

# 2019 Directive 054 Performance Presentation

Seal Scheme Approval No. 11320F  
October 9, 2019

# Agenda

## Subsurface

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1. Overview
2. Geology / Geoscience
3. Drilling and Completions
4. Scheme Performance
5. Injection Pressures
6. Future Plans

# Agenda

## Surface

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1. Facilities
2. Measurement and Reporting
3. Water Usage
4. Regulatory

# Subsurface

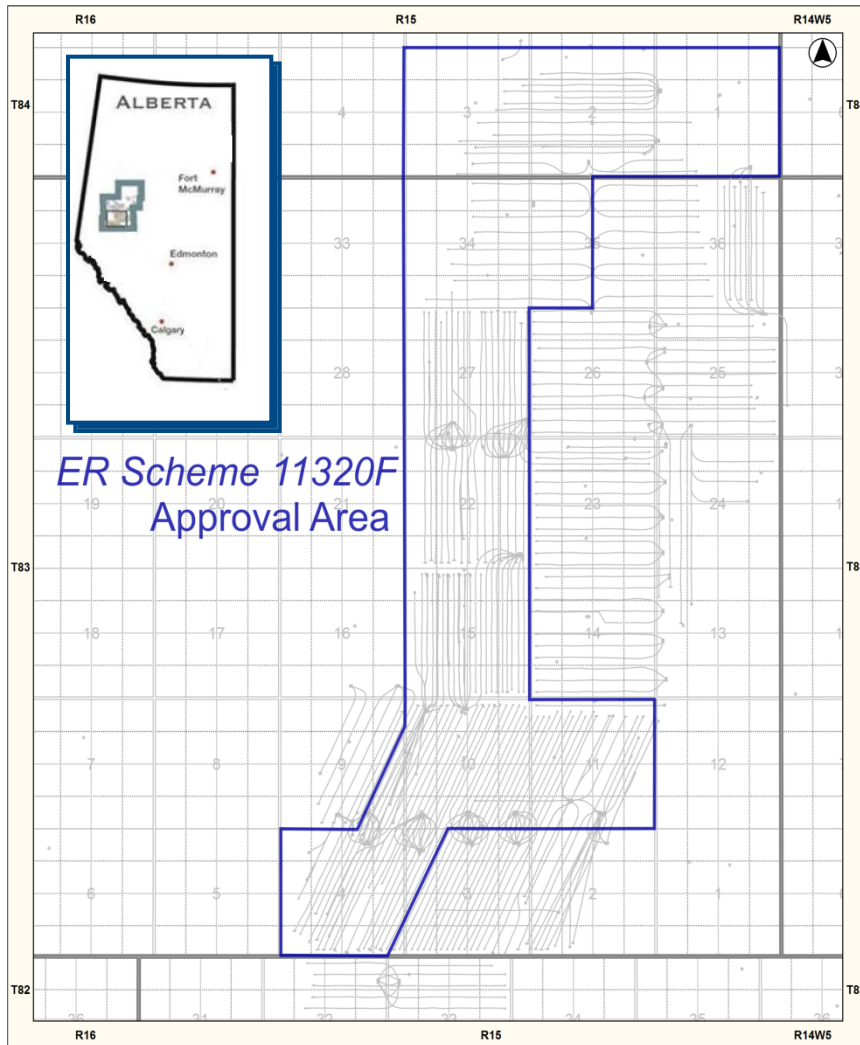


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# 1. Overview

## Background

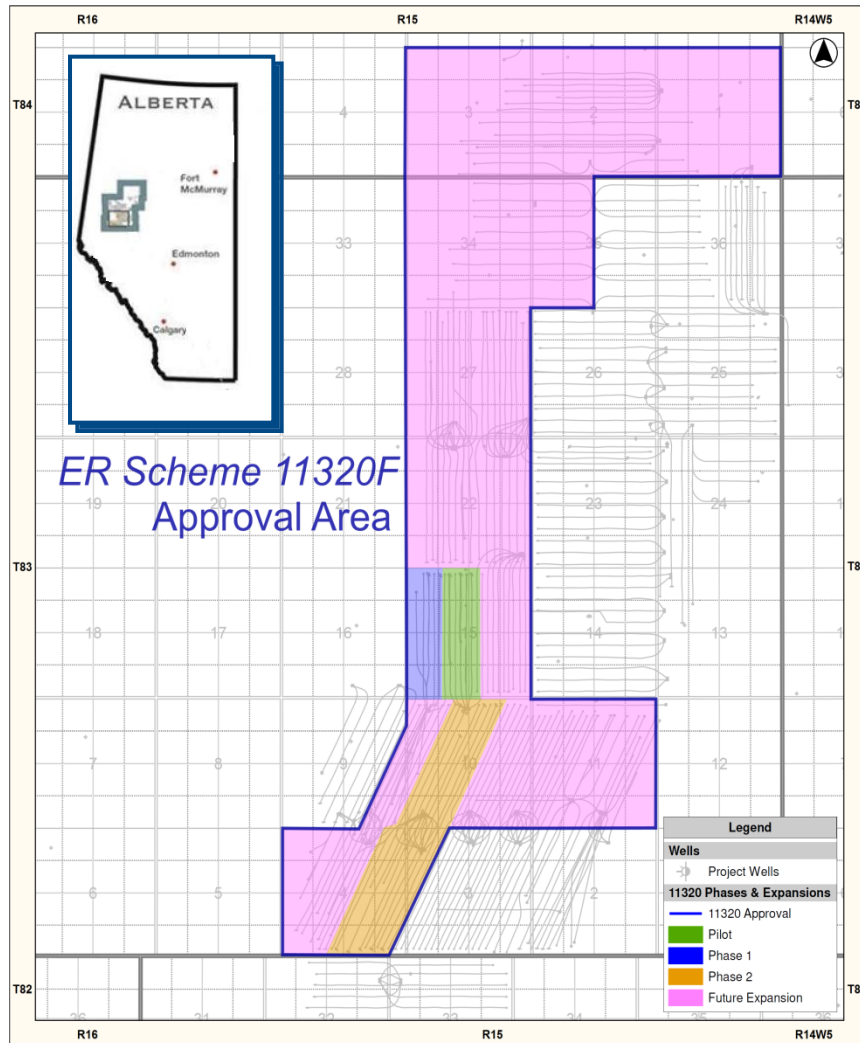


- Peace River Oil Sands Area 2
- Range 15 – Townships 83 & 84
  - Seal Central
  - Enhanced Recovery Scheme Approval 11320F
- Polymer injection into horizontal wellbores to increase recovery of heavy oil from the Bluesky Formation
- Baytex acquired Seal Central assets including the polymer enhanced recovery scheme in January of 2017
  - Current presentation covers the time period of July 2018 to July 2019
- Polymer flooding is an established technology for EOR whereby fluid is injected into a formation to sweep oil to offset producing wells. Polymer flooding consists of dissolving polymer in the injected water to increase its viscosity and improve the sweep efficiency in the hydrocarbon reservoir



# 1. Overview

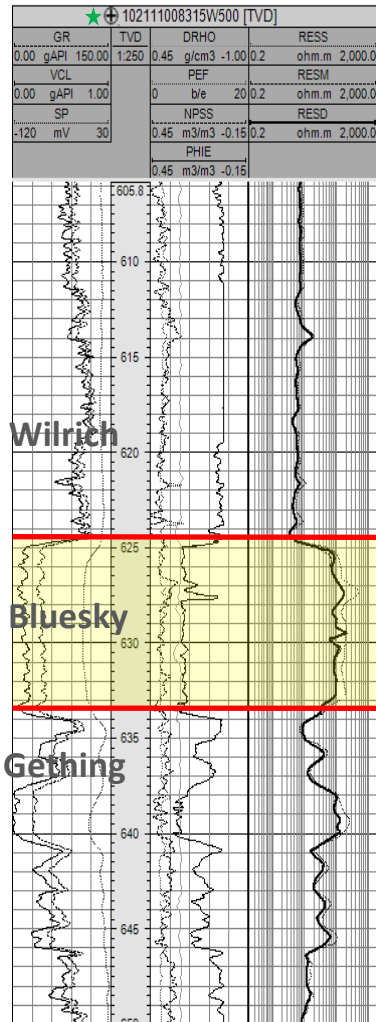
## History



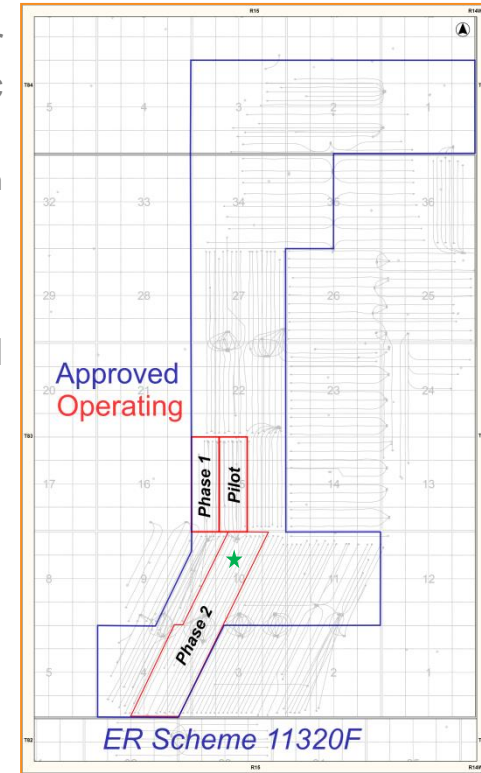
- Seal Central development began ~2001 under primary production utilizing single-leg horizontal wellbores; primary production continues to account for the majority of the oil produced in the area
- Beginning late 2010, Murphy Oil Corp. (Murphy) initiated an experimental polymer injection pilot making use of existing and infill drilled wellbores
- Based on encouraging preliminary results from the pilot, the scheme was expanded to include Phases 1, 2, and 3 (approved, not implemented) in 2012
- An application to expand the scheme was approved in 2013; this expansion was not implemented by Murphy
- Baytex Energy Corp. (Baytex) acquired all heavy oil assets in the Peace River area from Murphy effective January 2017; included in the acquisition was the Enhanced Oil Recovery (EOR) polymer flood, Approval 11320
- Baytex applied to expand the scheme area and the amended scheme was approved in January 2018; Baytex has plans to expand into areas adjacent to the Pilot (late 2019, early 2020)

## 2. Geology / Geoscience

### Type Log & Reservoir Parameters

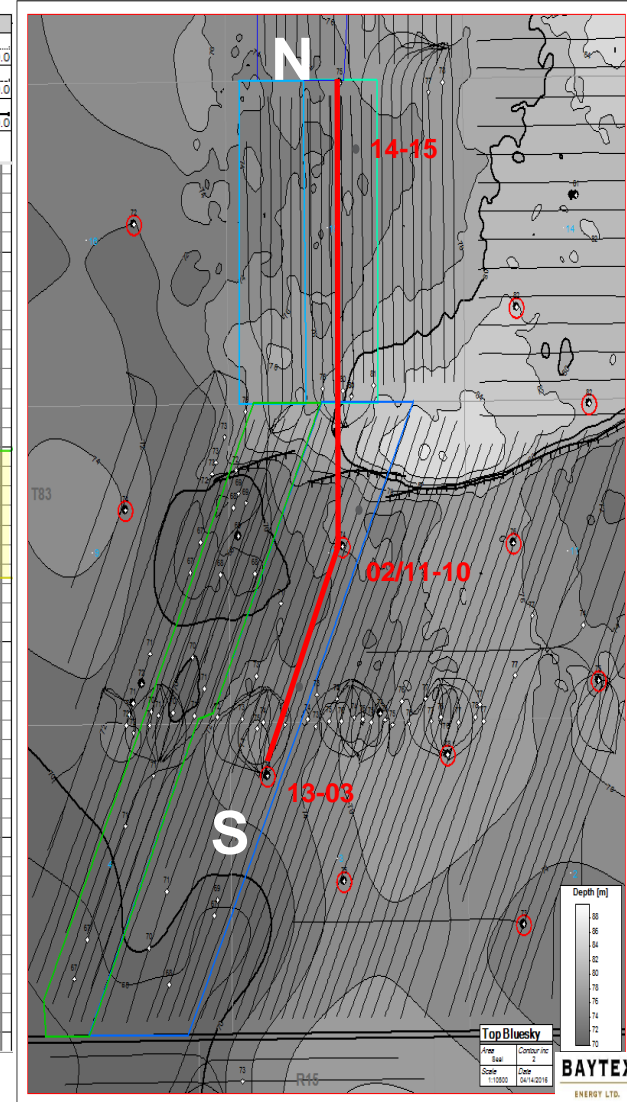
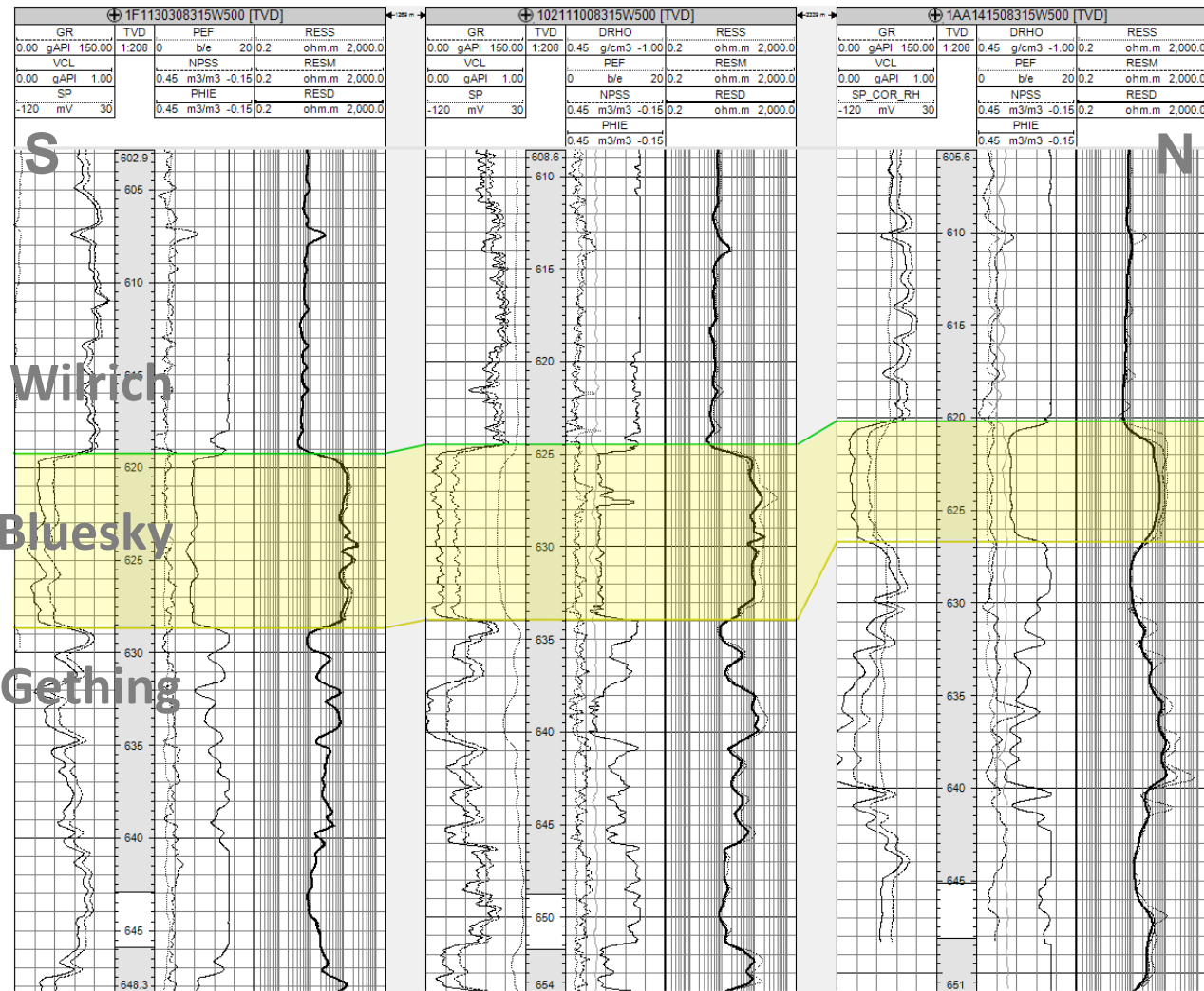


- Bluesky sand deposition represents a prograding barrier bar complex within a greater estuarine-deltaic environment
  - Moderately sorted, Quartz rich litharenite of upper fine to lower medium grain size
  - Relatively low clay content <5%
  - Absence of fluid contacts (top/bottom gas or water) over project area
- Capped by Wilrich marine shales above and basal seal by fluvio-estuarine, heterolithic Gething deposits
- Total OOIP – 32,712,000 m<sup>3</sup>
  - Includes 11320C expansion & Phase 3 (approved, not implemented)
- Operating OOIP – 5,297,000 m<sup>3</sup>
  - Includes Pilot, Phase 1 and Phase 2 only
  - Volumetric methodology
    - Well Tops, 3D Seismic Data where available
    - Core Sampling Data (Dean Stark / Helium Porosity) / Petrophysical Analysis
- Reservoir Parameters (Entire Scheme & Operating)
  - Depth: 625m TVD
  - Net Pay: 2 – 8m
  - Porosity: 22 – 30%
  - Permeability<sub>Air</sub>: 500 – 2,000mD
  - Reservoir Temp: 19°C
  - Water Saturation: 20%
  - Oil Viscosity: 5,000 – 30,000cSt (Dead Oil)
  - Initial Reservoir Pressure: 4,500 – 5,000kPa



