

Surmont In Situ Oil Sands Project

Directive 054 Submission & Annual OSCA Report

Commercial Scheme Approval No. 9426

EPEA Approval No. 48263-01-00, as amended

Class 1b Disposal Approval No. 10044M

Reporting Period: January 1, 2021 to December 31, 2021

Submission Date: June 30, 2022

This submission is intended to provide information in compliance with:

- ▶ *Directive 054: Performance Reporting and Surveillance of In Situ Oil Sands Schemes* (April 2020) for the operating period from January 1, 2021 to December 31, 2021
- ▶ Condition 22 of Commercial Scheme Approval No. 9426ZZ for the submission of an annual *Oil Sands Conservation Act Report (OSCA Report)*
- ▶ Condition 4 (d) of Class 1b Disposal Approval No. 10044M for the summary of the Basal McMurray disposal monitoring results



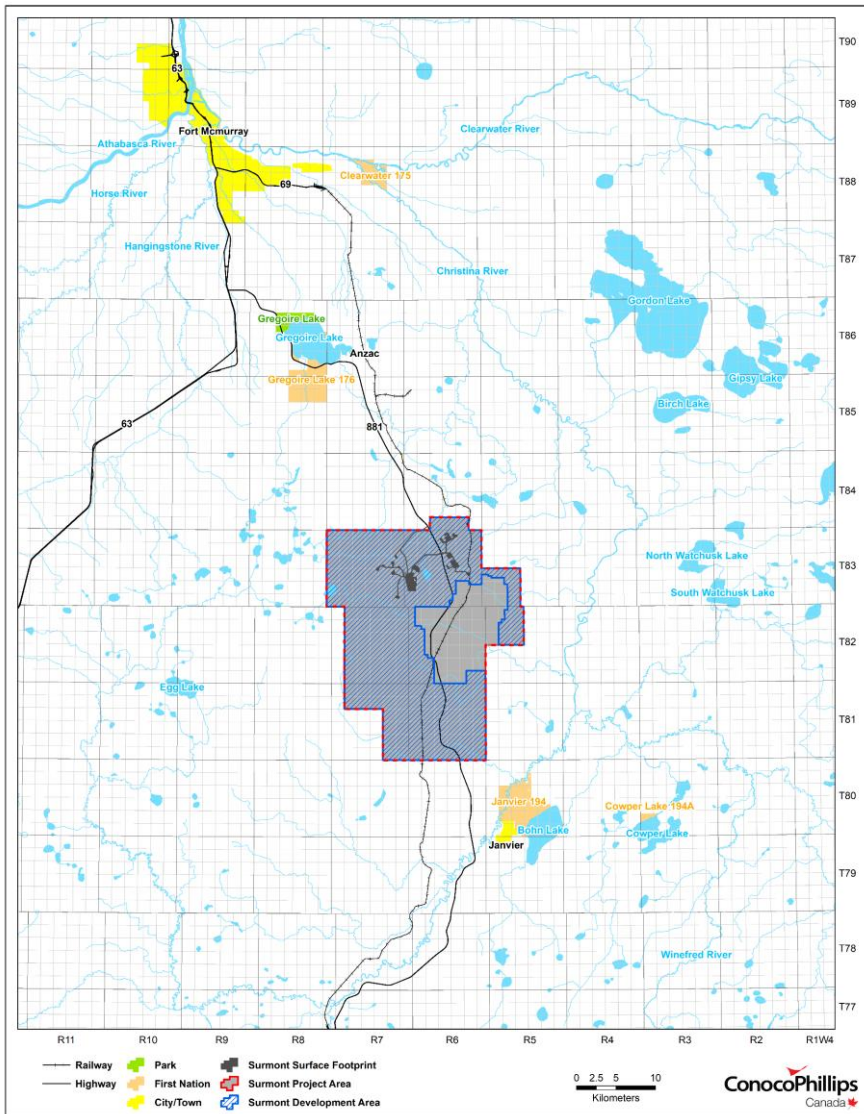
Introduction

Directive 054: Section 4.1



Surmont Overview

Area Map: Approved Surmont Project Area 



OWNERSHIP

Surmont is a steam-assisted gravity drainage (SAGD) bitumen recovery facility in the Athabasca oil sands area that is operated by ConocoPhillips Canada under a 50/50 joint venture agreement with TotalEnergies SE.



LOCATION

The project is approximately 63 km southeast of Fort McMurray, Alberta and covers 219 sections of land in Townships 80, 81, 82, 83, and 84, and Ranges 5, 6, and 7, west of the fourth meridian.



PROJECT HISTORY

Surmont currently features two phases:

- 2004 - construction start at Surmont Phase 1 (“S1”)
- 2007 - commercial production at S1
- 2010 - construction start at Surmont Phase 2 (“S2”)
- 2015 - commercial production at S2



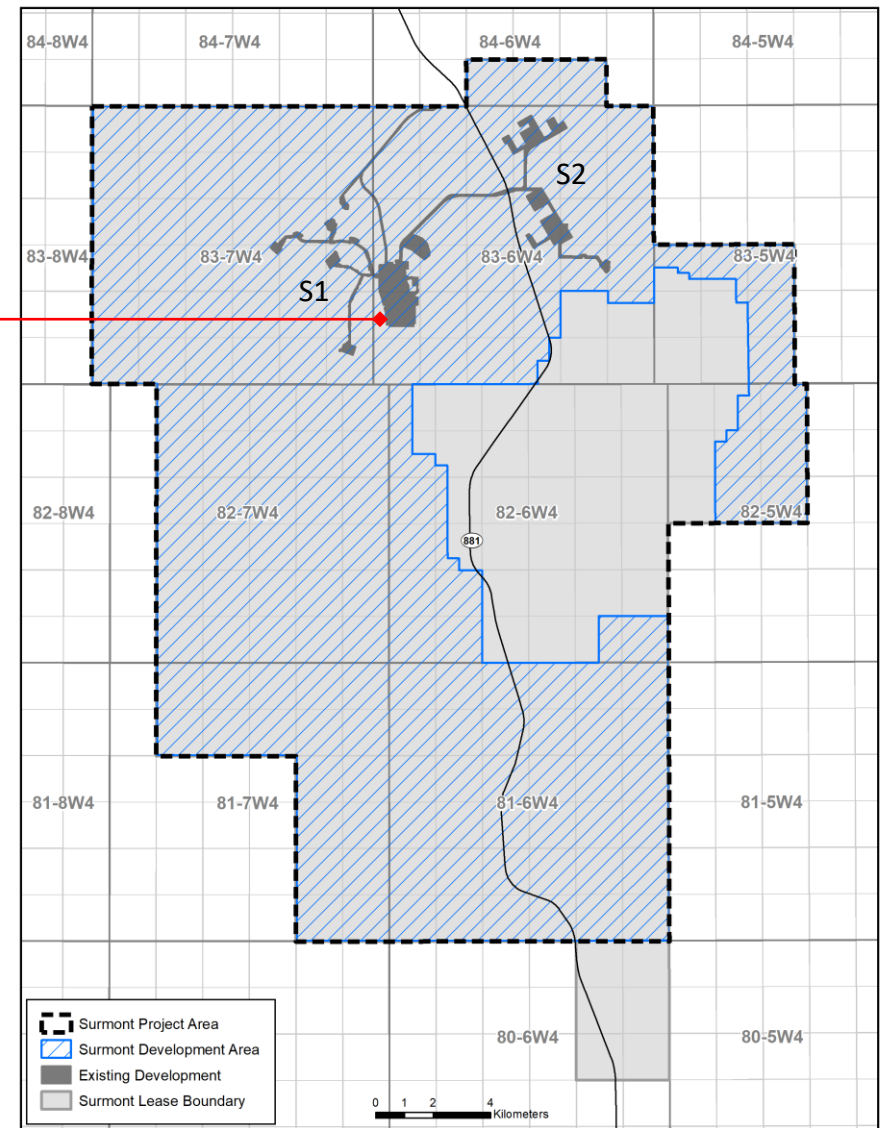
APPROVED BITUMEN PRODUCTION LIMIT

29,964 cubic metres per day (m³/d) on an annual average basis or 188 thousand barrels of oil equivalent per day (MBOED)

Surmont Overview: Development Area



Approved Surmont Development Area



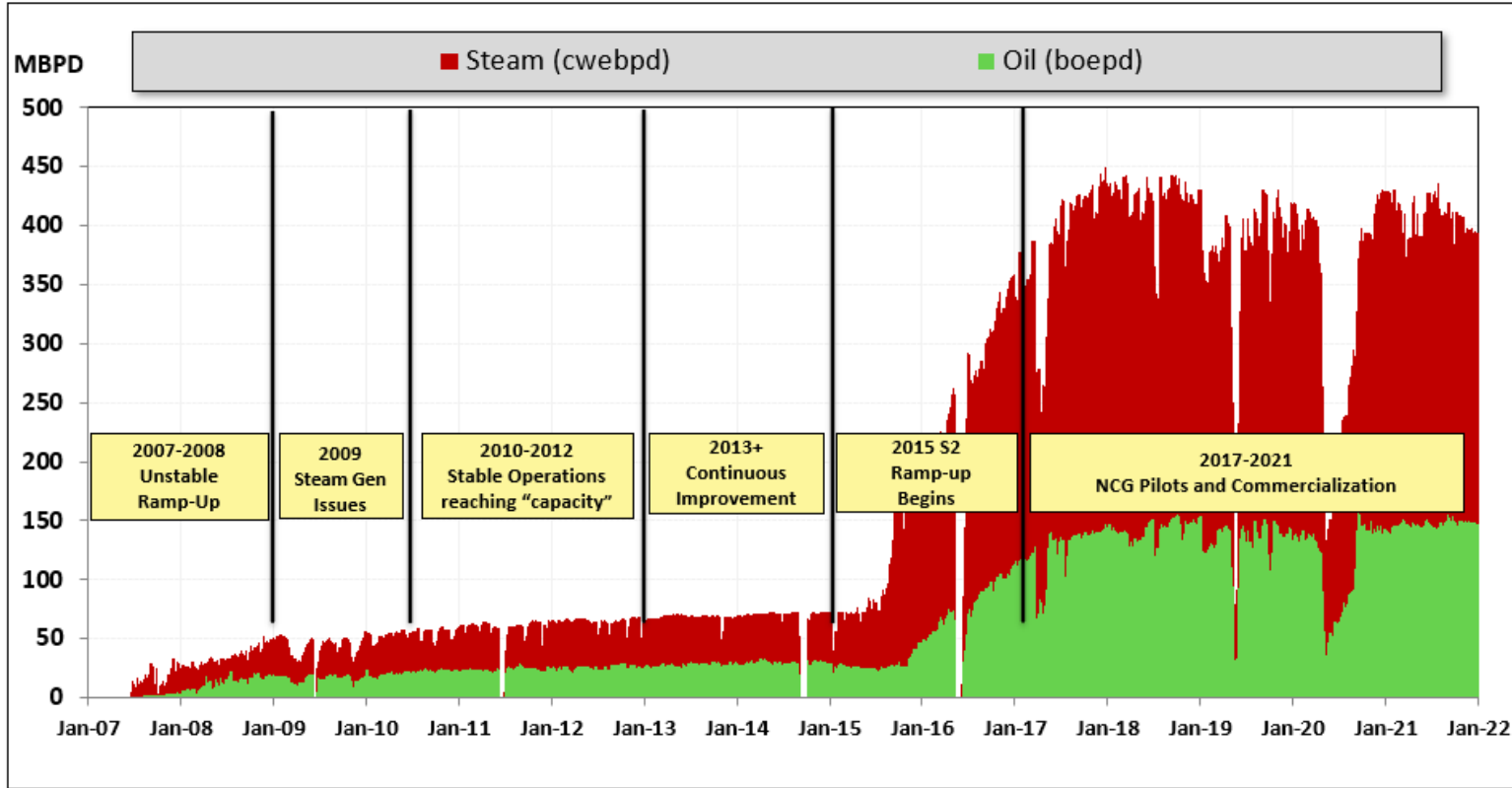
Subsurface

Directive 054: Section 4.2
OSCA Report: Table 1 (1)

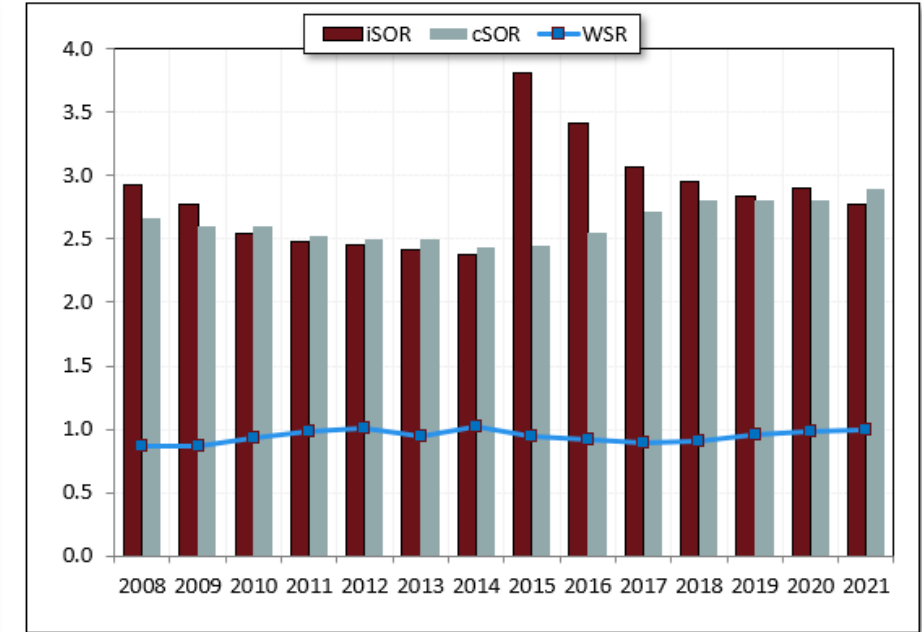


One Surmont Lifespan Production

Historical Steam Injection and Bitumen Production



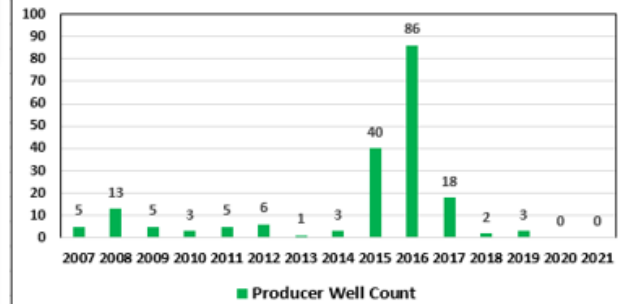
Historical iSOR, cSOR and WSR



2021 Highlights

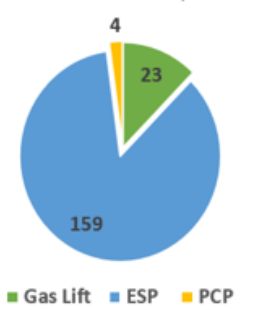
- Expanded NCG co-injection capabilities to more wells in Surmont for thief zone management and to optimize SOR
- 2021 redrill campaign executed to replace failed producer wells and optimize well placement
- Set Surmont maximum production record with daily peaks as high as 153,000 bbl/d oil in Q3 2021
- Steam additive pilot started up in Q1 2021
- Late life steam optimization at S1
- Drilled and completed two multilateral wells

Historical SAGD Starts

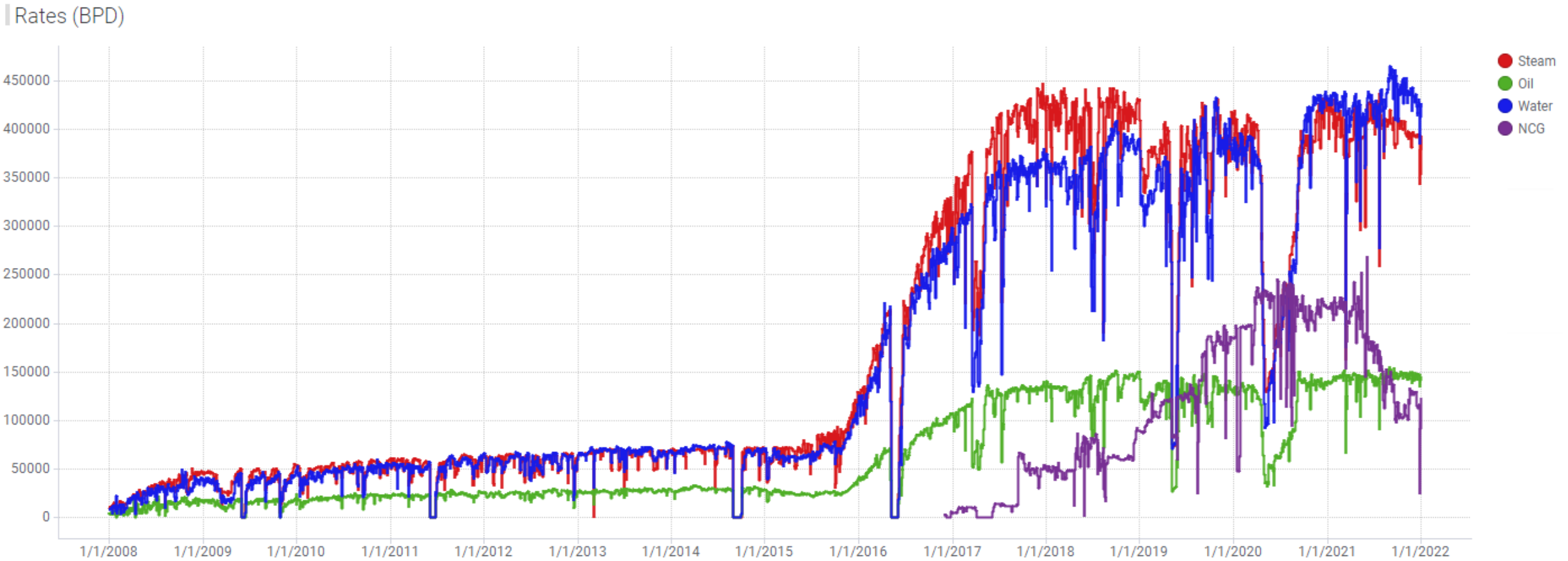


OneSurmont well count

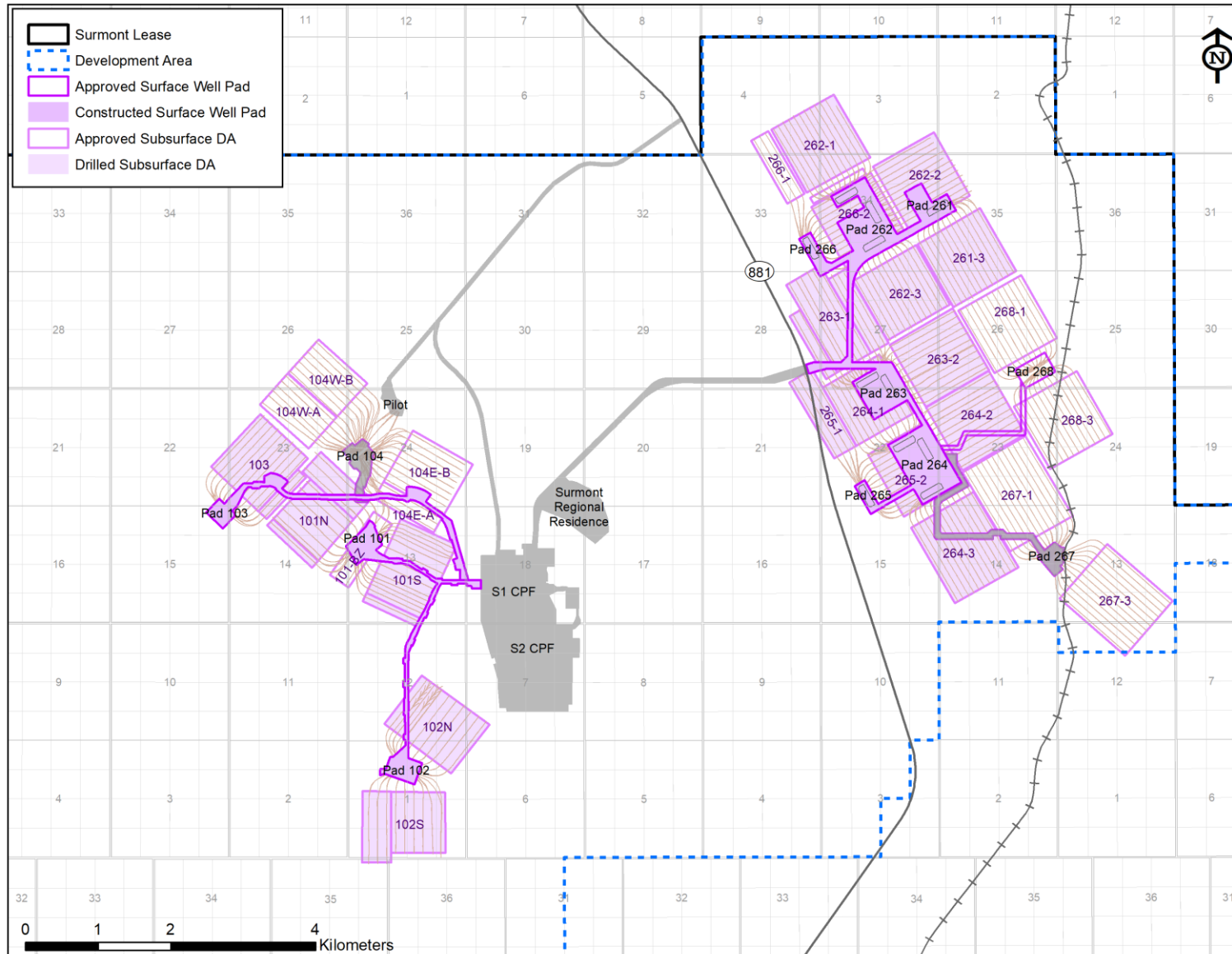
As of December 31, 2021



One Surrmont Lifespan Production



Development Area Maps: Drilled and Approved Drainage Areas



DRILLED DRAINAGE AREAS

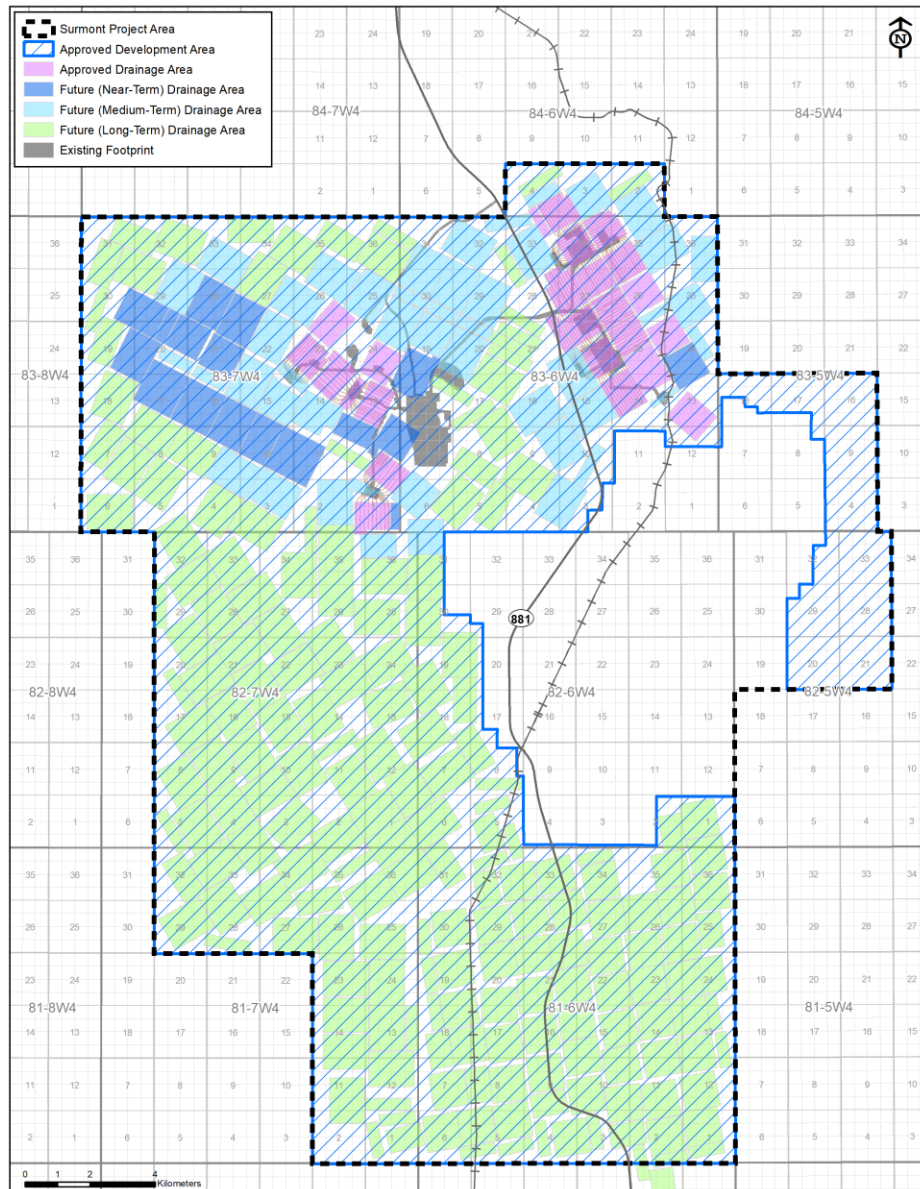
- 101N
- 101S
- 102N
- 102S
- 103
- 261-3
- 262-1
- 262-2
- 262-3
- 263-1
- 263-2
- 264-1
- 264-2
- 264-3
- 265-1
- 265-2
- 266-2

