2017 Performance Presentation

Devon Canada Corporation
Jackfish SAGD Project

Commercial Scheme Approval No. 10097 (as amended)

October 2017

Advisory

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Subsurface Operations

Table of Contents
Subsurface Operations

• Background	Dermot O'Shea
• Geology / Seismic	Dermot O'Shea
• Drilling and Completions	Laura McIntyre
• Artificial Lift	Laura McIntyre
• Instrumentation	Mike Brewster and Laura McIntyre
• Scheme Performance	Dan Wallace
• Future Plans	Dan Wallace

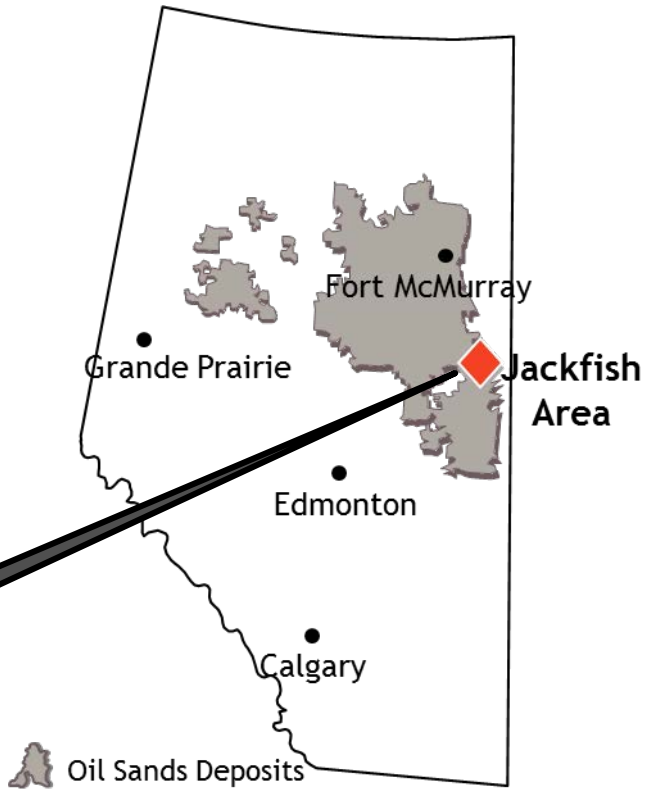
Project Background

Section 3.1.1-1

Brief Background of Scheme

3.1.1-1

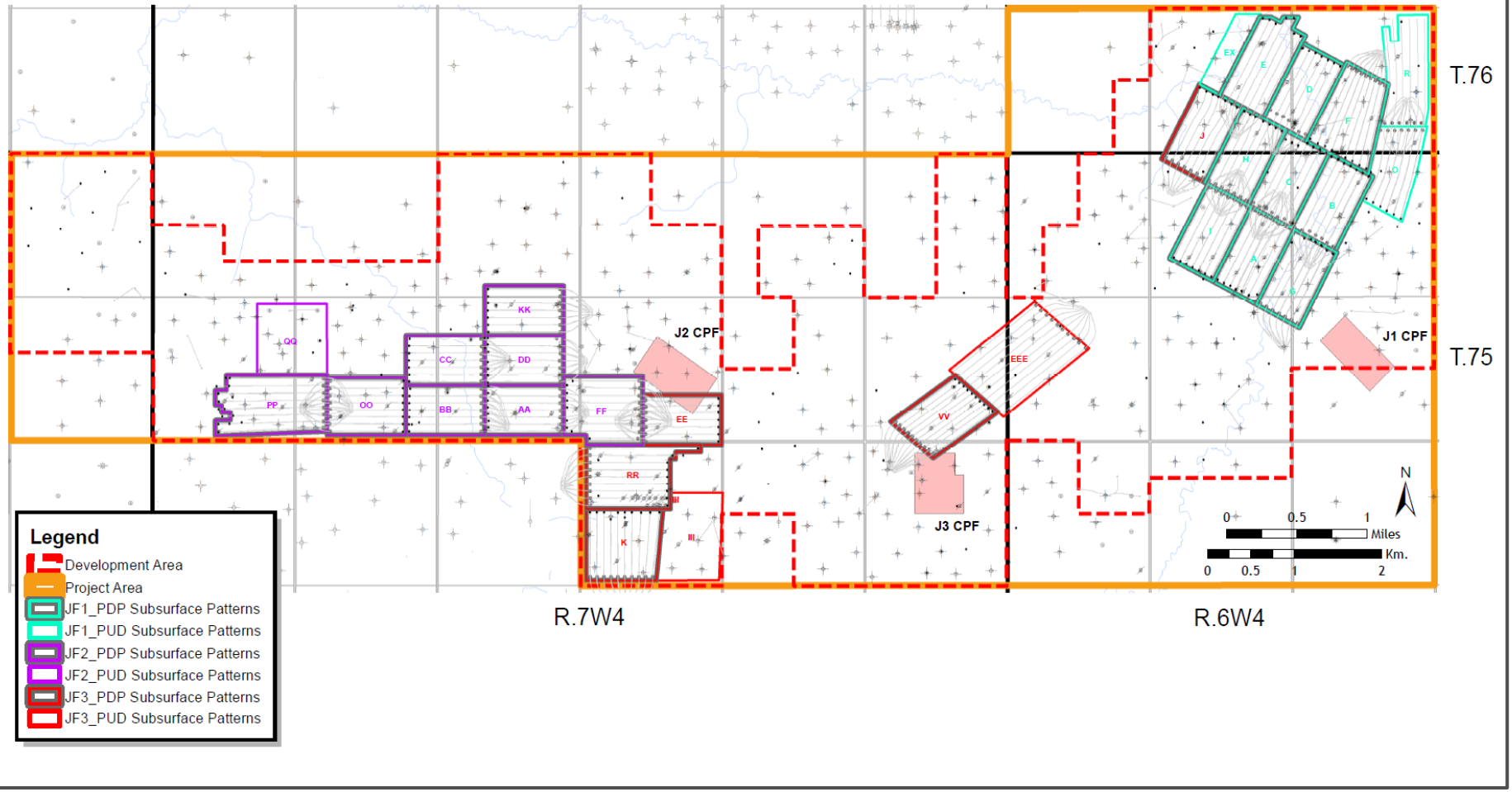
- Jackfish 1, 2, and 3 utilize steam-assisted gravity drainage (SAGD) to recover bitumen from the McMurray formation
- Located 150 km south of Fort McMurray
- Jackfish 1 scheme approval granted in August 2006; first steam was August 2007
- Jackfish 2 scheme approval granted in August 2008; first steam was May 2011
- Amalgamation of Jackfish approvals (including Jackfish 3) in November 2011; first steam was July 2014



Brief Background of Scheme

Overall Scheme Map

3.1.1-1



Brief Background of Scheme

Jackfish

3.1.1-1

Asset	Number of Operating Pads	Number of Operating Well Pairs	Upcoming Pads
Jackfish 1	9	65	O, R
Jackfish 2	8	60	QQ
Jackfish 3	5	43	EEE
TOTAL	**22**	**168**	**-**

Geology

Section 3.1.1-2

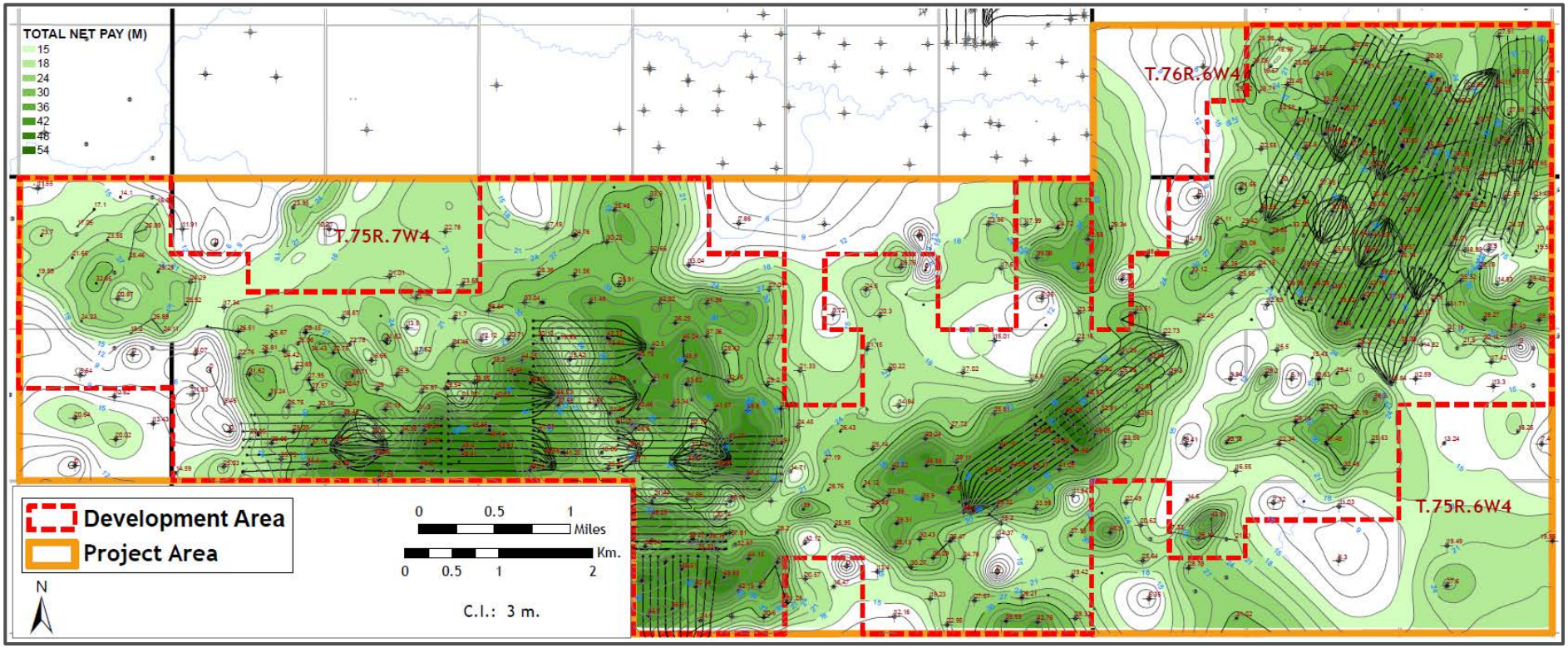
Geology

Jackfish Approved Area OBIP

3.1.1-2a

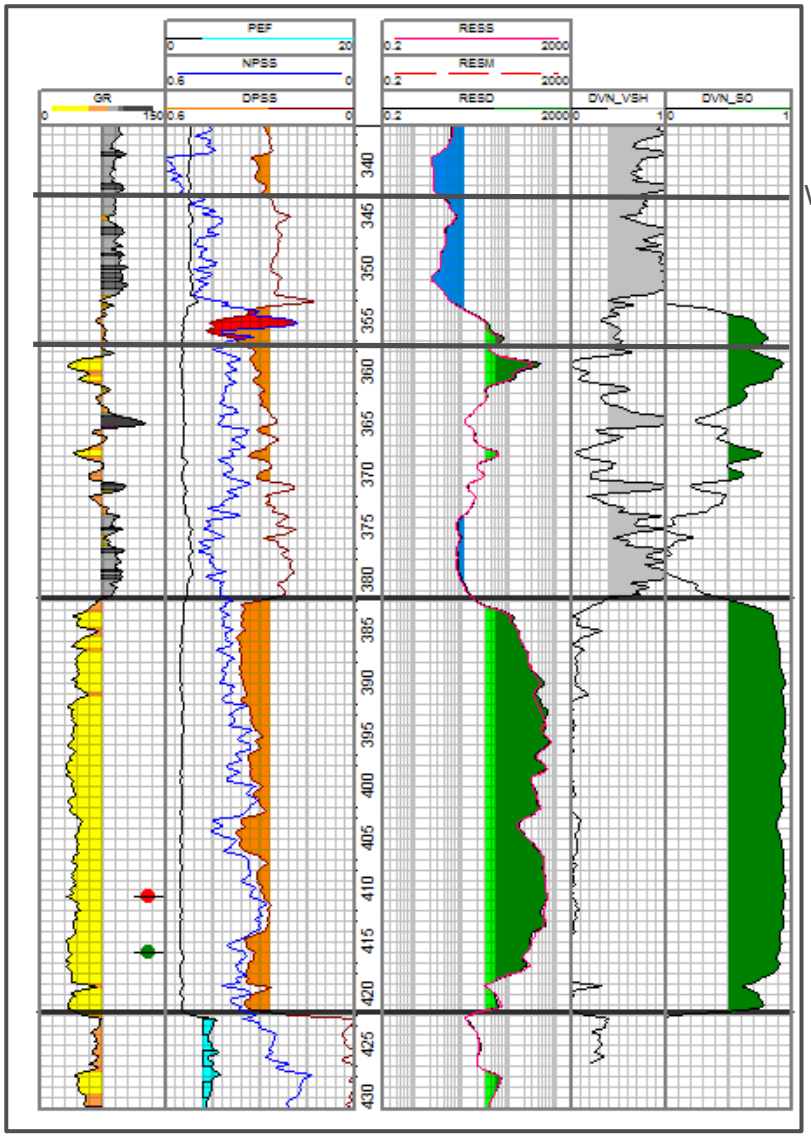
	Area (Ha)	OBIP (10^6m^3)	Avg. Net Pay (m)*	Avg. Oil Saturation (So)*	Avg. Porosity (%)*
Project Area	7,668	228.6	21.4	78.0	33.0
Development Area	5,445	221.8	23.0	79.0	34.0

**Average attributes derived from well control*



Geology
Jackfish Approved Area OBIP Methodology

3.1.1-2a



Gross Rock Volume (GRV)

GRV Base (GRV1_B): picked as the maximum lower limit of continuous exploitable bitumen >50% S_o and <40% V_{sh}

GRV Top (GRV1_T): first barrier above GRV Base >3m true vertical thickness of S_o < 50% and >40% V_{sh} or base of gas cap

Gross Rock Volume (GRV): interval between GRV1_B and GRV1_T

GRV Net Pay: determined by removing estimated mud volumes from the GRV using a cutoff of 40% on the V_{sh} curve

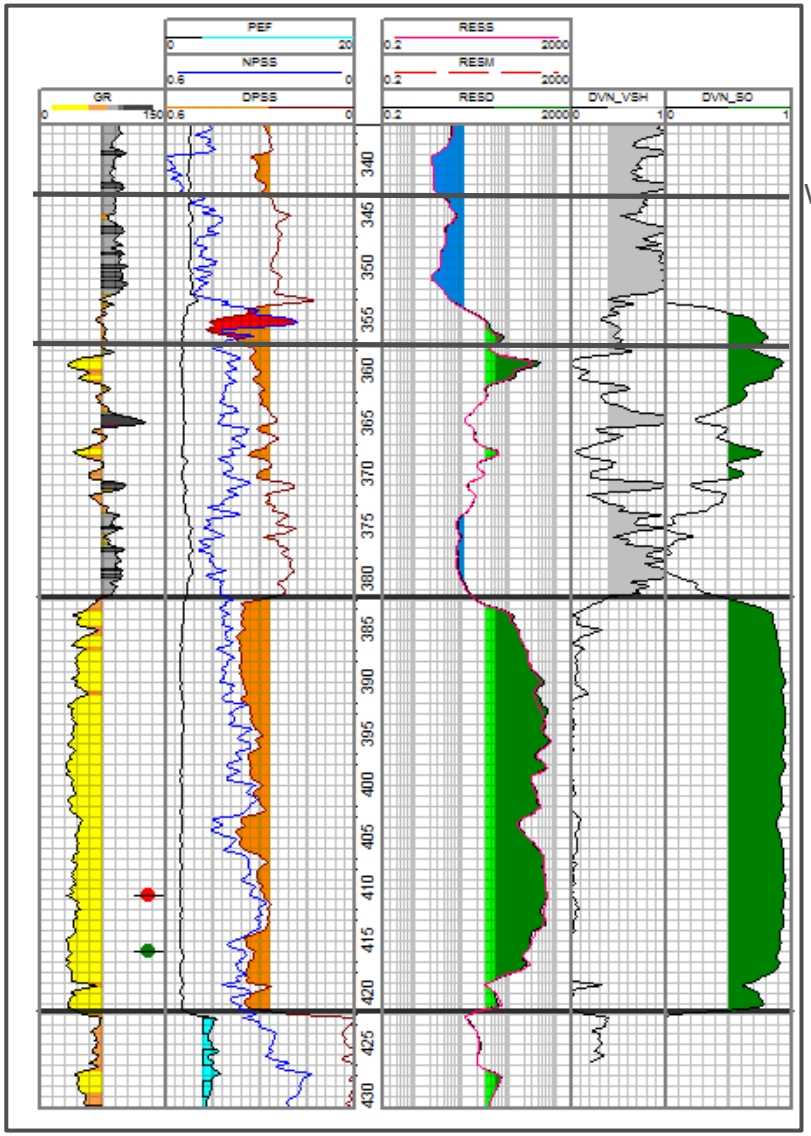
Average S_o and porosity values are calculated from the GRV Net Pay interval for each well

V_{sh} and S_o are standard petrophysical curves calculated from gamma ray, resistivity, and porosity logs, and correlated to image logs and core data

Geology

Jackfish Approved Area OBIP Methodology

3.1.1-2a



Gross Rock Volume Height on Logs

Generate GRV P50

Calculate Ave Net/Gross (NTG)

Net GRV Pay Porosity (Φ)

Net GRV Pay Oil Saturation (S_o)

OBIP = Gross Rock Volume * NTG * Φ * S_o

Original Bitumen in Place

Geology

Jackfish 1, 2, and 3 Average Reservoir Properties

3.1.1-2b

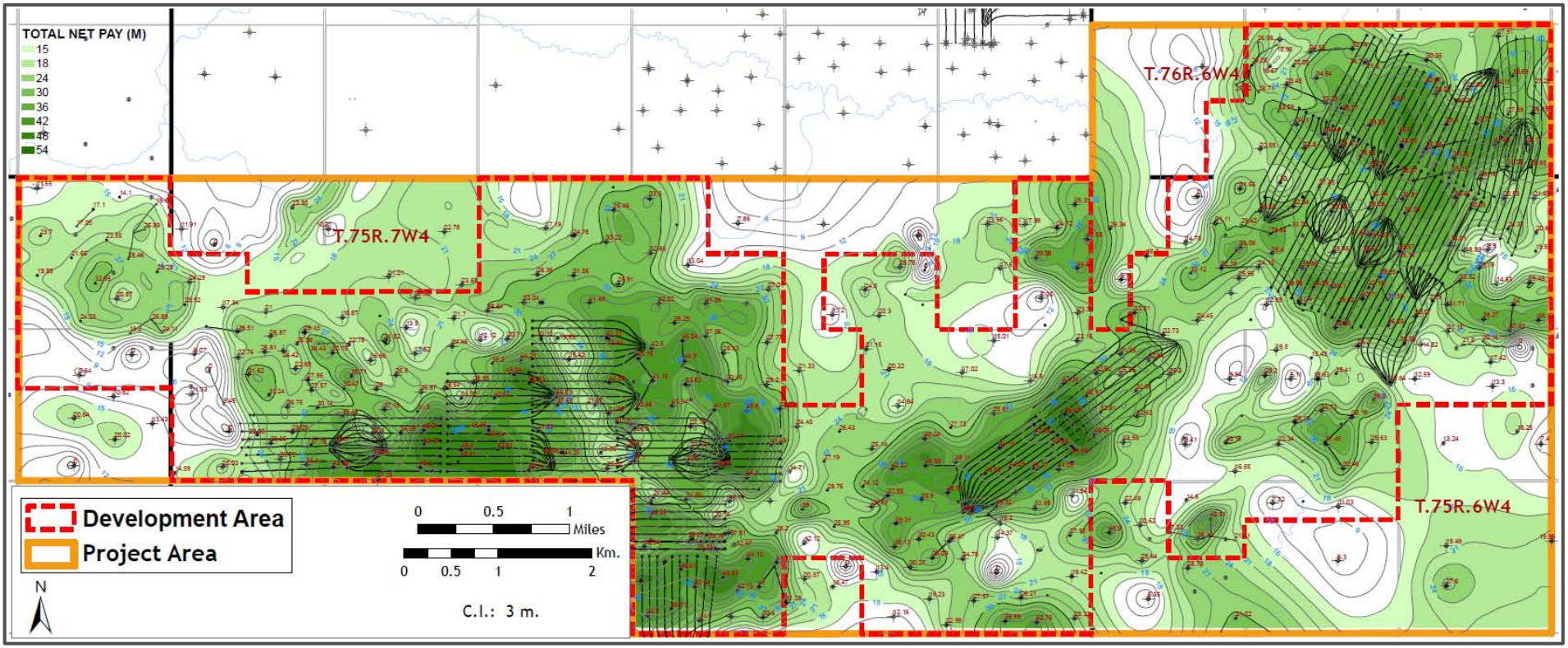
Property	Jackfish 1	Jackfish 2	Jackfish 3
OBIP *($10^6 m^3$)**	69.9	76.7	66.6
Avg. Reservoir Depth (*mTVD)* Avg. Reservoir Depth (*mASL)*	400 202	459 202	428 202
Avg. Original Reservoir Pressure *(kPa)*	2,700 @ scheme startup	2,700 @ scheme startup	2,700 @ scheme startup
Avg. Reservoir Temp. (*ºC)*	12	12	12
Avg. Kh *(md)*	5,000	3,000	4,000
Avg. Kv *(md)*	2,000	1,200	1,500
Avg. Phi *(%)*	33	33	33
Avg. Bitumen Viscosity *(Cp)*	1,000,000+	1,000,000+	1,000,000+
Original Bottom Water Pressure *(kPa)*	2,300	2,300	2,300

**Total for all producing, drilled, and planned pads utilizing GRV methodology (2015)*

Geology

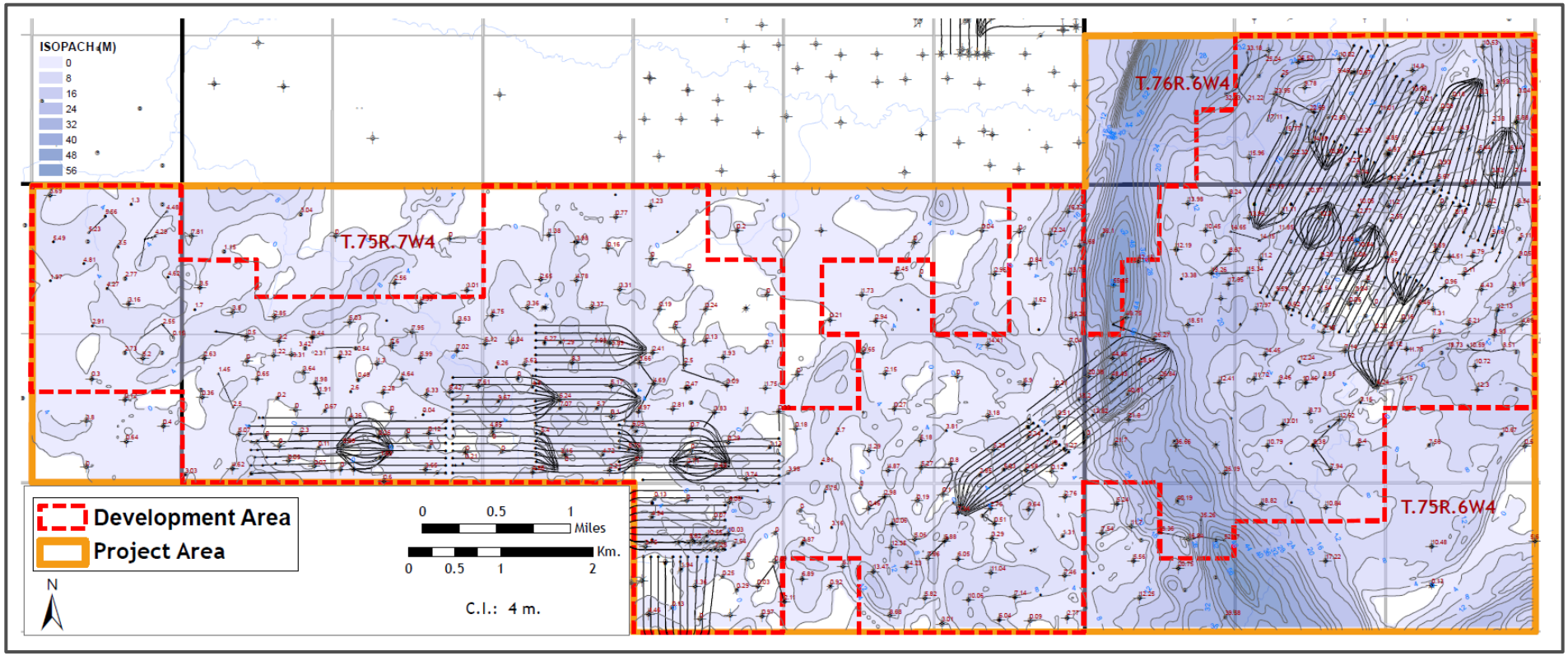
Jackfish Total Net Bitumen Pay Isopach

3.1.1-2c



Geology

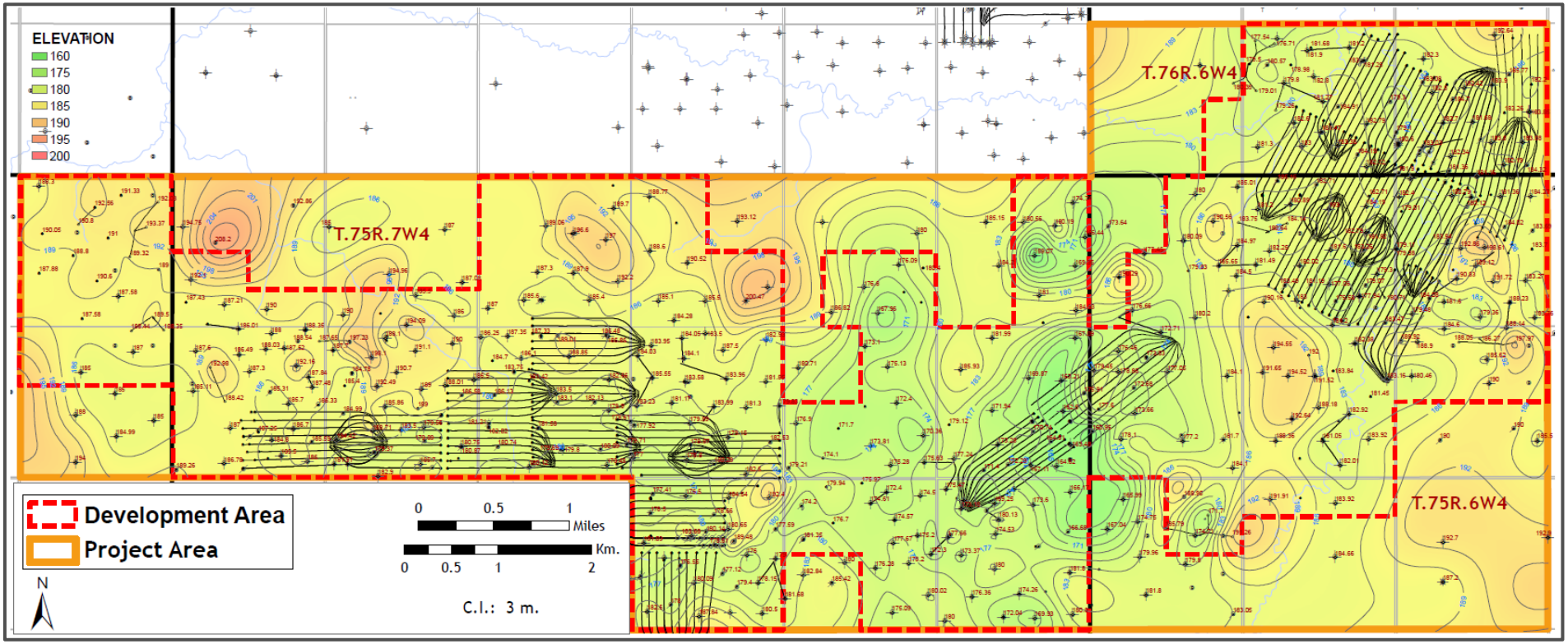
Jackfish McMurray Water Contact to Paleozoic Isopach



Geology

Jackfish Structure On Base Gross Rock Volume (GRV_B)

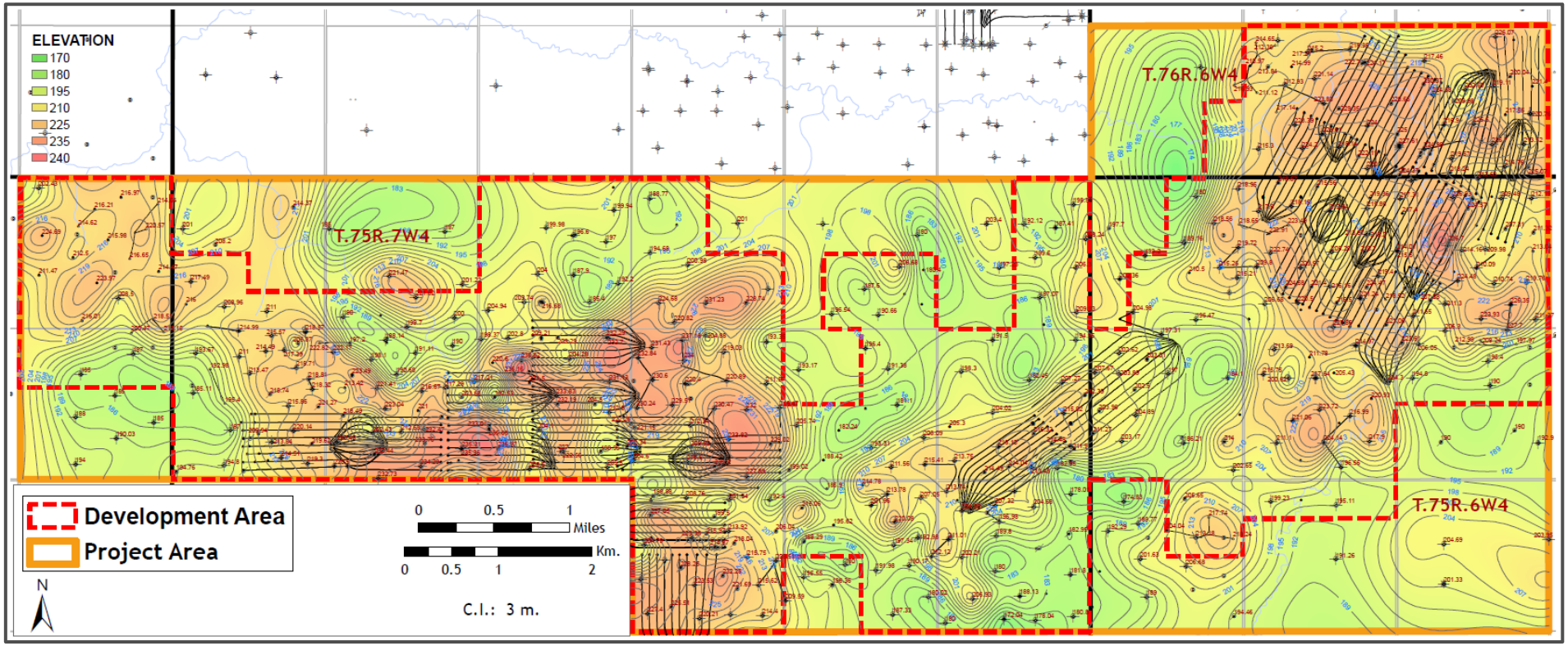
3.1.1-2d



Geology

Jackfish Structure On Top Gross Rock Volume (GRV_T)

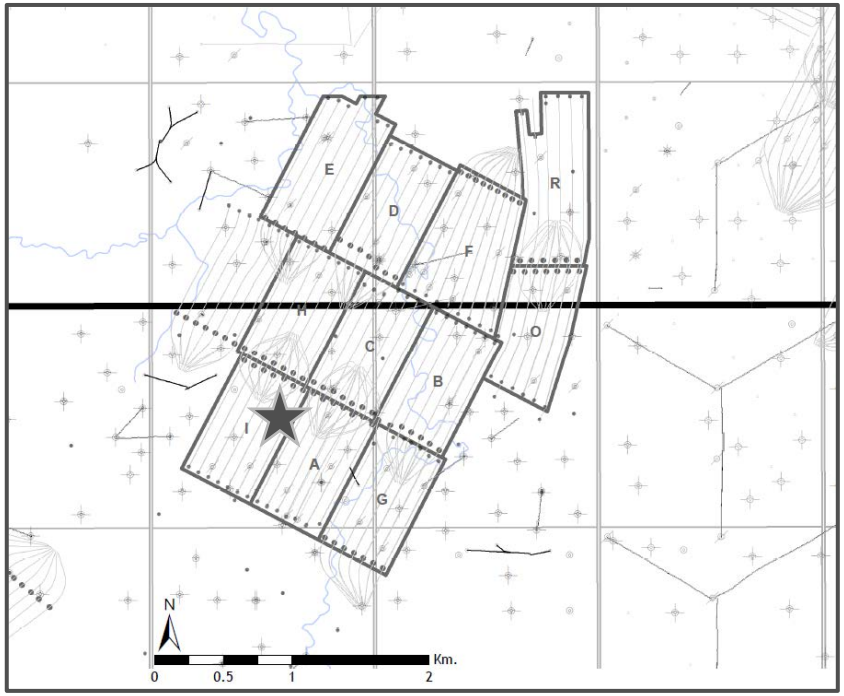
3.1.1-2d

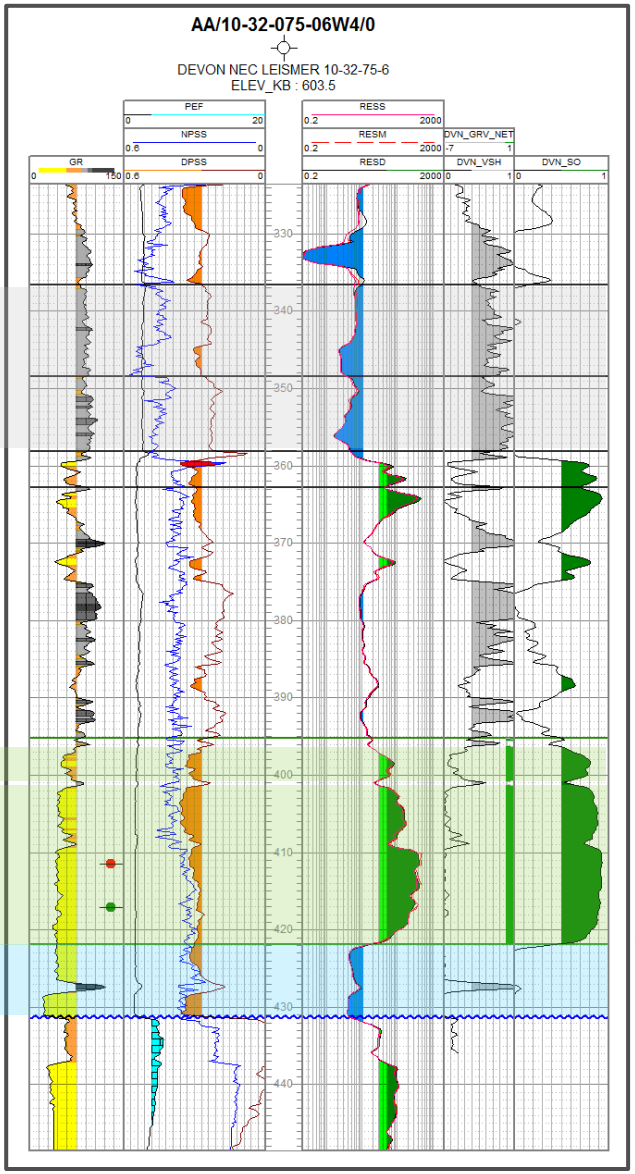


Geology

Jackfish 1 Representative Well Log

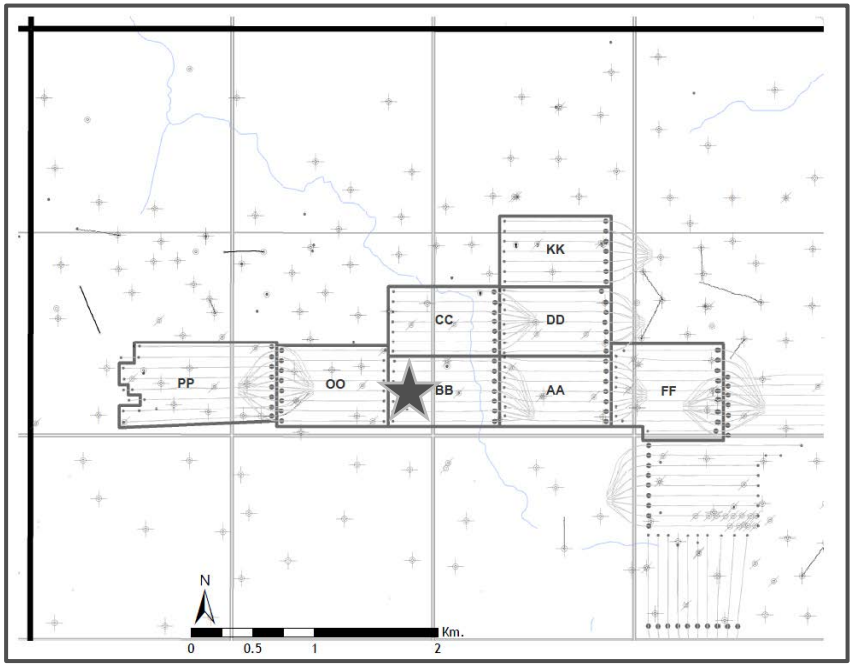
3.1.1-2e

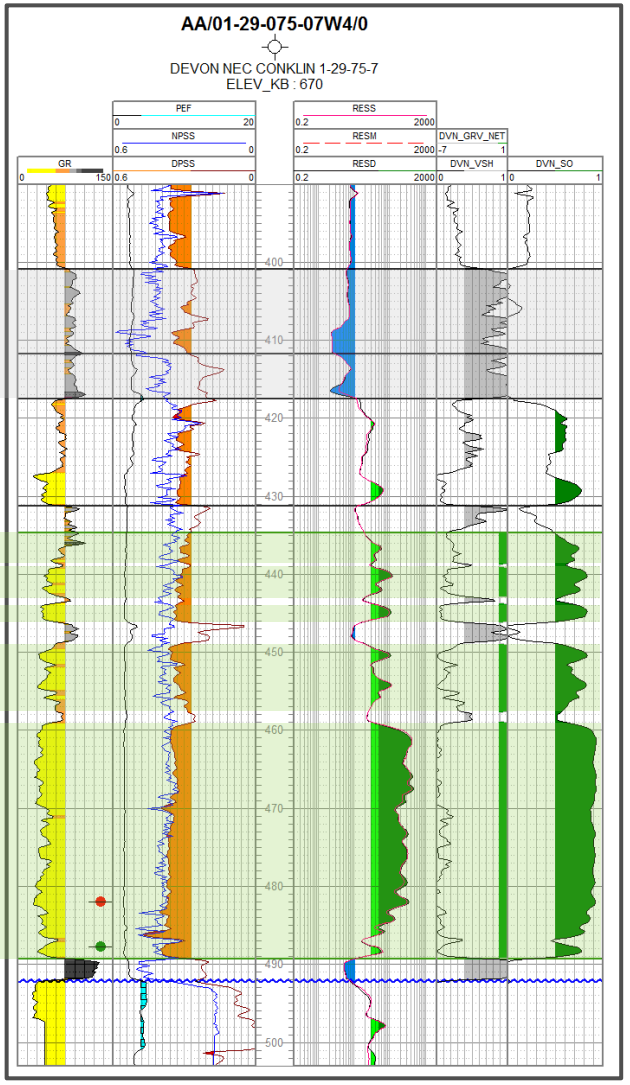




Geology
Jackfish 2 Representative Well Log

3.1.1-2e

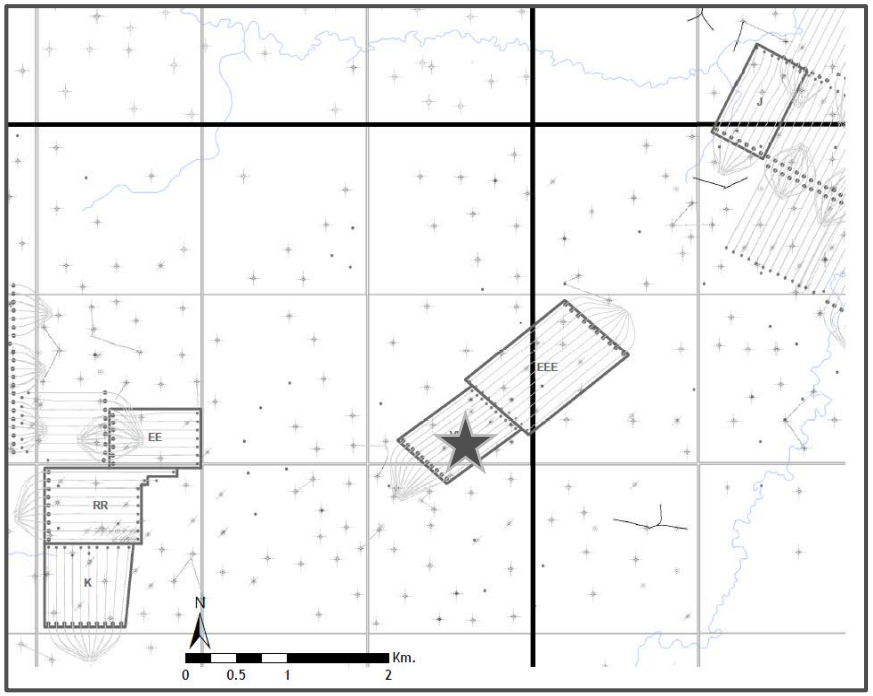


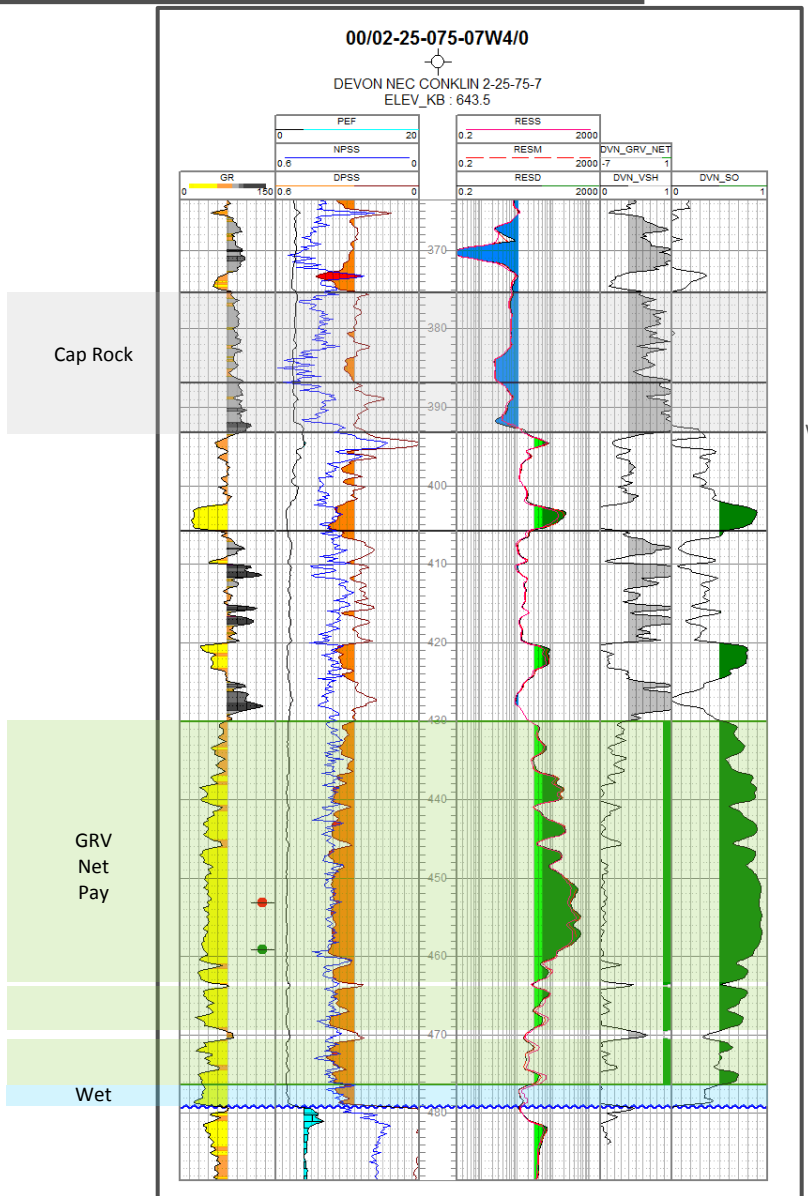


Geology

Jackfish 3 Representative Well Log

3.1.1-2e

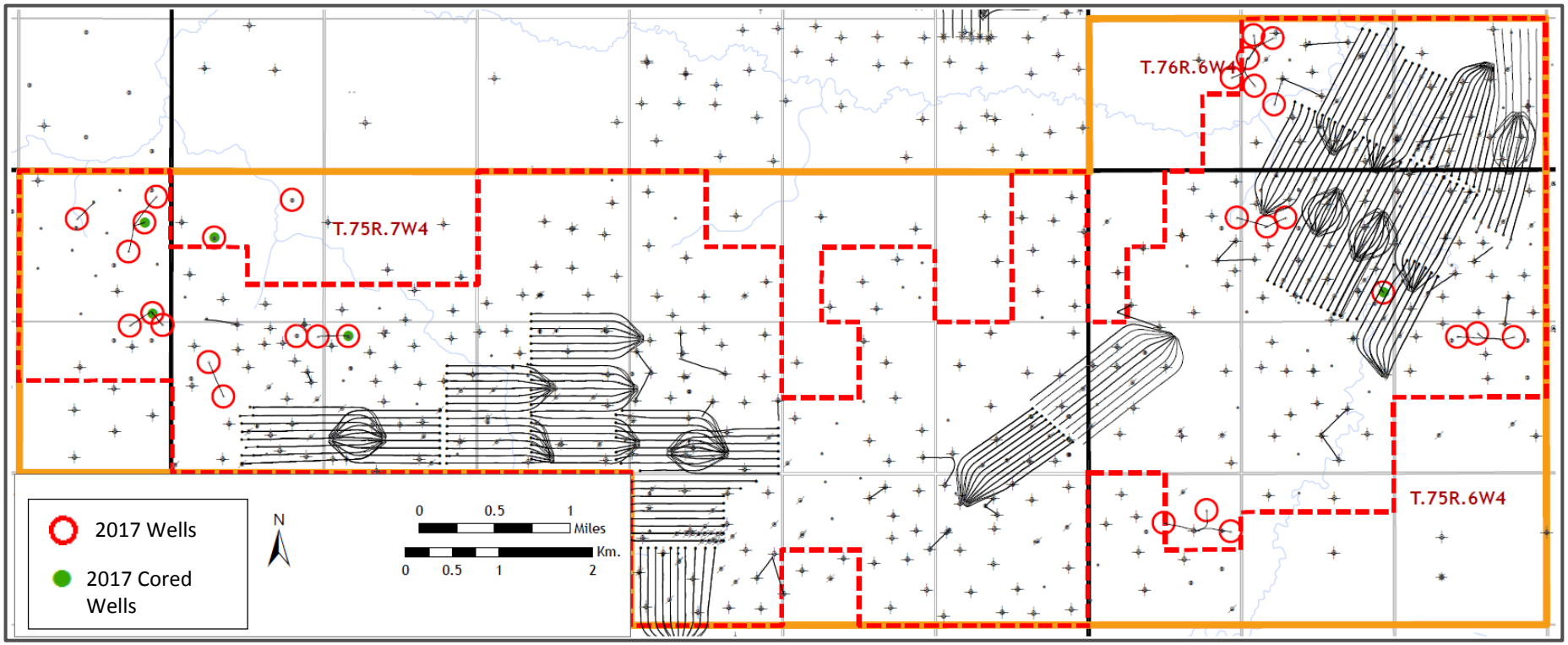




Geology

Jackfish 2017 Drilling Program and Cored Wells

3.1.1-2f



Project Area

2016-2017 Wells: 30
2016-2017 Core: 5
Total Well Count: 433
Total Core: 196

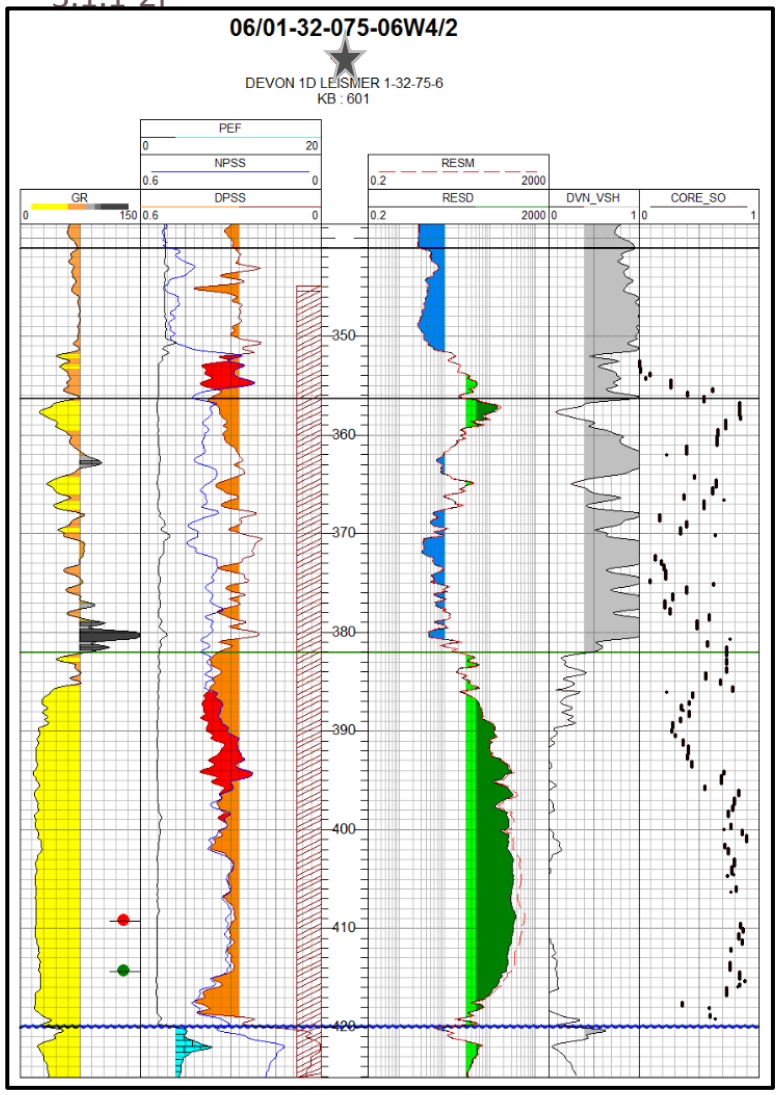
Special Core Analysis

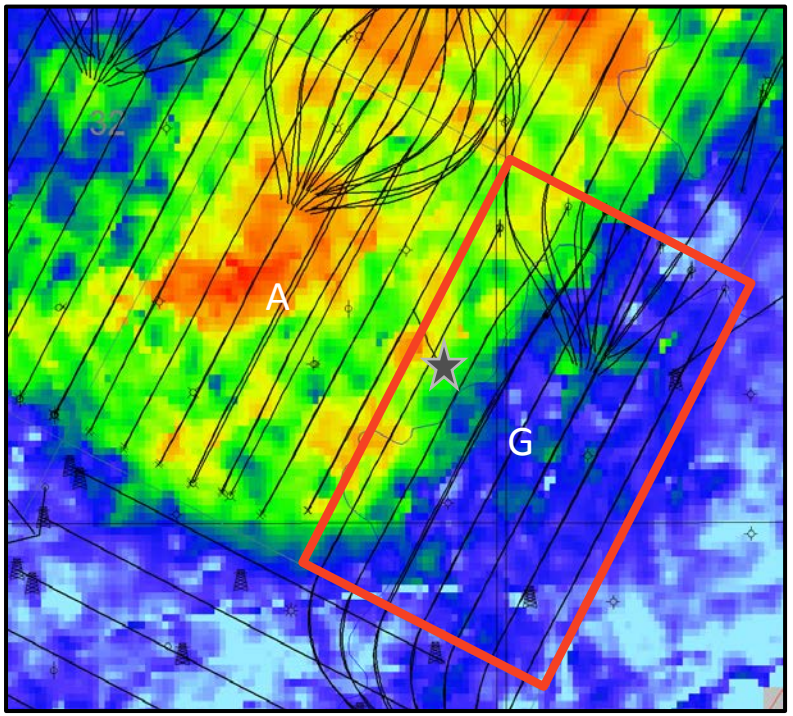
No special core analysis conducted on core from the 2017 drilling program.

