Husky Oil Operations Limited

Sunrise Thermal Project

Annual Performance Presentation

Commercial Scheme Approval No. 10419

September 18, 2019

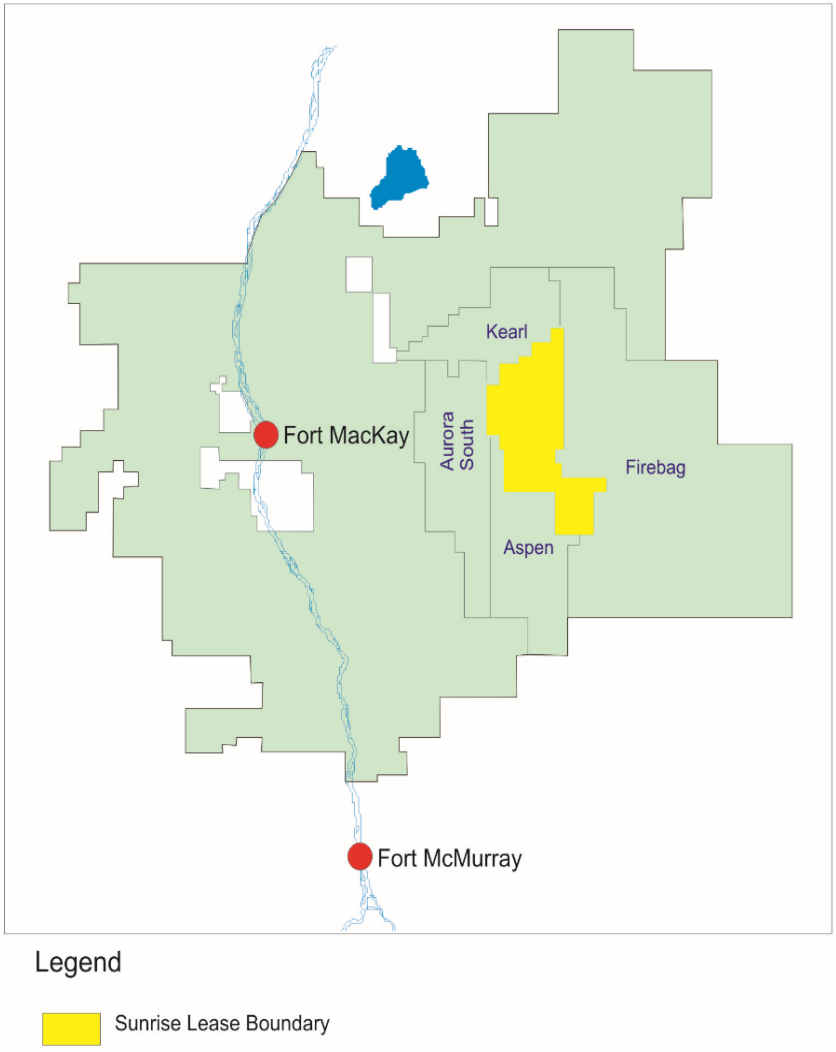
3.1.1. Subsurface Issues

TABLE OF CONTENTS

1. Brief Background

PROJECT OVERVIEW

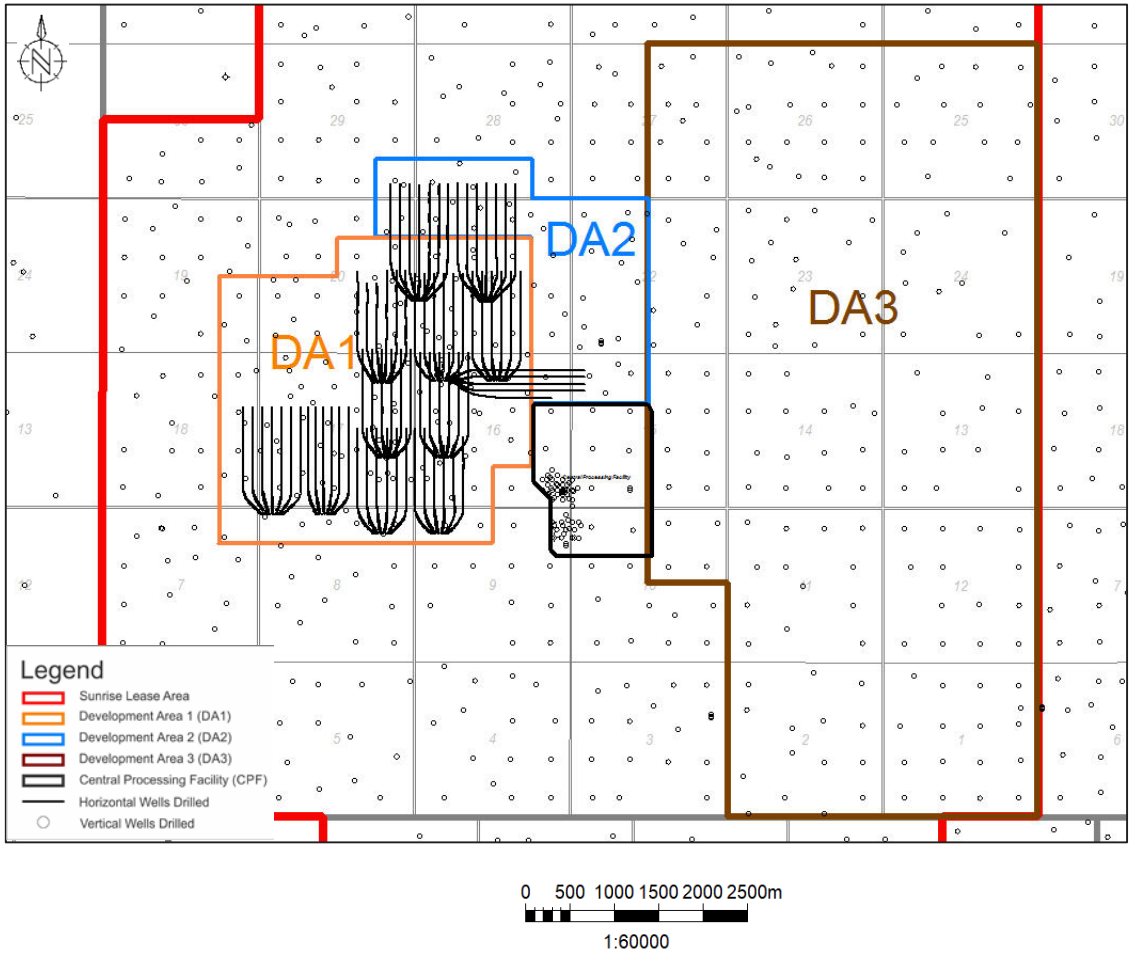
- AER Approval No's. 10419 and 206355-01-00, as amended
- SAGD Project: 31,798 m^3/d (200,000 BOPD)
- Phase 1: 11,765 m^3/d (74,000 BOPD)
- McMurray Formation
- 7-9º API Bitumen
- 50% Partnership with BP
- First Steam December 12, 2014
- First Production March 8, 2015



1. Brief Background

PROJECT DEVELOPMENT AREA

- Approval Area:
  - 64 ¼ sections over TWP 94, 95 and 96, RGE 6 and 7 W4M
- Project Life Development:
  - Approx. 600 well pairs
  - Approx. 40-year life
- Development Area 1 (DA1):
  - Nine well pads
  - 55 well pairs
- Development Area 2 (DA2):
  - Three well pads constructed
  - 19 well pairs
  - Two well pads drilled/tied in (B05-21 (P) and B06-21 (Q))
  - Drilled drainage pattern B10-16 (R)
- Development Area 3 (DA3):
  - 18 well pads
  - 222 well pairs
  - AER Approved January 25, 2016



1. Brief Background

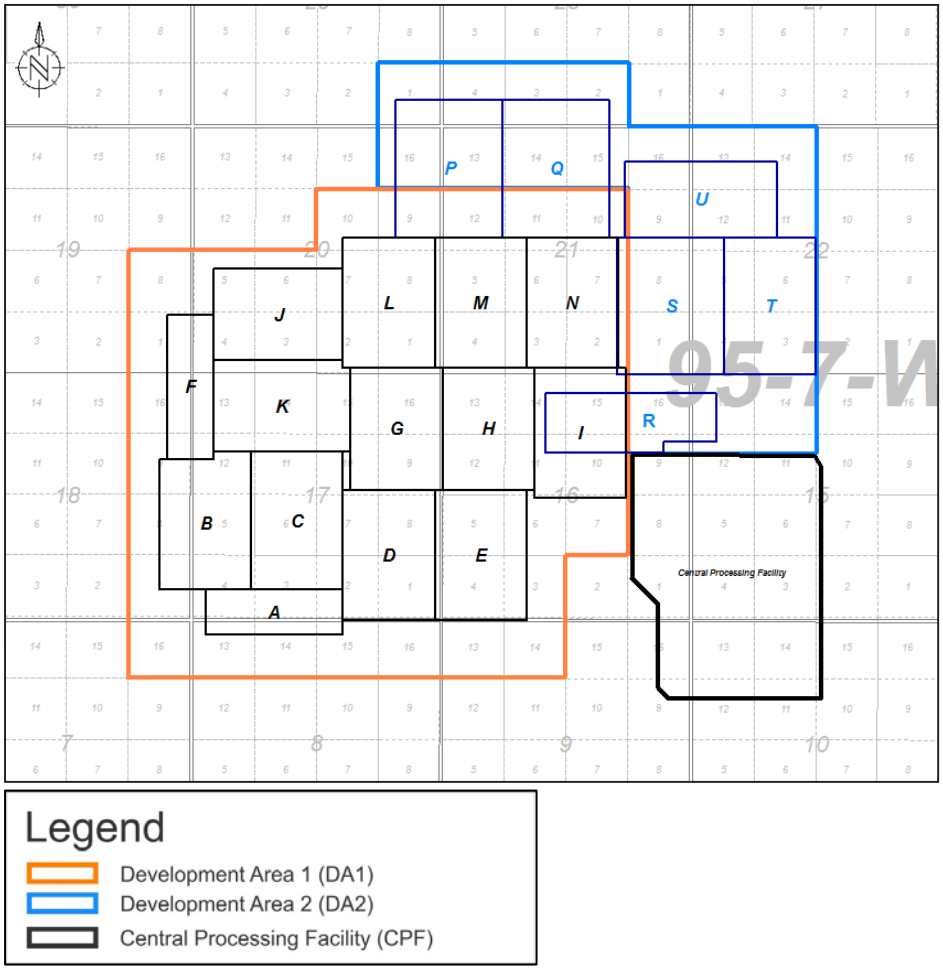
SITE OVERVIEW

- 74 horizontal well pairs drilled:
  - 55 well pairs in DA1 on production
  - 14 well pairs in DA2 on production
  - 5 well pairs in DA2 drilled (B16-16 (R))
- Field Facilities:
  - 11 well pads constructed and tied in
  - 12 Infill wells drilled and on production
- Central Plant Facility:
  - Bitumen treating – 11,765 m^3/d (74,000 bbl/day)
  - Water Treatment – 43,860 m^3/d (276,000 bbl/day)
  - Steam Generation – 35,290 m^3 /d (222,000 bbl/day) CWE
  - Utilities
- Water Source & Disposal Wells
- Observation Wells
- Borrow Sources
- Class 2 Landfill
- Metering and Export Pipelines to Fort Saskatchewan via Norealis Terminal and Cheecham

2. Geosciences

AVERAGE RESERVOIR CHARACTERISTICS & OBIP DA1 & DA2*

Drainage Pattern	Area (ha)	Porosity (%)	Bitumen Saturation (%)	Developable OBIP (10^3 m^3)
B16-07 (A)	27.0	31.0	75.0	1,345
B13-08 (B)	62.1	32.0	75.0	4,475
B14-08 (C)	45.9	33.0	75.0	3,260
B16-08 (D)	51.0	32.0	75.0	3,079
B13-09 (E)	51.0	32.0	75.0	2,778
B08-18 (F)	28.5	31.0	67.0	1,199
B08-17 (G)	48.0	32.0	72.0	2,990
B05-16 (H)	48.0	33.0	76.0	3,155
B07-16 (I)	51.0	32.0	75.0	3,245
B01-19 (J)	51.0	32.0	76.0	3,046
B16-18 (K)	54.0	33.0	71.0	3,990
B16-17 (L)	51.0	33.0	74.0	3,648
B13-16 (M)	51.0	33.0	73.0	3,887
B15-16 (N)	51.0	33.0	76.0	4,765
B05-21 (P)	63.0	32.0	74.0	5,660
B06-21 (Q)	63.0	32.0	73.0	3,928
B10-21 (U)	50.0	31.0	75.0	3,720
B16-16 (S)	63.0	32.0	75.0	3,745
B14-15 (T)	54.0	32.0	78.0	2,947
B10-16 (R)	43.0	32.0	77.0	3,116

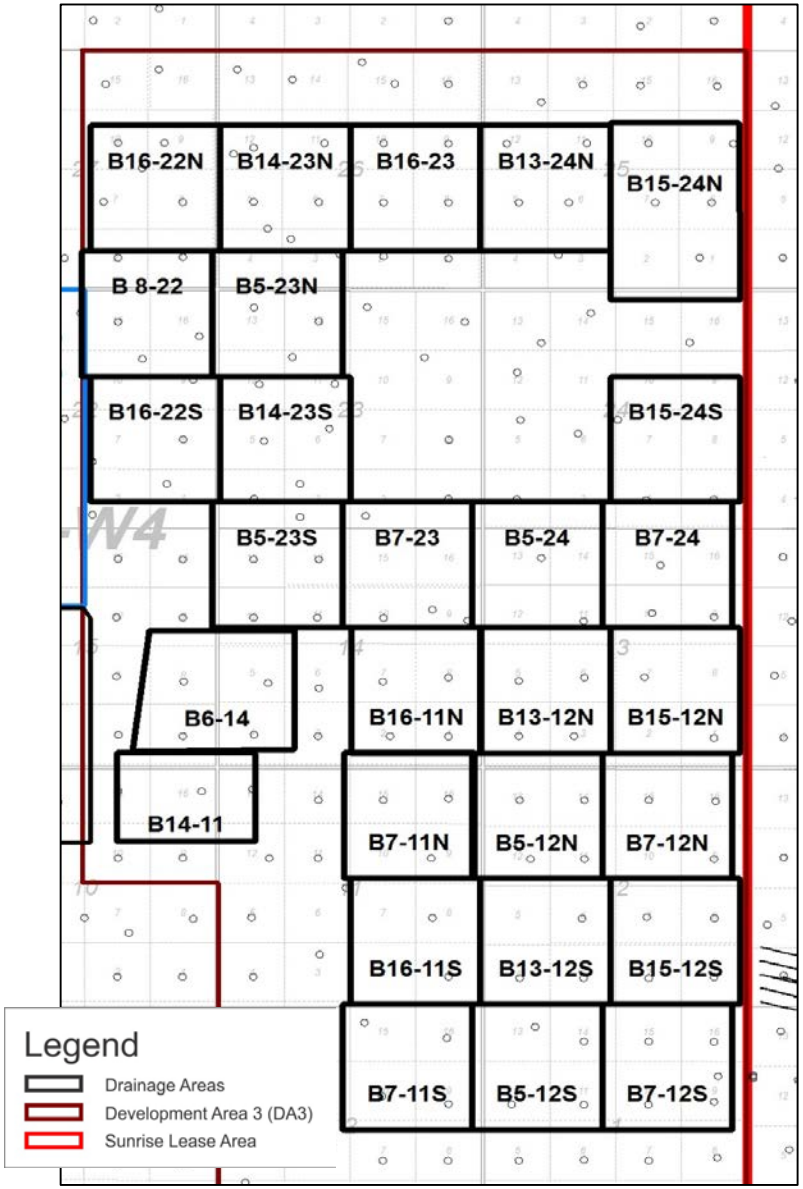


Note:
* Revised with updated mapping

2. Geosciences

AVERAGE RESERVOIR CHARACTERISTICS & OBIP – DA3

Drainage Pattern	Area (ha)	Porosity (m)	Bitumen Saturation (%)	Developable OBIP (10^3m^3)
B05-12N	68.0	31.7	76.4	4,310
B05-12S	68.0	29.2	79.2	3,460
B07-12N	68.0	31.6	81.3	4,600
B07-12S	68.0	31.8	81.8	5,530
B13-12N	68.0	31.7	79.7	4,860
B13-12S	68.0	31.1	78.5	3,340
B15-12N	68.0	31.3	84.0	3,840
B15-12S	68.0	31.6	83.5	4,700
B06-14	76.6	31.0	84.1	5,480
B07-11N	68.0	30.3	79.0	3,420
B07-11S	68.0	31.2	74.4	3,770
B14-11	51.0	30.7	81.4	2,720
B16-11N	68.0	30.5	79.7	4,050
B16-11S	68.0	31.2	74.4	1,730
B13-24	68.0	30.8	84.4	6,620
B14-23N	68.0	32.2	79.0	5,750
B14-23S	68.0	31.9	81.1	2,950
B15-24N	95.3	31.3	83.6	5.790
B15-24S	68.0	30.4	78.1	2,290
B16-22N	68.0	32.7	78.4	5,160
B16-22S	68.0	32.4	75.9	2,580
B16-23	68.0	31.3	83.0	5,310
B05-23N	68.0	31.0	79.9	5,050
B05-23S	68.0	32.7	75.2	3,740
B05-24	68.0	29.6	80.5	4,100
B07-23	68.0	30.6	79.7	3,430
B07-24	68.0	29.9	79.0	3,330
B08-24	68.0	30.0	84.7	4,120



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AVERAGE RESERVOIR CHARACTERISTICS & OBIP

- There are decreased values of bitumen saturation and original bitumen in place (OBIP) in the majority of pads compared to 2018. The decrease in values of bitumen saturation and OBIP numbers are based on adjustments to the petrophysical curves and changes in pay zone definition from the learnings obtained on the producing pads. The methodology used for bitumen saturation (S_o) was modified with the introduction of zones corresponding to changes in water resistivity within the reservoir. This resulted in a lower average S_o for the drainage patterns and improved quality control between the Dean-Stark core Bulk Mass Bitumen fraction (BMB) and log derived BMB. The pay intervals are now separated based on stratigraphic mapping

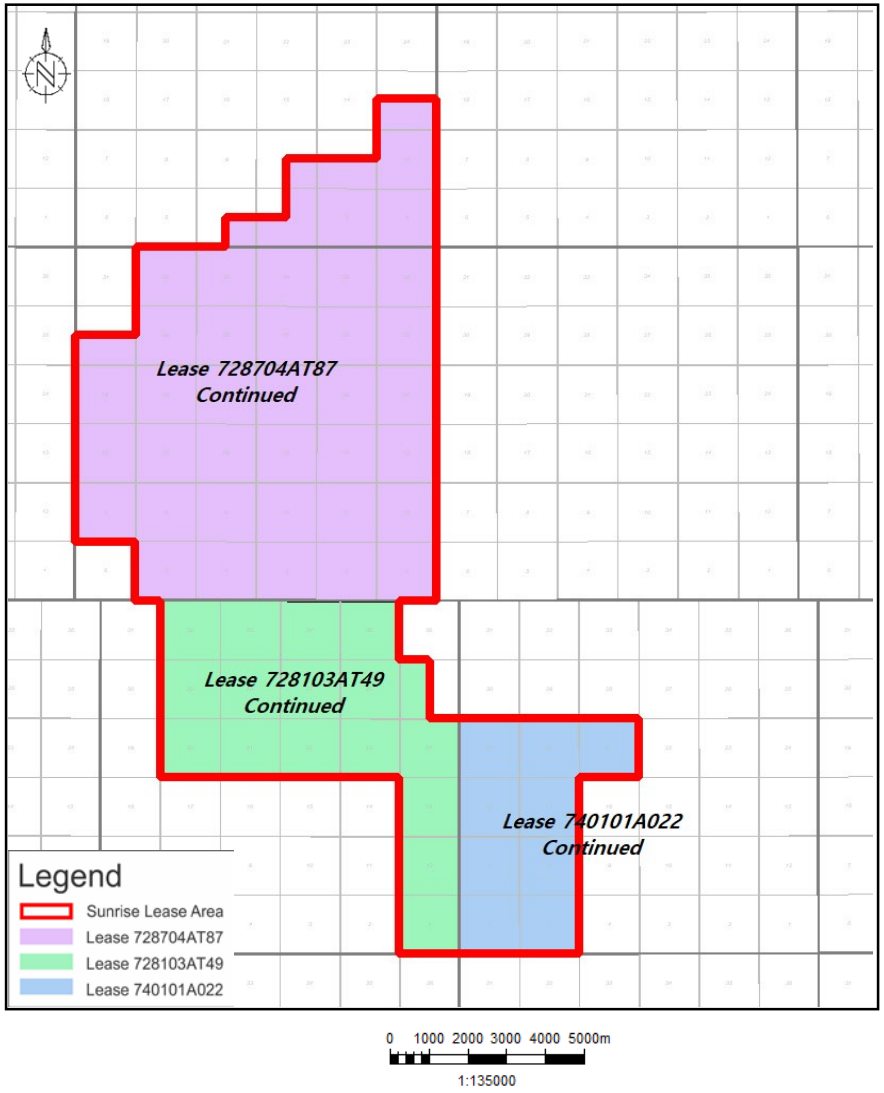
2. Geosciences

OBIP PROJECT AREA

Methodology

- Volumetric Calculation
  - OBIP = Area (m^2) times HPV (m)
  - HPV = thickness x bitumen
  - saturation x effective Porosity
  - 24 percent (%) PhiE cutoff
  - MU3 and MU2 zones
- Petrel Application

Lease	OBIP 24% PhiE cutoff (10^3 m^3)	Gross Thickness (m)	Porosity (%)	Bitumen Saturation (%)
Total	1,122,109	35.0	31.5	70



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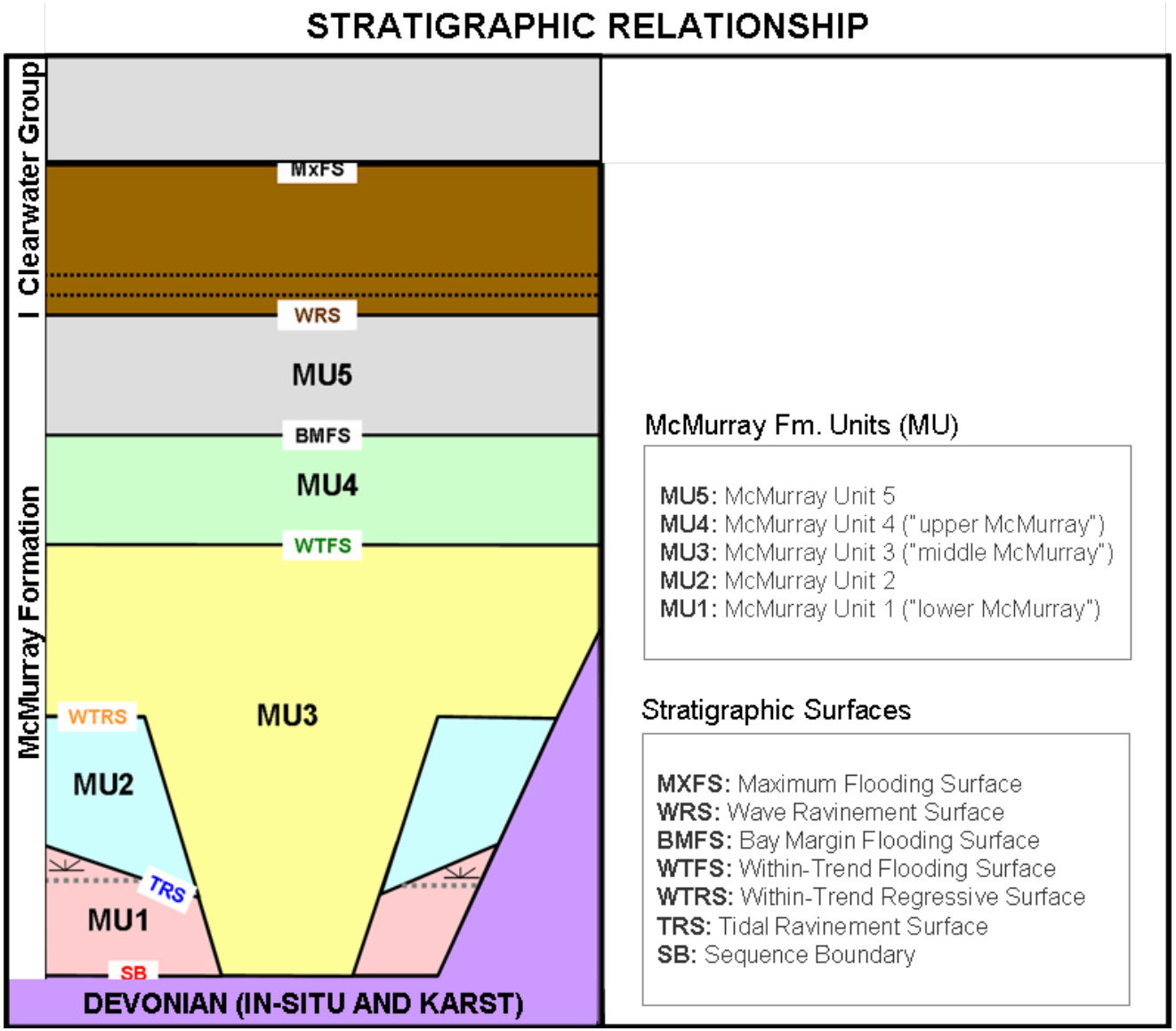
RESERVOIR PROPERTIES

Property	Value
Initial Reservoir Pressure (kPa_g)	450 at 300 masl
Reservoir Temperature (°C)	7
Depth to Reservoir (m)	160 – 200
Average Net Pay (m)	24
Average Horizontal Permeability (mD)	3,700
Average Vertical Permeability (mD)	2,000

2. Geosciences

SUNRISE STRATIGRAPHIC COLUMN



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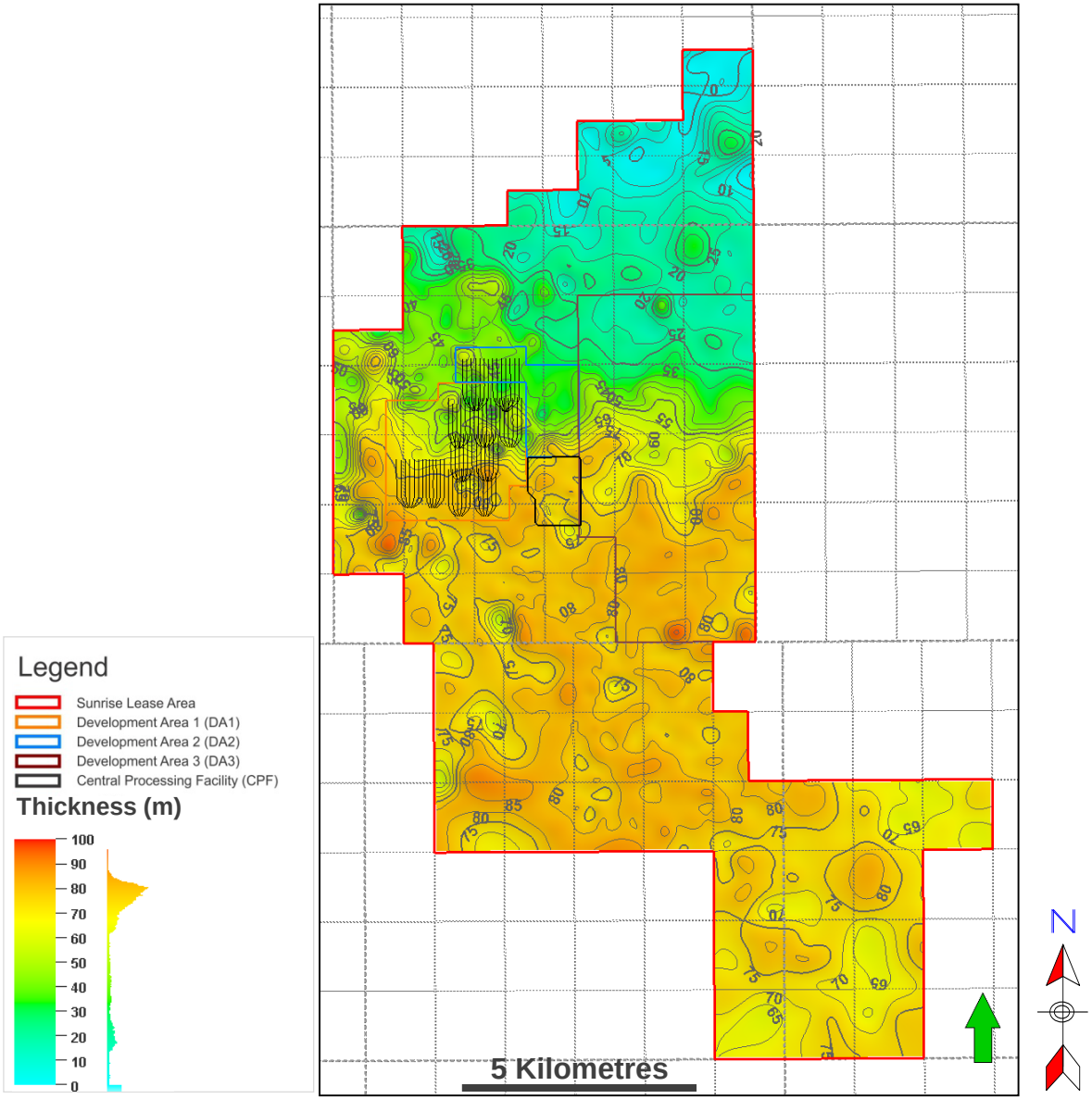
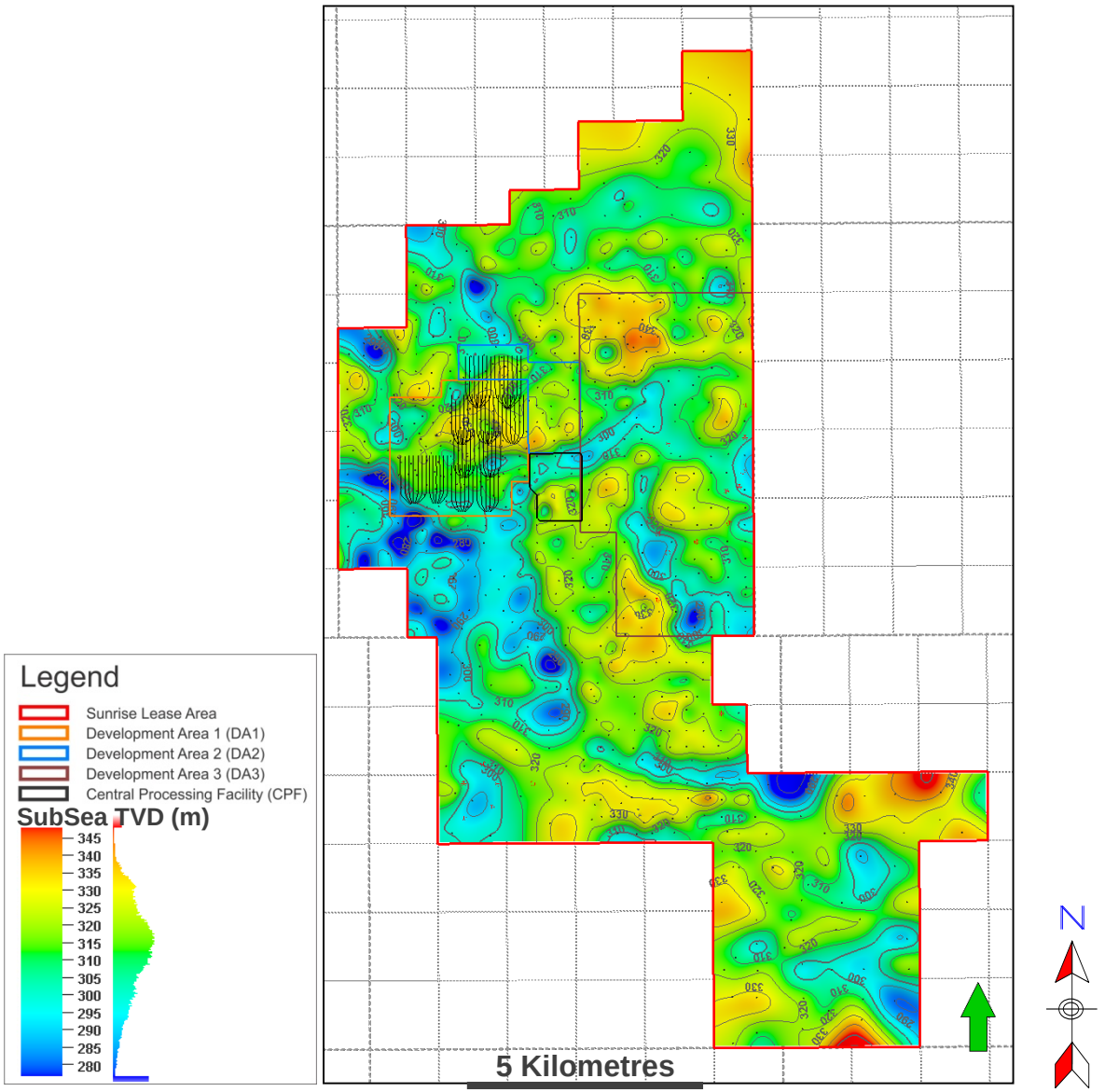
CLEARWATER FORMATION ISOPACH MAP



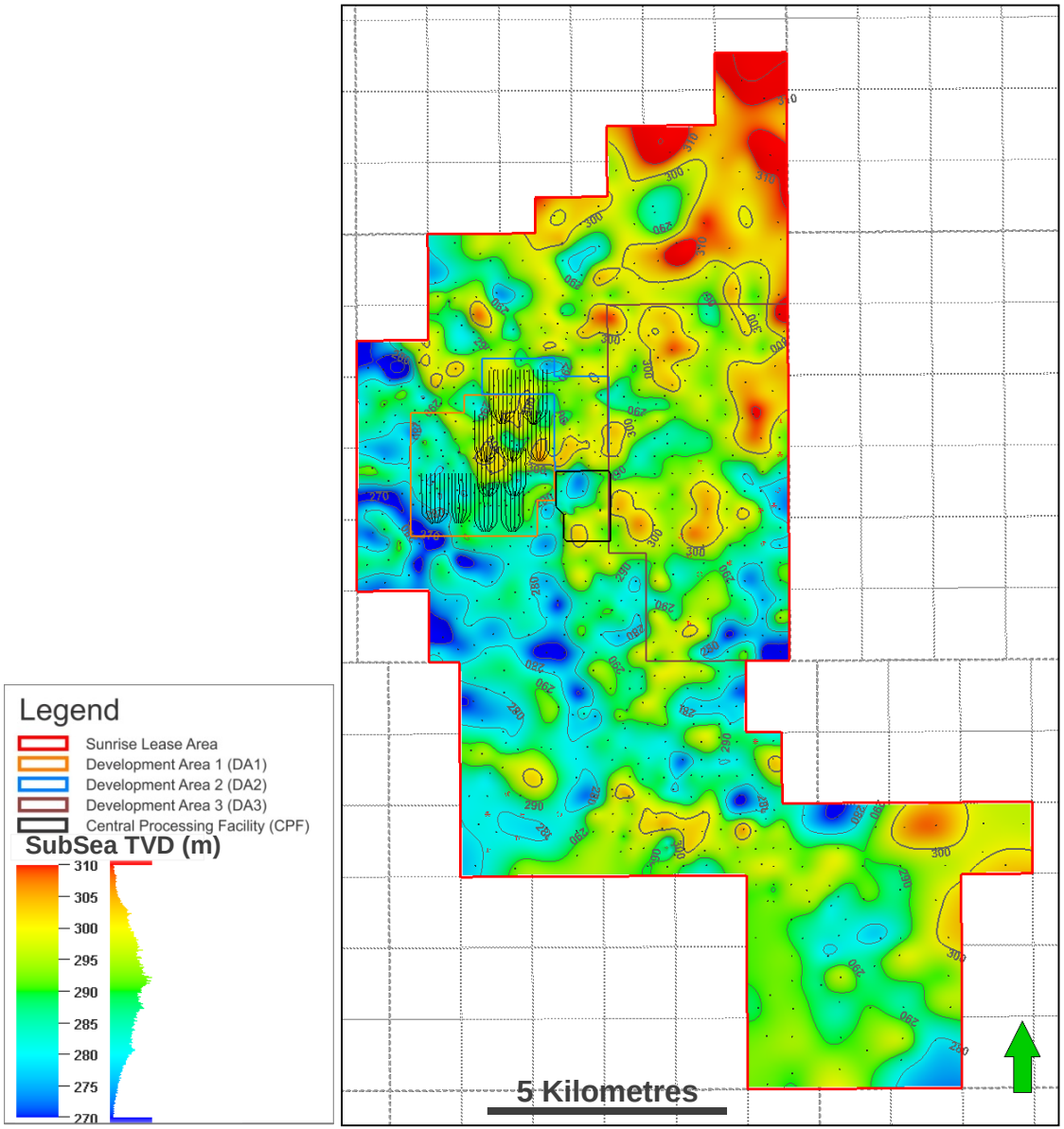
2. Geosciences

TOP OF PAY STRUCTURE CONTOUR MAP



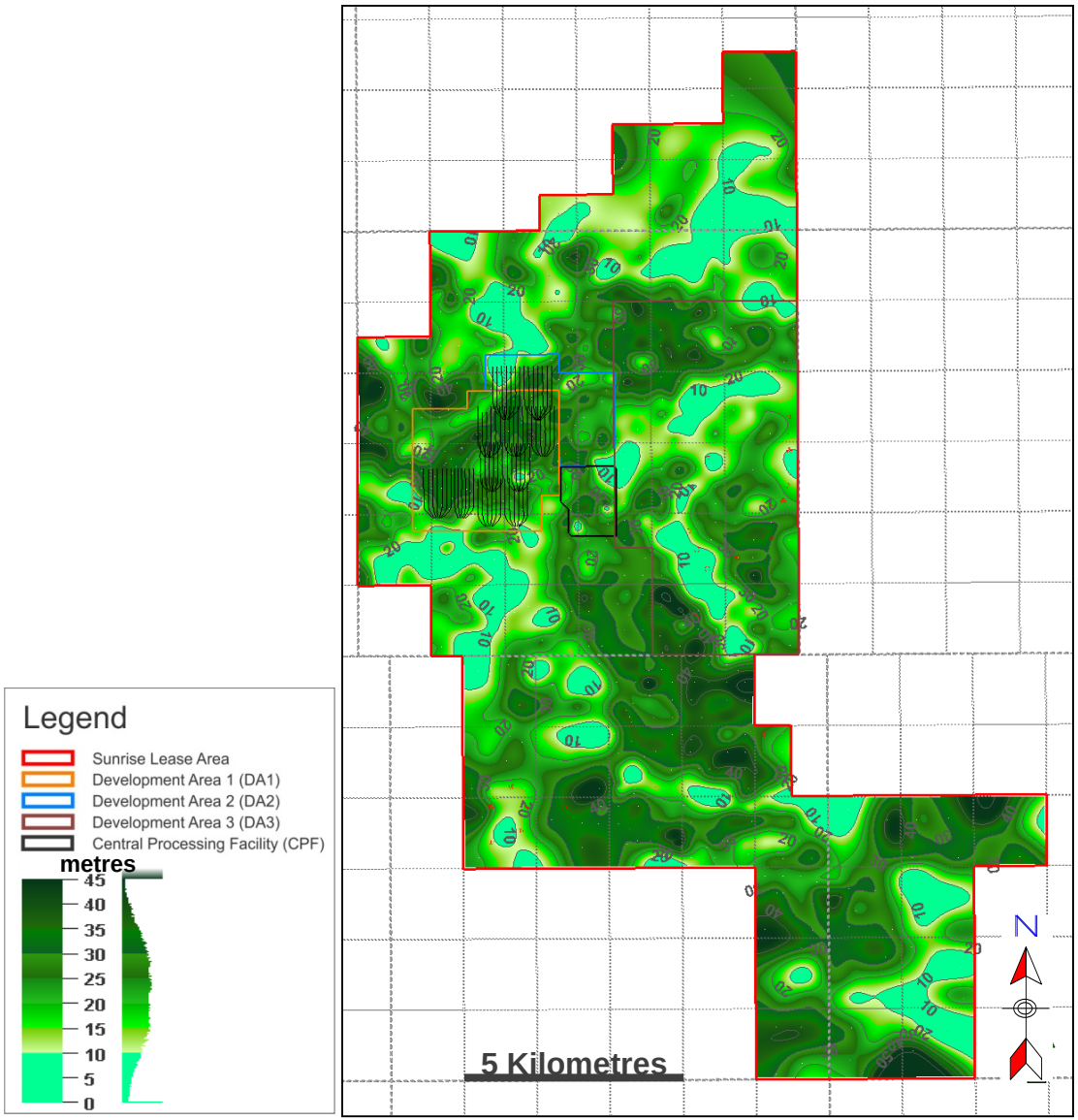
2. Geosciences

BASE OF PAY STRUCTURE CONTOUR MAP



2. Geosciences

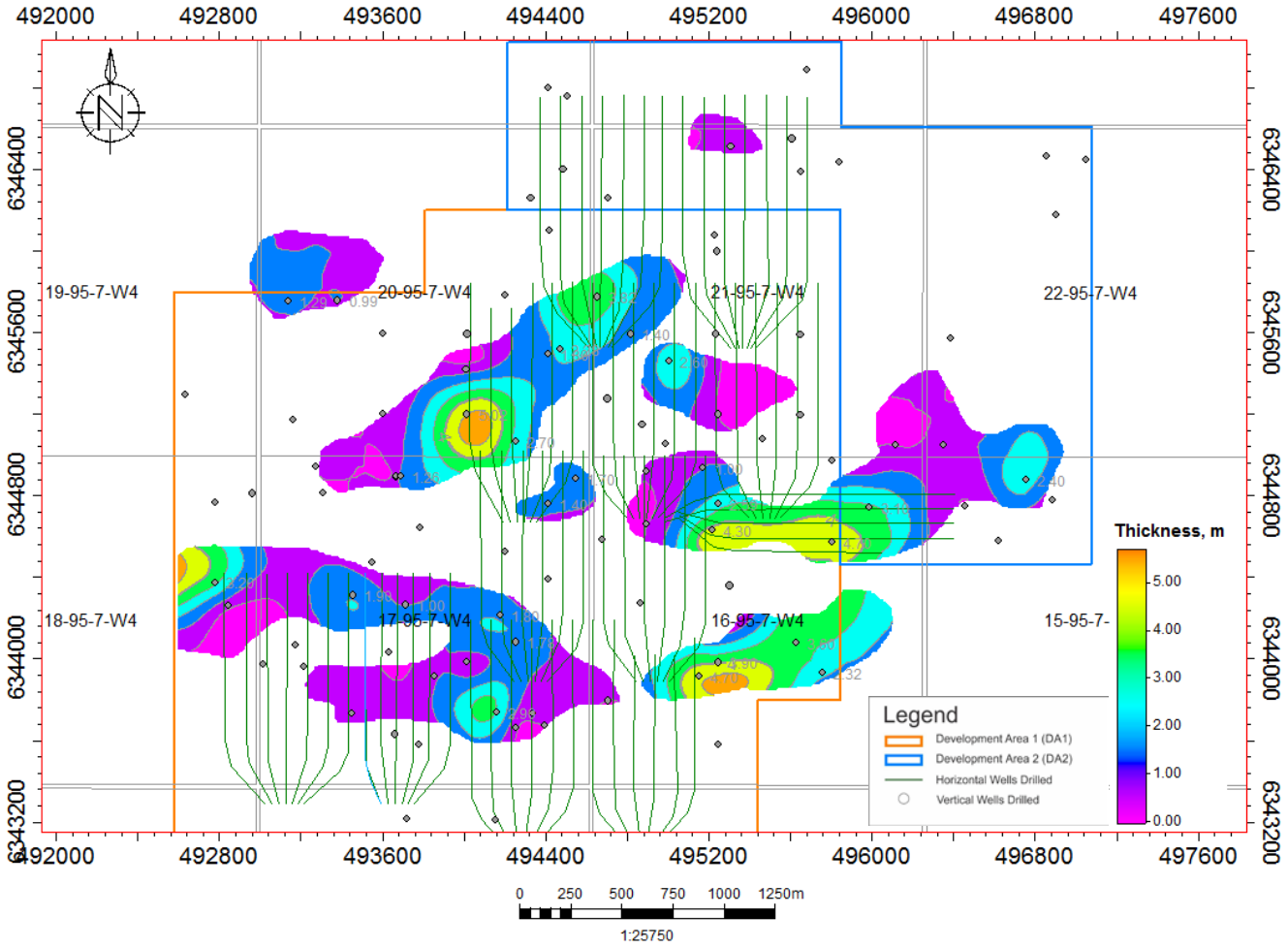
MAIN GROSS CONTINUOUS BITUMEN THICKNESS (M)



2. Geosciences

THIEF ZONES - NET TOP GAS THICKNESS (M)

- No bottom water and varied discontinuous
- Depleted top gas in DA1 and DA2



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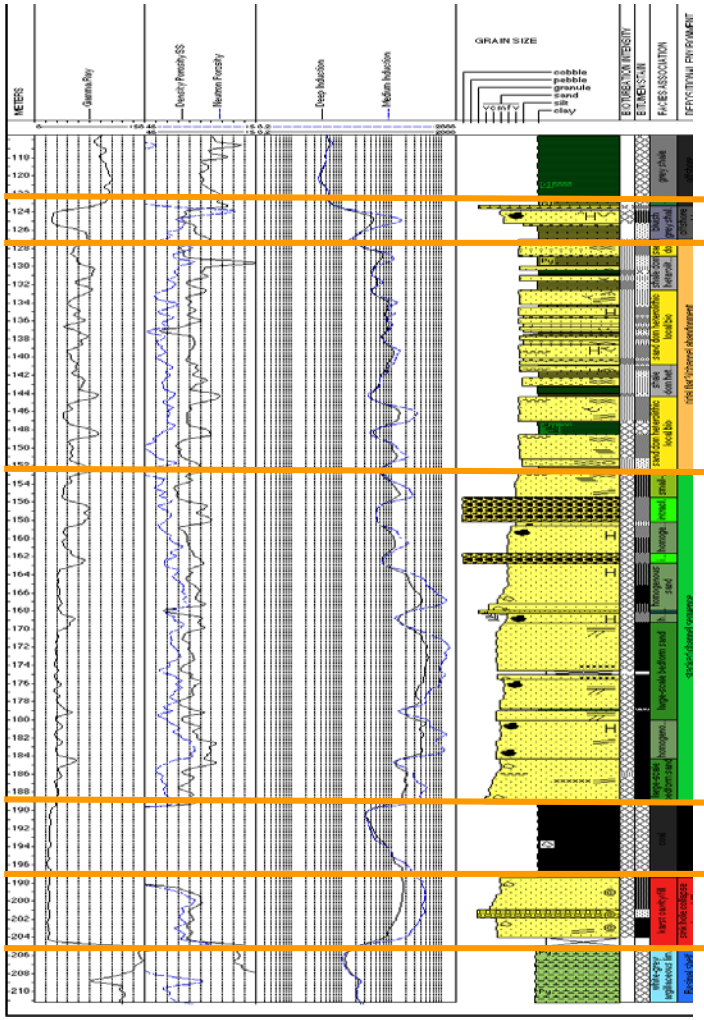
DEPOSITIONAL ENVIRONMENT



