Annual Performance Presentation

In Situ Oil Sands Schemes
9673 / 10147 / 10423 / 10787

April 2017

Premium Value | Defined Growth | Independent

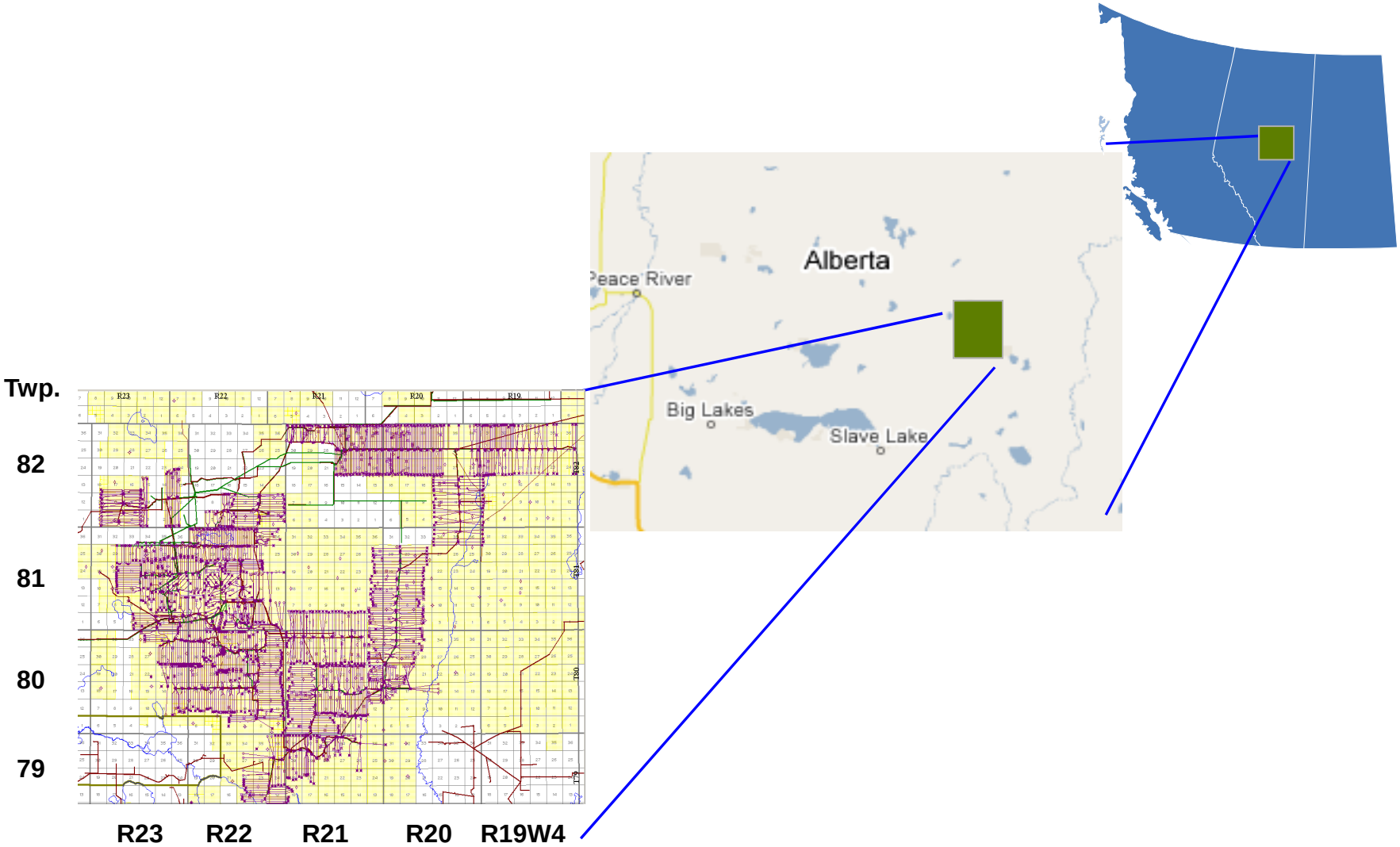
Canadian Natural

Agenda

Canadian Natural

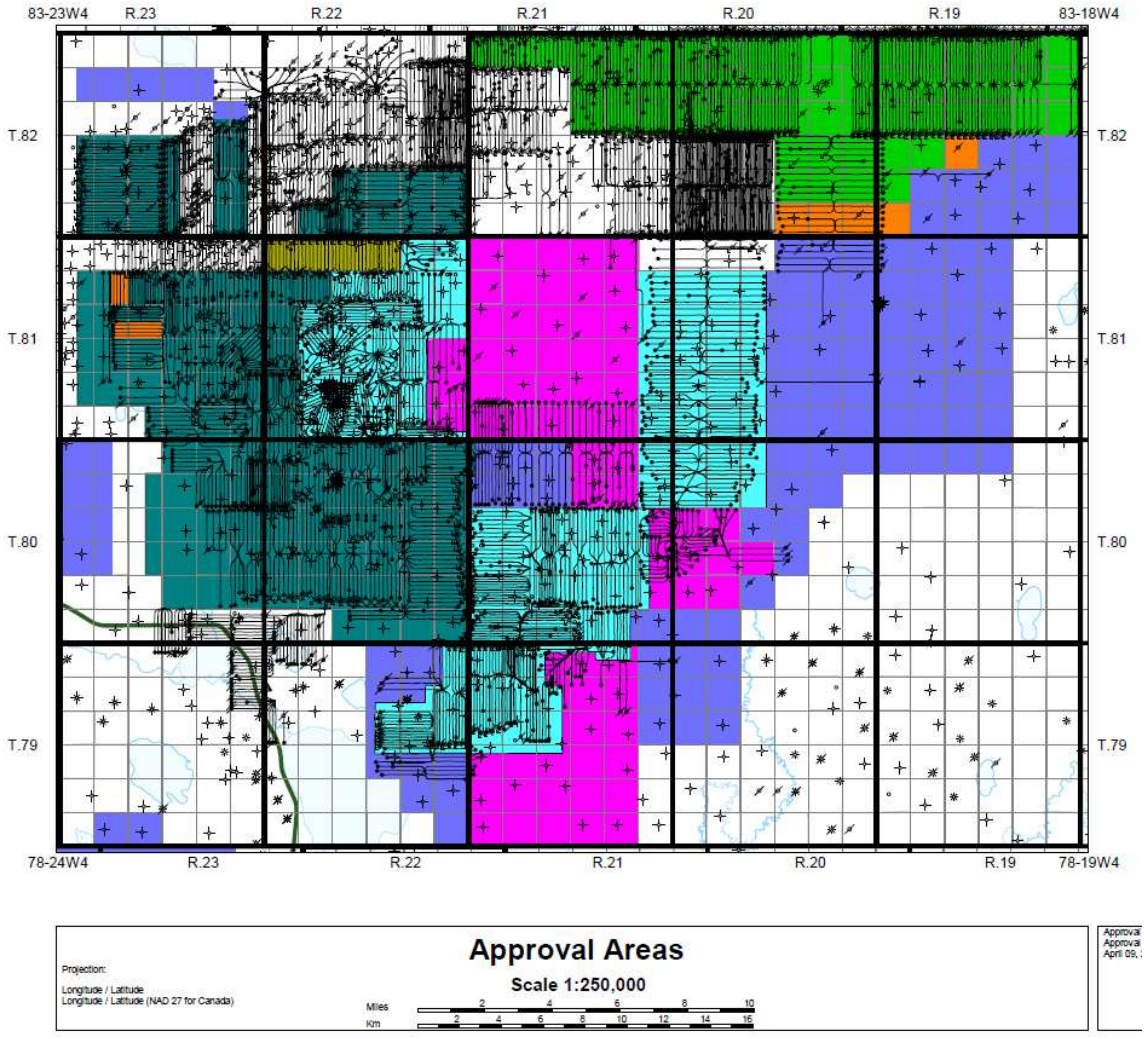
- Current Approvals
- Geological Overview
- Drilling, Completions, and Artificial Lift
- Field Performance and Surveillance
- Cap Rock Integrity & Monitoring
- Future Development Plans
- Facilities
- Measuring & Reporting
- Facility Future Plans
- Water Use, Conservation & Disposal
- AER Compliance
- Conclusions

Brintnell Location



Oil Sands Royalties (OSR 101, OSR 006)

Primary and Enhanced Approval Regions



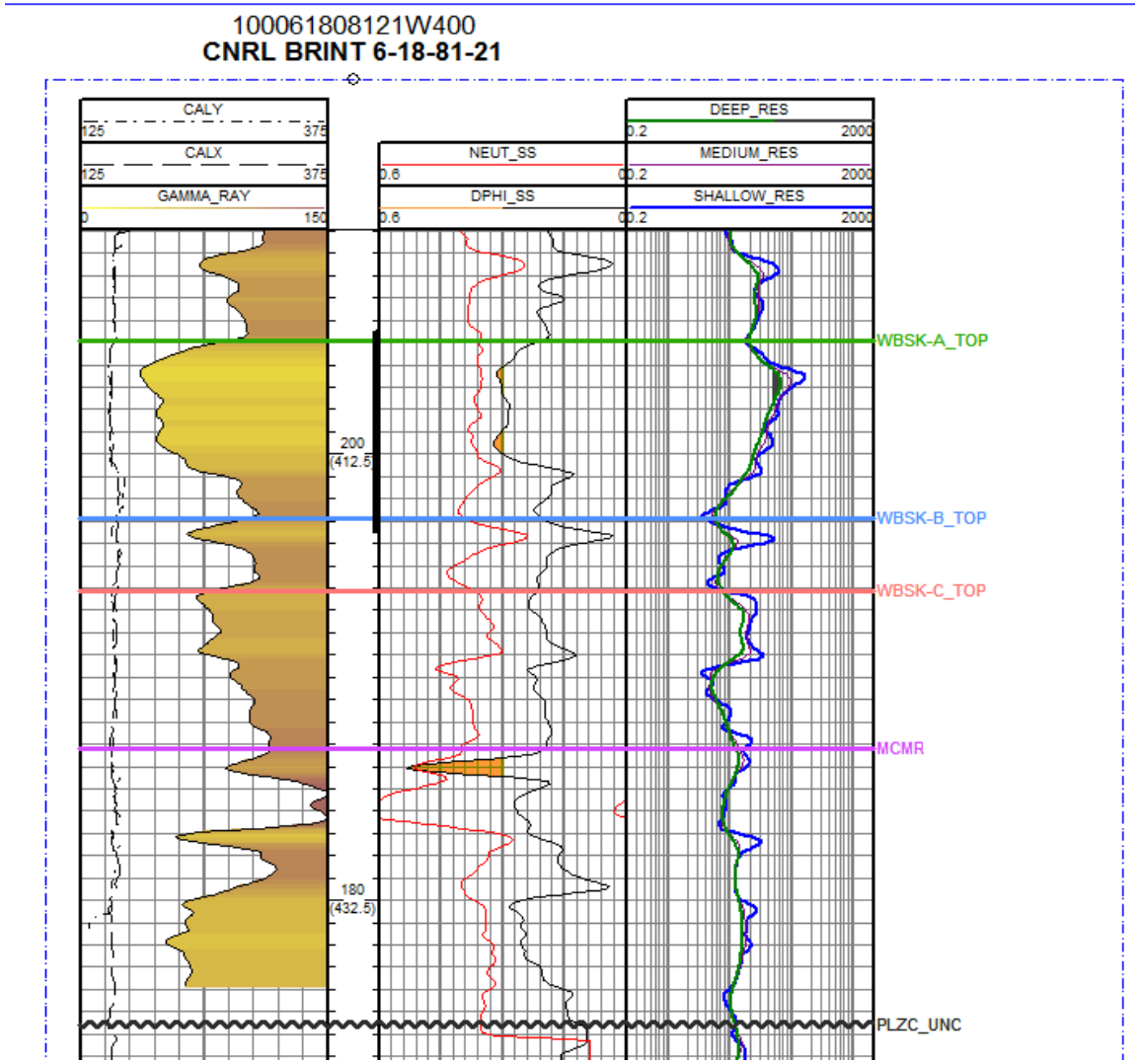
Enhanced Recovery Schemes

- 10147
- 9673
- 10787
- 10423

Primary Recovery Schemes

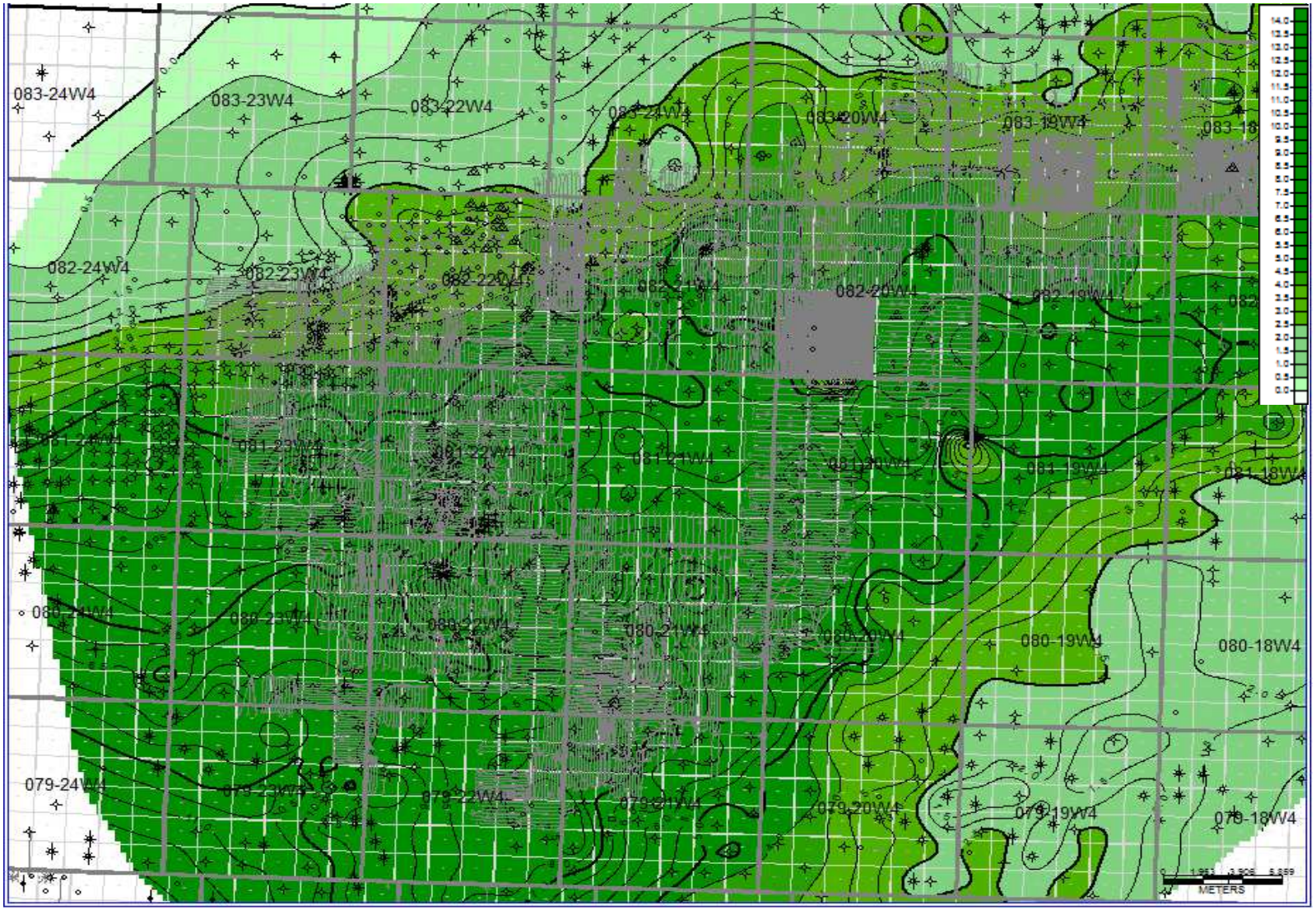
- 6619
- 9466
- 9884

CNRL Brint 6-14-81-21 W4M Type Log



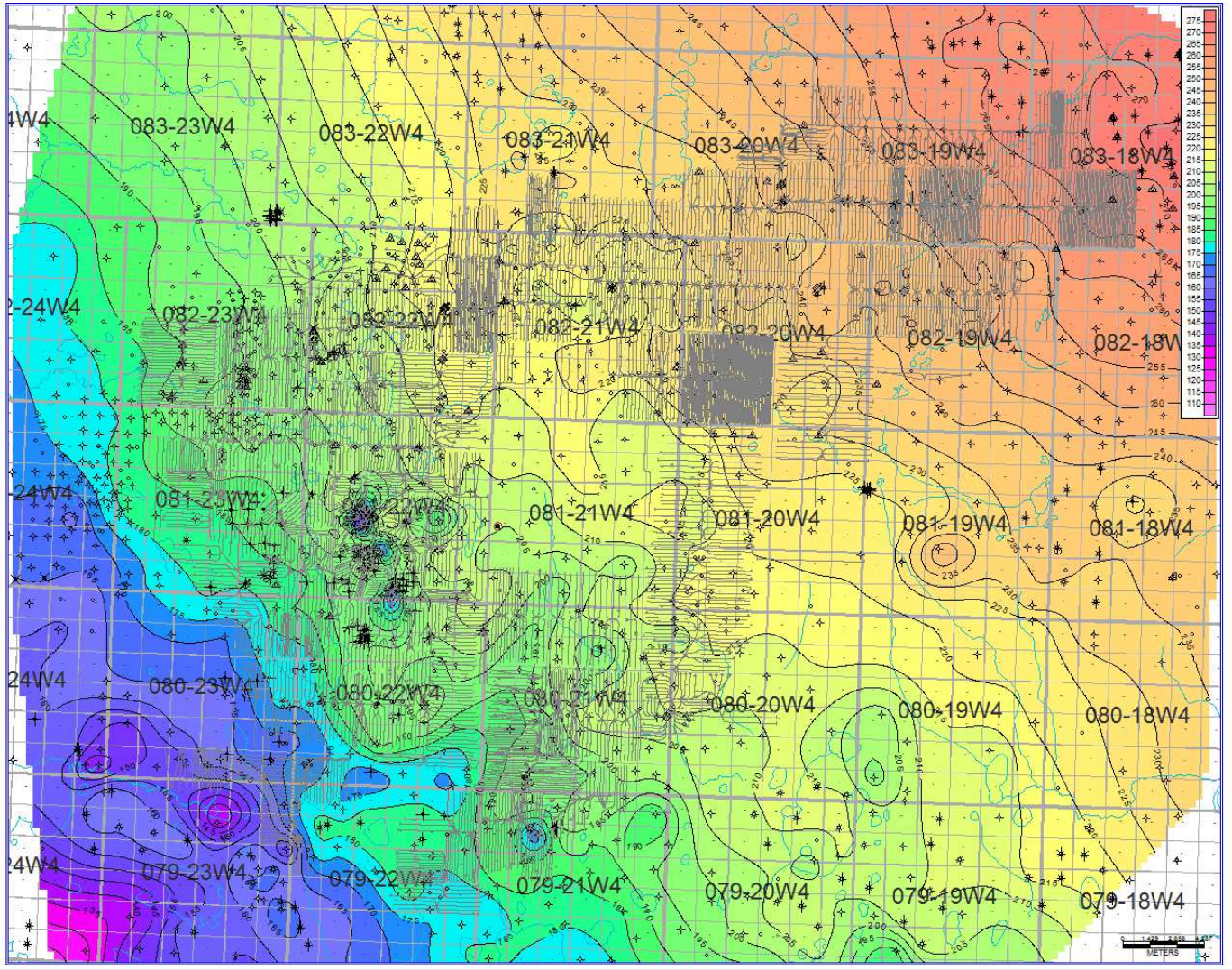
Wabiskaw ‘A’ Net Pay Map

Canadian Natural

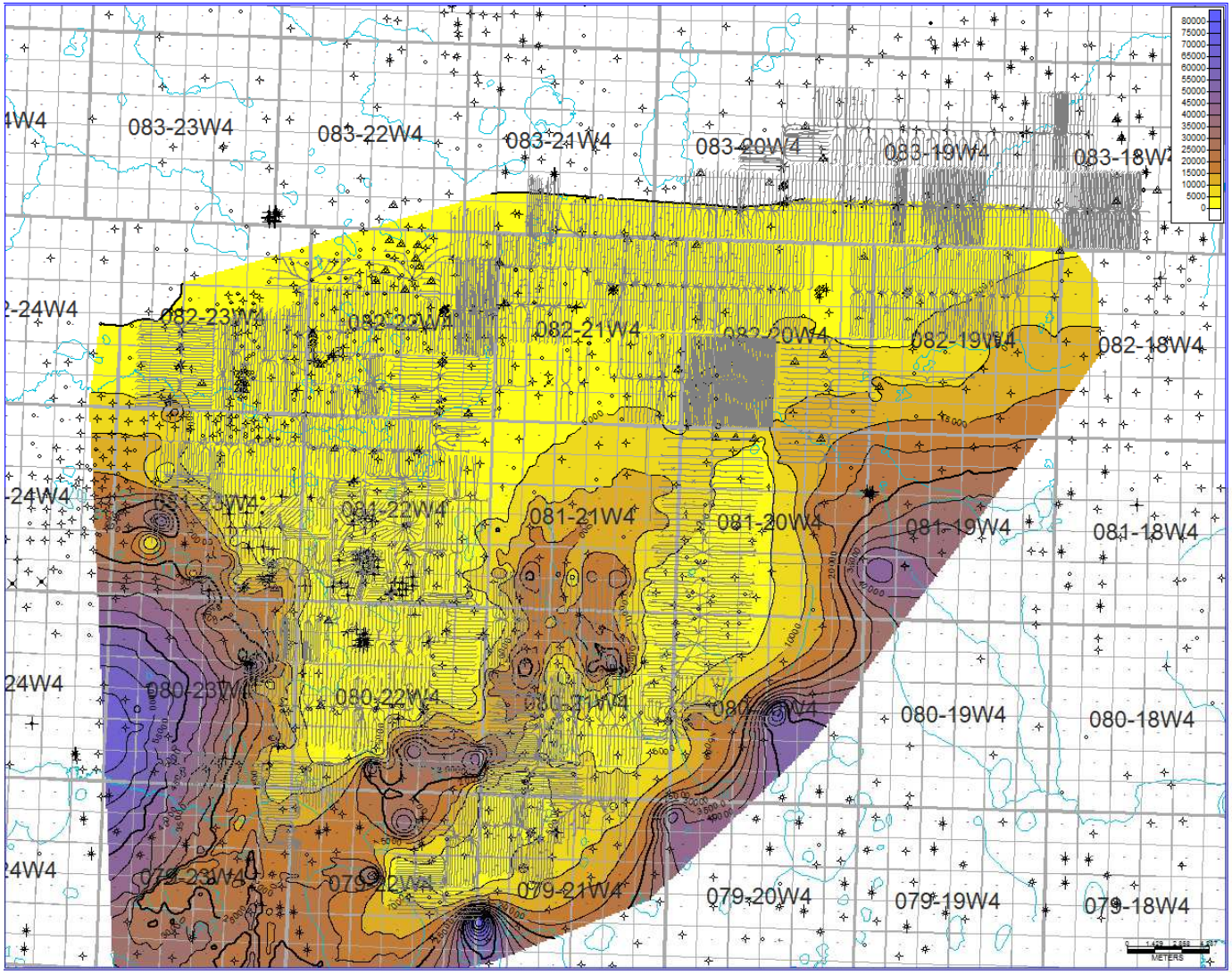


Wabiskaw Structure Map

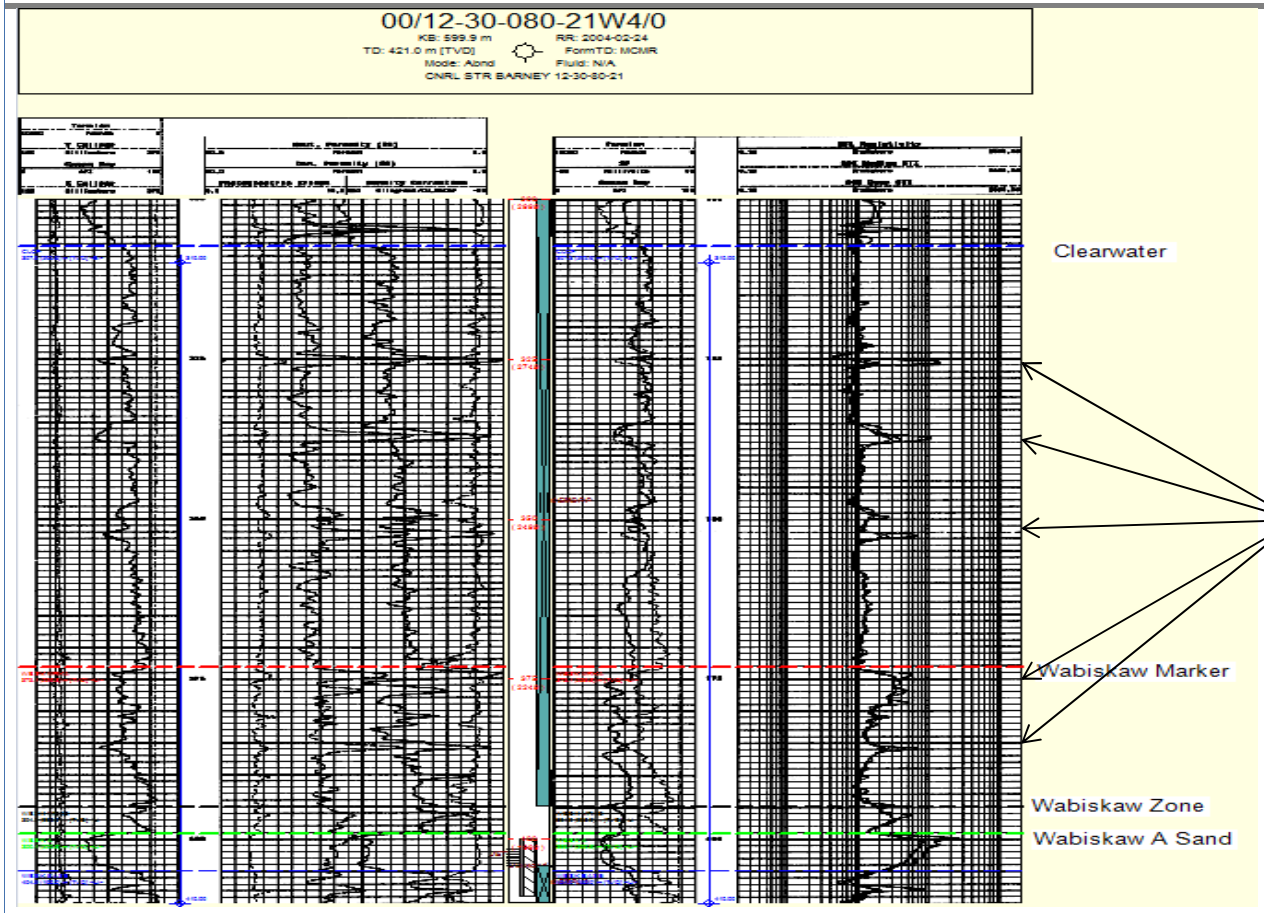
Canadian Natural



Produced Oil Viscosity Map



Type Log Clearwater Isopach/Tight Streaks



The cap rock comprises the Clearwater Shales, Wabiskaw Marker and the Wabiskaw zone (which ranges in thickness from 80 to 95 meters) and over lies the Wabiskaw A Sand.