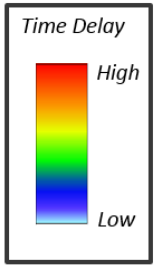
Geology

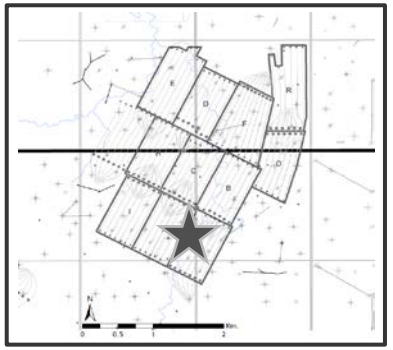
Jackfish 1 Pad G Steam Evaluation Core

3.1.1-2f









No new implications on ultimate recovery at this point in time

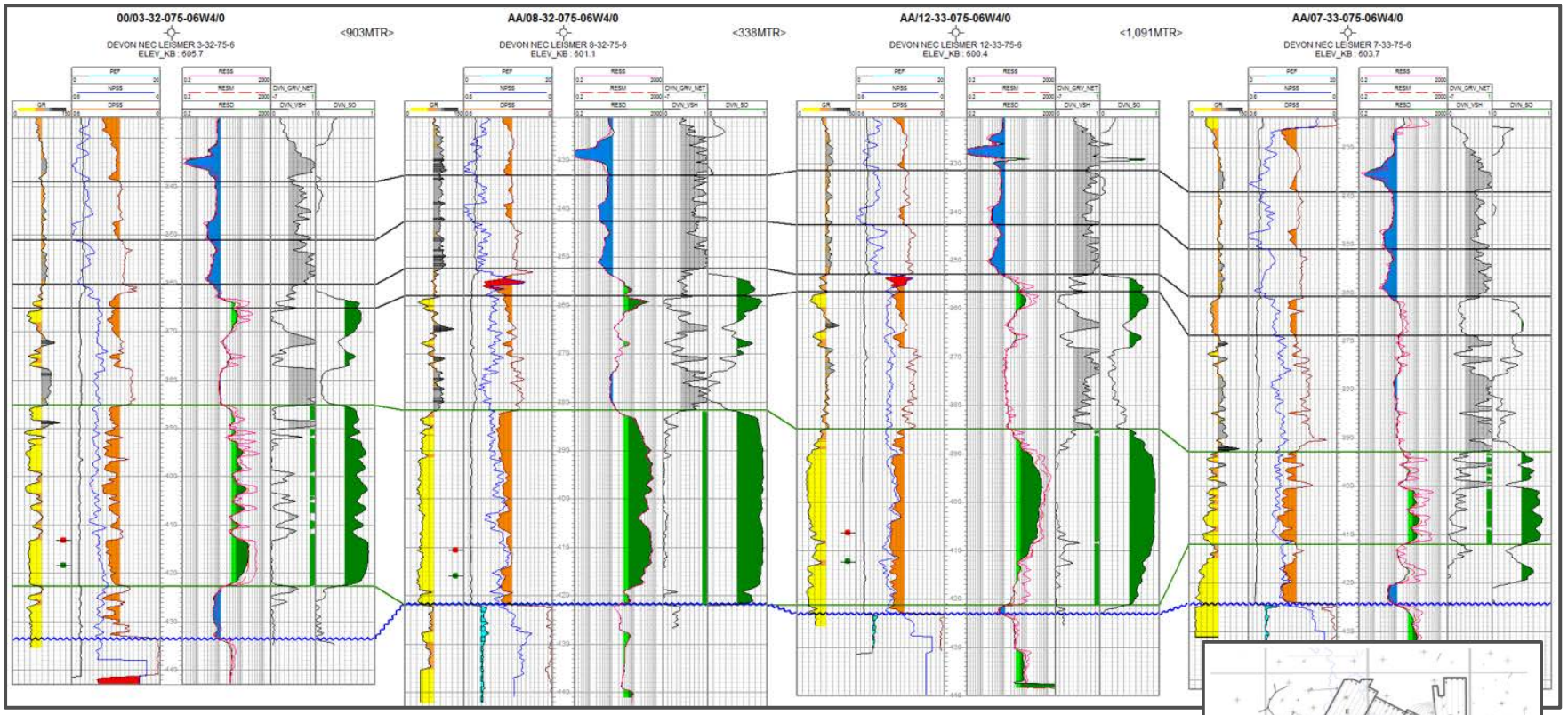
Geology

Jackfish 1 Representative Structural Cross-section

3.1.1-2i

A

A’



Clearwater Cap Rock

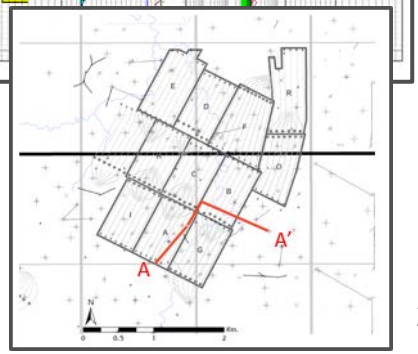
Wabiskaw

McMurray Fm

GRV_T

GRV_B

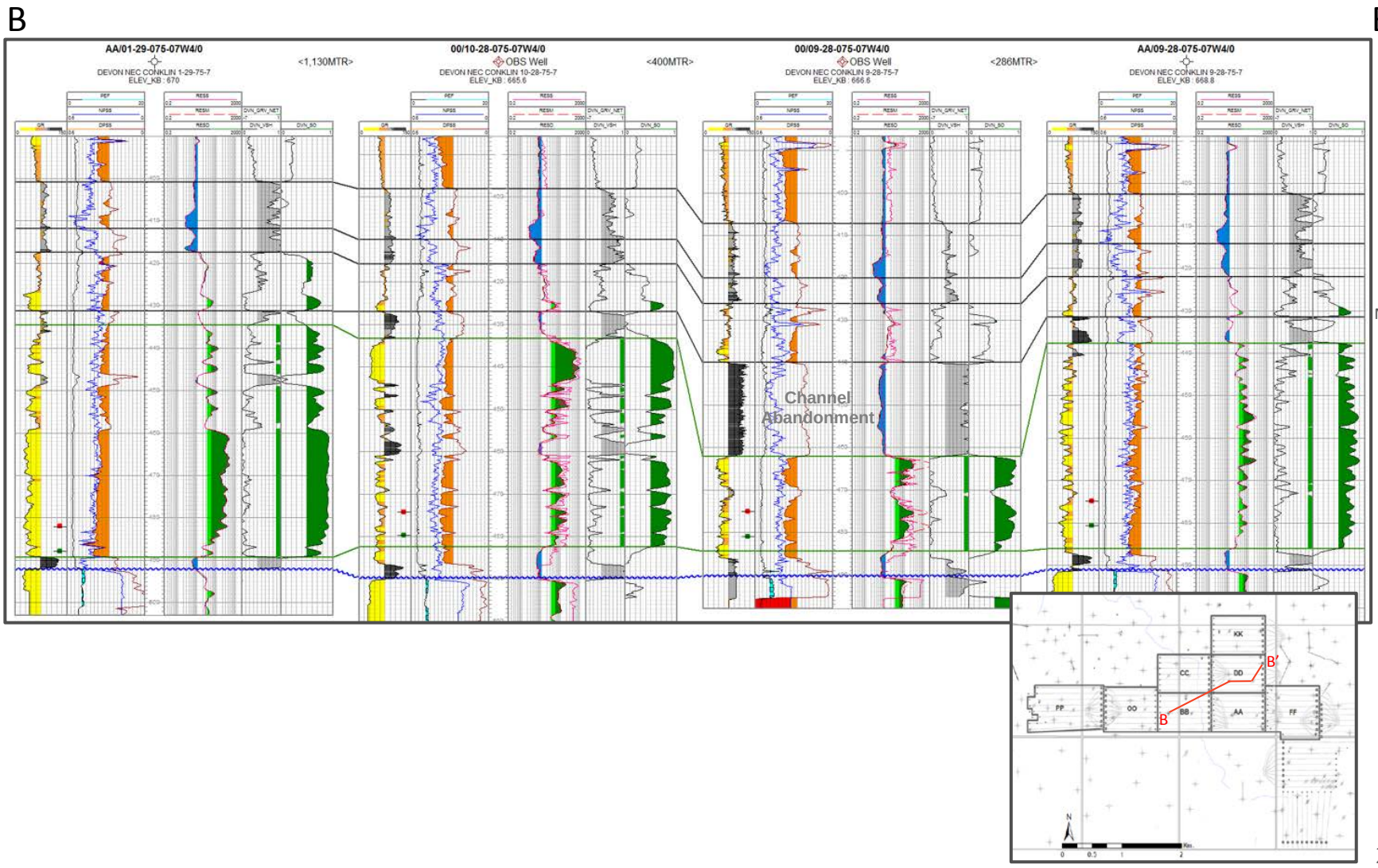
Paleozoic



Geology

Jackfish 2 Representative Structural Cross-section

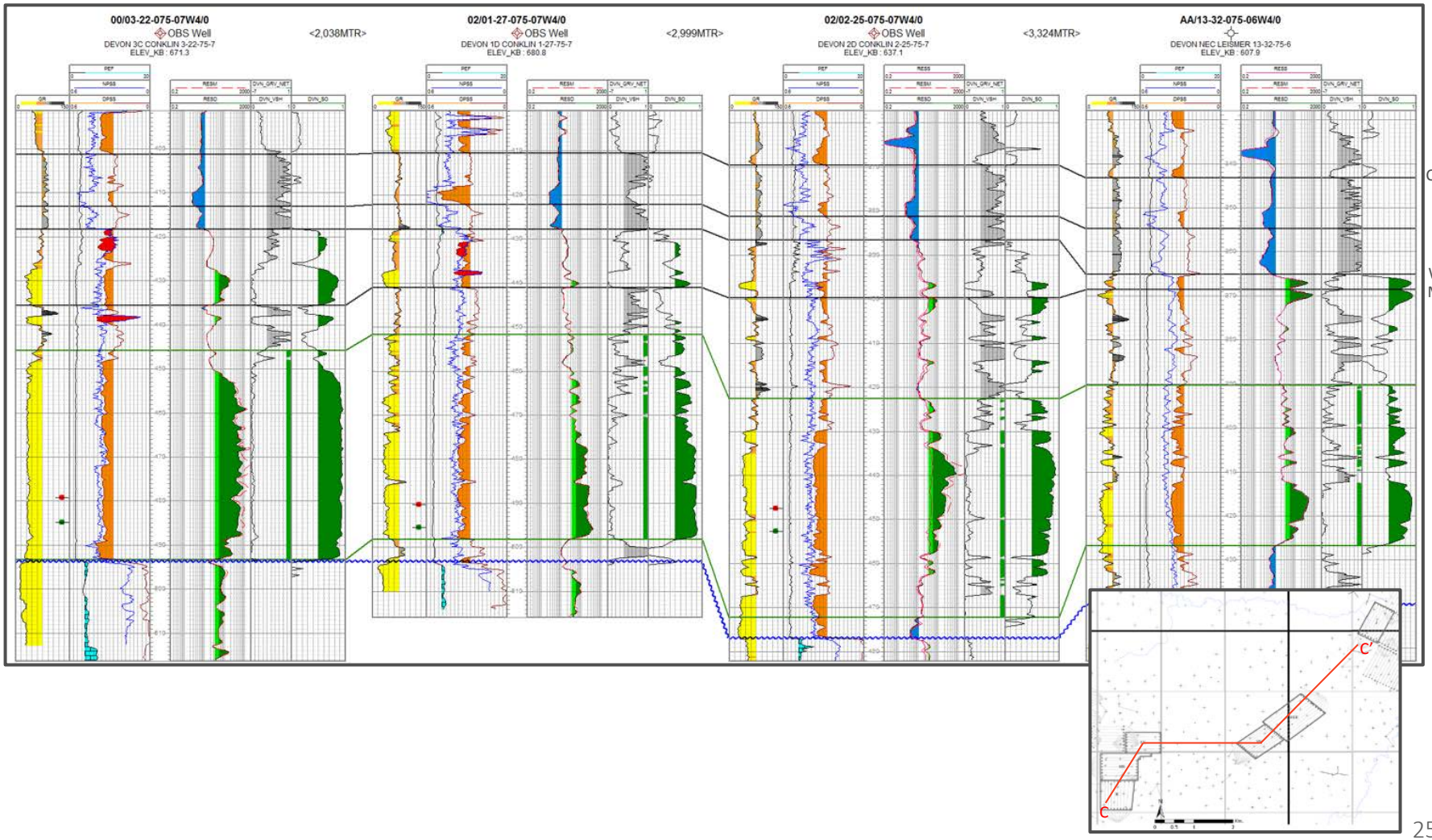
3.1.1-2i



Geology

Jackfish 3 Representative Structural Cross-section

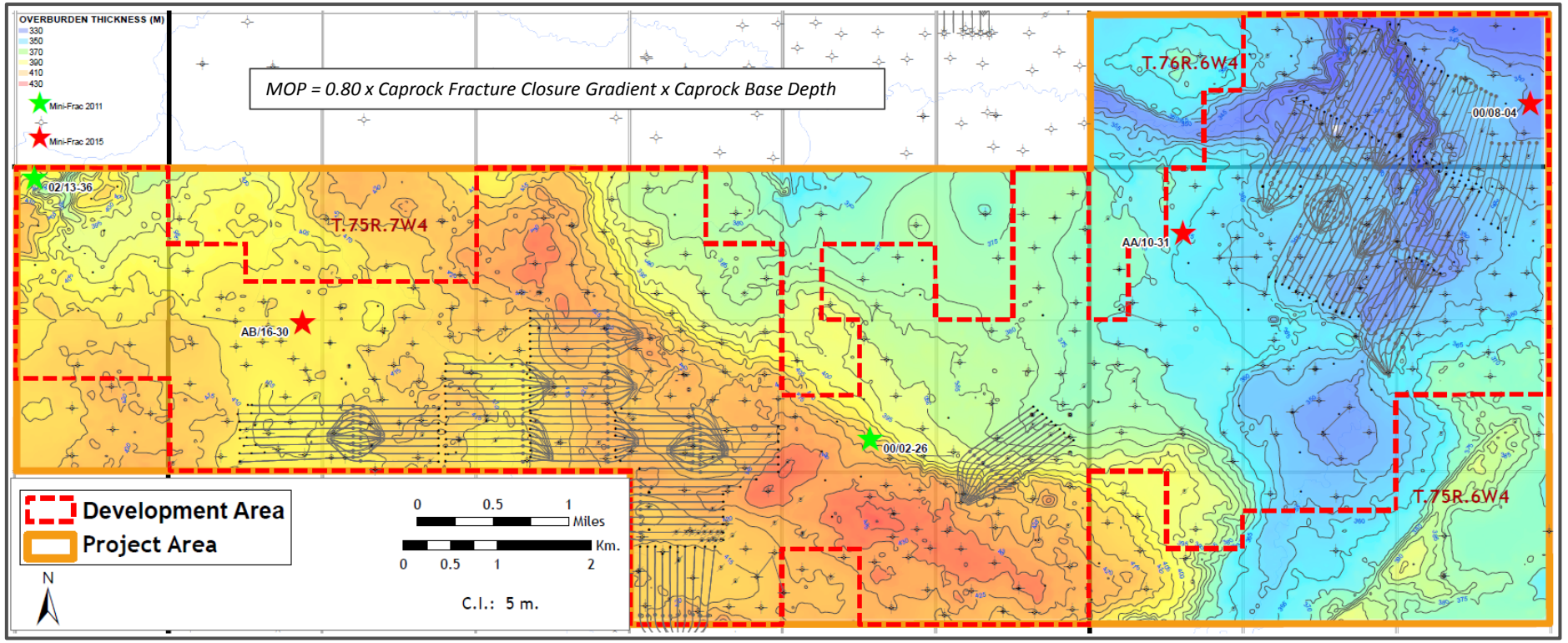
3.1.1-2i



Geology

Caprock Overburden Map and 2015 Mini Frac's

3.1.1-2m



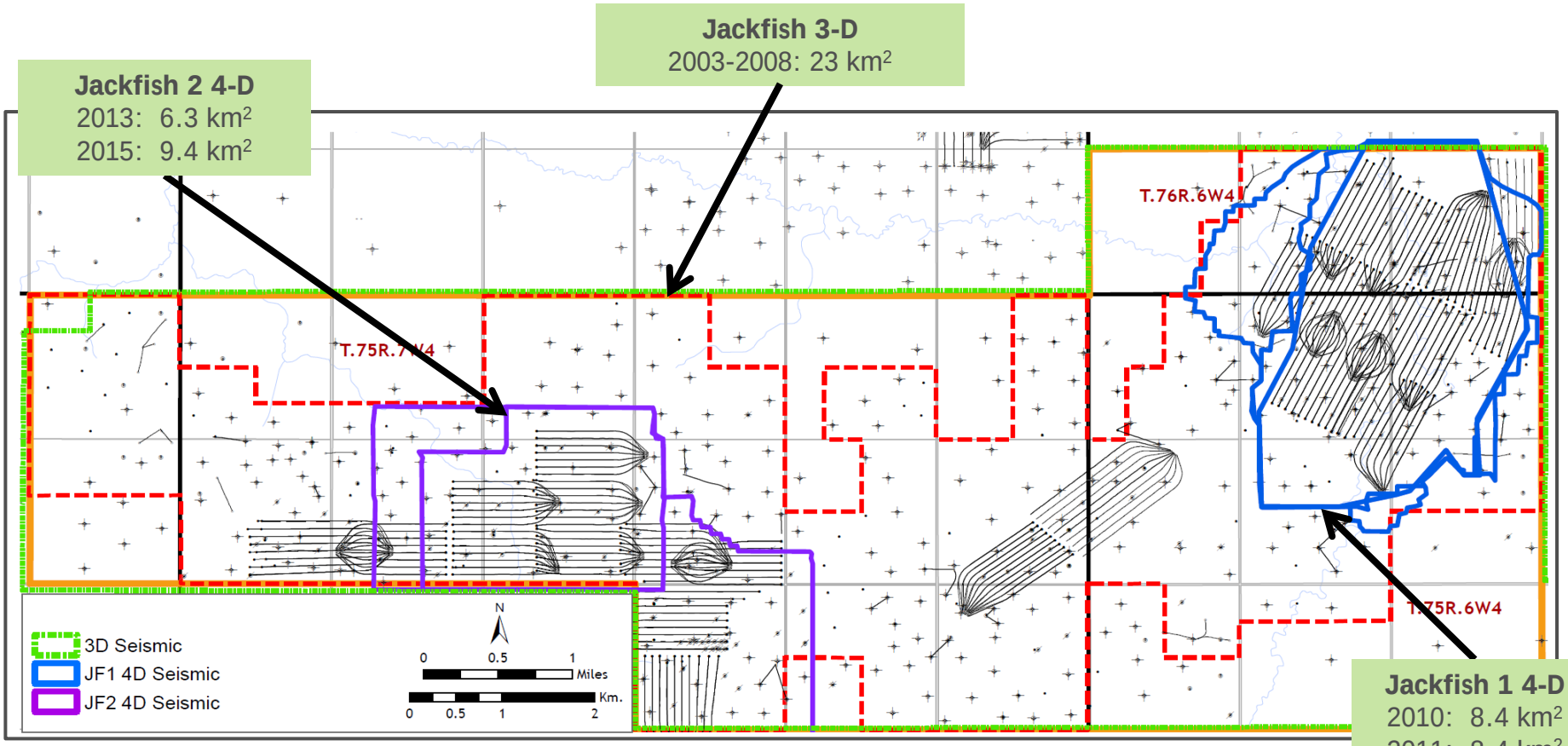
Interpretation complete on 2015 mini frac program:

- Lowest Wabiskaw shale fracture closure gradient of 14.1kPa/m at AA/10-31
- Fracture closure gradient of 18.6kPa/m from the 2011 mini frac program was utilized for the earlier MOP approval
- Category 2 Amendment to adjust the Jackfish MOP submitted in Q3 2016 and subsequently approved

Seismic

Historical Jackfish 3-D and 4-D to 2015

3.1.1-2l

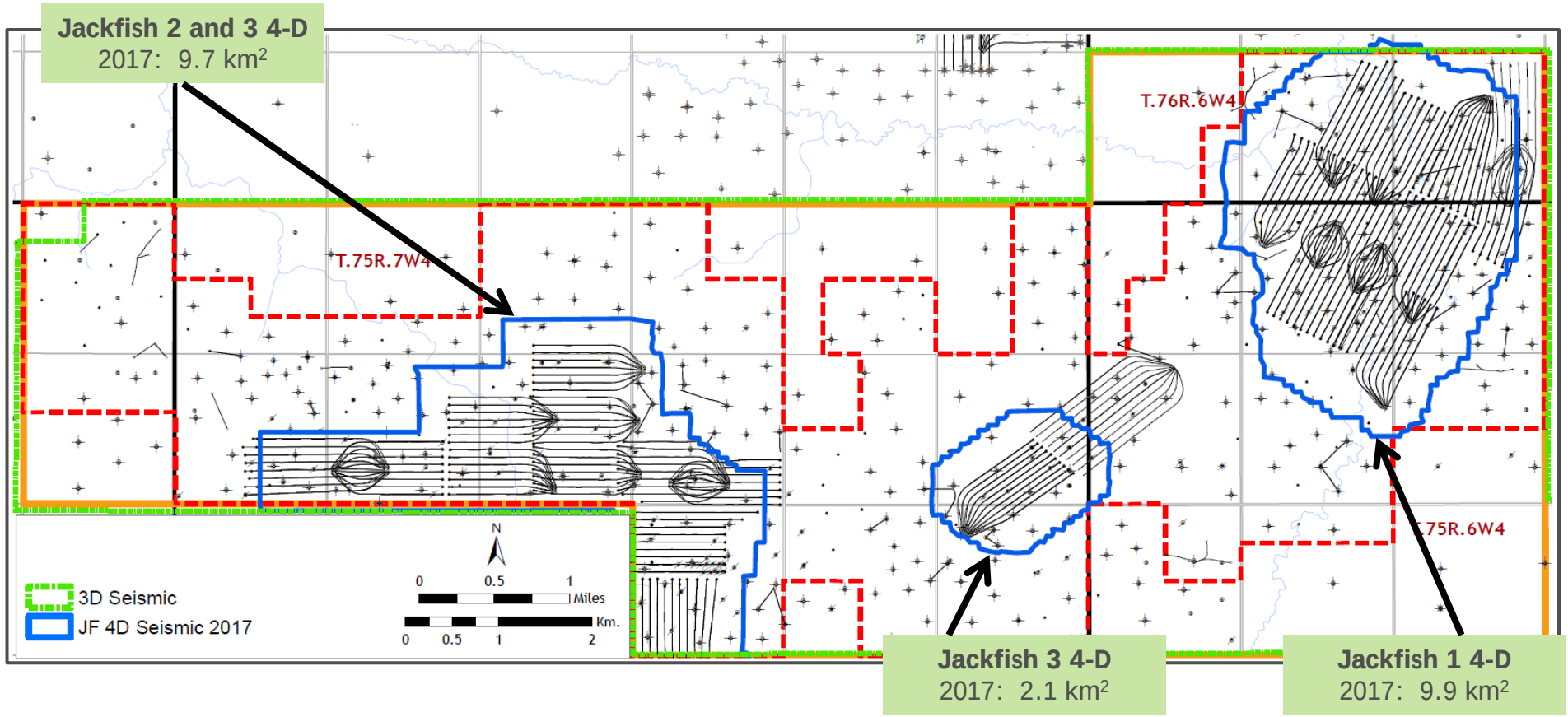


No seismic acquisition in 2016

Seismic

Jackfish 2017 4D Acquisition

3.1.1-6a

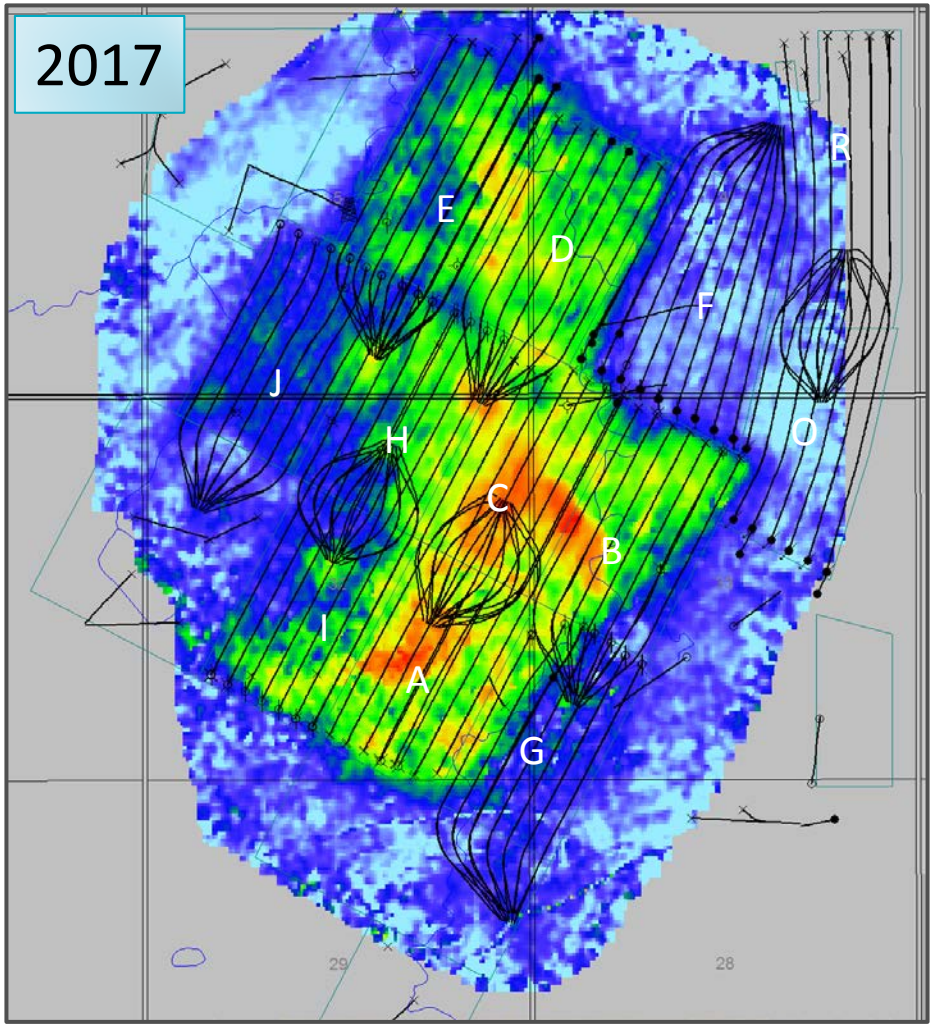


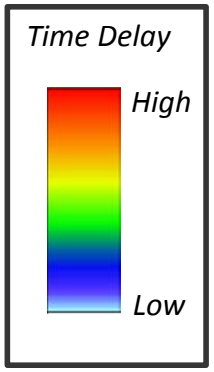
Extensive seismic acquisition totaling 21.7 km²

Jackfish 1 4D Seismic Survey

2017 4D Interpretation

3.1.1-6b





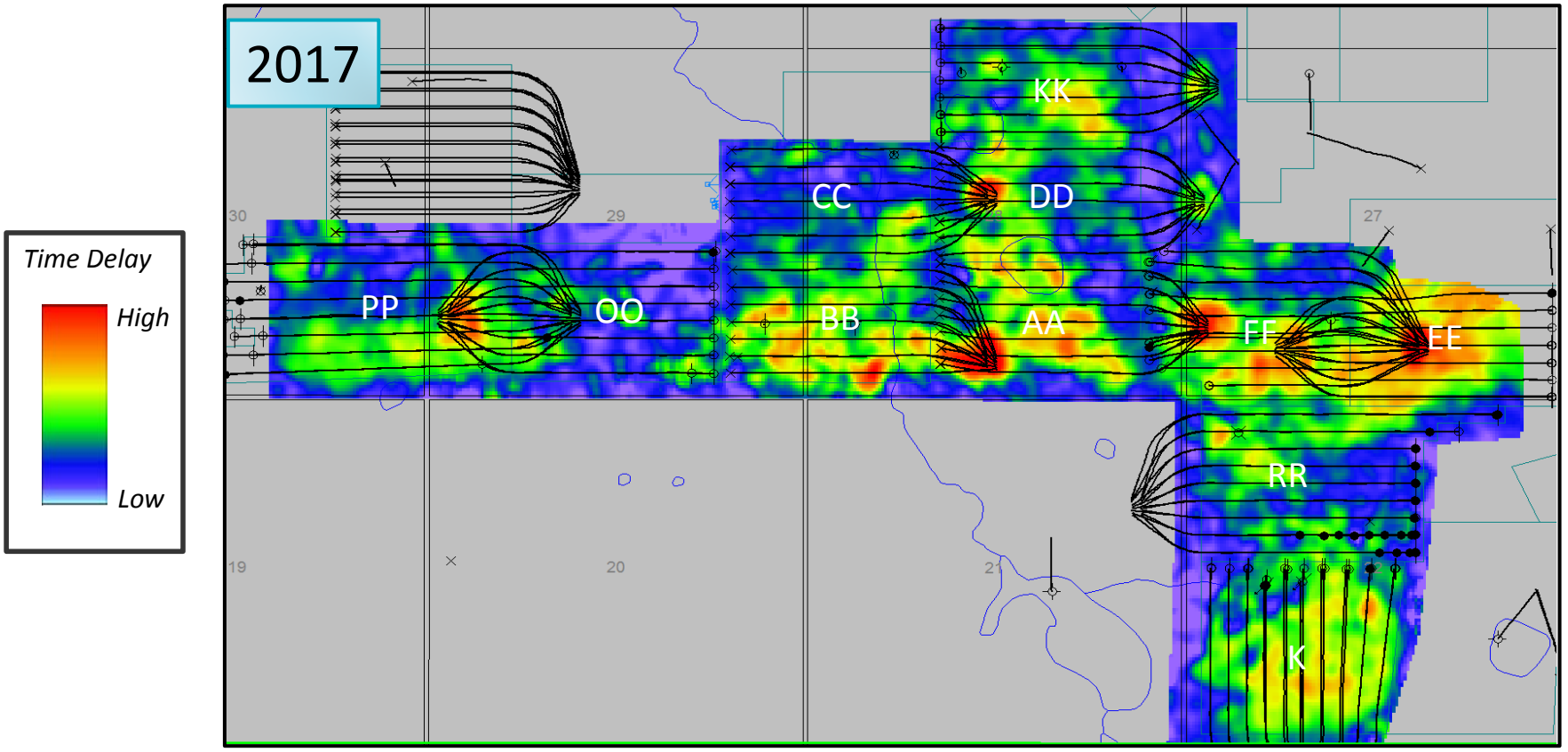
Time delay is in direct relation to steam chamber development

Colour gradient represents Paleozoic reflector time change from 2003 (baseline) to 2017

Jackfish 2 and 3 4D Seismic Survey

2017 4D Interpretation

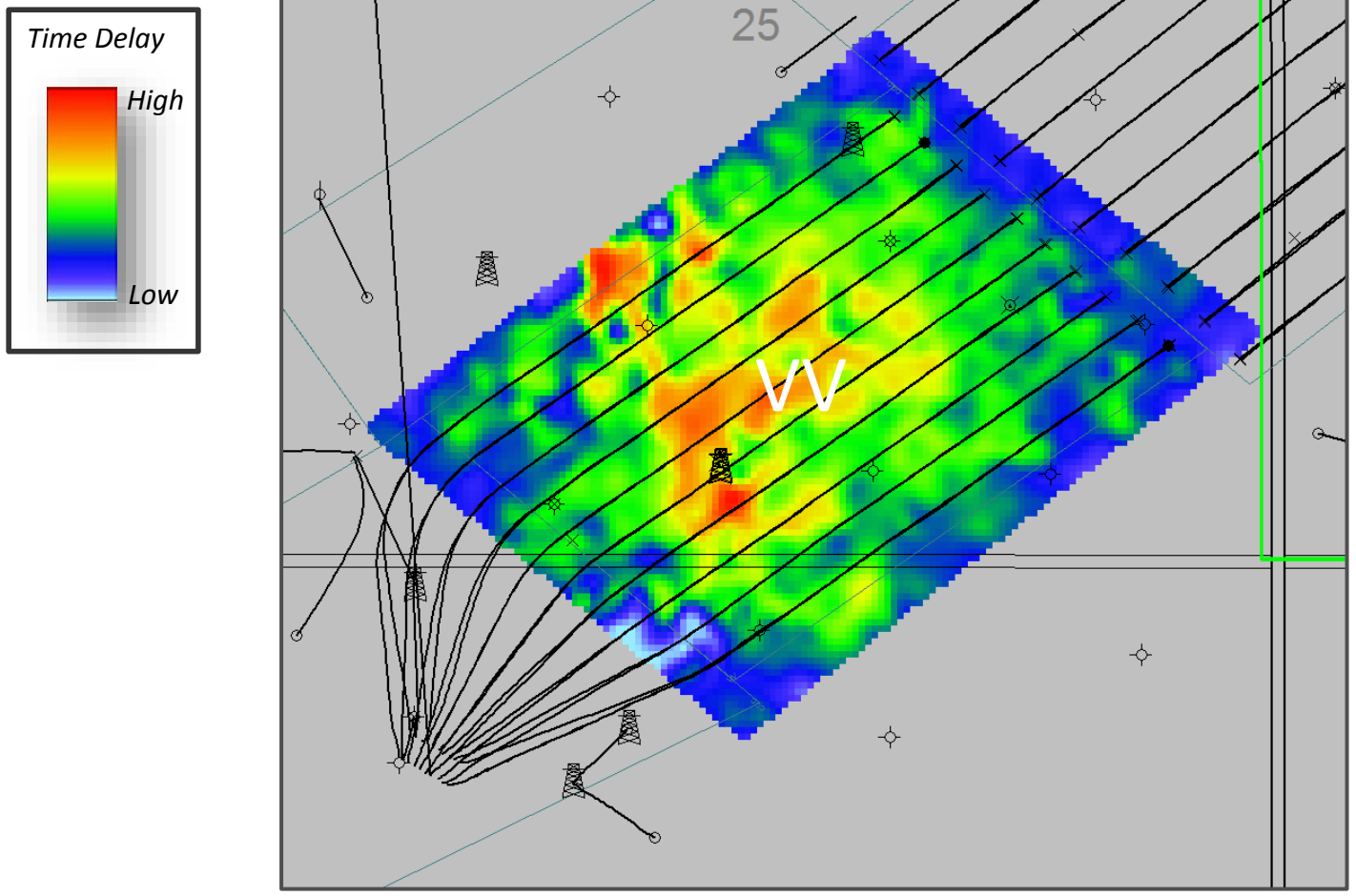
3.1.1-6b



Jackfish 3 4D Seismic Survey

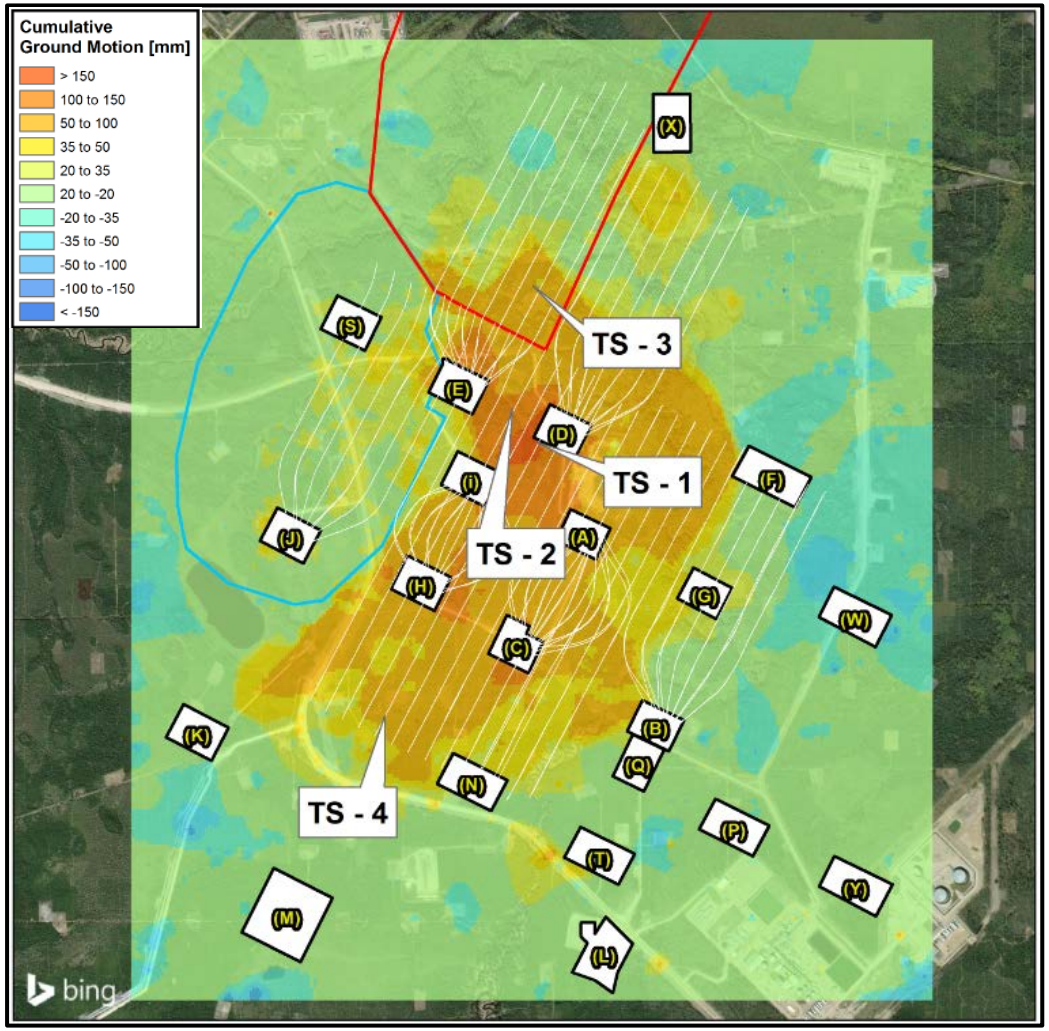
2017 4D Interpretation

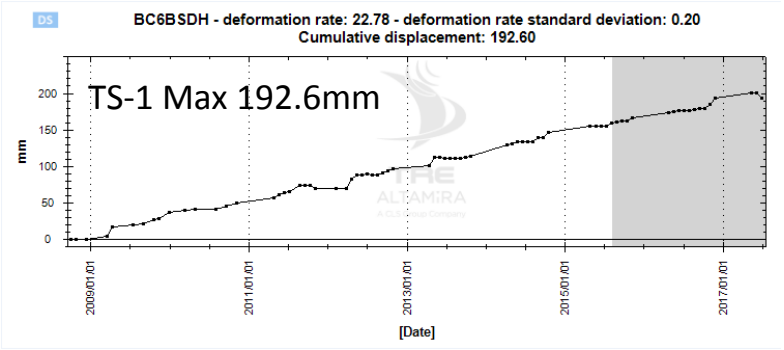
3.1.1-6b

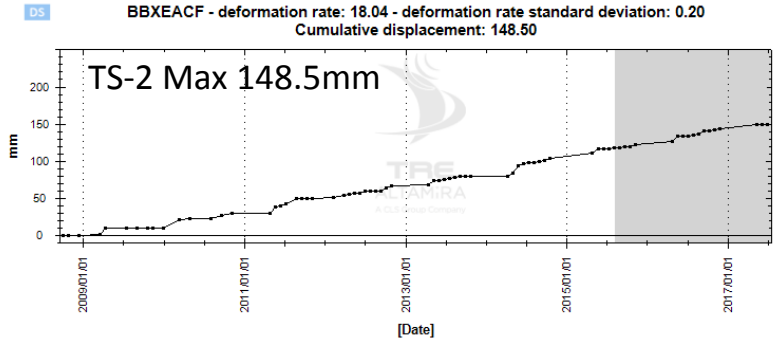


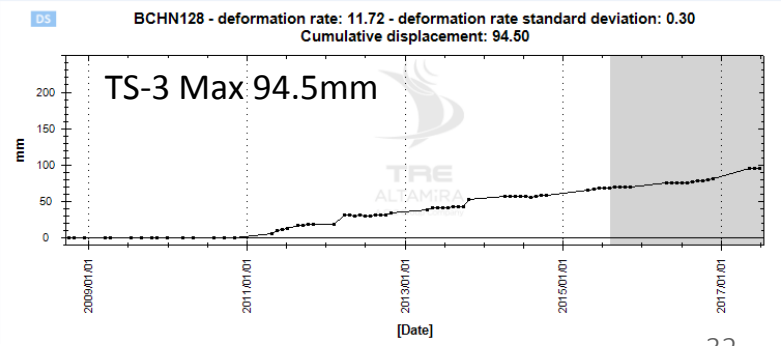
Jackfish 1
Accumulated Displacement 2008-2017