Marine Shale — **Clearwater**

Marine Sands and Shales — **McMurray**

Tidal Flats/IHS

Estuarine Channels

Coal/Marsh

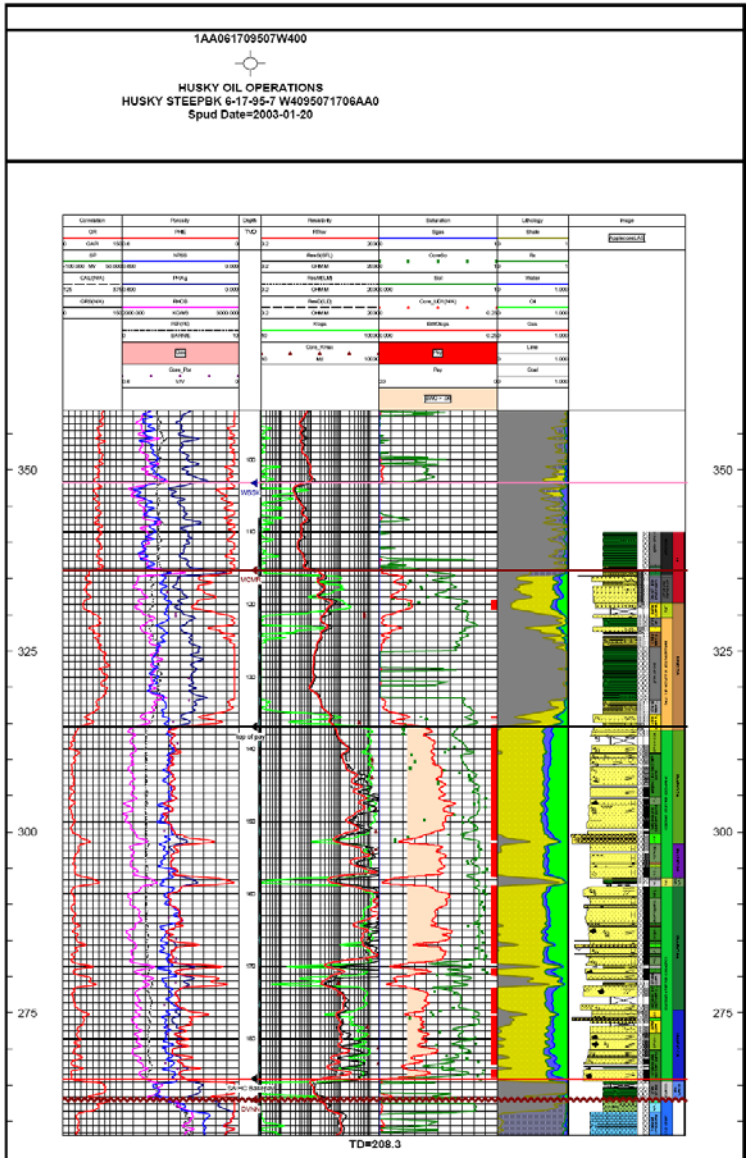
Lower Channel

Devonian

2. Geosciences

COMPOSITE WELL LOG

- Well 06-17-095-07W4M

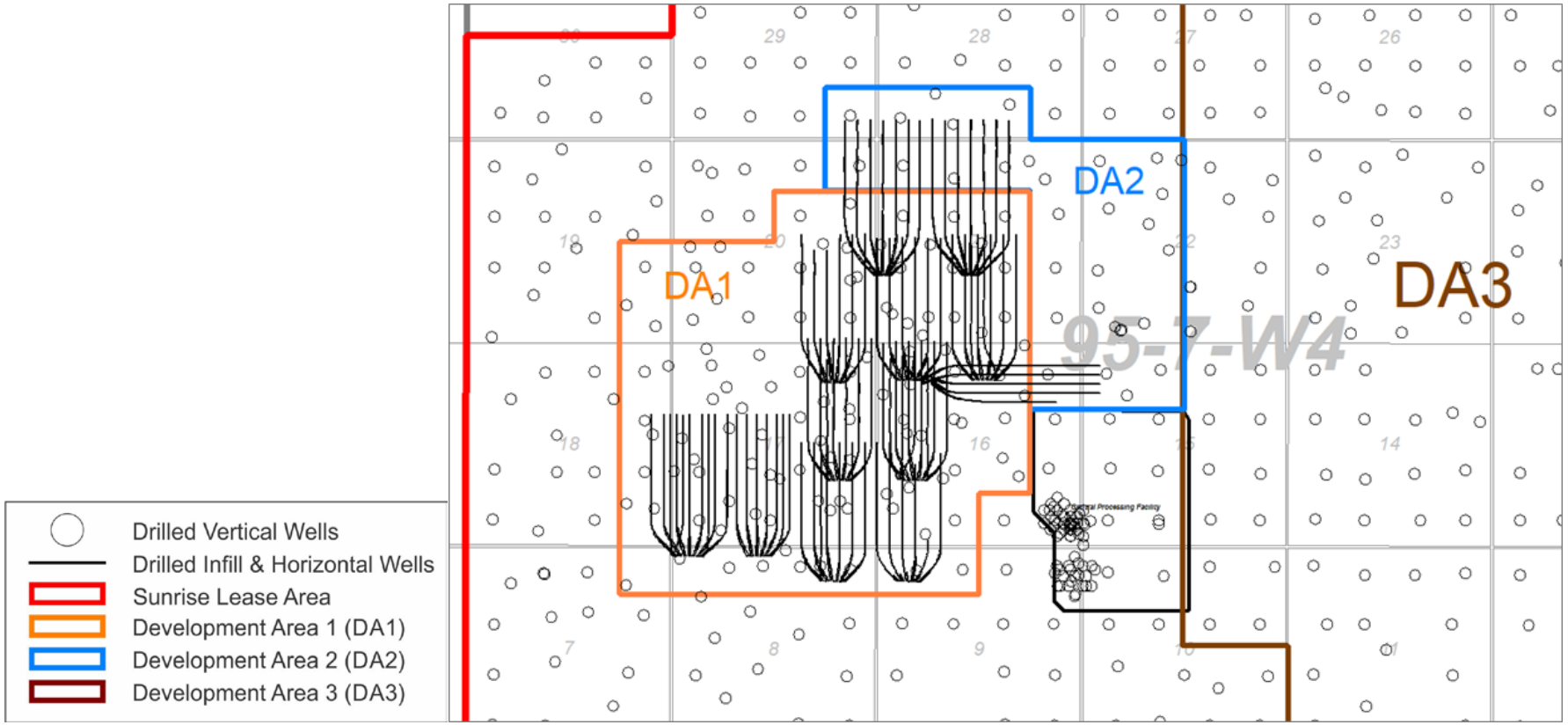


2. Geosciences

VERTICAL AND HORIZONTAL WELLS

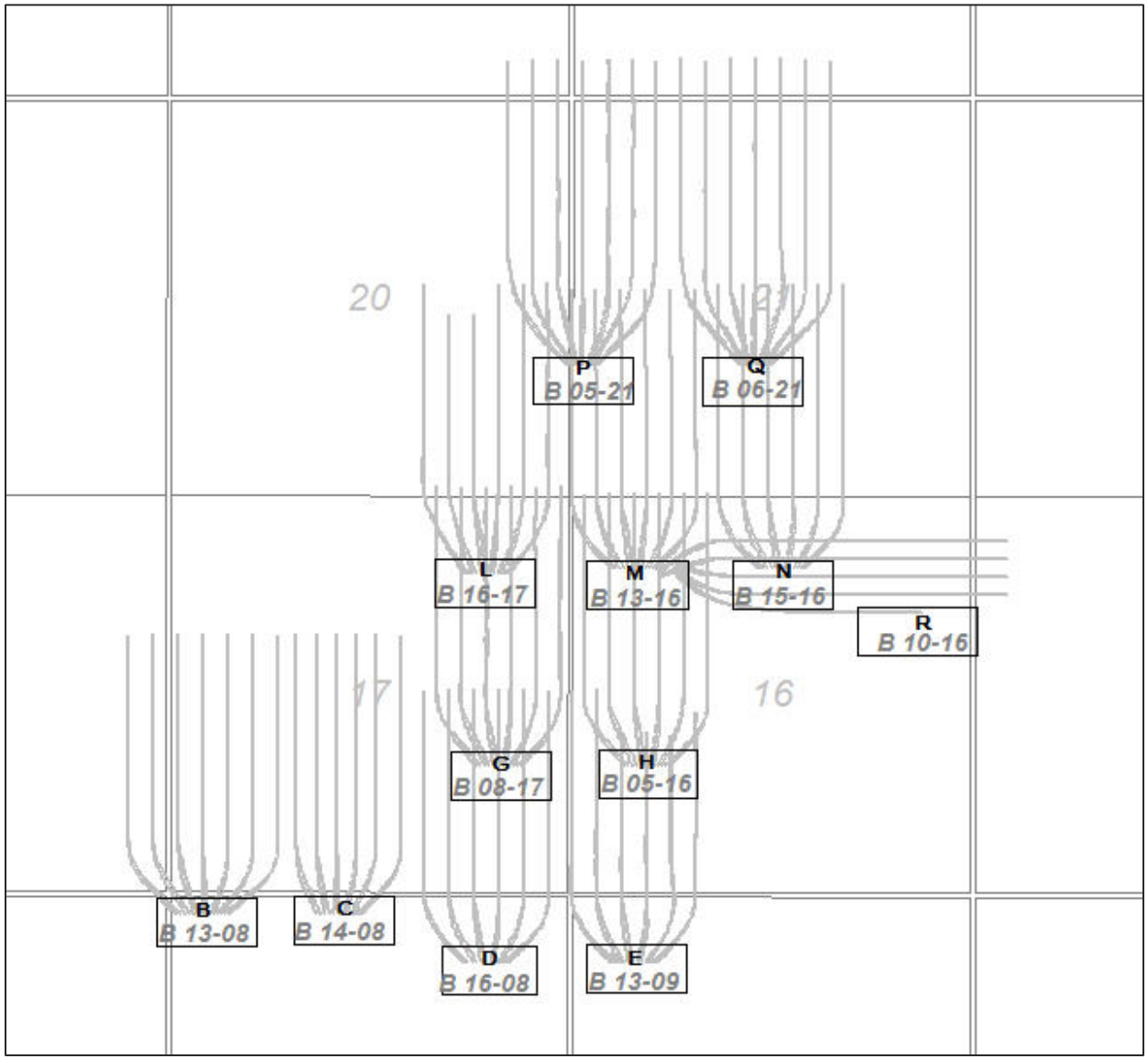
2019 Program:

- No vertical wells drilled during the reporting period
- No horizonal wells drilled during the reporting period



2. Geosciences

PAD INTER-WELL SPACING SCHEMATIC



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PAD INTER-WELL SPACING

Well Pad	Inter-well Spacing (meters)
B13-08 (B)	100
B14-08 (C)	80 - 100
B16-08 (D)	100
B13-09 (E)	100
B08-17 (G)	100
B05-16 (H)	100
B16-17 (L)	100
B13-16 (M)	100
B15-16 (N)	100
B-05-21 (P)	100 (P6-7 90)
B06-21 (Q)	100
B16-16 (R)	72

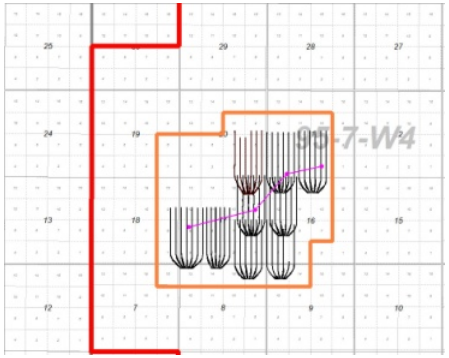
2. Geosciences

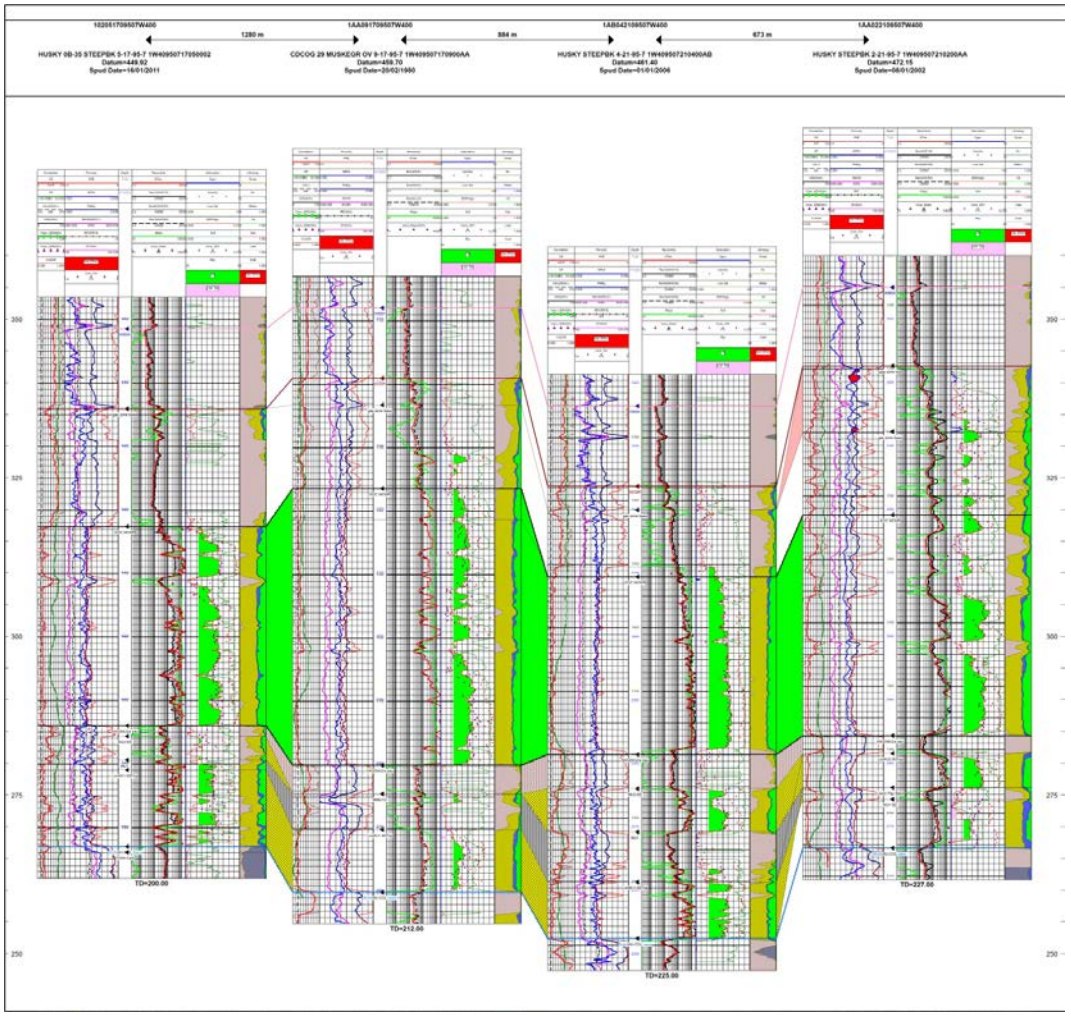
PETROGRAPHIC ANALYSIS

- No petrographic analysis was conducted during the reporting period

2. Geosciences

REPRESENTATIVE STRUCTURAL E-W CROSS-SECTION THROUGH DA1





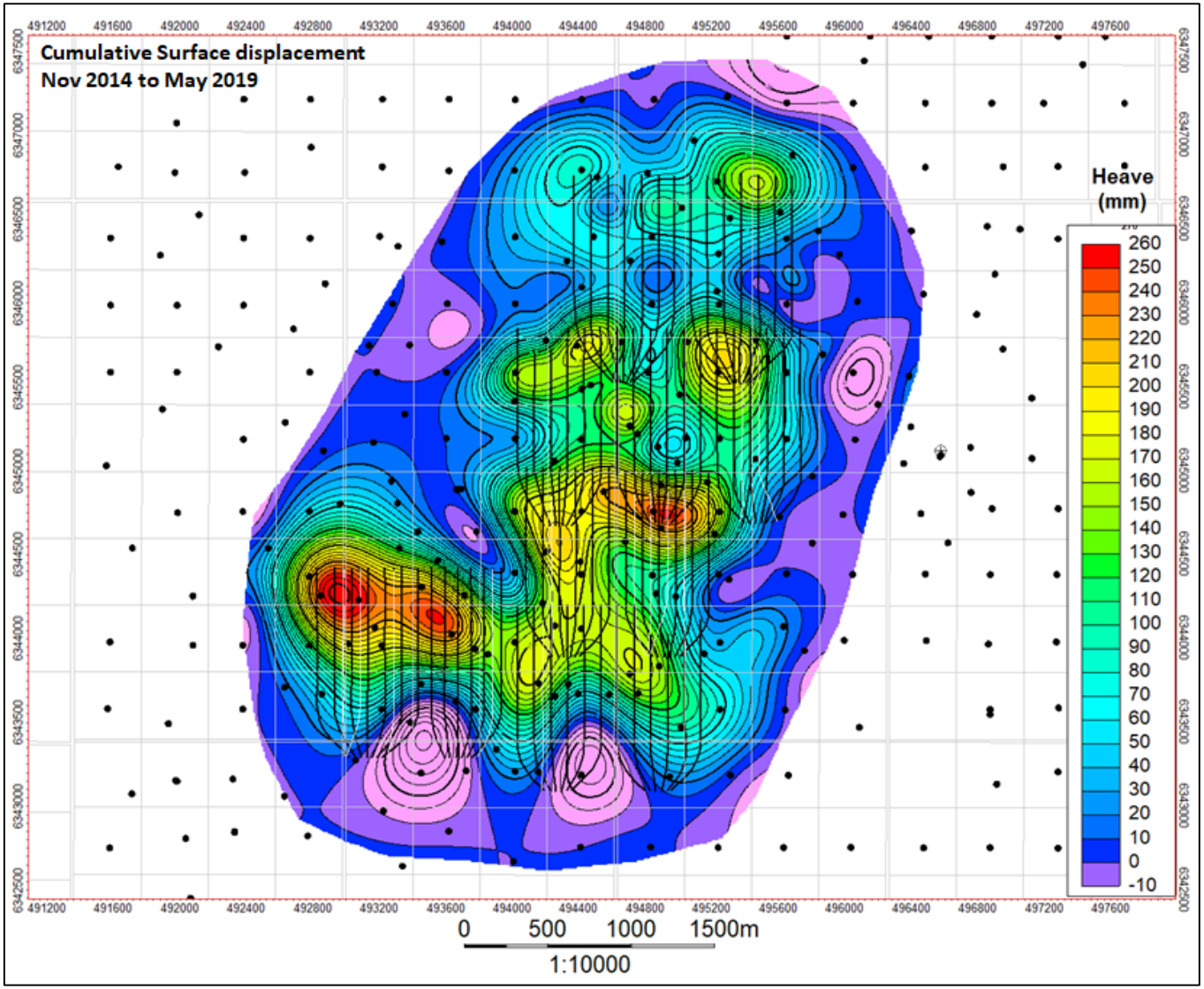
2. Geosciences

GEOMECHANICAL DATA

- No geomechanical data was acquired during the reporting period

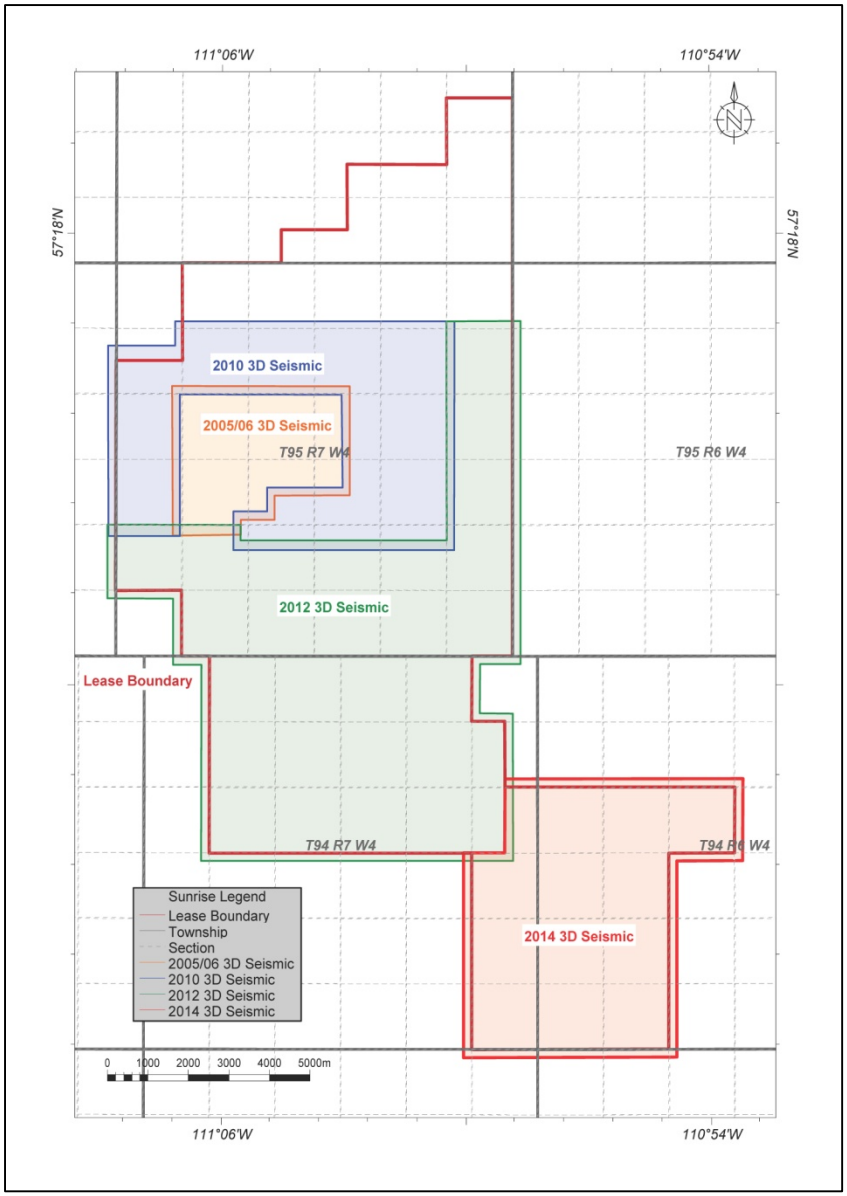
2. Geosciences

SURFACE HEAVE



2. Geosciences

3D SEISMIC COVERAGE



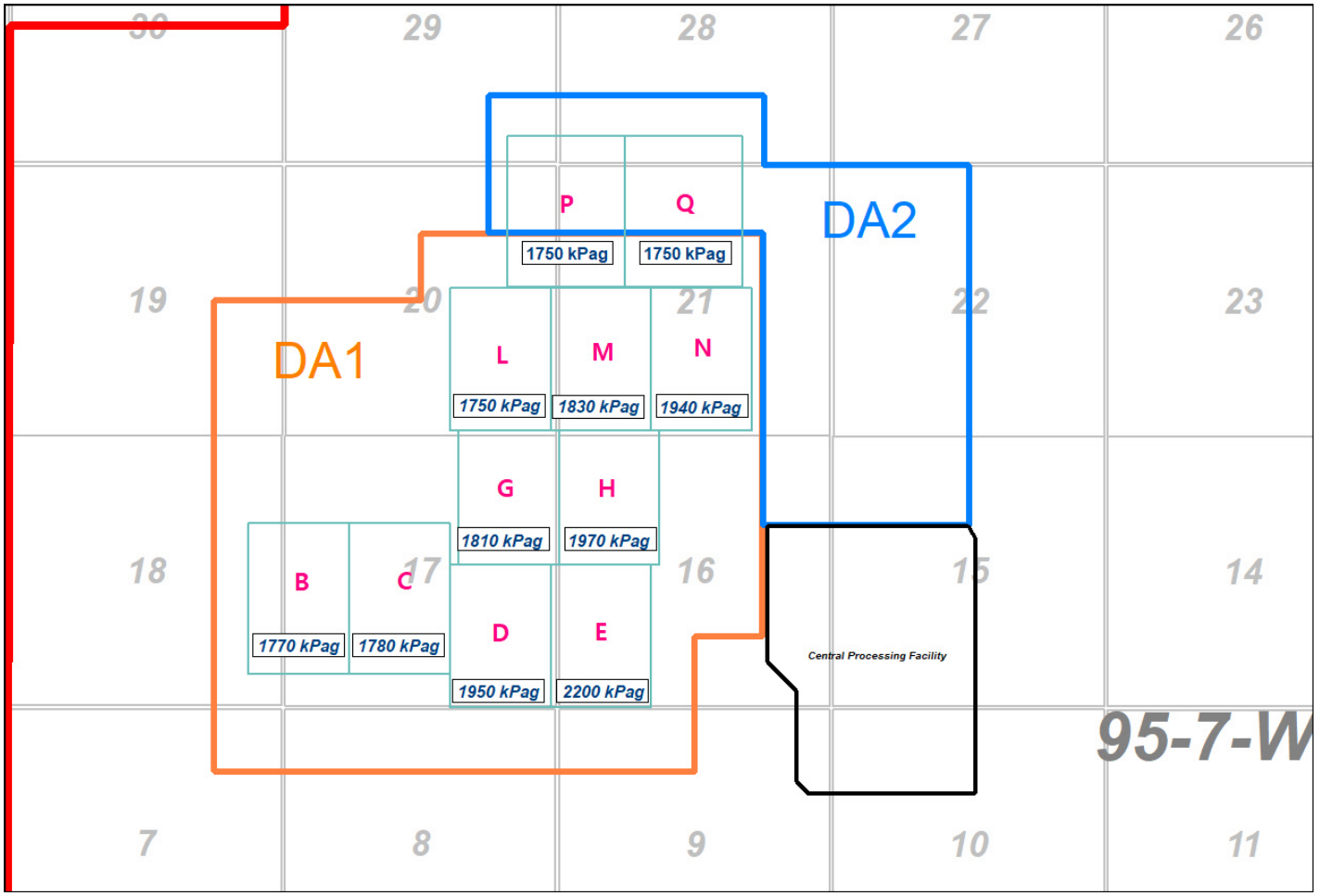
2. Geosciences

3D SEISMIC

- No 3D seismic program was conducted for the reporting period

2. Geosciences

APPROVED MAXIMUM OPERATING PRESSURE ON PRODUCING DRAINAGE PATTERNS

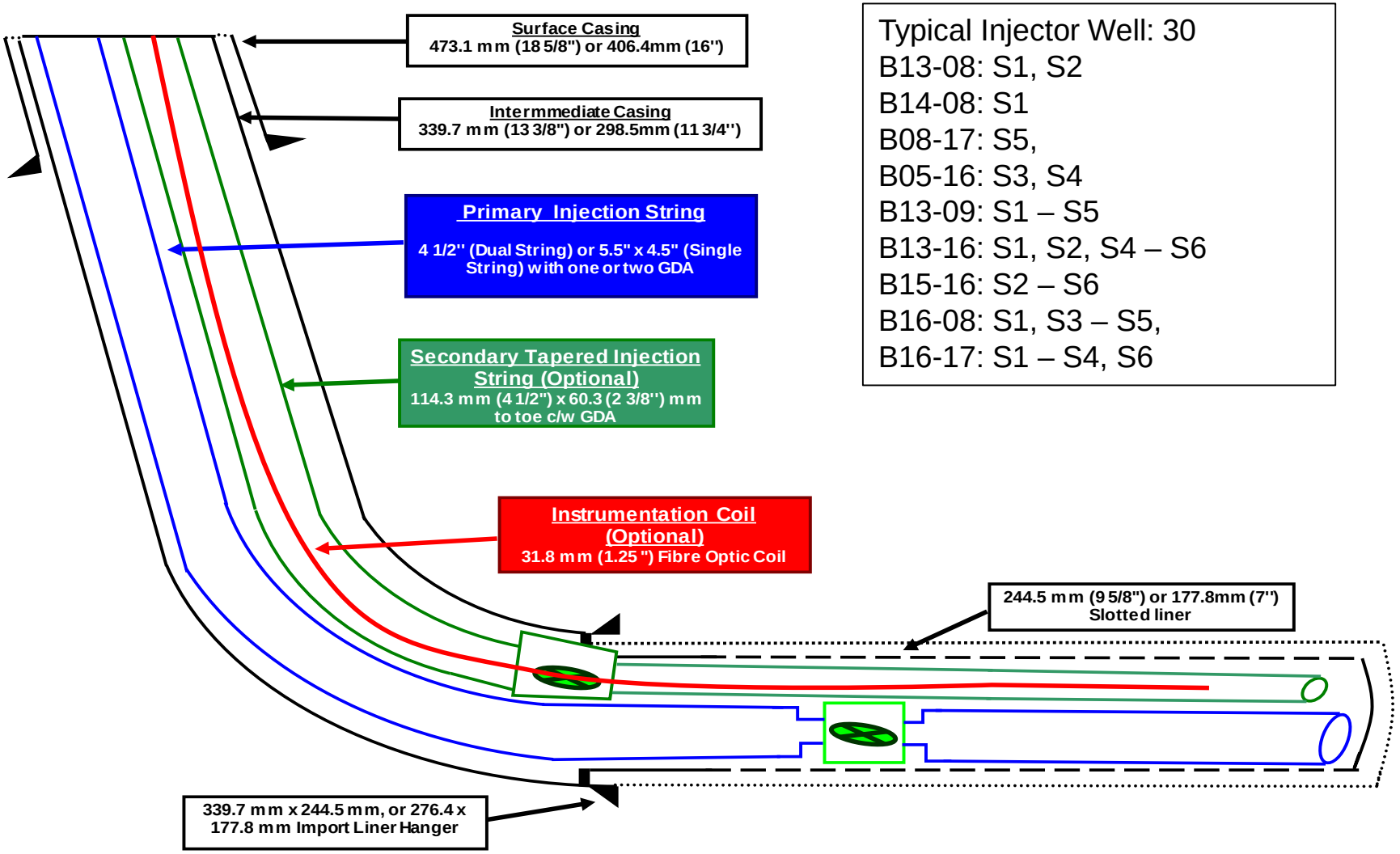


Legend

- Sunrise Mineral Lease Boundary
- Development Area 1 (DA1)
- Development Area 2 (DA2)
- Central Processing Facility (CPF)
- Drainage Patterns

3. Drilling and Completions

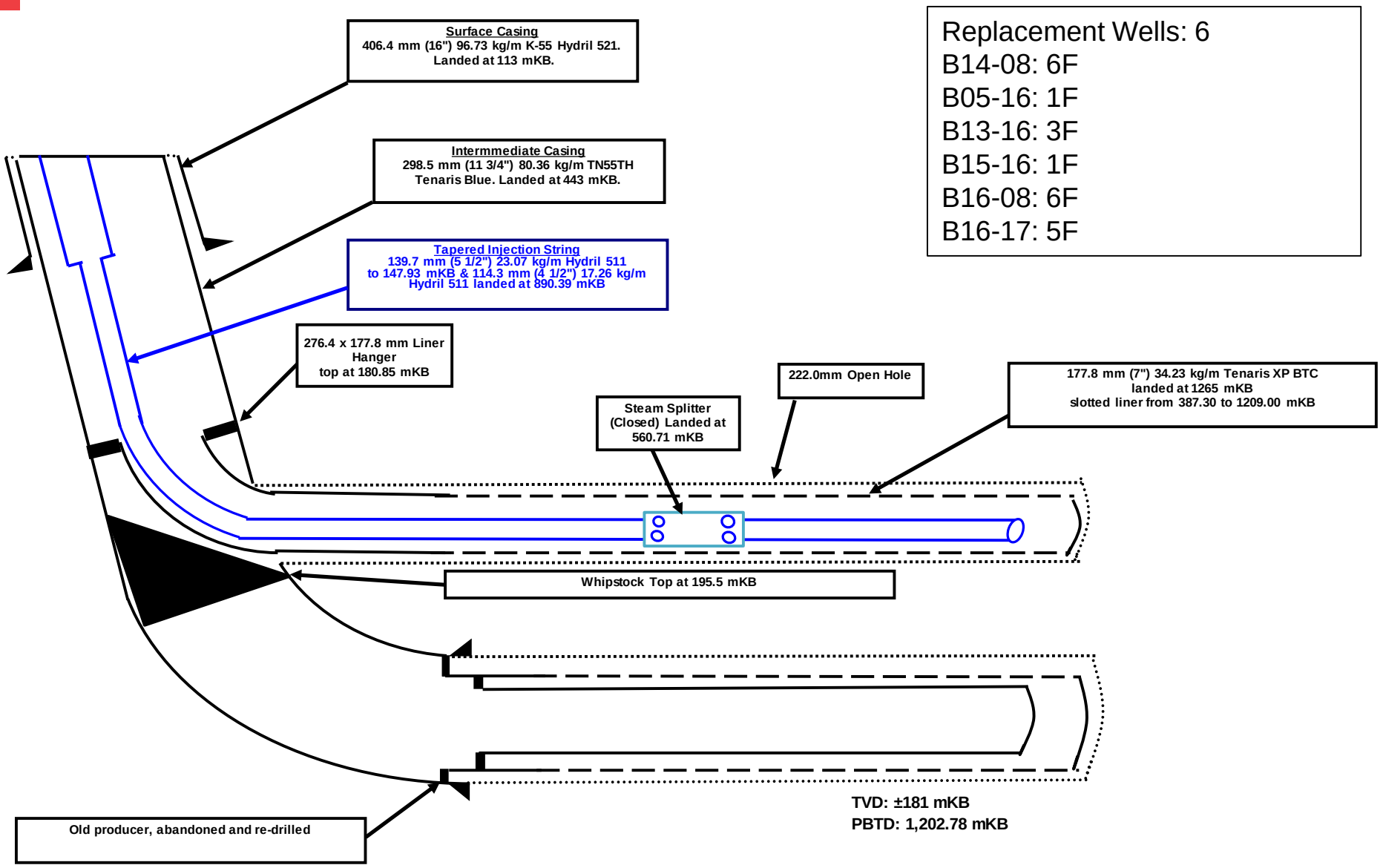
SAGD WELL DESIGN: TYPICAL INJECTOR WELL



Typical Injector Well: 30
B13-08: S1, S2
B14-08: S1
B08-17: S5,
B05-16: S3, S4
B13-09: S1 – S5
B13-16: S1, S2, S4 – S6
B15-16: S2 – S6
B16-08: S1, S3 – S5,
B16-17: S1 – S4, S6

3. Drilling and Completions

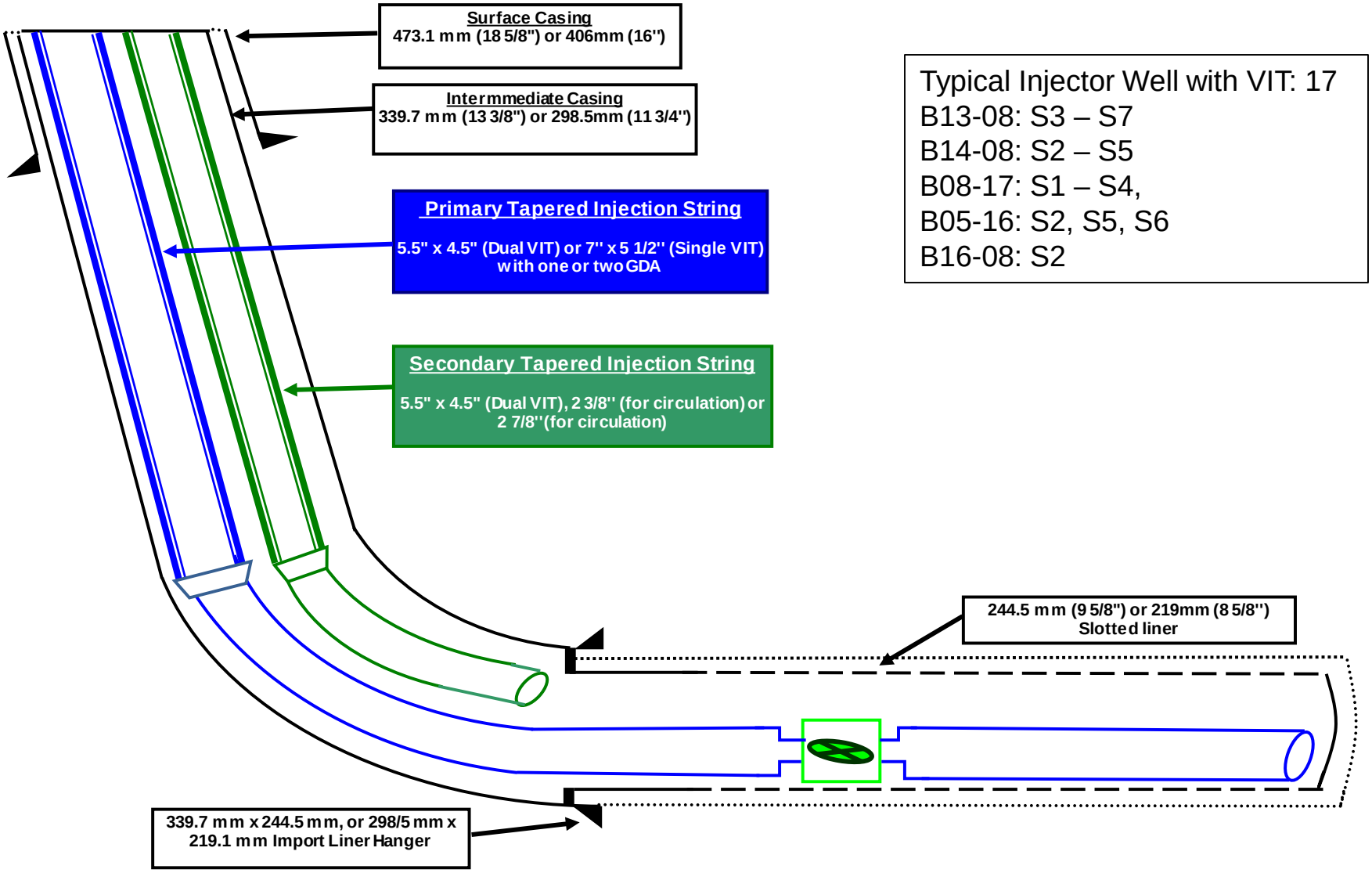
SAGD WELL DESIGN: FLIP WELL, INJECTOR



Replacement Wells: 6
B14-08: 6F
B05-16: 1F
B13-16: 3F
B15-16: 1F
B16-08: 6F
B16-17: 5F

3. Drilling and Completions

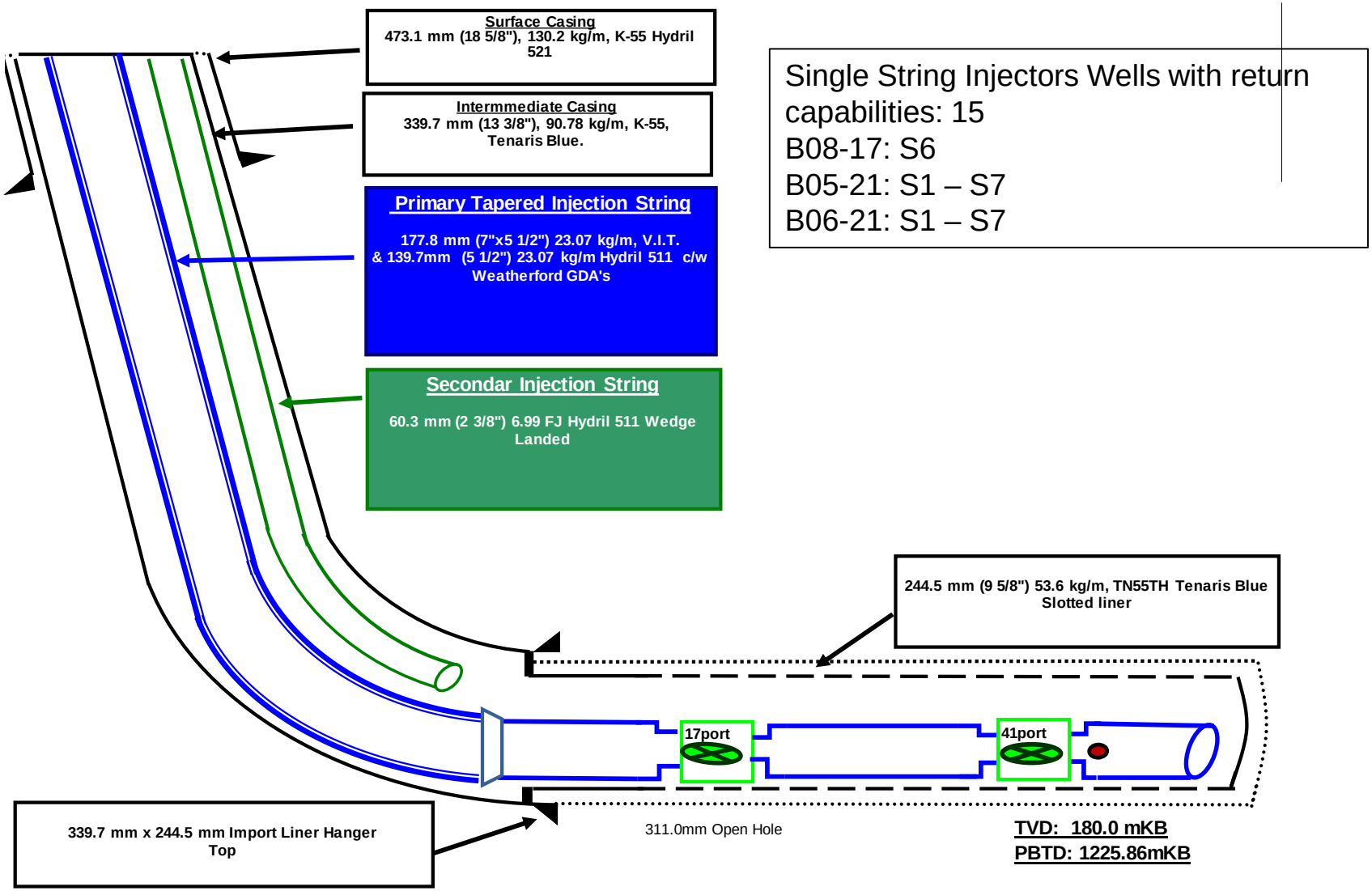
SAGD WELL DESIGN: INJECTOR WELL WITH VIT



Typical Injector Well with VIT: 17
B13-08: S3 – S7
B14-08: S2 – S5
B08-17: S1 – S4,
B05-16: S2, S5, S6
B16-08: S2

3. Drilling and Completions

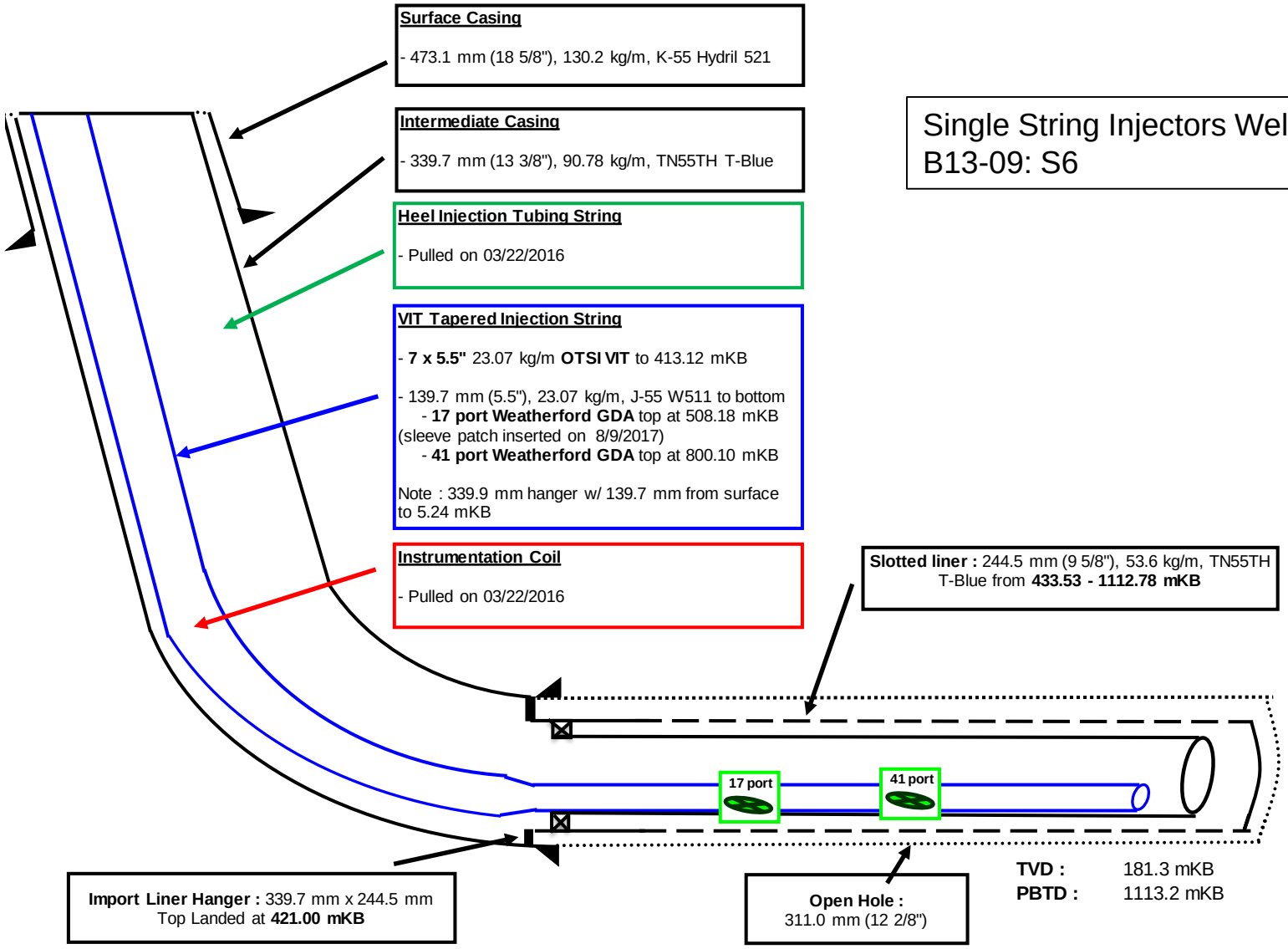
SAGD WELL DESIGN: SINGLE STRING INJECTION WITH RETURN CAPABILITIES



Single String Injectors Wells with return capabilities: 15
B08-17: S6
B05-21: S1 – S7
B06-21: S1 – S7

3. Drilling and Completions

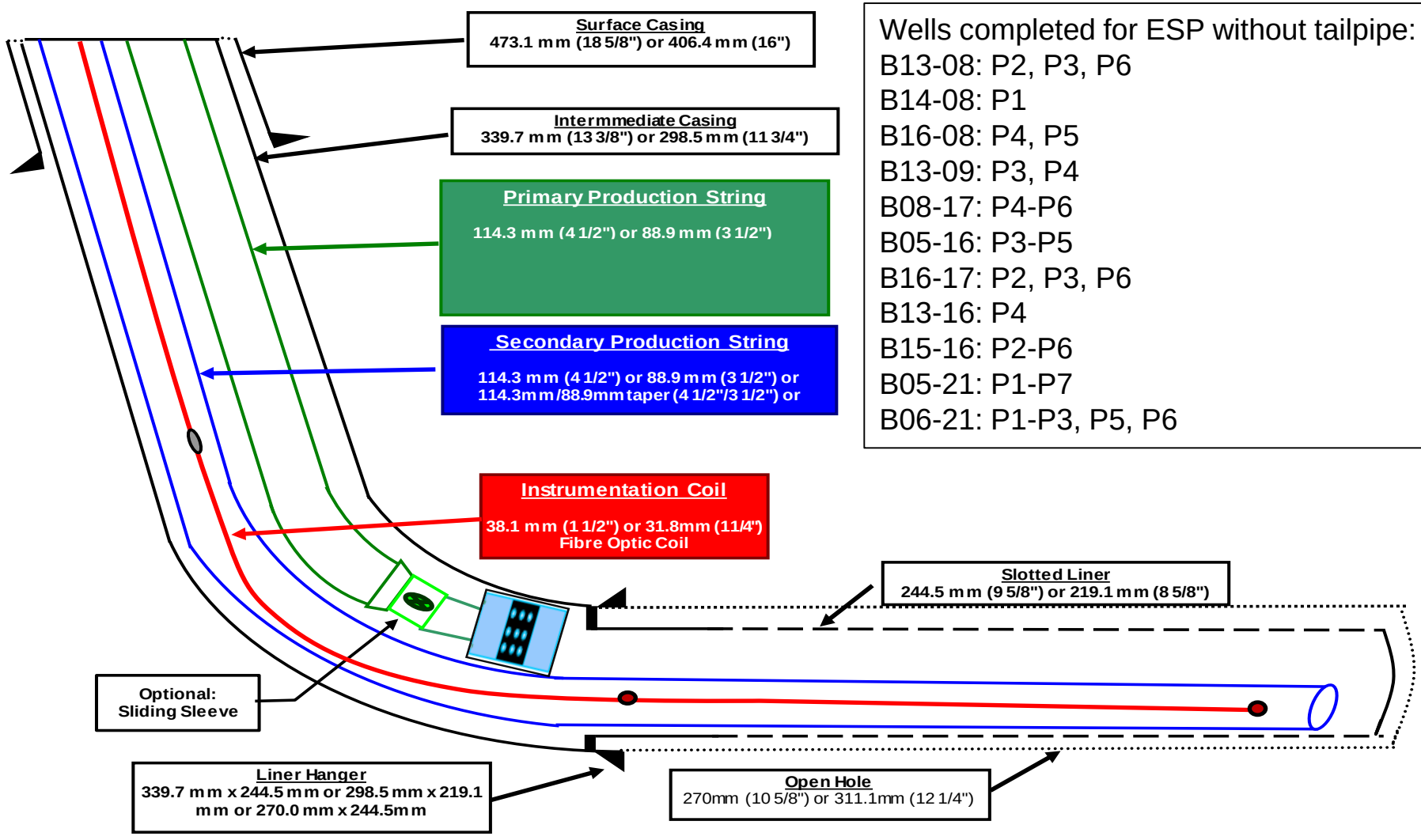
SAGD WELL DESIGN: SINGLE STRING COMPLETION



Single String Injectors Wells: 1
B13-09: S6

3. Drilling and Completions

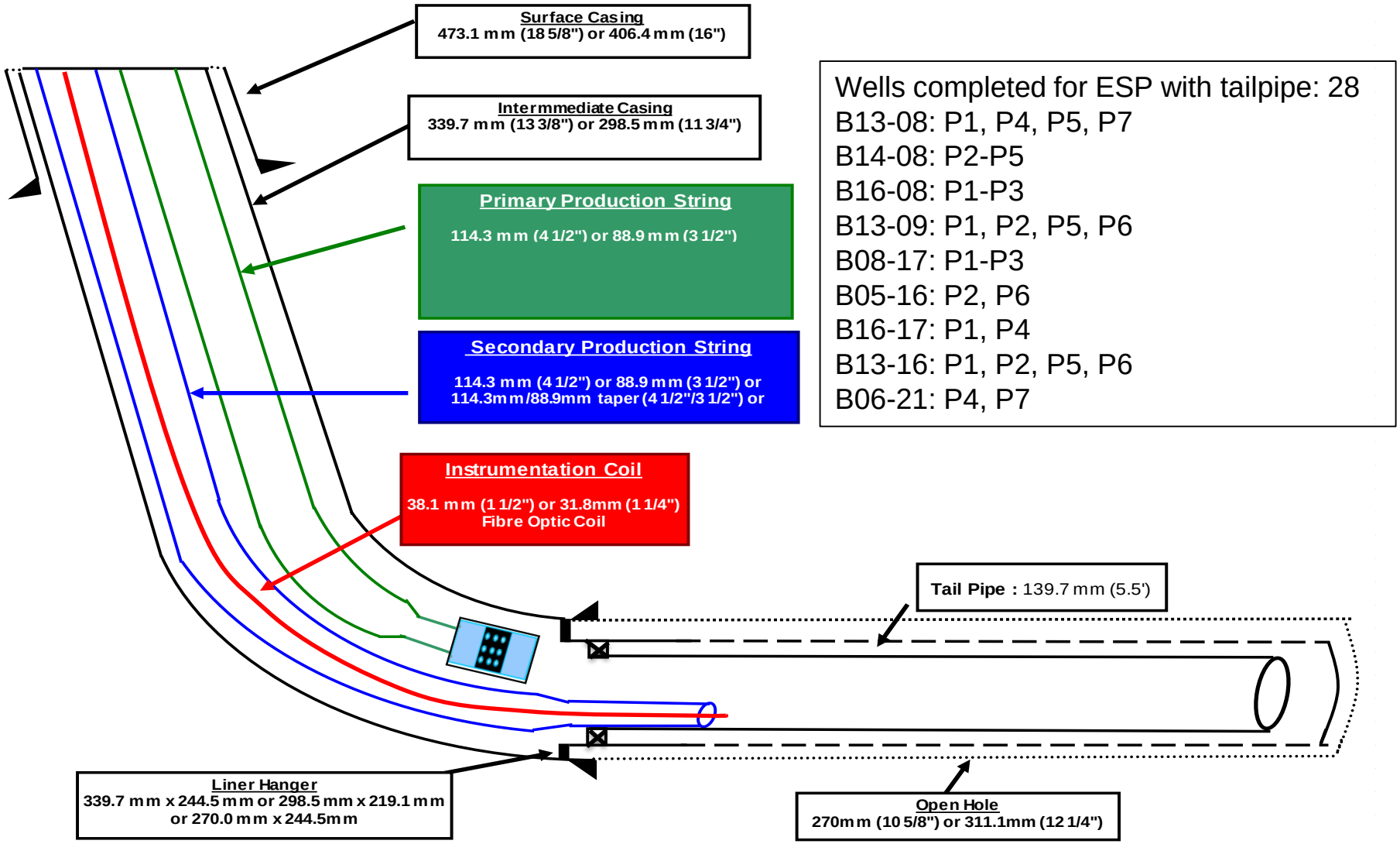
SAGD WELL DESIGN: PRODUCER WELL – ESP WITHOUT TAILPIPE



Wells completed for ESP without tailpipe: 35
B13-08: P2, P3, P6
B14-08: P1
B16-08: P4, P5
B13-09: P3, P4
B08-17: P4-P6
B05-16: P3-P5
B16-17: P2, P3, P6
B13-16: P4
B15-16: P2-P6
B05-21: P1-P7
B06-21: P1-P3, P5, P6

