Annual Performance Presentation

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

April 2015

Premium Value I Defined Growth I Independent

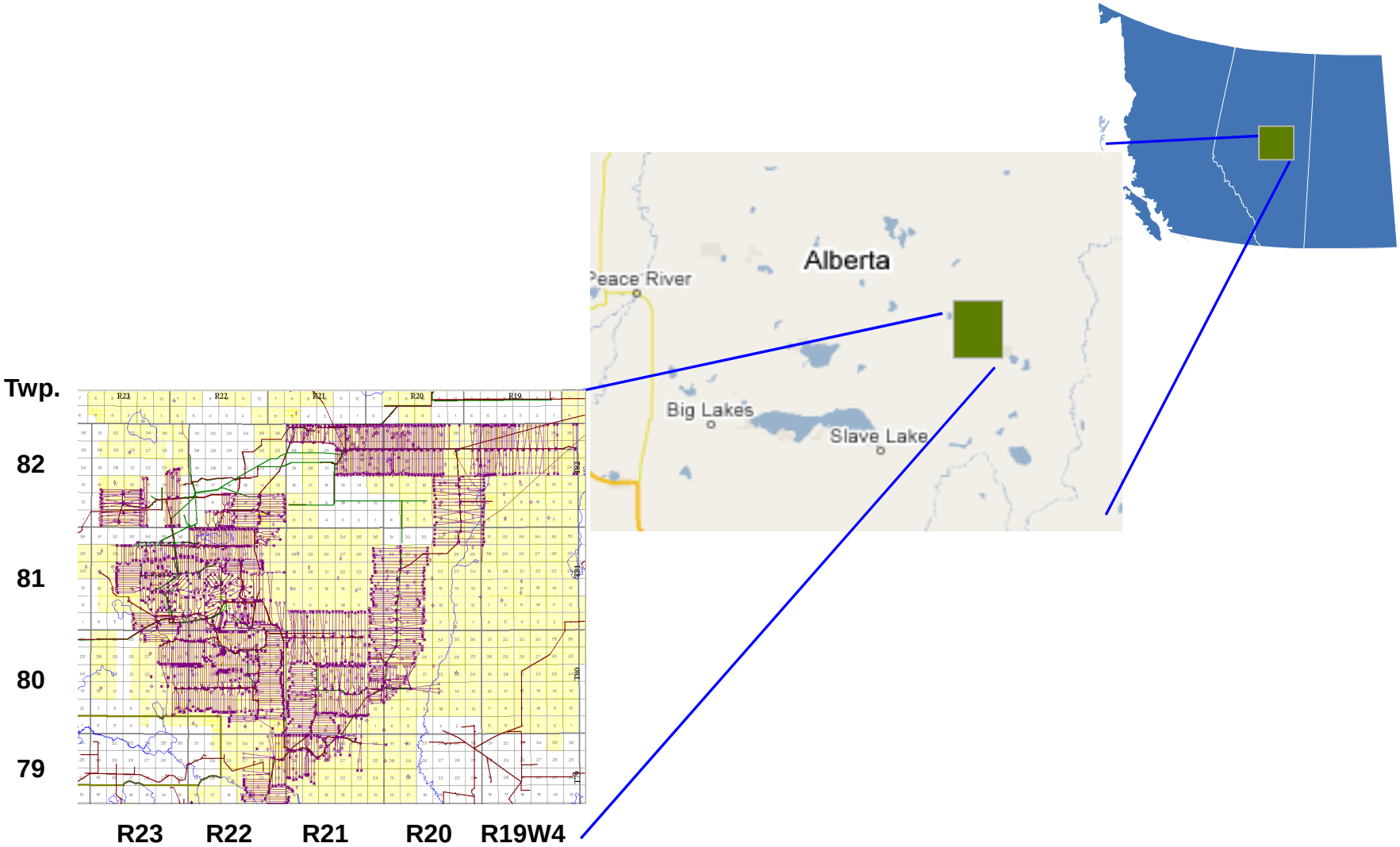
Canadian Natural

Agenda

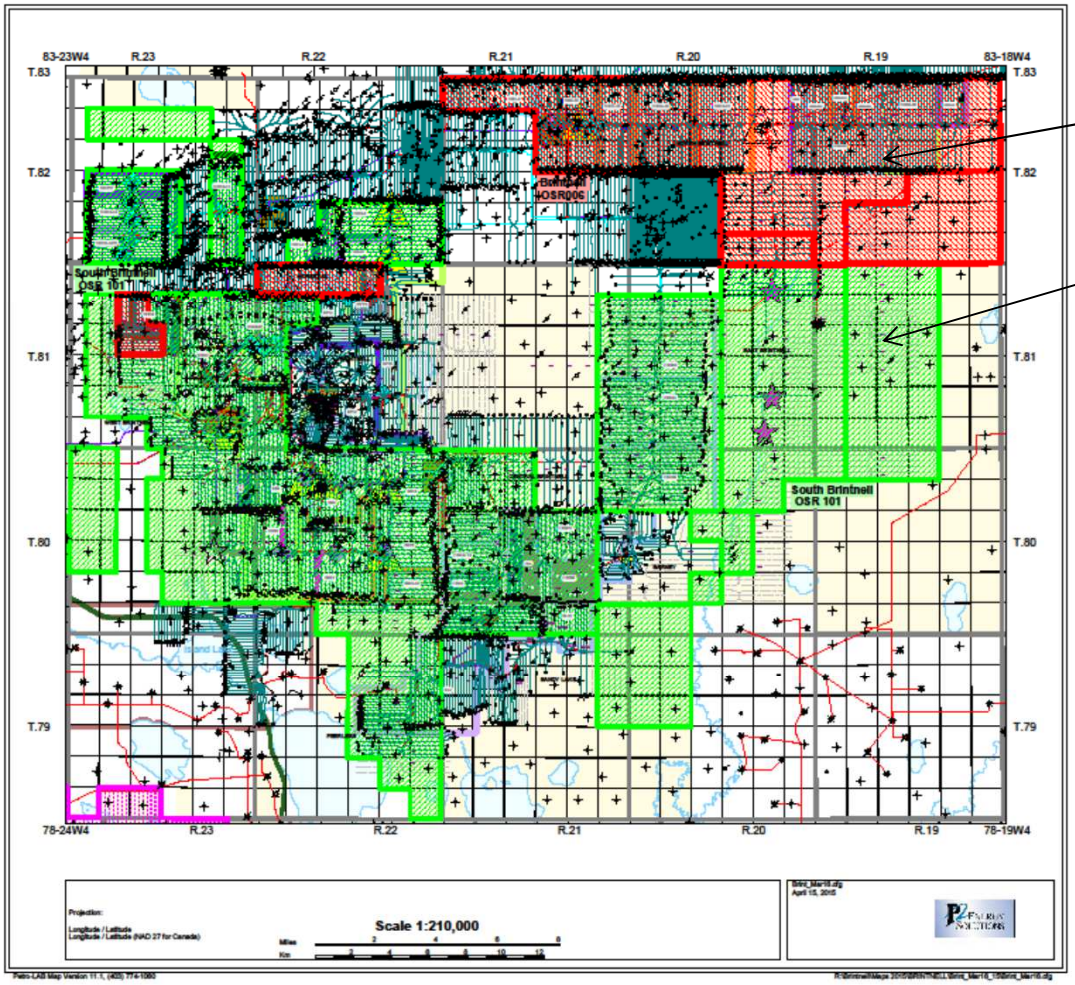
Canadian Natural

- 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



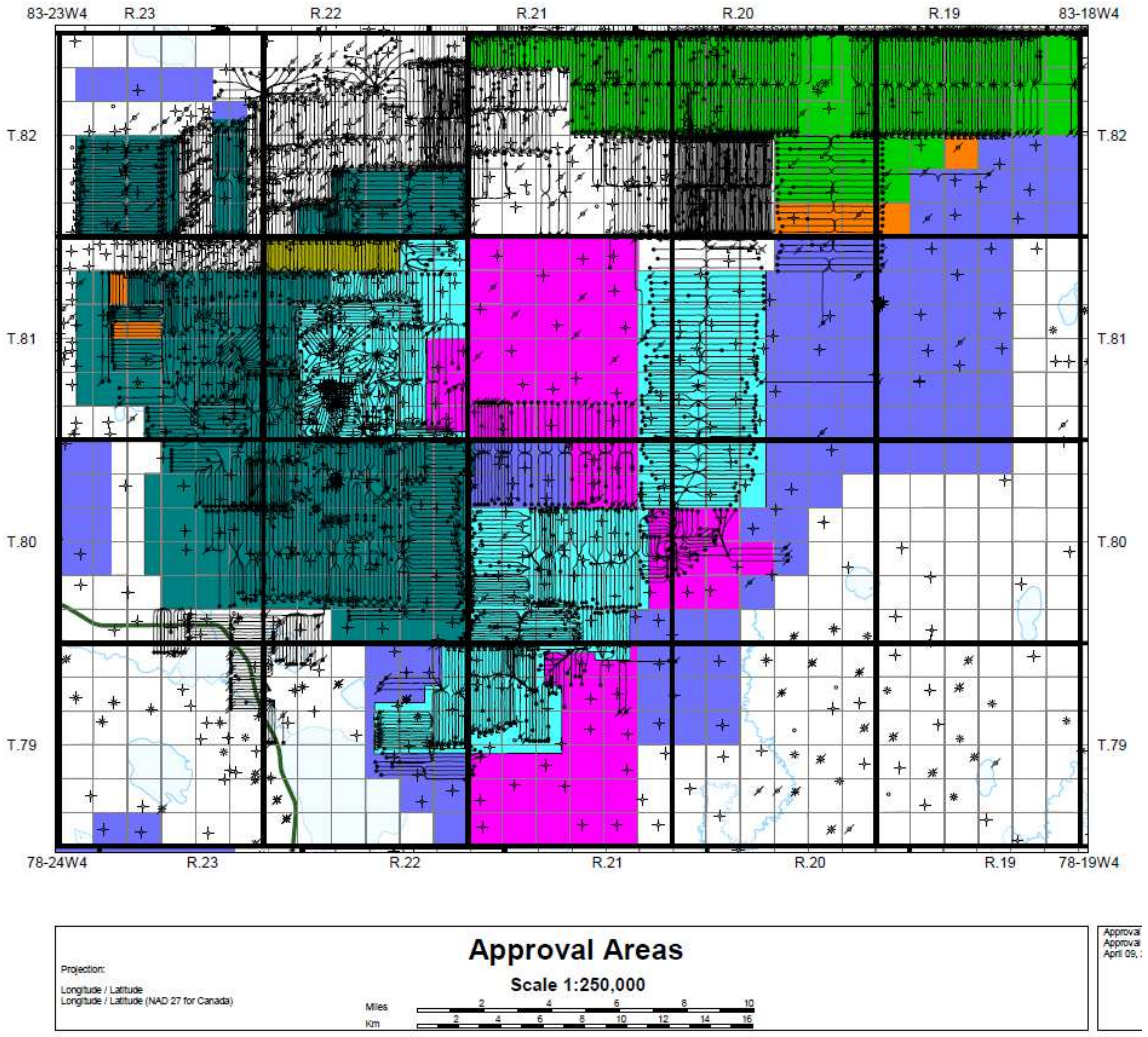
Oil Sands Royalties (OSR 101, OSR 006)