3.1.1-2k





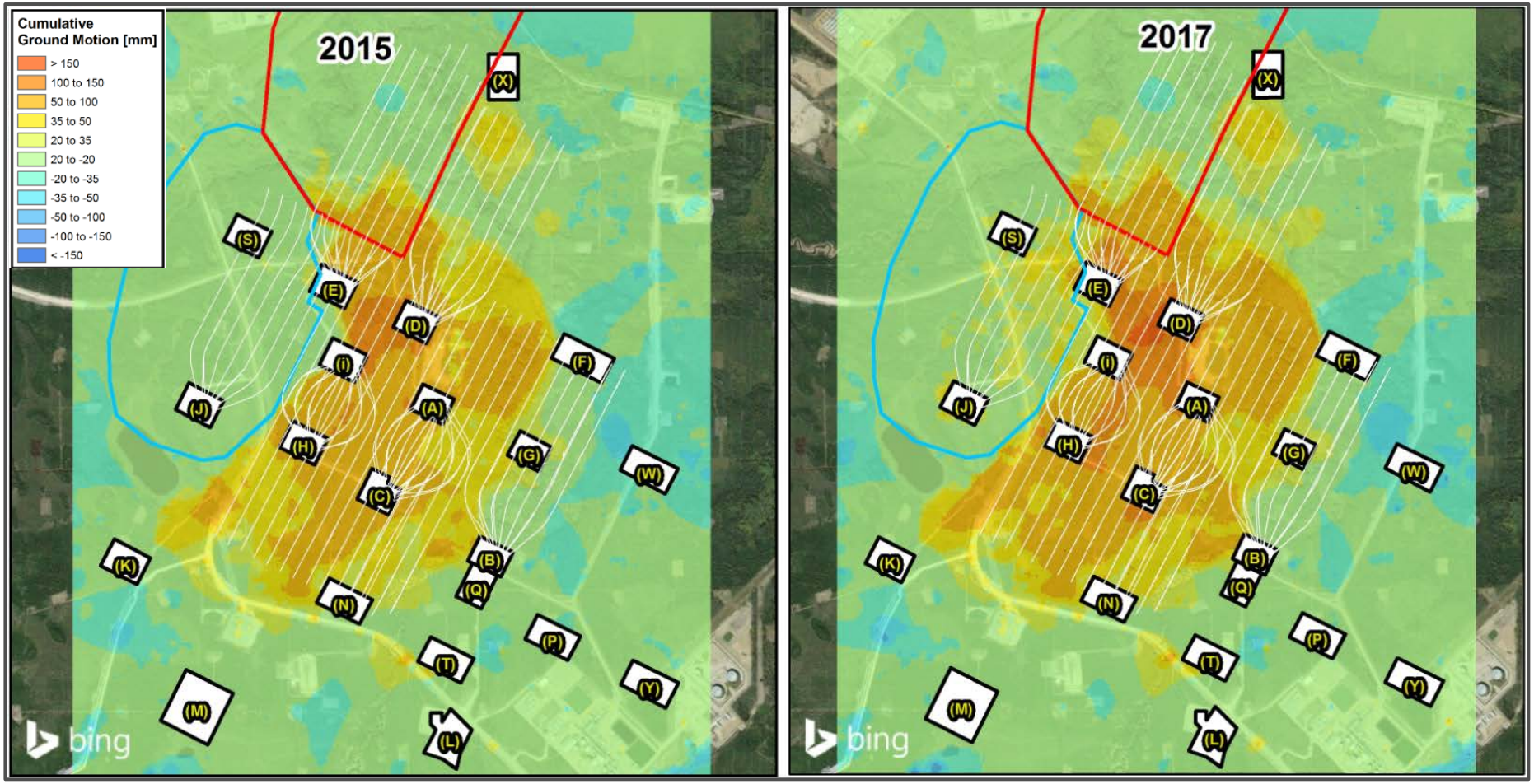




Jackfish 1

Comparing Accumulated Displacement 2015 to 2017

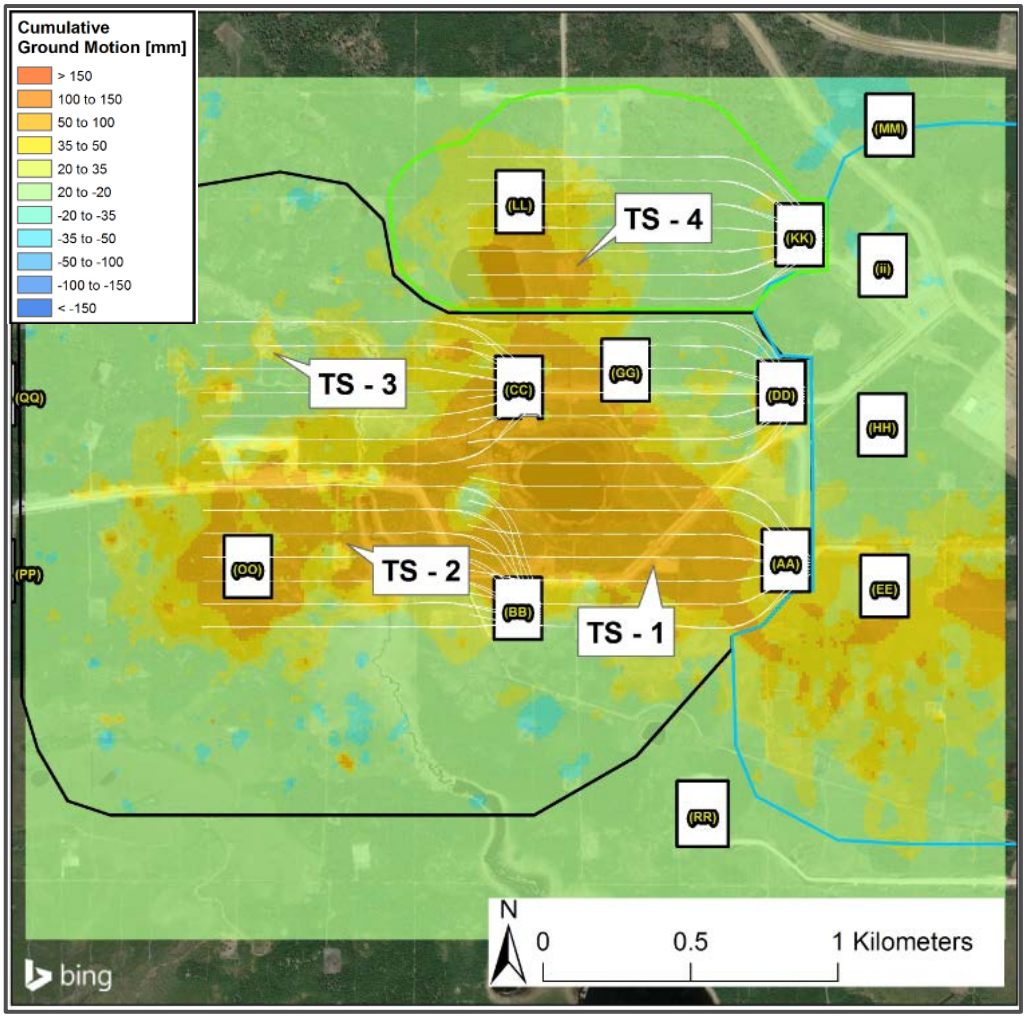
3.1.1-2k

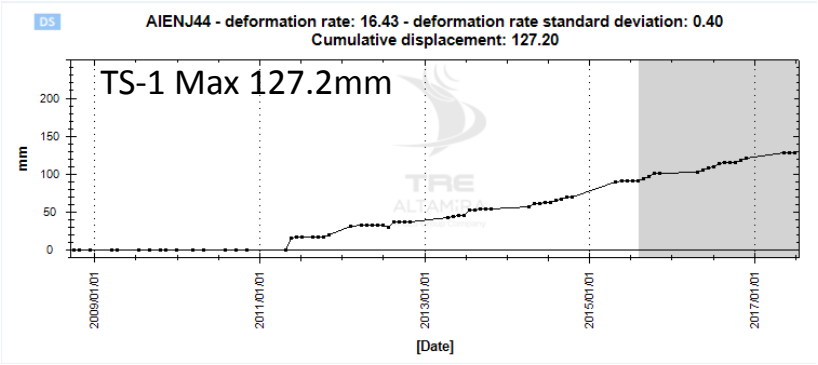


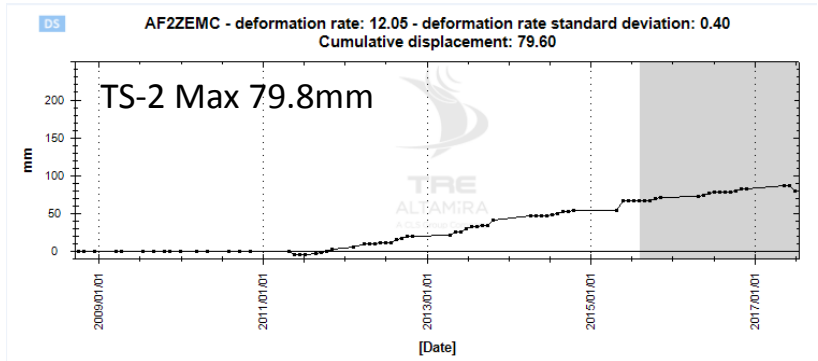
Jackfish 2

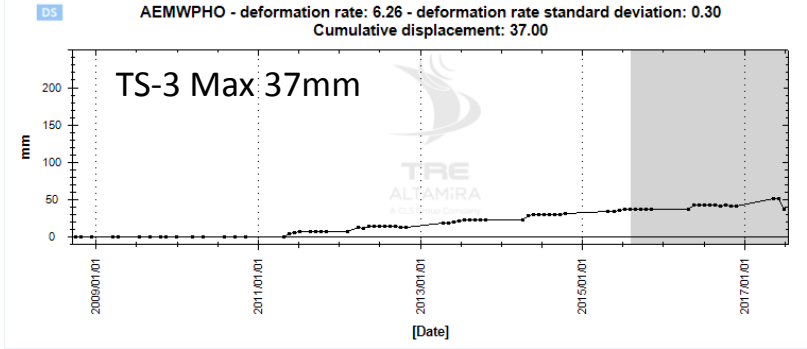
Accumulated Displacement 2011-2017

3.1.1-2k





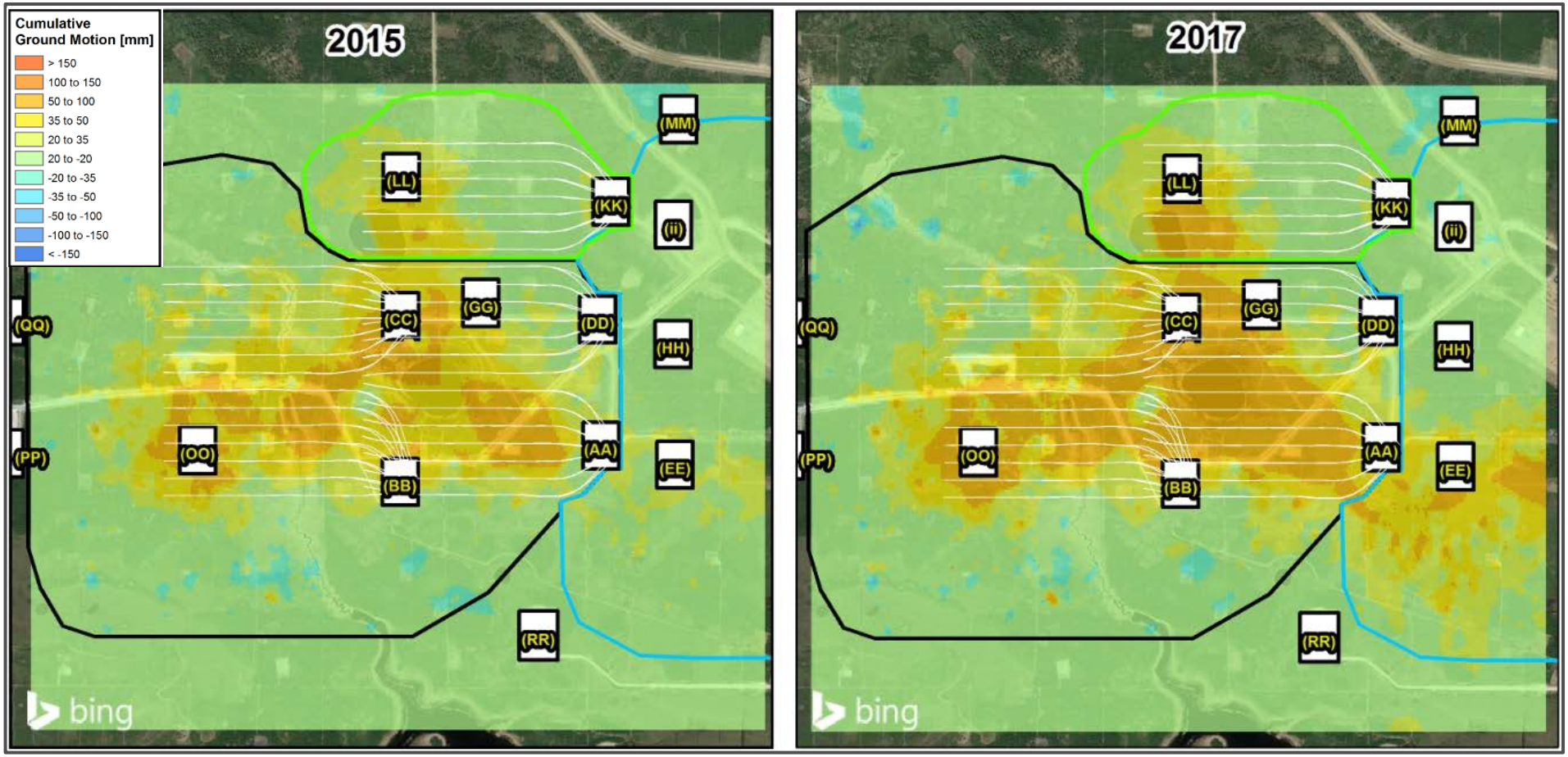




Jackfish 2

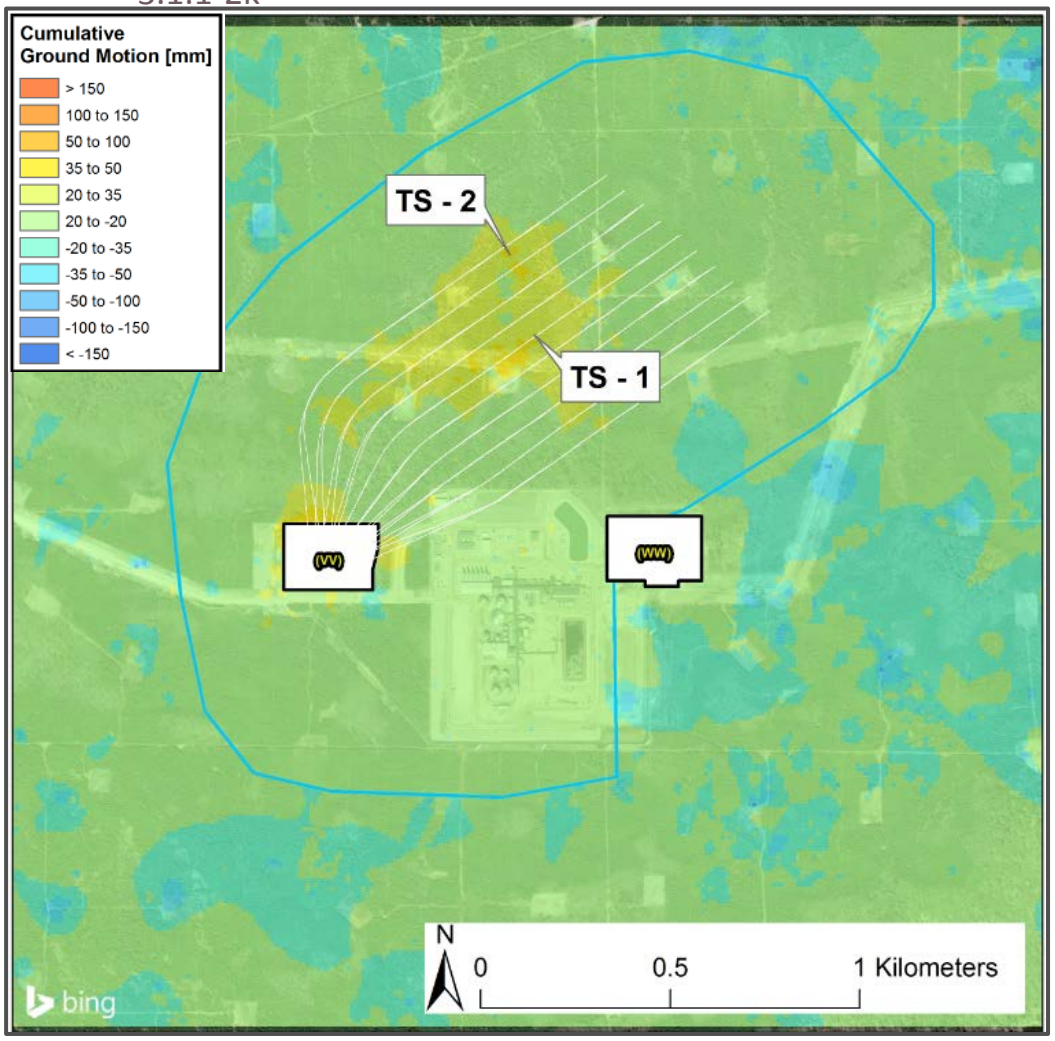
Comparing Accumulated Displacement 2016 to2017

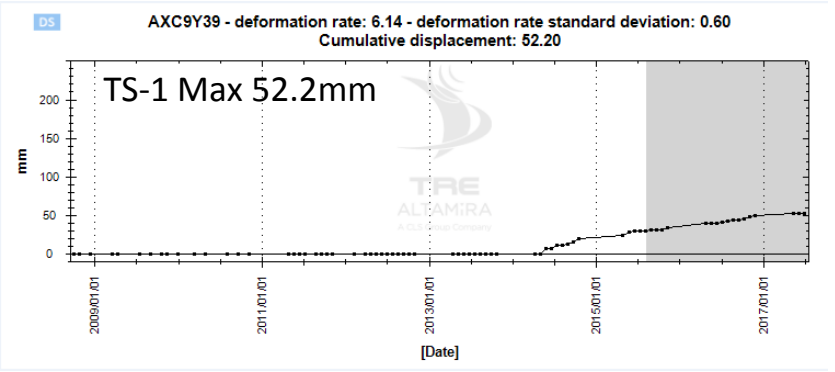
3.1.1-2k

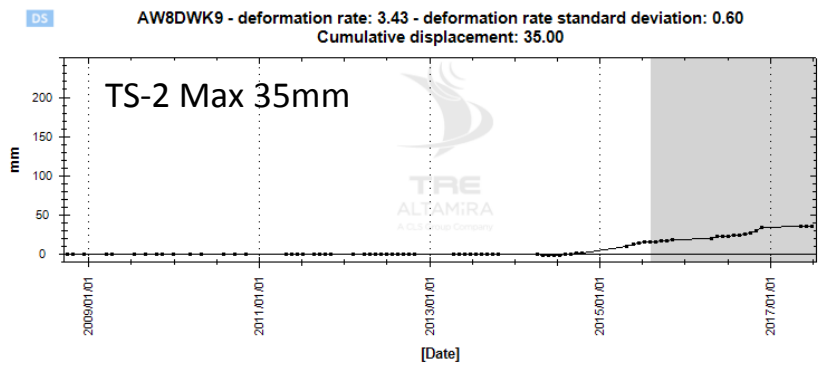


Jackfish 3
Accumulated Displacement 2014-2017

3.1.1-2k



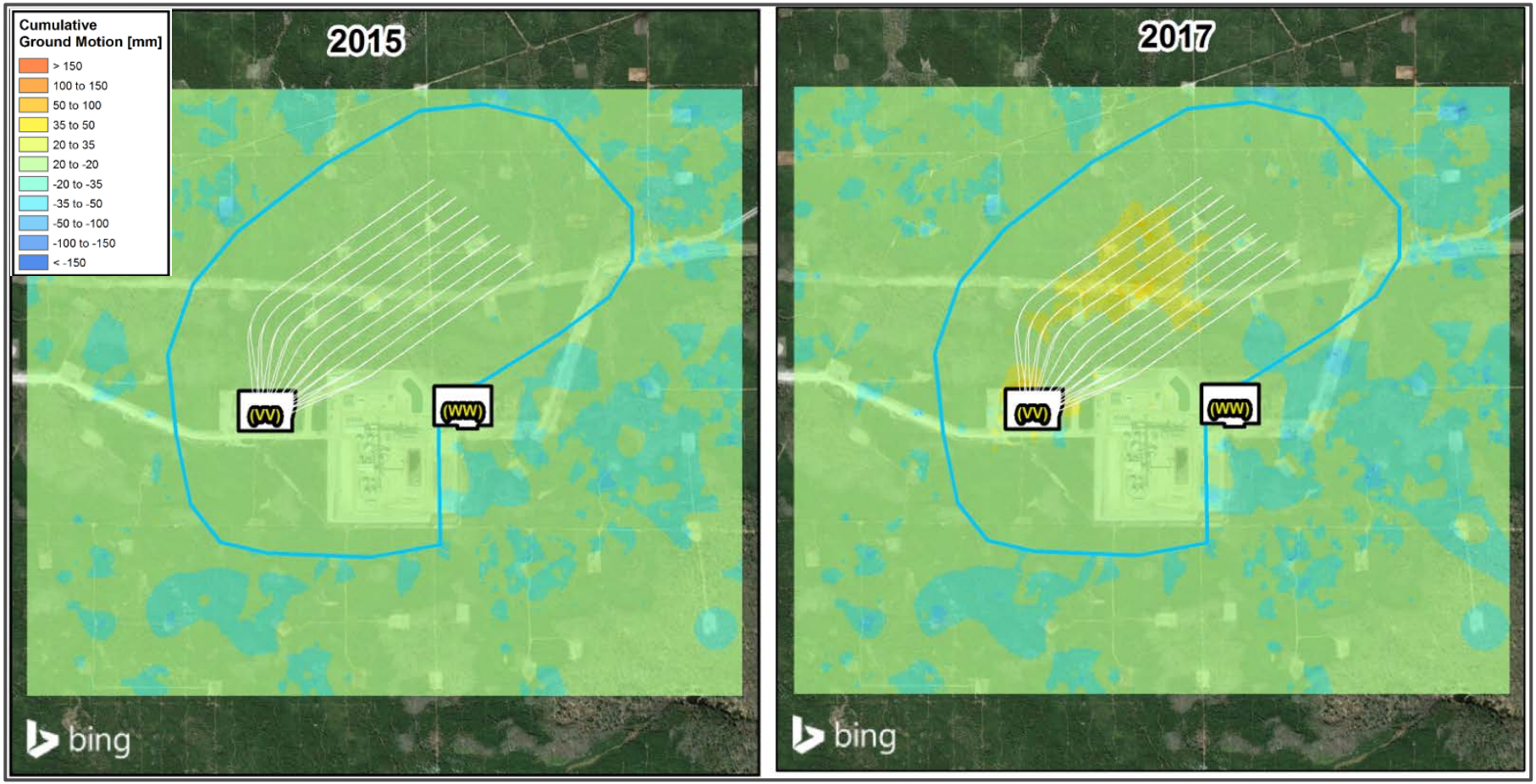




Jackfish 3

Comparing Accumulated Displacement 2016 to2017

3.1.1-2k



Drilling and Completions

Section 3.1.1-3

Drilling and Completions
Overview

3.1.1-3a

Operating SAGD Horizontal Wells

- **Jackfish 1:** 65 well pairs on nine pads (horizontal sections are 790 – 1,200m)
- **Jackfish 2:** 60 well pairs on eight pads (horizontal sections are 790 – 1,200m)
- **Jackfish 3:** 43 well pairs on five pads (horizontal sections are 720 – 1,200m)

Observation Wells

- 52 active SAGD observation wells (two to three wells per operating pad)
- 21 regional multi-zone monitoring wells equipped with piezometers

Service Wells

- Six Grand Rapids brackish source water wells
- Two McMurray brackish source water wells
- 14 water disposal wells (Class 1b)
  - 12 active wells
  - 1 inactive well (102/12-05-076-06W4)
  - 1 suspended well (102/03-22-075-06W4)

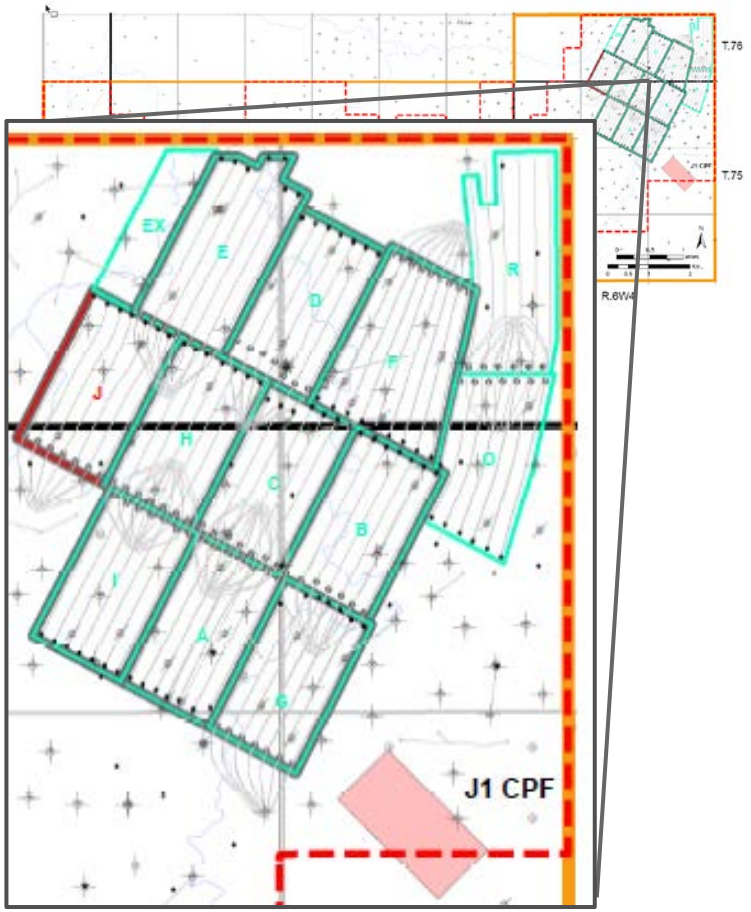
Drilling and Completions

Jackfish 1 Overview – SAGD Wells

3.1.1-3a

Existing Pads

- Pad A, B, C, D, E, G, H, and I: Seven well pairs per pad
- Pad F: Nine wells pairs
- Pad O: Seven well pairs
  - Planned for steam Q4 2017
- Pad R: Six well pairs
  - Planned for steam Q1 2018
- Two observation wells per pad (heel and toe)



Drilling and Completions
Jackfish 2 Overview – SAGD Wells

3.1.1-3a

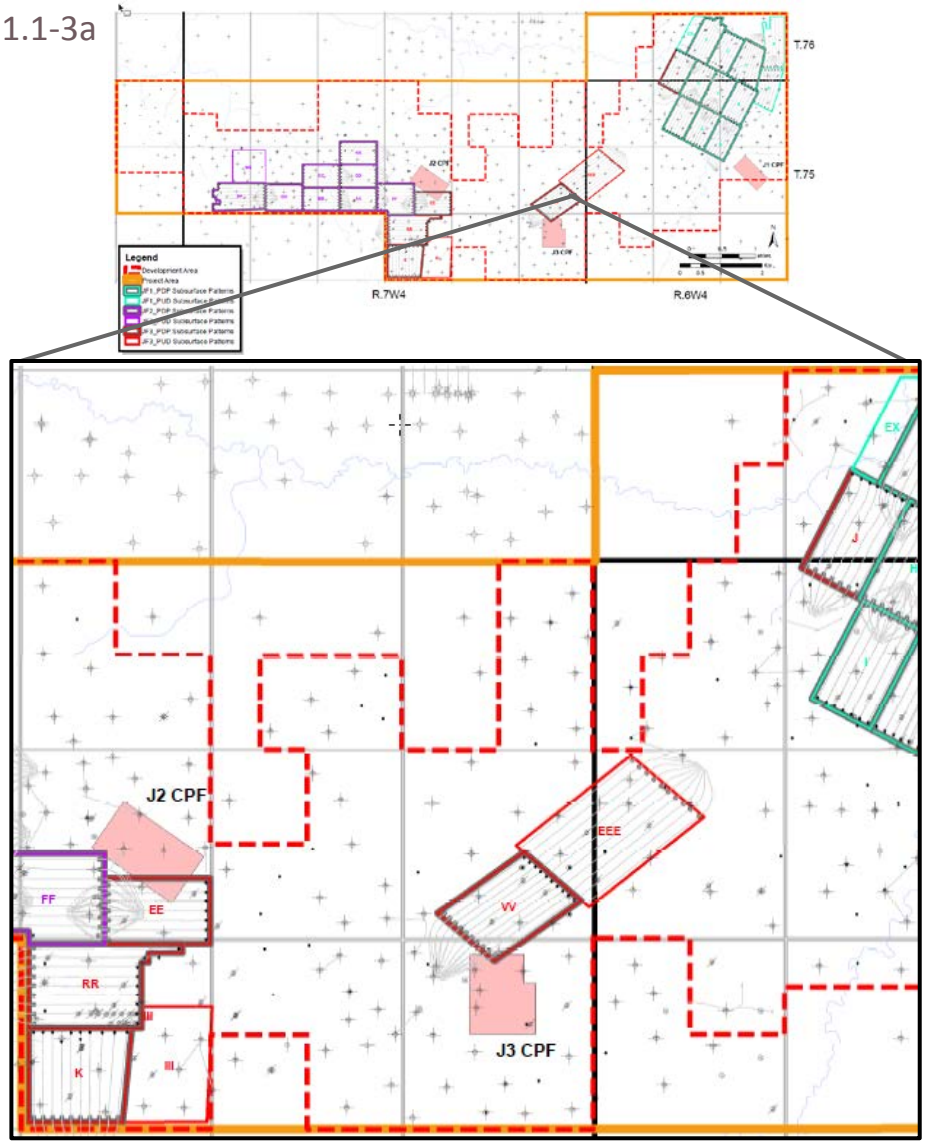
Existing Pads

- Pad AA, BB, CC, DD, and KK: Seven well pairs per pad
- Pad OO and PP: Eight well pairs per pad
- Pad FF: Nine well pairs
- Two observation wells per pad (heel and toe), three wells at Pad FF

Drilling and Completions

Jackfish 3 Overview – SAGD Wells

3.1.1-3a



Existing Pads

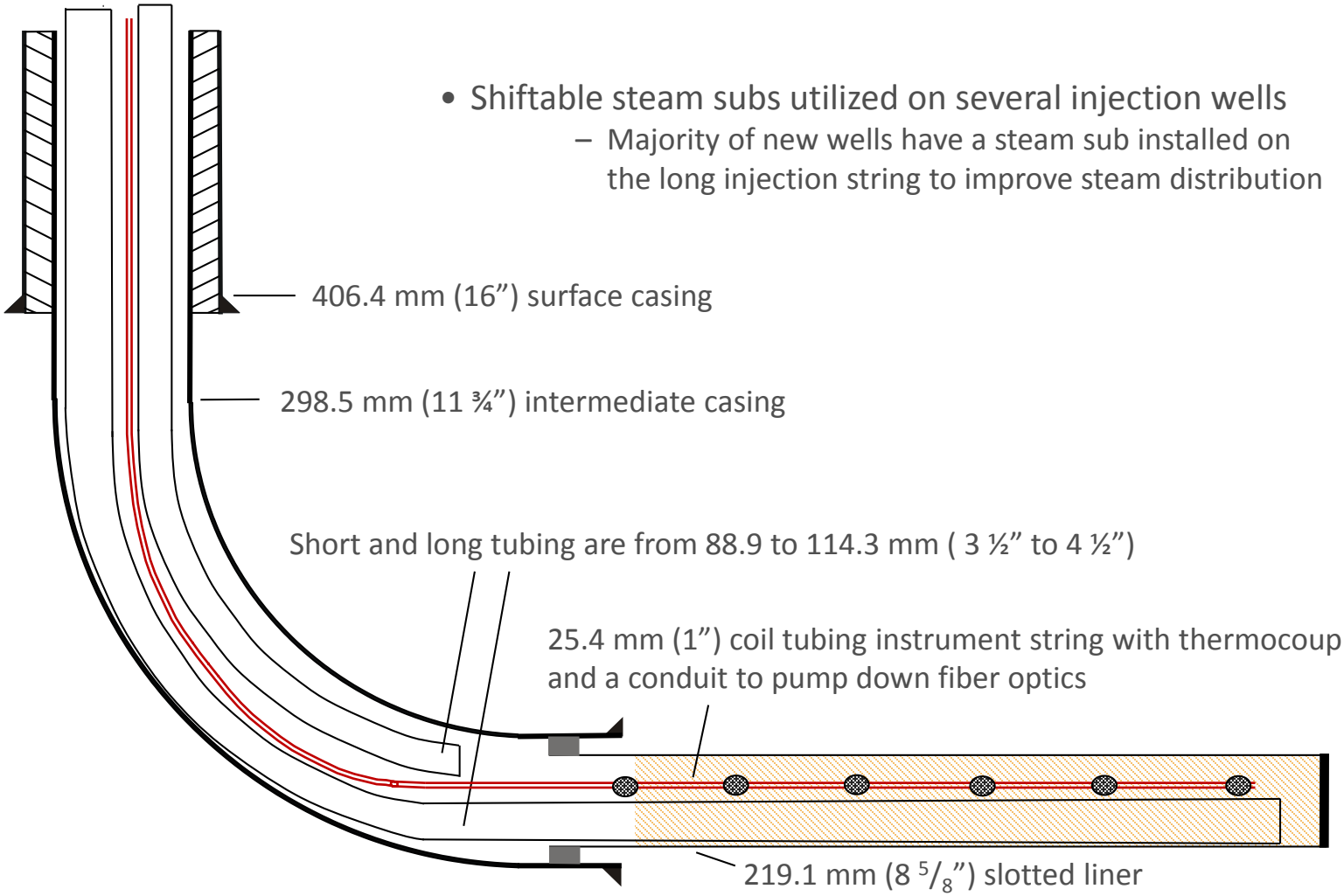
- Pad J and EE: Seven well pairs per pad
- Pad VV and K: Ten well pairs per pad
- Pad RR: Nine well pairs
- Pad EEE: Ten well pairs
  - Planned for steam Q4 2017

Drilling and Completions
Inter-well Spacing

- Standard lateral inter-well spacing at Jackfish is 80m
- Currently drilled pads that differ from the standard are:
  - Pad VV: Spacing of 60m
  - Pad F: Spacing of 60m at the heels fanning to 90m at the toes
  - Pad O: Spacing of 75m at the heels fanning to 90m at the toes
  - Pad R: Spacing varies from 71 to 90m due to boundary restrictions

Drilling and Completions
Typical Injection Well Schematic

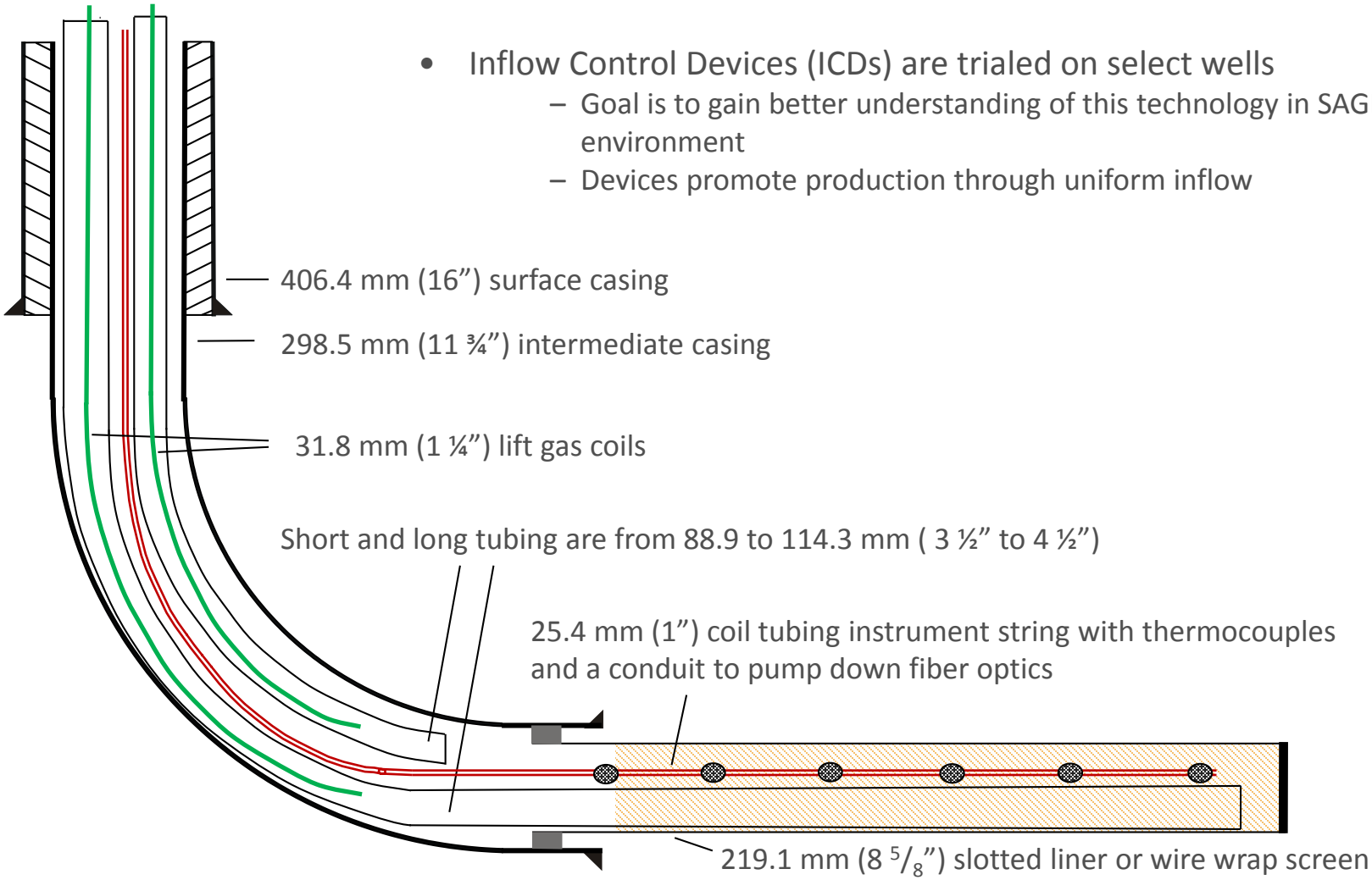
3.1.1-3c



- Shiftable steam subs utilized on several injection wells
  - Majority of new wells have a steam sub installed on the long injection string to improve steam distribution

Drilling and Completions
Typical Production Well Schematic

3.1.1-3c



- Inflow Control Devices (ICDs) are trialed on select wells
  - Goal is to gain better understanding of this technology in SAGD environment
  - Devices promote production through uniform inflow

Drilling and Completions
Inflow Control Devices (ICDs)

devon

3.1.1-3c

- Tubing-deployed systems on wells CC1P, DD2P, and DD7P
  - Installed successfully via service rig
- Liner-deployed systems on wells RR2P and RR6P
  - Installed successfully via drilling rig
- Performance measured through sustained production uplift
  - Sustained uplift yet to be observed on tubing deployed systems
  - Evaluation of liner deployed systems ongoing, learnings will be incorporated in future ICD design
- Key learnings were:
  - Actual pressure drops through ICDs different than designed

Drilling and Completions

Wire Wrapped Screens

3.1.1-3c

- Wire wrapped screens are the producer sand control standard for all future pads at Jackfish
- Expected benefits of wire wrapped screens:
  - Reduced liner pressure drop
  - Increased open flow area
  - Mechanical strength
  - Sand control
- First implementation at Jackfish 1 was at Pad F
  - Successful start up in 2016

Drilling and Completions
Liner Failures

3.1.1-3c

- G5i
  - Liner failure confirmed, re-entered well
  - Re-entry drilled and completed in Q1 2017
  - Conversion to full SAGD Q2 2017
  - Excellent performance to date

- G6P
  - Liner failure confirmed
  - Re-entry planned for Q4 2017

Artificial Lift

Section 3.1.1-4

Artificial Lift

3.1.1-4a, b

- Gas lift is currently used for artificial lift at Jackfish District
- Gas lift continues to be an effective lift strategy for Jackfish operating conditions
  - Typical producer operating pressure above 1,800 kPag
  - Ability to handle over 1,000 m^3/day emulsion flow
  - No operating temperature limitation
- One ESP installed in March 2015 (B3P)
  - B3P was selected due to lift issues caused by high pressure drop when operating on gas lift
  - Plan to continue to evaluate feasibility and deploy ESPs as deemed necessary

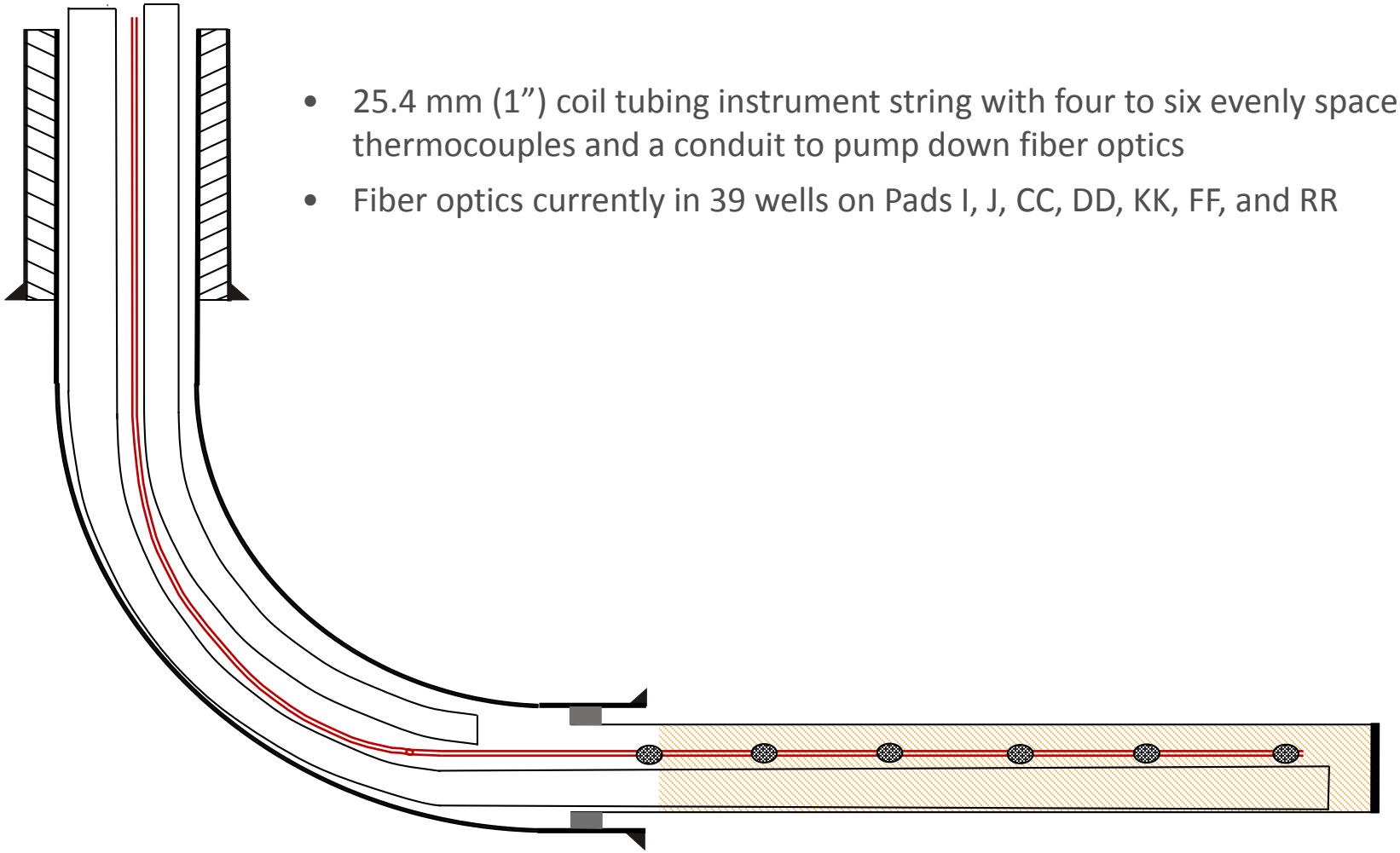
Instrumentation

Section 3.1.1-5

Instrumentation in Wells

SAGD Injection and Producer Wells

3.1.1-5b



- 25.4 mm (1”) coil tubing instrument string with four to six evenly spaced thermocouples and a conduit to pump down fiber optics
- Fiber optics currently in 39 wells on Pads I, J, CC, DD, KK, FF, and RR

Instrumentation in Wells
Downhole Pressure Monitoring

devon

3.1.1-5b

As of September 2017 all injector and gas lift producer wells use annulus gas pressure measurement. B3P (ESP) uses a downhole gauge. Prior to the implementation of AGPM, several methods of downhole pressure measurement were available, as discussed below:

For Injector Wells:

- Using thermocouples / fiber optics temperature data to convert downhole live steam temperature from T_{sat} to P_{sat}*
- Conducting annulus blanket gas pressure survey on periodic basis
- Calculate downhole pressure based on surface steam injection pressures on short and long tubing strings
  - BHP = steam injection surface pressure – frictional losses
- Conducting periodic near-zero steam injection rate test to estimate bottomhole pressure from surface injection pressure

For Producer Wells:

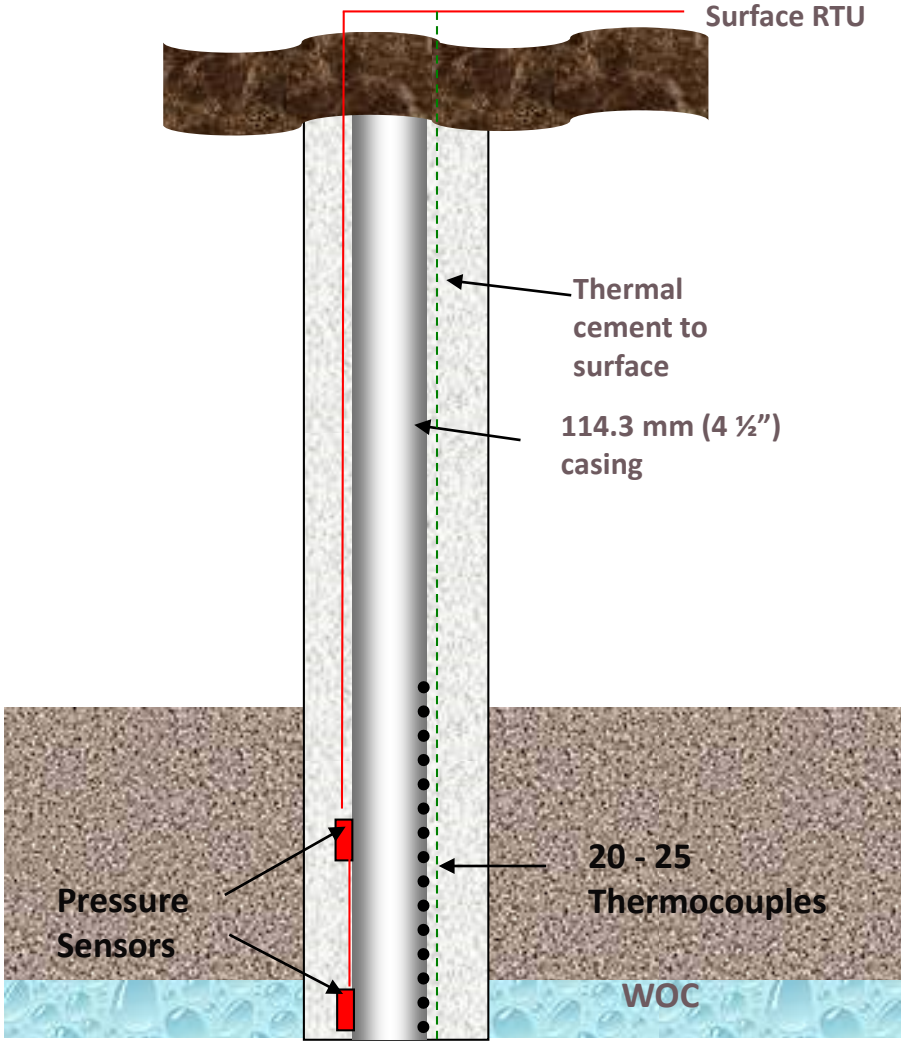
- Use concentric open-ended lift gas (LG) coiled tubing to calculate down hole pressure
  - BHP = LG surface pressure – frictional losses + static head
  - Frictional losses are correlated/calculated by performing numerous gas lift step rate tests
- Validation of the above correlation is performed by periodic annulus blanket gas pressure surveys

* Prior initial start up of circulation, well pairs would be purged to eliminate dead fluid column inside the wellbore. Historical data also showed such procedures improve warm up time in the horizontal wellbore section.

