

SINCLAIR UNIT NO. 13
WATERFLOOD EOR PROJECT
ANNUAL REPORT FOR 2016

May 30, 2017

Tundra Oil and Gas Partnership

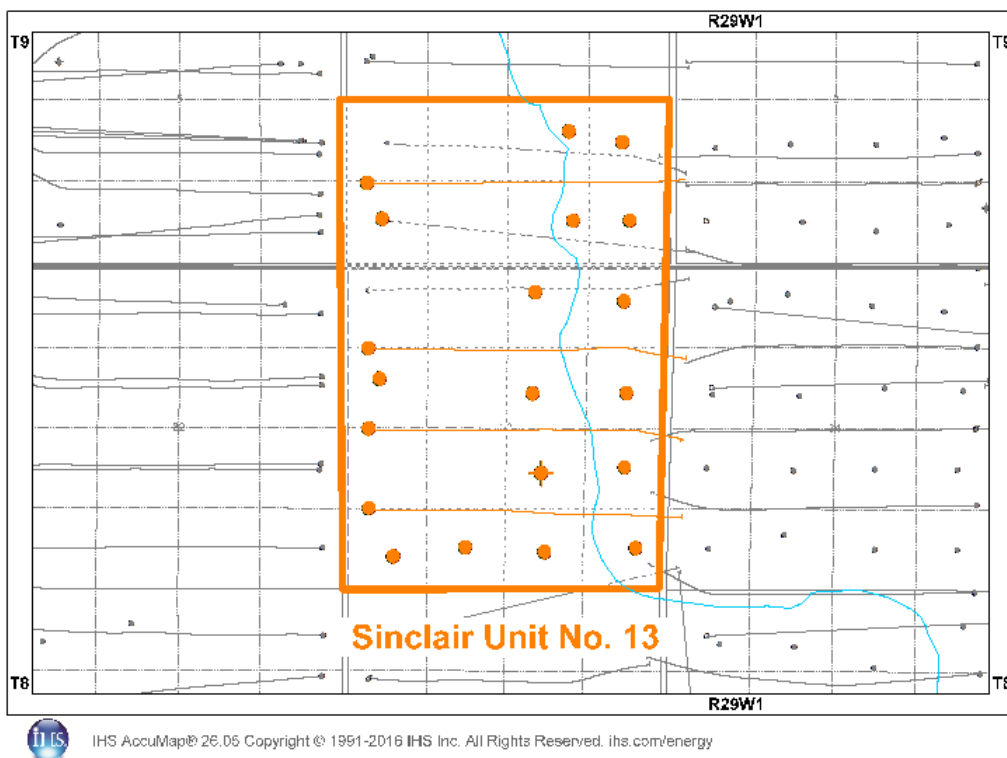
Table of Contents

Introduction	3.
Discussion	3.
Production History	3.
Waterflood Development Plan	5.
Waterflood EOR Operating Strategy and Performance	6.
Water Source and Quality	6.
Injection Wellhead Pressures	6.
Reservoir Pressure	6.
Well Servicing	6.
Waterflood Performance Discussion	6.
List of Appendices	7.
Appendix A: Well Name and Well Status	
Appendix B: Injection Pattern Summary	
Appendix C: Reservoir Pressure Summary	
Appendix D: Injector Pattern Production/Injection Rates, Cumulative and VRR Plots	

INTRODUCTION

Sinclair Unit No. 13 Enhanced Oil Recovery (EOR) Waterflood Project was approved on March 1, 2015 with Tundra Oil and Gas (Tundra) as Operator. The EOR Unit area, outlined in orange, contains 16 producing vertical wells and 4 producing horizontal wells in 24 LSDs in Township 8 & 9 Range 29 W1 as shown in the figure below. Well list and well status is available in Appendix A.

Figure 1: Sinclair Unit No. 13 Area Outline



In accordance with Section 73 of the Manitoba Drilling and Production Regulation, Tundra hereby submits the following 2016 Annual Progress Report for Sinclair Unit No. 13.