3. Drilling and Completions

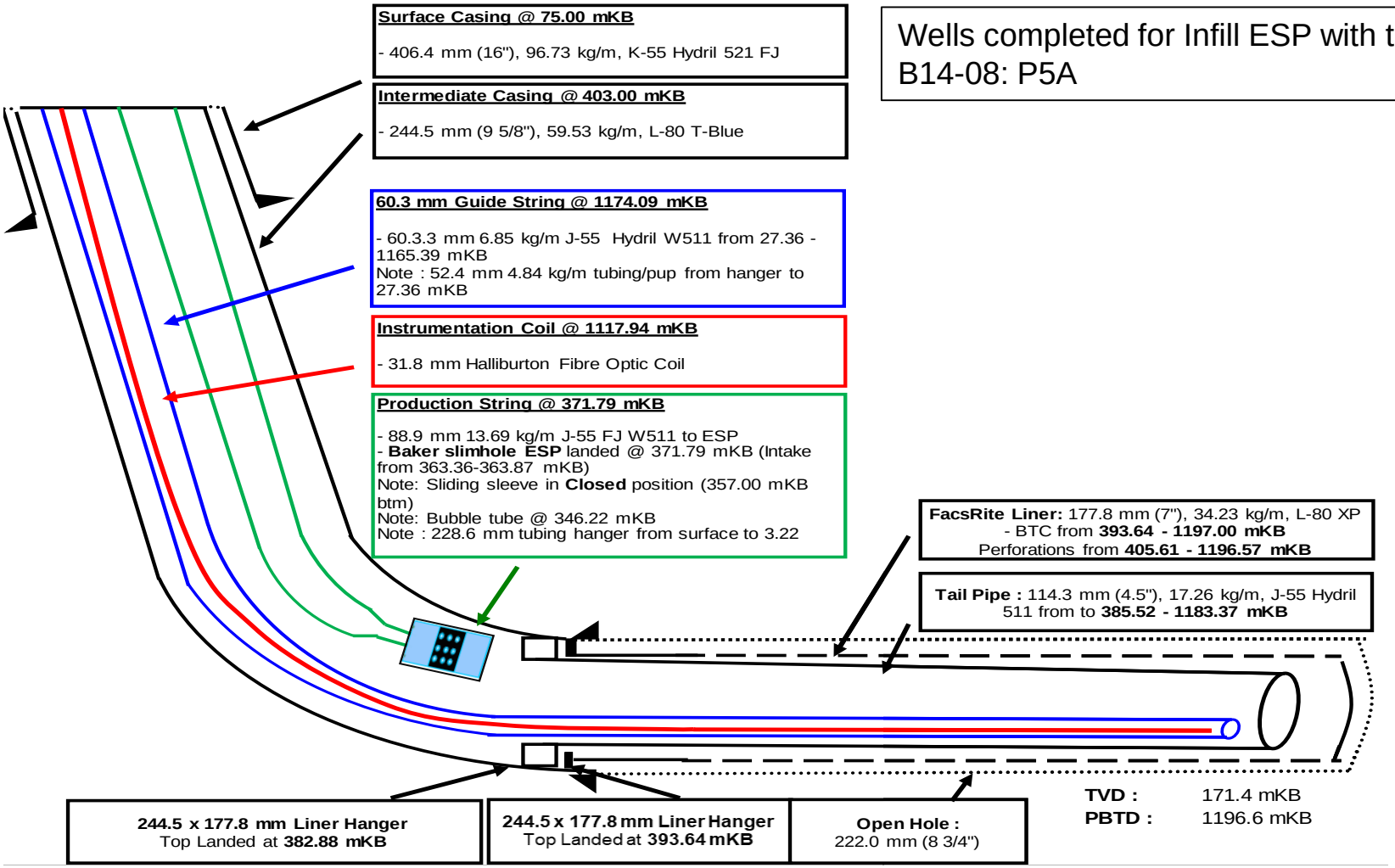
SAGD WELL DESIGN: PRODUCER WELL – ESP WITH TAIL PIPE



Wells completed for ESP with tailpipe: 28
B13-08: P1, P4, P5, P7
B14-08: P2-P5
B16-08: P1-P3
B13-09: P1, P2, P5, P6
B08-17: P1-P3
B05-16: P2, P6
B16-17: P1, P4
B13-16: P1, P2, P5, P6
B06-21: P4, P7

3. Drilling and Completions

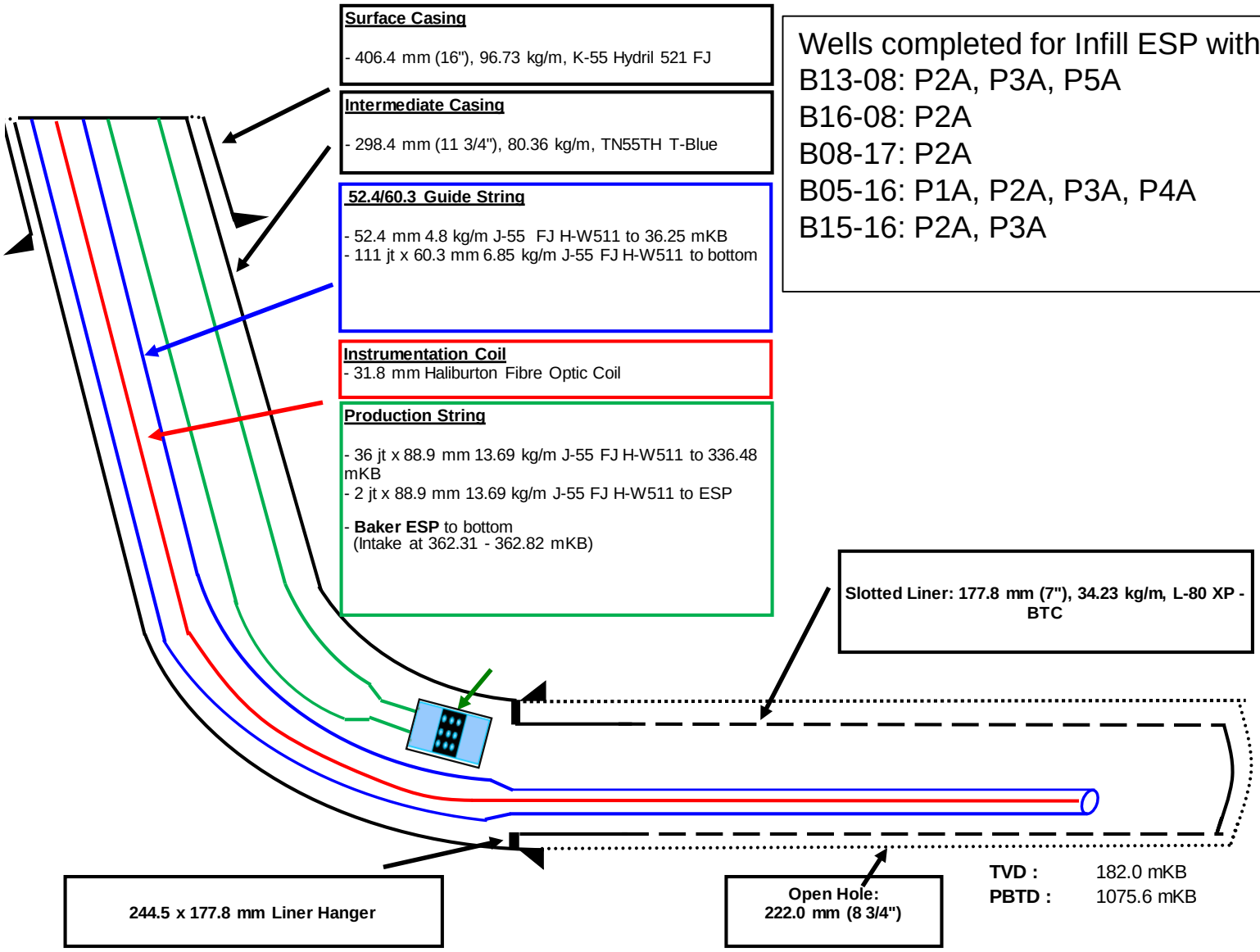
SAGD WELL DESIGN: INFILL WELL – ESP WITH TAIL PIPE



Wells completed for Infill ESP with tailpipe: 1
B14-08: P5A

3. Drilling and Completions

SAGD WELL DESIGN: INFILL WELL – ESP WITHOUT TAIL PIPE



Wells completed for Infill ESP without a tailpipe: 11
B13-08: P2A, P3A, P5A
B16-08: P2A
B08-17: P2A
B05-16: P1A, P2A, P3A, P4A
B15-16: P2A, P3A

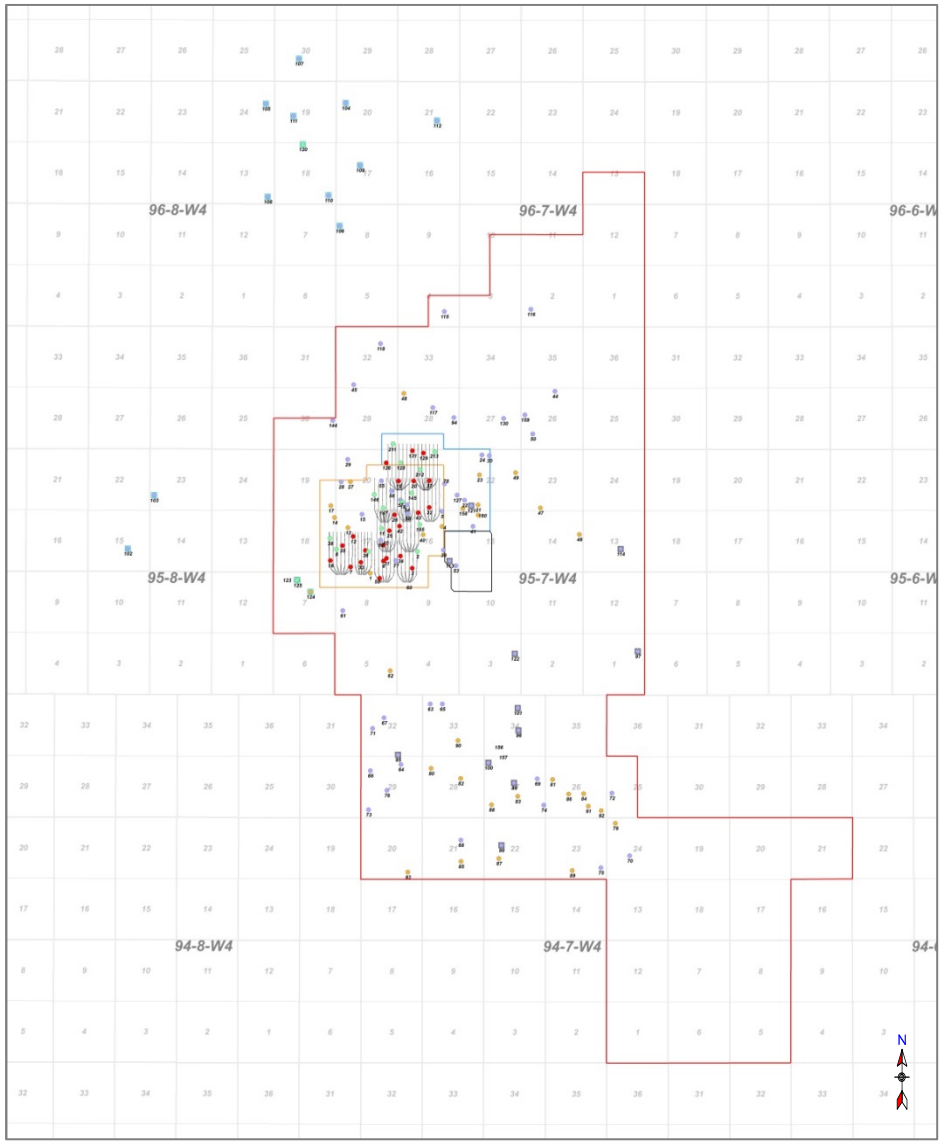
4. Artificial Lift

- All producer wells on SAGD mode are equipped with electric submersible pumps (ESPs)
- ESP operational parameters:
  - Bottom hole Pressure: 600 kPa – 1,700 kPa
  - Bottom hole Temperature: 120 – 200 ºC
  - Surface Temperature: 120 – 190 ºC
  - Emulsion Production rate: 200 – 1,600 m^3/day

ESP Production (81 wells)	**B13-08: P1 – P7, P2A, P3A, P5A** **B14-08: P1 – P5, P5A, S6** **B16-08: P1 – P5, P2A, S6** **B13-09: P1 – P6** **B08-17: P1 – P6, P2A** **B05-16: P1 – P6, P1A – P4A** **B13-16: P1, P2, P4 – P6, S3,** **B15-16: P2 – P6, P2A, P3A, S1** **B16-17: P1 – P4, S5, P6** **B05-21: P1 – P7** **B06-21: P1 – P7**

5. Instrumentation in Wells

OBSERVATION WELLS MAP



Legend

- Sunrise Lease Area
- Development Area 1 (DA1)
- Development Area 2 (DA2)
- Central Processing Facility (CPF)
- Drilled Horizontal Well
- Proposed Horizontal Well
- Temperature Sensor
- Pressure & Temperature
- Pressure Sensor
- Cased No Instrument
- Water Disposal Well
- Water Source Well

5. Instrumentation in Wells

OBSERVATION WELLS LIST

New Well Name	License Number	Downhole Instrumentation - Piezometers (P) or Pressure/Temperature Gauge (PG)	Downhole Instrumentation - Thermocouples	Spud Date
HUSKY OB-1 STEEPBK 15-8-95-7	0387616			24/01/2008
HUSKY OB-2 STEEPBK 6-16-95-7	0388000	P (5)	T	23/02/2008
HUSKY OB-3 STEEPBK 4-16-95-7	0387999		T	21/01/2008
HUSKY OB-4 STEEPBK 10-16-95-7	0387993	Cased	Cased	11/01/2008
HUSKY OB-5 STEEPBK 15-16-95-7	0387992	P (5)		26/02/2008
HUSKY OB-6 STEEPBK 1-17-95-7	0387662		T	05/01/2008
HUSKY OB-7 STEEPBK 4-17-95-7	0388001		T	15/01/2008
HUSKY OB-8 STEEPBK 5-17-95-7	0387994	P (5)	T	11/02/2008
HUSKY OB-9 STEEPBK 7-17-95-7	0388098	P (5)	T	16/02/2008
HUSKY OB-10 STEEPBK 8-17-95-7	0388099		T	07/01/2008
HUSKY OB-11 STEEPBK 10-17-95-7	0388100	P (4) + B.T. (1)	T	20/02/2008
HUSKY OB-12 STEEPBK 11-17-95-7	0388101		T	12/01/2008
HUSKY OB-13 STEEPBK 12-17-95-7	0388102	Cased	Cased	17/01/2008
HUSKY OB-14 STEEPBK 16-18-95-7	0387991	Cased	Cased	21/01/2008
HUSKY OB-15 STEEPBK 14-17-95-7	0323815	P (5) + B.T. (1)	cemented	27/06/2005
HUSKY OB-16 STEEPBK 1-18-95-7	0387995		T	05/02/2008
HUSKY OB-17 STEEPBK 1-19-95-7	0388807	Cased	Cased	10/03/2008
HUSKY OB-18 STEEPBK 4-21-95-7	0388806	P (3)	T	02/03/2008
HUSKY OB-19 STEEPBK 5-21-95-7	0388805		T	12/03/2008
HUSKY OB-20 STEEPBK 6-21-95-7	0388808		T	10/03/2008
HUSKY OB-21 STEEPBK 3-22-95-7	0388104	Cased	Cased	07/02/2008
HUSKY OB-22 STEEPBK 4-22-95-7	0391296	P (8)		04/03/2008
HUSKY OB-23 STEEPBK 11-22-95-7	0388105	Cased	Cased	04/02/2008
HUSKY OB-24 STEEPBK 14-22-95-7	0388106	PG		04/03/2008
HUSKY OB-25 STEEPBK 9-17-95-7	0430827		T	10/02/2011
HUSKY OB-26 STEEPBK 16-17-95-7	0428000		T	22/01/2011
HUSKY OB-27 STEEPBK 5-20-95-7	0428458	Cased	Cased	12/01/2011
HUSKY OB-28 STEEPBK 5-20-95-7	0428380	P (5)		06/01/2011
HUSKY OB-29 STEEPBK 13-20-95-7	0428593	P (5)		06/01/2011
HUSKY OB-30 STEEPBK 14-22-95-7	0430161	PG		17/02/2011
HUSKY OB-31 STEPK 1-17-95-7	0428815		T	05/02/2011
HUSKY OB-32 STEEPBK 2-21-95-7	0428146		T	12/02/2011
HUSKY OB-33 STEEPBK 3-17-95-7	0428809		T	20/01/2011
HUSKY OB 34 STEEPBK 5-16-95-7	0428818		T	01/02/2011
HUSKY OB-35 STEEPBK 5-17-95-7	0428145		T	16/01/2011
HUSKY OB-36 STEEPBK 6-17-95-7	0428403		T	08/02/2011
HUSKY OB-37 STEPBK 7-21-95-7	0428399		T	15/02/2011
HUSKY OB-38 STEEPBK 9-18-95-7	0428404	P (5)	T	11/01/2011
HUSKY OB-39 STEEPBK 7-16-95-7	0439378	P (5)		04/01/2012
HUSKY OB-40 STEEPBK 11-16-95-7	0428256	Cased	Cased	06/02/2011
HUSKY OB-41 STEEPBK 12-15-95-7	0429570	P (5)		16/01/2011
HUSKY OB-42 STEEPBK 12-16-95-7	0428713		T	13/02/2011
HUSKY OB-43 STEEPBK 14-16-95-7	0428111		T	01/02/2011
HUSKY OB-44 STEEPBK 15-26-95-7	0430112	PG		19/02/2011
HUSKY OB-45 STEEPBK 3-32-95-7	0430049	PG		07/03/2011
HUSKY OB-46 STEEPBK 9-14-95-7	0430158	Cased	Cased	22/03/2011
HUSKY OB-47 STEEPBK 3-23-95-7	0430887	Cased	Cased	15/03/2011
HUSKY OB-48 STEEPBK 13-28-95-7	0429927	Cased	Cased	03/03/2011
HUSKY OB-49 STEEPBK 9-22-95-7	0430163	Cased	Cased	18/03/2011
HUSKY OB-50 STEEPBK 4-26-95-7	0430160	PG		21/02/2011
HUSKY OB-51 MFOB D STEEPBK 14-17-9	0343952	P (8)	cemented	07/01/2006
HUSKY OB-52 STEEPBK 10-17-95-7	0323817	P (5) + B.T. (1)	cemented	06/02/2005
HUSKY OB-53 C STEEPBK 1-16-95-7	0343949	P (4)	cemented	15/12/2005
HUSKY OB-54 1Y01 STEEPBK 4-21-95-7	0417750	P (2)	cemented	16/02/2010
HUSKY OB-55 1AB STEEPBK 7-20-95-7	0417694	P (2)	cemented	26/01/2010
HUSKY OB-56 STEEPBK 8-20-95-7	0418062	P (2)	cemented	21/02/2010
HUSKY OB-57 1Y6 STEEPBK 4-21-95-7	0417837	P (2)	cemented	02/02/2010
HUSKY OB-58 1Y7 STEEPBK 13-16-95-7	0417754	P (2)	cemented	11/02/2010
HUSKY OB-59 STEEPBK 15-8-95-7	Y0002686		T	22/03/1964
HUSKY OB-60 B 13-9 PS STEEPBK 4-16-9	0434958		T	10/02/2011
HUSKY OB-61 STEPBK 5-8-95-7	0441331	PG		06/02/2012
HUSKY OB-62 STEEPBK 8-5-95-7	0440567	Cased	Cased	14/02/2012
HUSKY OB-63 STEEPBK 13-33-94-7	0452132	P (2)		17/03/2013
HUSKY OB-64 STEEPBK 15-29-94-7	0452096	P (4)		09/03/2013
HUSKY OB-65 STEEPBK 14-33-94-7	0452081	P (3)		26/03/2013
HUSKY OB-66 STEEPBK 13-29-94-7	0451950	P (4)		13/03/2013
HUSKY OB-67 STEEPBK 11-32-94-7	0451966	P (3)		13/03/2013
HUSKY OB-68 STEEPBK 10-21-94-7	0451963	P (3)		25/02/2013
HUSKY OB-69 STEEPBK 9-27-94-7	0452011	P (3)		04/03/2013
HUSKY OB-70 STEEPBK 6-24-94-7	0453872	P (3)		25/02/2013
HUSKY OB-71 STEEPBK 5-32-94-7	0452211	P (3)		08/03/2013
HUSKY OB-72 STEEPBK 5-25-94-7	0452259	P (3)		10/01/2013
HUSKY OB-73 STEEPBK 4-29-94-7	0453641	P (3)		20/02/2013
HUSKY OB-74 STEEPBK 1-27-94-7	0451935	P (3)		03/03/2013
HUSKY OB-75 STEEPBK 1-23-94-7	0451815	P (3)		19/02/2013
HUSKY OB-76 STEEPBK 6-29-94-7	0451933	P (3)		17/03/2013
HUSKY OB-77 STEEPBK 1-17-95-7	0452022	P (3)	T	03/01/2013
HUSKY OB-78 STEPBK B-21-95-7	0451944	P (3)		09/01/2013
HUSKY OB-79 STEEPBK 13-24-94-7	0451938	Cased	Cased	17/02/2013
HUSKY OB-80 STEEPBK 13-28-94-7	0451945	Cased	Cased	03/03/2013
HUSKY OB-81 STEEPBK 12-26-94-7	0452023	Cased	Cased	12/02/2013
HUSKY OB-82 STEEPBK 10-28-94-7	0451937	Cased	Cased	07/03/2013
HUSKY OB-83 STEEPBK 7-27-94-7	0452215	Cased	Cased	04/01/2013
HUSKY OB-84 STEEPBK 7-26-94-7	0451970	Cased	Cased	18/01/2013
HUSKY OB-85 STEEPBK 7-21-94-7	0452021	Cased	Cased	20/02/2013
HUSKY OB-86 STEEPBK 6-26-94-7	0452084	Cased	Cased	07/02/2013
HUSKY OB-87 STEEPBK 5-22-94-7	0452024	Cased	Cased	02/03/2013
HUSKY OB-88 STEEPBK 4-27-94-7	0452083	Cased	Cased	11/01/2013
HUSKY OB-89 STEEPBK 3-23-94-7	0452029	Cased	Cased	15/02/2013
HUSKY OB-90 STEEPBK 7-33-94-7	0453639	Cased	Cased	06/03/2013
HUSKY OB-91 STEEPBK 2-26-94-7	0453807	Cased	Cased	26/02/2013
HUSKY OB-92 STEEPBK 1-26-94-7	0452210	Cased	Cased	22/02/2013
HUSKY OB-93 STEEPBK 1-20-94-7	0451942	Cased	Cased	15/02/2013
HUSKY OB-94 STEEPBK 9-28-95-7	0451951	PG		04/01/2013
HUSKY KR-OB-95 STEEPBK 2-32-94-7	0452332	P(2)		24/02/2013
HUSKY KR-OB-96 STEEPBK 7-34-94-7	0452291	P(2)		04/02/2013
HUSKY KR-OB-97 STEEPBK 9-1-95-7	0452736	P(2)		12/02/2013
HUSKY KR-OB-98 STEEPBK 11-22-94-7	0452280	P(2)		25/01/2013
HUSKY KR-OB-99 STEEPBK 11-27-94-7	0452270	P(2)		25/01/2013
HUSKY KR-OB-100 STEEPBK 13-27-94-7	0452281	P(2)		18/01/2013
HUSKY KR-OB-101 STEEPBK 15-34-94-7	0452269	P(2)		31/01/2013
HUSKY SRC-OB-102 SUNRISE 7-15-95-8	0373494	P (2)		09/02/2007
HUSKY SRC-OB-103 SUNRISE 5-23-95-8	0373506	P (3)		13/02/2007
HUSKY SRC-OB-104 SUNRISE 12-20-96-7	0389637	P (2)		26/01/2008
HUSKY SRC-OB-105 SUNRISE 9-24-96-8	0363115	P (2)		18/09/2006
HUSKY SRC-OB-106 SUNRISE 12-8-96-7	0362523	P (2)		13/09/2006
HUSKY SRC-OB-107 SUNRISE 6-30-96-7	0389630	P (2)		14/02/2008
HUSKY SRC-OB-108 SUNRISE 1-13-96-8	0391346	P (2)		19/02/2008
HUSKY SRC-OB-109 SUNRISE 11-17-96-7	0389636	P (2)		19/01/2008
HUSKY SRC-OB-110 SUNRISE 1-18-96-7	0362866	P (2)		15/09/2006
HUSKY SRC-OB-111 SUNRISE 6-19-96-7	0362577	P (2)		13/09/2006
HUSKY SRC-OB-112 SUNRISE 7-21-96-7	0389635	P (2)		03/02/2008
HUSKY KR-OB-113 A2L STEEPBK 1-16-95	0316284	P		22/10/2004
HUSKY KR-OB-114 STEEPBK 7-13-95-7	0305423	P		15/03/2004
HUSKY PM-OB-115 STEEPBK 1-4-96-7	0452212	P (3)		14/03/2013
HUSKY PM-OB-116 STEEPBK 5-2-96-7	0452226	P (3)		10/03/2013
HUSKY PM-OB-117 STEEPBK 10-28-95-7	0453724	P (3)		12/03/2013
HUSKY PM-OB-118 STEEPBK 10-32-95-7	0453768	P (3)		18/03/2013
HUSKY SWS-OB-119 SUNRISE 9-21-93-9	0442976	Cased	Cased	25/02/2012
HUSKY SRC-OB-120 SUNRISE 14-18-96-7	0362870	P (2)		17/09/2006
HUSKY SWD-OB-121 STEEPBK 4-22-95-7	0431972	PG		15/03/2011
HUSKY SWD-OB-122 STEEPBK 9-3-95-7	0431974	PG		24/03/2011
HUSKY SRC-OB-123 STEEPBK 14-7-95-7	0304979	PG		14/03/2004
HUSKY SRC-OB-124 STEEPBK 10-7-95-7	0304964	Cased	Cased	09/03/2004
HUSKY SRC-OB-125 STEEPBK 14-7-95-7	0305114	Cased	Cased	15/03/2004
HUSKY OB-126 STEEPBK 16-20-95-7	0461747		T	11/01/2014
HUSKY OB-127 STEEPBK 8-21-95-7	0461748	P (6)		18/02/2014
HUSKY OB-128 STEEPBK 13-21-95-7	0461549	P (6)	T	16/01/2014
HUSKY OB-129 STEEPBK 14-21-95-7	0461765		T	20/01/2014
HUSKY OB-130 STEEPBK 10-27-95-7	0462203	PG		07/01/2014
HUSKY OB-131 STEEPBK 13-21-95-7	0461937		T	28/01/2014
HUSKY OB-144 STEEPBK 8-30-95-7	0462043	P (4)		03/03/2014
HUSKY OB-145 STEEPBK 5-21-95-7	0462143	P (6)	T	21/01/2014
HUSKY OB- 146 STEPBK 7-20-95-7	0462141	P (6)	T	26/01/2014
HUSKY OB- 147 STEEPBK 1-20-95-7	0462142	P (5)	T	14/02/2014
HUSKY OB-155 STEEPBK 14-16-95-7	0462196	P (5)	T	11/02/2014
HUSKY KR-OB-156 STEEPBK 4-34-94-7	0462294	PG		31/01/2014
HUSKY KR-OB-157 STEEPBK 3-34-94-7	0462372	PG		05/02/2014
HUSKY OB-158 STEEPBK 4-22-95-7	0462359	Cased	Cased	03/02/2014
HUSKY OB-159 STEEPBK 12-26-95-7	0462065	PG		07/01/2014
HUSKY OB-160 STEEPBK 14-15-95-7	0461803	Cased	Cased	08/02/2014
HUSKY OB-211 STEEPBK 1-29-95-7	0481495	P (6)	T	02/16/2017
HUSKY OB-212 STEEPBK 11-21-95-7	0481496	P (6)	T	02/23/2017
HUSKY OB-213 STEEPBK 15-21-95-7	0480952	P (6)	T	02/19/2017

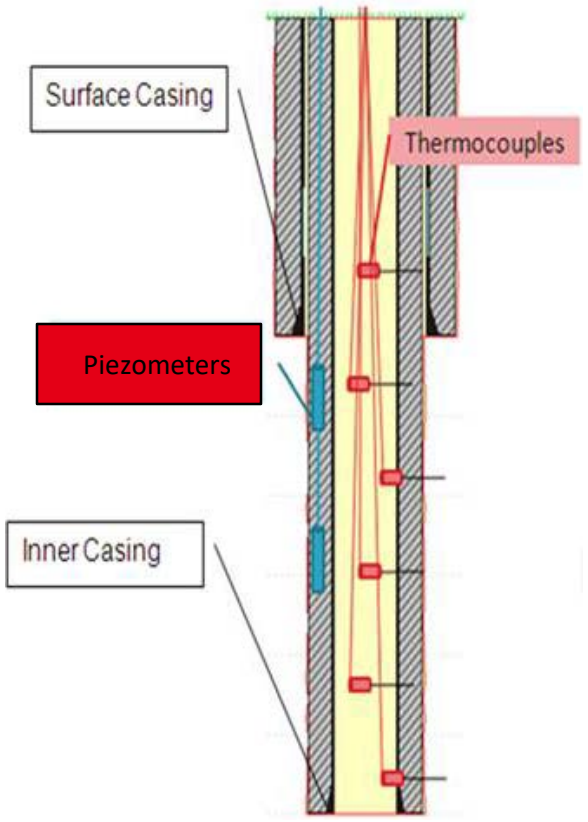
5. Instrumentation in Wells

OBSERVATION WELL

- 84 OBS Wells with Instrumentation:
  - 24 wells with thermocouple only
  - 46 wells with piezometer only
  - 15 wells with piezometer and thermocouples

- 68 OBS Wells connected to SCADA:
  - 23 wells with thermocouple only
  - 30 wells with piezometers only
  - 15 wells with piezometer and thermocouples

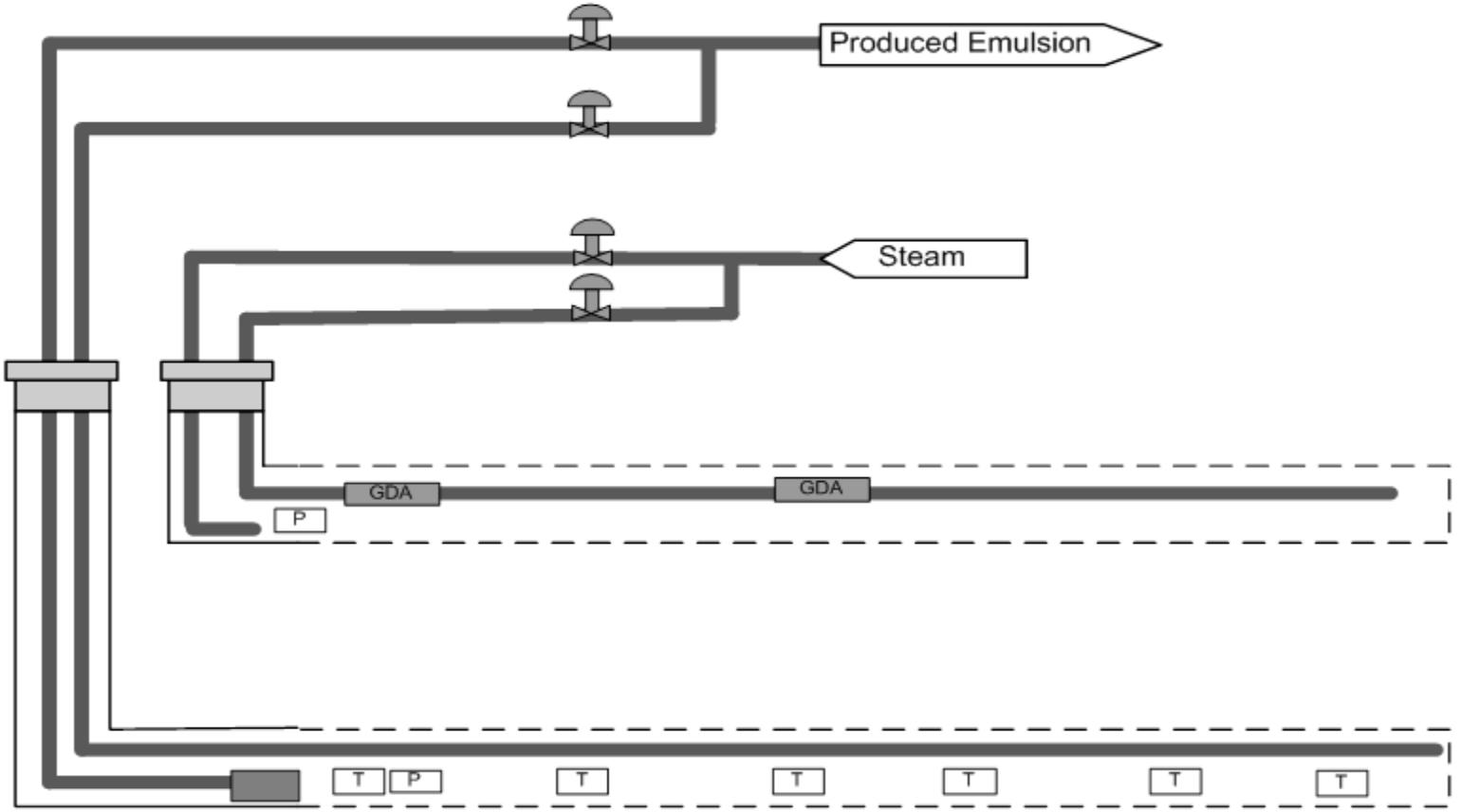
- Thermocouples: Up to 24 thermocouples per well, the majority of which are placed across the pay interval
- Piezometers: Up to 8 piezometers per well. Cemented behind casing. Placed within the Clearwater, Wabiskaw, IHS and/or the McMurray Intervals



Typical SAGD Observation Well

5. Instrumentation in Wells

TEMPERATURE AND PRESSURE MEASUREMENT – ESP



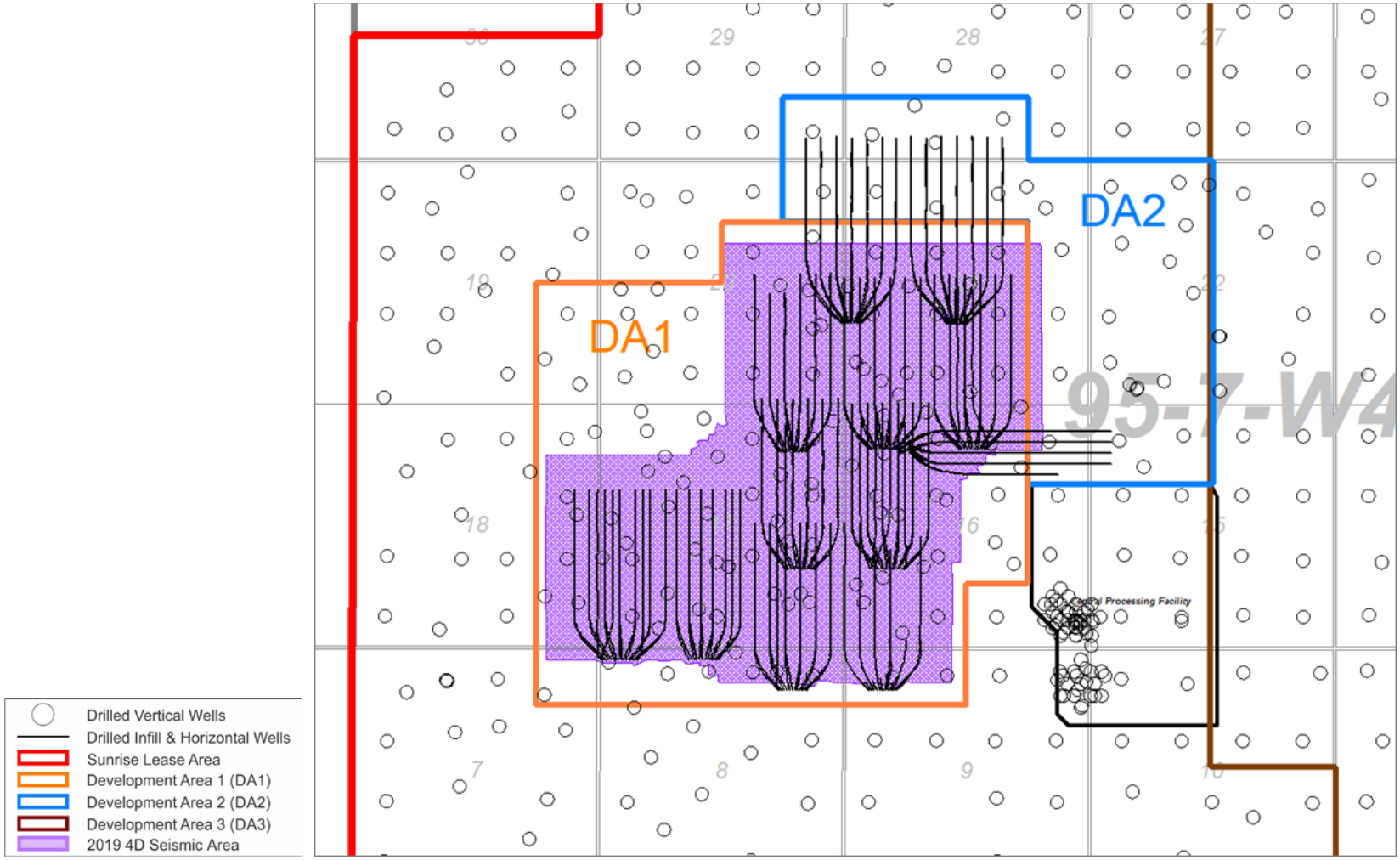
Legend

GDA	Gravity Drainage Accessory
P	Pressure Measurement
T	Temperature Measurement

6. 4D Seismic

4D SEISMIC DATA

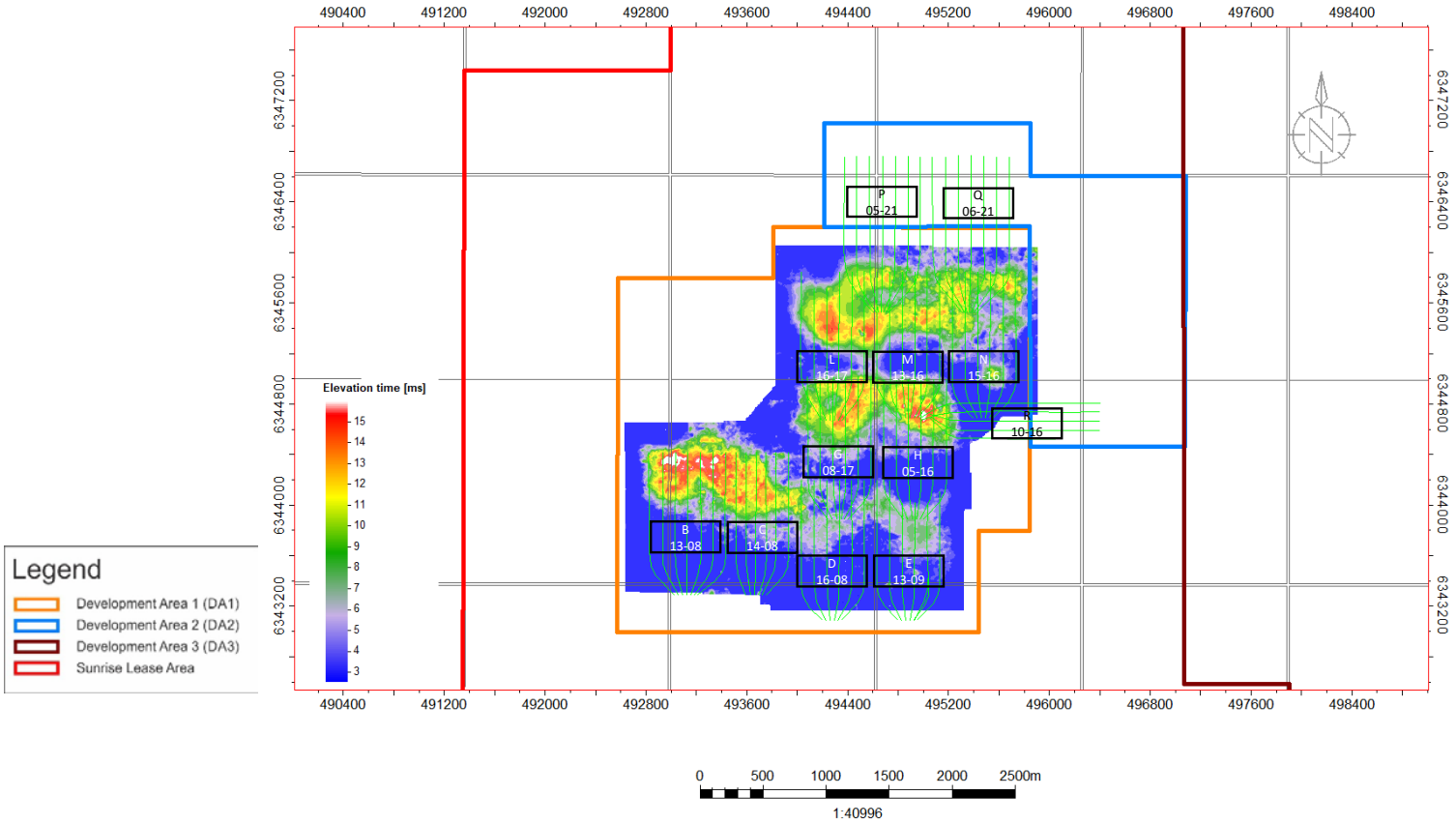
- Conducted 4D seismic program over 9 producing well pads in DA1



6. 4D Seismic

4D SEISMIC DATA

- The 4D seismic conducted in 2019 is still being evaluated. Based on initial interpretations, one component is the time delay map on the Devonian unconformity under the entire reservoir interval. This correlates with the steam chamber thickness within the reservoir. As seen below, increasing delay time in milliseconds (ms) corresponds to increased steam chamber development



7. Scheme Performance

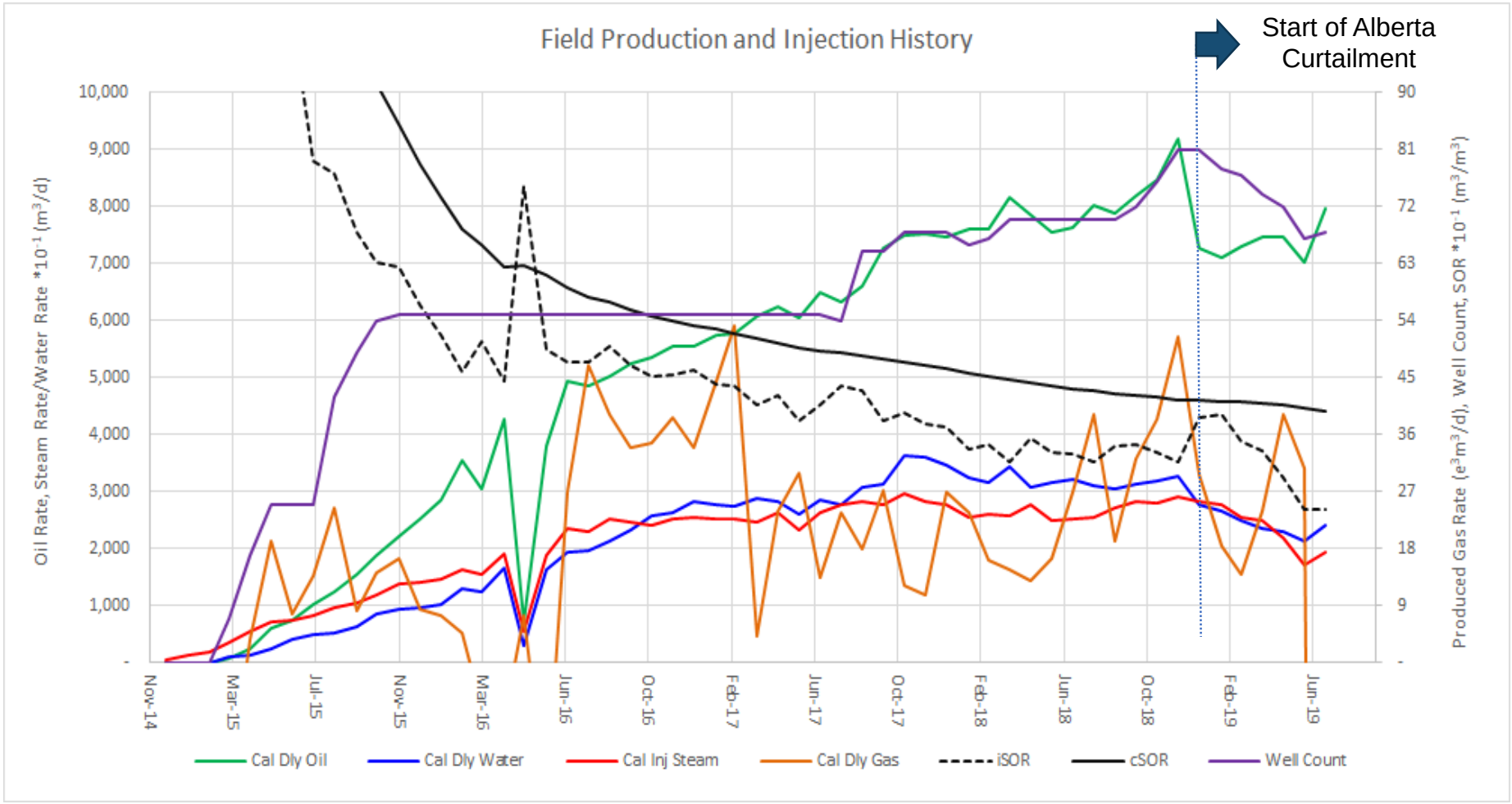
SCHEME PERFORMANCE PREDICTION METHODOLOGY

- Current performance prediction built on:
  - Actual performance
  - Analysis of analogous SAGD projects
  - Updated geological model supplemented with simulation and analytical models