Contained within this isopach are numerous tight streaks ranging from 1.5 - 4 meters in thickness throughout this interval; they are found in both the Clearwater shale interval the Wabiskaw marker interval, as illustrated in the accompanying log.

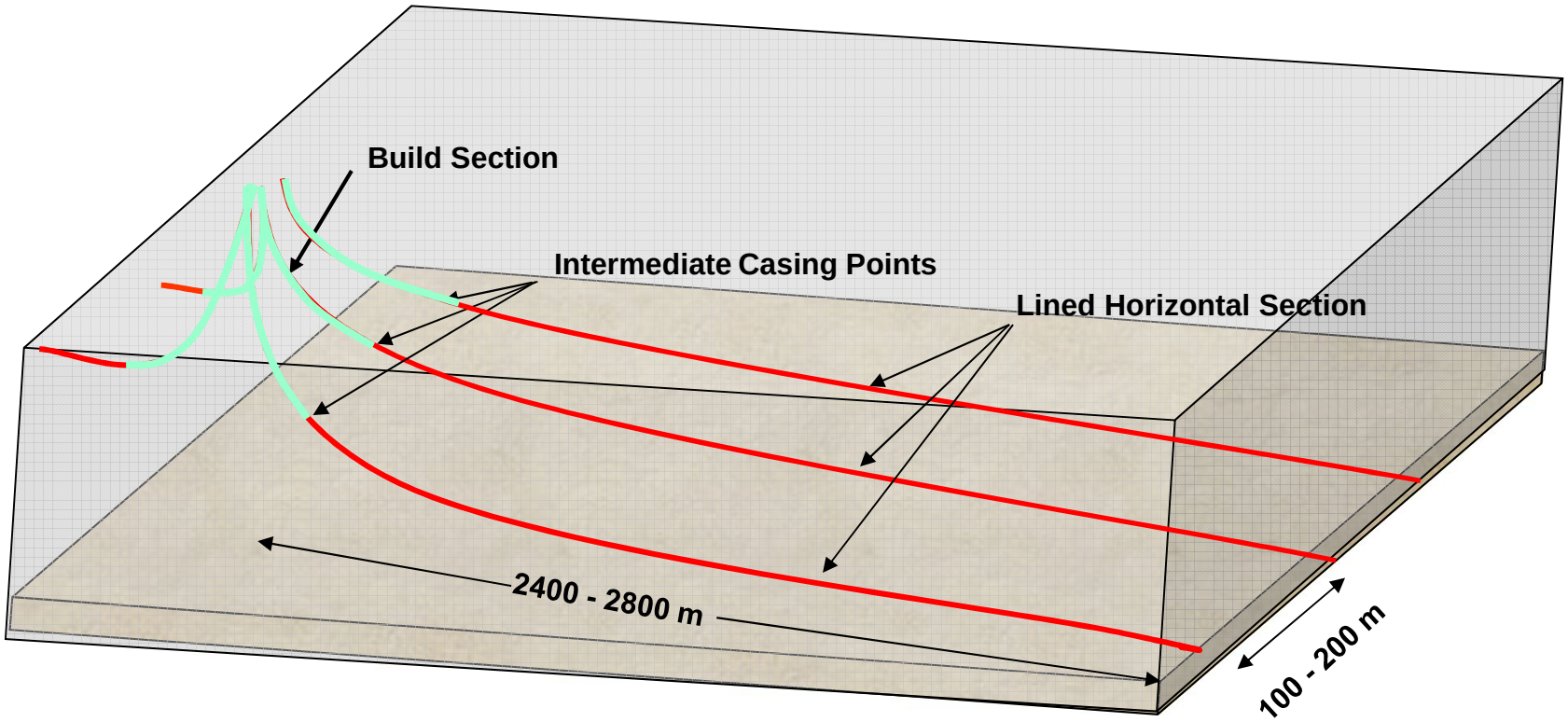
Brintnell Regional Reservoir Properties

Canadian Natural

- **Upper Wabiskaw Sand**
  - Depth of 300-425m TVD
  - Net Pay Range 1 – 9m
  - Porosity 28 – 32%
  - Permeability 300 – 3000md
  - Temperature 13-17 deg. C
  - Water Saturation 30 – 40%
  - Oil Viscosity (dead oil) 800 – 80,000cp @ 15 deg. C
  - Initial Reservoir Pressure 1900 – 2600kpa

Drilling, Completions, and Artificial Lift

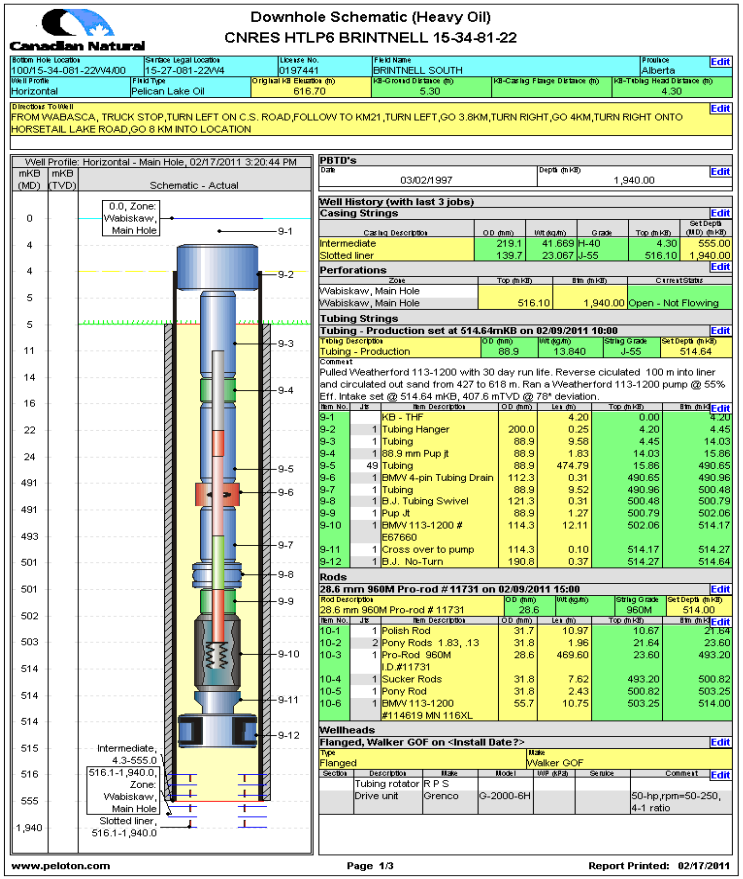
Typical Drilling Configuration



- **CNRL lands the intermediate casing within the Wabiskaw formation.**

Typical Well Configurations

- **Producer**



Downhole Schematic (Heavy Oil)
CNRES HTLP6 BRINTNELL 15-34-81-22

Bottom Hole Location	Surface Legal Location	License No.	Field Name	Province
100/15-34-081-22W4/00	15-27-081-22W4	0197441	BRINTNELL SOUTH	Alberta

Well Profile	Field Type	Original KB Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)	KB-Tbg Head Distance (m)
Horizontal	Pelican Lake Oil	616.70	5.30		4.30

Directions To Well
FROM WABASCA, TRUCK STOP,TURN LEFT ON C.S. ROAD,FOLLOW TO KM21,TURN LEFT,GO 3.8KM,TURN RIGHT,GO 4KM,TURN RIGHT ONTO HORSETAIL LAKE ROAD,GO 8 KM INTO LOCATION

Well Profile: Horizontal - Main Hole, 02/17/2011 3:20:44 PM
Schematic - Actual

PBTD's

Date	Depth (mKB)
03/02/1997	1,940.00

Well History (with last 3 jobs)
Casing Strings

Casing Description	OD (mm)	Wt (kg/m)	Grade	Top (mKB)	Set Depth (MD) (mKB)
Intermediate	219.1	41.669	H-40	4.30	555.00
Slotted liner	139.7	23.067	J-55	516.10	1,940.00

Perforations

Zone	Top (mKB)	Btm (mKB)	Current Status
Wabiskaw, Main Hole			
Wabiskaw, Main Hole	516.10	1,940.00	Open - Not Flowing

Tubing Strings
Tubing - Production set at 514.64mKB on 02/09/2011 10:00

Tubing Description	OD (mm)	Wt (kg/m)	String Grade	Set Depth (mKB)
Tubing - Production	88.9	13.840	J-55	514.64

Comment
Pulled Weatherford 113-1200 with 30 day run life. Reverse ciculated 100 m into liner and circulated out sand from 427 to 618 m. Ran a Weatherford 113-1200 pump @ 55% Eff. Intake set @ 514.64 mKB, 407.6 mTVD @ 78° deviation.

Item No.	Jts	Item Description	OD (mm)	Len (m)	Top (mKB)	Btm (mKB)
9-1		KB - THF		4.20	0.00	4.20
9-2	1	Tubing Hanger	200.0	0.25	4.20	4.45
9-3	1	Tubing	88.9	9.58	4.45	14.03
9-4	1	88.9 mm Pup jt	88.9	1.83	14.03	15.86
9-5	49	Tubing	88.9	474.79	15.86	490.65
9-6	1	BMV 4-pin Tubing Drain	112.3	0.31	490.65	490.96
9-7	1	Tubing	88.9	9.52	490.96	500.48
9-8	1	B.J. Tubing Swivel	121.3	0.31	500.48	500.79
9-9	1	Pup jt	88.9	1.27	500.79	502.06
9-10	1	BMW 113-1200 # E67660	114.3	12.11	502.06	514.17
9-11	1	Cross over to pump	114.3	0.10	514.17	514.27
9-12	1	B.J. No-Turn	190.8	0.37	514.27	514.64

Rods
28.6 mm 960M Pro-rod # 11731 on 02/09/2011 15:00

Rod Description	OD (mm)	Wt (kg/m)	String Grade	Set Depth (mKB)
28.6 mm 960M Pro-rod # 11731	28.6		960M	514.00

Item No.	Jts	Item Description	OD (mm)	Len (m)	Top (mKB)	Btm (mKB)
10-1	1	Polish Rod	31.7	10.97	10.67	21.64
10-2	2	Pony Rods 1.83, .13	31.8	1.96	21.64	23.60
10-3	1	Pro-Rod 960M I.D.#11731	28.6	469.60	23.60	493.20
10-4	1	Sucker Rods	31.8	7.62	493.20	500.82
10-5	1	Pony Rod	31.8	2.43	500.82	503.25
10-6	1	BMW 113-1200 #114619 MN 116XL	55.7	10.75	503.25	514.00

Wellheads
Flanged, Walker GOF on <Install Date?>

Type	Make
Flanged	Walker GOF

Section	Description	Make	Model	WP (kPa)	Service	Comment
	Tubing rotator	R P S				
	Drive unit	Grenco	G-2000-6H			50-hp,rpm=50-250, 4-1 ratio

0.0, Zone: Wabiskaw, Main Hole
Intermediate, 4.3-555.0
516.1-1,940.0, Zone: Wabiskaw, Main Hole
Slotted liner, 516.1-1,940.0

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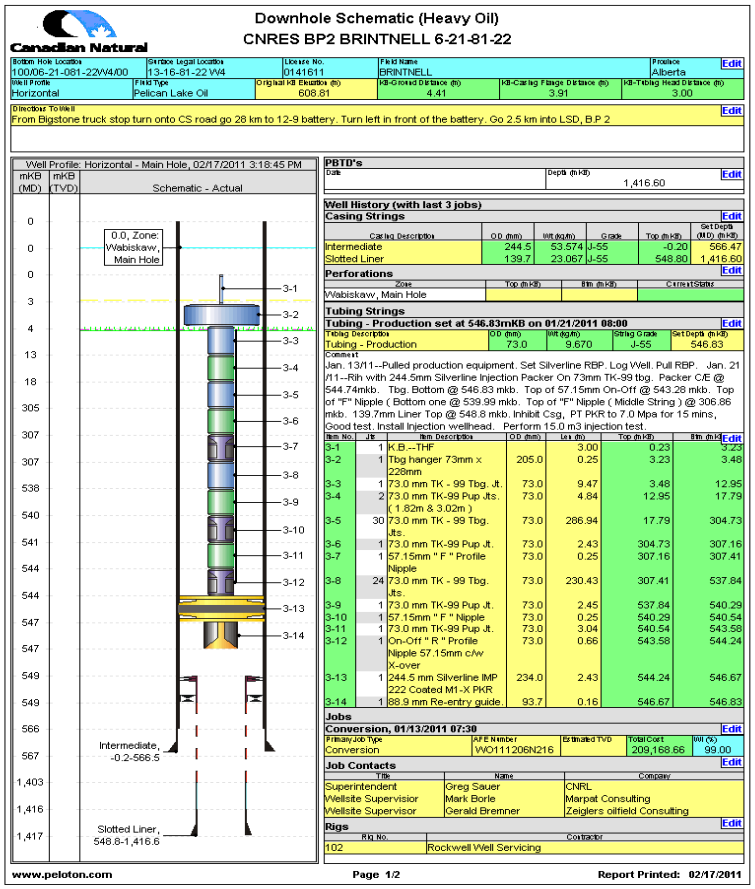
- **Injector**



Downhole Schematic (Heavy Oil)
CNRES BP2 BRINTNELL 6-21-81-22

Bottom Hole Location	Surface Legal Location	License No.	Field Name	Province
100/06-21-081-22W4/00	13-16-81-22 W4	0141611	BRINTNELL	Alberta

Well Profile	Field Type	Original KB Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)	KB-Tbg Head Distance (m)
Horizontal	Pelican Lake Oil	608.81	4.41	3.91	3.00

Directions To Well
From Bigstone truck stop turn onto CS road go 28 km to 12-9 battery. Turn left in front of the battery. Go 2.5 km into LSD, B.P 2

Well Profile: Horizontal - Main Hole, 02/17/2011 3:18:45 PM
Schematic - Actual

PBTD's

Date	Depth (mKB)
	1,416.60

Well History (with last 3 jobs)
Casing Strings

Casing Description	OD (mm)	Wt (kg/m)	Grade	Top (mKB)	Set Depth (MD) (mKB)
Intermediate	244.5	53.574	J-55	0.20	566.47
Slotted Liner	139.7	23.067	J-55	548.80	1,416.60

Perforations

Zone	Top (mKB)	Btm (mKB)	Current Status
Wabiskaw, Main Hole			

Tubing Strings
Tubing - Production set at 546.83mKB on 01/21/2011 08:00

Tubing Description	OD (mm)	Wt (kg/m)	String Grade	Set Depth (mKB)
Tubing - Production	73.0	9.670	J-55	546.83

Comment
Jan. 13/11--Pulled production equipment. Set Silverline RBP. Log Well. Pull RBP. Jan. 21 /11--Rih with 244.5mm Silverline Injection Packer On 73mm TK-99 tbg. Packer C/E @ 544.74mkb. Tbg. Bottom @ 546.83 mkb. Top of 57.15mm On-Off @ 543.28 mkb. Top of "F" Nipple (Bottom one @ 539.99 mkb. Top of "F" Nipple (Middle String) @ 306.86 mkb. 139.7mm Liner Top @ 548.8 mkb. Inhibit Csg, PT PKR to 7.0 Mpa for 15 mins, Good test. Install Injection wellhead. Perform 15.0 m3 injection test.

Item No.	Jts	Item Description	OD (mm)	Len (m)	Top (mKB)	Btm (mKB)
3-1	1	K.B.--THF		3.00	0.23	3.23
3-2	1	Tbg hanger 73mm x 228mm	205.0	0.25	3.23	3.48
3-3	1	73.0 mm TK - 99 Tbg. Jt.	73.0	9.47	3.48	12.95
3-4	2	73.0 mm TK-99 Pup Jts. (1.82m & 3.02m)	73.0	4.84	12.95	17.79
3-5	30	73.0 mm TK - 99 Tbg. Jts.	73.0	286.94	17.79	304.73
3-6	1	73.0 mm TK-99 Pup Jt.	73.0	2.43	304.73	307.16
3-7	1	57.15mm " F " Profile Nipple	73.0	0.25	307.16	307.41
3-8	24	73.0 mm TK - 99 Tbg. Jts.	73.0	230.43	307.41	537.84
3-9	1	73.0 mm TK-99 Pup Jt.	73.0	2.45	537.84	540.29
3-10	1	57.15mm " F " Nipple	73.0	0.25	540.29	540.54
3-11	1	73.0 mm TK-99 Pup Jt.	73.0	3.04	540.54	543.58
3-12	1	On-Off " R " Profile Nipple 57.15mm c/w X-over	73.0	0.66	543.58	544.24
3-13	1	244.5 mm Silverline IMP 222 Coated M1-X PKR	234.0	2.43	544.24	546.67
3-14	1	88.9 mm Re-entry guide.	93.7	0.16	546.67	546.83

Jobs
Conversion, 01/13/2011 07:30

Primary Job Type	AFE Number	Estimated TVD	Total Cost	WI (%)
Conversion	WO111206N216		209,168.66	99.00

Job Contacts

Title	Name	Company
Superintendent	Greg Sauer	CNRL
Wellsite Supervisor	Mark Borle	Marpat Consulting
Wellsite Supervisor	Gerald Bremner	Zeiglers oilfield Consulting

Rigs

Rig No.	Contractor
102	Rockwell Well Servicing

Intermediate, -0.2-566.5
Slotted Liner, 548.8-1,416.6

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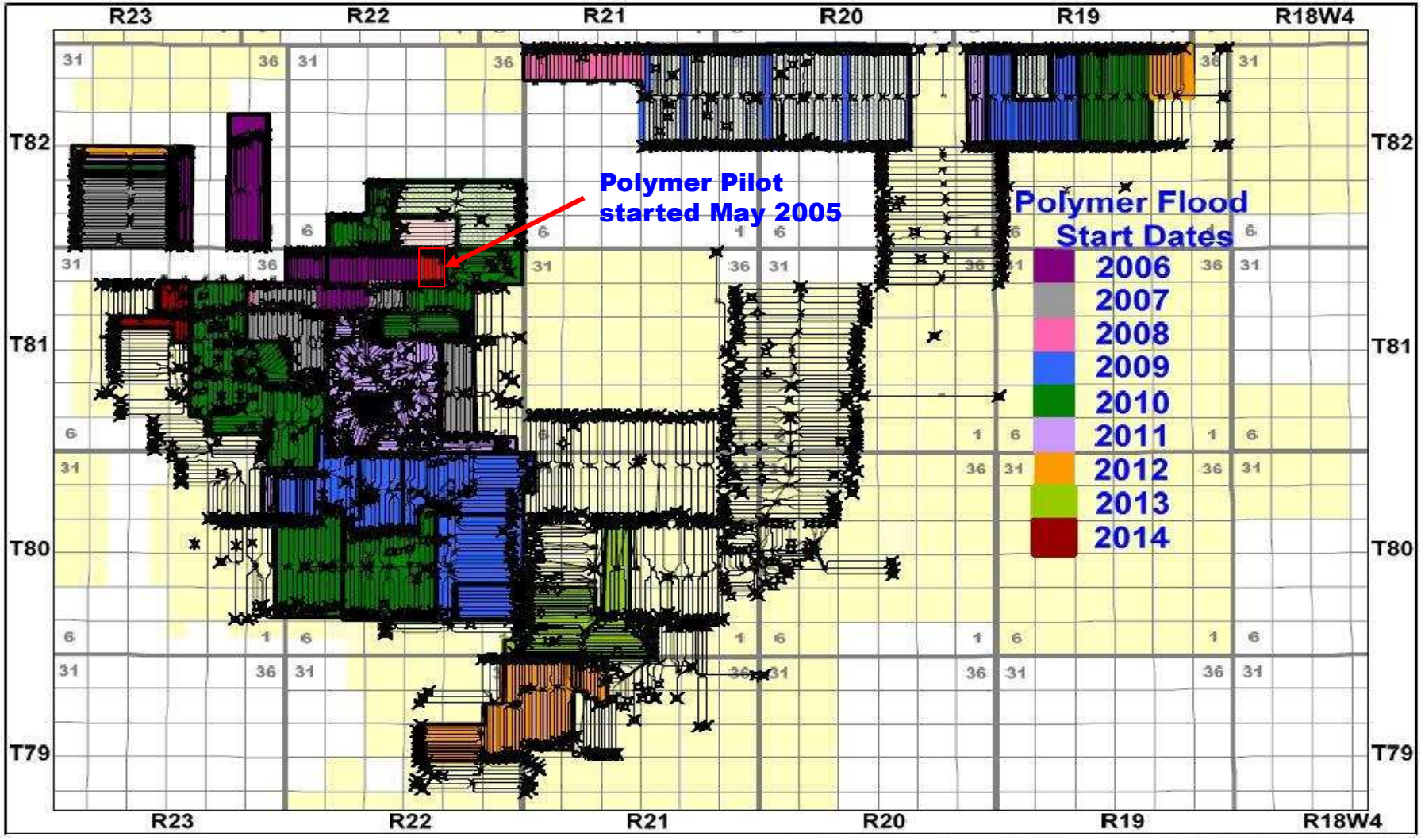
- **Intermediate Casing landed in Wabiskaw sand (producers and injectors).**

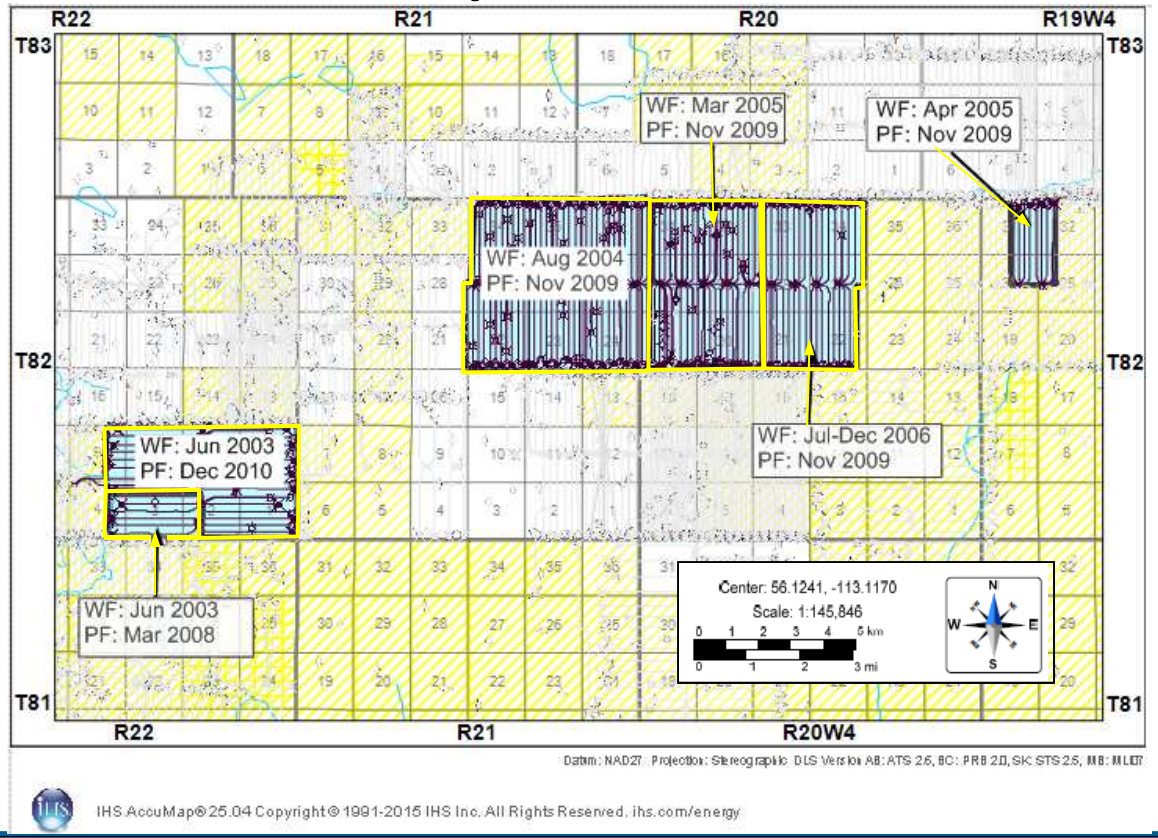
EOR History and Current Approvals

Polymer Flood Development



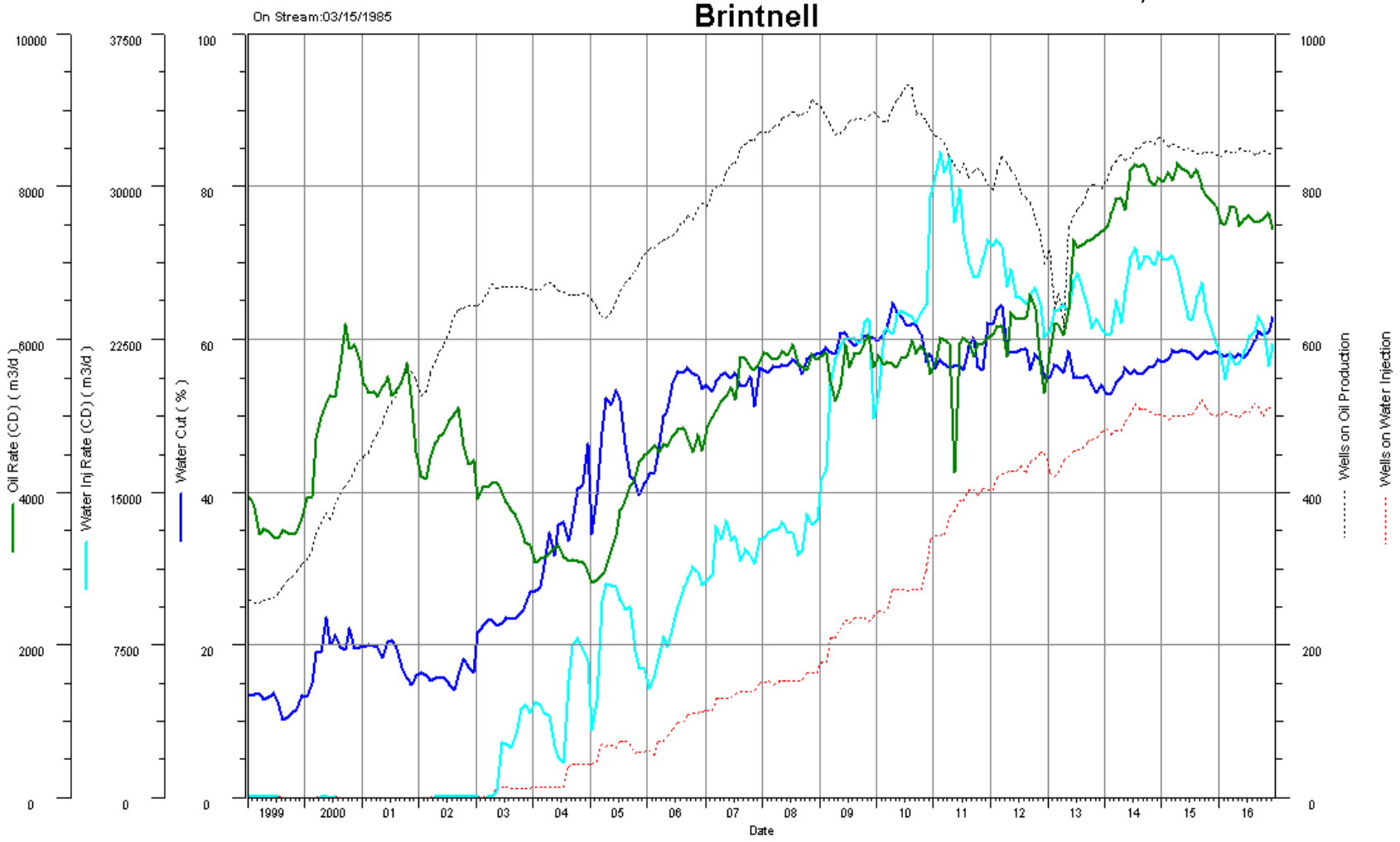
Polymer Flood After Water Flood

- **The areas highlighted in blue for the map below started on waterflood (WF) prior to being converted to polymer flood (PF). All CNRL Pelican Lake water flood schemes have now been converted to polymer flood. Since 2007, all new enhanced recovery schemes are converted directly to polymer flooding.**



