0.3%	4,002	66.8%
L02 PAD	980,071	26	33%	83%	6,903	66	1.0%	3,994	57.9%
L03 PAD	716,007	31	34%	85%	6,377	2,092	32.8%	4,432	69.5%
L05 PAD	469,077	33	29%	76%	3,410	1,089	31.9%	2,074	60.8%
L09 PAD	715,617	26	30%	86%	4,763	916	19.2%	3,408	71.5%
Total CL	18,148,253				150,764	74,734	49.6%	109,864	72.9%

*As of December 31st, 2019

Map of co-injection wells



Non-condensable gas

- NCG injected in 6-15 well, and wells on A01, A02, B01, B02, B02C, B03, B04, B05, B06, B07, B07b, B08, B09, B11 and B13 pads

Solvent

- No solvent injection at CL, currently.

Injection Strategy and Impacts

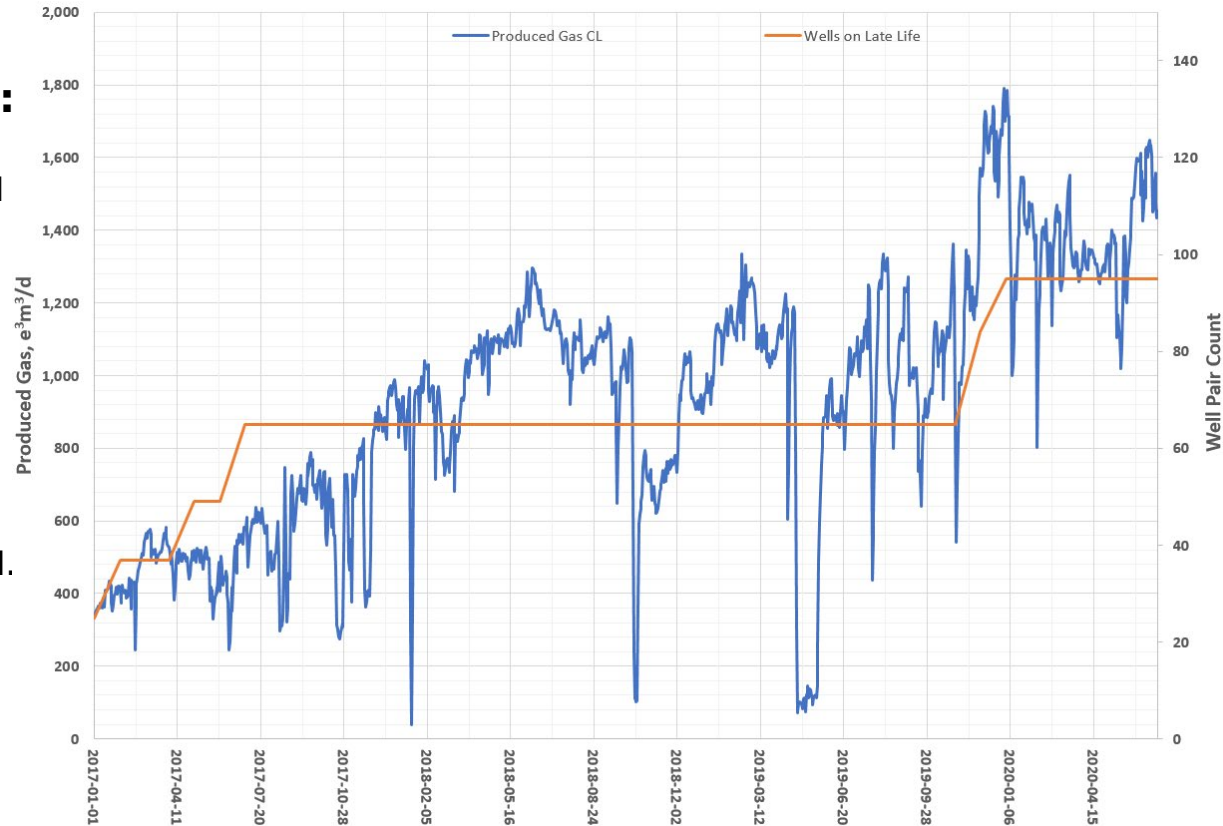
NCG Injection commencement is based on:

- Pads with high RF
- Pads with high SOR/declining oil rates

Steam cuts are typically made in 25% increments.