- Simulation and Analytical models will be periodically history matched to actual performance

7. Scheme Performance

FIELD PRODUCTION AND INJECTION HISTORY



7. Scheme Performance

PRODUCTION

- Highest monthly bitumen production rate during the reporting period was 9,187 m^3/d
- The cumulative oil production for the reporting period was 2,840,141 m^3
- Most of producing well pairs in the 9 DA1 pads are at or close to peak rate; however, production adjustments to meet allocated targets required under provincial curtailment does not allow full well potential to be observed
- 55 well pairs in DA1, 14 well pairs (Pads B05-21 (P) and B06-21 (Q)) in DA2and 2 infill wells (B5A and C5A) on production during the reporting period. 10 new infills (B2A, B3A, D2A, G2A, H1A, H2A, H3A, H4A, N2A, N3A) started up
- Start-up of infill wells required some amount of steam; however, infill well start-up times were relatively short
- Infill wells are performing as expected
- The average Steam Oil Ratio (SOR): 3.24 m^3 CWE/m^3
- As of July 31, 2019 the cumulative SOR: 3.97 m^3 CWE/m^3
- The cumulative SOR is expected to continue to drop as bitumen production at lower iSOR continues

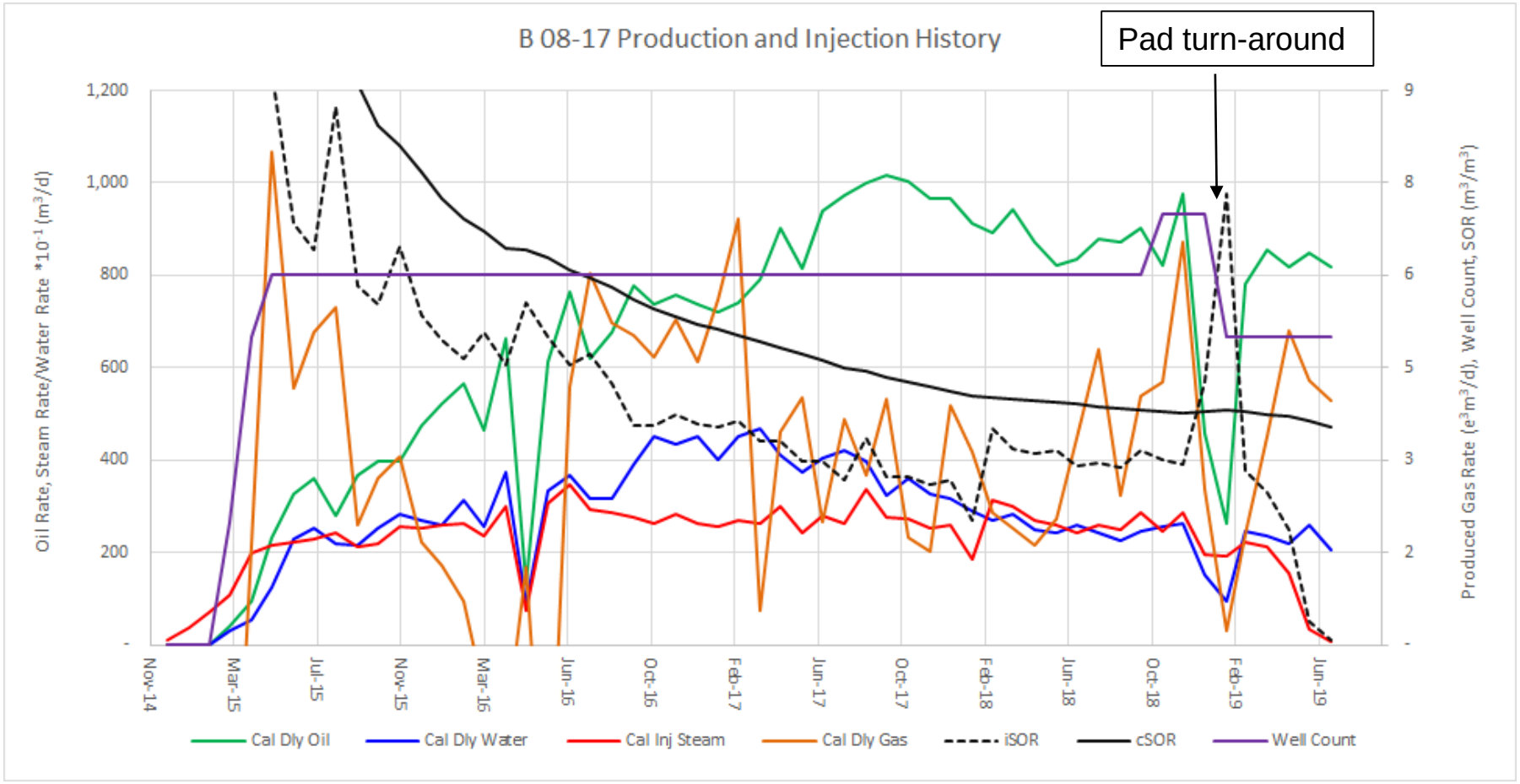
7. Scheme Performance

PRODUCTION VS. APPROVAL CAPACITY VARIANCE

- Ramp-up will continue during the next reporting period (pending production curtailment requirements)

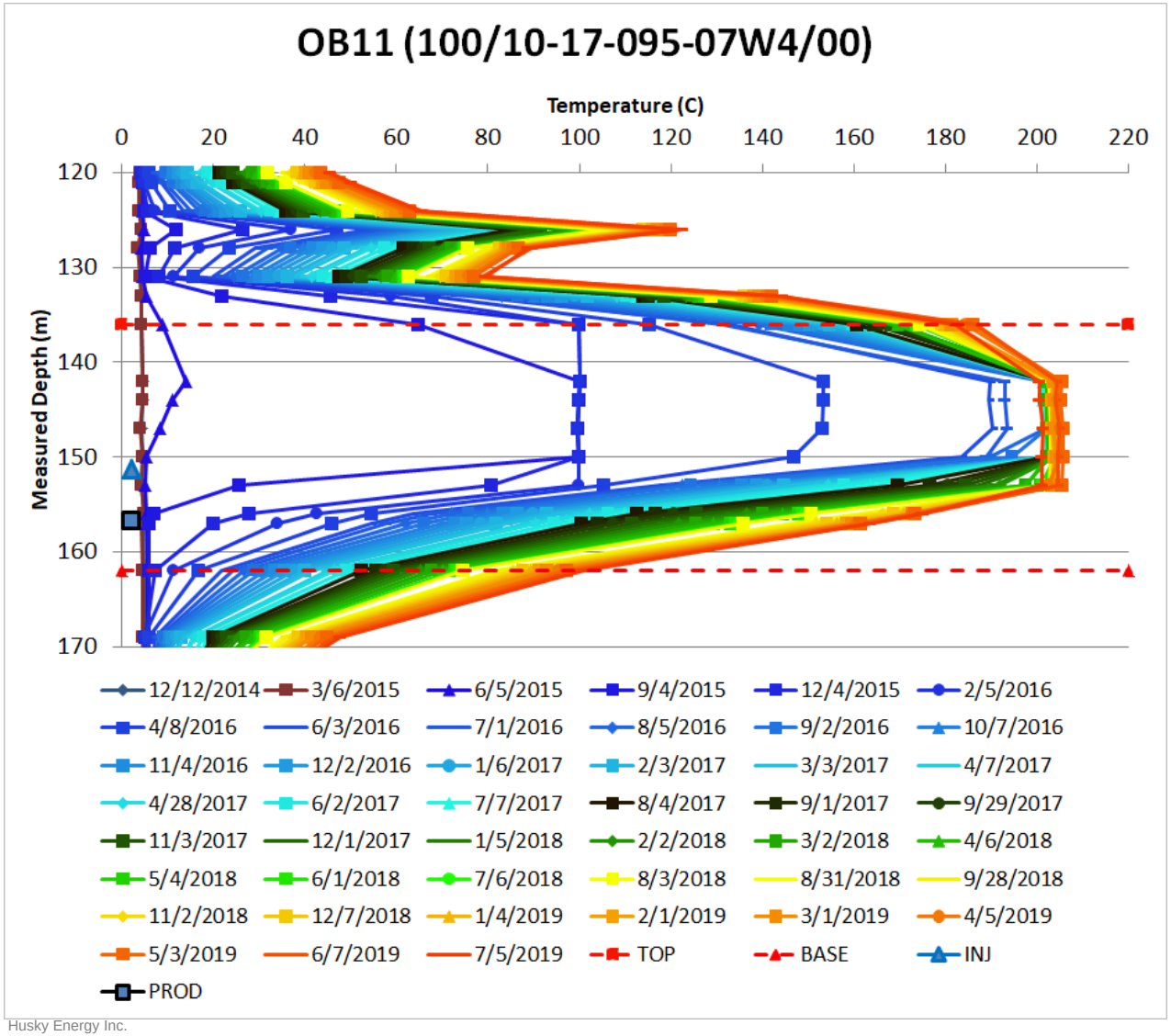
7. Scheme Performance

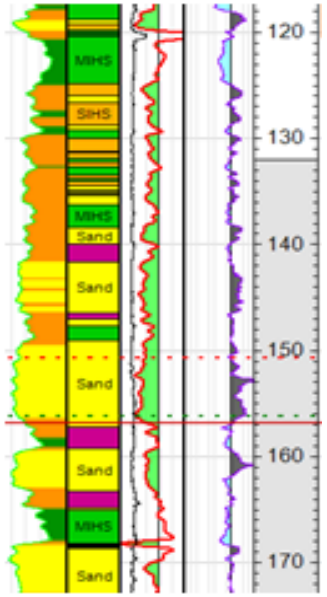
PAD B08-17 (G) PRODUCTION AND INJECTION HISTORY (HIGH RECOVERY PAD)

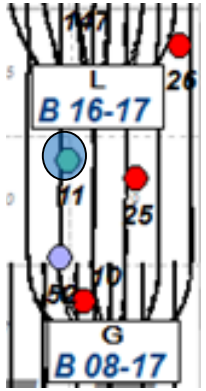


7. Scheme Performance

PAD B08-17 (G) MID OBSERVATION WELL



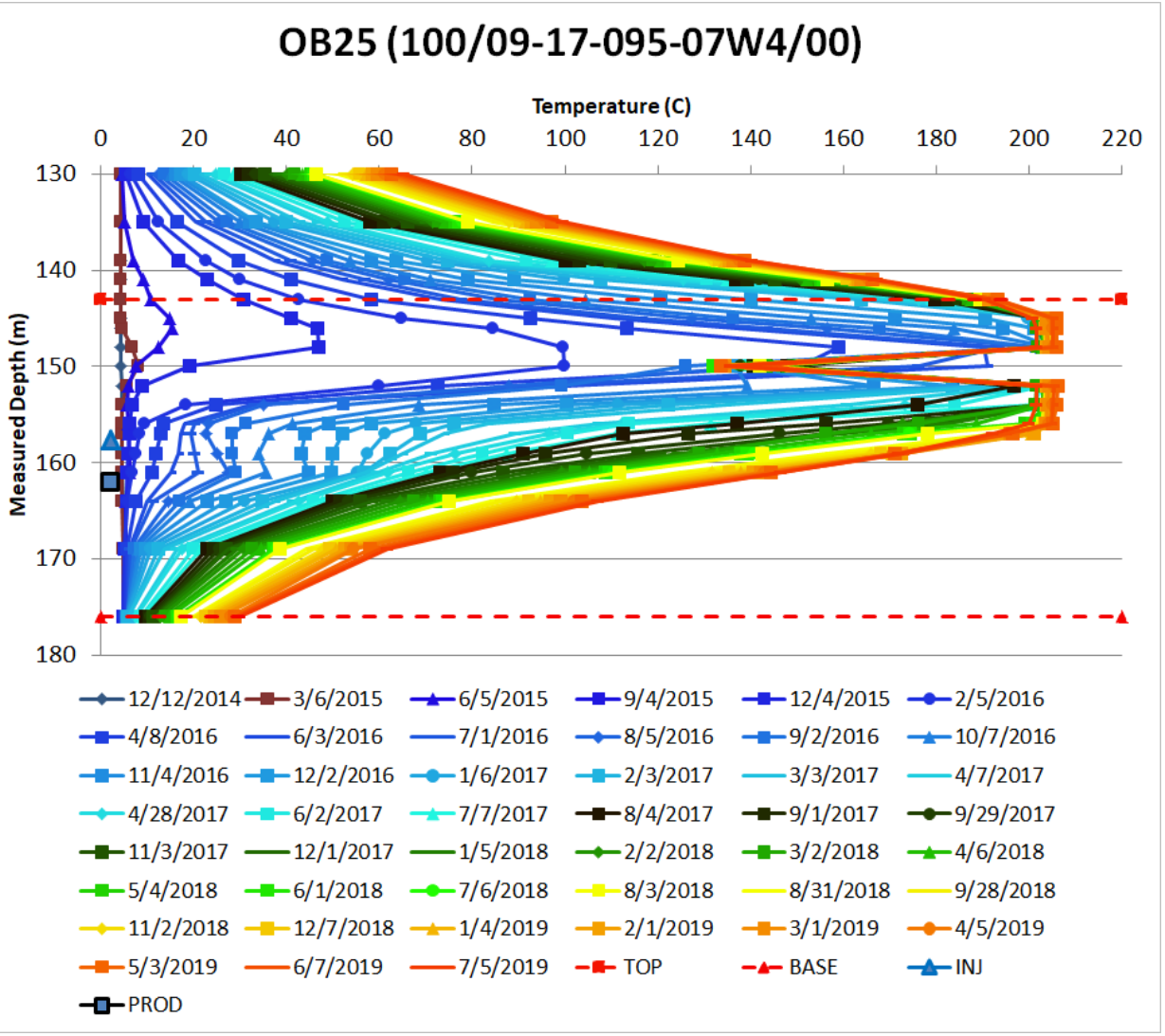


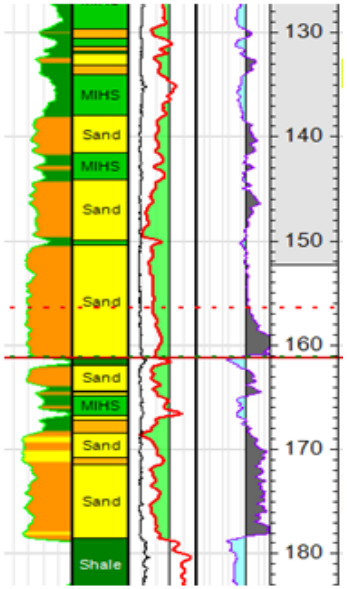


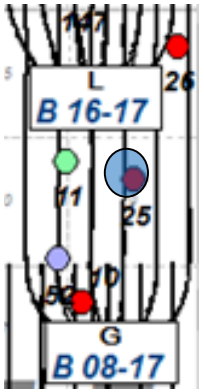
Distance to Horizontal: 20 m
Measured Depth: 710 m

7. Scheme Performance

PAD B08-17 (G) MID OBSERVATION WELL



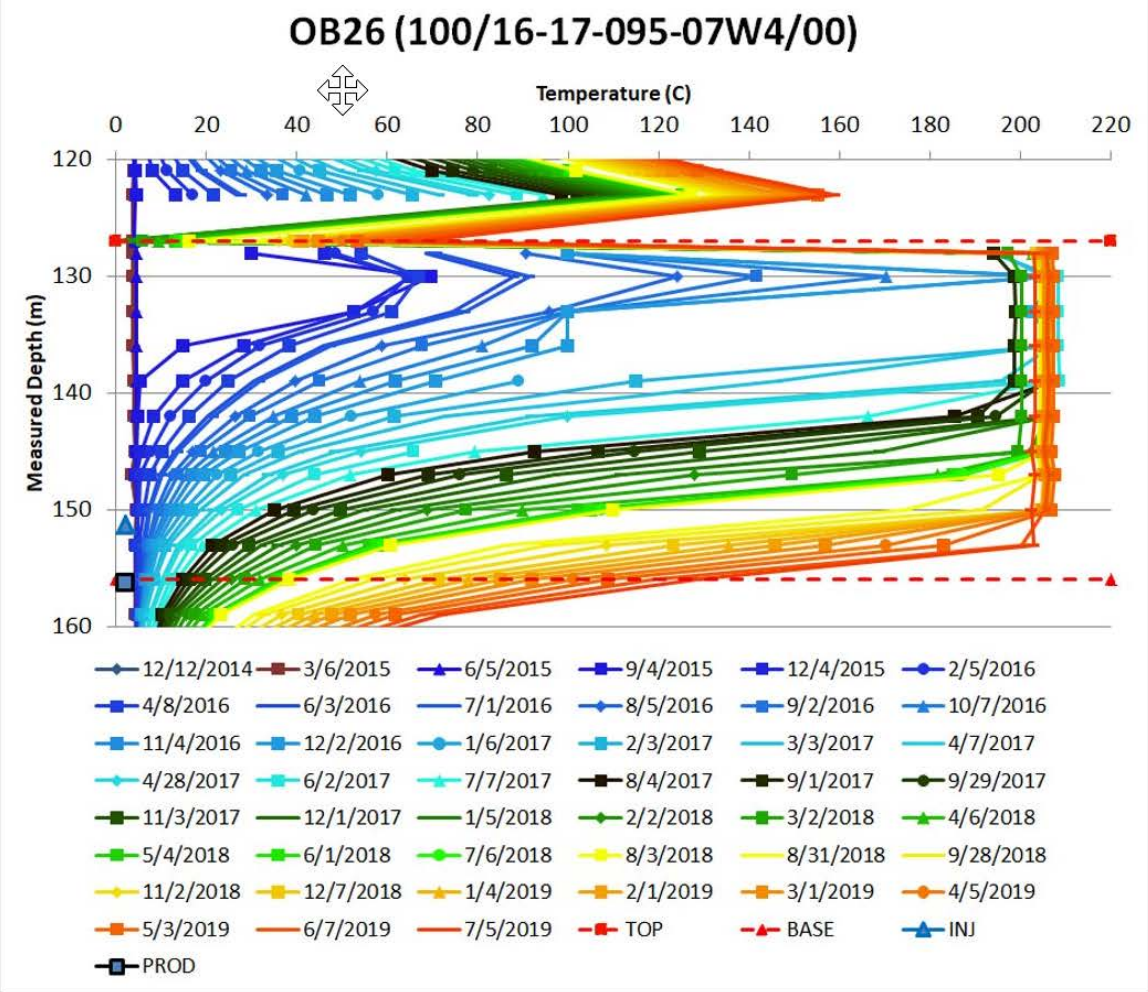


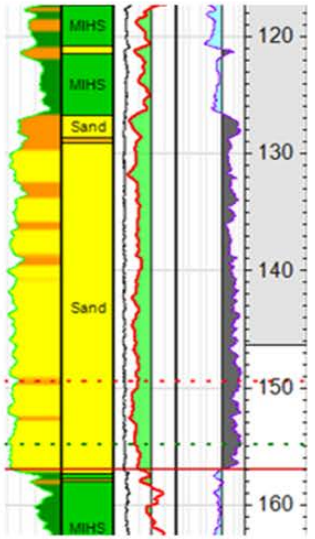


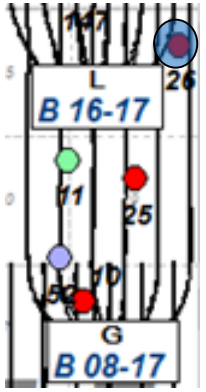
Distance to Horizontal: 25 m
Measured Depth: 626 m

7. Scheme Performance

PAD B08-17 (G) TOE OBSERVATION WELL







Distance to Horizontal: 34 m
Measured Depth: 1093 m

Note:

Faulty Thermocouple at 127m

7. Scheme Performance

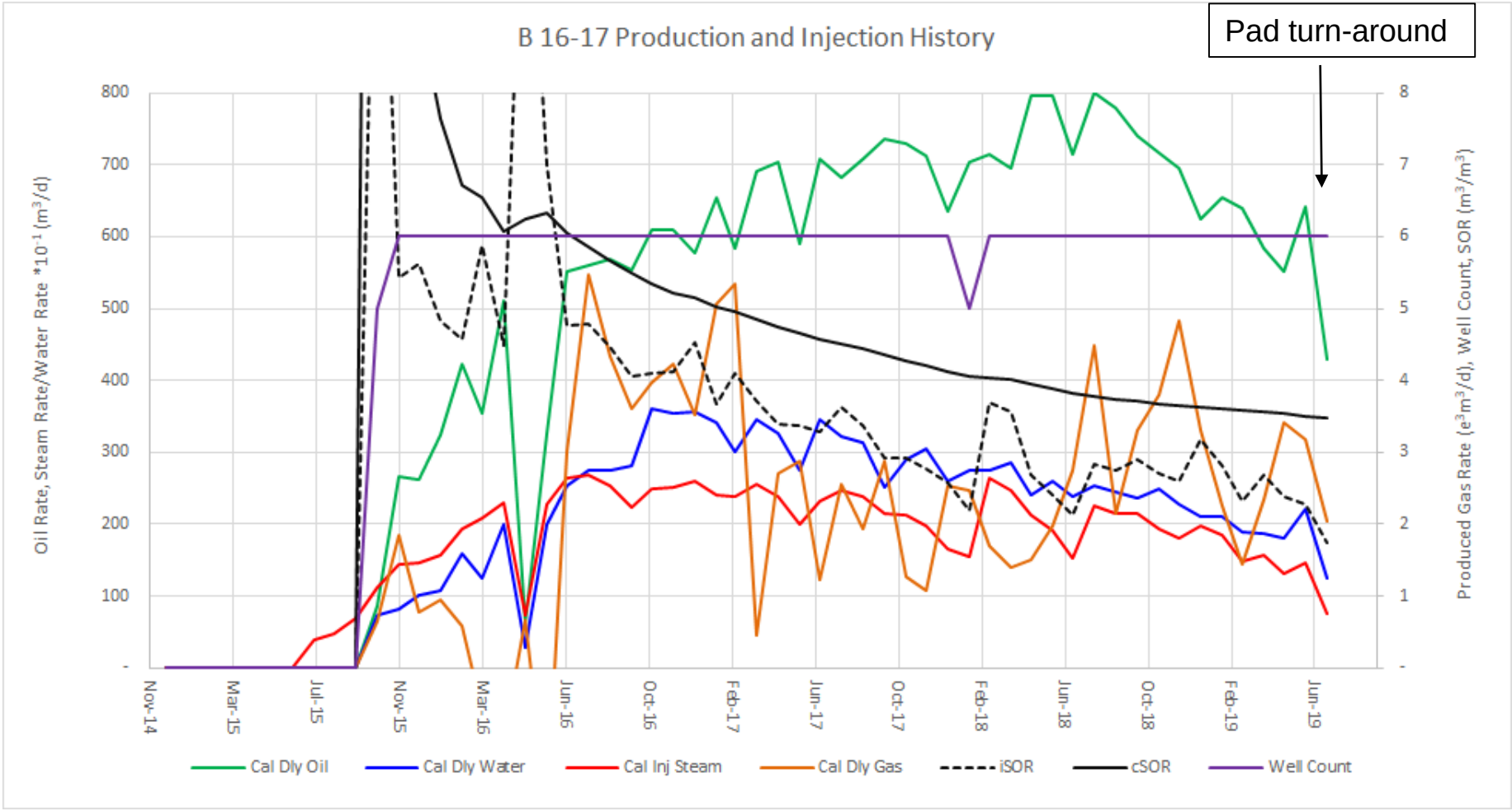
DISCUSSION OF PAD B08-17 (G) PERFORMANCE

- Overall bitumen and steam rates are as per expectations. Well Pad is expected to reach peak bitumen rate
- The bitumen rate drop at the end of 2017 is due to lower operating pressure as a result of steam management
- Injection pressure during the reporting period ranged from 1,403 kPa_g to 1,782 kPa_g
- Infill well G2A started up in December 2018 experiencing steam breakthrough, re-completion is planned for Q3 2019
- All observation wells on well pad B08-17 (G) indicate vertical and lateral chamber growth

- Pad B08-17 (G) performance indicators as of July 31, 2019:
  - Cum Oil : 1,109,154 m^3 (RF = 37.1%)
  - Cum Steam Injected: 3,934,425 m^3
  - Cum Water Produced: 4,621,052 m^3
  - CSOR: 3.55 m^3 CWE/m^3

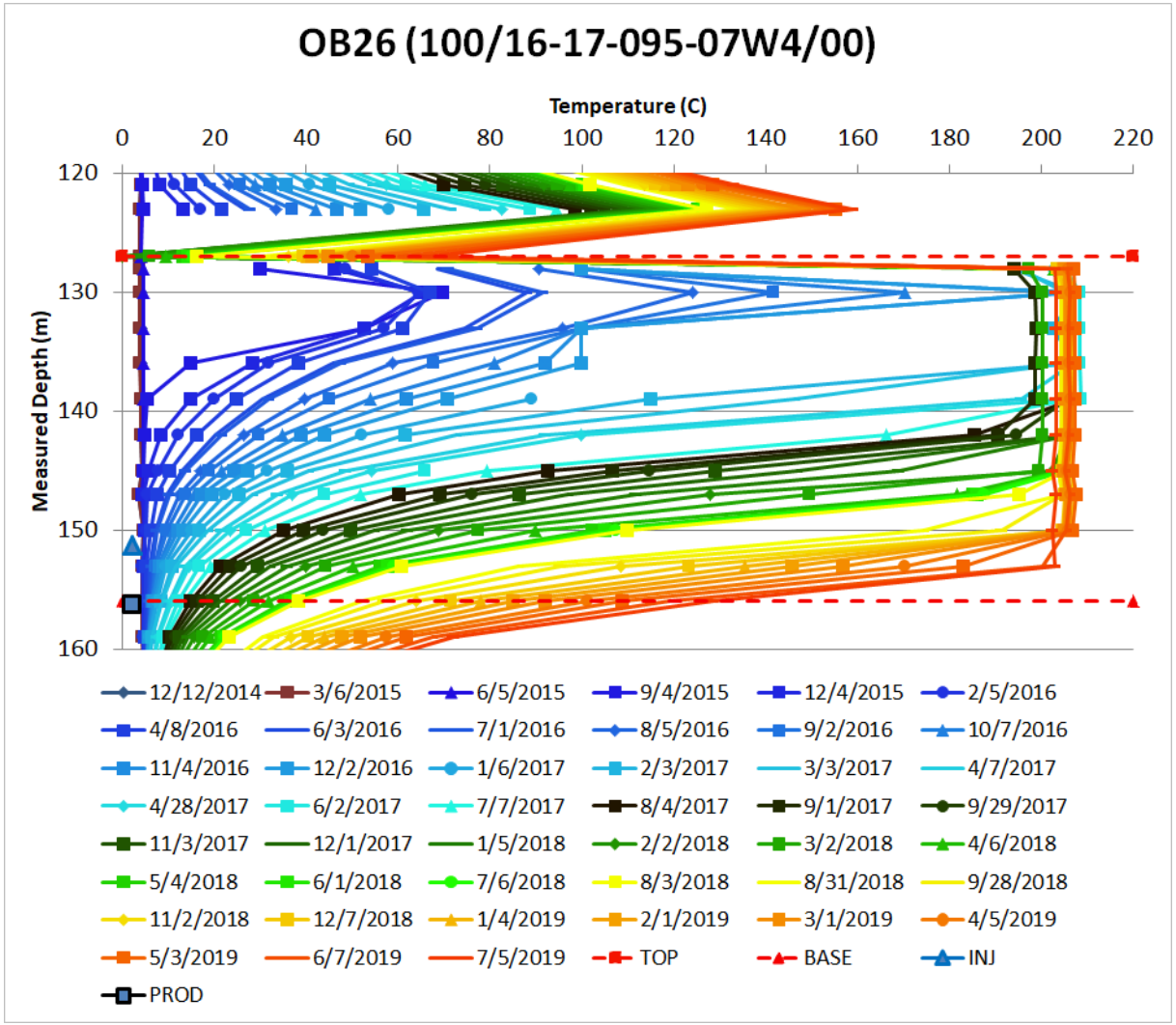
7. Scheme Performance

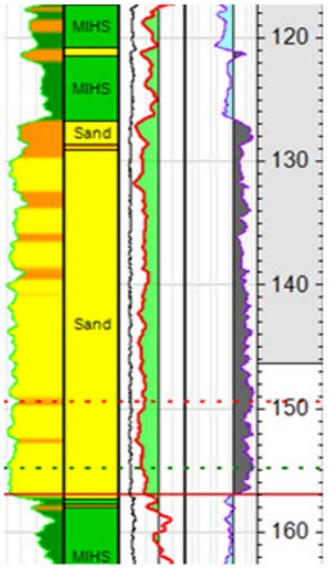
PAD B16-17 (L) PRODUCTION AND INJECTION HISTORY (MID RECOVERY PAD)

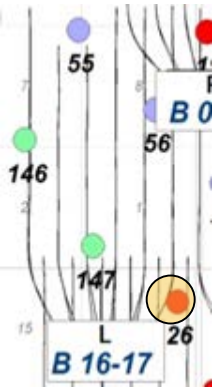


7. Scheme Performance

PAD B16-17 (L) HEEL OBSERVATION WELL





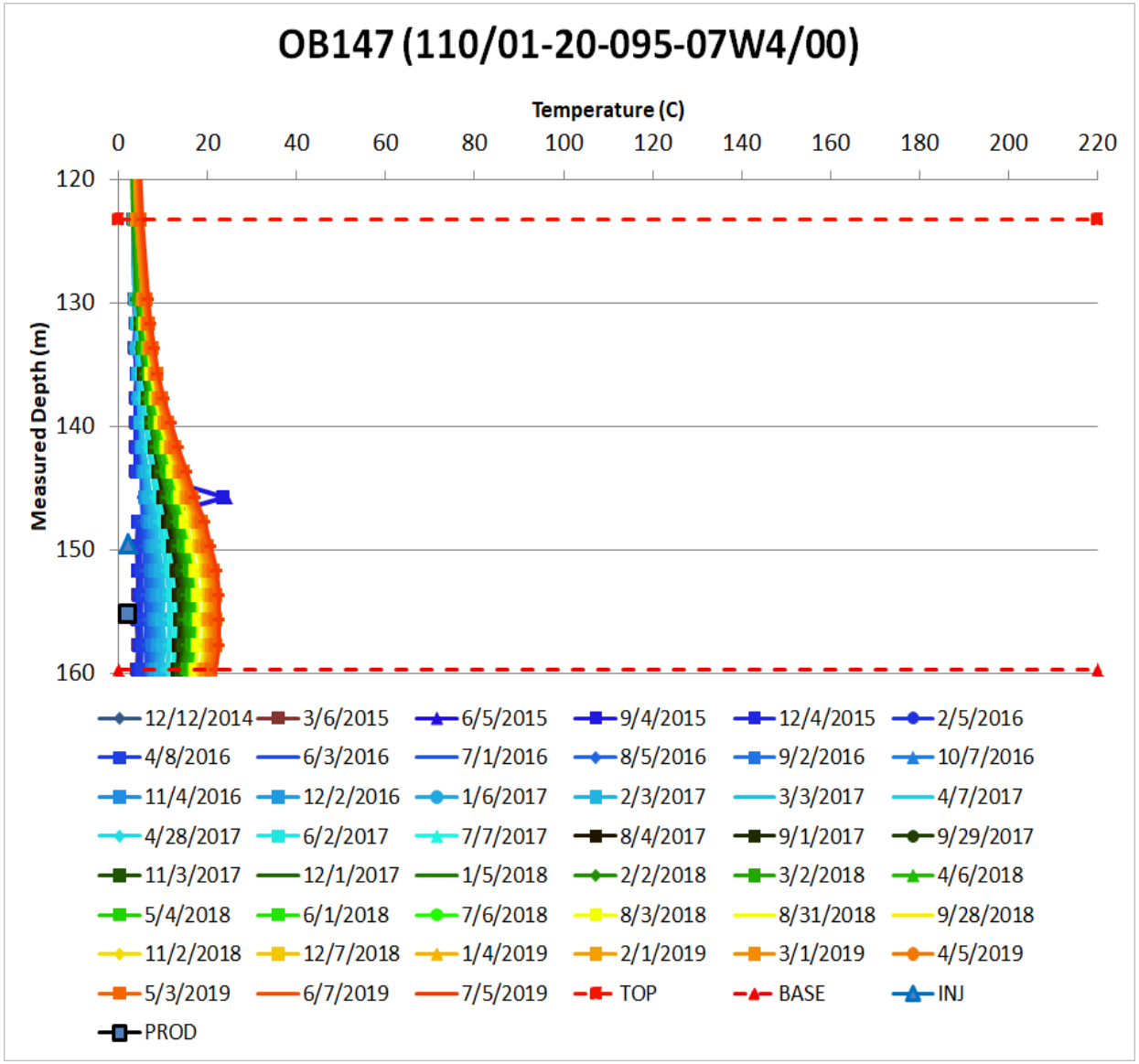


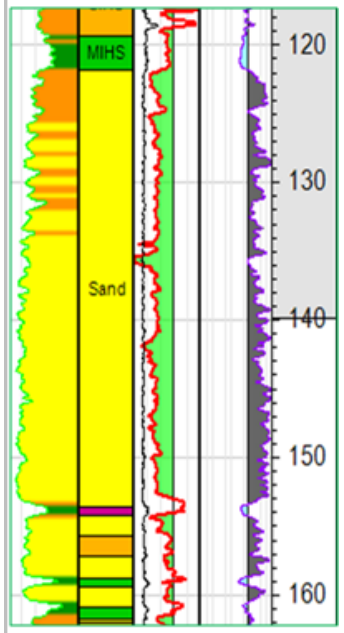
Distance to Horizontal: 34 m
Measured Depth: 1093 m

Note:
Faulty thermocouple at 127 m

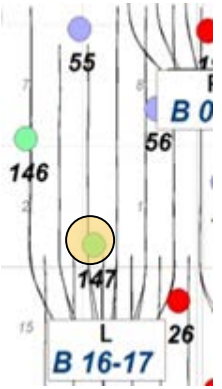
7. Scheme Performance

PAD B16-17 (L) HEEL OBSERVATION WELL





Distance to Horizontal: 20 m
Measured Depth: 448 m



7. Scheme Performance

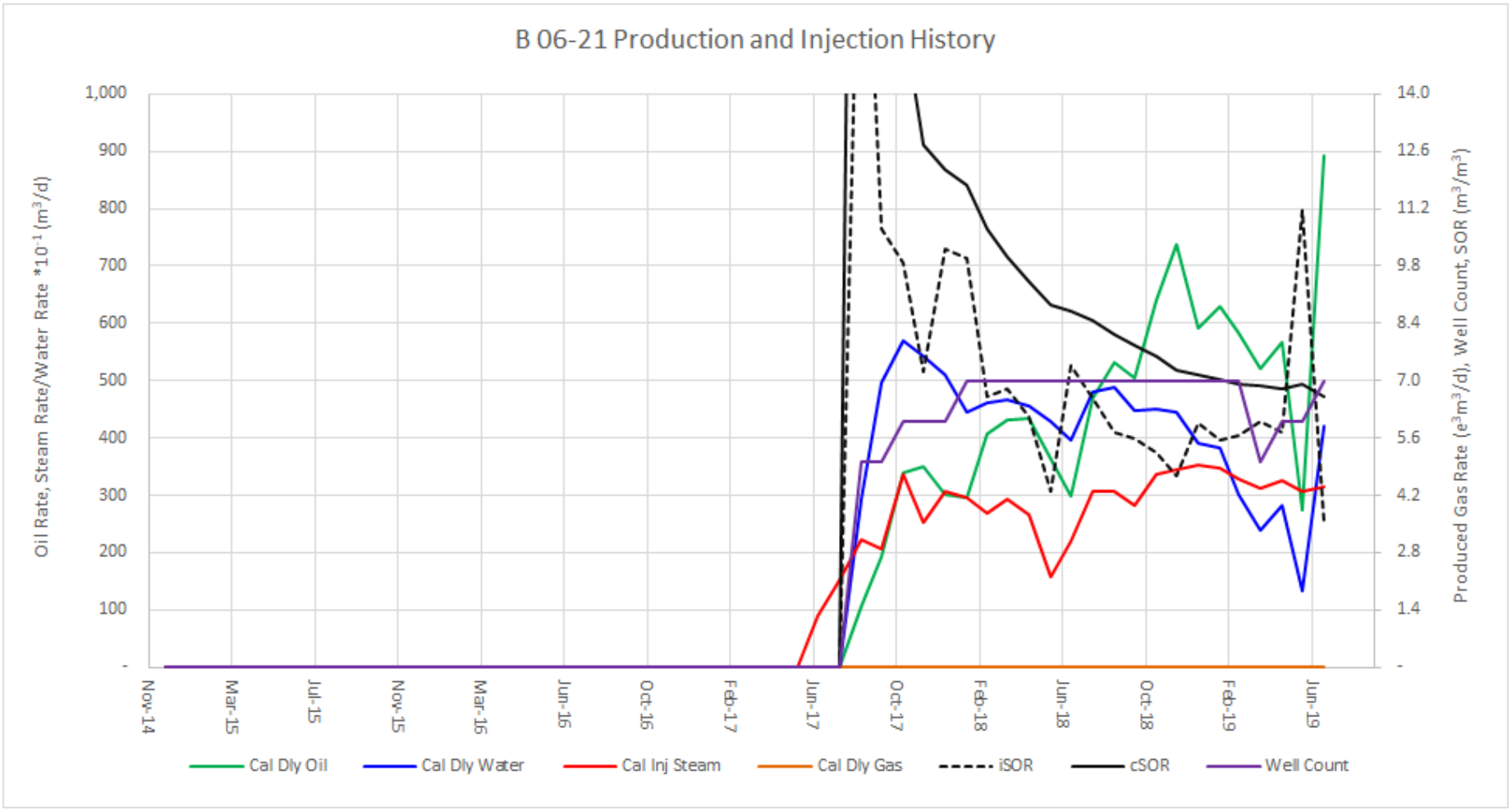
DISCUSSION OF B16-17 (L) PERFORMANCE

- The operating pressure has varied between 1,475 kPa_g and 1,725 kPa_g
- In March 2018, producer well L5 was sidetracked to drill a new injector while the old injector was converted to a producer (Replacement). Results show approximately a 50% improvement in production
- In July 2018, producer well L2 was re-completed with inflow control devices (ICD's). Results show approximately a 30% improvement in production
- Four observation wells located on this pad. There is evidence of steam chamber development at the top of pay. Piezometers are reading expected pressures

- Pad B16-17 (L) performance indicators as of July 31, 2019:
  - Cum Oil : 822,566 m^3 (RF = 22.6 %)
  - Cum Steam Injected: 2,857,313 m^3
  - Cum Water Produced: 3,349,034 m^3
  - CSOR: 3.47 m^3 CWE/m^3

7. Scheme Performance

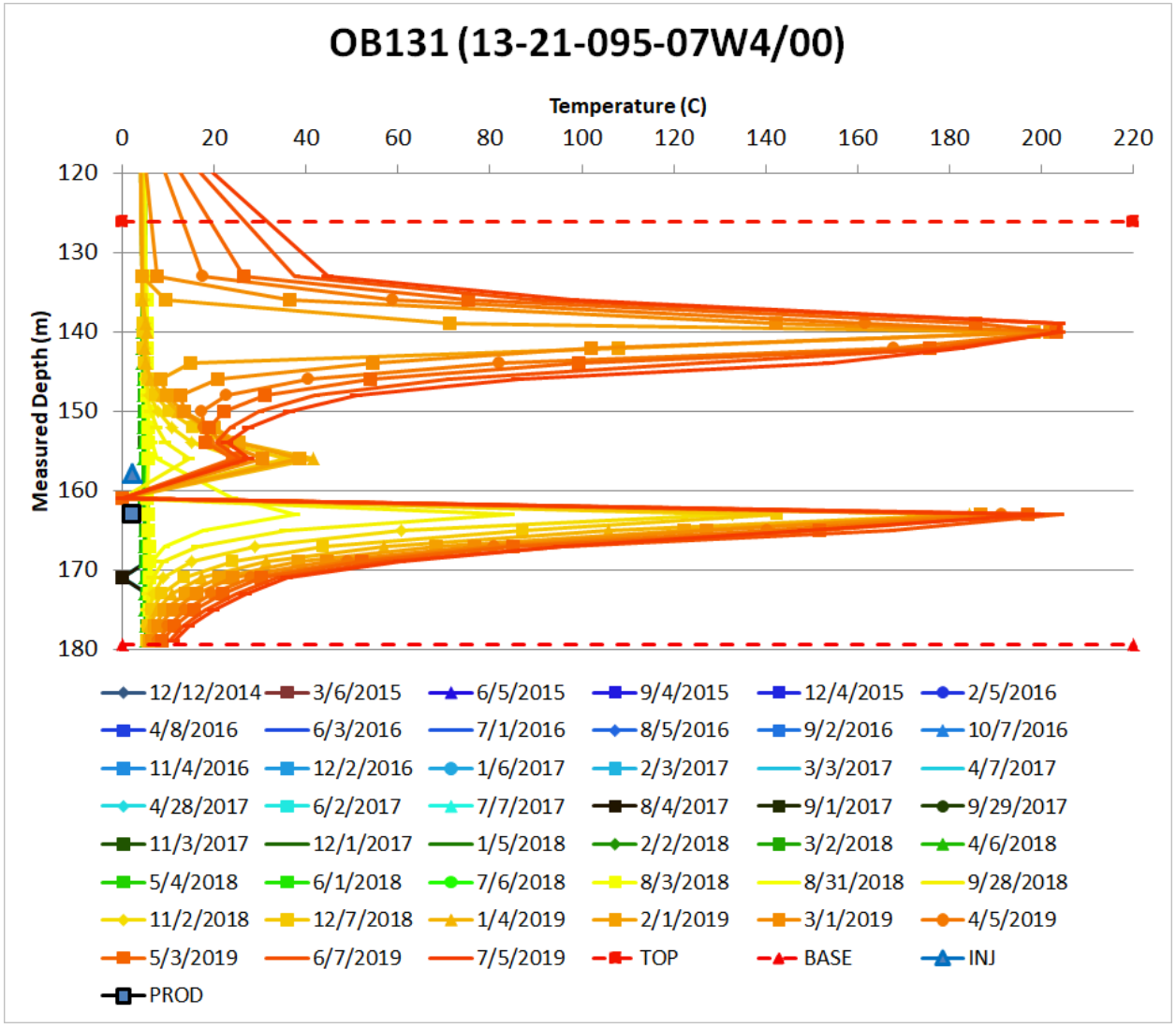
PAD B06-21 (Q) PRODUCTION AND INJECTION HISTORY (LOW RECOVERY PAD)

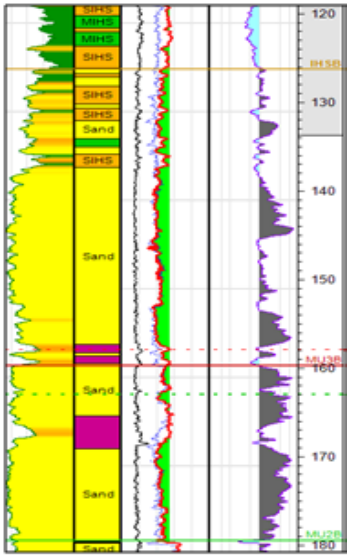


Note:
There is no test separator in the surface facility design, hence, no gas readings are directly associated with Pad B06-21 (Q)