APPROVED DRAINAGE AREAS*

- 104E
- 104W
- 104S
- 266-1
- 267-1
- 267-3
- 268-1
- 268-3




* Additional approved drainage areas described in Lifecycle Application No. 1922683 are illustrated on the next slide.

Development Area Maps: Drilled and Approved Drainage Areas



LIFECYCLE APPROACH (APPLICATION NO. 1922683)

The conceptual locations of future subsurface drainage pattern areas are identified based on current sequencing scenarios as follows:

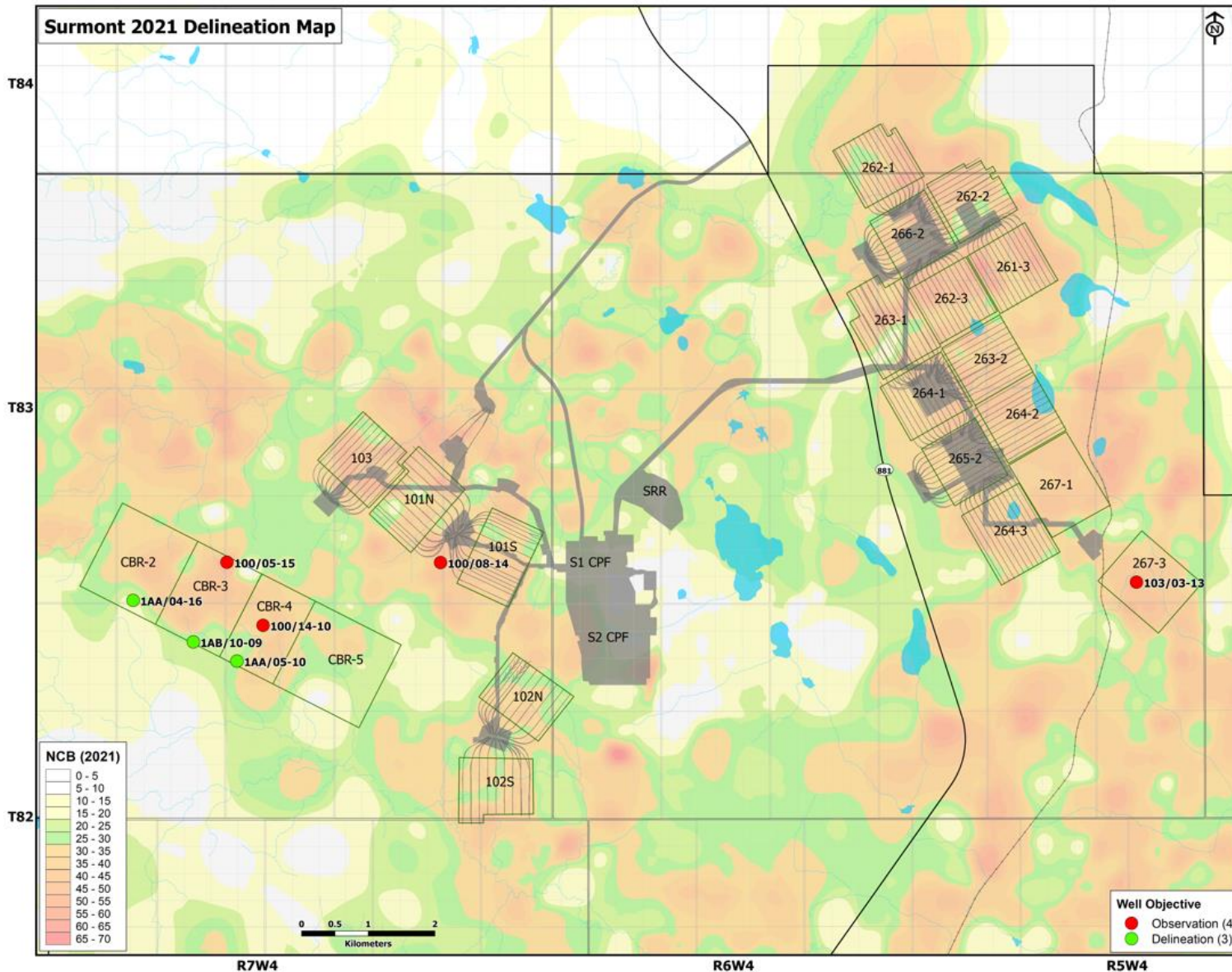
- future near-term drainage areas: next 10-15 years 
- future medium-term drainage areas: development years 15-41 
- future long-term drainage areas: beyond development year 41 



SUBSURFACE INFORMATION

No new subsurface information is available related to approved lifecycle activities, i.e., drainage area evaluation, design, or development

New Geological, Geomechanical & Reservoir Data

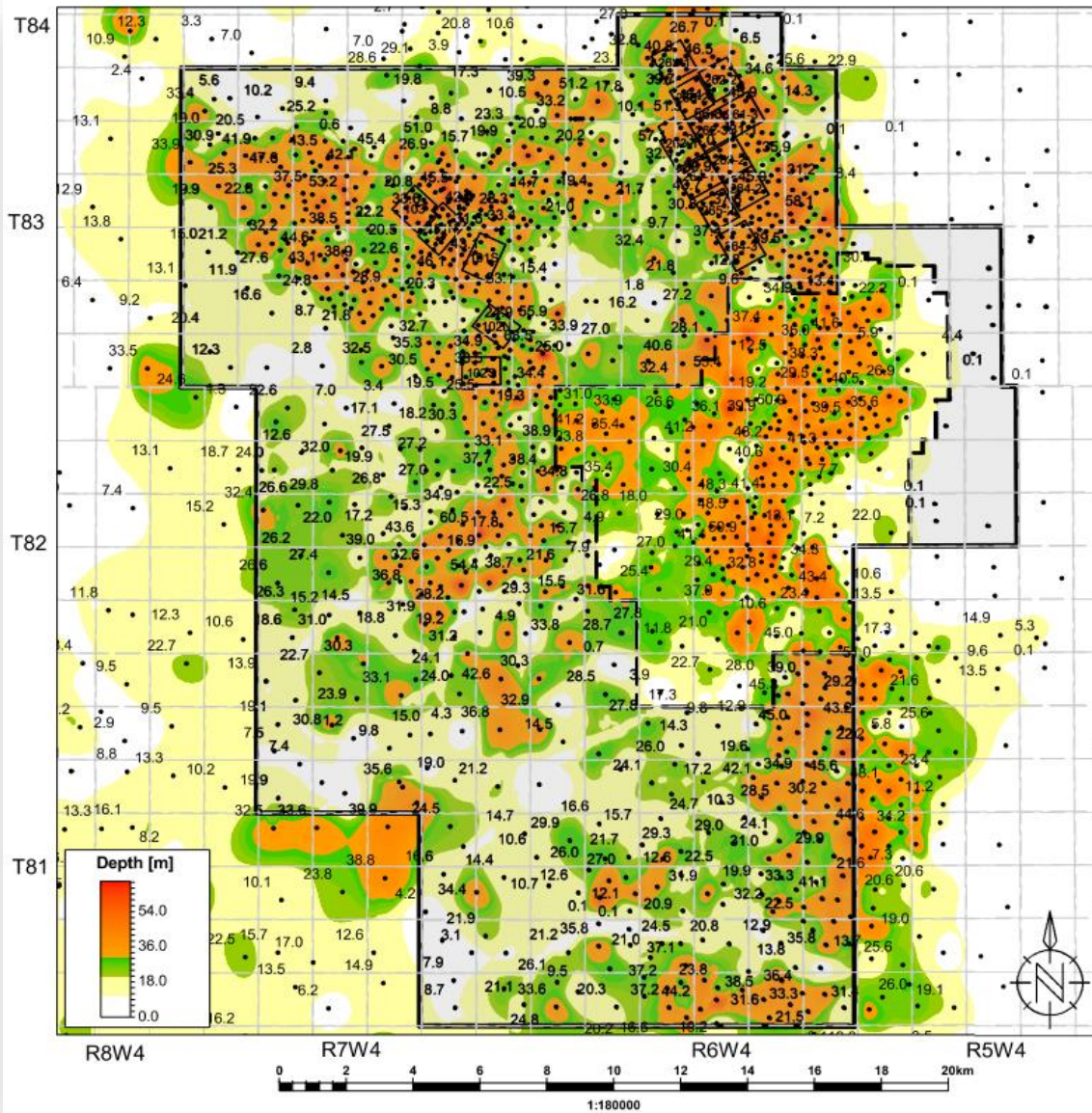


Wells Drilled in 2021	DA	Type
1AA041608307W400	CBR 2_7	Delineation
1AA051008307W400	CBR 4_3	Delineation
1AB100908307W400	CBR 3_4	Delineation (Cored)
100051508307W400	CBR 3_2	Delineation
100081408307W400	104-3	Delineation
100141008307W400	CBR 4_1	Delineation
103031308306W400	267-3_1	Delineation

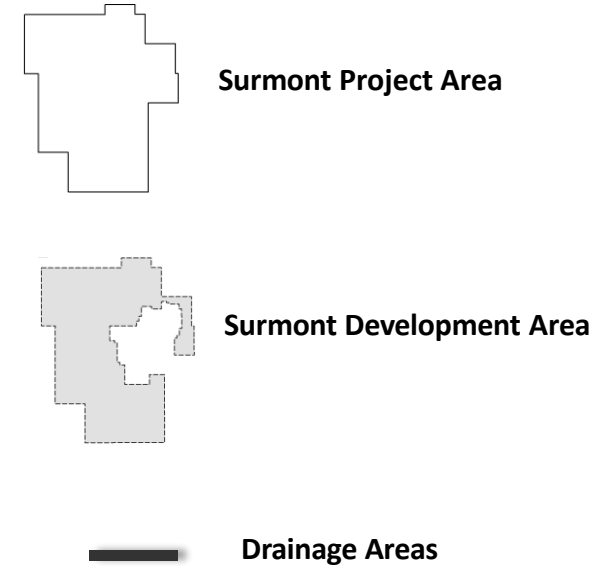
2021 Data Acquisition Table

Data Types Acquired	Quantity
Basic Logs	7
Shear Sonic	4
Micro Image Logs	7
Wireline Pressure	2
Core (McMurray Formation)	1
Dean Stark Analysis	109 Samples
PSA	6 Samples
Grain Density	16 Samples

Development Area Maps: Net Pay Isopach



Net Pay Isopach

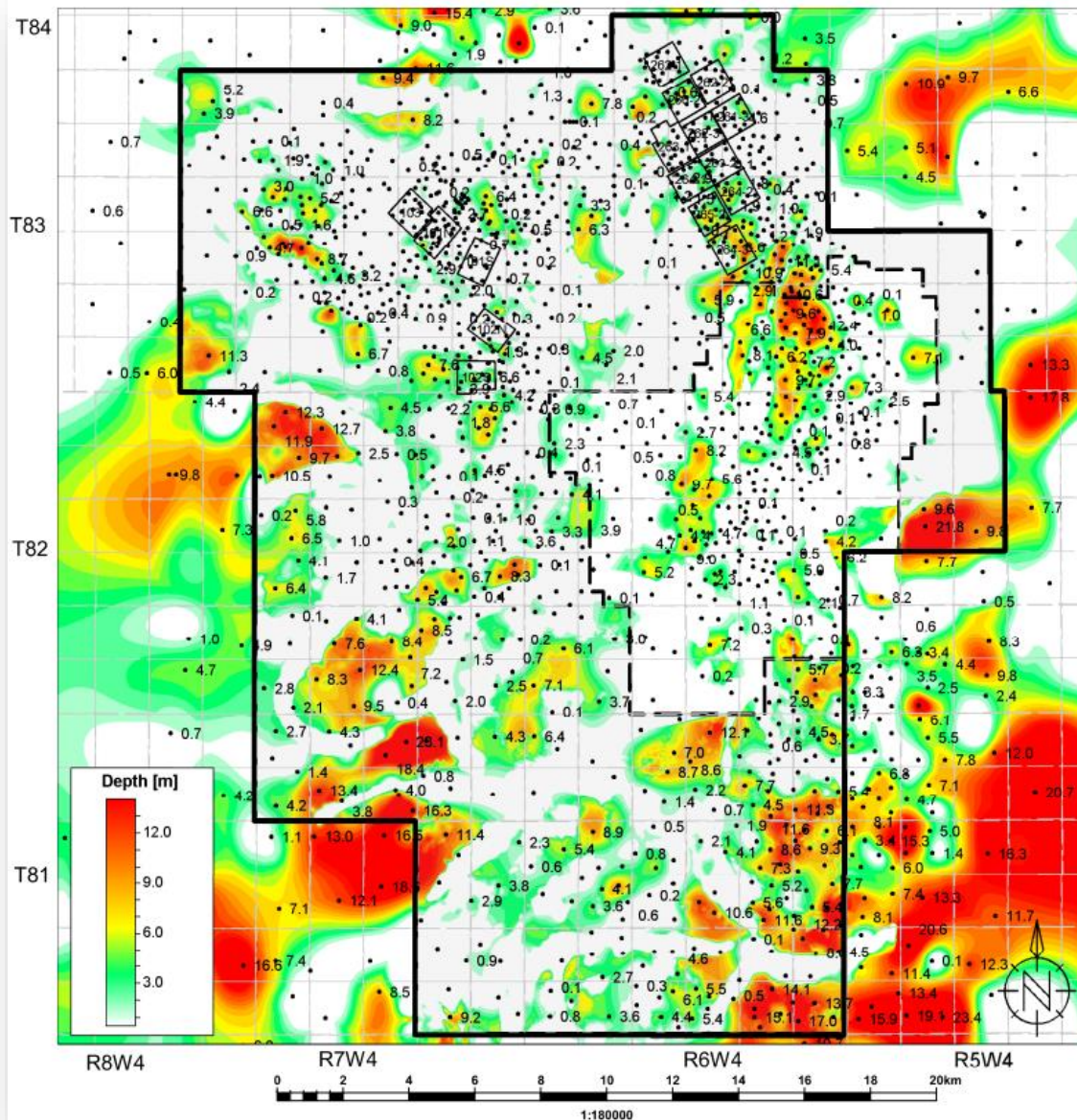


Net Continuous Bitumen Thickness (NCB) =
Sands have Deep Resistivity ≥ 10 Ohm-m and $V_{sh} < 33\%$

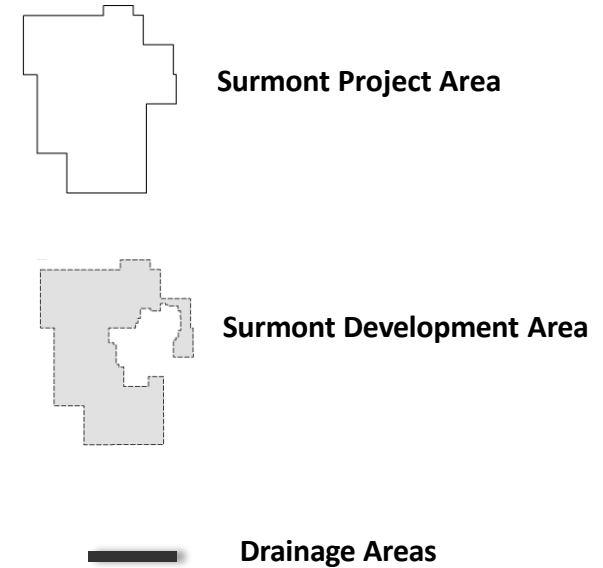
OBIP = Thickness x Phie x So x Area

Properties	Development Area
NCB Thickness Range	0 to Greater than 30 m
NCB Thickness	13.55%
Phie in NCB	31.86%
So in NCB	76.36%
OBIP in NCB > 18m	13973.74 MMbbls Deterministic

Development Area Maps: Net Top Gas Interval

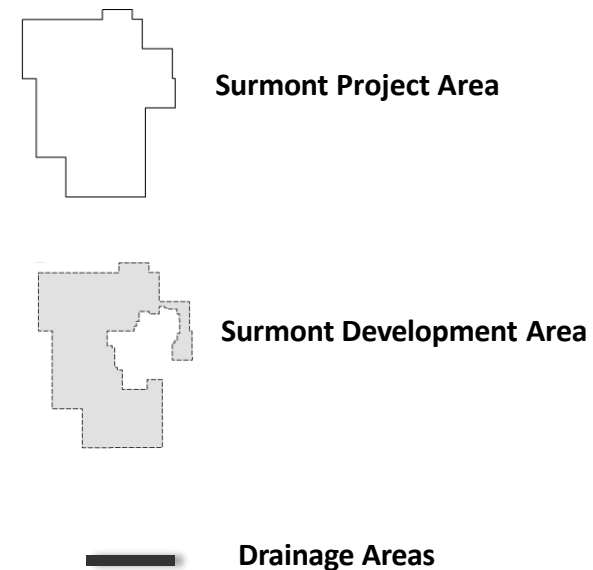
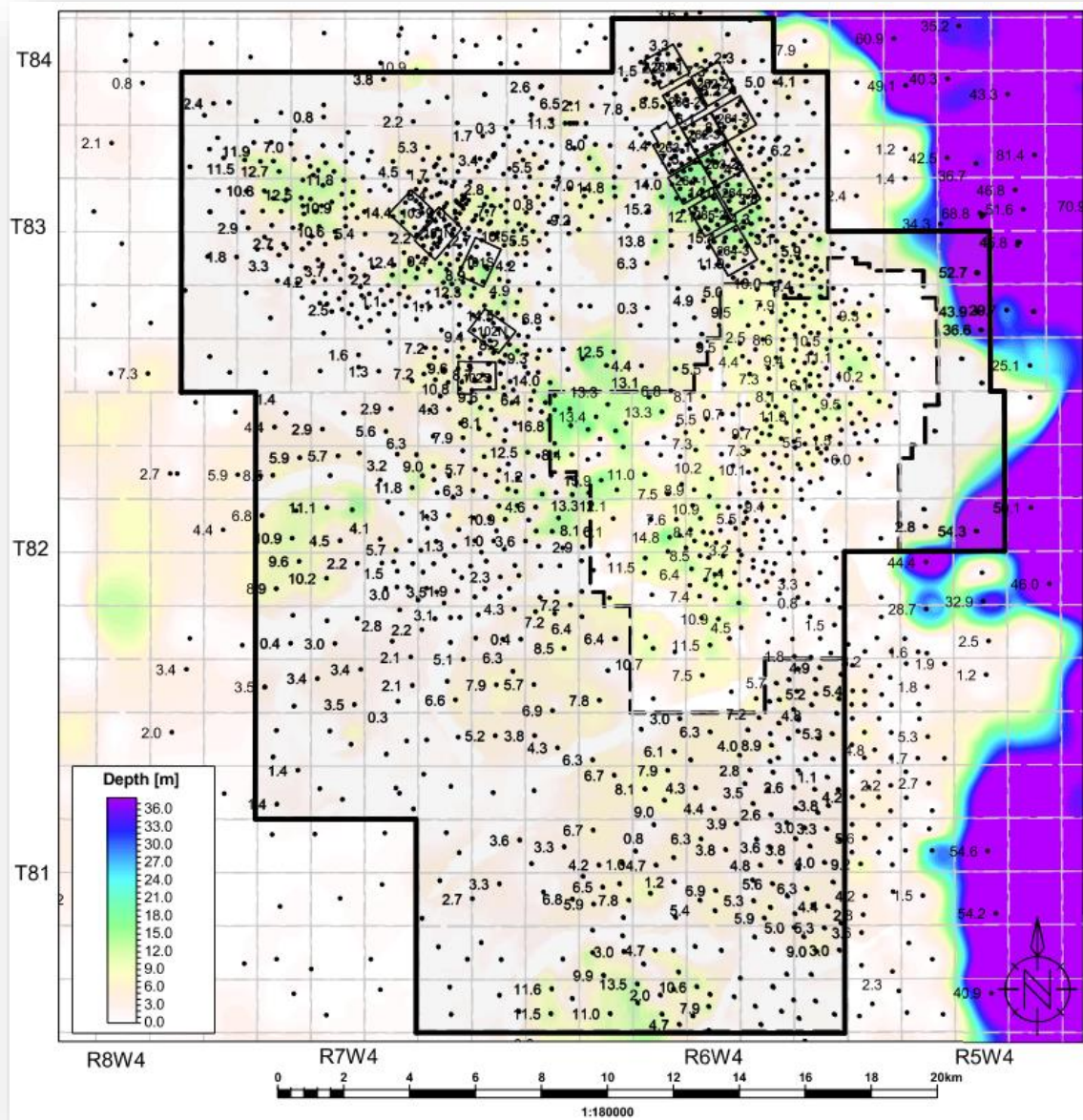