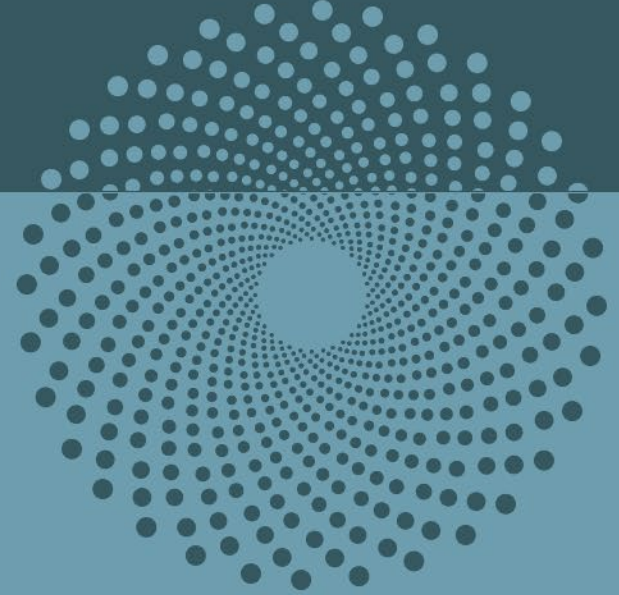
Impact of co-injection:

- High gas production. Trials underway to determine if produced gas may be decreased.
- Production declines and RFs cannot be reasonably compared as they may be impacted by trials/facility limitations, and re-development wells.



Subsection 4.3 8

Surface



Source Water Infrastructure

Fresh water source wells – Empress Aquifer :

- Two wells at 09-17-076-06W4M (TDS ~440-560 mg/L)
- One well at 06-16-076-06W4M (TDS ~380-650 mg/L)

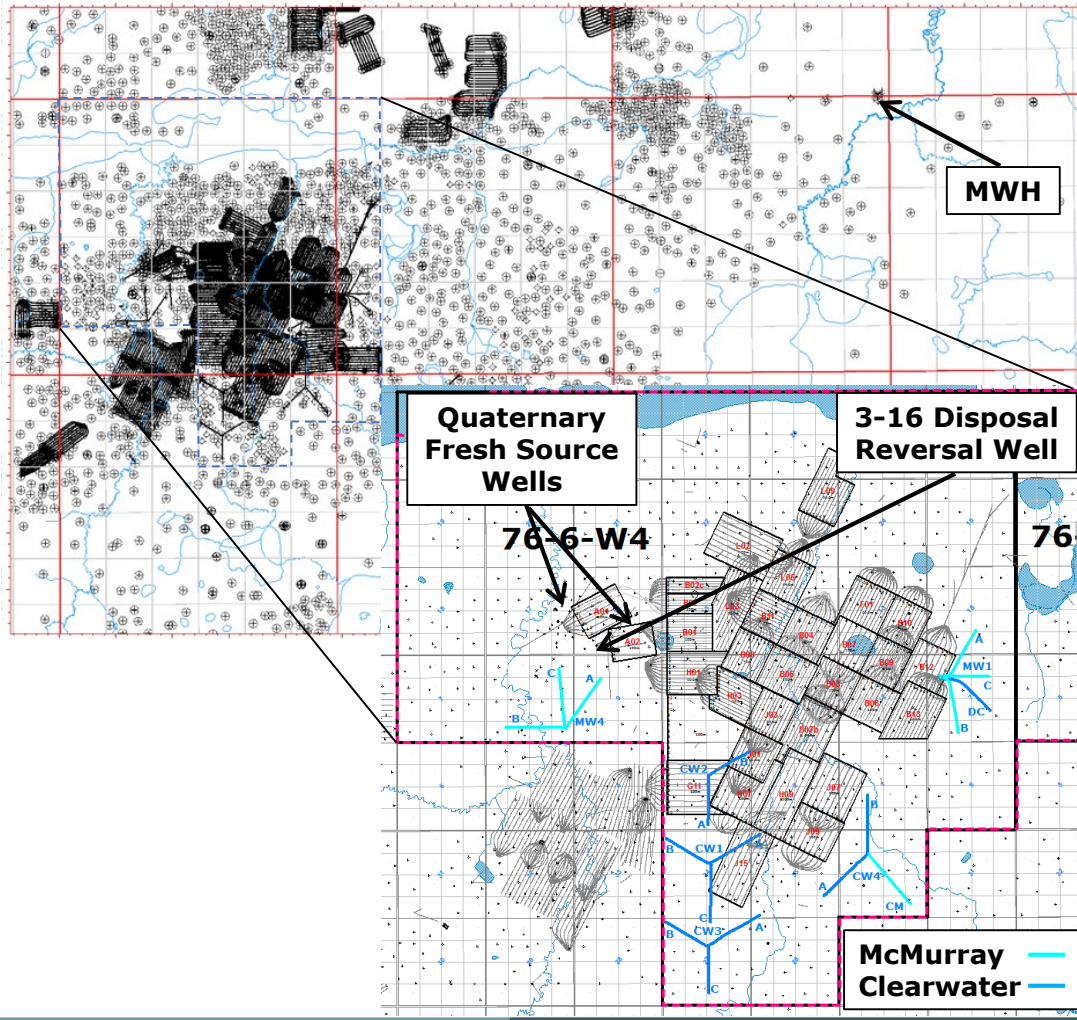
Brackish water source wells – Clearwater B Aquifer:

- CW1-A 1F1/13-35-075-06W4/00 TDS ~ 7,400 mg/L
- CW1-B 1F1/13-34-075-06W4/00 TDS ~ 5,070 mg/L
- CW1-C 1F1/15-27-075-06W4/00 TDS ~ 7,780 mg/L
- CW2-A 1F1/16-03-076-06W4/00 TDS ~ 4,600 mg/L
- CW2-B 1F1/02-03-076-06W4/00 TDS ~ 5,580 mg/L
- CW3-A 100/04-35-075-06W4/00 TDS ~ 9,730 mg/L
- CW3-B 100/13-27-075-06W4/00 TDS ~ 8,900 mg/L
- CW-3C 100/02-27-075-06W4/00 TDS ~ 11,700 mg/L
- CW4-A 1F1/01-35-075-06W4 TDS ~ 13,200 mg/L
- CW4-B 1F1/06-01-076-06W4 TDS ~ 8,800 mg/L
- MW1-DC 1F1/07-07-076-05W4 TDS ~ 4,300 mg/L
- 3-16 1F5/03-16-076-06W4/00 TDS ~ 8,400 mg/L

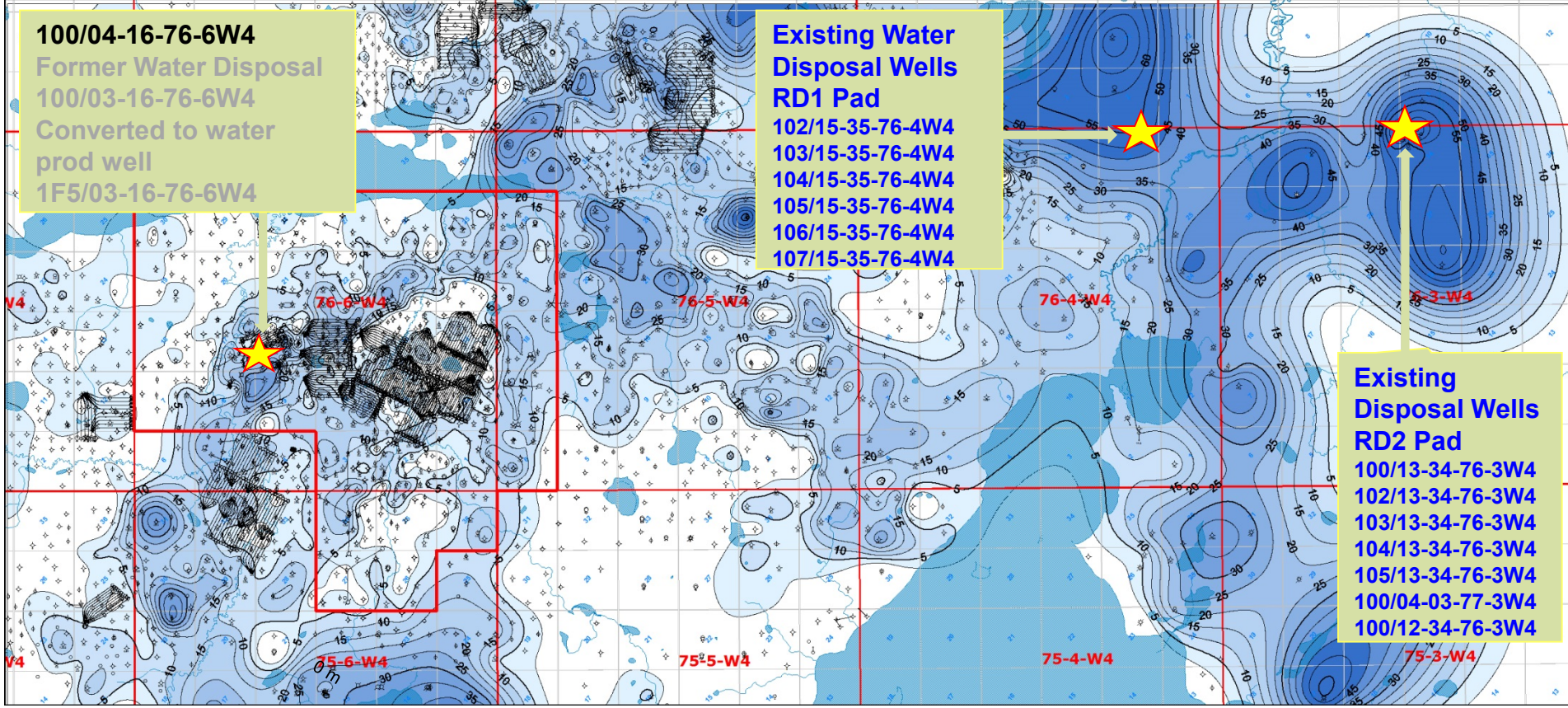
McMurray water source wells (Online Q4 2016):