OSR 006

OSR 101

Primary and Enhanced Approval Regions



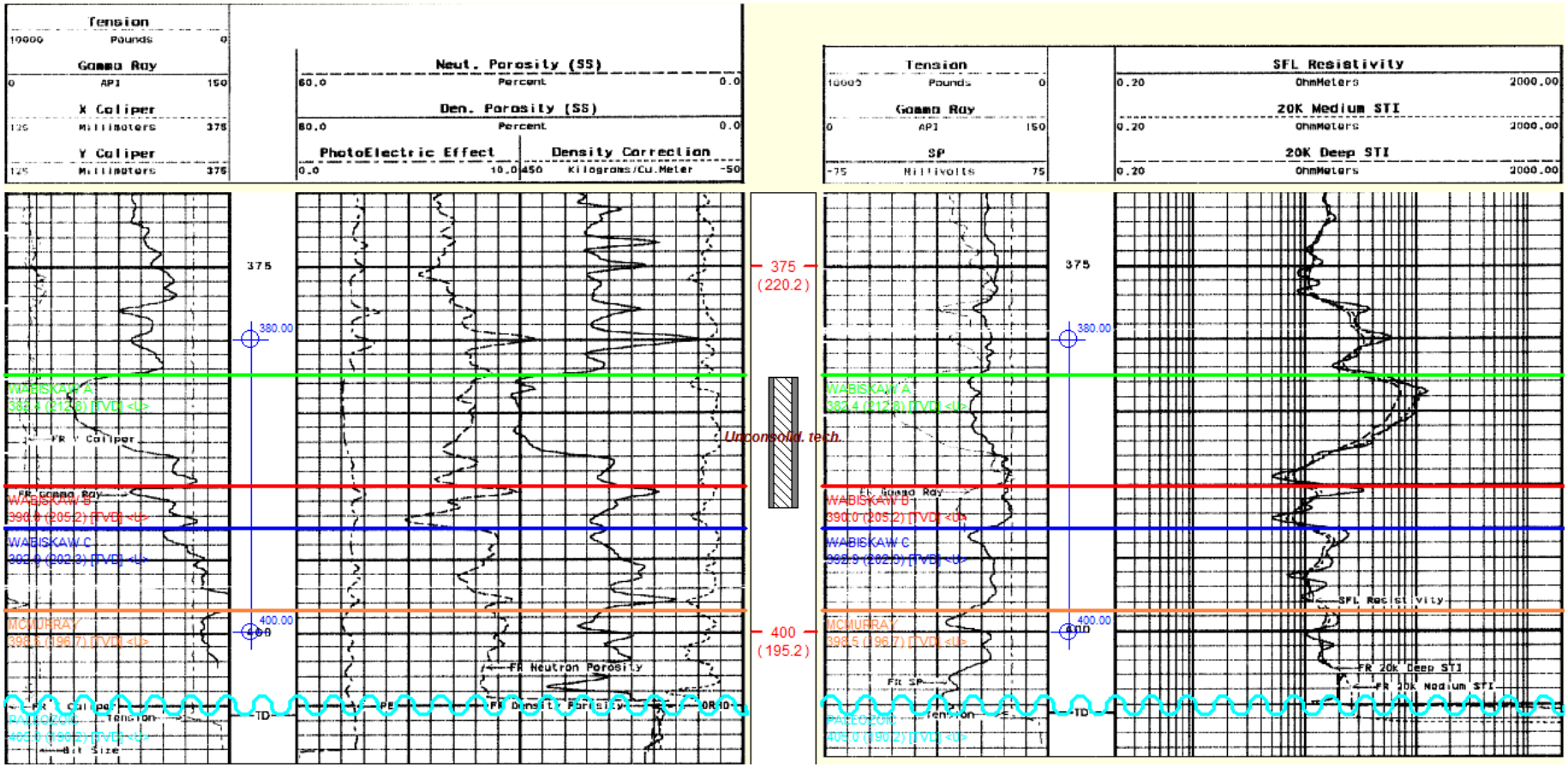
Enhanced Recovery Schemes

- 10147
- 9673
- 10787
- 10423

Primary Recovery Schemes

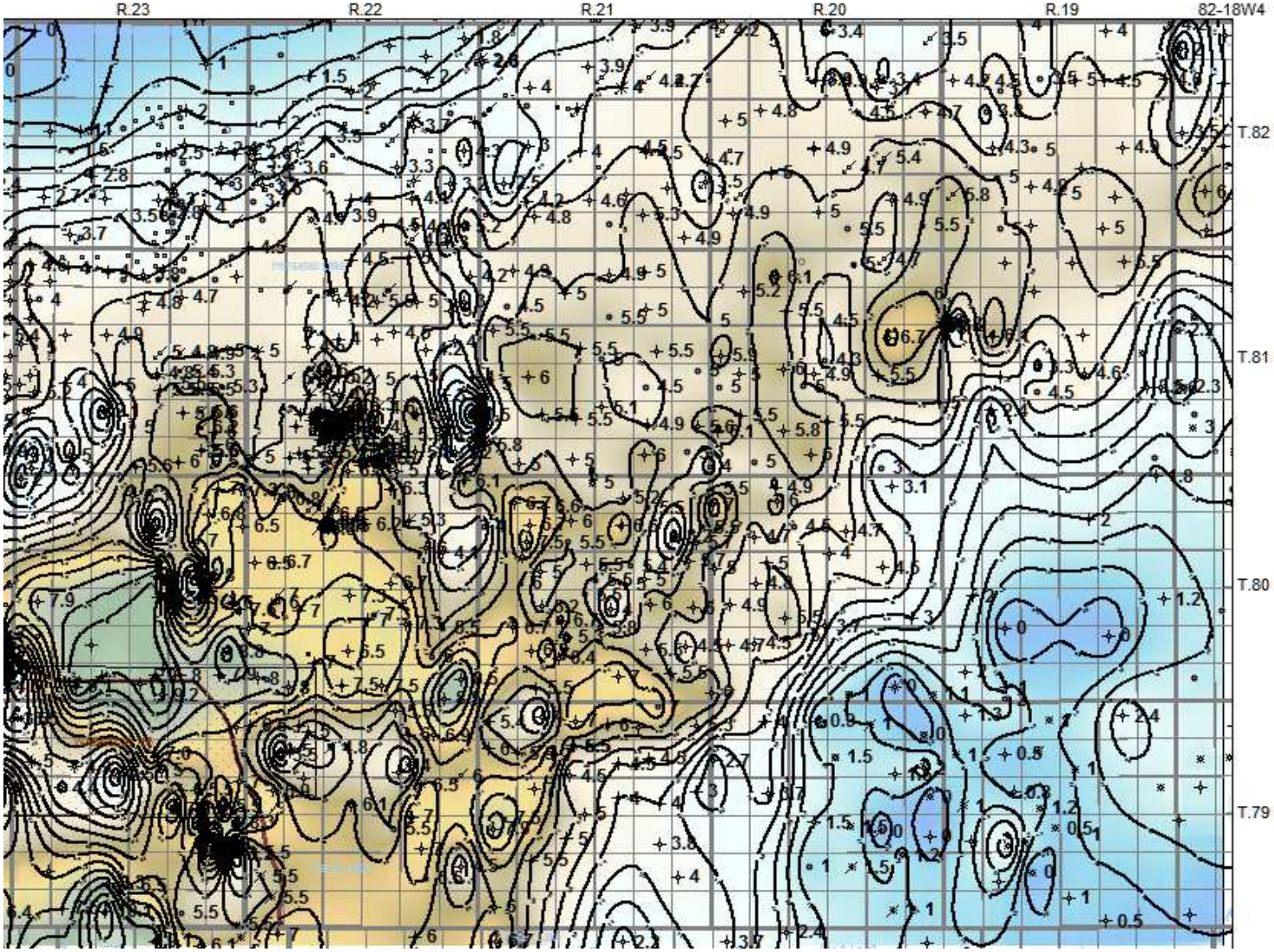
- 6619
- 9466
- 9884

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

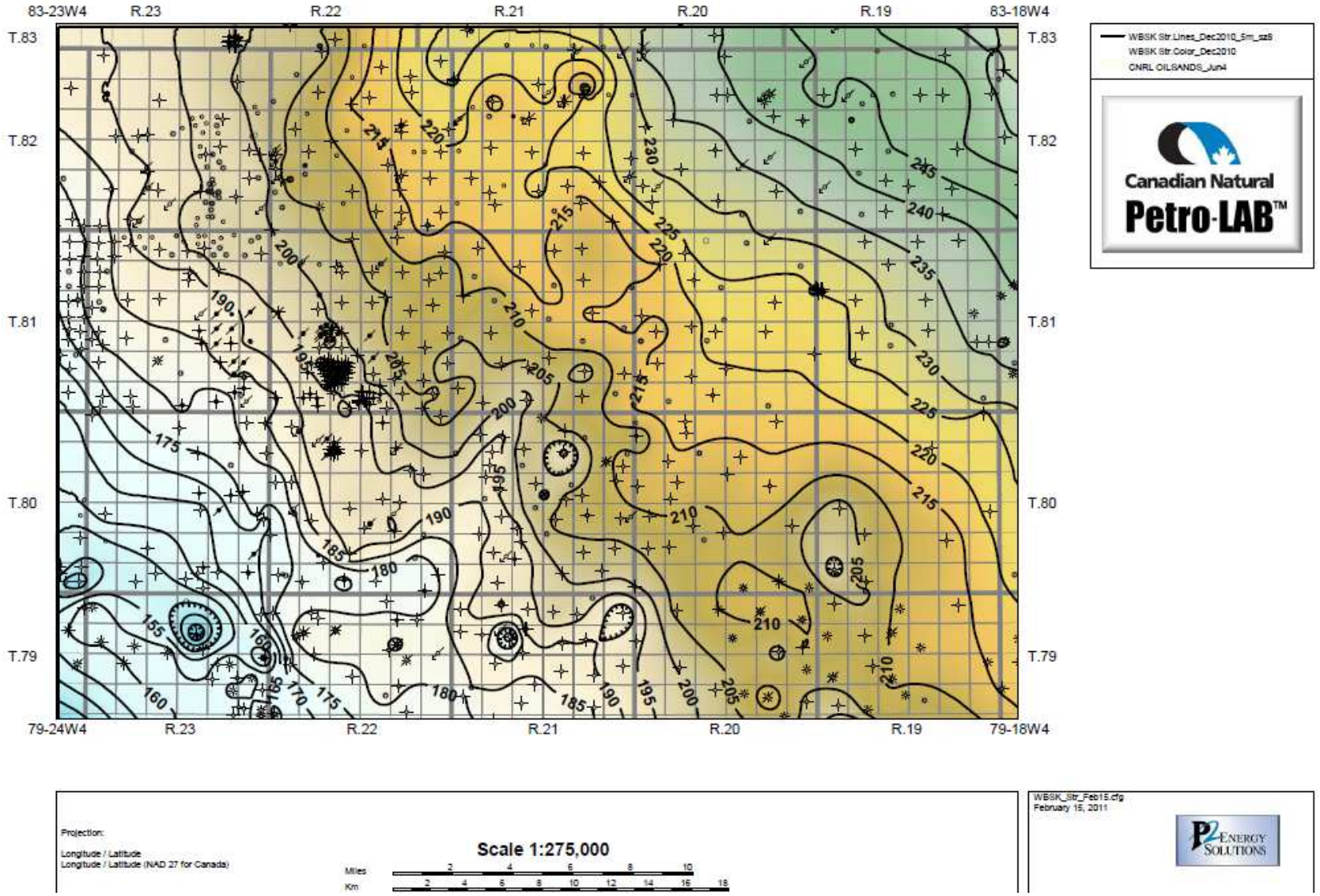


Wabiskaw ‘A’ Net Pay Map

Canadian Natural

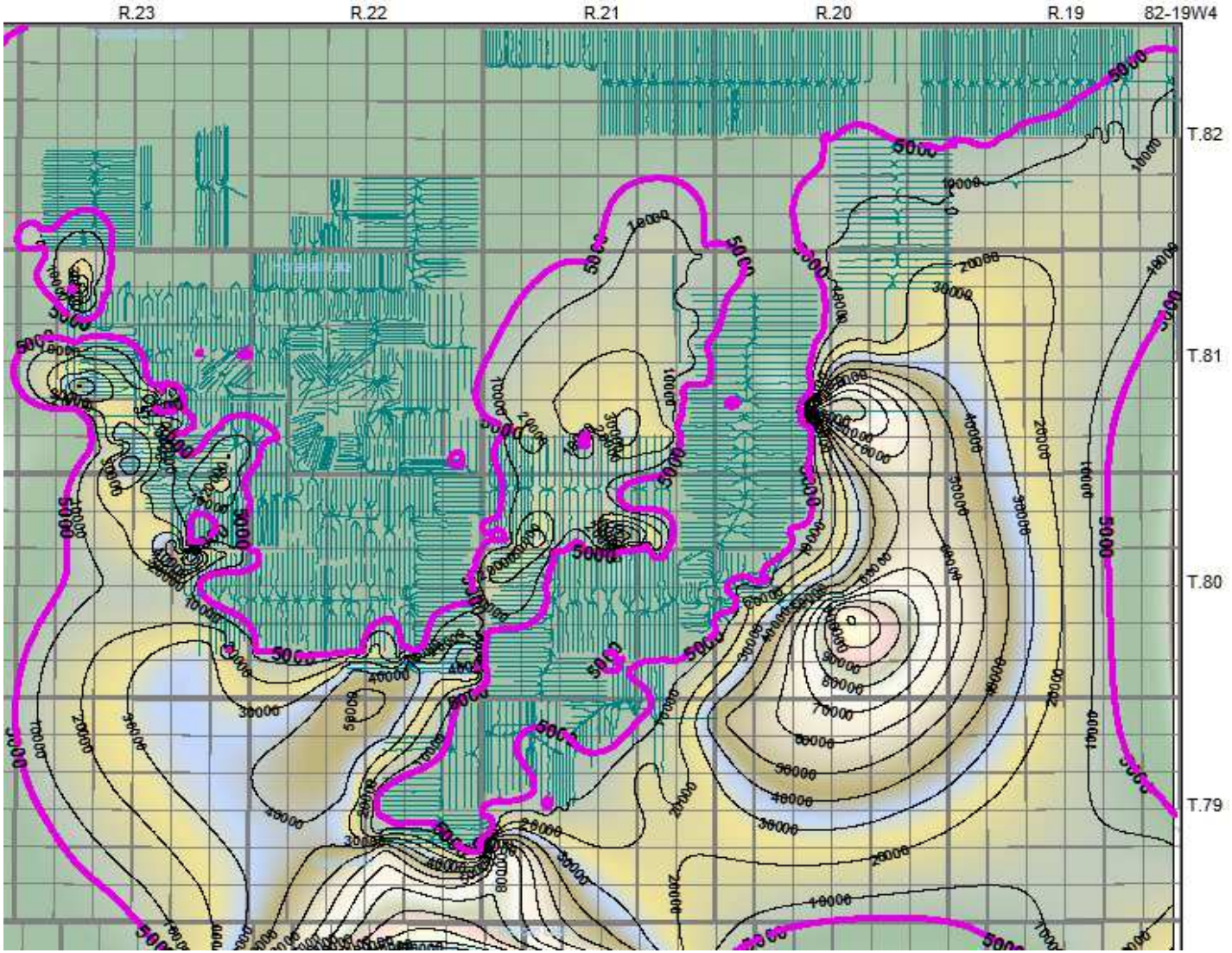


Wabiskaw Structure Map



Produced Oil Viscosity Map

Canadian Natural



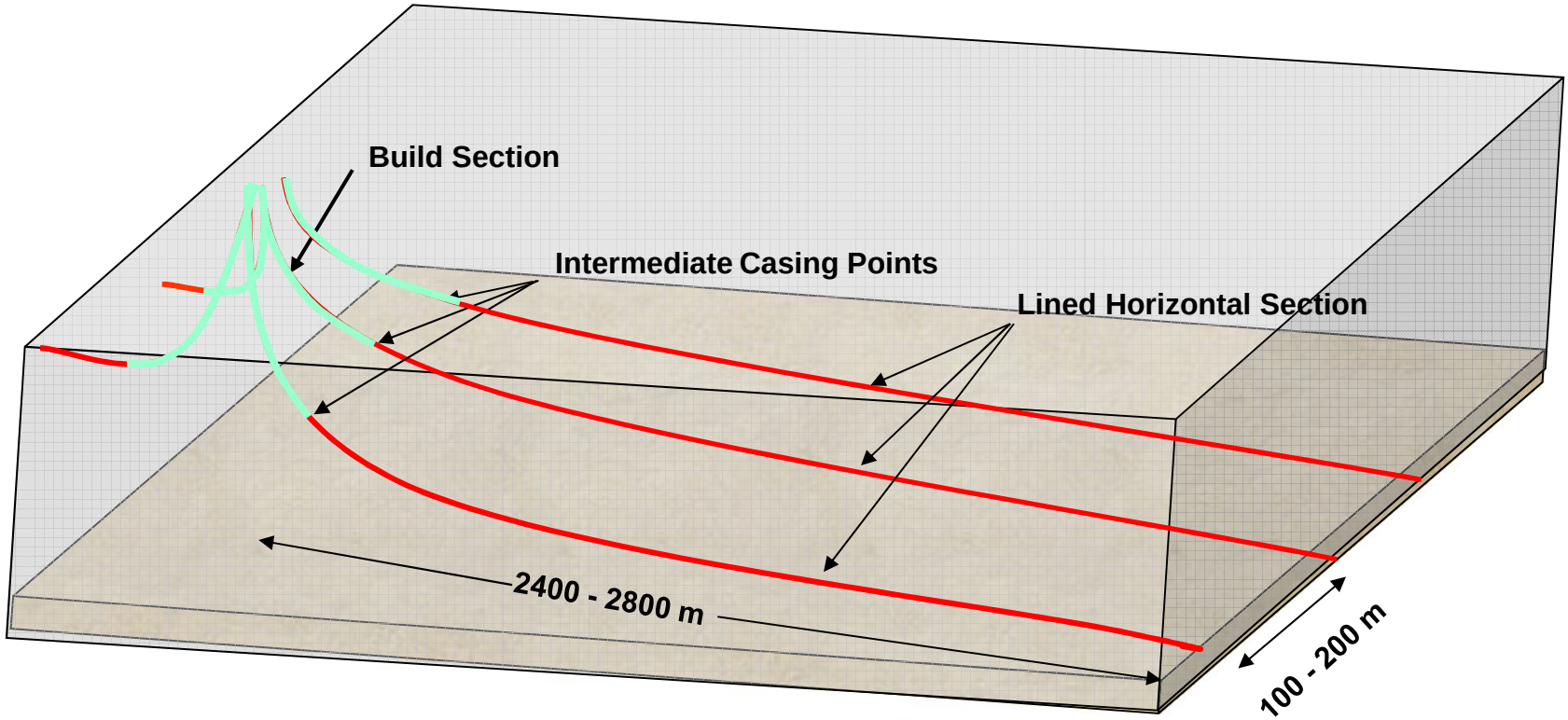
Brintnell Regional Reservoir Properties

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

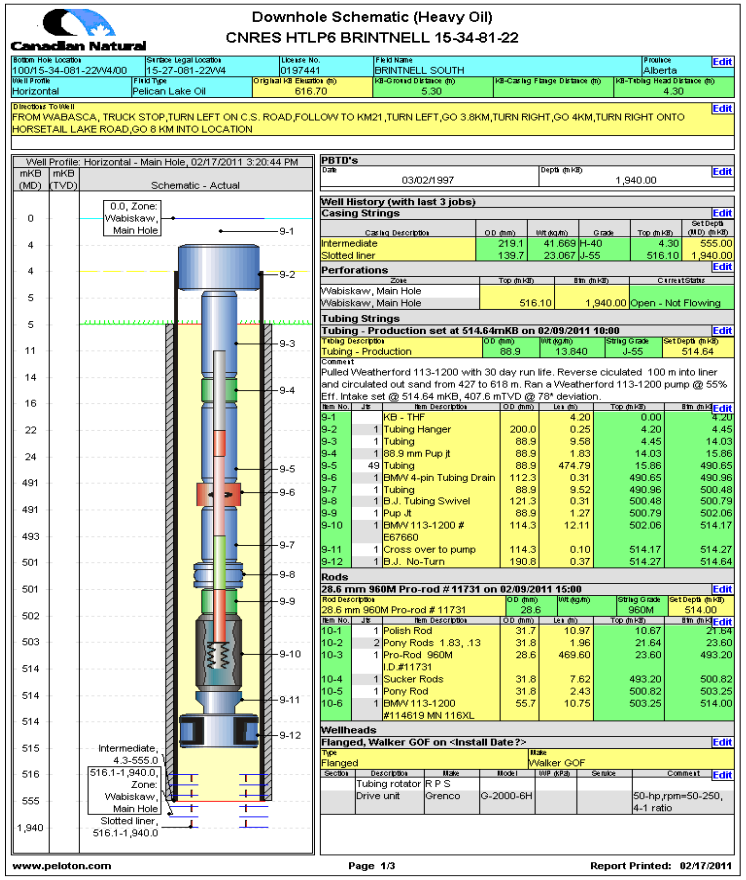
Drilling, Completions, and Artificial Lift

Typical Drilling Configuration



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 (ft)	KB-Ground Distance (ft)	KB-Casing Flange Distance (ft)	KB-Tbg Head Distance (ft)
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
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

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

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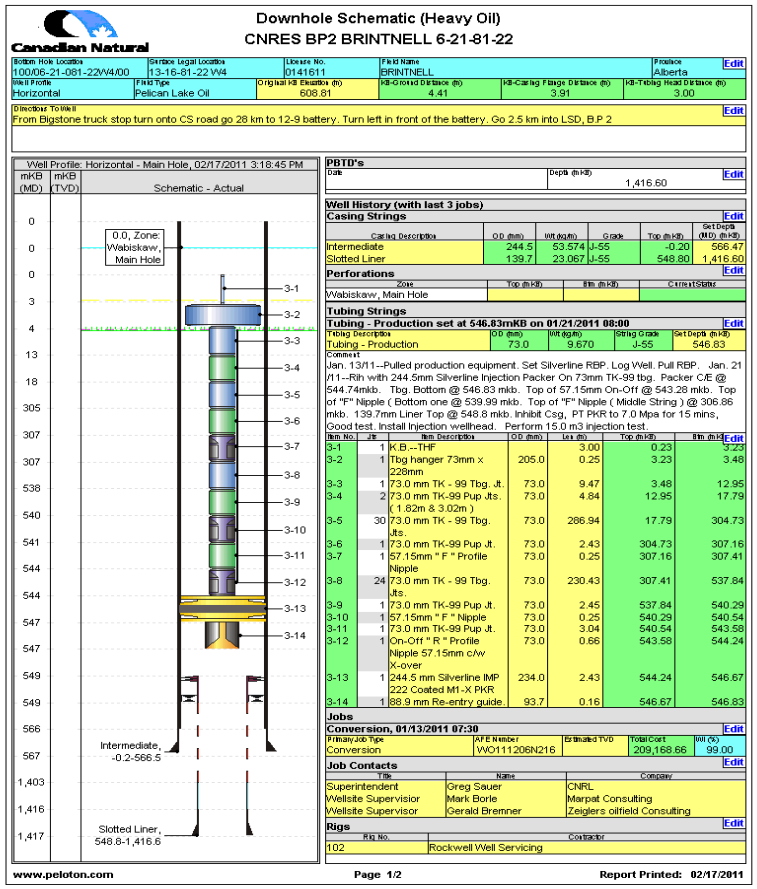
- **Injector**



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 (ft)	KB-Ground Distance (ft)	KB-Casing Flange Distance (ft)	KB-Tbg Head Distance (ft)
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
0.0, Zone: Wabiskaw, Main Hole
Intermediate, -0.2-566.5
Slotted Liner, 548.8-1,416.6

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 Mt -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	Wt (%)
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

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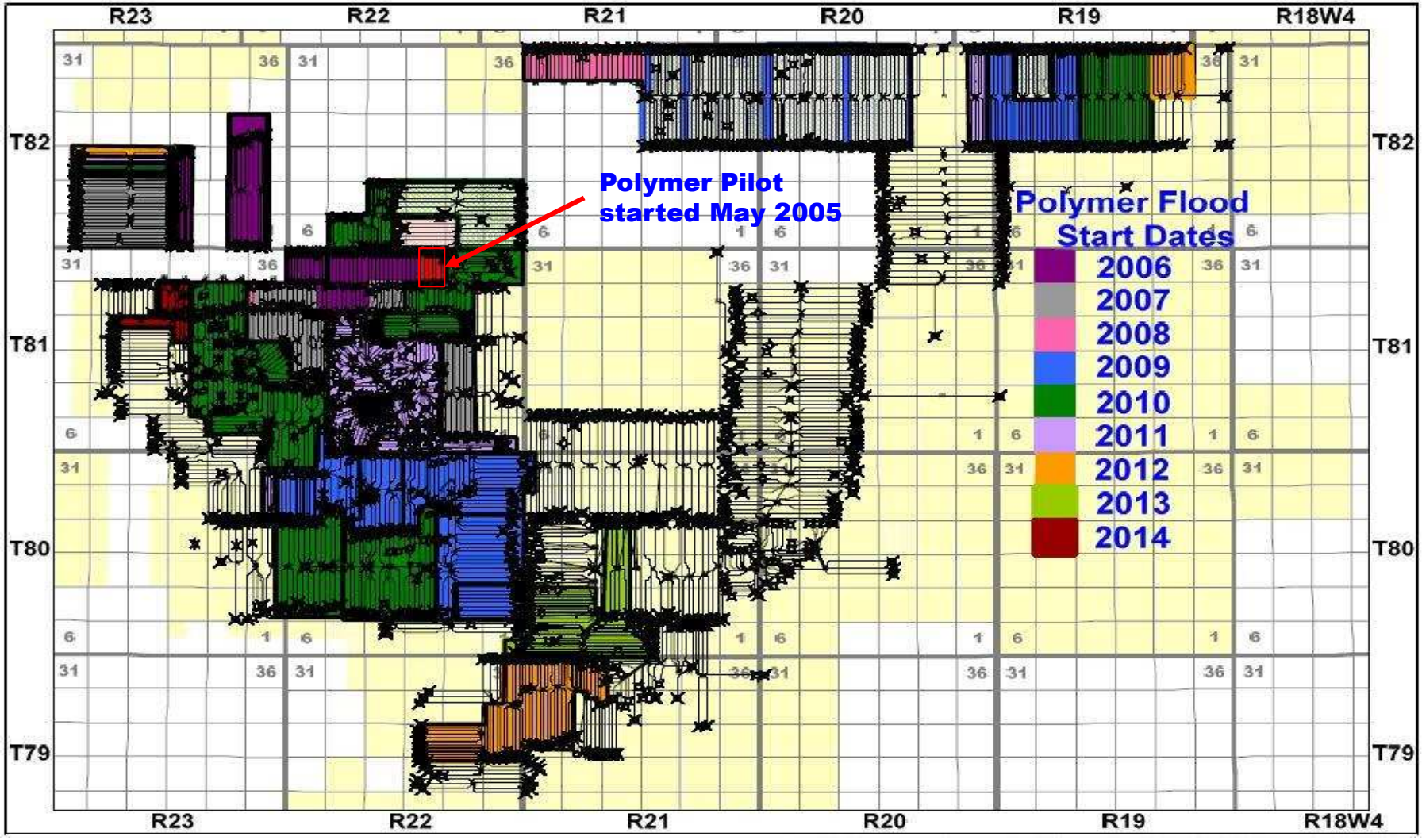
- **Intermediate Casing landed in Wabiskaw sand (producers and injectors).**