Field Overview

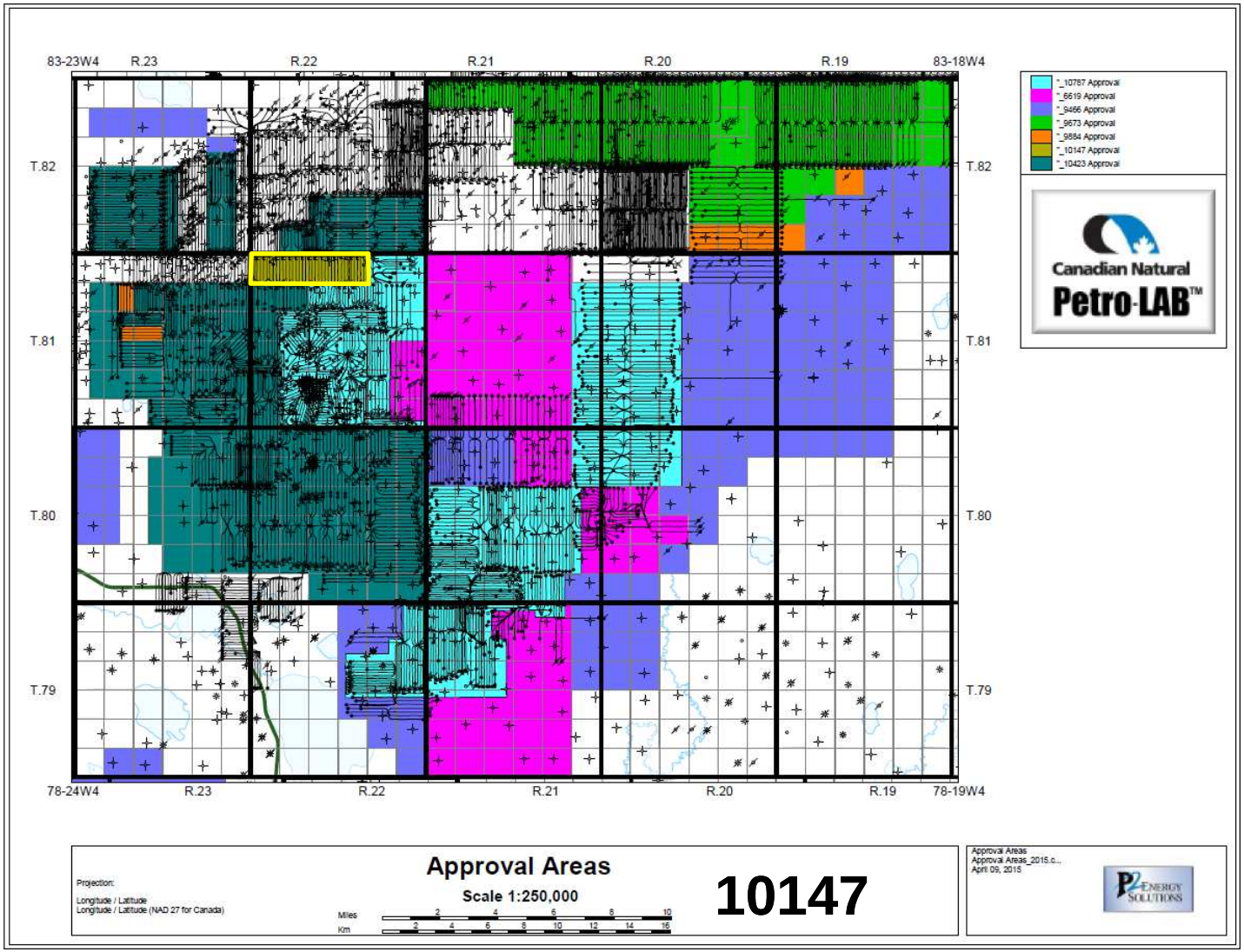
Cum. oil: 40,699 E3m3



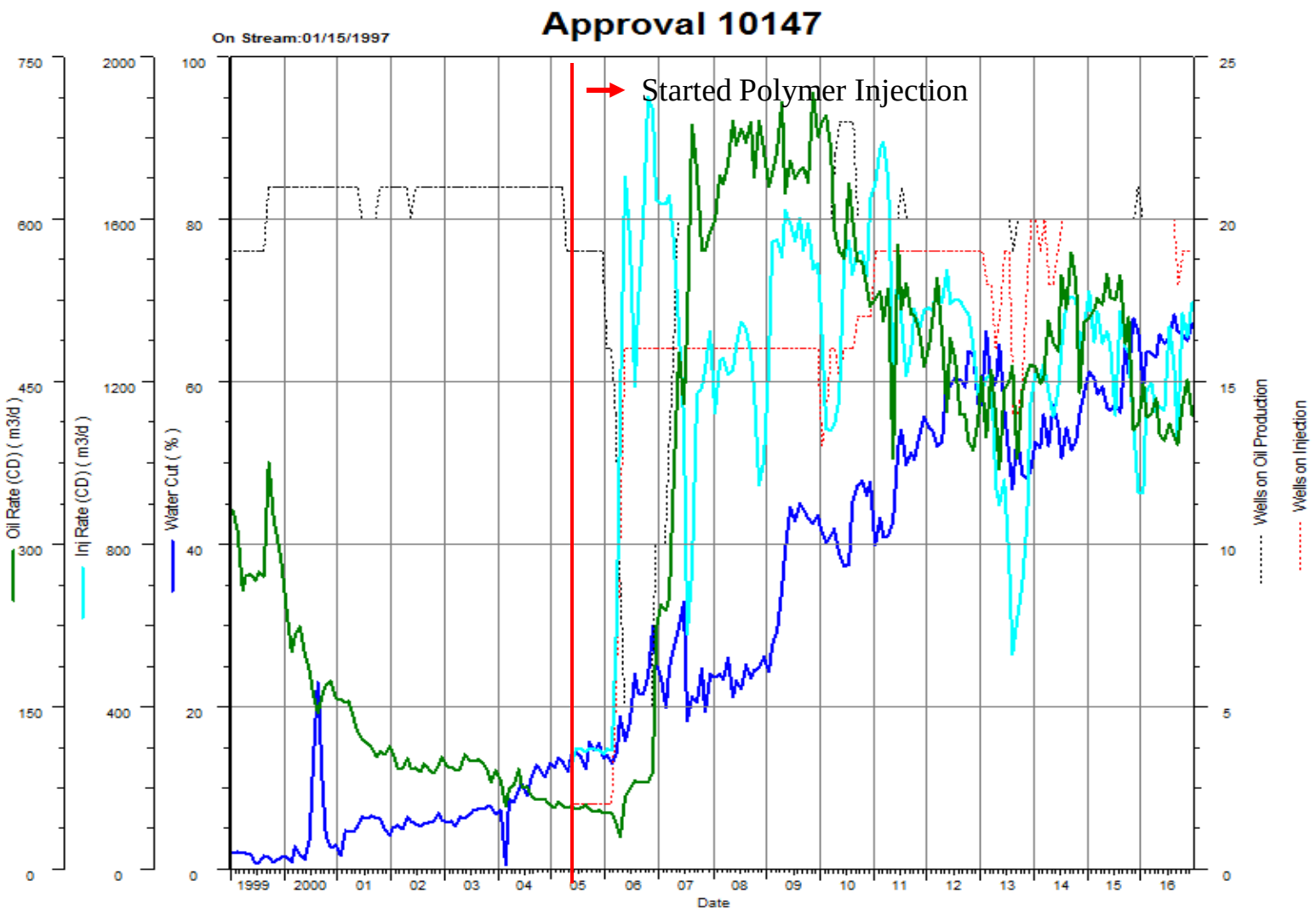
Approximately 63% of the approved EOR scheme areas are currently developed and under flood as of the end of 2016

Field Performance and Surveillance

Approval 10147



Approval 10147 Production Update



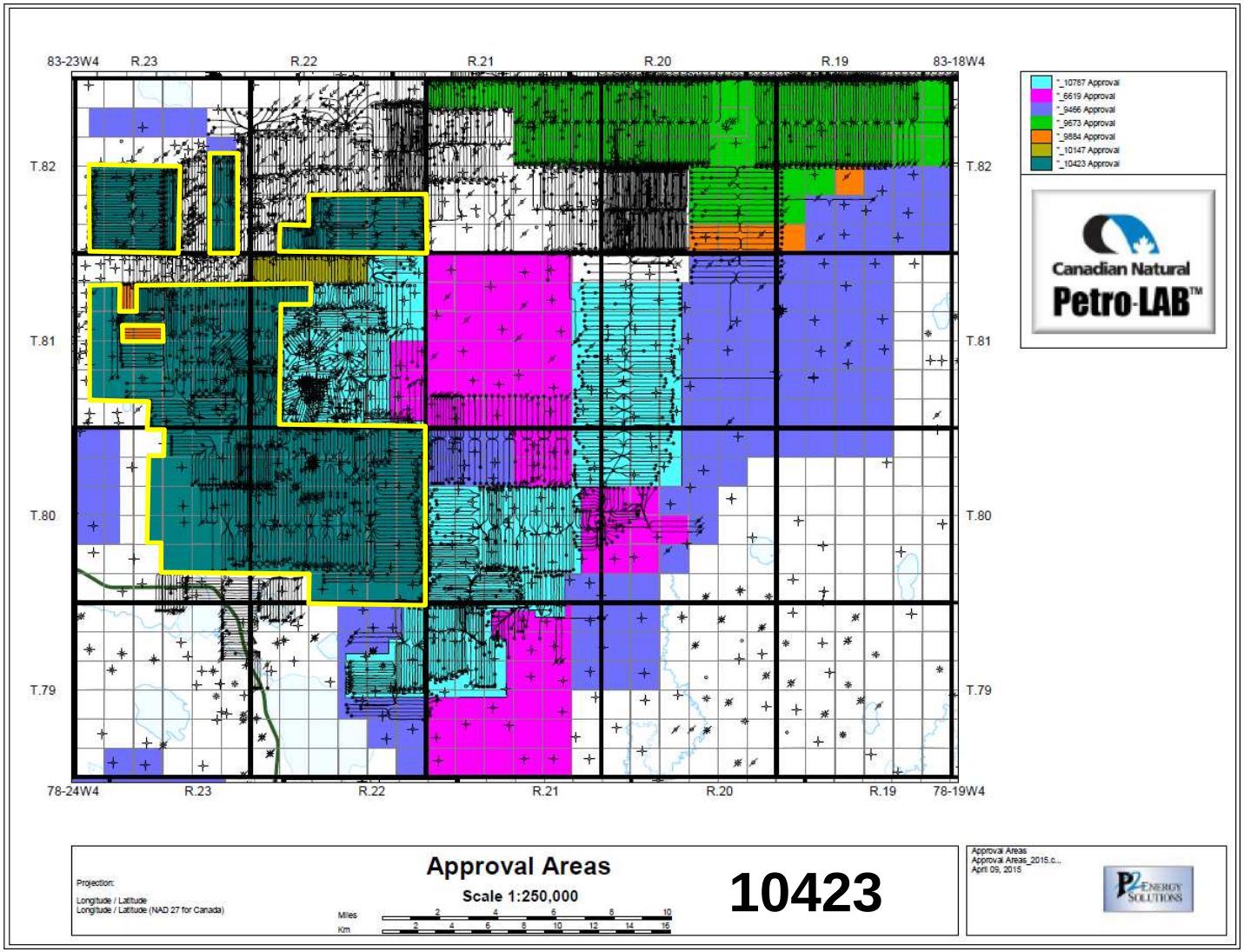
Cum oil: 2,565 E3m3 Cum water: 1,860 E3m3 Cum injection: 5,222 E3m3

Approval 10147 Discussion

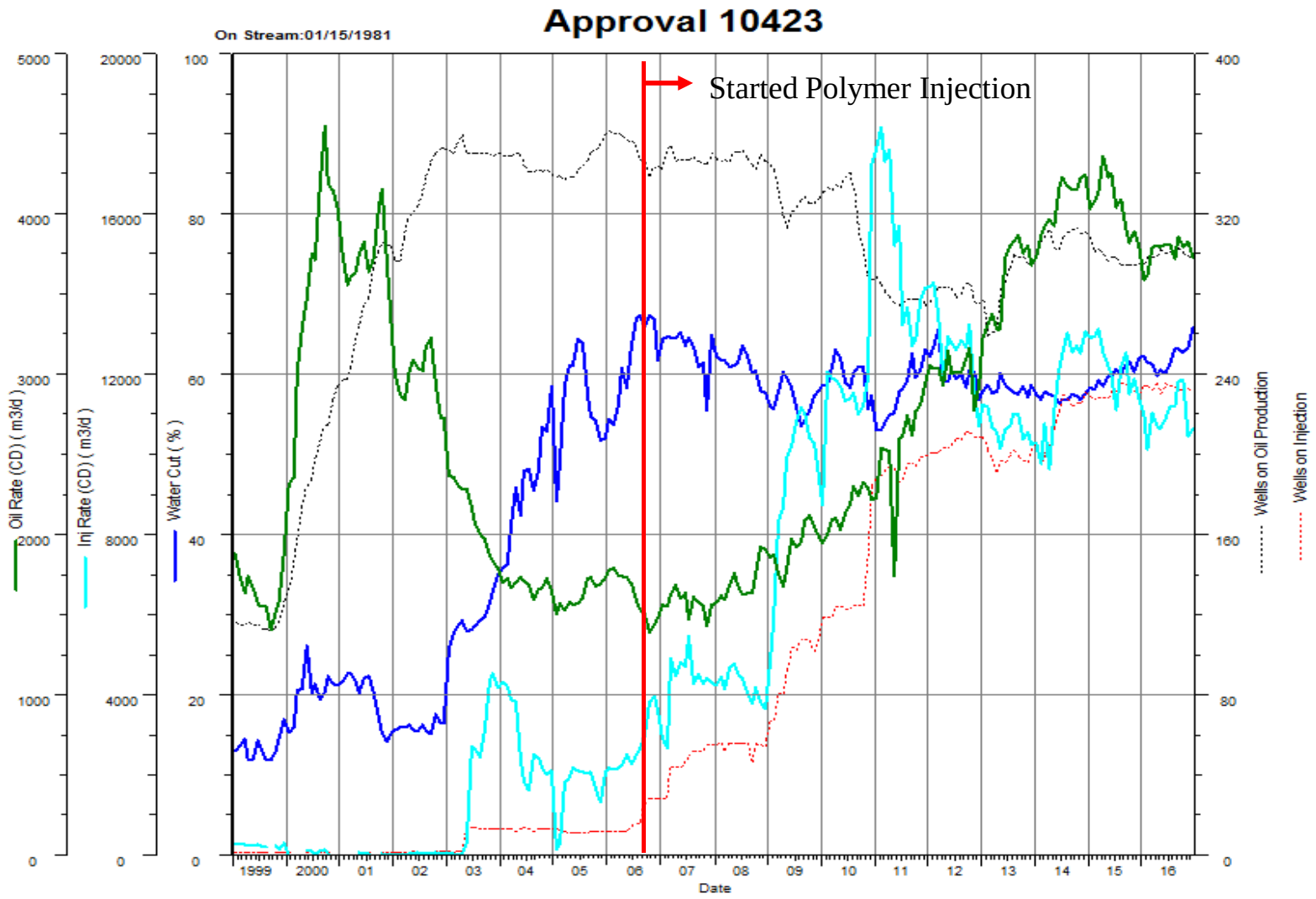
Canadian Natural

- Contains the most mature polymer flood patterns including the original pilot area which began flooding in 2005.
- First Polymer Response in April 2006 from the HTL6 Pilot area.
- Peak production occurred from mid 2007 to early 2010 at 650 m3/d oil.
- Injection returned to normal in 2014-2015 following a significant reduction in 2013 for offset drilling.
- Increased water cut was observed in 2016 due to the maturity of the flood.
- Water cut averaged roughly 65% during 2016.
- Oil viscosity ranges from 1,300 cp to 2,800 cP.

Approval 10423



Approval 10423 Production Update



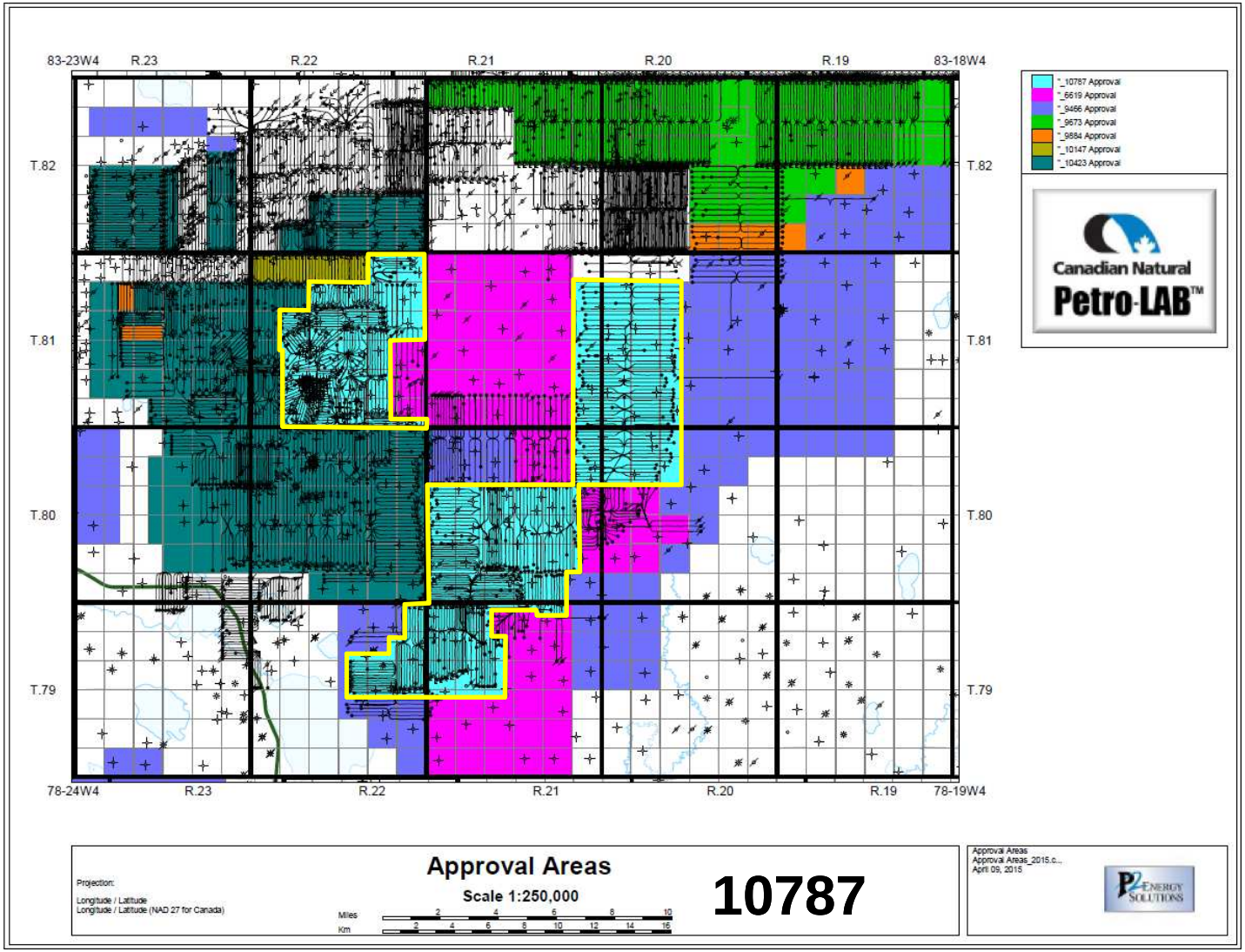
Cum oil: 18,366 E3m3 Cum water: 18,315 E3m3 Cum injection: 39,891 E3m3

Approval 10423 Discussion

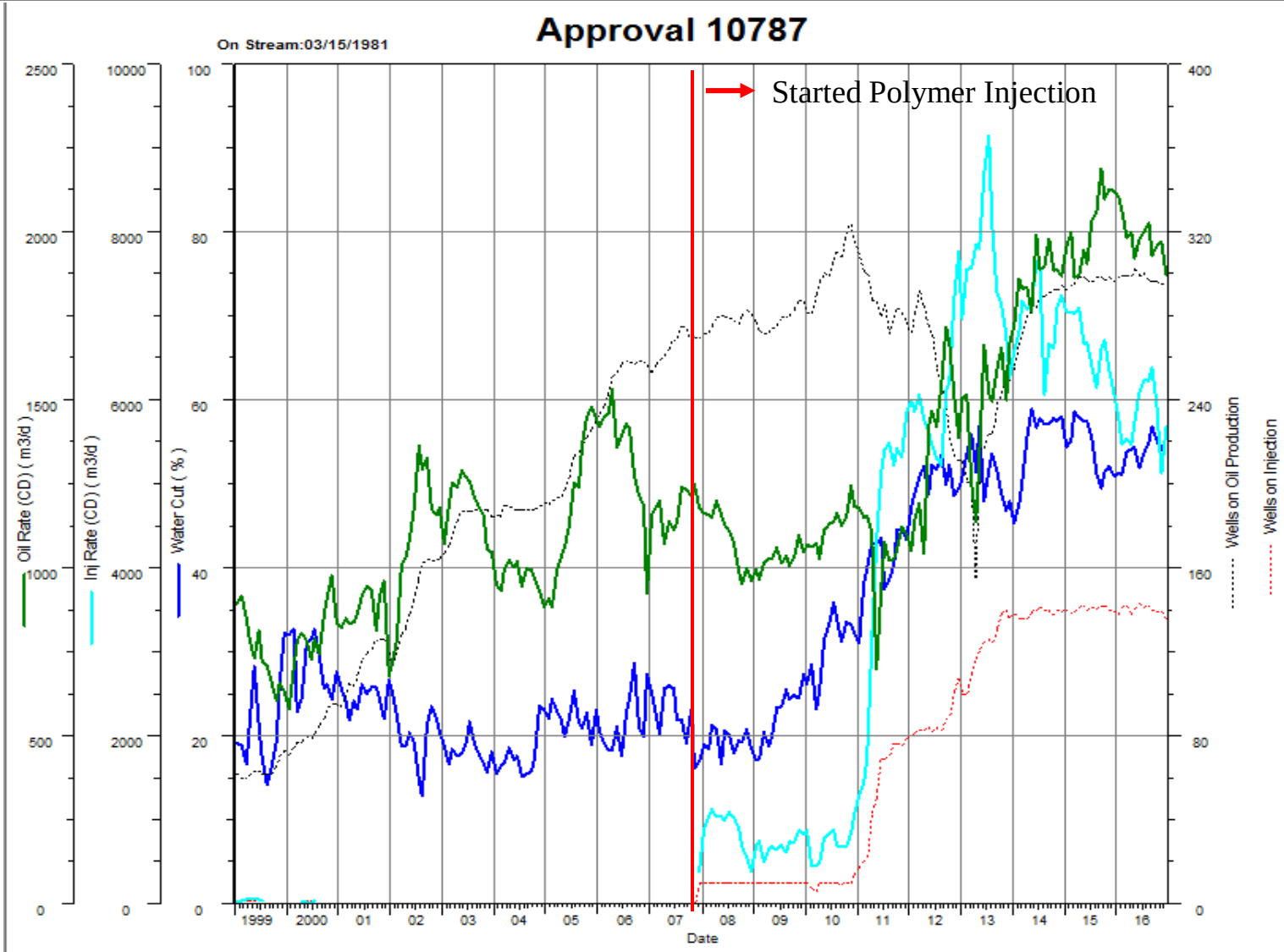
Canadian Natural

- Polymerflood started in 2006 covering roughly 5% of the approval area split between 3 small groups. The flood was expanded every year up to 2010. In 2012, small area from PRSA 9884 was added to the approval.
- Currently 73% of the approval area is under flood.
- Small portion of approval area under waterflood starting in 2003. This area was converted to polymer in 2008 and 2010.
- First polymer response in July 2007 but due to the size and staged flood expansion, did not see a ramp up in oil volumes until early 2009.
- Portions of the approval area are affected by higher in-situ water saturation and/or oil viscosity. Response in these regions has been more delayed and erratic when compared to other portions of the pool.
- Oil viscosity ranges from 1,100 cp to 50,000 cp.
- 14 producers in WB 14 converted to injection in 2014. 6 producers in WB32 area converted to injection in 2015.
- Average WCT in 2016 approximately 62%.