Net Top Gas Isopach



Net Top Gas Thickness =
Sands have Deep Resistivity ≥ 10 Ohm-m and
Vsh $< 65\%$

Development Area Maps: Major Water Intervals (Net Top Water)

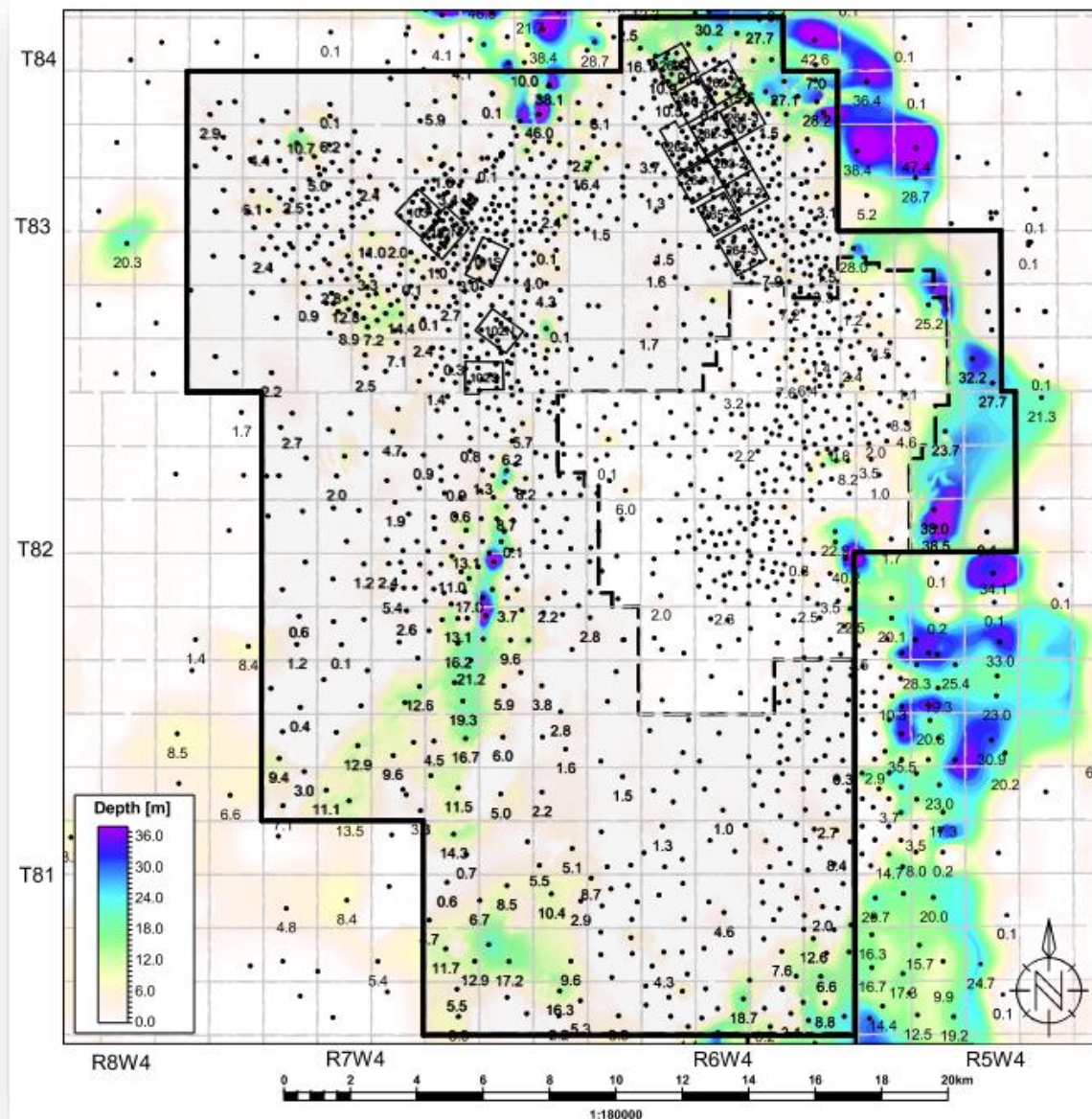


Net Top Water thickness = sands having

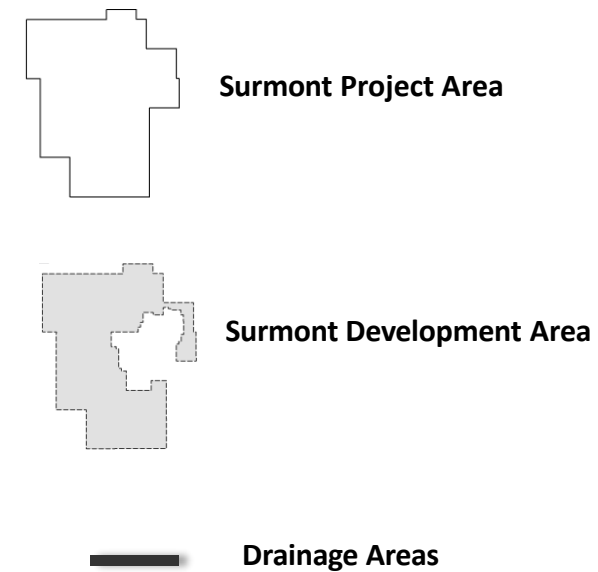
- Deep Resistivity < 10 Ω -m, and
- Vsh < 45%

Net Top Water Isopach

Development Area Maps: Major Water Intervals (Net Bottom Water)

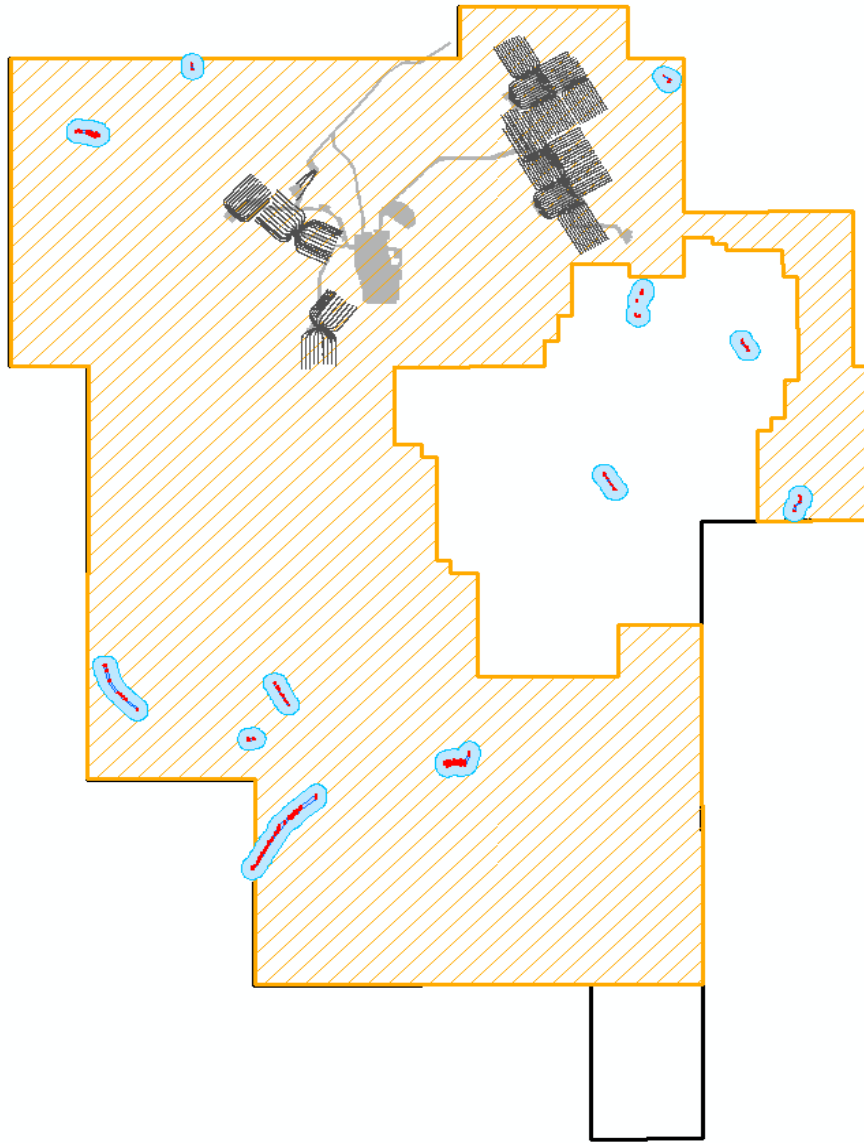


Net Bottom Water Isopach



Net Bottom Water thickness = sands having

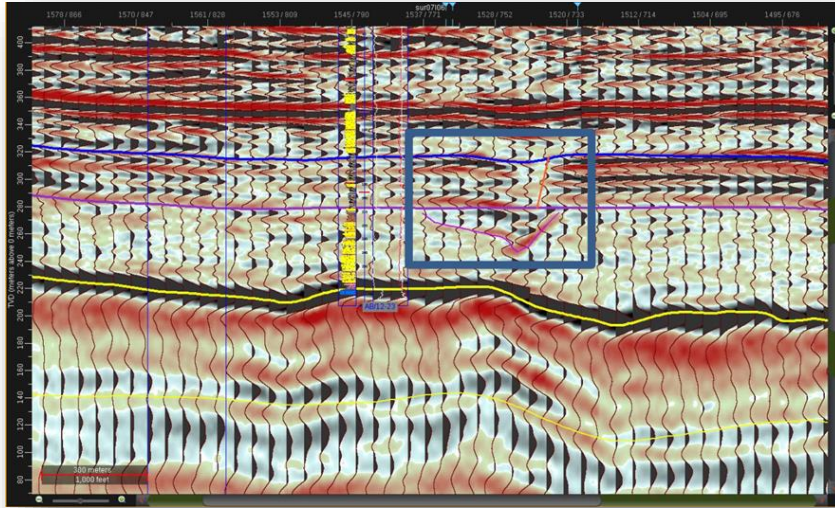
- Deep Resistivity < 10 Ω -m, and
- Vsh < 45%



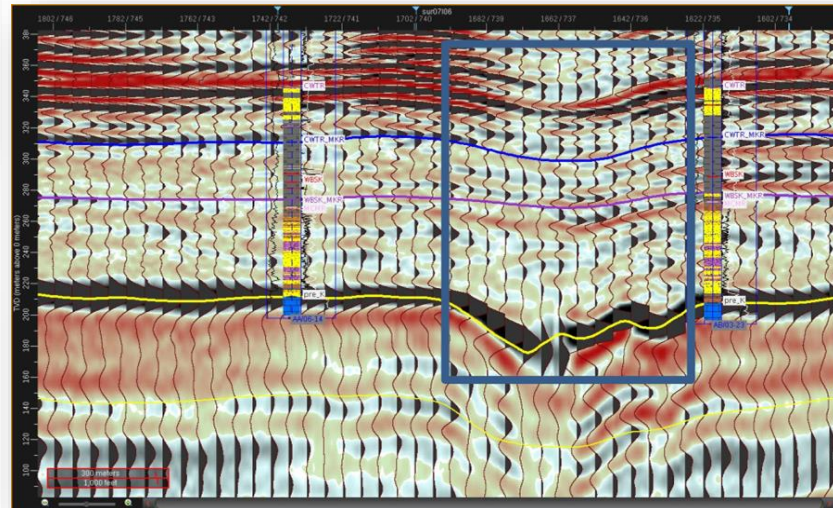
► CAPROCK GEOTECHNICAL HAZARD ANALYSIS

- No new seismic discontinuities have been identified within the Surmont development area since the submission of Lifecycle Application No. 1922683.
- The three highest risk structural mechanisms for caprock integrity are:
 - 1) caprock faulting or fracturing,
 - 2) post-caprock dissolution of the Prairie Evaporite, and
 - 3) post-caprock karsting of underlying Devonian carbonates.
- None of these features are present within the near-term development area. Discontinuities will be investigated prior to pad development activities in those areas.

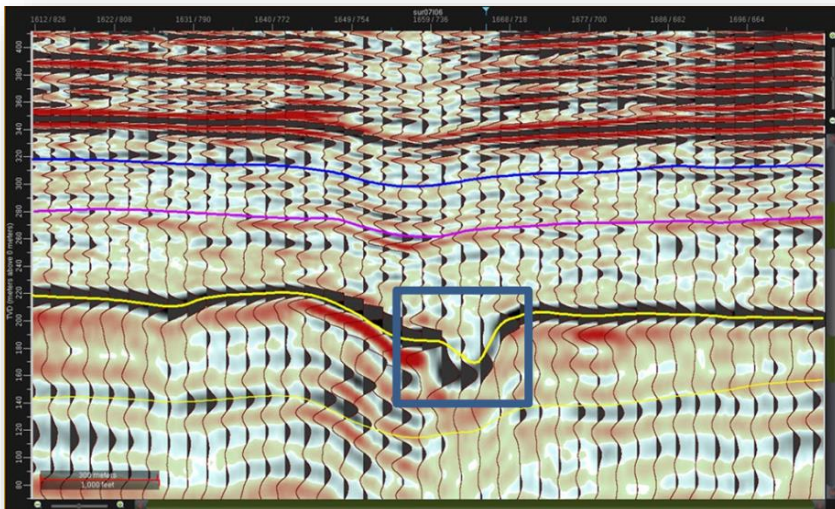
Development Area Maps: Potential Geomechanical Anomalies



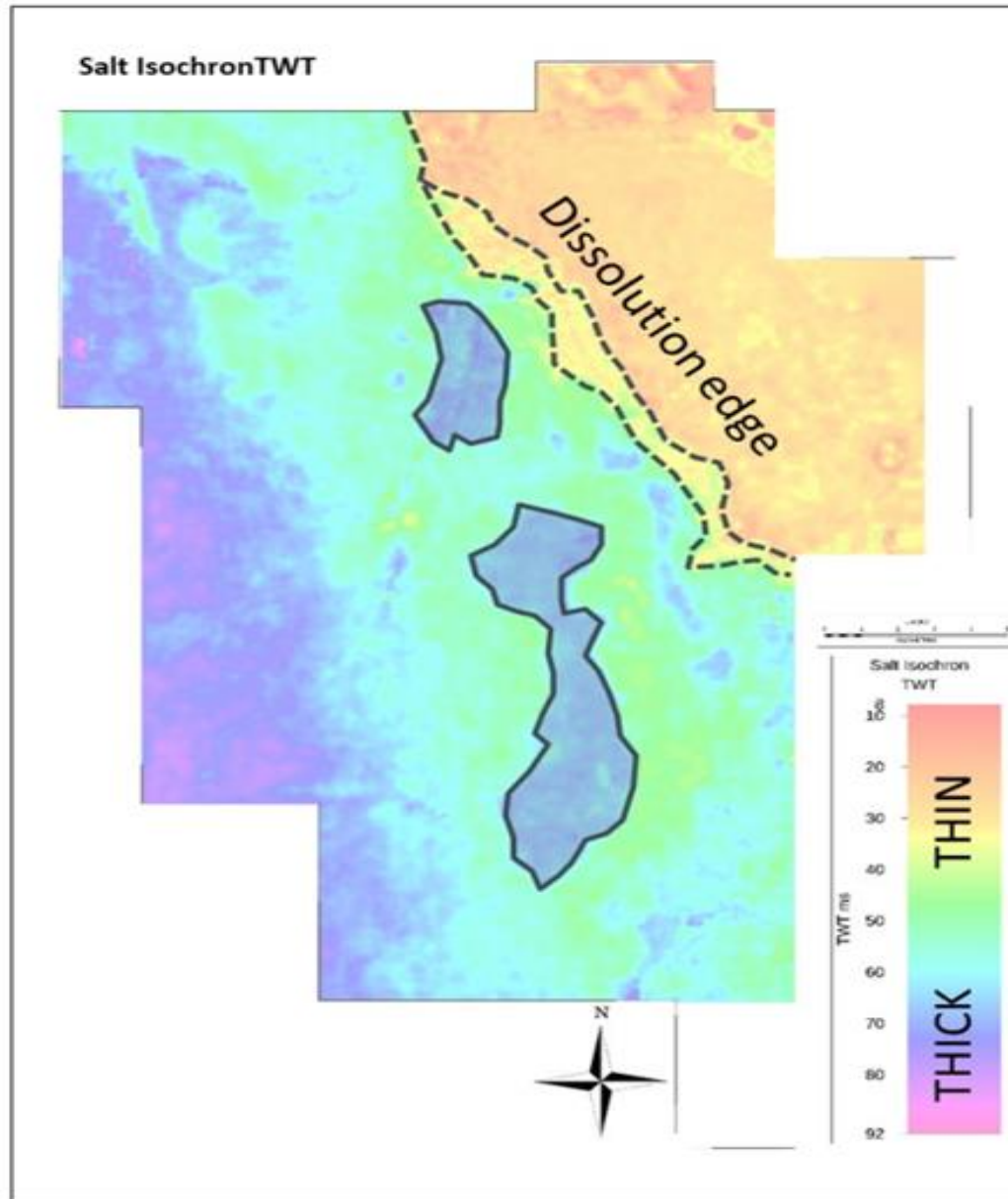
- 1) Caprock seismic discontinuities due to Differential Compaction of McMurray mud abandoned channels



- 2) Post caprock Dissolution of the Prairie Evaporite, Cold Lake, or Lotsberg Salts



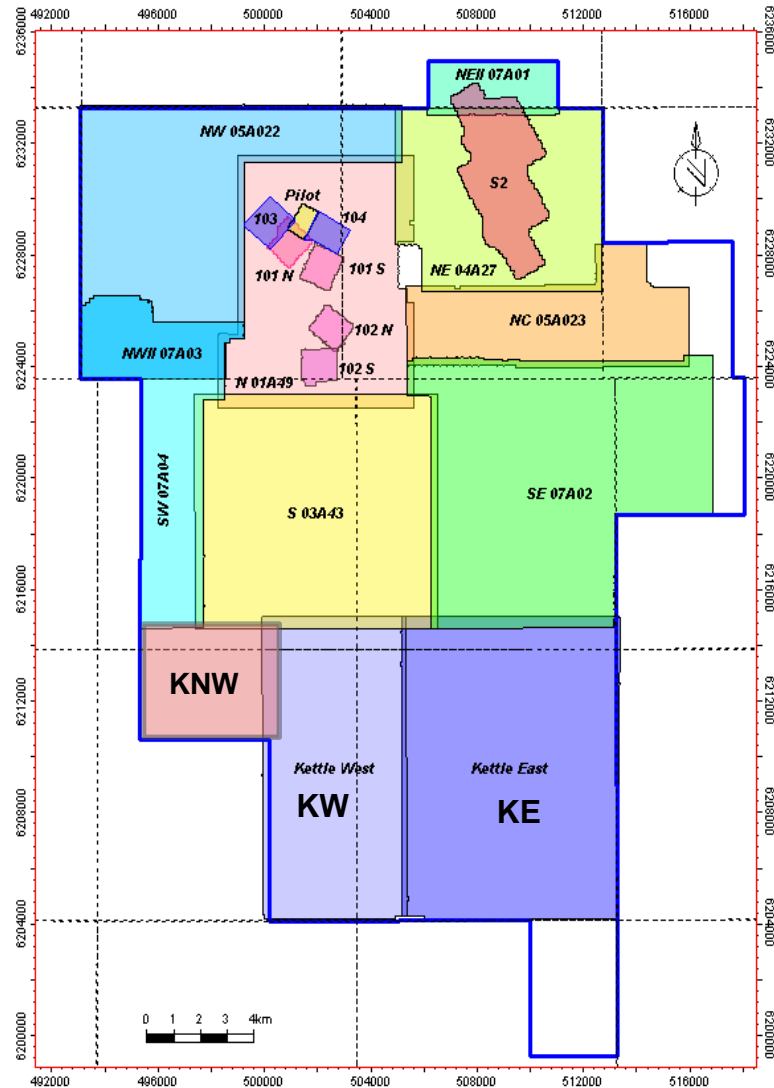
- 3) Post caprock Karsting of underlying Devonian carbonates



▶ MAP OF MAJOR DISSOLUTION

- Seismically interpreted isochron of Prairie Evaporite at Surmont illustrating areas of major dissolution

Development Area Maps: Existing Seismic Acquisition



3D SEISMIC AT SURMONT

Existing Seismic

	3D	km ²	Shots	S-R line	S-R
N		60	17 004	60	60x30
S		75	33 668	80x120	24x18
NE		50	24 512	120x80	24x18
NW		65	29 906	80(160)x120	20x20
NC		33	24 009	60(120)x80	20x20
NEII		9	3 598	120x80	24x18
NWII		14	4 394	160x120	20x20
SW		23	7 236	160x120	20x20
SE		86	54 801	80x100	20x20
KNW		22	9 543	120x80	20x20
KW		58	24 690	120x80	20x20
KE		85	55 808	80x80	20x20
		580	289 169		