EOR History and Current Approvals

Polymer Flood Development

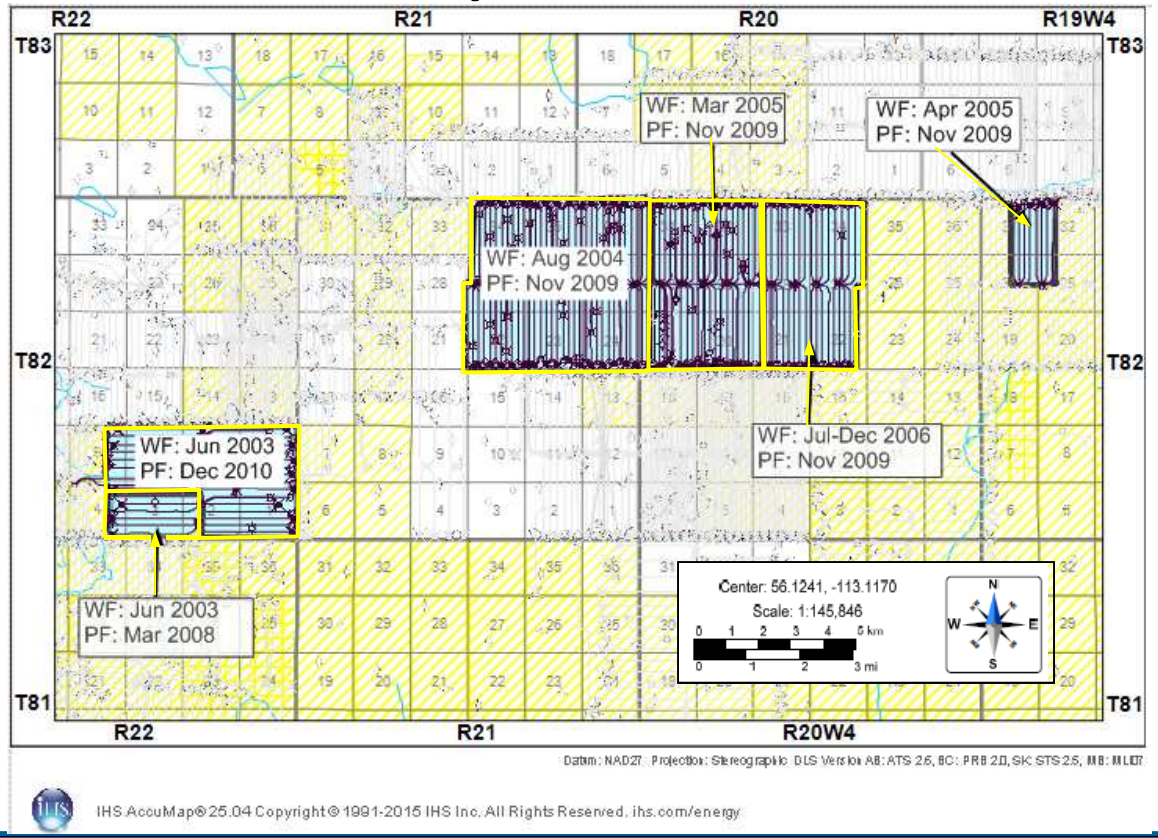
Canadian Natural



Polymer Flood After Water Flood

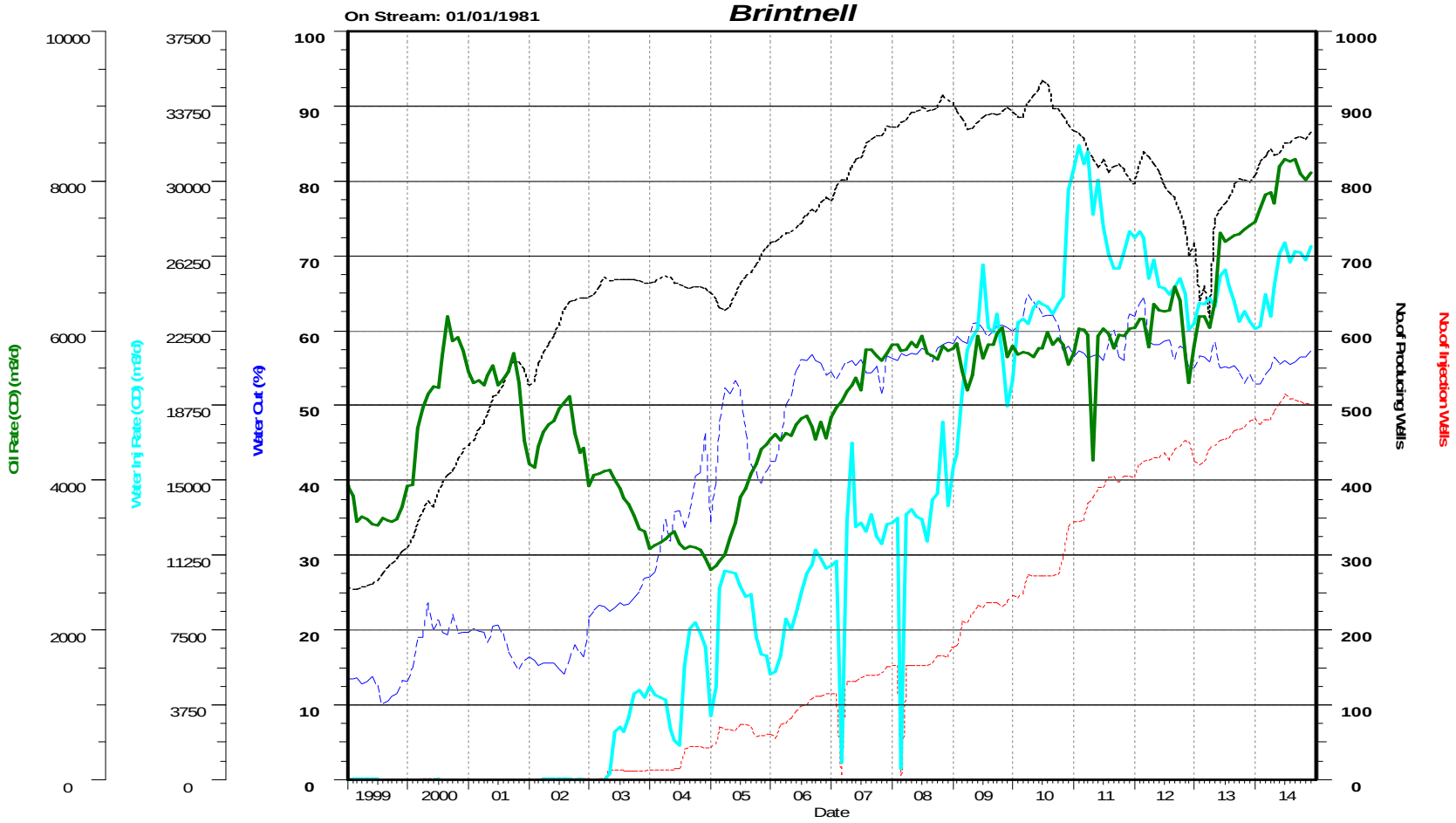
Canadian Natural

- **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

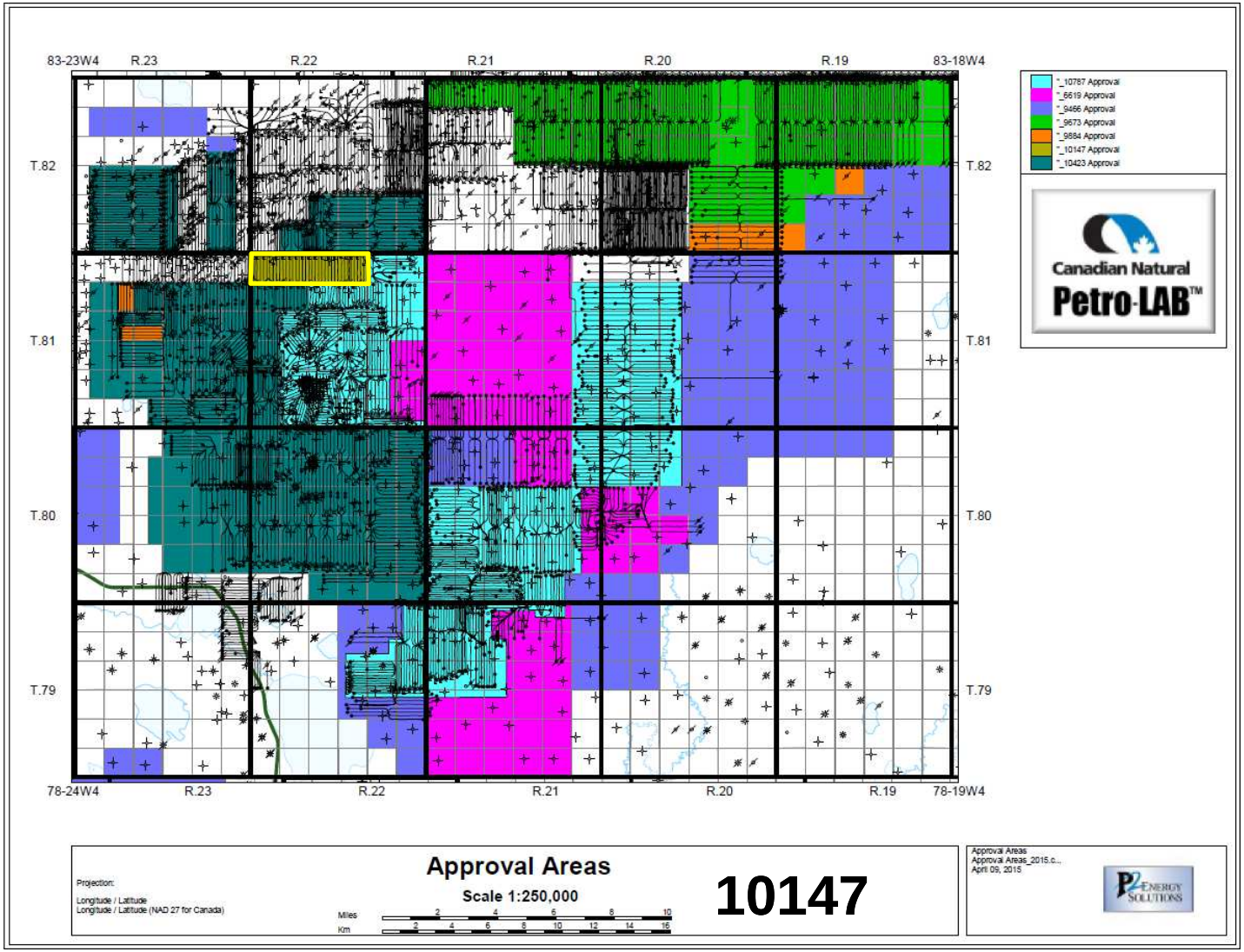
Cum oil: 33,824 E3m3



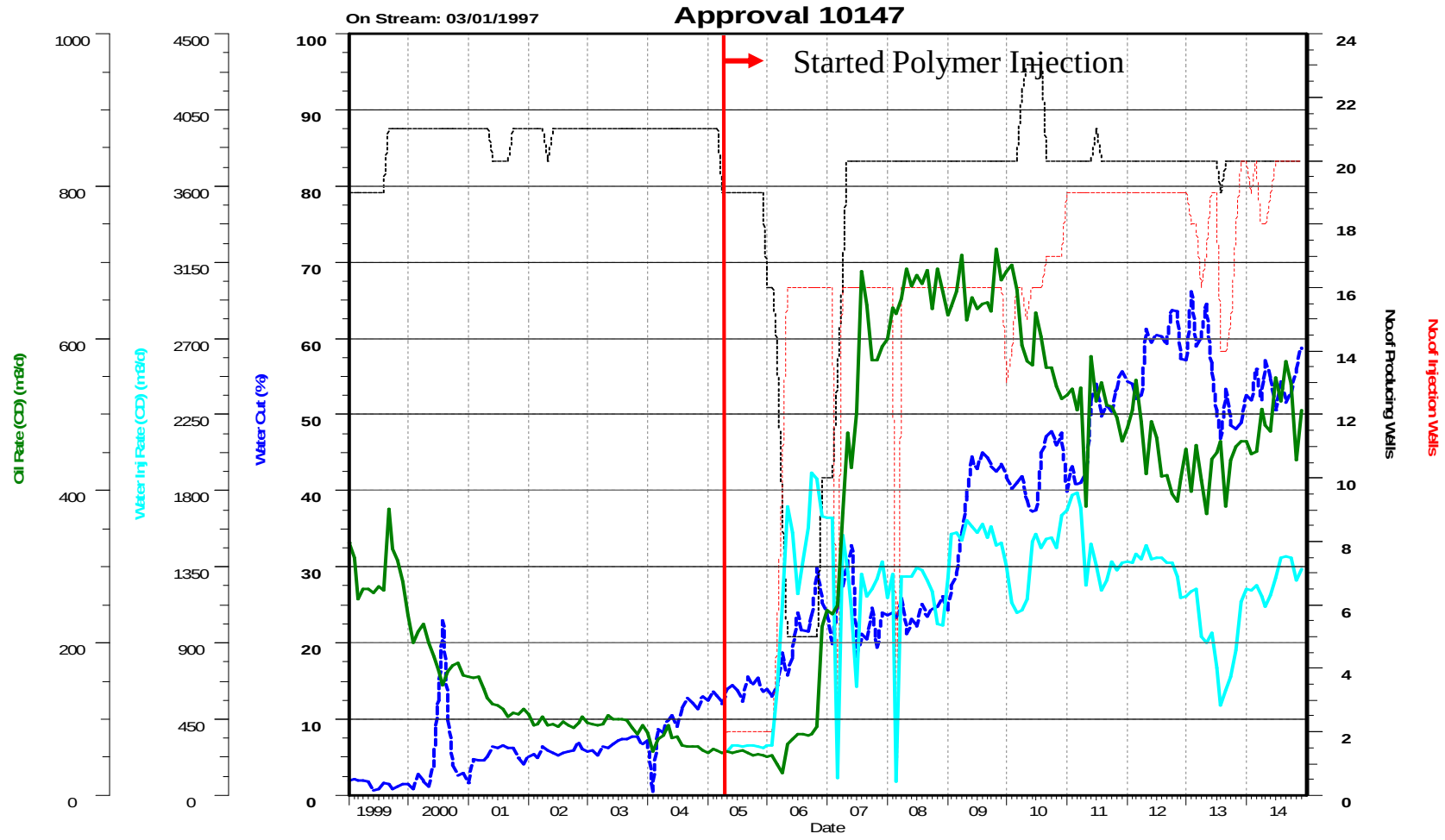
Approximately 63% of the approved EOR scheme areas are currently developed and under flood as of the end of 2014

Field Performance and Surveillance

Approval 10147



Approval 10147 Production Update



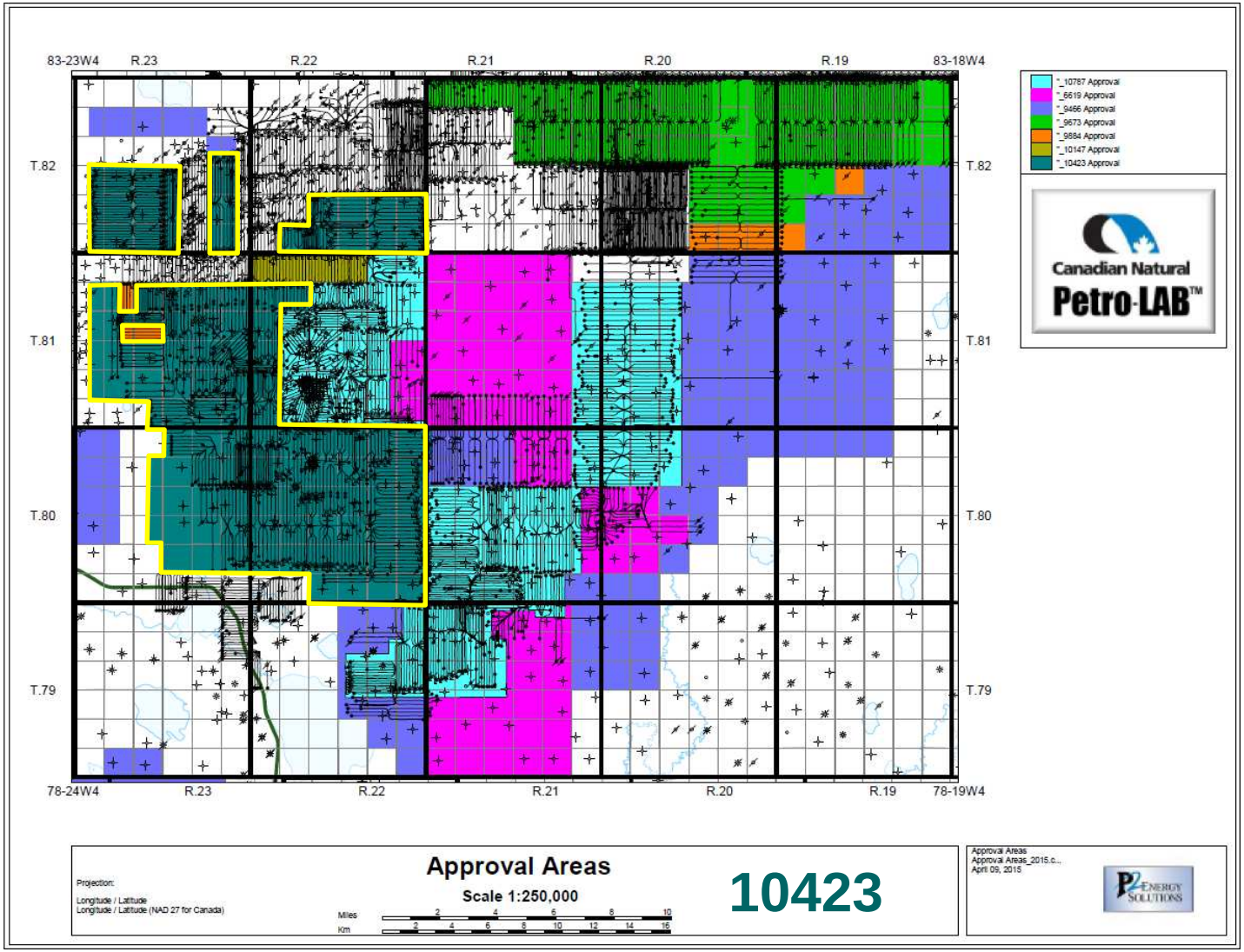
Cum oil: 2,202 E3m3 Cum water: 1,296 E3m3 Cum injection: 4,322 E3m3

Approval 10147 Discussion

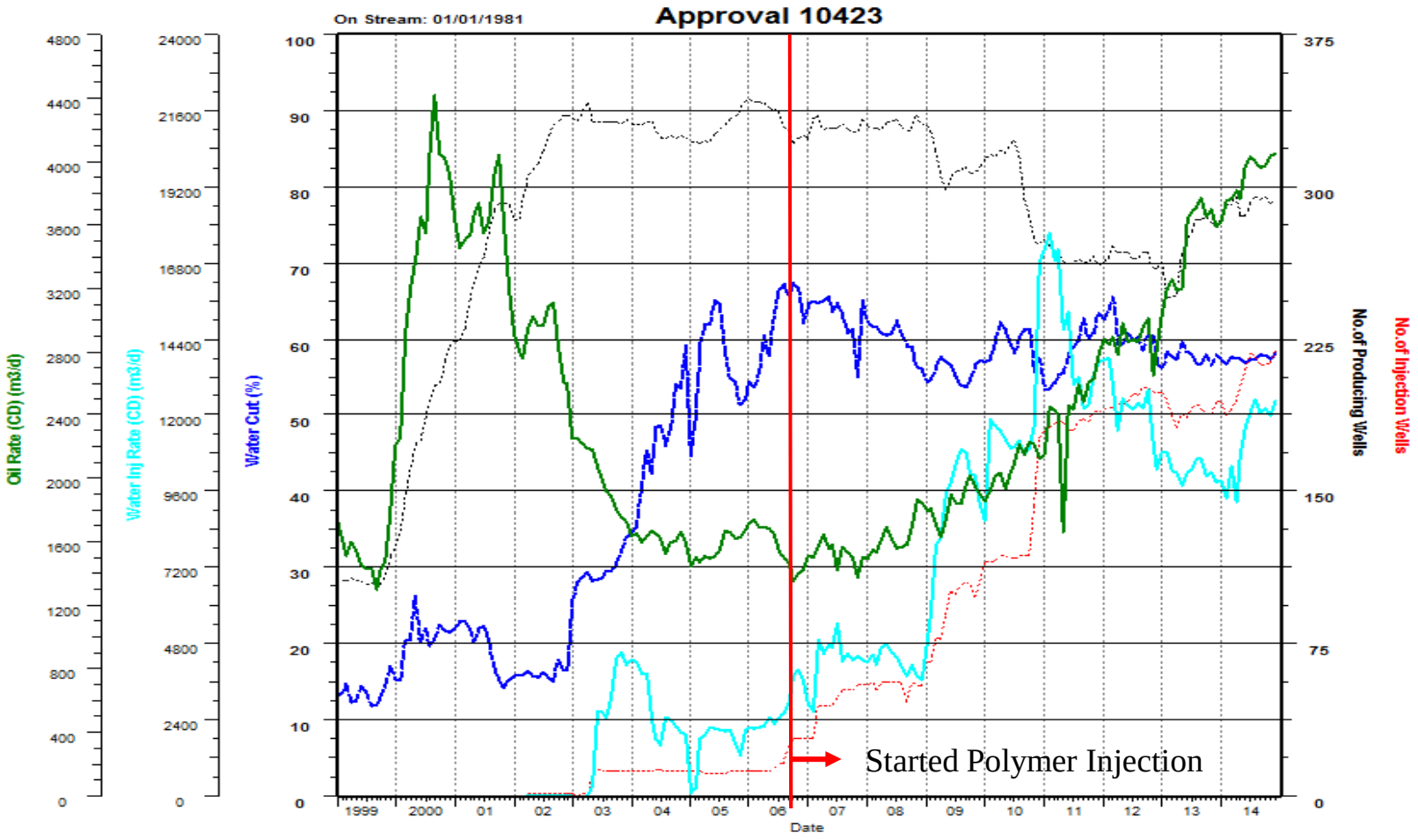
Canadian Natural

- Contains the most mature polymer flood patterns including the original pilot area which began flooding in 2005.
- Entire scheme area is currently under flood. Cenovus injection started along the west border of the area. Otherwise no changes to patterns or well counts in 2014.
- 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 following a significant reduction in the previous year for offset drilling.
- Water cuts had declined in 2013 are associated with this reduced injection but have climbed back towards 60% at the end of 2014.
- Producer cleanouts executed since 2013 have helped recent production
- Oil viscosity ranges from 1,300 cp to 2,800 cP.

Approval 10423



Approval 10423 Production Update



Cum oil: 15,641 E3m3 Cum water: 13,991 E3m3 Cum injection: 31,703 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.