Approval 10787



Approval 10787 Production Update



Cum oil: 8,835 E3m3 Cum water: 5,372 E3m3 Cum injection: 14,020 E3m3

Approval 10787 Discussion

Canadian Natural

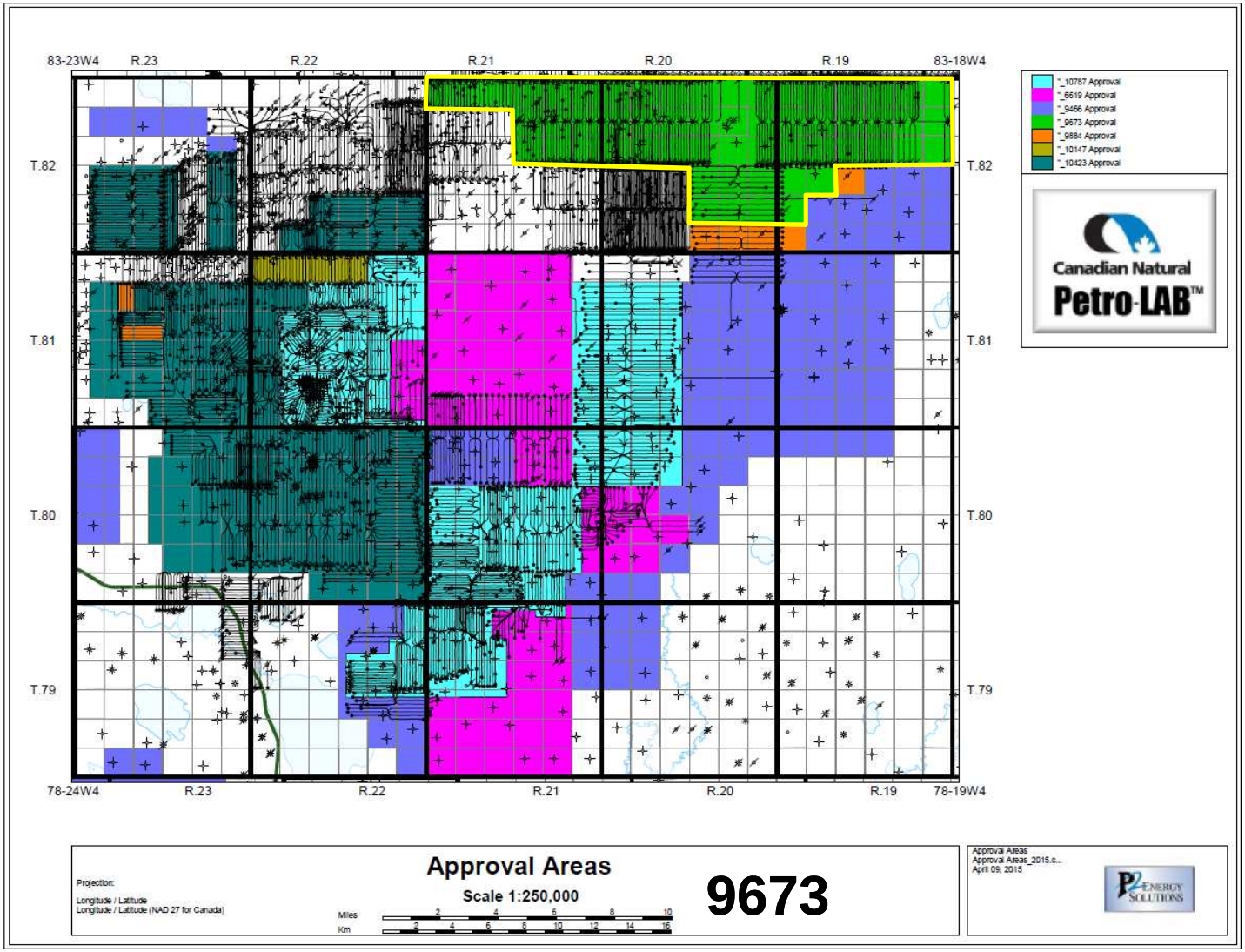
- Polymer flood started in Dec 2007 covering roughly 4% of the approval area split into 2 small groups. There were no expansions until 2010, since then there has been an expansion completed in every year including 2013. Currently 45% of the approval area is under flood.
- First polymer response in Nov 2008 but due to the size and staged flood expansion, did not see a ramp up in oil volumes until mid 2012.
- Oil production increased in the late part of 2013 and early 2014, mostly due to new well activations.
- Polymer injection was commenced in the Peerless and Sandy Lake portions of the area in 2013, with the majority of wells exhibiting some form or polymer flood response.
- The BP 23-24 area has demonstrated reduced formation water production after 8 years of flooding.
- WCT increased slightly in 2016 to average roughly 55%.
- Oil viscosity ranges from 1,100 cp to 14,400 cp.

Approval 10787 – 04/01-24-079-22W4 Monitoring

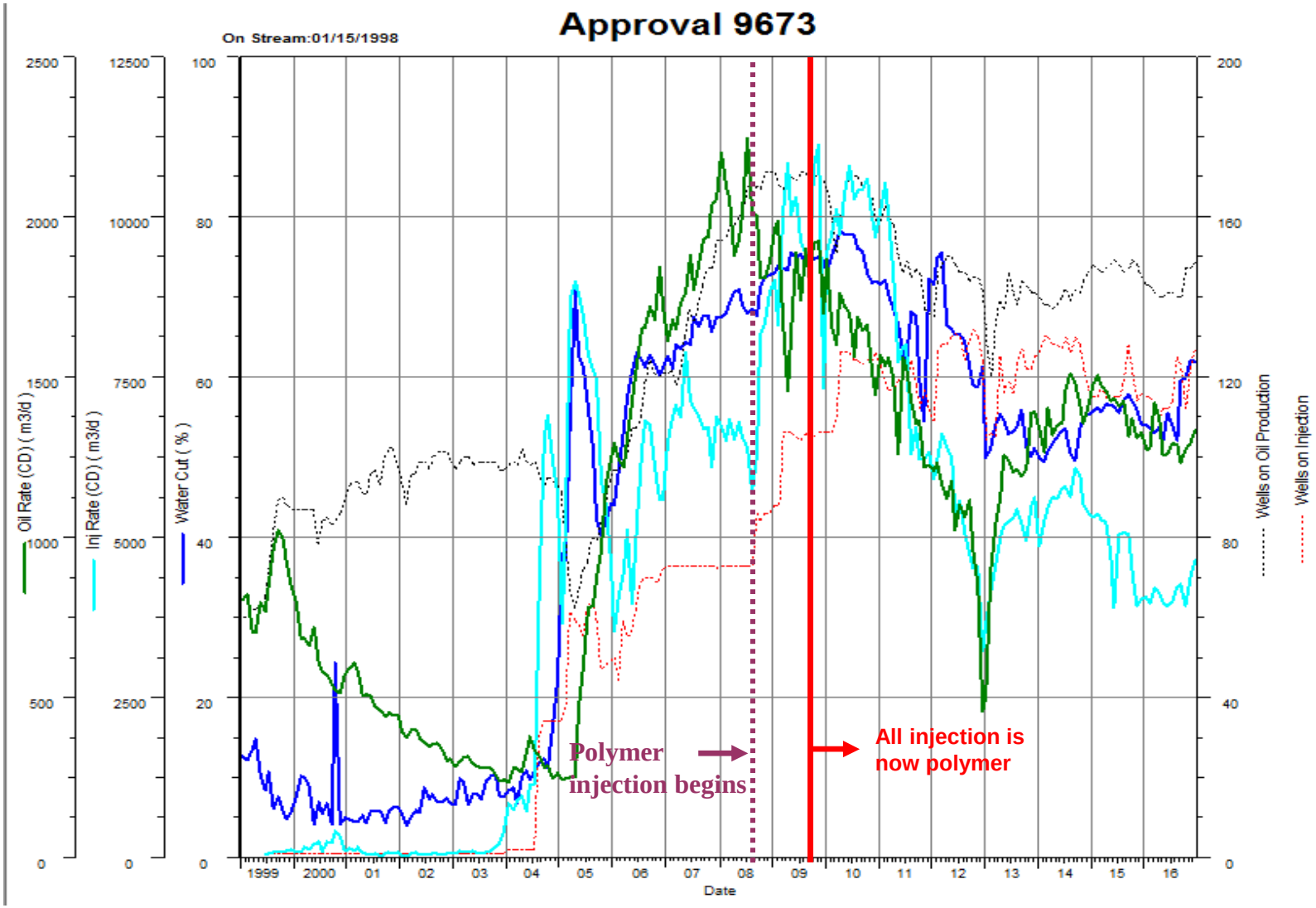
Canadian Natural

- In May 2012, the 03/16-36-079-22W4 well intersected the 00/01-24-079-22W4 wellbore while drilling
- Numerous attempts were made to repair the 00/01-24 well but ultimately the wellbore could not be returned to service. A non-routine abandonment was conducted on 00/01-24 in March 2013. The 04/01-24-079-22W4 observation well was drilled in September 2013 to monitor the polymer flood near the 00/01-24 offset following consultations with the AER (Approval 10787K).
- 04/01-24-079-22W4 Monitoring Program:
  - Produced water has been monitored continuously since Q4 2013. Through 2016, the well has not produced enough water to obtain a representative water analysis.
  - The bottomhole reservoir pressure was measure quarterly in 2013/2014 and yearly in 2015/2016.
  - The pressure was measured in November 2016 to be 548 kPa; this is comparable to measurements taken in previous years and in line with expectations for the Wabiskaw reservoir under primary depletion.
  - CNRL will continue to monitor the produced watercut and take yearly pressure measurements on this well.

Approval 9673



Approval 9673 Production Update



Cum oil: 7,307 E3m3 Cum water: 11,463 E3m3 Cum Injection: 28,773 E3m3

Approval 9673 Discussion

Canadian Natural

- Originally approved for waterflood in 2004; waterflood was expanded in 2005/2006 to cover roughly 40% of the current approval area.
- Waterflood peak production occurred from late 2007 to early 2009 at 1850 m3/d oil.
- Polymerflood began in Sept 2008 covering 6% of approval area. Existing waterflood patterns remained unchanged at this time.
- In 2009 all waterflood areas were converted to polymer and a small expansion area from primary was added; additional small expansions from primary were conducted in each year from 2010 to 2012. Currently 70% of the approval area is under flood.
- First polymer response occurred in Sept 2009 but due to declining production from the waterflood areas, have only recently started to see a ramp up in oil volumes from the polymer flood.

Approval 9673 Discussion

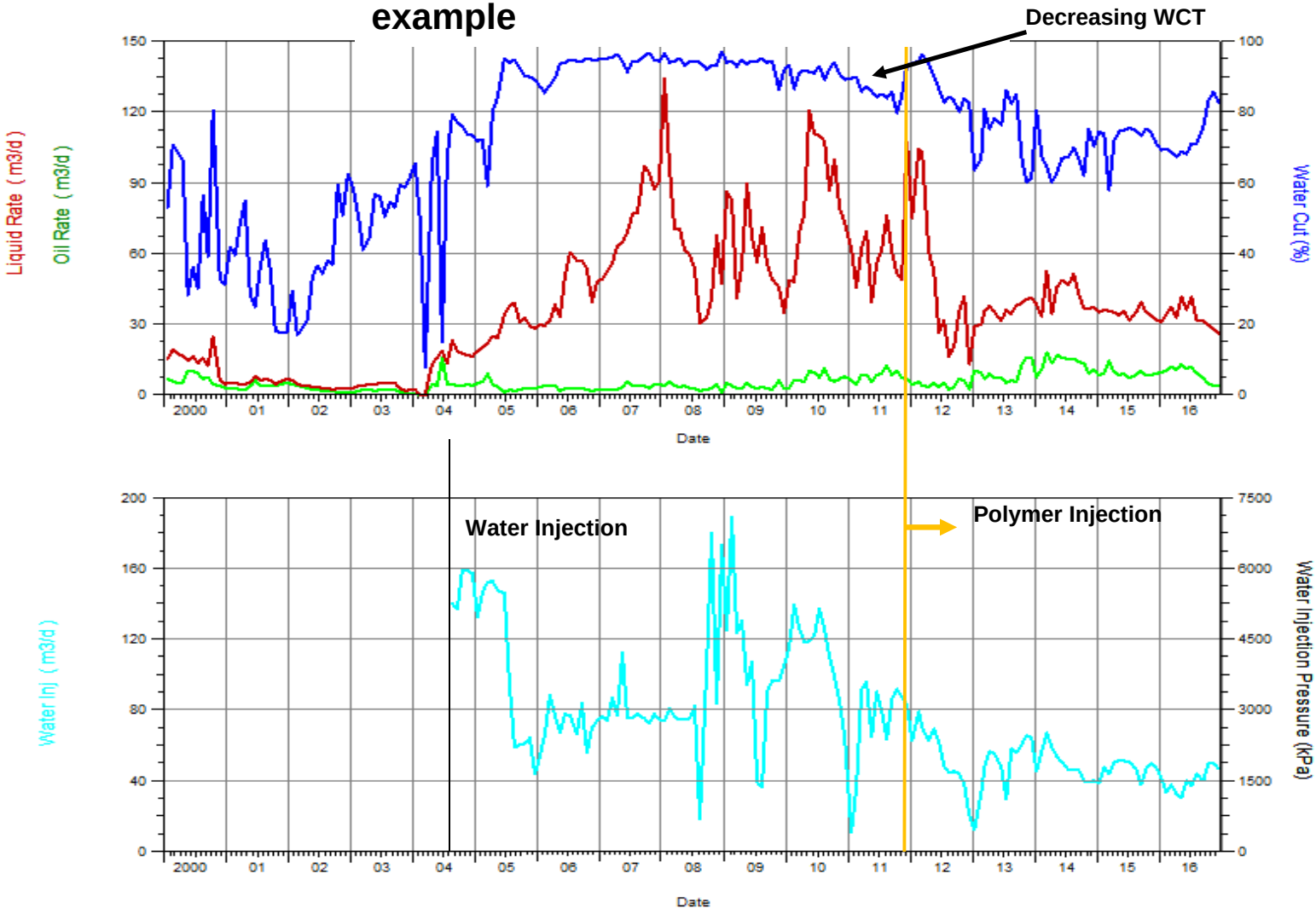
Canadian Natural

- The conversion from water to polymer has had a dramatic effect on the conformance of the flood. Within two years of conversion for most areas, watercuts declined.
- In 2016 watercut averaged about 58%.
- Oil viscosity ranges from 600 cp to 13,000 cp.

Approval 9673 Discussion

Canadian Natural

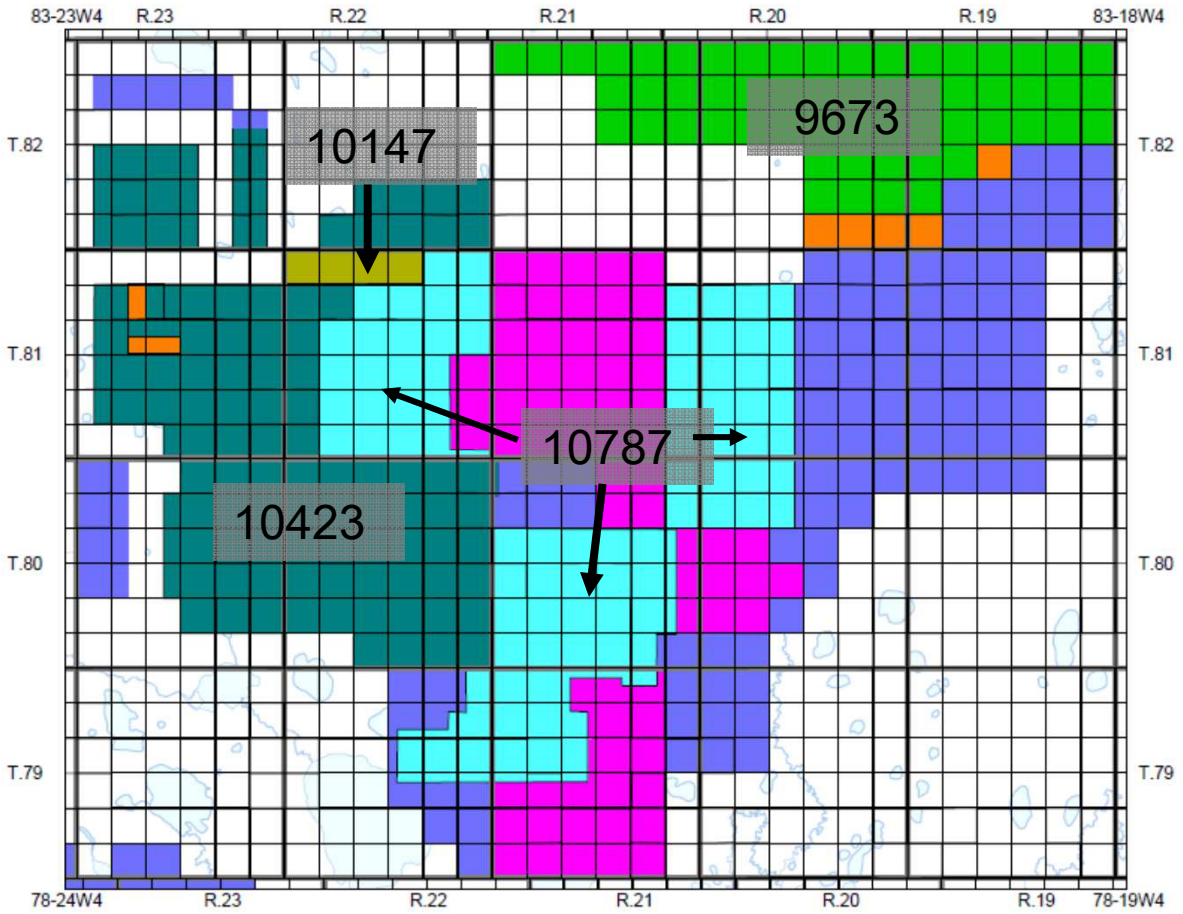
Polymerflood after Waterflood example



Results from polymer flood after waterflood areas vary by pattern but do show substantial polymer flood response on both oil and WCUT.

The range of performance is similar to that experienced in polymer after primary.

Estimated Ultimate Recovery Factors for Flooded Areas (excludes primary areas)



Approval 9673
Total area OBIP 97.4 E^6m^3
OBIP under flood: 78.4 E^6m^3
Primary RF: 3%
RF to date: 9%
Estimated ultimate recovery factors:
17-22%

Approval 10787
Total area OBIP 205.2 E^6m^3
OBIP under flood: 81.4 E^6m^3
Primary RF: 5%
RF to date: 10%
Estimated ultimate recovery factors:
23-30%

Approval 10147
Total area OBIP 8.98 E^6m^3
OBIP under flood: 8.98 E^6m^3
Primary RF: 5%
RF to date: 28%
Estimated ultimate recovery factors:
32-38%

Approval 10423
Total area OBIP 229.0 E^6m^3
OBIP under flood: 163.8 E^6m^3
Primary RF: 6%
RF to date: 11%
Estimated ultimate recovery factors:
24-30%

*RF to-date represents the RF from the polymer flooding areas only. Estimated RF range represents RF from areas recognized for EOR reserves by reserve auditor.

Good Performance – HTL4 (Approval 10147)

- **HTL4 100/14-33 Pattern**
  - **Well list and allocation factors:**

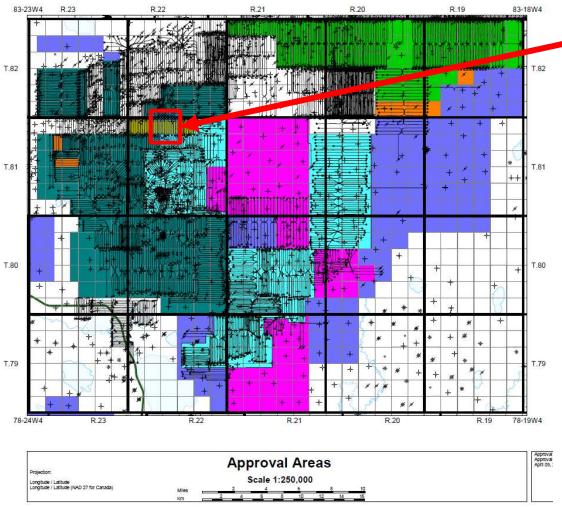
    Injectors

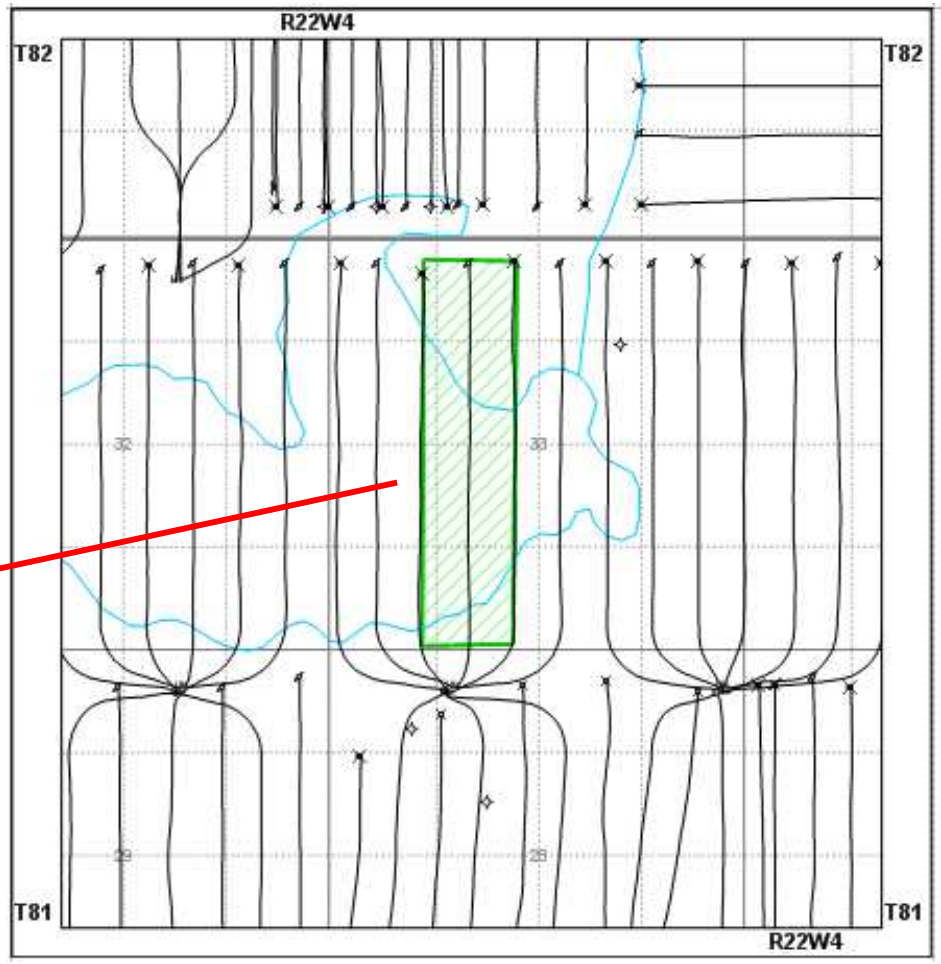
    ➢**100/14-33-081-22W4/0 (100%)**

    Producers

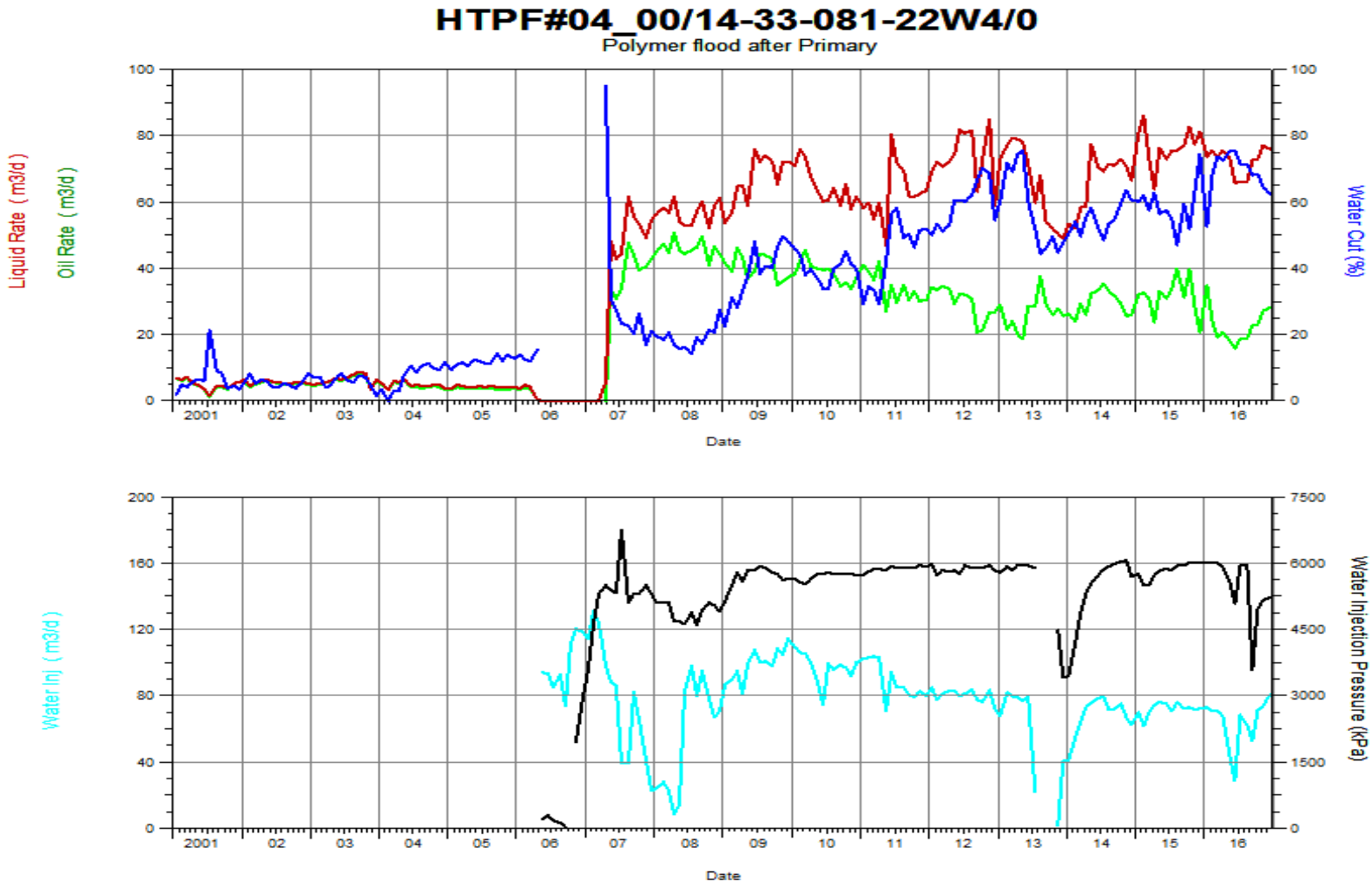
    ➢**102/14-33-081-22W4/0 (50%)**

    ➢**103/13-33-081-22W4/0 (50%)**





Good Performance – HTL4 (Approval 10147)



Average Performance – BP6 (Approval 10787)

- **BP6 100/6-20 Pattern**
  - **Well List and allocation factors:**

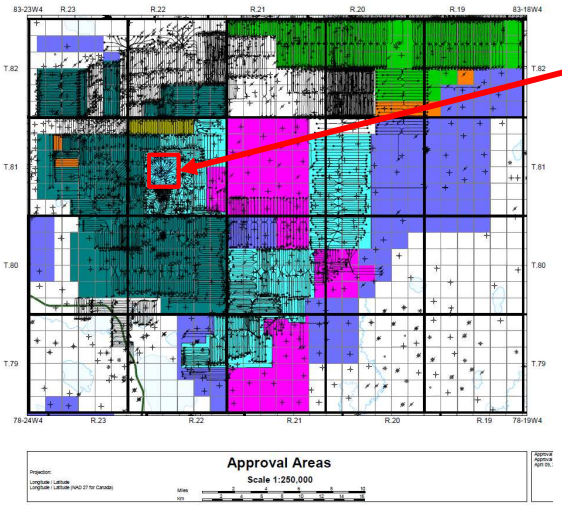
    Injectors

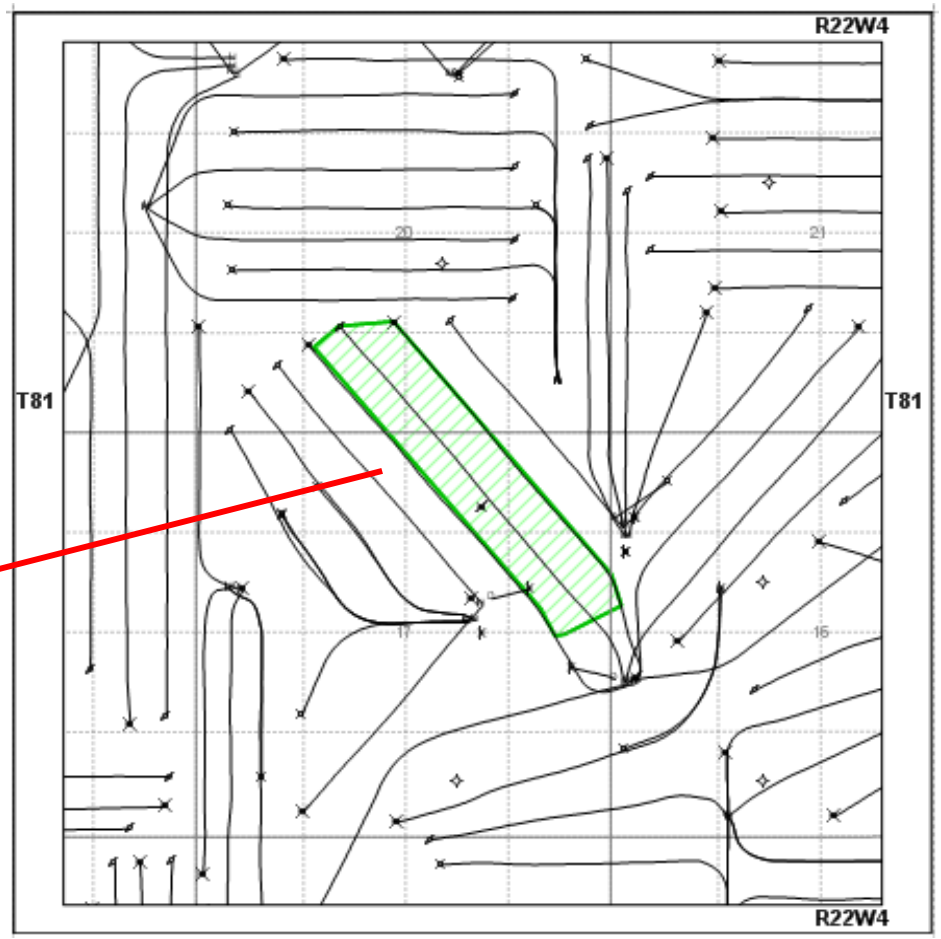
    ➢ **100/06-20-081-22W4/0 (100%)**

    Producers:

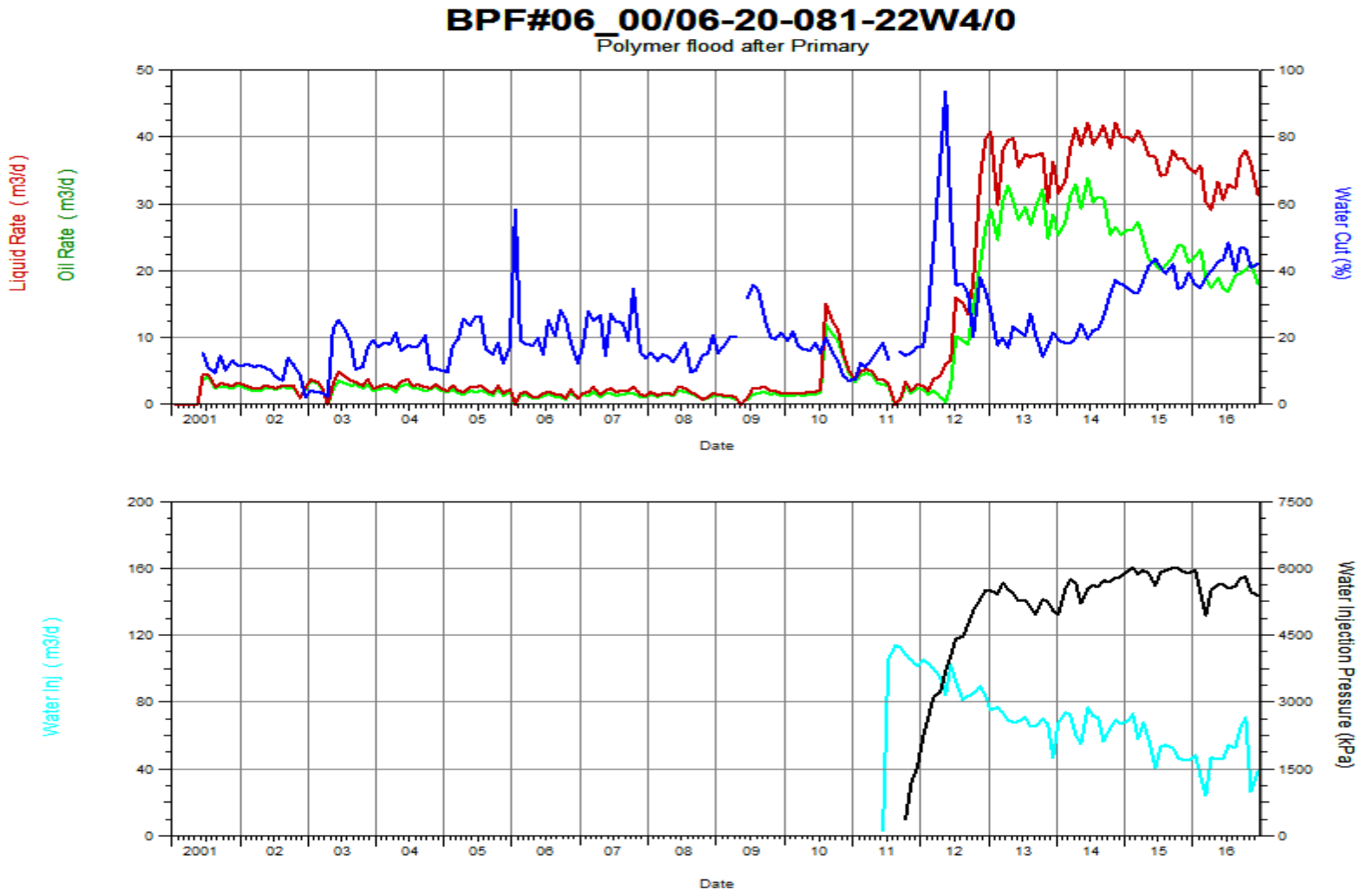
    ➢ **100/03-20-081-22W4/0 (50%)**

    ➢ **102/06-20-081-22W4/0 (50%)**





Average Performance – BP6 (Approval 10787)



Below Average Performance – SB 29 (Approval 10423)

Canadian Natural

- **SB 29 102/08-13 Pattern**
  - **Well List and allocation factors:**

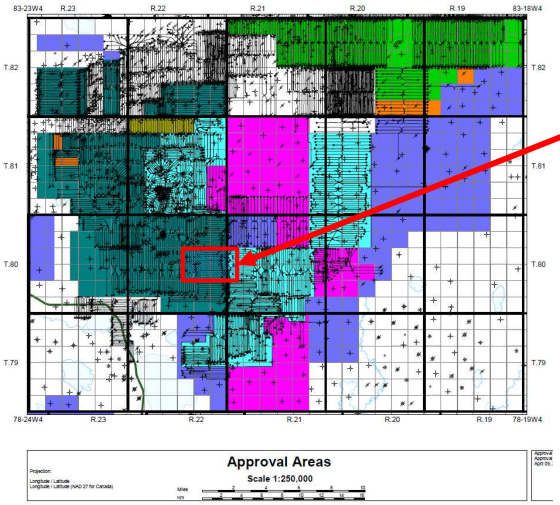
    Injector

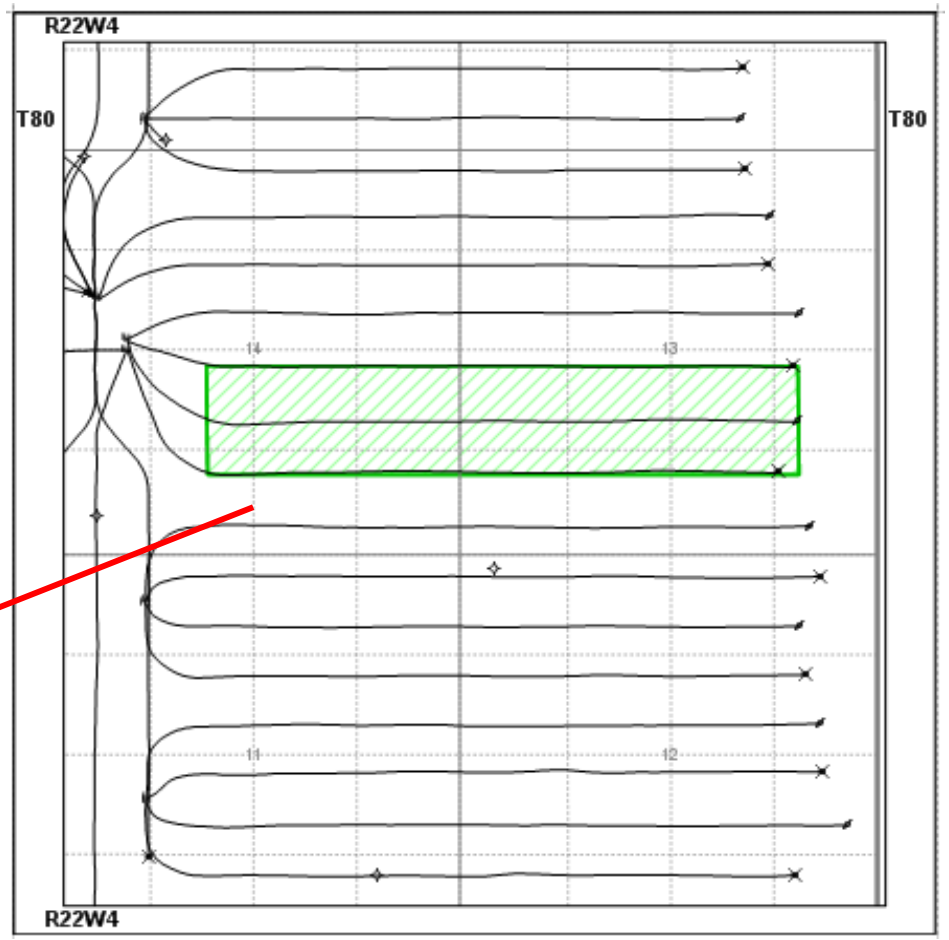
    ➢ **102/08-13-080-22W4/0 (100%)**

    Producers

    ➢ **100/01-13-080-22W4/0 (50%)**

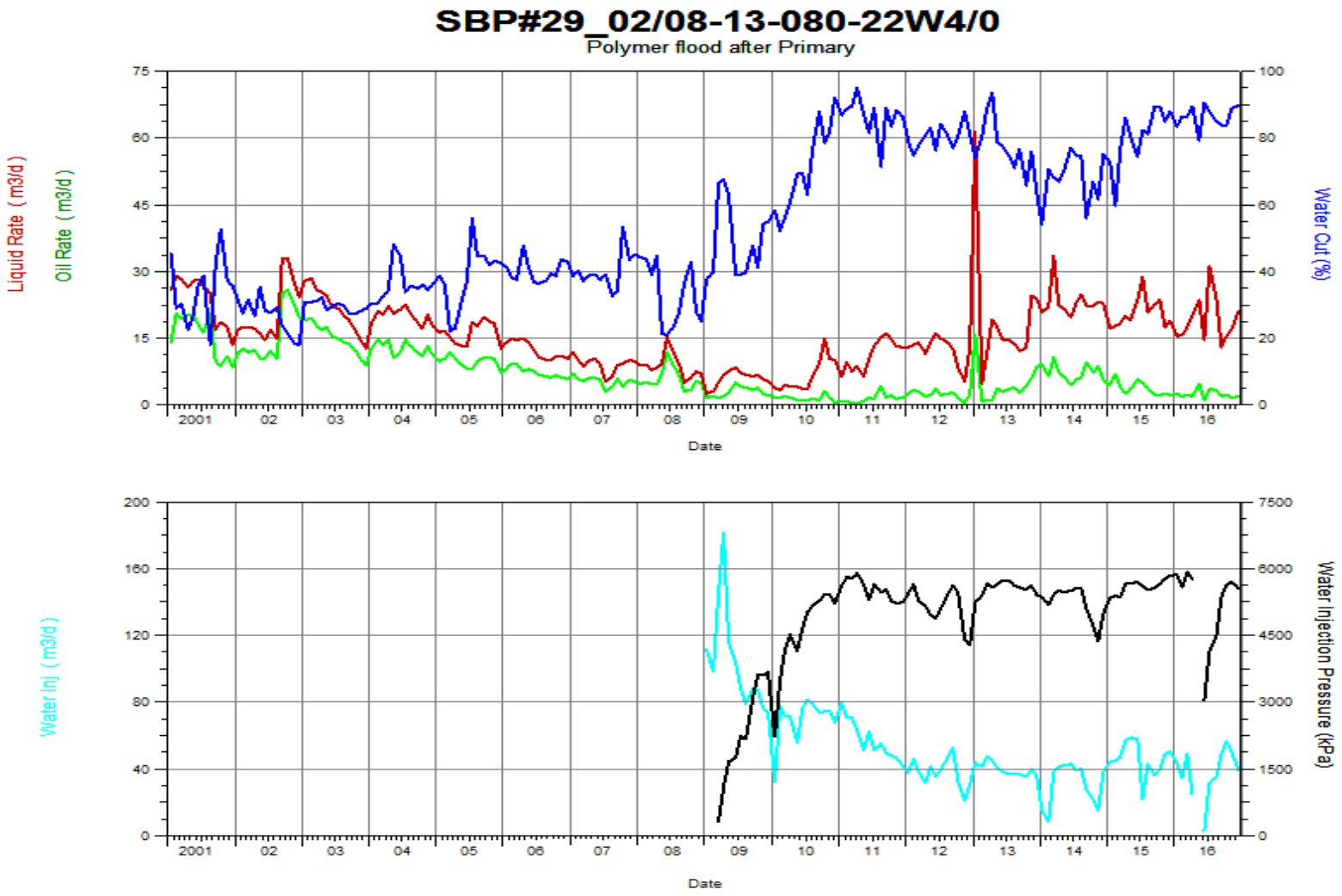
    ➢ **100/08-13-080-22W4/0 (50%)**



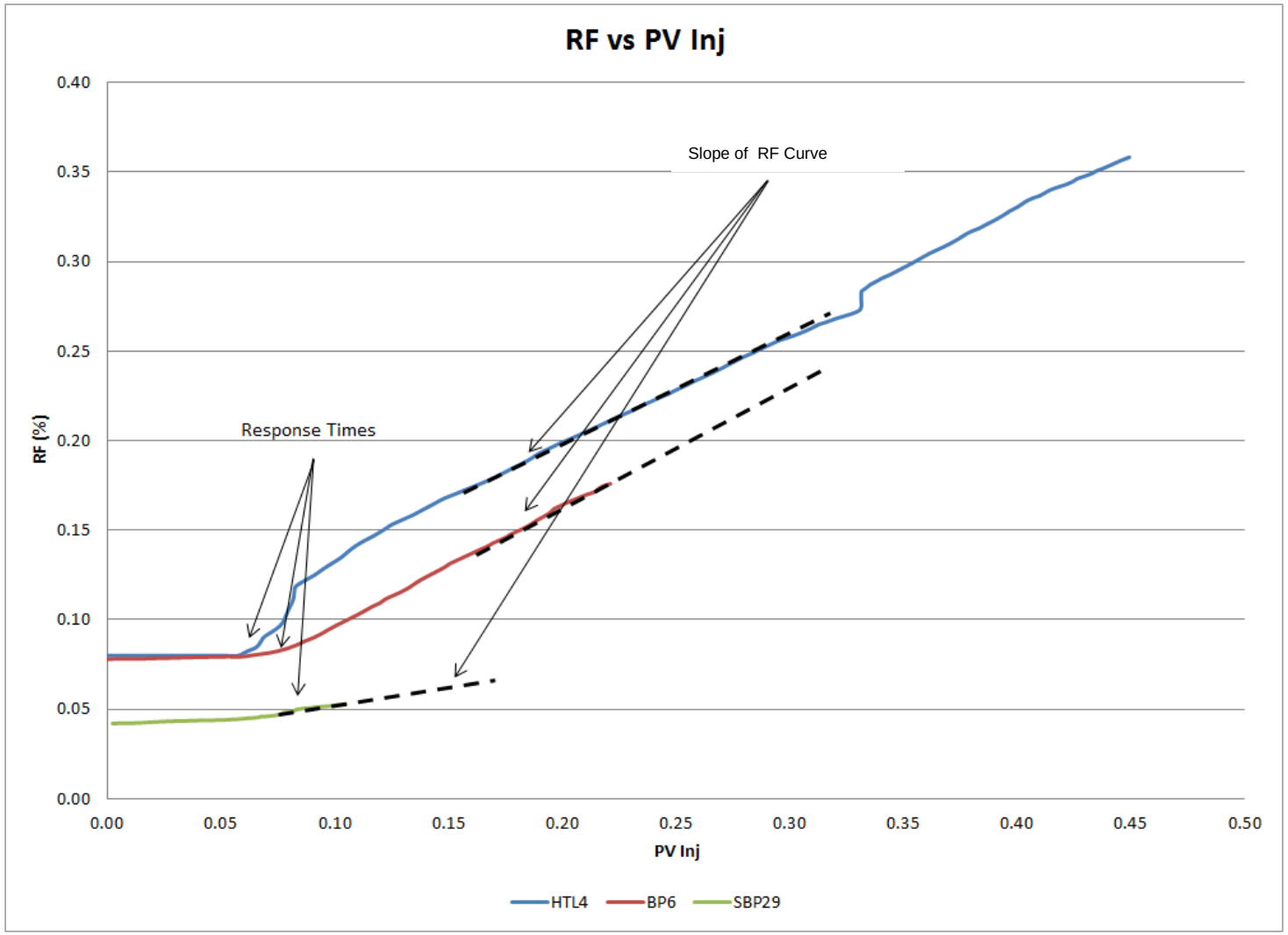


Below Average Performance – SB 29 (Approval 10423)

Canadian Natural



Summary of Good/Average/Poor Areas



Plot showing Recovery Factor (RF) versus Pore Volume (PF) Injected. Indicates effectiveness and performance of the flood.

High Viscosity Performance – SB 41 (Approval 10423)

- **SB 41 102/01-13 Pattern**
  - **Well list and allocation factors:**

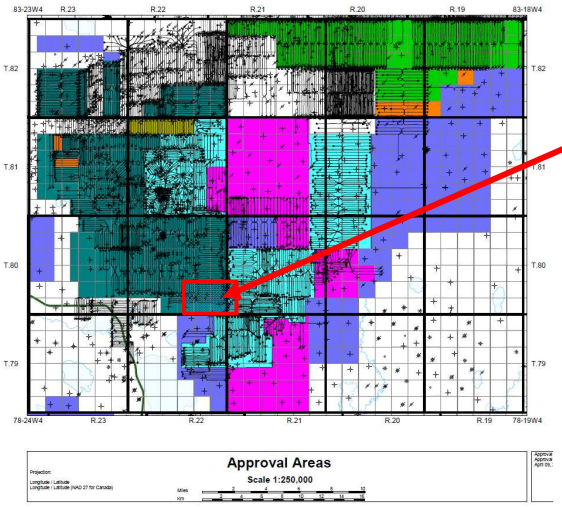
    Injectors

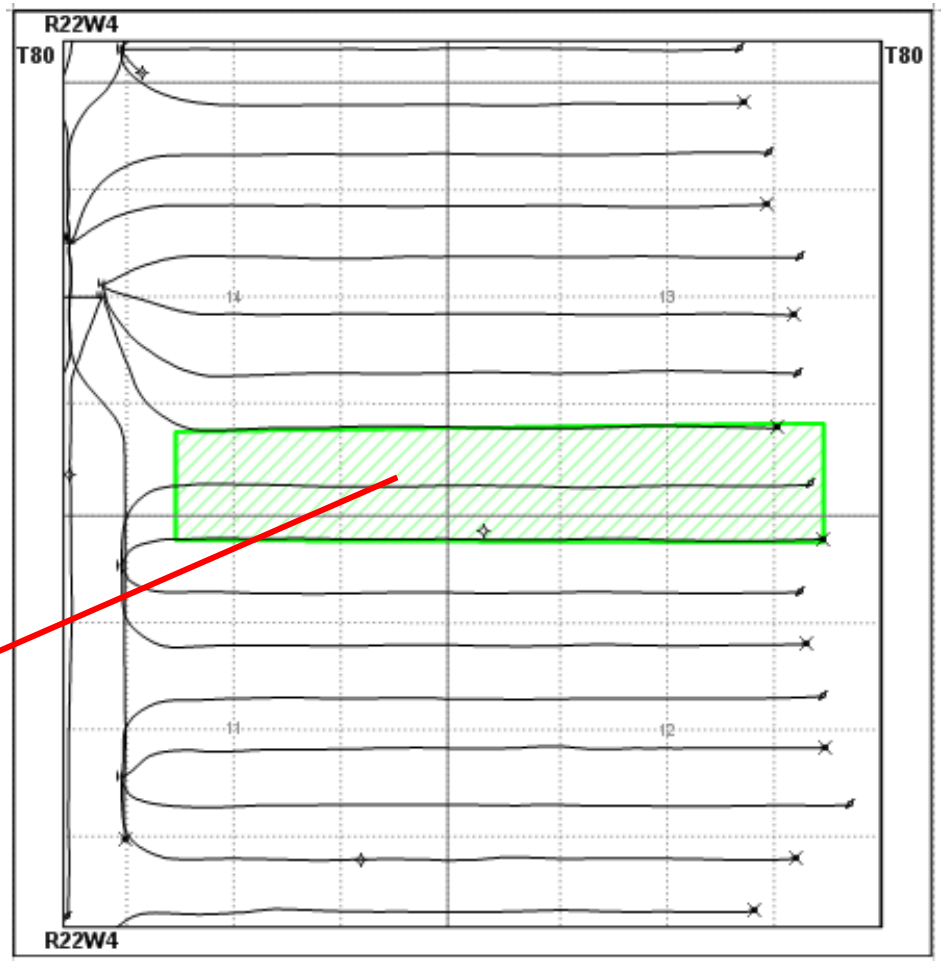
    ➢ **102/01-13-080-22W4/0 (100%)**

    Producers

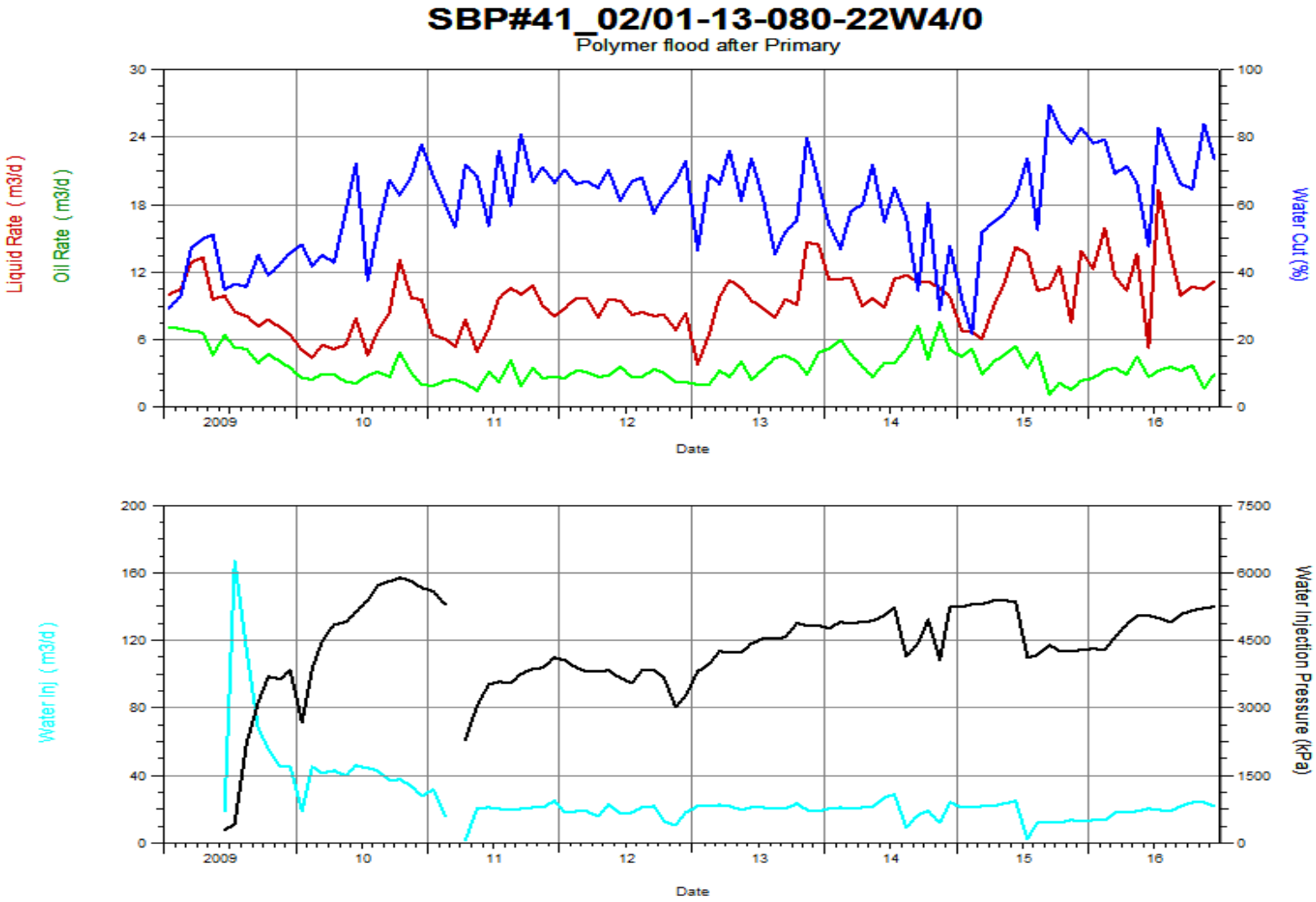
    ➢ **100/01-13-080-22W4/0 (50%)**

    ➢ **102/16-12-080-22W4/0 (50%)**





High Viscosity Performance – SB 41 (Approval 10423)



High Viscosity Performance – SB 41 (Approval 10423)

Canadian Natural

- **Experience with higher viscosity flooding has been varied but indications are that response is to be expected but is harder to predict**
  - **In the example total production from pattern has doubled in response to polymer flooding**
  - **Water cut response has been muted compared to lower viscosity examples**
- **Lower injection rates and slower response characteristic of polymer flooding higher viscosity oil.**