7. Scheme Performance

PAD B06-21 (Q) TOE OBSERVATION WELL

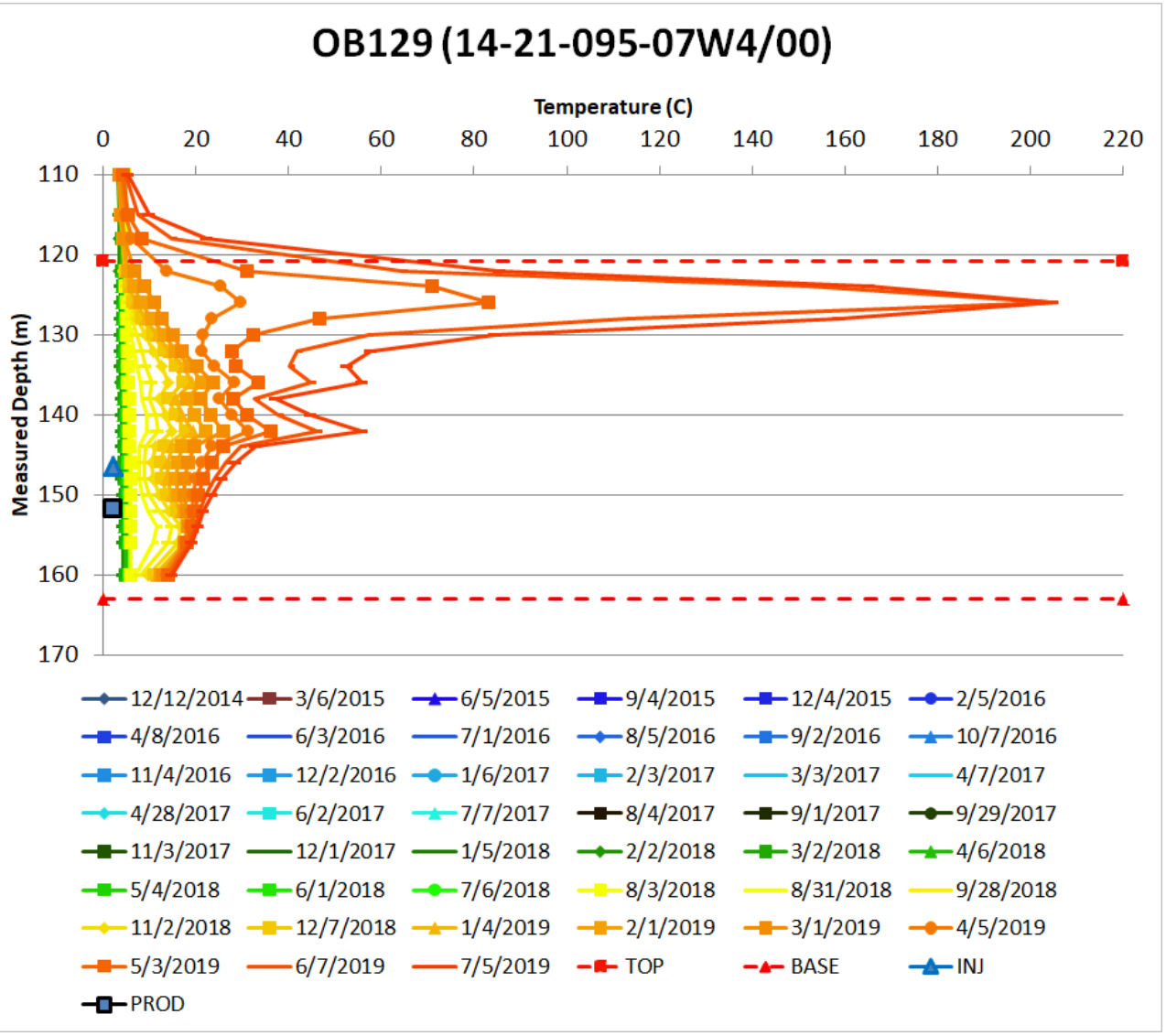


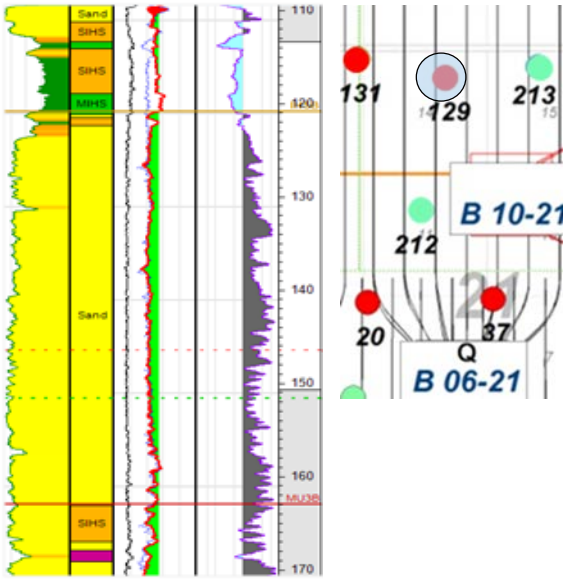


Distance to Horizontal: 50 m
Measured Depth: 857 m

7. Scheme Performance

PAD B06-21 (Q) TOE OBSERVATION WELL

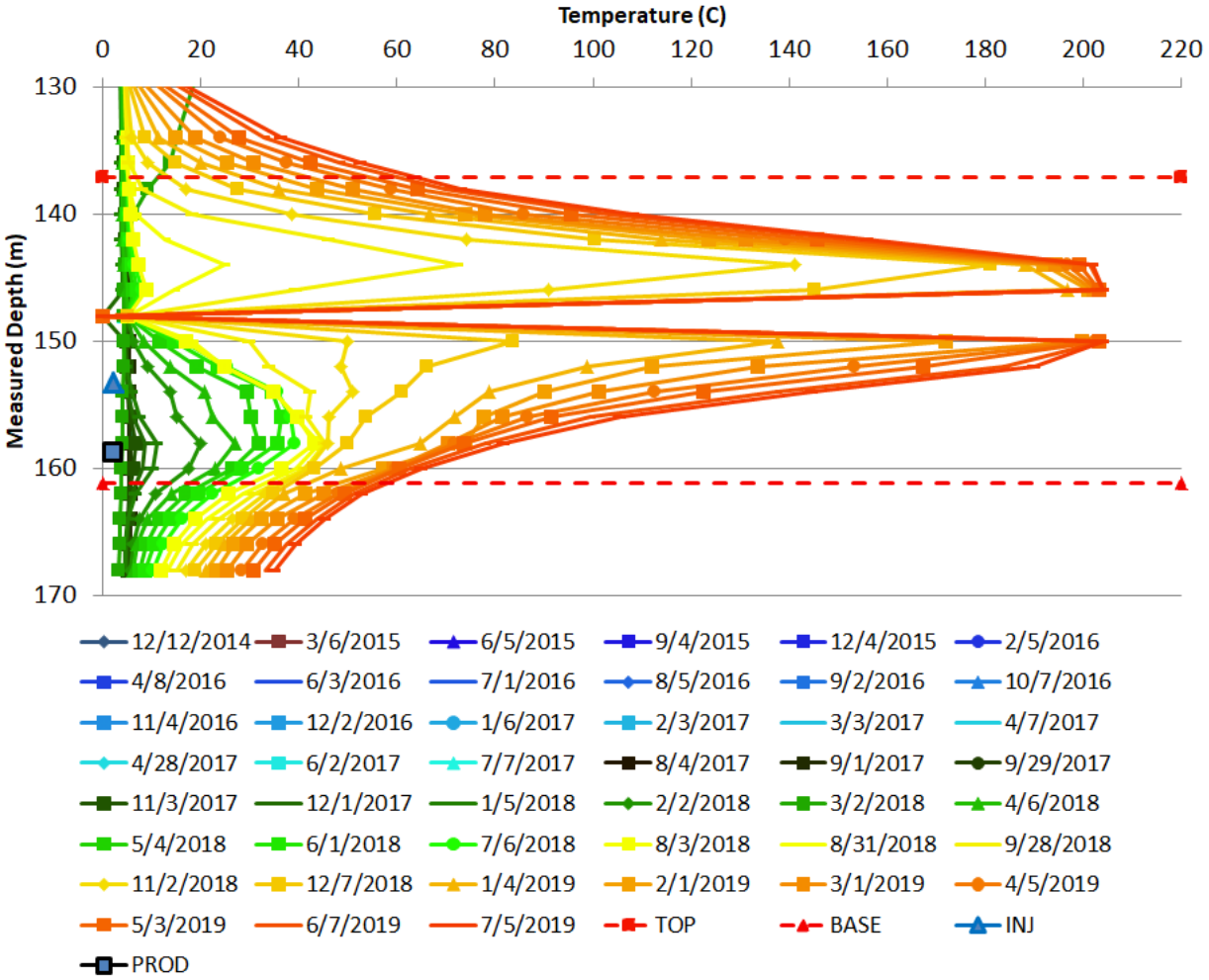


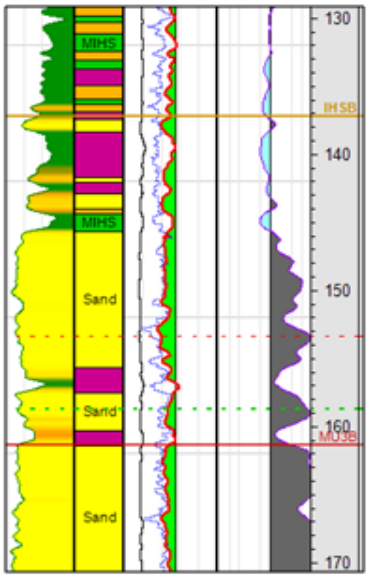


Distance to Horizontal: 32 m
Measured Depth: 857 m

7. Scheme Performance

PAD B06-21 (Q) TOE OBSERVATION WELL





Distance to Horizontal: 25 m
Measured Depth: 857 m

7. Scheme Performance

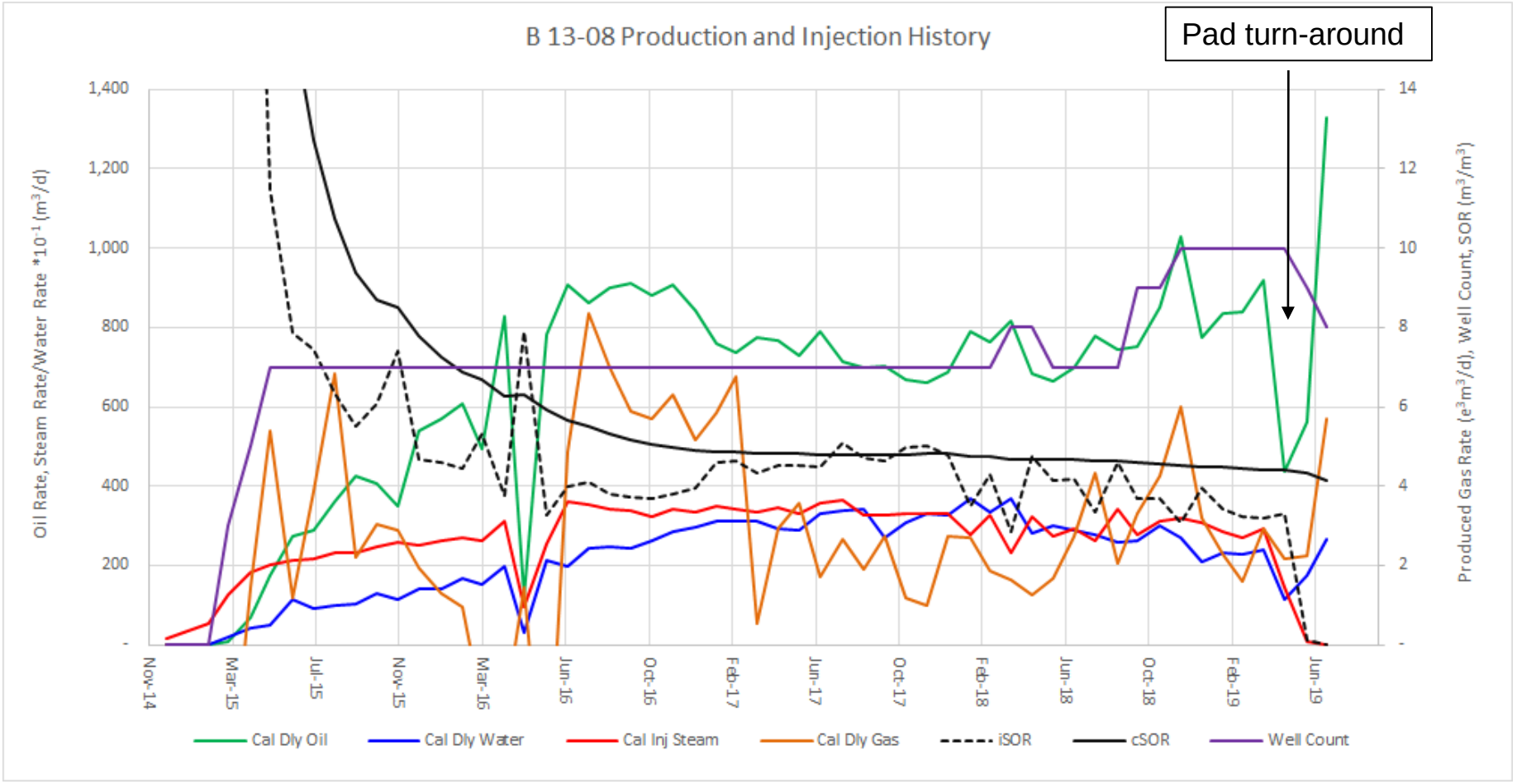
DISCUSSION OF PAD B06-21 (Q) PERFORMANCE

- Ramp up as per expectations, showing high initial emulsion rates, consistent with high water saturation in parts of the reservoir. Oil cut showed gradual improvement in all the well pairs
- Operating pressure ramped up continuously in a controlled manner up to approved MOP (1,750 kPa), however steam management strategies to maximize field production made operating pressure vary later in the year
- After an initial period of high emulsion production with low water cut and high steam injectivity, emulsion and steam rate started decreasing as oil cut started increasing; as expected
- Four observation wells located on the pad. There is evidence of steam chamber development close to the top of pay. Piezometers are reading expected pressures
- There is no test separator in the surface facility design, hence, no gas readings are directly associated with Pad B06-21 (Q)

- Pad B06-21 (Q) performance indicators as of July 31, 2019:
  - Cum Oil : 318,137 m^3 (RF = 8.1%)
  - Cum Steam Injected: 2,106,276 m^3
  - Cum Water Produced: 2,896,516 m^3
  - CSOR: 6.6 m^3 CWE/m^3

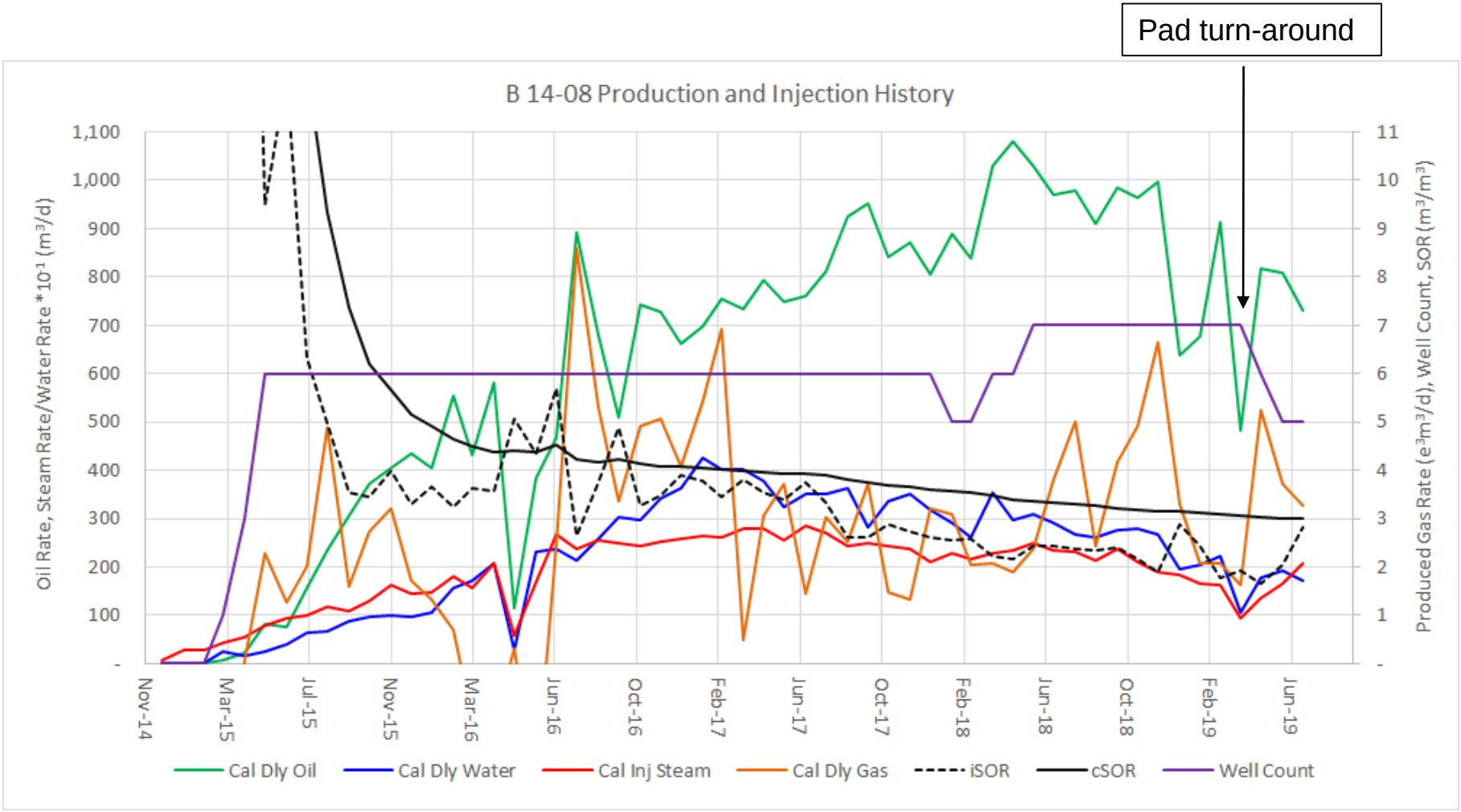
7. Scheme Performance

PAD B13-08 (B) PRODUCTION AND INJECTION HISTORY



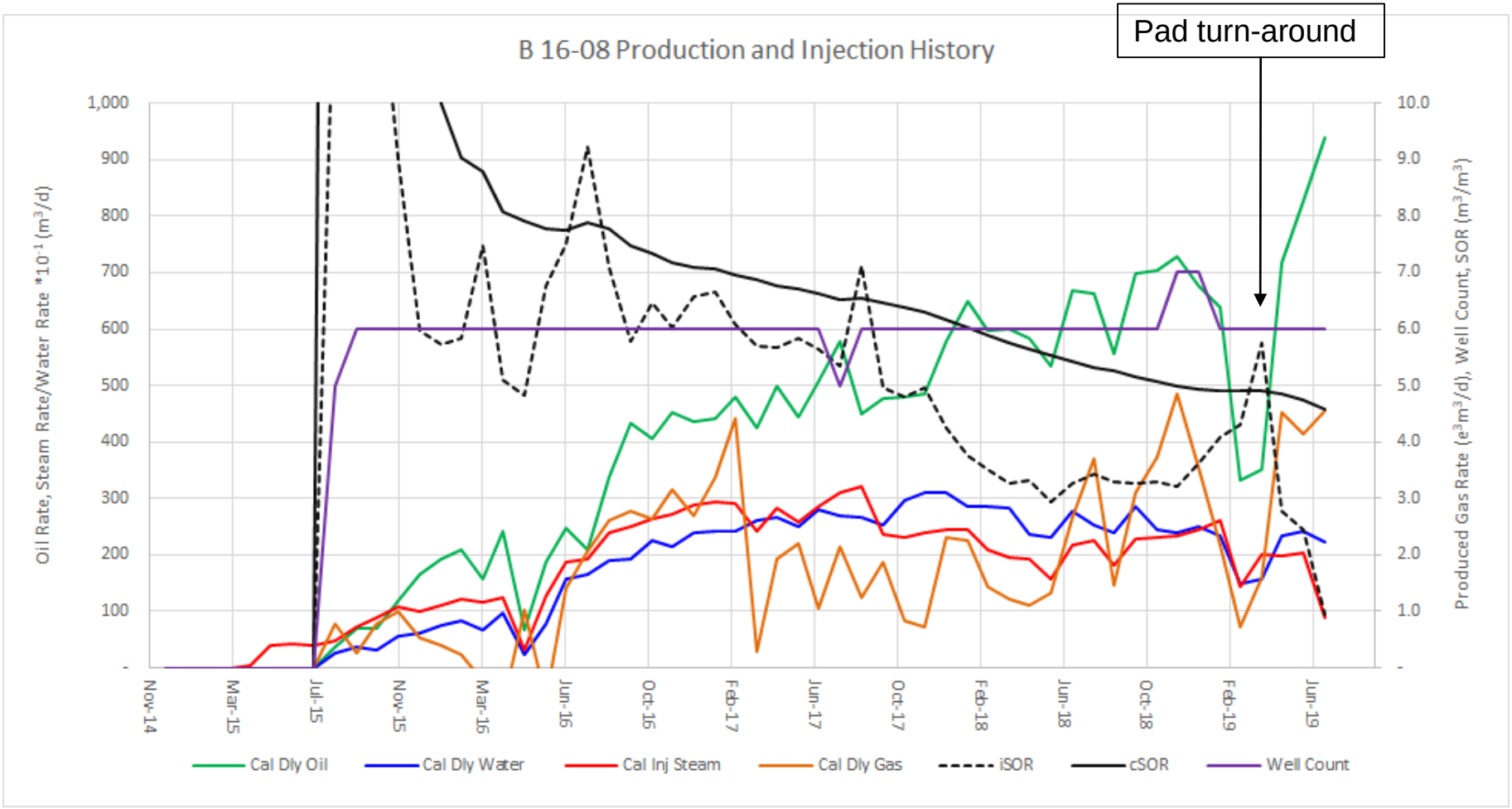
7. Scheme Performance

PAD B14-08 (C) PRODUCTION AND INJECTION HISTORY



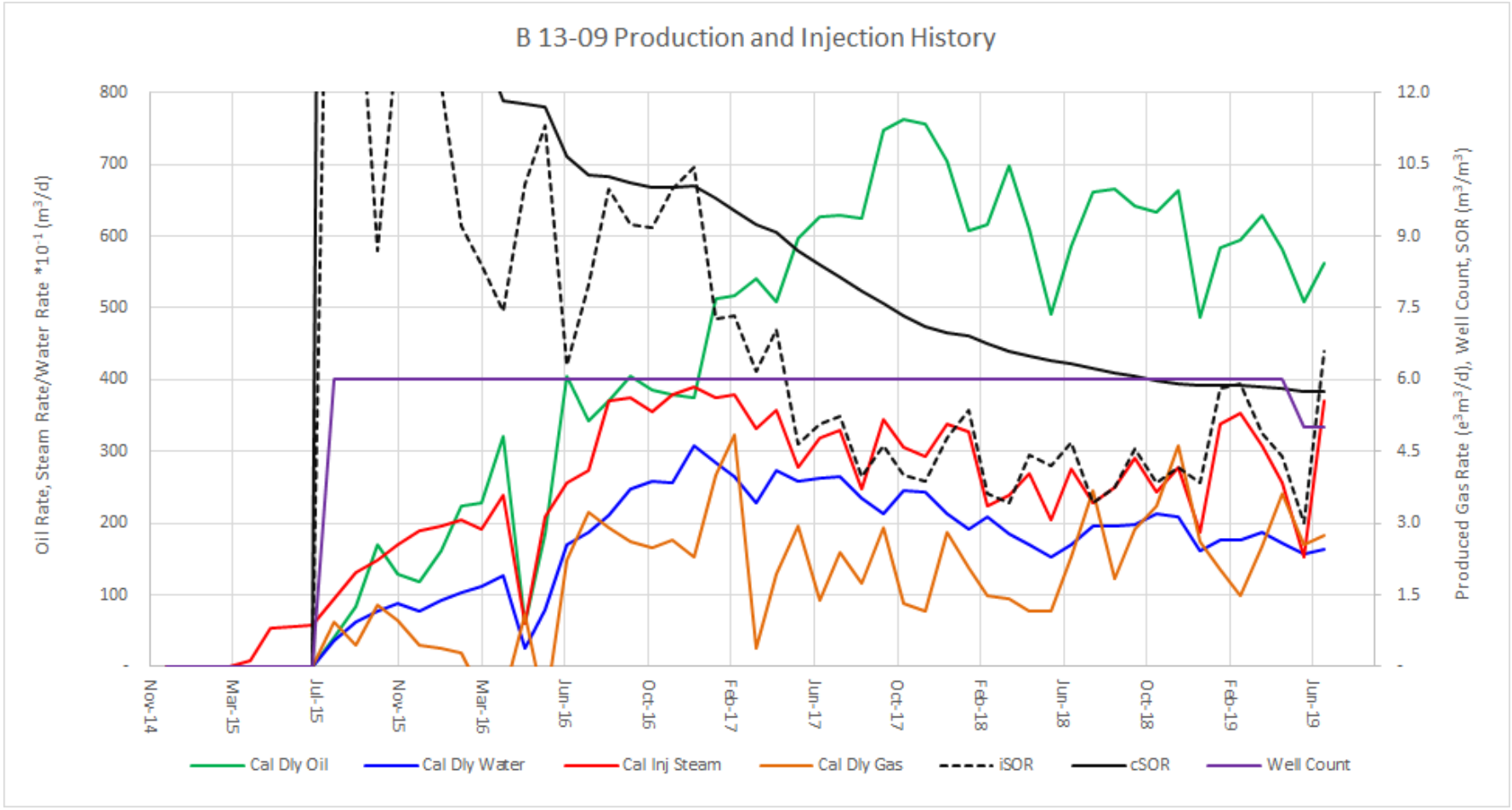
7. Scheme Performance

PAD B16-08 (D) PRODUCTION AND INJECTION HISTORY



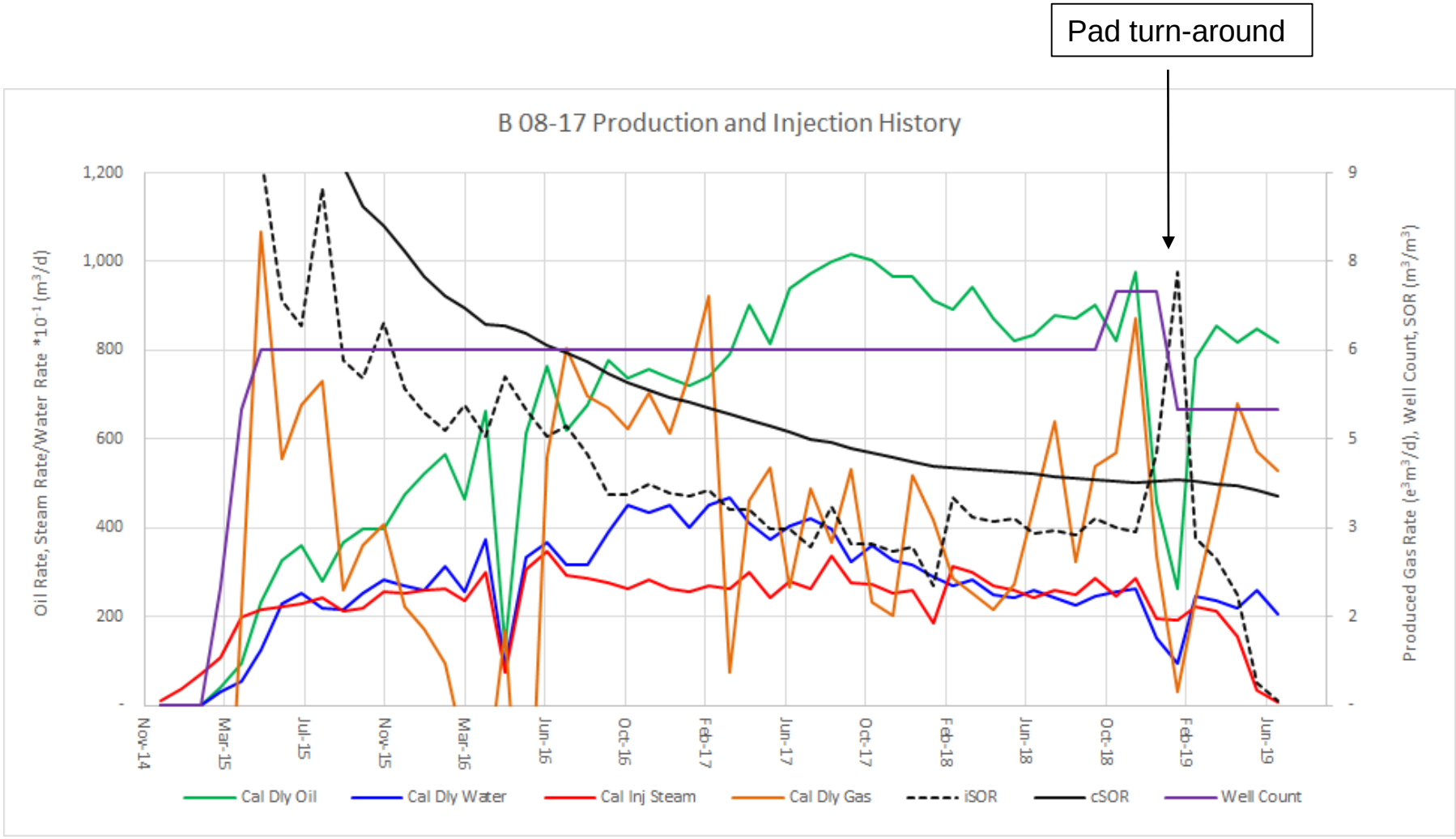
7. Scheme Performance

PAD B13-09 (E) PRODUCTION AND INJECTION HISTORY



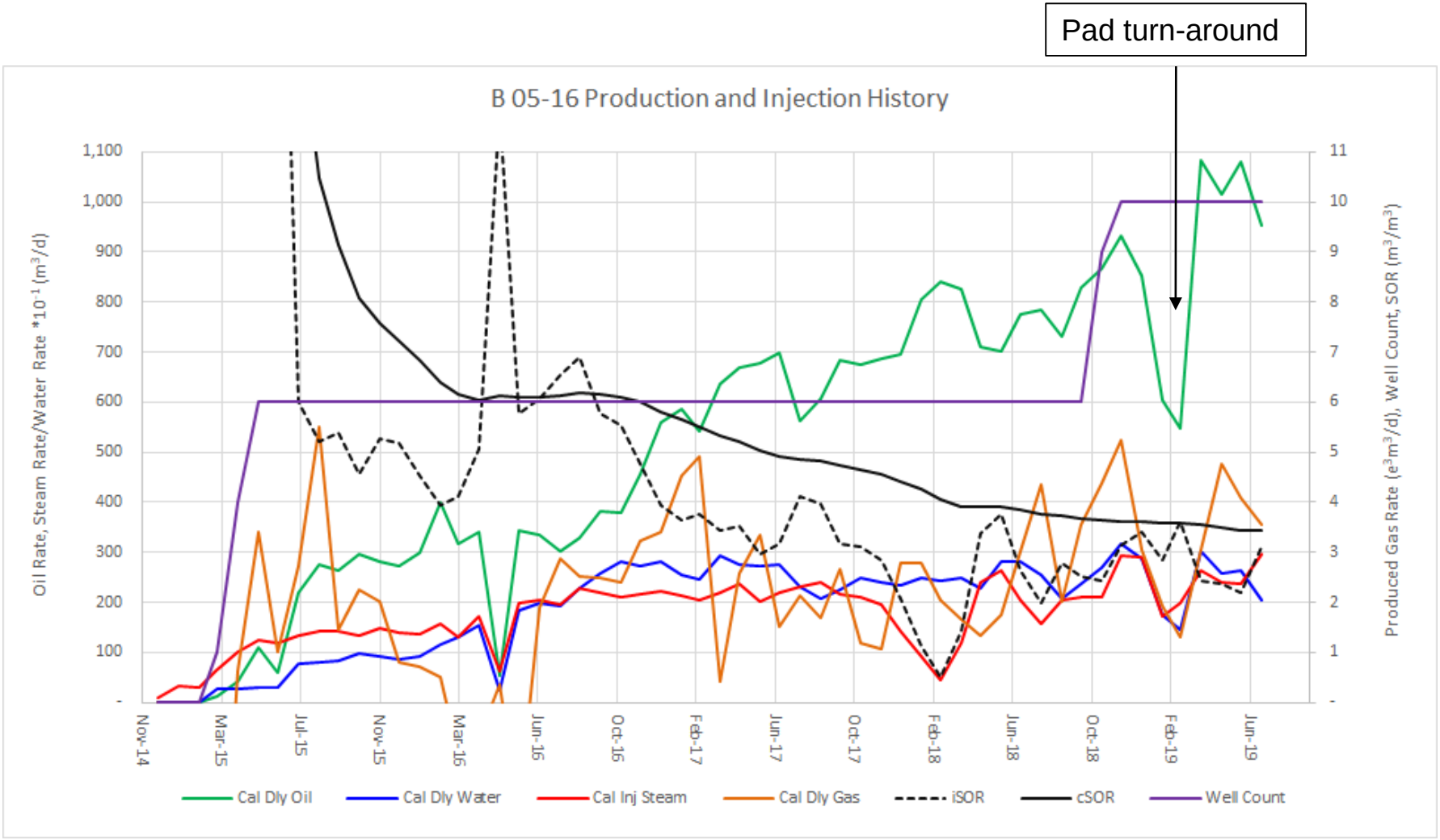
7. Scheme Performance

PAD B08-17 (G) PRODUCTION AND INJECTION HISTORY



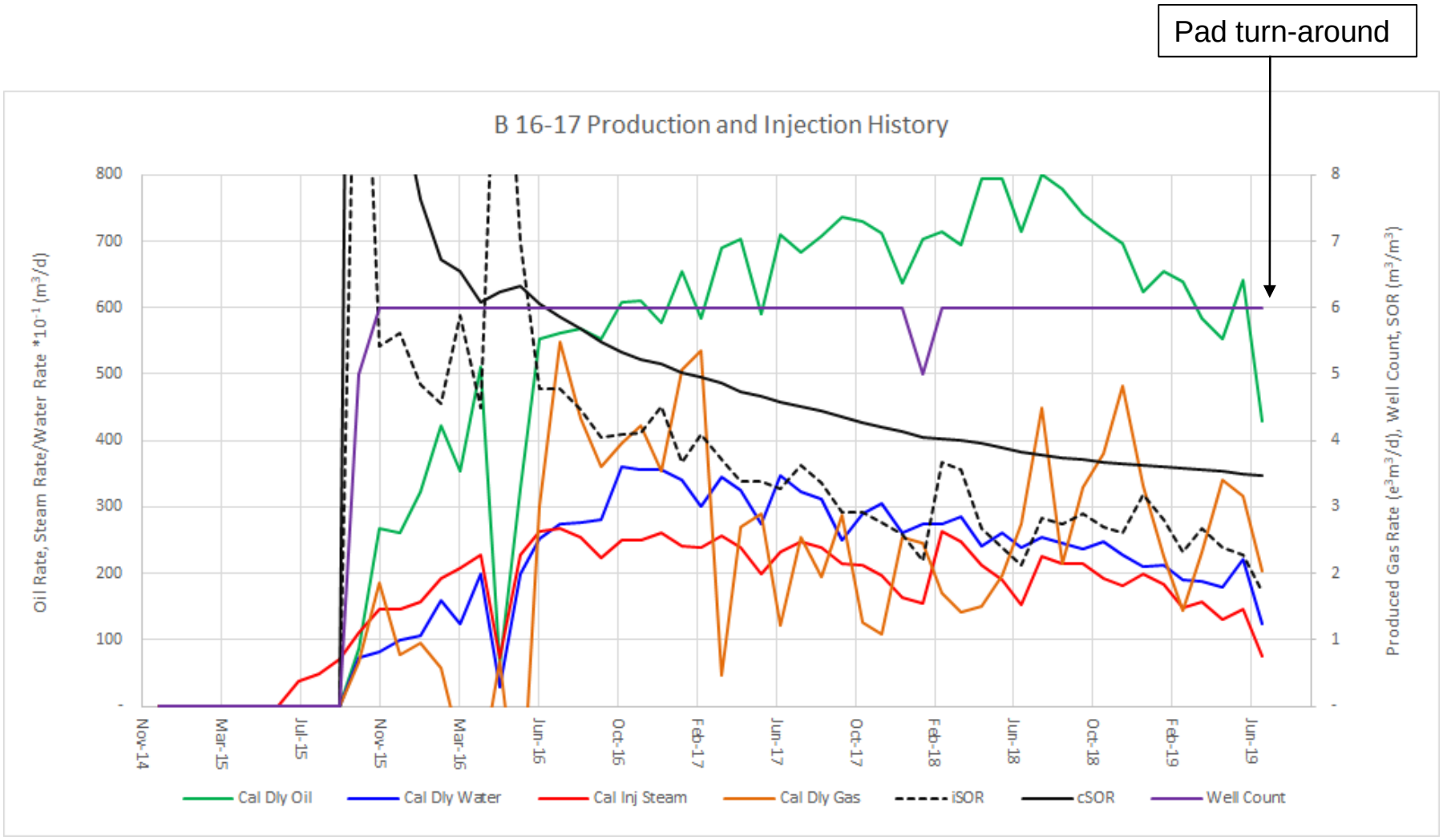
7. Scheme Performance

PAD B05-16 (H) PRODUCTION AND INJECTION HISTORY



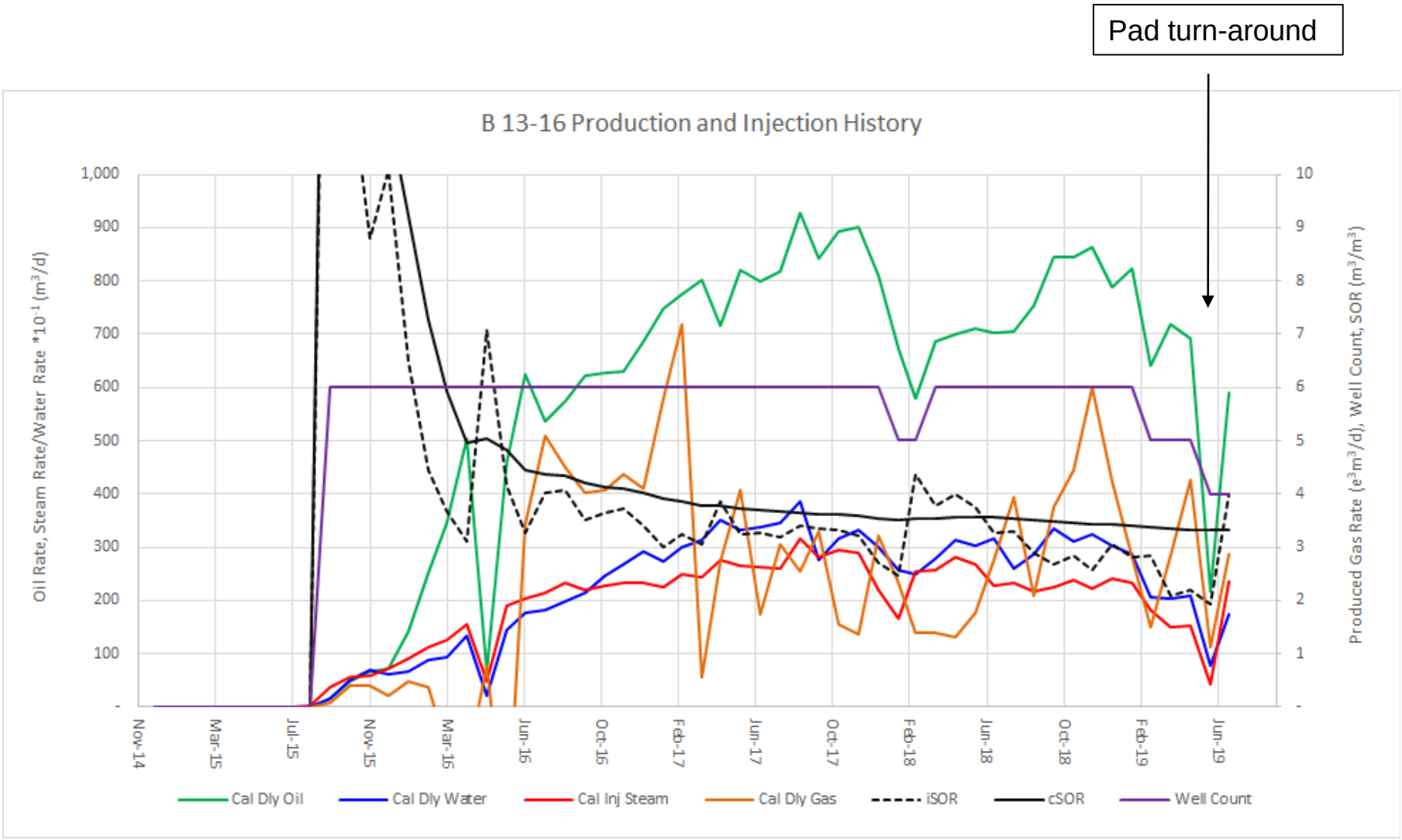
7. Scheme Performance

PAD B16-17 (L) PRODUCTION AND INJECTION HISTORY



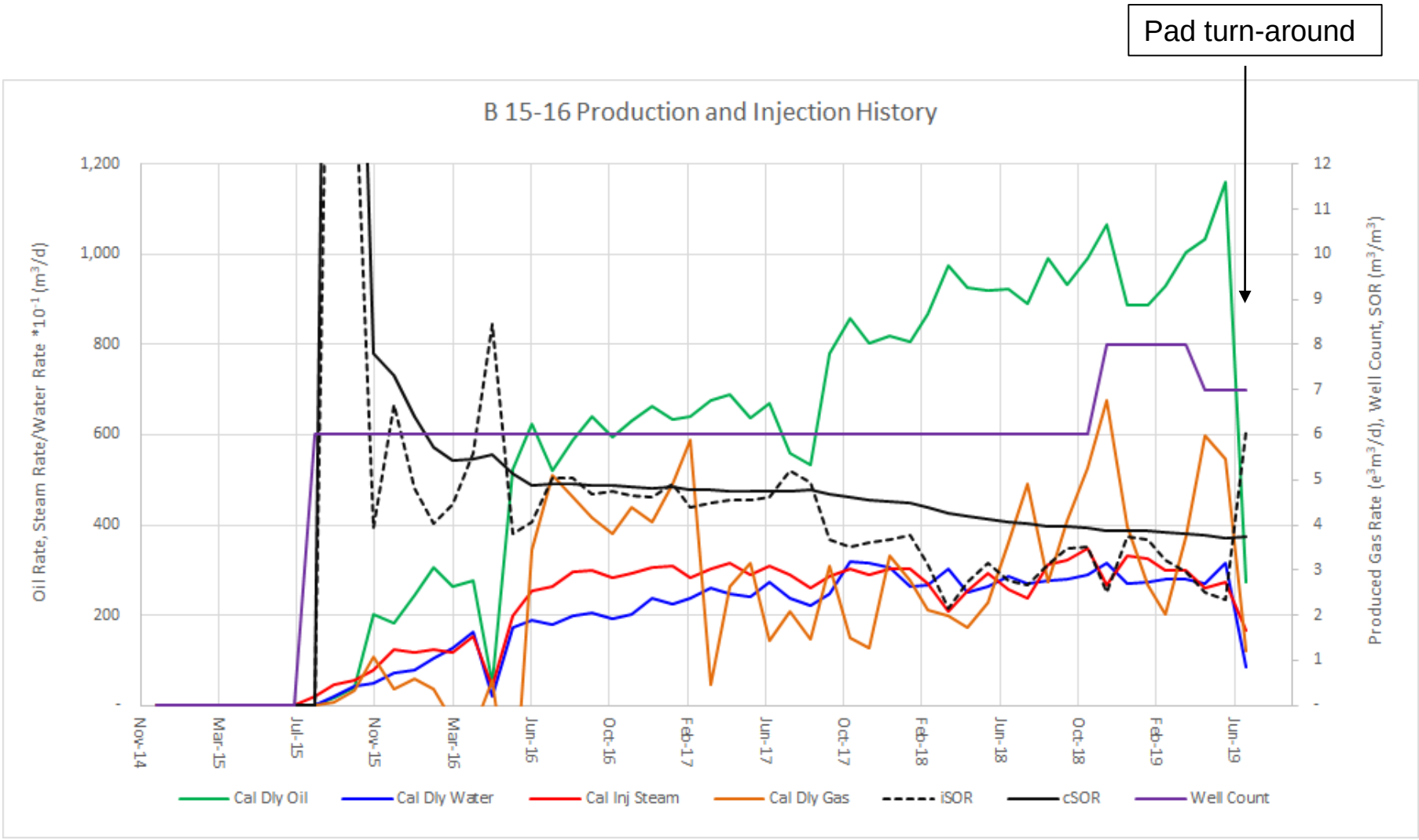
7. Scheme Performance

PAD B13-16 (M) PRODUCTION AND INJECTION HISTORY



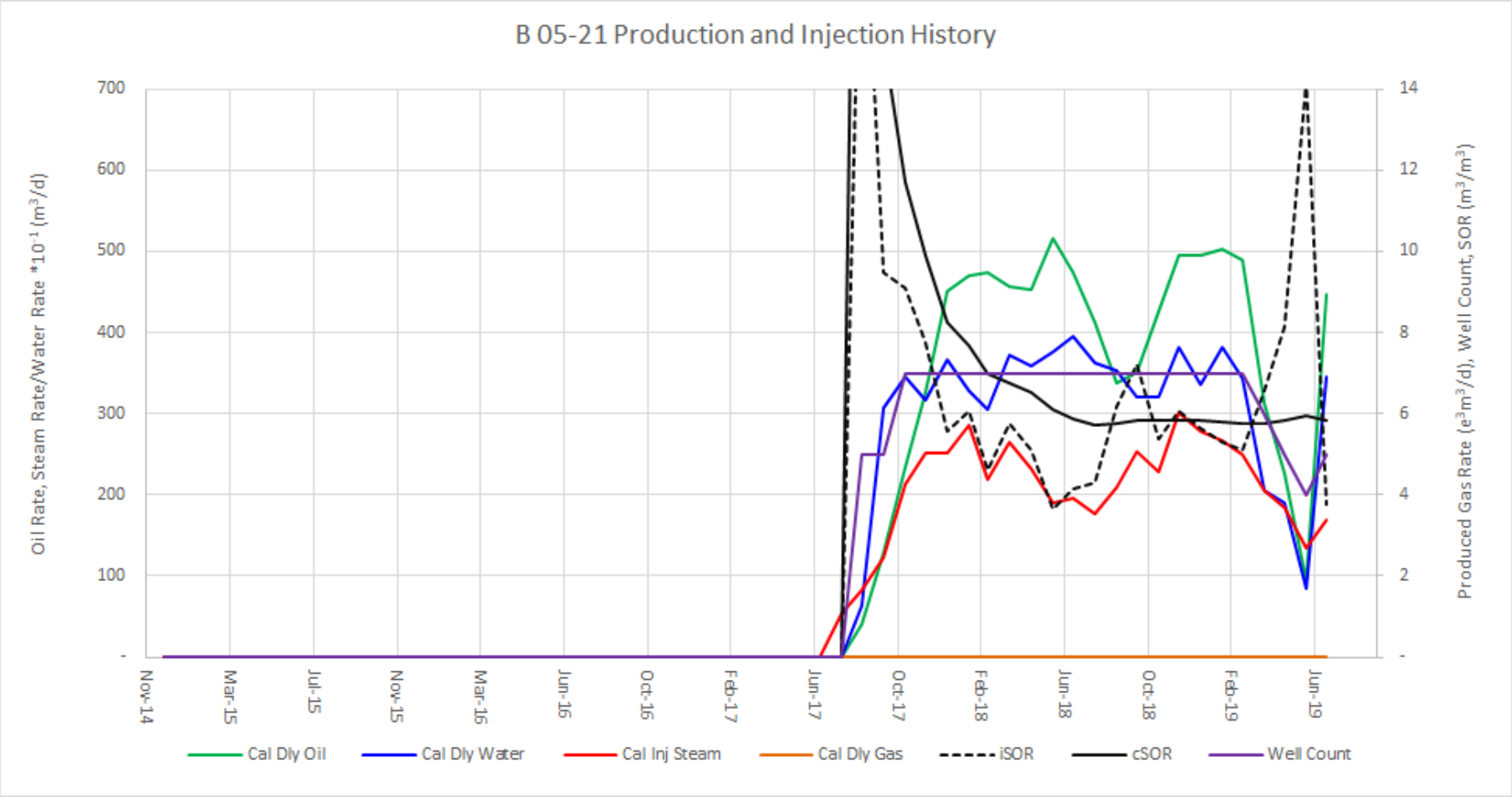
7. Scheme Performance

PAD B15-16 (N) PRODUCTION AND INJECTION HISTORY



7. Scheme Performance

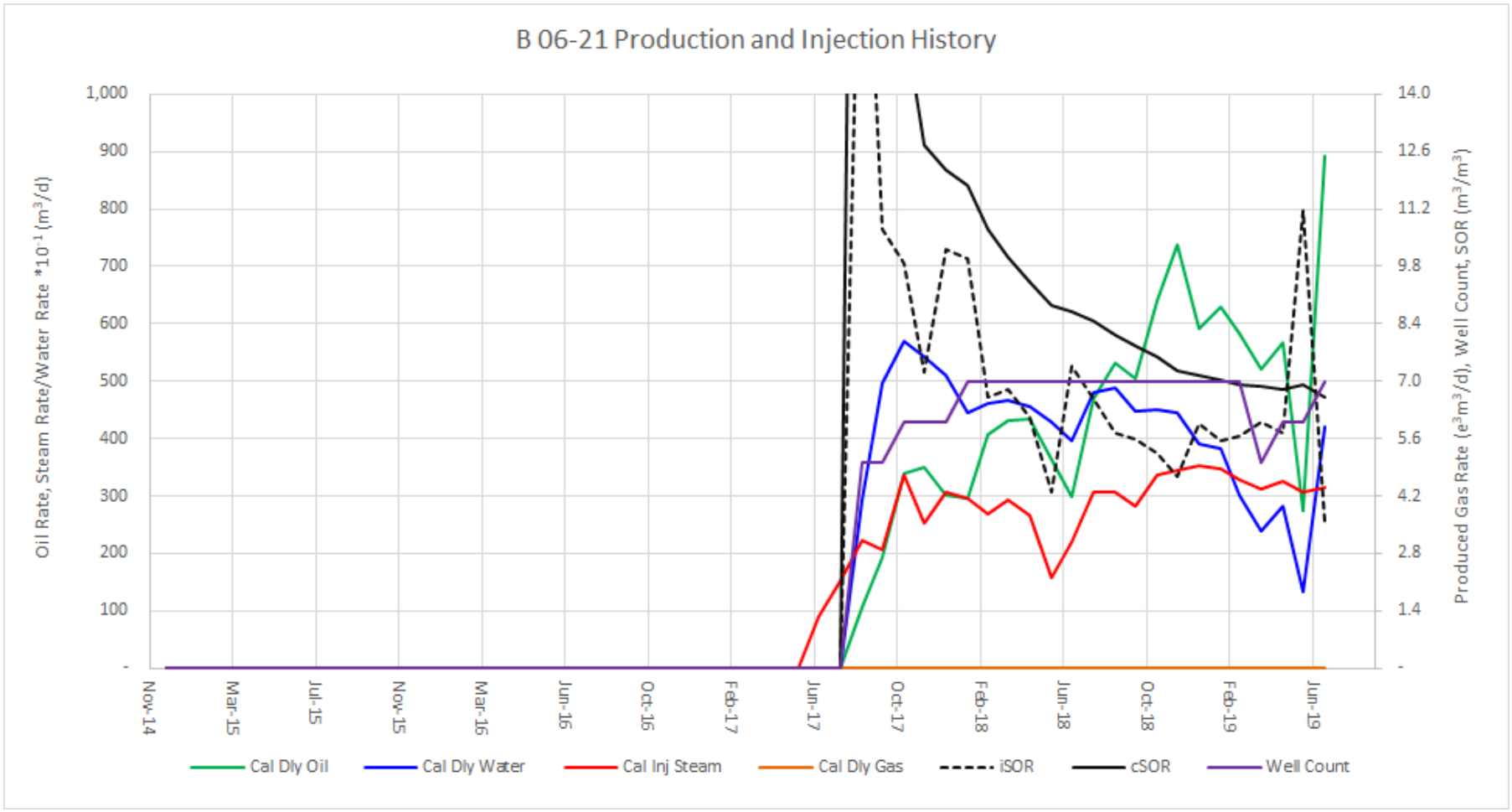
PAD B05-21 (P) PRODUCTION AND INJECTION HISTORY



Note:
There is no test separator in the surface facility design of Pad B05-21 (P), hence, no gas readings are directly associated with Pad B05-21 (P)

7. Scheme Performance

PAD B06-21 (Q) PRODUCTION AND INJECTION HISTORY



There is no test separator in the design of Pad B06-21 (Q). Hence, no gas readings are directly associated with Pad B06-21 (Q)

7. Scheme Performance

START-UP STRATEGY / KEY LEARNINGS

- No new pads were started up in the reporting period
- Infill wells needed small amounts of steam to start up
- Key learnings:
  - Bullheading is the preferred method of start-up
  - For low steam rate wells circulation was required to achieve desirable steam qualities

7. Scheme Performance

OBIP AND RECOVERIES BY PAD

- OBIP for each pad is calculated from the formula:

$$OBIP = L \times W \times H \times (1-S_w) \times \Phi \times 1/B_o$$

Where

L = Length of Drainage Area

W = Width of Drainage Area

H = Net* Thickness from the Top of Pay to the Base of Pay

Φ = Average Net* Porosity in the Pay zone

S_w = Average Net* Water Saturation in the Pay zone

B_o = Oil Volume factor/Shrinkage factor (taken as 1)

*Net properties calculated using a 6% BWO Cut-off

7. Scheme Performance

OBIP AND RECOVERIES BY PAD

Well Pads	Wells		OBIP	Recovery to Date, July 31st, 2019	Recovery Factor	Estimated Ultimate Recovery	Ultimate RF
	Total	Infill Wells	(10^3m^3)	(10^3m^3)	%	(10^3m^3)	%
B 13-08 (B)	10	3	4,475	1,079	24	2,238	50
B 14-08 (C)	7	1	3,260	1,056	32	1,630	50
B 16-08 (D)	7	1	3,079	649	21	1,540	50
B 13-09 (E)	6		2,778	692	25	1,389	50
B 08-17 (G)	7	1	2,990	1,109	37	1,495	50
B 05-16 (H)	10	4	3,155	882	28	1,578	50
B 16-17 (L)	6		3,648	823	23	1,824	50
B 13-16 (M)	6		3,887	871	22	1,944	50
B 15-16 (N)	8	2	4,765	947	20	2,383	50
B 05-21 (P)	7		5,660	262	5	2,830	50
B 06-21 (Q)	7		3,928	318	8	1,964	50
Total	81	12	41,625	8,687	21	20,813	50