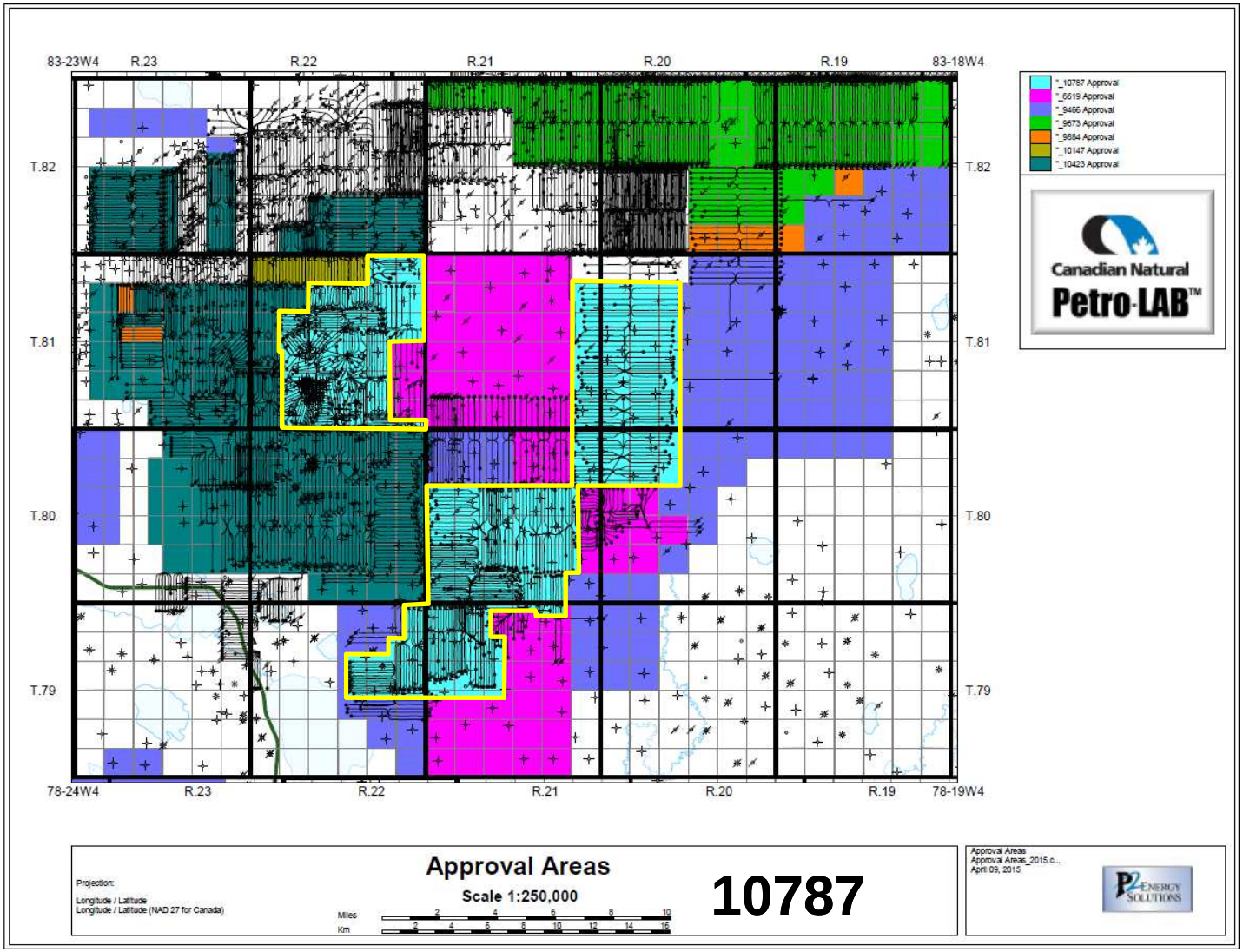
Approval 10423 Discussion

Canadian Natural

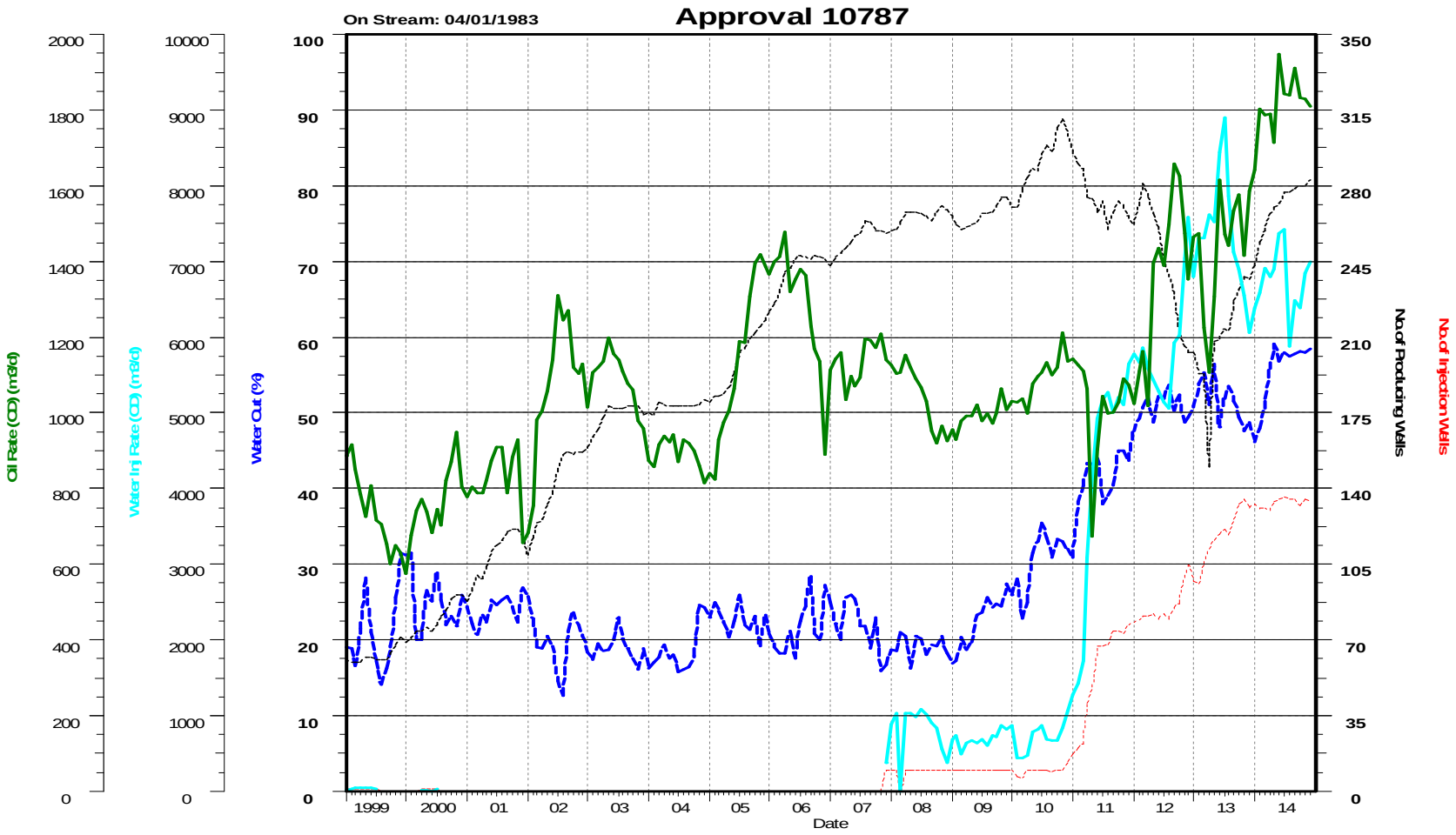
2014 Activity

- Oil volumes continued to ramp up through 2014 and does not appear to have plateaued; watercut has remained flat through 2014.
- 12 producers were converted to injectors in the WB14 area following a period of primary production.
- Drilled 20 wells in this approval area. 10 of these wells have been or will be completed as new injectors in the flood. The remaining 10 wells are completed and will remain as producers.
- 3 of the injectors were originally planned for the 2013 program but spilled over into the Q1 2014 drill program.

Approval 10787



Approval 10787 Production Update



Cum oil: 7,413 E3m3 Cum water: 3,681 E3m3 Cum injection: 9,648 E3m3

Approval 10787 Discussion

Canadian Natural

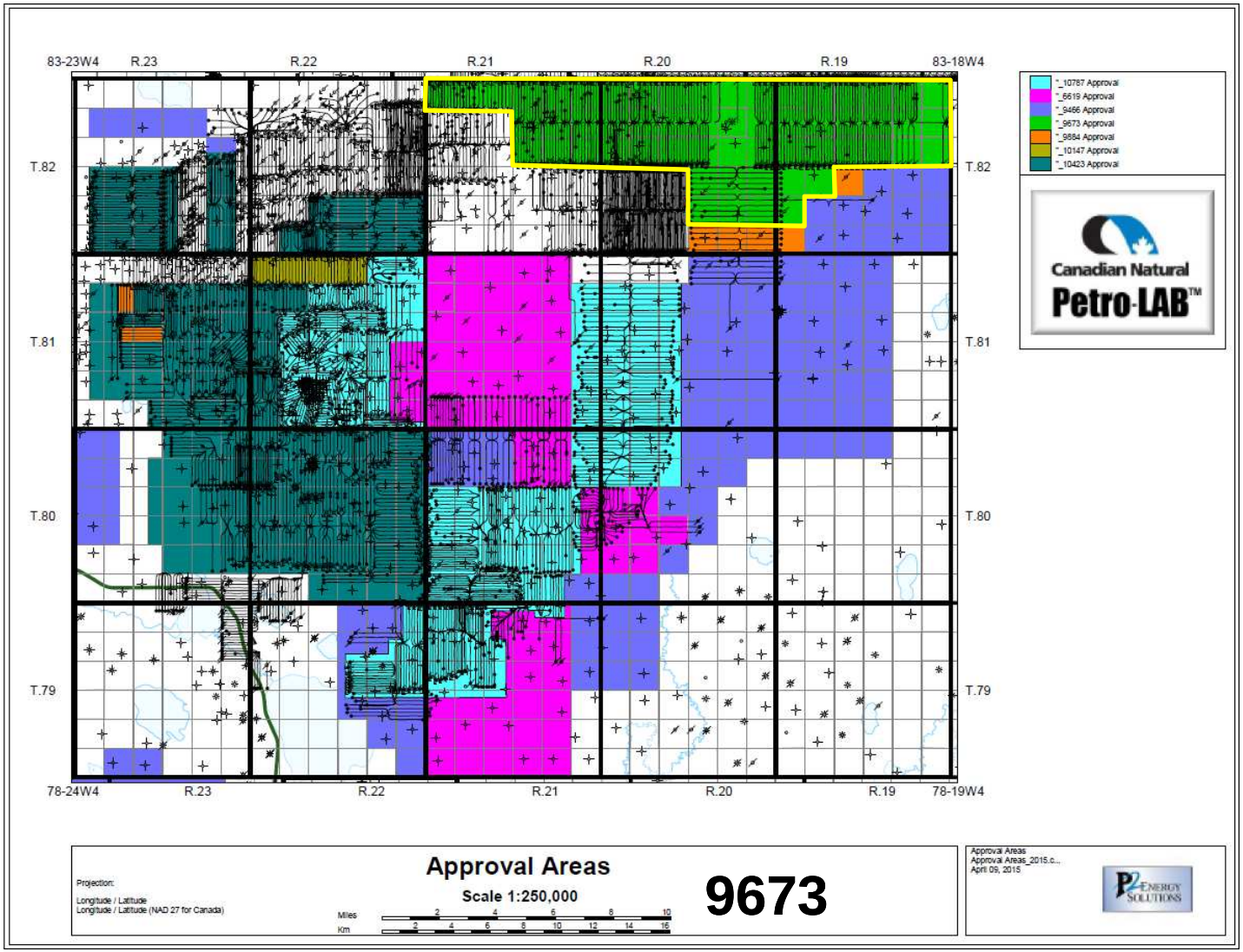
- Polymerflood started in Dec 2007 covering roughly 4% of the approval area split into 2 small groups. There were no expansions until 2010, since then there has been an expansion completed in every year including 2013. Currently 45% of the approval area is under flood.
- First polymer response in Nov 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.
- Operational problems with the Grosmont source well and injection skid led to reduced injection during parts of 2014.
- Polymer injection was commenced in the Peerless and Sandy Lake portions of the area in 2013; production wells are activated/reactivated as dictated by fluid levels and/or surface pressure readings.
- Oil viscosity ranges from 1,100 cp to 14,400 cp.

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

Canadian Natural

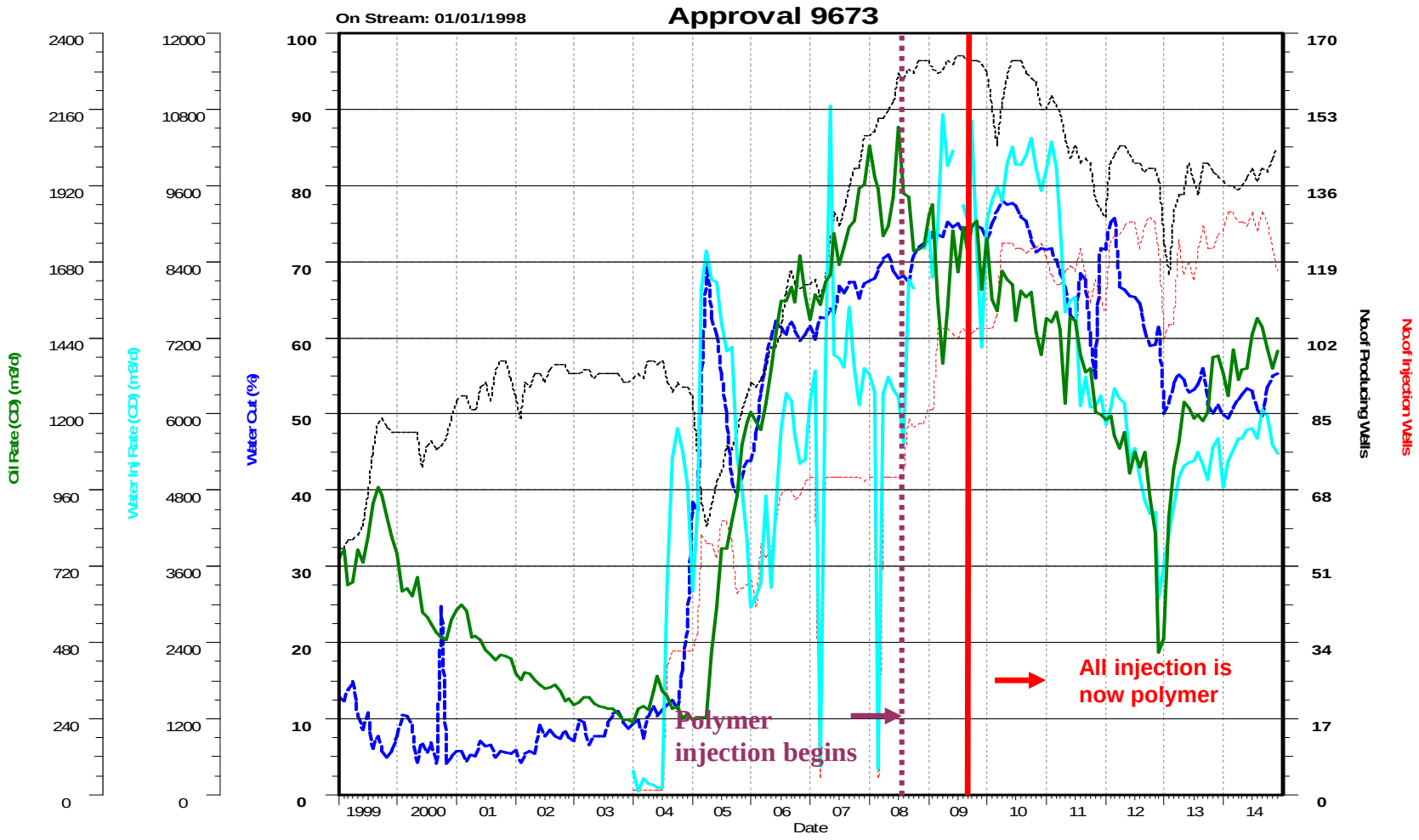
- **In May 2012, the 03/16-36-079-22W4 well intersected the 00/01-24-079-22W4 wellbore while drilling**
- **Numerous attempts were made to repair the 00/01-24 well but ultimately the wellbore could not be returned to service. A non-routine abandonment was conducted on 00/01-24 in March 2013. The 04/01-24-079-22W4 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:**
  - **Reservoir pressure and produced water was monitored quarterly for Q4 2013 and the first three quarters of 2014**
  - **The reservoir pressure declined in each observation indicating normal primary decline and no communication from outside the Wabiskaw**
  - **Produced watercut was less than 10% throughout 2014 therefore could not obtain a sufficient volume of water to analyze**
  - **CNRL will continue to monitor the produced watercut and take yearly pressure measurements on this well**

Approval 9673



Approval 9673 Production Update

Canadian Natural



Cum oil: 6,267 E3m3 Cum water: 10,137 E3m3 Cum Injection: 25,496 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.

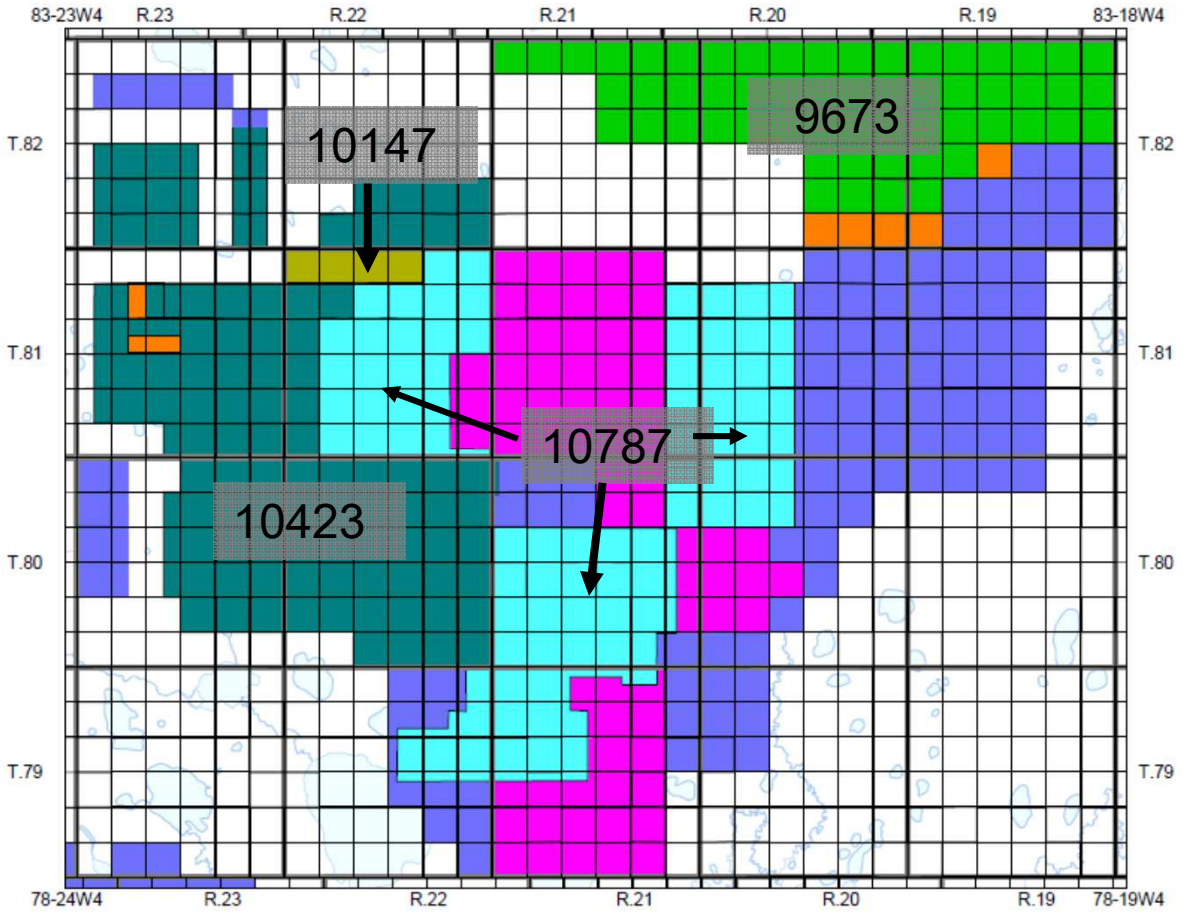
Approval 9673 Discussion

Canadian Natural

- In 2014, CNRL re-drilled two wells in the area. One was to replace a producer which had a downhole failure; the other was to replace an injector which was found to have poor well placement within the flood pattern. Both of the original wellbores are now abandoned.
- 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 2014, following several months of declining watercut for converted polymerflood areas, the watercut trend has been stable.

- Oil viscosity ranges from 600 cp to 13,000 cp.

Estimated Ultimate Recovery Factors for Flooded Areas (includes primary)



Approval 9673
Total area OBIP 97,439,555 m^3
OBIP under flood: 78,437,884 m^3
RF to date: 8%
Estimated ultimate recovery factors:
16-20%

Approval 10787
Total area OBIP 205,220,952m^3
OBIP under flood: 81,382,556 m^3
RF to date: 9%
Estimated ultimate recovery factors:
20-27%

Approval 10147
Total area OBIP 8,987,327 m^3
OBIP under flood: 8,987,327 m^3
RF to date: 25%
Estimated ultimate recovery factors:
31-37%

Approval 10423
Total area OBIP 229,018,235 m^3
OBIP under flood: 167,396,677 m^3
RF to date: 10%
Estimated ultimate recovery factors:
20-25%

*The recovery factors shown for each area represent the recovery for the portions of the scheme approval areas that are currently under polymer flood and includes primary production.

Good Performance – HTL1

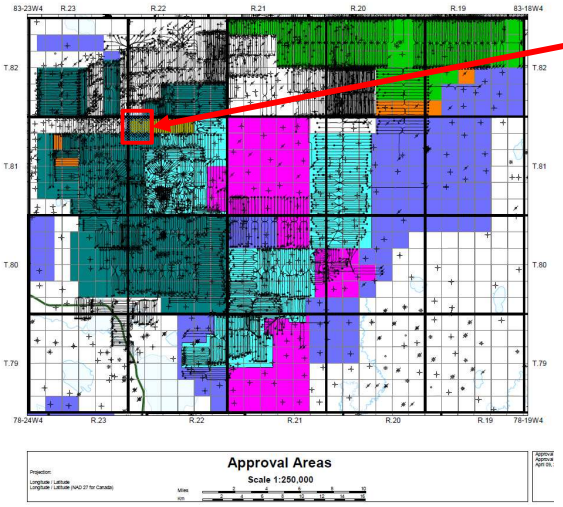
- **HTL1 Pad**
  - **Well list and allocation factors:**

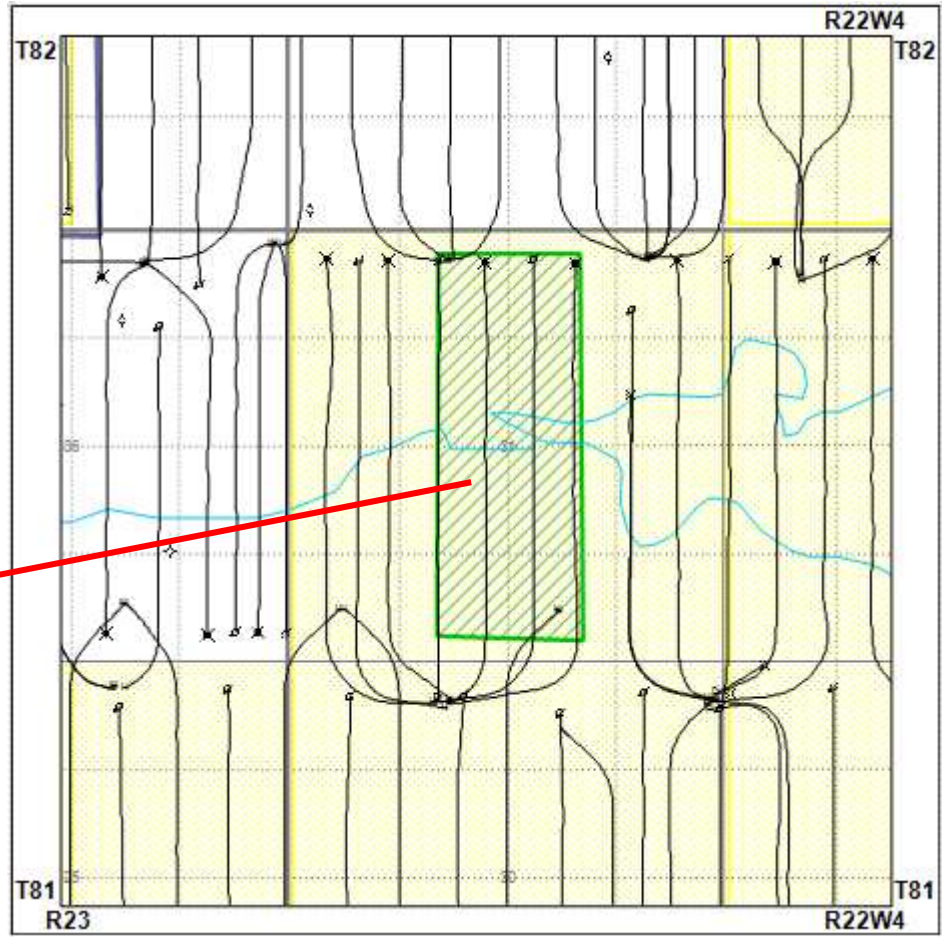
Injectors

- 100/14-31-081-22W4/0 (50%)
- 100/15-31-081-22W4/0 (100%)

