

next steps

VALUE | GROWTH | INNOVATION



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**AER 2015 Annual Presentation**

**Germain Grand Rapids  
Commercial Demonstration  
Project (Phase 1)  
AER Approval 11509**

**July 31, 2015**

# Agenda

- Activity Update
- Project Overview
- Resource Recovery
- Facility Update
- Compliance



next steps

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# Germain Phase 1- AER Approval 11509

## Subsection 3.1.1

### Subsurface Issues Related to Resource Evaluation and Recovery

July 31, 2015

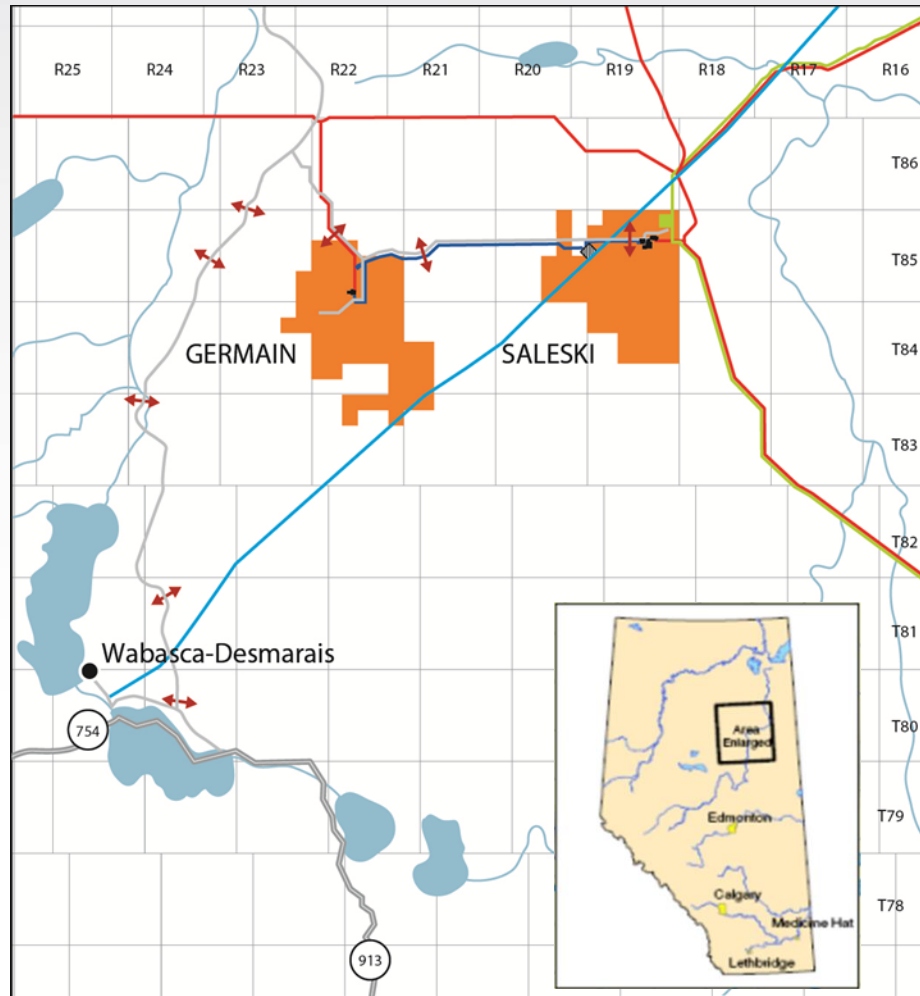
# Update on Activity










<b>Application No. and Date</b>	<b>Application Summary</b>	<b>Approval No. and Date</b>
AER -1812122 Oct 21, 2014	Top injection of NCG in upper transition zone	11509I Nov 25, 2014
AER -1827094 March 2015	Germain Suspension variance request	11509J April 21, 2015

## **Presentation to the AER on Mar 9, 2015**

- **Project Suspension Activities**

# Laricina Germain Lease



- |   |  |
|---|--|
|  Proposed Grand Rapids pipeline      |  Powerline and substation |
|  Proposed Stony Mountain terminal    |  Highway                  |
|  Gas pipeline                        |  Road                     |
|  ATCO 240kV powerline and substation |  Bridge                   |
|   |  Plant site               |

# Scheme Description

- Commercial Demonstration Project (Phase1)
  - 5,000 bpd facility using Laricina’s SC-SAGD process
  - Incorporates water recycle
- Delineation at Germain provides a high degree of geologic confidence
  - **Grand Rapids** (primary target): 172 delineation wells and 11.2 km<sup>2</sup> 3D seismic
  - **Winterburn** (secondary target): 20 delineation wells and 90.1km 2D seismic



## Total Laricina Germain resource:

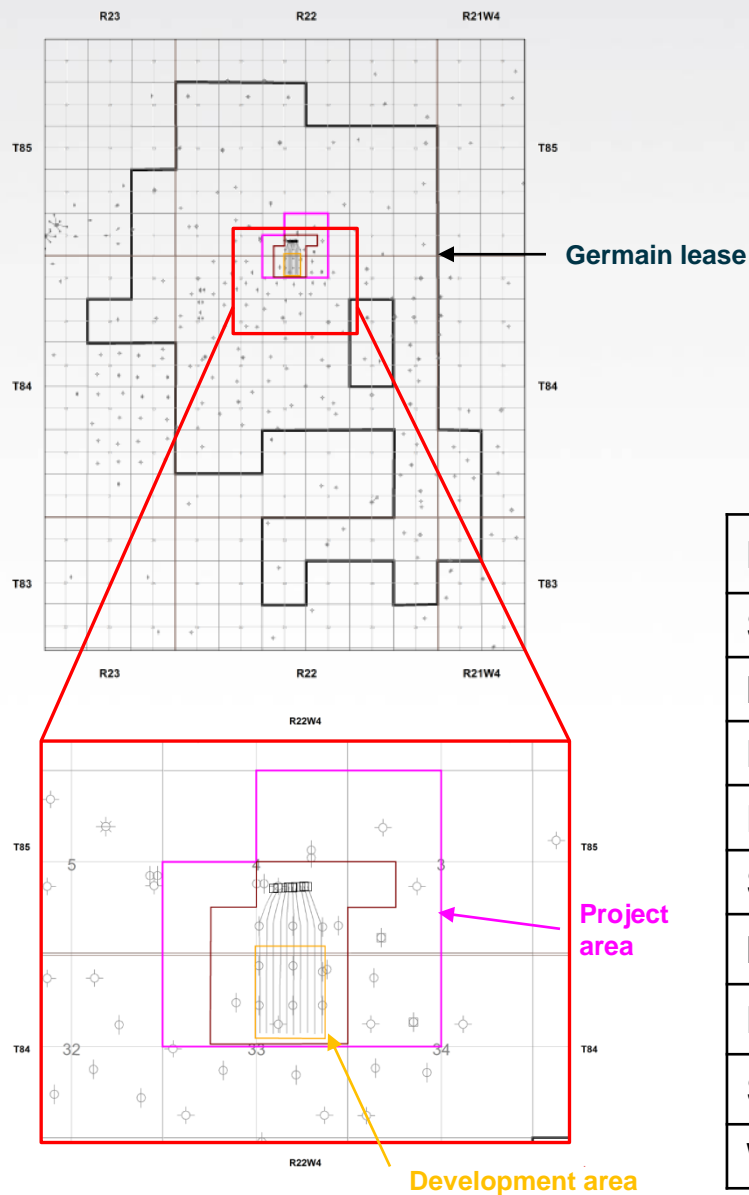
Formation	2P Reserves (bn bbl) <sup>(1)</sup>	Best Estimate Contingent Resources (bn bbl) <sup>(1)</sup>	Project Design Capacity (bbl/d) <sup>(1)</sup>
Grand Rapids	0.4	0.9	203,000
Winterburn	-	0.4	55,500
<b>Total</b>	<b>0.4</b>	<b>1.3</b>	<b>258,500</b>

(1) GLJ Report, effective year end, 2013. “bn” means billion.

## Key components of the Germain Project

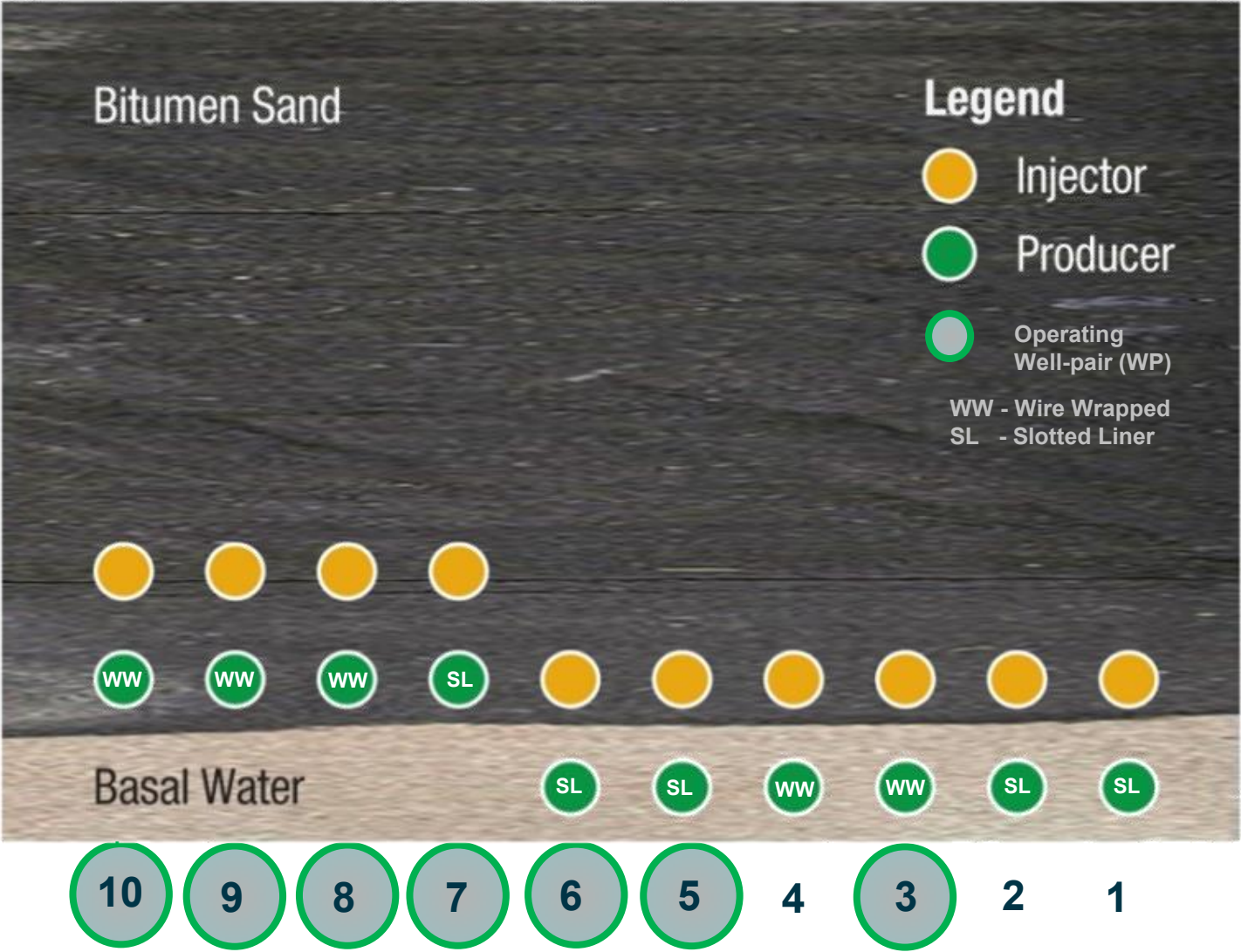
- Central processing facility
- Single pad with 10 SAGD well-pairs (WPs)
- Equipment lay down and staging area
- Observation wells, groundwater monitoring wells, water source and disposal wells
- Electrical substation, utility corridor including roads, gathering lines and power lines
- Associated infrastructure such as storage tanks, surface run-off pond, flow lines and construction and operations camps

# Phase 1 Overview



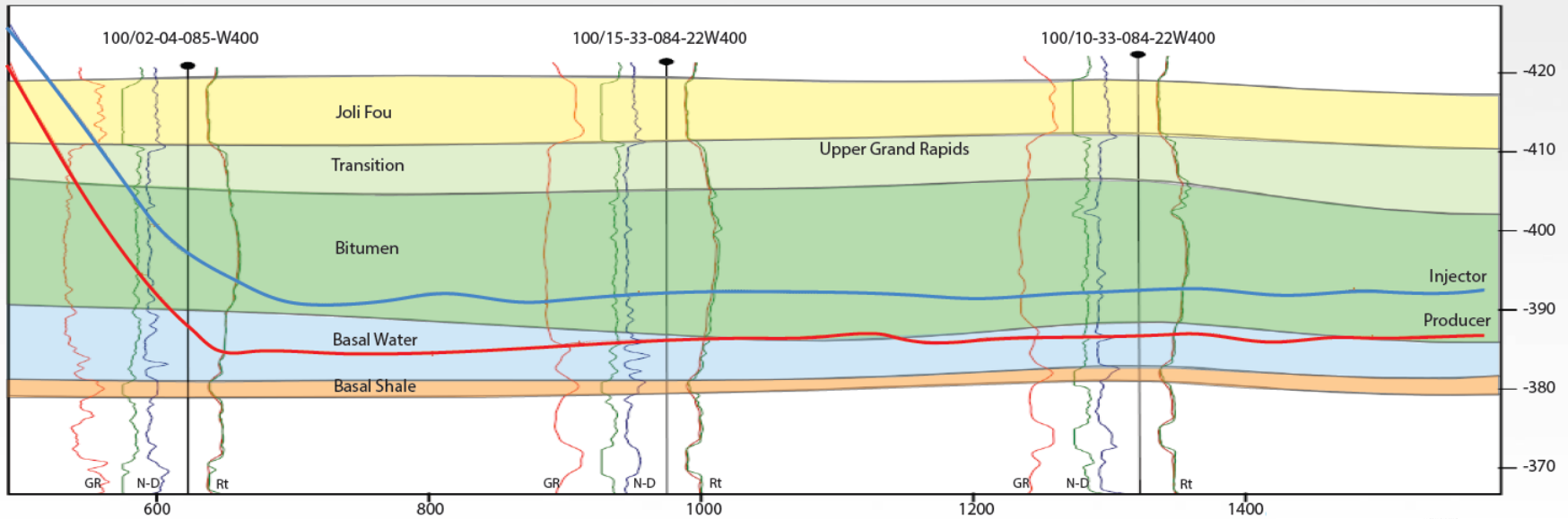
Drilled WP	10
Started WP	7
Bitumen Rate	795 m <sup>3</sup> /day
Dry Steam Injection	1,670 m <sup>3</sup> /day
Produced Water Recycle	Yes, HLS
Source Water Wells	4
Make-up water (Steady-state)	176 m <sup>3</sup> /day
Disposal wells	3 wells total 338 m <sup>3</sup> /day
Steam Generators	4 x 50 mmBtu/hr
WP Spacing	60 m

# Well placement in the Grand Rapids

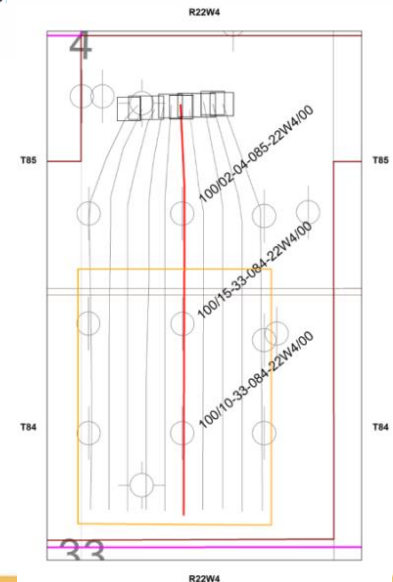




# WP 5 Trajectory / Cross-Section

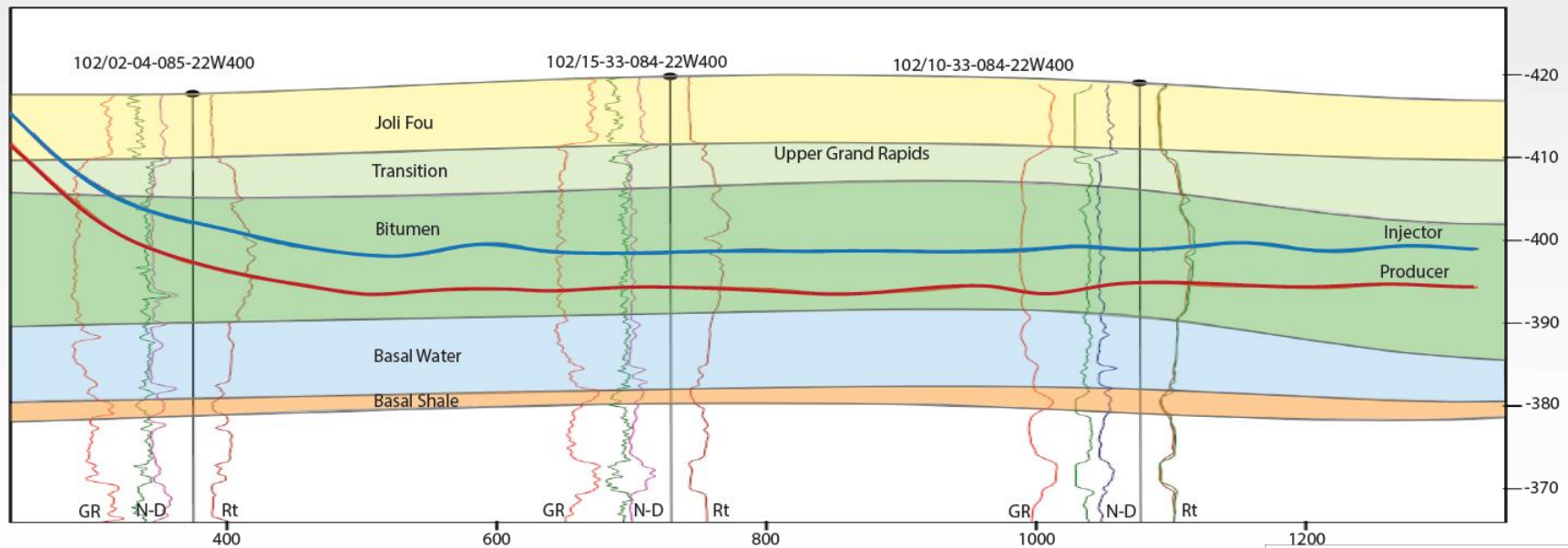


- Production wells P1-P6 targeted the basal water zone above the basal shale with injection wells 5 m above the production wells
- WPs 1-6 were drilled in this configuration to optimize resource recovery