- MW1-A 1F1/07-18-076-05W4 TDS ~ 16,880 mg/L
- MW1-B 1F1/03-07-076-05W4 (not in use) TDS ~ 16,520 mg/L
- MW1-C 1F1/09-07-076-05W4 TDS ~ 16,420 mg/L
- MW4-A 1F3/11-09-076-06W4 TDS ~ 10,850 mg/L
- MW4-B 1F1/04-08-076-06W4 TDS ~ 11,300 mg/L
- MW4-C 1F1/16-08-076-06W4 TDS ~ 10,990 mg/L
- CW4-C 1F1/01-36-075-06W4 TDS ~ 18,600 mg/L
- MWH 1F1/01-01-077-04W4 (not in use)
- MWH 1F1/02-01-077-04W4 (not in use)
- MWH 1F2/01-01-077-04W4 (not in use)
- MWH 1F1/15-36-076-04W4 (not in use)
- MWH 1F1/16-36-076-04W4 (not in use)
- MWH 1F2/16-36-076-04W4 (not in use)

MWH TDS ~ 13700-16800 mg/L



McMurray water disposal wells



Facility summary

- Phase G Start-up – 2019:
 - Steam Plant – February
 - Water Plant – March
 - Process/De-oiling – end of April
- Production curtailment (January – August) limited inlet production rates
 - Fresh water TDL's utilized for steam production to maintain well health/operation
- Phase CDE Turnaround – April/May
- Approval of New Directive 081 Disposal Regulation
 - CL will meet new allowable disposable ratio (<100%)

Plant performance

Steam

- System capacity increased to 82,560 m³/d of steam (23% increase)*
- 2019 average flowrate of 62,970 m³/d | 76% of Capacity
- System capacity increase due to start-up of Phase G OTSGs (Q1, 2019)
- Phase A to H approved steam capacity is 92,618 m³/d