Cap Rock Integrity

Cap Rock Integrity

Canadian Natural

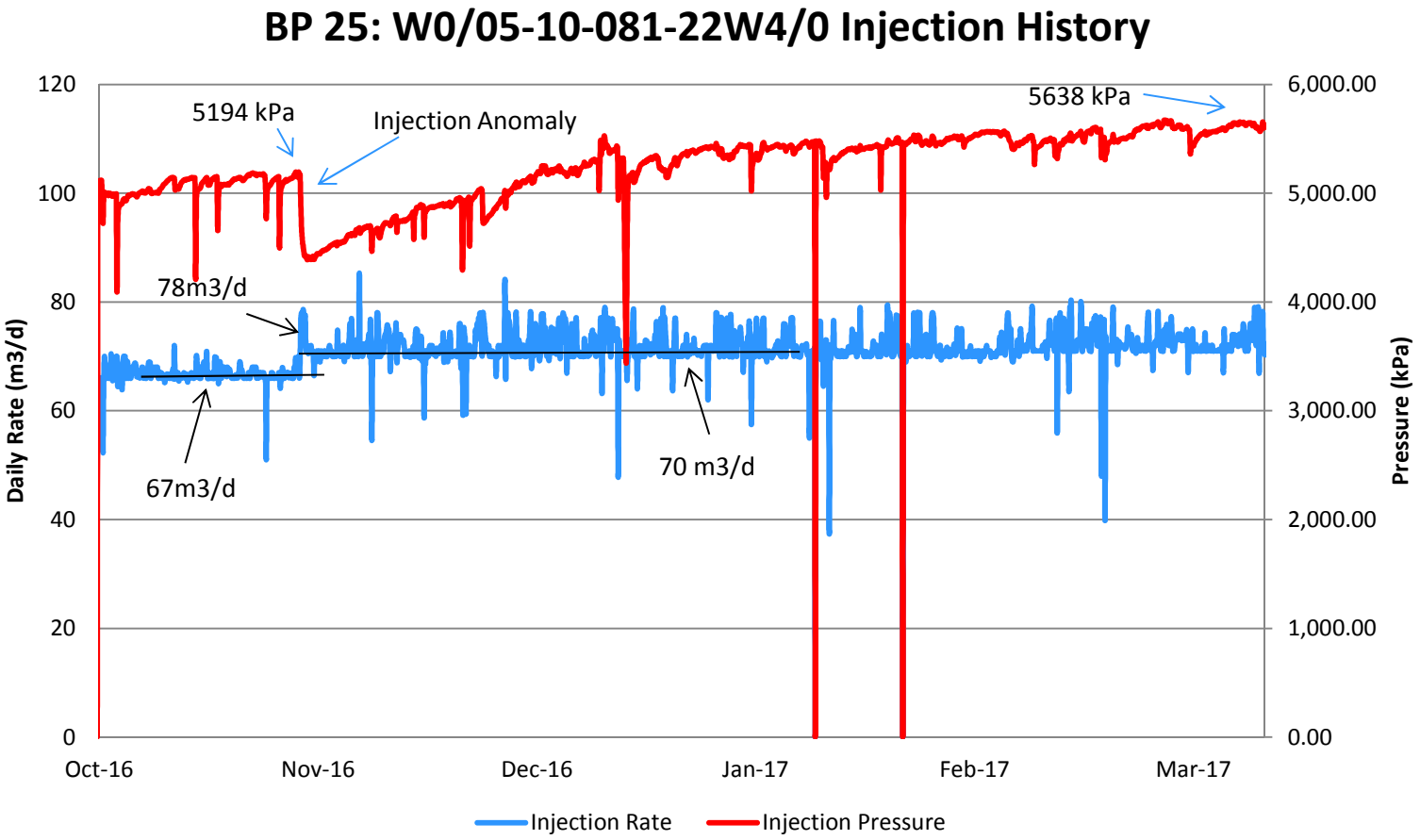
- **2016 Anomalies (7 in total)**

Date of Event	Location	Cause of Alarm	Operations Review of Injection Well	Initial Injection Pressure	Anomalous Pressure	Initial Injection Rate	Anomalous Rate	Cause of Anomaly
(MM/DD/YYYY)	(Pad Name and UWI)			(kPag)	(kPag)	(m3/d)	(m3/d)	
June 26, 2016	NBP 9: 00/14-35-08-21W4/0	Drop in injection pressure/injection rate increase	Surface facilities and instrumentation checked and found to be working properly	4850	4240	43	53	Breakthrough to offsetting production wells
Sept 18th, 2016	NBP 9: 00/14-35-08-21W4/0	Drop in injection pressure	Surface facilities and instrumentation checked and found to be working properly	4610	3365	39	39	Breakthrough to offsetting production wells
Sept 19th, 2016	BP 19: 02/06-03-081-22W4/0	Drop in injection pressure/injection rate increase	Surface facilities and instrumentation checked and found to be working properly	4817	3955	94	147	Flood accessing new higher permablility reservoir
October 1, 2016	NBP 8: 00/13-35-08-21W4/2	Drop in injection pressure/injection rate increase	Surface facilities and instrumentation checked and found to be working properly	5423	4668	57	78	Flood accessing new higher permablility reservoir
October 4, 2016	NBP28 100/16-36-082-20W4/0	Drop in injection pressure	Surface facilities and instrumentation checked and found to be working properly	4914	3708	27	27	Breakthrough to offsetting production wells
October 29, 2016	BP 25: W0/05-10-081-22W4/0	Drop in injection pressure/injection rate increase	Surface facilities and instrumentation checked and found to be working properly	5181	4387	67	78	Flood accessing new higher permablility reservoir
November 20, 2016	BP 17: 00/15-16-081-22W4/0	Drop in injection pressure/injection rate increase	Surface facilities and instrumentation checked and found to be working properly	5006	4493	60	99	Flood accessing new higher permablility reservoir

- **5 anomalies in 2015, 7 anomalies in 2014, 4 anomalies in 2013, 9 anomalies in 2012; 18 anomalies in 2011**

All seven 2016 anomalies were fully investigated. All injectors are back on-stream under normal operating conditions and have regained pressure following the event.

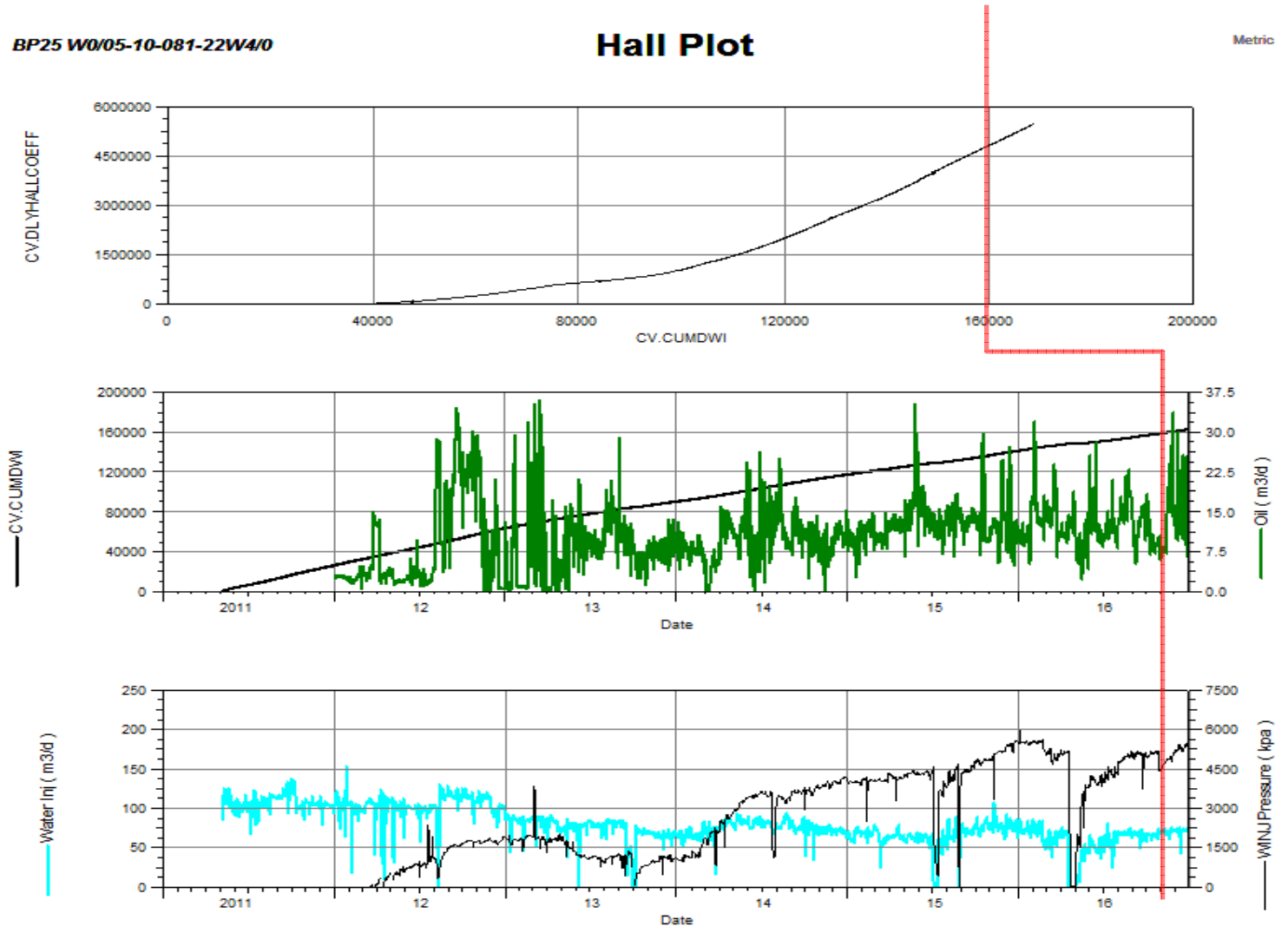
Cap Rock Integrity – BP25: W0/05-10



- Offsetting production wells monitored post anomaly with no change if offsetting WCT observed.
- Injection pressure exceeded pre-anomaly levels within several weeks.
- Cause of anomaly determined a function of reservoir heterogeneity and flood accessing higher permeability reservoir as no change in offsetting WCT observed and pressure built above pre-anomaly levels.

W0/05-10-081-22W4/0: Injection rate was lowered immediately after anomaly. Inj. rate remained stable with injection pressure climbing higher then pre-anomaly level with-in several weeks.

Cap Rock Integrity – BP19 – 100/16-10



Hall plots are reviewed regularly to investigate potential cap rock breaches. A sudden change in the Hall Plot slope may indicate a potential issue.

Future Development Plans

Future Development Plans

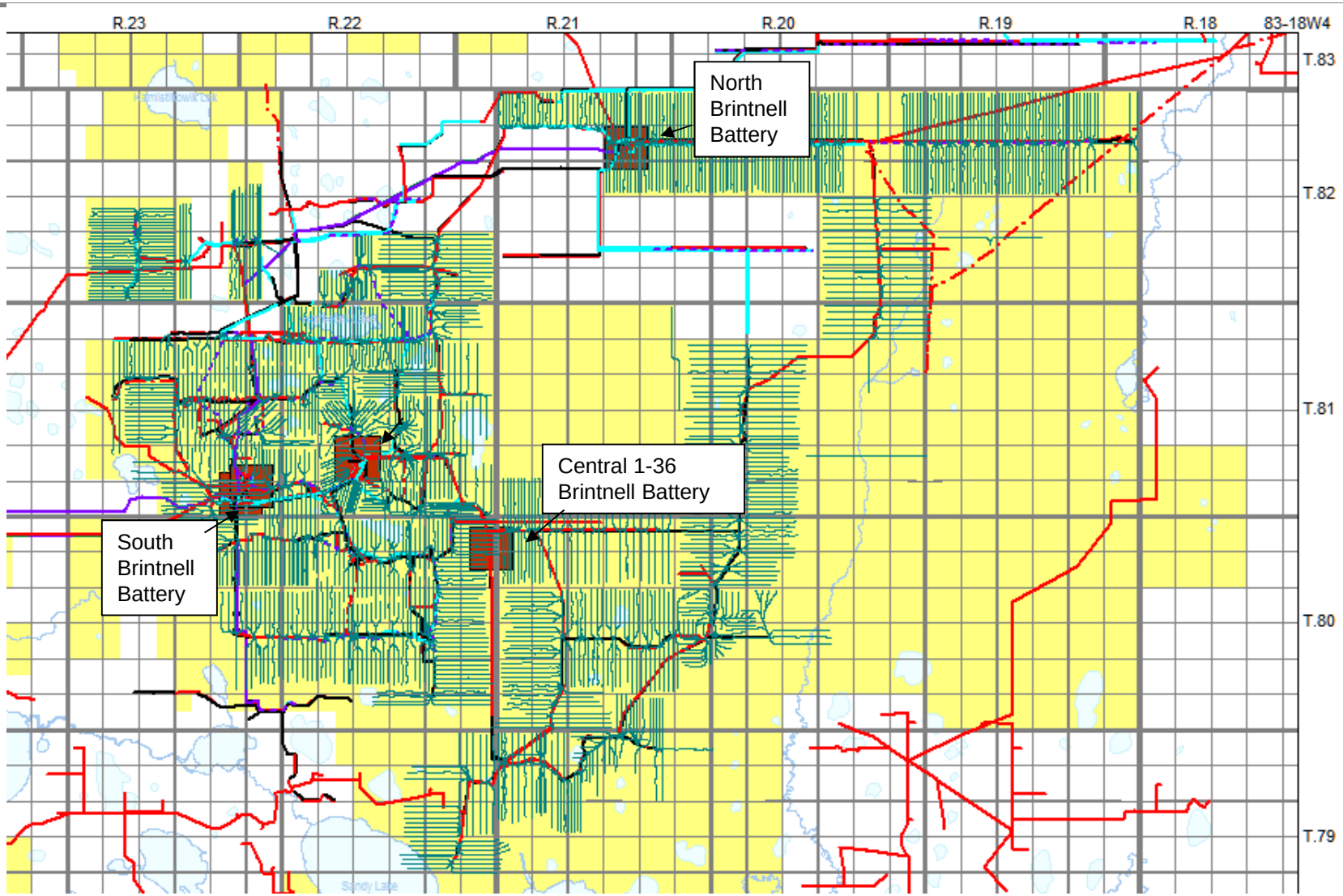
Canadian Natural

- Canadian Natural plans to continue with the expansion of the polymer flood at Brintnell over the next several years. Expansion will push the flood to the southeastern and western edges of the pool.
- The focus of this year's capital program will be infill drilling and polymer flood optimization of existing well patterns. Optimization will be achieved through continuous flood management to ensure balance and optimal recovery factor.
- CNRL received approval in 2012 to implement a surfactant pilot in the field. CNRL is not pursuing surfactant flooding at the present time.

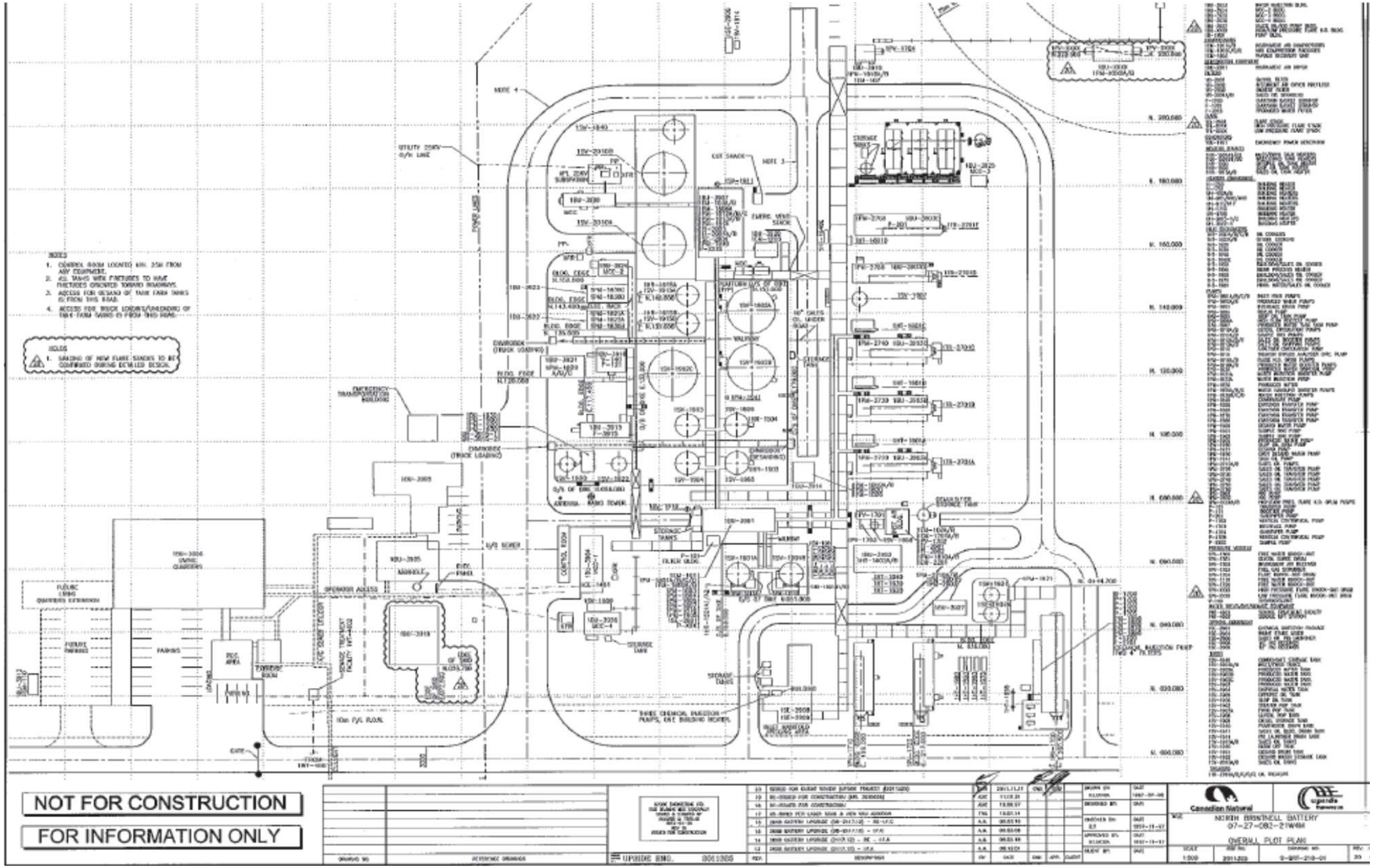
Facilities

Brintnell Batteries

Canadian Natural



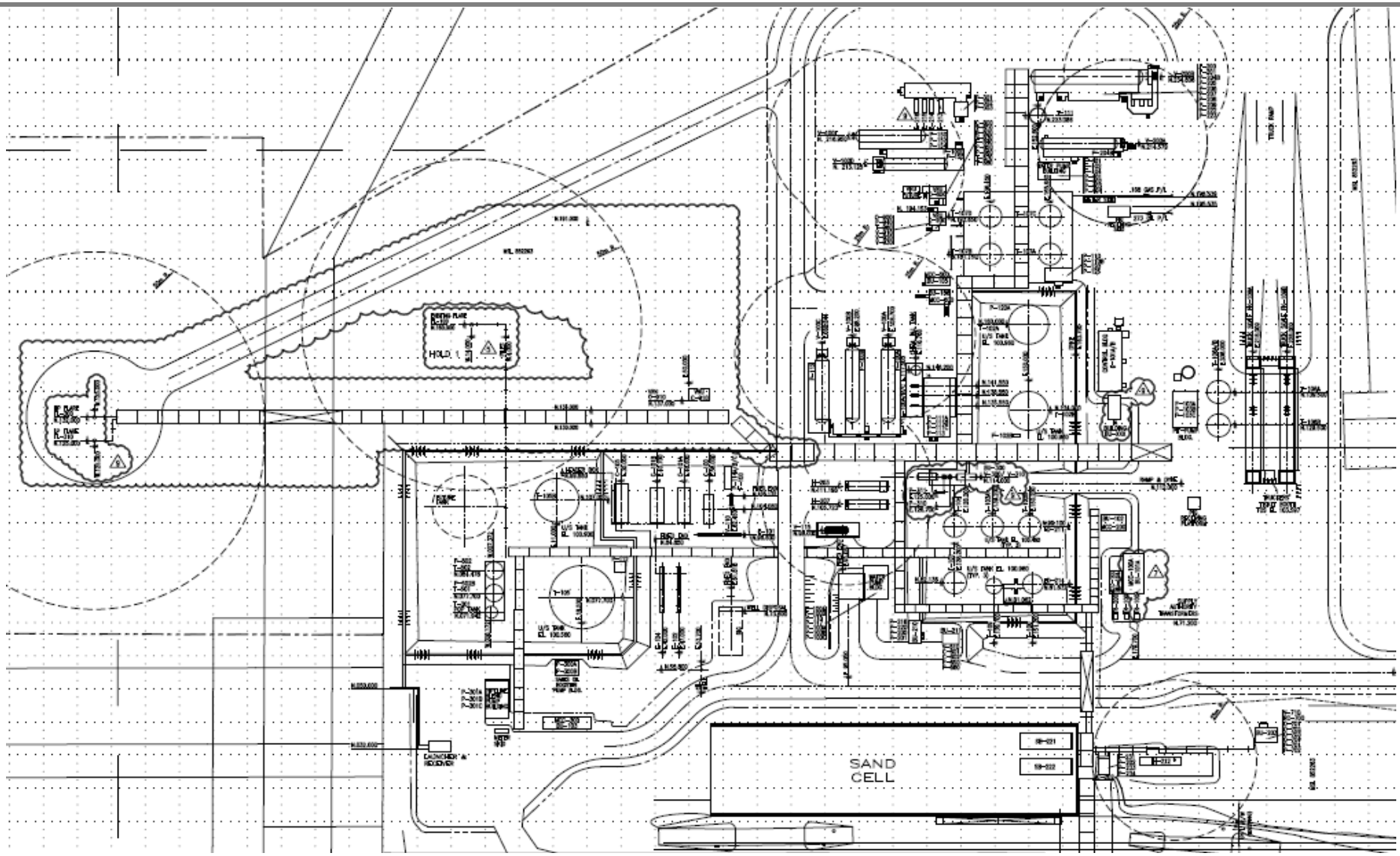
Facility: NB 07-27-82-21W4 Battery Plot Plan



Refer to Appendix A

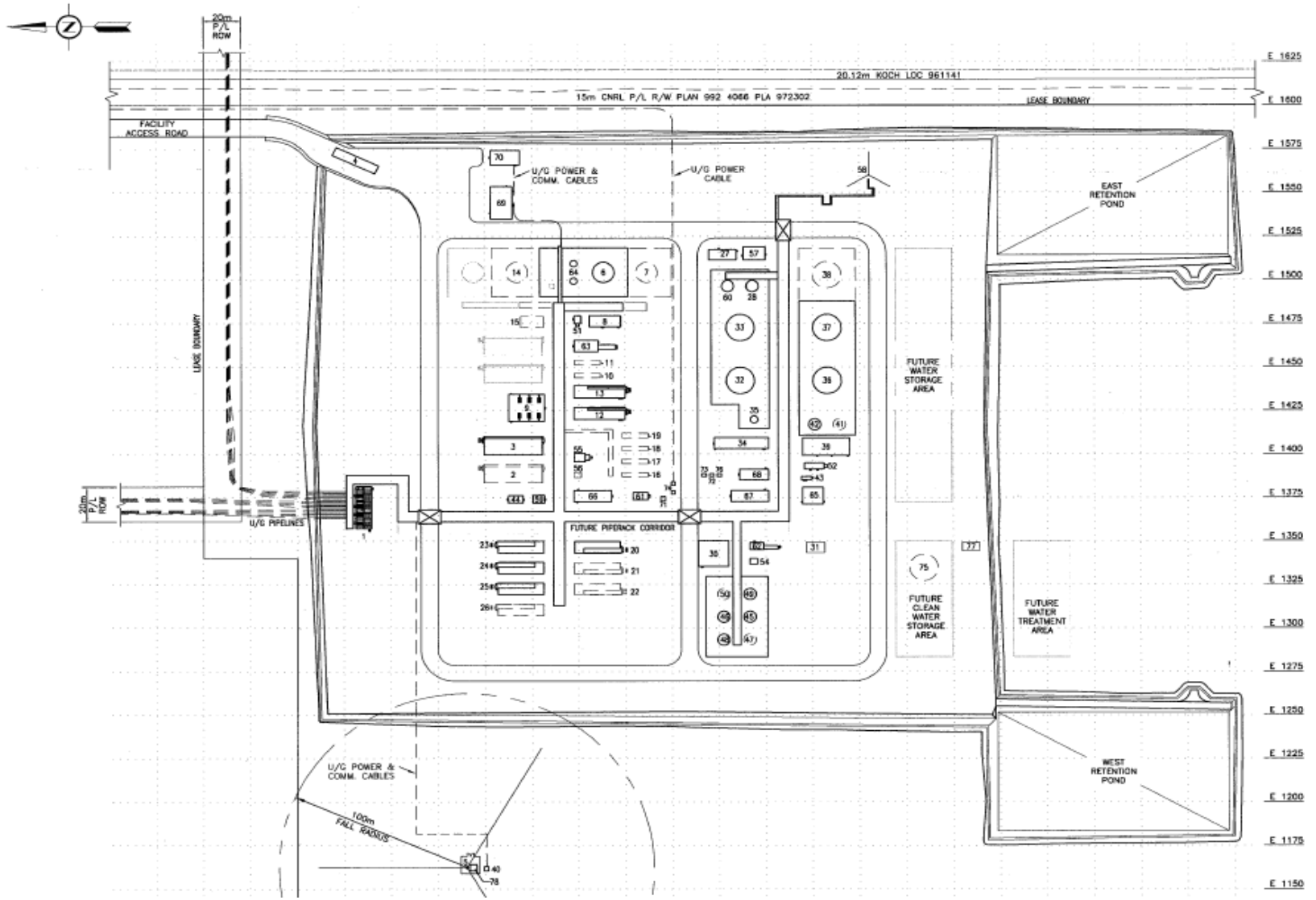
Facility: SB 09-02-81-23W4 Battery Plot Plan

Canadian Natural



Refer to Appendix A

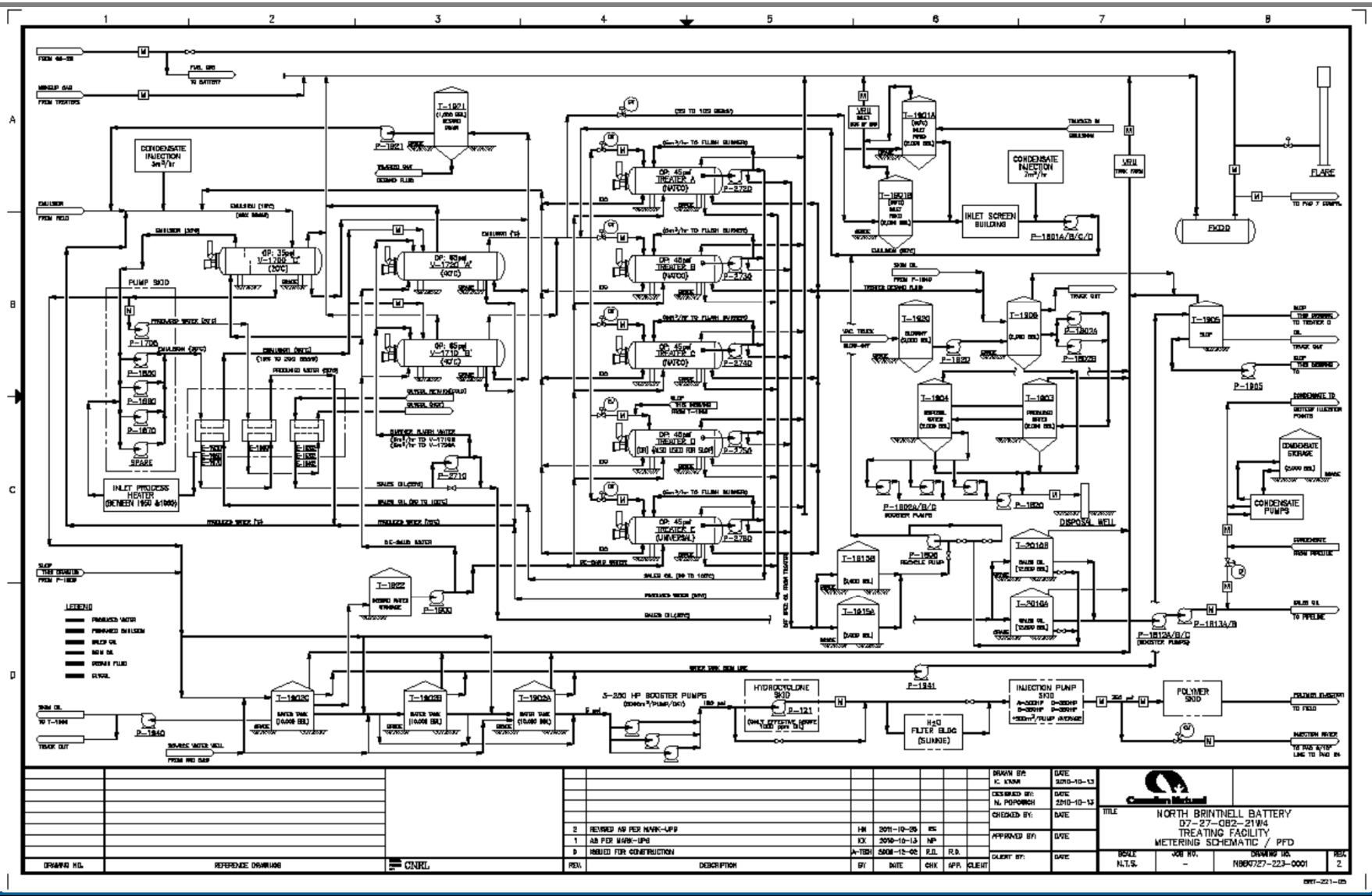
Facility: CB 01-36-80-22W4 Battery Plot Plan