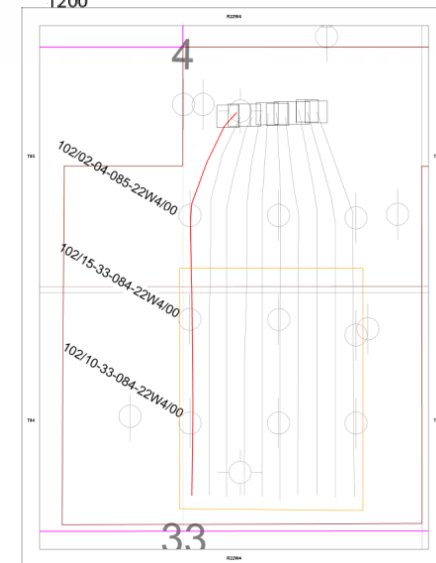


## Section 3.1.1(2i)

# WP 10 Trajectory / Cross-Section

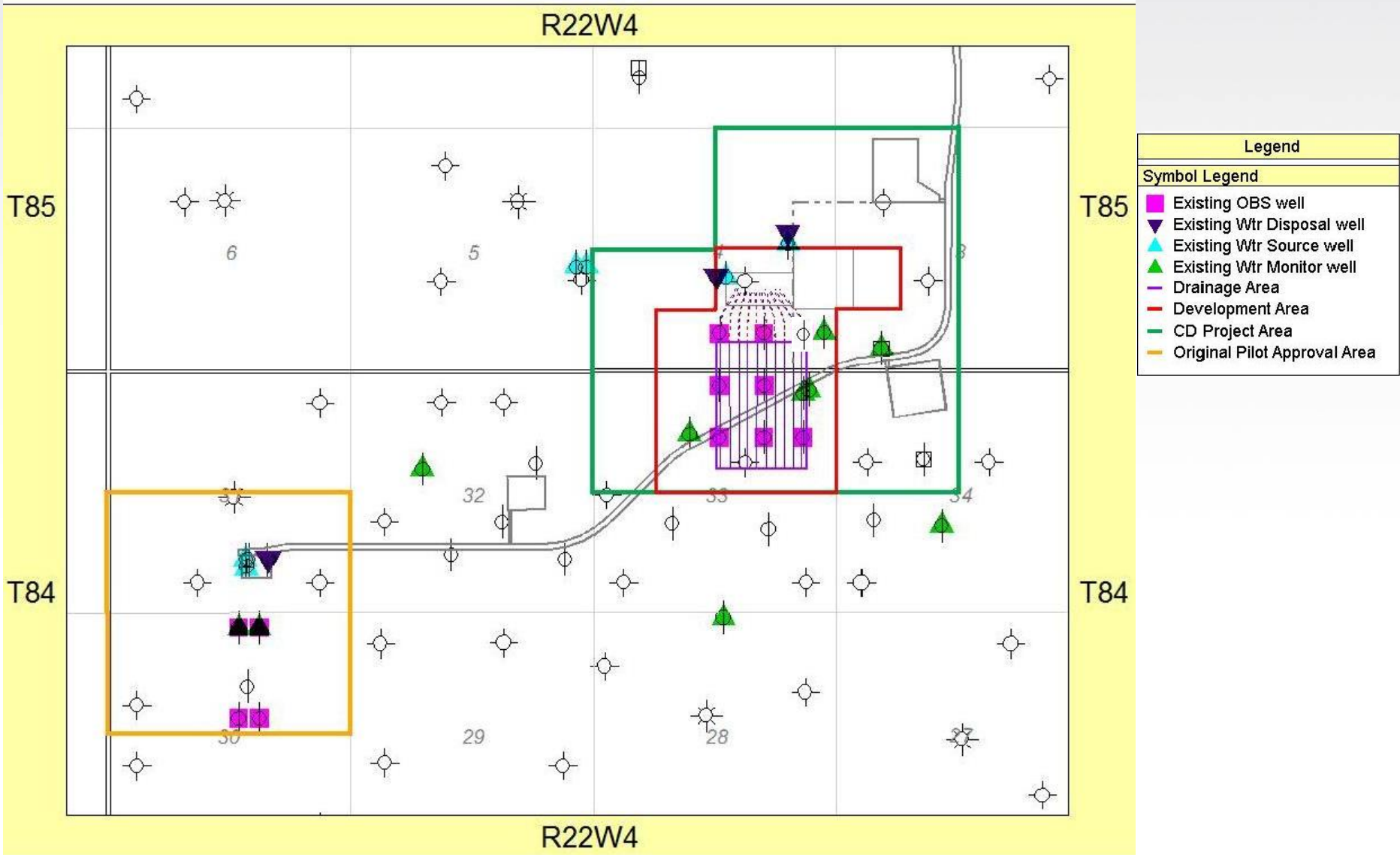


- As authorized by AER Approval No. 11509D, the production wells for WPs 7-10 were placed in the bitumen approximately 1 m above the bitumen-water contact
- WPs 7-10 were drilled in this configuration in order to mitigate the potential effect of swelling clays in the basal water



## Section 3.1.1(2i)

# Existing Wells



Legend	
Symbol Legend	
<span style="color: magenta;">■</span>	Existing OBS well
<span style="color: purple;">▼</span>	Existing Wtr Disposal well
<span style="color: cyan;">▲</span>	Existing Wtr Source well
<span style="color: green;">▲</span>	Existing Wtr Monitor well
<span style="color: purple;">—</span>	Drainage Area
<span style="color: red;">—</span>	Development Area
<span style="color: green;">—</span>	CD Project Area
<span style="color: orange;">—</span>	Original Pilot Approval Area

## Section 3.1.1(3a)

# Artificial Lift

- Electric Submersible Pumps (ESP)
  - P3/P5/P6 (basal water wells) supplied by Baker Hughes
    - Variable frequency drives
    - Pump range between 125-600 m<sup>3</sup>/d
    - Design temperature of 230°C
      - P3 shut-in May 2014 due to high producing water cut
      - P5 shut-in Jun 2014 due to high producing water cut
      - P6 shut-in Jul 2014 due to high producing water cut
  - P7-P10 pumps supplied by GE
    - Pump range between 175-600 m<sup>3</sup>/d
  - Smaller pump installed in P7 with more gas handling equipment
    - Pump range between 100-400 m<sup>3</sup>/d
    - Design temperature of 230 °C

# Artificial Lift continued

- Original pump in P8 (same as P9/P10) was determined to be oversized with insufficient gas handling capabilities - replaced September 2014 with similar pump installed in P7
  - **Well performance greatly improved after pump change**
  - P9 and P10 pumps were also identified for replacement due to similar performance issues as P8, but well workovers were deferred due to capital constraints
- P7 pump shaft failed Jan 3 2015 – was not repaired; well subsequently shut-in

# Suspension Schedule - Well Types

- SAGD production wells – ***Suspended***
- SAGD steam injection wells - ***Suspended***
- Water source wells – ***scheduled to complete in September***
- Class 1B disposal wells – ***scheduled to complete in September***
- Observation wells will remain and continue to monitor temperature and pressure
- The wells will be suspended in a manner that will ensure they remain in a safe state during the suspension period in accordance to *AER Directive 13*

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## Scheme Performance

July 31, 2015

# Project Activities

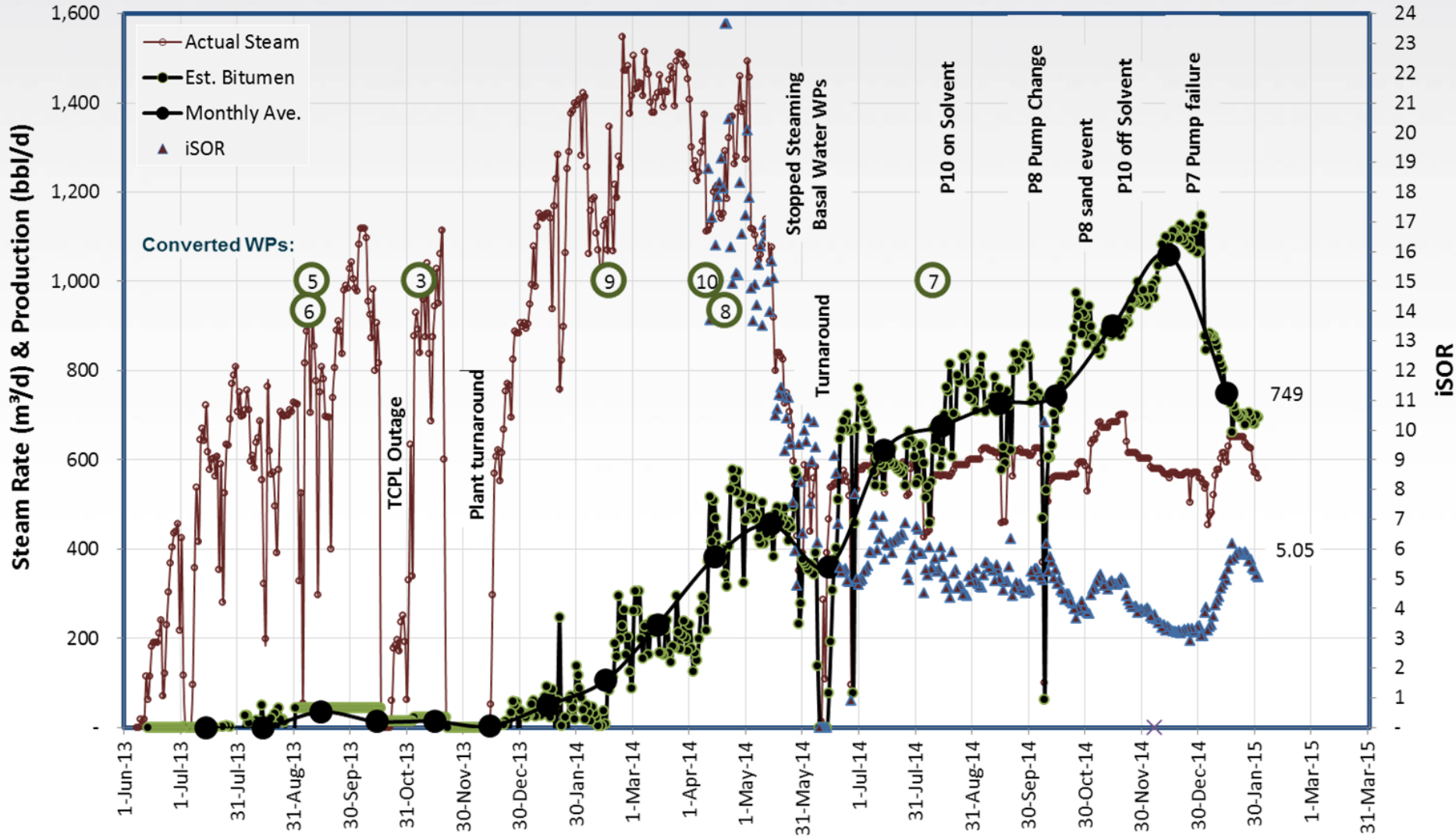
- WP7 converted to SAGD operation mid-Aug 2014
- SC-SAGD process
  - WP10 - began Aug 20, 2014
  - WPs 7 to 9 solvent injection initiated mid-Oct 2014
- Production uplift & SOR reduction observed in almost all SC-SAGD WPs
  - Early Dec 2014 solvent injection ceased in WPs 7 & 10 and reduced by half in WPs 8 & 9
- Injection and production rates were reduced late Dec - early Jan 2015 to balance local pad pressure with regional upper transition zone & bottom water zone
- Production ceased Feb 16, 2015 with gas injection initiated to delay chamber collapse
- CPF Suspended Mar 23, 2015



## Section 3.1.1(7)

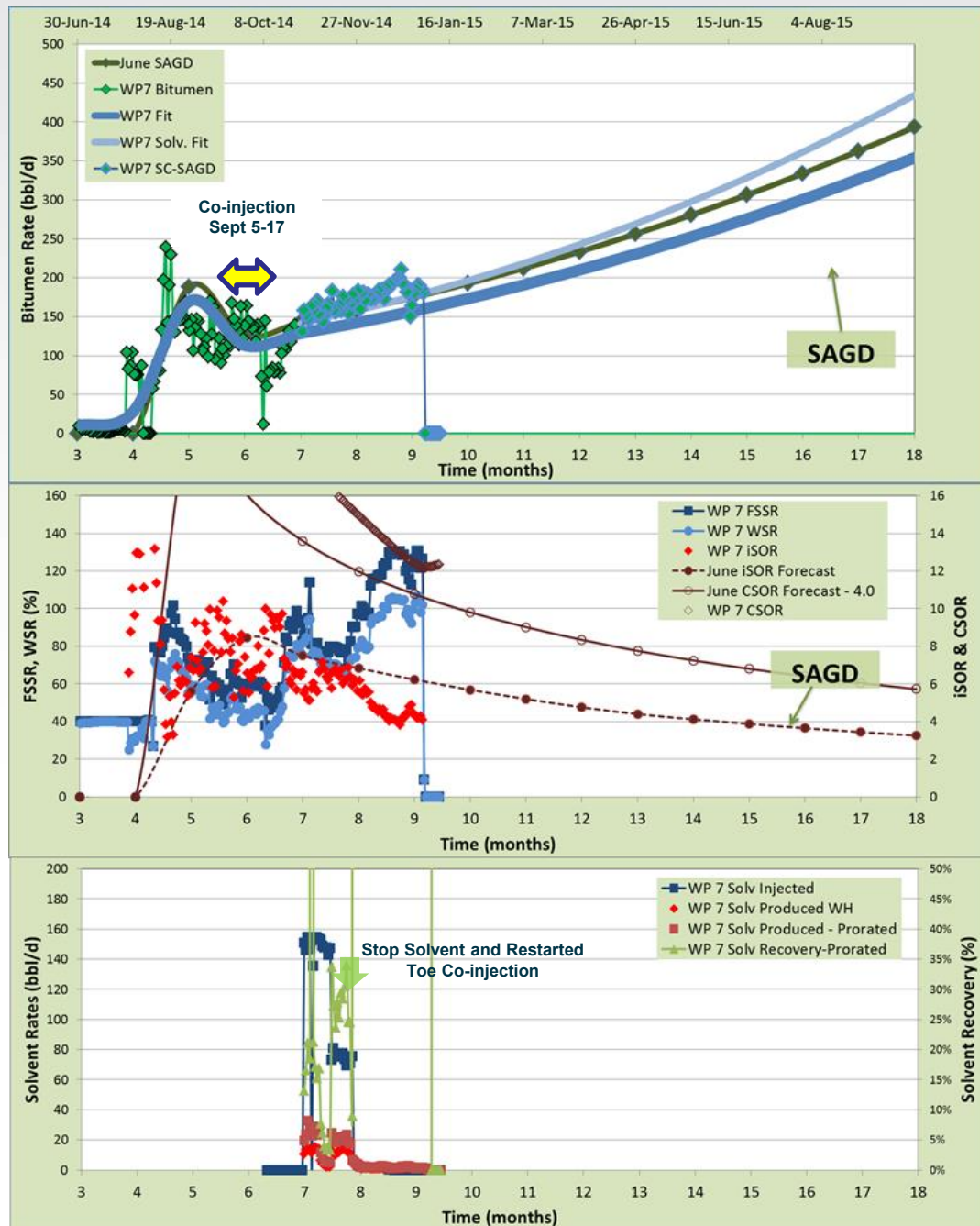


# Performance



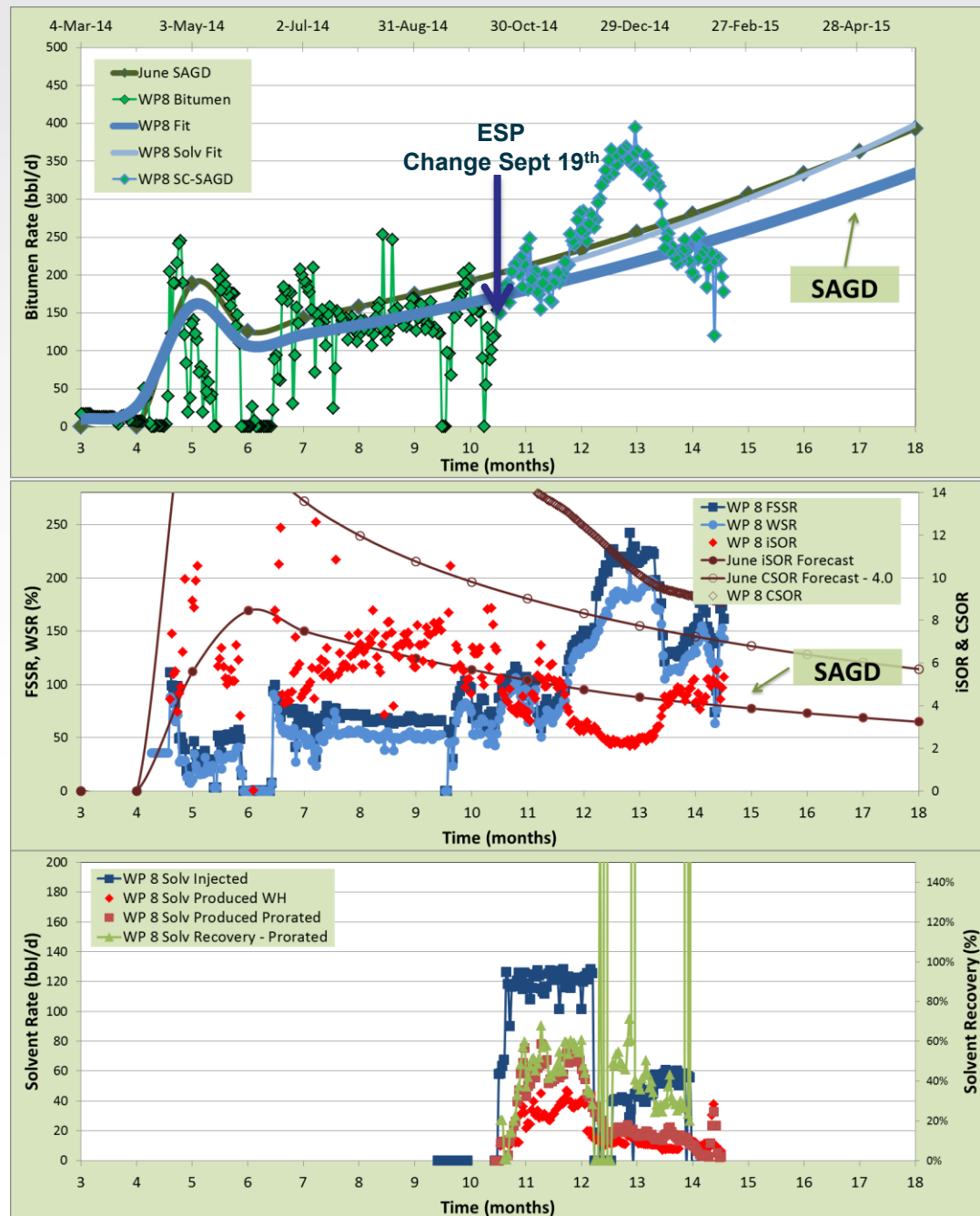
# WP 7 Performance

- Converted to SC-SAGD Oct 28 2014
- Production improved with solvent but not enough to continue
- Solvent ceased Nov 21 2014, no negative effect observed
- WP was young but still tracking type curve
- Pump failed mid-Jan 2015
- Well was shut-in on Jan 3 2015
- Gas injection initiated Feb 7 2015 (82 Sm<sup>3</sup>/d) and ended Mar 22 2015



# WP 8 Performance

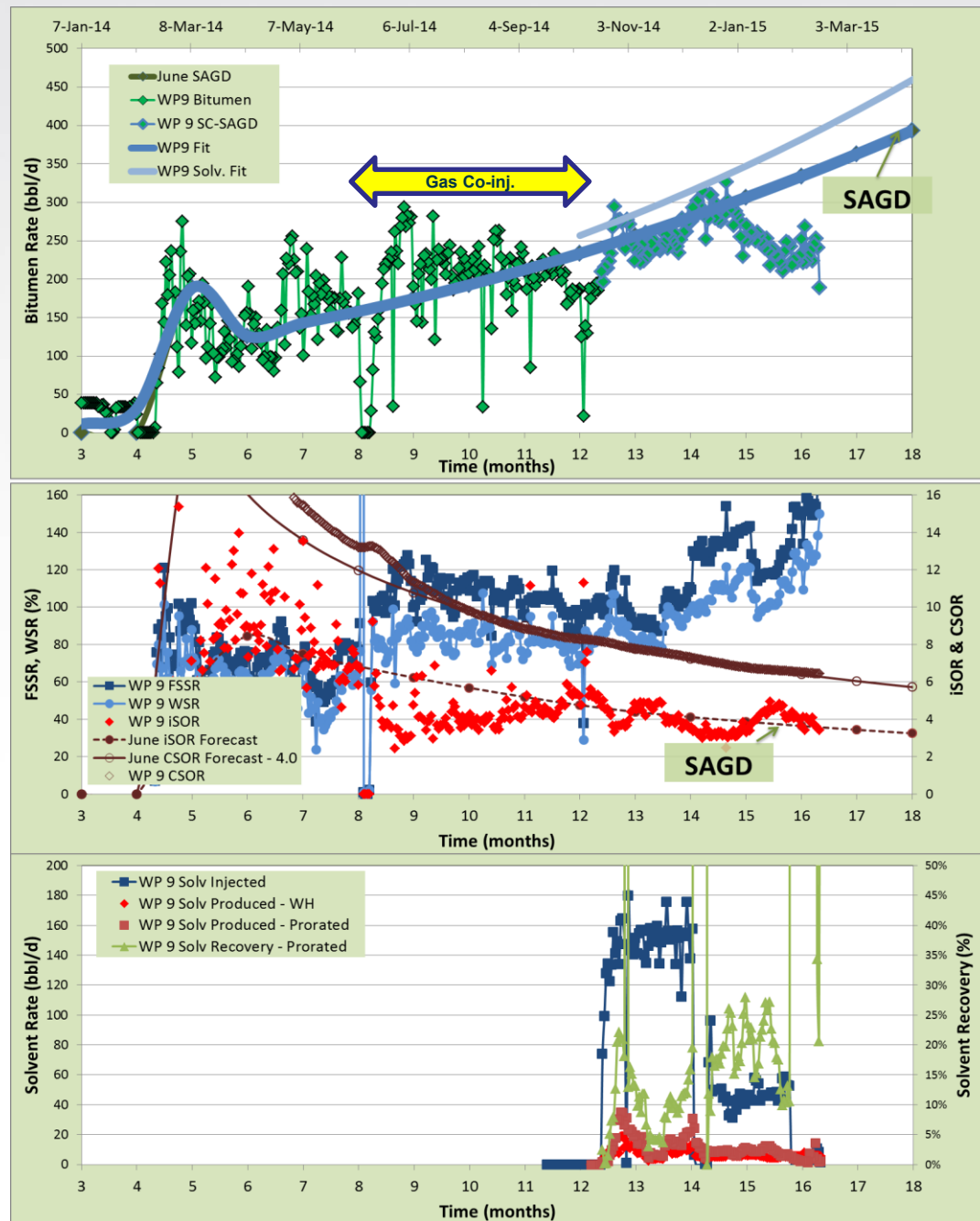
- Converted to SC-SAGD Oct 16 2014
- Pump change in Sept 2014 to improve production capability; rates also improved aided by solvent
- Higher solvent returns compared to others WPs
- Solvent injection ended on Jan 29 2015
- Well was shut-in on Feb 16 2015
- Gas injection initiated Feb 16 2015 (96 Sm<sup>3</sup>/d) and ended Mar 22 2015