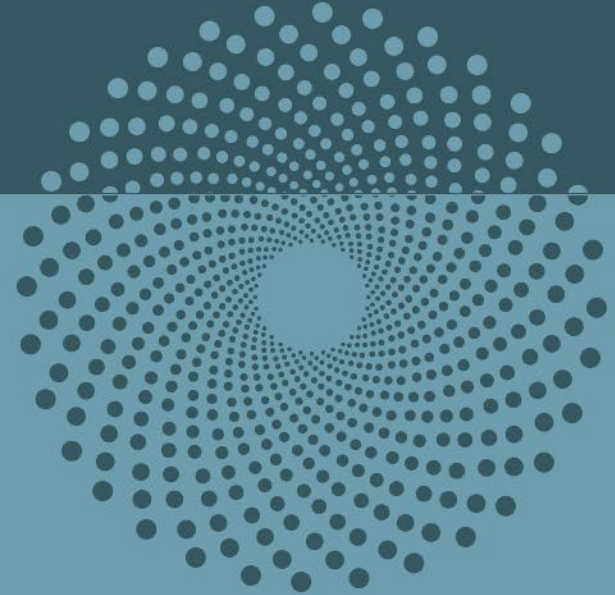
Oil

- System capacity increased to 43,880 m³/d of oil (276,000 bbl/d) (20% increase)*
- 2019 average flowrate of 30,957 m³/d (194,807 bbl/d) | 71% of Capacity
- System capacity increase due to start-up of Phase G Process Treating (Q2 2019)
- Phase A to H approved annual average bitumen capacity is 49,284 m³/d (310,000 bbl/d)

*Capacity values are based on proven best 7 day averages

Subsection 4.4 9-12

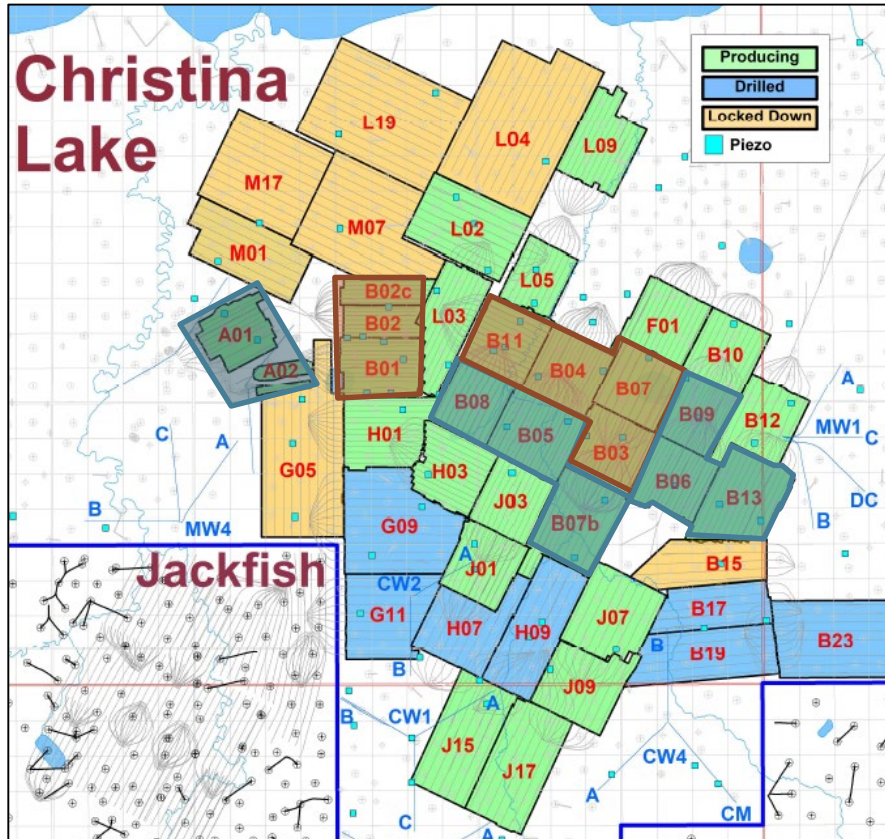
Historical and Upcoming Activity



Pad Abandonments

- No pad abandonments are currently planned at Christina Lake in the next 5 years.

Well patterns with active blow-down or ramp-down



2019 Regulatory application/approval summary

Act	Application No.	Application Description	Approval Date
OSCA	1920148	Well Pad B07B and B13 Natural Gas Co-injection	2019-04-22
OSCA	1921704	Well Pad E01 Trajectory Update	2019-06-13
OSCA	1922184	Butane Blending Project Application	2019-07-10
OSCA	1922415	TriCanter Trial - 6 month extension	2019-07-15
OSCA	1925206	ID 2001-03 Sulphur Variance Waiver for 2020	2019-11-07
EPEA	028-48522	Short-term variance to SO ₂ emission limit (3 months)	2019-02-01
EPEA	029-48522	Short-term variance to SO ₂ emission limit (to year-end 2020)	2019-10-18

Facility modifications

- Phase G plant expansion:
 - Start-up - 2019:
 - Steam Plant – February
 - Water Plant – March
 - Process/De-oiling – end of April

Emulsion treatment

Process Treating Area:

- Reduced inlet emulsion rates due to production apportionment resulted in:
 - minimal OIW excursions
 - little process cooling limitations
 - execution of opportunistic maintenance
- Phase G Start-Up (April 2019) added capacity/flexibility for:
 - treating
 - maintenance outages/turn-arounds

Produced Water treatment

De-oiling Area:

- Reduced produced water rates during the production apportionment resulted in minimal oil and grease excursions
- Phase G Start-Up (April 2019) added capacity/flexibility for:
 - Treating
 - Maintenance outages/Turn-around
- Post curtailment, issues in de-oiling were:
 - On-going monitoring of oil-in-water excursions

Water treatment

- Reduced produced water rates due to production apportionment resulted in lack of sufficient boiler feed water to generate the steam required to maintain well health/operation:
 - Fresh water TDL (temporary diversion license) provided the ability to utilize additional fresh water to increase steam production by $\sim 2,120 \text{ Sm}^3/\text{d}$
- Phase G water plant start-Up (March 2019) added capacity/flexibility for:
 - Necessary maintenance outages / turn-around activities
 - Distribution of water treatment during off-spec / excursion events to limit impacts to downstream equipment (ion exchange trains & OTSGs / HRSGs)
- Equipment reliability issues, process upsets and unplanned outages occasionally continued to limit total water plant capacity through 2019

Steam generation

- Reduced produced water rates due to production apportionment resulted in lack of sufficient boiler feed water to generate the steam required to maintain well health/operation
 - Fresh water TDL (temporary diversion license) provided the ability to bring in additional fresh water to increase steam by $\sim 2,120 \text{ Sm}^3/\text{d}$ (per previous slide)
- Phase G steam plant start-Up (April 2019) added capacity/flexibility for:
 - Generating additional steam to manage well health during apportionment
 - Maintenance outages/turn-around

Pilots/technical innovations

Butane Blending Project – displace diluent volumes to reduce Opex

- Phase 1 of trial started September 2019:
 - Positive results however economics are not as prolific as originally projected due to pricing driver degradation
- Phases 2/3 of trial to commence Nov/Dec 2020
 - Instrumentation improvements and increased injection capacity changes have been completed to enable next set of trials

Tricanter Project – recycle slop water/slop oil

- Operated Nov 2018 – Oct 2019
- Encountered treating issues due to the quality of slop – addition of sales oil helped process fluids
- Proven economical on short-term basis when the facility produced higher than normal off-spec process fluids
- Review will continue in 2020-2021 to determine if a permanent Tricanter system will be pursued

2019 Non-compliance summary - AER

Date	Non compliance/Self Disclosure	Follow-up
2019-01-15	Pipeline Inspection @ 4-16-76-6W4 P35664. Discontinued pipeline not left in a safe condition, notification to the AER of a pipeline leak.	Complete, response letter and action plan submitted June 12, 2019.
2019-03-18	Pipeline Inspection @ 10-35-75-6W4 P51139. Discontinued pipeline not left in a safe condition.	Complete, response letter and action plan submitted June 11, 2019.
2019-11-20	Well Site Inspection @ 02-14-076-06W4. 5 suspended wells located immediately behind operational wells do not have signs identifying the wells.	Complete, response letter submitted January 29, 2020.

2019 Non-compliance Summary – EPEA

Date	Non compliance	Follow-up
2019-02-11	EDGE Ref# 349409. CEMS unit B-2100 failed to meet 90% availability on flow meter due to a faulty connector.	Replaced faulty connector.
2019-03-30	EDGE Ref# 351744. CEMS unit B-3100 failed to meet 90% availability on the temperature probe due to a faulty loop isolator.	Faulty loop isolator was replaced.
2019-07-24	EDGE Ref# 356907. Failed RATA on B-3460 due to drift on NO ₂ channel.	Unit was re-calibrated and second RATA passed.
2019-11-01	EDGE Ref# 360806. CEMS unit B-3500 failed to meet 90% availability on flow meter as the flowsic malfunctioned.	Replaced flowsic. Data backfill performed using approved AER method.
2019-11-16	EDGE Ref# 0361130. Failure of B05 Pad produced water tank gate valve seal.	Spilled volume cleaned up and tank replaced.
2019-12-07	EDGE Ref# 361853. SO ₂ limit exceedance. H ₂ S analyzer drifted to 0 ppm resulting in additional by-pass of the scavenger system.	Manual H ₂ S sampling in place to verify analyzer readings.
2019-12-31	EDGE Ref# 362198. Failed to perform second CGA on B-3460 due to expired CGA gas and extended downtime of B-3460.	Additional procedures put in place to check audit gas expiry dates.