DISCUSSION

Production History

For the wells included in Sinclair Unit No. 13, production started in November 2005 with the 00/03-33 and 00/04-33-008-29W1 wells. Average oil production peaked at 4.52 m³/d

per well in November 2007. This production was coming from 14 wells and totaled 63.33 m³/d for the Unit. In December 2016, the Unit was producing 16.97 m³/d of oil and 6.17 m³/d of water. There is currently no water injection in Sinclair Unit No. 13. The rates and WOR are presented in Figure 2.

Figure 2: Sinclair Unit No. 13 Production/Injection Rates and WOR vs Time

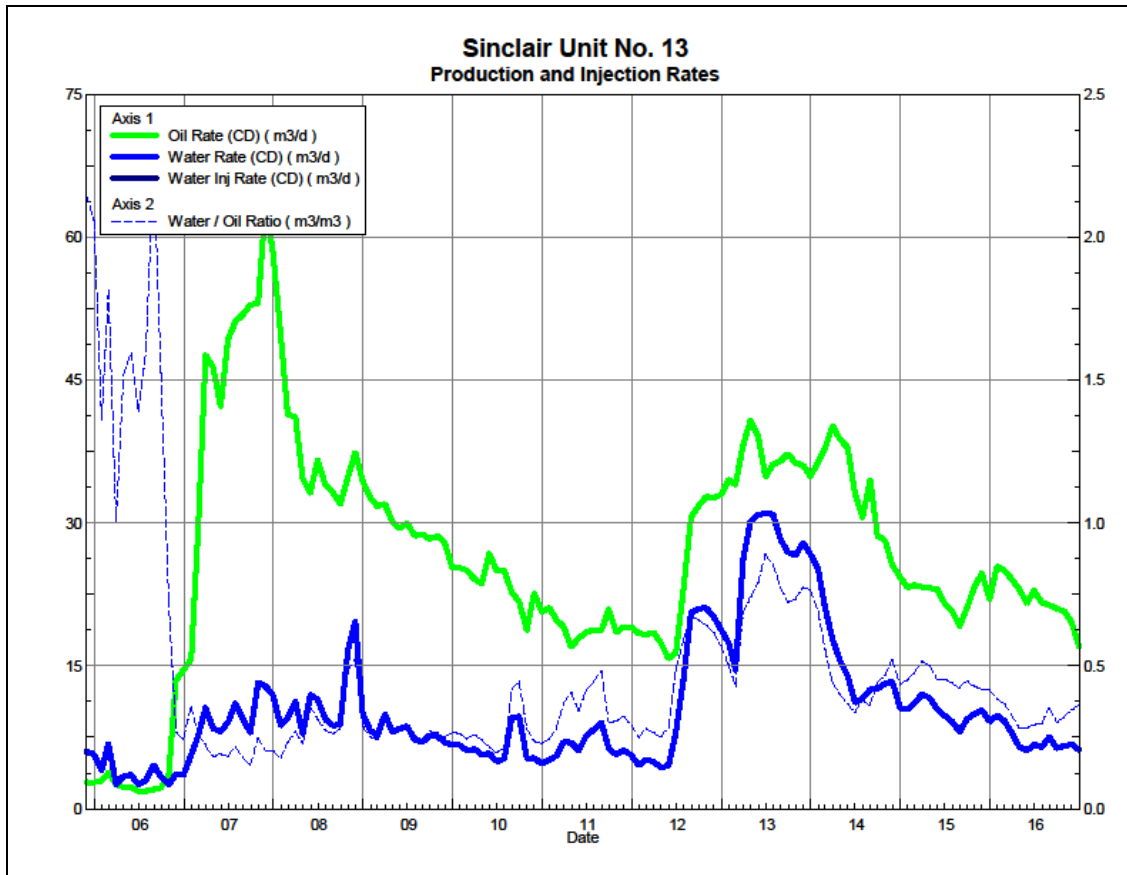
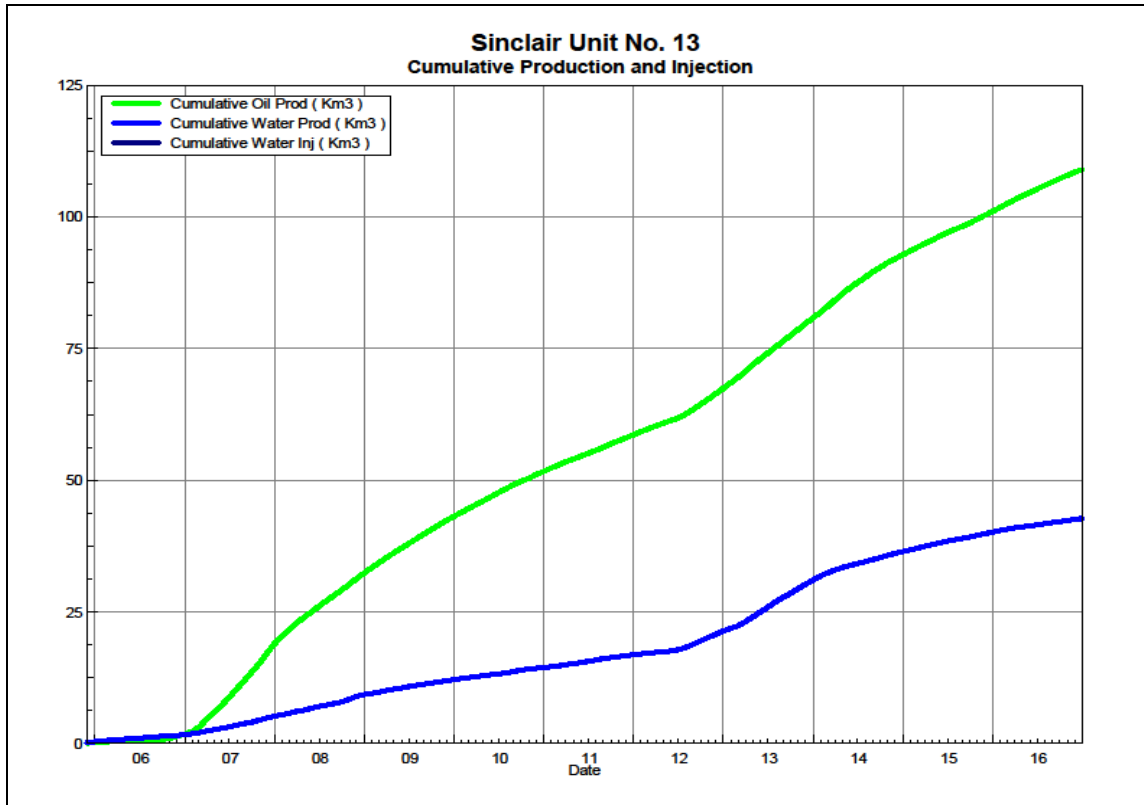