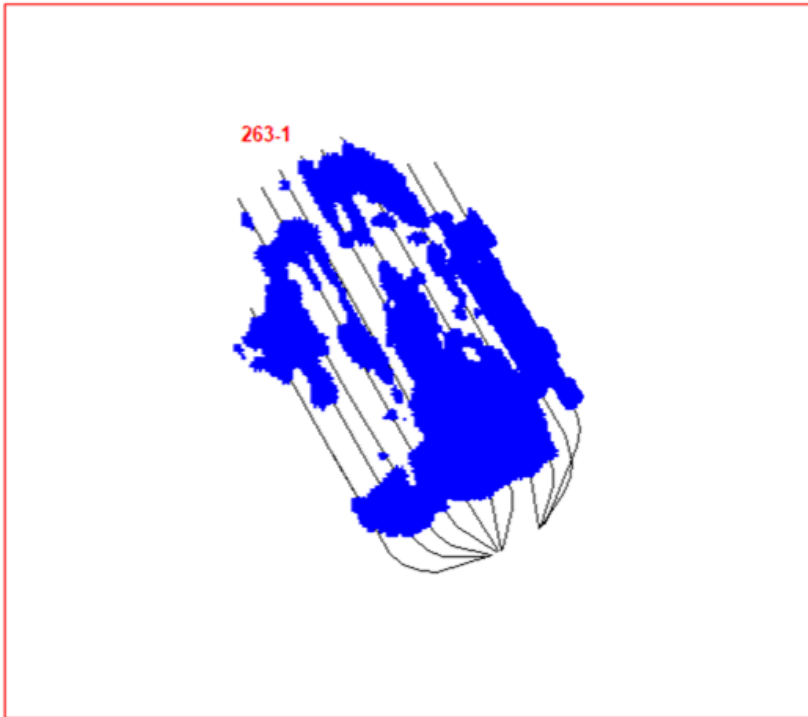
4D SEISMIC AT SURMONT

Existing Seismic

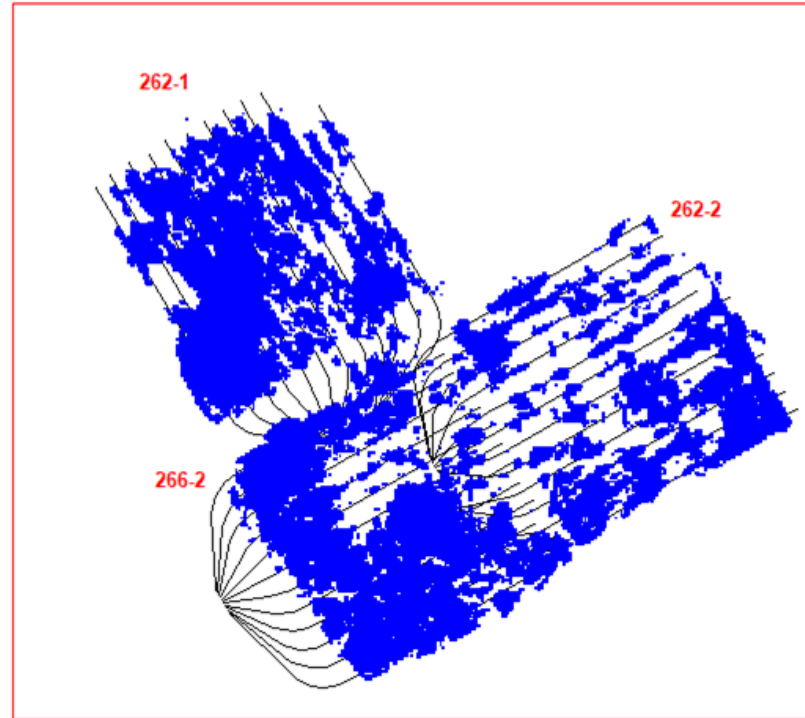
	4D	km ²	S-R	# Monitors
101N		1.8	10x10	9
101S		1.8	10x10	10
102N		1.6	20x20	10
102S		1.7	20x20	7
103		1.9	20x20	4
S2		15.0	20x20	3 (*)
		23.8		43

(*) Average # Monitor per DA in S2

S2 4D Monitor – Spring 2021



S2 4D Monitor – Fall 2021

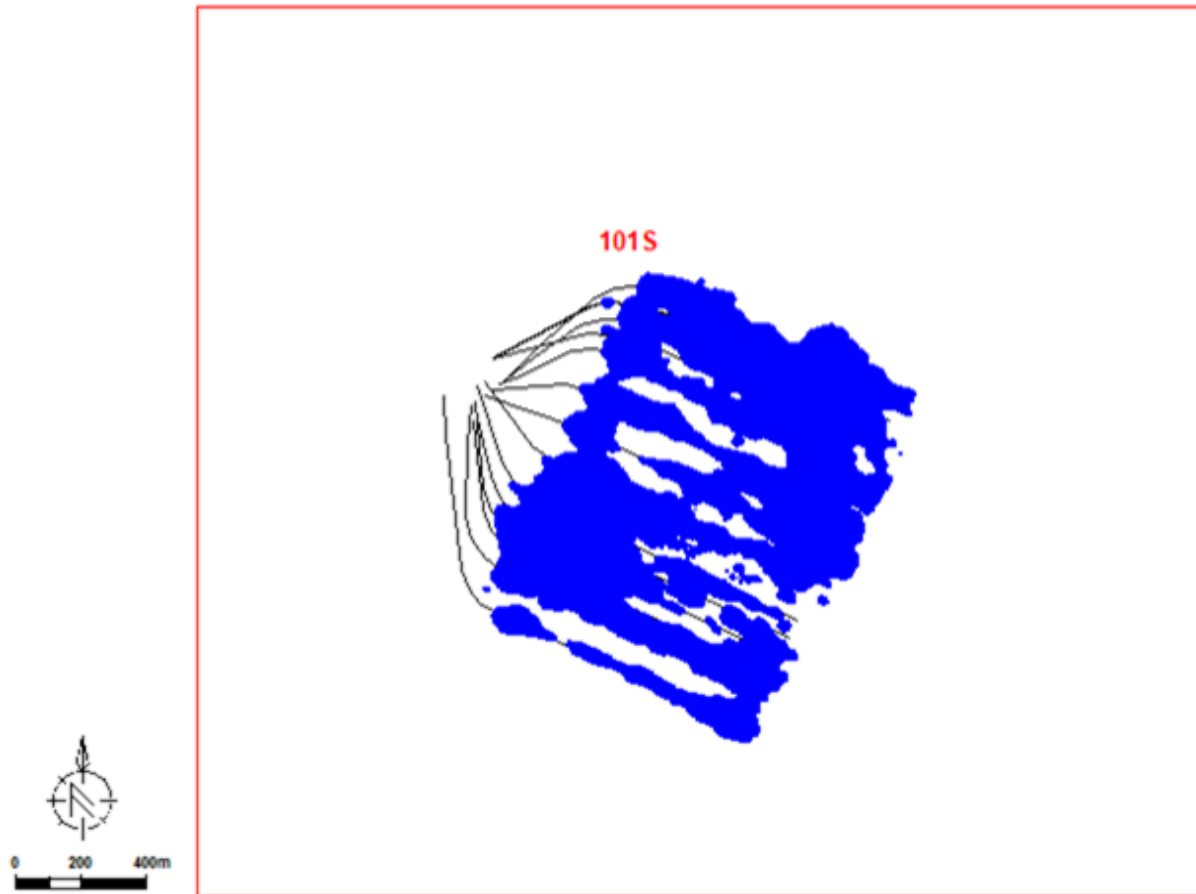


4D SEISMIC AT SURMONT

4D Monitors Spring/Fall 2021

4D	S-R	# Monitors
S2 / 263-1	20x20	4 th
S2 / 266-2	20x20	3 rd
S2 / 262-2	20x20	4 th
S2 / 262-1	20x20	3 rd

S1 4D Monitor – Fall 2021

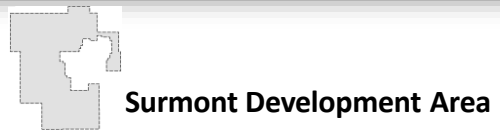
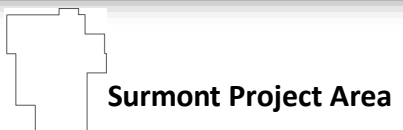
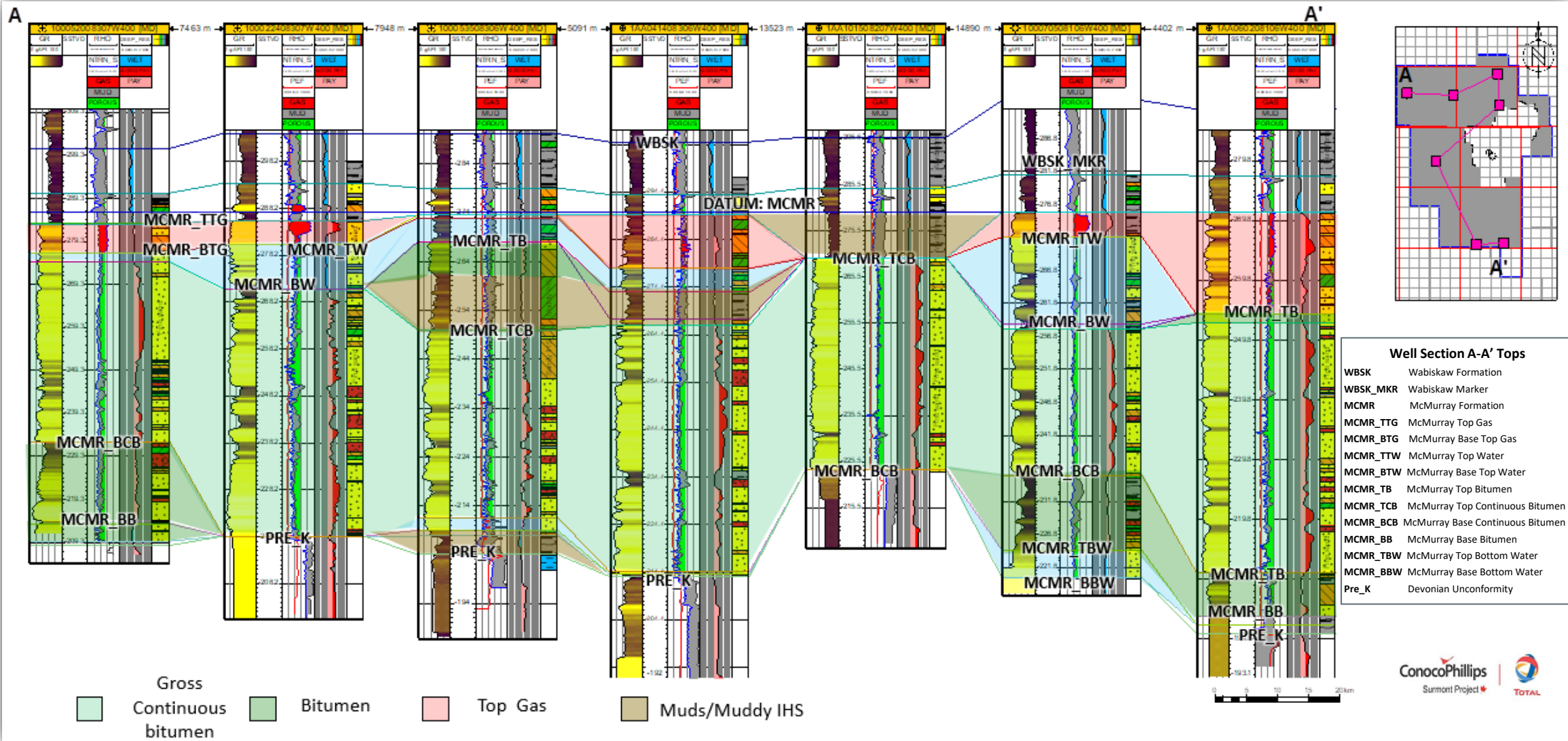


4D SEISMIC AT SURMONT

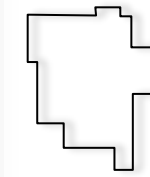
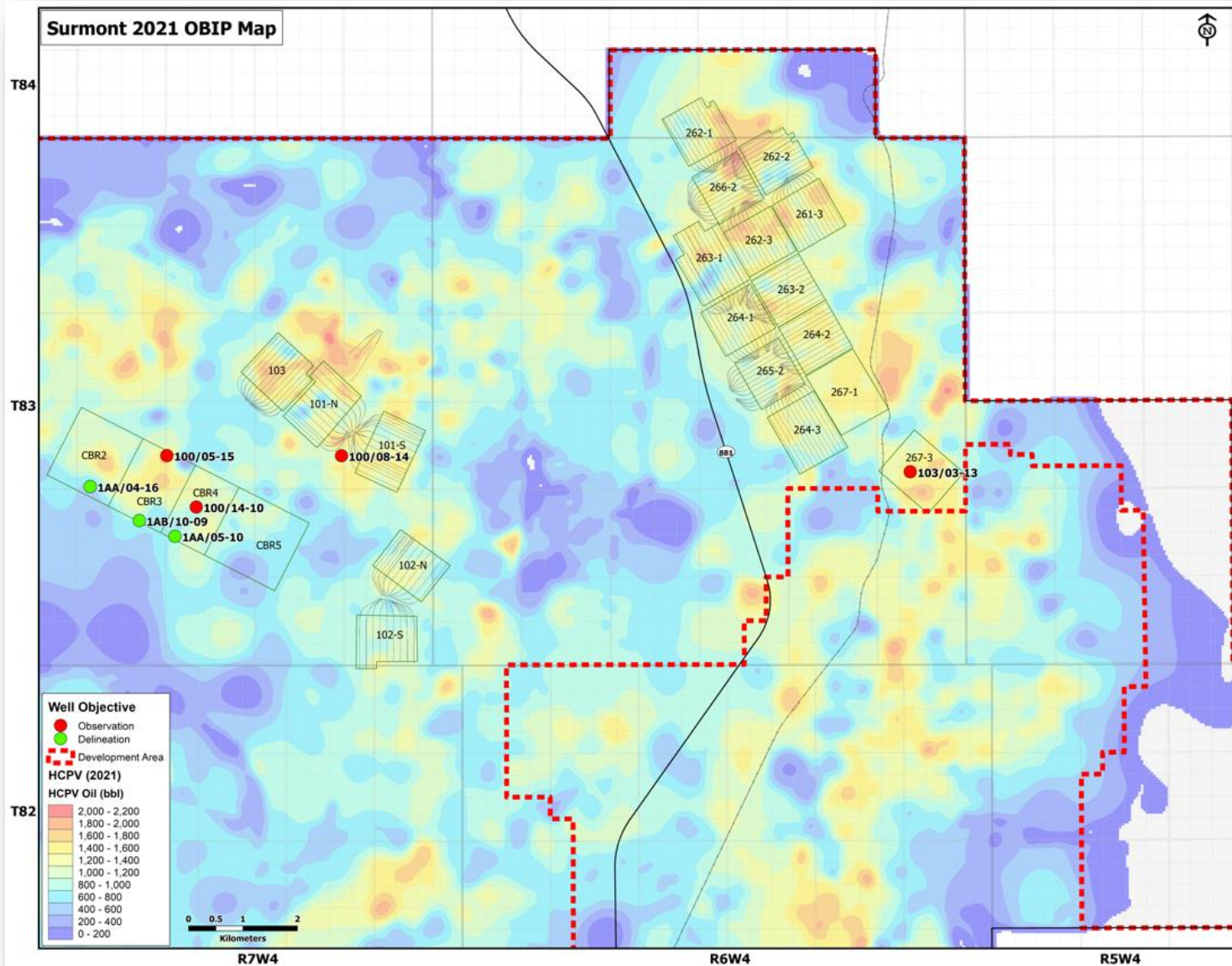
4D Monitors Fall 2021

4D	S-R	# Monitors
S1 / 101S	10x10	10 th

Representative Well Cross-Section A - A'



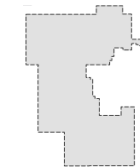
Original Bitumen in Place



Surmont
Lease



Project
Area



Development
Area



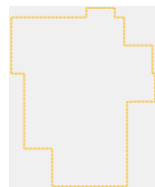
Drainage
Areas

Region	MMBBLs
Surmont Lease	20901.28
Project Area	20684.79
Development Area	16305.48
101N	66.07
102N	50.38
103	71.56
101S	67.28
102S	51.12
261-3	69.67
262-1	63.41
262-2	61.82
262-3	66.78
263-1	75.29
263-2	65.00
264-1	67.21
264-2	68.03
264-3	69.09
265-2	55.97
266-2	67.69

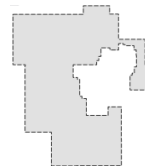
Hydrocarbon Pore Volume (HCPV) Map 2021

Well Patterns, Bitumen Recovery & Reservoir Parameters

Properties	Depth (masl)	Area (m2)	Thickness NCB (m)	Phie in NCB %	So in NCB %	KH in NCB (mD)	KV in NCB (mD)	Initial Pressure (KPa)	Original Bitumen in Place (MMBBLs)	Producible Oil in Place (MMBBLs)	Expected RF	Current RF
Project Area	~256.23	561632100	23.6	31.9%	77.0%	4131	3434		20684.79	16637.15	50%	1.9%
Dev Area	~255.98	457757230	22.9	31.8%	76.7%	4080	3391		16305.48	12969.90	50%	2.5%
101N	277.5 - 215.06	1090775	36.7	32.3%	80.9%	4360	3614	1690	66.07	56.70	60%	51.0%
101S	272.6 - 218.53	1064692	37.7	33.3%	80.4%	5432	4559	1684	67.28	61.46	80%	70.0%
102N	276.3 - 226.03	975251	31.0	32.8%	80.5%	4730	3974	1735	50.38	44.07	60%	53.0%
102S	272.9 - 223.6	1019252	34.2	31.3%	74.2%	4005	3295	1800	51.12	45.56	80%	75.0%
103	272.8 - 214.3	1022239	42.9	32.0%	80.9%	4437	3695	1691	71.56	67.16	50%	45.0%
261-3	269.8 - 201.8	1000542	44.8	32.0%	78.0%	4329	3551	1328	69.67	49.47	50%	26.0%
262-1	270.5 - 206.1	996252	39.6	31.7%	80.2%	4115	3405	1307	63.41	48.06	50%	45.0%
262-2	270.3 - 212.7	974291	38.6	33.2%	78.7%	5290	4462	1296	61.82	50.98	50%	29.0%
262-3	269.7 - 208.7	943213	43.8	32.9%	78.3%	4919	4100	1368	66.78	59.75	50%	11.0%
263-1	270.5 - 211	1271315	36.2	33.0%	79.4%	5077	4269	1404	75.29	57.27	50%	45.0%
263-2	268.7 - 212.9	998219	40.9	32.4%	78.1%	4696	3912	1397	65.00	56.37	50%	25.0%
264-1	270.1 - 213.5	1033834	39.5	32.9%	80.0%	5216	4398	1444	67.21	57.15	50%	18.0%
264-2	269.2 - 217.5	1011337	42.1	32.6%	77.9%	4778	3974	1437	68.03	61.71	50%	19.0%
264-3	271.9 - 217.6	1209485	37.5	32.0%	75.6%	4462	3699	1564	69.09	64.34	50%	31.0%
265-2	270.4 - 217.9	917433	38.7	32.5%	76.6%	5107	4264	1496	55.97	41.87	60%	54.0%
266-2	273.1 - 211.5	949974	42.9	32.8%	80.0%	4955	4144	1337	67.69	56.65	50%	39.0%



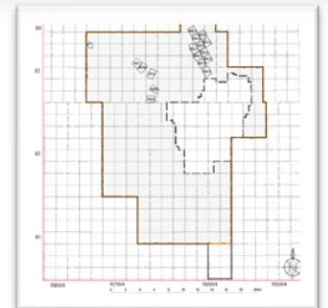
Project Area



Development Area



Drainage Areas



▶ Casing Integrity

- Four casing failures detected during the reporting period
 - 3 SAGD wells
 - Failures were reported in DDS. The wellbores were abandoned, cementing off casing failure interval
 - Observation well found with near surface casing damage
 - Failure was reported in DDS and has been isolated with packer and tubing string

▶ Surface Casing Vent Flow/Gas Migration

- Four SCVF/GM issues identified on SAGD wells during the reporting period
 - Gas samples collected for isotope analysis against database of known samples and diagnostics completed to verify source of all SCVF/GM issues
 - Total of 14 open SCVF/GM issues in DDS for all SAGD wells
 - One classified as serious due to low-rate water flow, repair plan has been reviewed with AER

▶ Wellhead Integrity

- Scheduled wellhead preventative maintenance program
- Active wellhead valve inspection program to identify compromised valves
 - One wellhead valve was changed out due to freezing/thermal expansion, no release of well fluids
- Continuing with wellhead valve upgrade to reduce freezing/thermal expansion events

Workovers & Recompletions

▶ Workovers:

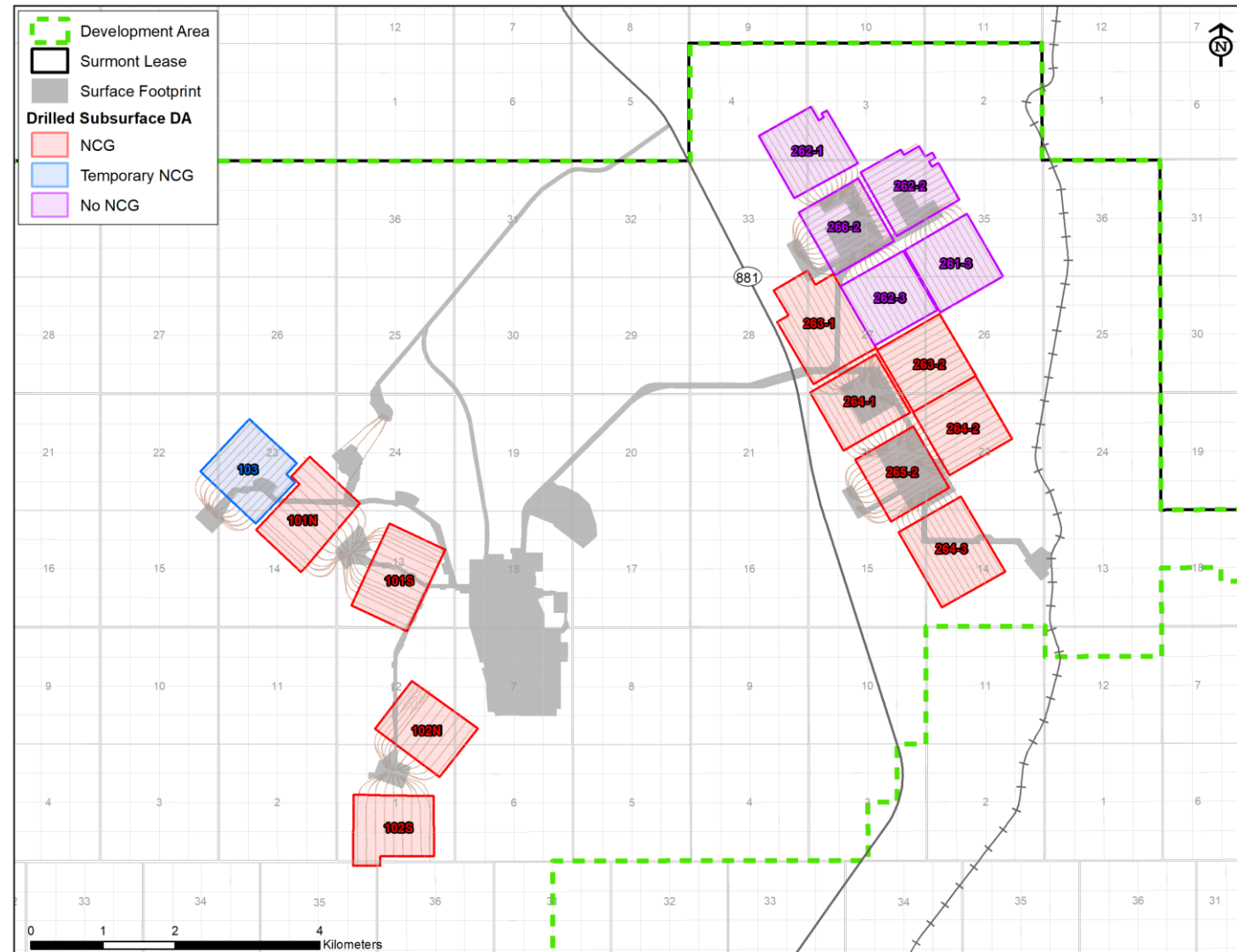
Well	Date	Scope	Status
266-2 P06	Jan-21	Liner repair – continuation of 2020 work	Successful – online in 2021
264-3 P03	Jun-21	Liner investigation and repair	Successful – online in 2021
261-3 P12	Jul-21	Downhole suspension	Completed – awaiting possible redrill
266-2 P07	Sep-21	Liner investigation and repair	Successful – online in 2021
263-2 P08	Nov-21	Liner investigation only	Preparing for repair in 2022
101 P16	Nov-21	Coil cleanout with logging – continuation of 2020 inspection	Completed – repair planed for 2022

▶ Redrills:

Well	Date	Scope	Status
265-2 P03	Apr-21	Sidetrack producer	Online in 2021
264-1 WP06	Apr-21	Sidetrack producer and injector	Online in 2021
263-2 P05	Apr-21	Sidetrack producer	Abandoned due to intermediate casing issues
264-1 P04	Apr-21	Sidetrack producer	Online in 2021
261-3 P10	Jun-21	Stepout multilateral well	Online in 2021 – old P10 abandoned
103 P01	Jun-21	Stepout multilateral well	Online in 2021 – old P01 abandoned
103 P06	Jul-21	Stepout producer well	Online in 2021 – old P06 abandoned
262-3 WP07	Sep-21	Sidetrack injector – stepout producer (unsuccessful sidetrack)	Online in 2021 – old P07 abandoned
264-2 P01	Oct-21	Sidetrack producer	Online in 2021
264-3 P10	Nov-21	Sidetrack producer	Online in 2021
266-2 P06	Nov-21	Sidetrack producer	Online in 2021
266-2 P09	Nov-21	Sidetrack producer	Online in 2021

Non-Condensable Gas Co-Injection

- Non-Condensable Gas (NCG) co-injection was deployed on the pads indicated on the map for pressure maintenance and top water thief zone mitigation, where pressure imbalance and steam losses can be a challenge.
- NCG has reduced SOR on pads with top water and reduced the SOR impact of re-pressurizing pads under a top water thief zone.
- NCG injection can cause Electric Submersible Pump (ESP) interference and inefficiency due to excess gas production, requiring rate optimization.
- NCG was injected at an average of 10,000-22,000 Sm³/d per subsurface pad in 2021. NCG rates vary with recovery factor and injectivity; larger steam chambers have greater rates of gas injected. NCG co-injection concentration varies from 0.1 to 4 mol% steam to manage steam chamber pressure maintenance and ESP interference.
- Fuel gas from TransCanada Pipeline (TCPL) is used for NCG co-injection. Surface metering of produced gas is highly uncertain at a pad level because there is no distinction between produced steam and hydrocarbon gas. NCG recovery percentage cannot be estimated.

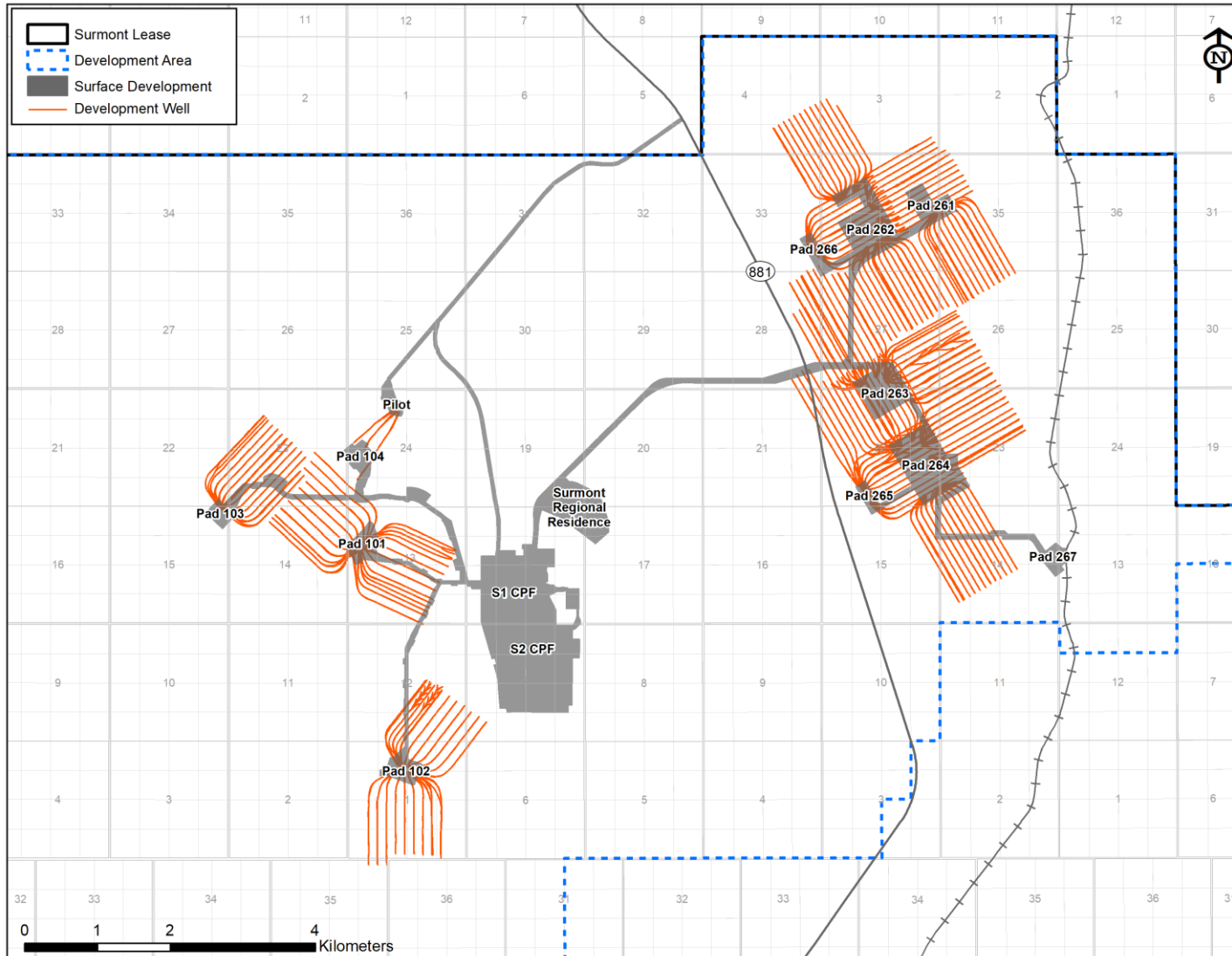


Surface

Directive 054: Section 4.3
OSCA Report: Table 1 (2)



Surface Infrastructure: Built & In Progress



▶ S1/S2 CENTRAL PROCESSING FACILITIES

▶ WELL PADS - BUILT

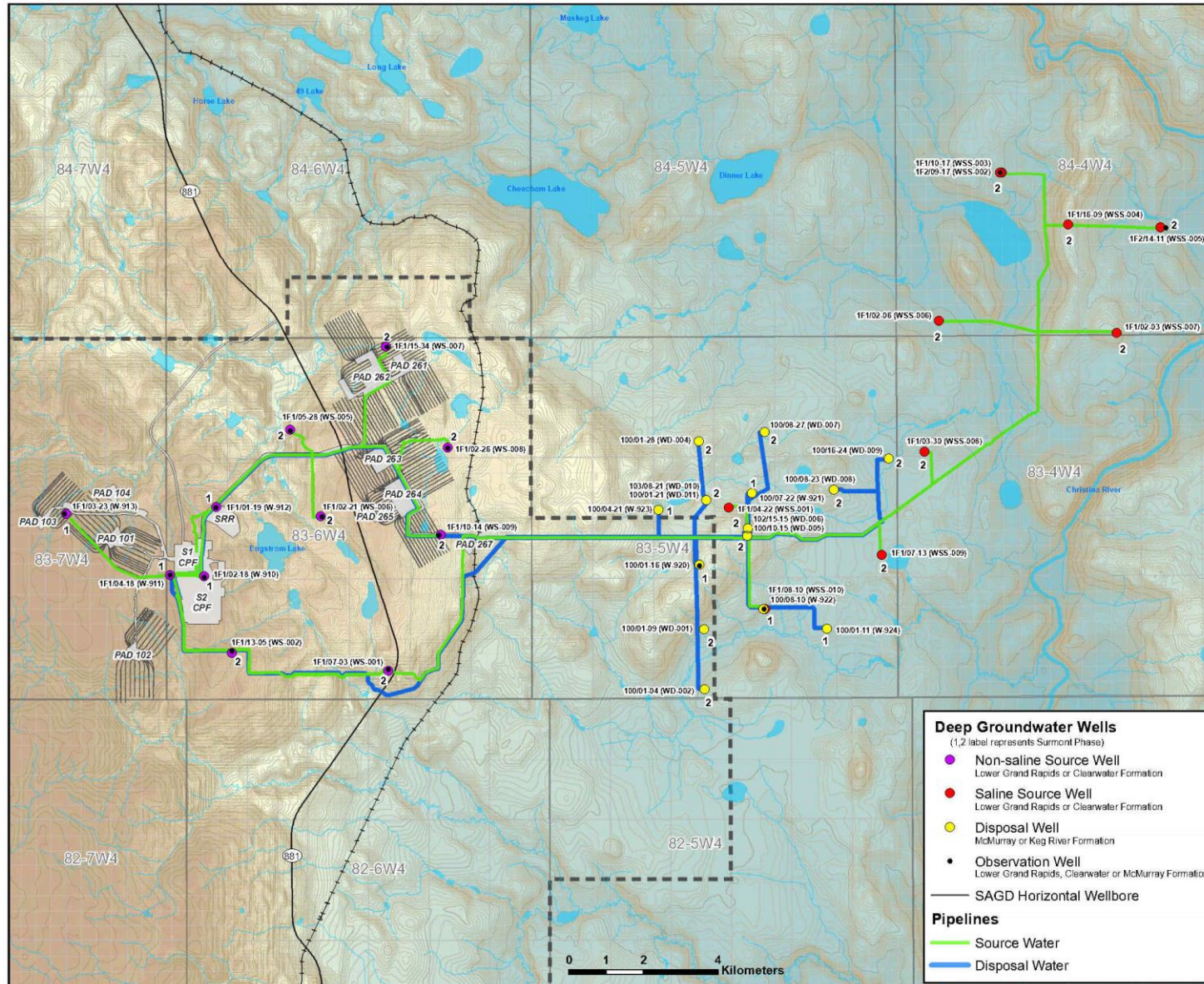
- 101
- 261
- 264
- 102
- 262
- 265
- 103
- 263
- 266

▶ WELL PADS – IN PROGRESS

- 104
- 267

▶ SURMONT REGIONAL RESIDENCE

Surface Infrastructure: Water Source & Disposal Wells



2021 Surmont Operations

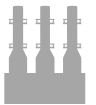
GENERAL

- Steady production through the year
- No new surface technologies were trialed during the reporting period



SURMONT PHASE 1

- Construction and commissioning of Alternate Blend project

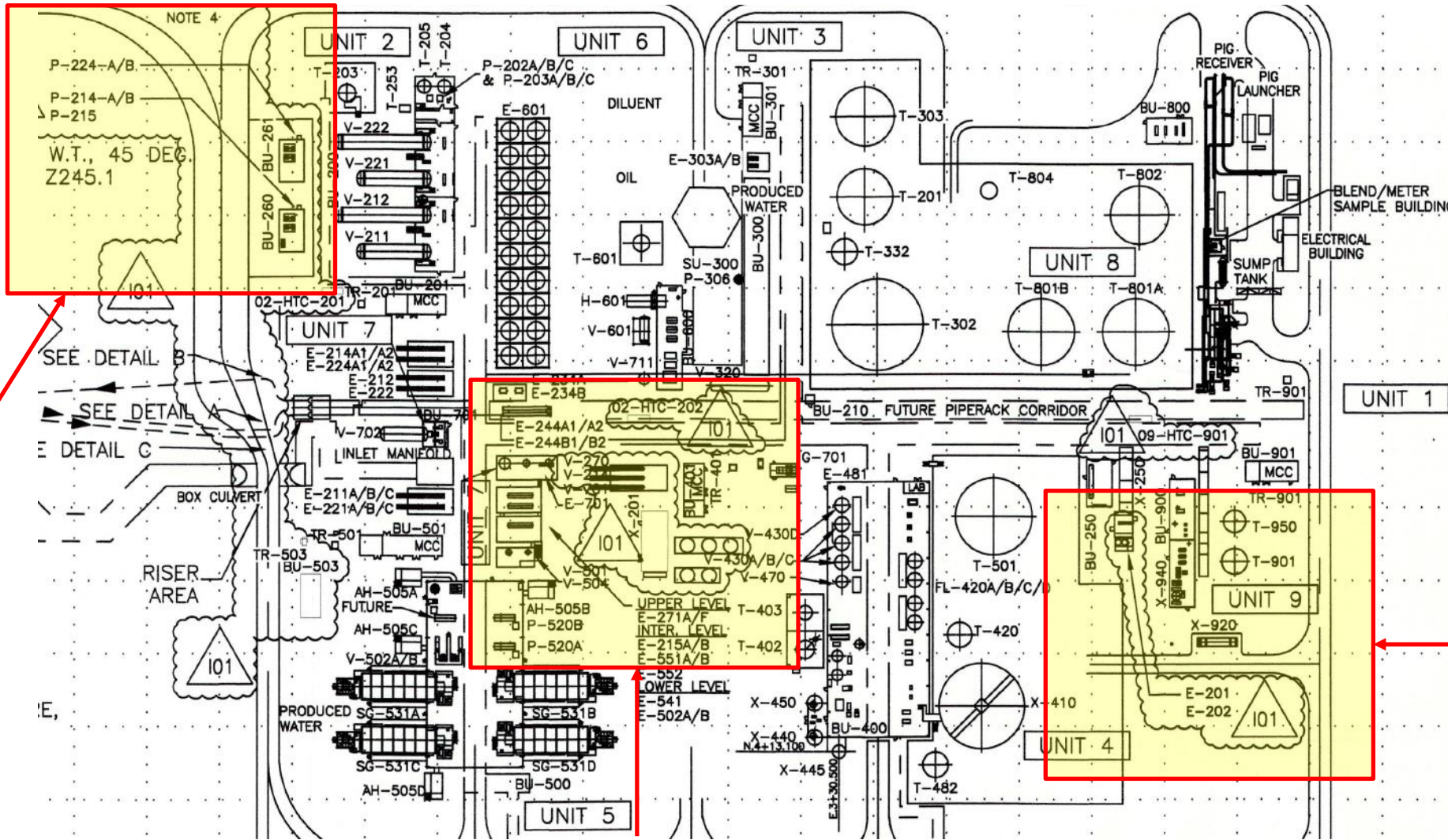


SURMONT PHASE 2

- Steady operation



Central Processing Facility Modifications: Surmont Phase 1 Plot Plan

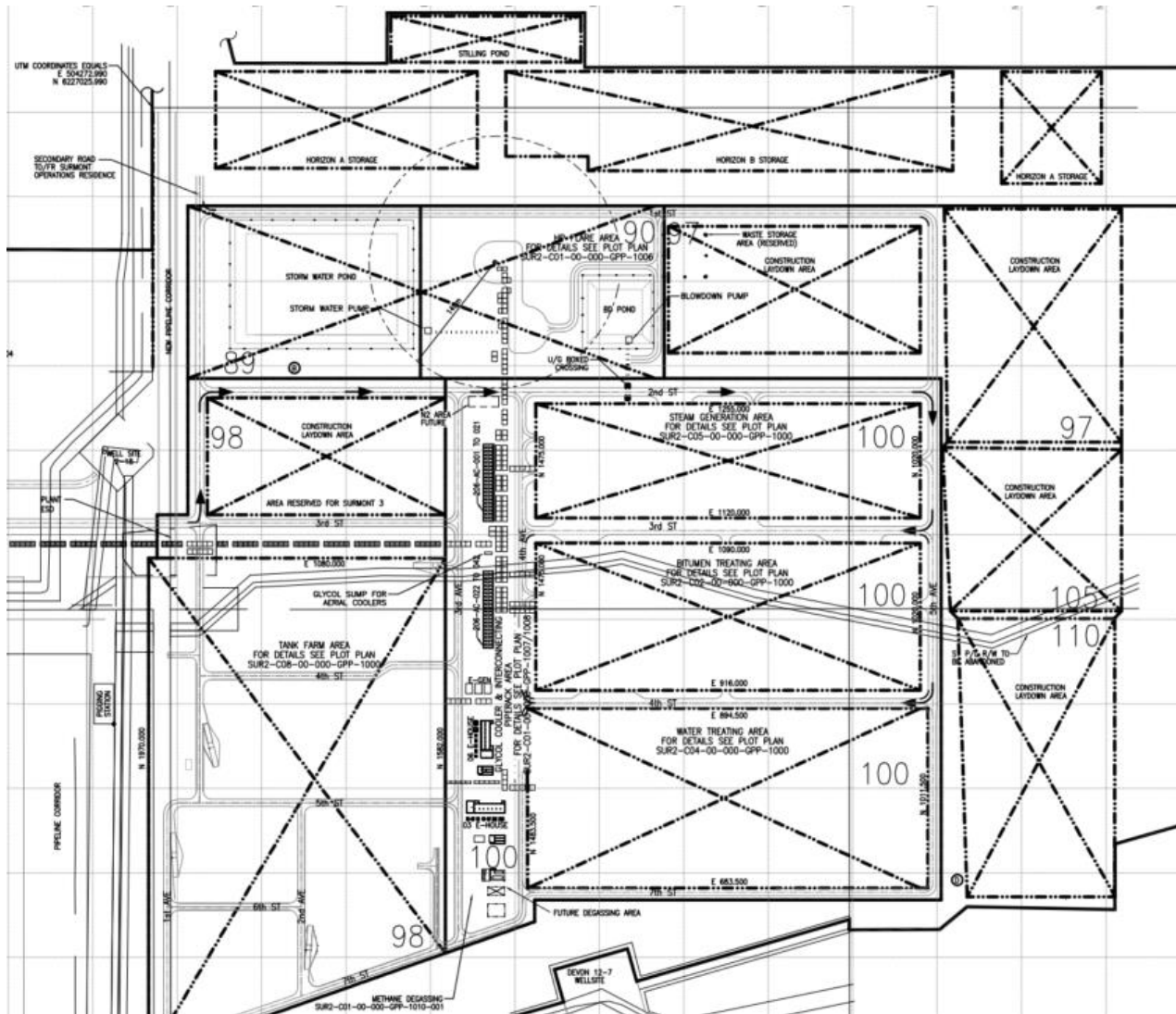


► **Lifecycle Activity**
Installation and commissioning of diluent recovery equipment at Surmont 1 as part of the 2021 Alternate Blend project.