# WP 9 Performance

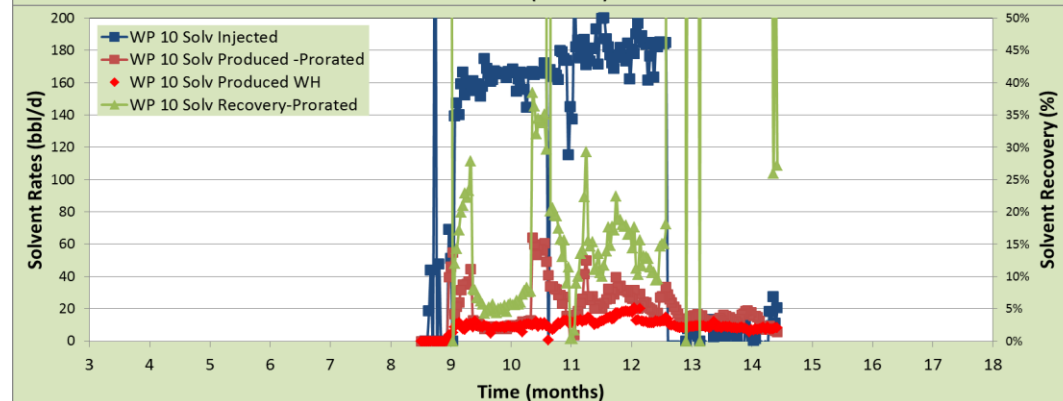
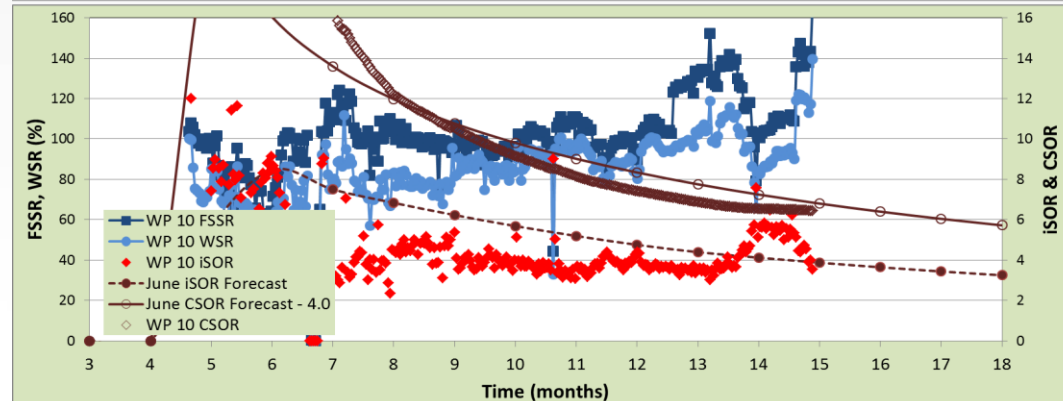
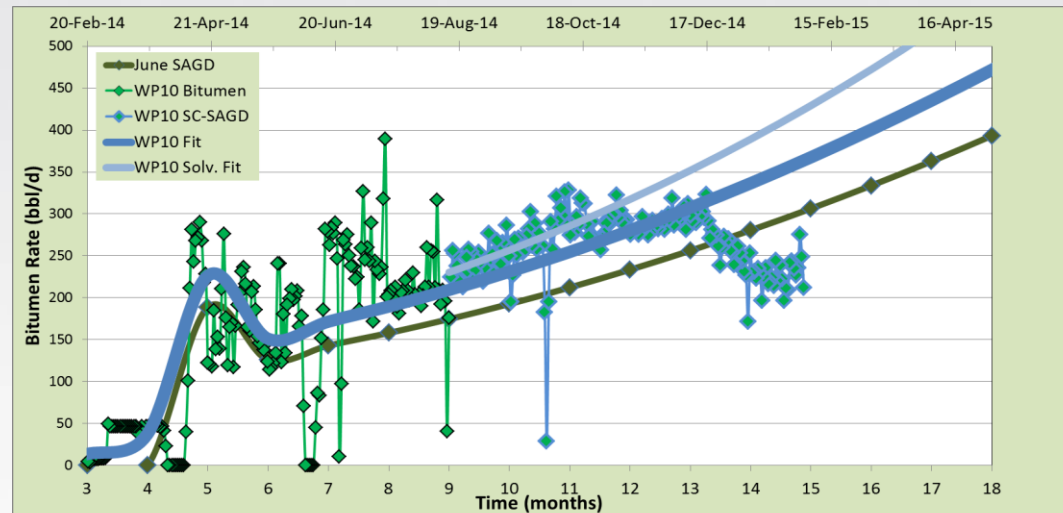
- Converted to SC-SAGD Oct 18 2014
- Recovered from initial dip in FSSR\* after stopping gas co-injection
- Recent production below SC-SAGD forecast following lower solvent rates
- Production limited due to gas production, candidate for possible pump change
- Solvent injection ended Jan 29 2015
- Well was shut-in on Feb 17 2015
- Gas injection initiated Jan 29 2015 (75 Sm<sup>3</sup>/d) and ended Mar 22 2015

\*FSSR – fluid to steam + solvent ratio

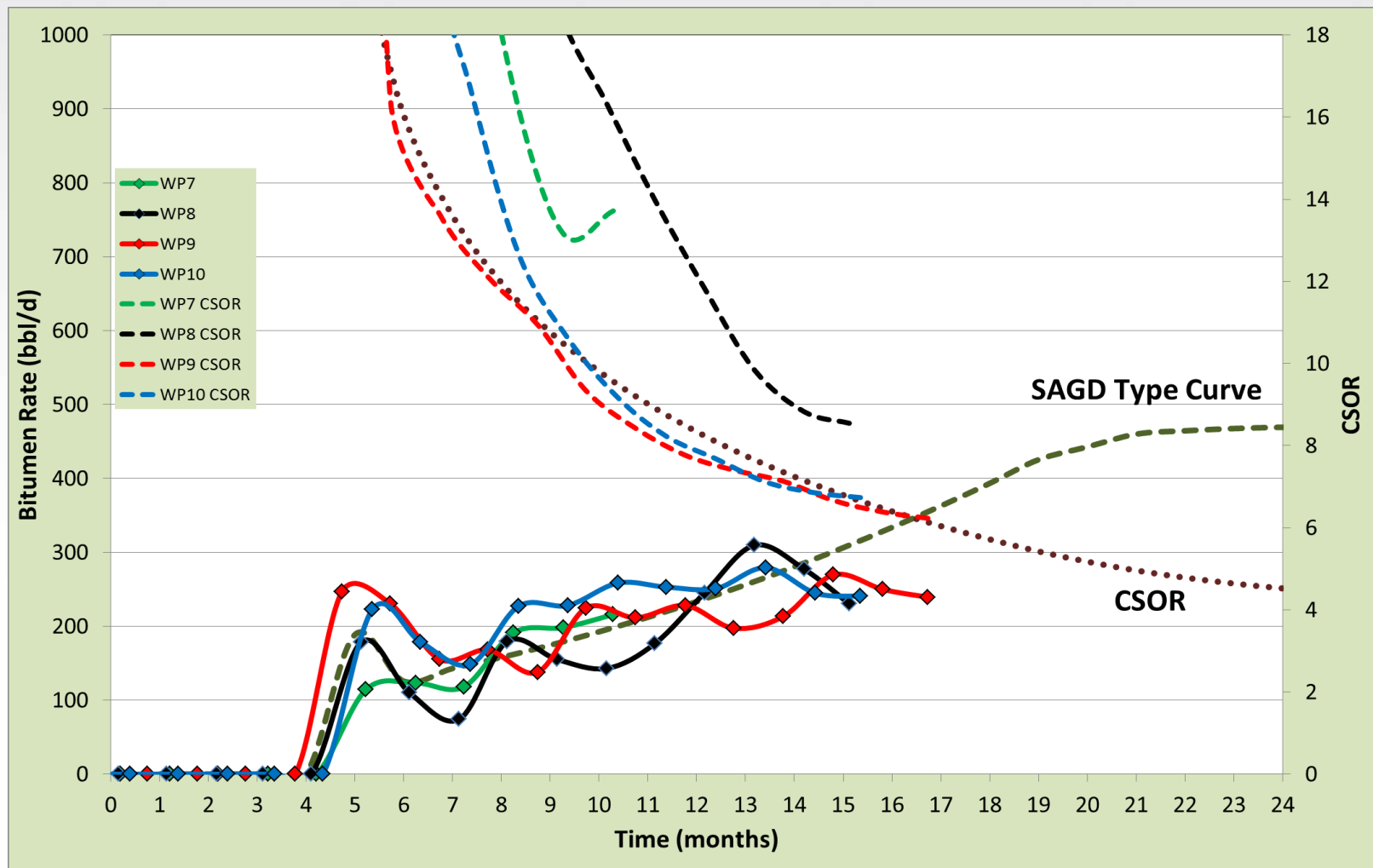


# WP 10 Performance

- Converted to SC-SAGD Aug 20 2014
- Production remained flat from mid-Oct 2014
- Recent decline due to
  - active management of pressure decline
  - excessive gas production, a candidate for pump change once operation is re-started
- Positive solvent response and recovery consistent with model (refluxing)
- Solvent injection ended on Dec 7 2014
- Well was shut-in on Feb 17 2015
- Gas injection initiated Feb 17 2015 (50 Sm<sup>3</sup>/d) and ended Mar 22 2015



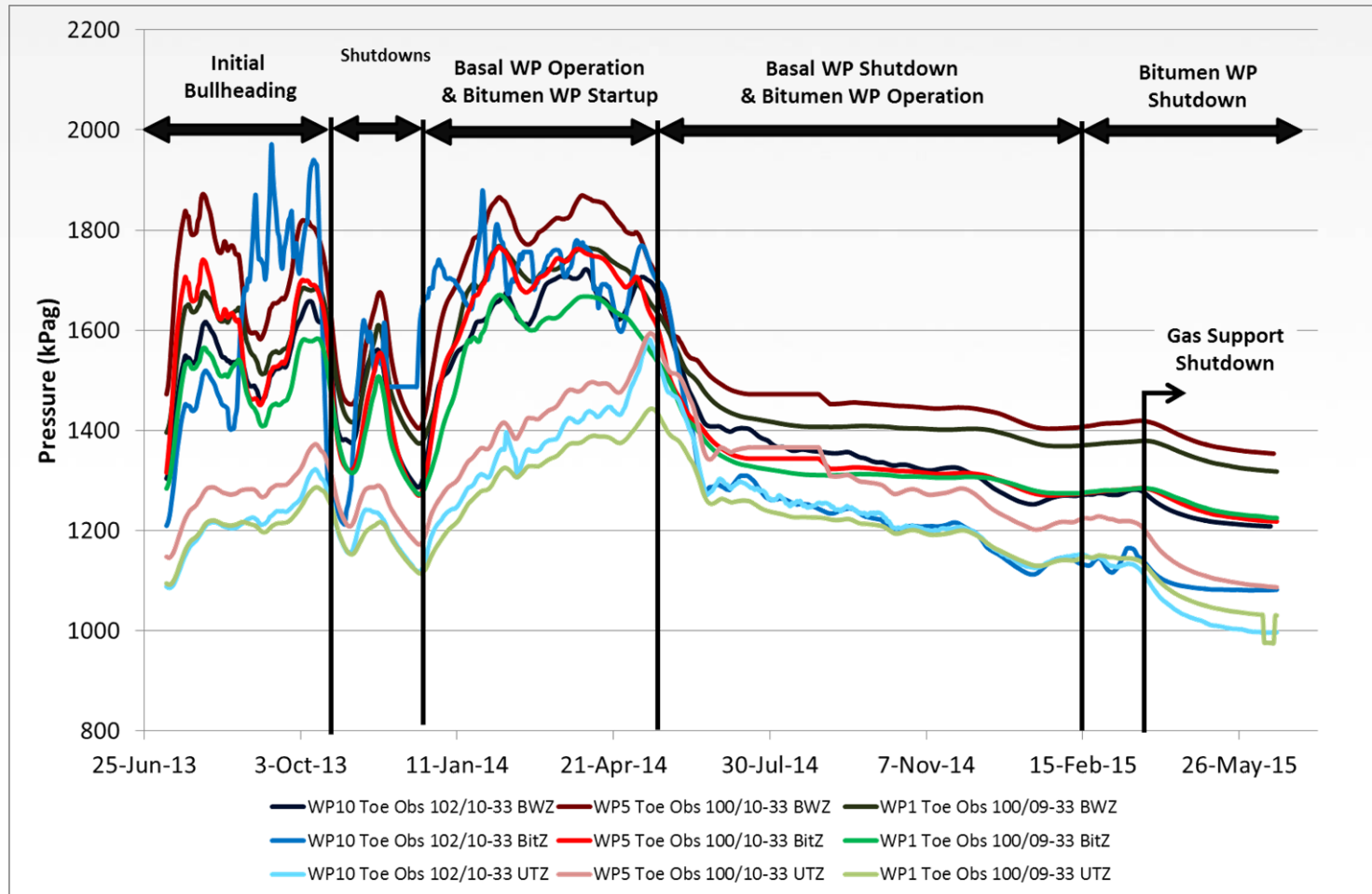
# WP Overall Performance



- Overall performance tracking type curve

# Reservoir Pressure

- Reservoir chamber pressure responded to changes in operations
- Gas injection used briefly to sustain chamber pressures following shut-in, shut off Mar 23 2015 as part of final plant suspension

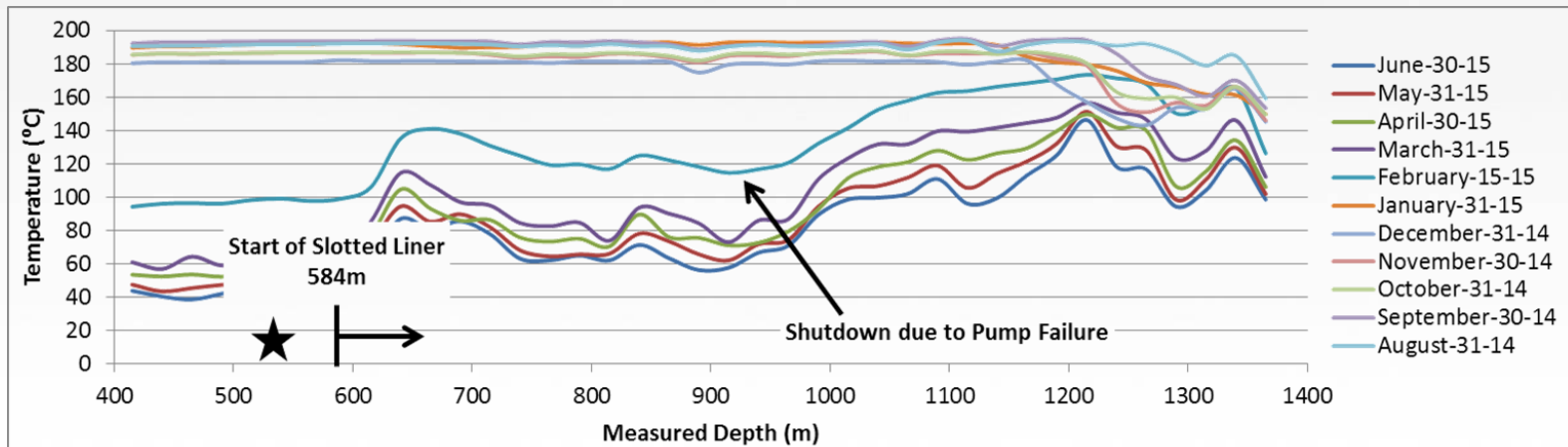


## Section 3.1.1(7d)

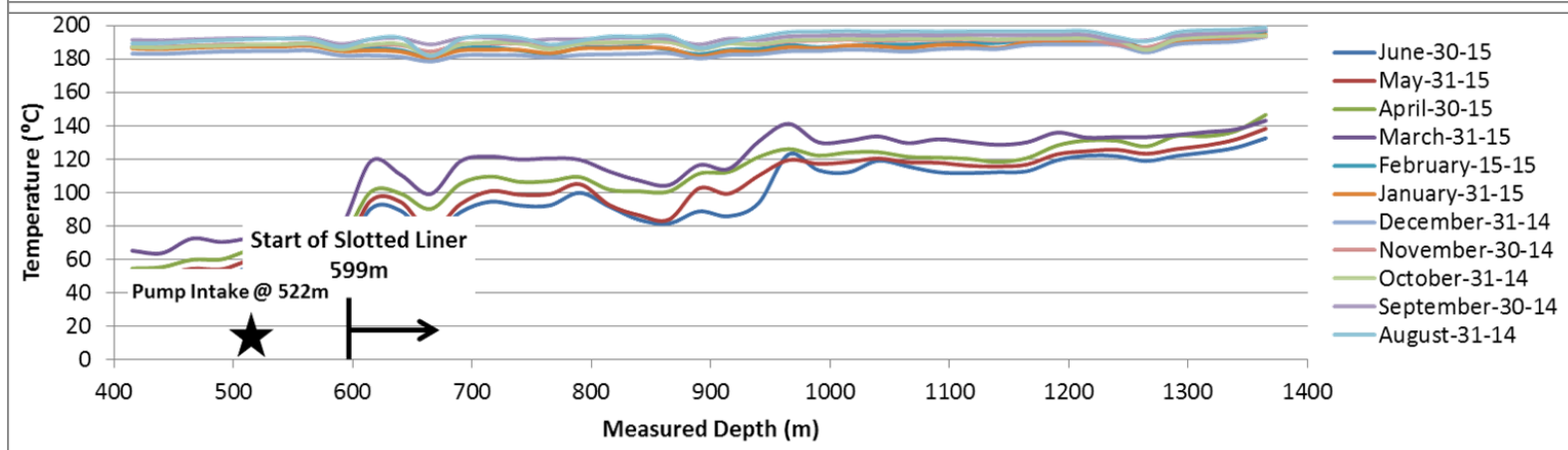
# WP Horizontal Temperatures

- Chambers cooled following SAGD suspension and initiation of gas injection to delay chamber collapse