Refer to Appendix A

Facility: Typical Brintnell Battery PFD

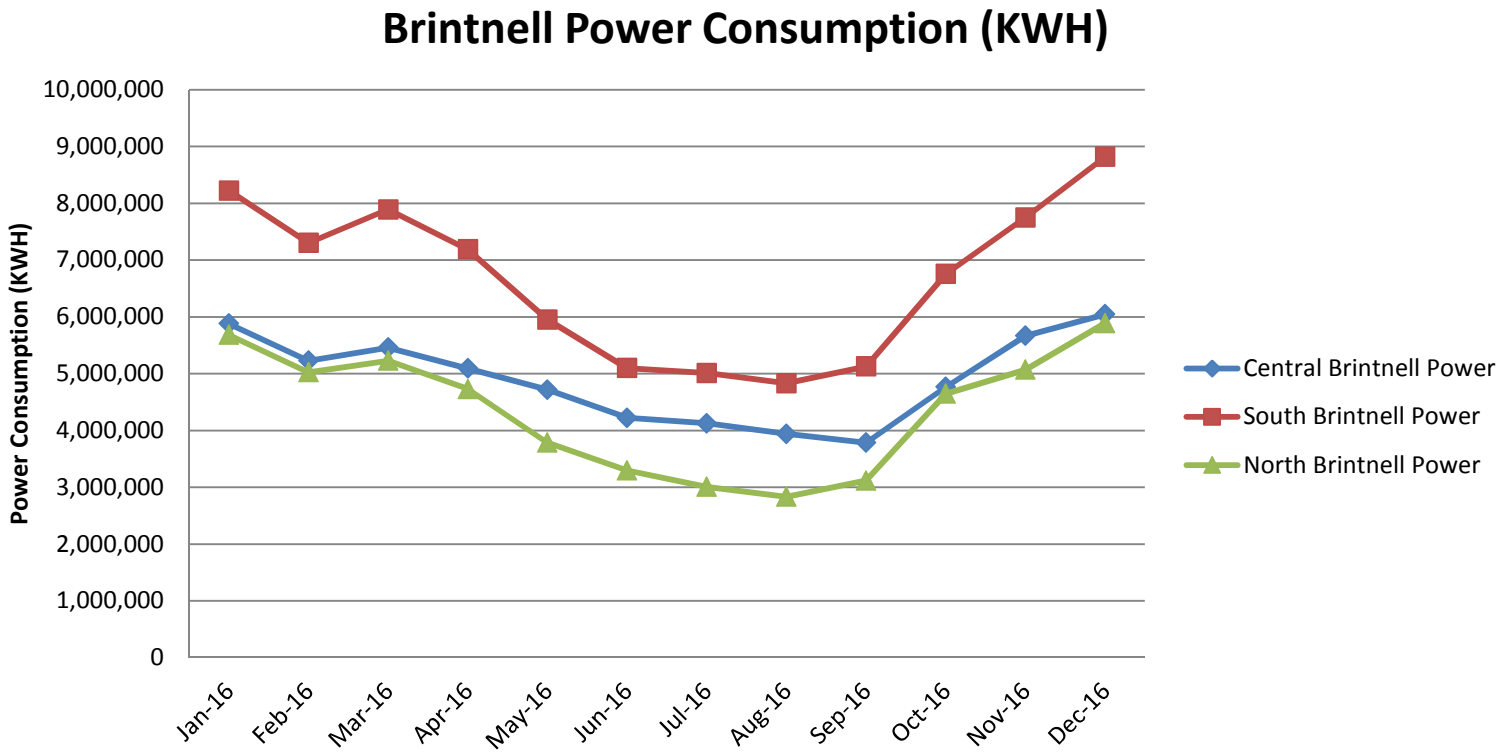
Canadian Natural



Refer to Appendix B

Brintnell Power Consumption

Power Consumption - KWH													
	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total
Central Brintnell	5,880,640	5,226,063	5,458,563	5,090,711	4,717,776	4,221,819	4,126,621	3,940,437	3,784,130	4,764,569	5,667,146	6,044,215	58,922,690
South Brintnell	8,221,987	7,301,424	7,890,070	7,187,245	5,950,432	5,098,711	5,010,761	4,830,538	5,125,216	6,755,010	7,747,347	8,816,008	79,934,749
North Brintnell	5,684,717	5,025,517	5,228,170	4,728,771	3,783,894	3,293,791	3,005,937	2,833,665	3,116,309	4,646,476	5,069,706	5,888,314	52,305,267
	19,787,344	17,553,004	18,576,803	17,006,727	14,452,102	12,614,321	12,143,319	11,604,640	12,025,655	16,166,055	18,484,199	20,748,537	191,162,706



Facility Modifications

- **Reasons for Modifications:**
  - **Oil Treating:**
    - Heat integration: Installing indirect heating projects to reduce OPEX. Currently investigating other opportunities.
    - Optimizing battery process
  - **Integrity:**
    - Implementing plan to rebuild existing flood areas; future flood areas to be rebuilt as the flood is expanded
    - Construction and routine monitoring ongoing. Working towards 2019 compliance.
    - All high risk sour pipelines have been lined as of Feb, 2014
  - **Improve Water Quality:**
    - De-oiling and Filtration

Battery Performance

Canadian Natural

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
North Brintnell 7-27											
Oil Produced (m3)	705,917	809,627	959,335	988,448	957,855	835,263	1,075,836	1,027,258	937,154	900,340	644,768
Produced Water (m3)	1,374,731	1,775,300	2,096,258	2,292,879	2,386,085	1,484,277	1,795,440	1,567,398	1,772,860	1,618,804	1,325,432
Recycle Rates (m3)	1,220,482	1,779,160	2,057,161	2,238,740	2,330,418	1,453,371	1,786,316	1,559,325	1,772,860	1,618,804	1,325,432
Produce Recycle	88.8%	100.2%	98.1%	97.6%	97.7%	97.9%	99.5%	99.5%	100.0%	100.0%	100.0%
Average Daily Recycle (m3/d)	3,344	4,874	5,621	6,134	6,385	3,982	4,881	4,272	4,857	4,435	3,621
Average Disposal Rates (m3/d)	423	-11	107	148	153	85	25	22	0	0	0
Central Brintnell 12-09											
Oil Produced (m3)	568,076	603,657	569,149	533,178	528,267	492,495	546,580	237,914			
Produced Water (m3)	167,755	193,349	267,607	378,988	323,086	402,772	402,822	143,284			
Recycle Rates (m3)	0	26,826	159,288	346,418	301,720	357,025	329,781	104,583	*Battery converted to trucked in facility May 15, 2013*		
Produce Recycle	0.0%	13.9%	59.5%	91.4%	93.4%	88.6%	81.9%	73.0%			
Average Daily Recycle (m3/d)	0	73	435	949	827	978	901	775			
Average Disposal Rates (m3/d)	460	456	296	89	59	125	200	106			
Central Brintnell 01-36											
Oil Produced (m3)								584,297	780,513	951,411	1,298,572
Produced Water (m3)								638,159	1,946,244	2,347,871	2,570,249
Recycle Rates (m3)					*Battery Commissioned May 2014 - first oil May 15, 2013*			565,099	1,615,263	1,908,506	2,150,738
Produce Recycle								88.6%	83.0%	81.3%	83.7%
Average Daily Recycle (m3/d)								2,457	4,425	5,229	5,876
Average Disposal Rates (m3/d)								318	907	1,204	1,146
South Brintnell 9-02											
Oil Produced (m3)	441,942	575,306	620,631	602,897	645,053	782,847	1,080,977	1,055,952	1,220,367	1,100,589	840,998
Produced Water (m3)	341,034	413,480	501,318	544,390	776,095	1,014,789	1,505,539	1,494,985	1,205,459	1,278,060	1,438,774
Recycle Rates (m3)	0	22,465	173,011	204,727	173,120	823,109	1,412,965	1,384,546	1,091,455	1,172,557	1,173,748
Produce Recycle	0.0%	5.4%	34.5%	37.6%	22.3%	81.1%	93.9%	92.6%	90.5%	91.7%	81.6%
Average Daily Recycle (m3/d)	0	62	473	561	474	2,255	3,861	3,793	2,990	3,212	3,207
Average Disposal Rates (m3/d)	934	1,071	897	931	1,652	525	253	303	312	289	726
Total Volumes											
Oil Produced (m3)	1,715,934	1,988,589	2,149,115	2,124,523	2,131,175	2,110,605	2,703,393	2,905,421	2,938,034	2,952,339	2,784,338
Produced Water (m3)	1,883,520	2,382,129	2,865,183	3,216,258	3,485,267	2,901,838	3,703,800	3,843,826	4,924,563	5,244,736	5,334,455
Recycle Rates (m3)	1,220,482	1,828,451	2,389,460	2,789,885	2,805,257	2,633,505	3,529,061	3,613,553	4,479,577	4,699,867	4,649,918
Fresh Water (m3)	512,766	1,026,684	1,493,264	1,433,242	1,553,045	1,479,780	1,876,840	2,041,938	2,028,731	1,937,567	1,916,943
Brackish Water (m3) - Grosmont	1,438,110	1,661,989	764,664	2,963,684	3,999,848	6,274,361	4,780,011	3,800,437	3,666,120	3,133,047	2,276,529
Disposal Volume (m3)	663,038	553,678	475,723	426,373	680,010	268,333	174,739	222,200	464,554	544,868	684,537
Total Produce Recycle (%)	64.8%	76.8%	83.4%	86.7%	80.5%	90.8%	95.3%	94.0%	91.0%	89.6%	87.2%
Average Daily Recycle (m3/d)	3,344	5,009	6,529	7,644	7,686	7,215	9,642	9,900	12,273	12,876	12,705
Average Daily Disposal (m3/d)	1,817	1,517	1,300	1,168	1,863	735	477	748	1,219	1,493	1,870

Measuring and Reporting

Measurement and Reporting

Canadian Natural

- **Methods of Measurement:**
  - Oil and Water: flow meters and test tanks (Primary only)
  - Solution Gas: orifice meters/GOR Testing
- **Typical Well Testing:**
  - Frequency and duration: well testing as per Directive 17.
  - Meter installations have replaced test tanks (high volume and flood producers).
    - Part of all new pad expansions and rebuilds.
- **2016 Field Proration Factors:**
  - Meets directive 17 requirements (Oil: 0.85, Water: 1.08)

Measurement and Reporting – Continued

Canadian Natural

- **Optimization:**
  - Remove test tanks and install flow meters on pads/wells
    - Increase testing frequency and duration
    - Perform testing inline
    - Eliminates gas venting from tanks
    - Reduces fuel gas consumption
    - Reduces potential for spill
  - Standardize testing equipment across field
    - Reduce downtime and maintenance
    - Increase reliability in calibration
    - Improve & revise BS&W testing procedures for better accuracy

Brintnell Gas Volumes - Update

Canadian Natural

Gas Volumes (e3m3)	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total
DISP	4,874	4,549	4,927	4,710	4,858	4,329	4,418	4,282	4,440	4,612	4,289	4,088	54,376
FLARE	121	67	66	69	85	117	182	162	80	88	83	238	1,357
FUEL	4,081	3,833	3,765	3,178	3,305	3,110	3,138	3,282	3,253	3,341	3,314	3,678	41,277
PROD	5,601	5,150	5,537	5,062	5,437	4,846	4,927	4,689	4,819	5,001	4,724	4,597	60,391
PURDISP	64	85	89	95	60	76							469
PURREC	64	85	89	95	60	76							469
REC	3,831	3,565	3,482	3,165	3,075	2,992	3,114	3,342	3,271	3,353	3,356	3,787	40,332
VENT	356	266	261	270	265	283	304	304	317	314	395	380	3,713

- Produced gas is captured, processed and used throughout the field as consumable fuel gas.
- Venting only occurs at the well leases when D-60 requirements have been approved by the AER. No sour gas vented.
- Year over year reductions in vented and flared gas volumes

Future Facility Plans

Facility Future Plans

- **Major Activities:**
  - Pad Rebuilds
  - Future Polymer Expansions
  - Water Management Plan

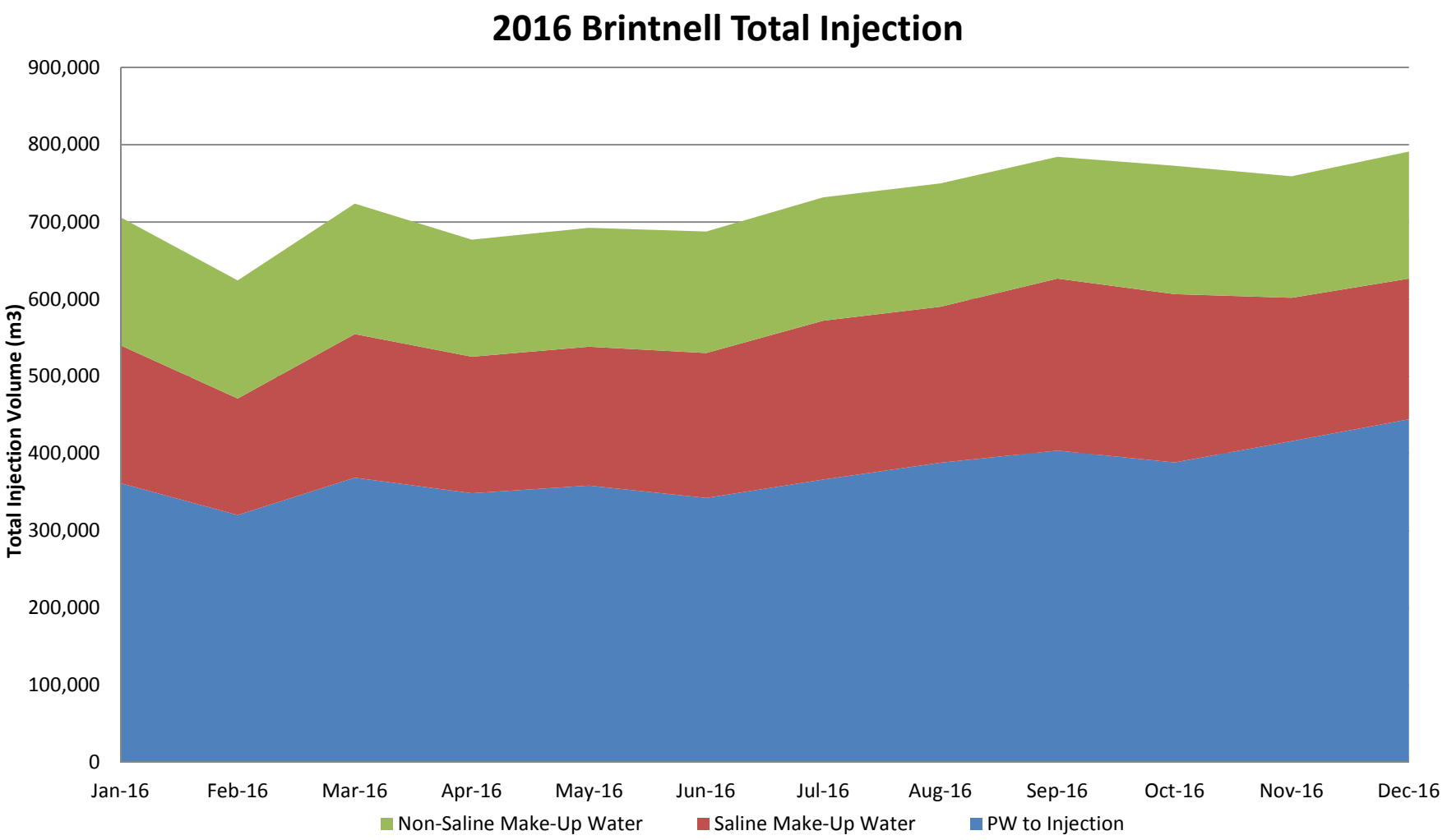
Water Use

Non-Saline Water Use

Canadian Natural

- Canadian Natural currently has license 00249595-00-00 with Alberta Energy Regulator for the annual diversion of up to 2,151,310 m3 of non-saline water for injection with an expiry date of 2019-01-25.
  - CNRL received a renewal of this license in early 2014.
- Canadian Natural has not increased the amount of licensed non-saline water since 2006, yet has significantly increased the amount of area under flood as seen in the polymer flood section of this presentation.
- Working to optimize the use of fresh water for polymer hydration to maximize its benefit
- Significant investment has been made in infrastructure and increased operating cost in order to continue to expand the polymer flood without the use of additional non-saline water to our current license.
- In Compliance with Alberta Environment and Water regarding monthly reporting, observation well monitoring, and all other terms of the License.

Brintnell Total Injection



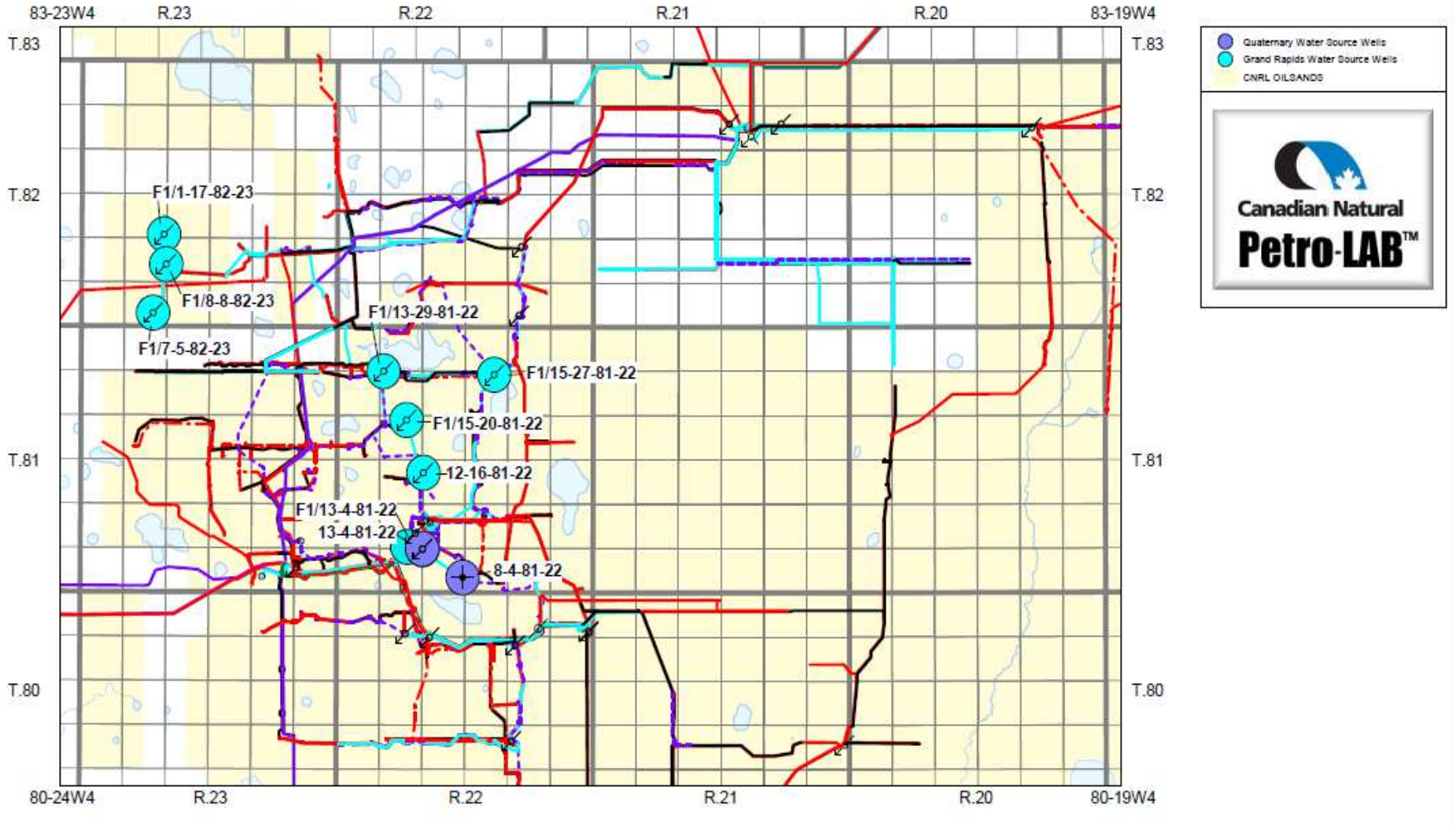
2016 Injection Water Summary

Canadian Natural

2016 Polymer Injection Volumes (m^3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Produced Water to Injection	361,568	320,192	368,792	348,762	358,408	342,411	366,221	388,012	403,739	388,431	416,131	444,370
Fresh Make-Up Water	165,864	152,842	169,033	151,731	153,981	157,362	159,819	159,857	157,942	166,232	157,629	164,651
Saline Make-Up Water	178,470	151,138	185,998	176,611	180,006	187,861	205,805	202,106	222,768	218,065	185,436	182,266
Total	705,902	624,171	723,823	677,104	692,395	687,634	731,845	749,975	784,449	772,728	759,196	791,286

Total Injection Volumes (m^3)	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016	
Produced Water to Injection	2,382,129	47%	2,865,183	56%	3,216,258	42%	3,485,267	39%	2,901,838	27%	3,388,006	34%	3,522,671	38%	4,390,618	44%	4,617,604	48%	4,507,036	52%
Fresh Make-Up Water	1,026,684	20%	1,493,264	29%	1,433,242	19%	1,553,045	17%	1,479,780	14%	1,876,840	19%	2,041,938	22%	2,028,731	20%	1,937,567	20%	1,916,943	22%
Saline Make-Up Water	1,661,989	33%	764,664	15%	2,963,684	39%	3,999,848	44%	6,274,361	59%	4,780,011	48%	3,800,437	41%	3,666,120	36%	3,133,047	32%	2,276,529	26%
Total	5,070,802		5,123,111		7,613,184		9,038,160		10,655,979		10,044,856		9,365,047		10,085,470		9,688,218		8,700,507	

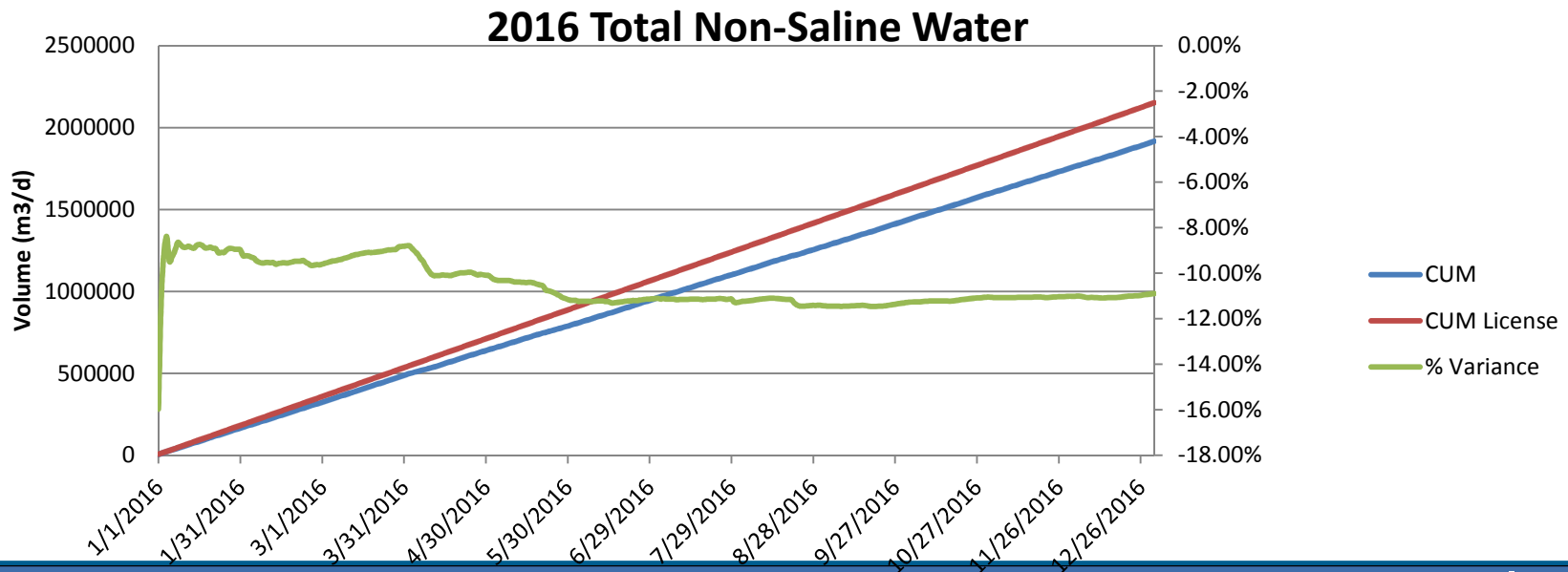
Non-Saline Well Locations



Non-Saline Water Make up Wells

Well Name	UWI	Production Interval	Maximum Rate of Diversion (m3/d)	Maximum Annual Diversion Volume (m3/d)	2016 Average Diversion Volumes (m3/d)
WSW BP25 - QUAT	100/08-04-081-22W4/00	53.3-65.2	818	247,470	525
WSW BP11 - QUAT	1F2/13-04-081-22W4/00	34.3-38.8	1200	153,300	410
WSW BP2 - GR	1AA/12-16-081-22W4/02	270.6-317.6	1200		778
WSW BP11 - GR	1F1/13-04-081-22W4/00	258.5-315.9	812		725
WSW HTP2 - GR	1F1/13-29-081-22W4/00	265.8-326.8	2250		1,354
WSW HTP6 - GR	1F1/15-27-081-22W4/00	264.8-317.8	468	1,750,540	394
WSW NHTP16 - GR	1F1/01-17-082-23W4/00	253.0-310.0	933		507
WSW WBP30 - GR	100/15-20-081-22W4/00	260-315	750		182
WSW NHP13 - GR	100/07-05-082-23W4/00	232-302	325		256
WSW NHP15 - GR	100/08-08-082-23W4/00	243-305	225		106