Instrumentation in Wells

SAGD Observation Wells

3.1.1-5b

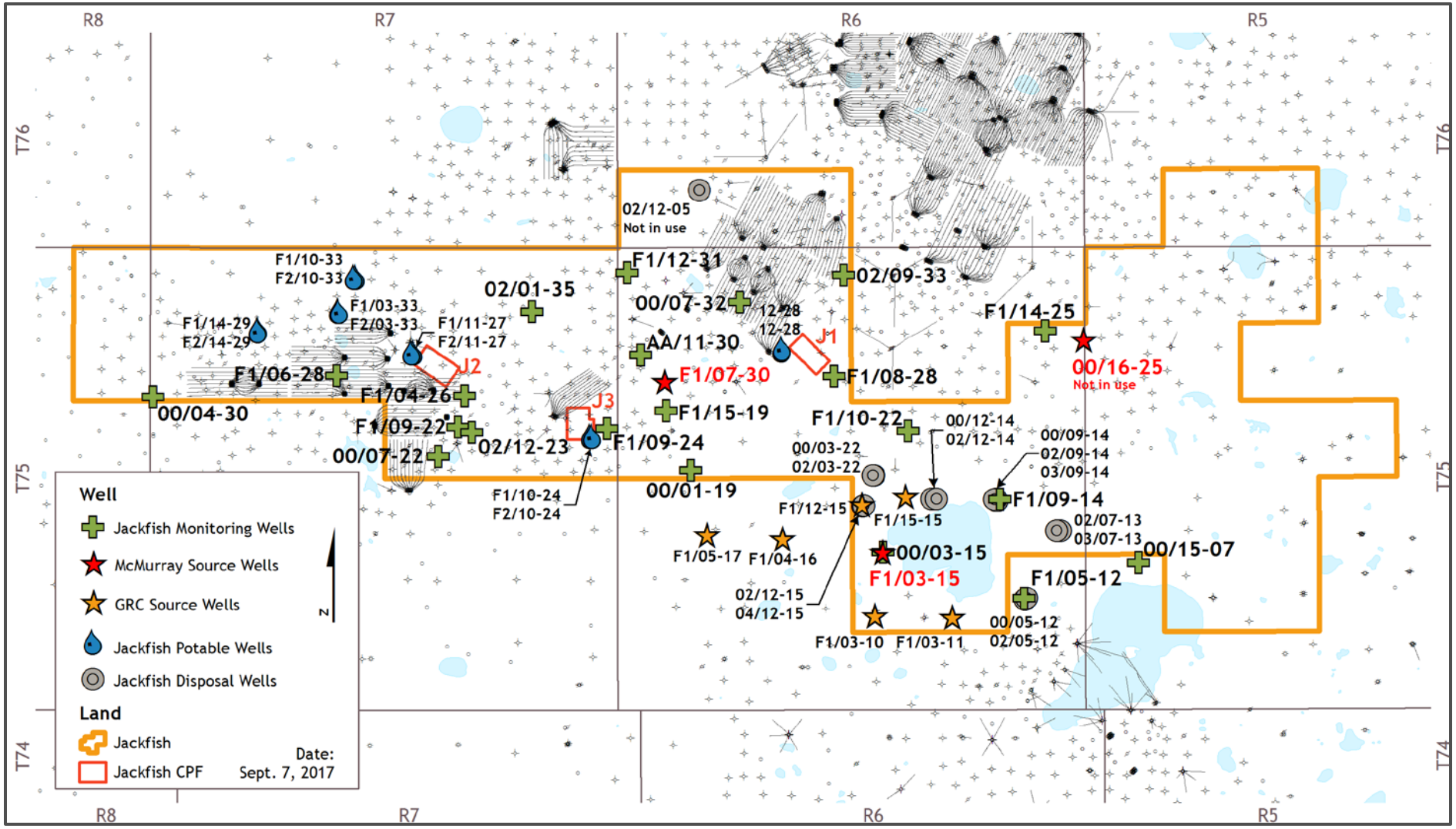


Jackfish 1, 2, and 3 SAGD observation wells contain:

- 20 points thermocouples (25 points in more recently drilled wells), spaced above, below, and within pay interval
- Two to four pressure sensors spaced above, below, and within pay interval

Instrumentation

Regional Monitoring Well Locations



Instrumentation in Wells
Regional Multi-zone Monitoring Wells

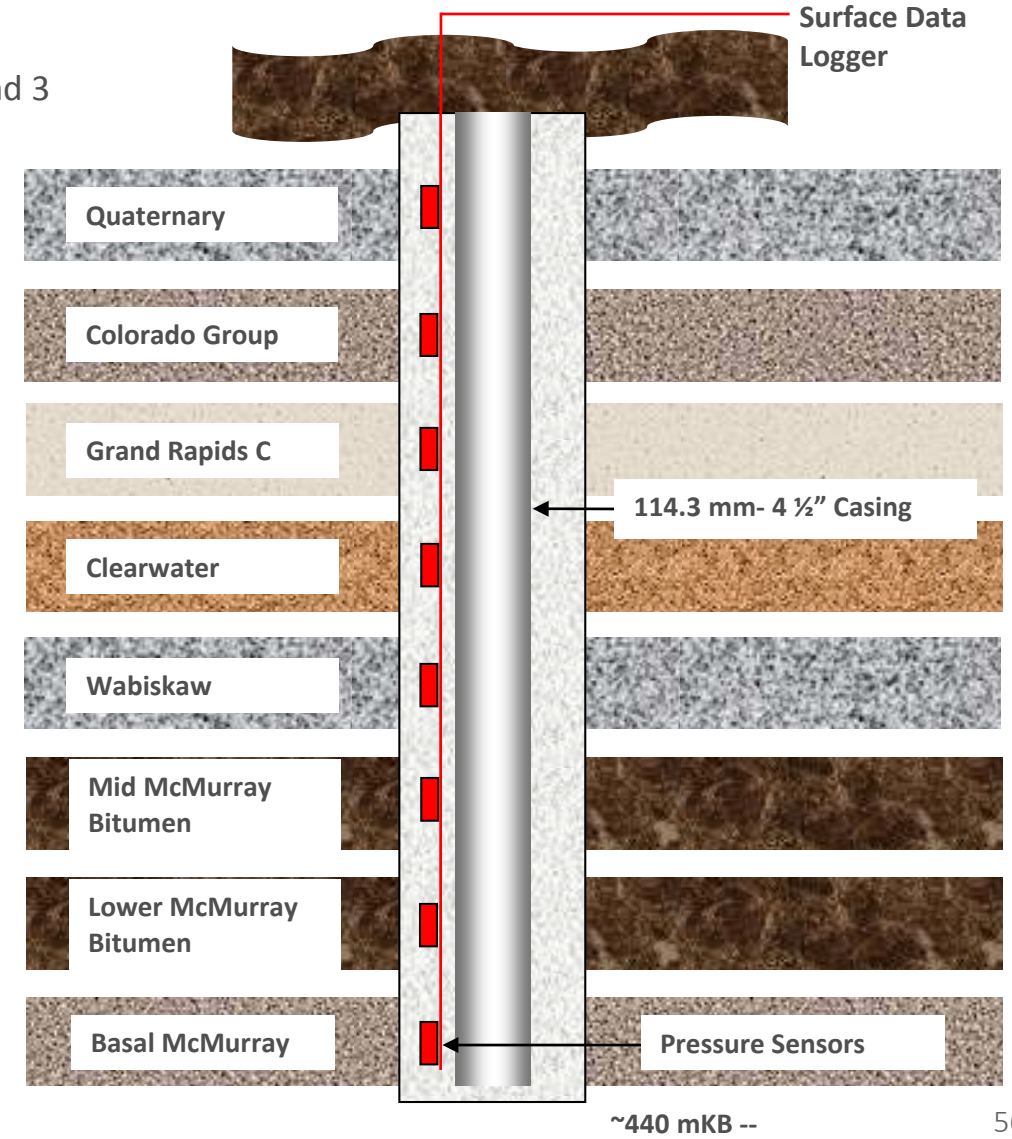
Monitoring wells cover areas of Jackfish 1, 2, and 3

Twenty-one wells

- 00/07-32-75-6W4 (5 piezometers)
- F1/08-28-75-6W4 (4 piezometers)
- F1/09-14-75-6W4 (4 piezometers)
- F1/12-31-75-6W4 (4 piezometers)
- F1/10-22-75-6W4 (5 piezometers)
- F1/04-26-75-7W4 (5 piezometers)
- F1/06-28-75-7W4 (5 piezometers)
- F1/15-19-75-6W4 (5 piezometers)
- F1/09-24-75-7W4 (5 piezometers)
- F1/14-25-75-6W4 (5 piezometers)
- F1/05-12-75-6W4 (5 piezometers)
- F1/09-22-75-7W4 (4 piezometers)
- 02/12-23-75-7W4 (4 piezometers) *
- 02/01-35-75-7W4 (3 piezometers)
- 00/15-07-75-5W4 (4 piezometers)
- 00/07-22-75-7W4 (2 piezometers)
- 00/03-15-75-6W4 (3 piezometers) **
- 02/09-33-75-6W4 (4 piezometers)
- 00/04-30-75-7W4 (3 piezometers)
- 00/01-19-75-6W4 (3 piezometers) **
- AA/11-30-75-6W4 (5 piezometers)

* Perf with a Level Logger

** Perf for water sampling



Instrumentation

Regional Multi-Zone Monitoring Wells

UWI	Rig Release	Quaternary	Colorado Group	Grand Rapids	Clearwater	Wabiskaw	McMurray Bitumen	Basal McMurray Water
00/07-32-075-06W4	2004/03/11			X		X	X	X
F1/08-28-075-06W4	2006/03/11			X	X	X		X
F1/09-14-075-06W4	2006/03/12			X	X	X		X
F1/12-31-075-06W4	2007/01/24			X	X	X		X
F1/10-22-075-06W4	2007/01/29		X	X	X	X		X
F1/04-26-075-07W4	2007/02/19			X	X	X	X	X
F1/06-28-075-07W4	2007/02/26			X	X	X	X	X
F1/15-19-075-06W4	2007/03/05		X	X	X	X		X
F1/09-24-075-07W4	2008/02/27		X	X	X	X		X
F1/14-25-075-06W4	2008/03/03		X	X	X	X		X
F1/05-12-075-06W4	2008/03/06			X	X	X		X
F1/09-22-075-07W4*	2008/03/07	X		X	X	X		
02/12-23-075-07W4	2012/03/05	X						
02/01-35-075-07W4	2012/03/06	X						
00/15-07-075-05W4	2012/03/09			X	X			X
02/09-33-075-06W4	2013/01/10	X		X	X			X
00/03-15-075-06W4	2013/01/18	X		X	X			
AA/11-30-075-06W4	2013/01/18							X
00/01-19-075-06W4	2013/02/17	X		X	X			
00/04-30-075-07W4	2013/03/03	X		X	X			
00/07-22-075-07W4	2013/03/13			X	X			

** F1/09-22 Quaternary piezometer is in the Empress Sand equivalent of the Sunday Creek Channel*

Scheme Performance

Section 3.1.1-7

Scheme Performance Prediction
Jackfish

devon

3.1.1-7a

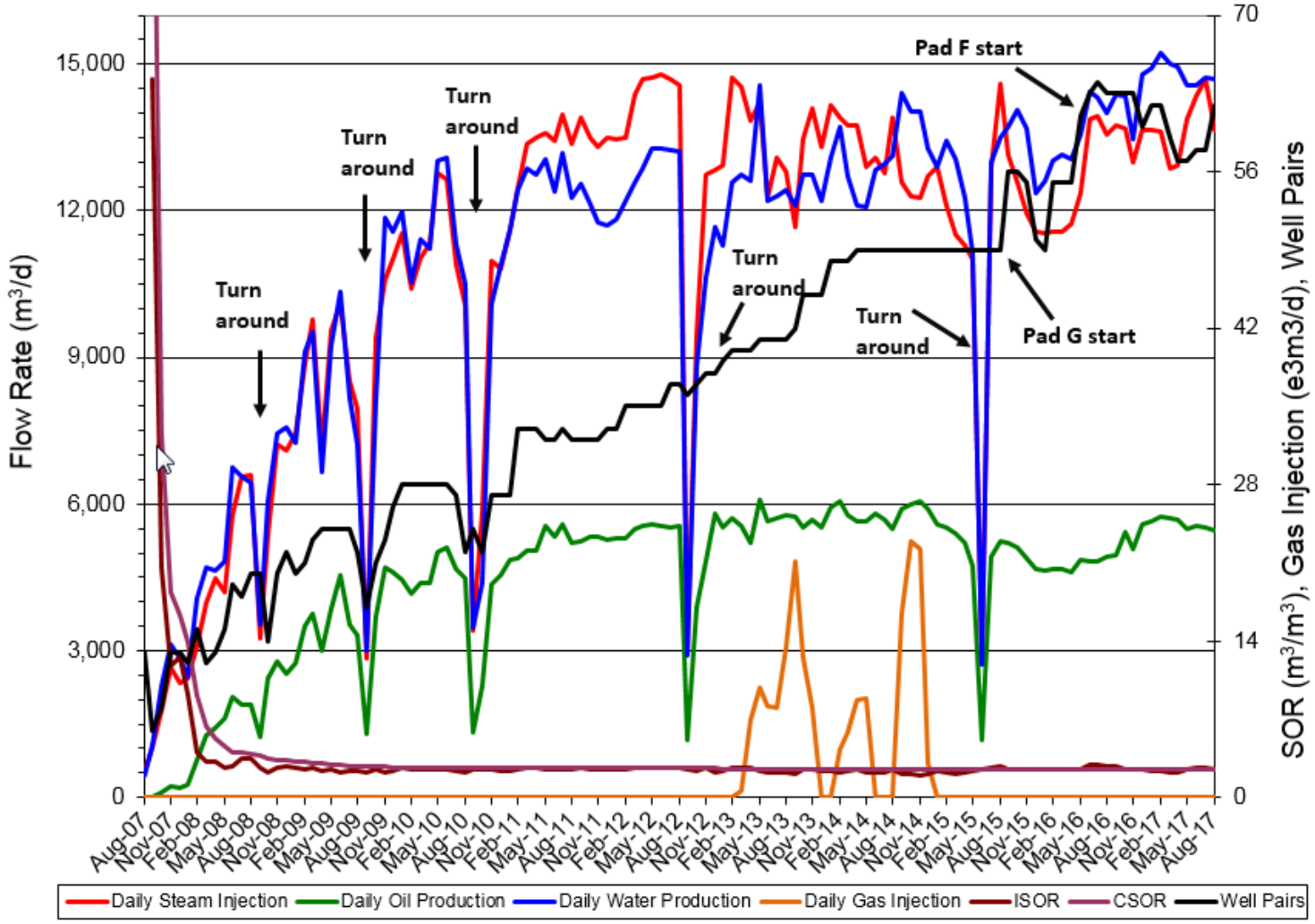
- Well pad performance forecasts generated using Jackfish and industry analogues; validated with numerical simulation and analytical methods

- Facility service factors based on historical data, future plans, and quantified risks

Scheme Performance

Jackfish 1 Project Life Plot

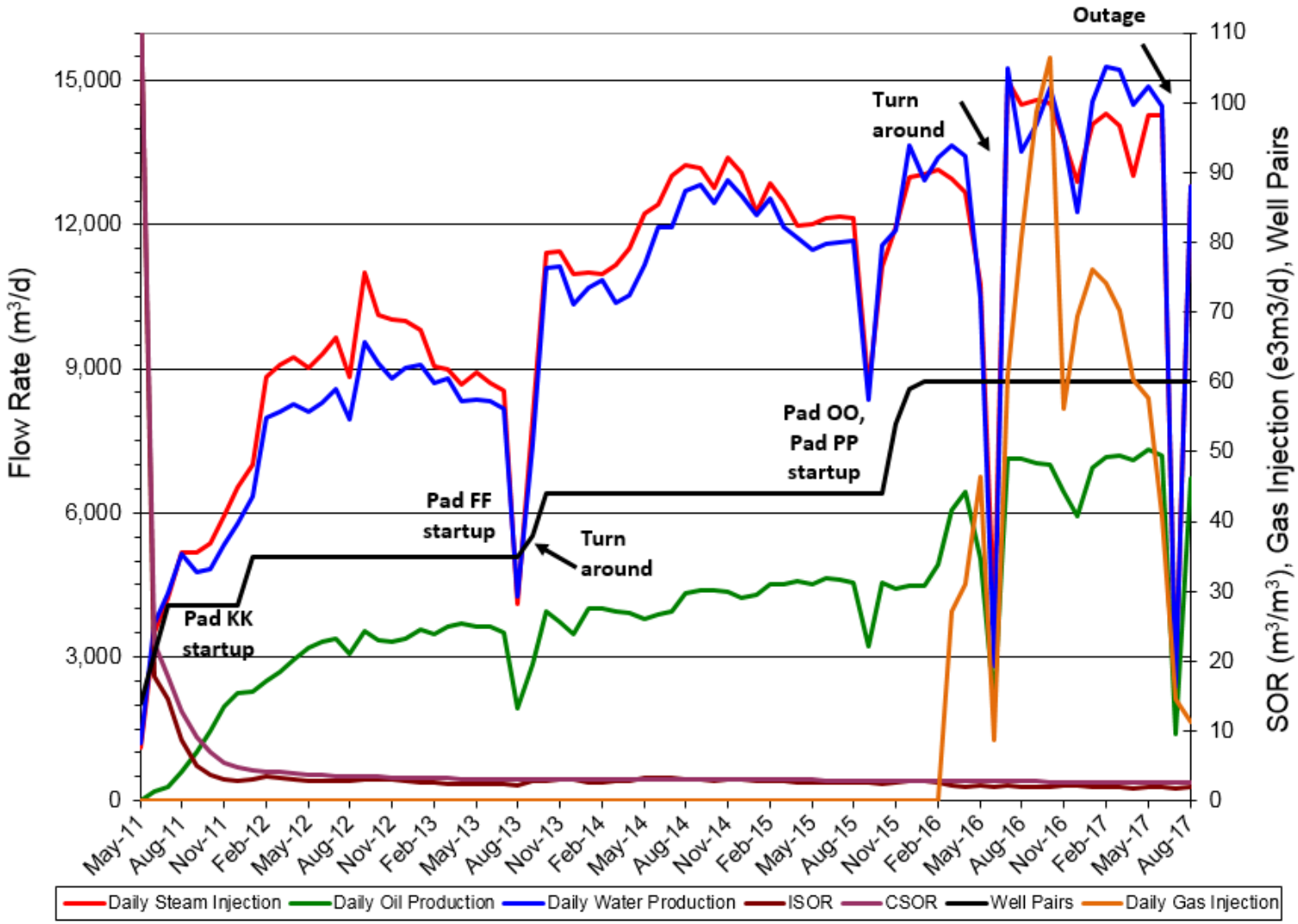
3.1.1-7a



Scheme Performance

Jackfish 2 Project Life Plot

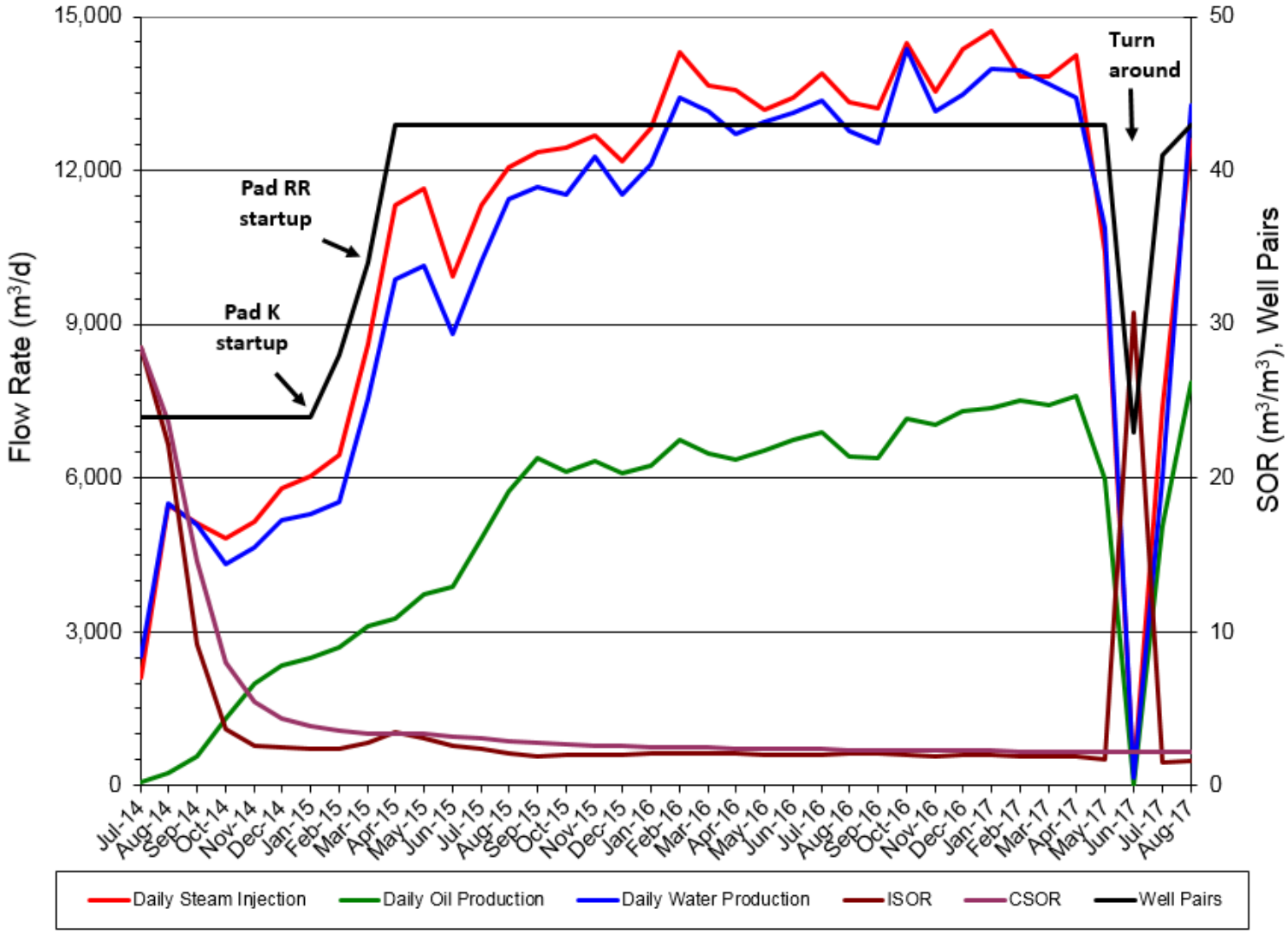
3.1.1-7a



Scheme Performance

Jackfish 3 Project Life Plot

3.1.1-7a

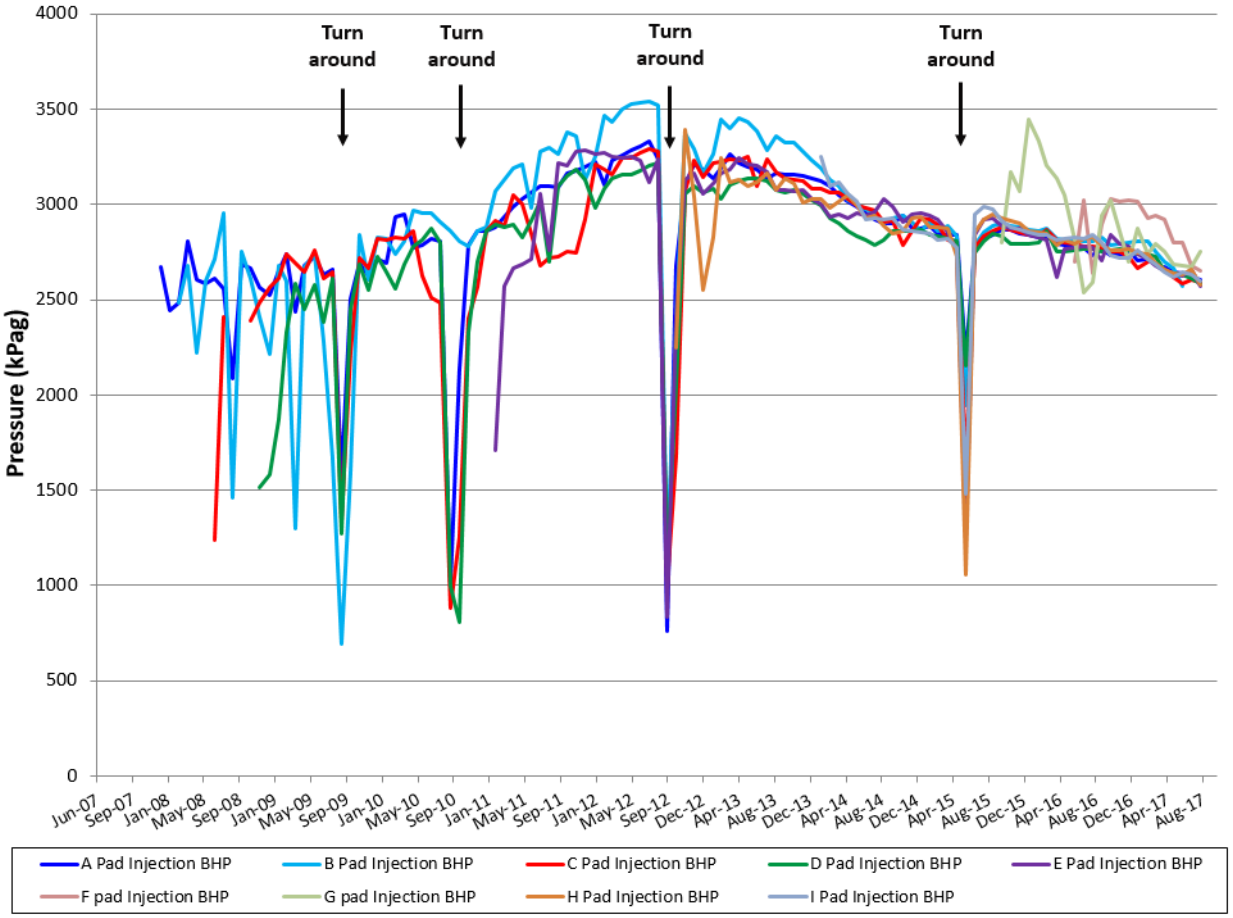


Scheme Performance

Jackfish 1 Bottom Hole Injector Pressures

3.1.1-7b

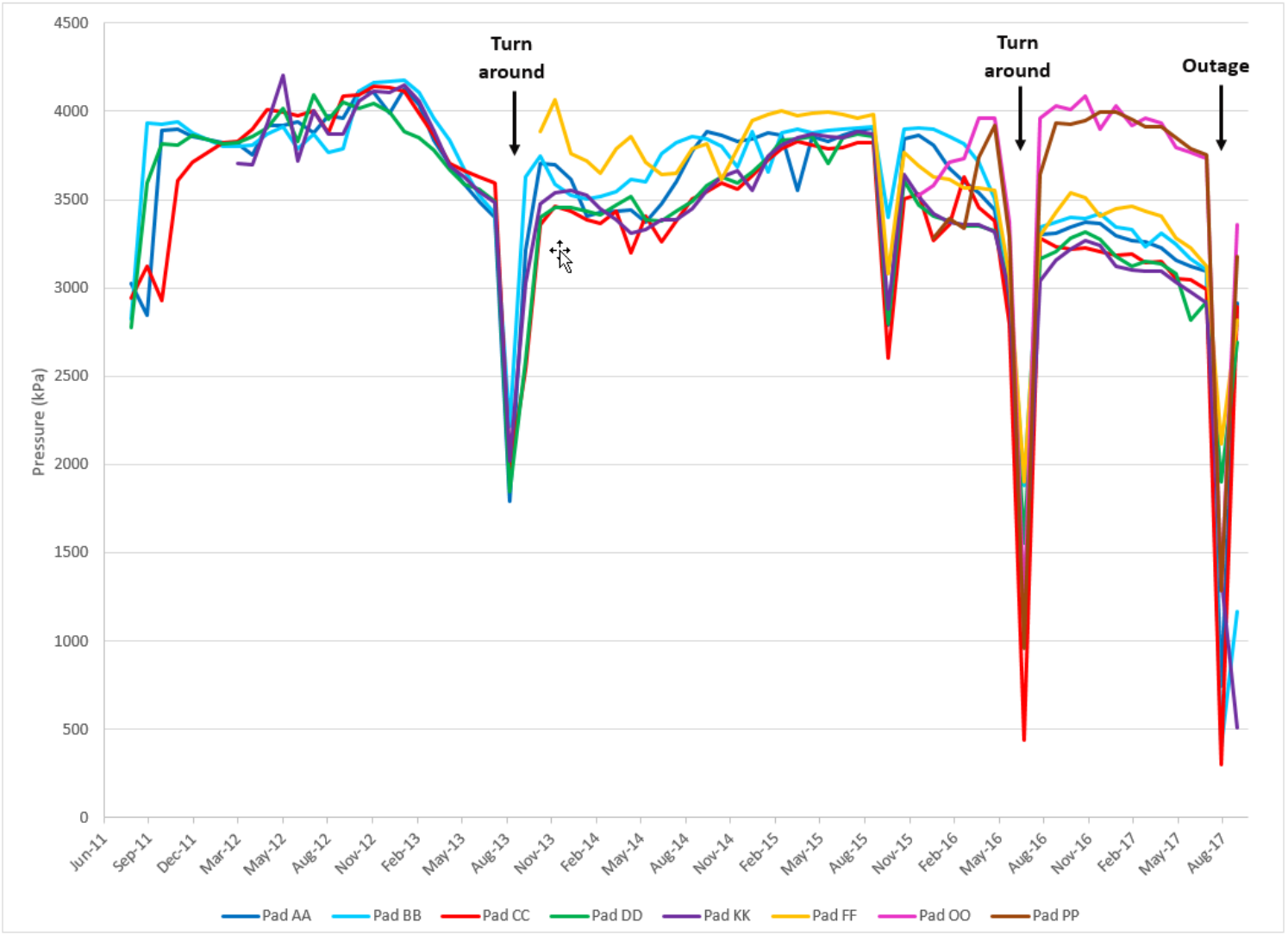
- Devon manages injection pressures to maximize producing rates, manage leakoff and increase overall reservoir recovery. A reduction in operating pressure was implemented in 2013 and continued into 2017.



Scheme Performance

Jackfish 2 Bottom Hole Injector Pressures

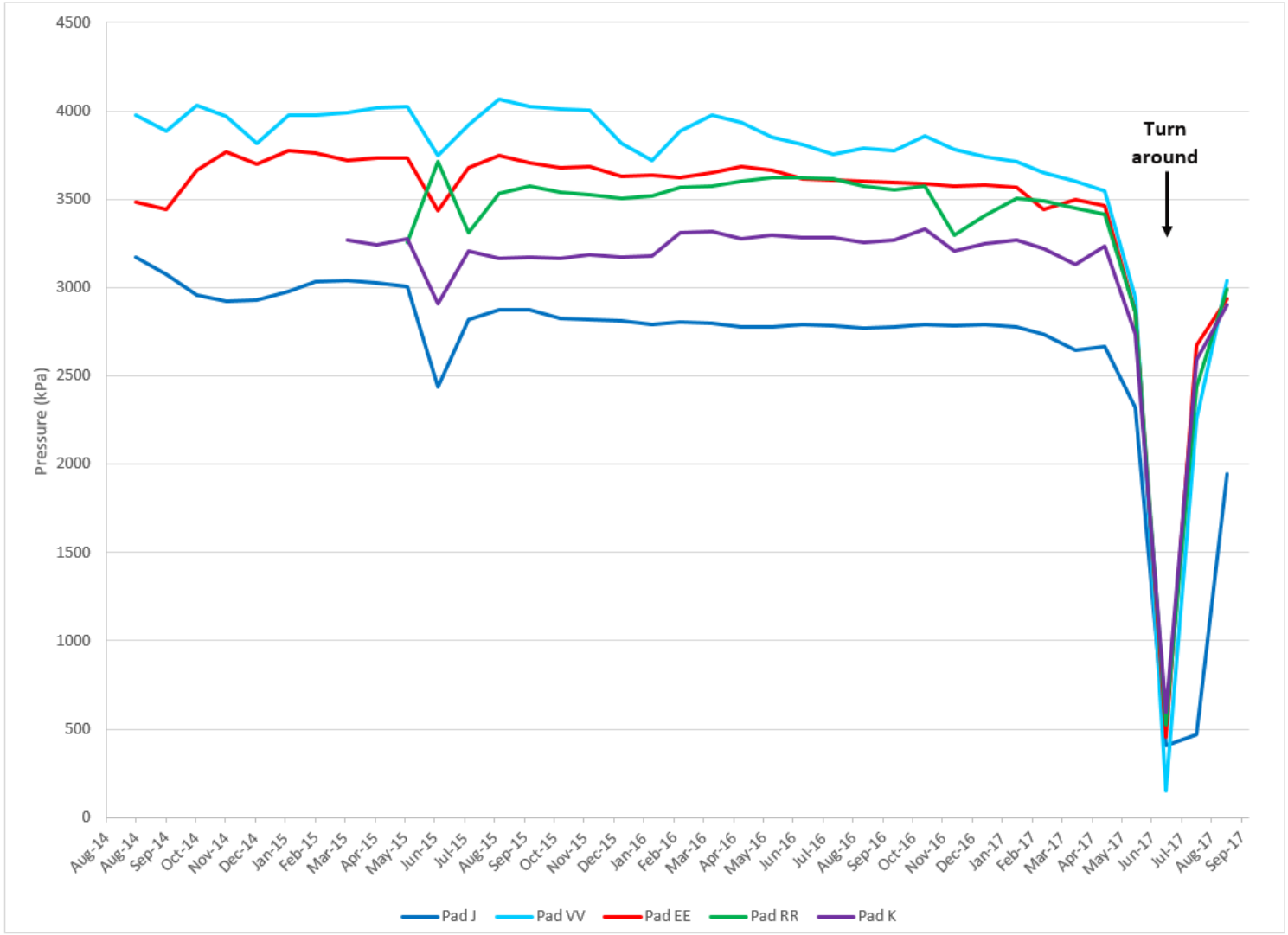
3.1.1-7b



Scheme Performance

Jackfish 3 Bottom Hole Injector Pressures

3.1.1-7b



2017 Scheme Performance

Jackfish 1 Pad Recoveries

3.1.1-7c

Pad	Area (m^2)	Avg. GRV Pay (m)	Avg. Net to Gross (%)	Net GRV Pay S_o (%)	Net GRV Pay Porosity (%)	OBIP (10^6m^3)	Ult Rec (10^6m^3)	Cum Prod [1] (10^6m^3)	RF (%) to Date [1]
A	529,789	41	94	84	33	5.7	4.6	4.3	76
B	532,736	44	78	78	34	4.9	2.6	2.2	44
C	530,374	40	93	84	35	5.7	3.0	2.7	47
D	531,193	43	90	82	35	5.8	2.6	2.2	39
E	603,920	39	84	78	34	5.3	2.7	2.0	38
F	675,933	36	86	78	35	5.7	2.7	0.4	7
G	525,389	35	93	84	34	4.9	2.2	0.2	4
H	530,353	36	80	74	34	3.7	2.2	1.4	37
I	530,093	36	84	79	34	4.3	1.7	0.9	21

[1] Effective August 31/2017

2017 Scheme Performance

Jackfish 2 Pad Recoveries

devon

3.1.1-7c

Pad	Area (m^2)	Avg. GRV Pay (m)	Avg. Net to Gross (%)	Net GRV Pay S_o (%)	Net GRV Pay Porosity (%)	OBIP (10^6m^3)	Ult Rec (10^6m^3)	Cum Prod [1] (10^6m^3)	RF (%) to Date [1]
AA	506,800	33	86	79	35	3.9	2.0	1.4	36
BB	506,800	47	90	79	34	5.8	4.1	2.9	50
CC	506,800	29	90	73	34	3.3	0.8	0.7	20
DD	506,800	34	90	79	34	4.1	1.1	0.8	19
FF	668,146	32	89	77	34	5.0	2.5	1.1	23
KK	506,800	28	88	75	34	3.1	1.3	0.8	26
OO	583,553	41	94	83	34	6.4	3.6	0.6	10
PP	797,381	30	92	81	35	6.2	3.2	1.0	17

[1] Effective August 31/2017

2017 Scheme Performance

Jackfish 3 Pad Recoveries

devon

3.1.1-7c

Pad	Area (m^2)	Avg. GRV Pay (m)	Avg. Net to Gross (%)	Net GRV Pay S_o (%)	Net GRV Pay Porosity (%)	OBIP (10^6m^3)	Ult Rec (10^6m^3)	Cum Prod [1] (10^6m^3)	RF (%) to Date [1]
J	530,754	39	76	75	35	4.0	1.7	0.6	15
K	675,778	46	95	86	34	8.6	5.0	1.7	19
EE	506,800	42	89	79	34	5.0	2.8	1.3	27
RR	727,813	32	91	82	34	6.0	3.0	1.0	17
VV	558,761	43	94	75	35	5.9	2.8	1.2	20

[1] Effective August 31/2017

Jackfish 2 - Pad DD Highlights

Low Performer

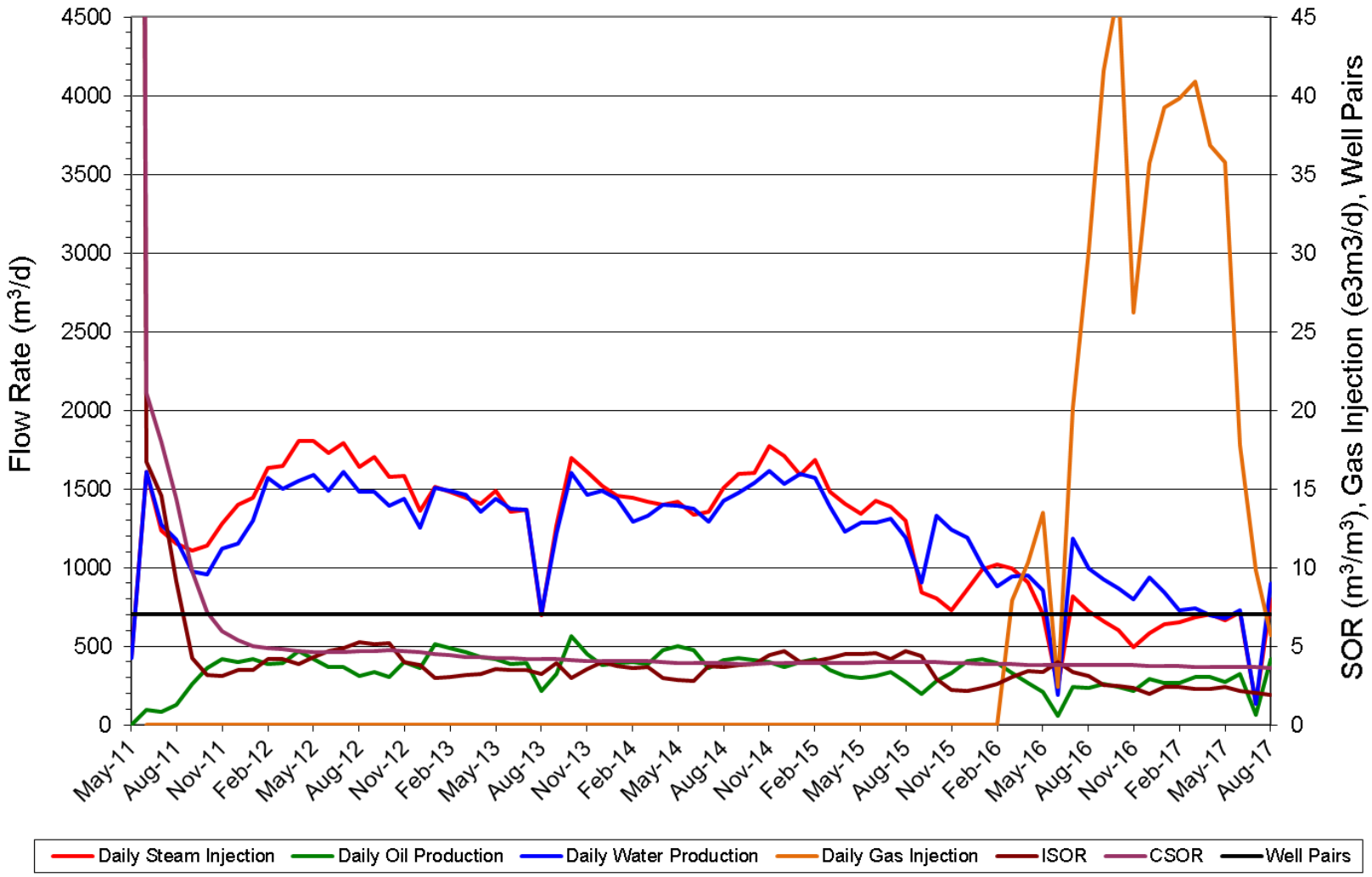
3.1.1-7c

- First steam occurred in June 2011
- Seven well pairs in operation
- NCG injection commenced as of March 2016 on wells DD1, DD3, DD5, and DD6
  - SOR improvement has been observed
- Heterogeneous reservoir with low mid-heel ceiling of ~5m pay thickness
  - Limited vertical steam chamber growth
  - Regions of poor temperature conformance
- Inflow Control Device installed in September 2013 (DD2); well achieved expected production with period of flush production
- Inflow Control Device installed in November 2014 (DD7); under-performing pre-installation rates, likely due to ΔP higher than anticipated in design
- Potential fluid interaction with Pad AA due to chamber growth on DD1-DD3 wells

Pad DD Performance

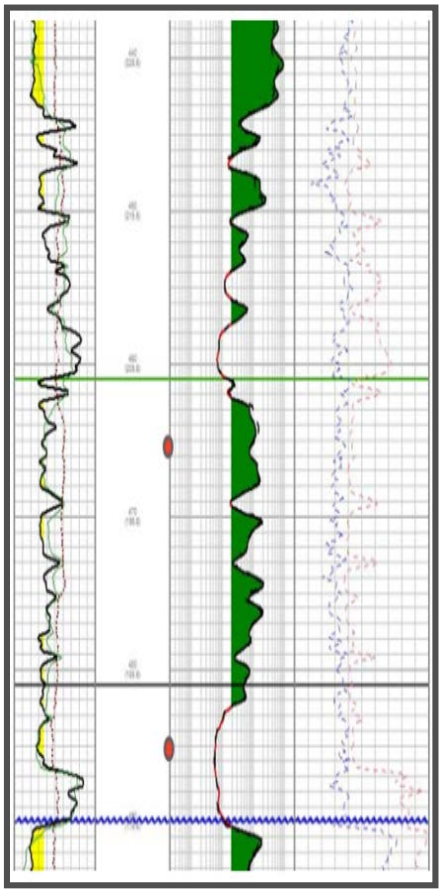
Jackfish 2 Pad DD Life Plot

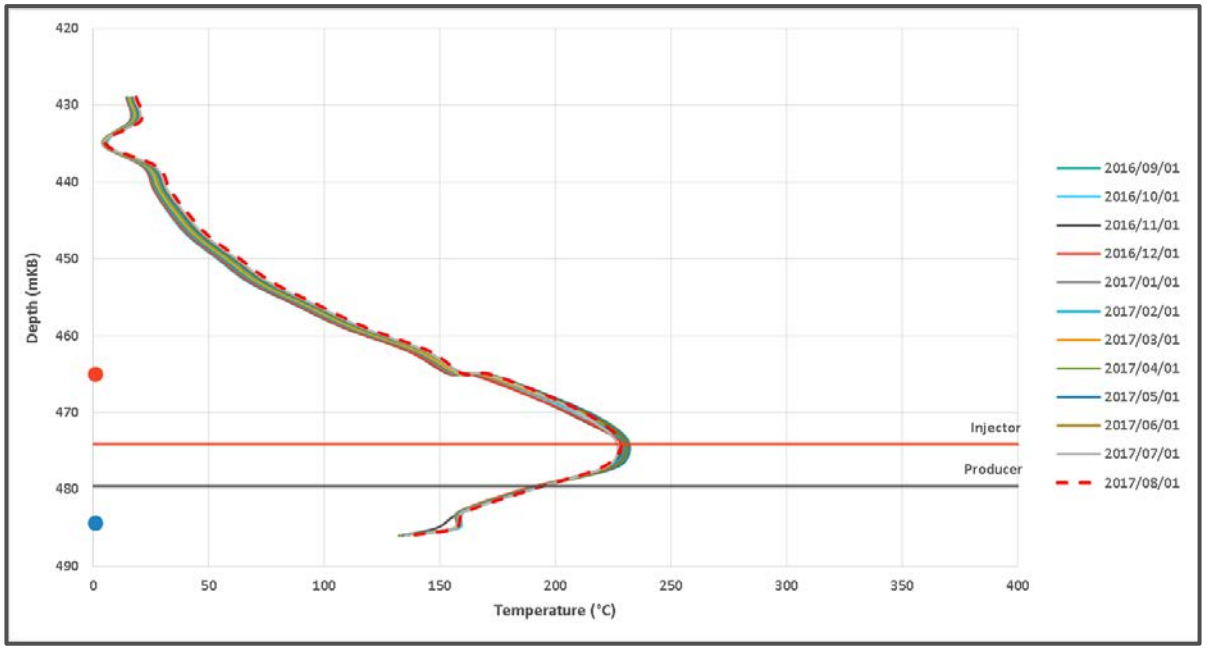
3.1.1-7c



Pad DD Toe Observation Well Temp
(10.5m from DD3 well pair)

3.1.1-5d





Jackfish 3 – Pad EE Highlights

Medium Performer

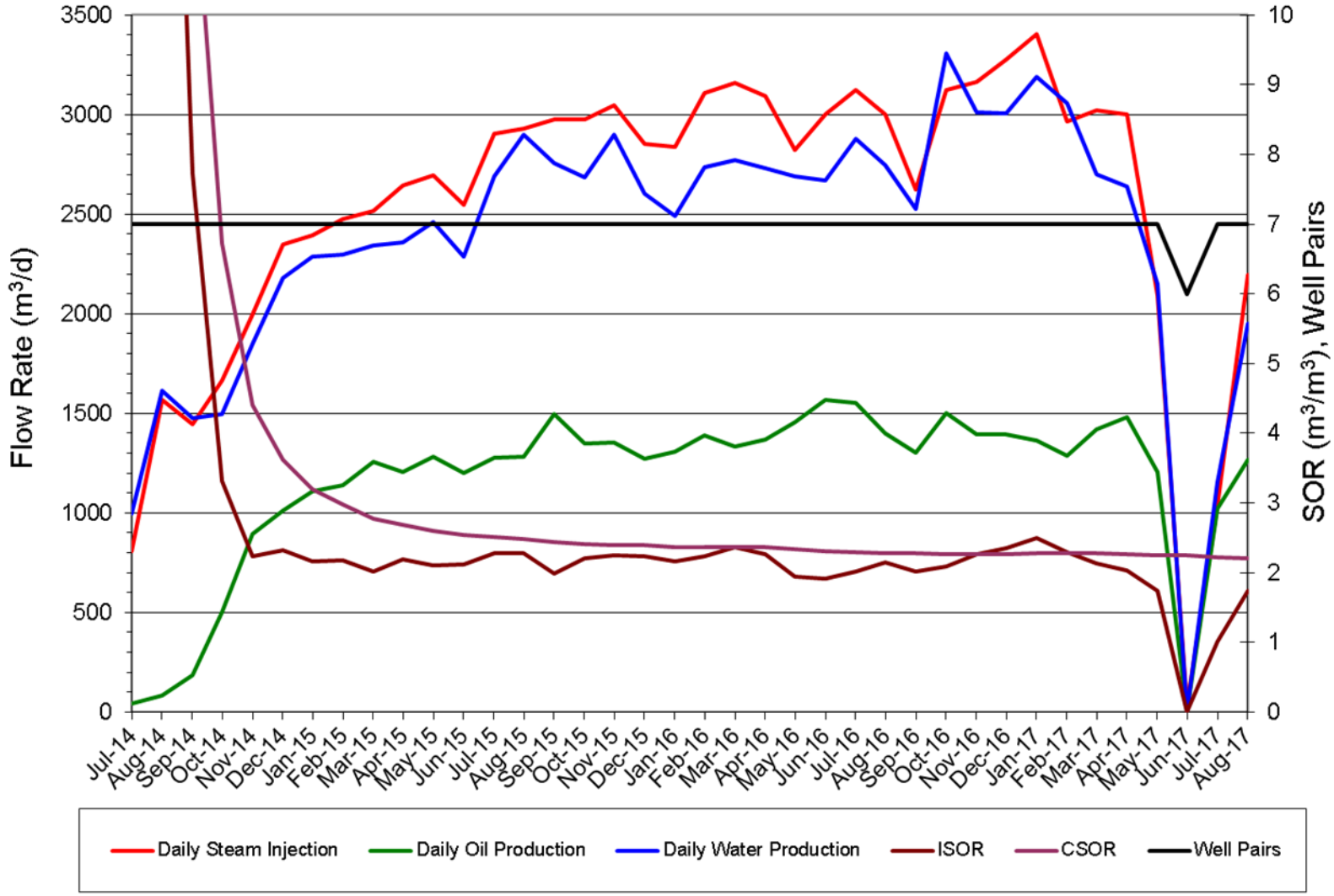
3.1.1-7c

- First steam occurred in July 2014
- Seven well pairs in operation
- Production currently in plateau phase
- Wells EE1 – EE5 have clean sand with uniform ceiling
- Wells EE6 – EE7 have low ceiling at toe of wells
- Steam subs opened on EE1 – EE5 in 2015 to increase steam injection rates
- Pad SOR historical average between 2.0 – 2.5

Pad EE Performance

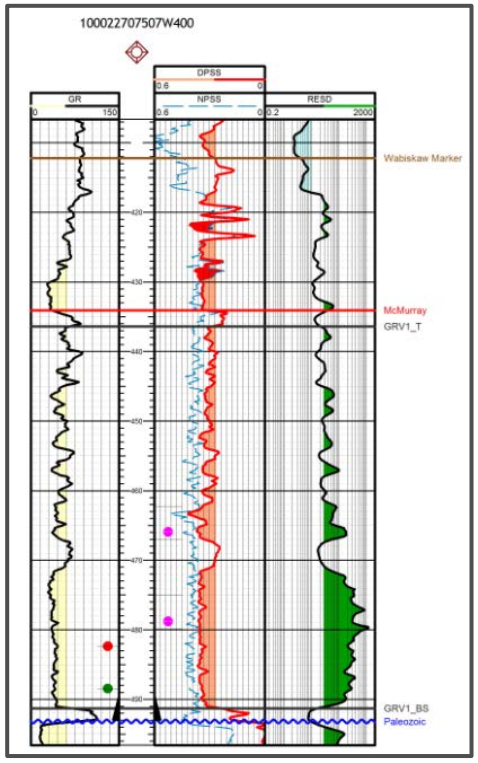
Jackfish 3 Pad EE Life Plot

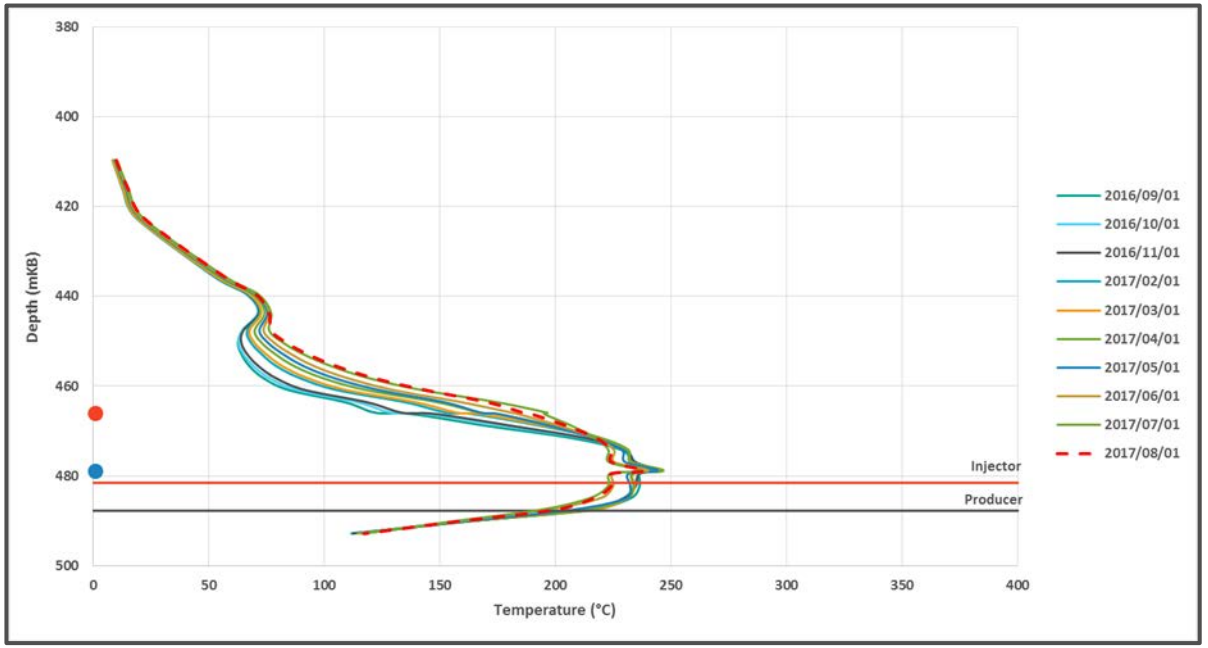
3.1.1-7c



Pad EE Heel Observation Well Temp
(4.8m from EE5 well pair)

3.1.1-5d





Jackfish 3 - Pad K Highlights

High Performer

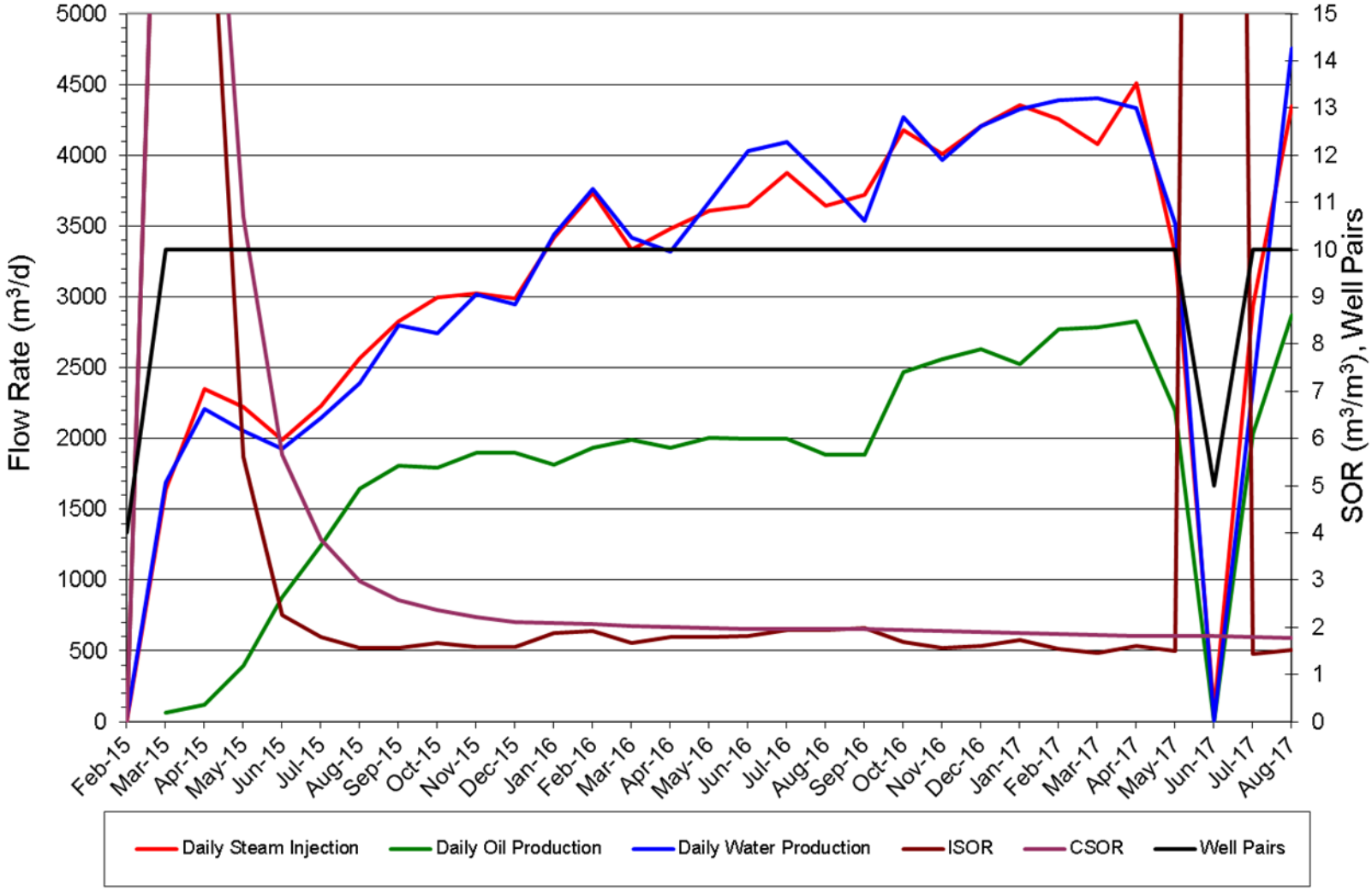
3.1.1-7c

- First steam occurred in February 2015
- Ten well pairs are in operation
- Best performing pad at Jackfish 3
- Clean sand throughout all ten well pairs
- Historical SOR < 2