Figure 3 shows the cumulative production for Sinclair Unit No. 13 to the end of December 2016 as 109.0 e³m³ of oil, and 42.76 e³m³ of water, representing a 6.8% recovery factor of the OOIP.

Figure 3: Sinclair Unit No. 13 Cumulative Oil, Water and Water Injected vs Time



Waterflood Development Plan

Sinclair Unit No. 13 Waterflood (WF) Development Plan

Sinclair Unit No. 13 is still in the development phase at the end of 2016. There are 8 undrilled LSDs within the unit boundary for which 8 vertical wells are planned. Four (4) future horizontal injectors have been drilled to date (02/04-33, 00/05-33, 02/12-33-008-29W1 and 02/04-04-009-29W1) with plans to drill an additional two (2) horizontal injection wells, completing waterflood patterns with effective 20 acre spacing. All of the horizontal wells are fracture stimulated to improve the injection rates. In 2017, Tundra's plan is to drill a future injection well at 02/13-33-008-29W1 and convert the 02/04-04 existing producer to an injector.

Production performance by injector pattern are summarized in Appendix B.

Any future revisions to the waterflood development or surveillance plan would be based on new production or performance response data, technical studies, or observed reservoir behavior and reserves recovery interpretations.

Waterflood EOR Operating Strategy and Performance

Water Source and Quality

The injection water for Sinclair Unit No. 13 will be sourced from the 16-32-007-29W1 well (Lodgepole formation). The water is treated at the 03-04-007-29W1 battery where it is filtered to 0.5 microns and has scale inhibitor added. The injection water is then distributed to the injectors through the dedicated infrastructure system.