► PG Aerial Cooler and Recovered Diluent Cooler

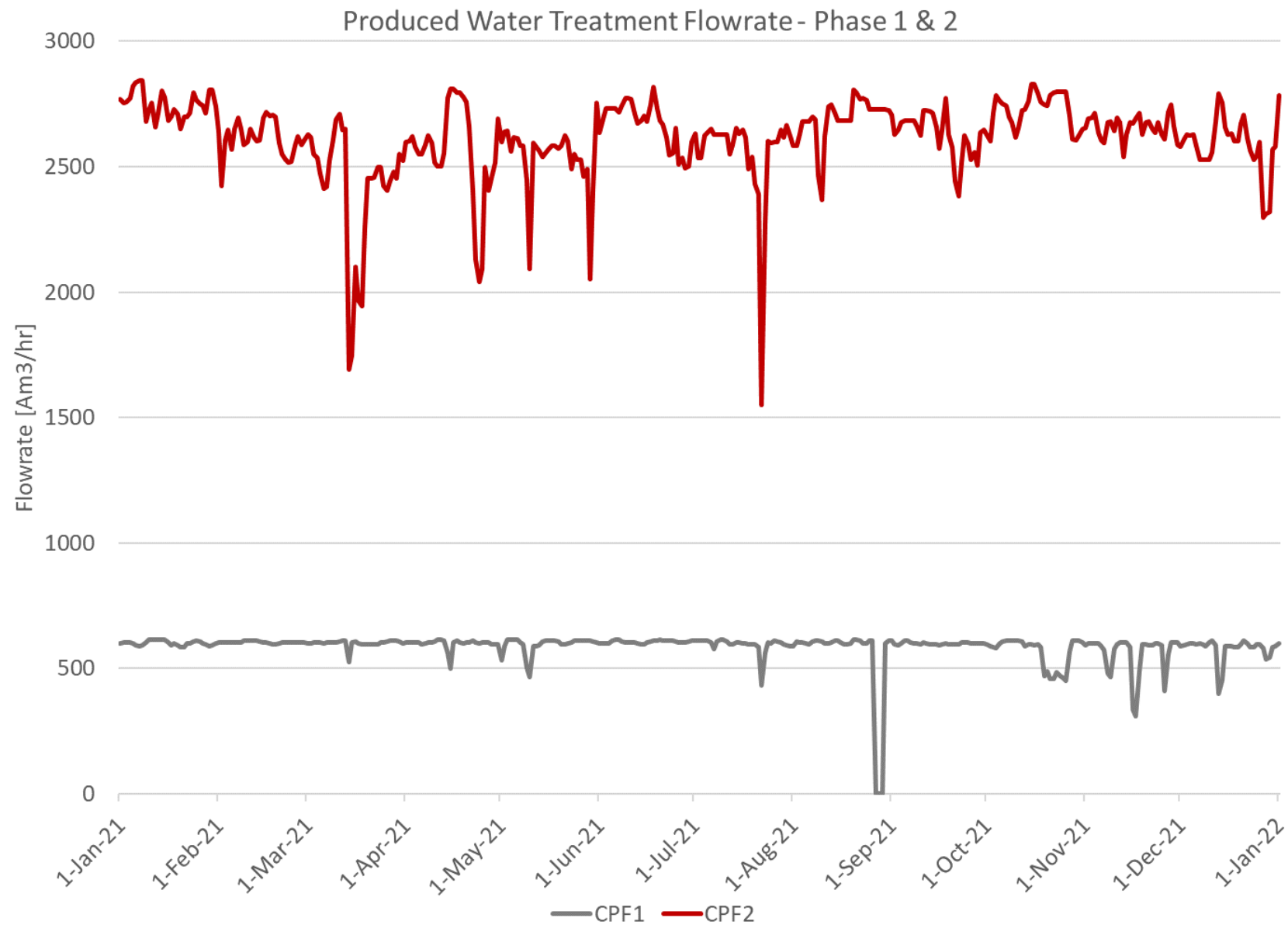
Sales Oil Cooler Package

Central Processing Facility Modifications: Surmont Phase 2 Plot Plan

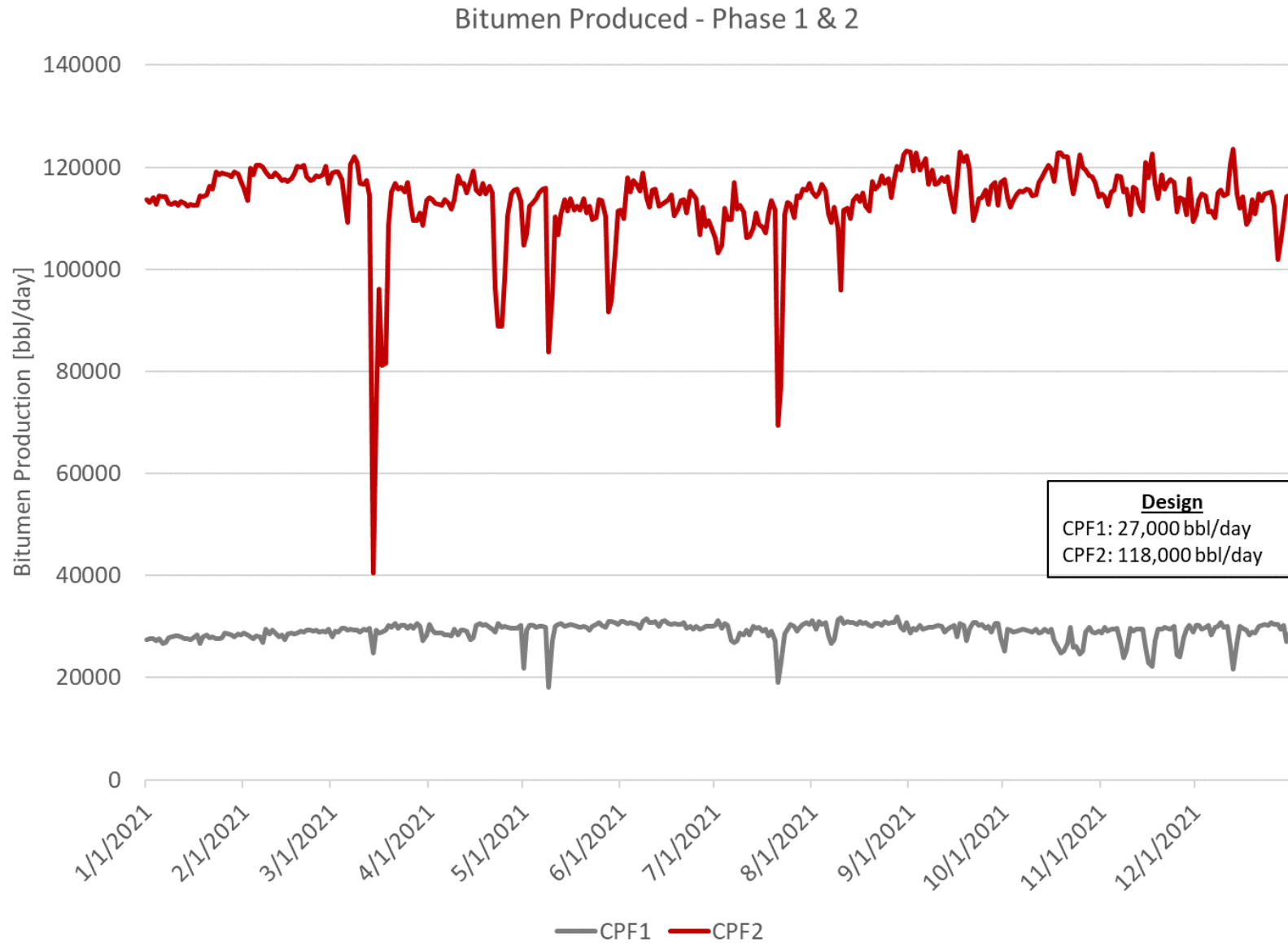


No modifications to the S2 central processing facility required an AER application approval during the 2021 reporting period.

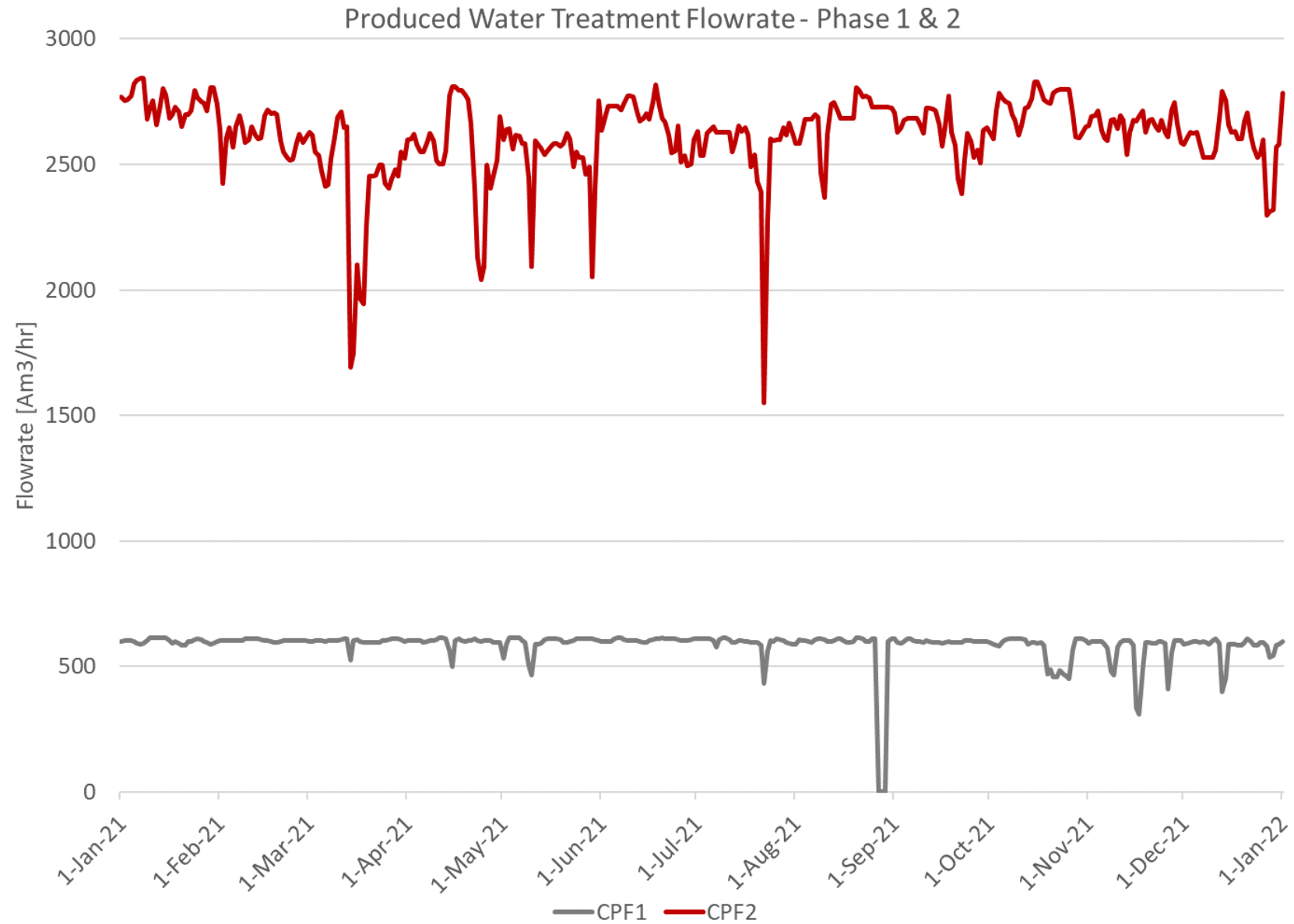
Facility Performance: Bitumen Treatment by Central Processing Facility (CPF)



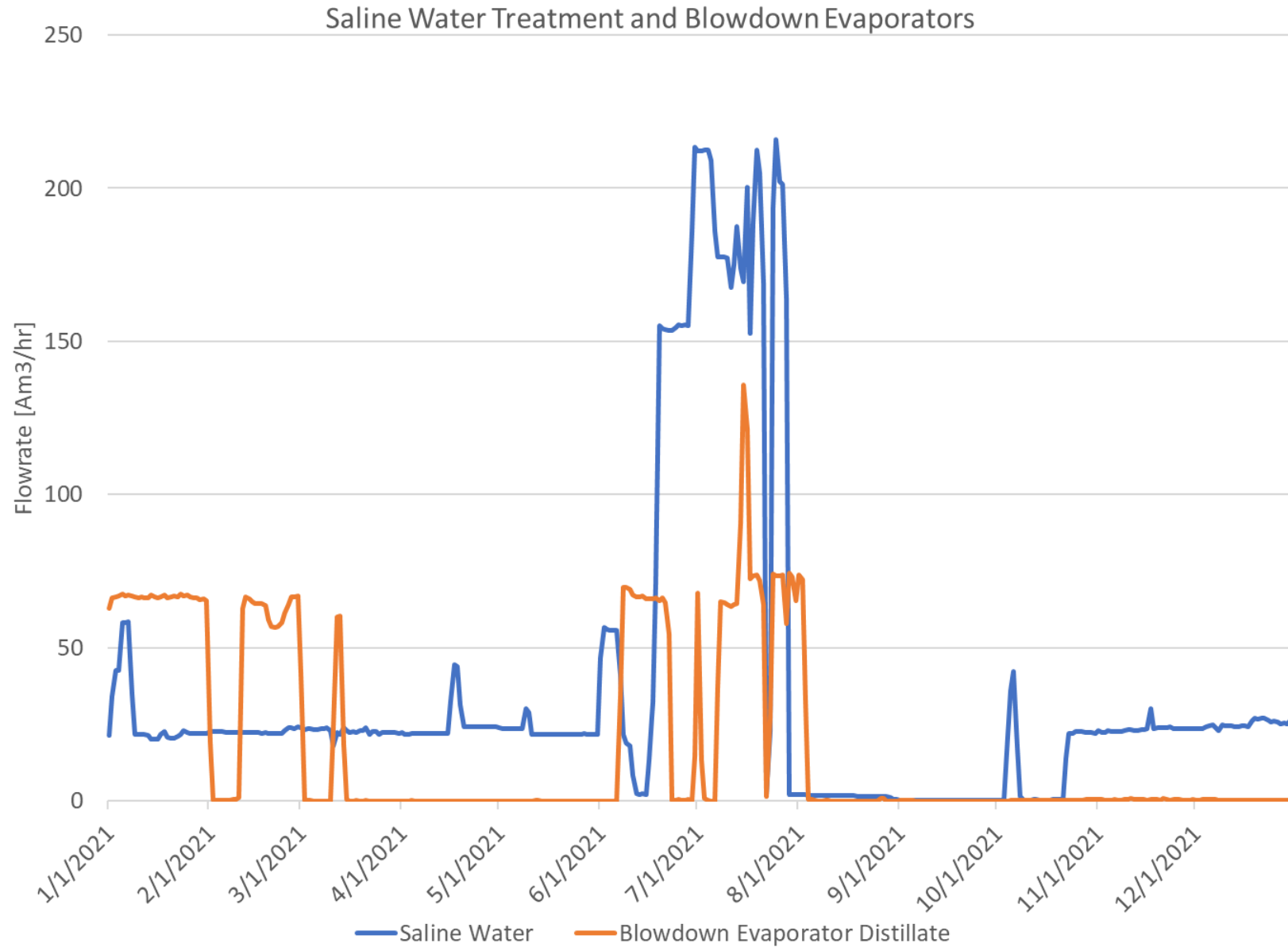
Facility Performance: Bitumen Production by CPF



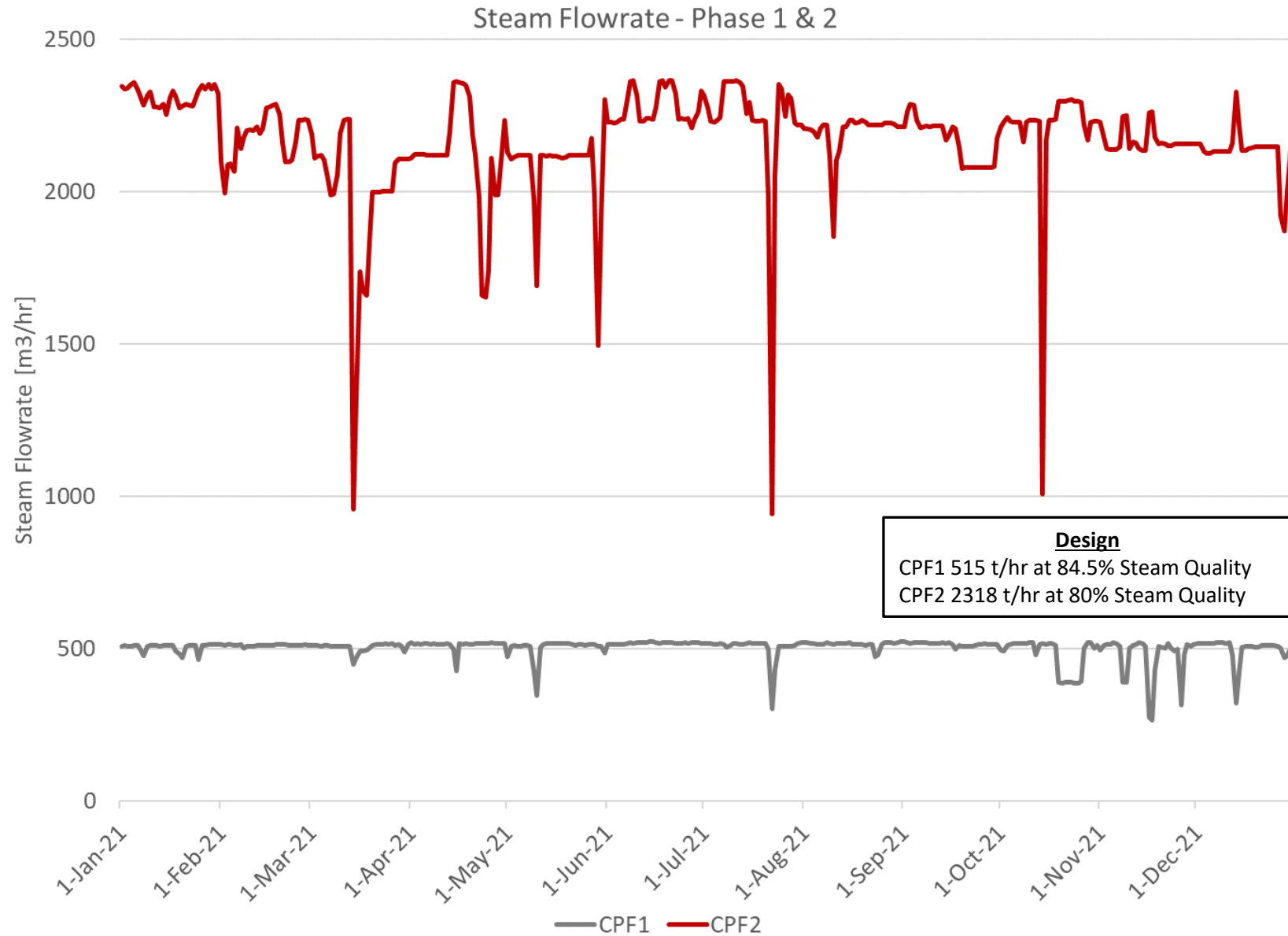
Facility Performance: Water Treatment by CPF



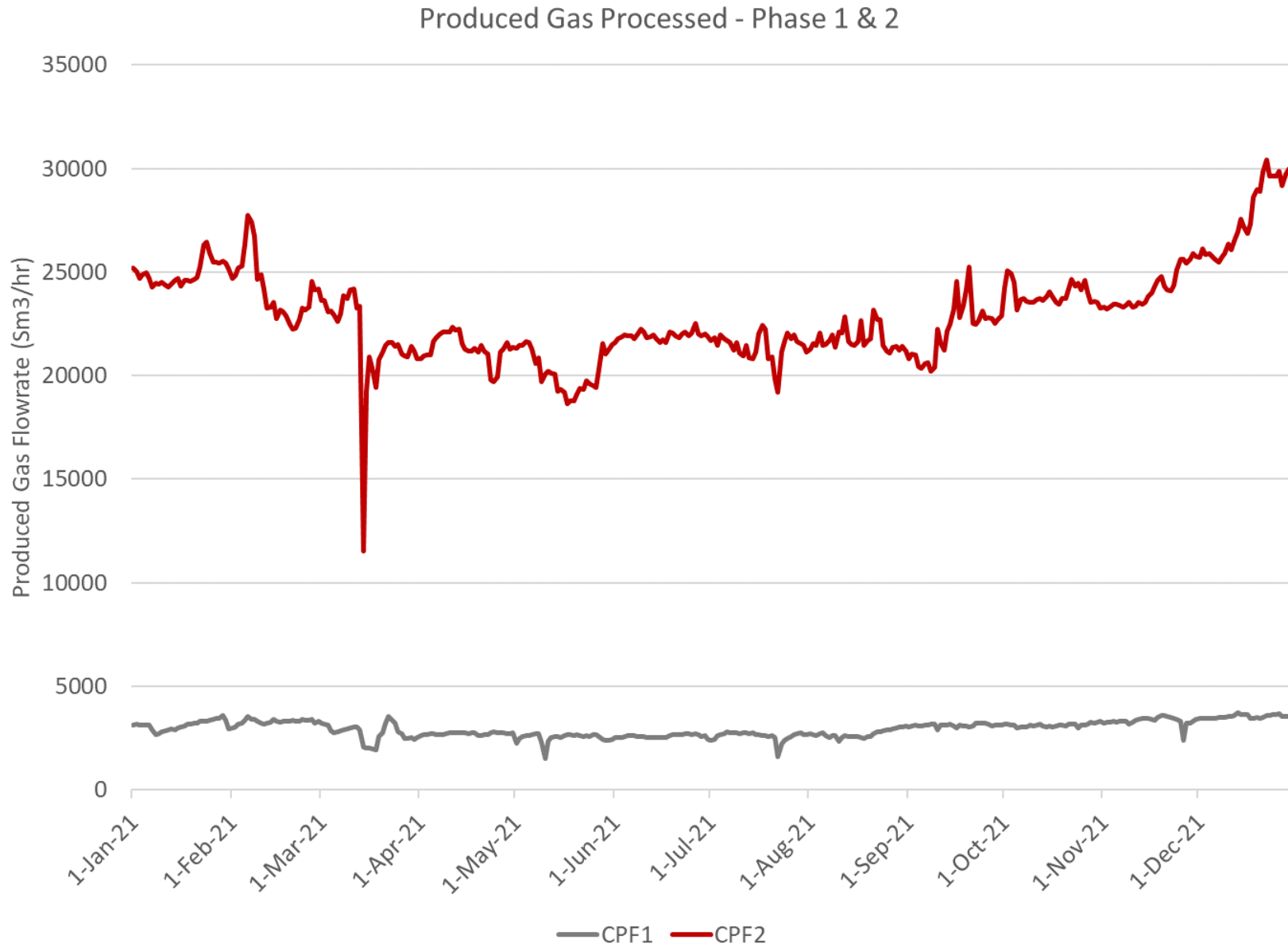
Facility Performance: Saline Water Treatment and Blowdown Evaporators