WP 7



WP 8

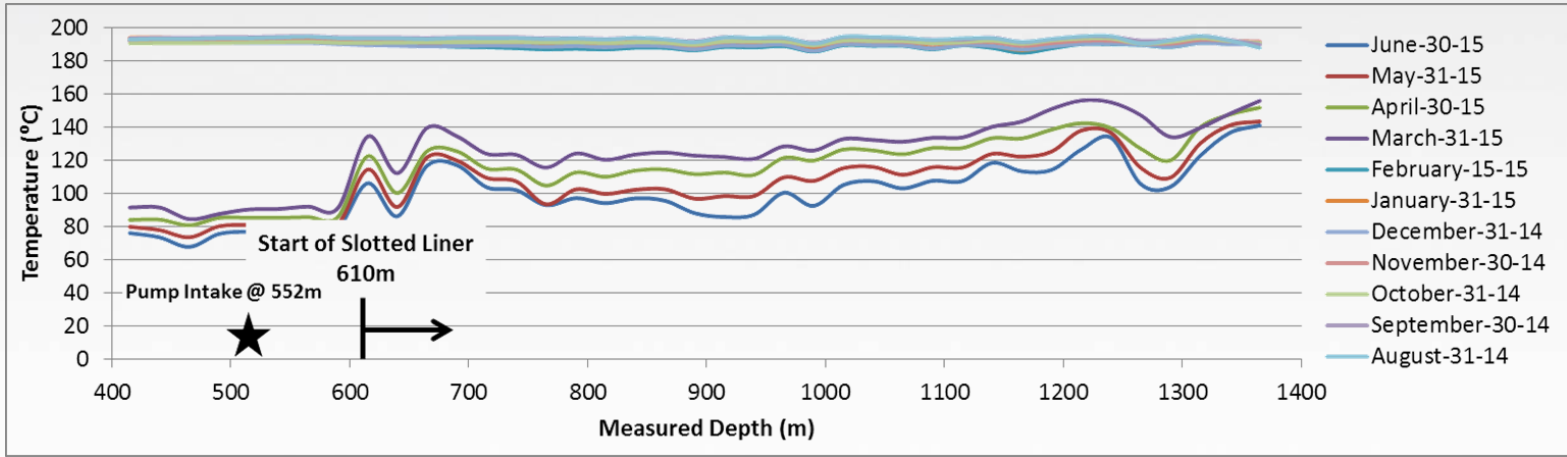


Section 3.1.1(7d)

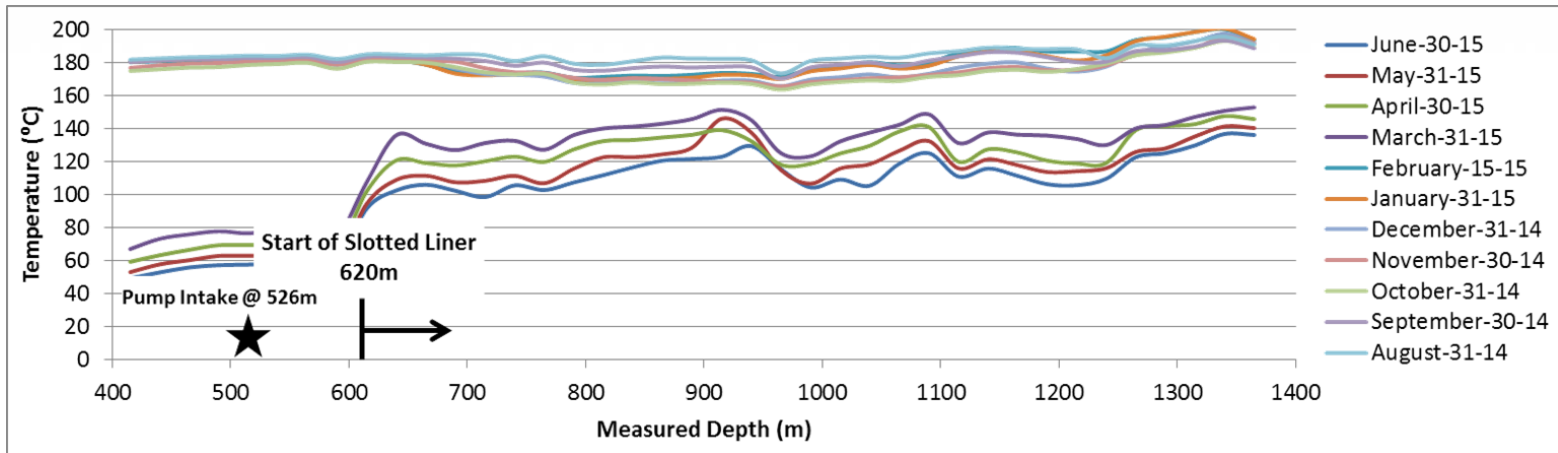


# WP Horizontal Temperatures

**WP 9**



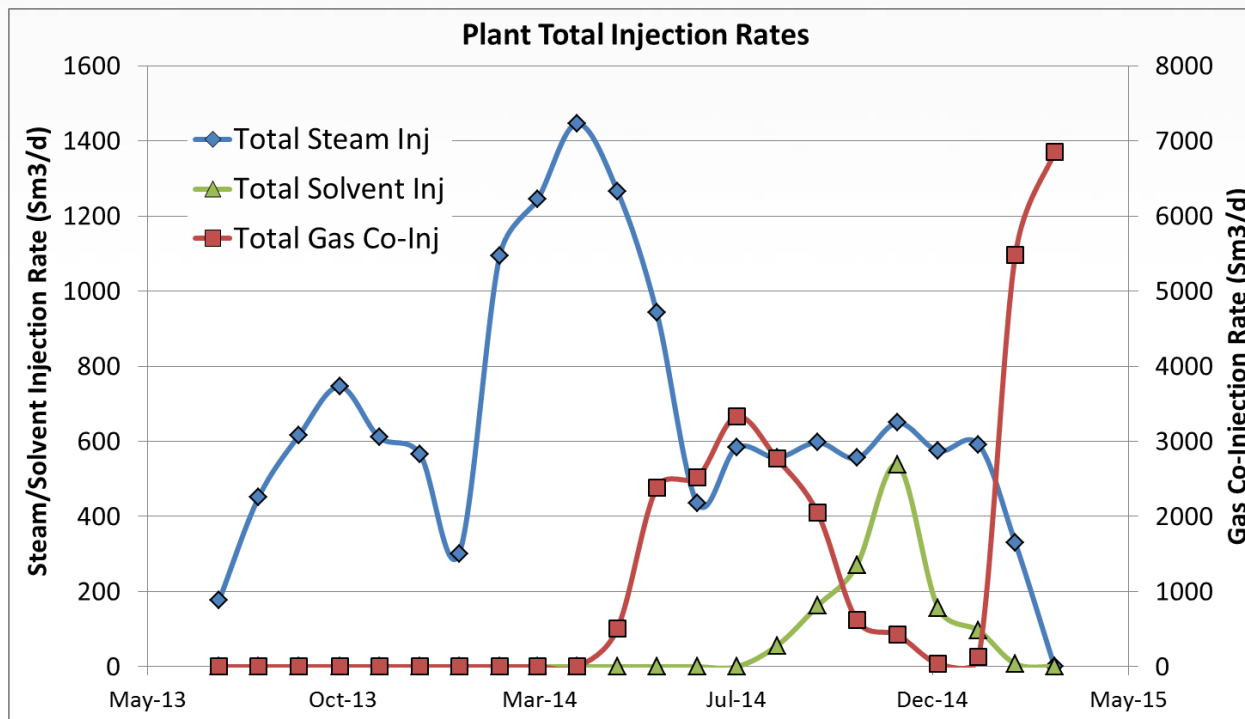
**WP 10**



## Section 3.1.1(7d)

# Steam Properties and Co-injection

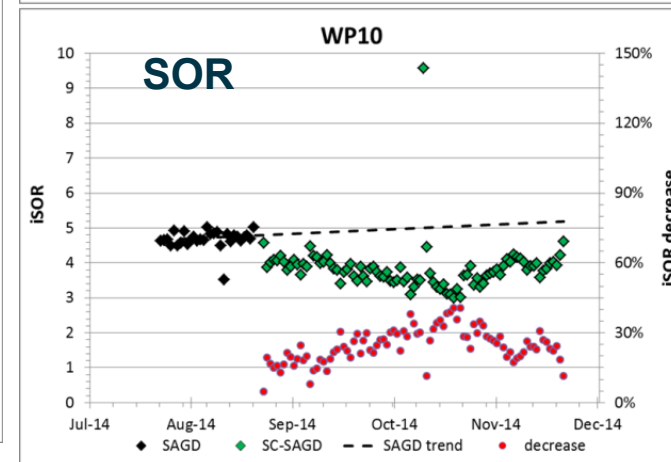
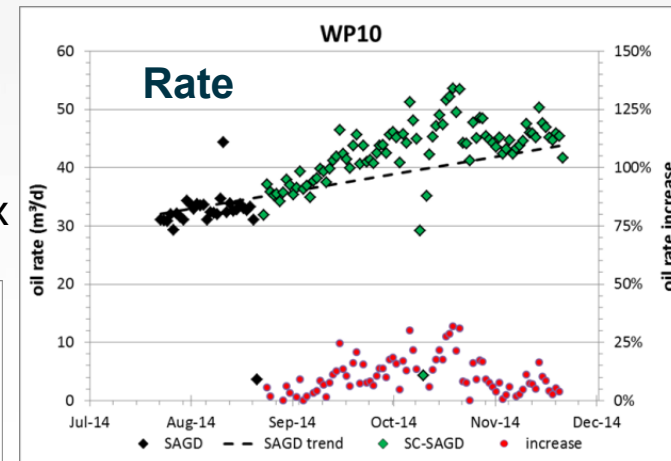
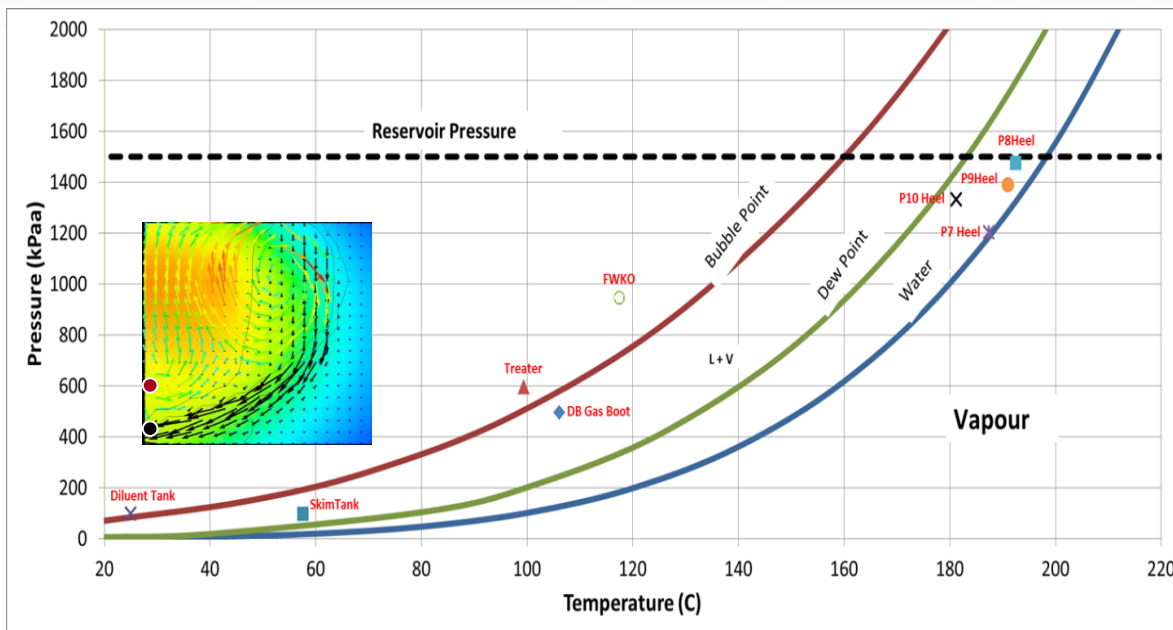
- Injected Steam properties: 3,000 kPag @ 235°C header conditions, 99% quality
- Solvent co-injection @ 5-15vol%
- Non-condensable gas co-injection/injection
  - Methane @ 0.7-1.5% mole fraction



## Section 3.1.1(7d,7e)

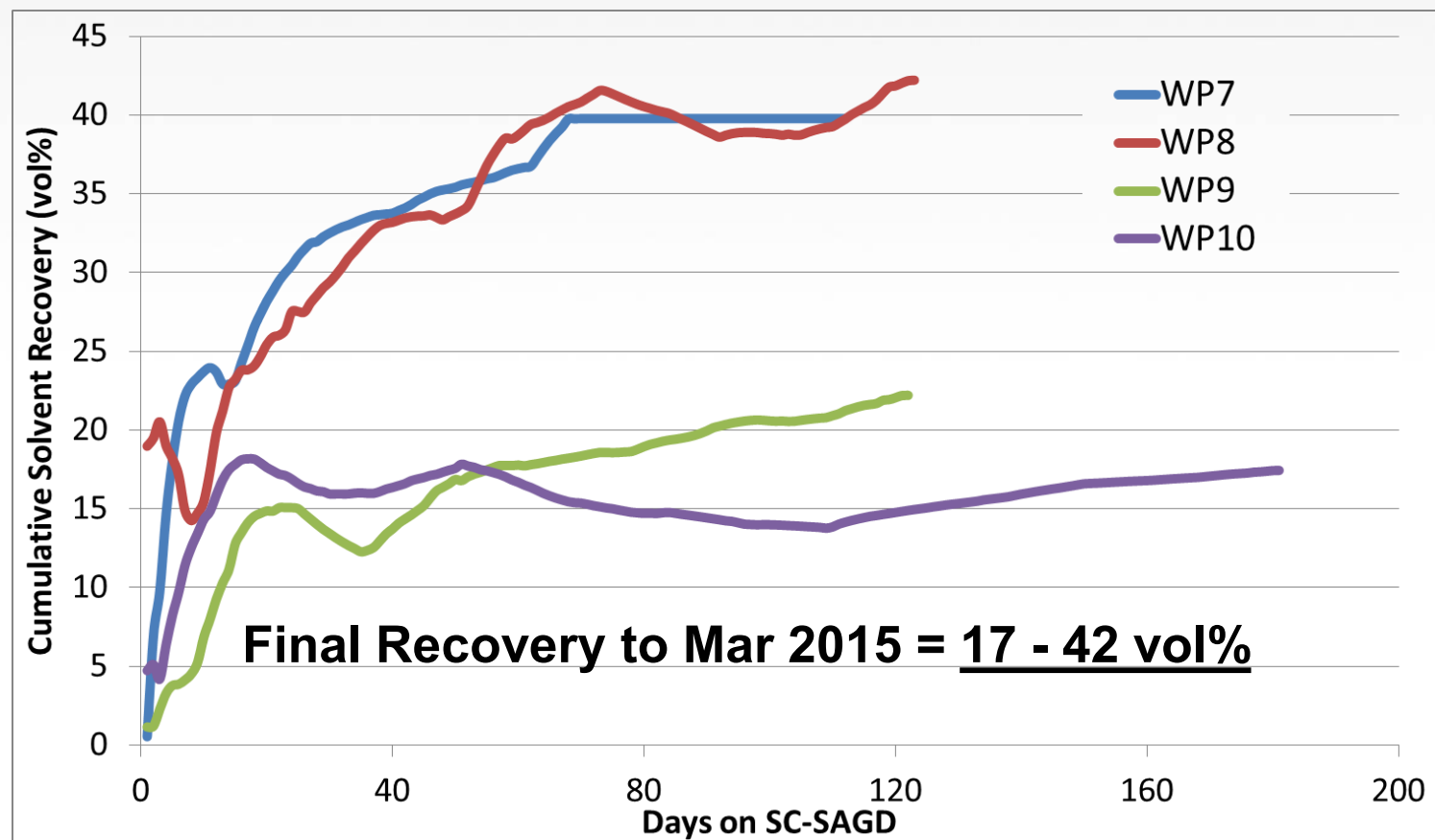
# SC-SAGD Performance

- SC-SAGD was tested to provide calibration data for reservoir models. An optimized process will be developed for future phases.
- Four WPs located in the Bitumen Saturated Zone have been operated with diluent (solvent) co-injection
- Sustainable improvement observed:
  - Rate uplift in the range of 5% - 26%
  - SOR reductions range from 10% - 20%
  - Wells operated at low subcool resulting in solvent reflux



# Solvent Recovery

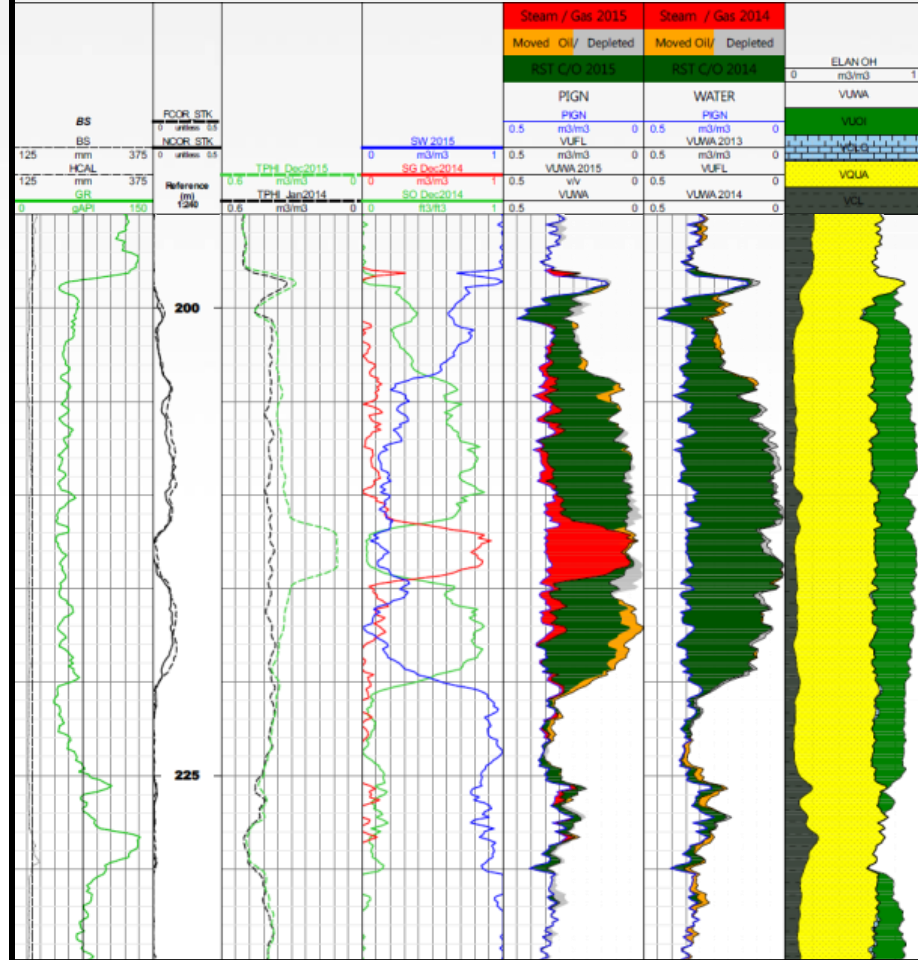
- Solvent reflux due to operating subcools resulted in lower solvent returns
  - Solvent recovery strongly dependent on gas production rate
  - Additional solvent recovered during final blowdown before suspension