Injection Wellhead Pressures

There is currently no injection in Sinclair Unit No. 13.

Reservoir Pressure

Where practical, Tundra is committed to collecting pressure data from newly drilled openhole injection wells. For Sinclair Unit No. 13, pressure data taken in 2014 from 00/03-33-008-29W1, 00/12-33-008-29W1, 00/01-04-009-29W1 and 00/04-04-009-29W1 is currently available (Appendix C). Pressures are corrected to a common datum of -450 m SS for comparison with other units in the area.

Well Servicing

Table 1 lists the maintenance that was required in Sinclair Unit No. 13 in 2016.

Table 1: Service and Maintenance in Sinclair Unit No. 13

100.05-33-008-29W1.00	Pump Change	12/05/2016
102.12-04-009-29W1.00	Pump Change	06/07/2016

Waterflood Performance Discussion

At the end of 2016, there is currently no water injection in Sinclair Unit No. 13, therefore, there is no waterflood analysis that can be done at this time. The waterflood area had 4 of the proposed horizontal injection wells drilled at the end of 2016, with plans to drill an additional two (2) horizontal injection wells, completing waterflood patterns with effective 20 acre spacing. Conversion of the horizontal wells to water injection wells is anticipated to start in 2017/2018.

Plots of the production and injection data along with the VRR information is presented in Appendix D for each of the injection patterns.

List of Appendices

Appendix A: Well Name and Well Status

Appendix B: Injection Pattern Summary

Appendix C: Reservoir Pressure Summary

Appendix D: Injector Pattern Production/Injection Rates, Cumulative and VRR Plots for
the following injectors:

02/04-33-008-29W1

00/05-33-008-29W1

02/12-33-008-29W1

02/04-04-009-29W1

APPENDIX A

<i>UWI</i>	<i>Surface Hole Location</i>	<i>License Number</i>	<i>Type</i>	<i>Status</i>
100/01-33-008-29W1/0		006138	Vertical	Capable of OIL Prod
100/02-33-008-29W1/0		006215	Vertical	Capable of OIL Prod
100/03-33-008-29W1/0		005605	Vertical	Suspended
100/04-33-008-29W1/0		005613	Vertical	Suspended
102/04-33-008-29W1/0	100/04-34-008-29W1/0	008587	Horizontal	Capable of OIL Prod
100/05-33-008-29W1/0	100/05-34-008-29W1/0	009164	Horizontal	Capable of OIL Prod
100/07-33-008-29W1/2		006216	Vertical	Capable of OIL Prod
100/08-33-008-29W1/0		006063	Vertical	Capable of OIL Prod
100/09-33-008-29W1/0		006213	Vertical	Capable of OIL Prod
100/10-33-008-29W1/2		006404	Vertical	Capable of OIL Prod
100/12-33-008-29W1/0		005769	Vertical	Suspended
102/12-33-008-29W1/0	102/12-34-008-29W1/0	008583	Horizontal	Capable of OIL Prod
100/15-33-008-29W1/2		006383	Vertical	Capable of OIL Prod
100/16-33-008-29W1/0		006214	Vertical	Capable of OIL Prod
100/01-04-009-29W1/0		006372	Vertical	Capable of OIL Prod
100/02-04-009-29W1/0		006782	Vertical	Capable of OIL Prod
100/04-04-009-29W1/0		006163	Vertical	Capable of OIL Prod
102/04-04-009-29W1/0	100/05-03-009-29W1/0	009041	Horizontal	Capable of OIL Prod
100/07-04-009-29W1/0		006783	Vertical	Capable of OIL Prod
100/08-04-009-29W1/0		006237	Vertical	Capable of OIL Prod