## 2. Geology / Geoscience

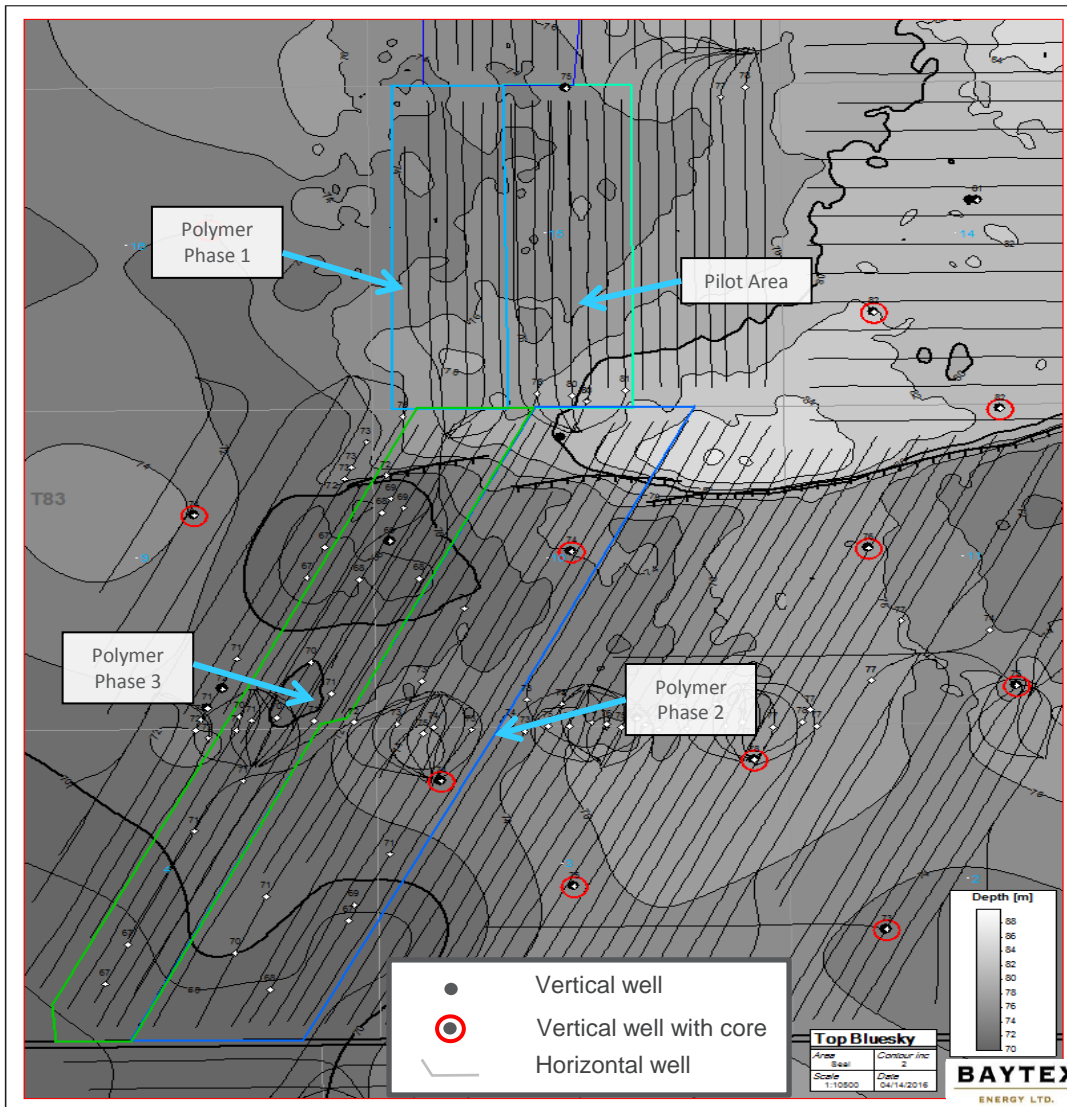
### Structural Cross Section - South to North





## 2. Geology / Geoscience

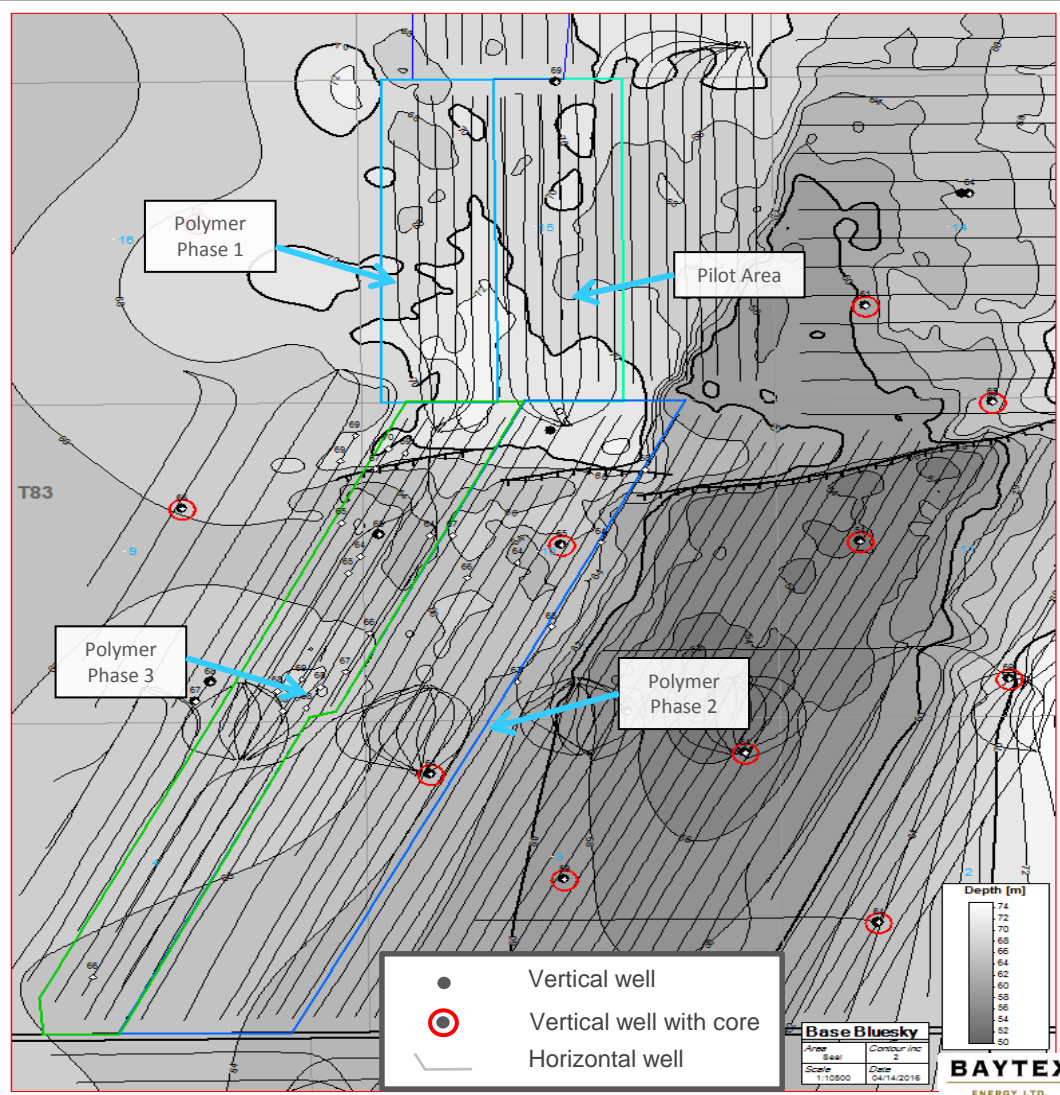
### Structure - Top Net Oil Pay (Bluesky Top)



- Top net oil is Bluesky top
  - No top gas or water over project area
- Higher regional structure to the northeast towards Red Earth Highlands (Bluesky onlap edge)
  - Average structural dip of 0.1°
- Locally structure is fault influenced with relative lows within Phase 3 and Phase 2N
  - Normal displacement, footwall to south
  - 5-9m TVD flexure across fault zone over 100-400m (~2.5-4.5°)
- 3D seismic produces erratic contours
  - High resolution data

## 2. Geology / Geoscience

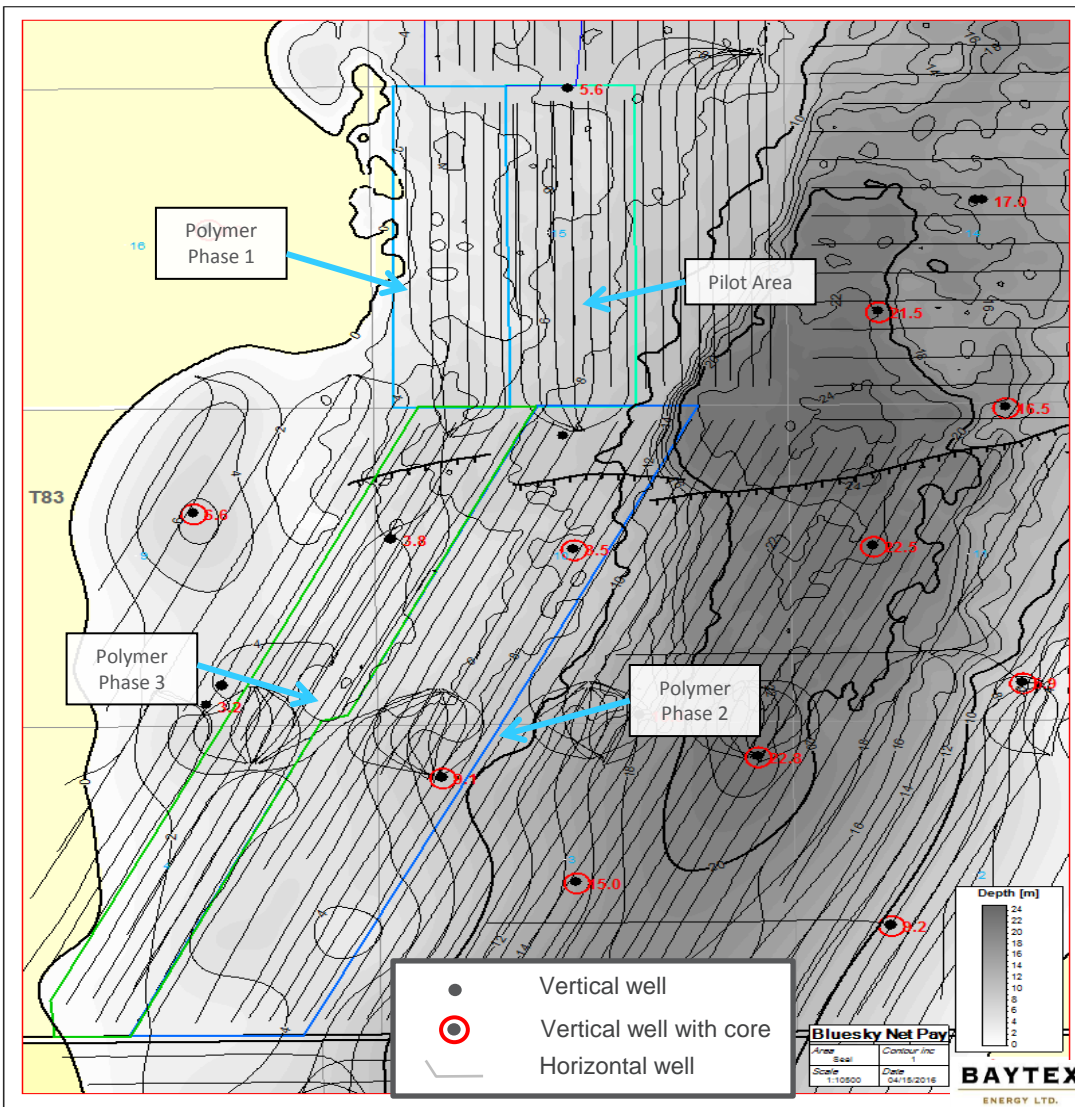
### Structure - Base Net Oil Pay



- Base Bluesky bitumen pay is equivalent to top Gething
  - No bottom water over project area
- Gething comprises a mixture of non reservoir fluvio-deltaic and estuarine deposits
  - Shales, silts and generally areally discontinuous sands
  - Shale flooding surface at Bluesky base/Gething top provides basal seal over project area
- Average structural dip of  $0.1^{\circ}$
- Consistent 5-9m flexure across fault zone with Bluesky top
  - Flexure due to faulting at lower stratigraphic levels
- 3D seismic produces erratic contours
  - High resolution data

## 2. Geology / Geoscience

### Net Oil Pay Isopach

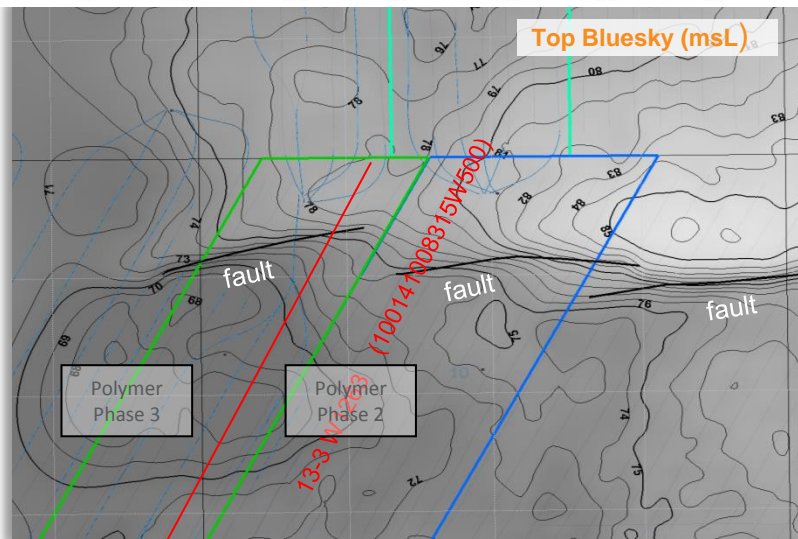
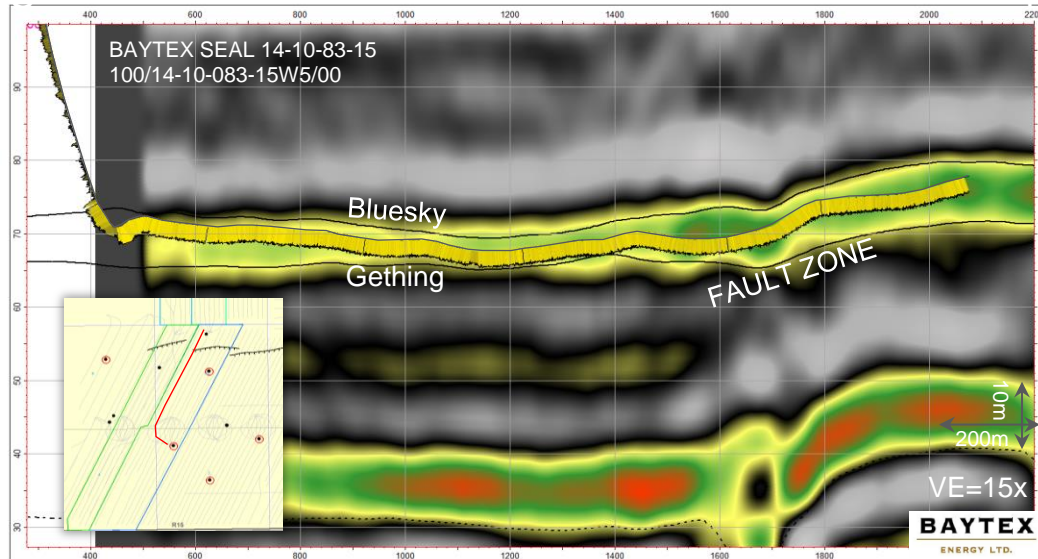


- Net bitumen pay calculated from
  - VCL (~75-80 API Gamma Ray)
  - $\Phi_{ie} > 17\%$
  - $Sw_e < 30\%$
- Net Pay ranges from ~2-10m thick in Polymer project area
  - Locally, generally thinning east to west
- Depth converted 3D seismic included in interpretation
- MWD Gamma Ray from horizontal drilling included in interpretation
- Operating OOIP – 5,297,000 m<sup>3</sup> (~33,300,000 bbl)

## 2. Geology / Geoscience

### Local Faulting

100/14-10-83-15W5/00 section along horizontal well

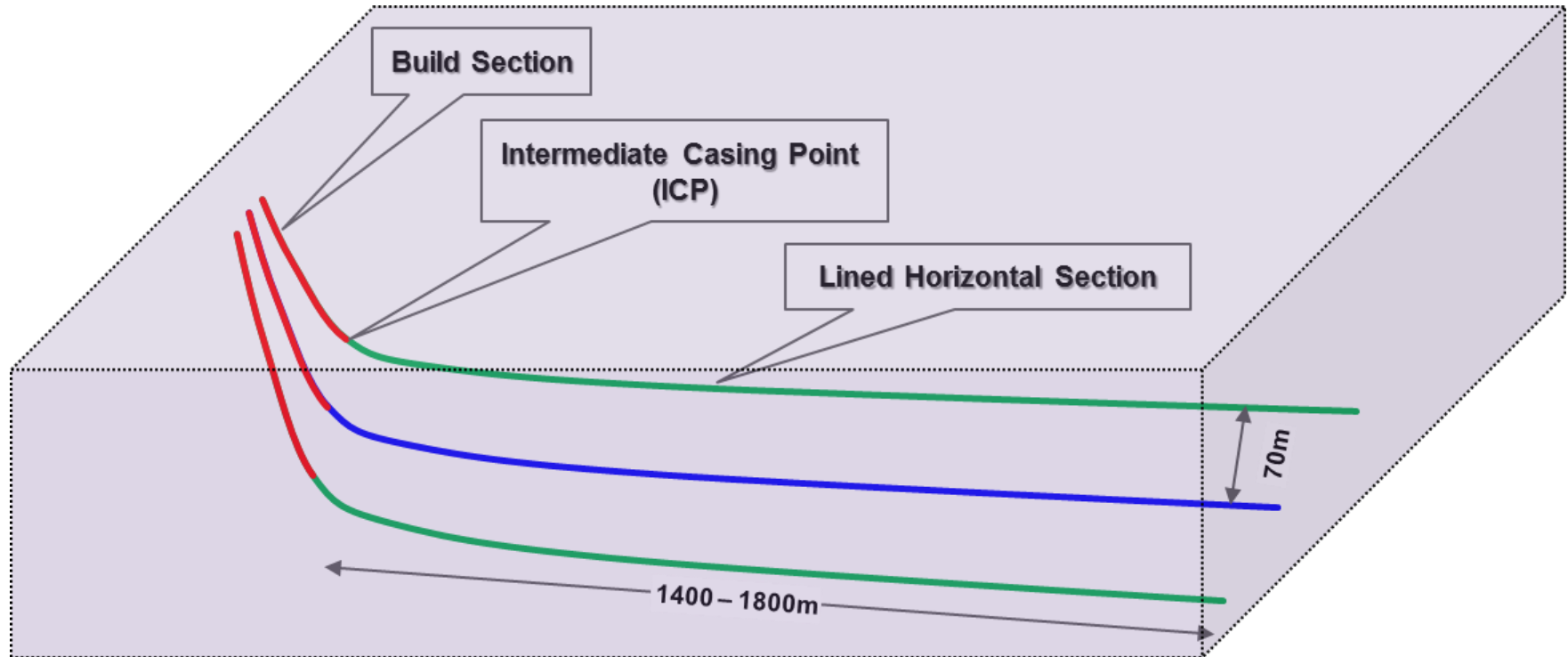


- Fault zones do not appear to cross the Bluesky level
  - Limited to deeper stratigraphic layers
  - Result is flexure at Bluesky level; 5-9m TVD flexure across fault zone over 100-400m (~2.5-4.5°)
- Fault is interpreted from structure mapping utilizing horizontal and vertical well control at this time with credence given to seismic interpretations from the previous operator
  - Reservoir continuity is demonstrated through horizontals across fault zone
  - Consistent Bluesky isopach across fault zone
- Faulting does not affect operating strategy or well placement
  - Horizontal well paths follow reservoir through structural flexure
  - Where zone is 5m or less, no priority given to drilling target
  - >10m thickness, top 5m has been targeted