Facility Performance: Steam Production by CPF



Facility Performance: Produced Gas Production by CPF



Surmont Water Source & Disposal Wells

Directive 054: Section 4.3 (8)(a)
Class 1b Disposal Approval No. 10044M



Surmont Phase 1 and Phase 2 Water Source Wells

Surmont Phase 1 Non-Saline Water Source Wells

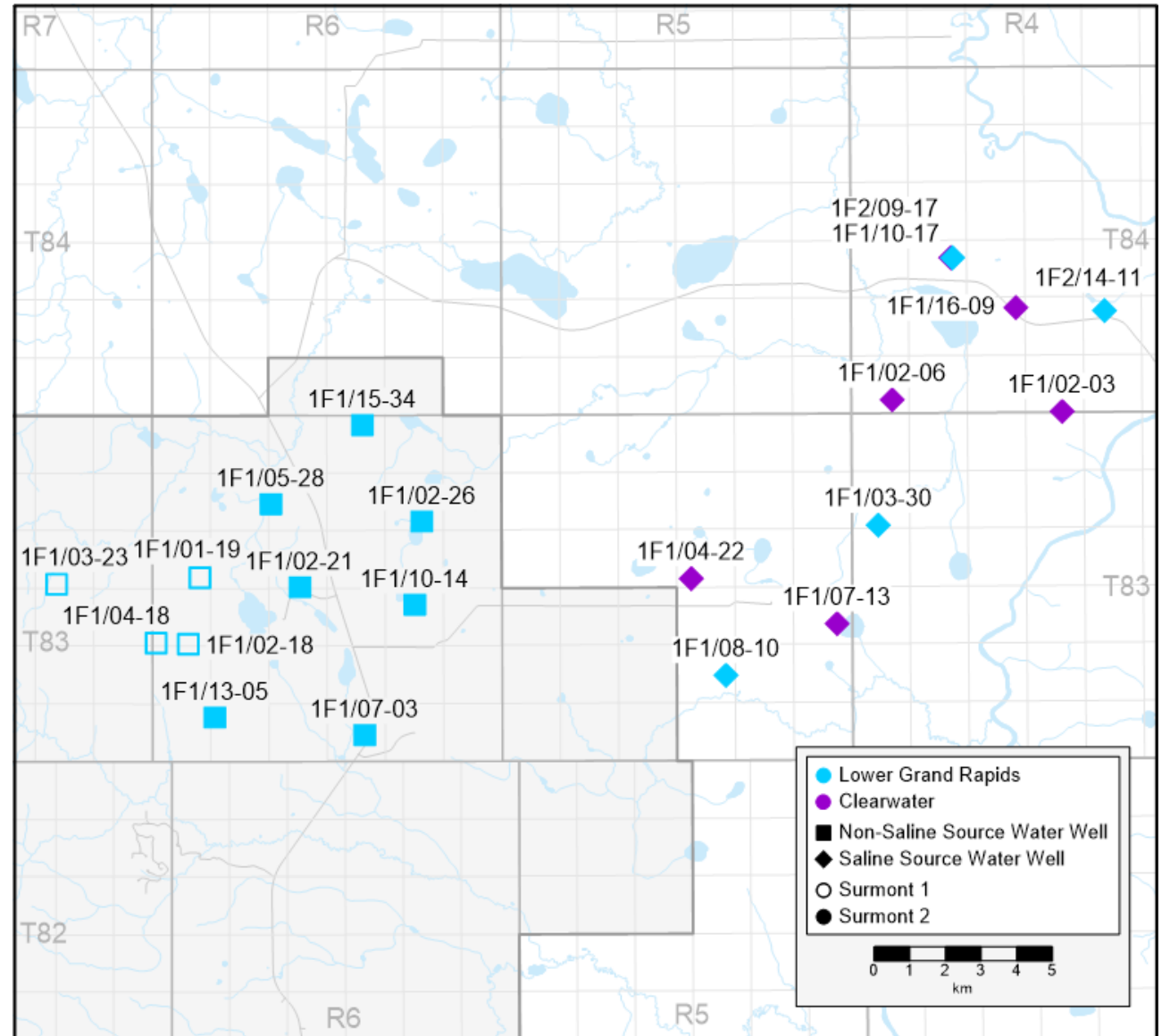
Source Well	Observation Well	Formation	Water Act Licence No.
1F1021808306W400	1F2021808306W400	Lower Grand Rapids	00253532-03-00
1F1041808306W400	102041808306W400	Lower Grand Rapids	00253532-03-00
1F1011908306W400	100011908306W400	Lower Grand Rapids	00253532-03-00
1F1032308307W400	100032308307W400	Lower Grand Rapids	00253532-03-00

Surmont Phase 2 Non-Saline Water Source Wells

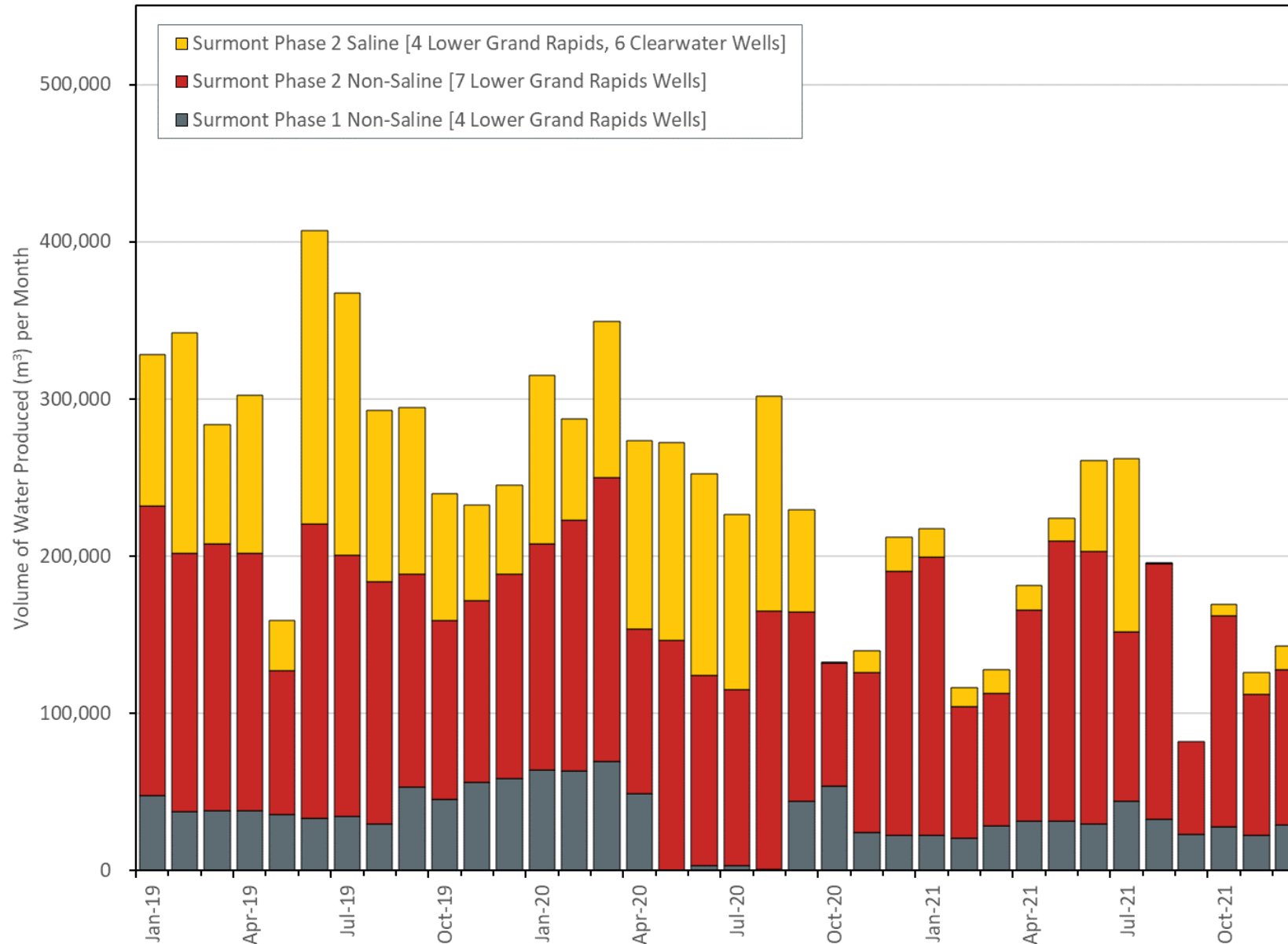
Source Well	Observation Well	Formation	Water Act Licence No.
1F1022108306W400	100022108306W400	Lower Grand Rapids	00312463-02-00
1F1022608306W400	100022608306W400	Lower Grand Rapids	00312463-02-00
1F1052808306W400	100052808306W400	Lower Grand Rapids	00312463-02-00
1F1070308306W400	1F2070308306W400	Lower Grand Rapids	00312463-02-00
1F1101408306W400	1F1111408306W400	Lower Grand Rapids	00312463-02-00
1F1130508306W400	100130508306W400	Lower Grand Rapids	00312463-02-00
1F1153408307W400	1F2153408307W400	Lower Grand Rapids	00312463-02-00

Surmont Phase 2 Saline Water Source Wells

Source Well	Formation
1F1020308404W400	Clearwater
1F1020608404W400	Clearwater
1F1033008304W400	Lower Grand Rapids
1F1042208305W400	Clearwater
1F1071308305W400	Clearwater
1F1081008305W400	Lower Grand Rapids
1F1101708404W400	Clearwater
1F1160908404W400	Clearwater
1F2091708404W400	Lower Grand Rapids
1F2141108404W400	Lower Grand Rapids



Surmont Non-Saline and Saline Water Source Wells: Production Volumes



Surmont Phase 1 and Phase 2 Water Disposal Wells

Surmont Phase 1 Water Disposal Wells

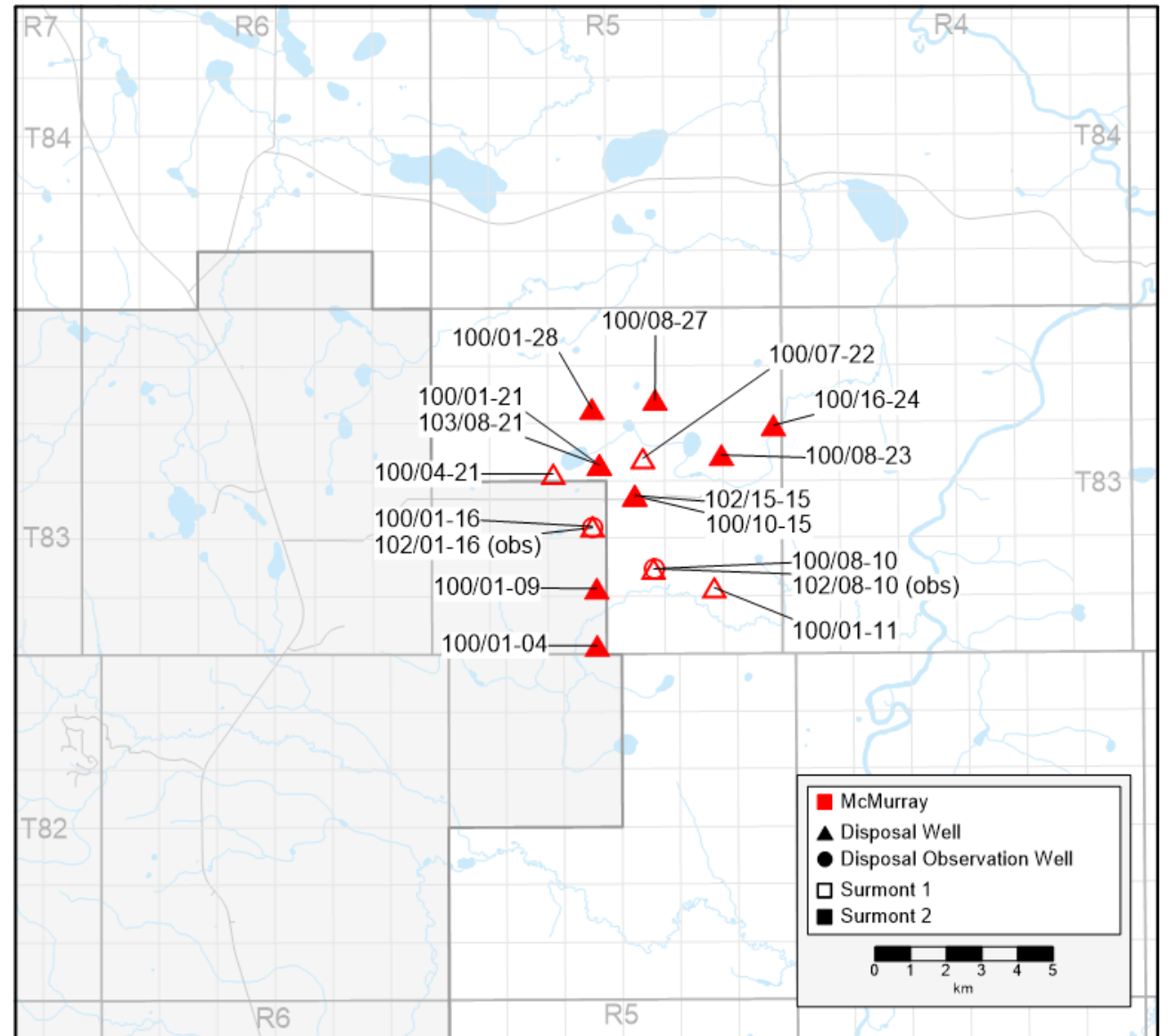
UWI	Formation	Approval No.
100011608305W400	McMurray	10044M
100072208305W400	McMurray	10044M
100081008305W400	McMurray	10044M
100042108305W400	McMurray	10044M
100011108305W400	McMurray	10044M

Surmont Phase 2 Water Disposal Wells

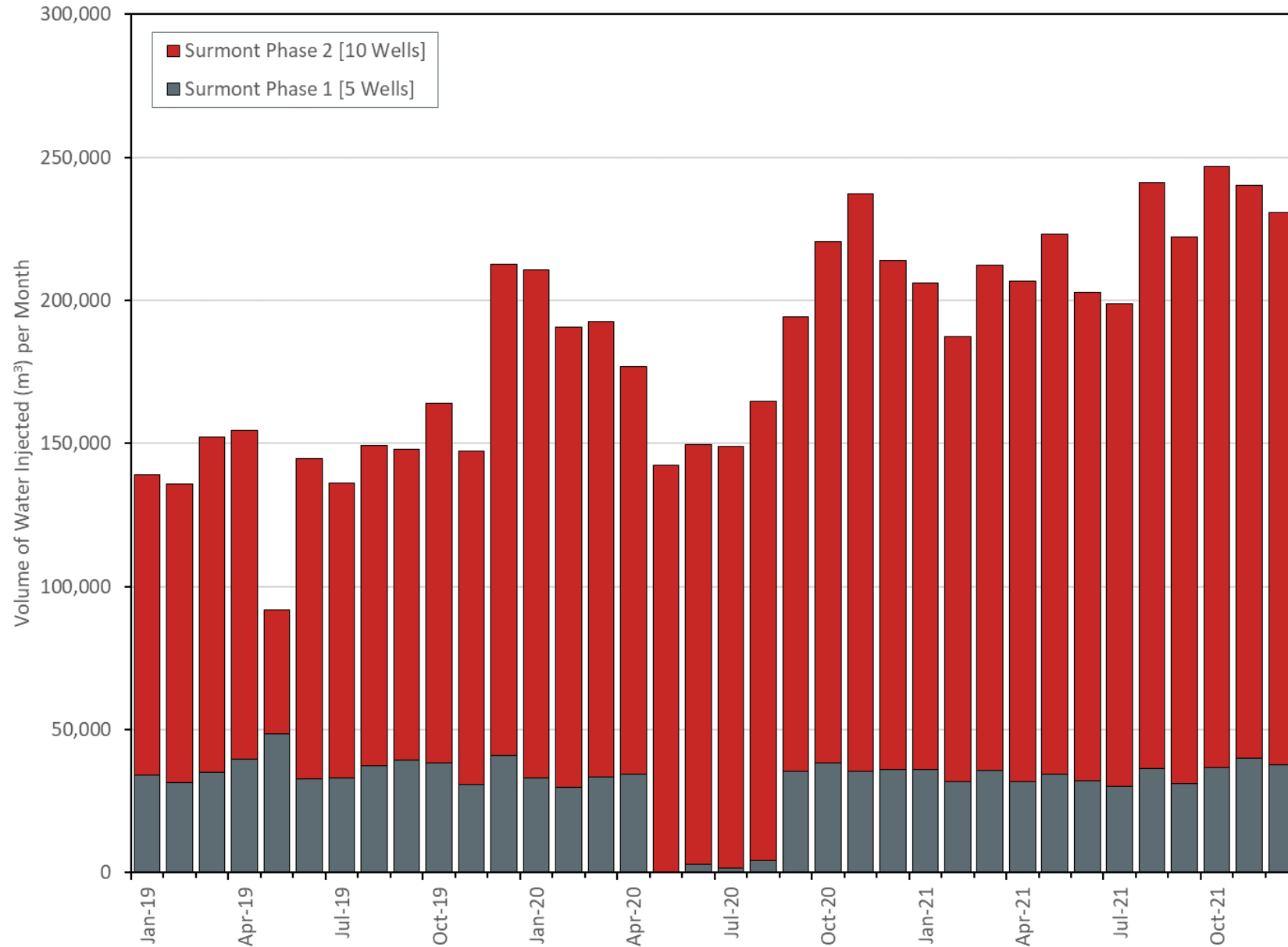
UWI	Formation	Approval No.
100010908305W400	McMurray	10044M
100010408305W400	McMurray	10044M
100012808305W400	McMurray	10044M
100101508305W400	McMurray	10044M
102151508305W400	McMurray	10044M
100082708305W400	McMurray	10044M
100082308305W400	McMurray	10044M
100162408305W400	McMurray	10044M
100012108305W400	McMurray	10044M
103082108305W400	McMurray	10044M

Surmont Water Disposal Observation Wells

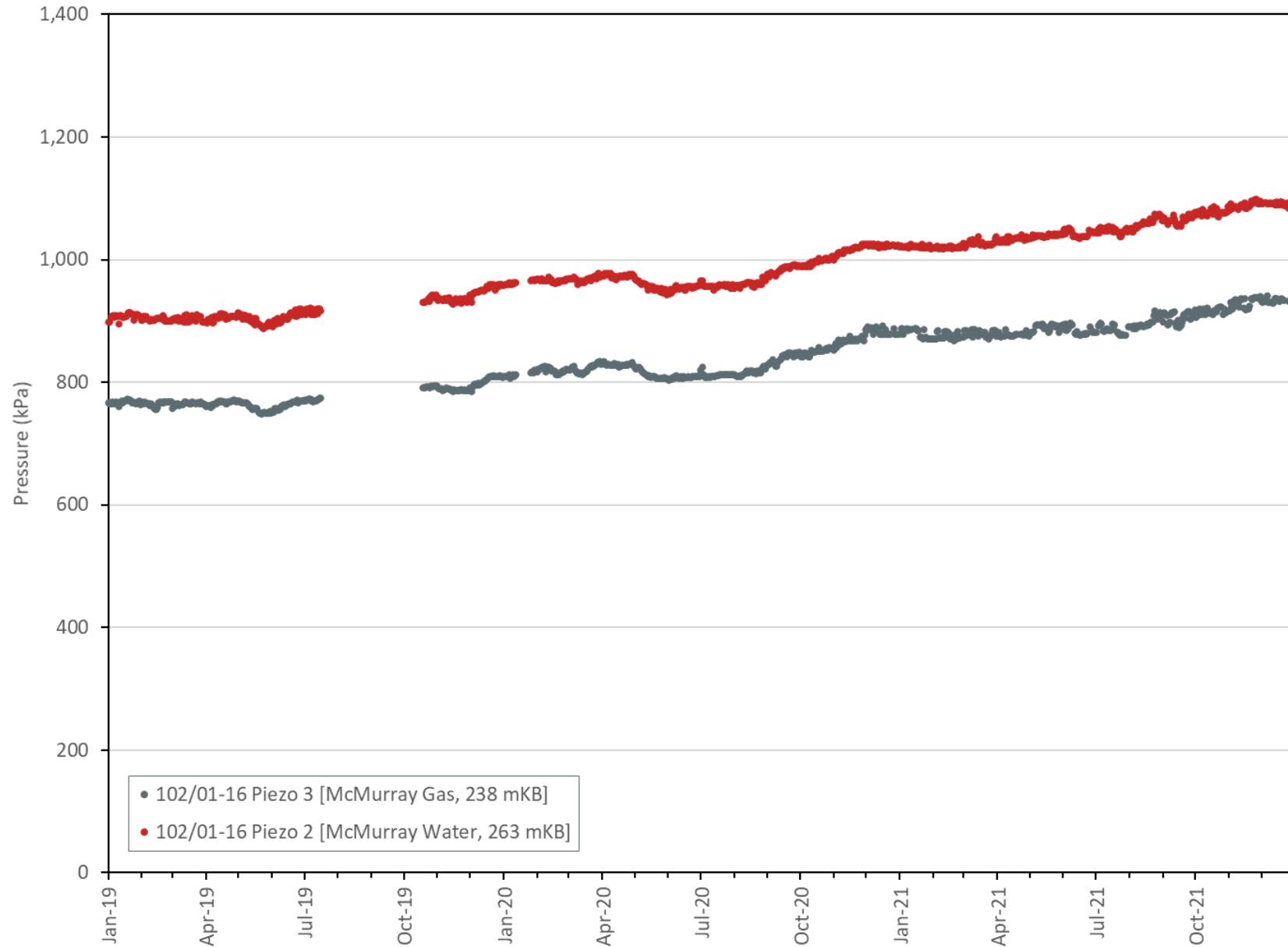
UWI	Formation
102011608305W400	McMurray
102081008305W400	McMurray



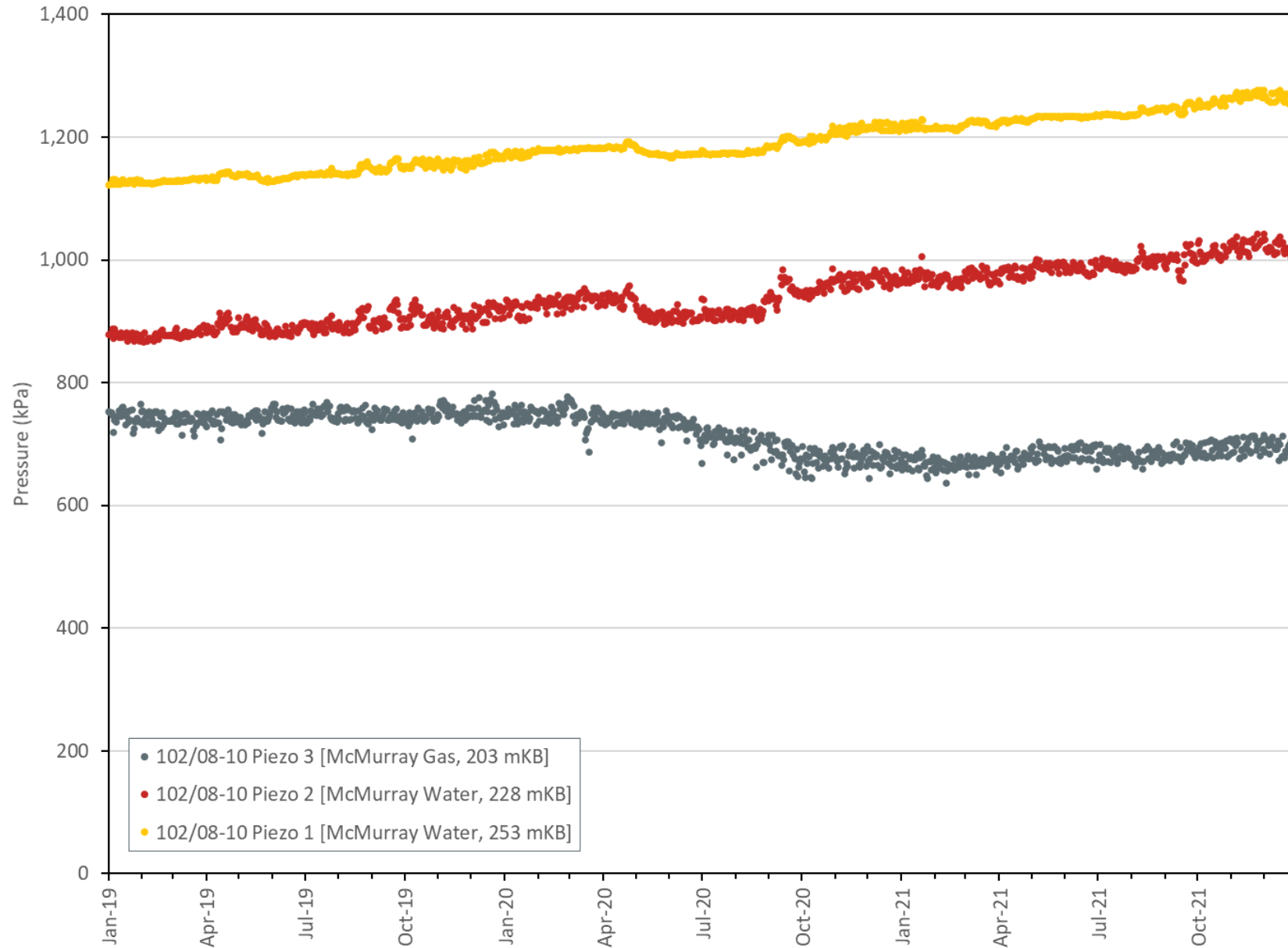
Surmont Water Disposal Wells: Injection Rates (McMurray)