# 2015 RST Logs (two wells logged in 2015)

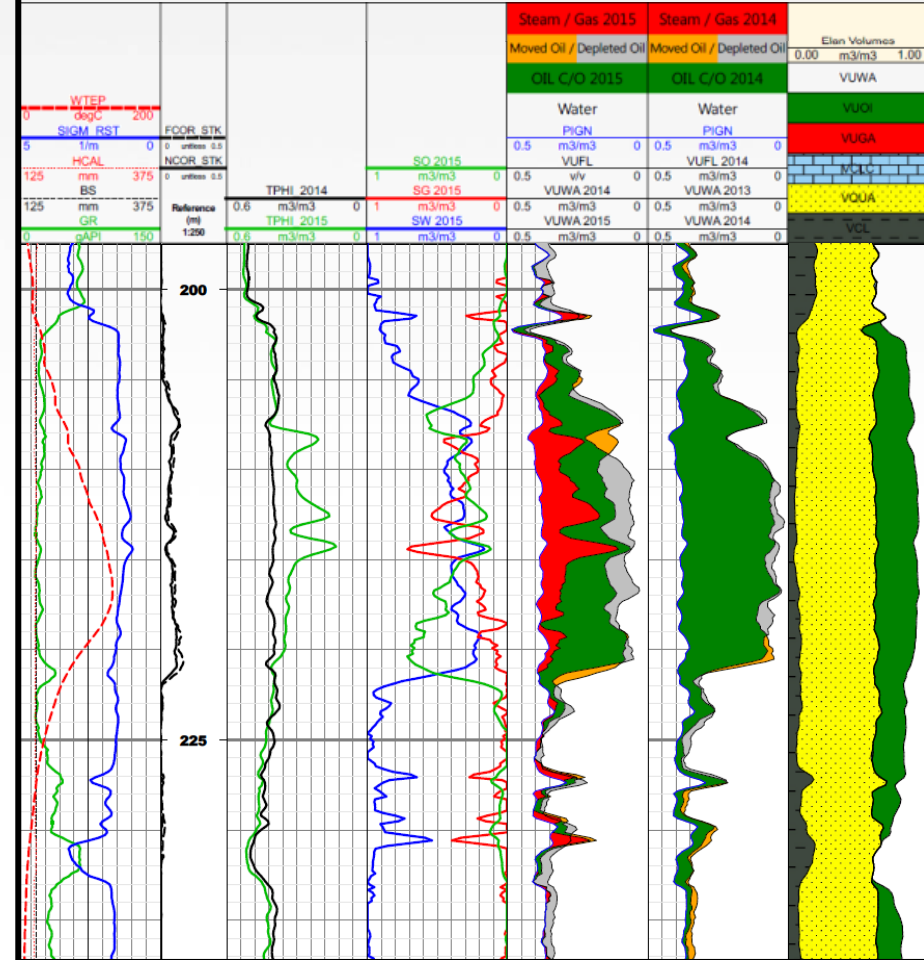
## 02/15-33-84-22W4 – WP 10 Mid

Feb 2015      Feb 2014

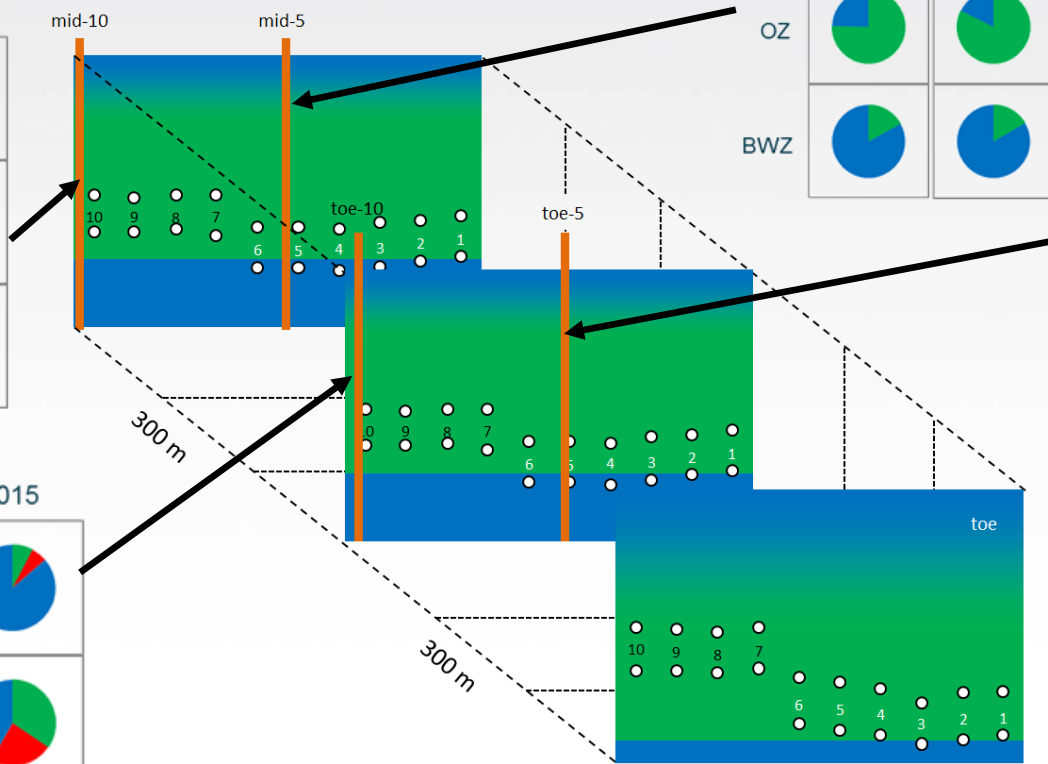
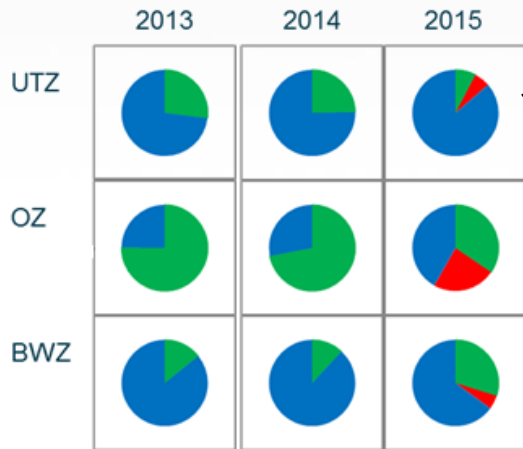
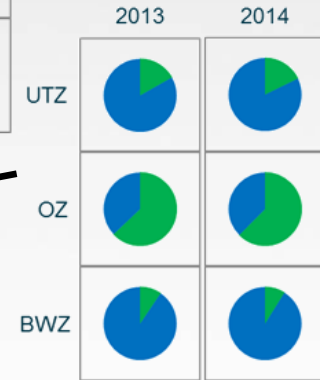
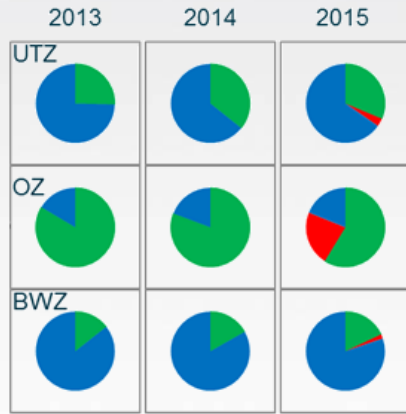


## 02/10-33-84-22W4 – WP 10 Toe

Feb 2015      Feb 2014



# RST Logs Overview



## Saturation Pie Charts

**Green = Bitumen**

**Blue = Water**

**Red = Gas**

- Latest RST Logs of WP10 OBS wells show chamber growth and bitumen sag into Basal Water Zone

# RST Logs Observations

- RST shows reduction in bitumen saturation up to 6m above injector at toe and 2.5m above injector at mid of WP10
- No steam temperatures observed at this OBS well, indicating gas saturation is likely composed of NCG and Solvent
- Increase in bitumen saturation below the producer suggests bitumen loss to the bottom water but above the basal water mudstone
- Bitumen drainage into the clean water sand above the basal water mudstone is observed, consistent with our hypothesis

# Summary of Key Scheme Insights

- Fluid losses to upper transition zone managed through changes in operating pressure, steam injection rates and utilization of gas co-injection
  - Improved understanding of relationship between FSR and upper transition zone/bottom water zone pressure management
- SC-SAGD operation demonstrated consistent production uplift and solvent recovery up to 42vol%
- Learnings from the Germain Phase 1 Project are being applied to Phase 2 development



next steps

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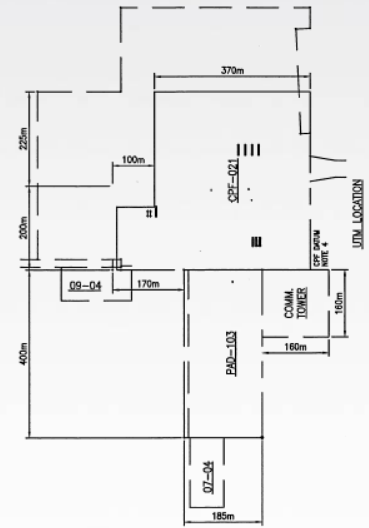
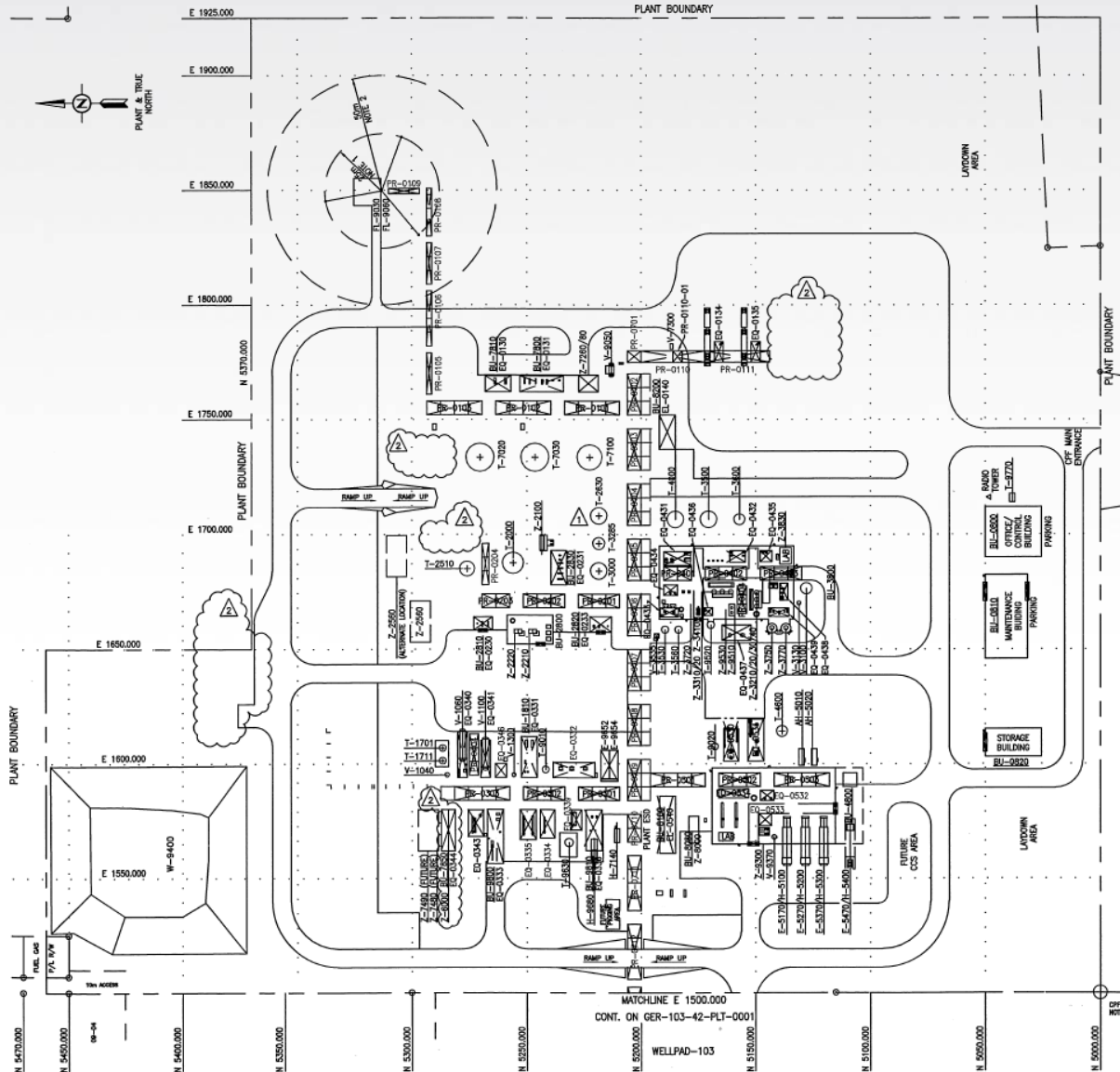


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**Subsection 3.1.2**  
**Surface Operations, Compliance, and Issues Not**  
**Related to Resource Evaluation and Recovery**

July 31, 2015

# Detailed Site Survey Plan



**NOTES**

1. REQUIRED MINIMUM DISTANCE FROM PROCESS EQUIPMENT.
2. REQUIRED MINIMUM DISTANCE FROM OIL STORAGE TANK.
3. SEE MECHANICAL EQUIPMENT LIST GER-021-4514-0001 FOR FULL LIST OF EQUIPMENT.
4. OFF DATUM  

PLANT GRID	= N. 5000.000
	= E. 1500.000
UTM WAD 83	= N. 6,246,186.770
	= E. 351,139.076

CPF & WELLPAD:  
PLANT EL. 100.000  
= 609.800 GEODETIC

**HOLD**

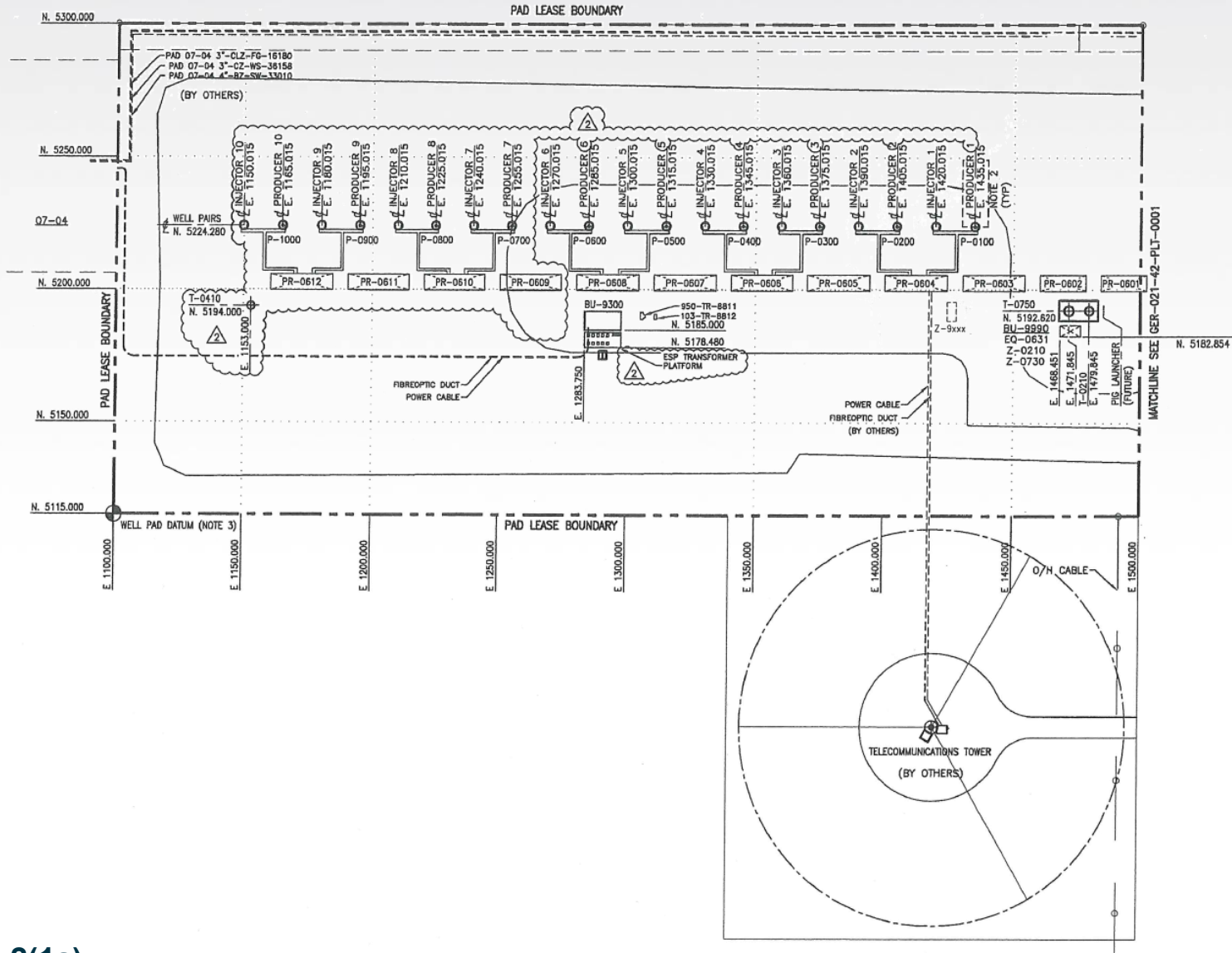
1. LOCATION TO BE CONFIRMED.