### 3. Drilling and Completions

#### Typical Drilling Configuration

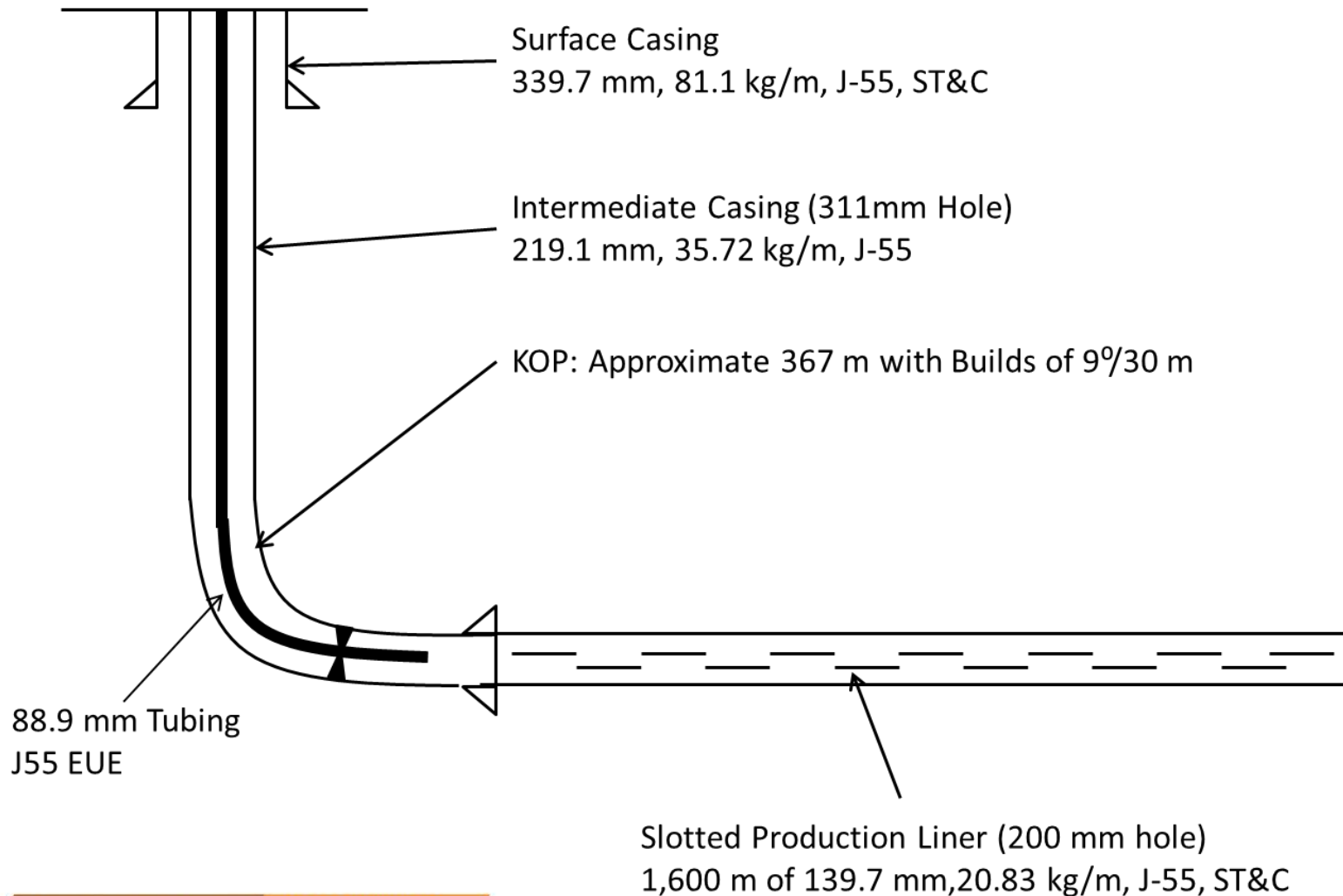


- Original primary inter-well spacing was 140 meters
- Open hole laterals re-entered to add slotted liners
- Infill wellbores drilled prior to injection
  - Resultant producer to injector spacing of 70m
  - Producer and injector planned to be drilled at the same elevation



### 3. Drilling and Completions

#### Typical Completion Details



## 4. Scheme Performance

### Operating History

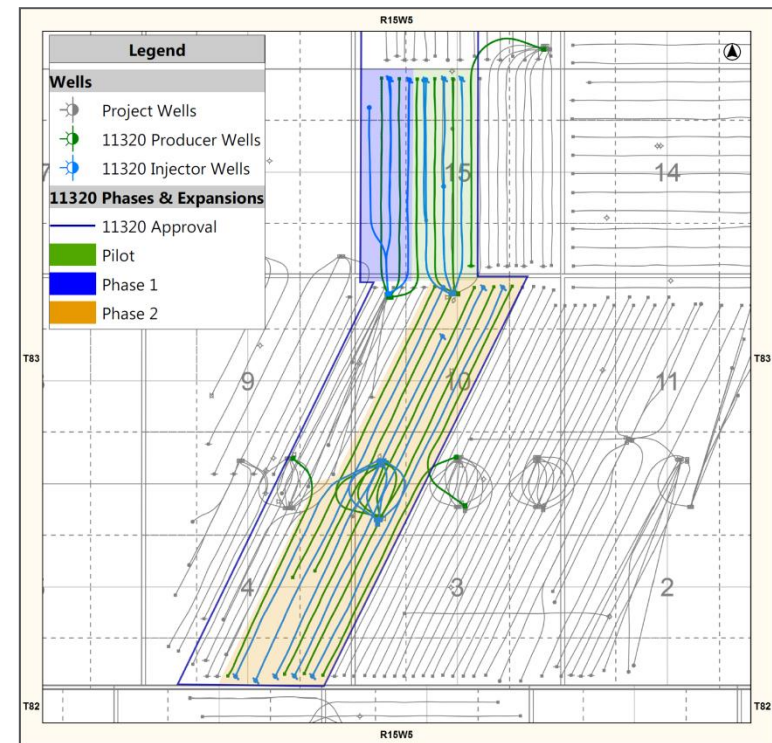
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- Historic primary wells were drilled on 140m spacing; these were converted to injectors under scheme approval
- Primary recovery levels prior to polymer injection range from 3 – 7%
- Infill wells at 70m spacing were drilled and brought online as production wells
- Polymer injection commenced October 2010 at Pilot, late 2012 for Phase 1 and Phase 2 expansions
- Operational phases have seen little in the way of downtime since inception; what downtime was experienced was mostly attributed to flowline issues at surface (Pilot, Phase 1, Phase 2 North)
- Only one of the Phase 1 injection wells is operating due to premature communication between 100/13-15 and offsetting producer 103/13-15
- Phase 2 South (04-10 Pad) has experienced premature communication between injectors and producers and is currently not operating
- Consistent with the previous operator, Baytex has continued to target an injection viscosity of 50cp, which is within the optimal range for the current producing phases
- Since assuming operations, Baytex has pursued an optimization strategy to ensure producers remain in a nearly pumped-off state while injection is targeted within 500 kPa of MAWHIP (4900 kPa-g); this has resulted in a significant increase in oil production, particularly at the Pilot
- Water production has increased due to both normal maturing operations, as well as efforts to pump off excess injected water that accumulated when production was not optimized

## 4. Scheme Performance

### Resource Recovery

- Variability in recovery is driven by changes in oil viscosity and reservoir permeability across the schemes
- Well placement, i.e. minimum distances between injectors and producers, is critical to successful performance
- In Phase 1 and Phase 2, poor well placement has resulted in significantly lower recovery than what would otherwise be achievable

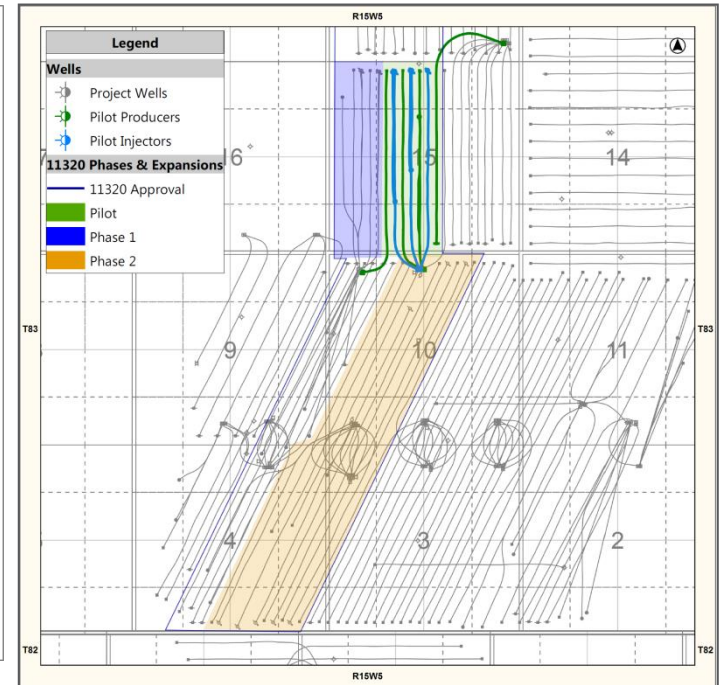
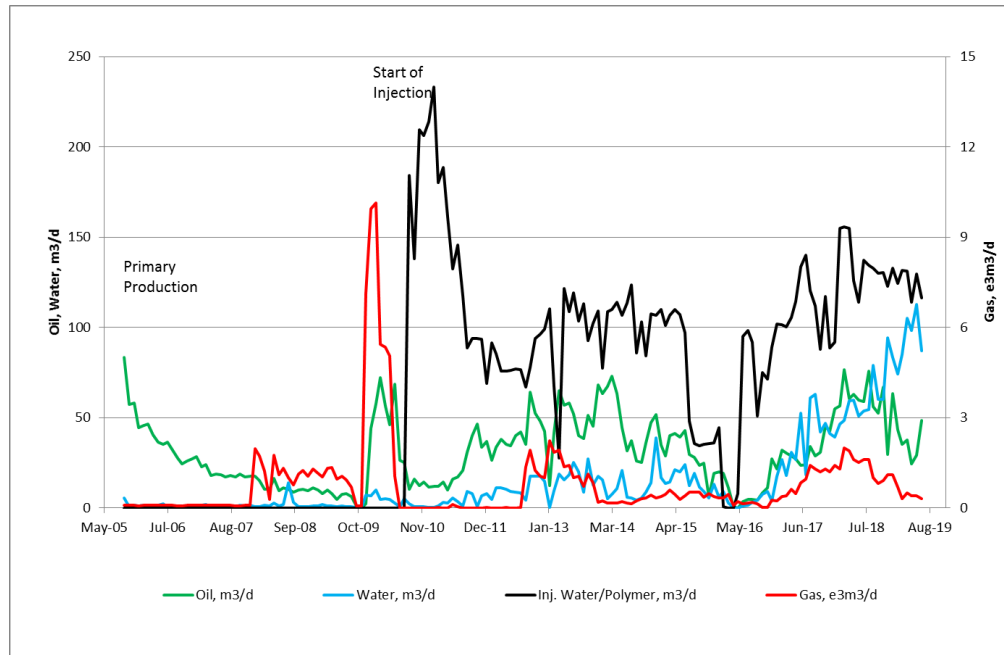


### Resource Summary

	Original Oil In Place (e <sup>3</sup> m <sup>3</sup> )	Primary Recovery (e <sup>3</sup> m <sup>3</sup> )	Primary Recovery %	Secondary Recovery (e <sup>3</sup> m <sup>3</sup> )	Secondary Recovery %	Current Recovery %	Ultimate Recovery %
<b>Pilot</b>	1,093	44.8	4.1%	143.2	13.1%	17.2%	25.0%
<b>Phase 1</b>	588	39.4	6.7%	23.5	4.0%	10.7%	12.7%
<b>Phase 2</b>	3,616	127.8	3.5%	68.7	1.9%	5.4%	6.0%

## 4. Scheme Performance

### Pilot

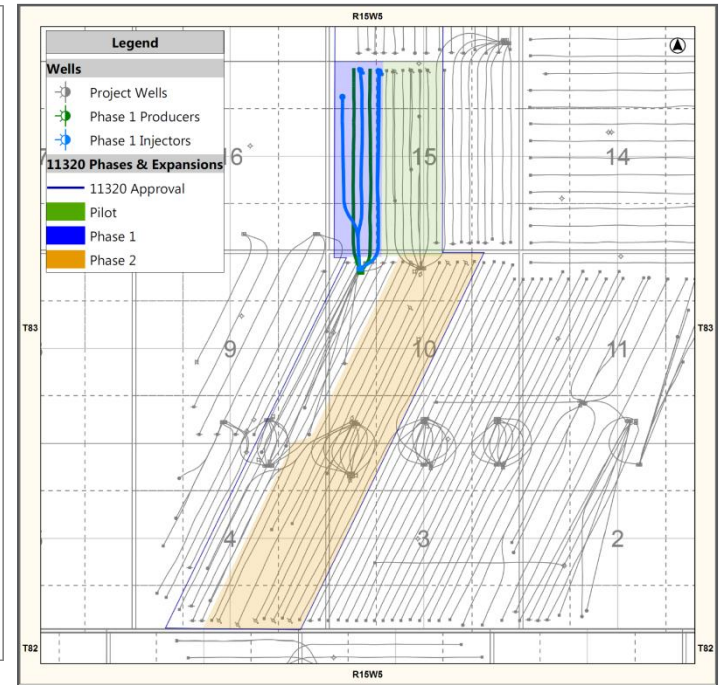
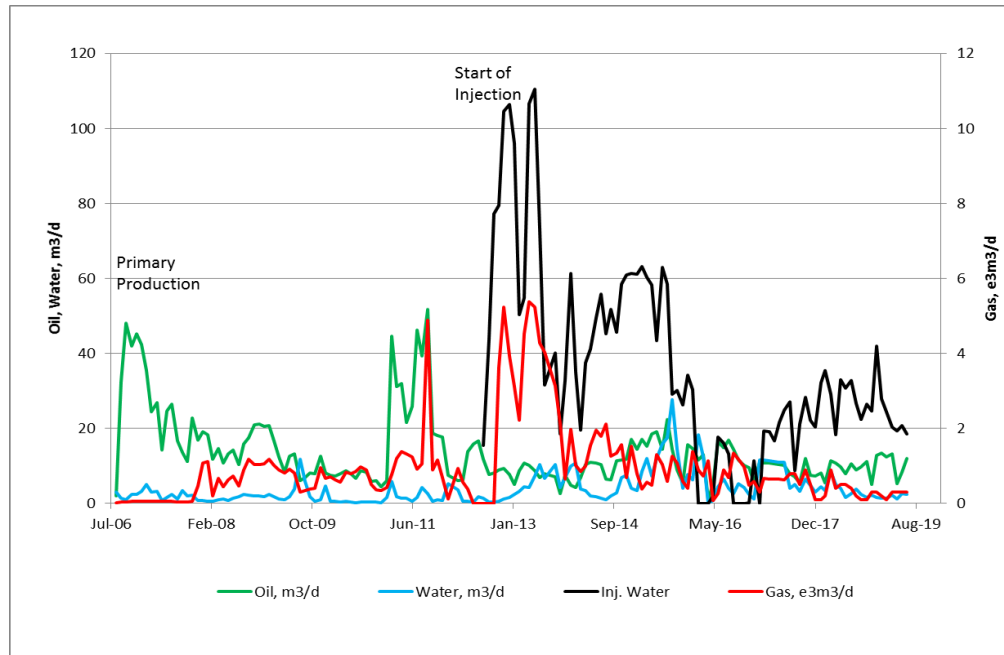


- Pilot consists of 3 injectors and 4 producers on 70m spacing
- Injection commenced Q4 2010, production response observed Q3 2011
- Oil production increased significantly with resumption of high rate injection
- Water production is trending up as expected with a maturing polymer flood

	Original Oil In Place (e <sup>3</sup> m <sup>3</sup> )	Primary Recovery (e <sup>3</sup> m <sup>3</sup> )	Primary Recovery %	Secondary Recovery (e <sup>3</sup> m <sup>3</sup> )	Secondary Recovery %	Current Recovery %	Ultimate Recovery %
Pilot	1,093	44.8	4.1%	143.2	13.1%	17.2%	25.0%

## 4. Scheme Performance

### Phase 1



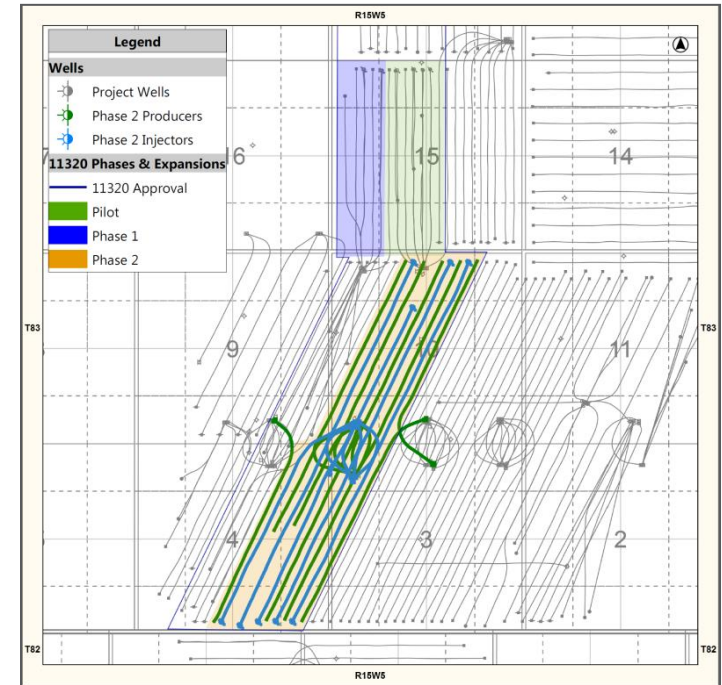
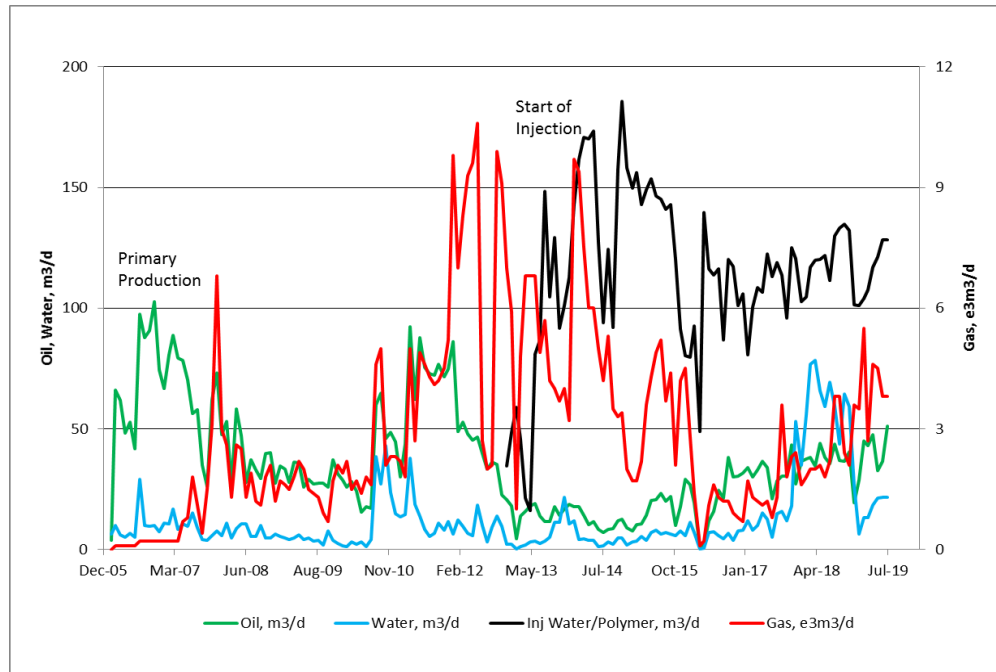
- Phase 1 consists of 2 injectors and 2 producers
- Injection commenced Q3 2012, production response observed Q4 2014
- Oil production continues to be stable despite shut-in of 100/13-15-083-15W5 injector
- Only half of the pattern receives injector support, which results in an ultimate recovery factor that is half of the Pilot