7. Scheme Performance

5 YEAR OUTLOOK OF EXPECTED PAD ABANDONMENT

- No pad abandonment is anticipated in the next 5 years

7. Scheme Performance

TEMPERATURE, PRESSURE AND QUALITY OF STEAM

- High pressure steam separator delivers steam at a 100% quality
- Steam quality losses are experienced during transportation to the pads
- Steam quality at the wellhead is estimated to be 95%

7. Scheme Performance

COMPOSITION OF OTHER INJECTED / PRODUCED FLUIDS

- No solvent injection during the reporting period

7. Scheme Performance

INFLOW CONTROL DEVICES (ICD’s)

- No new ICD's were installed during the reporting period
- ICD re-completion is planned for infill well G2A; target Q3 2019
- Installed ICDs continue to perform as per expectations helping control steam breakthrough and improving well production

7. Scheme Performance

SUMMARY OF KEY LEARNINGS

- Production managed to comply with production curtailment requirements
  - Oil cuts and SOR's varied, as needed, given operational constraints (primarily water balance)
- Infill wells performed as expected; however, modifications to completions were made to meet expectations, where needed

8. Future Plans

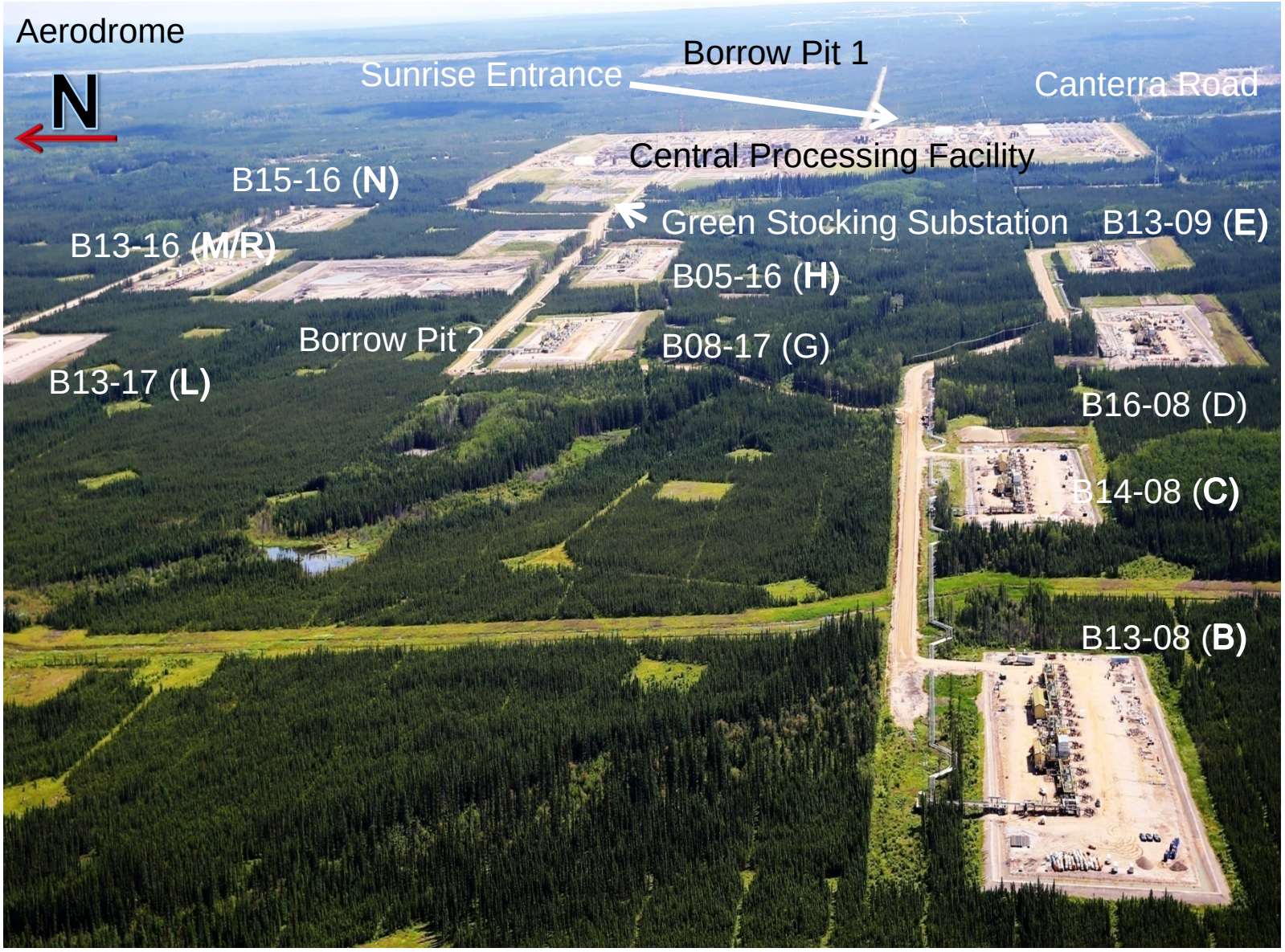
FUTURE PLANS (2019/2020)

- Infill Well Application (21 wells) in DA1/DA2; target submission Q4 2019
- Sustaining Well Pad B16-18 (K) in DA1 and Well Pad B10-21 (U) in DA2 Amendment Application; target submission Q4 2019
- Non-condensable Gas Pressure Maintenance Full Field Application; target submission Q4 2019/Q1 2020
- Development Area 4 Amendment Application; target submission Q4 2020
- Infill well drilling planned for 2019/2020

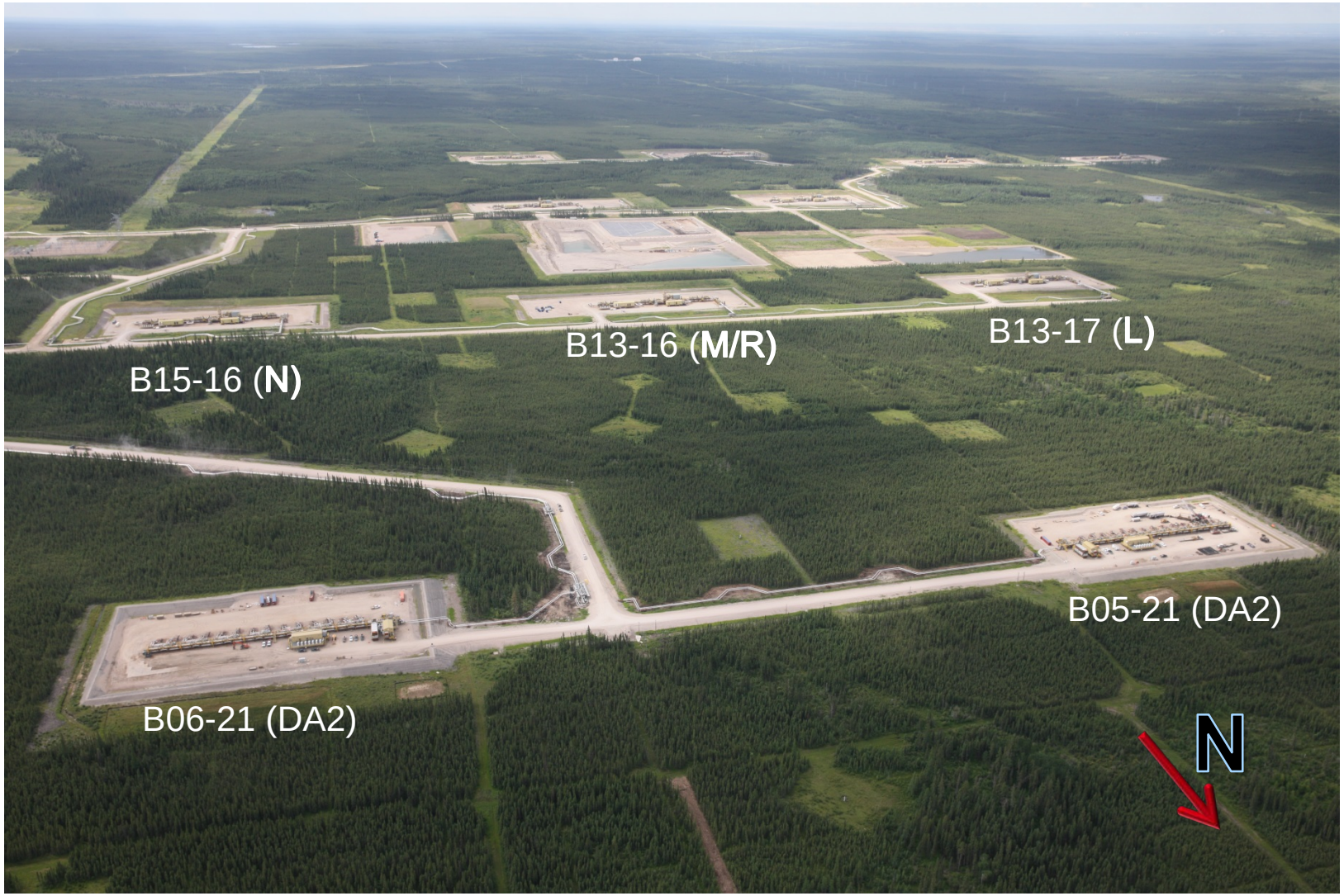
3.1.2 Surface Operations

TABLE OF CONTENTS

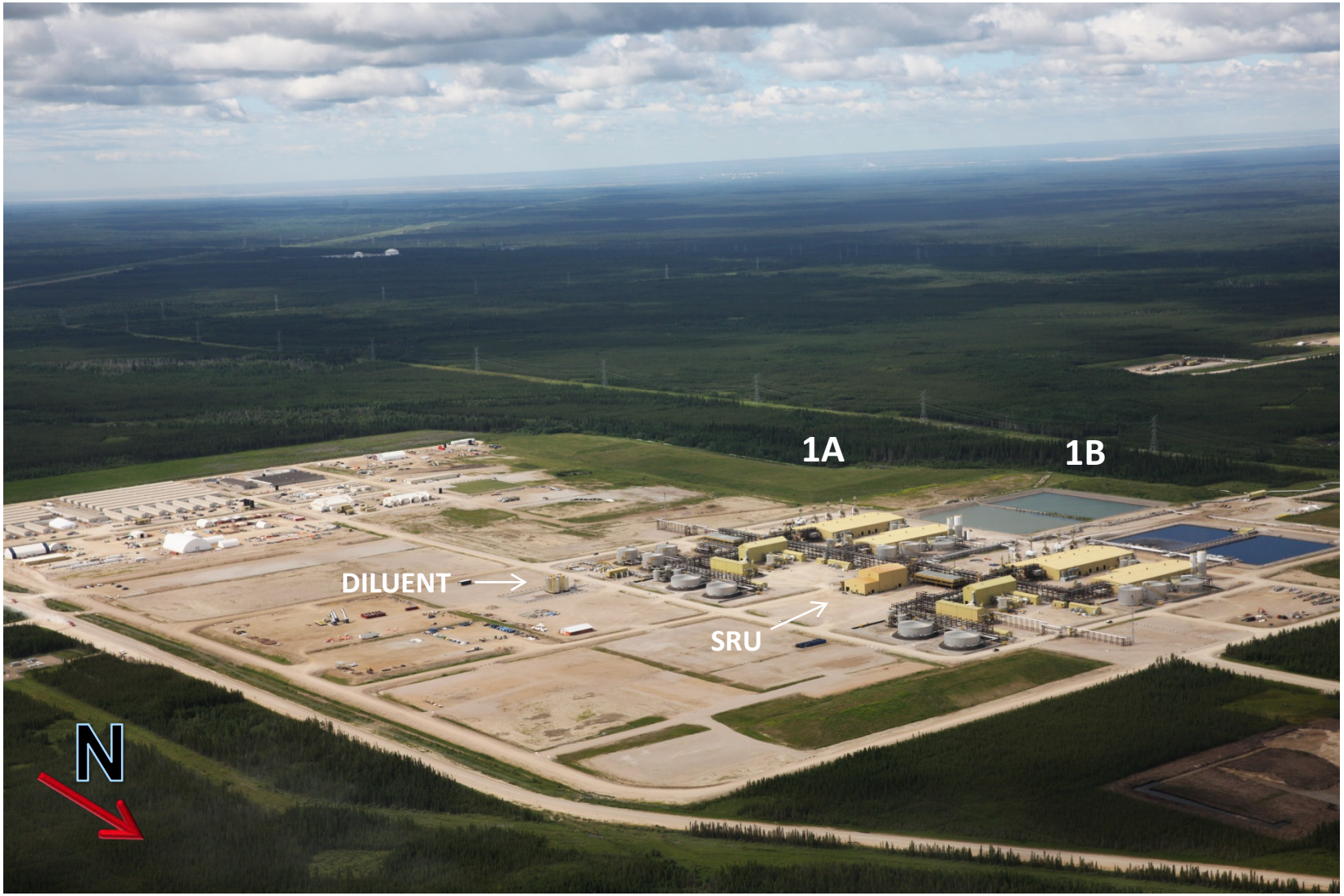
1. Facilities



1. Facilities

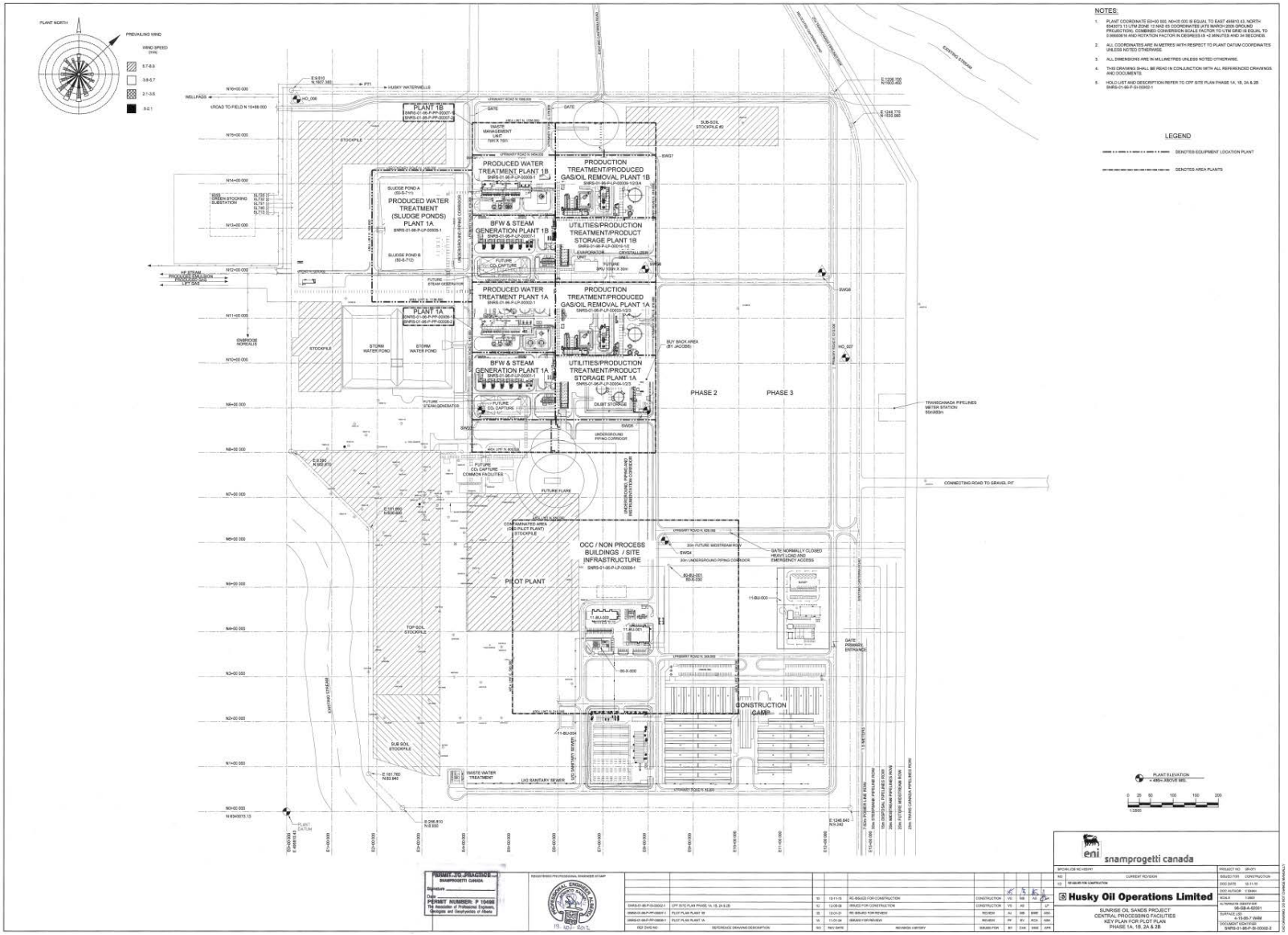


1. Facilities



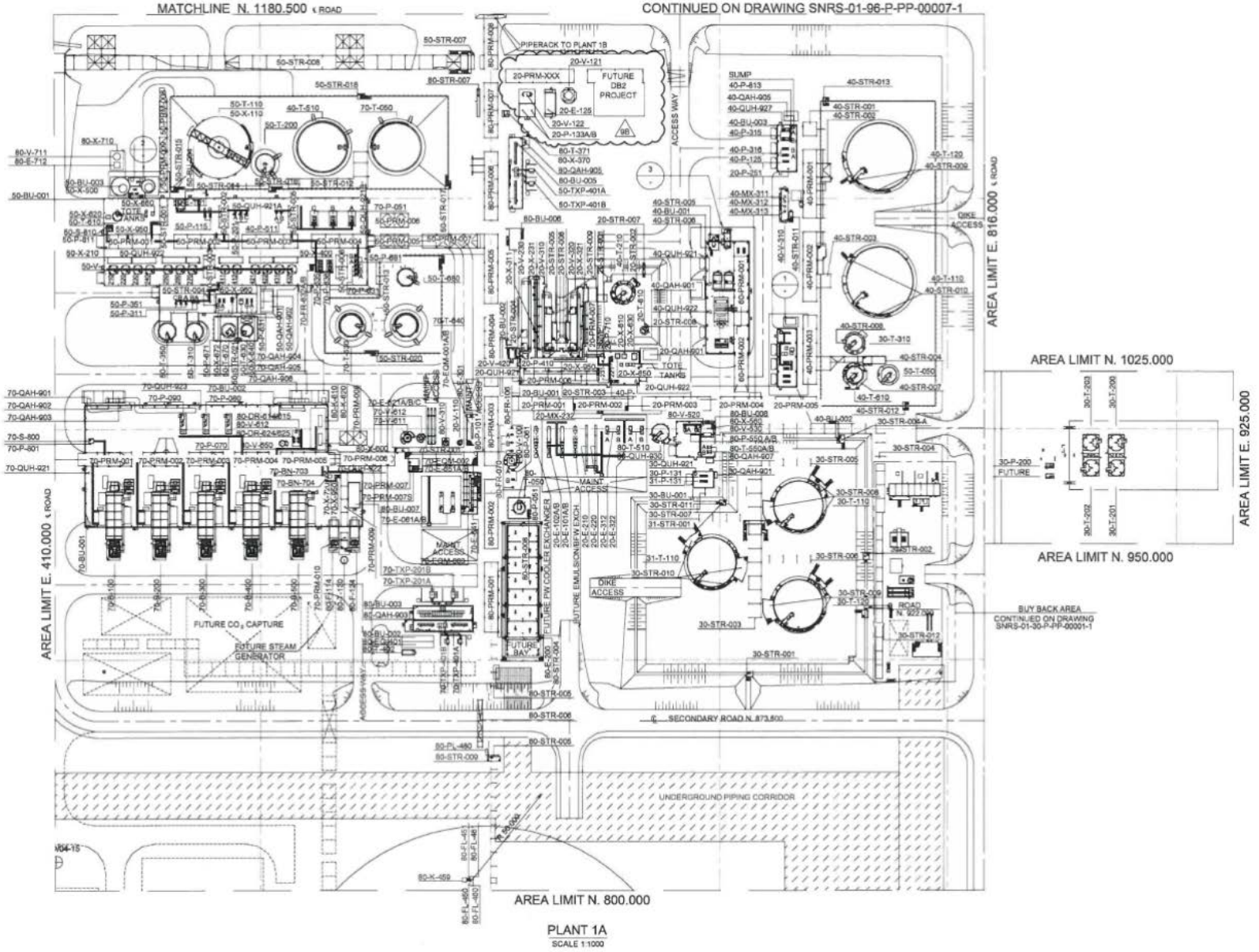
1. Facilities

FACILITY PLOT PLAN



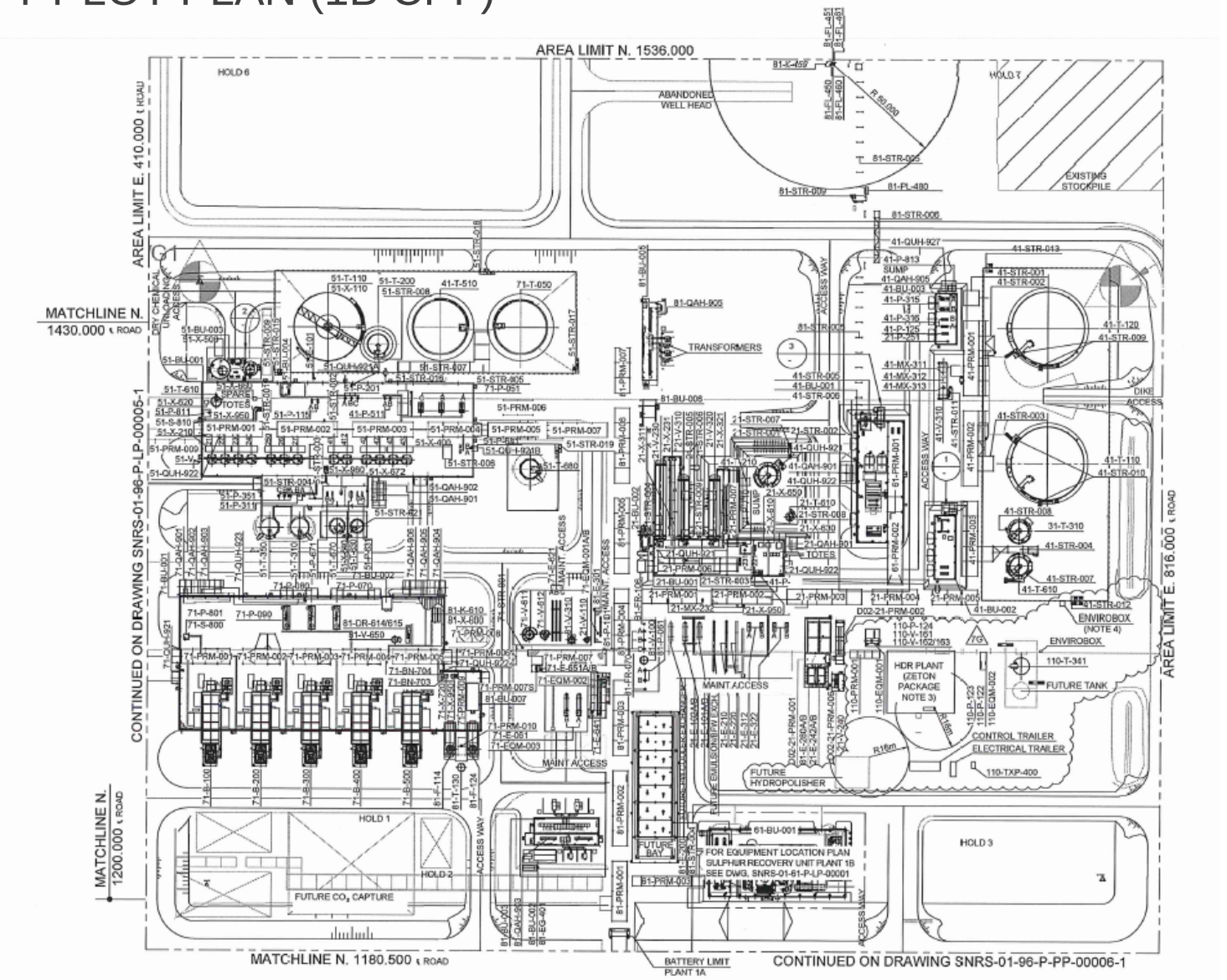
1. Facilities

FACILITY PLOT PLAN (1A CPF)



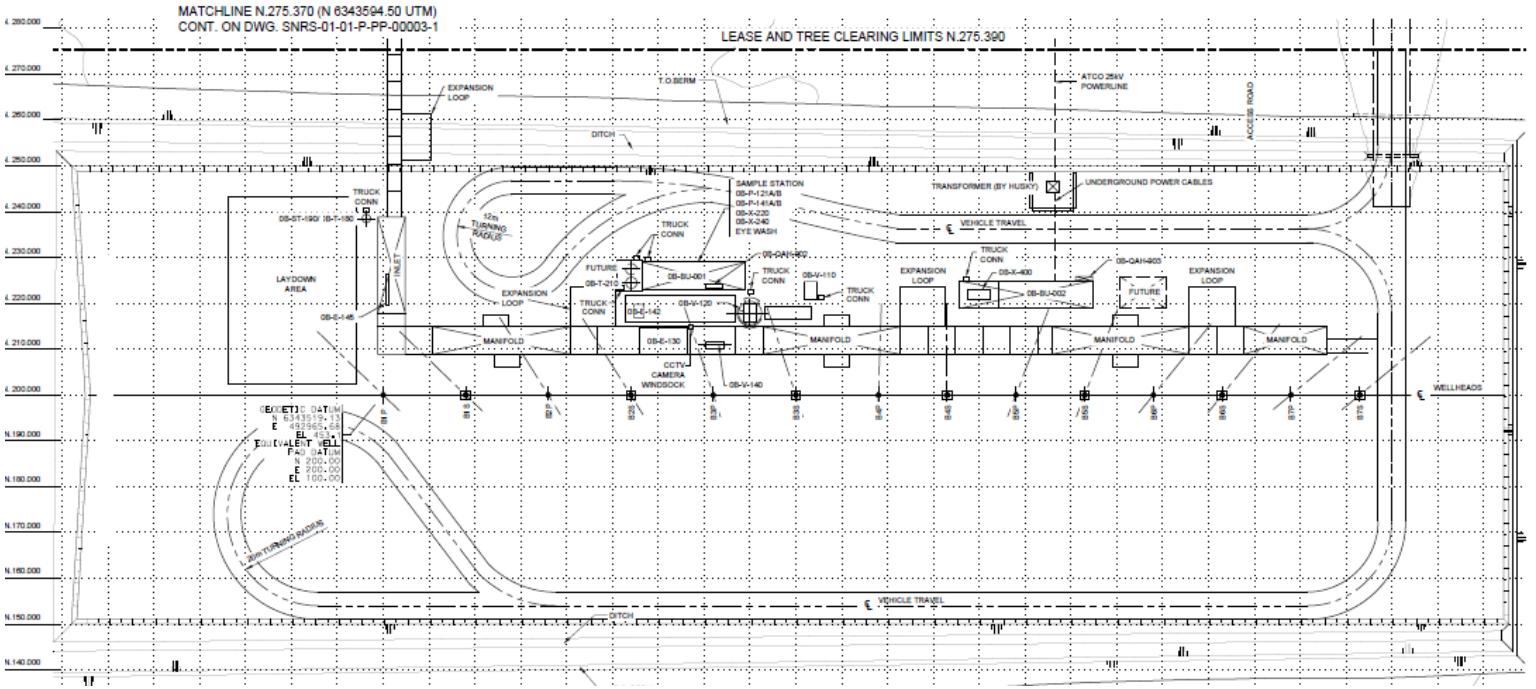
1. Facilities

FACILITY PLOT PLAN (1B CPF)



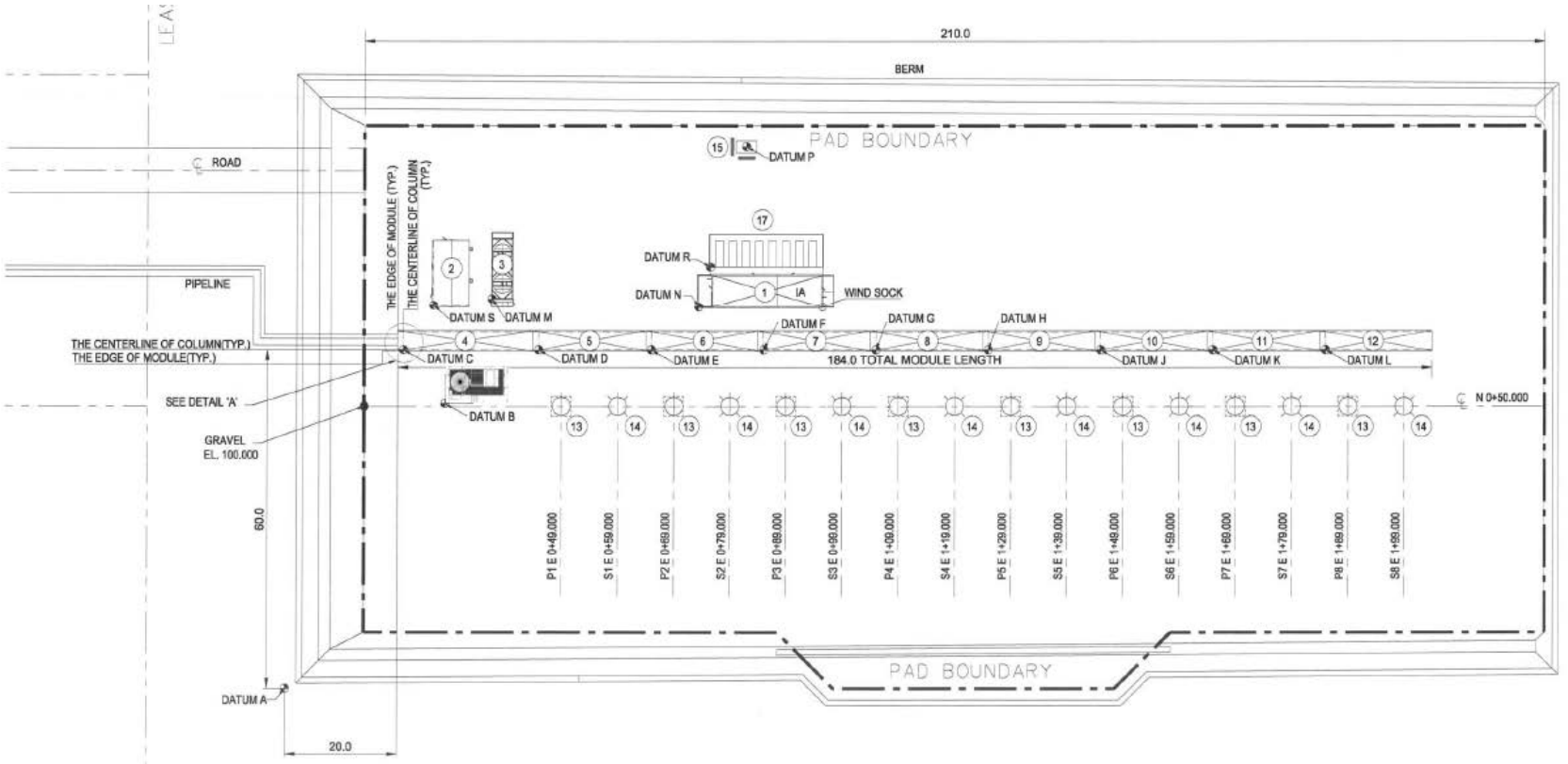
1. Facilities

FIELD FACILITY PLOT PLAN (DA1)



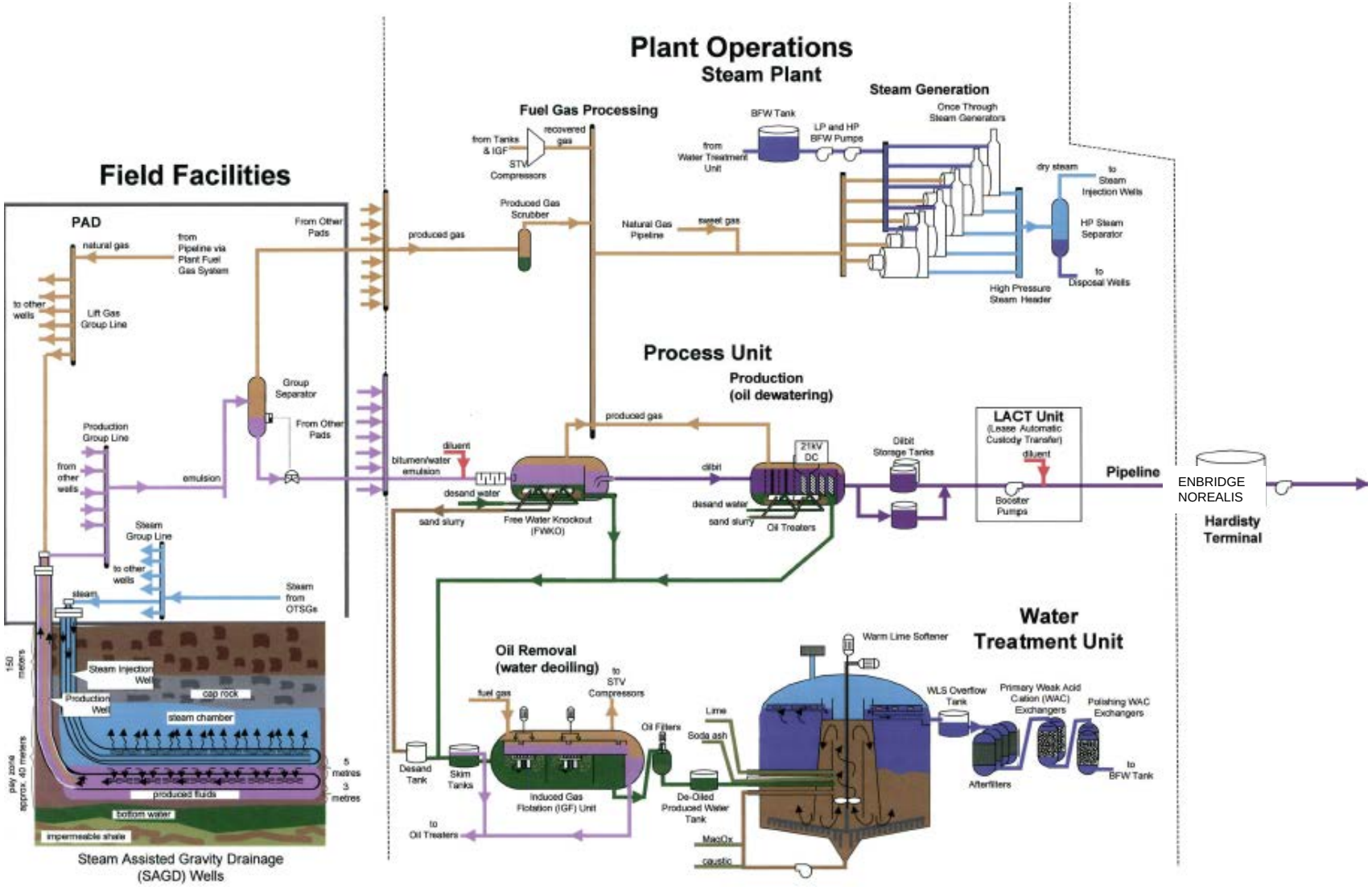
1. Facilities

FIELD FACILITY PLOT PLAN (DA2)



1. Facilities

SIMPLIFIED PLANT SCHEMATIC



1. Facilities

FIELD FACILITIES

Development Area 1 field facilities consist of:

- Steam, emulsion, gas supply, and produced gas pipelines
- Injection and production wells
- All wells use Electric Submersible Pumps (ESPs)
- Group separator
- Test separator package
- Produced gas condenser
- Produced gas separator
- Emulsion and condensate pumps

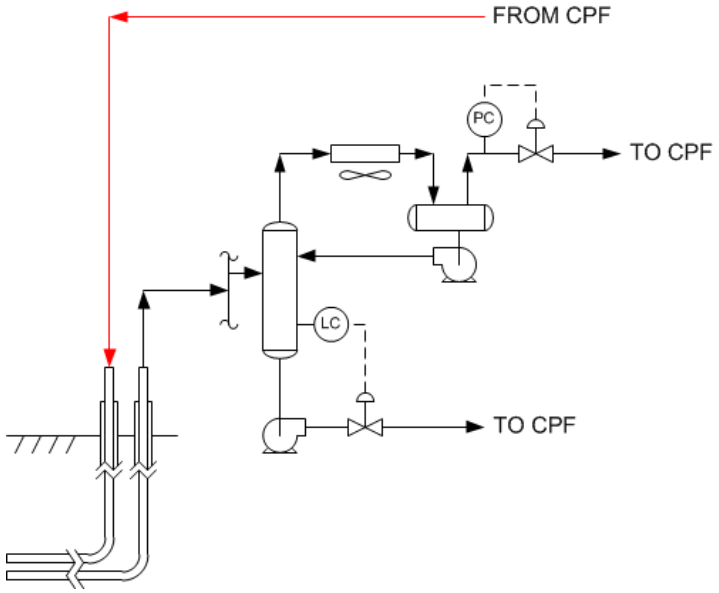
Development Area 2:

- Steam, emulsion, and gas supply pipelines
- Injection and production wells
- Electric submersible pumps (ESPs)
- Multiphase pumps for casing gas re-injection into emulsion line
- Minimal surface equipment

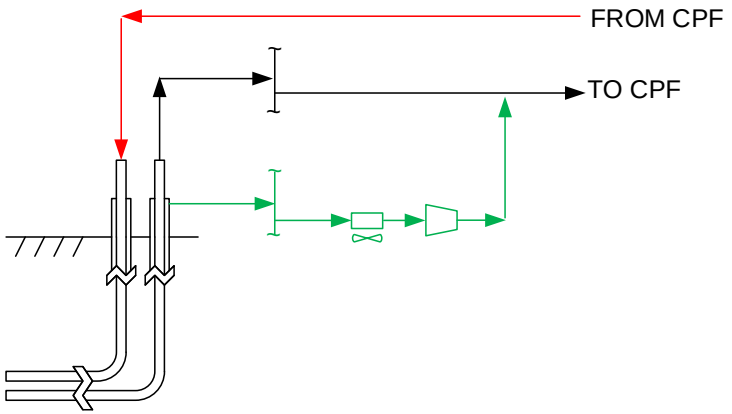
Field facilities performance challenges:

- DA2 Water cut Analyzers
  - Working with manufacturer on troubleshooting
- DA2 sampling for water cut calibration and production estimates
  - New engineered sampling cabinet in service Q3 2019
- Casing gas debottlenecks
  - Completed casing gas re-routes and casing gas control valve upsizes

DA1 FIELD FACILITIES



DA2 FIELD FACILITIES

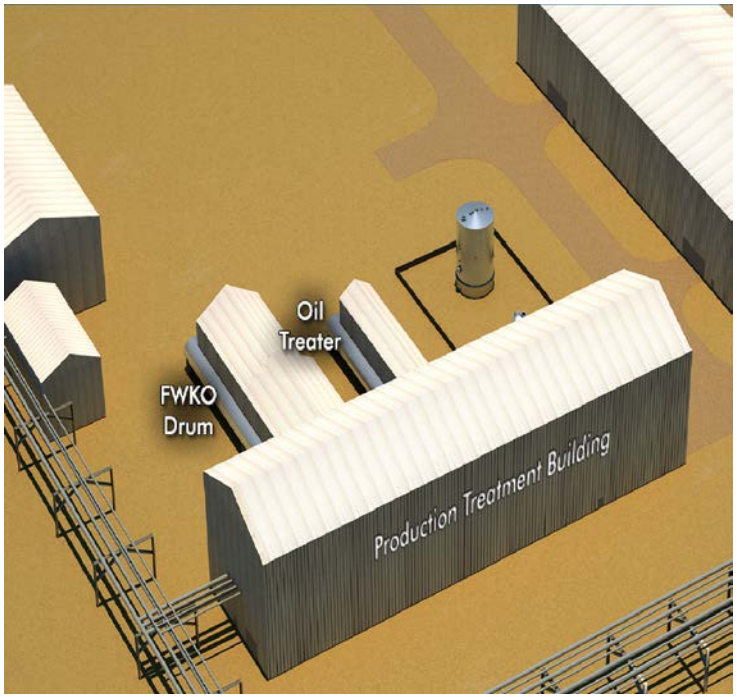


1. Facilities

OIL TREATING

Each Oil Treating train consists of:

- Emulsion Coolers
- 1 Free Water Knock Out
- 2 Treaters
- Sales Oil Coolers
- Produced Water Coolers



Oil Treating KPIs are:

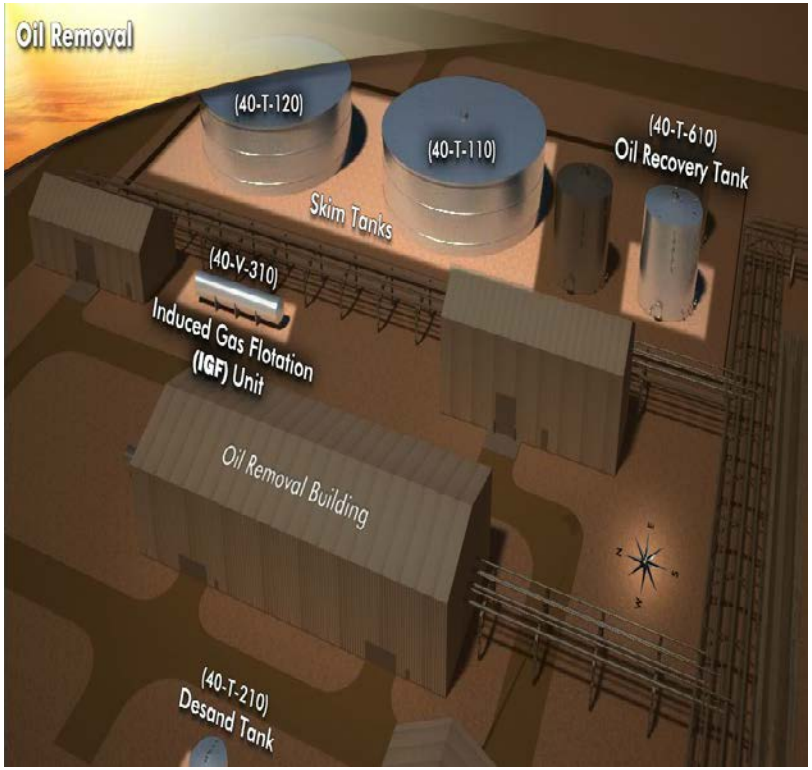
- <0.5% BS&W in Oil (average ~0.4%)
- <500 ppm Oil in PW (average <400 ppm)

1. Facilities

PROCESS WATER DE-OILING

Each De-oiling train consists of:

- 2 Skim Tanks
- 1 Induced Gas Flotation Unit
- 2 Oil Removal Filters
- 1 Oil Recovery Tank
- 1 Desand Tank
- The performance of the de-oiling equipment has continued to improve due to steady upstream performance
- Currently undergoing maintenance campaign to clean and inspect all skim tanks



De-Oiling KPIs are:

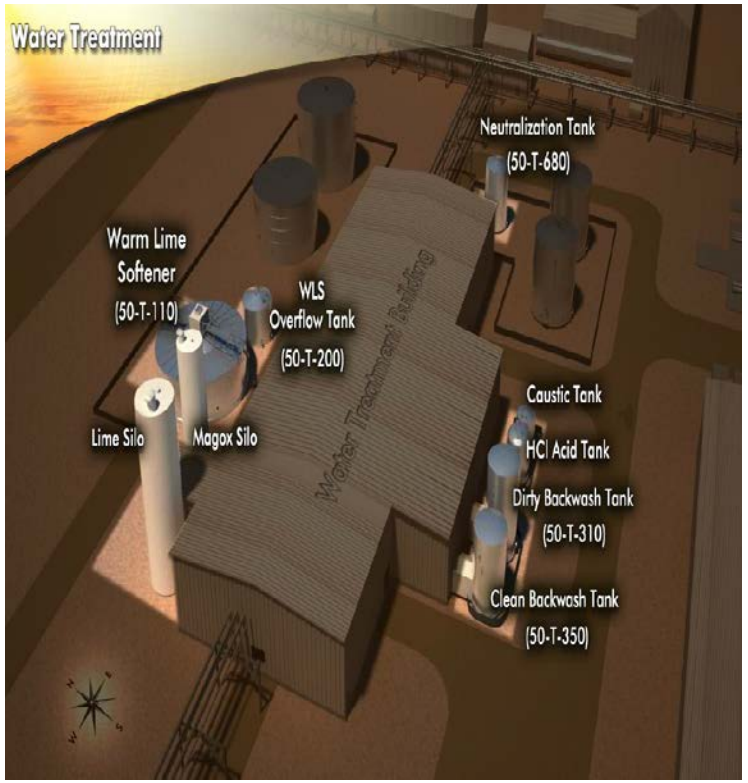
- FWKO outlet – 500 ppm (average 240 ppm)
- IGF Inlet – 100 ppm (average 63 ppm)
- IGF Outlet – 20 ppm (average 14 ppm)
- ORF Outlet – 3 ppm (average 4 ppm)

1. Facilities

WATER TREATMENT

Each Water Treatment train consists of:

- 1 Warm Lime Softener
- 7 After Filters
- 3 pairs Weak Acid Cation (WAC) Exchangers/Polishers
- Neutralization / Backwash Systems
- Water Treatment Chemical Feed Systems
- Sludge Ponds
- Water treatment equipment has been performing well overall
- 1A Plant Turnaround completed and Major Maintenance Campaign on-going to clean/inspect Water Treatment equipment and top-up/replace vessel media
- Sludge pond cleaning on-going to manage water inventories



Water Treatment KPIs are:

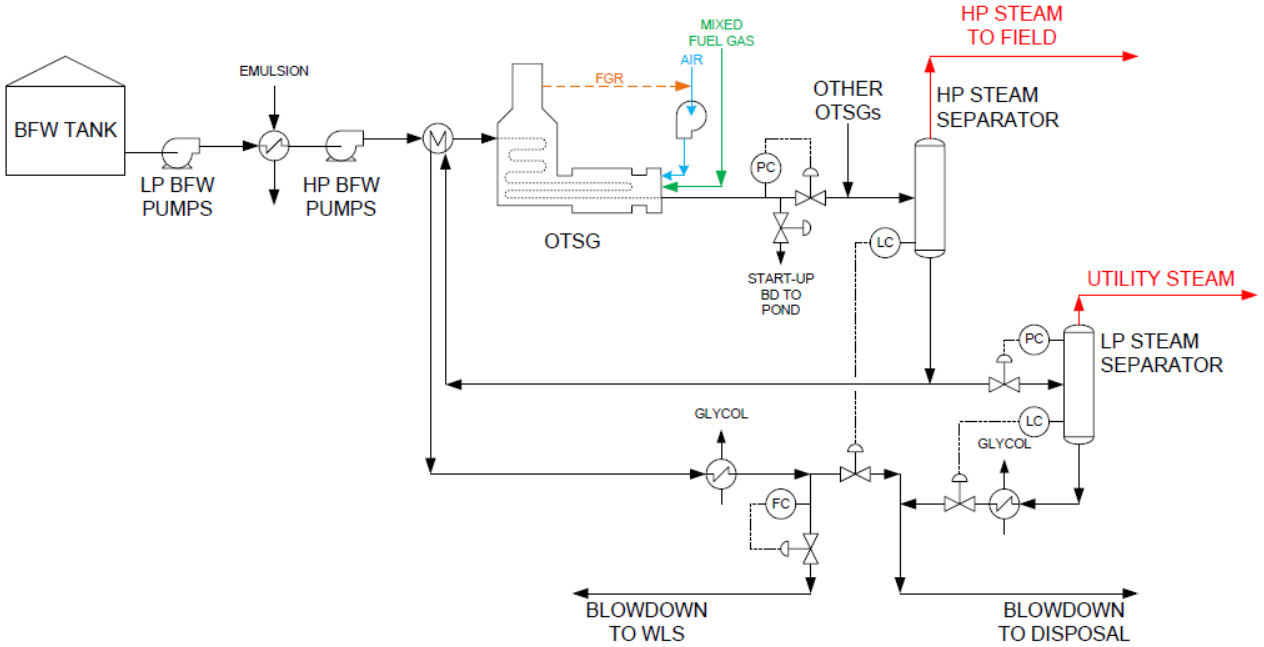
- Total Dissolved Hardness: < 0.3 mg/L (average <0.1 mg/L)
- Silica: < 50 mg/L (average 35 mg/L)
- Turbidity < 2 NTU (average 1.3 NTU)
- Oil in Water < 1.0 (average 0.22)
- Total Iron: < 300 ppb (average 25.08 ppb)
- pH: 9.8 to 10.2 (average 10.07)

1. Facilities

STEAM GENERATION

Each Steam Generation train consists of:

- 5 Once-Through Steam Generators (OTSGs)
- 3 Low Pressure (LP) and 3 High Pressure (HP) Boiler Feed Water (BFW) Pumps
- LP Steam system
- Blowdown cooling and disposal
- Burner modifications and re-characterization work completed in Q4 2018 to increase capacity of each OTSG to 123% of original name plate. AER application to re-rate Phase 1 OTSGs to 105 MW submitted and approved in Q4 2018

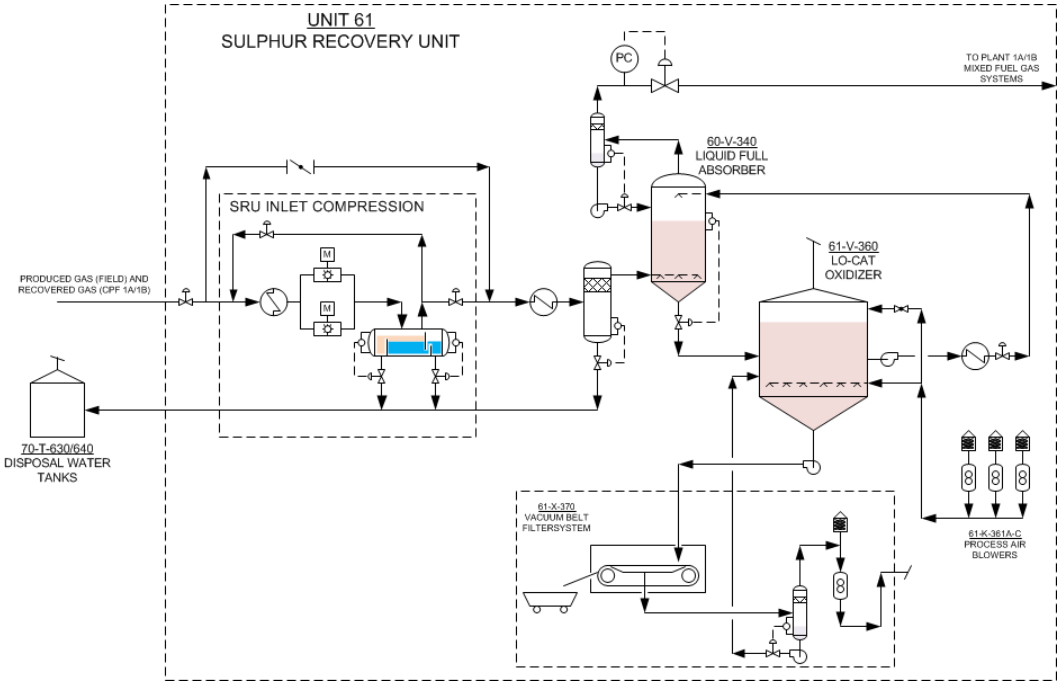


1. Facilities

LO-CAT SULPHUR RECOVERY UNIT (SRU)

- Permanent SRU online as of October 2015
- SRU down-time for cleaning and maintenance from May 1 – May 17, 2019

- SRU consists of:
  - Sour Gas Compression Package
  - Cooler & Coalescing Filter
  - Liquid Full Absorber
  - Absorber Knock Out Pot
  - LO-CAT® Oxidizer
  - Solution Cooler/Heater
  - Process Air Blowers
  - Vacuum Belt Package
  - Circulation, Slurry, and Chemical Feed Pumps, Tanks, and Ancillary Equipment



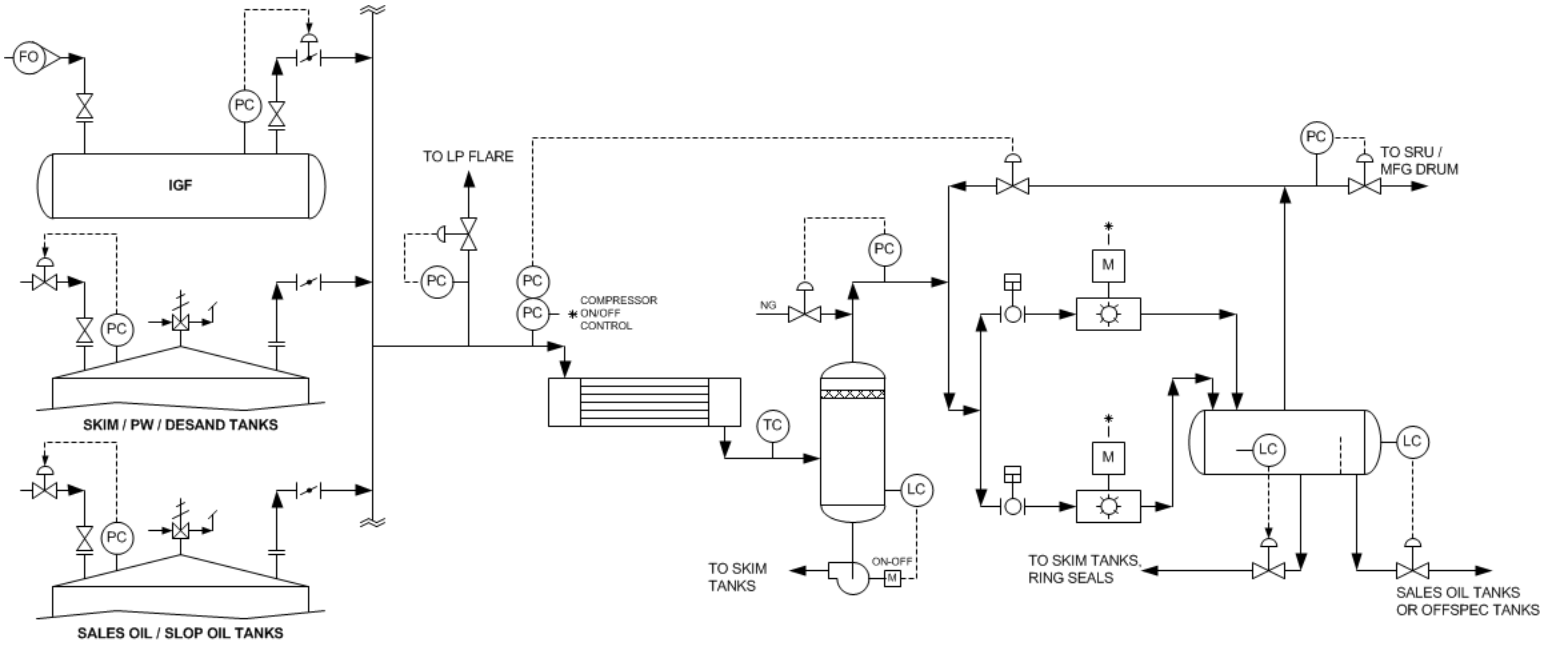
- SRU Approval Conditions:
  - Sulphur Recovery: minimum 70 % per calendar quarter
  - SO_2 Emission Limit < 1.8 t/d

1. Facilities

VAPOUR RECOVERY

Each Storage Tank Vapour (STV) recovery system consists of:

- Collection header with high pressure diversion to LP Flare
- 1 Inlet Cooler & Suction Scrubber
- 2 Liquid Ring Compressors
- 1 Discharge Separator
- 2 Casing Water Coolers (liquid ring seal water)
- Condensate Pumps



1. Facilities

FACILITY MODIFICATIONS - 1A/SRU TURNAROUND

- Tie-ins for future BFW/Emulsion heat exchanger
- FWKO modifications (Reduced chemical cost and improved vessel performance)
    - Cleaning and general repairs
    - Nuclear profiler wash system
    - Drain valve
- Tie-ins for Oil Removal Filter PSV Relocation – reduce potential for hammering of ORF discharge line
- 1A PWC Inlet piping configuration change - eliminate vapor lock of exchanger
- Diluent valve bypass to ensure diluent supply reliability in the event of pluggage
- Quench Water Temperature Control - optimize quench water for produced water cooling to ensure D081 Compliance
- 1A Warm Lime Softener (improved operability)
    - Lower weir height
    - Install new sludge sample tap (improved visibility of sludge bed profile)
    - WLS roof repairs
    - Modify WLS Overflow Tank Internals – Adjust height of overflow piping so high level trips can protect the WLS from an overflow/overpressure scenario
- Install 3rd PSV in 1A HP Steam System (spare PSV for reliability)
- SRU Modifications
    - SRU Tie-ins for glycol, flare, utilities for Plant 1A (for future turnarounds)
    - Duckbill modifications for improved sparging in absorber and oxidizer
    - Upgrade sour gas inlet valve to ball valve (increase reliability)

1. Facilities

FACILITY MODIFICATIONS – OTSG'S

- Phase 1 OTSG re-rate (increase to 105 MW) application submitted and approved in Q4 2018
- Convection section tube replacements started in June 2019

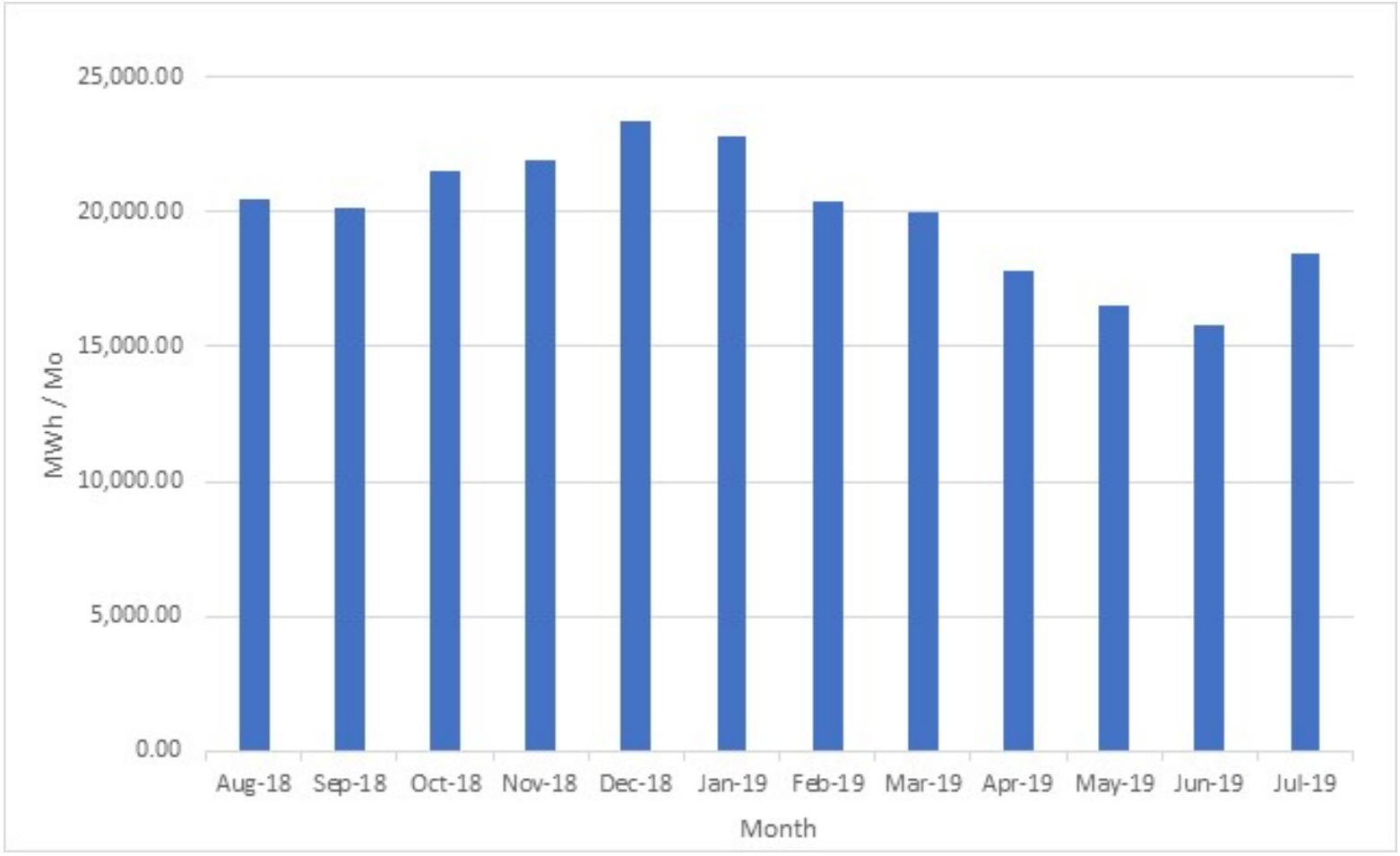
2. Facilities Performance

SRU ISSUES SUMMARY

- Oxidizer Vent hydrocarbon emissions
  - Venting waiver currently in place; expires December 31, 2019
  - Offset plan:
    - Produced water / make-up water Quench completed and operational
    - Casing gas bypass / increased Group Separator pressure increases completed, operational as field conditions allow
- Continuous Emissions Monitoring System (CEMS)
  - Brought back on line in May 2019; long term reliability/capability still under evaluation
  - Continuing manual sampling of oxidizer vent stack for hydrogen sulphide (H_2S) when the CEMS is not operational (as per waiver extension application submitted and approved July 2019)
  - To date, H_2S has not exceeded the regulatory limit in the samples collected from the vent stream

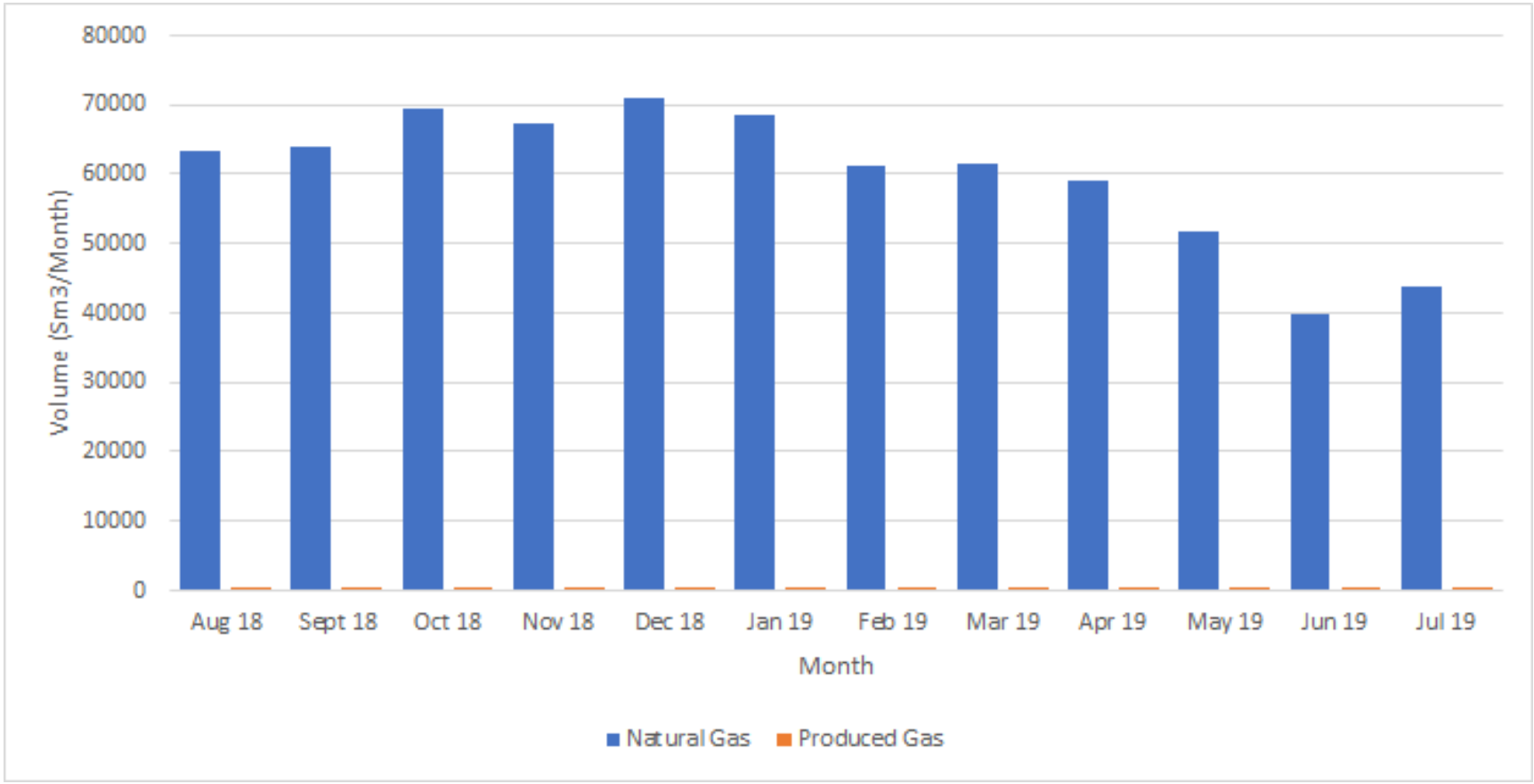
2. Facilities Performance

POWER CONSUMPTION



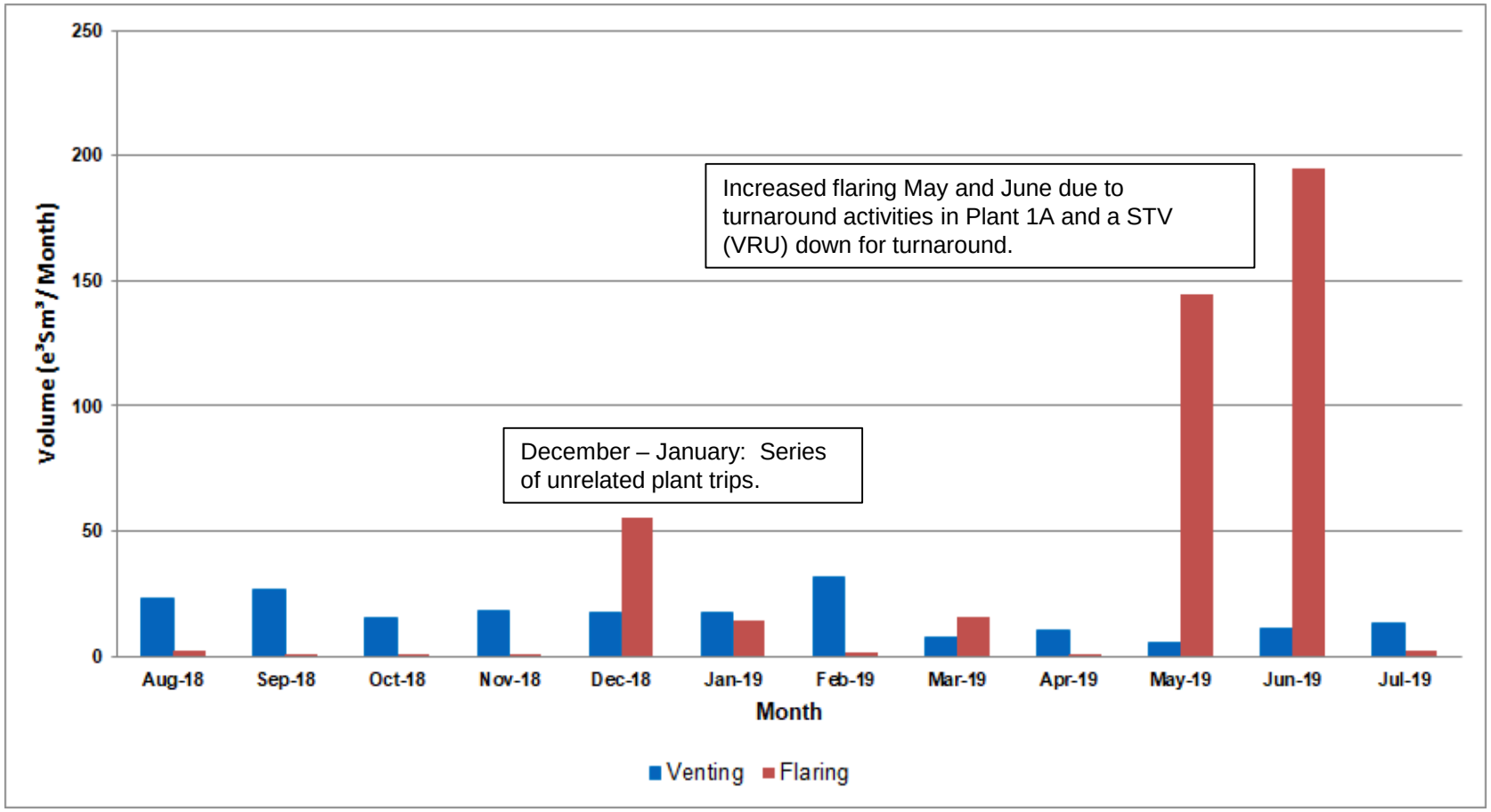
2. Facilities Performance

GAS USAGE



2. Facilities Performance

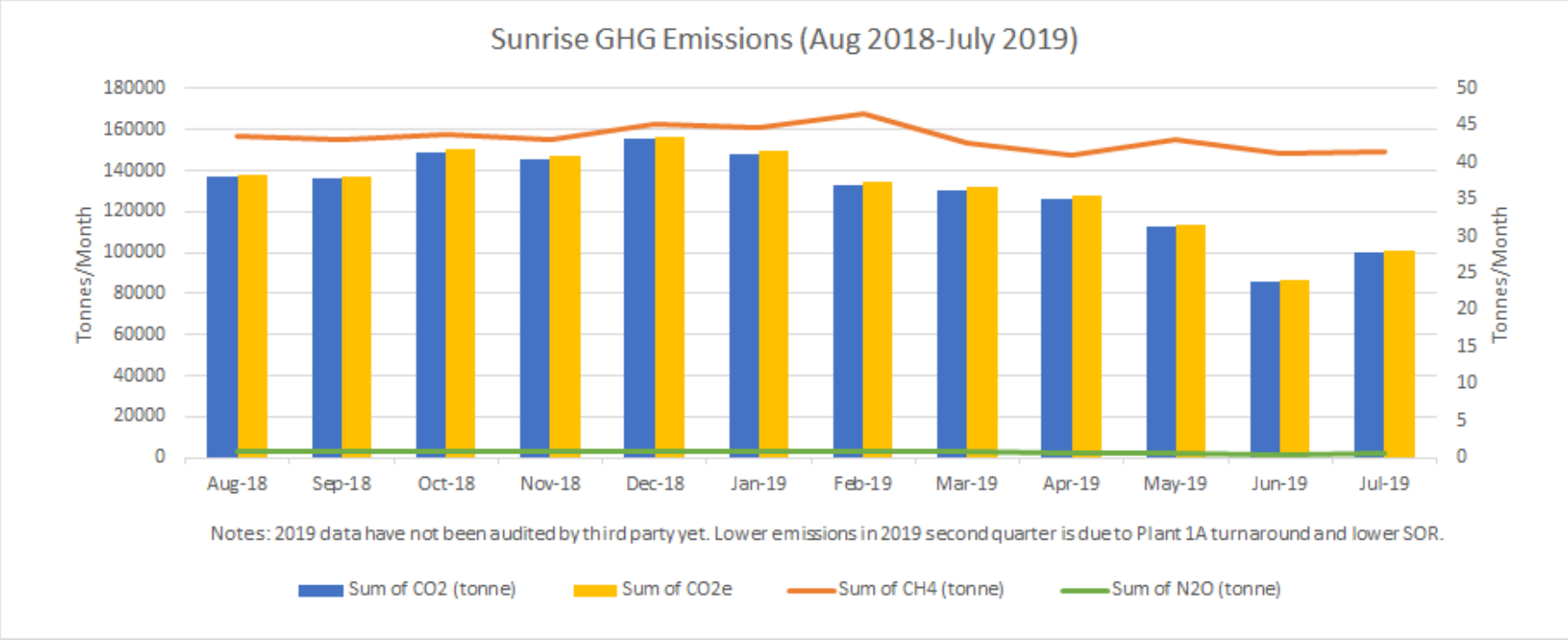
FLARING AND VENTING



2. Facilities Performance

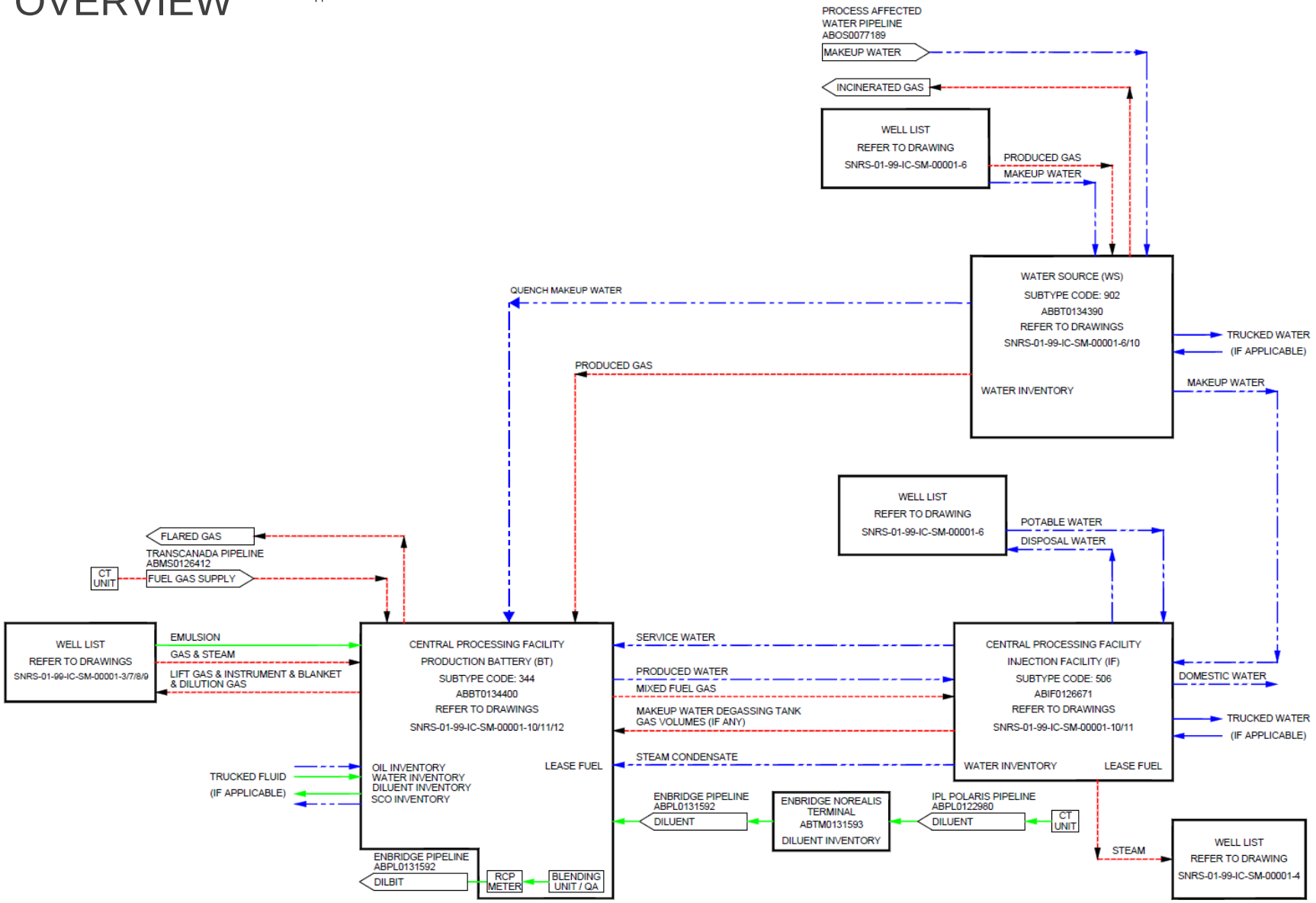
GREEN HOUSE GAS (GHG)

- Emission sources considered include stationary combustion associated with steam generators and glycol heaters, flaring, venting and fugitive emissions, diesel and propane combustion and onsite transportation



3. Measurement and Reporting

OVERVIEW



3. Measurement and Reporting

WATER SOURCE BATTERY ABBT0134390

- Suncor PAW water receipt average 2,620 m^3/d for past 12 months (August 2018 – July 2019)
- PAW water started up late September 2018 after water balance resolved
- No PAW water used from mid-June 2019 to mid-August 2019 due to plant water balance issue and leak detection meter troubleshooting
- Kearl MUW well lists:
  - 09-24-096-08W4
  - 01-13-096-08W4
  - 06-30-096-07W4
  - 12-08-096-07W4
  - 11-17-095-07W4
  - 12-20-096-07W4
  - 14-18-096-07W4
  - 06-19-096-07W4
- Increased water balance deviation starting in January likely due to quench water flow measurement. Currently under investigation

Date	Water Balance (%)
Aug-18	1.9
Sep-18	0.7
Oct-18	2.7
Nov-18	0.7
Dec-18	2.1
Jan-19	3.7
Feb-19	2.7
Mar-19	7.7
Apr-19	11.2
May-19	4.8
Jun-19	4.7
Jul-19	4.7

3. Measurement and Reporting

INJECTION FACILITY ABIF0126671

- Primary and secondary Boiler Feed Water (BFW) measurement balances within 5%
- Reported Spent Lime Pond inventory:
  - o Sources: OTSG blowdown, SWS, leachate from landfill
  - o Users: Water treatment
- Trucked in/out water loads have been accounted
- Injection Facility closing water balance and steam allocation:

Date	Water Balance (%)	Steam Allocation
Aug-18	2.5	1.02
Sep-18	1.6	1.01
Oct-18	2.8	1.01
Nov-18	4.9	1.01
Dec-18	4.4	1.01
Jan-19	2.6	1.01
Feb-19	1.2	1.01
Mar-19	2.6	1.01
Apr-19	0.8	1.01
May-19	2.0	1.01
Jun-19	2.9	1.02
Jul-19	1.6	1.01

3. Measurement and Reporting

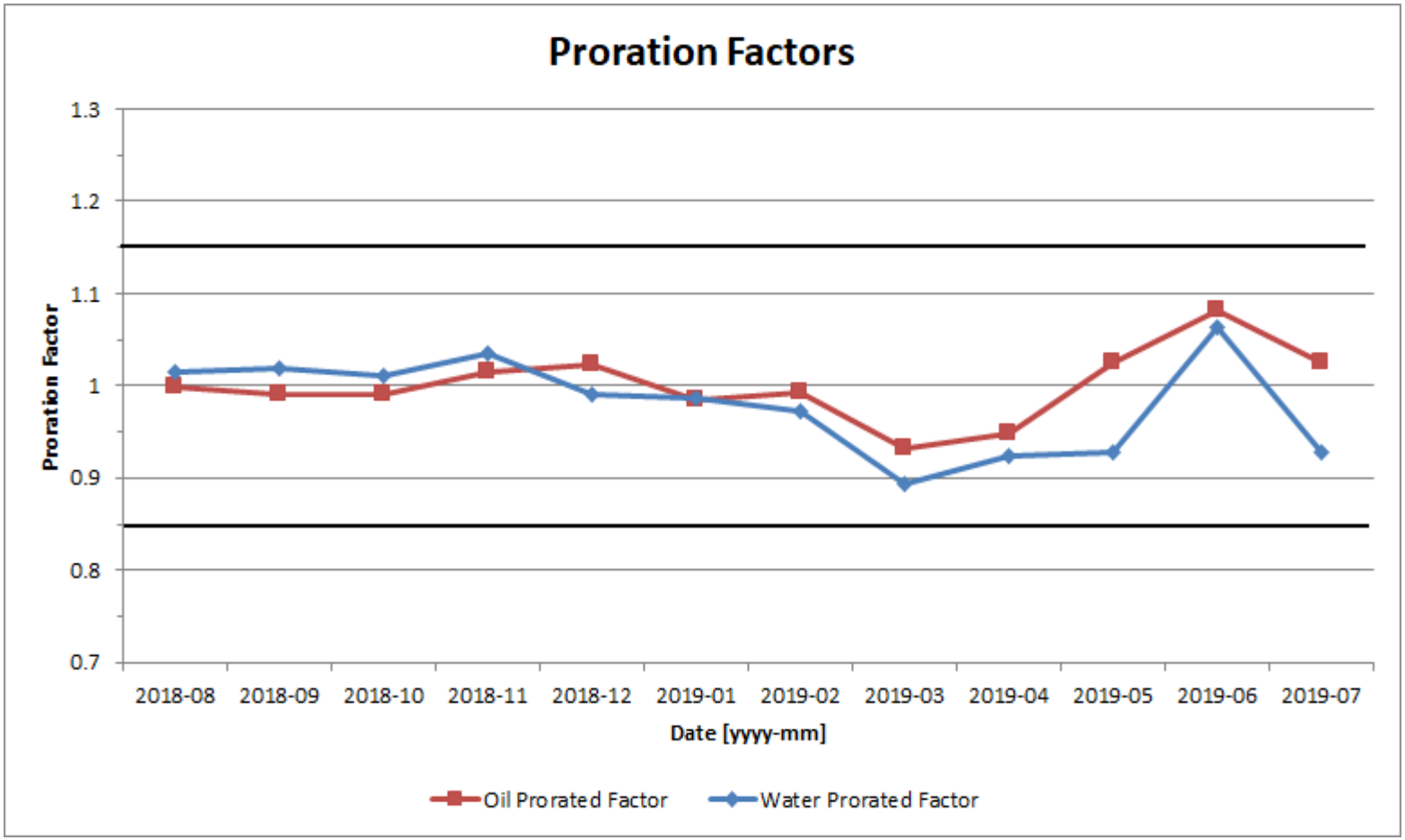
IN SITU OIL SANDS BATTERY ABBT0134400

- Primary and secondary produced water measurement balances within 5%
- Trucked in/out water and oil loads are accounted for the reporting period

Monthly Battery GOR	
Date	GOR e^3m^3/m^3
Aug-18	0.00490
Sep-18	0.00243
Oct-18	0.00394
Nov-18	0.00456
Dec-18	0.00562
Jan-19	0.00378
Feb-19	0.00261
Mar-19	0.00191
Apr-19	0.00322
May-19	0.00531
Jun-19	0.00441
Jul-19	0.00376

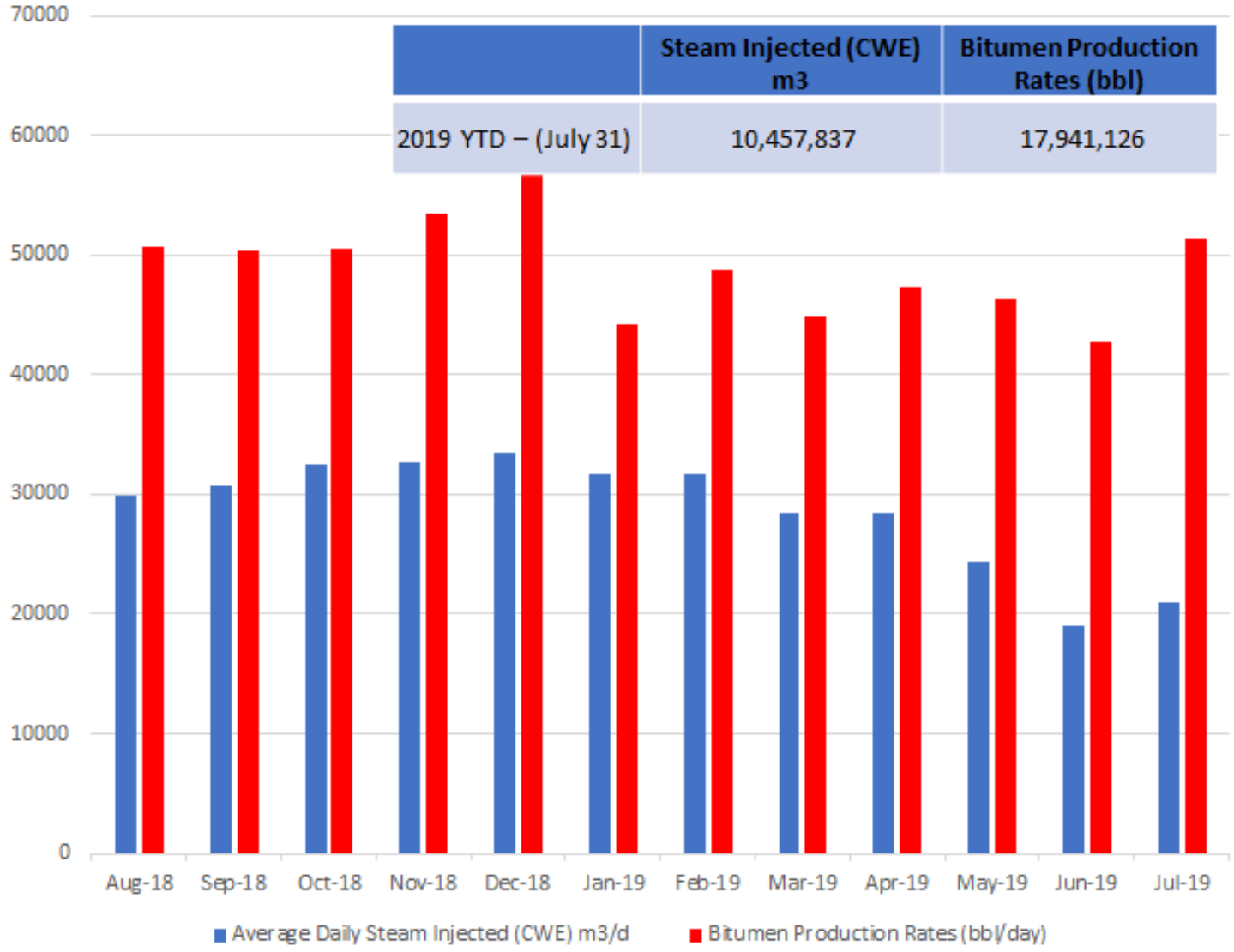
3. Measurement and Reporting

PRORATION FACTORS



3. Measurement and Reporting

STEAM INJECTION VS BITUMEN PRODUCTION



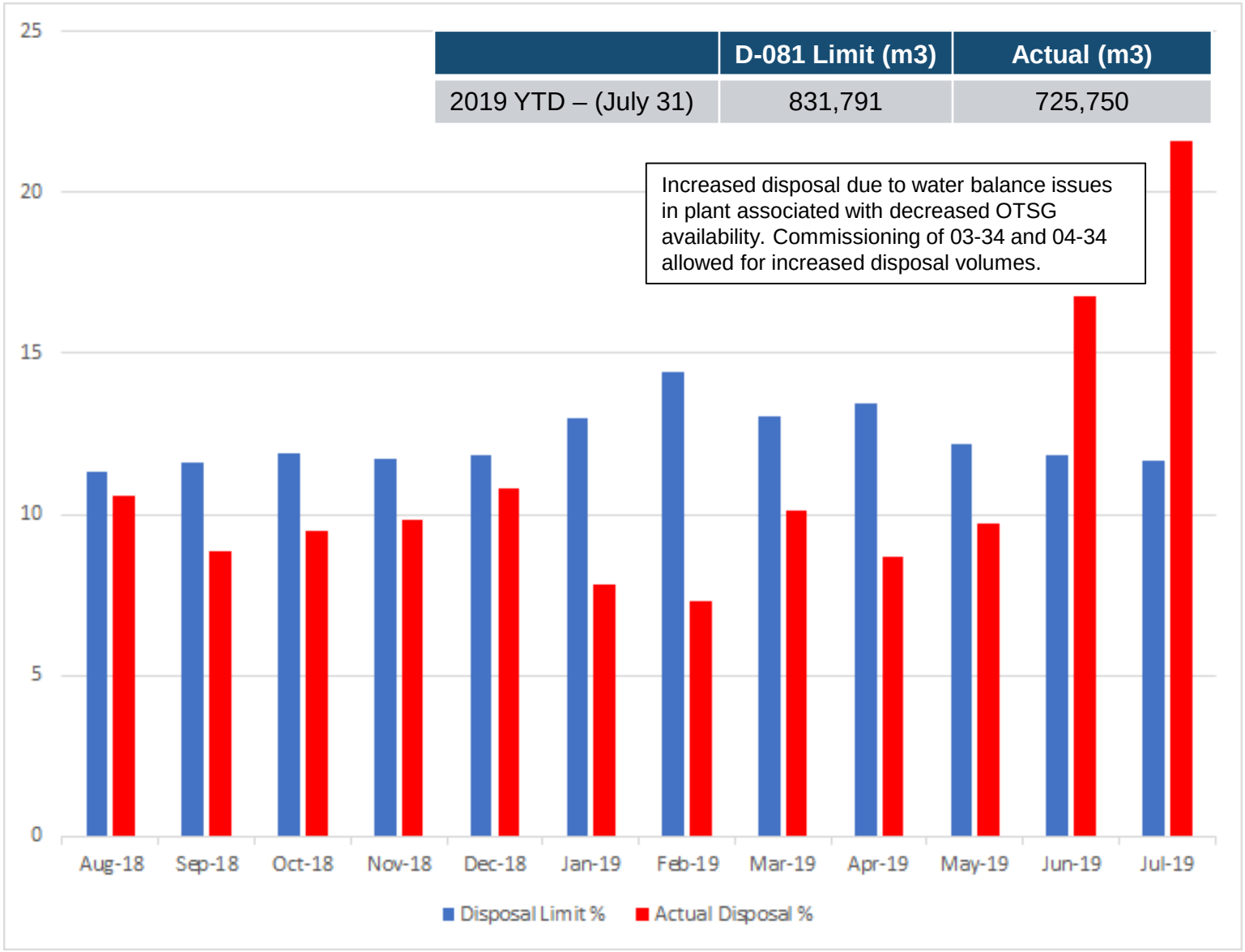
	Steam Injected (CWE) m3	Bitumen Production Rates (bbl)
2019 YTD – (July 31)	10,457,837	17,941,126

3. Measurement and Reporting

WATER DISPOSAL – DIRECTIVE 081

	D-081 Limit (m3)	Actual (m3)
2019 YTD – (July 31)	831,791	725,750

Increased disposal due to water balance issues in plant associated with decreased OTSG availability. Commissioning of 03-34 and 04-34 allowed for increased disposal volumes.

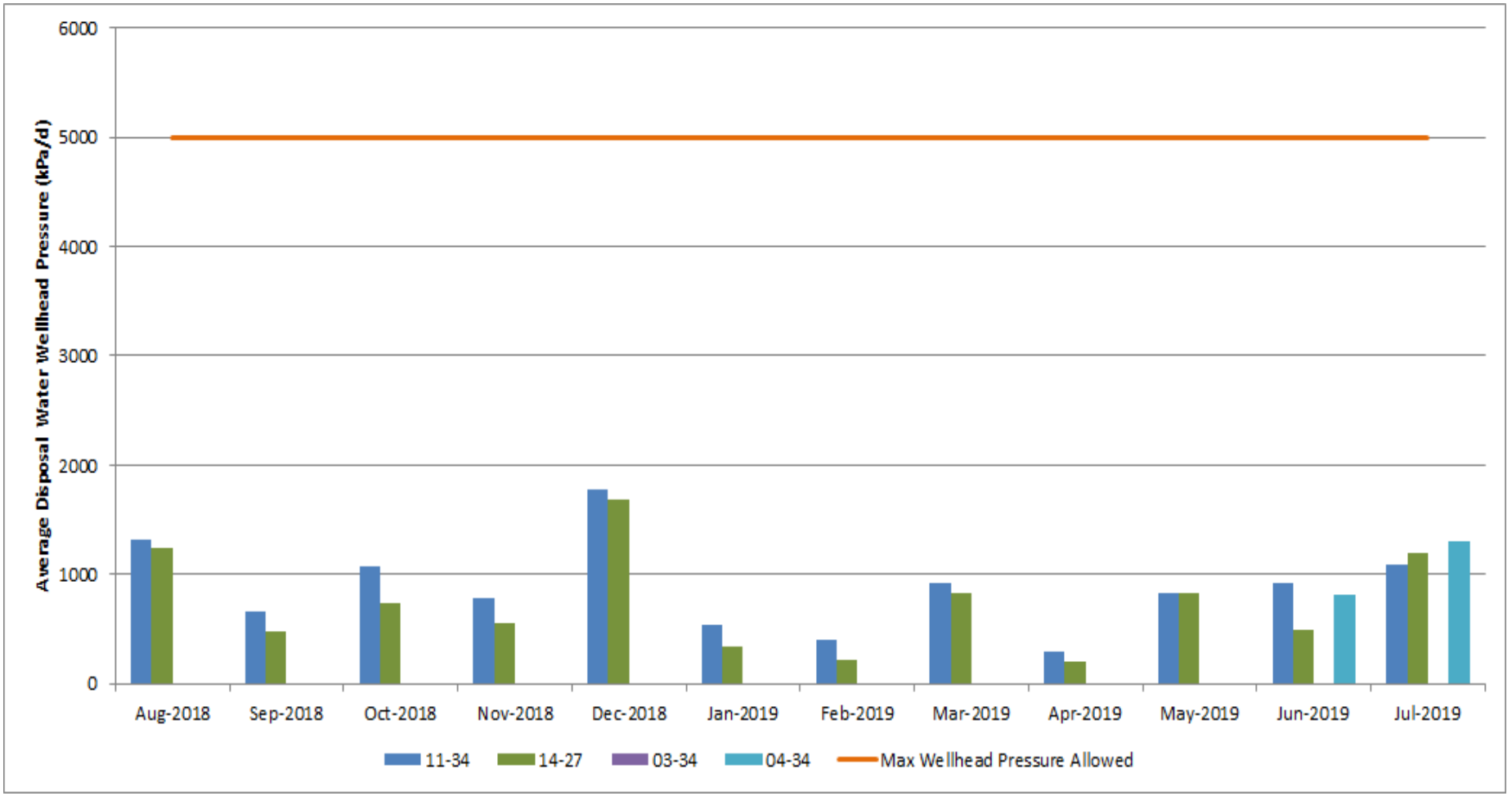


3. Measurement and Reporting

MONTHLY WATER IMBALANCE – DIRECTIVE 081

3. Measurement and Reporting

WATER DISPOSAL – WELL HEAD PRESSURE



3. Measurement and Reporting

FUTURE PLANS (2019/2020)

- Six Infill wells are planned to start up in Q4 2019
  - Use existing well test facilities, 3 well test tags per infill well
- Well Pad B10-16 (R) start up Q4 2019
  - Use existing Pad B13-16 (M) well test facilities
  - 3 tags per well for well tests added
  - 1 tag per well for steam injection added
- New Natural Gas odorizer skid planned to start up in Q3/4 2019
  - Supporting camp related services, not production related
  - New accounting positive displacement meter
- Husky Diluent Reduction (HDR) pilot operations concluded in Q3 2019. Evaluation will be done to guide decisions on further testing
- MARP AER Audit requested January 9, 2019; pending AER review

Note: MARP will be updated to reflect all changes above

4. Water Production, Injection and Uses

WATER USAGE

Water Sources:

- Quaternary (non-saline)
  - Water Act License No. 267760
  - 2 wells: 01-23-095-07W4 and 16-22-095-07W4
  - Licensed to divert 202,575 m3 annually for Industrial (Camp) purposes
    - Up to 18,650 m^3 annually for Industrial uses (general maintenance and processes)
    - Outflow: licensed to divert 202,575 m3 annually from the *Domestic Wastewater Treatment Plant* for Industrial (injection) purposes
  - Withdrawal from August 1, 2018 – July 31, 2019: 70,196 m^3

- Surface Water Runoff (non-saline)
  - Water Act License No. 331927
  - 14 diversion locations
  - Licensed to divert 250,000 m^3 annually for Commercial purposes
  - Withdrawal from August 1, 2018 to July 31, 2019: 3,548 m^3

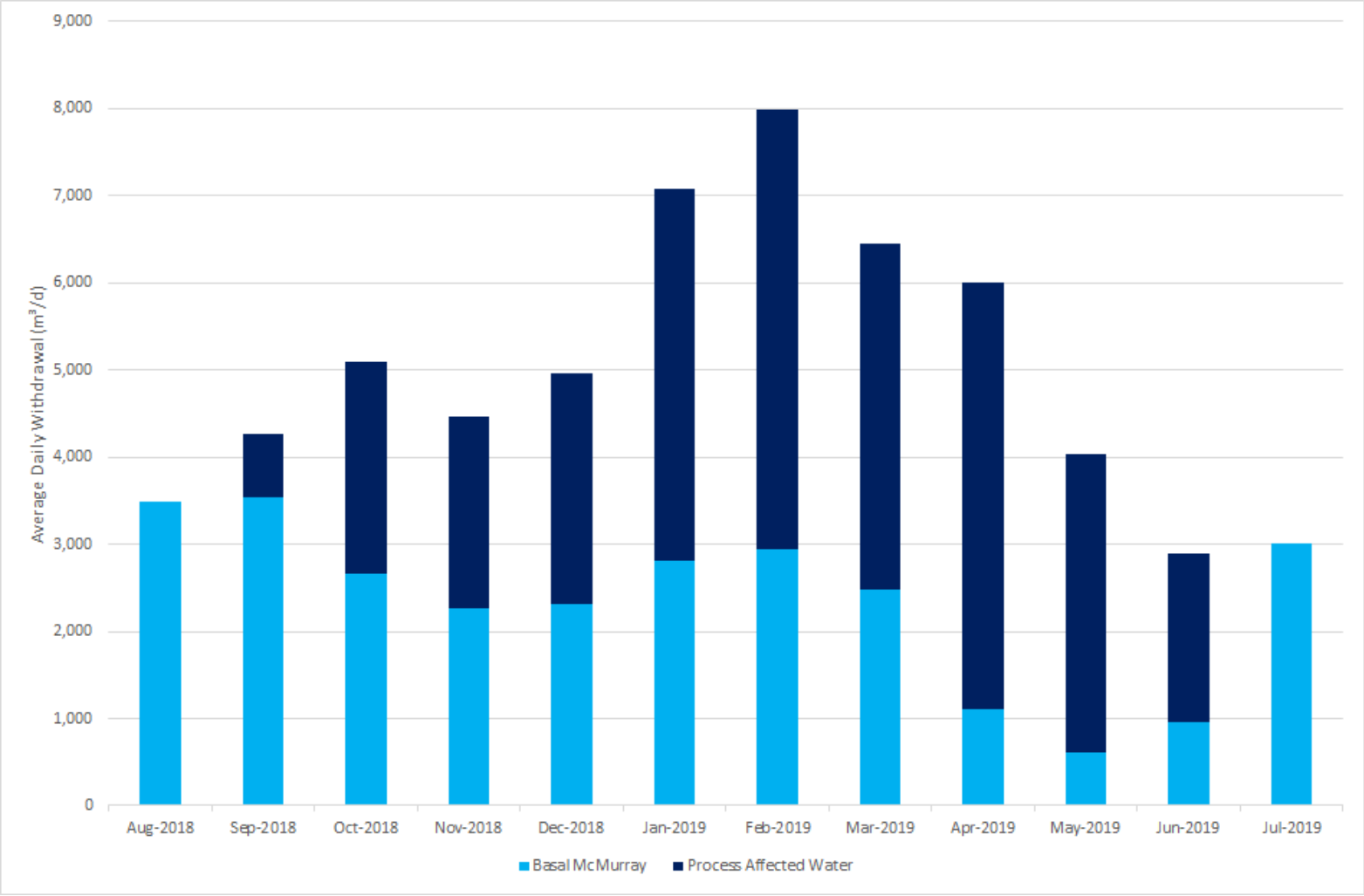
4. Water Production, Injection and Uses

WATER USAGE (CONT'D)