Pad K Performance

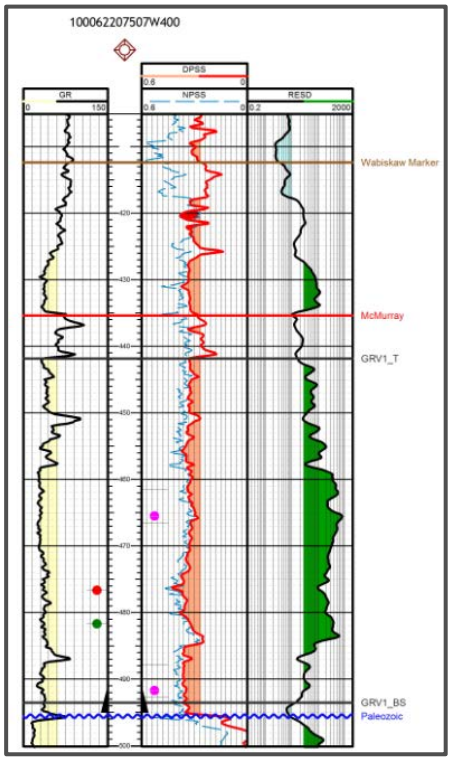
Jackfish 3 Pad K Life Plot

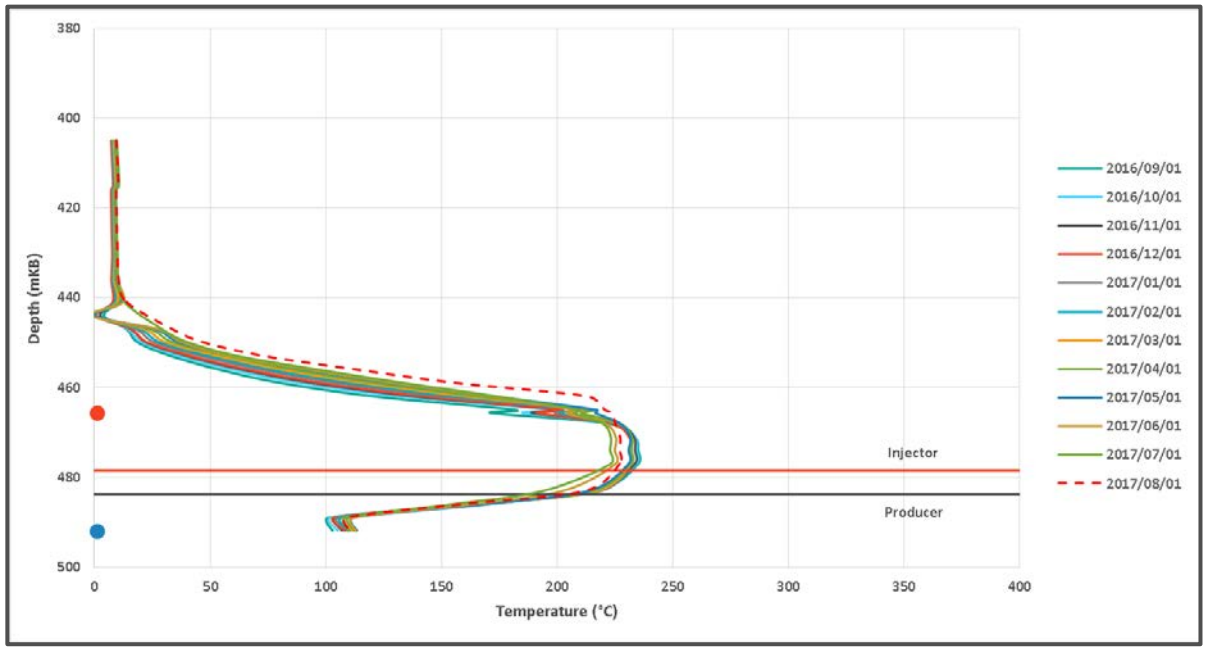
3.1.1-7c



Pad K Toe Observation Well Temp
(9.5m from K5 well pair)

3.1.1-5d





Five Year Outlook

Jackfish Pad Abandonments

3.1.1-7c

- No anticipated pad abandonments at Jackfish within the next five years

Wellhead Steam Quality

3.1.1-7d

	Pressure (kPag)	Temperature (°C)	Quality (%)
Plant Gate	9,600	311	100%
Wellhead	2,600-4,600	228-260	97%

- Losses in steam quality occur as steam is transported to the pads
- Utilize condensate traps at each pad to maximize wellhead steam quality

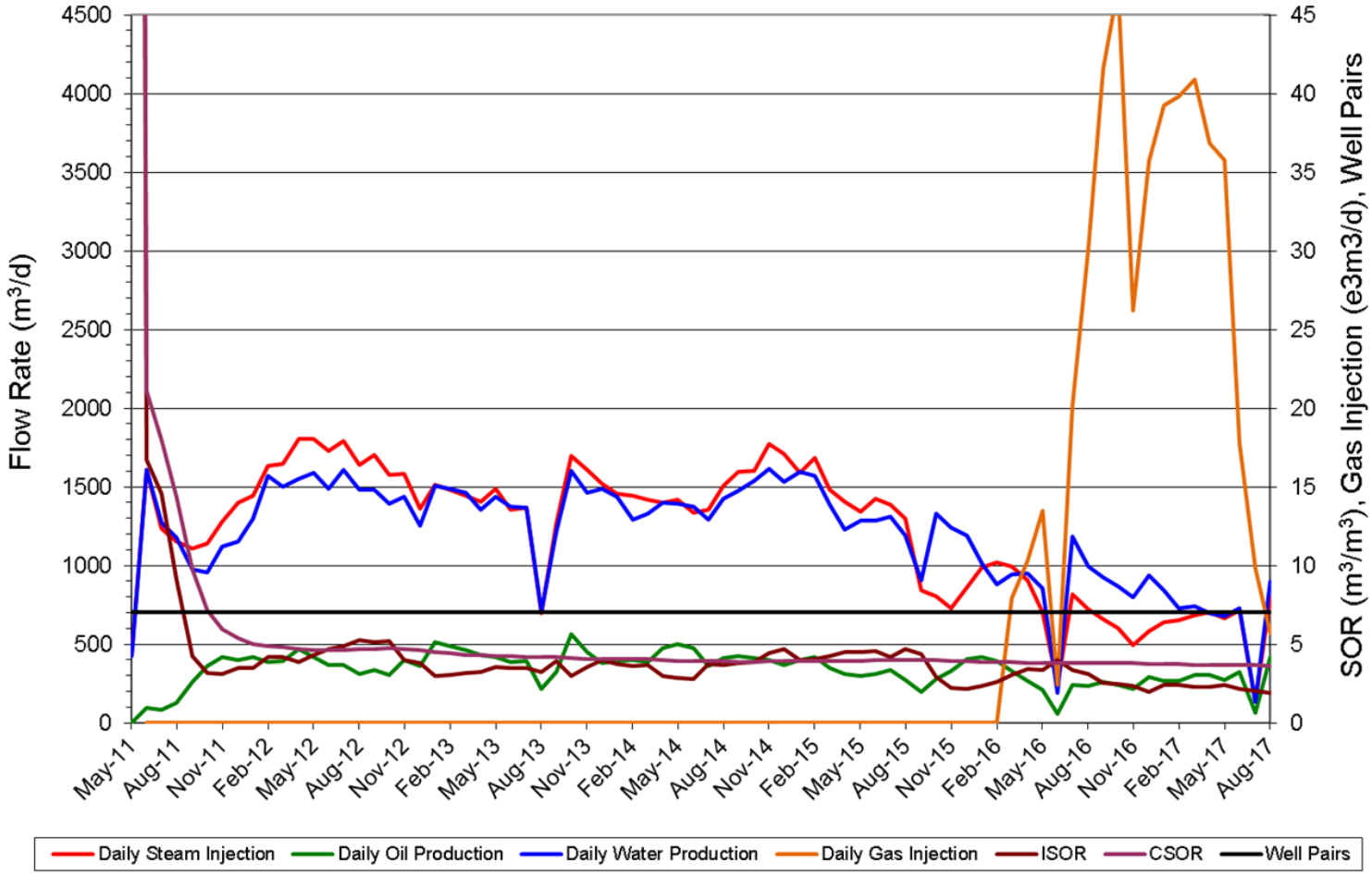
NCG Co-Injection

3.1.1-7e, g

- NCG source is fuel gas, primarily composed of methane
- NCG co-injection pilot at Pad A was discontinued in late 2014
- NCG co-injection started on Pads DD, FF, and KK in March 2016
  - NCG co-injection was taken off of Pad FF in August 2017
- Learnings to date:
  - NCG injection rates within expected range (1 – 4 mole%, per pad)
  - NCG successful in maintaining chamber pressure with reduced steam injection
  - No negative impact to resource recovery observed in late life NCG co-injection
  - Improved SOR observed
- Continuing to monitor and evaluate NCG performance

NCG Co-Injection
Pad DD

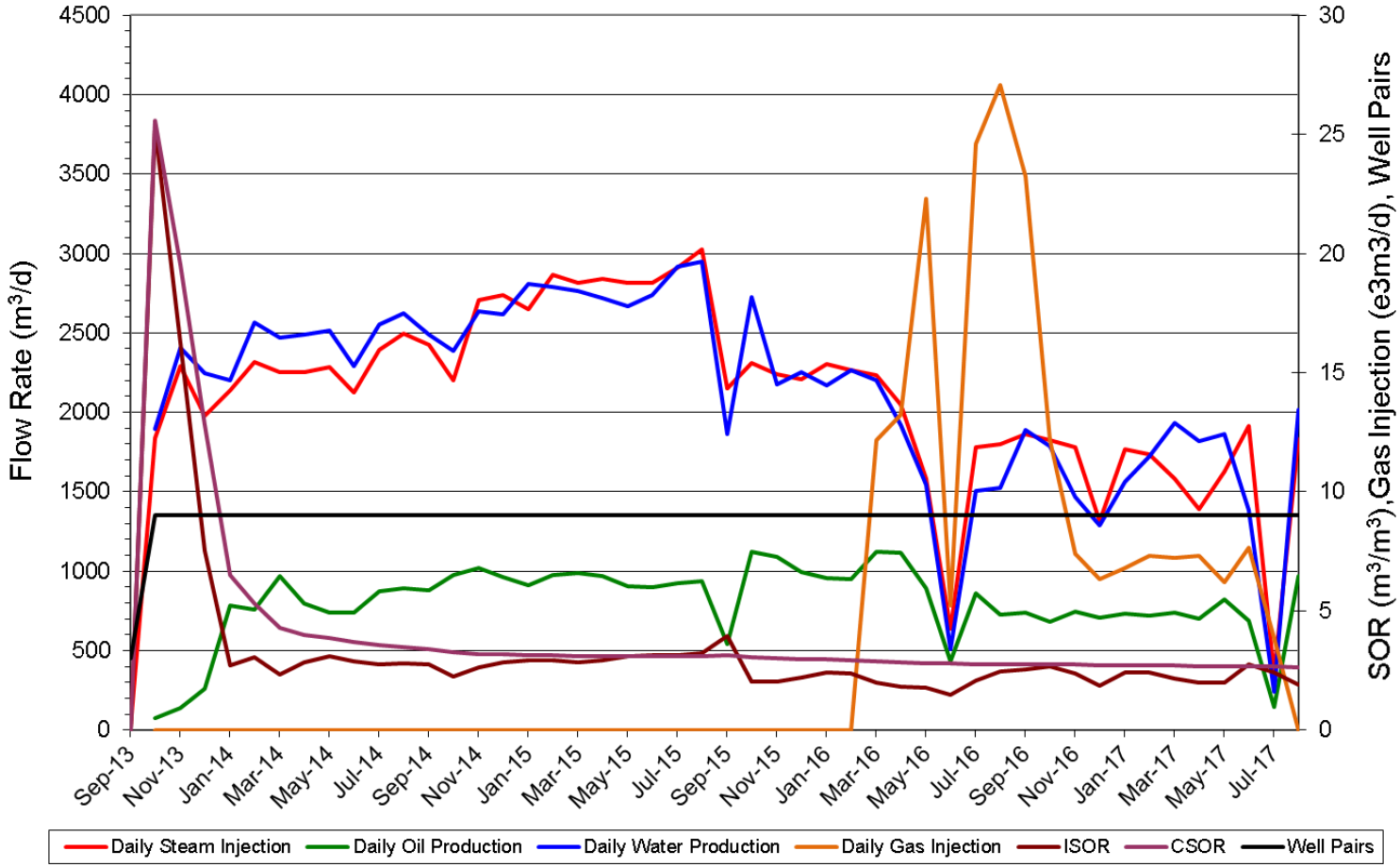
3.1.1-7e, g



- NCG co-injection as of August 2017 on DD1, DD3, DD5, and DD6

NCG Co-Injection
Pad FF

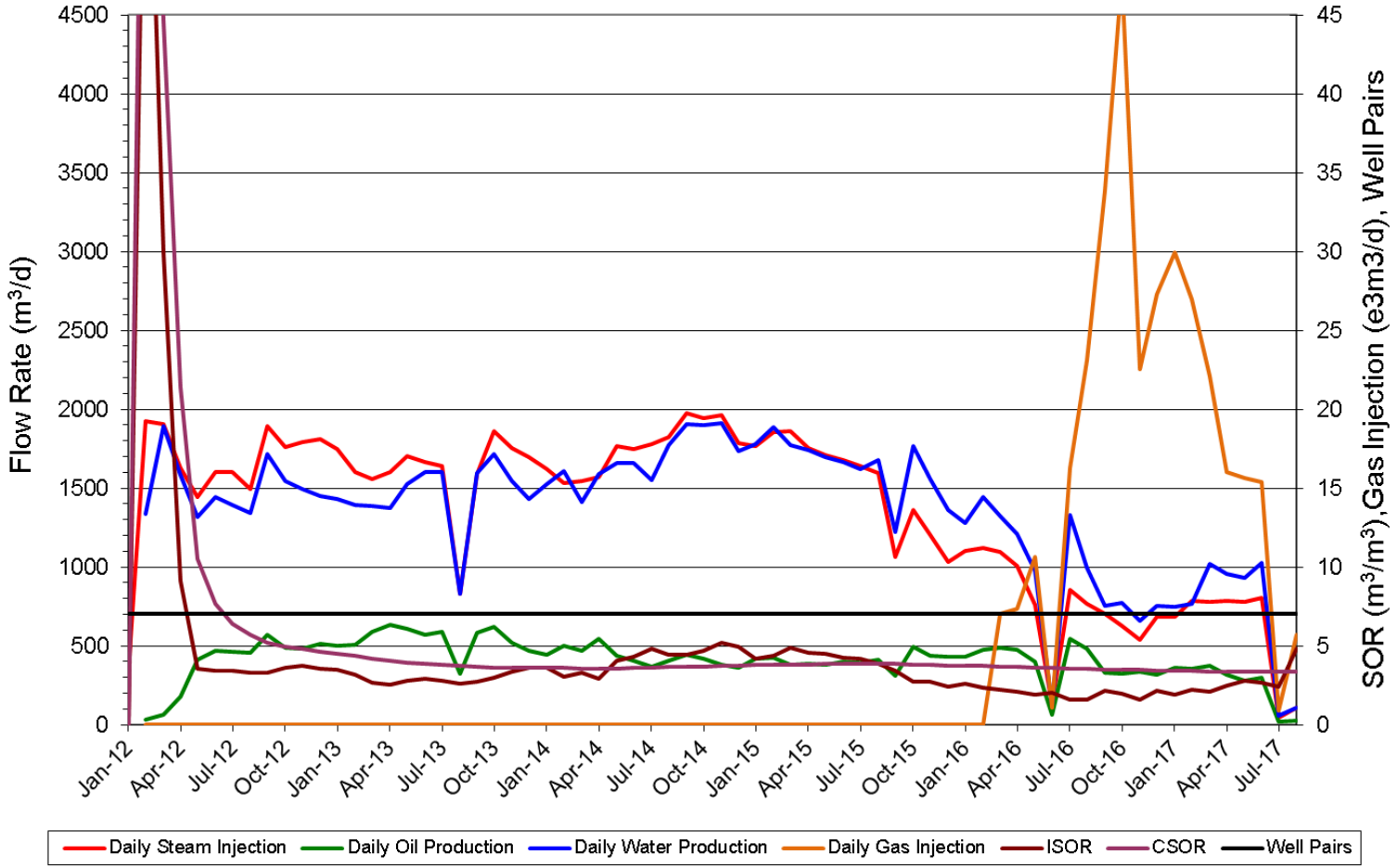
3.1.1-7e, g



- NCG co-injection discontinued as of August 2017 on FF1, FF2, FF3, FF4, FF5, FF6, FF8, and FF9

NCG Co-Injection
Pad KK

3.1.1-7e, g



- NCG injection as of August 2017 on KK2, KK3, KK5, and KK6

Jackfish Performance

Key Learnings

3.1.1-7f

- District SOR improvements tied to pressure reduction and optimization
- Continued focus on pressure balance with aquifer
- Successful use of NCG enables steam transfer to higher quality pads

Future Plans

Section 3.1.1-8

Future Plans
Well Operations, Drilling, and Trials

3.1.1-8a, b

Jackfish 1
- Pad G – G2i and G6i/p planned re-entry drilling start Q4 2017
- Pad EX – SAGD drilling planned Q4 2017
- Pad O – Planned circulation start Q4 2017
- Pad R – Planned circulation start Q1 2018
- Planned implementation of NCG co-injection
- Pad F10P well drilling in Q3 2017

Jackfish 2
- Pad QQ – SAGD drilling planned Q3 2017
- Pad MM – SAGD drilling planned Q2 2018

Jackfish 3
- Pad EEE – Planned circulation start Q4 2017
- Pad III – SAGD drilling planned Q4 2017

Future Plans
Jackfish District Steam Strategy

3.1.1-8c

Jackfish 1

- Utilizing steam capacity while managing SOR through steam allocation, implementation of NCG co-injection, and continued balanced chamber pressures with aquifer

Jackfish 2

- Utilizing steam capacity while managing SOR through steam allocation, pressure management, and leveraging NCG co-injection on Pads DD and KK

Jackfish 3

- Utilizing steam capacity while managing SOR through steam allocation and pressure management

Surface Operations

Table of Contents

Surface Operations

• Facilities Overview	Travis Swallow
• Facilities Performance	Travis Swallow
• Measurement and Reporting	Mike Brewster and Jody Kutschera
• Water Production, Injection, and Uses	Travis Swallow
• Sulphur Production and Air Emissions	Katie Howes
• Environment	Katie Howes
• Regulatory Compliance	Katie Howes
• Future Plans	Travis Swallow

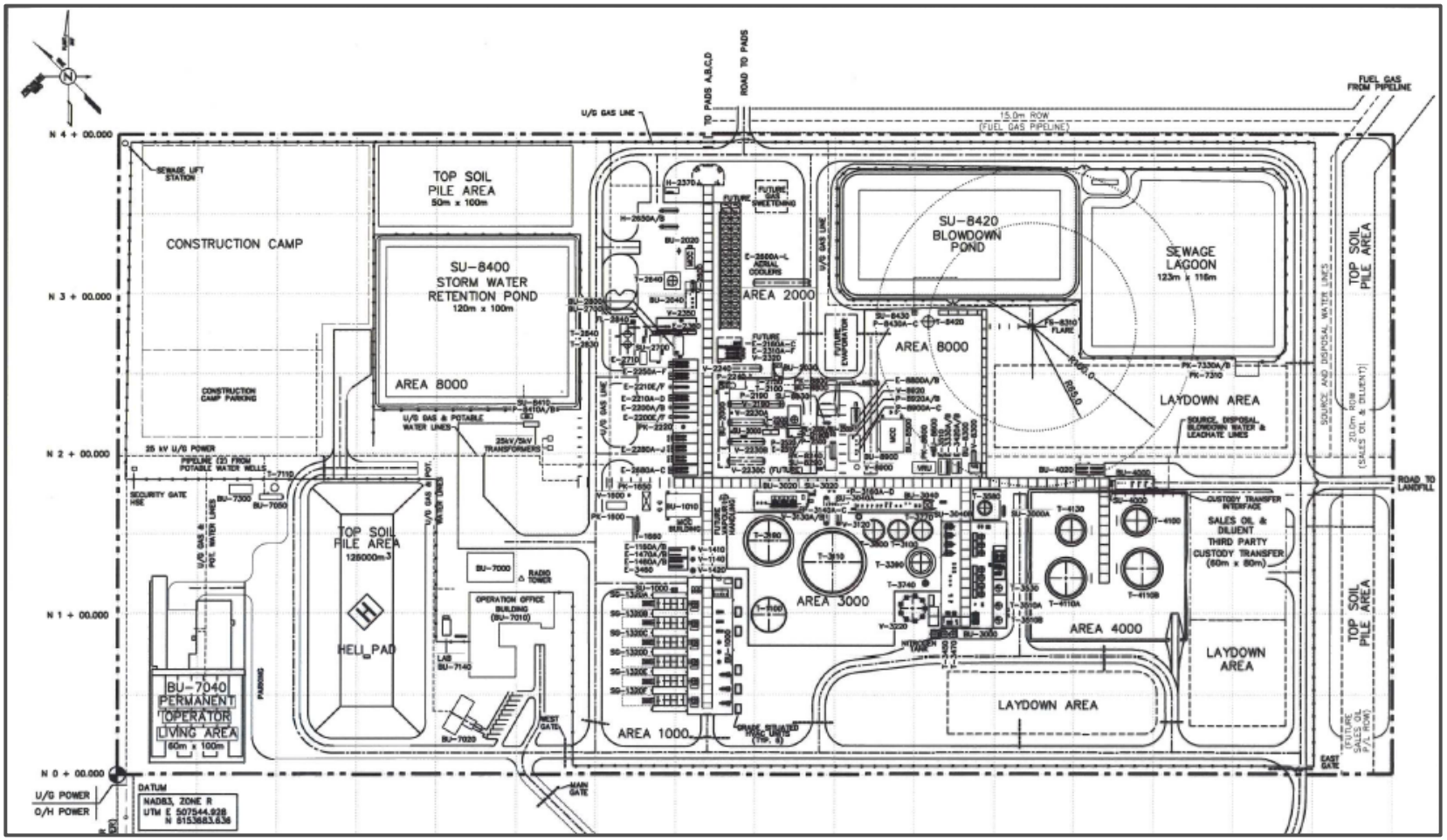
Facilities

Section 3.1.2-1

Facilities

Plot Plan – Jackfish 1

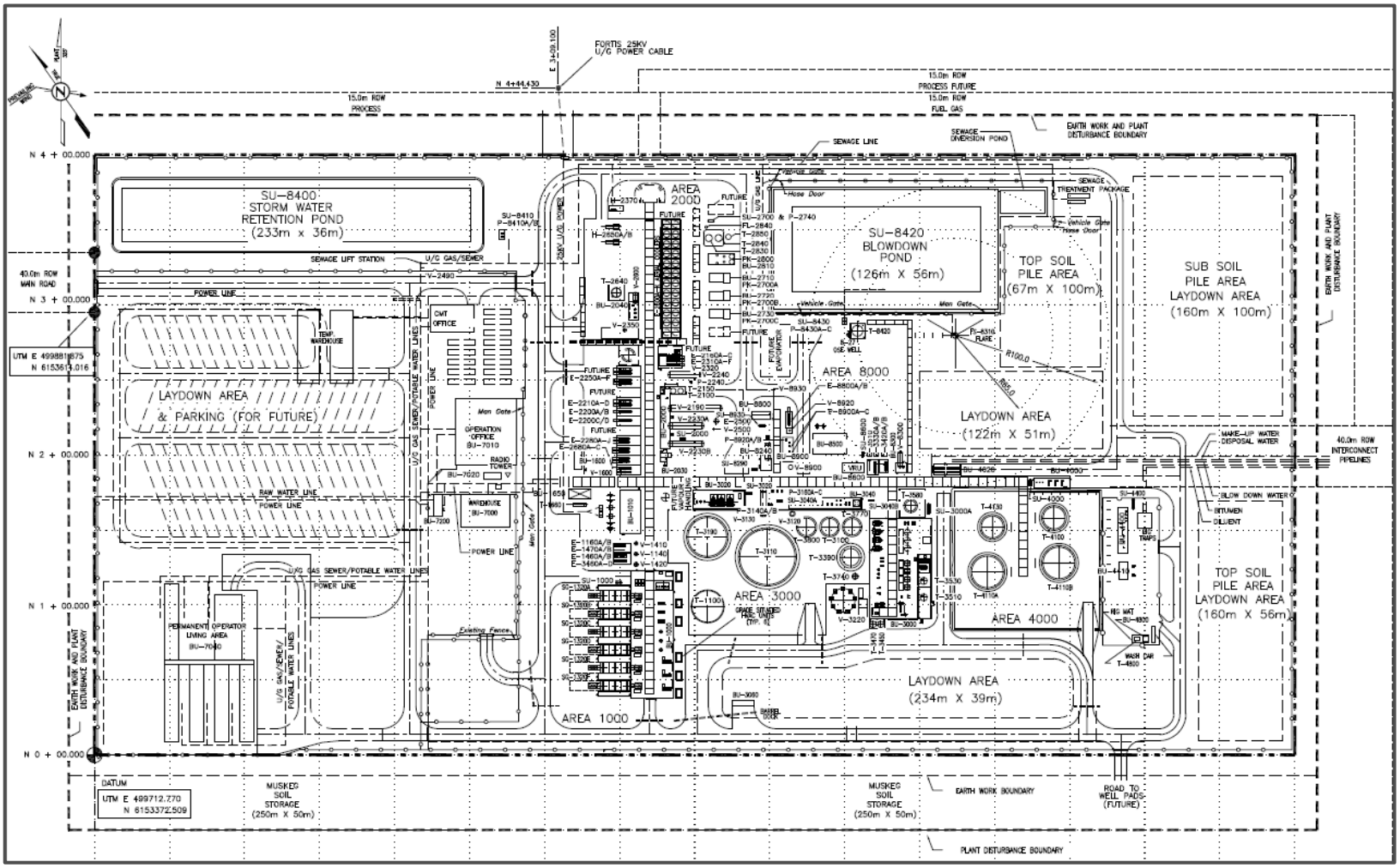
3.1.2-1a



Facilities

Plot Plan – Jackfish 2

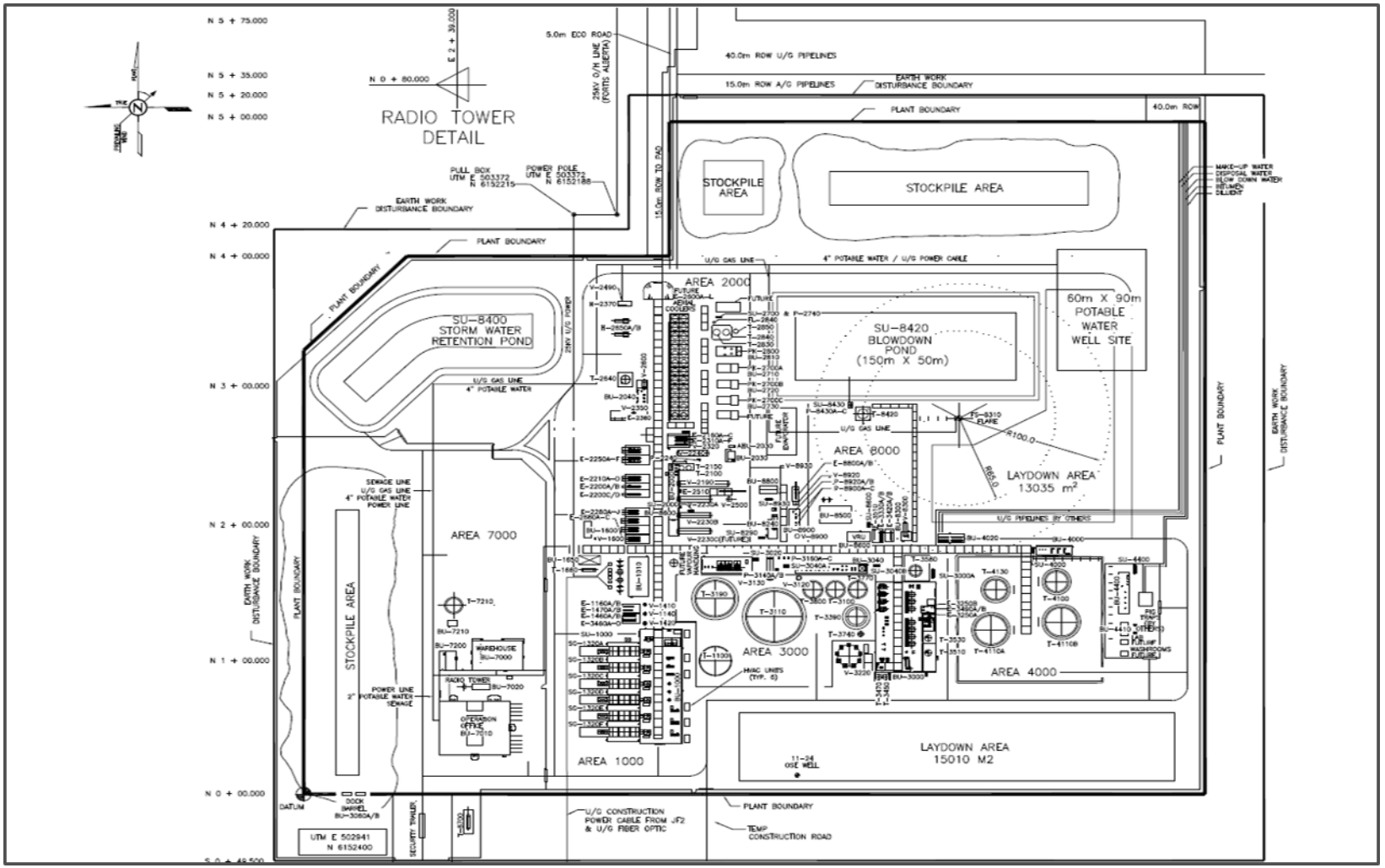
3.1.2-1a



Facilities

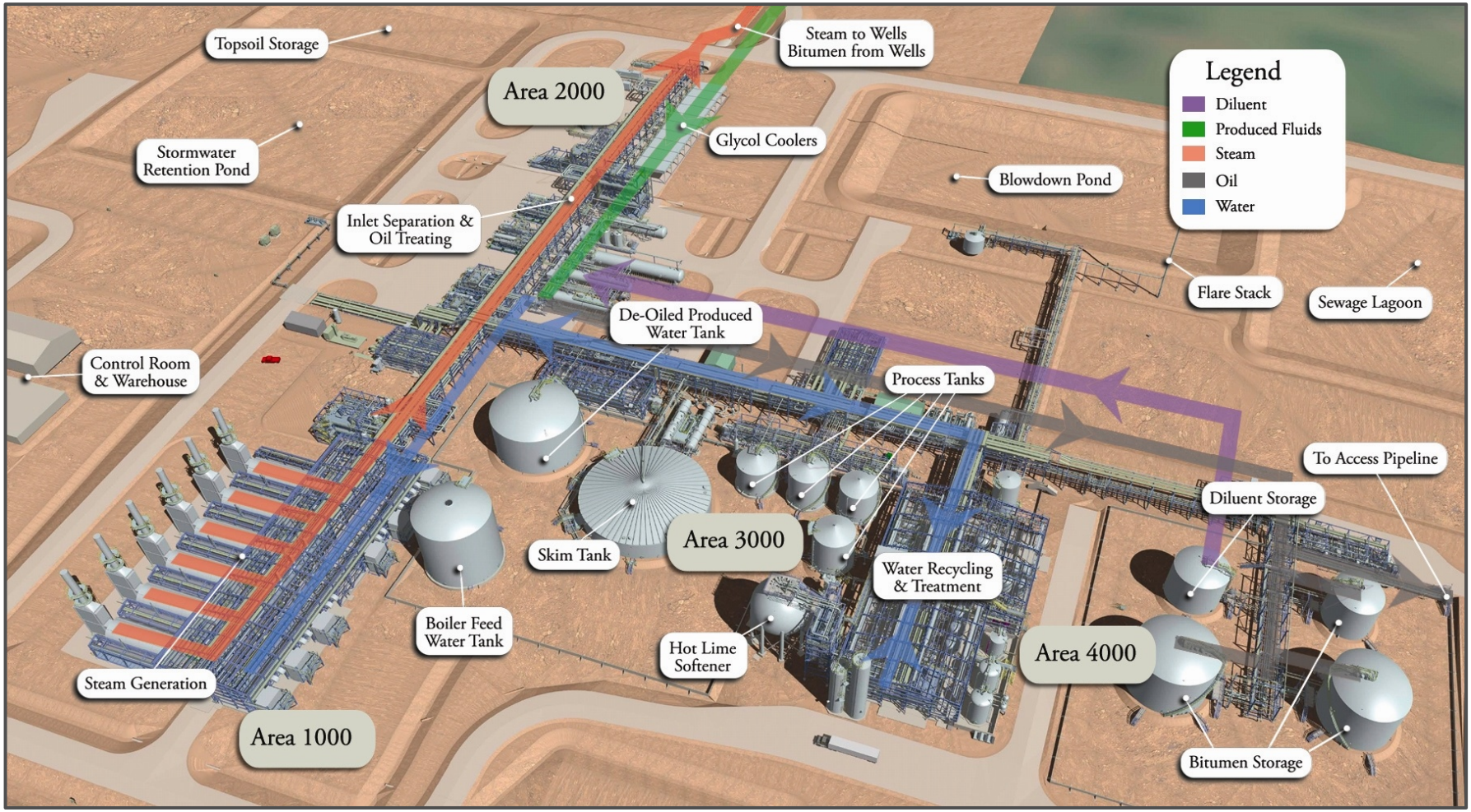
Plot Plan – Jackfish 3

3.1.2-1a



Facilities
Plant Schematic

3.1.2-1b



Facilities Performance

Section 3.1.2-2

Facilities Performance

3.1.2-2a-c

Turnarounds/Outages

- Jackfish 3 maintenance turnaround completed June 2017
- Jackfish 2 maintenance outage completed July 2017

Bitumen Treatment

- Stable operation at elevated production rates at J2/J3 compared to historical

Water Treatment

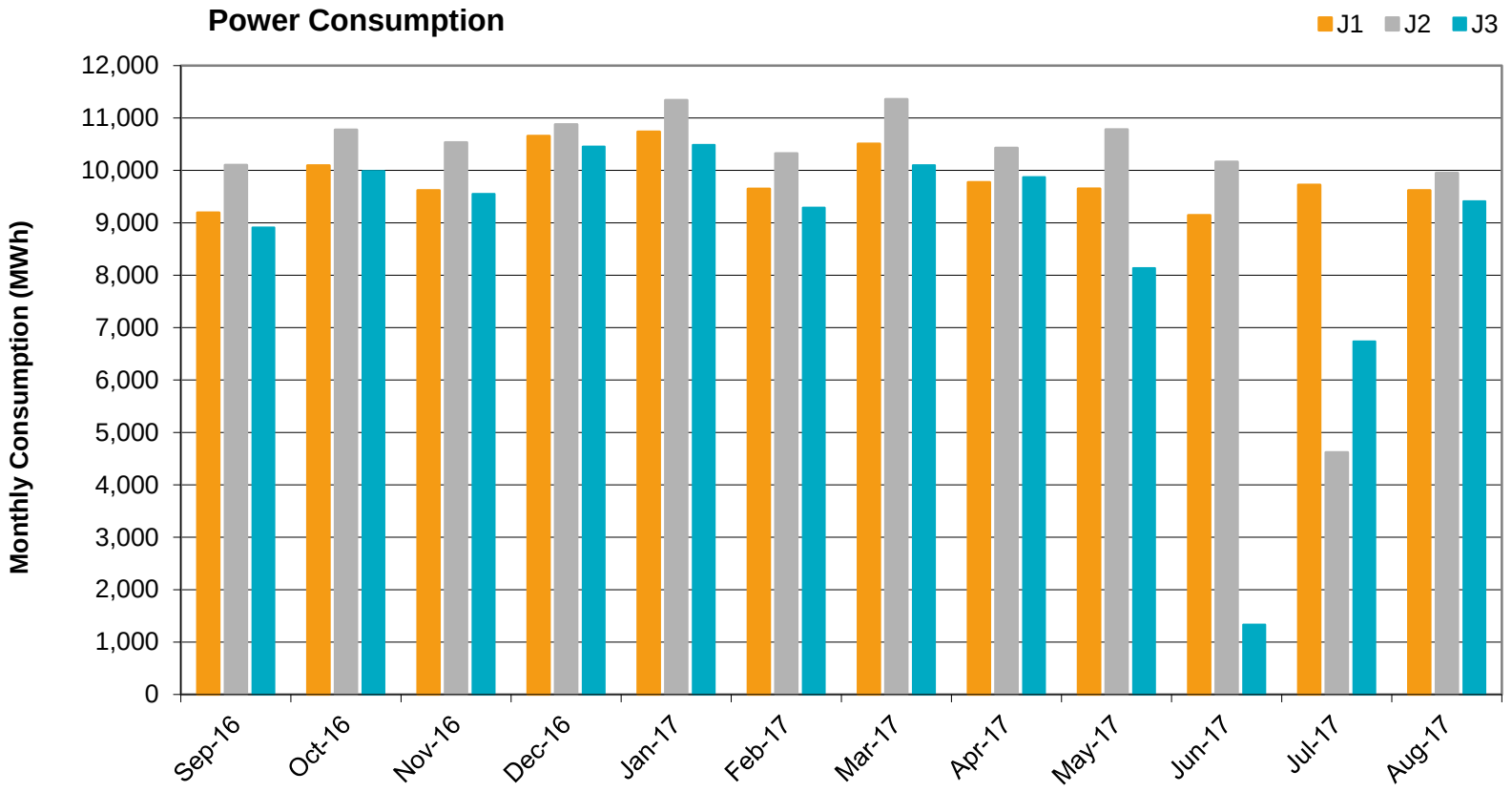
- Utilized brackish water wells with TDS ranging from 5,000-13,000 ppm for all make up water requirements
- Jackfish 3 upgrades completed to Lime and MagOx systems and HLS to improve system reliability

Steam Generation

- 80% overall steam quality targeted to decrease blowdown disposal volumes and increase steam generation

Facilities Performance
Power Consumption

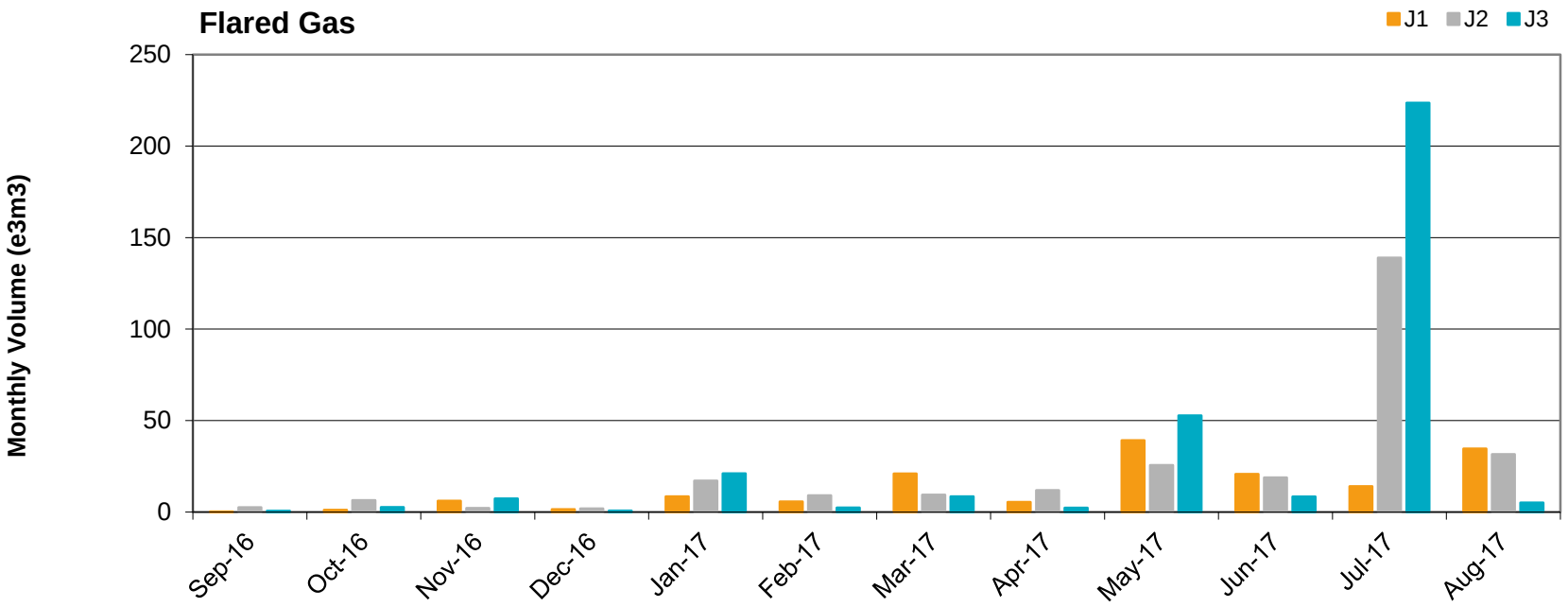
3.1.2-2d



- Power consumption was low in May-July 2017 for maintenance turnaround
- Power consumption was low in July 2017 for maintenance outage

Facilities Performance
Flared Gas Volume

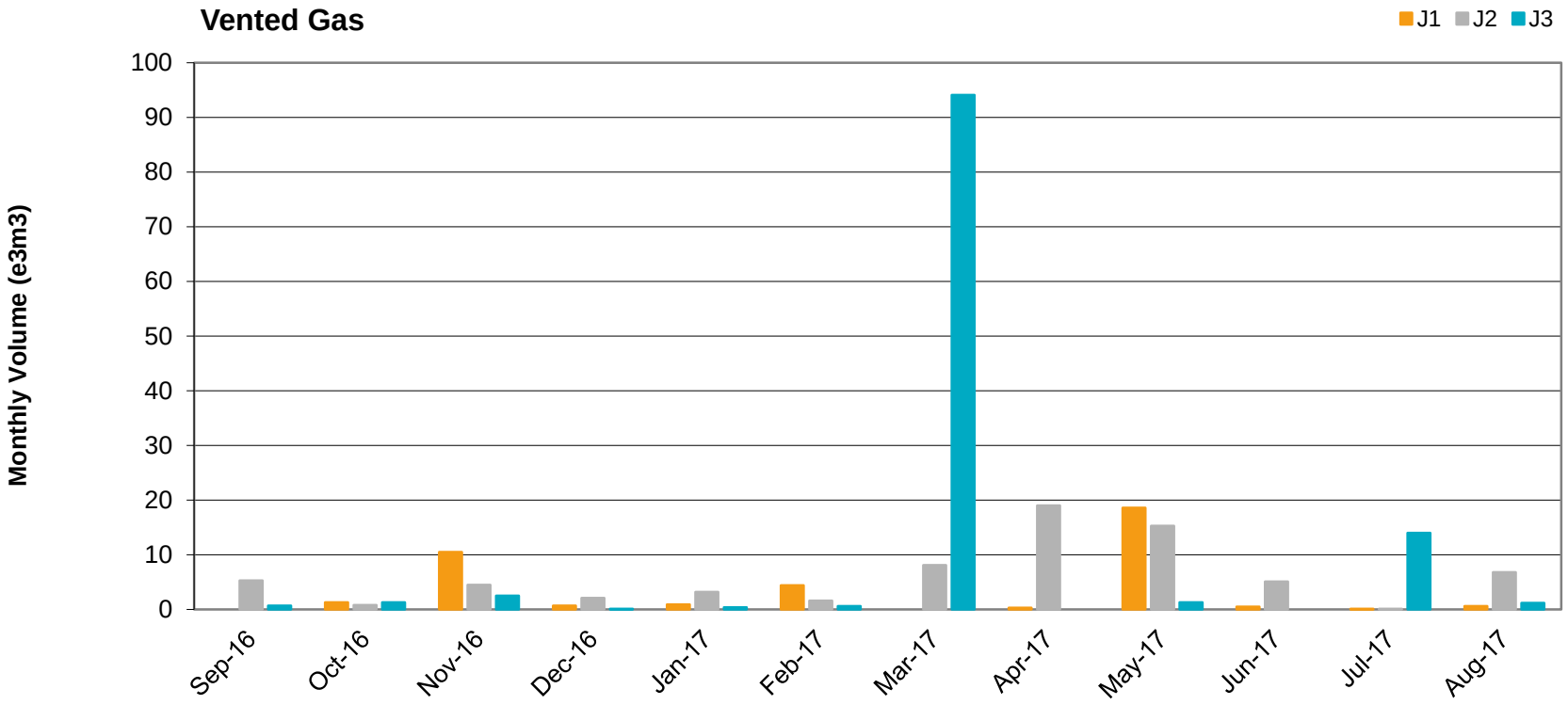
3.1.2-2e



- Flare volumes include produced gas only. Volumes are aligned with MARP reporting requirements for Jackfish.
- J1: Plant trip in May and August.
- J2: VRU and gas boot compressor maintenance in May. Production ramp-up following outage resulted increased flaring in July and August.
- J3: Increased flaring in May in preparation for turnaround. Production ramp-up following outage resulted increased flaring in July.
- Devon has notified the AER of all events as per *Directive 60*

Facilities Performance
Vented Gas Volume

3.1.2-2e

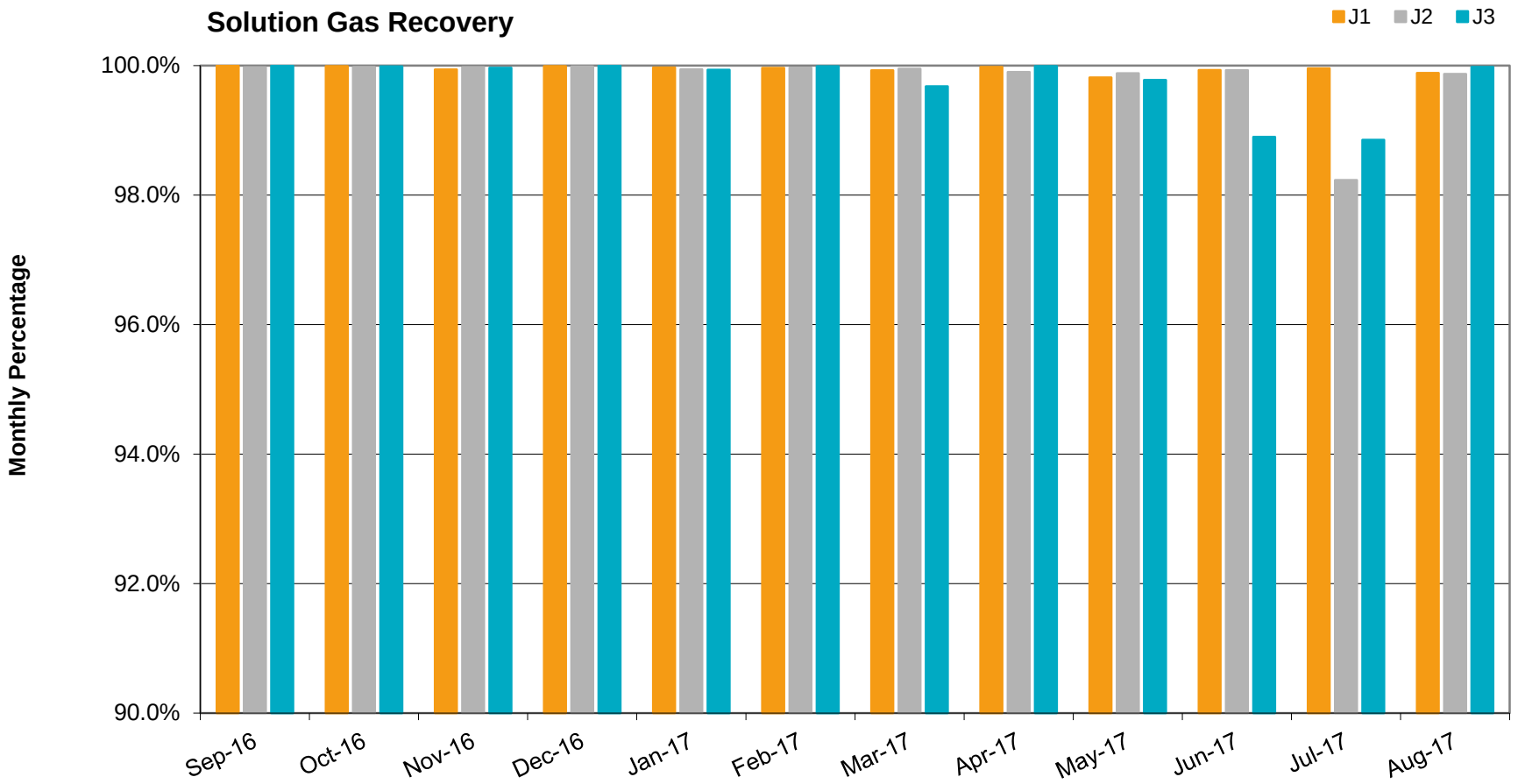


- J3 gas boot compressors taken offline in March for repair following AER notification
- Devon has notified the AER of all events as per *Directive 60*