	Original Oil In Place (e³m³)	Primary Recovery (e³m³)	Primary Recovery %	Secondary Recovery (e³m³)	Secondary Recovery %	Current Recovery %	Ultimate Recovery %
Phase 1	588	39.4	6.7%	23.5	4.0%	10.7%	12.7%



## 4. Scheme Performance

### Phase 2

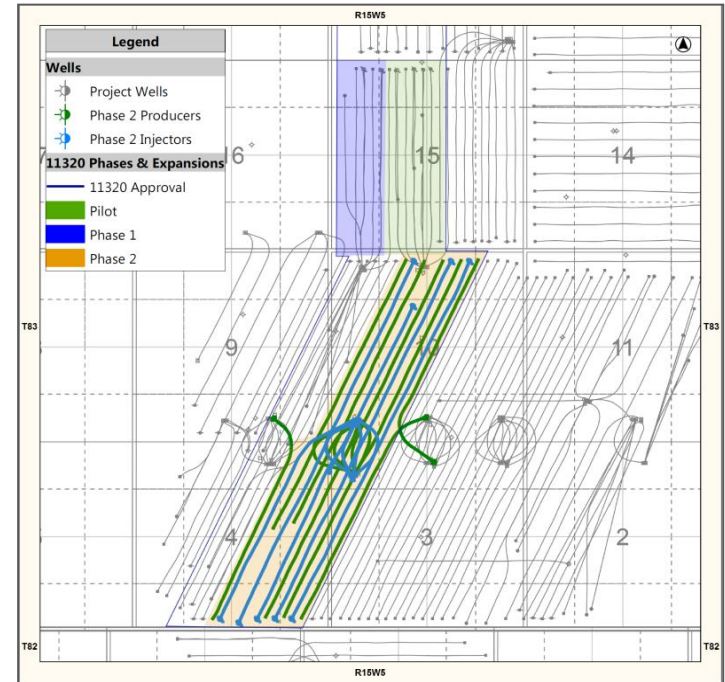
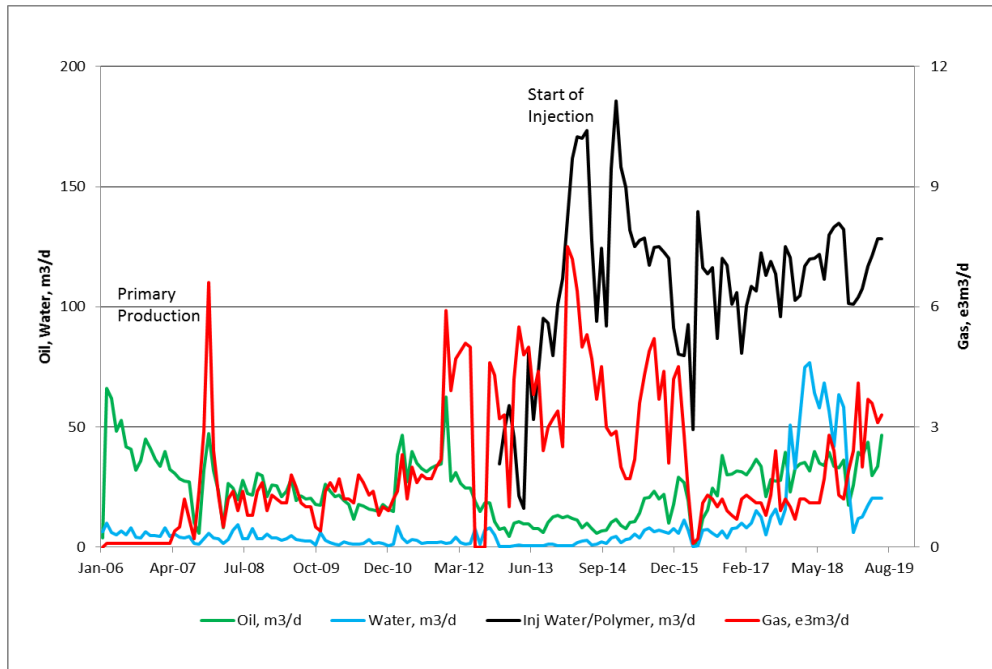


- Phase 2 consists of 9 injectors and 11 producers
- Injection commenced Q4 2012 at the 13-03 pad & Q2 2013 on the 04-10 pad
- 13-03 pad is driving Phase 2 production, 04-10 pad performance has been poor due to unfavourable well placement

	Original Oil In Place (e <sup>3</sup> m <sup>3</sup> )	Primary Recovery (e <sup>3</sup> m <sup>3</sup> )	Primary Recovery %	Secondary Recovery (e <sup>3</sup> m <sup>3</sup> )	Secondary Recovery %	Current Recovery %	Ultimate Recovery %
Phase 2	3,616	127.8	3.5%	68.7	1.9%	5.4%	6.0%

## 4. Scheme Performance

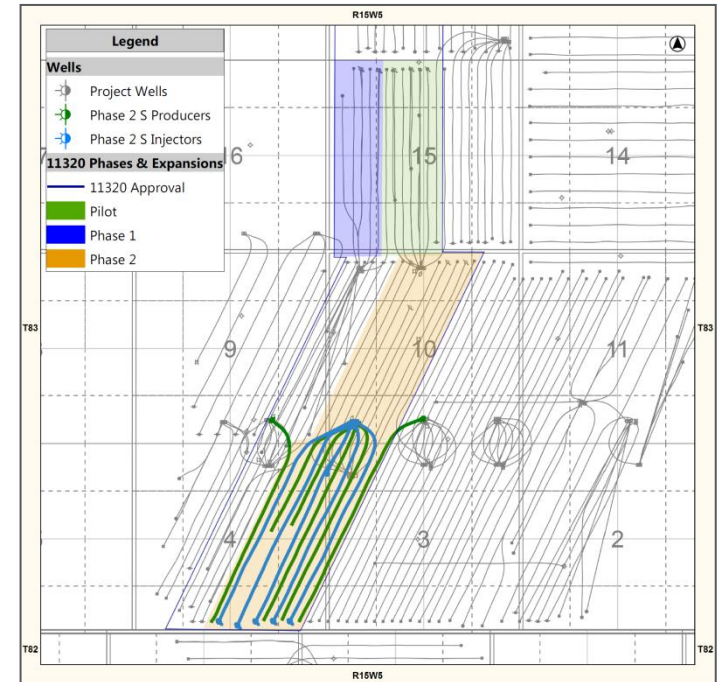
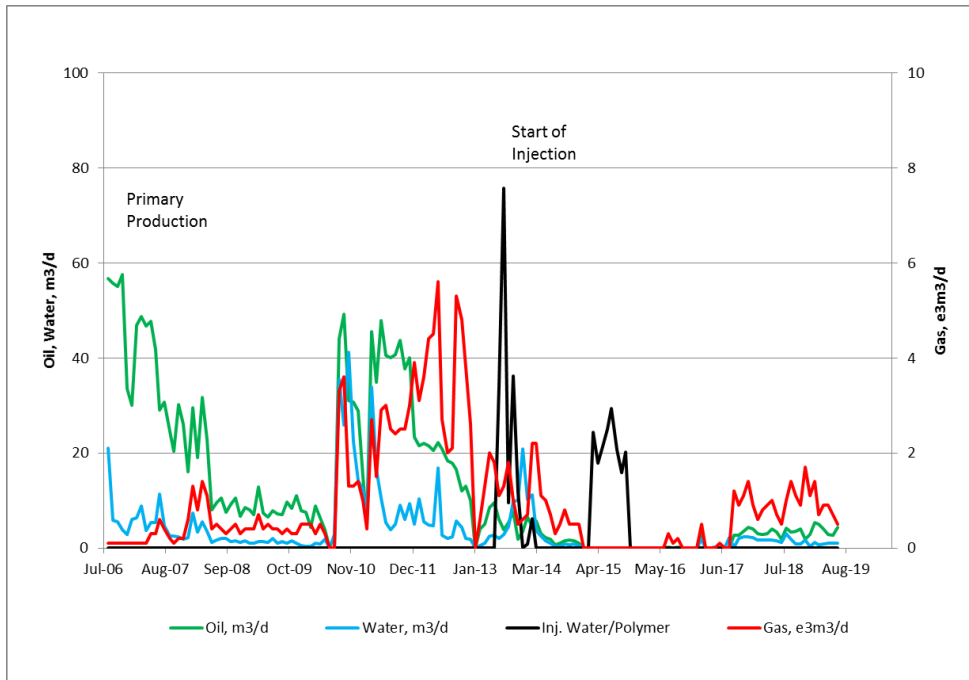
### Phase 2 North (13-03 Pad)



- Phase 2 (North) consists of 4 injectors and 5 producers
- Injection commenced Q4 2012 at the 13-03 pad
- Oil production has remained consistent since ramp up in late 2016
- Higher water production has primarily resulted from the pump off of excess inventory of injected water at the eastern edge of the pattern, which accumulated when the 104/16-10-083-15W5 producer was shut in while injection continued

## 4. Scheme Performance

### Phase 2 South (04-10 Pad)



- Phase 2 (South) consists of 5 injectors and 6 producers
- Injection commenced Q2 2013 at the 04-10 pad
- Wells experienced early communication from Phase 2 North injectors, likely due to the “cross-drilled” nature of the pads with insufficient heel to heel offset
- Poor well placement cannot be rectified without major workovers, no timeline is proposed to resume injection into Phase 2 South
- 105/01-04 producer operates with limited support from Phase 2 North injector 100/15-10

## 4. Scheme Performance

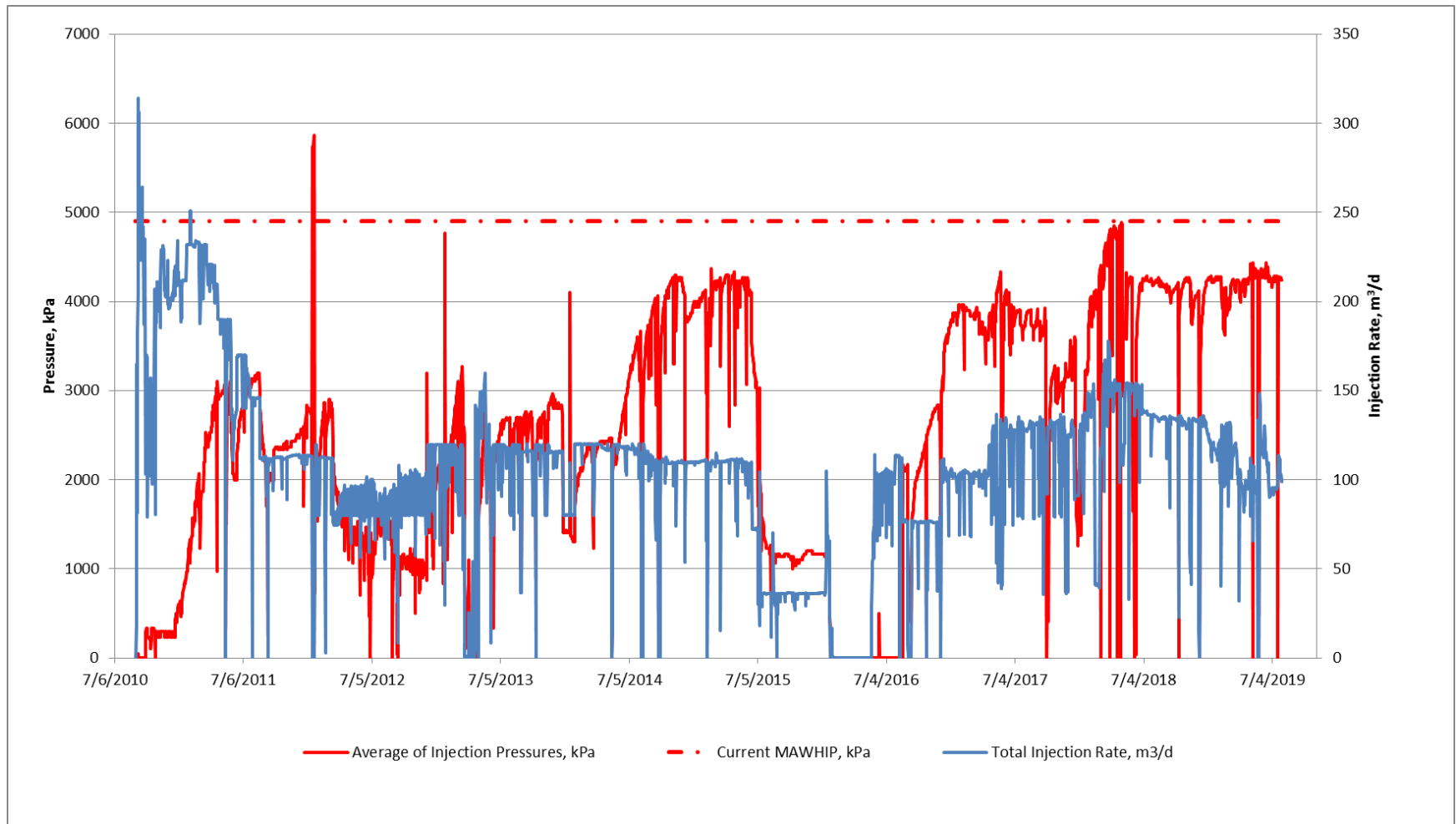
### Lessons Learned

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- High rate injection near MAWHIP combined with maintaining producer wells in a nearly pumped-off state has been an effective operating strategy to increase production and recovery
- Water cut is increasing across operational phases, which is expected as the flood continues to mature. Prior efforts at reducing production in attempt to alleviate increasing water cut have been counter-productive to optimizing scheme performance
- Positive results from operating strategy has increased confidence to expand the polymer flood into adjacent reservoir