1,574,935



Water Chemistry

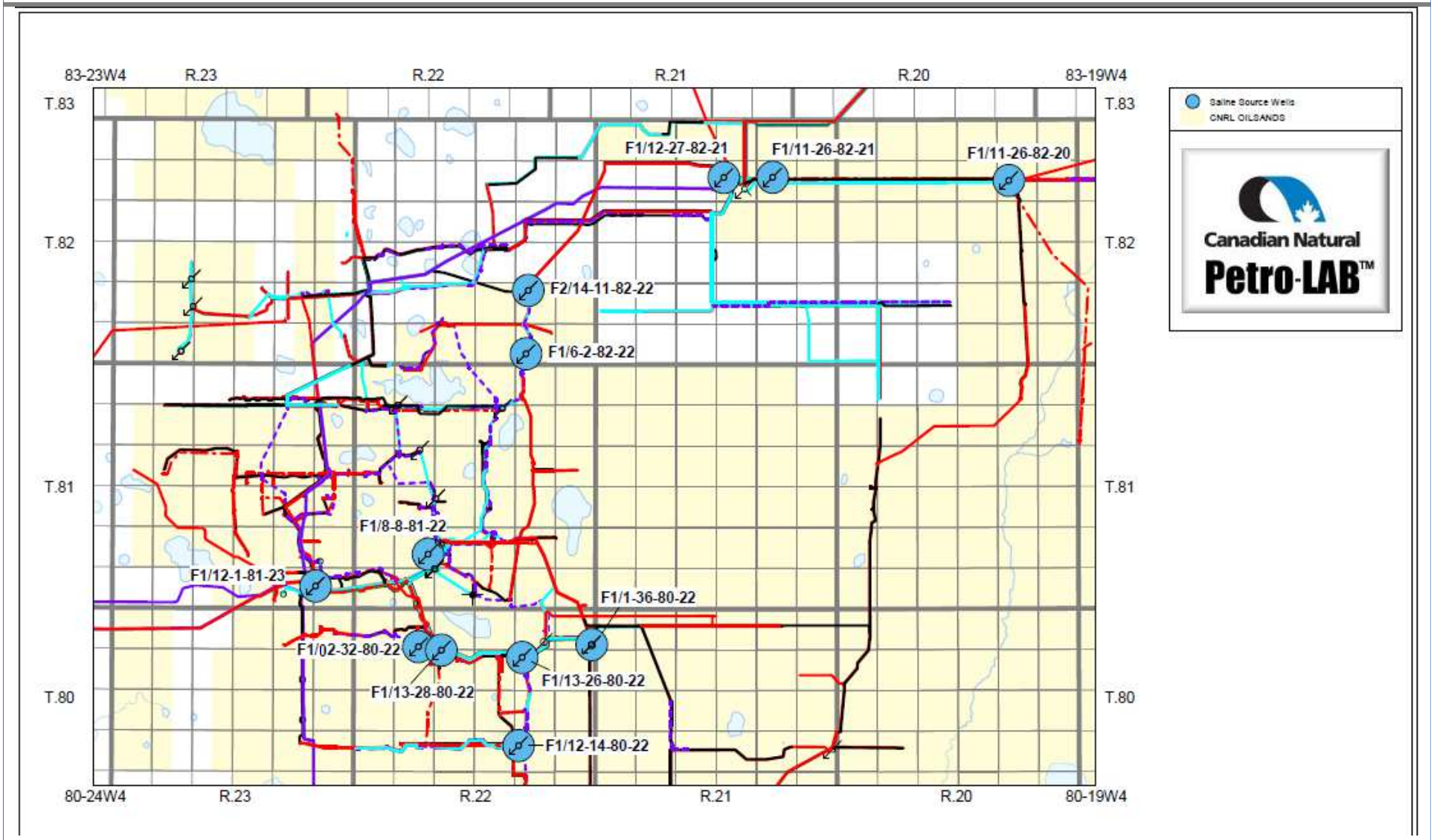
Canadian Natural

- **Non-Saline Water Source Wells**

Monitoring Well	Sample Date	Lab pH	Lab EC µS/cm	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	T-Alkalinity mg/L	HCO_3 mg/L	CO_3 mg/L	SO_4 mg/L	NO_2-N mg/L	NO_3-N mg/L	NO_2-N+NO_3-N mg/L	Hardness mg/L	TDS mg/L
WSW HTP 2 - GR	25-Jul-15	*8.95*	2600	2.05	1.41	*608*	3.64	82.6	1270	1340	104	<0.60	<0.020	<0.040	<0.045	10.9	*1460*
WSW HTP 6 - GR	25-Jul-15	*8.95*	2580	1.95	1.34	*602*	3.58	91.3	1250	1320	98.7	<0.60	<0.020	<0.040	<0.045	10.4	*1450*
WSW NHTP 13 - GR	26-Jul-15	*8.65*	2570	2.35	1.56	*603*	4.17	94.8	1260	1400	66.6	<0.60	<0.020	<0.040	<0.045	12.3	*1470*
WSW NHTP 15 - GR	26-Jul-15	*8.96*	2560	1.88	1.52	*610*	3.71	99.8	1230	1300	102	<0.60	<0.020	<0.040	<0.045	11	*1460*
WSW NHTP 16 - GR	26-Jul-15	*8.93*	2670	1.99	1.71	*637*	3.99	93.2	1350	1430	108	<1.5	<0.050	<0.10	<0.11	12	*1550*
WSW BP 2 - GR	25-Jul-15	*8.94*	2470	1.84	1.23	*609*	3.57	89	1210	1270	96.2	<0.60	<0.020	<0.040	<0.045	9.7	*1430*
WSW BP 11 - GR	25-Jul-15	*8.95*	2390	1.74	1.17	*595*	3.53	76	1210	1280	101	<0.60	<0.020	<0.040	<0.045	9.2	*1410*
WSW BP 11 - Quat	25-Jul-15	*8.54*	740	88	24.1	*53.8*	4.9	0.73	329	369	16.2	73.8	<0.010	0.062	0.062	319	*443*
WSW BP 25 - Quat	19-Jan-16	*7.59*	1600	129	39.4	*207*	6.32	1.52	487	594	<5.0	462	<0.010	<0.020	<0.050	484	*1140*
WB30 - GR	25-Jul-15	*9.01*	2610	2.22	1.37	*631*	3.74	98.3	1330	1380	116	<0.60	<0.020	<0.040	<0.045	11.2	*1540*

- **Saline Water Source Wells – Grosmont**
  - **Typical TDS range – 22,000-35,000 mg/L**

Saline Water Source Map



2016 Saline Water Source Well Diversion Volumes (m^3)

Canadian Natural

Non-Saline Wells	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Totals
1F1/01-36-080-22W4/00	58,502	52,120	58,871	60,327	63,188	62,001	58,853	59,414	65,057	63,402	57,681	61,669	**721,085**
1F1/02-32-080-22W4/00	40,974	43,048	38,919	33,485	33,073	33,601	29,408	42,662	55,107	58,749	38,798	30,496	**478,320**
1F1/08-08-081-22W4/00	11,050	17,507	14,626	4,200	3,417	16,937	30,795	23,490	10,232	0	594	2,940	**135,788**
1F1/11-26-082-21W4/00	23,974	13,755	23,428	24,752	27,382	26,706	23,231	29,106	34,655	20,089	41,034	38,747	**326,859**
1F1/12-01-081-23W400	3,515	208	760	707	302	366	4,176	1,733	12,361	32,898	1,249	4,318	**62,592**
1F1/13-26-080-22W4/00	31,674	24,500	49,394	53,140	52,644	48,250	59,342	45,701	45,356	42,927	46,080	44,096	**543,104**
1F1/13-28-080-22W4/00	8,781	0	0	0	0	0	0	0	0	0	0	0	**8,781**
1F1/12-14-080-22W4/00	-	-	-	-	-	-	-	-	-	-	-	-	**-**
1F1/11-26-082-20W4/00	-	-	-	-	-	-	-	-	-	-	-	-	**-**
1F1/12-27-082-21W4/00	-	-	-	-	-	-	-	-	-	-	-	-	**-**
1F1/06-02-082-22W4/00	-	-	-	-	-	-	-	-	-	-	-	-	**-**
1F2/14-11-082-22W4/00	-	-	-	-	-	-	-	-	-	-	-	-	**-**
TOTAL SALINE	**178,470**	**151,138**	**185,998**	**176,611**	**180,006**	**187,861**	**205,805**	**202,106**	**222,768**	**218,065**	**185,436**	**182,266**	**2,276,529**

- Inactive wells above have been suspended and could be reactivated for future use.

Water Usage and Disposal

Canadian Natural

Total Water Volumes	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Produced Water for Injection (m3)	2,382,129	2,865,183	3,216,258	3,485,267	2,901,838	3,703,800	3,522,671	4,390,618	4,617,604	4,507,036
Fresh Water (m3)	1,026,684	1,493,264	1,433,242	1,553,045	1,479,780	1,876,840	2,041,938	2,028,731	1,937,567	1,916,943
Brackish Water (m3) - Grosmont	1,661,989	764,664	2,963,684	3,999,848	6,274,361	4,780,011	3,800,437	3,666,120	3,133,047	2,276,529
Disposal Volume (m3)	553,678	475,723	426,373	680,010	268,333	174,739	222,200	464,554	544,868	684,537
Total Produce Recycle (%)	76.80%	83.40%	86.70%	80.50%	90.80%	95.30%	94.00%	91.0%	89.6%	**87.2%**
Average Daily Recycle (m3/d)	5,009	6,529	7,644	7,686	7,215	9,642	9,900	12,273	12,876	12,740

- **Continued to focus on maintaining high water recycling ratios.**
  - **2016 recycle at 87.2%.**
- **CNRL continues to be in compliance with AENV water diversion license.**
- **CNRL Disposal injection in compliance with Directive 51 Guidelines and Approvals.**

Pelican Lake Water Information

Canadian Natural

Pelican Lake Water Information

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fresh Water (m3/day) - Quaternary and Grand Rapids	1405	2813	4091	3927	4255	4054	5142	5594	5558	5308	5252
Brackish Water (m3/day) - Grosmont	3940	4553	2095	8120	10958	17190	13096	10412	10044	8584	6237
Total Source Water (m3/day)	5345	7366	6186	12046	15213	21244	18238	16007	15602	13892	11489
Total Source Water per barrel of oil	1.1	1.4	1.1	2.1	2.6	3.7	3.0	2.3	2.0	1.7	1.5
Brackish Water per barrel of oil	0.8	0.8	0.4	1.4	1.9	3.0	2.1	1.5	1.3	1.1	0.8
Fresh Water per barrel of oil	0.3	0.5	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.7	0.7
Produced Water Recycle (m3/day)	3344	5009	6546	7644	7686	7215	9669	9900	12273	12876	12740
Recycle Rates	64.8%	76.8%	83.4%	86.7%	80.5%	90.8%	95.3%	94.0%	91.0%	89.6%	87.2%
Oil Produced (bbl/day)	29570	34269	37035	36612	36726	36372	38656	42934	50194	50877	47982

Pelican Lake Water Information
2016 Monthly

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fresh Water (m3/day) - Quaternary and Grand Rapids	5,438	5,011	5,542	4,975	5,049	5,159	5,240	5,241	5,178	5,450	5,168	5,398
Brackish Water (m3/day) - Grosmont	5,851	4,955	6,098	5,791	5,902	6,159	6,748	6,626	7,304	7,150	6,080	5,976
Total Makeup Water (m3/day)	11,290	9,967	11,640	10,765	10,950	11,319	11,988	11,868	12,482	12,600	11,248	11,374
Total Makeup Water per barrel of oil	1.5	1.4	1.5	1.4	1.4	1.5	1.5	1.5	1.7	1.6	1.5	1.5
Brackish Water per barrel of oil	0.8	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.0	0.9	0.8	0.8
Fresh Water per barrel of oil	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Produced Water Recylce (m3/day)	12220	10903	12464	11841	12249	12126	12641	13095	13564	13115	14047	14693
Recycle Rates	87.27%	88.27%	88.19%	87.60%	87.78%	87.33%	85.99%	86.18%	86.25%	86.20%	86.54%	88.71%
Oil Produced (bbl/day)	48,345	44,932	49,620	48,017	48,199	47,157	49,030	48,423	46,731	48,491	47,503	47,765

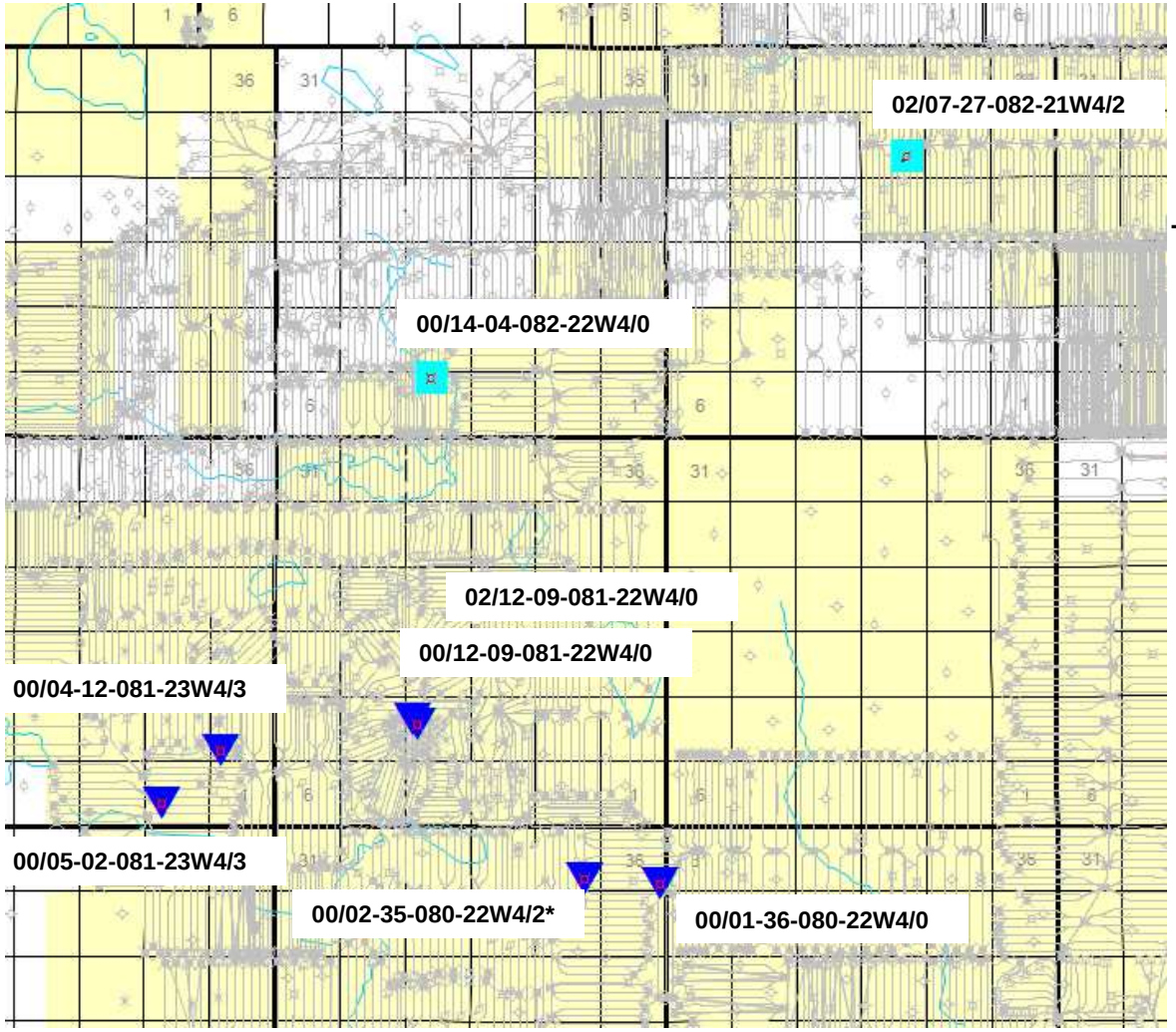
Pelican Water Management Plan

Canadian Natural

- Striving to improve field performance by increasing throughput through injectivity improvements
- Optimize polymer loading with the use of existing fresh water volumes
- Additional water treatment processes previously piloted but not implemented – economics and operating limitations posed challenges
- 2015 – Small water treatment pilot to investigate new technologies to improve produced water quality.
- Additional Grosmont Source/Disposal options are being investigated as we plan the long-term Water Sourcing options.
  - 2017 Approval for additional disposal at 1F1/13-28 which was converted from Grosmont source to disposal.

Water and Oilfield Disposal Map

Canadian Natural



8898E

00/12-09-081-22W4/0	Nisku
02/12-09-081-22W4/0	Grosmont
00/05-02-081-23W4/3	Nisku
00/04-12-081-23W4/3	Nisku
00/01-36-080-22W4/0	Nisku
00/02-35-080-22W4/0	Nisku

8309E

00/14-04-082-22W4/0
Nisku/Graminia/Blue Ridge/Calmar

02/07-27-082-21W4/2 Grosmont

Abandoned Disposal wells

00/05-02-081-23W4/2	Grosmont
02/09-02-081-23W4/0	Nisku
00/13-01-081-23W4/2	Nisku

Approval 8309E

Approval 8898E

CNRL Brintnell Disposal Wells

Canadian Natural

TABLE 1
APPROVAL NO. 8898E

1	2	3	4	5
Unique Well Identifiers	Disposal Zone	Top of Injection Interval (Measured depth - metres KB)	Depth of Production Packer (Measured depth - metres KB)	Maximum Wellhead Injection Pressure (kilopascals gauge)
00/12-09-081-22W4/0	Nisku	487.5	478.9	6000
02/12-09-081-22W4/0	Grosmont	536.0	526.7	4325
† 00/05-02-081-23W4/3	Nisku	513.0	508.2	3300
00/04-12-081-23W4/3	Nisku	508.0	506.0	3450
† 00/02-35-080-22W4/0[1]	Nisku	475.0	473.0	3200
00/01-36-080-22W4/0	Nisku	458.1	454.0	3200

CNRL Brintnell Disposal Wells

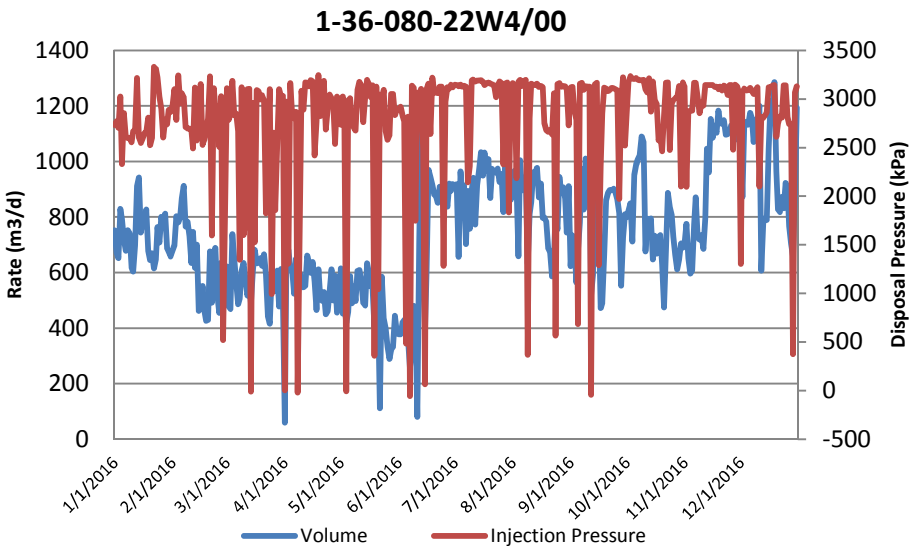
Canadian Natural

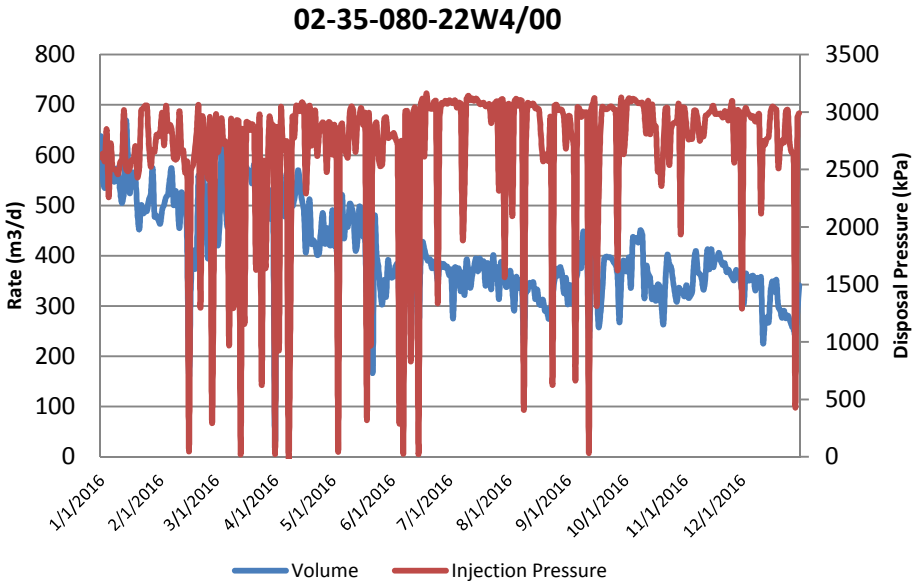
TABLE 1
APPROVAL NO. 8309E

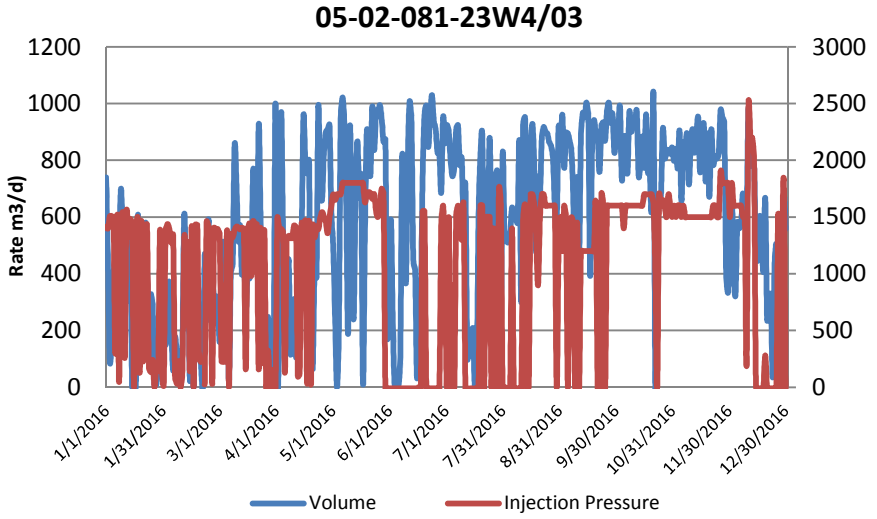
1	2	3	4	5
Unique Well Identifiers	Disposal Zone	Top of Injection Interval (Measured depth - metres KB)	Depth of Production Packer (Measured depth - metres KB)	Maximum Wellhead Injection Pressure (kilopascals gauge)
02/07-27-082-21W4/2[1]	Grosmont	555.0	545.1	3450
00/14-04-082-22W4/0	Nisku/Graminia/ Blue Ridge/ Calmar	453.0	438.0	3500

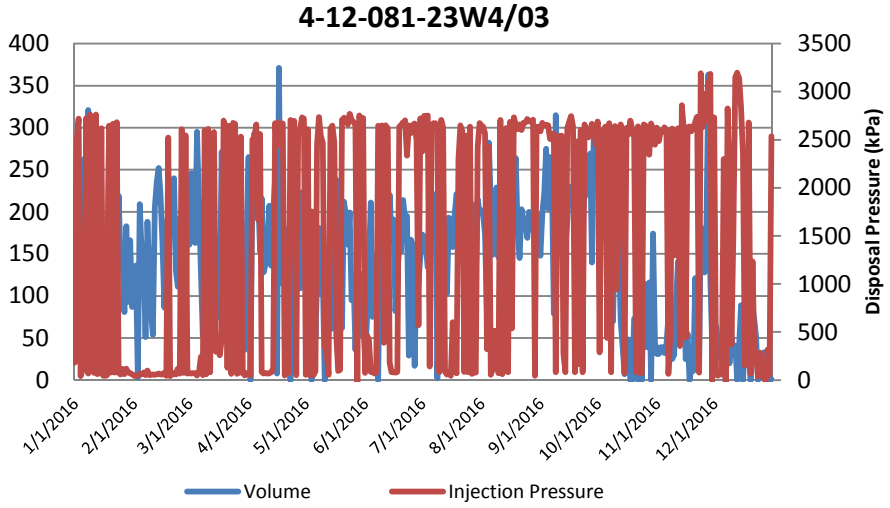
Disposal Well Data

Canadian Natural









AER Compliance

Hydrogen Sulphide

Canadian Natural

- Souring of production to occur over time, Engineering and Construction, has and will continue to ensure compliance across the entire Field to handle sour production (<1% H2S).
- H2S produced at padsites and batteries is expected to be in low concentration and volume.
- CNRL collects solution gas at batteries and wellsites in a common solution gas gathering system.
- Gas to be sweetened in field and at major facility sites (emulsion batteries, compressor station).

AER Compliance

Canadian Natural

- **CNRL continues to work with AER regarding injection well integrity:**
  - **Formation/hydraulic isolation**
  - **Cement bond**
  - **Casing corrosion**
- **Process of upgrading existing wellsite facilities to meet current regulations and codes for the expected service (higher WCT, higher TDS, less than 1% H2S). Timeline to be completed over next 2-3 years throughout field (existing facilities met regulations at time of original construction).**
  - **Priority on areas where we have seen corrosion through inspections, and areas with high water cut**

AER Compliance

Canadian Natural

- Canadian Natural Resources is not aware of any outstanding compliance issues regarding the current approvals.
- CNRL currently in compliance with other regulatory bodies (AER, AENV).
- Reclamation programs: Well and Pipeline abandonments as required by Directives 65 and 13.
- Inactive wells: currently compliant.
  - Long Term Inactives.
  - Review future flood areas to properly downhole suspend/abandon wells within a reasonable time of start of injection (some wells to be completed for flood monitoring).

Outstanding Applications

- **Water Act Application: 001-00329572**
  - **Water Act File 00218314**

Conclusion

Canadian Natural

- Canadian Natural continues to be committed to maximizing the value of the resource for the both itself and the Province of Alberta through it's Royalty Interest
  - 2016 – Stable production in low commodity price environment
- Results from the polymer flood continue to be encouraging
  - Continuing to evaluate the impacts of oil viscosity and water production on the ultimate performance and recovery under polymer flooding
- CNRL continues to optimize the operation of the flood and expand to new, more challenging areas
  - Injection management is a balance of OPEX, power consumption and flood management
- CNRL is working on an injection plan to maximize field throughput and thus ultimate recovery of the field. Several options are being investigated over the next several years.
- Compliance with all AER regulations, including cap rock integrity monitoring, and communication with the AER remains a top priority for CNRL.

THE FUTURE CLEARLY DEFINED

Premium Value I Defined Growth I Independent

Canadian Natural