Facilities Performance

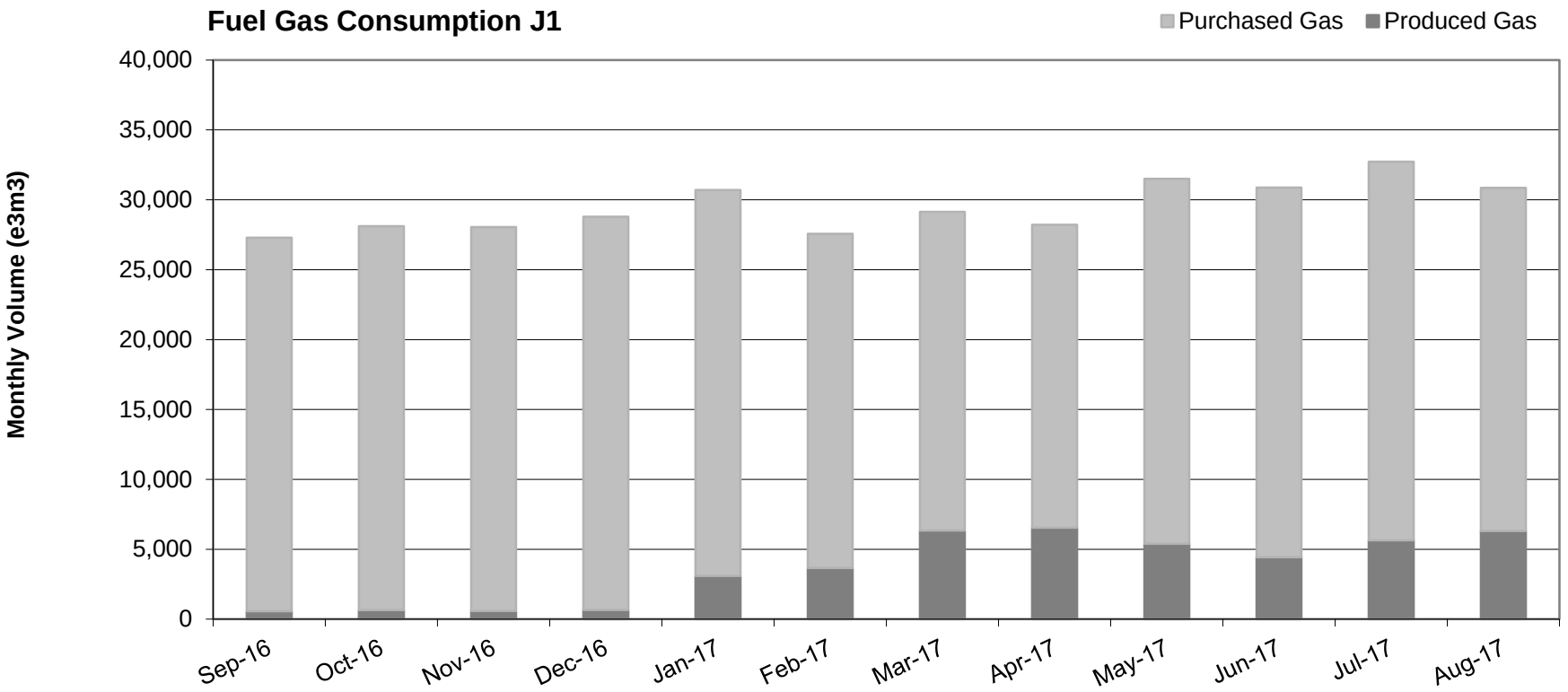
Solution Gas Recovery

3.1.2-2e



Facilities Performance
Fuel Gas Consumption

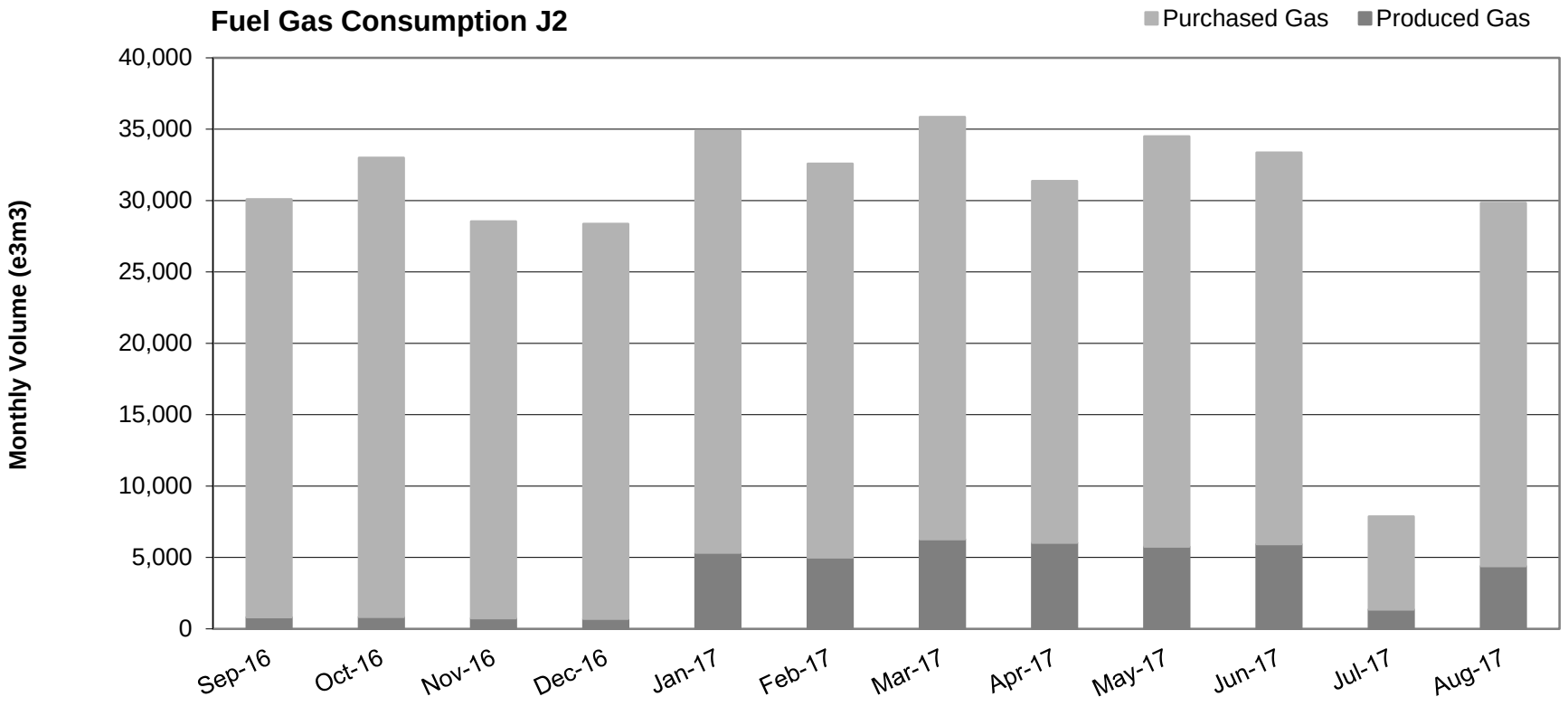
3.1.2-2e



- Methodology for calculating produced gas volumes changed January 1/2017 to improve accuracy.
- The amount of fuel consumed remains constant.
- Gas production calculation methodology was adjusted for 2017 production. This was done to incorporate a net monthly, facility level GOR (as per Devon's MARP).

Facilities Performance
Fuel Gas Consumption

3.1.2-2e



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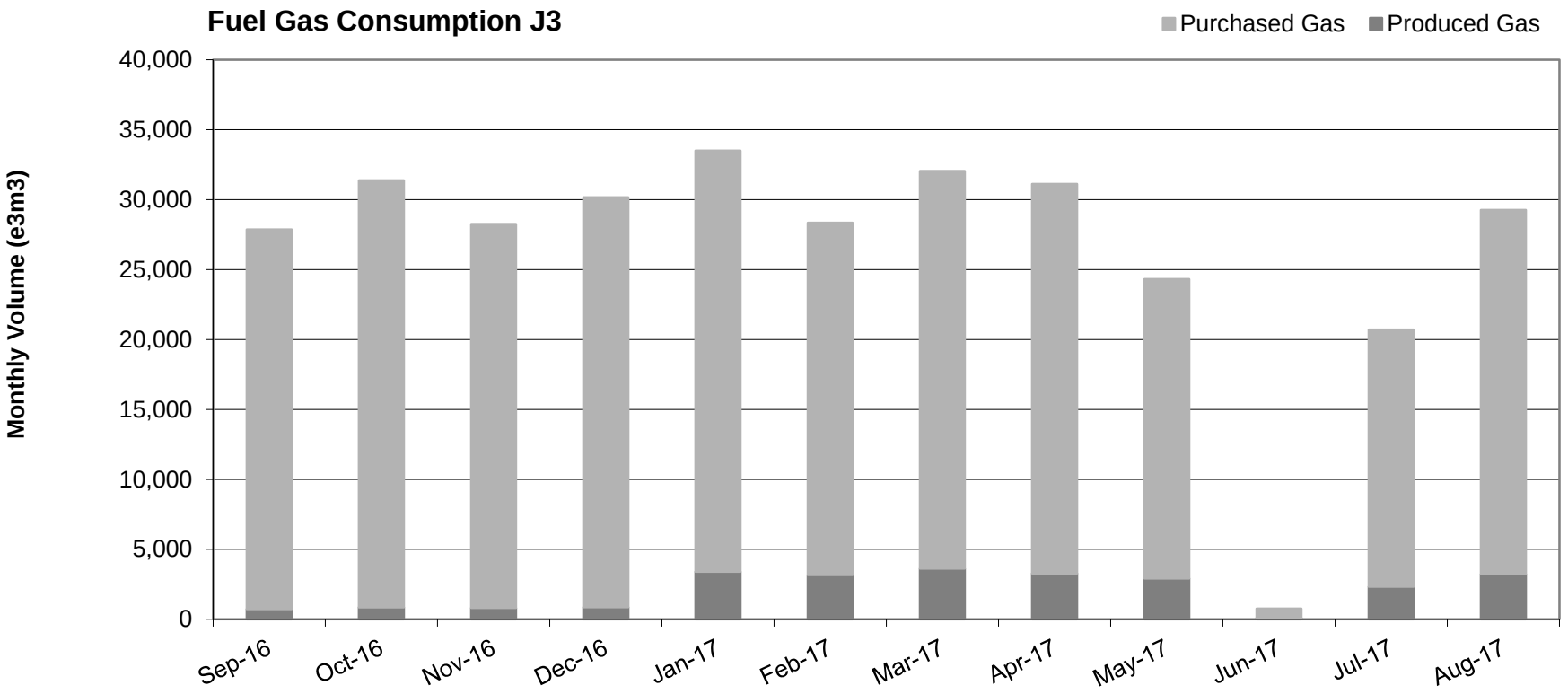
Facilities Performance
Fuel Gas Consumption

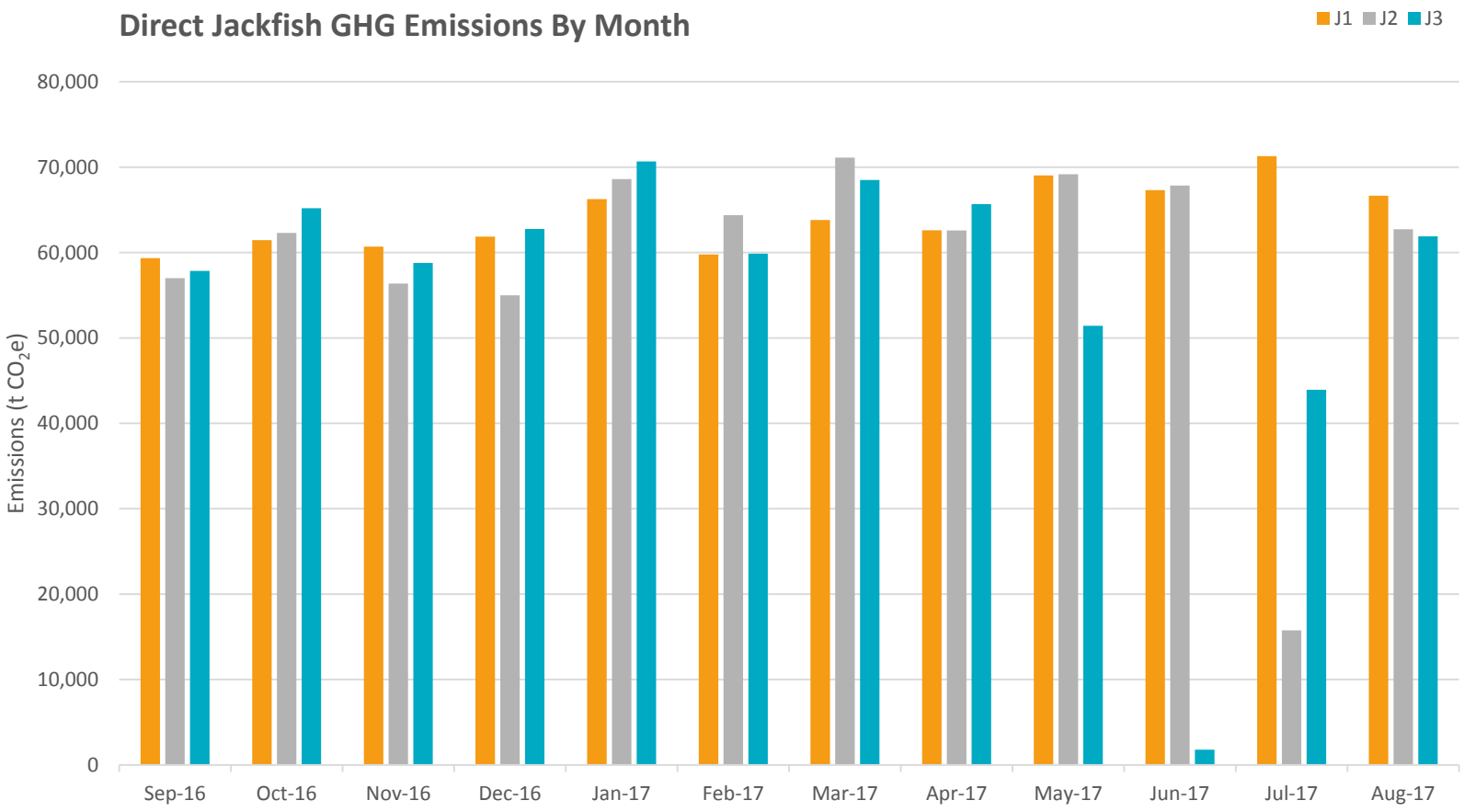
3.1.2-2e



- Methodology for calculating produced gas volumes changed January 1/2017 to improve accuracy.
- The amount of fuel consumed remains constant.
- Gas production calculation methodology was adjusted for 2017 production. This was done to incorporate a net monthly, facility level GOR (as per Devon's MARP).

Facilities Performance
Greenhouse Gas Emissions (GHG)

3.1.2-2f



Measurement and Reporting

Section 3.1.2-3

Measurement and Reporting
Production and Injection Volumes

3.1.2-3a, c

Well Bitumen / Water Production

- The total battery production is allocated to each SAGD producing well based on individual well tests
- Battery Bitumen Production = Dispositions – Receipts + ΔInventory + Blending Shrinkage
- Battery Water Production = Inlet Produced Water + ΔInventory + Truck Out – Truck in – Desand Water to Treater and FWKO
- Individual well test:
  - Each pad equipped with test separator along with coriolis meter and watercut analyzer on liquid leg
  - Vortex meter for gas measurement / water vapor calculation
  - Tested water volume includes the calculated water vapor (from $P_{sat}/P_{measured}$)
  - Typical well test duration is nine hours

Measurement and Reporting

Production and Injection Volumes

3.1.2-3a, c

Well Gas Production

- Well estimated test gas production = GOR x test bitumen production
- Battery Gas Production = Fuel + Fuel to IF + Flare – TCPL Purchase – Receipt Gas – Diluent Flash
- Battery gas is allocated to each well based on well test

Steam Injection

- Total steam to field measured downstream of HP separators minus the steam condensate
  - Alternate steam determination in place at J2 and J3
- Vortex meters at each wellhead are used to allocate the total steam

Measurement and Reporting
Proration factors

3.1.2-3a, b

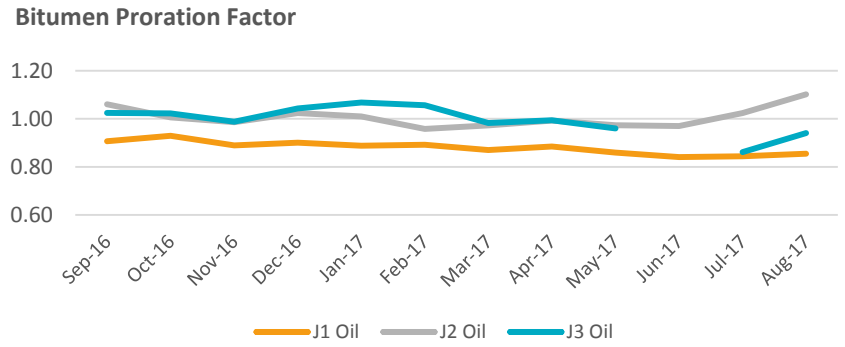
Bitumen / Water Proration Factor

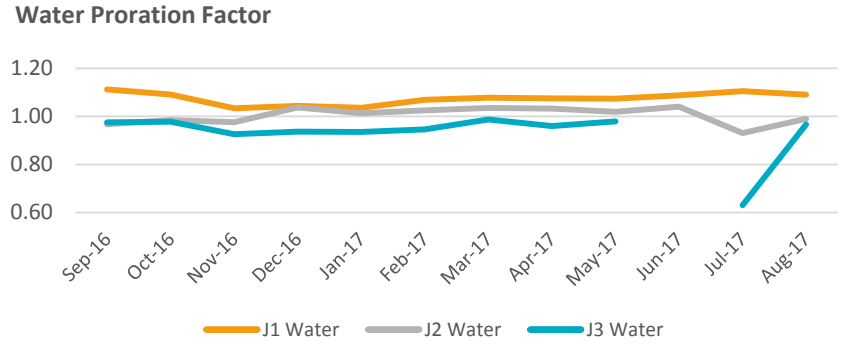
- Within AER target tolerances on an ongoing basis
- Jackfish 3 extended facility outage June / July 2017
- Jackfish 1 bitumen proration being monitored by Devon

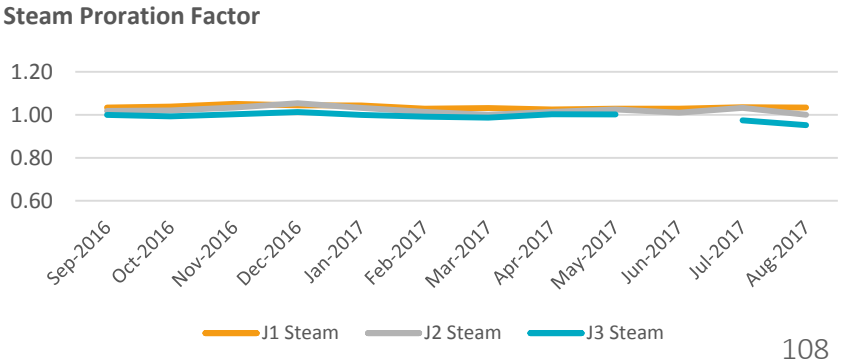
Steam Proration Factor

- 12 months average was 1.033 for Jackfish 1, 1.024 for Jackfish 2, and 0.990 for Jackfish 3
- Trends for all facilities highly stable

Note: Data for June 2017 for J3 was omitted from graphs as facility was down for maintenance for bulk of month







Measurement and Reporting

Production and Injection Volumes

3.1.2-3a, c

Facility Reporting Codes

Facility Code	Facility Sub-type	Description
ABBT 0094366	344 In-Situ Oil Sands	Jackfish 1 CPF
ABIF 0094395	506 In-Situ Oil Sands	Jackfish 1 IF
ABBT 0114300	344 In-Situ Oil Sands	Jackfish 2 CPF
ABIF 0114303	506 In-Situ Oil Sands	Jackfish 2 IF
ABBT 0130642	344 In-Situ Oil Sands	Jackfish 3 CPF
ABIF 0130641	506 In-Situ Oil Sands	Jackfish 3 IF
ABIF 0115392	506 In-Situ Oil Sands	Source / Disposal Facility
ABGS 0131346	621 Gas Gathering System	Purchase Fuel Distribution

Measurement and Reporting

New Measurement Technology - Update

3.1.2-3d

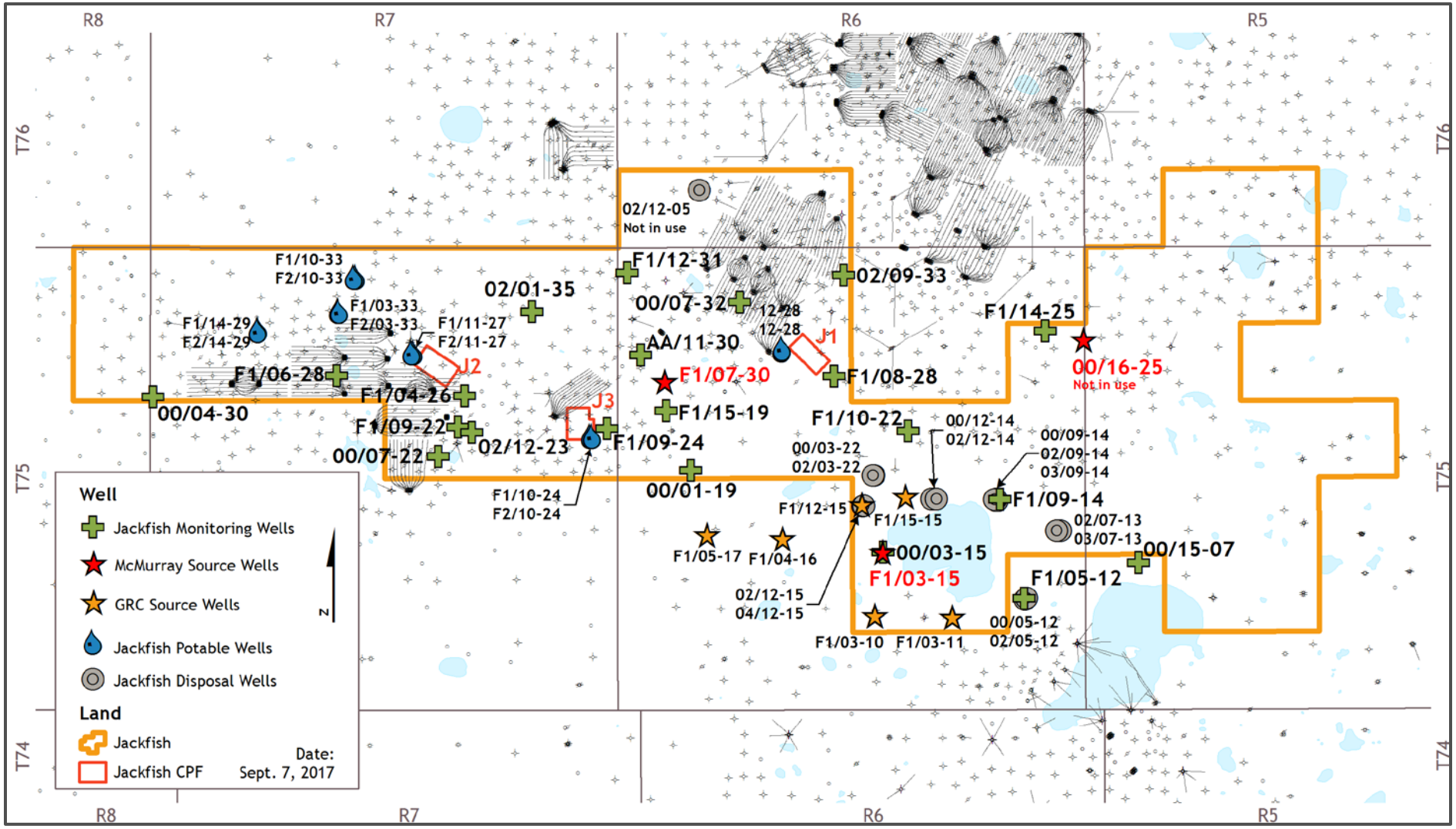
Primary Steam Metering with Bypass

- Primary meters (vortex) currently isolated
- Alternate steam volume determination has been authorized by the AER
- Investigation into root cause of failure continues
- Engineering project to replace failed meters currently in final design

Water Production, Injection, and Uses

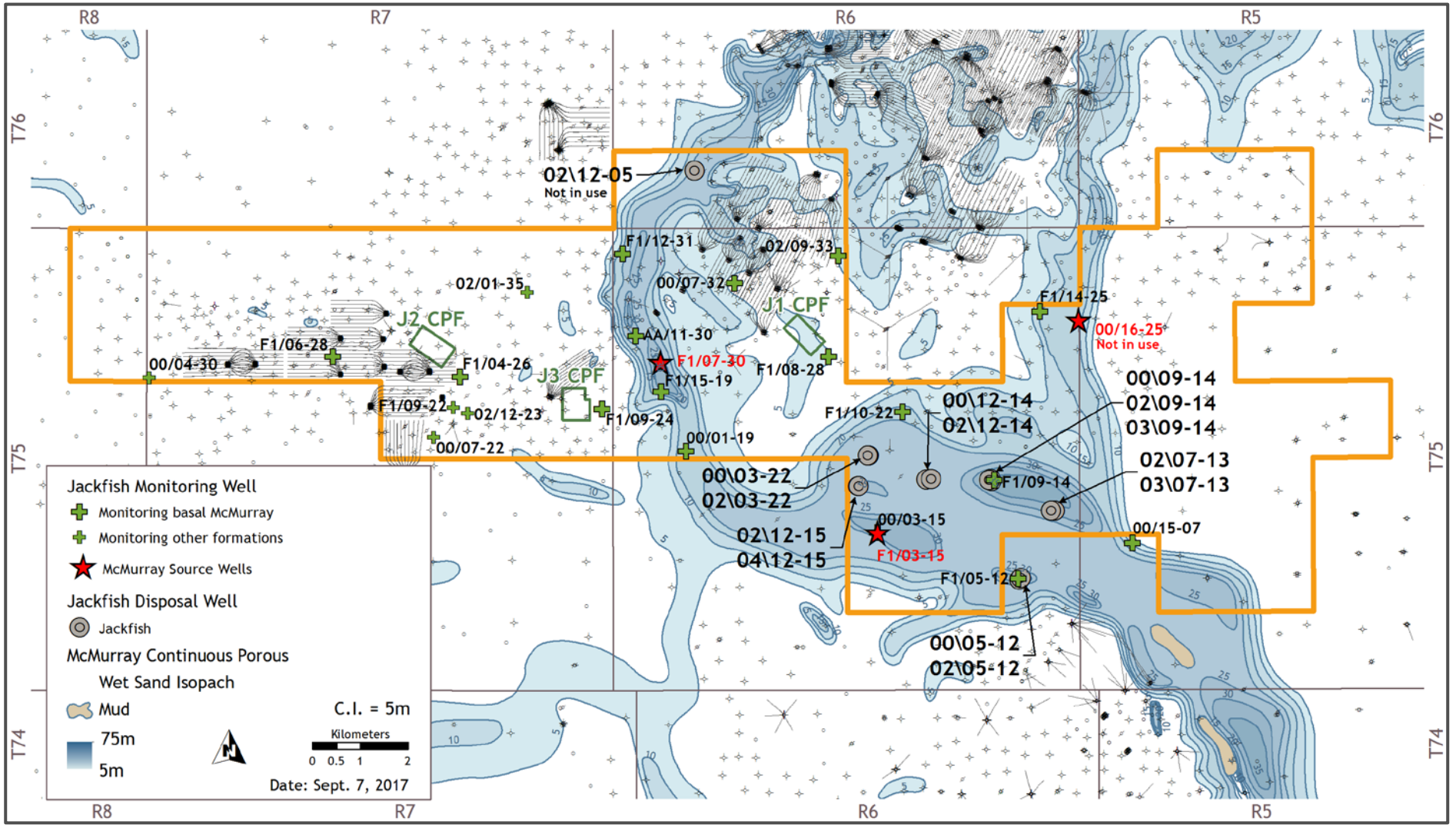
Section 3.1.2-4

Water Disposal and Source Water
Well Locations



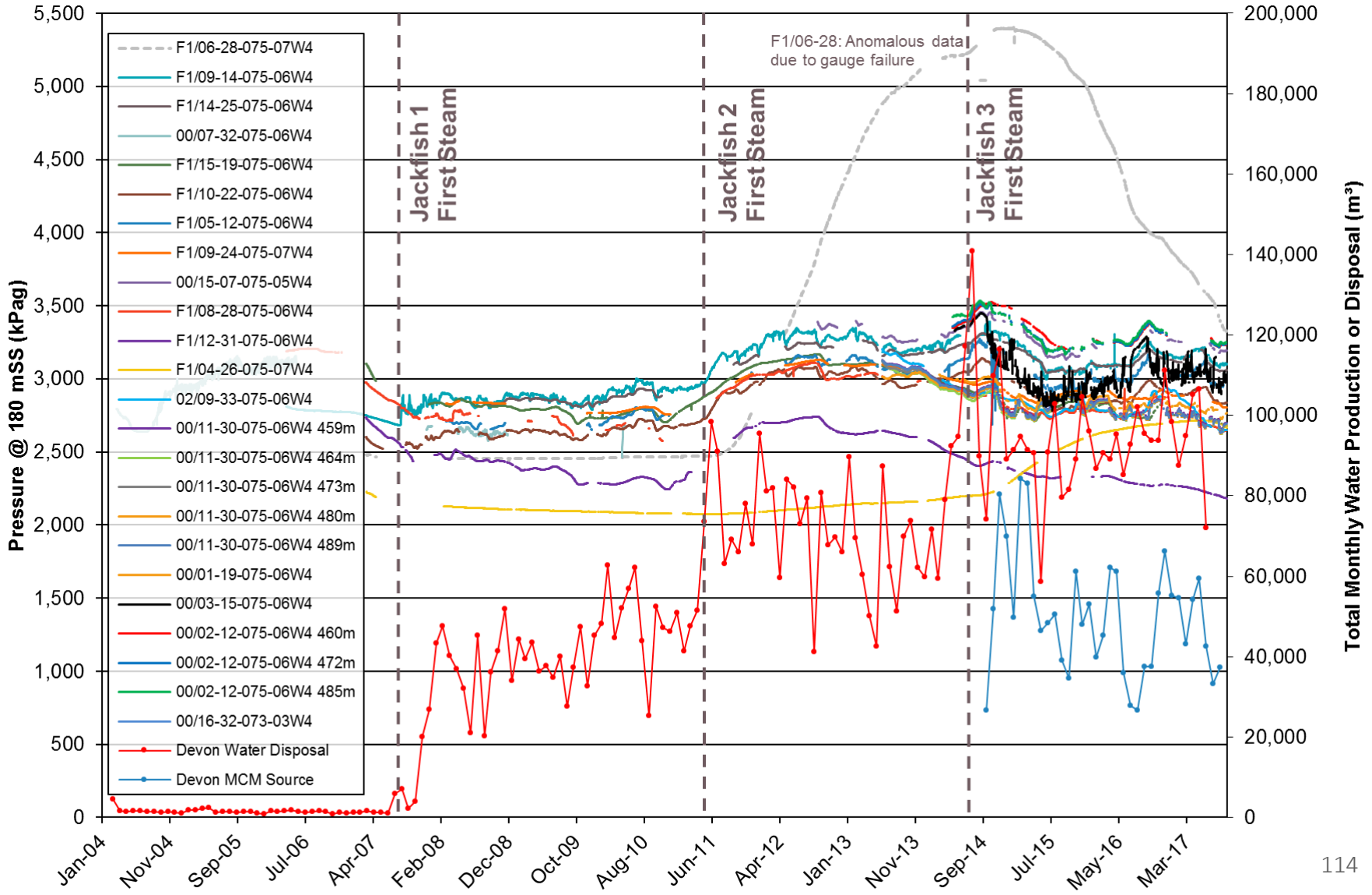
Water Disposal Geology

Basal McMurray Aquifer



Water Disposal Operations

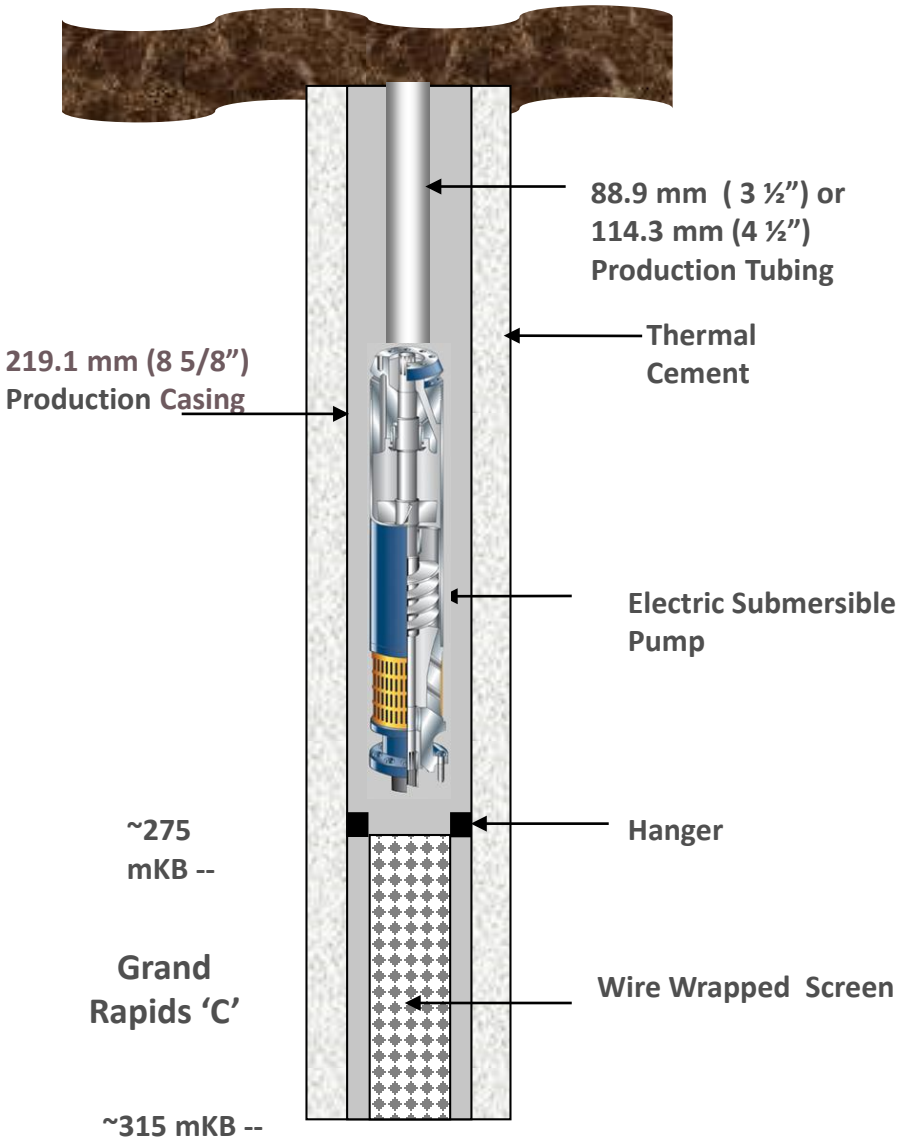
Basal McMurray Pressure in 75-6W4, 75-7W4



Water Usage - Brackish

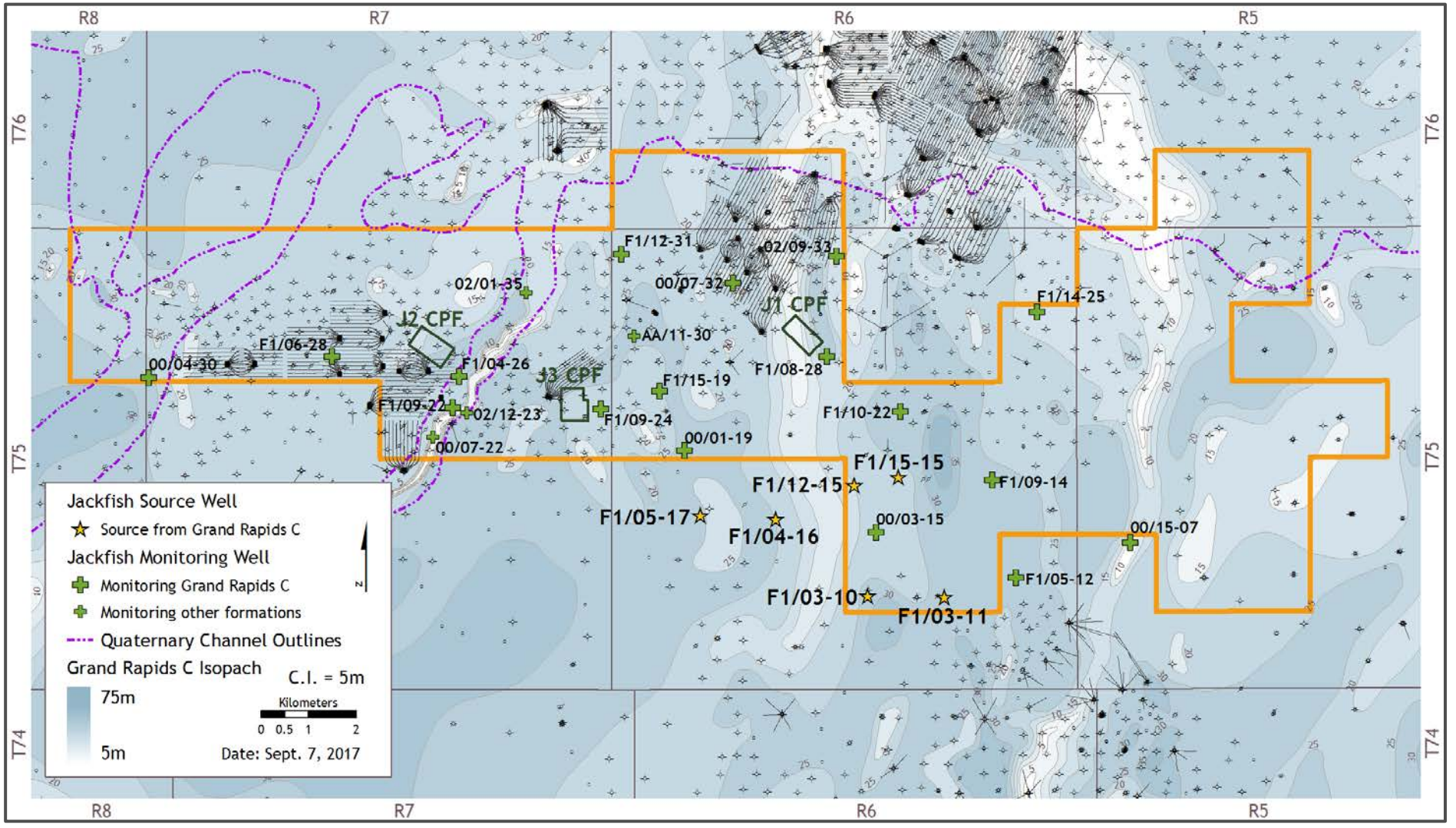
3.1.2-4a

- Brackish source water produced from the Grand Rapids ‘C’ and McMurray zones
- Available for Jackfish 1, Jackfish 2, and Jackfish 3
- Two McMurray Wells:
  - F1/07-30-075-06W4
  - F1/03-15-075-06W4
- Six Grand Rapid Wells:
  - F1/12-15-075-06W4
  - F1/15-15-075-06W4
  - F1/03-10-075-06W4
  - F1/03-11-075-06W4
  - F1/04-16-075-06W4
  - F1/05-17-075-06W4



Source Water Geology

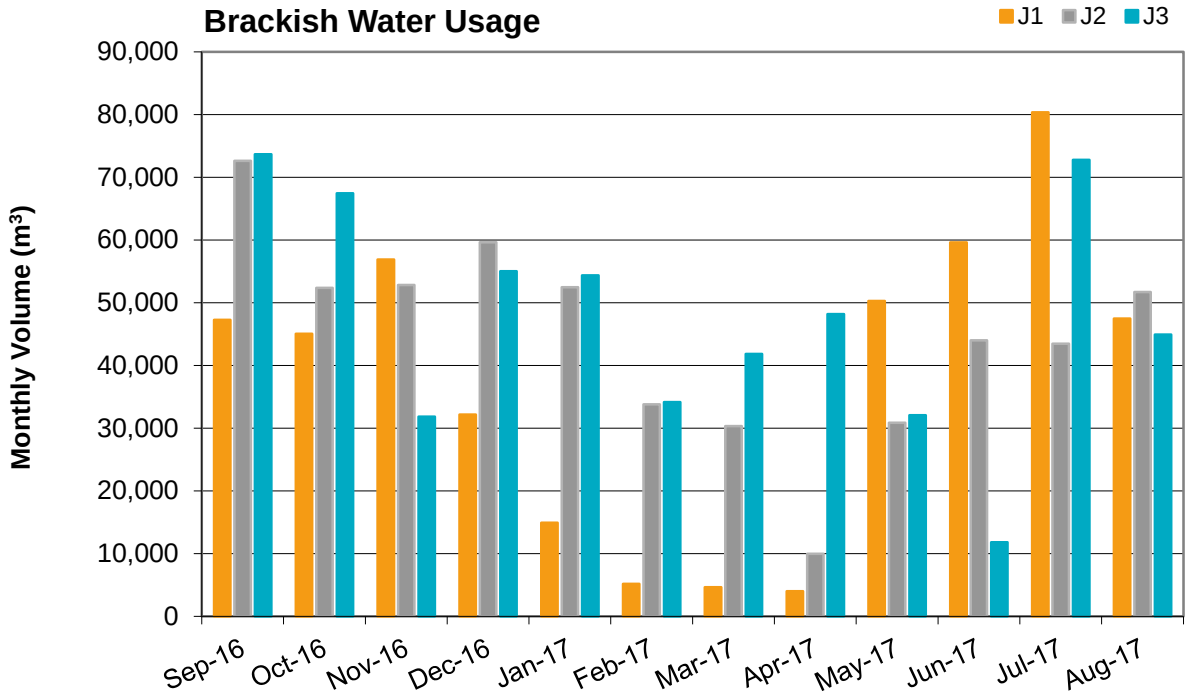
Grand Rapids C Aquifer



Water Usage - Brackish

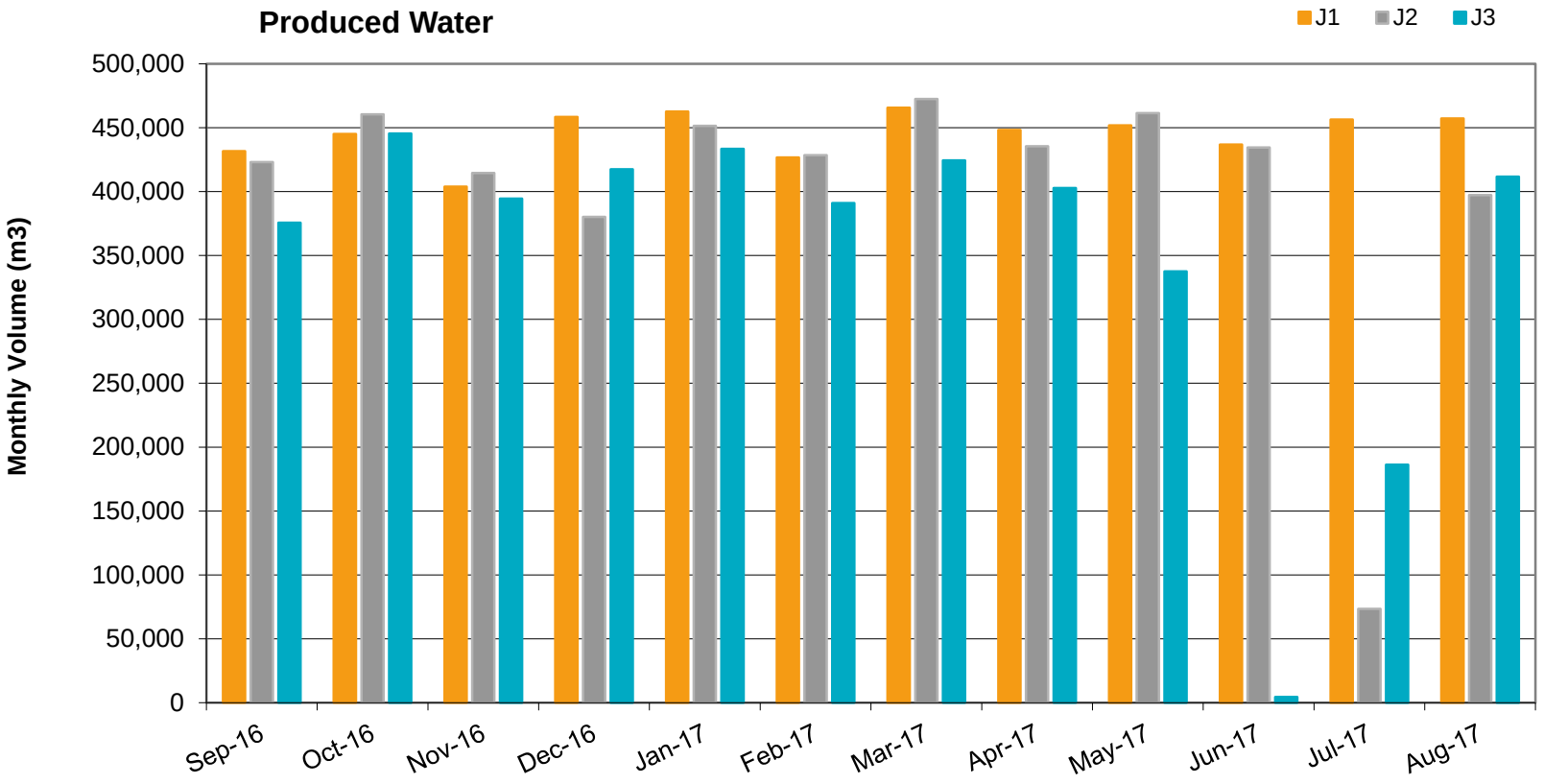
3.1.2-4b

- Brackish water production from the Grand Rapids ‘C’ commenced on July 12/2007 and McMurray commenced on October 2/2014
- Brackish water quality analyzed 1-2 times per year



Produced Water Volume

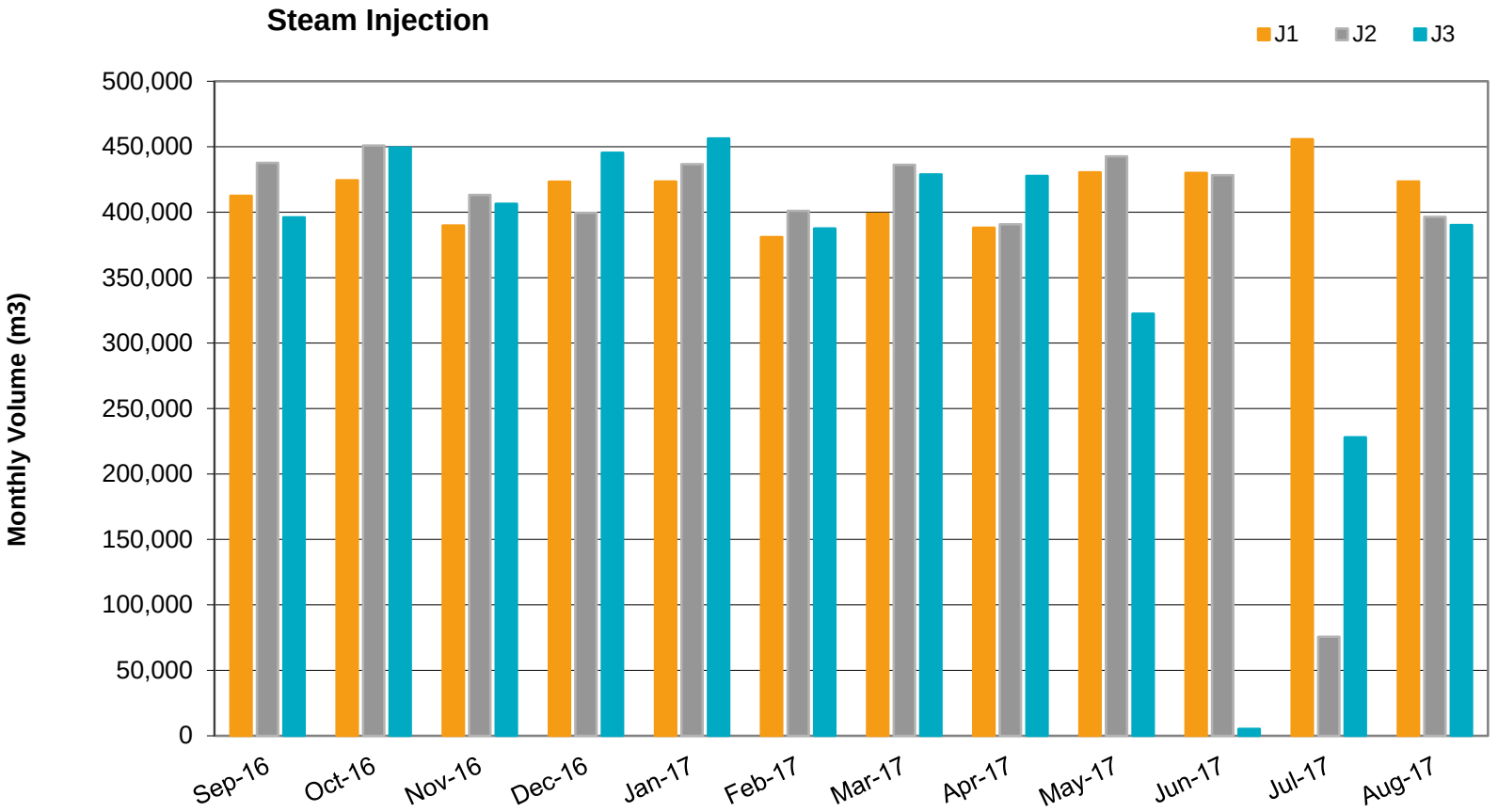
3.1.2-4c



- J3 produced water was low in June/July 2017 due to a planned maintenance turnaround
- J2 produced water was low in July 2017 due to maintenance