Future plans

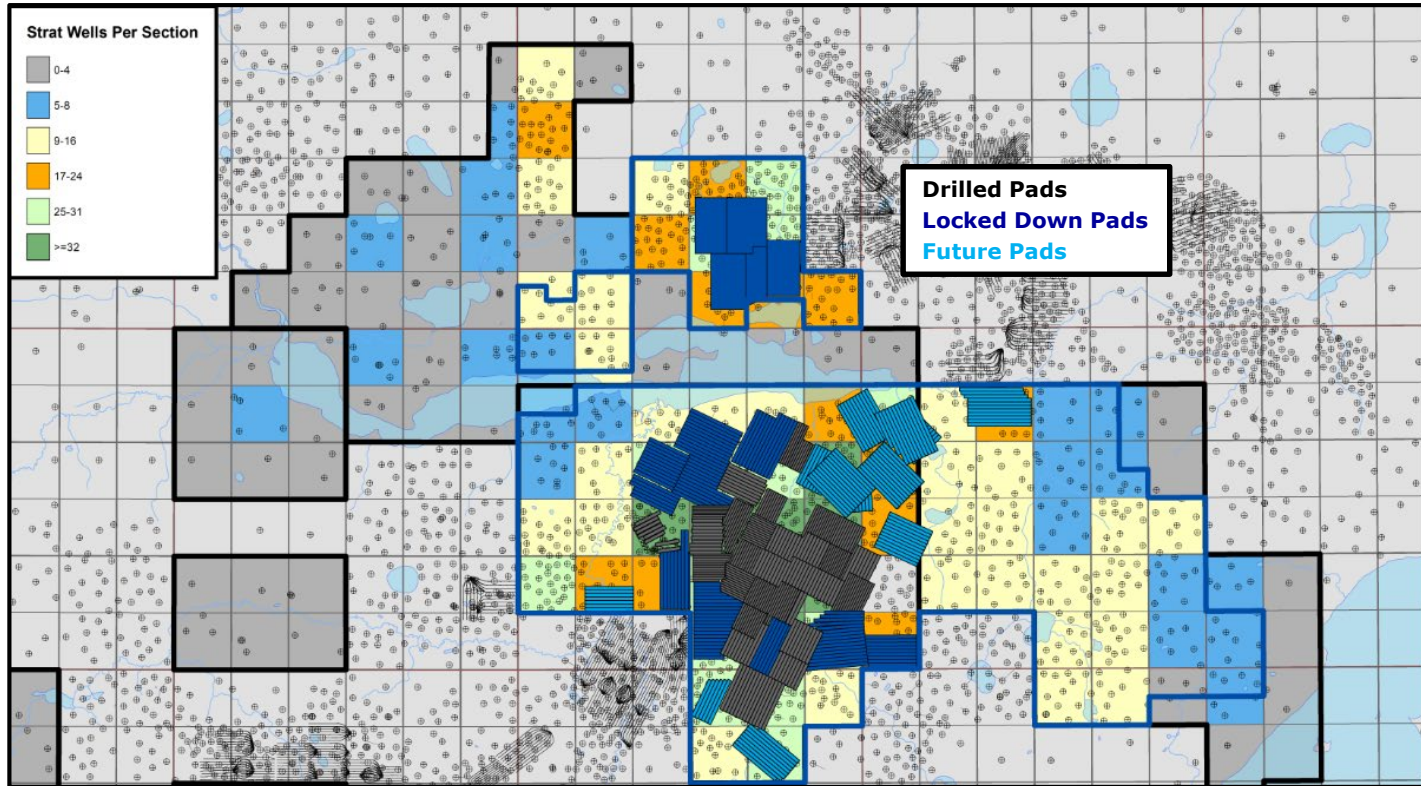
Potential Future Applications

- Diluent Solvent Aided Process
- Brackish Water Debottleneck
- Phase H Amendment
- Produced Gas Cooler Debottleneck

Future Plant Activity

- Due to the COVID-19 pandemic, there were no plans/activities that affected plant operation in Q1-Q3 2020
- Phases A-E plant turnaround scheduled for Sept/Oct 2020

Planned development



Questions

please contact us

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