**LEGEND**

- EQUIPMENT AND PIPERACK MODULES ONLY
- FUTURE CONSTRUCTION
- FENCE
- TRANSFORMER
- BUILDING SUMP

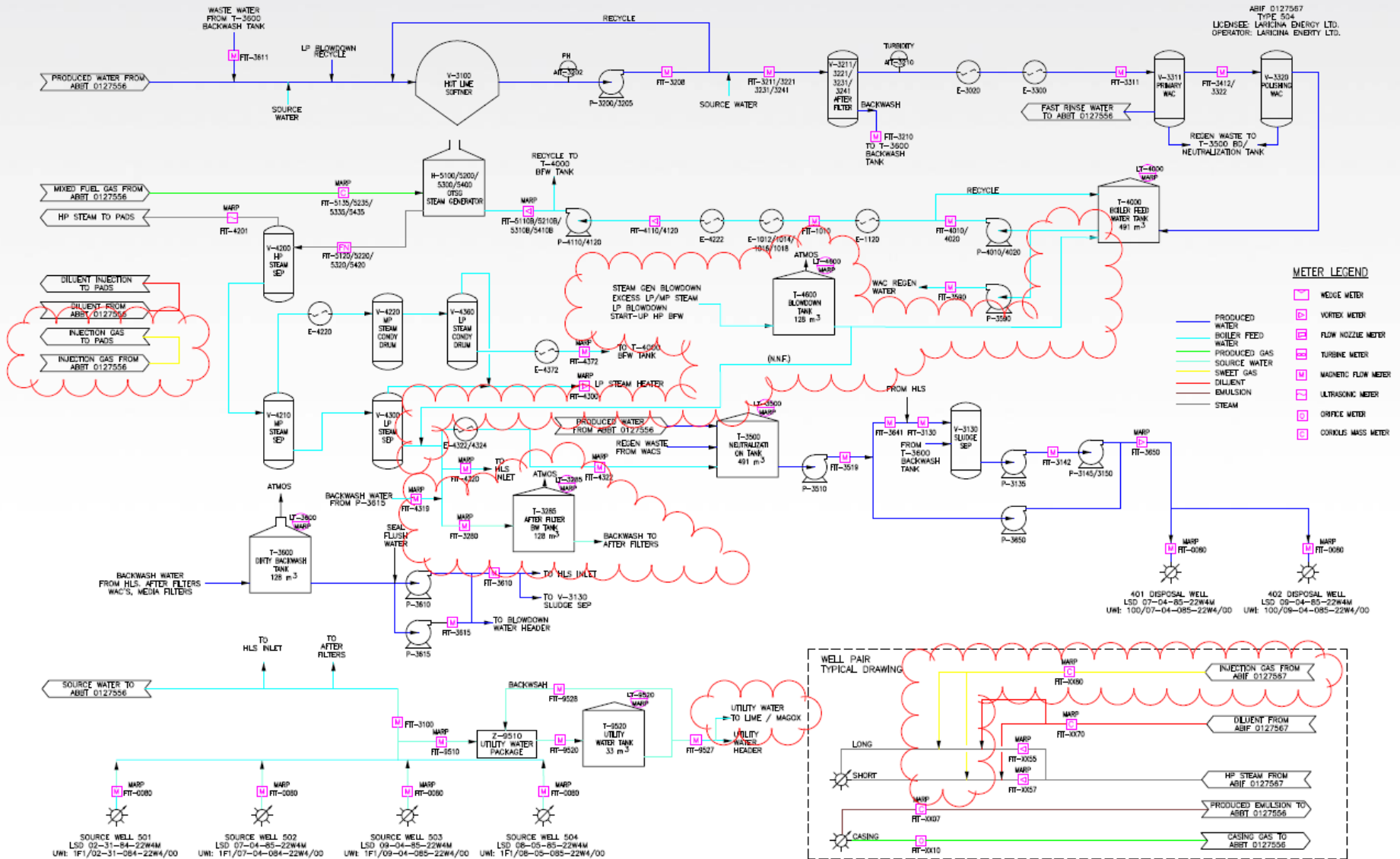
**Section 3.1.2(1a)**

# Well Pad Site Survey Plan

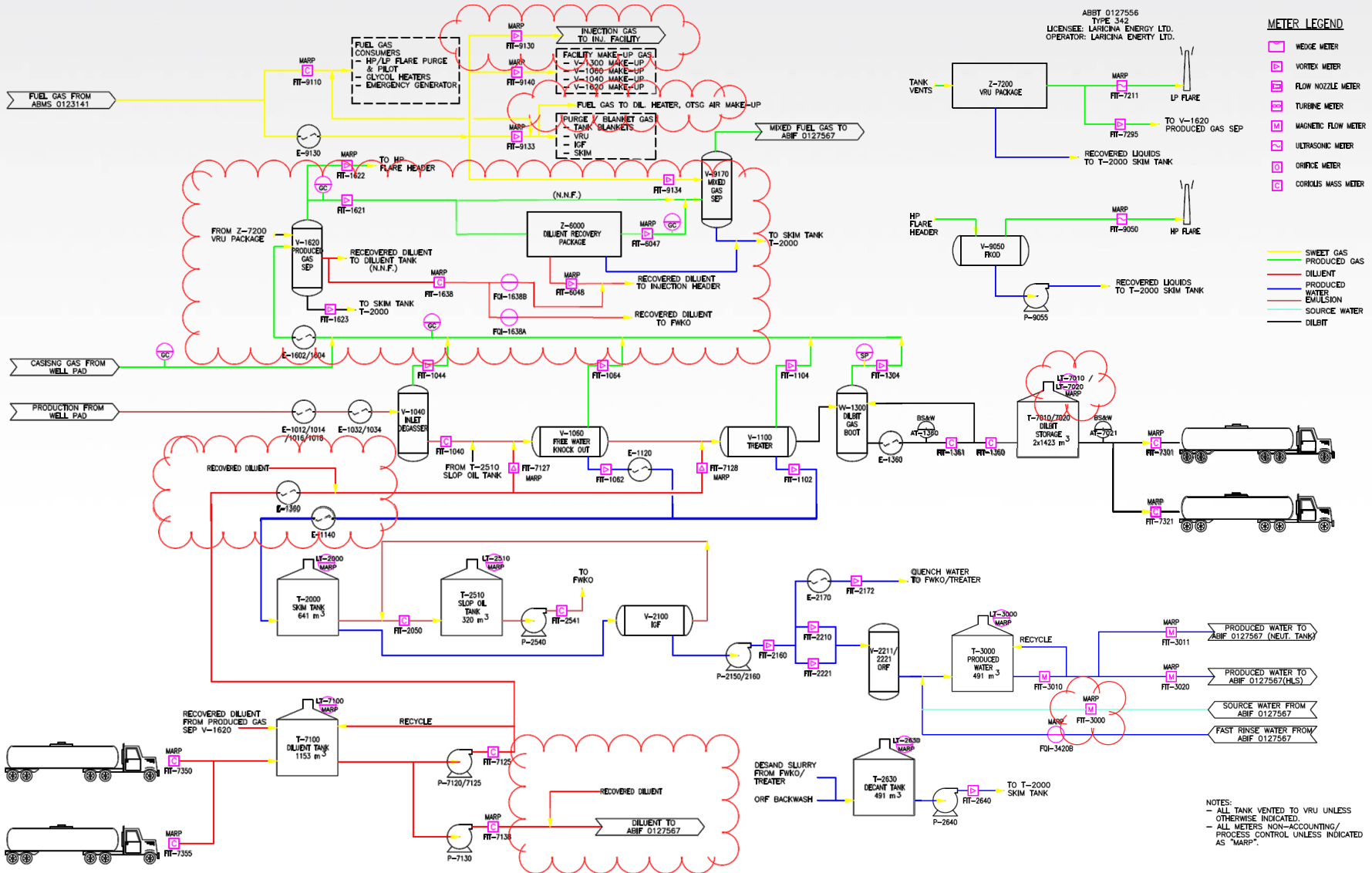


## Section 3.1.2(1a)

# Plant Schematic – Injection Facility



# Plant Schematic – Production Facility



# Facility – Key Events

- Ramped up bitumen and water treating operations throughout 2014 and the start of 2015
- Bitumen production >1000 bbl/d in Dec 2014
- New WACs ordered and installed
- Implemented dirty backwash water recycle to HLS in December to meet AER water recycle requirements
- Plant suspension and mothballed Mar 2015

# Facility Performance

## Bitumen treating

- Consistent treatment of produced bitumen was achieved with BS&W of <0.5 % and density >960 kg/m<sup>3</sup>

## Water treatment

- HLS design and operating issues
  - Maintaining the HLS bed greatly improved after modification completed
  - Modifications completed to improve operating performance
  - New flocculent skid installed
- Source water contains solution gas (with no detectable H<sub>2</sub>S) that negatively impacted WAC performance
  - Source water is directed to the Produced Water Tank (PWT) and any evolved gas is collected by the VRU
  - Utility water system still contains gas as it tees off before the PWT. D60 waiver has been requested; waiting on AER approval to submitted D56 amendment to increase venting volume

### Section 3.1.2(2a-c)

# Facility Performance

## Steam Generation

- Operated 2 of 4 OTSG's before shutdown as only 4 WPs are operating

## Additional challenges include:

- Glycol heat trace system balancing issues resulted in freezing of lines
- Installed booster pumps in several locations to prevent line freezing



# Plant Modifications

- Diluent Recovery Unit (DRU) installed and commissioned in spring 2014
- Start-up Tank modifications have been completed to deal with emulsion carry-over
- Water treatment modifications
  - Modified HLS internals to help stabilize bed formation
  - Increased the temperature of the source water entering the Produced Water Tank
- Installation of a bypass line around the disposal stream meter as per the MARP
- Installation of Magnetic Resonance (MR) water cut meter for testing

# Facility Power

<b>2014/2015</b>	<b>Power Imports (kWh)</b>	<b>Power Generation (kWh)</b>	<b>Power Exports (kWh)</b>
<b>August</b>	1,294,580	0	0
<b>September</b>	1,284,290	0	0
<b>October</b>	1,352,250	0	0
<b>November</b>	1,493,750	0	0
<b>December</b>	1,446,840	0	0
<b>January</b>	1,434,800	0	0
<b>February</b>	1,187,210	0	0
<b>March</b>	700,470	0	0

# Facility Gas Production

2014/2015	Produced Bitumen (m <sup>3</sup> )	Produced Gas (10 <sup>3</sup> m <sup>3</sup> )	Purchased Fuel Gas (10 <sup>3</sup> m <sup>3</sup> )	Flared Gas (10 <sup>3</sup> m <sup>3</sup> )
August	3,333.1	147.8	1,467.5	11.1
September	3,591.7	183.8	2,089.3	9.0
October	3,674.4	278.6	2,167.9	17.3
November	4,298.4	286.8	2,333.2	80.6
December	5,208.6	356.9	2,228.3	35.5
January	3,872.8	245.4	1,506.4	0.0
February	1,884.6	245.5	719.4	9.4
March	0.0	0.0	256.1	0.0

- Produced gas is recovered and utilized as an OTSG fuel supply

# Summary of Environmental Greenhouse Gas Emissions

- Phase 1 GHG threshold for reporting both provincially & federally is 50 kilotonnes CO<sub>2</sub>e per year
- Laricina added this facility and its emissions in its annual participation in NPRI, GHG and CAPP Responsible Canadian Energy reporting
- In 2014 Laricina reported both provincially & federally 81.30 kilotonnes CO<sub>2</sub>e

# Measurement and Reporting

- All WPs have individual flow measurement installed at the wellhead (Coriolis mass meter) and a manual sample point for water cut determination
- Each well is deemed to be “on-test” at all times when it is producing
- Water cuts are measured daily and averaged to estimate the daily produced water and bitumen for each well
- On-line Magnetic Resonance (MR) water cut meter installed March 2014 to develop a comparison against manual water cuts and evaluate its future use as a primary continuous BS&W measurement device (**accepted for use in MARP, see following slides**)

# Measurement and Reporting

- Proration Factors:

Monthly	2014					2015						
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.
<b>Water Proration</b>	1.14	1.11	1.12	1.07	1.06	1.06	1.1	--	--	--	--	--
<b>Bitumen Proration</b>	0.99	0.94	0.93	1.01	0.96	0.96	1.07	--	--	--	--	--

\*Gas proration factor is always 1.0, per MARP

- Optimization
  - Since Aug 2014, proration factors showed gradual improvement, up until the month prior to the start of mothballing activities

# Measurement and Reporting

- On-line Magnetic Resonance (MR) water cut meter comparison against manual water cuts:
  - Operator factor represents manual cuts obtained by the operator and demonstrate greater variance
  - The meter allows for real time monitoring of water cuts, minimizing error associated with slug flow and operator error in sample collection
  - Presented to the AER on Nov 28, 2014 a proposal to use the MR meter as a primary BS&W measurement device in the MARP based on successful field testing results performed at the Germain project facility
    - **AER accepted Laricina's MARP amendment in Dec 2014**

# Measurement and Reporting

- In accordance with AER mandated annual facility MARP updates, the Germain MARP was submitted in Feb 2015 for review
  - In addition to the Feb 2015 MARP update, the MARP was also submitted in Aug 2014 and Oct 2014 to address various equipment additions, calculation changes/clarifications, and methodology updates that occurred throughout the course of last year

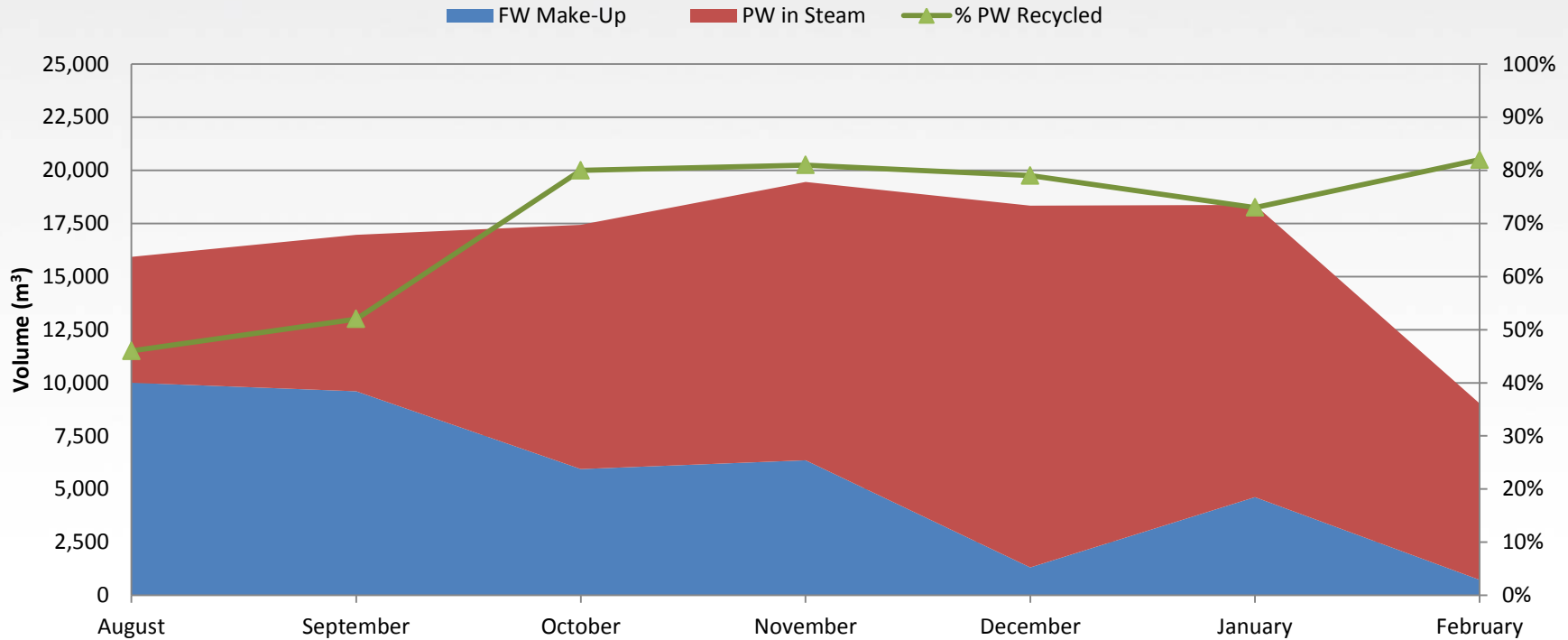


# UWI's of Source Water Wells and Water Disposal Wells

- Diversion licence (# 00330267-00-00) from ESRD for 4 Grand Rapids source water wells:
  - 1F1/07-04-085-22W4, 1F1/08-05-085-22W4, 1F1/09-04-085-22W4, 1F1/02-31-084-22W4
- One Class 1B Disposal Well Approval No. 11544
  - 100/02-31-084-22W4 (Grosmont A Formation)
- Two additional wells have been drilled and approved as 1B wells for disposal Approval No. 11799A
  - 100/07-04-085-22W4 (Grosmont A Formation)
  - 100/09-04-085-22W4 (Grosmont A Formation)

# Water Sources and Uses

## Water Sources and Recycle

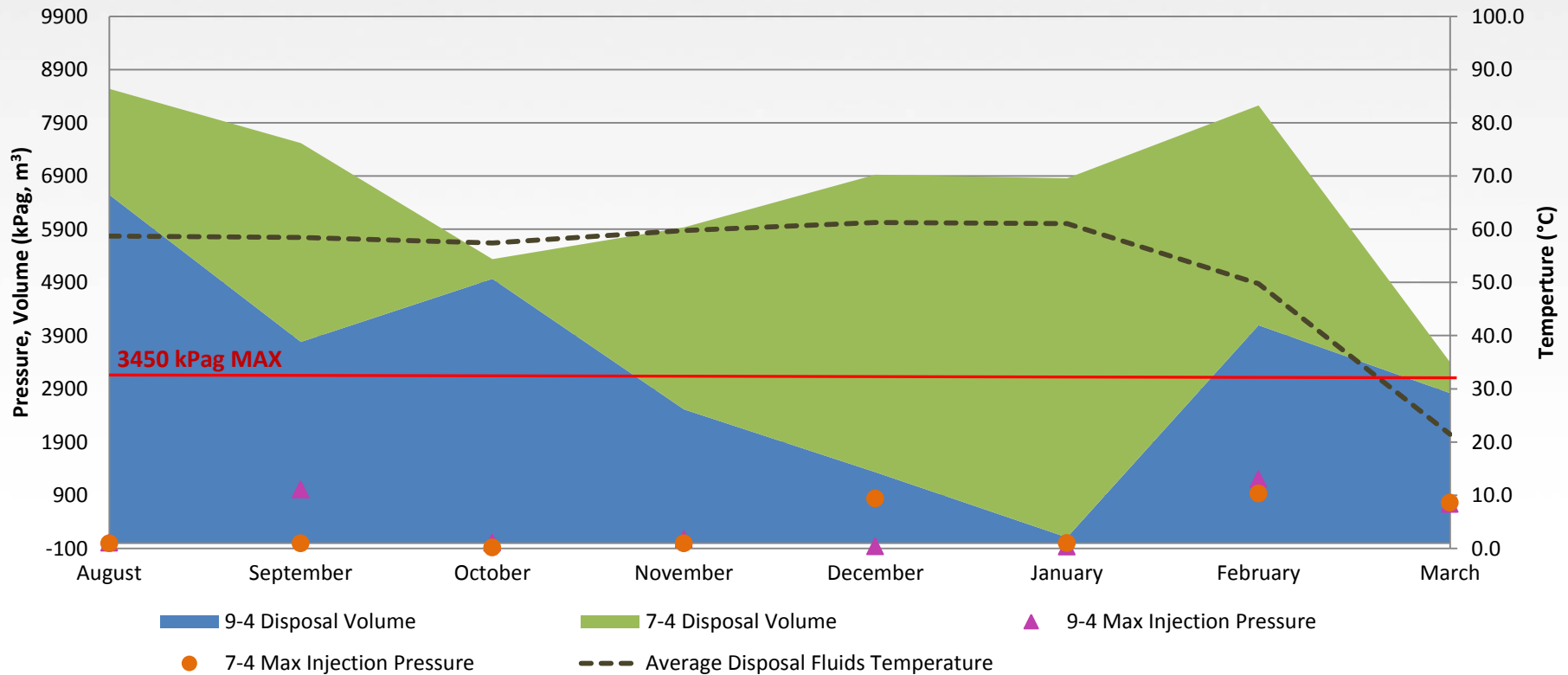


2014/2015	FW Make (m <sup>3</sup> )	Produced Water (m <sup>3</sup> )	Steam (m <sup>3</sup> )	Produced Water Recycle	Blowdown Recycle
August	10,003	13,006	15,929	46%	0%
September	9,601	14,061	16,965	52%	0%
October	5,939	14,400	17,437	80%	0%
November	6,353	16,108	19,455	81%	0%
December	1,309	21,684	18,338	79%	0%
January	4,618	18,729	18,375	73%	0%
February	723	10,185	9,026	82%	0%

### Section 3.1.2(4b-f)

# Disposal Wells Performance

## Disposal Well Metrics



- Both disposal wells 00/07-04-085-22W4/00 and 00/09-04-085-22W4/00 completed in the Grosmont A disposal zone are operating at low pressures and are often under vacuum conditions
- The 100/02-31-084-22W4 well was not utilized in 2014/2015

### Section 3.1.2(4h)

# Sulphur Production

- Project is approved for 0.2 tonnes/day SO<sub>2</sub>. To date the facility has emitted from 0 to <0.06 tonnes/day SO<sub>2</sub>
- Emission monitoring – Stack Sampling and Analysis occurred in March 2014 and again in July 2014 due to a NO<sub>x</sub> rate issue with the glycol trim heater - sampling and verification of emission rates met approval criteria
- Passive sampling monitors continue to demonstrate that Germain Phase 1 is well within allowable limits for SO<sub>2</sub> and H<sub>2</sub>S
- Sulphur production remains well below the 1 t/cd

Sulphur Compliance	Total Monthly Production (kg/month)	Average daily Production (kg/cd)	Average daily Production (t/cd)	Quarterly Sulphur Production (t/cd)
Aug-14	761	24.5	0.02	0.02
Sep-14	793	26.4	0.03	
Oct-14	756	24.4	0.02	0.02
Nov-14	854	28.5	0.03	
Dec-14	773	24.9	0.02	
Jan-15	780	25.2	0.03	0.02
Feb-15	412	14.7	0.01	

# Summary of Environmental Issues

- Compliance issues related to regulatory approvals (e.g. EPEA, Sustainable Resource Development (SRD), Department of Fisheries and Oceans (DFO))
- In the table on the next slide are all the 2014-2015 non-compliance issues related to regulatory approvals
- Over this time period 2 events had been reported to AER
- All action items with respect to non-compliances have been undertaken and completed
- Laricina continues to be proactive in communications with regulatory agencies to maintain transparency and provide self disclosures where applicable

# Environmental Issues

- Water Act Licence # 00330267-00-00 from ESRD for 4 Grand Rapids source water wells:
  - Maximum annual diversion of 300,000 m<sup>3</sup>
  - 1F1/07-04-85-22W4, 1F1/08-5-85-22W4, 1F1/09-04-85-22W4, 1F1/02-31-084-22W4
  - In 2014/2015 the facility utilized 64,976 m<sup>3</sup> of water withdrawn from the water source wells
- Groundwater sampling continues as per the management plan with no changes in water quality observed to date
- The 2014 Annual Groundwater Monitoring Program Summary Report was submitted for review in March of 2015. All sampling was completed as per the submitted report
- Laricina will continue to monitor only the three upper Grand Rapids wells annually during the suspended operations

# Summary of Compliance Issues

<b>Germain CDP Facility EPEA Approval 242701-00-02</b>			
<b>AER FIS Incident Number/AESRD</b>	<b>Volume of Material Released</b>	<b>Brief Description of Non-compliance</b>	<b>Actions completed to correct the Non-compliance</b>
<b>20141573</b>	4 m <sup>3</sup> process water	Boiler blowdown water release from an overflow from blowdown tank into secondary containment.	Release material removed from secondary containment and 7 day letter completed. Tank High alarm recalibrated. Procedures reviewed with operations
<b>20141445</b>	71 m <sup>3</sup> process water	Disposal water release through a drain that was left open in error. Small amount of released wastewater diluted with rain runoff (Estimated at 50L) was observed to have migrated through the berm.	Release material removed including skimmed soils. Samples taken per guidelines . De-isolation procedure reviewed with operations.