Steam Injection Volume

3.1.2-4d

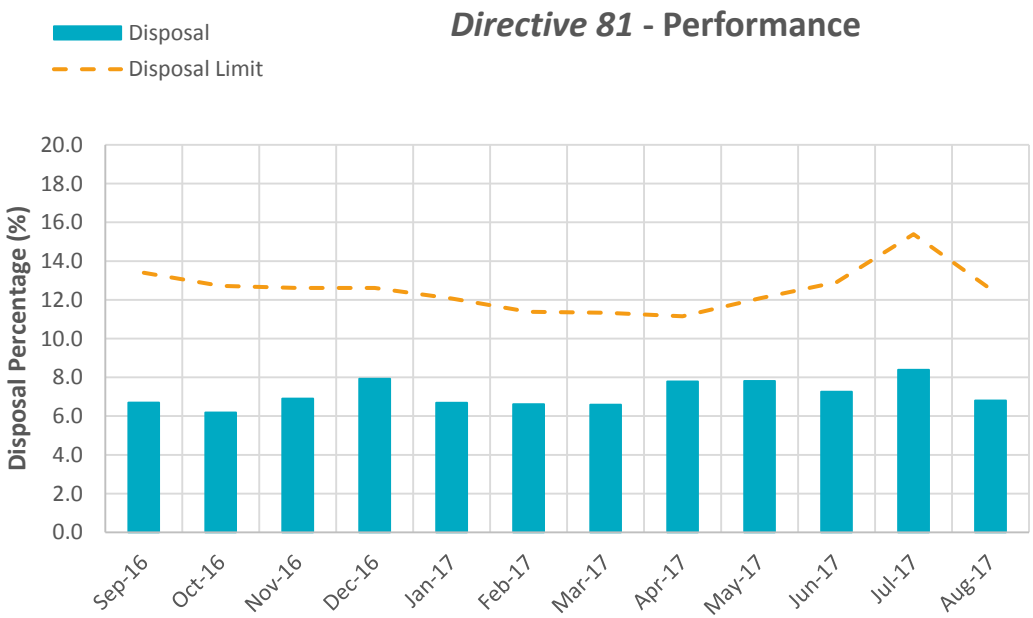


- J3 steam injection was low in June/July 2017 due to a planned maintenance turnaround
- J2 steam injection was low in July 2017 due to maintenance

Produced Water Recycle

3.1.2-4e

- Only brackish water is used for required makeup volumes
- Jackfish disposal limit = 12 - 15%
  - –Jackfish 1 2016/17 disposal rate = 7.7%
  - –Jackfish 2 2016/17 disposal rate = 7.6%
  - –Jackfish 3 2016/17 disposal rate = 6.6%



$$Disposal\ Limit = \frac{(Brackish\ Water\ X\ D_f) + (Produced\ Water\ X\ D_p)}{(Brackish\ Water + Produced\ Water)}\ X\ 100\%$$

Water Disposal – Approval No. 10790

Class 1b

3.1.2-4g

Disposal System is shared between Jackfish 1, 2, and 3

Two disposal streams:

- Blowdown and regen waste

Fourteen Class 1b disposal wells in total:

- Twelve active (see list below)
- One inactive (102/12-05-076-06W4)
- One suspended (102/03-22-075-06W4)

Approved MWIP of 6,000 kPa (July 2009)

Jackfish 1 disposal wells:

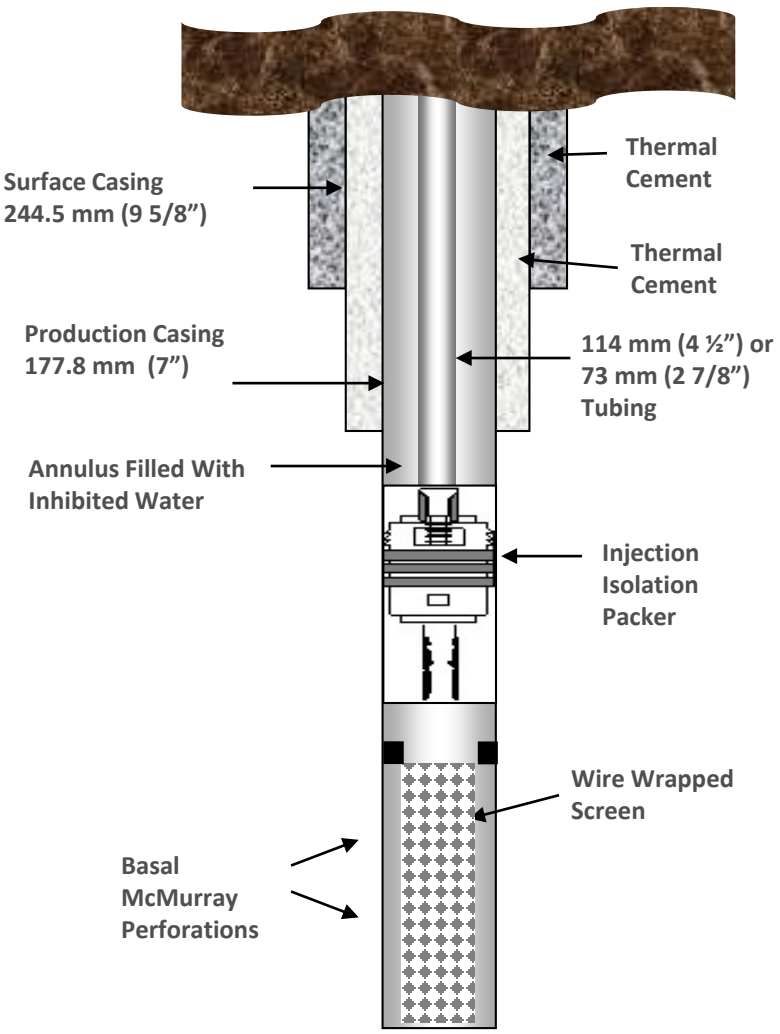
- 00, 02, and 03/09-14-075-06W4 (blowdown)
- 00 and 02/12-14-075-06W4 (regen)

Jackfish 2 disposal wells:

- 02 and 03/07-13-075-06W4 (blowdown)
- 02 and 04/12-15-075-06W4 (regen)

Jackfish 3 disposal wells:

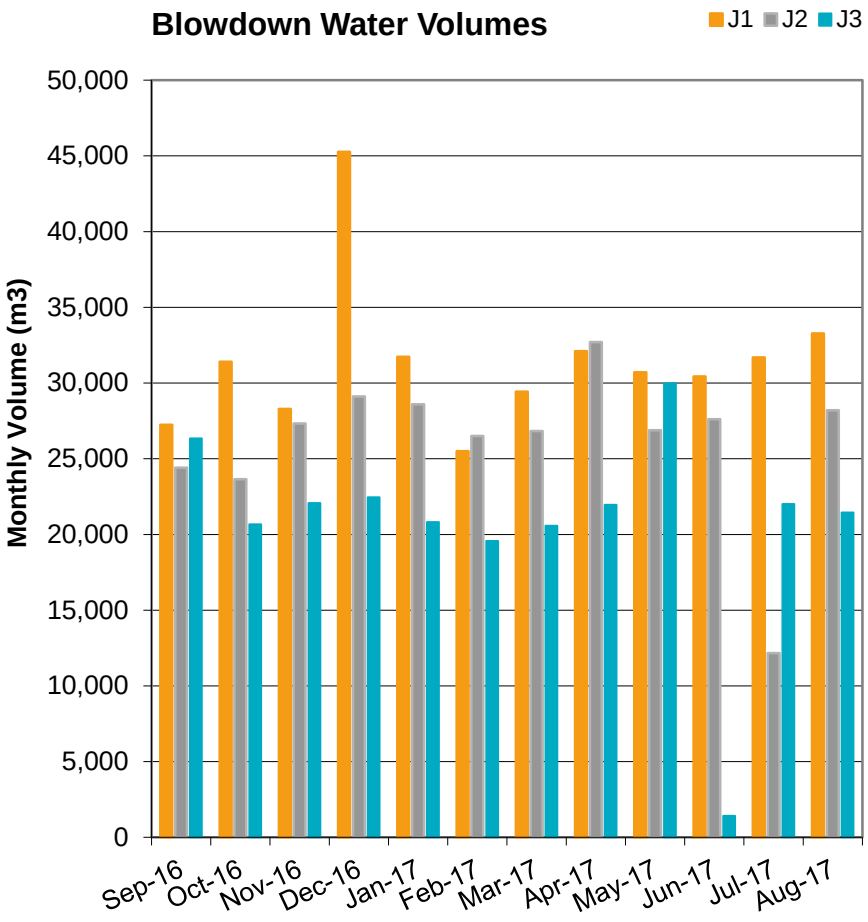
- 00 and 02/05-12-075-06W4 (blowdown)
- 00/03-22-075-06W4 (regen)