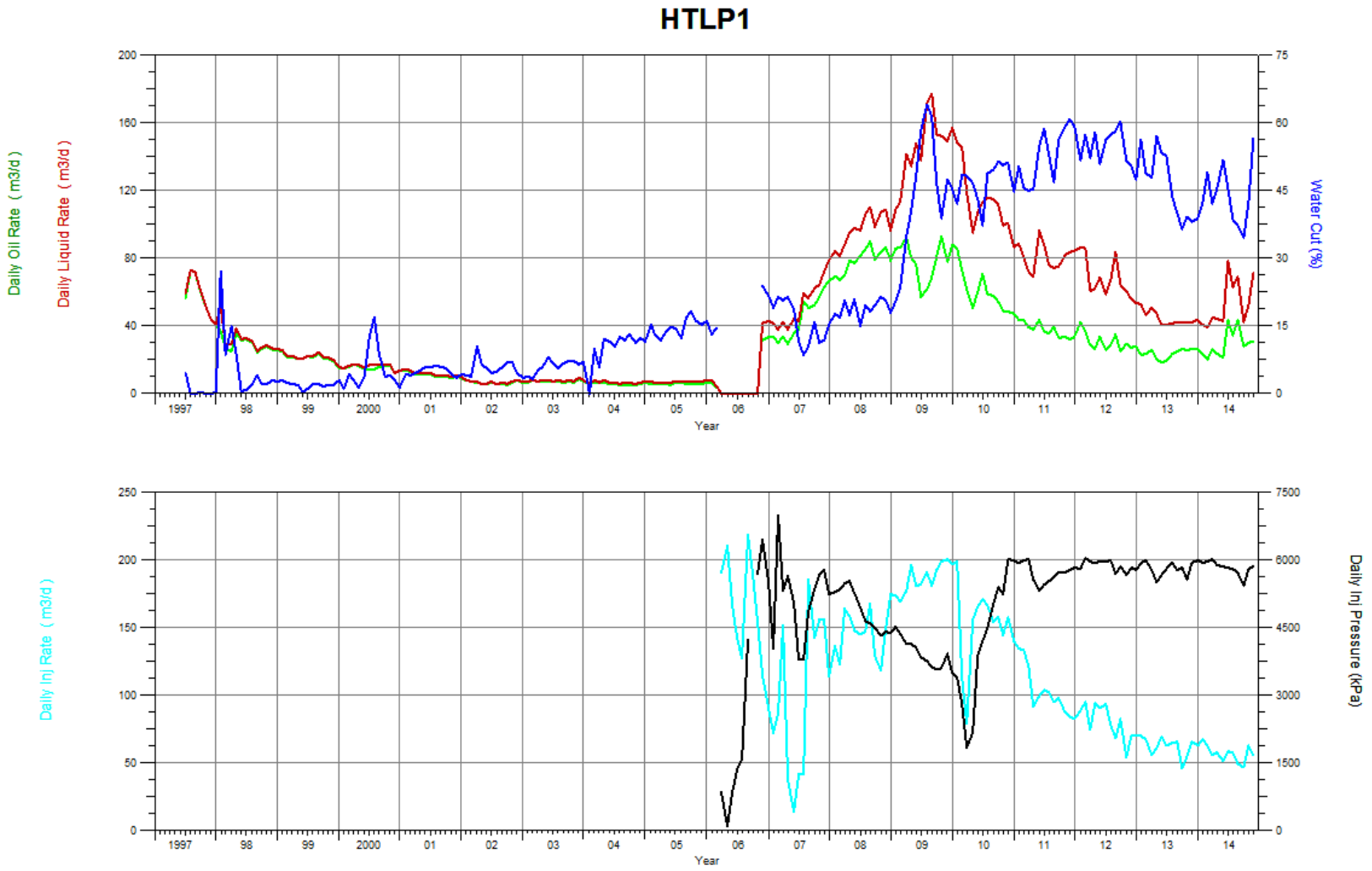
Producers

- 102/15-31-081-22W4/0 (50%)
- 102/14-31-081-22W4/0 (100%)





Good Performance – HTL1



Average Performance – NHTP10

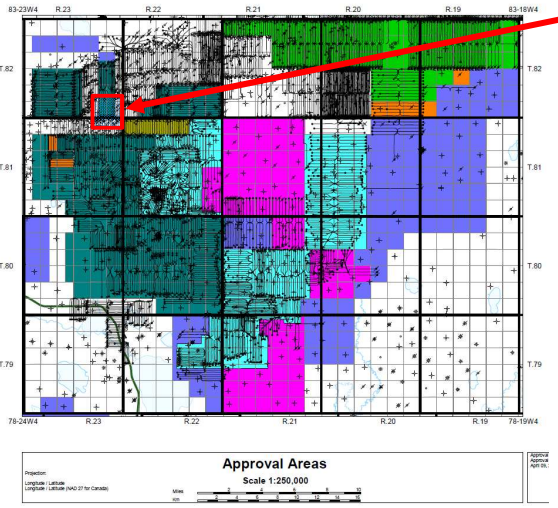
- **NHT Pad 10 subgroup**
  - **Well List and allocation factors:**

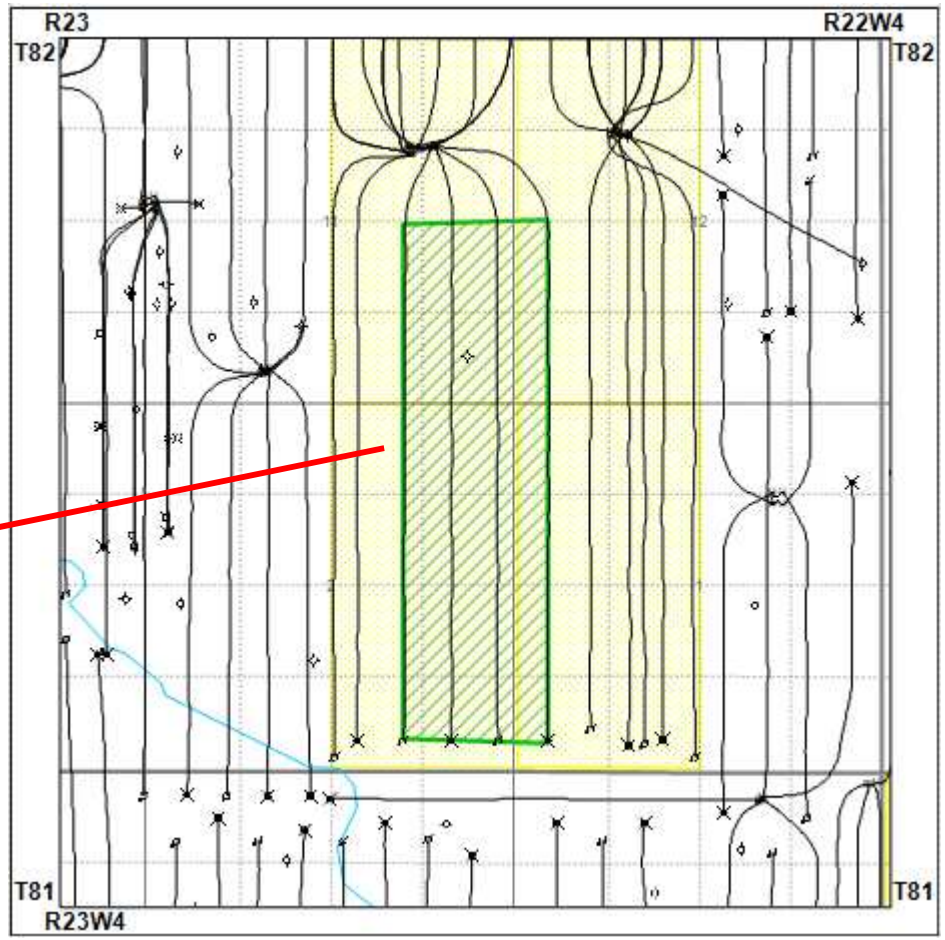
Injectors

- 100/02-02-082-23W4/0 (50%)
- 100/01-02-082-23W4/0 (100%)

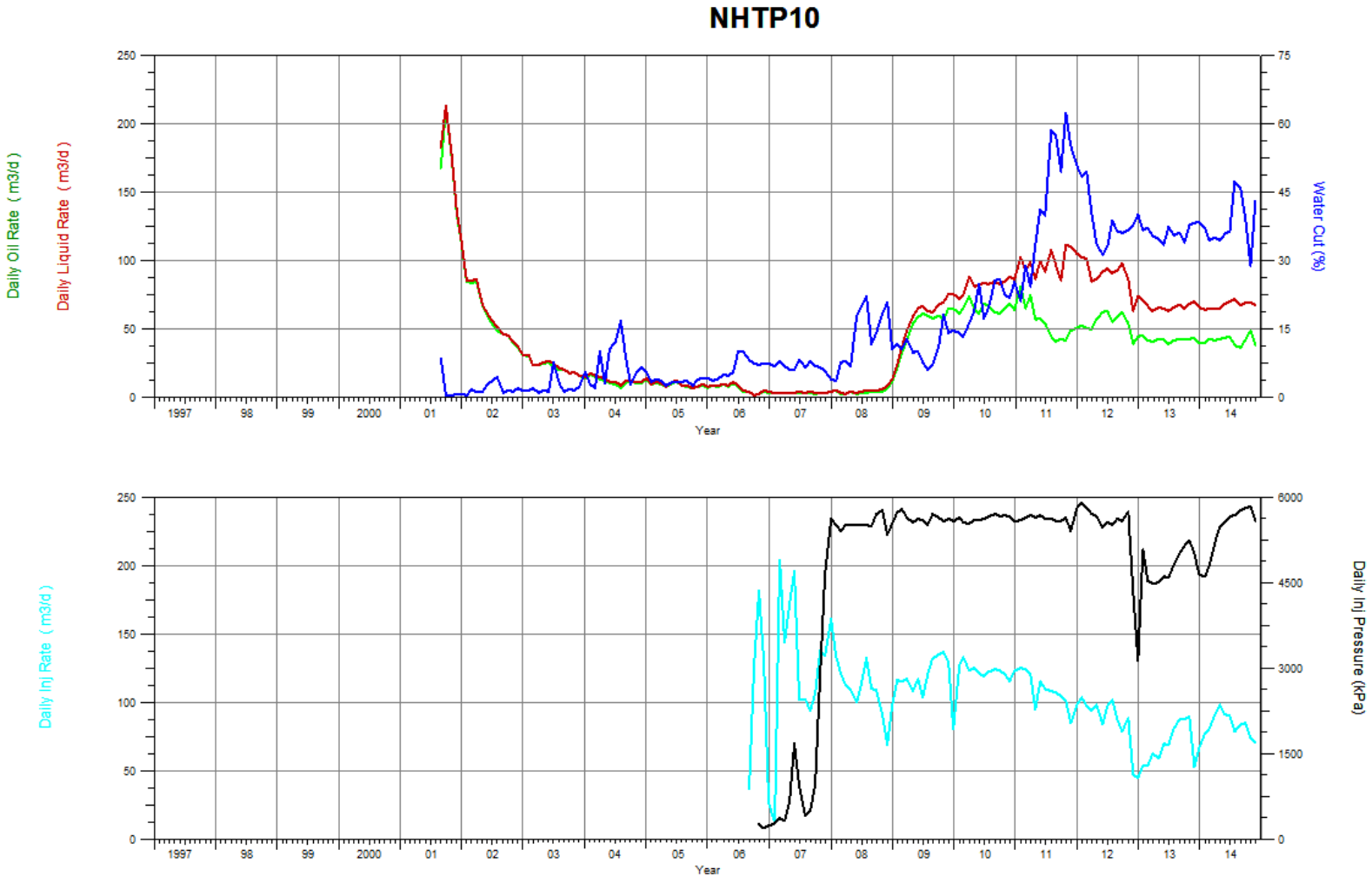
Producers:

- 102/01-02-082-23W4/0 (100%)
- 102/04-01-082-23W4/0 (50%)