# Statement Confirming Compliance

- Germain Phase 1 Project it has been operating in accordance with approvals and regulatory requirements of the AER, AESRD and DFO
- Previous non-compliance events and self-disclosures are listed under 3.1.2 (6)



# Forward-looking Statements Advisory

This Laricina Energy Ltd. (the “Company”) presentation contains certain forward-looking statements. Forward-looking statements may include, but are not limited to, statements concerning estimates of exploitable original-bitumen-in-place, predicted recovery factors, steam-to-oil ratios and well production rates, estimated recoverable resources as defined below, expected regulatory filing, review and approval dates, construction and start-up timelines and schedules, company project potential production volumes as well as comparisons to other projects, statements relating to the continued overall advancement of the Company’s projects, comparisons of recoverable resources to other oil sands projects, estimated relative supply costs, potential cost reductions, recovery and production increases resulting from the application of new technology and recovery schemes, estimates of carbon sequestration capacity, costs for carbon capture and sequestration and possible implementation schedule for carbon capture and sequestration processes or related emissions mitigation or reduction scheme and other statements which are not historical facts. You are cautioned not to place undue reliance on any forward-looking statements as there can be no assurance that the plans, intentions or expectations upon which they are based will occur. By their nature forward-looking statements involve numerous assumptions, known and unknown risks and uncertainties, both generally and specific, that contribute to the possibility that the predictions, forecasts, projections and other forward-looking statements will not occur. Although the Company believes that the expectations represented by such forward-looking statements are reasonable, there can be no assurance that such expectations will prove to be correct and, accordingly that actual results will be consistent with the forward-looking statements. Some of the risks and other factors that could cause results to differ materially from those expressed in the forward-looking statements contained in this presentation include, but are not limited to geological conditions relating to the Company’s properties, the impact of regulatory changes especially as such relate to royalties, taxation and environmental changes, the impact of technology on operations and processes and the performance of new technology expected to be applied or utilized by the Company; labour shortages; supply and demand metrics for oil and natural gas; the impact of pipeline capacity, upgrading capacity and refinery demand; general economic business and market conditions and such other risks and uncertainties described from time to time in the reports and filings made with security regulatory authorities, contained in other disclosure documents or otherwise provided by the Company. Furthermore the forward-looking statements contained in this presentation are made as of the date hereof. Unless required by law the Company does not undertake any obligation to update publicly or to revise any of the included forward-looking statements, whether as a result of new information, future events or otherwise. The forward-looking statements contained in this presentation are expressly qualified by this advisory and disclaimer.

# Significant Definitions

In this presentation the reserve and recoverable resource numbers, along with the net present values given, are as defined in the report of GLJ Petroleum Consultants Ltd. (“GLJ”) regarding Laricina’s Germain Grand Rapids, Germain Winterburn, Saleski Grosmont, Burnt Lakes, Conn Creek, Poplar Creek and Portage properties as at December 30, 2014, and as at December 31, 2013 for Thornbury, Thornbury West, House River, Germain Wabiskaw and Boiler Rapids properties, collectively referred to herein (the “GLJ Report”). “Exploitable OBIP” or “Expl. OBIP” refers to original-bitumen-in-place that is targeted for development using thermal recovery technologies. The best and high estimate of the Company’s resources include contingent and prospective resources. “Cont.” or “2C” and “Pros.” refer to contingent and prospective bitumen resources, respectively. Contingent resource values have not been risked for chance of development while prospective resource values have been risked for chance of discovery but not for chance of development. There is no certainty that it will be commercially viable to produce any portion of the contingent resources. There is no certainty that any portion of the prospective resources will be discovered or, if discovered, if it will be commercially viable to produce any portion of the prospective resources. “2P” means proved plus probable reserves and “3P” means proved plus probable plus possible reserves. “SAGD” means steam-assisted gravity drainage. “C-SAGD” means cyclic SAGD. “SC-SAGD” means solvent-cyclic SAGD. “CSS” means cyclic steam stimulation. The SC-SAGD best estimate technology sensitivity (Laricina technology sensitivity) net economic forecasts were prepared on Saleski-Grosmont and Germain-Grand Rapids based on SC-SAGD technology. “SOR” means steam-oil ratio. “CSOR” means cumulative steam-oil ratio. “iSOR” means instantaneous steam-oil ratio. “CDOR” means calendar day oil rate. “bbl” means barrel. “bn” means billions. “m” means metres. “mm” means million. “mmbbl” means millions of barrels. “bbl/d” means barrels per day. “EIA” means Energy Information Administration. “NPV” means net present value. “m<sup>3</sup>” means cubic metres. “m<sup>3</sup>/d” means cubic metres per day. “kPa” means kilopascal. “D<sub>keff</sub>” means Darcy’s effective permeability. “km<sup>2</sup>” means square-kilometres. “NPV10” means net present value, before tax, 10 percent discount. “US\$” means United States dollars. “U.S.” means United States of America. “WTI” means West Texas Intermediate. “WCS” means Western Canadian Select.

Unless otherwise stated, all dollar amounts are shown in Canadian dollars (C\$).

# Contact Us

Laricina Energy Ltd.  
800, 425 – 1<sup>st</sup> Street SW  
Calgary, Alberta T2P 3L8

403-750-0810

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

[laricina@laricinaenergy.com](mailto:laricina@laricinaenergy.com)



LARICINA  
E N E R G Y L T D .

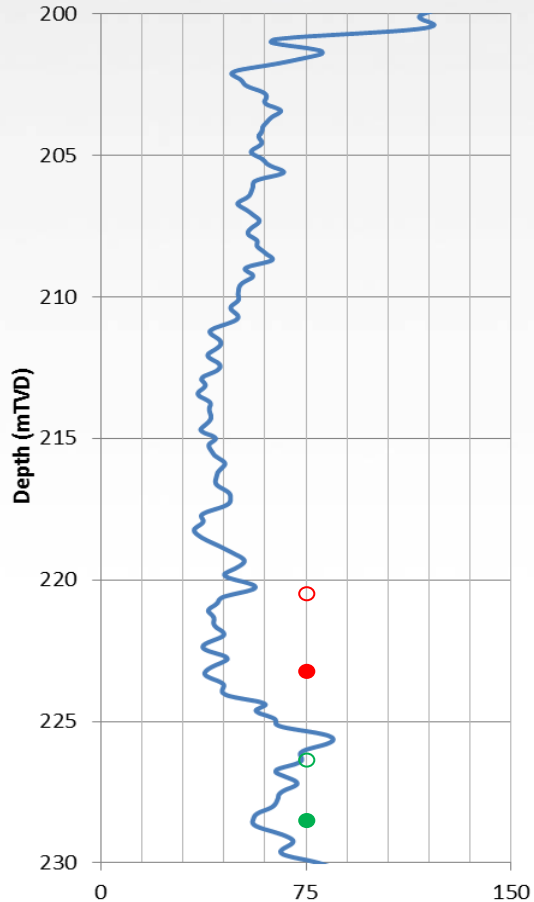
# Appendices

July 1, 2015

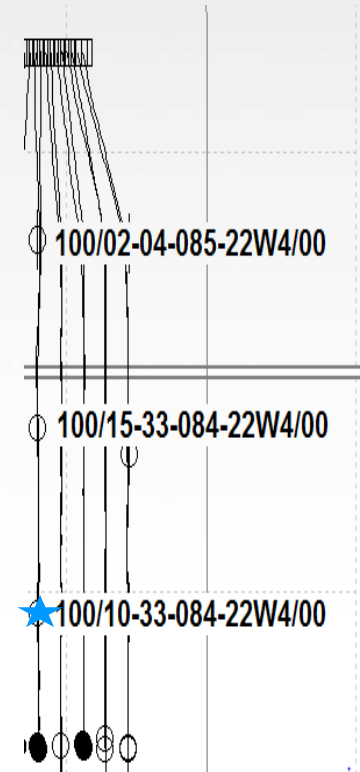
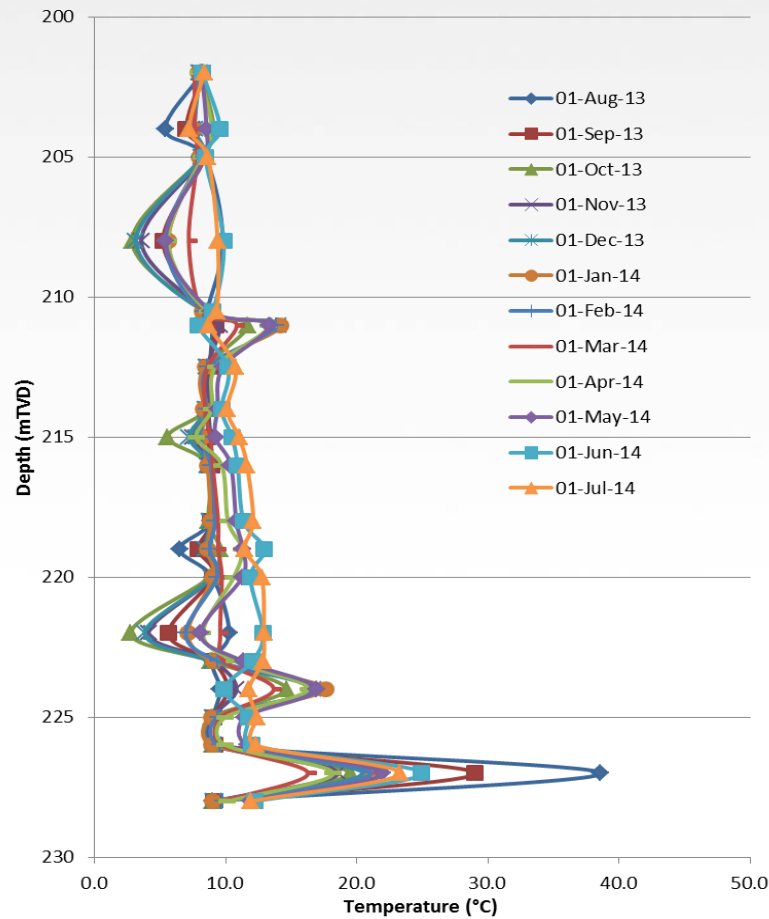
# Scheme Performance

## Thermal Growth at Observation Wells

Gamma Ray (API)  
100/10-33-84-22W4



WP5 Toe Obs Well Temperature (~8m away)  
(100/10-33-84-22W4)



● Injector/Producer location based on  
● horizontal well log interpretation

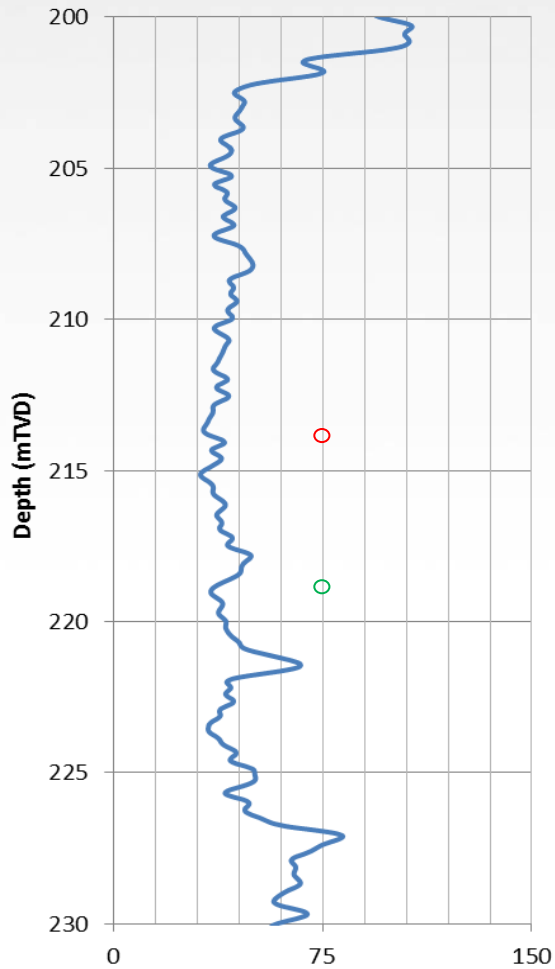
○ Injector/Producer location  
○ based on survey TVD at OBS

### Section 3.1.2(7b)

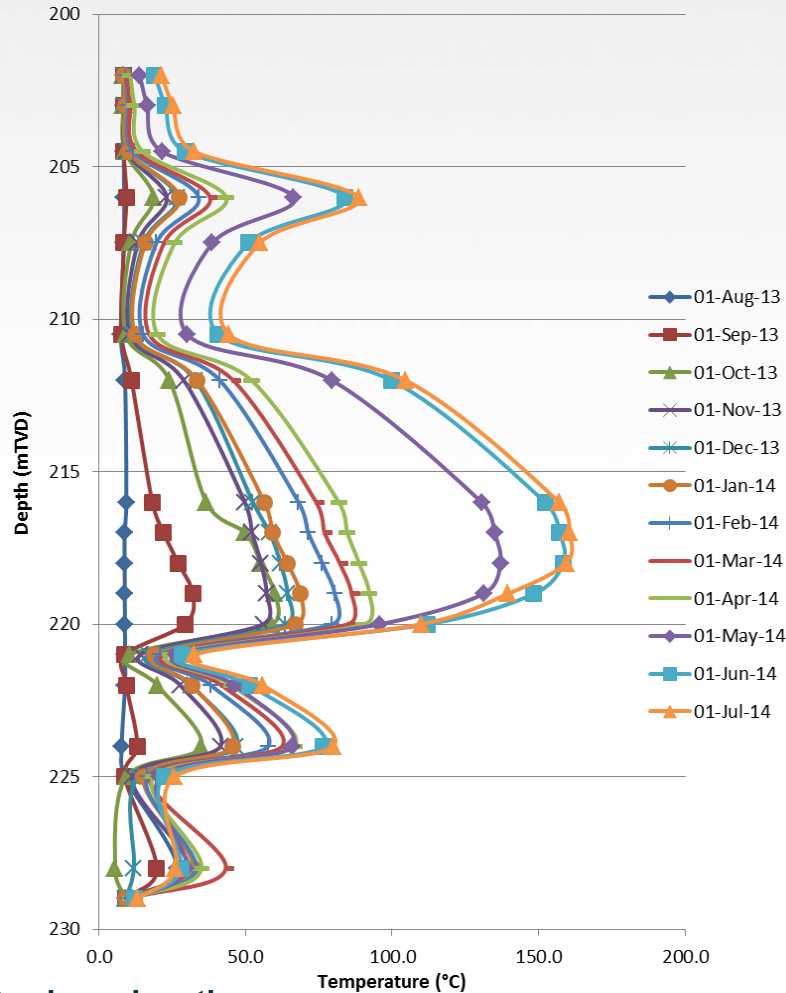
# Scheme Performance

## Thermal Growth at Observation Wells

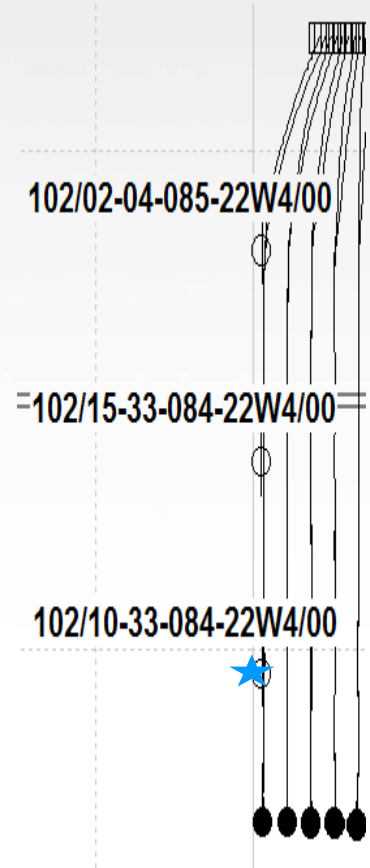
Gamma Ray (API)  
102/10-33-84-22W4



WP10 Toe Obs Well Temperature (1.2m away)  
102/10-33-84-22W4



○ Injector/Producer location  
○ based on survey TVD at OBS

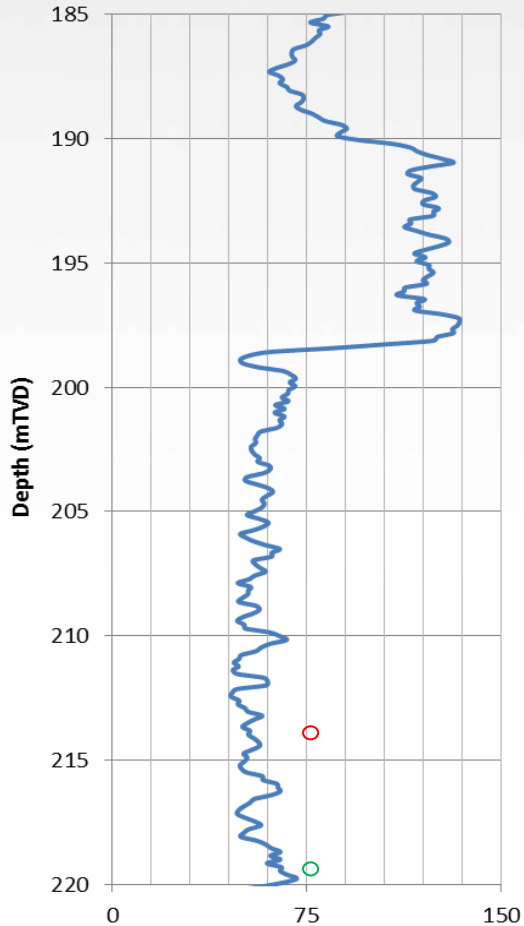


### Section 3.1.2(7b)

# Scheme Performance

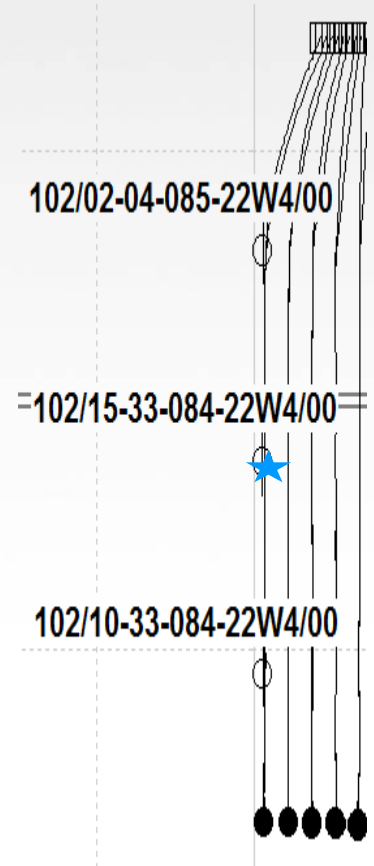
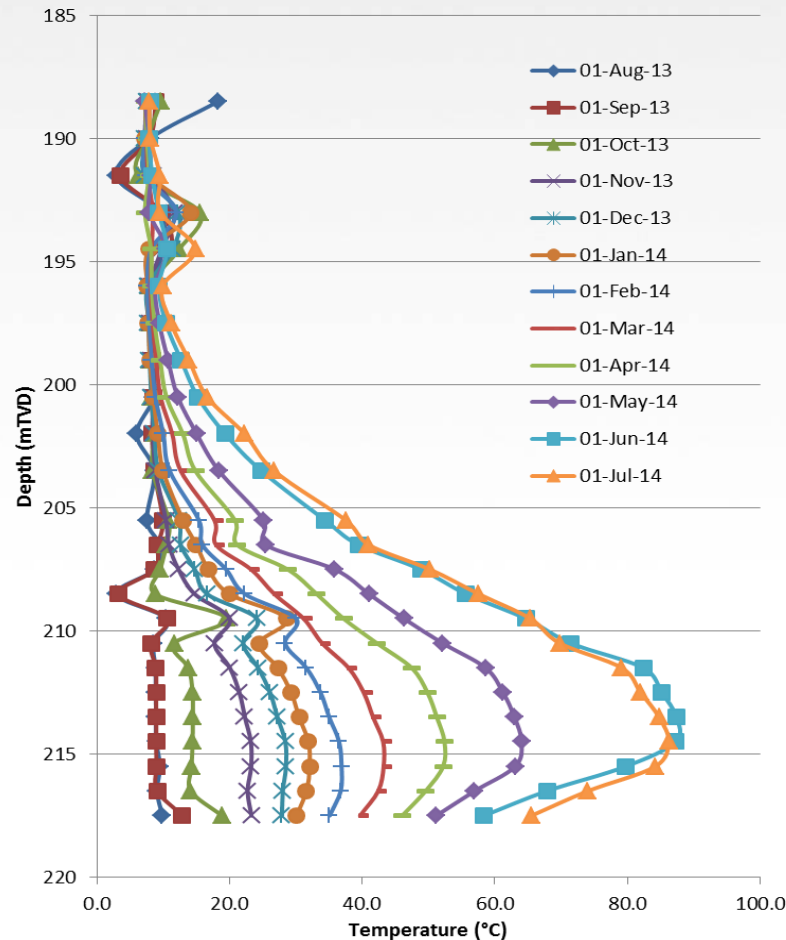
## Thermal Growth at Observation Wells