## 4. Scheme Performance

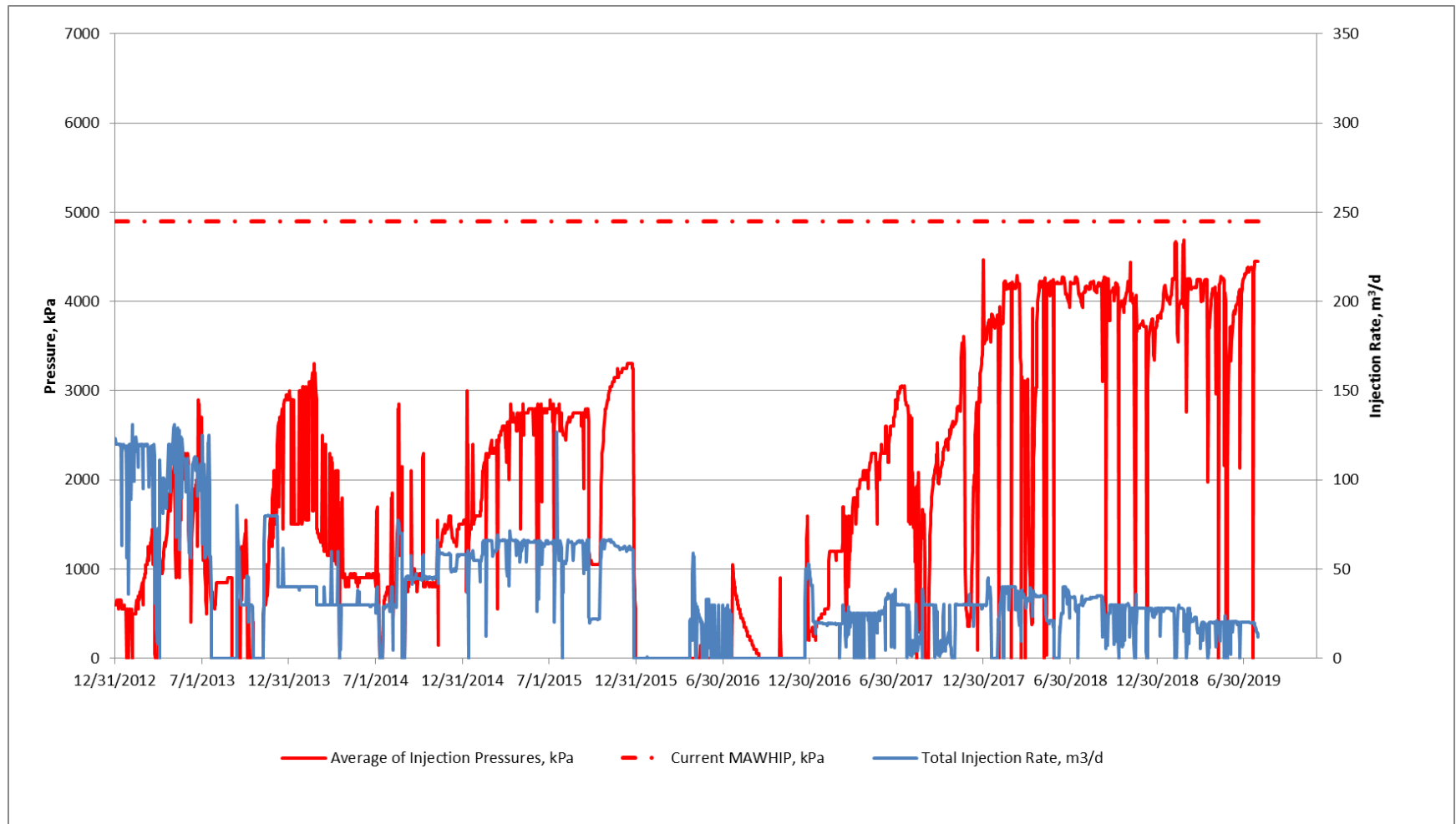
### Pilot Injection Pressures and Rates





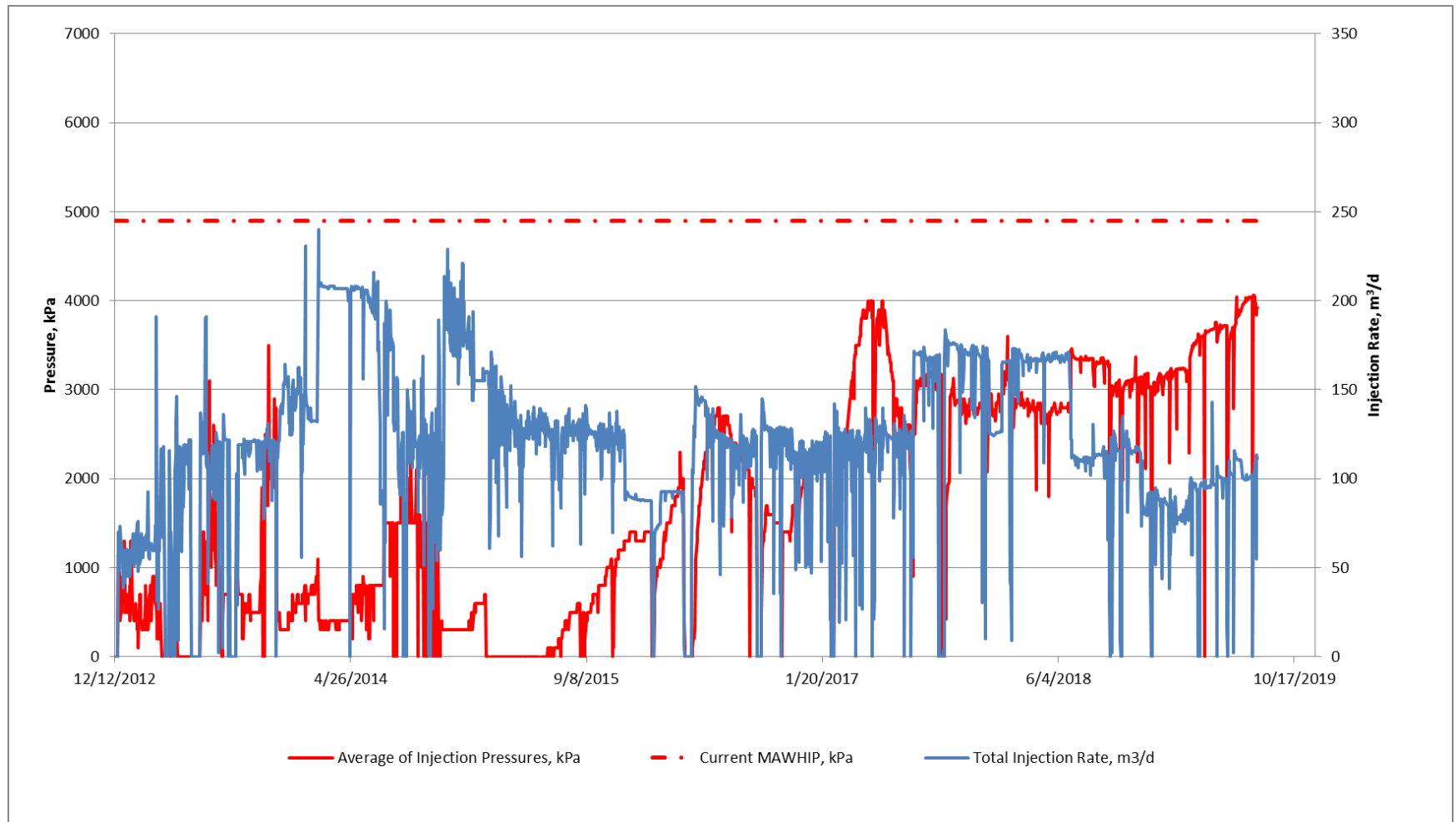
## 4. Scheme Performance

### Phase 1 Injection Pressures and Rates



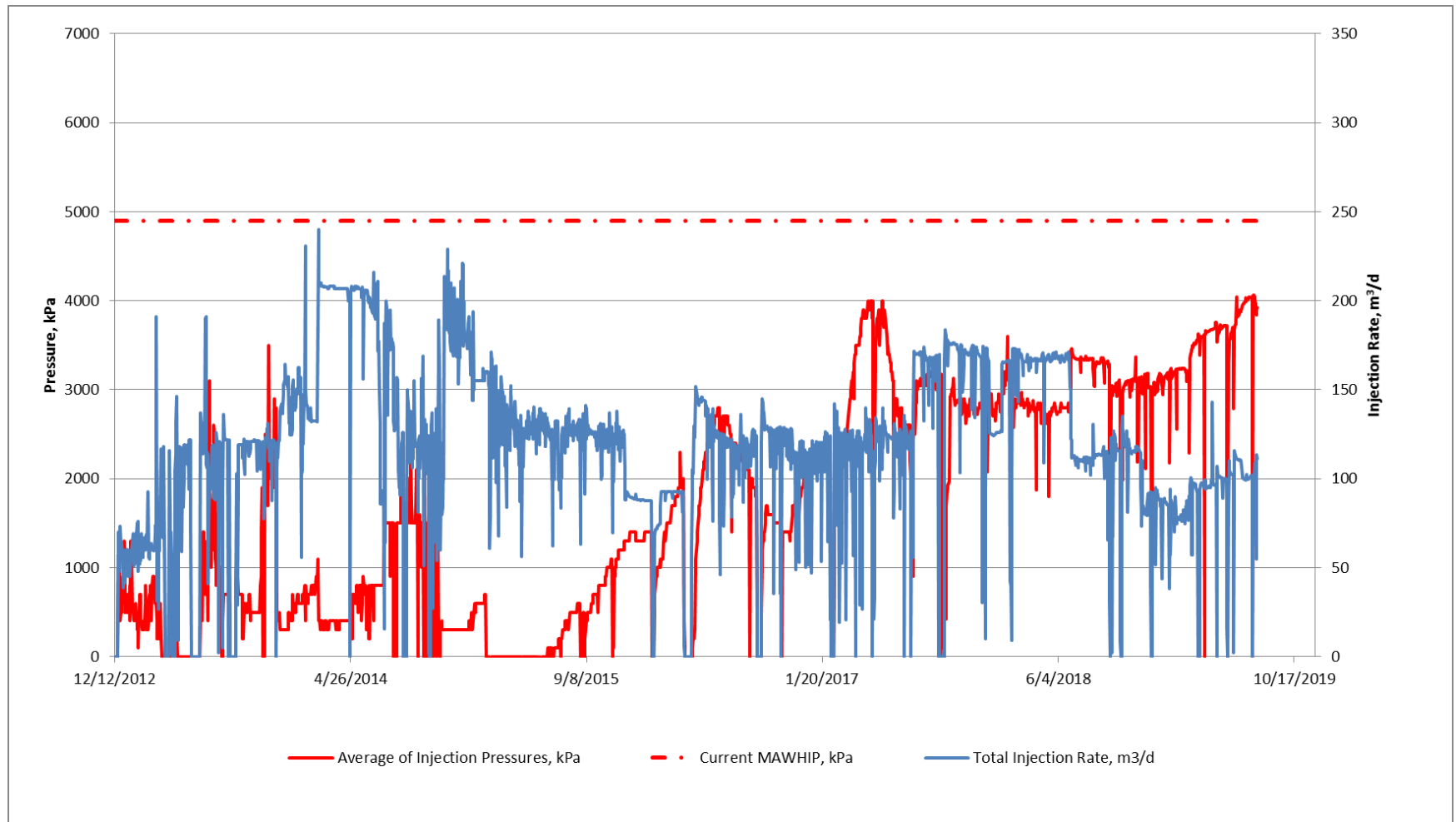
## 4. Scheme Performance

### Phase 2 North Injection Pressures and Rates



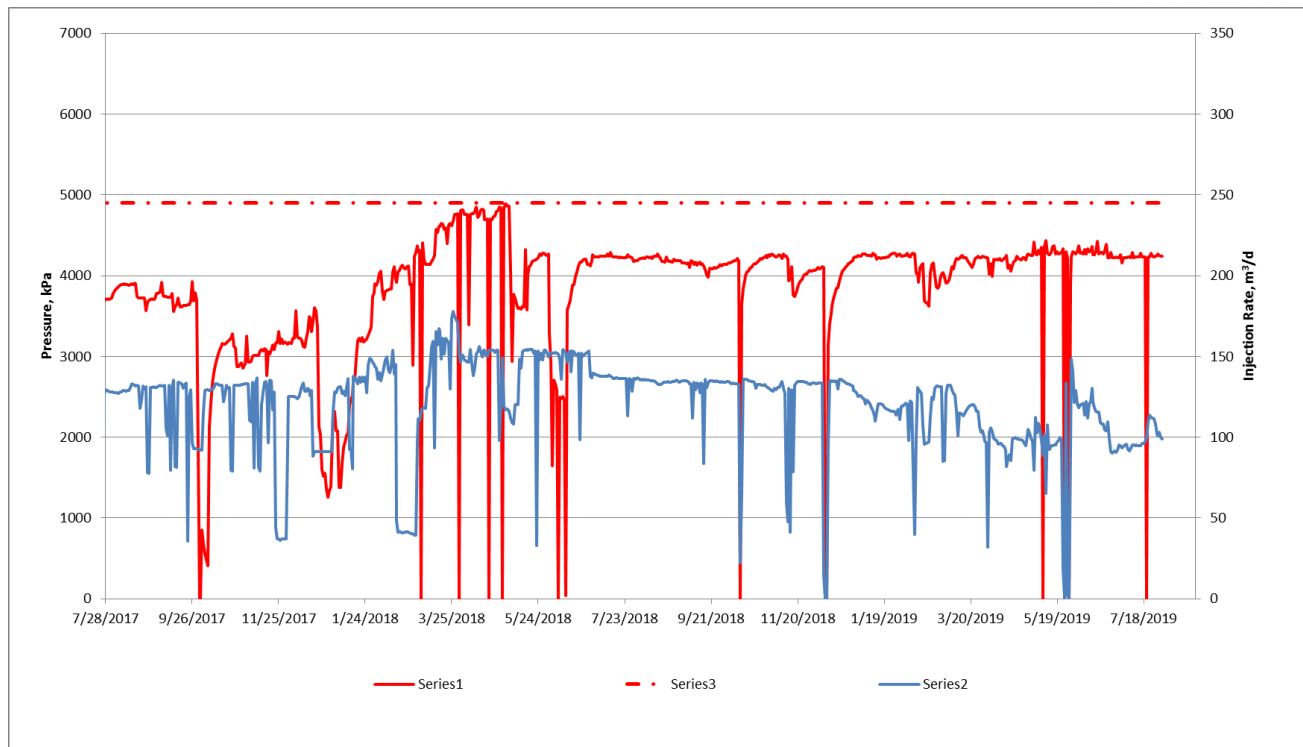
## 4. Scheme Performance

### Phase 2 South Injection Pressures and Rates



## 4. Injector Pressure Exceedance

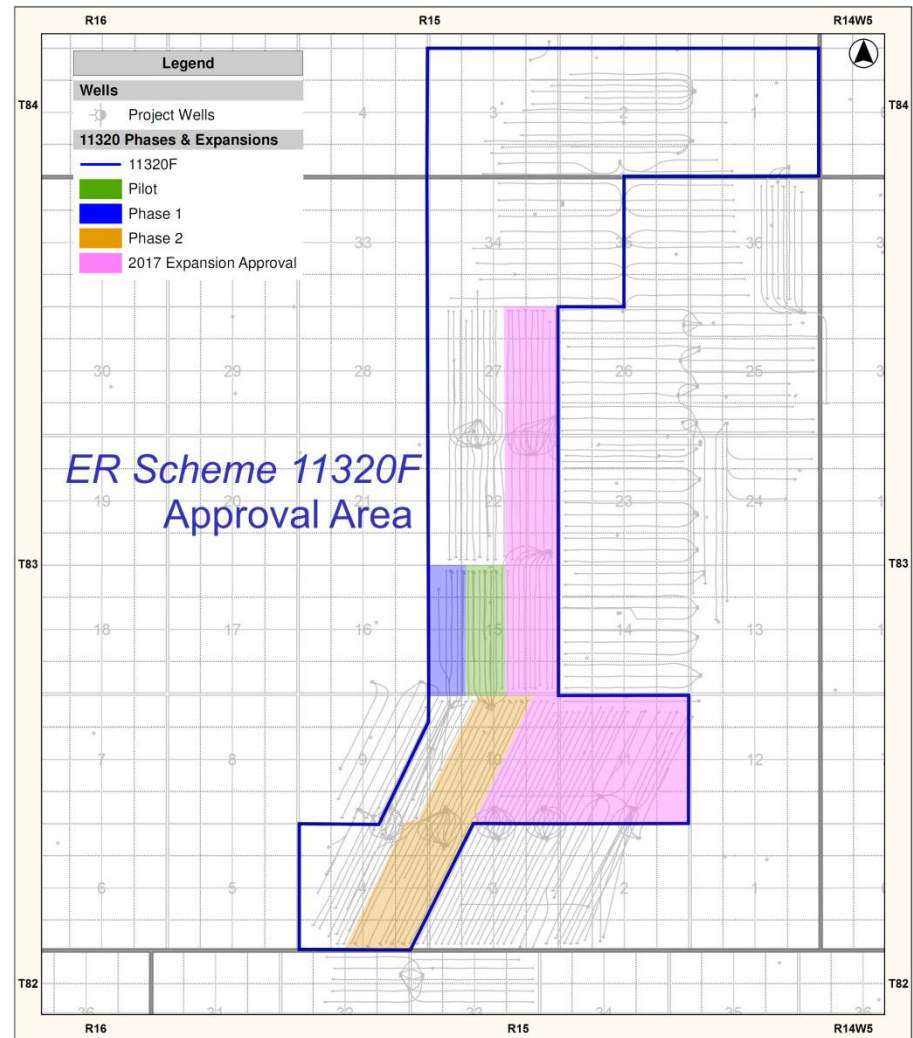
### Pilot Injection Pressure Above MAWHIP



- From March to May 2018 there were repeated incidents where injection pressures exceeded MAWHIP
- High pressure limit controls had been set to shut down injection at 4900 kPa. As 4900 kPa was the approved MAWHIP this was not an appropriate strategy; on a number of occasions, immediately following the shut down period, wellhead pressures could exceed MAWHIP by approximately 50 – 60 kPa
- In order to mitigate this situation pressure control set points were lowered to 4700 kPa. Since mid-May injection pressures have not exceeded 4400 kPa at any of the injectors
- Continued efforts from July 2018 to July 2019 have kept injection pressures below MAWHIP

## 5. Future Plans

- In 2017 Baytex applied for a scheme amendment to expand the scheme into the area adjacent to the Pilot and Phase 2 North patterns. Approval 11320F was received in January 2018
- Construction to expand the project into Section 15 East is expected to begin in Q4 2019
- Planning is currently underway for further expansion into Sections 22 and 27
- A new saline water source well 1F1/14-09-083-15W5 was drilled in Q4 2018 to supply water for the existing phases following the discontinued 1F1/14-10-083-15W5/0 fresh water source well in March 2019; This 1F1/14-09 will provide water volumes for the expansion in Section 15 East





# Surface

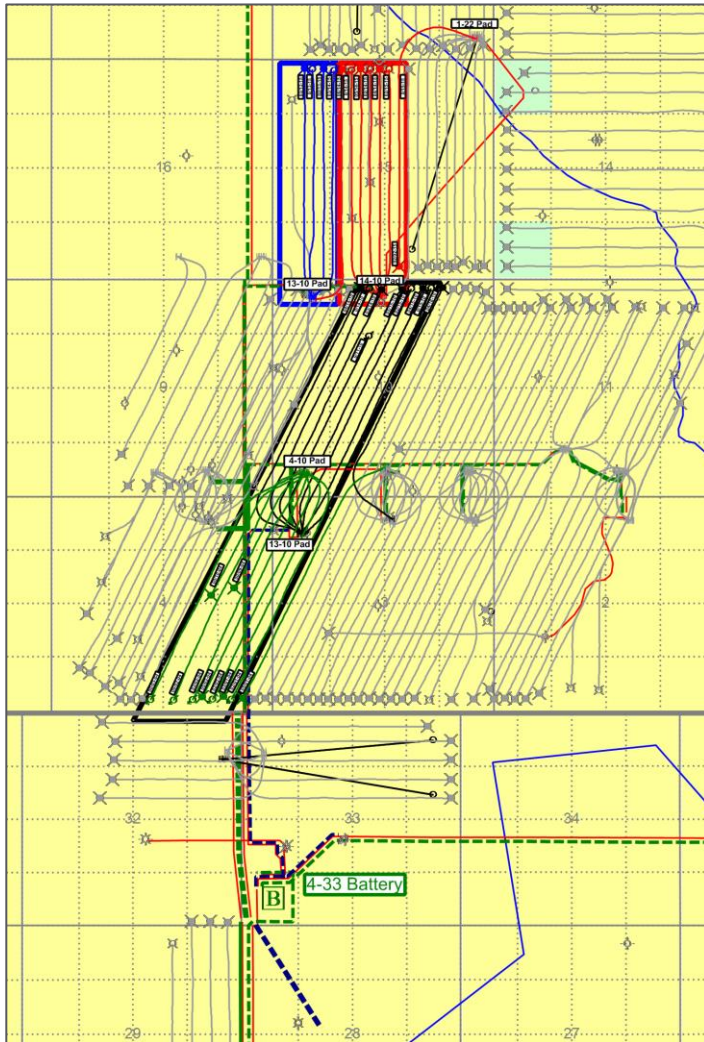


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# 1. Facilities

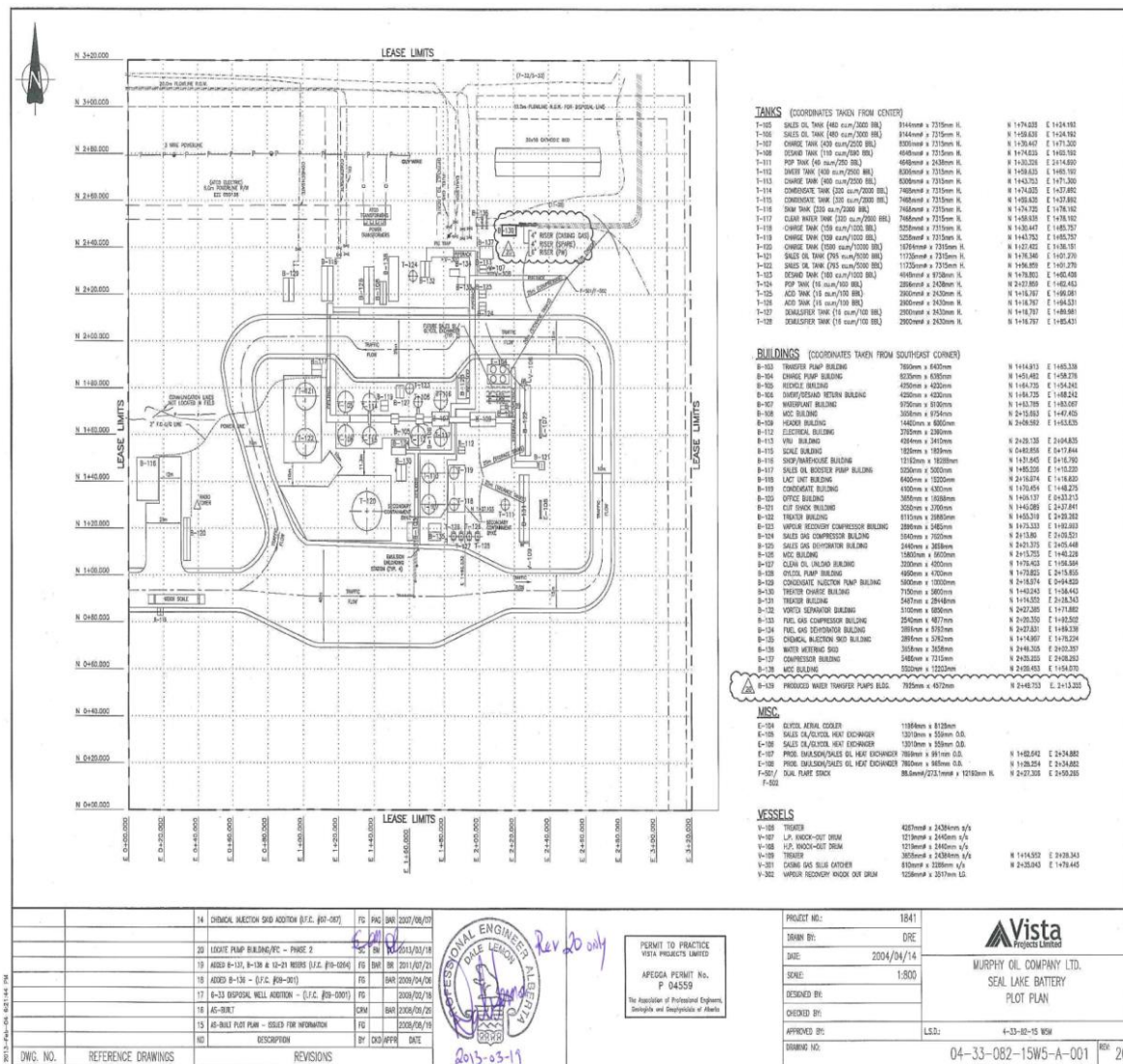
## Facility Locations



- The polymer flood surface locations are located at:
  - Pilot: 14-10-083-15W5
  - Phase 1: 13-10-083-15W5
  - Phase 2 N: 13-03-083-15W5
  - Phase 2 S: 04-10-083-15W5
- Polymer Injection facilities are located at:
  - 14-10-083-15W5 (Pilot & Phase 1)
  - 13-03-083-15W5 (Phase 2)