Water Disposal Well 102/01-16-083-05 W4M Observation Well Pressure (McMurray)



Water Disposal Well 102/08-10-083-05 W4M Observation Well Pressure (McMurray)

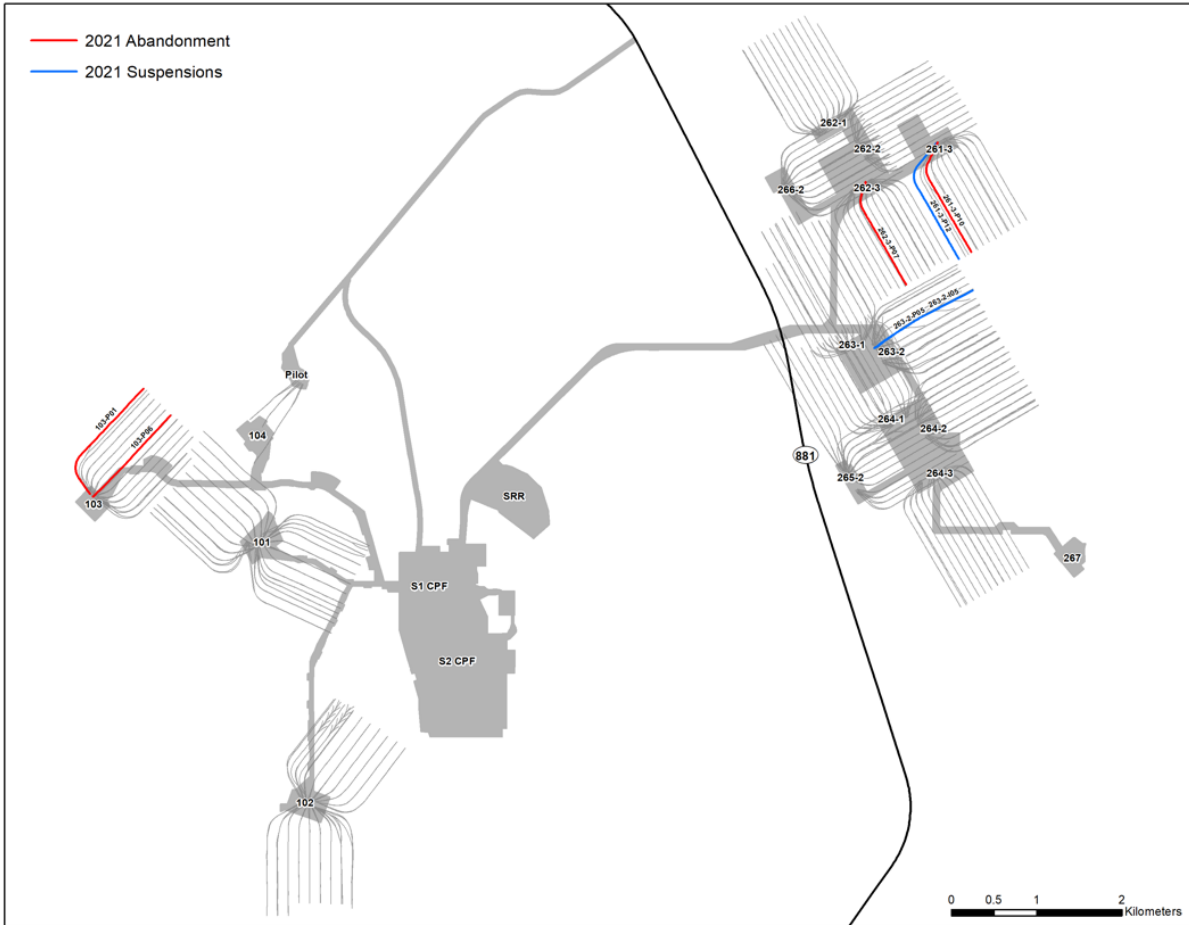


Historical & Upcoming Activity

Directive 054: Subsection 4.4



2021 Suspension & Abandonment Activity



- ▶ No pads currently in place for full scale suspension/abandonment
- ▶ No pads currently in blowdown/ramp down

Well	Status	Comments
103-P01	Abandoned	Well failed and re-drilled
103-P06	Abandoned	Well failed and re-drilled
261-3-P10	Abandoned	Well failed and re-drilled
262-3-WP07	Abandoned	Well pair re-drilled
263-2-I05	Suspended	Injectivity being supported by adjacent injectors. No plans to re-drill well.
263-2-P05	Suspended	Well failed and re-drill plan is under review
261-3-P12	Suspended	Well failed and re-drill plan is under review

Regulatory Approvals & Lifecycle Activities: 2021 Reporting Period

Application No./Date	Description	Approval Date/No.
1931892 January 8, 2021	OSCA reporting conditions – Category 2 amendment to change <i>OSCA</i> Annual Reporting conditions to better align with the new edition of <i>Directive 054</i> (April 2020).	March 1, 2021 9426WW
Lifecycle Activity June 2021	265-2 fishbone producer well – drilled a single outboard fishbone producer well in DA 265-2. Thermal connection was achieved by four secondary legs or “fishbones” in the producer.	N/A
Lifecycle Activity May 2021	103-P01 and 261-3-P10 multilateral producers – drilled and started up multi-lateral producers 103-P01 and 261-3-P10.	N/A
Lifecycle Activity March 2021	Steam Additives Pilot – co-injection of steam additives at four wells pairs on well pad 266.	N/A
1932491 March 10, 2021	Temporary MOP increase in 103-P01 and 261-3-P10 – Category 2 amendment to temporarily increase the MOP to start up two wells in 103-P01 and 261-3-P10.	April 12, 2021 9426XX
1932830 April 16, 2021	Permanent MOP increase in DAs 267-1 & 267-3 – Category 2 amendment to permanently increase the MOP in DA 267-1 and 267-3. Application was withdrawn until next steps could be discussed at a meeting with the AER.	August 12, 2021 Withdrawn
1933452 June 23, 2021	Temporary MOP increase extension in 261-3-P10 – Category 1 amendment to extend the temporary MOP increase to ensure steam temperature at the toe for optimal well conformance and start-up.	June 8, 2021 9426YY
Lifecycle Activity December 2021	Viper well technology in 263-2 – A new lateral well with multiple open holes drilled in a downward trajectory above existing well pairs in DA 263-2 to drain heated bitumen ‘trapped’ above reservoir baffles/barriers into existing SAGD producers.	N/A
1934937 November 19, 2021	Permanent MOP increase in 267-1 & 267-3 and temporary MOP increase in 267-3 – Category 2 amendment to permanently increase the MOP in DAs 267-1 & 267-3 and temporarily increase the MOP for the cold start-up of DA 267-3.	March 29, 2022 9426ZZ
1935261 December 16, 2021	Temporary MOP increase DAs 265-1 and 265-2 – Category 1 amendment to temporarily increase the MOP in four well pairs in DA 265-1 and one infill producer 265-2-P13 for start-up.	January 10, 2022



No activities took place that could materially affect scheme performance or energy or material balances.

▶ LESSONS LEARNED

- Some Flow Control Device (FCD) designs are prone to erosion and failure over time, requiring workovers or redrills to resume production.



▶ SUCCESSES

- Drilled and started up two multi-lateral producers, exceeding production expectations.
- Chelant stimulations have been effective in mitigating producer scaling/plugging and maximizing production.



- ▶ **STEAM ADDITIVES PILOT** - *Lifecycle Activity*
 - Started operation of a pilot project for the injection of steam additives into the reservoir, with the objective to reduce the viscosity of emulsion at downhole SAGD conditions and accelerate the flow of emulsion drainage in the reservoir.

- ▶ **MULTILATERAL WELLS PROGRAM** - *Lifecycle Activity*
 - Drilled and completed two additional multilateral wells in Surmont.

- ▶ **WARM APPLIED SOLVENT PROCESS (WASP) PILOT** - *Lifecycle Activity*
 - Continued the development of a solvent co-injection technology in Surmont 1. Plan for WASP execution in Q2 2022.

- ▶ **VIPER WELL** - *Lifecycle Activity*
 - Drilled and abandoned an upside-down “fishbone” well, on top of an existing well pair, to create communication through impermeable barriers in the reservoir and aid steam chamber growth vertically. No instrumentation nor data collection from this well. Expected impact in overall well production of the existing producer in the months to come.

Compliance History: Reportable Incidents and Contraventions

Incident / Contravention	Reference Number	Date	Detail	Action
Steam and Natural Gas Condensate Release	EDGE 0375830	5 Feb 2021	Release of 0.14 m ³ of steam condensate and 0.01 m ³ of natural gas condensate from a failed bonnet valve. During extreme cold weather, the heat trace failed causing the valve to freeze. Once identified, the produced gas line where the leak was found was shut-in to stop the leak.	Release material was frozen in place and was collected in a containment bin for disposal. AER closed incident on May 4, 2022.
EPEA Approval Contravention	EDGE 0377952	28 Feb 2021	CEMS monitoring equipment on steam generator SG-007 did not meet the 90% uptime in February due to differential pressure issues for Phase 2 OTSG SG-0007 CEMS pitot tube equipment.	ConocoPhillips will continue to review CEMS data daily to identify any issues with CEMS unit performance and continue with preventative maintenance activities to ensure equipment is running accordingly. AER closed incident on April 19, 2021.
Boiler Feed Water Release	EDGE 0376965	14 Mar 2021	Release of 80 m ³ of boiler feed water (BFW) from the PSV. Due to a plant power outage, the BFW pumps were down which created a back pressure in the line. To protect the line from damage due to high pressure, the PSV lifted and released BFW into building sump.	A pump in the sump pumped the BFW back into process. AER closed incident on June 29, 2021.
Boiler Feed Water Release	EDGE 0377195	22 Mar 2021	Release of 17.28 m ³ of boiler feed water (BFW). A failed engineered clamp resulted in the leak of BFW.	The leak was contained in a large spill tray and was cleaned up via vac track and returned to the blowdown pond. AER closed incident on January 27, 2022.
Steam Condensate Release	EDGE 0378186	22 Apr 2021	Release of 3.5 m ³ of steam condensate from a failed joint on the train two brine piping of the Surmont Phase 2 facility.	Immediately shut down the train 2 OTSG and curtailed the plant to minimize the loss. Dykes were created to contain the released volume and reduce spread. Release was cleaned up and disposed of via landfill. Not closed by AER at the time of this report.
Condensate Release	EDGE 0384851	21 Oct 2021	Release of 82.33 m ³ of condensate from a tank. During a condensate shipment, a tank overflowed due to a level indicator calibration issue.	Release is contained inside the tank farm and a tank truck was used to remove the free-standing fluids – cleanup operations are ongoing. Not closed by AER at the time of this report.
Boiler Feed Water Release	EDGE 0386306	10 Dec 2021	Release of 3.6 m ³ of boiler feed water (BFW). Release was caused due to a ruptured rubber flexible expansion coupling on a pump.	The release was contained in the building and washed into the building sump for disposal into the lime sludge pond. Not closed by AER at the time of this report.
EPEA Approval Contravention	EDGE 0387498	31 Dec 2021	CEMS monitoring equipment on steam generator SG-007 did not meet the 90% uptime in December due to differential pressure issues for Phase 2 OTSG SG-0007 CEMS pitot tube equipment.	ConocoPhillips will continue to review CEMS data daily to identify any issues with CEMS unit performance and continue with preventative maintenance activities to ensure equipment is running accordingly. Not closed by AER at the time of this report.

Compliance History: Voluntary Self-Disclosures and Noncompliance

Self Disclosure / Non-Compliance	Reference Number	Date	Detail	Action
Incorrect Injection Well Classification	VSD 11258	17 Dec 2021	Voluntary self-disclosure related to incorrect injection well classification as per <i>Directive 051</i> .	Submitted a <i>Directive 051</i> amendment application to reclassify 70 wells from Class IV to Class III and IV. Application was approved and VSD was closed by the AER on February 10, 2022.
Overpressure Event	N/A	4 Dec 2021	Voluntary self-disclosure due to maximum operating pressure (MOP) exceedance during gas injection while starting up well 265-1 I04.	ConocoPhillips took immediate actions to ensure this incident does not happen again.
Oil Facility Inspection	Inspection ID 516221	24 Nov 2021	Low risk inspection at 05-18-083-06W4 – Meter calibration tags out of date.	Meter tags were updated in accordance with <i>Directive 017</i> . AER closed inspection on January 14, 2022.

Future Plans: Next 12 Months



SURMONT PHASE 1

- Warm Applied Solvent Process (WASP) pilot; plan for WASP execution in Q2 2022 – *Lifecycle Activity*
- Multilateral redrill on 103 – *Lifecycle Activity*
- Full plant outage June 2022 (planned maintenance)



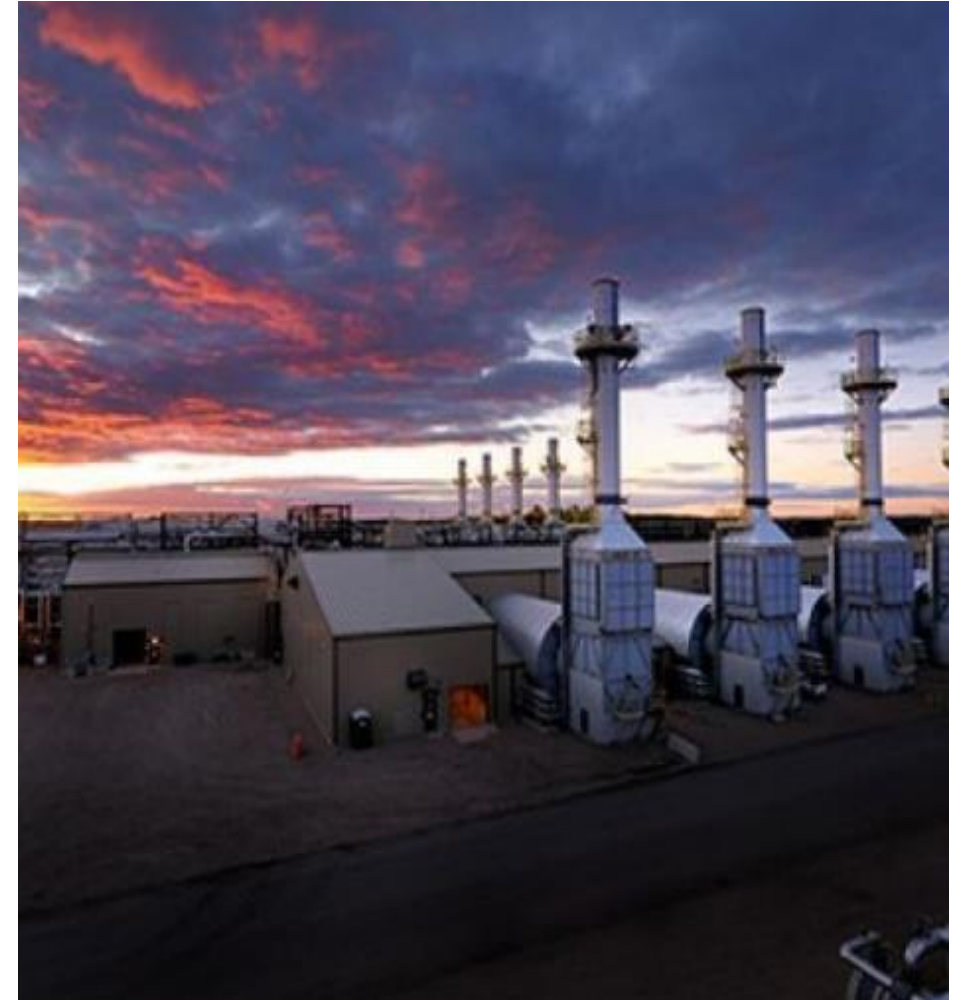
SURMONT PHASE 2

- Continuation of steam additives trial – *Lifecycle Activity*
- Redrill failed wells – *Lifecycle Activity*
- Uphole redrilled well pairs on 262-3, 264-1, 264-2 - *Lifecycle Activity*
- NCG co-injection expansion to 13 more wells on 263-2, 264-2, 263-1 – *Lifecycle Activity*

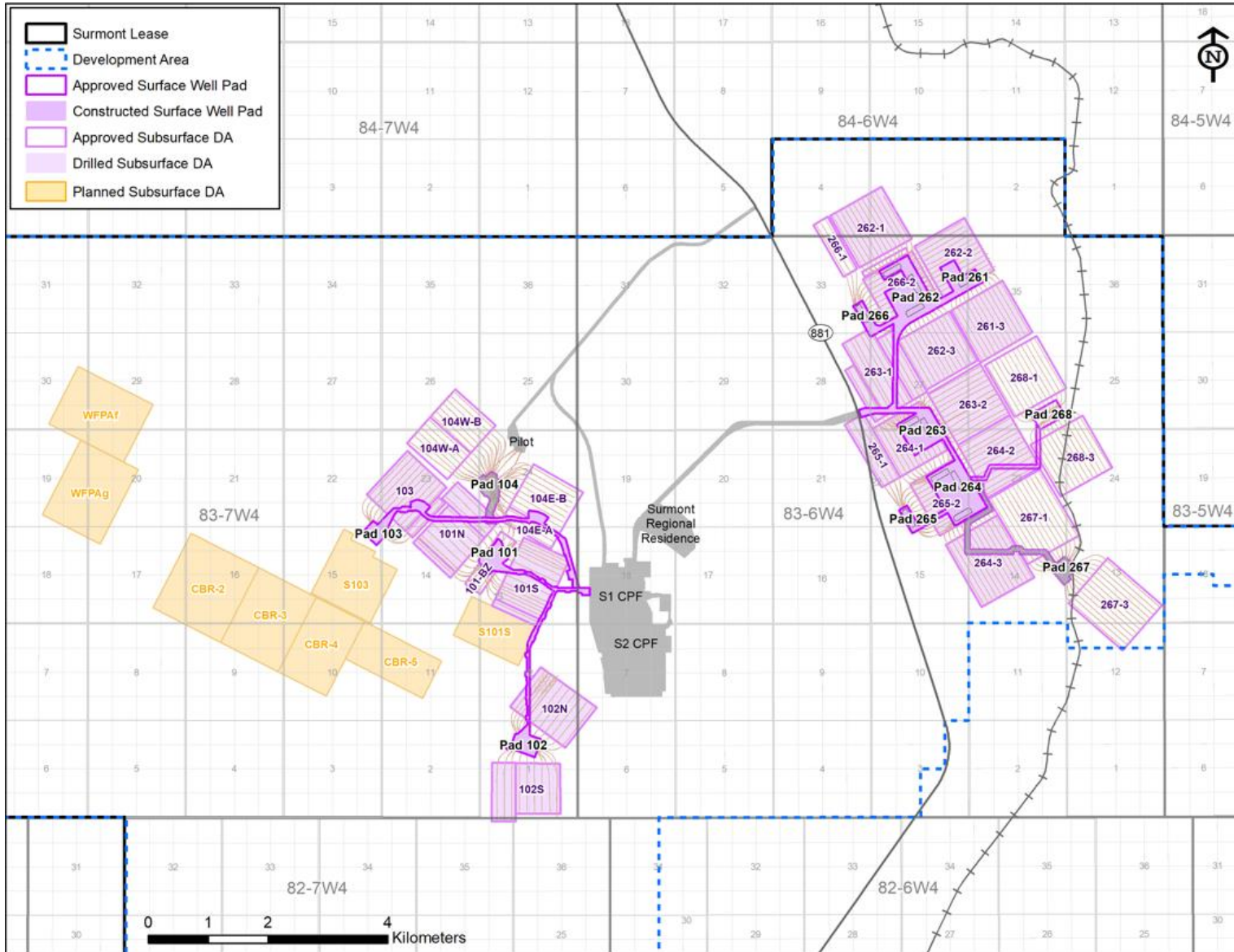


EXPECTED APPLICATIONS

- Temporary MOP increase for startup at Well Pad 103
- Development area expansion to encompass the entire project area



Future Plans: Five Year Development & Delineation Outlook



FUTURE PAD DEVELOPMENT OPTIONS

- Approved Drainage Areas (pre-Lifecycle)
 - 104S
 - 267-1
 - 268-1
 - 267-3
 - 268-3
- Lifecycle Approved Drainage Areas
 - CBR3
 - S101S
 - CBR4
 - 266-1
- Drainage Areas for Delineation
 - 266-1
 - 104W
 - 104E
 - CBR5
 - CBR2
 - S103
 - WFPAf
 - WFPAg

DELINEATION & OBSERVATION WELLS

- Proposed baseline seismic at 104W: 2022/23

Year	Observation Wells	Delineation Wells	Target Drainage Areas for Delineation
2022	9	2	103, 265-2, 267-1/3, 104W, 104WR, S101S, 266-1, 104E, S103, WFPAf, WFPAg
2023	0	0	None – no program
2024	9	5	TBD
2025	6	7	TBD
2026	6	7	TBD
2027	5	5	TBD