Average Performance – NHTP10



Below Average Performance – SB 26

- **SB 26 103/10-24 Pattern**
  - **Well List and allocation factors:**

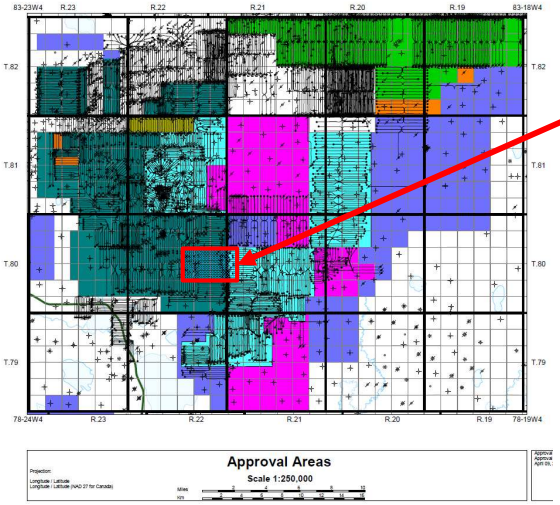
    Injector

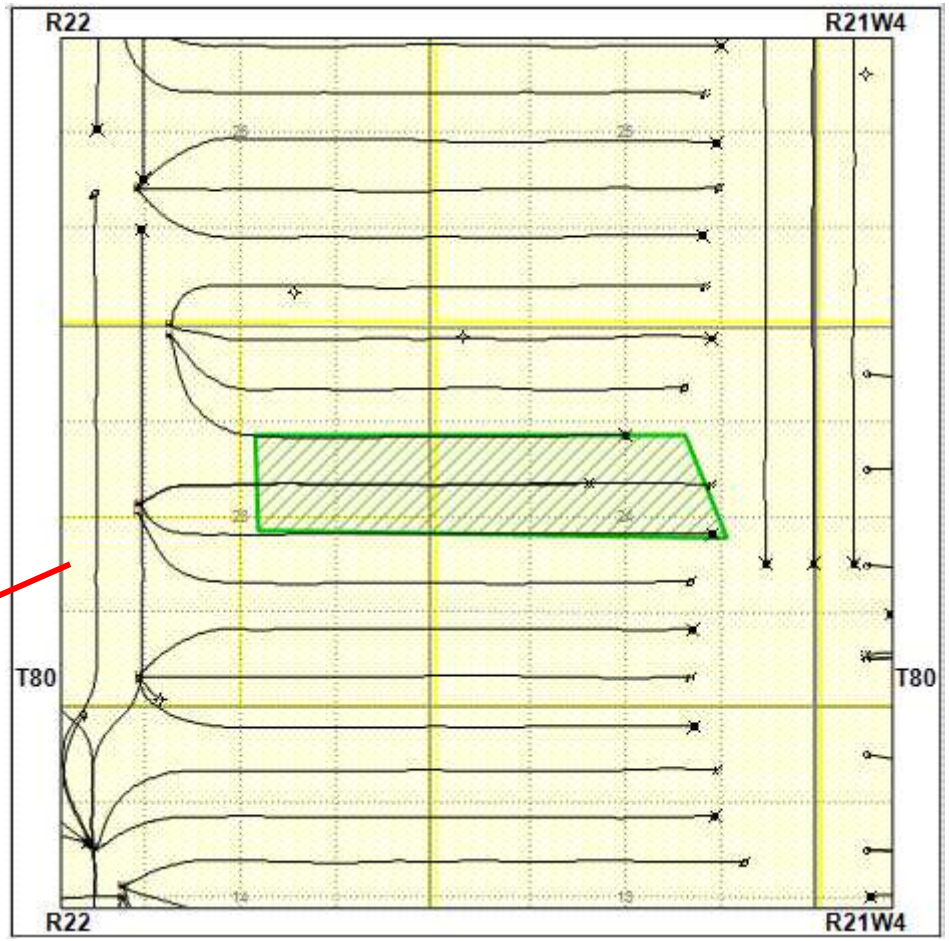
    ➢**103/10-24-080-22W4/2 (100%)**

    Producers

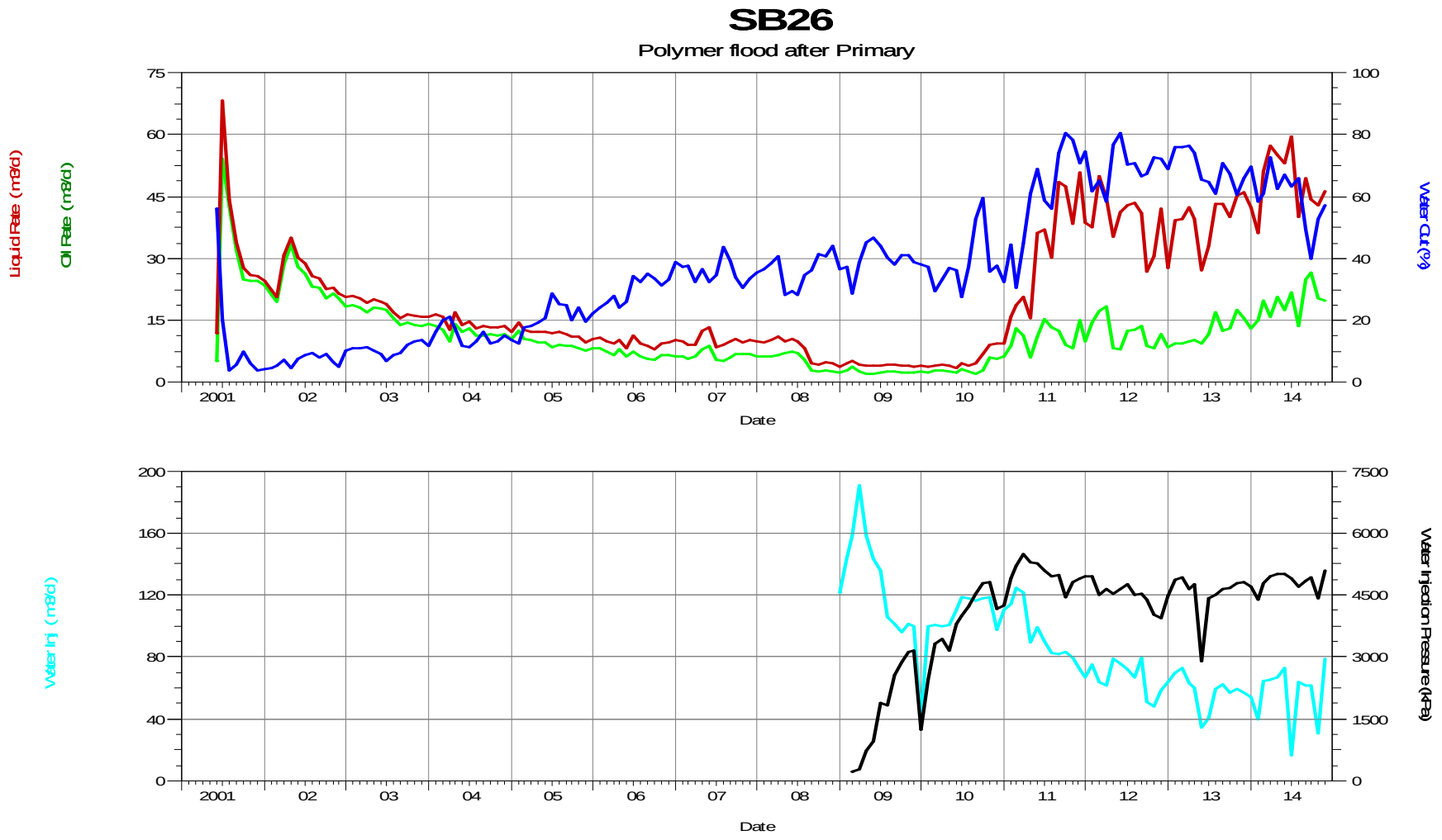
    ➢**102/11-24-080-22W4/0 (50%)**

    ➢**104/07-24-080-22W4/0 (50%)**

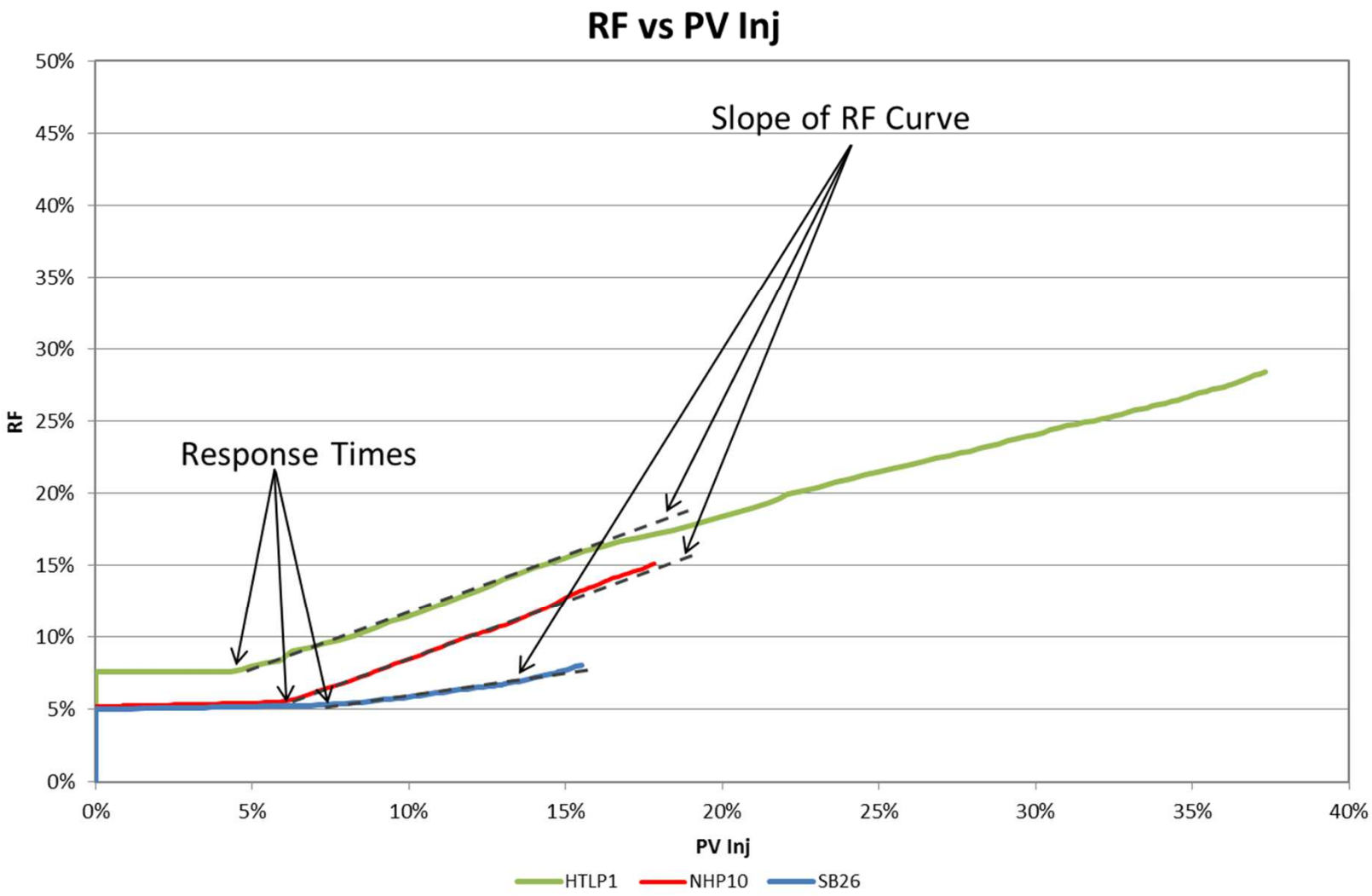




Below Average Performance – SB 26



Summary of Good/Average/Poor Areas



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

Cap Rock Integrity

Cap Rock Integrity

Canadian Natural

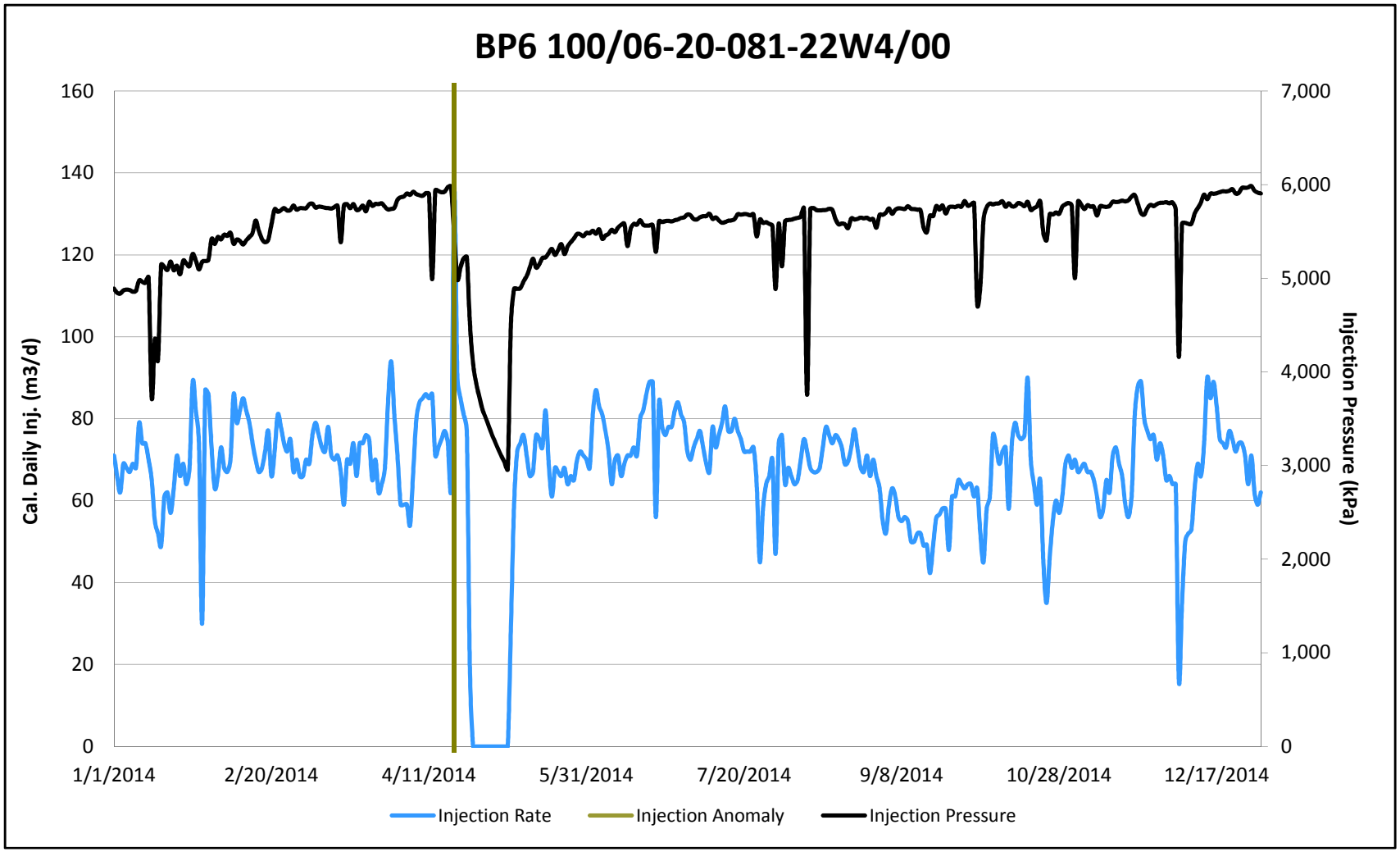
- **2014 Anomalies (7 in total):**

Date of Event	Location	Cause of Alarm	Operations Review of Injection Well	Initial Injection Pressure	Anomalous Pressure	Current Pressure (Apr 2015)	Suspected Cause
(MM/DD/YYYY)	(UWI)			(kPag)	(kPag)	(kPag)	
March 12, 2014	00/06-22-081-22W4	Drop in injection pressure/injection rate increase	Everything working operationally.	5,670	5,163	5,270	Breakthrough to producer
April 19, 2014	00/06-20-081-22W4	Drop in injection pressure/injection rate increase	Everything working operationally.	5,950	5,450	5,980	Breakthrough to producer
April 20, 2014	00/09-19-79-21W4	Drop in injection pressure/injection rate increase	Everything working operationally.	5,650	4,243	5,994	Accessing new highly permeable reservoir
May 1, 2014	00/03-10-80-22W4	Drop in injection pressure	Everything working operationally.	5,500	5,065	5,850	Breakthrough to producer
May 10, 2014	103/02-09-080-21W4	Drop in injection pressure/injection rate increase	Everything working operationally.	4,990	4,086	6,003	Accessing new highly permeable reservoir
June 13, 2014	02/13-18-81-22W4	Drop in injection pressure/injection rate increase	Everything working operationally.	5,970	5,450	5,927	Accessing new highly permeable reservoir
June 24, 2014	00/01-16-081-22W4	Drop in injection pressure/injection rate increase	Everything working operationally.	5,800	5,235	5,674	Accessing new highly permeable reservoir

- **4 anomalies in 2013, 9 anomalies in 2012; 18 anomalies in 2011**

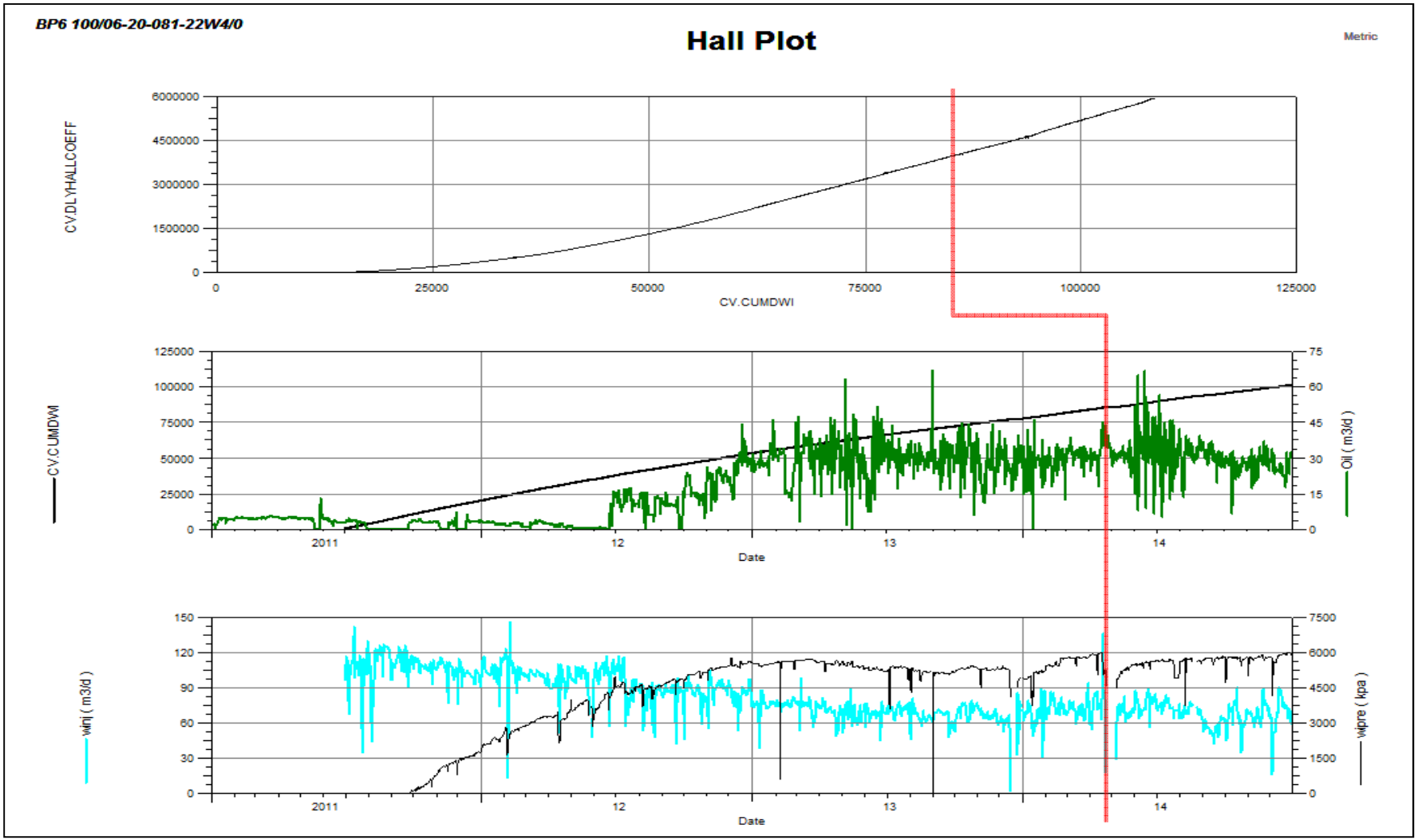
All seven 2014 anomalies were fully investigated and reported. All injectors are back on-stream under normal operating conditions and have regained pressure following the event.

Cap Rock Integrity – BP6 100/06-20



100/06-20-081-22W4/0: Well was shut in for 2 weeks as a precaution. Rates and pressures returned to normal upon restarting injection.

Cap Rock Integrity – BP6 – 100/06-20



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

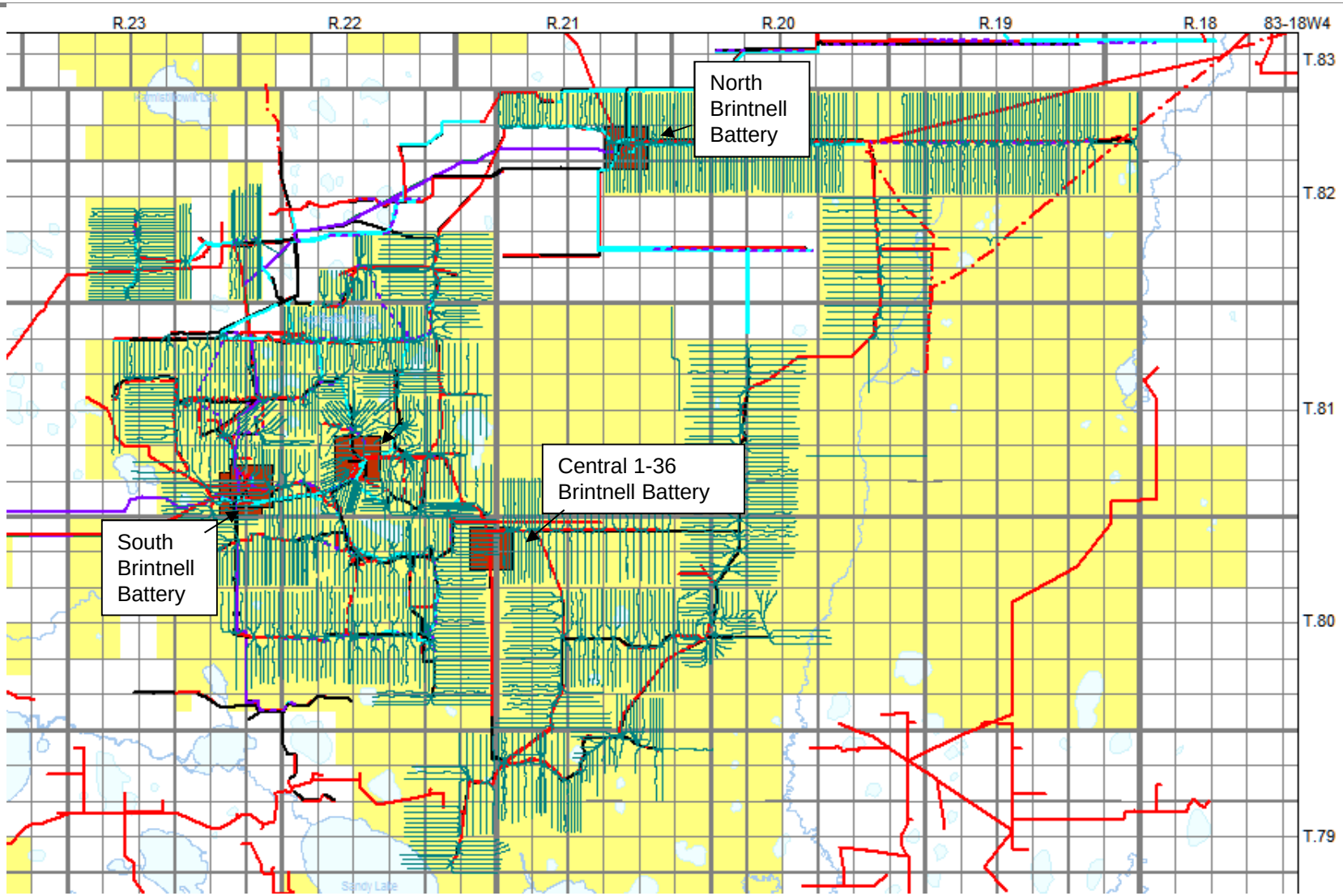
Future Development Plans

Canadian Natural

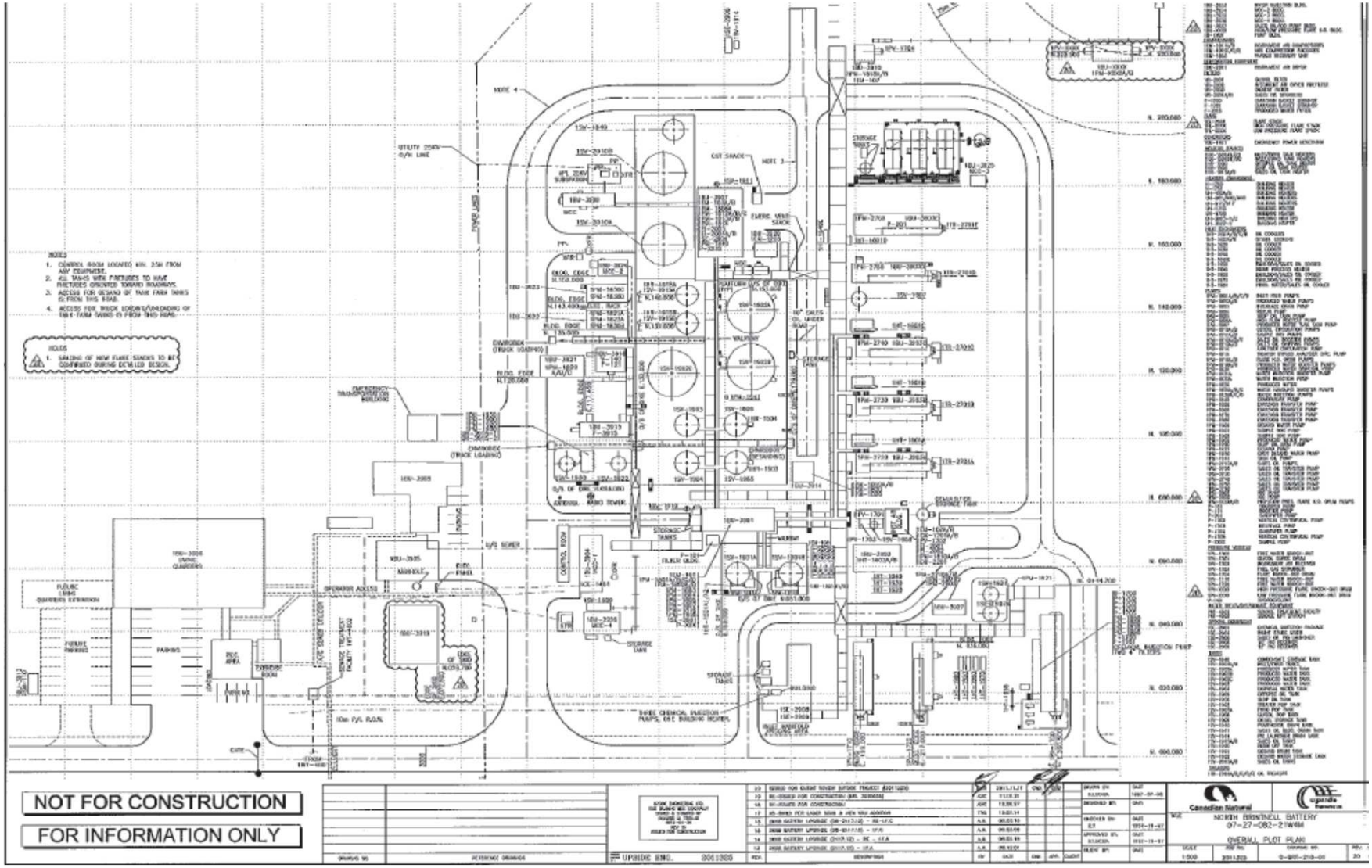
- Canadian Natural plans to continue with the expansion of the polymer flood at Brintnell over the next several years. Expansion will push the flood to the southeastern and western edges of the pool.
- The focus of this year's capital program will be optimization of the existing well patterns. No drilling is planned for 2015.
- 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