- Process Affected Water - Suncor (PAW)
  - Sourced from Suncor Oil Sands Facility under a Water Supply Agreement
  - No annual withdrawal limit (former License 331569 - cancelled by AER June 19, 2018)
  - Withdrawal from August 1, 2018 to July 31, 2019: 950,951 m^3
- Basal McMurray - Kearl
  - Water Act Approval 241442 converted into Water Act License 409247 - May 22, 2018
  - 8 Wells – 09-24, 01-13-096-08W4 and 06-19, 14-18, 12-20, 12-08, 06-30, 11-17-096-07W4
  - Licensed to divert 2,190,000 m^3 annually for Industrial (Injection) purposes
  - Withdrawal from August 1, 2018 to July 31, 2019: 858,449 m^3
- No Brackish water sources are currently available to Sunrise
- Produced Water
  - All produced water sent to water treatment
  - All neutralized waste from water treatment diverted to pond
  - All pond supernatant water recycled to water treatment
  - Portion of steam blowdown recycled to water treatment, remainder disposed via deep well injection

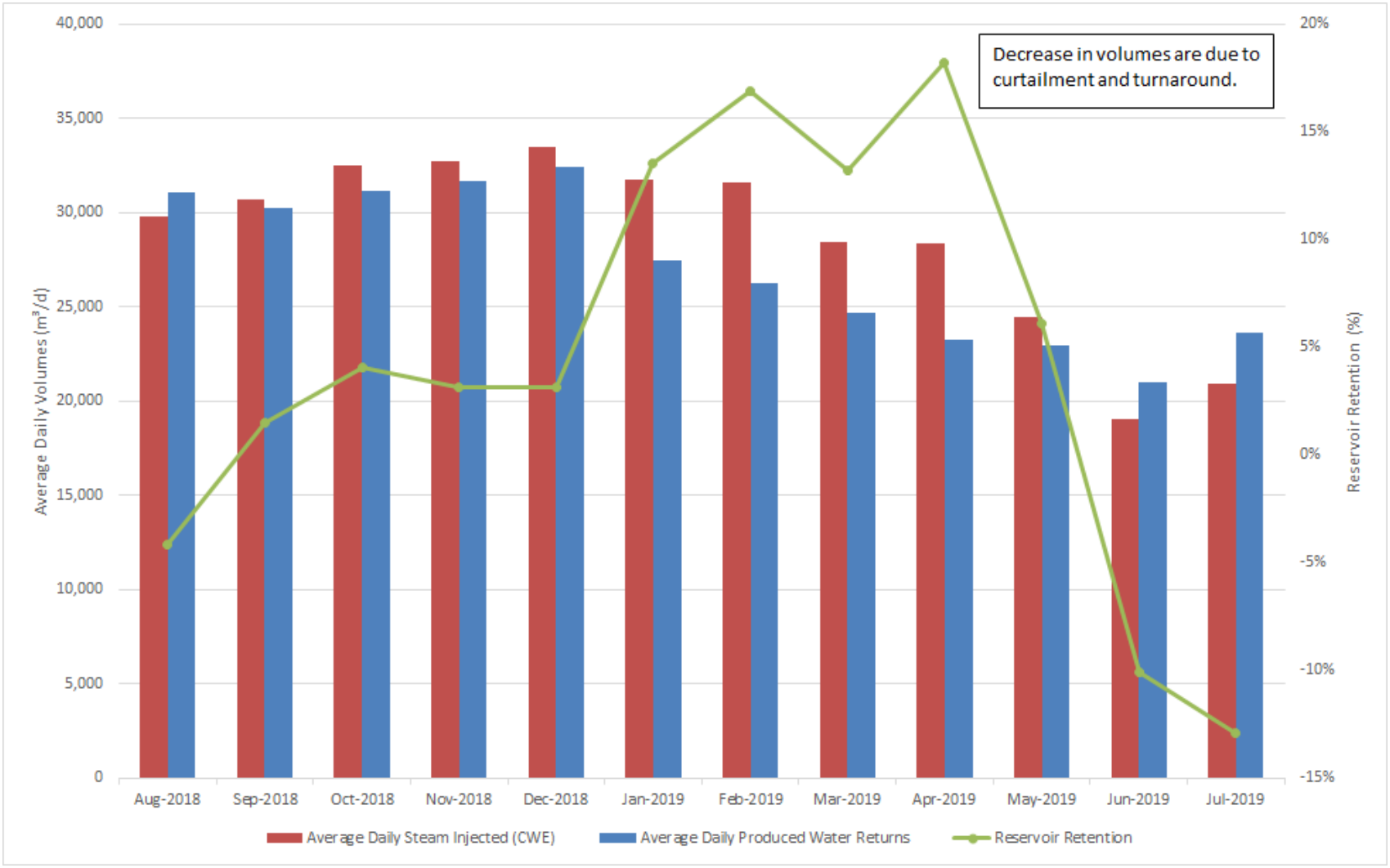
4. Water Production, Injection and Uses

TOTAL MAKE-UP WATER CONSUMPTION



4. Water Production, Injection and Uses

PRODUCED WATER AND STEAM INJECTED



4. Water Production, Injection and Uses

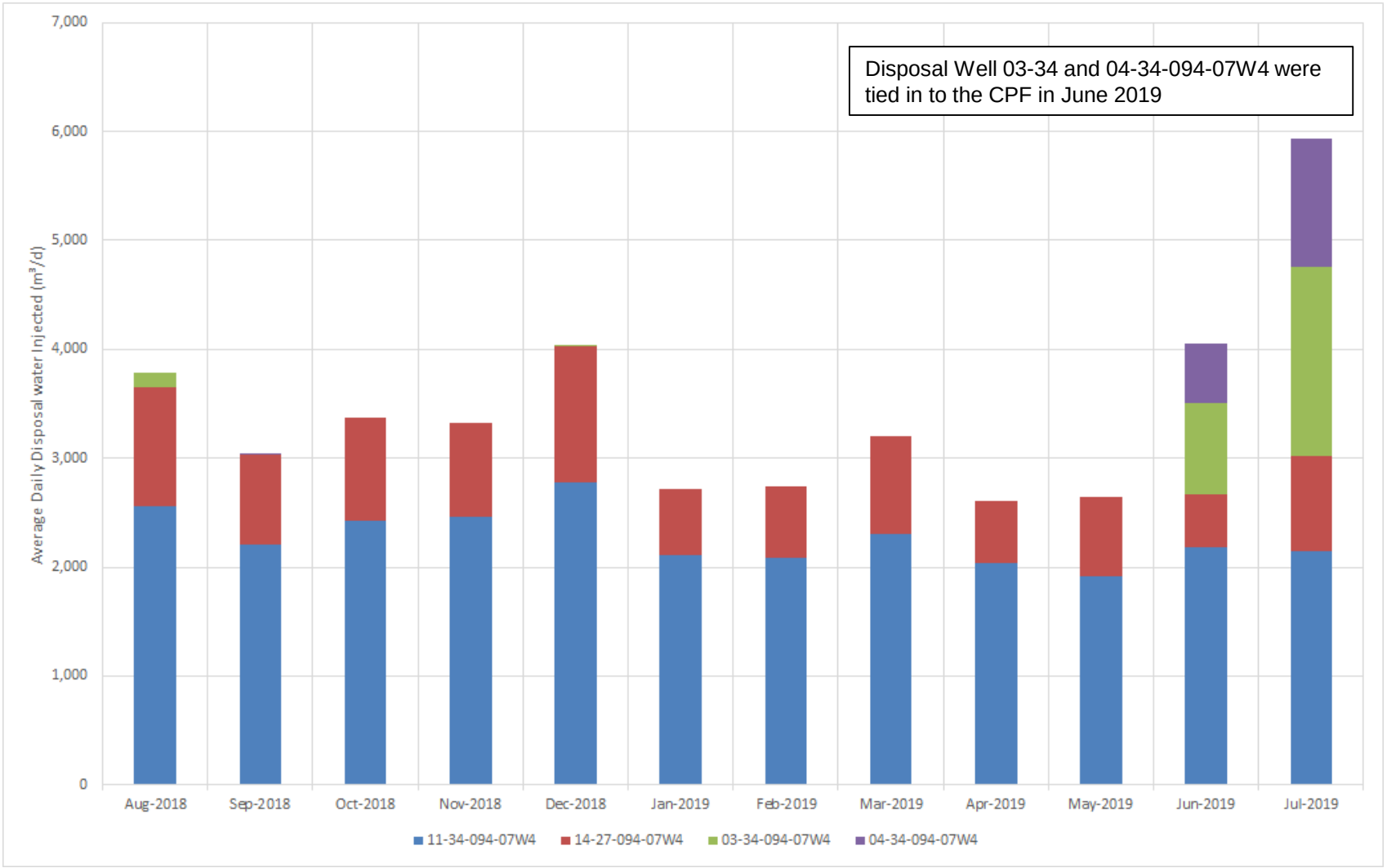
WATER DISPOSAL LIMITS

- Class 1b Disposal Approval 11754C
  - Four disposal wells: 14-27, 03-34, 04-34 and 11-34-094-07W4
  - Maximum well head injection pressure: 5,000 kPag
  - Fluids disposed for August 1, 2018 to July 31, 2019: 1,263,254 m3

- Directive 081
  - PAW and Kearl source water well disposal factors = 0.25
  - Produced water disposal factor = 0.10
  - 2018 Disposal Limit (%) = 11.55
  - 2018 Actual Disposal (%) = 10.65

4. Water Production, Injection and Uses

WATER DISPOSAL



4. Water Production, Injection and Uses

DISPOSAL WELLS

AER Class 1 Approved Disposal Wells (11754C):

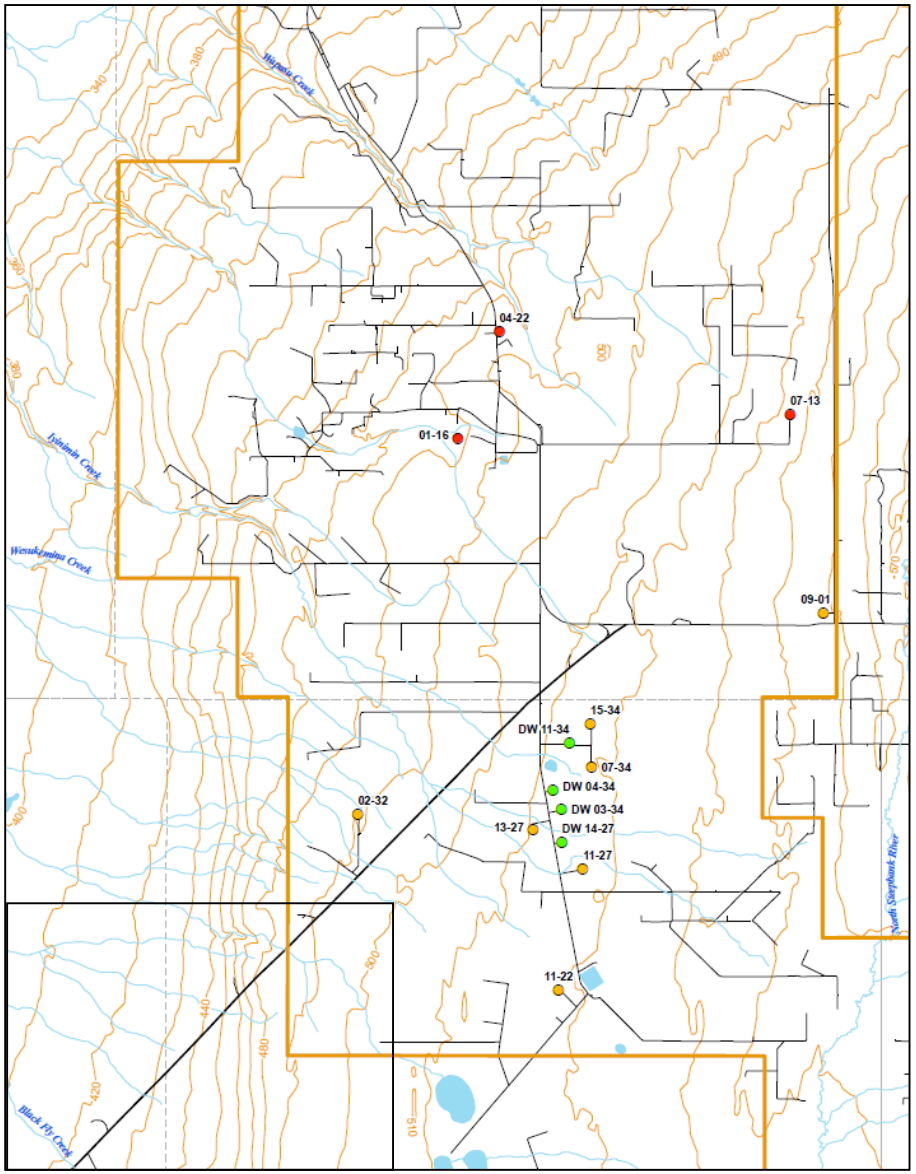
- 100/11-34-094-07W4/00
- 100/14-27-094-07W4/00
- 102/03-34-094-07W4/00 (tied in June 2019)
- 100/04-34-094-07W4/00 (tied in June 2019)

Pressure Monitoring Wells:

- 100/01-16-095-07W4/00
- 100/07-13-095-07W4/00
- 100/04-22-095-07W4/00

Pressure/Chemistry Monitoring Wells:

- 100/15-34-094-07W4/00
- 100/07-34-094-07W4/00
- 100/13-27-094-07W4/00
- 100/11-27-094-07W4/00
- 100/02-32-094-07W4/00
- 100/11-22-094-07W4/00
- 100/09-01-095-07W4/00



4. Water Production, Injection and Uses

DISPOSAL SUMMARY

- Class 1b Disposal Approval No. 11754C
  - Disposal wells 03-34 and 04-34-094-07W4 tied in to the CPF in June 2019
- 2019 Annual Report submitted to AER; approved June 4, 2019
- Fluids disposed August 1, 2018 – July 31, 2019: 1,263,254 m^3
- No exceedances in the Maximum Well Head Injection Pressure of 5,000 kPa_g
- The monitoring wells continue to indicate pressure responses as a result of disposal
- Interpretation of two local and one intermediate flow system to explain the hydraulic head at the monitoring wells has not changed
- Chemistry results indicate effects of disposal from the Project at wells 100/15-34-094-07W4/00, 100/07-34-094-07W4/00 and 100/11-27-094-07W4/00
- Muted pressure response observed in off-reef monitoring well 100/09-01-095-07W4/00

4. Water Production, Injection and Uses

DATA GAPS

One Pressure Data Gap >30 days:

- Monitoring well 11-22-094-07W4 from April 6 to June 15, 2019. Reported to AER September 6, 2019; repair completed

4. Landfill Waste Handling

LANDFILL WASTE HANDLING

- Class 2 Oil Field Landfill Onsite Approval No. WM139A
- EPEA application 015-206355, alternate disposal location for Sunrise Sludge waste materials submitted September 2018, approval received October 2018

Waste Description	Receiving Facility	Total	Unit
Contaminated Debris and Soil (produced/salt water)	Husky Sunrise Landfill	867	m^3
Construction/Demolition Debris	Husky Sunrise Landfill	446	m^3
Sulphur Waste	Husky Sunrise Landfill	429.5	m^3
Limestone (pH control)	Husky Sunrise Landfill	200	m^3
Lime Sludge	Husky Sunrise Landfill	6270	m^3

4. Water Production, Injection and Uses

WASTE VOLUMES

Waste Code	Waste Description	Receiving Facility	Total	Unit
COEMUL	Slop Oil	Tervita Fort McMurray Service Centre	8560.9	m3
	Waste Oil Solids	White Swan Grassland	923.1	m3
		Tervita Fort McMurray Service Centre	6417	m3
CAUS	Caustic / Water	White Swan Environmental Ltd.	117	m3
		Tervita Fort McMurrar Service Centre	8	m3
DRWSGC	Drilling Mud	Tervita Fort McMurray Service Centre	175	
		White Swan Environmental Ltd.	143	m3
SWTLIQ	Lo-Cat Solution and Water	Tervita Fort McMurray Service Centre	92	m3
		White Swan Environmental Ltd.	117	m3
FLBWSW	Filter Backwash	Tervita Fort McMurray Service Centre	10	m3
FILPWT	Filters Produced / Process Water	Tervita Fort McMurray Service Centre	40	m3
FILAPC	Filters Air Pollution Control - Cardboard	RBW Waste Mangement Ltd.	8.9	m3
FILFWT	Filters Raw/Fresh Water	White Swan Environmental Ltd.	6	m3
FILOTH	Filters	RBW Waste Management Ltd.	1.38	
		Tervita Fort McMurray Service Centre	10	
BATT-LA	Batteries – Lead Acid	RBW Waste Management Ltd.	0.9	m3
CEMENT	Cement	Clean Harbors – Ryley Landfill	9.2	m3
		White Swan Envitonmental Ltd.	24	m3
CWATER	Contaminated Water	Tervita Fort McMurray Service Centre Ltd.	14.3	m3
SAND	Sand	Tervita Fort McMurray Service Centre Ltd.	12	m3

4. Water Production, Injection and Uses

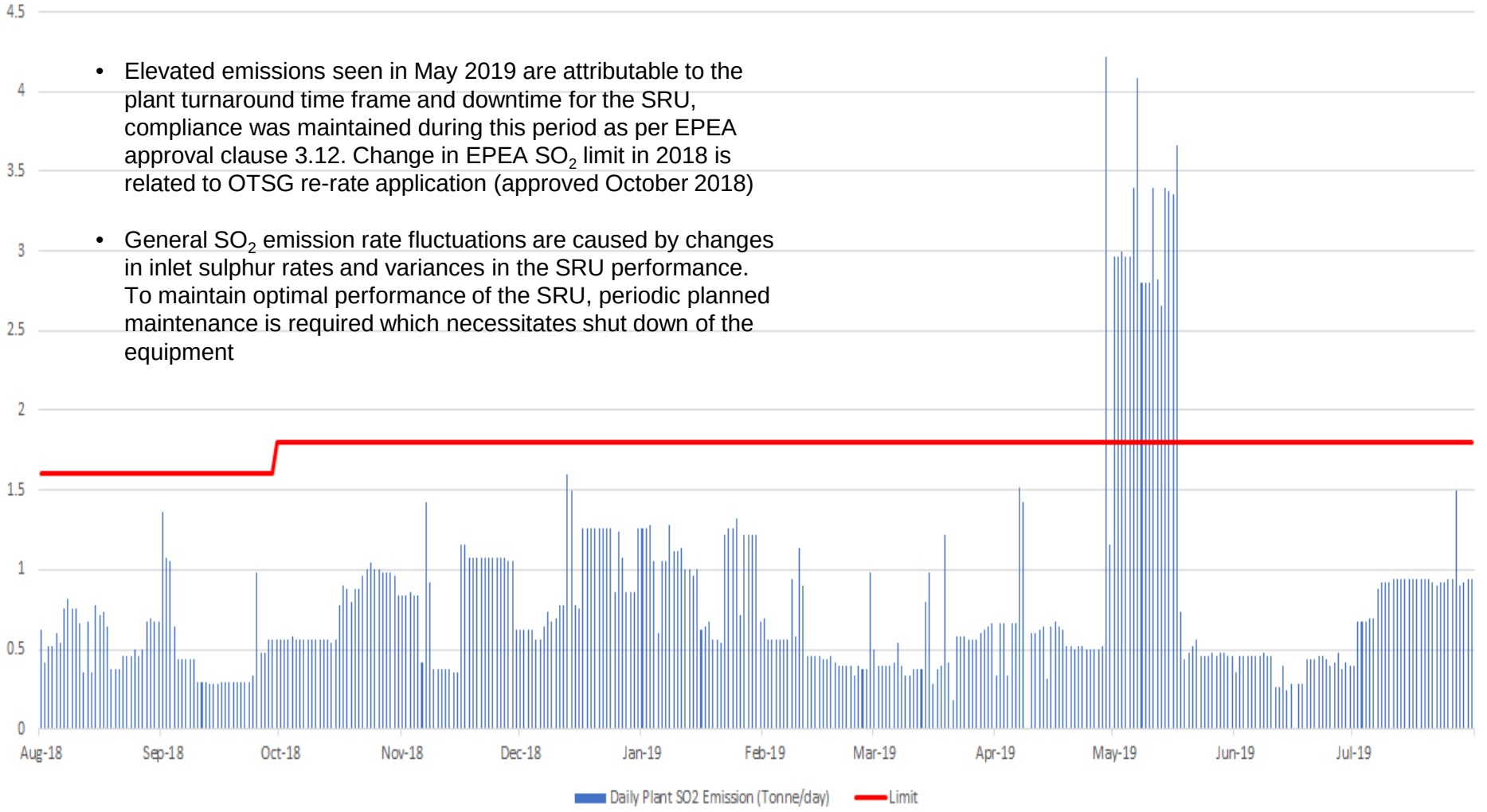
WASTE VOLUMES (CONT'D)

Waste Code	Waste Description	Receiving Facility	Total	Unit
EMTCON	Empty Containers	Clean Harbors – Ryley Landfill	1.4	m3
		RBW Waste Management Ltd.	64.77	
FILLUB	Filters - Lube Oil	RBW Waste Management Ltd.	2.56	m3
INOCHM	Chemicals - Inorganic	RBW Waste Management Ltd.	1	m3
NORM	Naturally Ocurring Radioactive Materials	RBW Waste Management Ltd.	13.8	m3
OILABS	Absorbents	RBW Waste Management Ltd.	11.347	m3
OILRAG	Rags - Oily	RBW Waste Management Ltd.	4.9952	m3
ORGCHM	Chemicals - Organic	RBW Waste Management Ltd.	3.84	m3
SMETAL	Metal - Scrap	RBW Waste Management Ltd.	31.865	m3
SOILCO	Contaminated Debris and Soil - Crude Oil/ Condensate	RBW Waste Management Ltd.	12.5	m3
		Tervita Fort McMurray Service Centre	6	m3
SLGHYD	Sludge Hydrocarbon	Tervita Fort McMurray Service Centre Ltd.	4	m3
WSTCGS	Waste Compressed or Liquified Gases	RBW Waste Management Ltd.	0.113	m3
WSTMIS-R	Waste Hydraulic Hoses (prior to 14/12/17 Waste Rubber)	MCL – Leduc Regional Landfill	2.3	m3
		RBW Waste Management Ltd.	5.52	m3

5. Sulphur Production

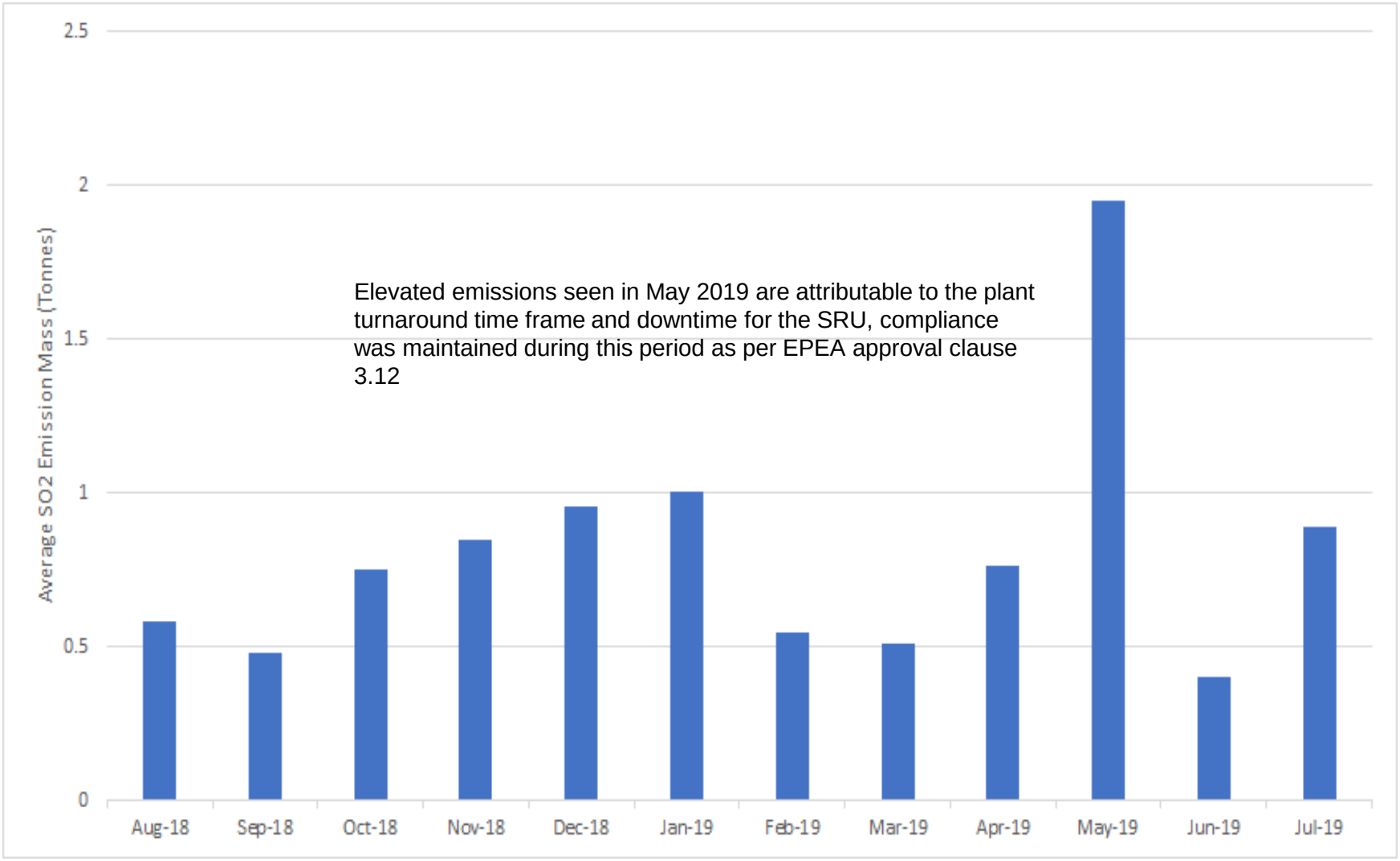
SO_2 EMISSIONS

- Elevated emissions seen in May 2019 are attributable to the plant turnaround time frame and downtime for the SRU, compliance was maintained during this period as per EPEA approval clause 3.12. Change in EPEA SO_2 limit in 2018 is related to OTSG re-rate application (approved October 2018)
- General SO_2 emission rate fluctuations are caused by changes in inlet sulphur rates and variances in the SRU performance. To maintain optimal performance of the SRU, periodic planned maintenance is required which necessitates shut down of the equipment



5. Sulphur Production

SO_2 EMISSIONS TRENDS



5. Sulphur Production

SRU STATUS

- The SRU was offline for 17 days during the plant turnaround in May 2019
- Summary for the remainder of SRU downtime during the operating period is as follows -

Month	Hours	Days
Aug-18	1.17	0.05
Sept-18	13.50	0.56
Oct-18	0.08	-
Nov-18	11.34	0.47
Dec-18	9.83	0.41
Jan-19	0.08	-
Feb-19	14.88	0.62
Mar-19	30.46	1.27
Apr-19	12.35	0.51
May-19	404.74	16.86
Jun-19	0.17	-
Jul-19	3.47	0.14

5. Sulphur Production

SULPHUR DIOXIDE (SO_2) SOURCES

- 10 Once-Through Steam Generators (OTSG) - all operational during the reporting period
- 2 High Pressure Flare Stacks – both operational during the reporting period
- 2 Low Pressure Flare Stacks - both operational during the reporting period

5. Sulphur Production

QUARTERLY SO_2 EMISSIONS

2018 Q3 (Aug – Sep)	32.42 tonnes
2018 Q4 (Oct - Dec)	78.42 tonnes
2019 Q1 (Jan – Mar)	62.32 tonnes
2019 Q2 (Apr – June)	94.14 tonnes
2019 Q3 (July)	27.62 tonnes

Note:
Elevated emissions in Q2 2019 are attributable to the May 2019 plant turnaround and downtime of the SRU; compliance was maintained during this period as per EPEA Approval clause 3.12

5. Sulphur Production

PEAK AND AVERAGE SO_2 EMISSIONS

SO_2 Emissions	
Average Daily	0.81 tonnes
Maximum Daily	1.6 tonnes

5. Sulphur Production

AMBIENT AIR MONITORING

- Husky installed Permanent Air Monitoring Station (Wapasu AMS; AMS 17)
- Part of Wood Buffalo Environmental Committee (WBEA) network of ambient monitoring stations and functions as a dual compliance and enhanced deposition station
- Reporting and monitoring is performed by WBEA
- No process-related exceedances recorded during the reporting period
- PM2.5 exceedances recorded as result of wildfires in the region during August 2018 and May/June 2019
- Current monitored data available the following link
  - https://wbea.org/stations/wapasu/
- Latest ambient air monitoring station site documentation available here
  - https://wbea.org/wp-content/uploads/2019/03/AAM-SDOC_AMS-17.pdf

6. Environmental

COMPLIANCE

- EPEA Approval 206355-01-00 (as amended):
  - Husky was in compliance with all regulatory approvals, decisions, regulations and conditions; with the exception of compliance items identified in this presentation

- Alberta Environment and Parks (AEP):
  - Husky had one AEP non-compliance due to unapproved soil management practice

- Federal Environmental and Regulatory Compliance:
  - No compliance issues during this reporting period

6.Environmental

COMPLIANCE (EPEA CONT'D)

- Continuous Emissions Monitoring System (CEMS):

Ongoing Event:

- As per the EPEA Approval conditions, a CEMS unit was required on the SRU oxidizer vent stack to monitor H_2S concentrations in the vented gas. Shortly after facility start-up, the SRU CEMS failed to operate reliably due to the high particulate concentration in the vent stream and high moisture content in the samples which caused the sample conditioning system to plug and malfunction

Corrective Action:

- November 11, 2015 Husky disclosed the matter to AER (File Ref. No. 305572)
- A corrective action of manually collecting vent gas samples and analyzing them for H_2S concentration on a weekly basis was proposed
- AER issued a temporary authorization (current waiver valid until December 31, 2019) permitting the manual sampling as an alternative to monitor for H_2S emissions while a permanent solution for the operational issues of CEMS was evaluated
  - Update: The CEMS resumed operations in May 2019 and is being evaluated for reliability. To maintain compliance with the waiver, if the CEMS operations fluctuates manual sampling will resume

6.Environmental

COMPLIANCE (AEP)

- Unapproved Soil Management Practices

Event:

- In March 2019, Husky was completing reclamation work on OSE well site 02-22-095-07W4M to backfill an area where ground subsidence occurred. Peat material was required to be spread along the top of the backfill area to complete reclamation and promote vegetation growth. Due to a miscommunication between Sunrise operations and the reclamation supervisor, 70 m^3 of peat was removed from an approved soil storage stockpile (TSP-28) associated with reclamation commitments at a nearby borrow pit. This was in contravention of the Sunrise EPEA approval and Pre-Disturbance Assessment and Conservation and Reclamation Plan (PDA/C&R Plan), which was disclosed to AEP (File Ref. No. 351361)

Corrective Action:

- TSP28 was recontoured following soil removal. The soil pile was seeded to promote vegetation growth
- Husky will develop an internal process to ensure that approved soil stockpiles earmarked for site specific reclamation under PDA/C&R Plans will not be used as a soil source for other reclamation areas. If a surplus soil balance is calculated for a specific area, Husky may approach the AER or AEP about using excess soil from approved stockpiles
- Husky will detail the soil removal and placement from TSP 28 as part of the 2019 Annual Conservation and Reclamation Report

6. Environmental

RELEASES

Spill Material	Number of Incidents	Total Volume (m^3)	AER Notification	Release Area
Hydrocarbon	2	1.89	Release report submitted	1. Pad B14-08 (C) steam PSV lifted 2. Pad B06-21 (P) frozen valve
Tanks Venting	0	0	N/A	N/A
Boiler Feed Water	2	32.94	Release report submitted	1. CPF 2. Pad B14-08 (C) and CPF
Blowdown Water	2	81.55	Release report submitted	1. 70 and 71 blowdown exchange 2. Area 71 blowdown exchange
Miscellaneous	6	9.39	Release report submitted	1. Condensate Management System 221 2. Pad B14-08 (C) and CPF 3. Disposal Well Pipeline SW-02-095-07W4 4. Disposal Pipeline SE-10-095-07W4 5. Corrosion inhibitor release during liner pull preparation 6. Pad B06-21 (P) frozen valve

- Husky tracks all non-reportable spill incidents within the Corporate Incident Management System
- All incidents are reviewed weekly to ensure corrective actions are included and preventative measures are taken

6. Environmental

EPEA APPROVAL AMENDMENTS

Approval Date	Application Number	Application Name
2018-08-03	014-206355	Amendment Application – Phase 1 OTSG Re-rate
2018-09-14	015-206355	Amendment Application – Alternate Wastewater Plant Disposal Location (for Sunrise Sludge Waste materials)
2018-12-07	N/A	Temporary Authorization - Extension Request, SRU Oxidizer Vent Stack CEMS
2019-05-13	N/A	Temporary Authorization – SRU Downtime Extension Request
2019-07-17	N/A	Temporary Authorization - Extension Request and Sampling Reduction, SRU Oxidizer Vent Stack CEMS

6. Environmental

WILDLIFE & BIODIVERSITY

- Caribou Mitigation and Monitoring Plan (CMMP)
  - Southern boundary of the project is located on the edge of the Richardson Caribou Range
  - CMMP originally approved by AER January 2015; a revised version was submitted October 2017 and is currently pending approval
  - Project facilities to be located within the Richardson Caribou Range are limited to a potential road and single well pad; approval is received but they are not developed
  - A caribou habitat restoration monitoring program was initiated in August 2016; monitoring was conducted along historical cutlines and seismic lines in a variety of habitat types to evaluate natural restoration success; this data establishes a baseline to use for assessing restoration over time
  - To date, 70 woodland caribou have been detected by wildlife cameras in the Richardson Range overlapping the Sunrise lease area

6. Environmental

WILDLIFE & BIODIVERSITY

- As an EPEA approval requirement, Husky conducts an annual Environmental Monitoring Program with data compilation and report submission every three years that includes results of monitoring hydrology (surface water quantity and quality), wetlands, wildlife and biodiversity for impacts from the Sunrise Project. The monitoring report was submitted in May of 2019
- Hydrology

  Quantity:

  - Evaluates project impacts on average annual runoff, peak flows, and low flow for various watersheds
  - Several sites showed runoff rates higher than the Control site, however a calculation of relative disturbance in the different watersheds assessed suggests that most of the disturbance is not attributable to Sunrise
  - No significant trends in changes to runoff versus the Control sites has been recorded

  Quality:

  - Monitors for trends and/or exceedances of nutrients, metals, hydrocarbons, and total dissolved solids (TDS) compared to the Protection of Aquatic Life guidelines
  - Water quality was generally similar among all sites from 2009 through 2018
  - Guideline exceedances for total aluminum and total iron were noted at all sites; however, these parameters also exceeded guidelines frequently during baseline surveys conducted prior to project activities

6. Environmental

WILDLIFE & BIODIVERSITY CONT'D

- Wetlands
  - Water level data analyzed at the source water wells and associated observation wells do not show evidence of a declining water level in the Quaternary Aquifer
  - Some differences in the vegetation community along the impoundment monitoring transect associated with the 16-22B access road are evident starting in 2014
    - Generally indicate that the north side of the road is getting wetter while the south side is getting drier, although the changes are not dramatic and the communities are still classified as the same wetland types

6. Environmental

WILDLIFE & BIODIVERSITY (CONT'D)

- Wildlife Monitoring and Mitigation Program (WMMP)
  - In accordance with the renewed EPEA Approval received in 2016, Husky prepared an updated WMMP which was approved by the AER in October 2016 to address measurable targets for wildlife monitoring
  - Studies are completed in the Lease area and a Control area to determine if biodiversity changes are resulting from the project
  - The following wildlife monitoring program components were completed in 2018:
    - Pipeline monitoring
      - ❑ Results indicate the pipeline was not a barrier to wildlife movement
    - Remote camera monitoring (DA2 and DA3)
      - ❑ 24 cameras total in DA2 and DA3, with data collected through 2018
    - Songbird and raptor monitoring
      - ❑ Both Lease and Control areas show an increase in species abundance & diversity over time
  - As per the approval conditions, future monitoring will also include:
    - Canadian toad monitoring
    - Mammal monitoring
    - Yellow Rail surveys
    - Acoustic bat surveys

6. Environmental

INDUSTRIAL WASTEWATER

- Disposal Locations:
  - Four Disposal wells, total of 1,263,254 m^3 from August 1, 2018 to July 31, 2019:
    - 1,126,793 m^3 was disposed using the primary disposal wells 100/14-27-094-07W4M and 100/11-34-094-07W4M
    - 136,461 m3 were disposed at the secondary disposal wells 102/03-34-094-07W4, 100/04-34-094-07W4 that were tied in June 2019
    - Nine Keg River Monitoring locations used to monitor pressures and/or water quality
- Domestic Wastewater:
  - Domestic wastewater from construction and operational activities was treated on the CPF by the operation of a domestic wastewater treatment plant (WWTP)
  - Domestic wastewater is treated and released to an unnamed tributary of Wapasu Creek located south of the CPF, a total of 56,345.6 m^3 during the reporting period
- Industrial Run-off :
  - Total of 13 discharge locations:
    - Well Pads: B13-08 (B), B14-08 (C), B16-08 (D), B13-09 (E), B08-17 (G), B05-16 (H), B16-17 (L), B13-16 (M/R), B15-16 (N), 5-21 (Q), 6-21 (P), and 16-16 (S)
      Total volumes discharged (2018-2019): 184,708 m^3
    - CPF Total volumes discharged (2018–2019): 509,532 m^3

  Note: all discharges were in compliance with EPEA approval

6. Environmental

SOILS

- Operational soil monitoring sampling and analysis as per the approved Operational Soil Monitoring Program Proposal started on May 14, 2018 and completed on June 30, 2018. The final Operational Soil Monitoring Program Report was submitted in September 2018
- The next Soil Monitoring Program will be scheduled for 2023

6. Environmental

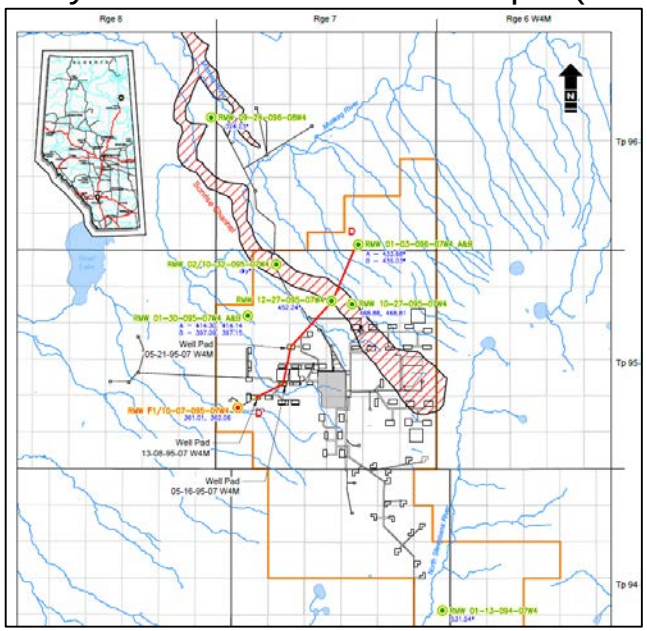
AIR

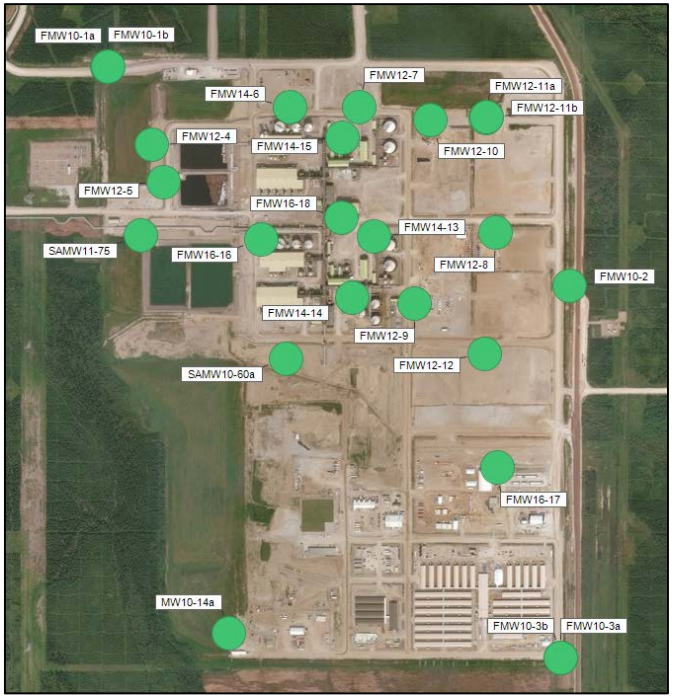
- Site air monitoring includes source and ambient air monitoring systems
- Source Monitoring
  - Three CEMS; two for the OTSGs and one for the SRU (note, CEMS SRU was not in operation during this entire reporting period)
  - Manual gas sampling of SRU oxidizer vent stack gas to ensure H_2S is below the allowable limit
  - Engineering calculations aided by gas metering and sampling or inline GC (Gas Chromatography)
  - Fugitive emission leak surveys (conducted August 2018)
- Ambient Air Monitoring
  - Permanent Air Monitoring Station
  - Participation in Wood Buffalo Environmental Association (WBEA) network of ambient air monitoring stations (Wapasu Station)
  - Continuous process area monitoring for LEL (Lower Exclusive Limit) and H_2S

6. Environmental

GROUNDWATER MONITORING

- 2018 Compliance Groundwater Monitoring Report submitted March 2019
- CPF:
  - 24 wells: 2.4 to 13.7 m depth (base of screen)
- Pad Wells:
  - 3 pads: B05-16 (H), B13-08 (B), B05-21 (P)
  - 8 wells: 19.5 m to 66.0 m depth (base of screen)
- Regional:
  - 1 McMurray well: 177.5 m depth (base of screen)
  - 9 Quaternary wells: 9.1 m to 61.9 m depth (base of screen)





6. Environmental

INITIATIVES

- Husky participates in and/or funds many regional environmental initiatives and committees pertaining to the Sunrise Project, including the following:
  - Monitoring Avian Productivity and Survivorship (MAPS) in the Boreal Region
  - Participation in Wood Buffalo Environmental Committee (WBEA) and Terrestrial Environmental Effects Monitoring Committee (TEEM)
  - Faster Forests Program (COSIA JIP)
  - CAPP Species Management and Caribou Shadow Committees
  - Petroleum Technology Alliance Canada (PTAC) Ecological Research Planning Committee
  - Industrial Footprint Reduction Options Group (iFROG)
  - Oil Sands Monitoring (formerly JOSM)
  - Monitoring Priority Areas (COSIA)
  - University of Waterloo – Wetland Research (Alberta Innovates)

6. Environmental

RECLAMATION

- Husky submitted the Sunrise Project Level Conservation Reclamation Plan on October 31, 2018. AER authorization was received March 21, 2019
- Annual Conservation and Reclamation Reporting as per the EPEA Approval:
  - Compliance with the development and reclamation approval
  - Site conditions and successful reclamation
  - General project development (surface disturbances) and reclamation activities
  - Problem areas and resolution
- Vegetation Monitoring:
  - Annual weed monitoring and control completed as per Husky's best practices
- Reclamation Activities:
  - No additional reclamation activities occurred within the reporting year
  - A total area of 10.7 hectares has been reclaimed associated with historical gravel and borrow pits

7. Compliance Statement

NON-COMPLIANCE EVENTS

OSCA (Oil Sands Conservation Act) Commercial Scheme Approval 10419 (as amended):

- Husky was in compliance with all regulatory approvals, decisions, regulations and conditions; with the exception of compliance items identified in this presentation

7. Compliance Statement

SELF DECLARATIONS (VSD)

- Process Building Floor Trenches and Sumps – Directive 055

Summary:

- During Directive 055 monthly inspections, fluids were detected in the VLDP (for interstitial space) of buildings trenches/sumps. Chemical analysis results showed similarity between the chemistry of the detected fluid and process fluids collected in building sumps. A VSD (ID 10829) was submitted to AER regarding the reoccurrence of the failure of Building trenches/sumps containment

Status Update:

- Process chemicals stored in buildings were placed within secondary containment
- Fluids detected in the interstitial space during monthly inspection are being emptied
- Sumps repair commenced and will be completed by December 31, 2019
- Installation of 4” hose in trenches to convey process fluids directly to sump has started
- Trench repair trials started in August 2019

7. Compliance Statement

SELF DECLARATIONS (VSD)

- Well 110/12-17-095-07W4/00 B5A (well pad B13-08 (B) License No. 0485188)

Summary:

- Experiencing challenges unloading the wells due to initial completion design and the well pressuring up with minimal pressure relief; the reservoir (near wellbore) was tighter than expected
  - December 3, 2018: exceeded approved MOP (1,770 kPag) by 24 kPag (1,794 kPag)

Status Update:

- Submitted VSD to AER Bonnyville Field Office on December 17, 2018
- Well recompleted to allow circulation return; as per email notification submitted to AER August 2018
- Converted to an Electrical Submersible Pump (ESP) December 2018
- Received acceptance letter from AER on December 20, 2018 (VSD 10797)

- Well 110/11-17-095-07-04W4 (well pad B14-08 (C) License No. 0428337)

Summary:

- Faulty downhole pressure measurement during maintenance work (transmitter offline)
  - December 6, 2018: exceeded approved MOP (1,780 kPag) by 96 kPag (1,876 kPag) for 40 minutes

Status Update:

- Submitted VSD to AER Bonnyville Field Office on December 17, 2018
- Review current maintenance and operation work procedure
- Steam injection rate will be restricted or isolated prior to downhole pressure measurement device going offline
- Received acceptance letter from AER on December 20, 2018 (VSD 10797)

7. Compliance Statement

SELF DECLARATIONS (VSD)

- Damage to secondary liner in tank farm

Summary:

- On August 8, 2018 during normal operating rounds, a unit operator noted damage to the secondary liner of the 40 area tank farm, west of 30-T-310 (slop oil rank). A puncture located approximately 30 cm above grade on the concrete berm and is approximately 10 cm in diameter. It extends through the protective synthetic cover and secondary synthetic liner

Status Update:

- Damage to the liner was repaired by a certified containment specialist

7. Compliance Statement

SELF DECLARATIONS (VSD)

- Alternative Calculation of Action Leakage Rate for Spent Lime Ponds

Summary:

- In July 2018 (declared August 2018), the fluids pumped from the Leak Detection Sump (LDS) of the South Lime Sludge Pond (SLSP) exceeded the notification Action Leakage Rate (ALR) and allowable chlorides level for the Construction Dewatering Sump (CDS) (500 mg/L)
- Fluids pumped from the LDS of SLSP exceeded the Modified Action Leakage Rate (MALR) (117.5 m^3/month) in September 2018 (declared October 2018)

Status Update:

- Repairs for liner penetration have been completed and fluid volumes pumped out of the SLSP are within accepted limits
- Allowable levels were not exceeded since the repair was completed

8. Future Plans

FUTURE PLANS (2019/2020)

- Permanent Drilling Waste Processing Facility (WM 200); commissioning and start-up; target Q3 2019
- Continued evaluation of steam production/debottlenecking through addition of OTSGs or Co-Generation