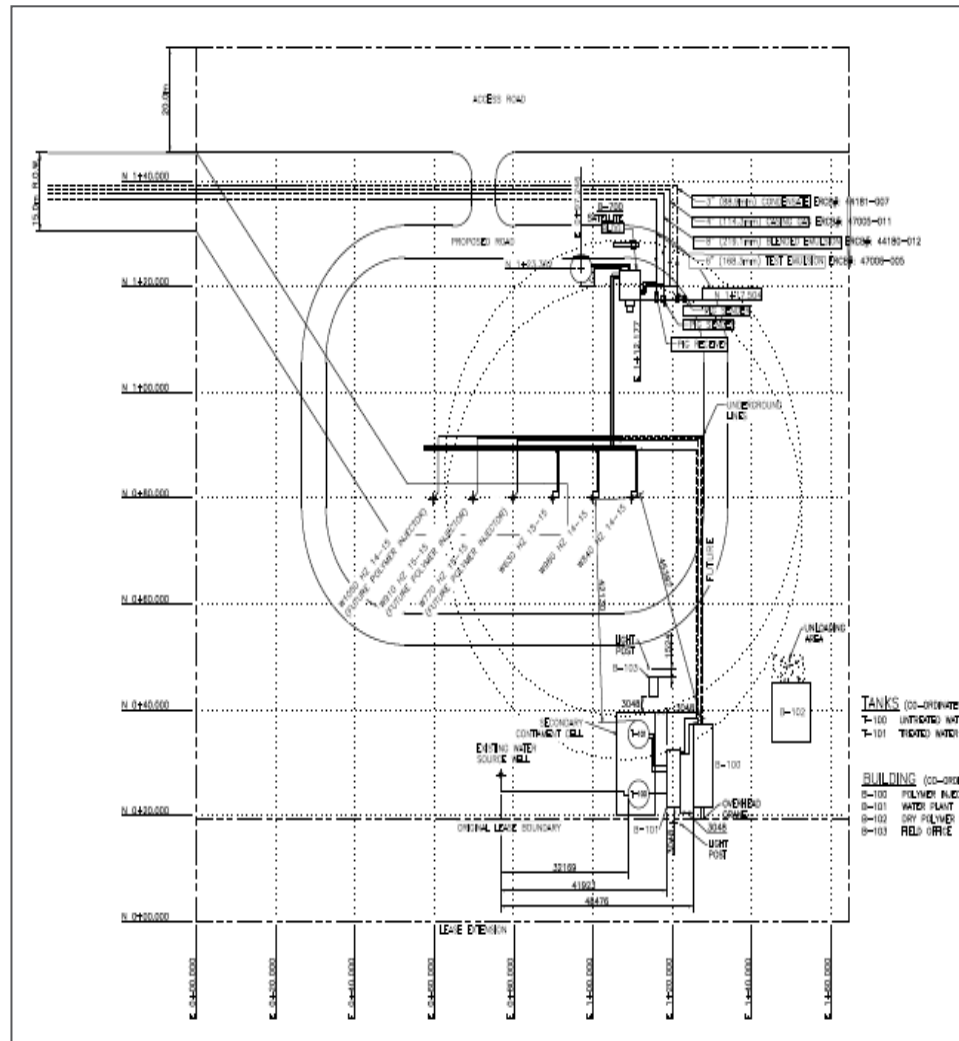
ABIF	ABBT	ABCT	Description
0111879	0121572	N/A	14-10 Polymer Injection Facility
0129026	0129029	N/A	13-03 Polymer Injection Facility
N/A	0129032	N/A	
N/A	0094150	N/A	Flow line of 04-33 CPF
N/A	N/A	0133398	04-33 CPF
0080049	N/A	N/A	10-04 SWD
0088019	N/A	N/A	11-28 SWD
0107239	N/A	0133398	06-33 SWD

## Central Processing Facility: 04-33-083-15W5 Plot Plan



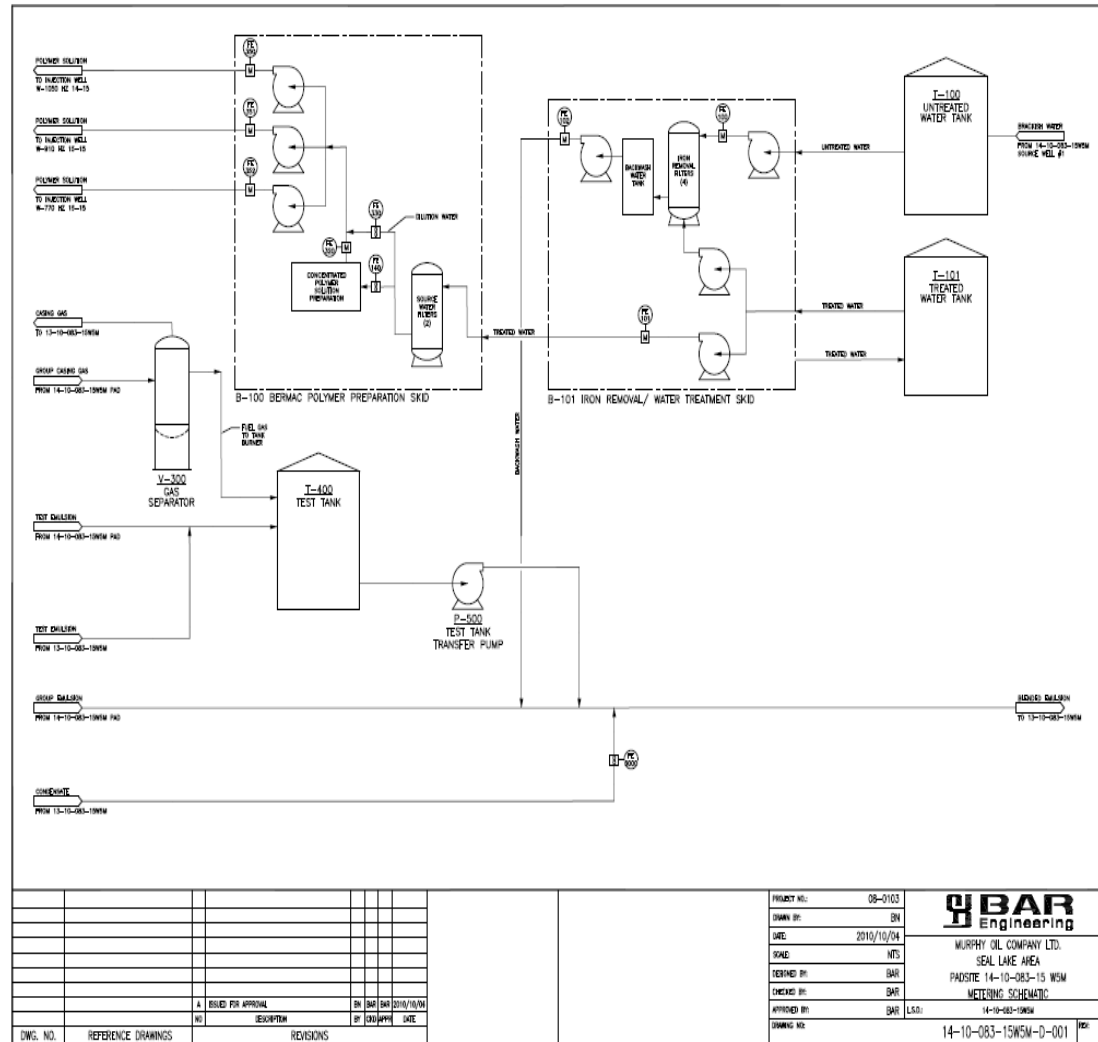
# 1. Facilities

## Pilot: 14-10-083-15W5 Plot Plan



# 1. Facilities

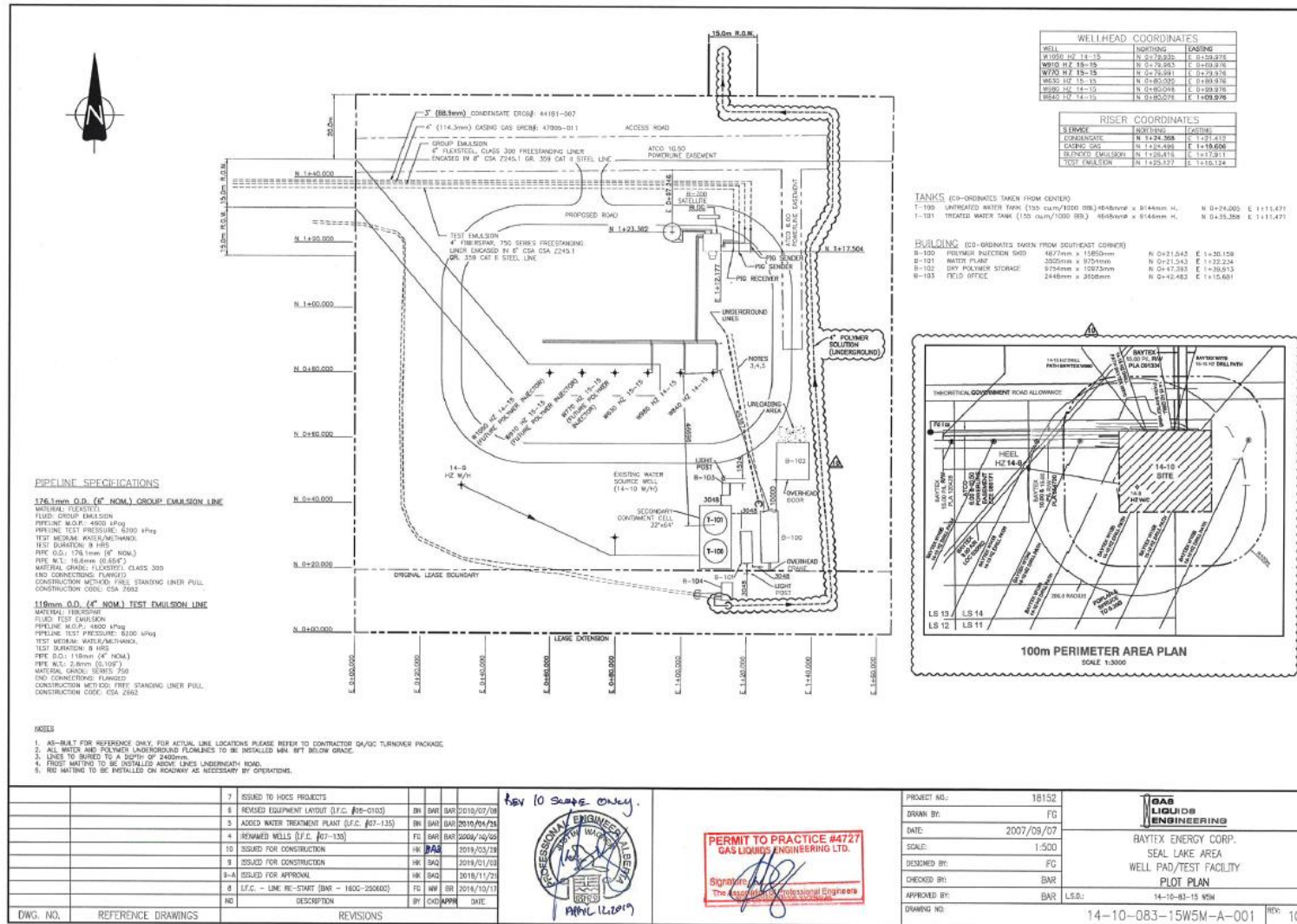
## Pilot: 14-10-083-15W5 Process Flow Diagram