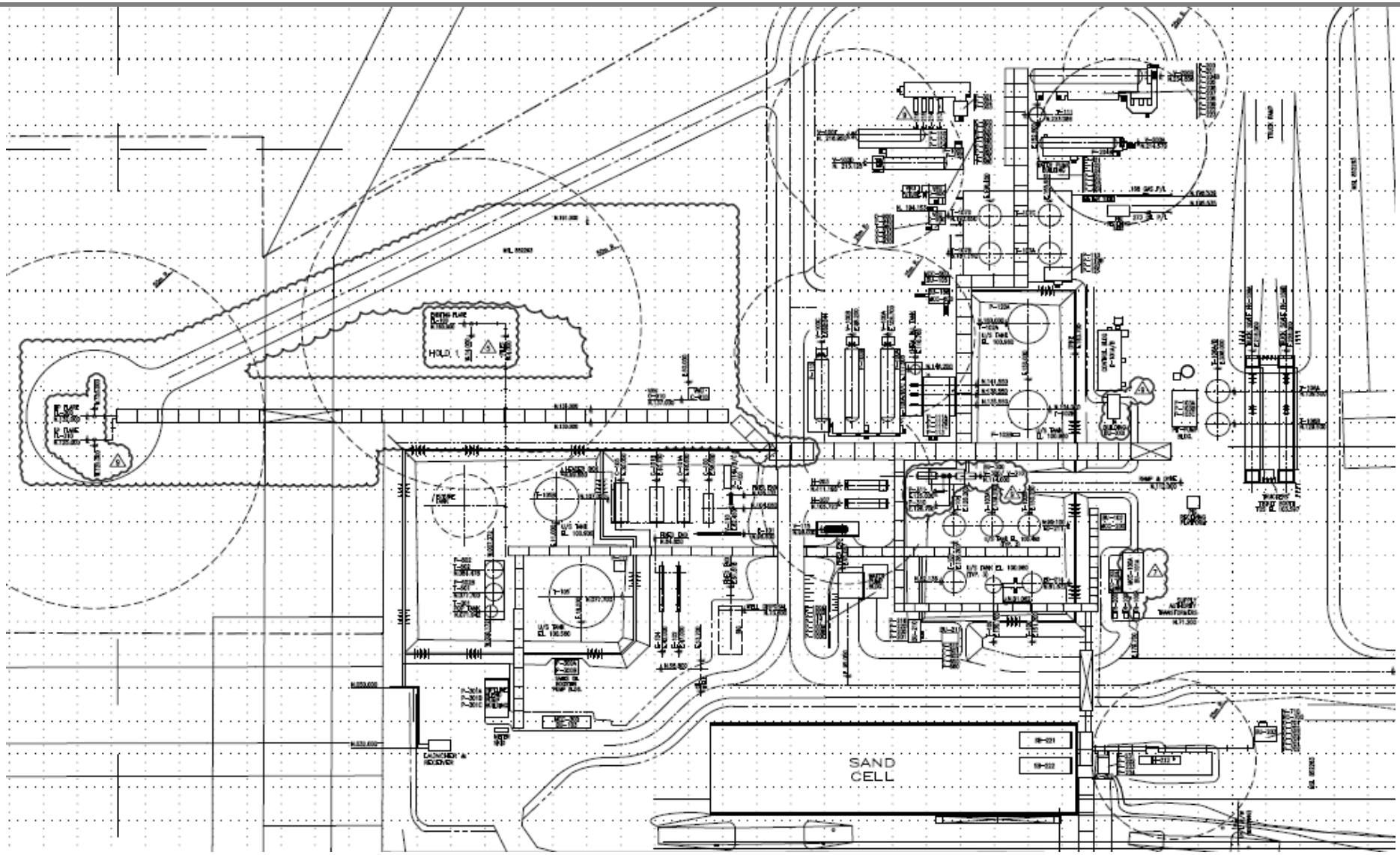


Facility: NB 07-27-82-21W4 Battery Plot Plan



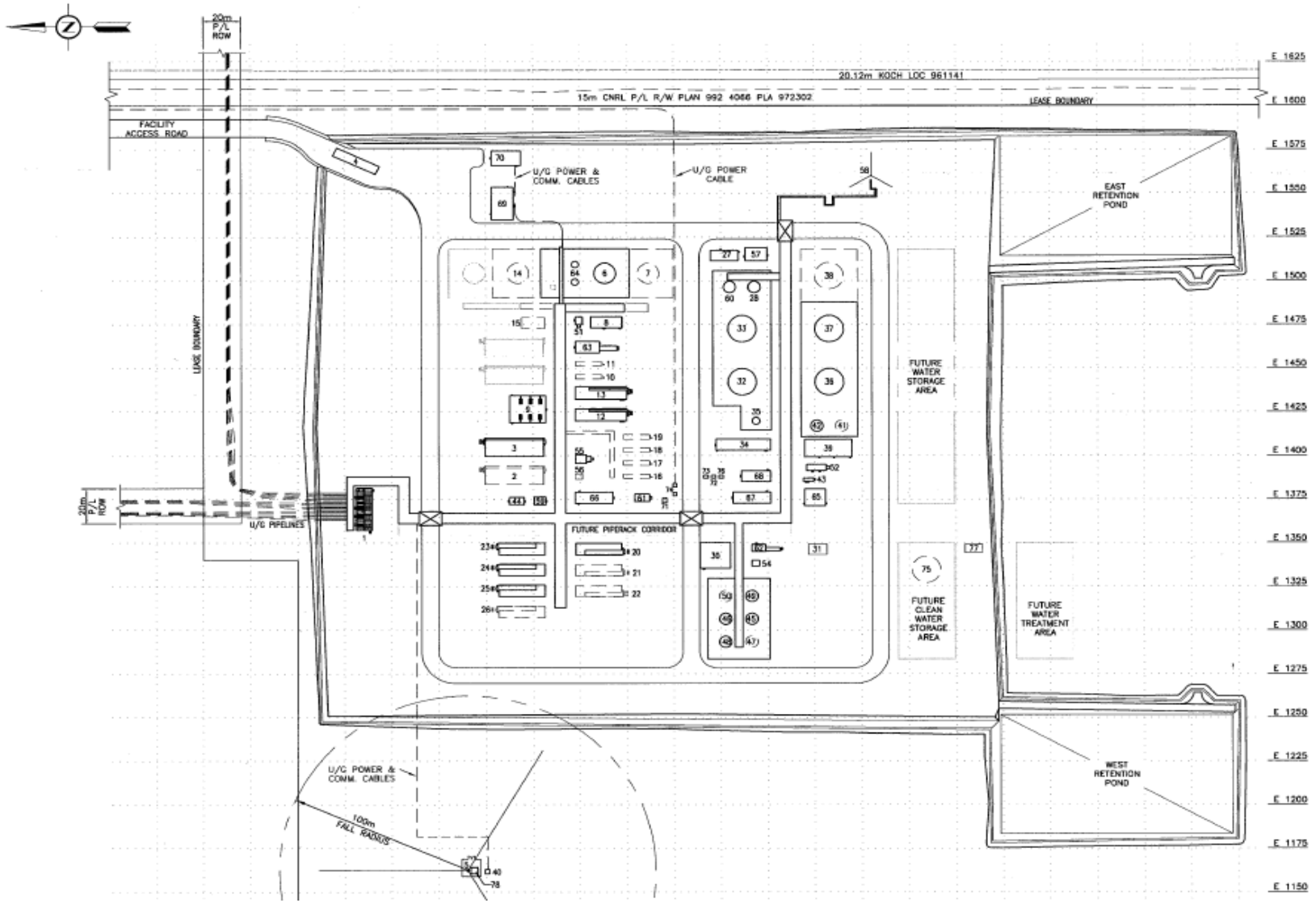
Refer to Appendix A

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



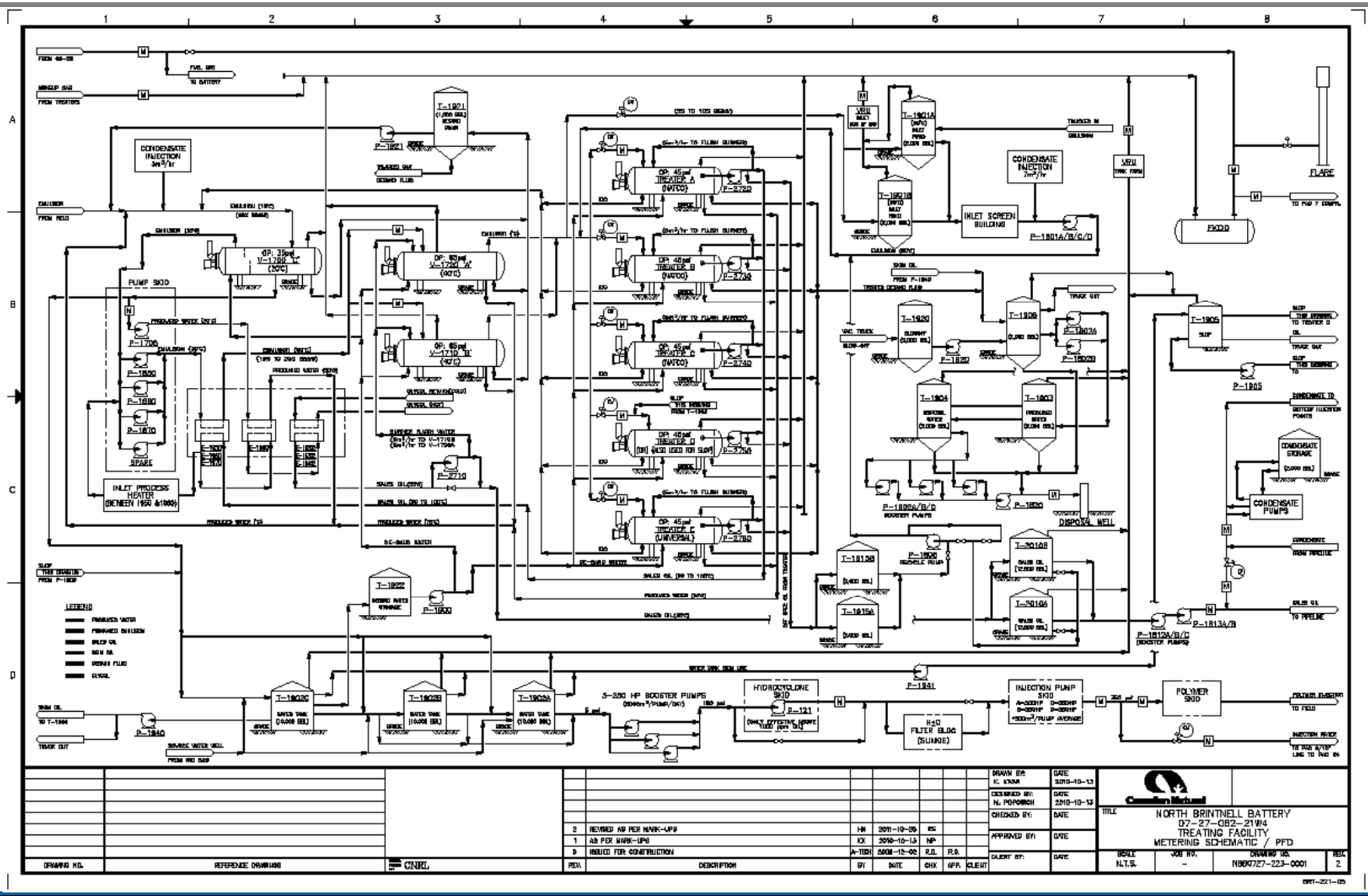
Refer to Appendix A

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



Refer to Appendix A

Facility: Typical Brintnell Battery PFD



Refer to Appendix B

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 ongoing. Working towards 2017 compliance.**
    - **All high risk sour pipelines have been lined as of Feb, 2014**

Battery Performance

Canadian Natural

Brintnell Water Recycle Analysis 2006 to 2014

	2006	2007	2008	2009	2010	2011	2012	2013	2014
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
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
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
Produce Recycle	88.8%	100.2%	98.1%	97.6%	97.7%	97.9%	**99.5%**	**99.5%**	**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
Average Disposal Rates (m3/d)	423	-11	107	148	153	85	25	22	0
Central Brintnell 12-09									**Battery converted to trucked in facility May 15, 2013**
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	
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
Produced Water (m3)							**Battery Commissioned May 2014 - first oil May 15, 2013**	638,159	1,946,244
Recycle Rates (m3)								565,099	1,615,263
Produce Recycle								**88.6%**	**83.0%**
Average Daily Recycle (m3/d)								2,457	4,425
Average Disposal Rates (m3/d)								318	907
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
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
Recycle Rates (m3)	0	22,465	173,011	204,727	173,120	823,109	1,412,965	1,384,546	1,091,455
Produce Recycle	0.0%	5.4%	34.5%	37.6%	22.3%	81.1%	93.9%	**92.6%**	**90.5%**
Average Daily Recycle (m3/d)	0	62	473	561	474	2,255	3,861	3,793	2,990
Average Disposal Rates (m3/d)	934	1,071	897	931	1,652	525	253	303	312
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
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
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
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
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
Disposal Volume (m3)	663,038	553,678	475,723	426,373	680,010	268,333	174,739	222,200	464,554
Total Produce Recycle (%)	64.8%	76.8%	83.4%	86.7%	80.5%	90.8%	95.3%	**94.0%**	**91.0%**
Average Daily Recycle (m3/d)	3,344	5,009	6,529	7,644	7,686	7,215	9,642	9,900	12,273
Average Daily Disposal (m3/d)	1,817	1,517	1,300	1,168	1,863	735	477	748	1,219

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.
- **Field Proration Factors:**
  - Within acceptable range (Oil: 0.892, Water: 1.13).

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 Balance

Canadian Natural

	2014 Annual volumes (E6M3)
PROD	81.9
FLARE	5.2
VENT	6.1
FACILITY DISPOSITION	74.1
FUEL	65.2
SALES GAS DISPOSITION	10.8

- 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.

Future Facility Plans

Facility Future Plans

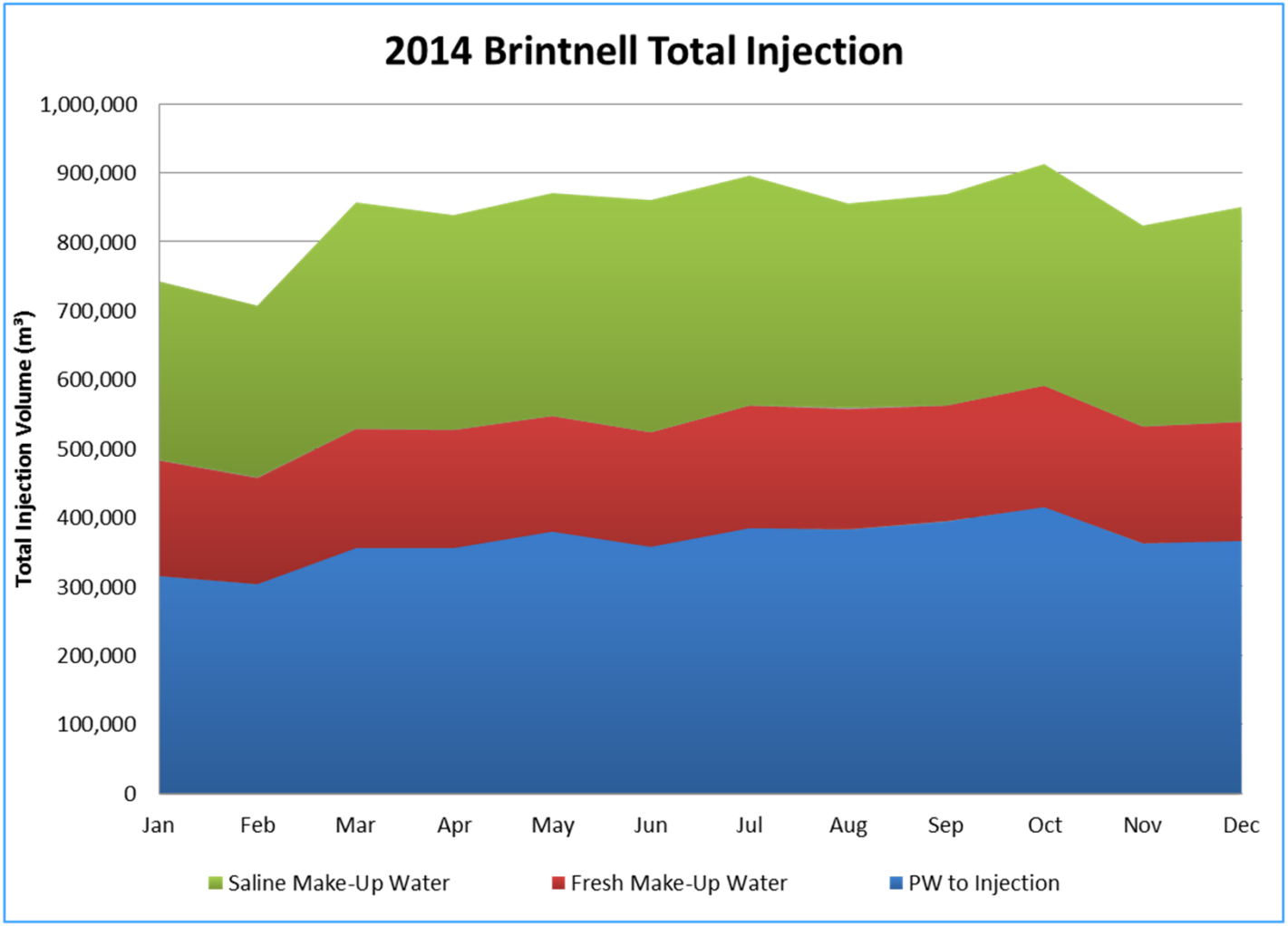
- **Major Activities:**
  - Pad Rebuilds
  - Future Polymer Expansions
  - Water Management Plan

Water Use

Non-Saline Water Use

- 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



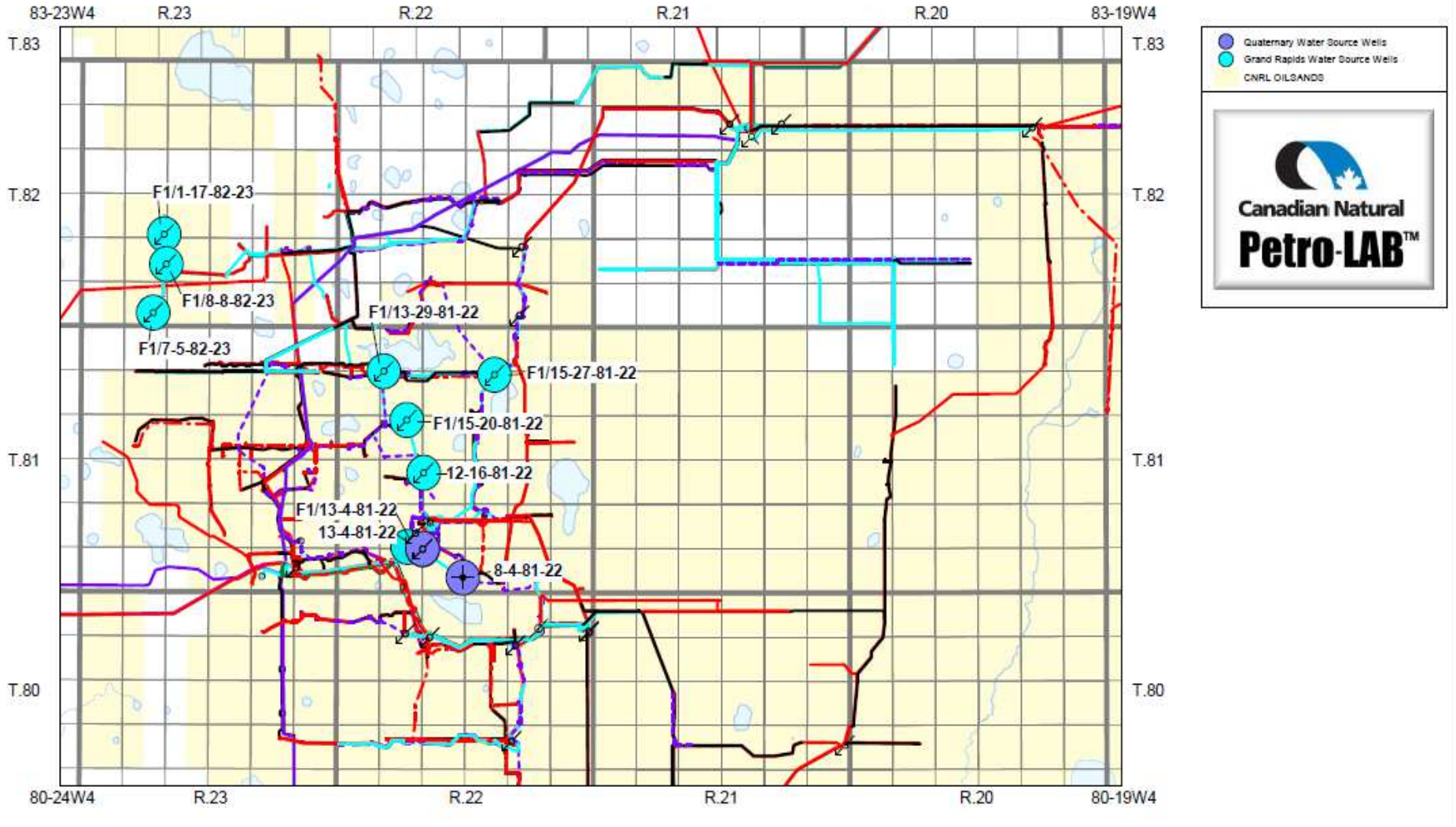
2014 Injection Water Summary

Canadian Natural

2014 Polymer Injection Volumes (m^3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Produced Water to Injection	316,272	304,442	357,665	357,531	381,366	359,115	386,342	383,574	395,613	416,934	363,870	367,896
Fresh Make-Up Water	167,905	154,136	171,583	170,617	166,693	165,091	176,116	175,006	167,581	174,534	168,175	171,295
Saline Make-Up Water	259,497	248,601	327,332	310,220	322,748	336,600	332,962	297,830	306,600	321,503	291,466	310,762
Total	743,674	707,178	856,580	838,367	870,806	860,806	895,420	856,410	869,794	912,971	823,510	849,953

Total Injection Volumes (m^3)	2007		2008		2009		2010		2011		2012		2013		2014	
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%
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%
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%
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	