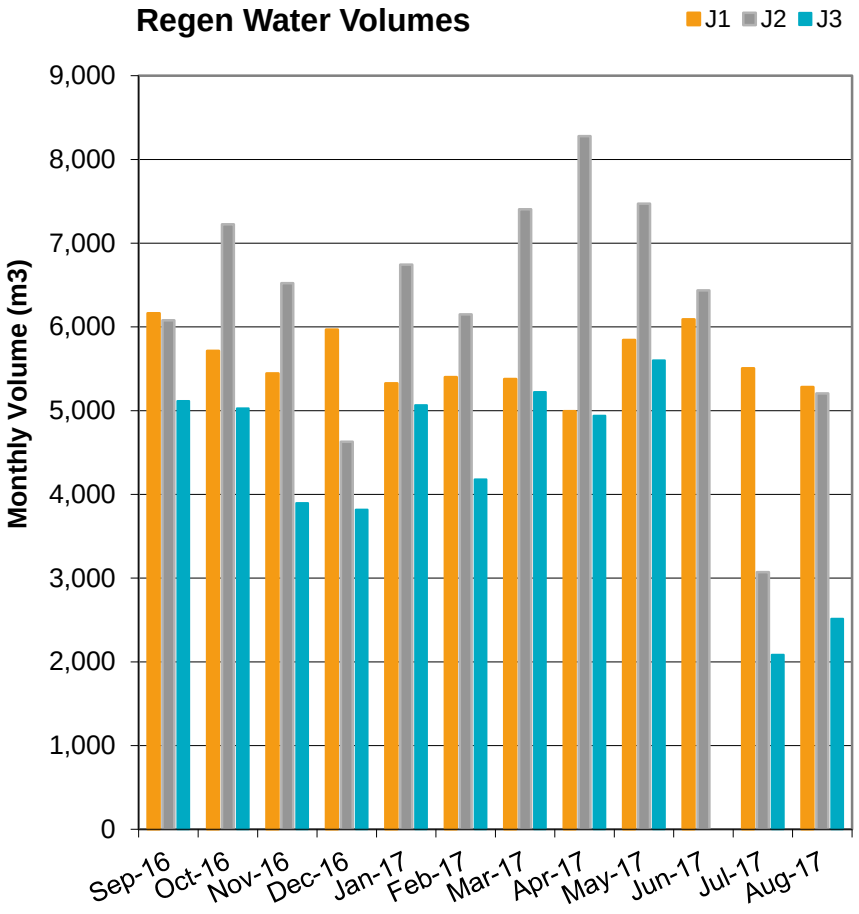


Water Disposal – Approval No. 10790

Volume Summary

3.1.2-4h

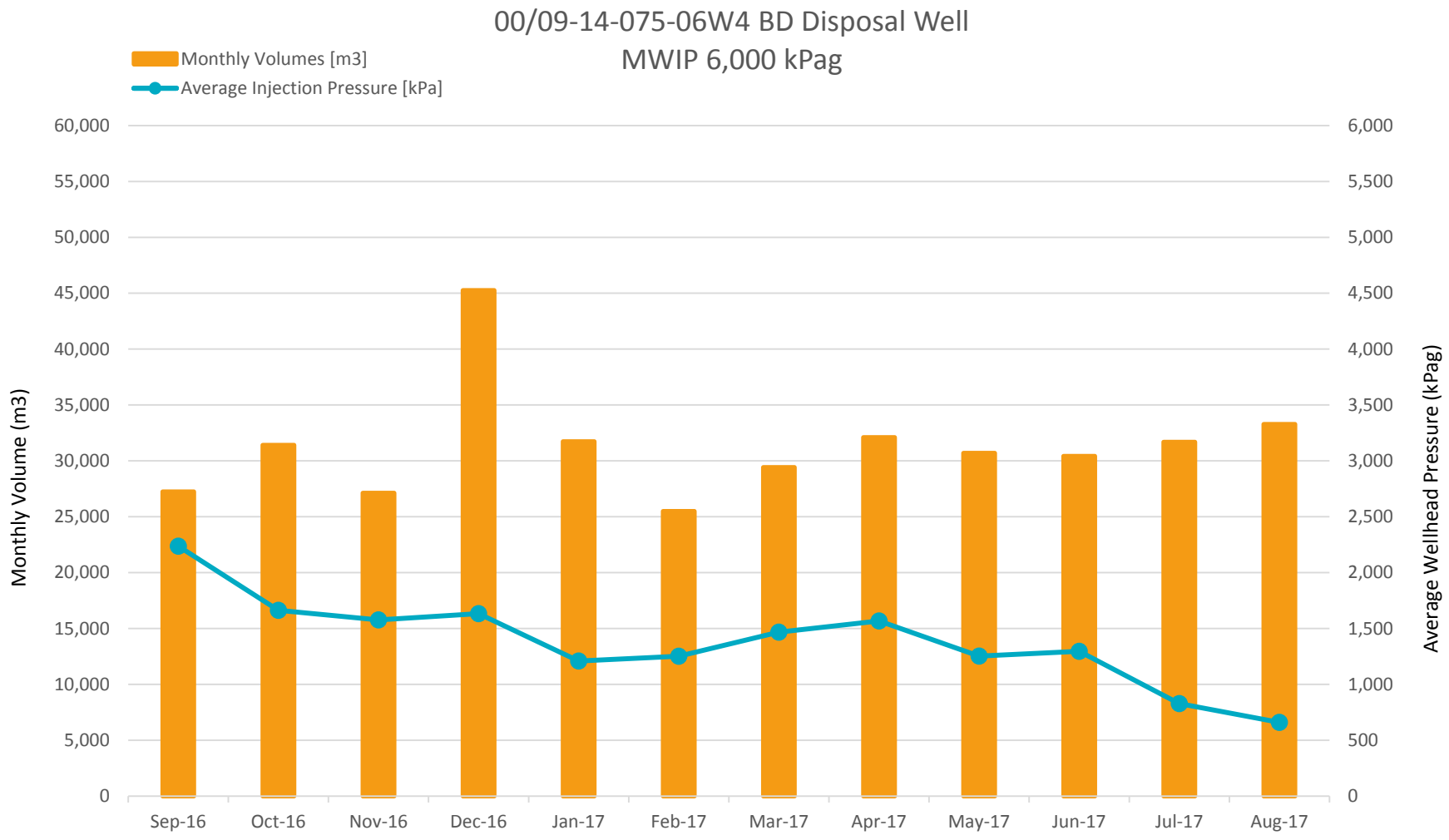




Water Disposal – Approval No. 10790

00/09-14-075-06W4

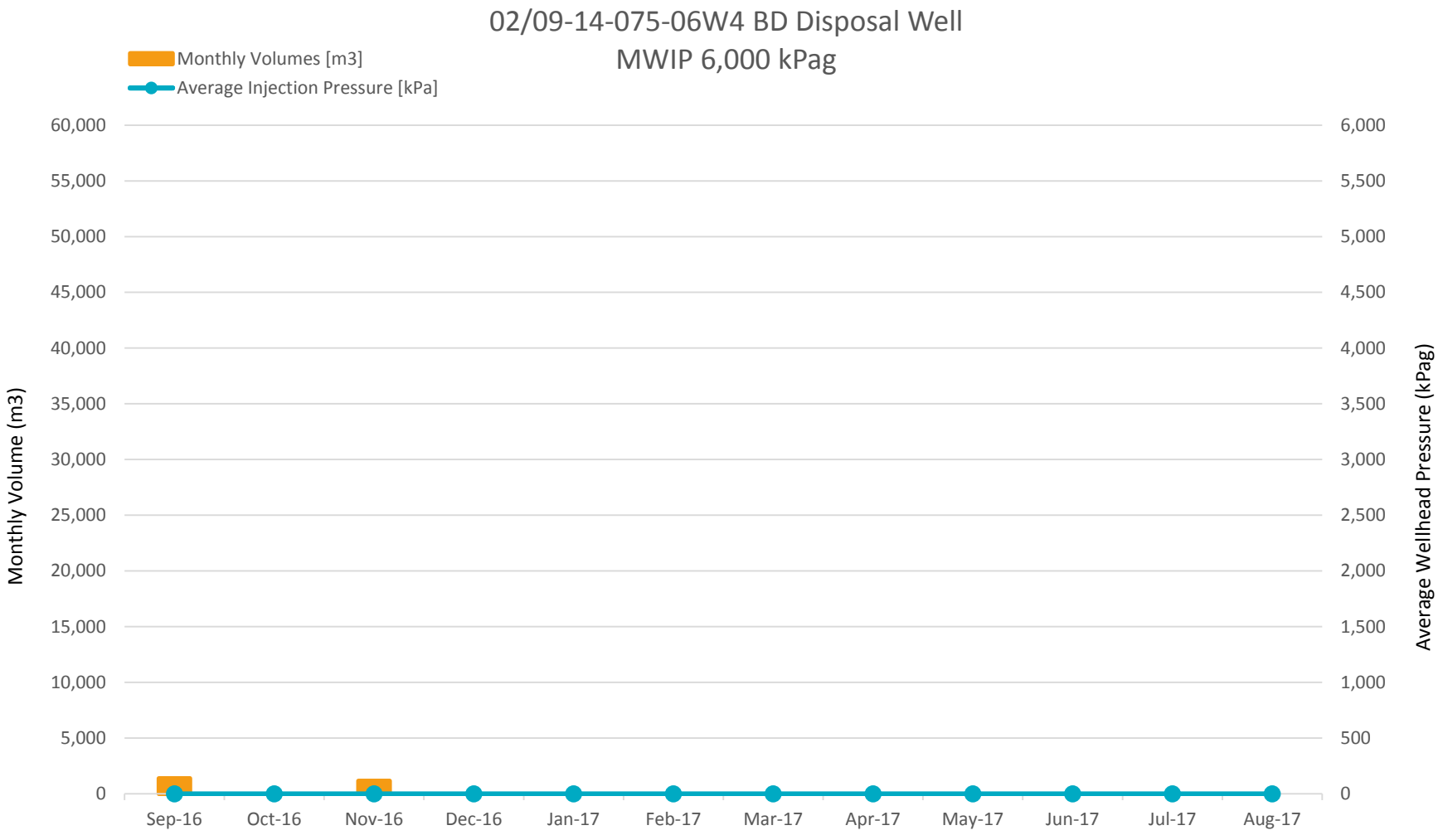
3.1.2-4h



Water Disposal – Approval No. 10790

02/09-14-075-06W4

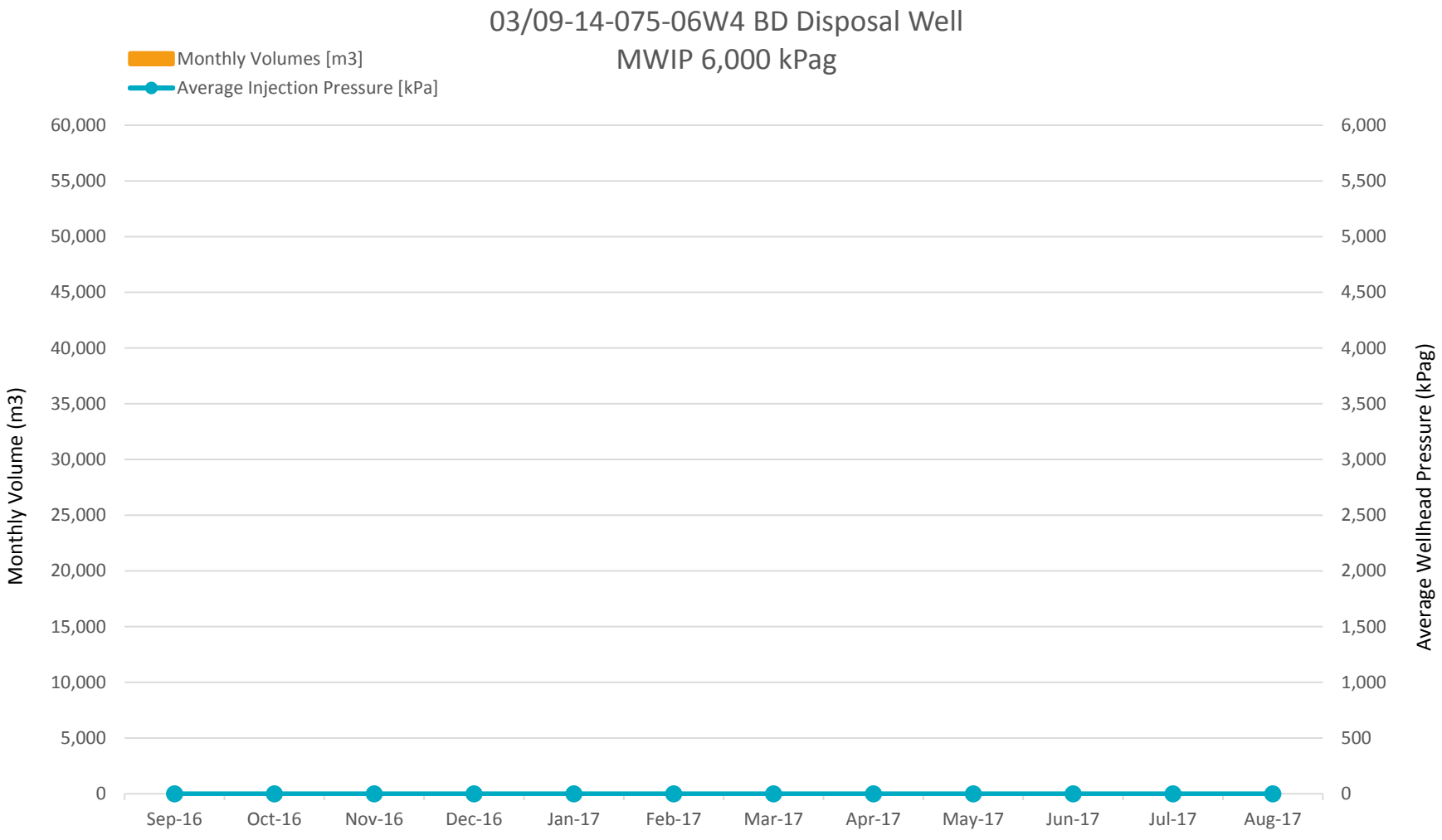
3.1.2-4h



Water Disposal – Approval No. 10790

03/09-14-075-06W4

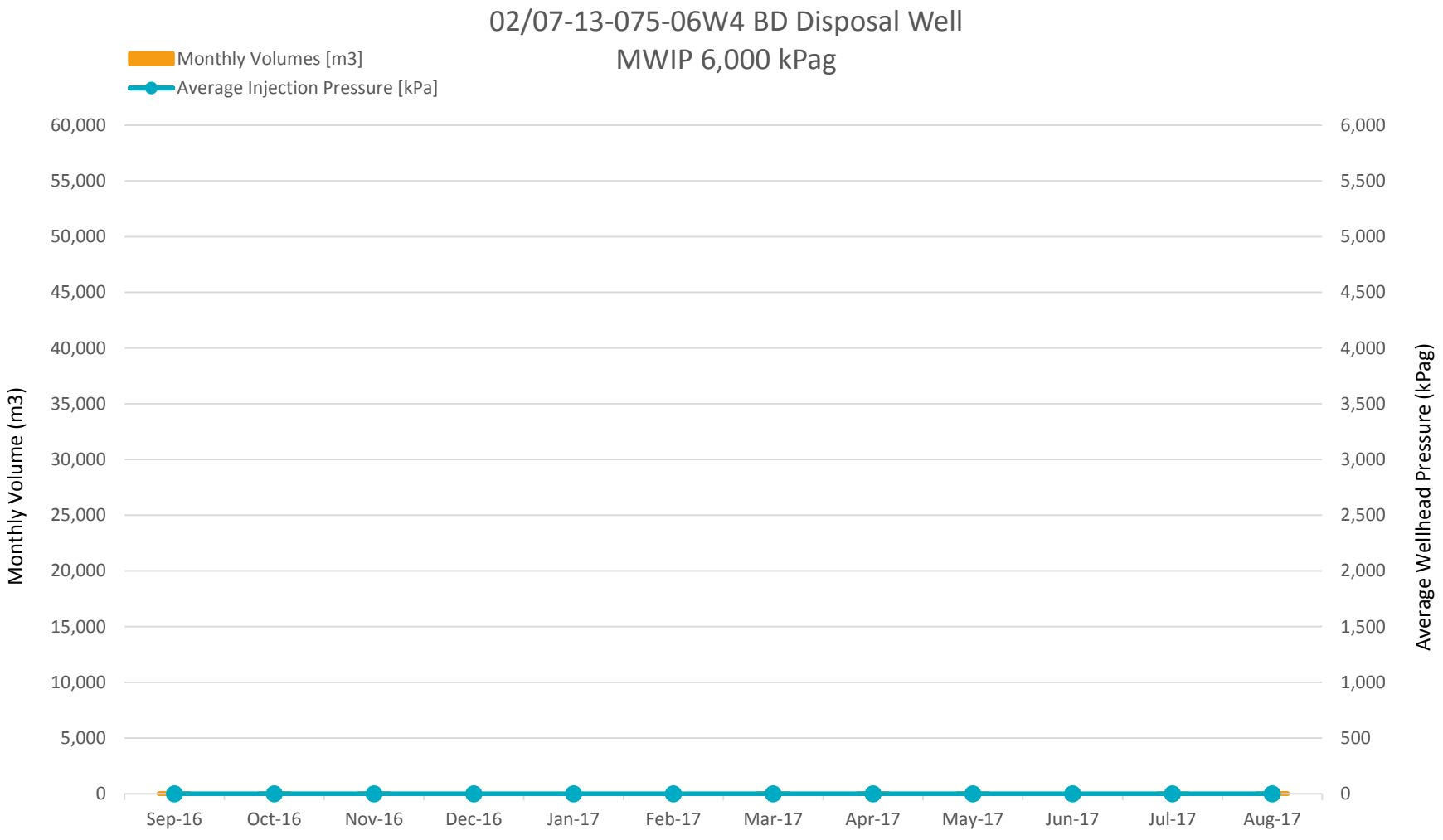
3.1.2-4h



Water Disposal – Approval No. 10790

02/07-13-075-06W4

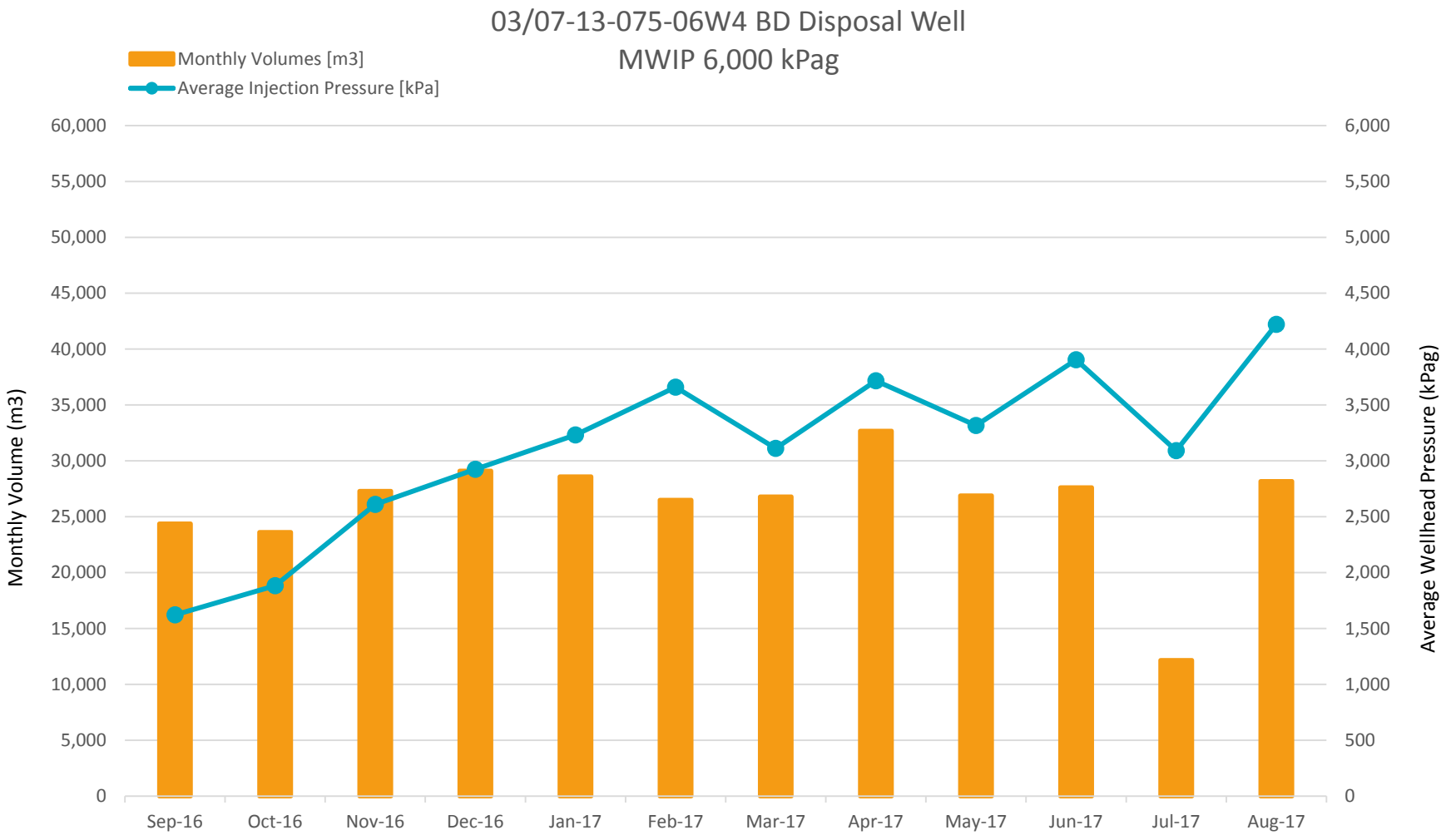
3.1.2-4h



Water Disposal – Approval No. 10790

03/07-13-075-06W4

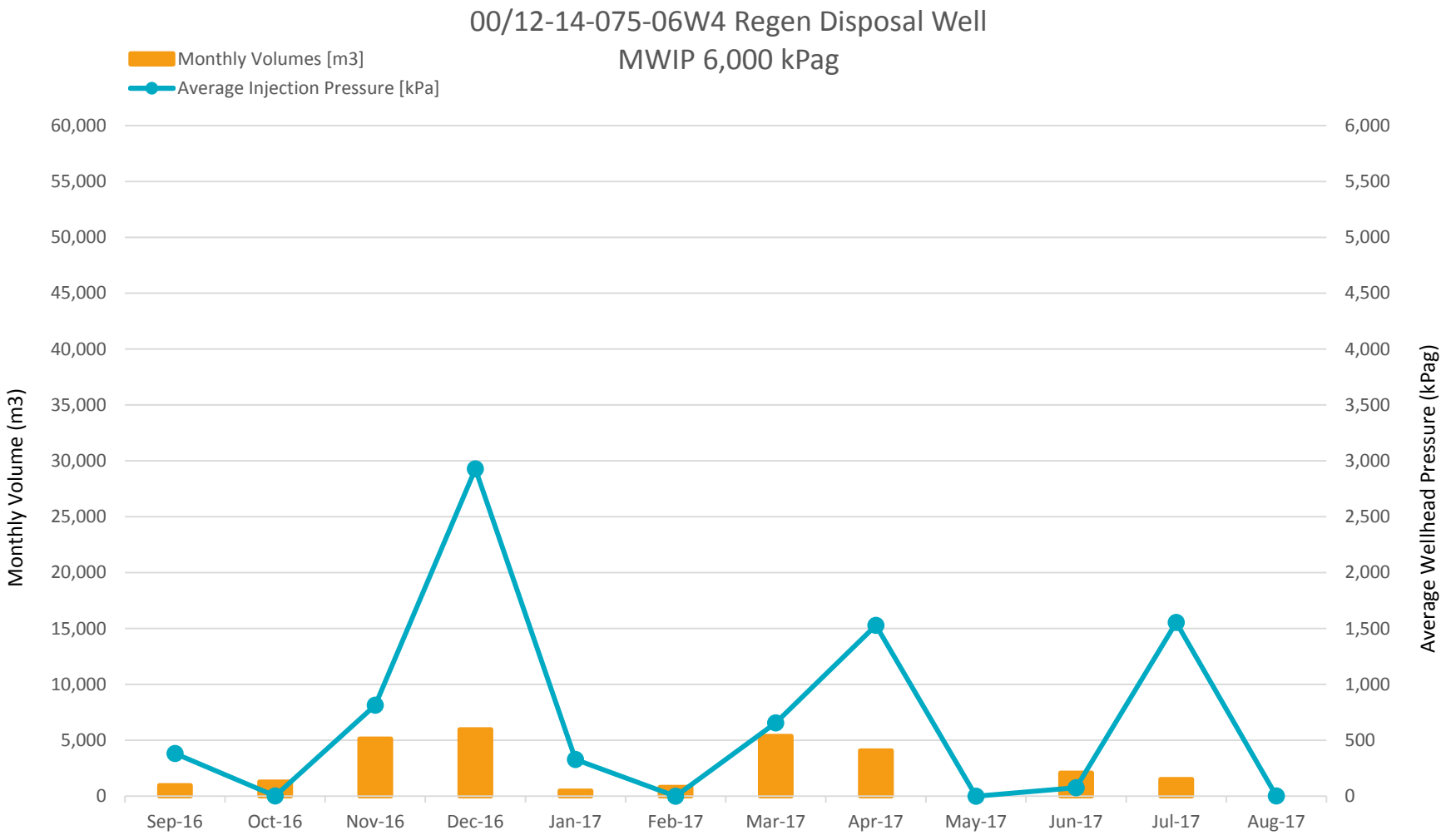
3.1.2-4h



Water Disposal – Approval No. 10790

00/12-14-075-06W4

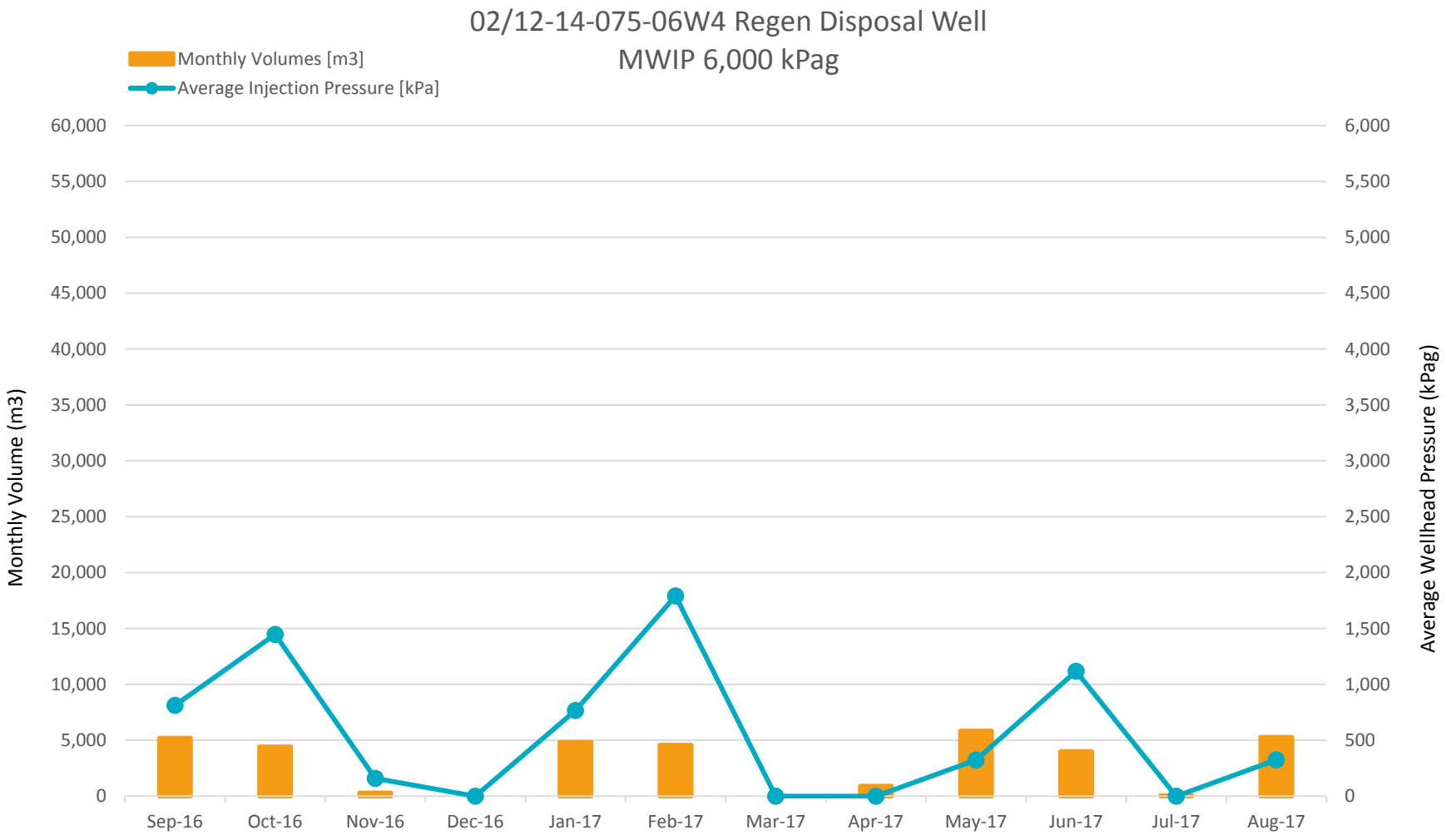
3.1.2-4h



Water Disposal – Approval No. 10790

02/12-14-075-06W4

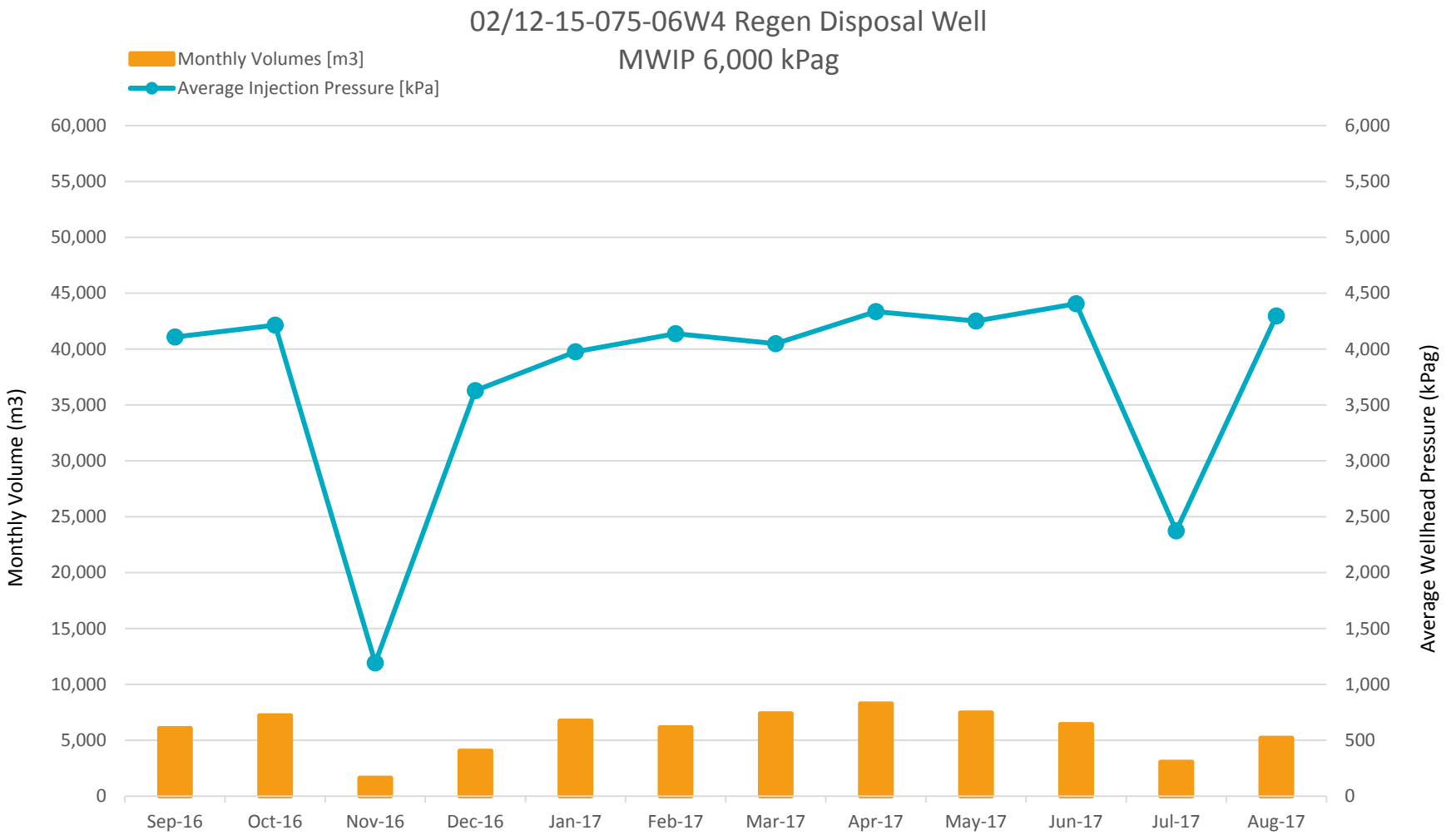
3.1.2-4h



Water Disposal – Approval No. 10790

02/12-15-075-06W4

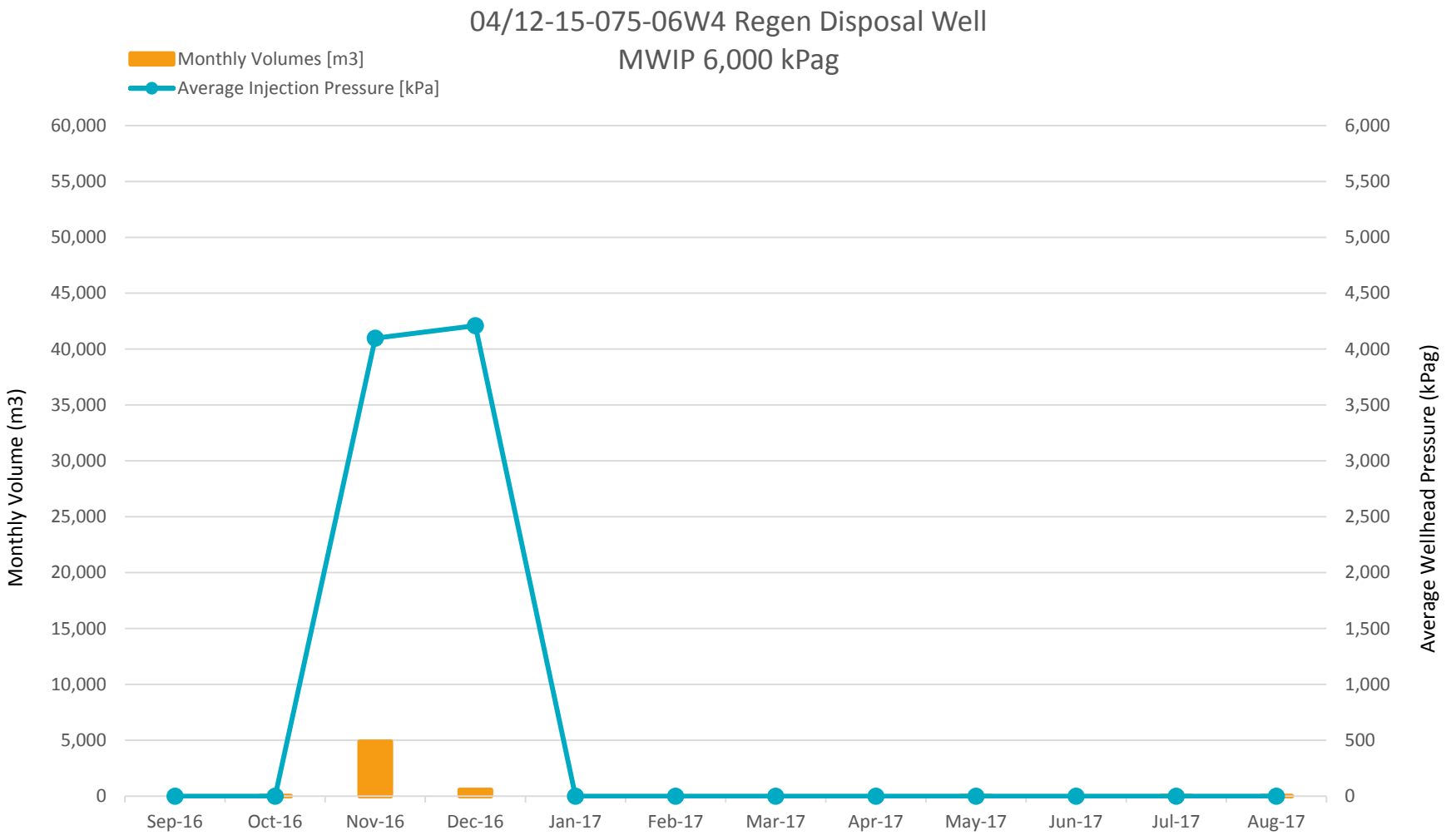
3.1.2-4h



Water Disposal – Approval No. 10790

04/12-15-075-06W4

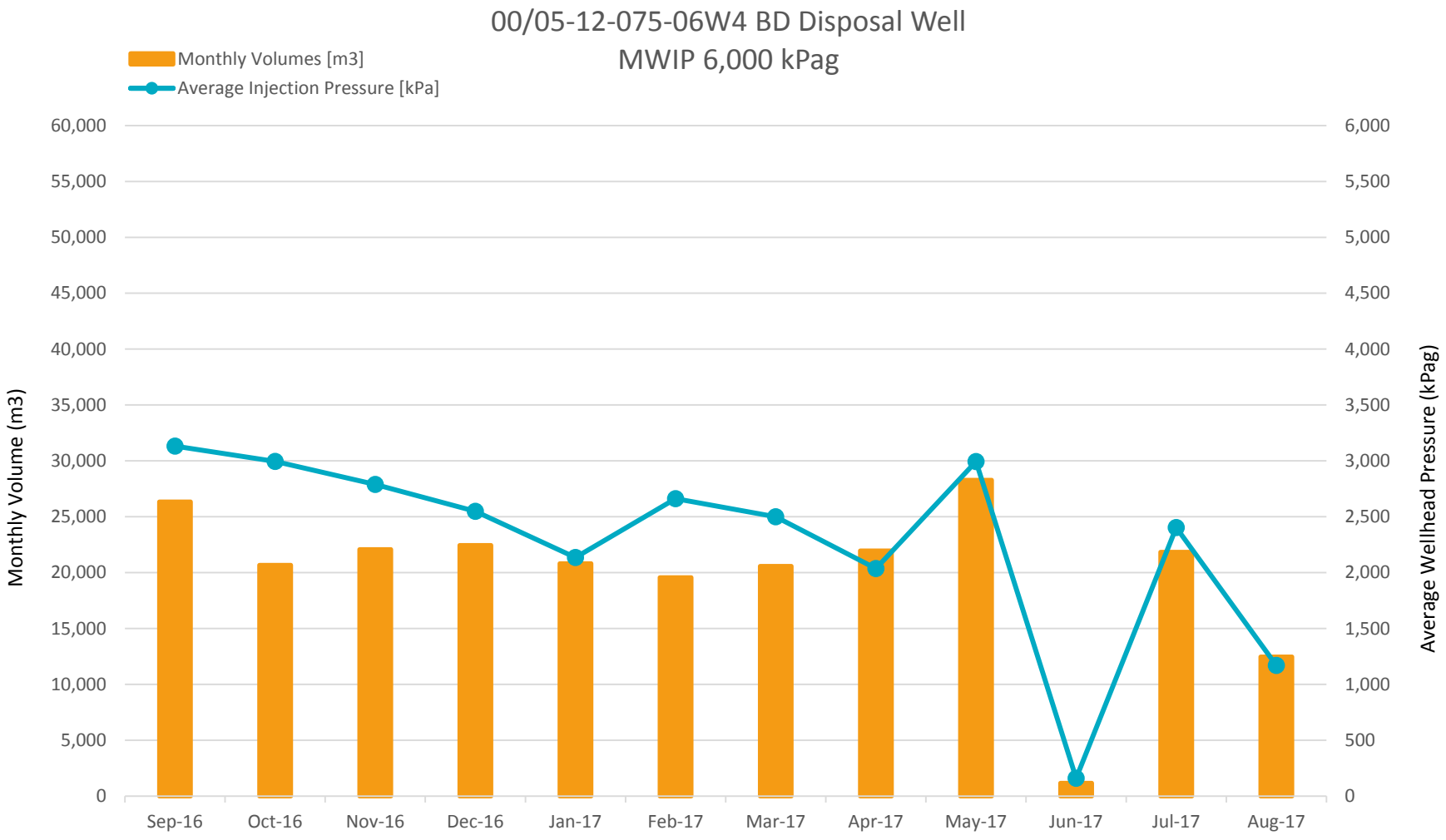
3.1.2-4h



Water Disposal – Approval No. 10790

00/05-12-075-06W4

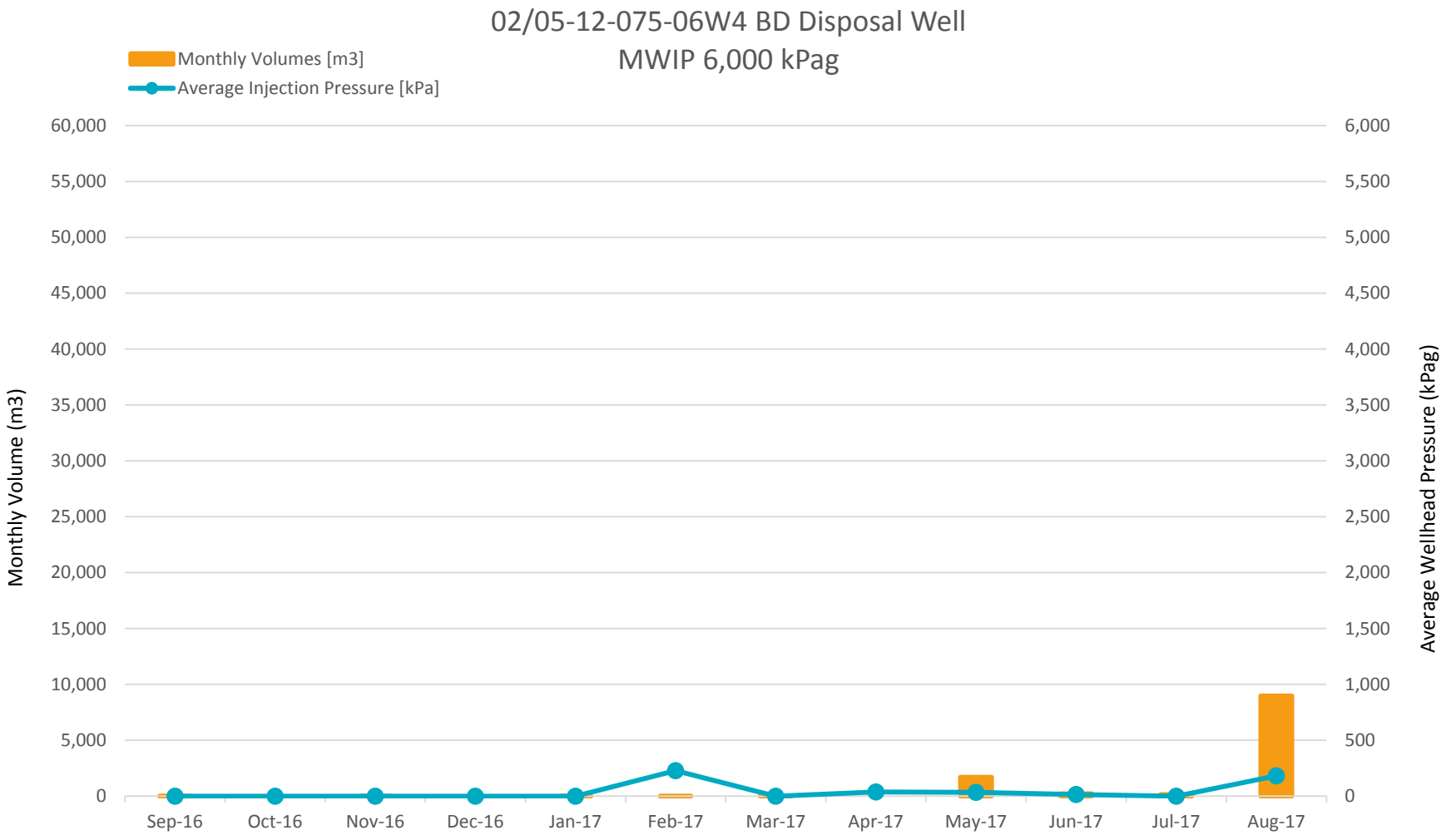
3.1.2-4h



Water Disposal – Approval No. 10790

02/05-12-075-06W4

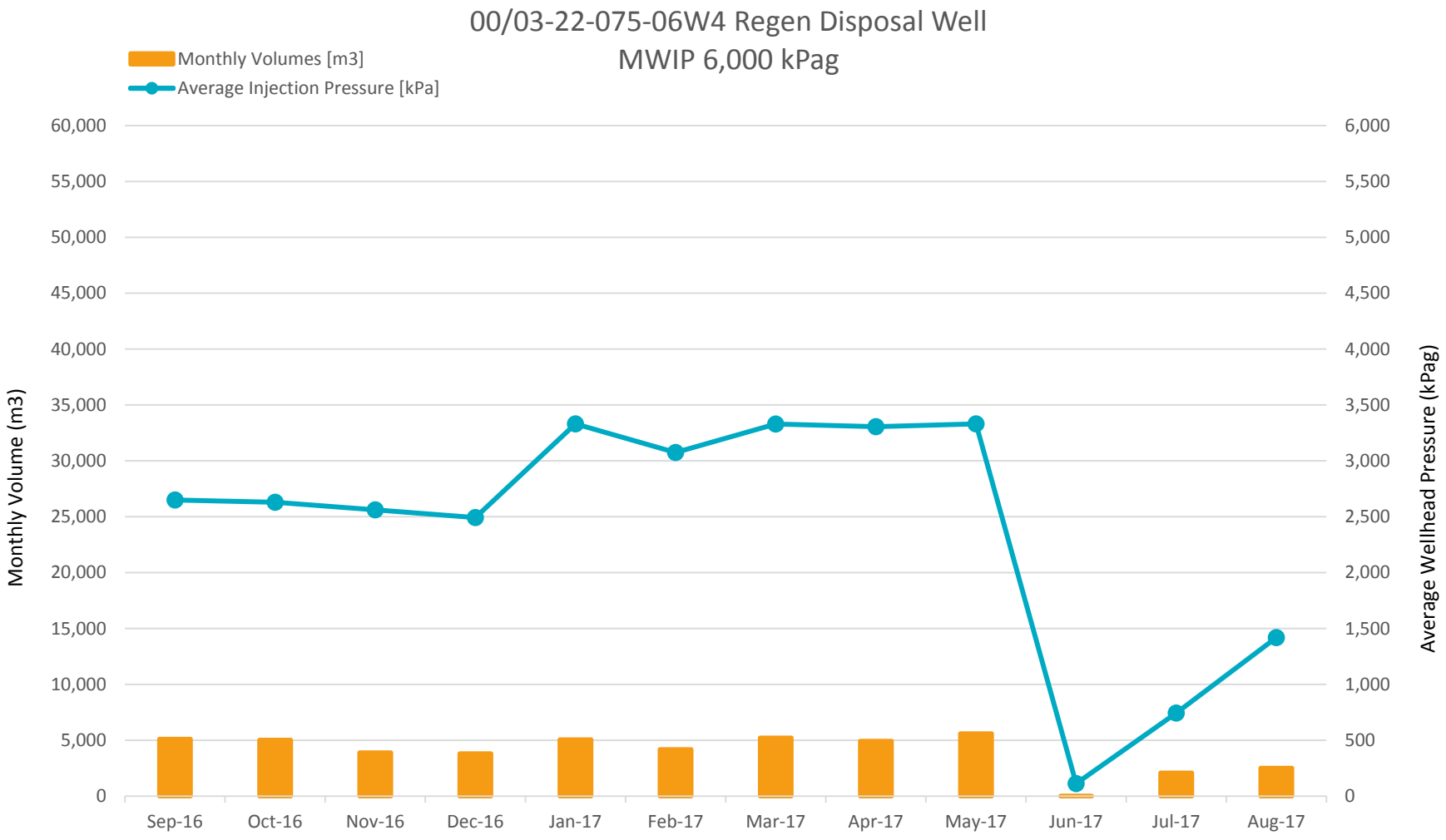
3.1.2-4h



Water Disposal – Approval No. 10790

00/03-22-075-06W4

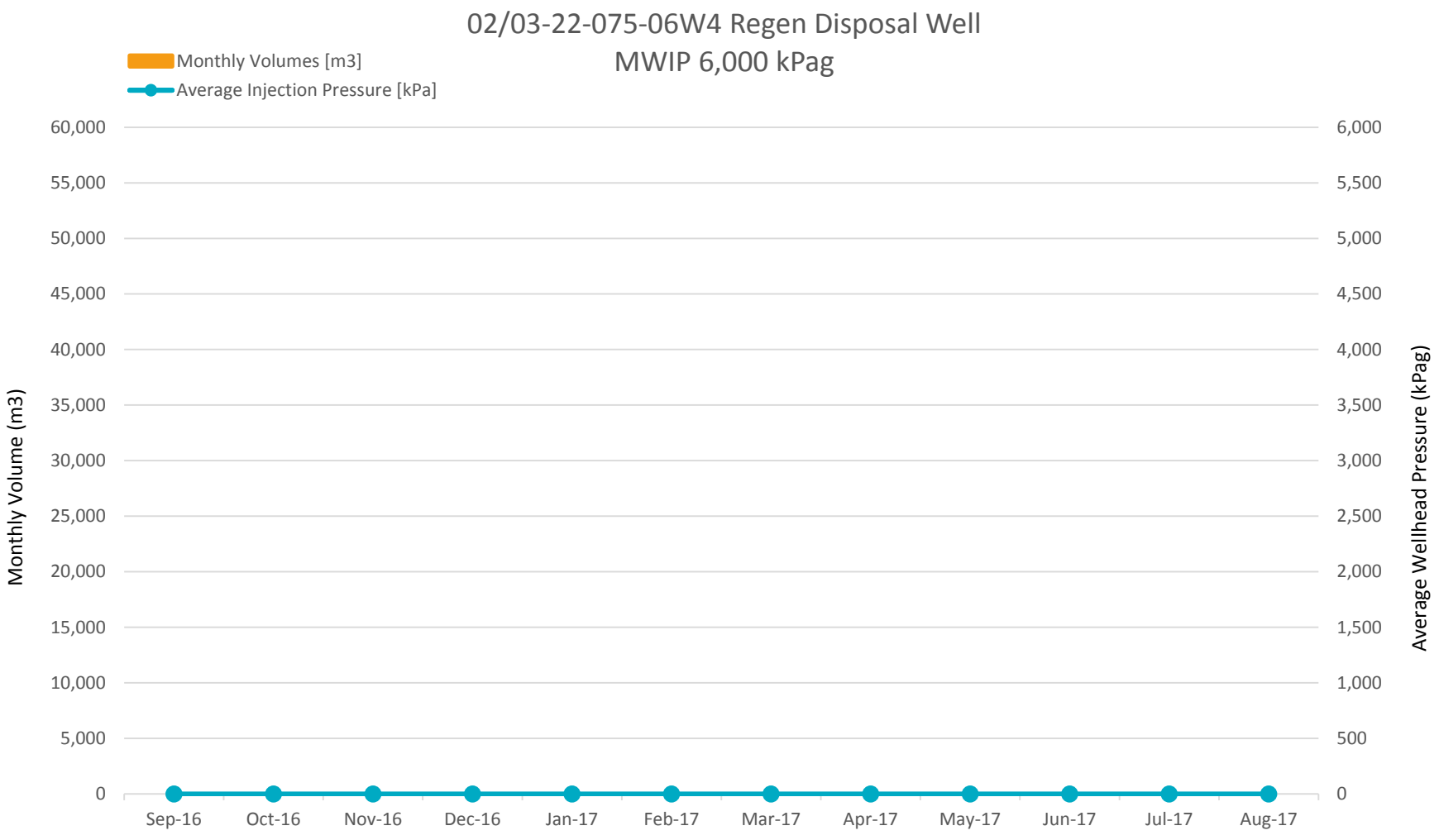
3.1.2-4h



Water Disposal – Approval No. 10790

02/03-22-075-06W4

3.1.2-4h



Off-site Water Disposal Volumes

3.1.2-4i

Facility	Volume (m^3)
White Swan Atmore Disposal Well	345
Tervita Lindberg	8,853
Newalta Kitscoty	125
Newalta Hughenden	284
Newalta Elkpoint	1,819
Cancen New Serepta Disposal	3,793
Newalta Fort McMurray	12,404
Ceiba Athabasca	2,693
White Swan Atmore Waste Management Facility	2,610
Secure Tulliby Lake Full Service Terminal	25
White Swan Conklin Waste Management Facility	8,474
Total	**41,424**

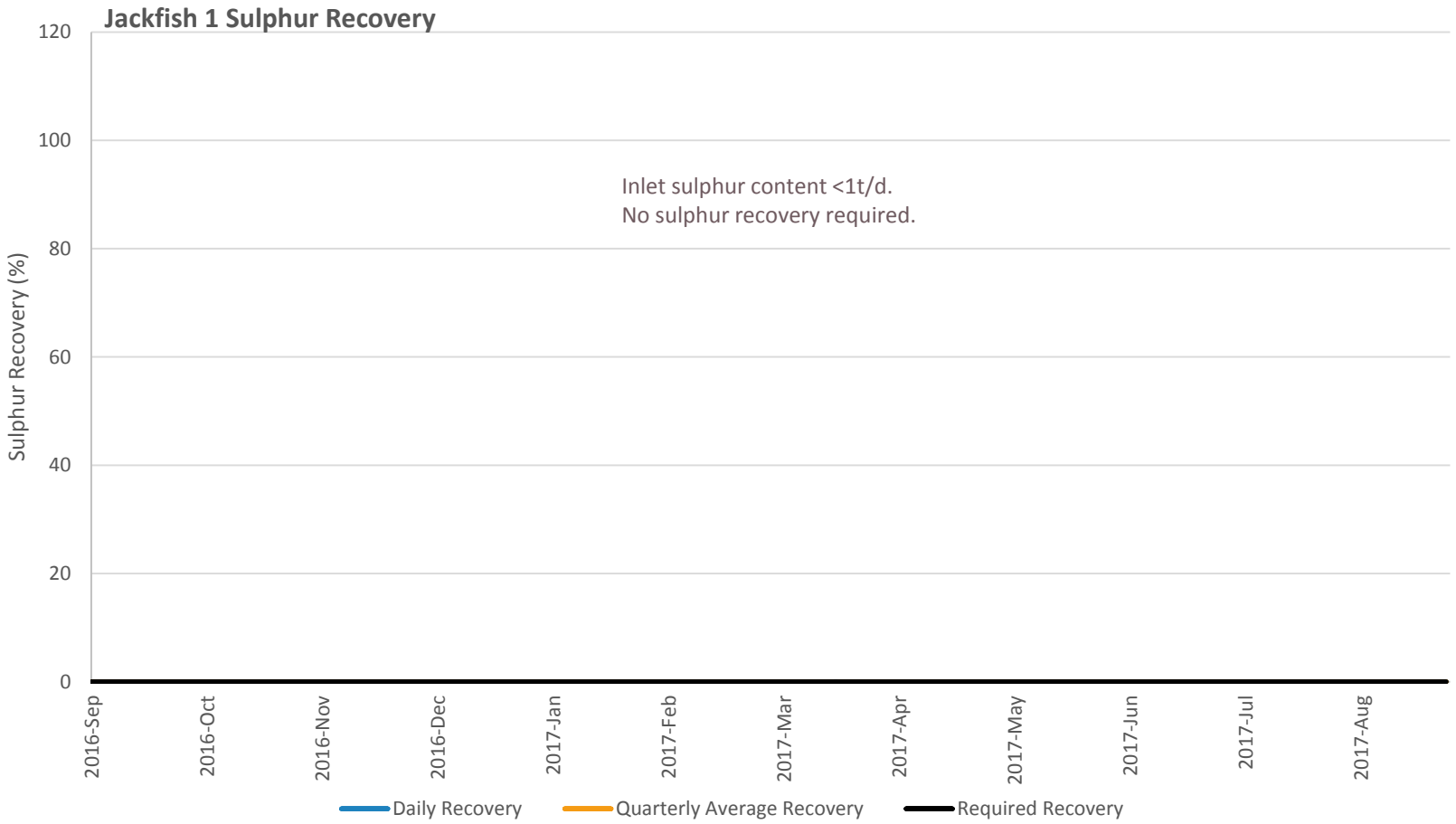
Sulphur Production and Air Emissions

Section 3.1.2-5

Sulphur Production

Operations with Sulphur Recovery

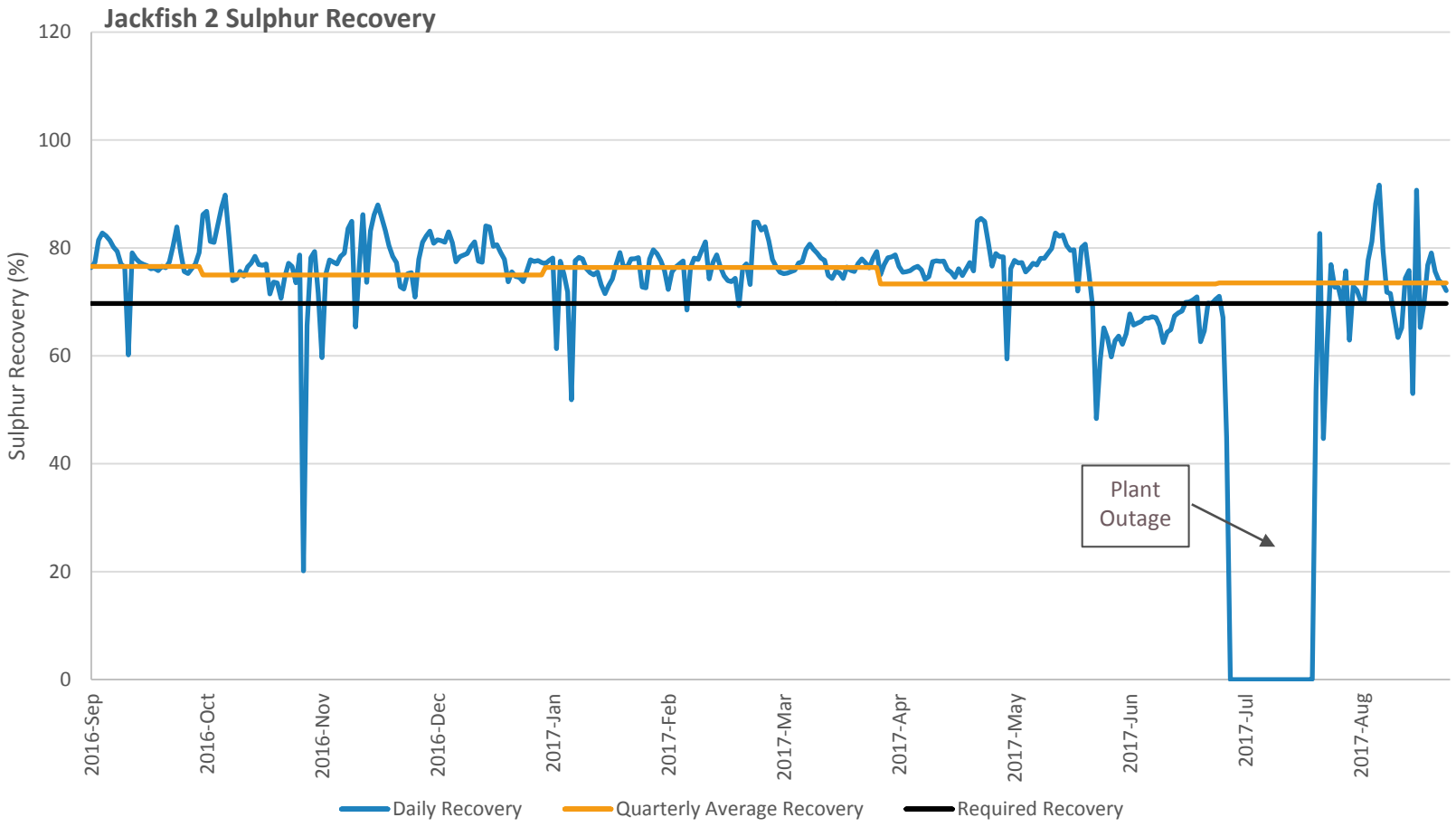
3.1.2-5a (i) and (ii)



Sulphur Production

Operations with Sulphur Recovery

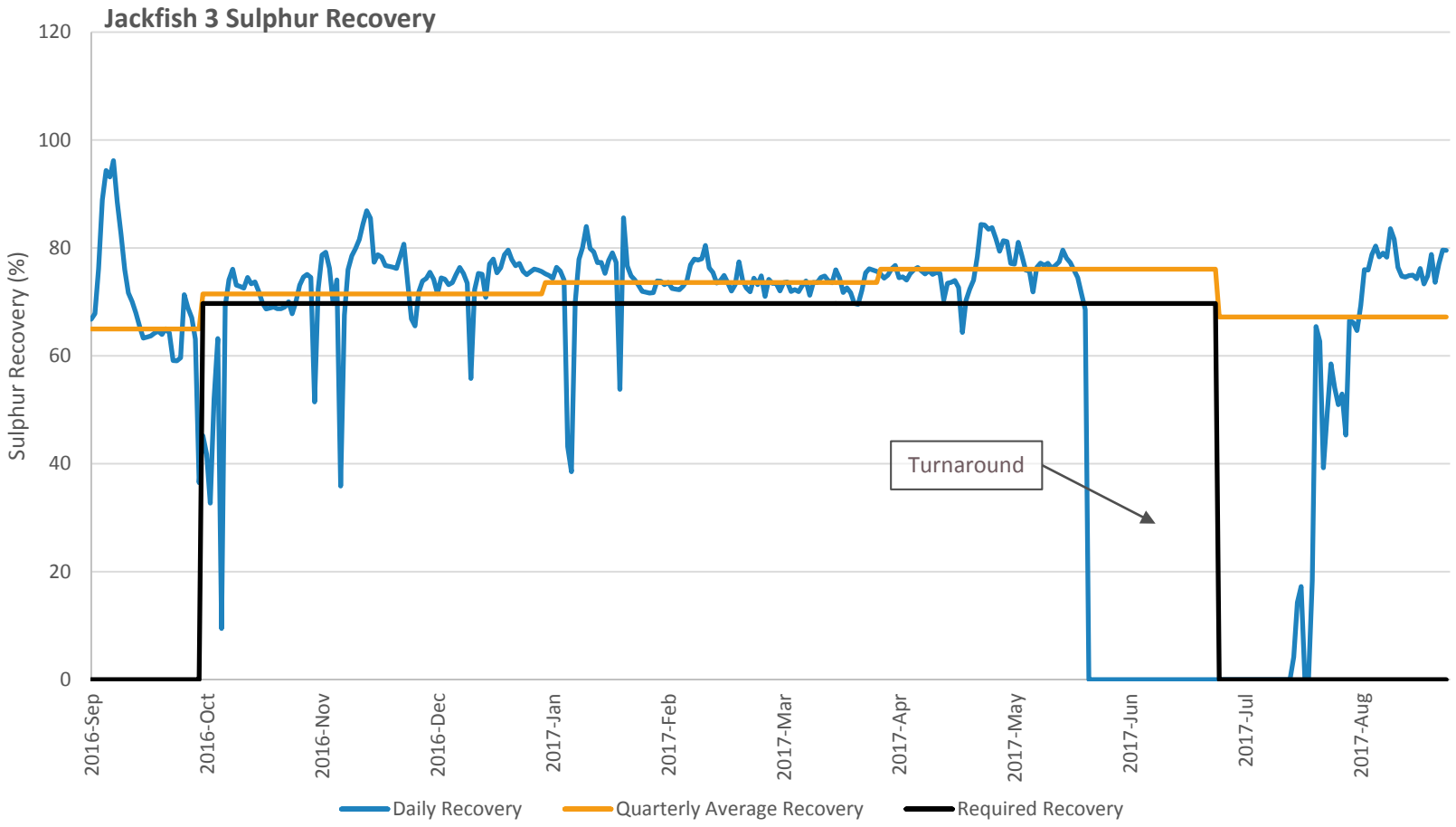
3.1.2-5a (i) and (ii)



Sulphur Production

Operations with Sulphur Recovery

3.1.2-5a (i) and (ii)

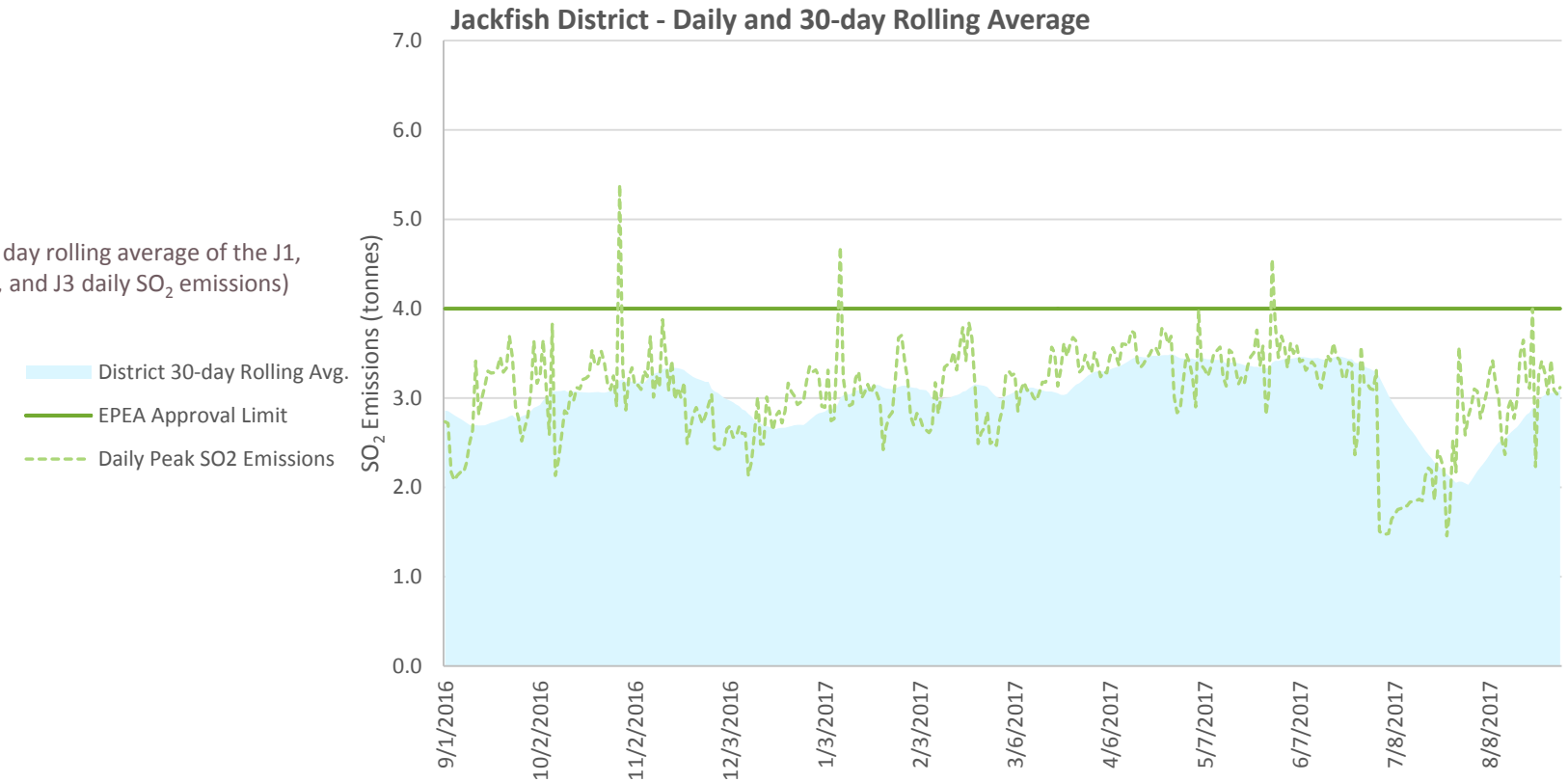


Sulphur Production

Peak Daily and Rolling Averages – SO_2 Emissions

3.1.2-5c

(30 day rolling average of the J1, J2, and J3 daily SO_2 emissions)



Notes:

- *The ID 2001-03 waiver was not used during the Sept. 2016 – Aug. 2017 period.*
- *Emissions above EPEA limit were the result of process upsets.*
- *All reporting required under the EPEA approval has been completed.*
- *Approval No. 224816-00-05 has since been granted to address sulphur emissions (received on October 11/2017).*

Ambient Air Quality Monitoring

3.1.2-5d

Passive air monitoring

- At minimum there are four passive stations located at each Jackfish site to monitor sulphur dioxide and hydrogen sulphide
- In September 2016, Devon was approved by the AER to relocate some of the passive monitoring stations to improve year-round accessibility
- Monitored parameters: sulphur dioxide and hydrogen sulphide

Continuous ambient monitoring

- Monitored parameters: sulphur dioxide, hydrogen sulphide, nitrogen dioxide, total hydrocarbons, wind speed, and direction

2016-2017 monitoring and reporting requirements were satisfactorily met

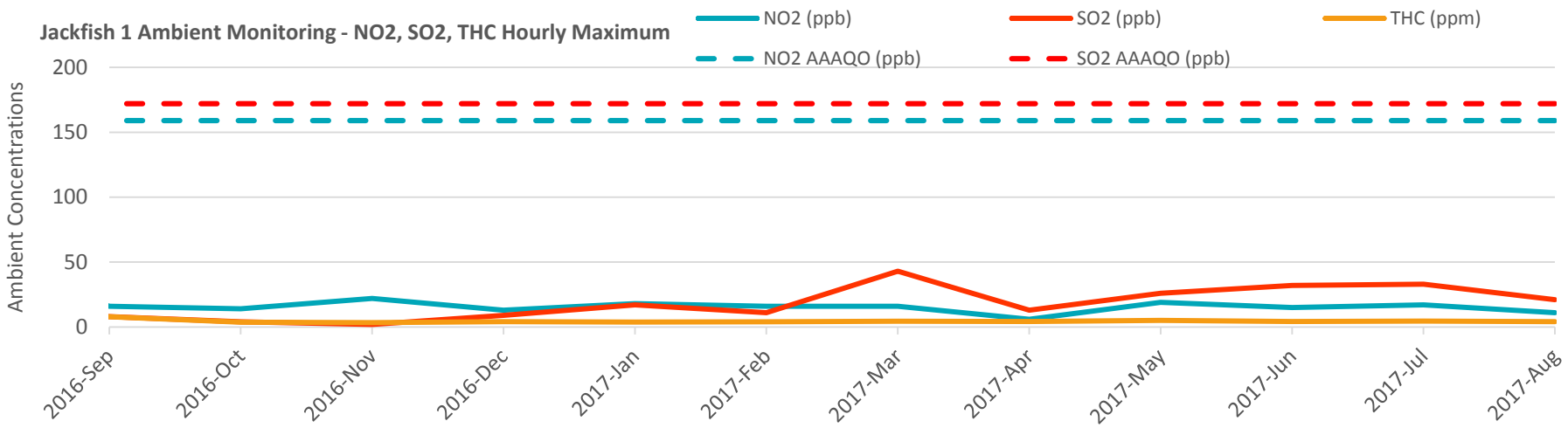
Ambient Air Quality Monitoring

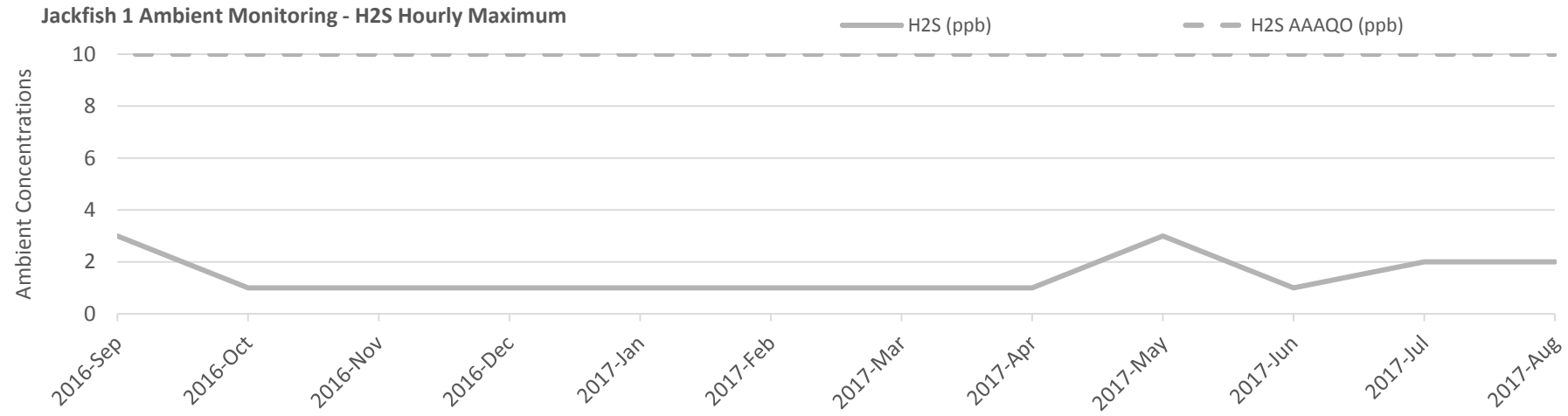
3.1.2-5d

Ambient Air Quality Monitoring

Jackfish 1 Results

3.1.2-5d

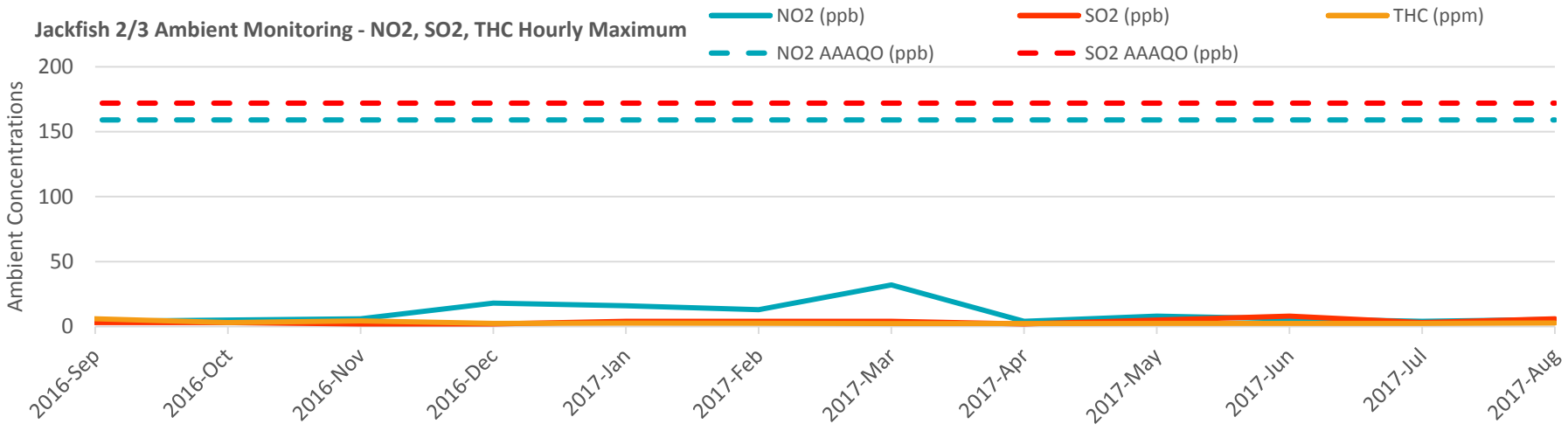


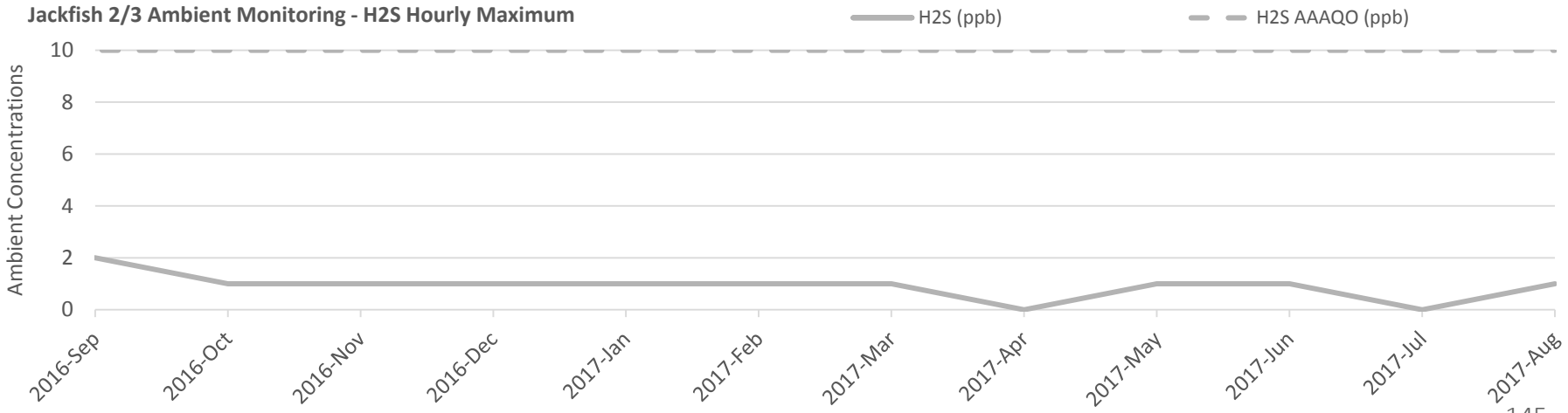


Ambient Air Quality Monitoring

Jackfish 2/3 Results

3.1.2-5d





Environmental Issues

Section 3.1.2-6

Environmental Issues
EPEA Notifications

3.1.2-6a

- District SO_2 Emission Limit Variances due to Operational Upsets
  - Devon currently has an application processing with the AER requesting temporary exceedances due to equipment failures or process upset conditions

- Jackfish 1 CEMS Downtime
  - Downtime caused by failure of the temperature probe (NO_x measurements were still recorded during this period)
  - AER approved Devon's proposal to use an alternate temperature probe located near the CEMS unit within the exhaust stack to allow for temperature measurement mitigation planning
  - Accuracy of the measurements taken with the alternate probe will be ensured by comparing them to reference method measurements taken during previously completed relative accuracy testing of the CEMS unit

AER Regulatory Approval Summary

3.1.2-6b

D78 Amendments – September 2016 to August 2017

* Indicates current approval as of August 31, 2017

Amendment			Category
Revised Annual Average Production	November 4/2016	10097HH	2
Jackfish Maximum Operating Pressure	November 21/2016	10097II	2
Temporary Waiver ID 2001-03	November 21/2016	10097JJ	2
Pad R Revised Well Trajectories	April 20/2017	10097KK	2
Pad D Sub-Producer Horizontal Well	May 26/2017	10097LL	2
Pad E Expansion (Pad EX)	July 11/2017	10097MM	3
Pad TT Proposal	Under Review		2
Pad MM Proposal	Under Review		2

AER Regulatory Approval Summary

3.1.2-6b

D56 Facilities Licences

- Changes to licence inlet and emission rates at the following facilities:
  - Jackfish 1 CPF (F33125)
  - Jackfish 2 CPF (F39950)
  - Jackfish 3 CPF (F44113)

D65 Disposal Approval No. 10790

- Amended to include 102/12-05-076-06W4 disposal well (Application No. 1870924)

AER Regulatory Approval Summary

Jackfish Class II Landfill

3.1.2-6b

D58 Approval WM 105 E

Date Issued	Approval To:
Nov 16, 2016	• One time approval to accept contaminated soil from Devon Leismer 15-33-077-06W4 lease • One time approval to accept OSE waste from the Devon Pike and Jackfish West Project Areas
Dec 16, 2016	• One time approval to accept contaminated soil from the Devon NE Gas Project Area
Jan 4, 2017	• One time approval to accept contaminated soil from Devon Leismer B Facility at 15-23-077-09W4
May 17, 2017	• One time approval to accept contaminated soil from Devon Kirby North Facility at 12-08-074-05W4
May 24, 2017	• One time approval to accept contaminated soil from Devon Leismer B Facility at 15-23-077-09W4

AER Regulatory Approval Summary

Jackfish District

3.1.2-6b

EPEA Operating Approval No. 00224816-00 (as amended)

- Application submitted for SO_2 limit amendment (July 2017)
- EPEA renewal application submitted (August 2017)

Water Diversion Licences

- No amendments

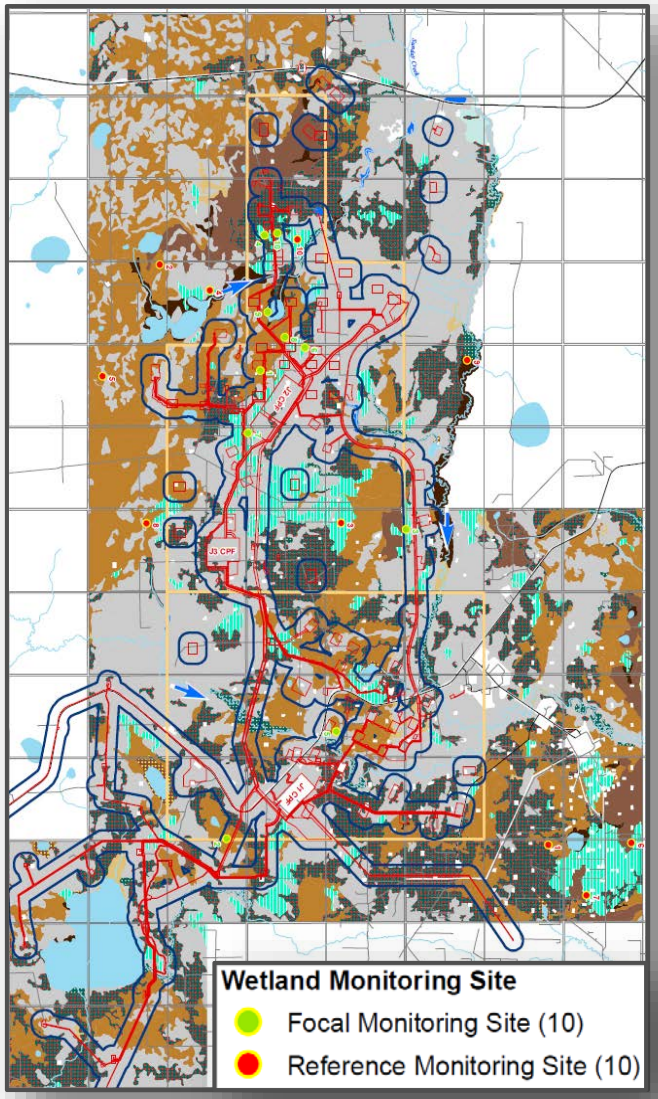
AER Regulatory Reporting Requirements

3.1.2-6c

- Industrial Wastewater and Industrial Runoff Report
- Groundwater Monitoring Report
- Wetland Monitoring Report
- Potable Water Monitoring Report
- Air Monitoring Report
- Soil Management Report
- Soil Monitoring Report
- Conservation and Reclamation Annual Report
- Wildlife Mitigation and Monitoring Program
- Caribou Mitigation and Monitoring Program

Water Management
Jackfish 1, 2, and 3

3.1.2-7c



Groundwater

- Jackfish 1, 2, and 3 groundwater monitoring twice yearly at CPF, well pads, and tank farm as per EPEA approval

- Minor issues to date include:
  - Slightly elevated chlorides due to de-icing agents and dust suppressants
  - Trace hydrocarbons identified at a single well downgradient of Jackfish 2, as result of an isolated spill in 2015
  - Rebalancing of water table below Jackfish 1 CPF

Wetlands

- Wetland monitoring program amendment approved by AER (September 2016)
- Wetland monitoring sites were surveyed in Q2 and Q3 2017
- No significant impacts observed to date

Soil Monitoring and Soil Management

Jackfish 1, 2 and 3

3.1.2-6c

- Jackfish 1 soil monitoring report submitted in 2011
  - Soil management report was not required
- Jackfish 2 soil monitoring report submitted 2012
  - Soil management report submitted 2013, 2014, and 2015
- District soil monitoring proposal for Jackfish 1, 2, and 3 was submitted November 2016
  - District soil monitoring report will be submitted November 2017

Environmental Monitoring and Progress

Wildlife Monitoring

3.1.2-7c

- As per EPEA approval condition, Devon's Jackfish Wildlife Monitoring Program was authorized in July 2012
- First comprehensive wildlife report was submitted July 2015
- Long term monitoring ongoing
- No significant project related impacts observed to date

Regional and Other Initiatives

3.1.2-6d

- Christina Lake Regional Water Management Agreement (CLRWMA)
- Canada's Oil Sands Innovation Alliance (COSIA)
- Alberta Biodiversity Monitoring Institute (ABMI)
- Regional Aquatics Monitoring Program (RAMP)
- Monitoring Avian Productivity and Survivorship (MAPS Program)
- Regional Industry Caribou Collaboration (RICC)
- Clean Air Strategic Alliance (CASA)
- Wood Buffalo Environmental Association (WBEA)
- Oil Sands Environmental Monitoring Program, within the Environmental Monitoring and Science Division (EMSD)

Other Environmental Initiatives

3.1.2-7d

Canada's Oil Sands Innovation Alliance (COSIA)

- Devon is an active participant of the Water, Land, and greenhouse gas (GHG) Environmental Priority Areas (EPAs) and the COSIA Monitoring Working Group
- Aspirations for each EPA have been developed and Devon is striving to:
  - GHG: Produce oil with lower GHG emissions than other sources of oil
  - Land: Be world leaders in land management, restoring the land and preserving biodiversity of plants and animals
  - Water: Be world leaders in water management, producing Canadian energy with no adverse impact on water
- Devon is either leading or participating in Joint Industry Projects in each of the EPAs

Other Environmental Initiatives

3.1.2-7d

Monitoring Avian Productivity and Survivorship (MAPS Program)

- Continued annual support (technical and financial) of the MAPS Program
- This program analyzes the influence of industry throughout NE Alberta on productivity and survivorship of migratory birds

Regional Industry Caribou Collaboration (RICC)

- Devon is leading a consortium of organizations in implementing a collaborative caribou conservation program for the Cold Lake Range, which includes the Jackfish and Pike areas
- This program focuses on:
  - Managing and reducing industry's current and future footprint
  - Monitoring wildlife use of linear features
  - Identifying effective techniques to reduce wolf and bear movements throughout the caribou habitat

Regulatory Compliance

Section 3.1.2-7, -8

Statement of Compliance

3.1.2-7

Devon Canada Corporation believes the Jackfish Project is in compliance with AER approvals and regulatory requirements. As of August 31/2017, Devon has no unaddressed non-compliant events.

Summary of Spill Releases

September 1/2016 – August 31/2017

3.1.2-8

The following list summarizes spills reported to the AER within the reporting period.

AER Spill Reporting		
Site	No. of Reportable Spills	Volume Released (m^3)
Jackfish 1	4	40.5
Jackfish 2	5	68.4
Jackfish 3	3	55.5

AER Summary of Noncompliance

September 1/2016 – August 31/2017

3.1.2-8

The following list summarizes non-compliant events within the reporting period. For all events corrective actions were identified and tracked to completion.

Date	Event	Corrective Actions
September 2016	Notice of Noncompliance re: missed deadline to update SCVF/GM in DDS	Clerical issue for not reporting on time was resolved.
September 2016	Notice of Noncompliance re: J1 injection facility water imbalance 2015-2016	Update: Source water meter relocation completed in September 2017 has significantly improved the water balance.
October 2016	Notice of Noncompliance re: unauthorized activity related to Surface Material Licences (SMC's)	Devon obtained TFAs and conducted necessary remedial work at three locations.
March 2017	Notice of Noncompliance re: well data deficiencies	Devon submitted required information and is working with vendors to ensure more timely data submission.
August 2017	Notice of P&NG Rights expiry for one well	DOE linked wellbore to an active mineral agreement.

Approved Variance Requests
September 1/2016 – August 31/2017

3.1.2-8

The following waiver or variance requests were approved by the AER within the reporting period.

Date	Waiver/Variance Description
September 2016	Authorization for alternative steam measurement at Jackfish 1, 2, and 3 due to failure of primary steam meters. Approval extended to December 31/2017.
August 2017	Authorization to defer until pad abandonment repair of failed intermediate casing at B3i

Future Plans

Section 3.1.2-9

Future Plans (2017 – 2018)

Surface Operations

3.1.2-9a, b, c, d

Jackfish 1

- Plant maintenance turnaround planned for 2018

Jackfish 2 and 3

- Fourth LSF installation to improve water treatment reliability

Thank you.