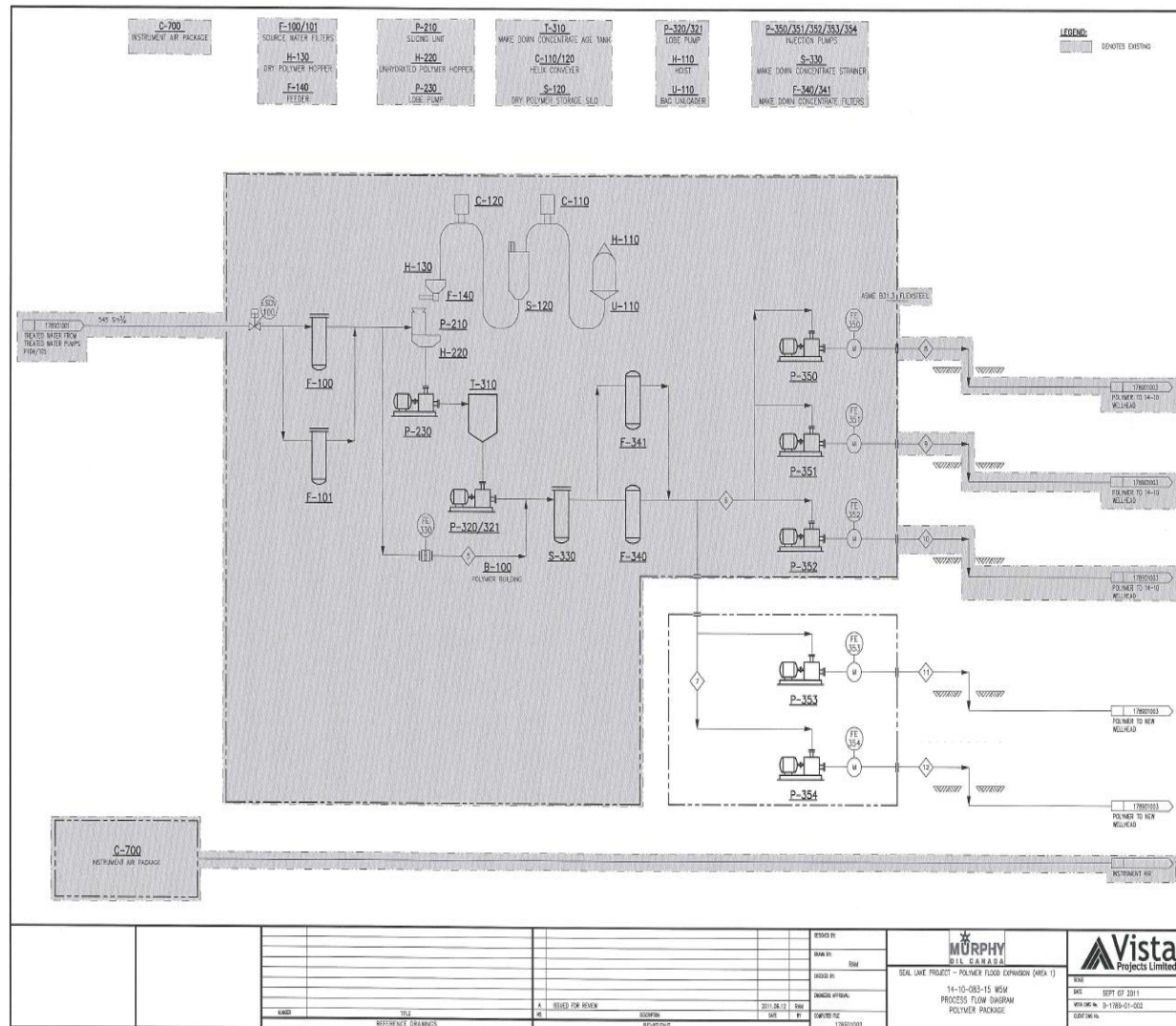
# 1. Facilities

## Phase 1: 14-10-083-15W5 Plot Plan



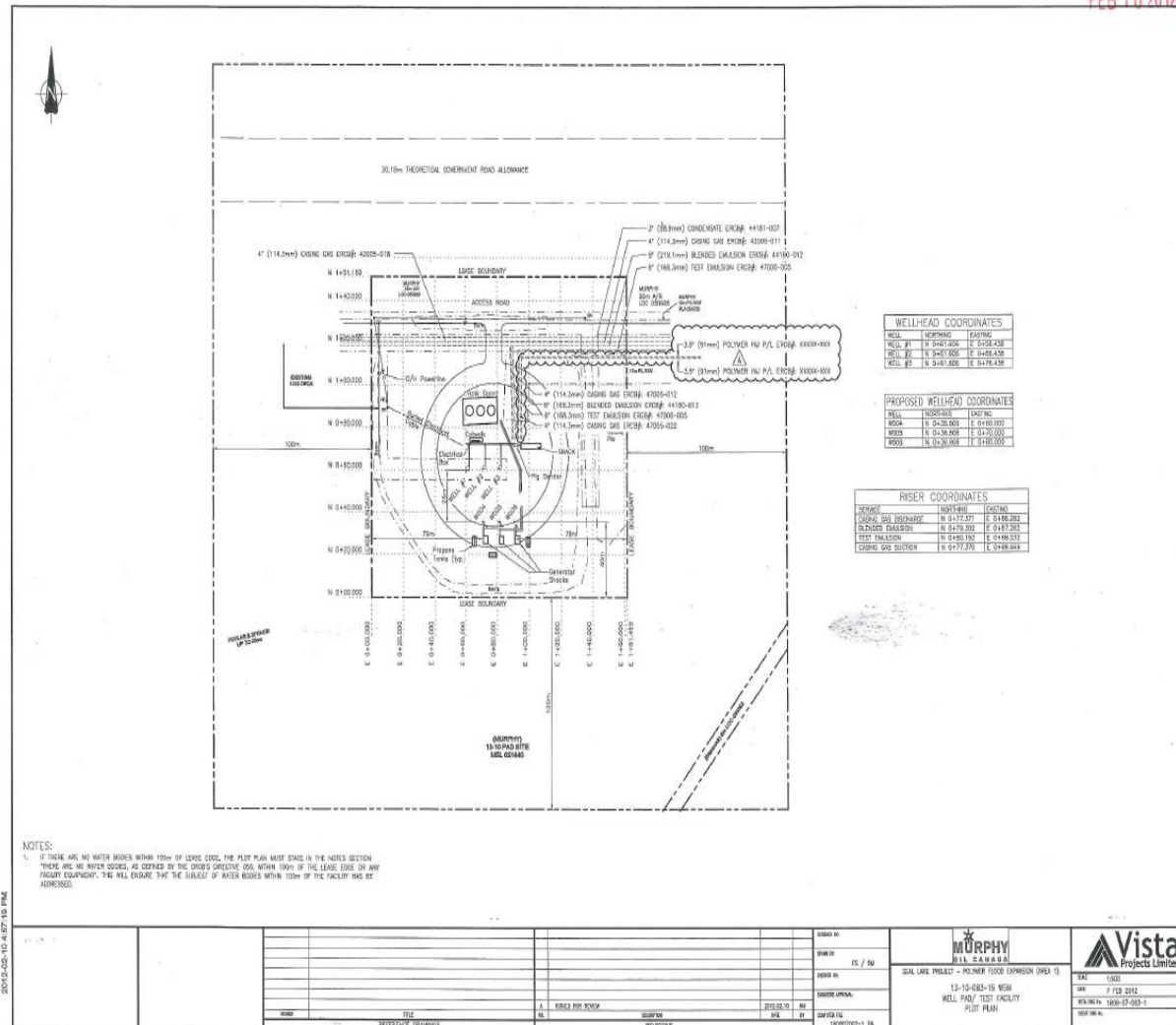
# 1. Facilities

## Phase 1: 14-10-083-15W5 Process Flow Diagram

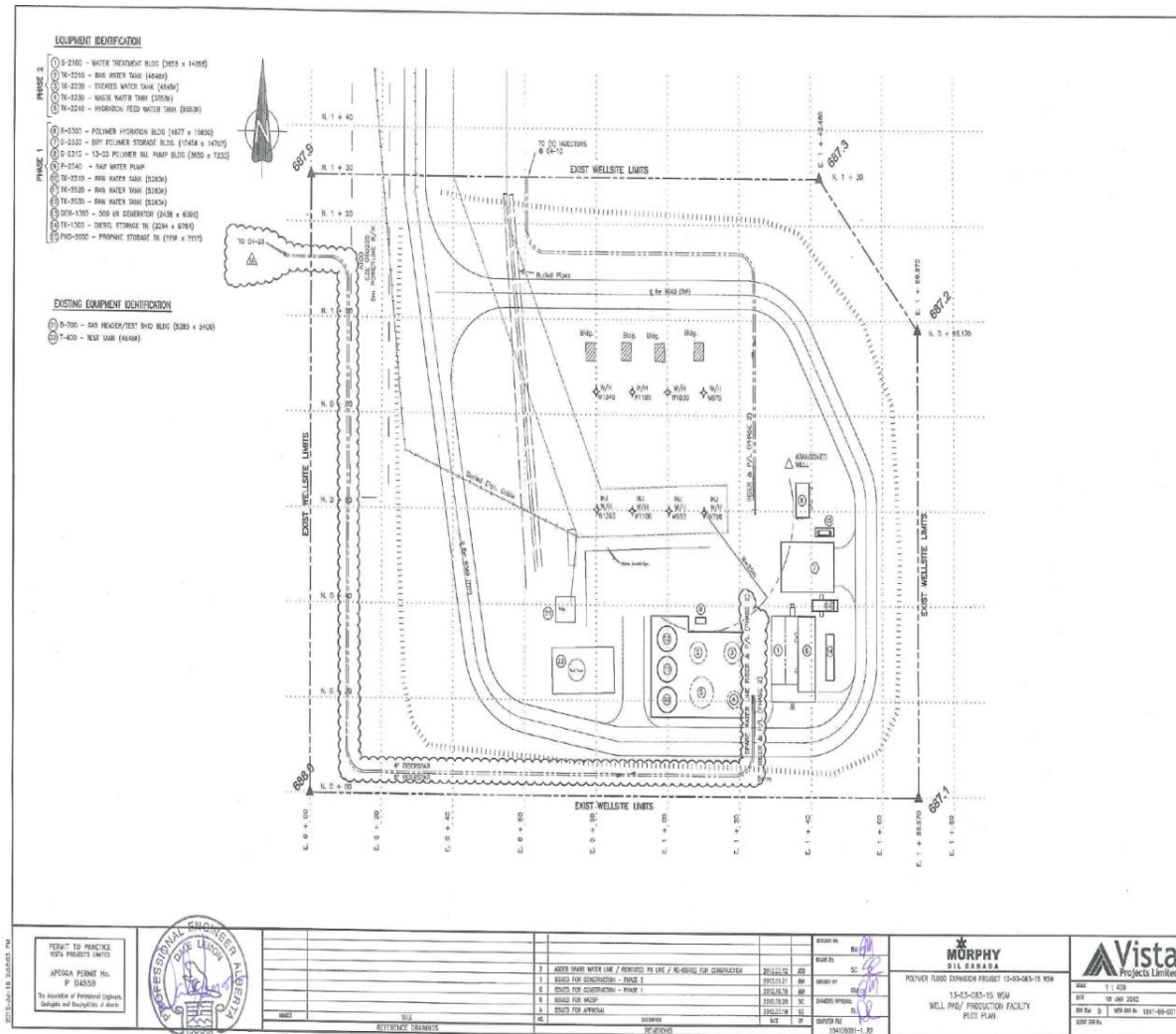


## Phase 1: 13-10-083-15W5 Plot Plan

FEB 10 2012

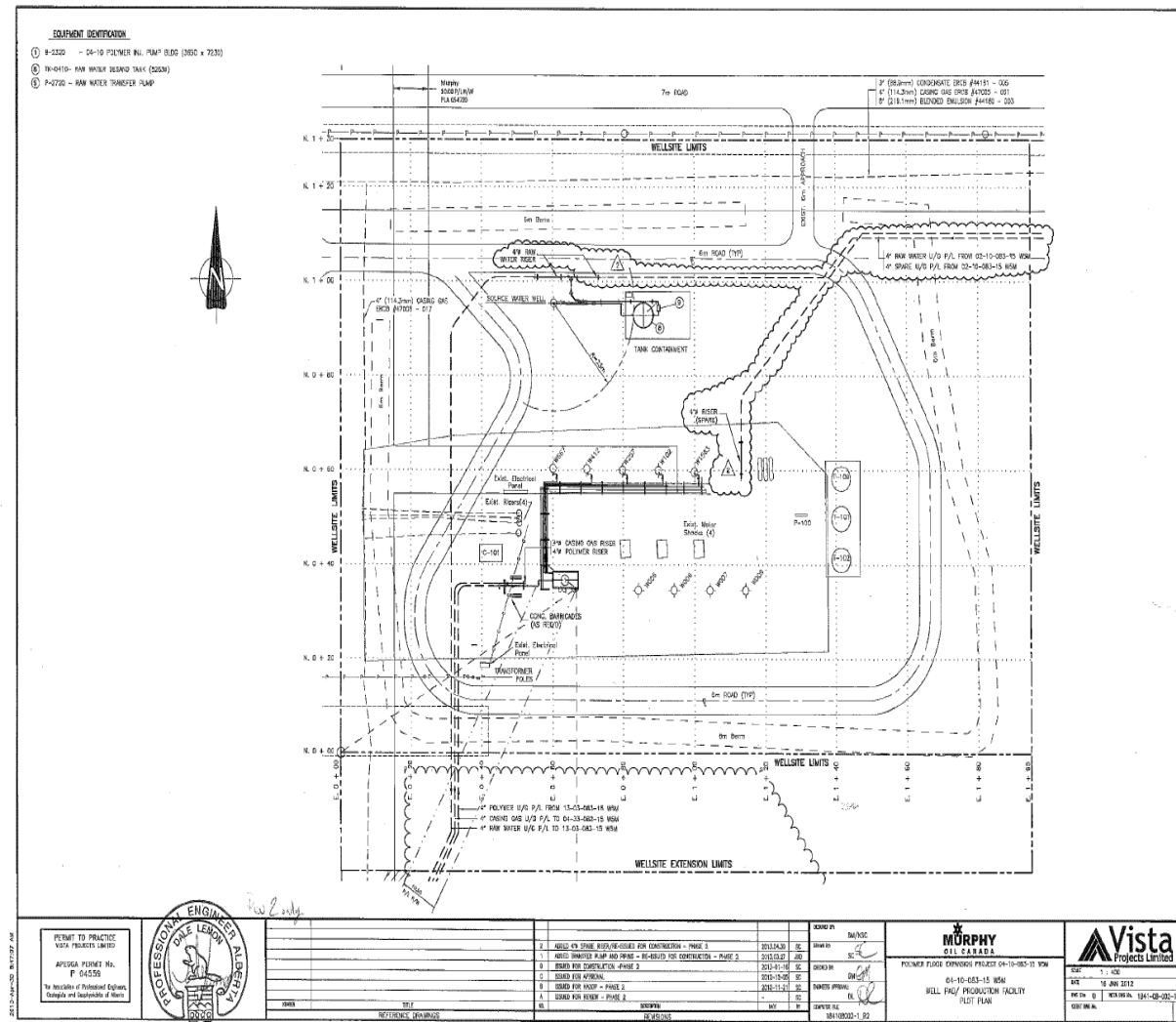


## Phase 2 – 13-03-083-15W5 Plot Plan





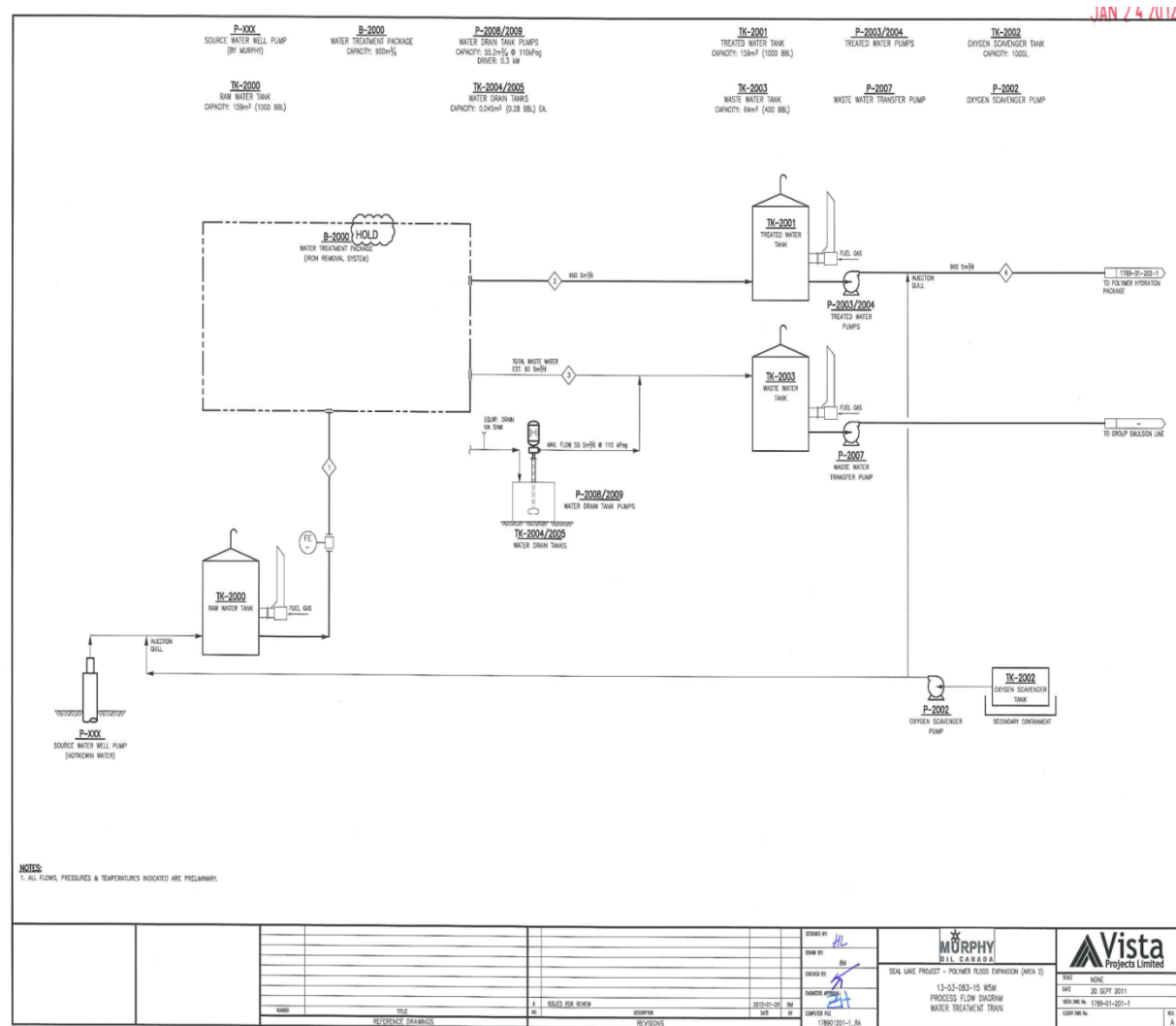
## Phase 2 – 04-10-083-15W5 Plot Plan



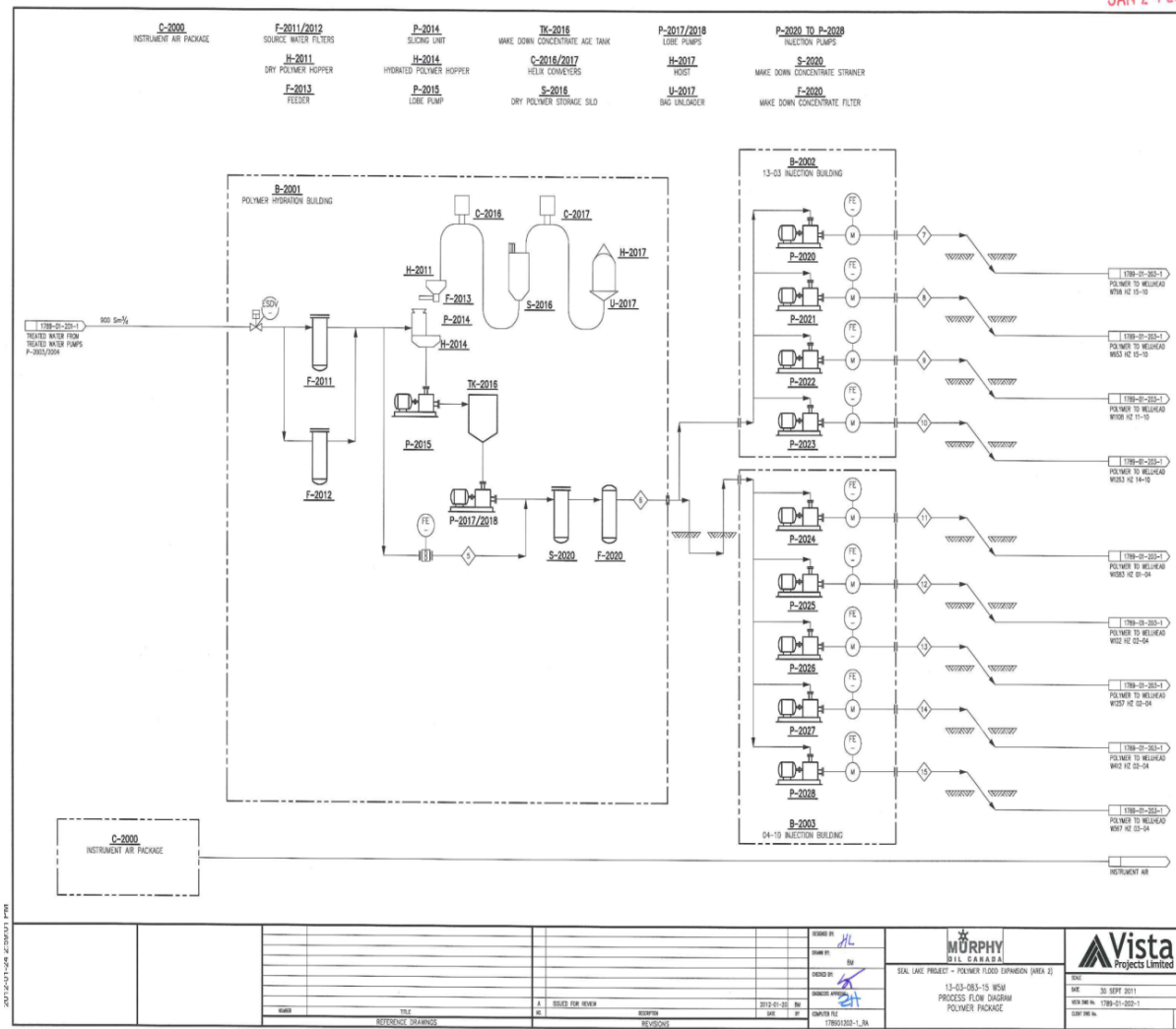


# 1. Facilities

## Phase 2 – Process Flow Diagram

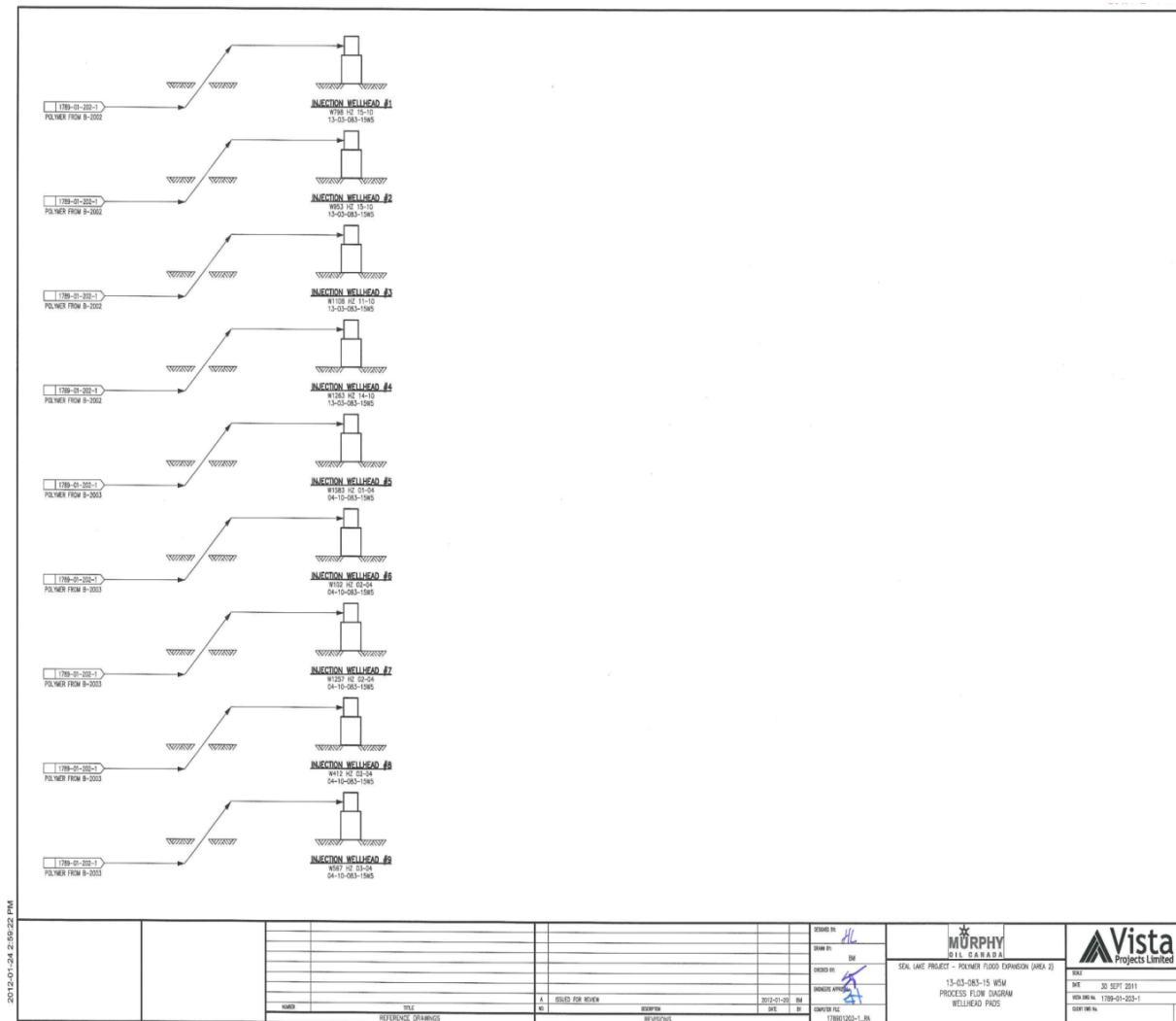


## Phase 2 – Process Flow Diagram (cont.)



# 1. Facilities

## Phase 2 – Process Flow Diagram (cont.)



## 2. Measurement and Reporting

### Well Testing and Injection Rates

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#### Well Tests

- Test tanks located at 14-10 (which also serves 13-10 pad), and 13-03 pads to determine production rates
- Composite fluid samples are collected via top cut samplers for manual BS&W measurement
- Production from the polymer flood is prorated against the inlet meter at the 04-33 Battery inlet
- There is a wide range of variability with respect to well productivity in the project, as such Baytex schedules its testing frequency and durations based on the requirements prescribed in Directive 17, Section 6.4.4, Table 6.1. There is no single testing frequency that is appropriate for all wells in the project.