Gamma Ray (API)  
102/15-33-84-22W4



○ Injector/Producer location  
○ based on survey TVD at OBS

WP10 Mid Obs Temperature (4.4m away)  
102/15-33-84-22W4

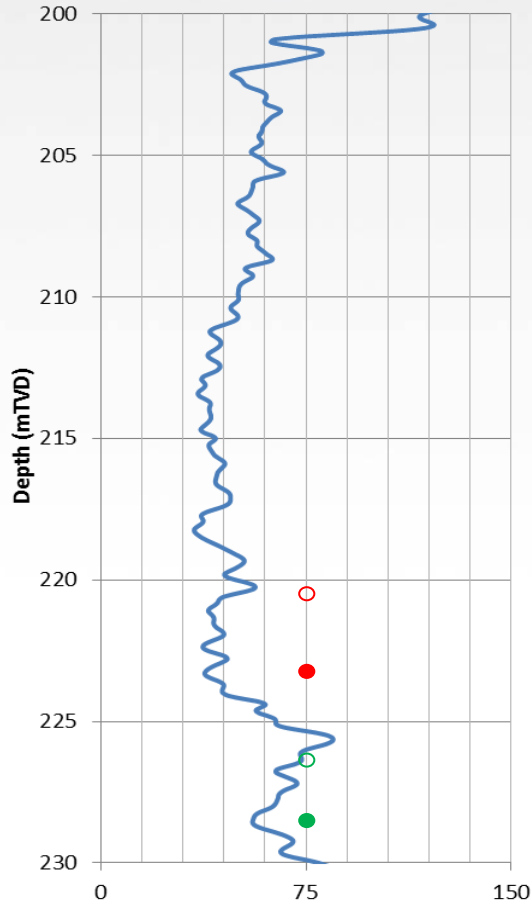


### Section 3.1.2(7b)

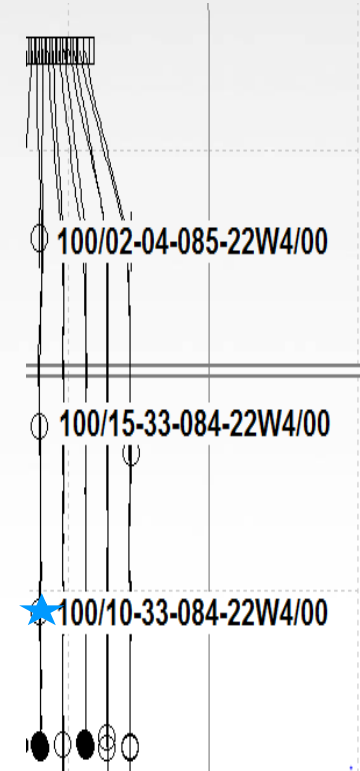
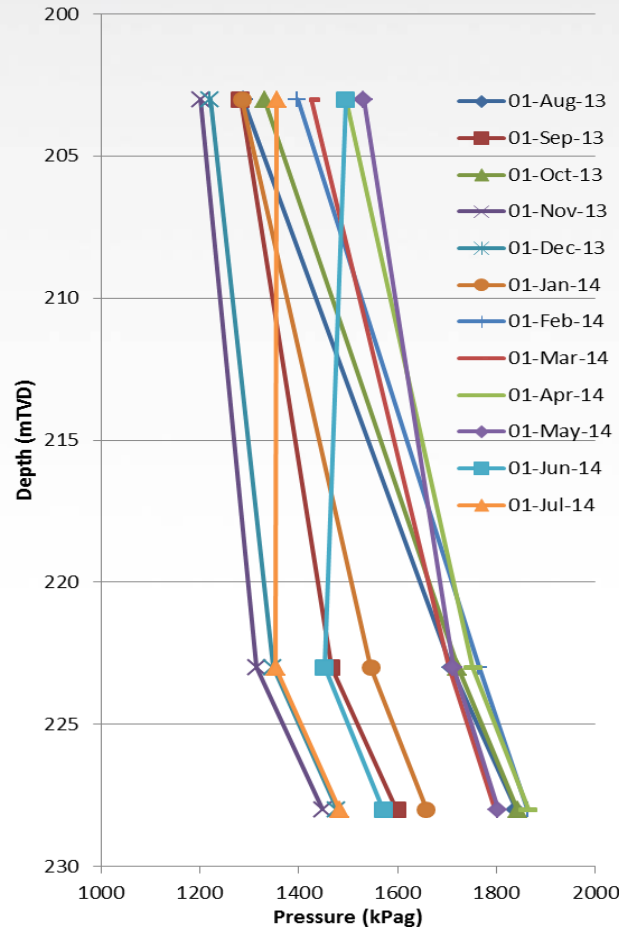
# Scheme Performance

## Pressure Response OBS Well

Gamma Ray (API)  
100/10-33-84-22W4



WP5 Toe Obs Well Pressure (8m away)  
100/10-33-84-22W4



● Injector/Producer location based on  
● horizontal well log interpretation

○ Injector/Producer location  
○ based on survey TVD at OBS

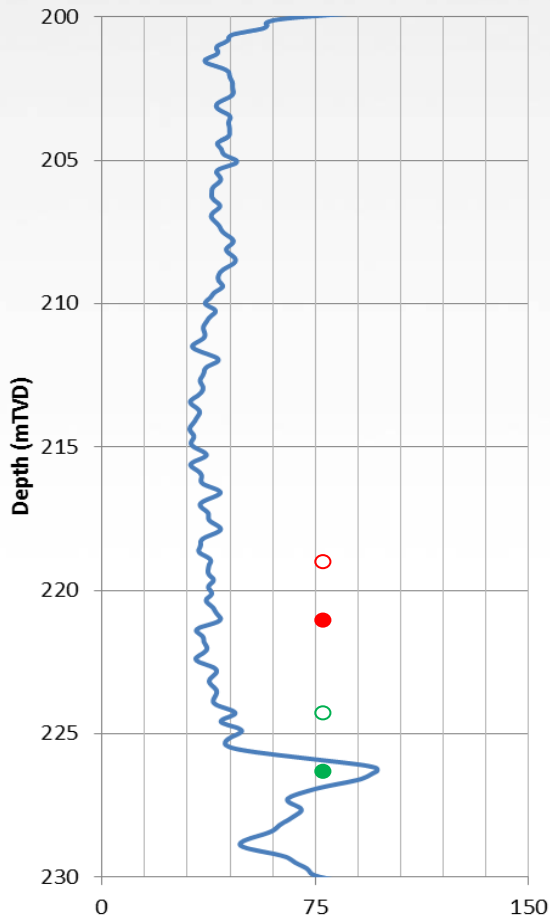
### Section 3.1.2(7b)



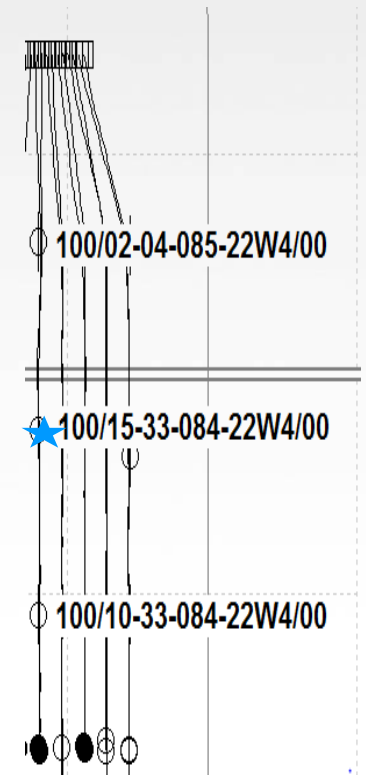
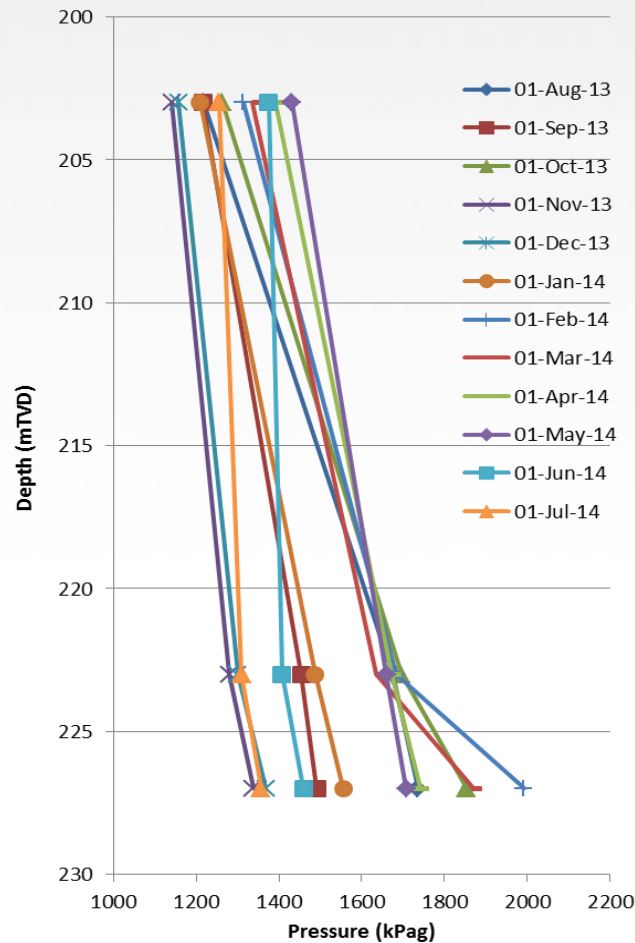
# Scheme Performance

## Pressure Response OBS Well

Gamma Ray (API)  
100/15-33-84-22W4



WP5 Mid Obs Well Pressure (4m  
away) 100/15-33-84-22W4



● Injector/Producer location based on  
● horizontal well log interpretation

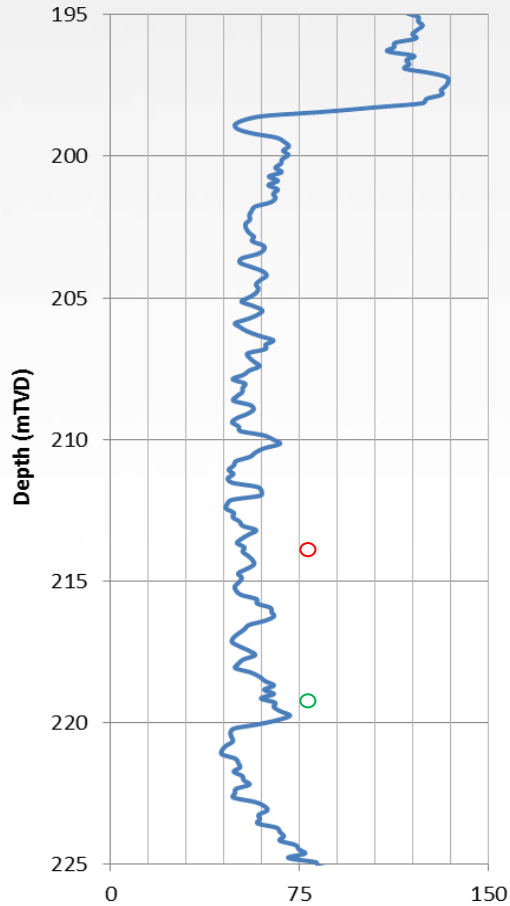
○ Injector/Producer location  
○ based on survey TVD at OBS

### Section 3.1.2(7b)

# Scheme Performance

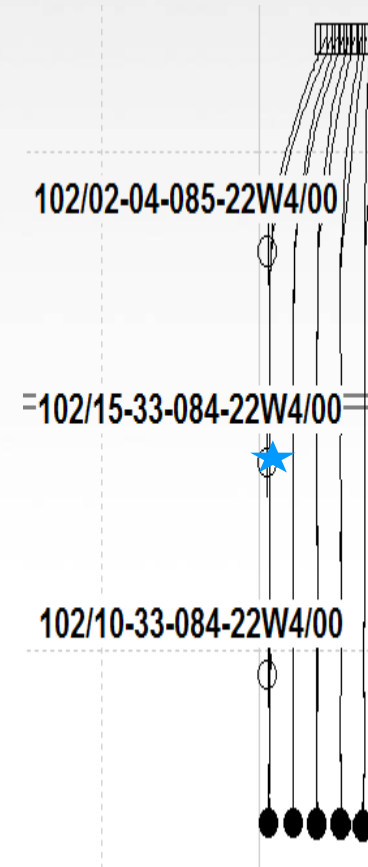
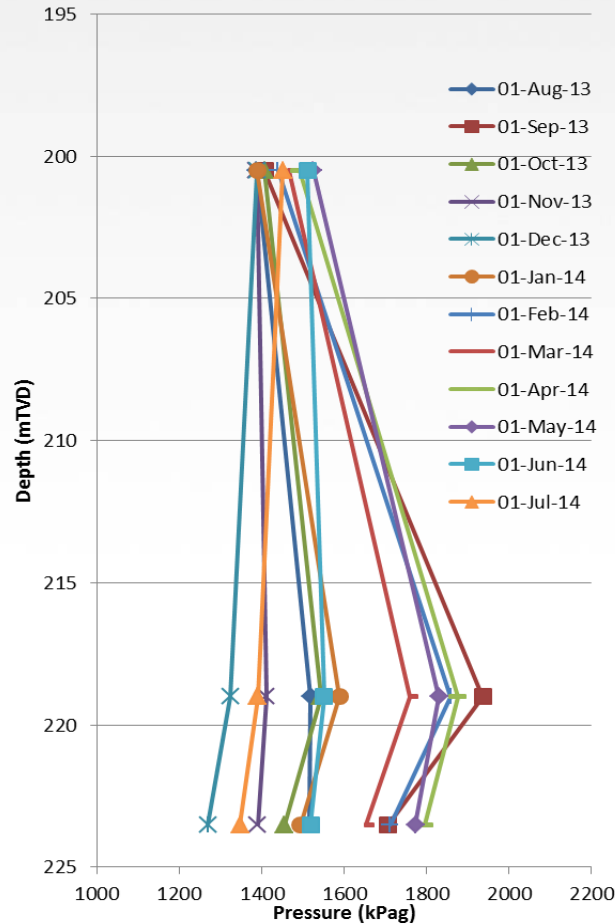
## Pressure Response OBS Well

Gamma Ray (API)  
102/15-33-84-22W4



- Injector/Producer location
- based on survey TVD at OBS

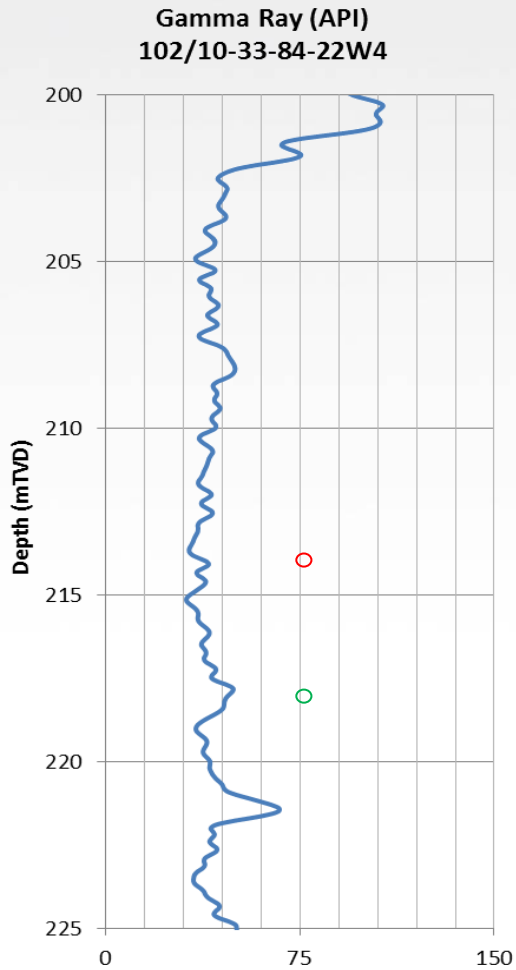
WP10 Mid Obs Well Pressure  
(4.4m away) 102/15-33-84-22W4



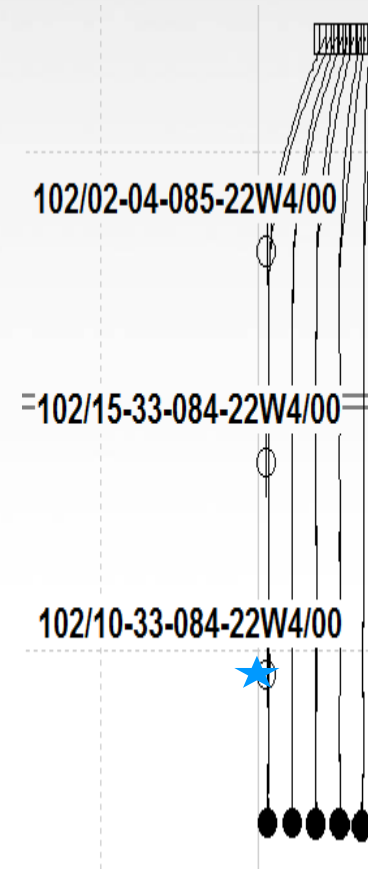
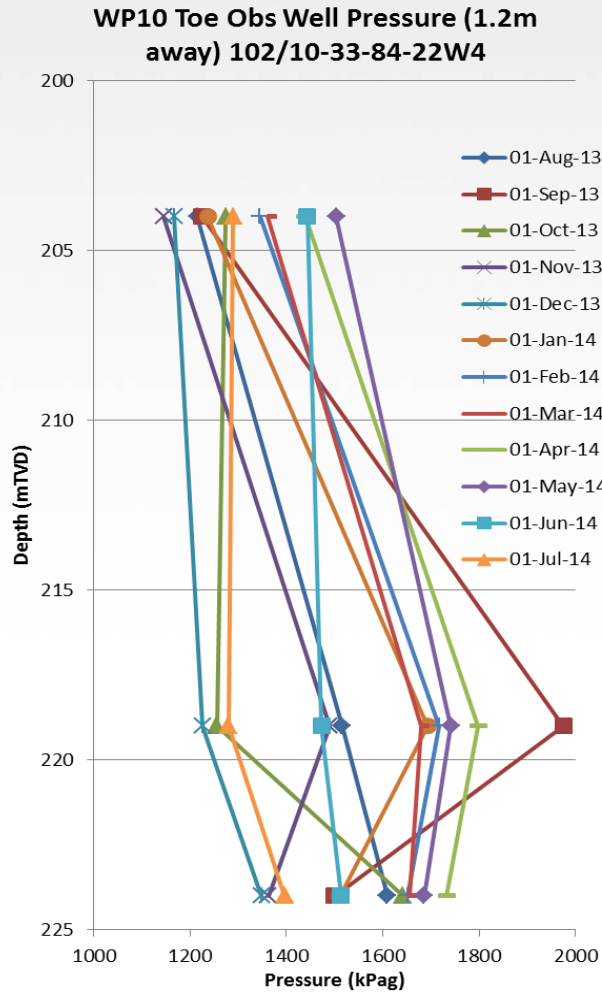
### Section 3.1.2(7b)

# Scheme Performance

## Pressure Response OBS Well



- Injector/Producer location
- based on survey TVD at OBS



### Section 3.1.2(7b)