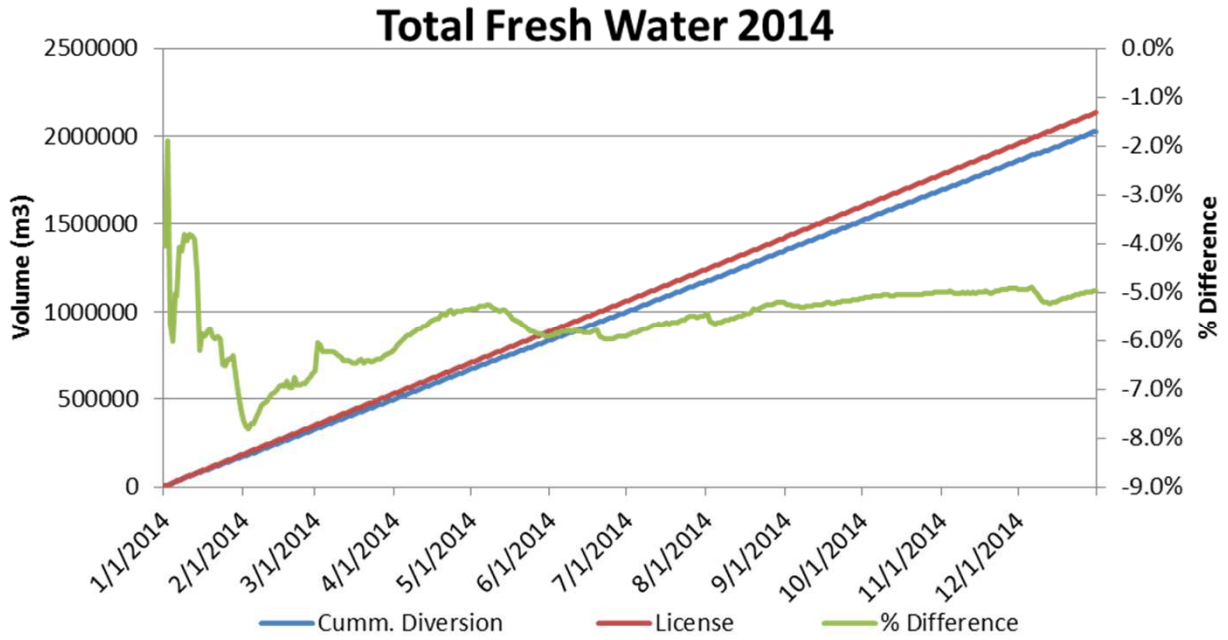
Non-Saline Well Locations



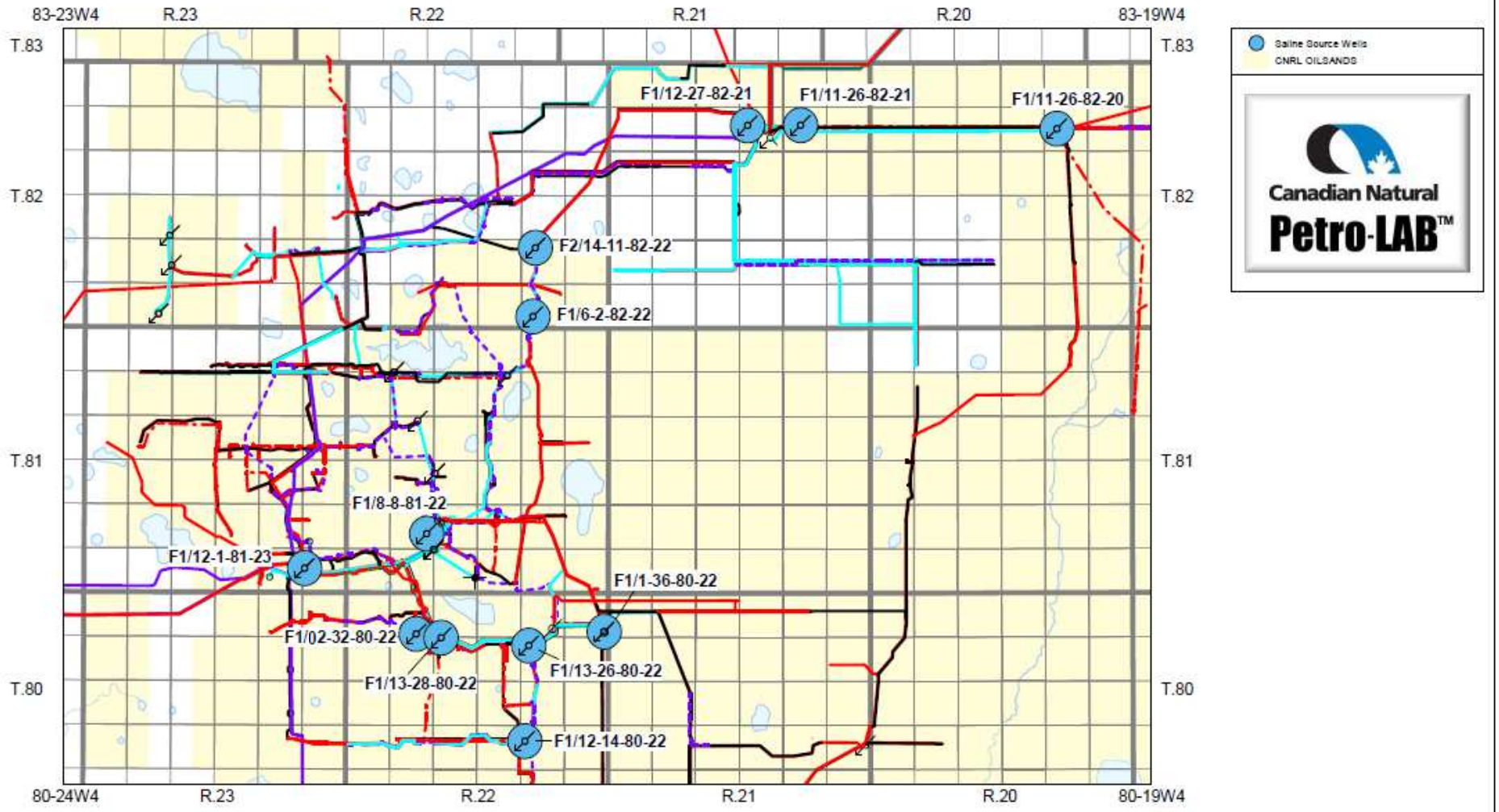
Non-Saline Water Make up Wells

Well Name	UWI	Production Interval	Maximum Rate of Diversion (m3/day)	Maximum Annual Diversion Vol (m3)	2014 Average Diversion Volumes (m3/day)
WSW BP25 - QUAT	100/08-04-081-22W4/00	53.3 - 65.2	818	247,470	679
WSW BP11 - QUAT	1F2/13-04-081-22W4/00	34.3 - 38.8	1,200	153,300	417
WSW BP2 - GR	1AA/12-16-081-22W4/02	270.6 - 317.6	1,200	1,750,540	831
WSW BP11 - GR	1F1/13-04-081-22W4/00	258.5 - 315.9	812		705
WSW HTP2 - GR	1F1/13-29-081-22W4/00	265.8 - 326.8	2,250		1458
WSW HTP6 - GR	1F1/15-27-081-22W4/00	264.8 - 317.8	468		347
WSW NHTP16 - GR	1F1/01-17-082-23W4/00	253.0 - 310.0	933		509
WSW WBP30 - GR	100/15-20-081-22W4/00	260-315	750		204
WSW NHP 13 - GR	100/07-05-082-23W4/00	232-302	325		260
WSW HHP 15 - GR	100/08-08-082-23W4/00	243-305	225		144

1,627,170



Saline Water Source Map



2014 Saline Water Source Well Diversion Volumes (m^3)

Canadian Natural

	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	TOTALS
BR NORTH 1F1/11-26-082-21W4/00 SRC	50,849	58,901	67,625	69,792	67,014	61,322	58,742	60,381	73,719	83,191	46,696	47,540	**745,772**
BR NORTH NBP24 1F1/11-26-082-20W4/00	0	0	0	0	0	0	0	0	0	0	0	0	**0**
BR NORTH NBP6 1F1/12-27-082-21W4/00 SRC	0	0	0	0	0	0	0	0	0	0	0	0	**0**
BR NORTH NHP5 1F1/06-02-082-22W4/00	0	0	0	0	0	0	0	0	0	0	0	0	**0**
BR NORTH NHP9 1F2/14-11-082-22W4/00	0	0	0	0	0	0	0	0	0	0	0	0	**0**
BR SOUTH SBP16 1F1/13-26-080-22W4/00	52,820	45,631	16,387	2,164	69,734	54,840	42,481	42,992	46,760	48,103	46,892	56,075	**524,879**
BR SOUTH SBP28 1F1/12-14-080-22W4/00	9,934	8,527	63,120	56,567	0	0	0	0	0	0	0	0	**138,148**
BR SOUTH SBP4 1F1/02-32-080-22W4/00	44,673	7,349	35,434	50,448	55,841	61,415	64,719	62,345	60,620	61,787	55,940	64,276	**624,847**
BR SOUTH SBP6 1F1/13-28-080-22W4/00	0	37,750	0	0	0	0	0	0	0	0	0	0	**37,750**
BR SOUTH WSW 1F1/01-36-080-22W4/00	0	32,131	96,394	85,093	97,980	88,264	90,652	33,616	94,786	87,201	88,445	103,559	**898,121**
BR SOUTH WSW 1F1/12-01-081-23W4/00	67,979	42,463	29,135	26	0	0	19,242	98,496	30,715	41,221	53,493	39,312	**422,082**
BRINTNELL BP9 1F1/08-08-081-22W4/00	33,242	15,849	19,237	46,130	32,179	70,759	57,126	0	0	0	0	0	**274,521**
	259,497	**248,601**	**327,332**	**310,220**	**322,748**	**336,600**	**332,962**	**297,830**	**306,600**	**321,503**	**291,466**	**310,762**	**3,666,120**

- Increased produced water recycle rates have reduced saline source demand at these above locations. Inactive wells above have been suspended and could be reactivated for future use.

Water Usage and Disposal

Canadian Natural

Total Volumes	2006	2007	2008	2009	2010	2011	2012	2013	2014
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
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
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
Disposal Volume (m3)	663,038	553,678	475,723	426,373	680,010	268,333	174,739	222,200	464,554
Total Produce Recycle (%)	64.8%	76.8%	83.4%	86.7%	80.5%	90.8%	95.3%	94.0%	**91.0%**
Average Daily Recycle (m3/d)	3,344	5,009	6,529	7,644	7,686	7,215	9,642	9,900	12,273

- **Continued to focus on maintaining high water recycling ratios.**
  - **2014 recycle at 91.0%.**
- **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

Pelican Lake Water Information

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Fresh Water (m3/day) - Quaternary and Grand Rapids	1405	2813	4091	3927	4255	4054	5142	5594	5558
Total Water per barrel of oil	1.1	1.4	1.1	2.1	2.6	3.7	3.0	2.3	2.0
Fresh Water per barrel of oil	0.3	0.5	0.7	0.7	0.7	0.7	0.8	0.8	0.7
Recycle Rates	64.8%	76.8%	83.4%	86.7%	80.5%	90.8%	95.3%	94.0%	91.4%
Oil Produced (bbl/day)	29570	34269	37035	36612	36726	36372	38656	42934	50194

Pelican Lake Water Information 2014 Monthly

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fresh Water (m3/day) - Quaternary and Grand Rapids	5,416	5,505	5,535	5,687	5,377	5,503	5,681	5,645	5,586	5,630	5,606	5,526
Brackish Water (m3/day) - Grosmont	8,371	8,879	10,559	10,341	10,411	11,220	10,741	9,607	10,220	10,371	9,716	10,025
Total Makeup Water (m3/day)	13,787	14,383	16,094	16,028	15,788	16,723	16,422	15,253	15,806	16,001	15,321	15,550
Total Makeup Water per barrel of oil	1.8	1.9	2.1	2.0	2.1	2.1	2.0	1.8	1.9	2.0	1.9	1.9
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
Oil Produced (bbl/day)	47,362	48,045	49,285	49,593	48,395	51,011	51,242	53,312	51,688	50,323	50,850	51,218

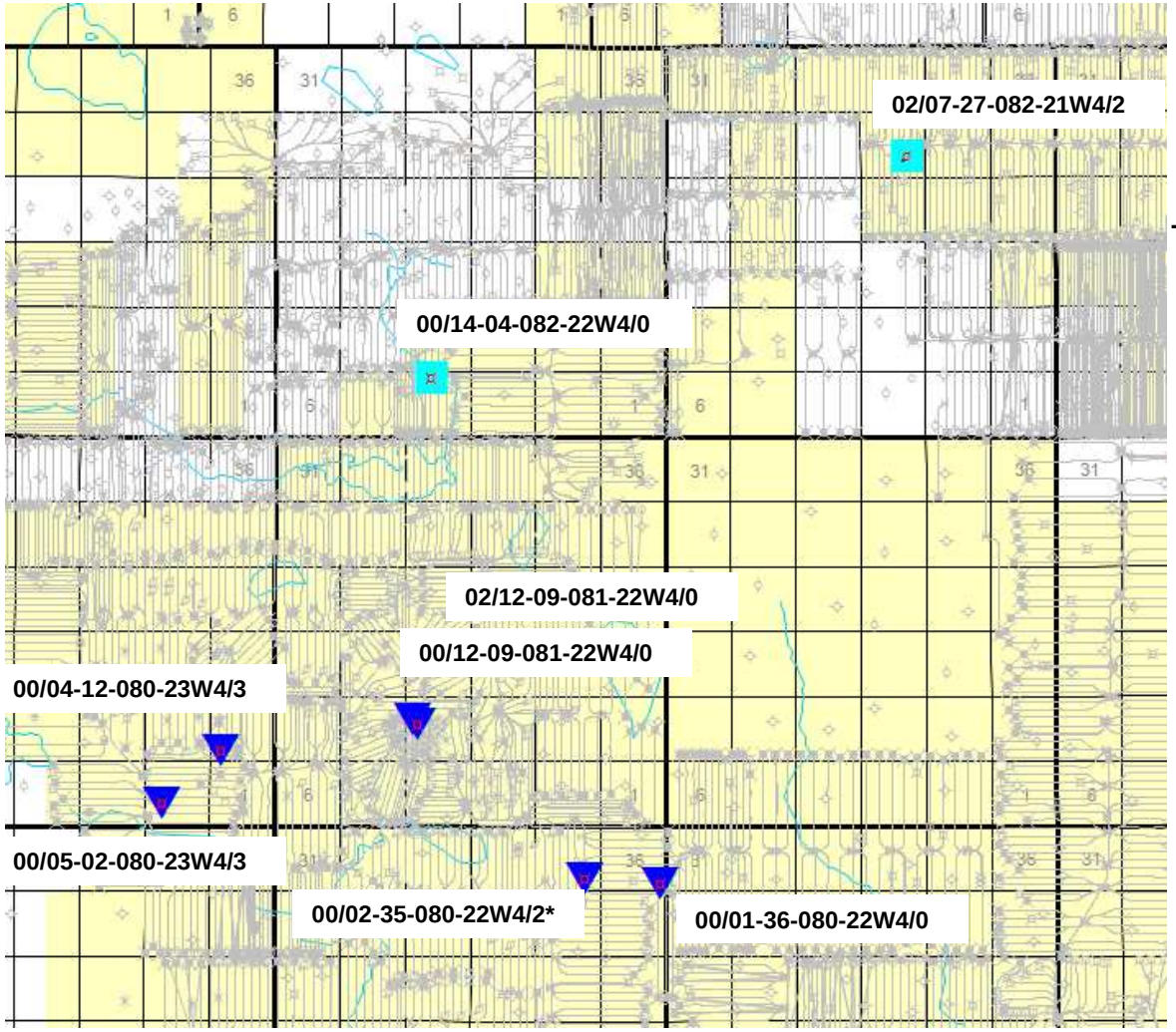
Pelican Water Management Plan

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.

Water and Oilfield Disposal Map

Canadian Natural



8898D

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
00/02-35-080-22W4/2* Nisku
*(*amendment underway)*

8309C

00/14-04-082-22W4/0 Nisku**
*(**to be amended)*
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 8309C

Approval 8898D

CNRL Brintnell Disposal Wells

Canadian Natural

TABLE 1
APPROVAL NO. 8898D

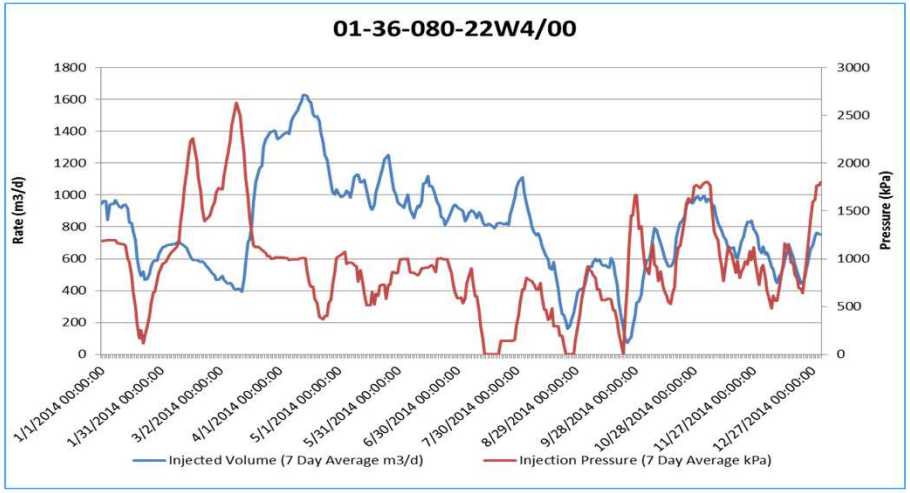
1	2	3	4	5	6
Unique Well Identifiers (*Directive 051* satisfied)	Unique Well Identifiers (*Directive 051* not satisfied)	Disposal Zone	Top of Injection Interval (Measured depth - metres KB)	Depth of Production Packer (Measured depth - metres KB)	Maximum Wellhead Injection Pressure (kilopascals gauge)
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
† 00/02-35-080-22W4/2 *		Nisku	487.0[1]	480.0	3200
00/01-36-080-22W4/0		Nisku	458.1[1]	454.0	3200

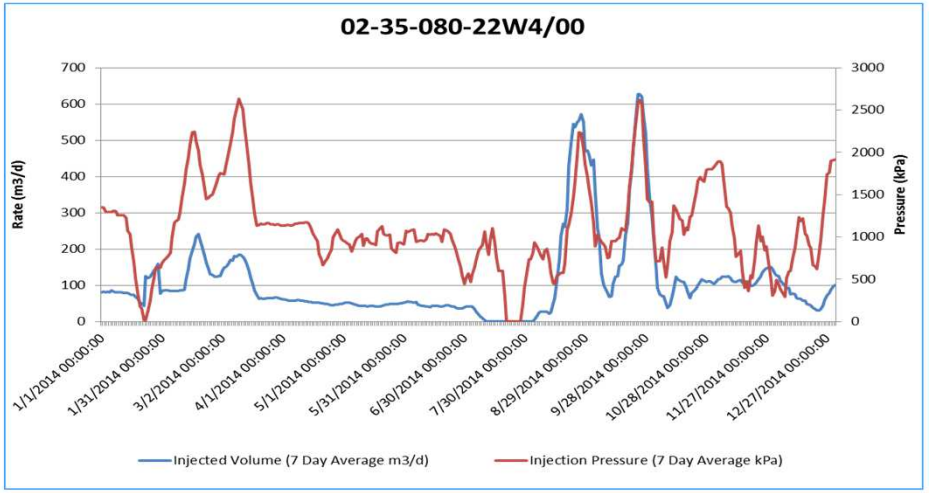
***00/02-35-080-22W4/2**

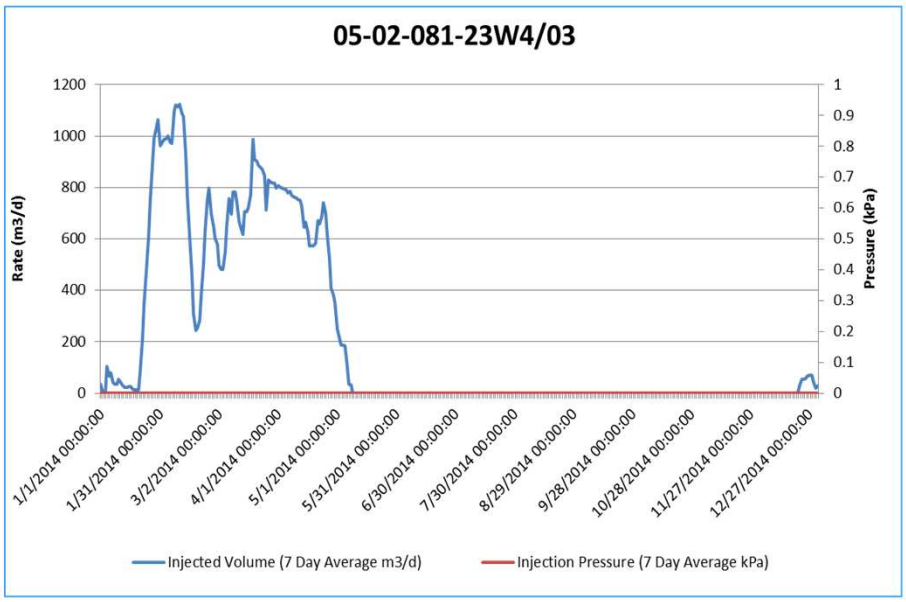
- **re-perfed and acidized within the Nisku, March 28-April 4, 2015, to optimize disposal capacity**
- **D65 application underway to amend perf interval & injection packer depth; submission pending AER review of event sequence**

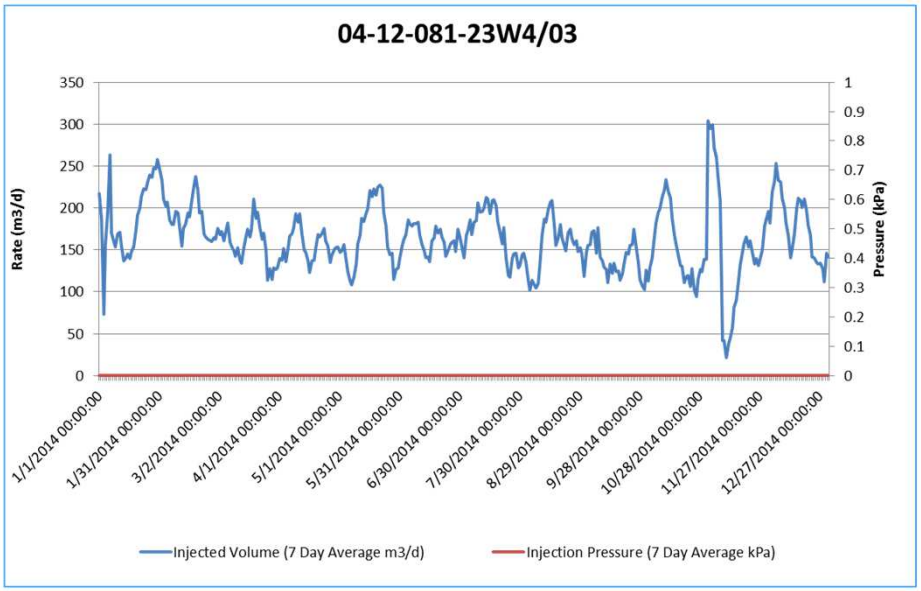
Disposal Well Data

Canadian Natural









AER Compliance

Hydrogen Sulphide

Canadian Natural

- Souring of production to occur over time, currently in Engineering and Construction phase 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.
- Several locations approved for venting under D-60 Regulations.
- 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

- **No outstanding applications**

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
  - 2014 – Record production year from Pelican Lake
- 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
- 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