#### Polymer Injection

- Polymer injection rates are measured via individual wellhead meters
- Produced polymer is contained in the aqueous phase and is not miscible with the oil phase

## 2. Measurement and Reporting

### Production Accounting Proration

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Production Date	Oil Proration Factor	Gas Proration Factor	Water Proration Factor
2018-08	0.62	0.92	1.50
2018-09	0.52	0.58	1.54
2018-10	0.67	0.56	1.41
2018-11	0.68	0.38	1.35
2018-12	0.41	0.93	2.45
2019-01	0.81	0.79	1.23
2019-02	0.83	0.59	1.05
2019-03	0.82	0.31	1.00
2019-04	0.85	0.51	1.26
2019-05	0.64	0.53	1.41
2019-06	0.63	0.42	1.28
2019-07	0.91	0.45	1.26



## 2. Measurement and Reporting

### Actions to Improve Proration Factors

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- On August 9, 2018 Baytex submitted a voluntary self disclosure (VSD) to the AER describing an ongoing non-compliance related to proration factors at the projects 04-33-082-15W5 battery (facility license F34313; AB BT 0094150 ).
- The VSD disclosed how proration factors at the facility have consistently exceeded the prescribed limits as defined in AER *Directive 017*, Section 3.14.
- The VSD proposed a plan to bring the proration factors back into compliance by December 31, 2019. Actions stemming from the VSD submitted have improved proration factors, however, as of the date of this submission, they are not yet compliant with AER Directive 017 requirements. While recognizing the inherent challenges of testing heavy oil, Baytex is continuously evaluating new methods and procedures to improve proration accuracy.

### 3. Water Usage

#### Paddy Cadotte Formation Source Water

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- UWI: 1F1/14-10-083-15W5/0
  - Alberta Environment & Parks (AEP) Water Act approval 00289082-00-00 for the diversion of up to 164,250 m<sup>3</sup> of water for injection
  - 3,750 ppm TDS
  - Total volume of water diverted over the lifetime was 472,010 m<sup>3</sup>
  - Suspended March 4, 2019
  
- UWI: 1F1/15-03-083-15W5/0
  - No Water Act approval necessary with TDS testing >4,000 ppm
  - 5,383 ppm TDS
  - High iron concentrations were not detected
  - Not in use since 2013

### 3. Water Usage

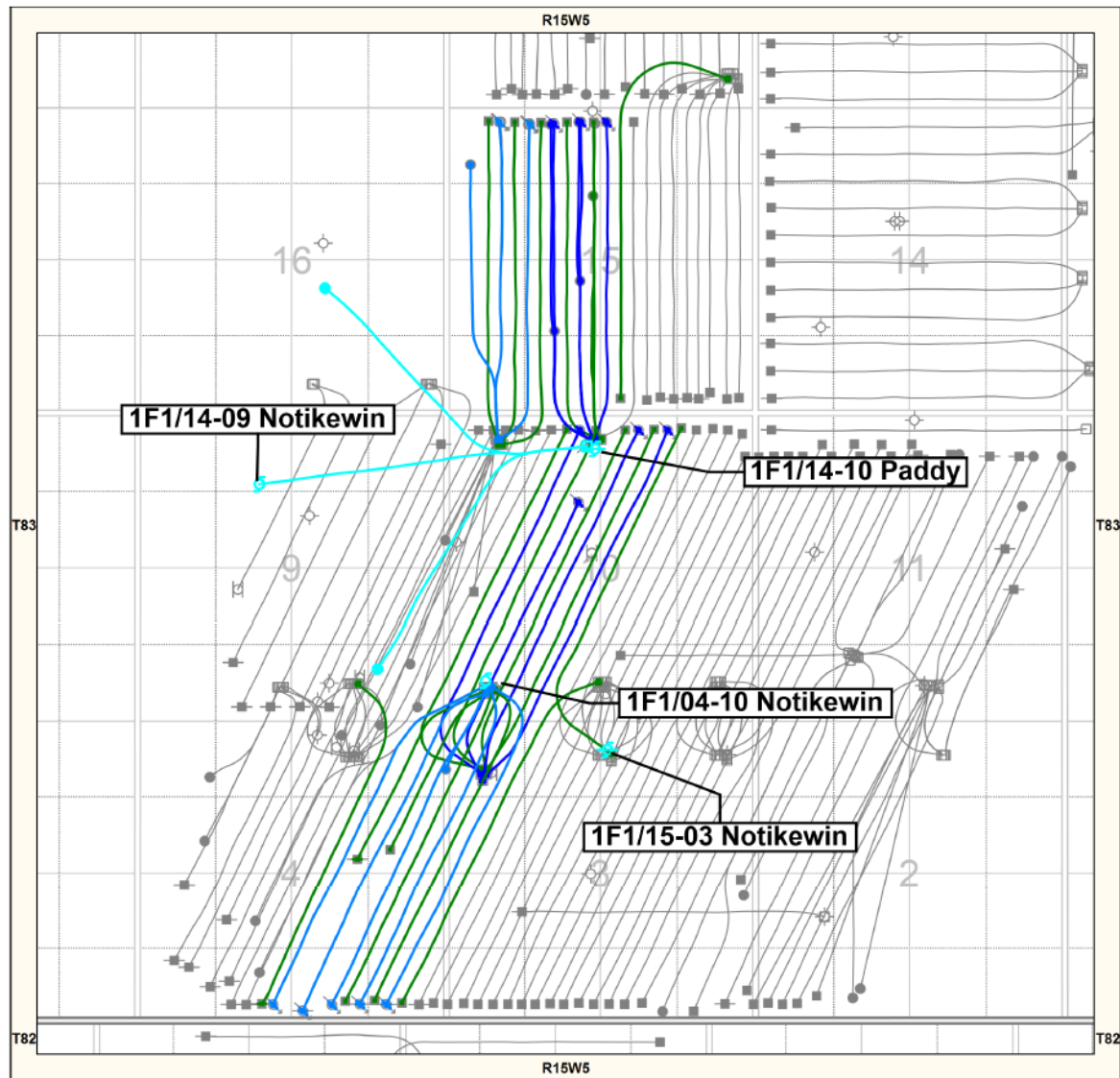
#### Notikewan Formation Source Water

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- UWI: 1F1/4-10-083-15W5
  - Water Act approvals are not needed for Notikewan wells with TDS >4,000 ppm
  - 10,592 ppm TDS
  - High iron concentrations were not detected
  - Current supply for the polymer facility at the 13-03 Pad
  - Volume of water diverted August 2018 – July 2019 was 37,060 m<sup>3</sup>
  
- UWI: 1F1/14-09-083-15W5
  - Rig released November 17, 2018; Began producing February 2019
  - Water Act approvals are not needed for Notikewan wells with TDS >4,000 ppm
  - 10,100 ppm TDS
  - High iron concentrations were not detected
  - Current supply for the Polymer facility at the 14-10 Pad
  - Volume of water diverted February 2019 – July 2019 was 11,738 m<sup>3</sup>

### 3. Water Usage

#### Source Water Well Locations



### 3. Water Usage

#### Water Volumes

	Water Production and Source Water Volumes, m <sup>3</sup>					
	Pilot Production	Phase 1 Production	Pilot + Phase 1 Total Produced	Source Water Volumes Used (Pilot and Phase 1, combined)	Phase 2N Production	Phase 2N Source Water Volumes Used
2018-08	1252	82	1334	5772	1926	3733
2018-09	1990	118	2108	5252	1393	3006
2018-10	1638	73	1710	5178	2038	3642
2018-11	1440	51	1491	4914	1839	3767
2018-12	2906	70	2976	5102	877	2518
2019-01	2143	48	2190	5295	265	2631
2019-02	1609	40	1650	4277	439	2338
2019-03	2225	39	2264	5065	478	2972
2019-04	2906	70	2976	3791	574	3383
2019-05	2815	37	2852	3463	707	3254
2019-06	2955	77	3031	4399	718	2908
2019-07	2373	77	2451	3876	740	2908
<b>Totals</b>	<b>26252</b>	<b>782</b>	<b>27033</b>	<b>56384</b>	<b>11994</b>	<b>37060</b>

### 3. Water Usage

#### Produced Water Volumes

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- Produced volumes are prorated back to the producing wells by periodic well tests performed at each pad and a group meter at the 04-33 battery
- As of July 2019, there has been a recorded 150,767 m<sup>3</sup> of water produced during polymer flood operation at the respective phases. Volumes are considered from the beginning of polymer injection at each individual pattern
- Produced water is currently being injected into the disposal well at 102/06-33-082-15W5/0 that is connected to the 04-33 battery by a pipeline



### 3. Water Usage

#### Injected Volumes

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- Pilot            331,495 m<sup>3</sup> injected
  - Phase 1       89,814 m<sup>3</sup> injected
  - Phase 2       272,417 m<sup>3</sup> injected
  - **Total           693,726 m<sup>3</sup> injected**
- 
- Baytex measures bacteria levels as part of the field monitoring program for corrosion and fouling
  - Currently employing a biocide batch treatment program to reduce levels of sulphur-reducing bacteria and acid producing bacteria

## 4. Regulatory Compliance Statement

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- As described in the Measurement and Reporting Section a voluntary self-disclosure, describing the non-compliance at Baytex's 04-33-082-15W5 facility and proposing a plan to resolve it, was submitted on August 9, 2018 (Application No. A10085876). This voluntary self-disclosure was subsequently approved by the AER on November 28, 2018.
- While Baytex has continued to improve proration factors since disclosing the issue they are not yet compliant with Directive 017 requirements. For the remainder of the timeframe allotted in the VSD (to December 31, 2019) Baytex will continue working diligently to improve the proration factors.
- If Baytex is unable to restore compliance with the 04-33-082-15W5 facility proration factors the company will engage with the AER's Measurement Group to collaboratively develop a remedial action plan to restore compliance.

# Contact Information



## Baytex Energy Corp.

Suite 2800, Centennial Place  
520 – 3rd Avenue S.W.  
Calgary, Alberta T2P 0R3

T 587.952.3000

Toll Free 1.800.524.5521

[www.baytexenergy.com](http://www.baytexenergy.com)

## Adrian Blazevic

Geologist

587.952.3303

## Karl Naundorf, P. Eng.

Production Engineer

587.952.3297

## Tyler Kushniruk, P. Eng.

Exploitation Engineer

587.952.3170

# Appendix

## Injection Pressures for Injection Wells

Well	Phase	Date	Injection Pressure (kPa)
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Jul-18	4143
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Aug-18	4117
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Sep-18	3888
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Oct-18	3935
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Nov-18	3869
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Dec-18	3834
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Jan-19	4096
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Feb-19	4149
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Mar-19	4149
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Apr-19	4002
13-03 PAD W1263 00/14-10-083-15W5/0	2N	May-19	3881
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Jun-19	4124
13-03 PAD W1263 00/14-10-083-15W5/0	2N	Jul-19	4016
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Jul-18	4139
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Aug-18	4102
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Sep-18	3892
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Oct-18	3778
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Nov-18	4138
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Dec-18	3907
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Jan-19	4101
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Feb-19	4150
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Mar-19	4017
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Apr-19	4001
13-03 PAD W1108 00/11-10-083-15W5/0	2N	May-19	3859
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Jun-19	4135
13-03 PAD W1108 00/11-10-083-15W5/0	2N	Jul-19	4017
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Jul-18	4146
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Aug-18	4080
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Sep-18	3646
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Oct-18	3210
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Nov-18	3604
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Dec-18	3405
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Jan-19	3868
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Feb-19	4045
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Mar-19	4115
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Apr-19	4003
13-03 PAD W0953 02/15-10-083-15W5/0	2N	May-19	3792
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Jun-19	3935
13-03 PAD W0953 02/15-10-083-15W5/0	2N	Jul-19	3987
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Jul-18	997
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Aug-18	891
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Sep-18	698
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Oct-18	484
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Nov-18	530
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Dec-18	239
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Jan-19	324
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Feb-19	444
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Mar-19	1245
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Apr-19	2051
13-03 PAD W0798 00/15-10-083-15W5/0	2N	May-19	2165
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Jun-19	2718
13-03 PAD W0798 00/15-10-083-15W5/0	2N	Jul-19	3461

Well	Phase	Date	Injection Pressure (kPa)
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Jul-18	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Aug-18	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Sep-18	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Oct-18	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Nov-18	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Dec-18	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Jan-19	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Feb-19	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Mar-19	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Apr-19	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	May-19	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Jun-19	0
13-10 PAD W1330 00/13-15-083-15W5/0 - FIT 353	1	Jul-19	0
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Jul-18	4144
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Aug-18	4169
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Sep-18	3965
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Oct-18	3927
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Nov-18	3590
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Dec-18	3415
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Jan-19	3998
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Feb-19	4163
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Mar-19	4124
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Apr-19	3923
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	May-19	3310
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Jun-19	3847
13-10 PAD W1190 03/14-15-083-15W5/0 - FIT 354	1	Jul-19	4230
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Jul-18	4229
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Aug-18	4230
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Sep-18	3801
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Oct-18	4072
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Nov-18	4374
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Dec-18	3860
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Jan-19	4234
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Feb-19	4628
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Mar-19	4224
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Apr-19	4249
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	May-19	4010
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Jun-19	4434
14-10 PAD W1050 00/14-15-083-15W5/0 - FIT 350	Pilot	Jul-19	4279
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Jul-18	4223
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Aug-18	4177
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Sep-18	4036
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Oct-18	3937
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Nov-18	4268
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Dec-18	3627
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Jan-19	4206
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Feb-19	4419
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Mar-19	4105
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Apr-19	4160
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	May-19	3797
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Jun-19	4227
14-10 PAD W0910 02/14-15-083-15W5/0 - FIT 351	Pilot	Jul-19	4019
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Jul-18	4245
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Aug-18	4215
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Sep-18	4124
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Oct-18	3974
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Nov-18	4104
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Dec-18	3667
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Jan-19	4306
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Feb-19	4082
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Mar-19	4128
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Apr-19	4145
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	May-19	3790
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Jun-19	4200
14-10 PAD W0770 02/15-15-083-15W5/0 - FIT 352	Pilot	Jul-19	4002

# Appendix

## Pressure and Temperature for Observation Well

Operator Name	Scheme Name	Approval # (without Suffix)	Date	Well Category	UWI (i.e., 02/11-10-083-15W5)	Well Name	Associated Well Pair	Dist. from Associated Well Pair (m)	Fluids / Zones	TVD (m KB)	MD (mKB)	Instrumentation	Reported Value	Units
Baytex Energy Ltd.	Seal Lake Polymer	11320	7/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-10	35 m	Bitumen	685.00	694.00	Piezometer	4132.24	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11321	8/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-11	36 m	Bitumen	685.00	694.00	Piezometer	4149.98	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11322	9/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-12	37 m	Bitumen	685.00	694.00	Piezometer	4160.35	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11323	10/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-13	38 m	Bitumen	685.00	694.00	Piezometer	4170.63	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11324	11/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-14	39 m	Bitumen	685.00	694.00	Piezometer	4181.23	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11325	12/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-15	40 m	Bitumen	685.00	694.00	Piezometer	4188.58	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11326	1/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-16	41 m	Bitumen	685.00	694.00	Piezometer	4205.93	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11327	2/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-17	42 m	Bitumen	685.00	694.00	Piezometer	4217.10	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11328	3/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-18	43 m	Bitumen	685.00	694.00	Piezometer	4228.71	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11329	4/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-19	44 m	Bitumen	685.00	694.00	Piezometer	4239.51	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11330	5/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-20	45 m	Bitumen	685.00	694.00	Piezometer	4251.52	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11331	6/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-21	46 m	Bitumen	685.00	694.00	Piezometer	4263.09	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11332	7/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-22	47 m	Bitumen	685.00	694.00	Piezometer	4275.31	kPaa
Baytex Energy Ltd.	Seal Lake Polymer	11320	7/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-10	35 m	Bitumen	685.00	694.00	Thermocouple	19.69	°C
Baytex Energy Ltd.	Seal Lake Polymer	11321	8/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-11	36 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11322	9/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-12	37 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11323	10/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-13	38 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11324	11/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-14	39 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11325	12/1/2018	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-15	40 m	Bitumen	685.00	694.00	Thermocouple	19.69	°C
Baytex Energy Ltd.	Seal Lake Polymer	11326	1/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-16	41 m	Bitumen	685.00	694.00	Thermocouple	19.69	°C
Baytex Energy Ltd.	Seal Lake Polymer	11327	2/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-17	42 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11328	3/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-18	43 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11329	4/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-19	44 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11330	5/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-20	45 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11331	6/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-21	46 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C
Baytex Energy Ltd.	Seal Lake Polymer	11332	7/1/2019	OBS	02/11-10-083-15W5/	11-10 OBS	02/15-10 & 04/15-22	47 m	Bitumen	685.00	694.00	Thermocouple	19.70	°C