Appendix B

Sinclair Unit No. 13 Injection Pattern Summary as of December 2016

Pattern Name	Injector BH Location (008-29W1)	Injector Surf. Location (008-29W1)	Status	No. of Supported Wells	Supported Wells (008-29W1)	Allocation Factor	Pattern Prod Start Month	Inj Start Month	Oil Rate (m³/d)	Water Rate (m³/d)	WOR (m³/m³)	Water Injection (m³/d)	Cum Oil (E³m³)	Cum Water (E³m³)	Cum Inj Water (E³m³)	Monthly VRR	Cum VRR
02/04-33-008-29Inj	02/04-33	00/04-34	Capable of OIL Prod	7	01-33, 02-33, 03-33, 04-33 05-33, 07-33, 08-33	0.5	Nov 2005	-	7.9	2.5	0.31	-	32.3	14.2	0.0	0.00	0.00
00/05-33-008-29Inj	00/05-33	00/05-34	Capable of OIL Prod	5	07-33, 08-33 09-33, 10-33, 12-33	0.5	Jan 2006	-	2.6	0.4	0.16	-	18.3	7.4	0.0	0.00	0.00
02/12-33-008-29Inj	02/12-33	02/12-34	Capable of OIL Prod	5	09-33, 10-33, 12-33, 15-33, 16-33	0.5	Jan 2006	-	3.6	1.2	0.34	-	21.7	8.9	0.0	0.00	0.00
02/04-04-009-29Inj	02/04-04-009-29W1	00/05-03-009-29W1	Capable of OIL Prod	5	01-04, 02-04, 04-04-009-29W1 07-04, 08-04-009-29W1	0.5	Jan 2007	-	2.8	1.4	0.51	-	14.3	7.7	0.0	0.00	0.00

APPENDIX C

Sinclair Unit No. 13 - Pressure Summary

Location	Test Date	Final Pressure (kPaa)	MPP (mTVD)	KB	Datum Depth	Gradient	Pressure @ -450 masl
00/03-33-008-29W1/0	Aug 2 - 25, 2014	724.9	960.1	529.6	-450	8.25	886
00/12-33-008-29W1/0	Oct 21 - Nov 1, 2014	6968.2	961.0	533.8	-450	8.25	7156
00/04-04-009-29W1/0	Jul 16 - Aug 28, 2014	1100.0	940.5	528.33	-450	8.25	1412
00/04-04-009-29W1/0	Mar 6 - Jun 27, 2014	4328.8	949.5	534.85	-450	8.25	4620

Appendix D

Rates and VRR Plots

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.33 m3/m3

Pattern: 02/04-33-008-29Inj Set: SinclairUnit#13

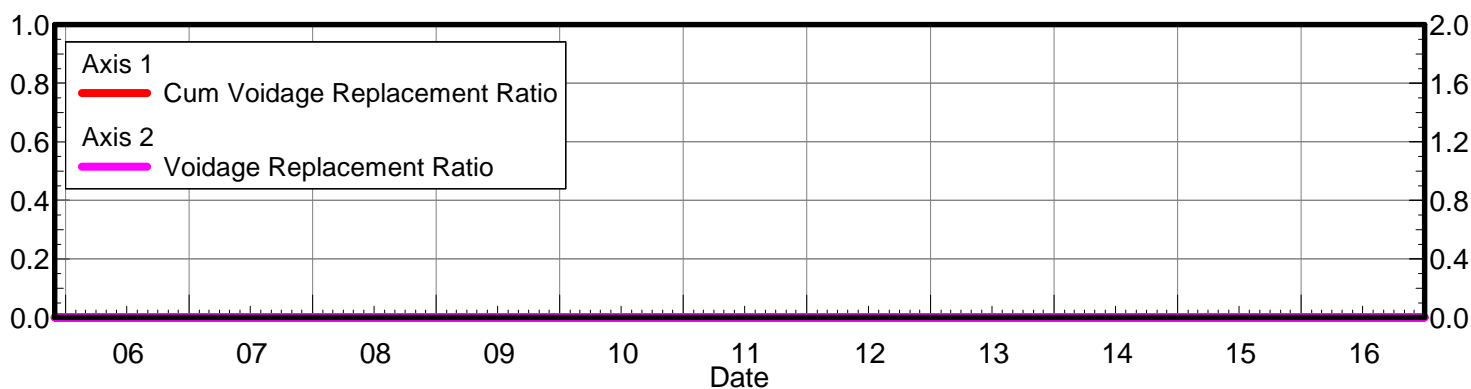
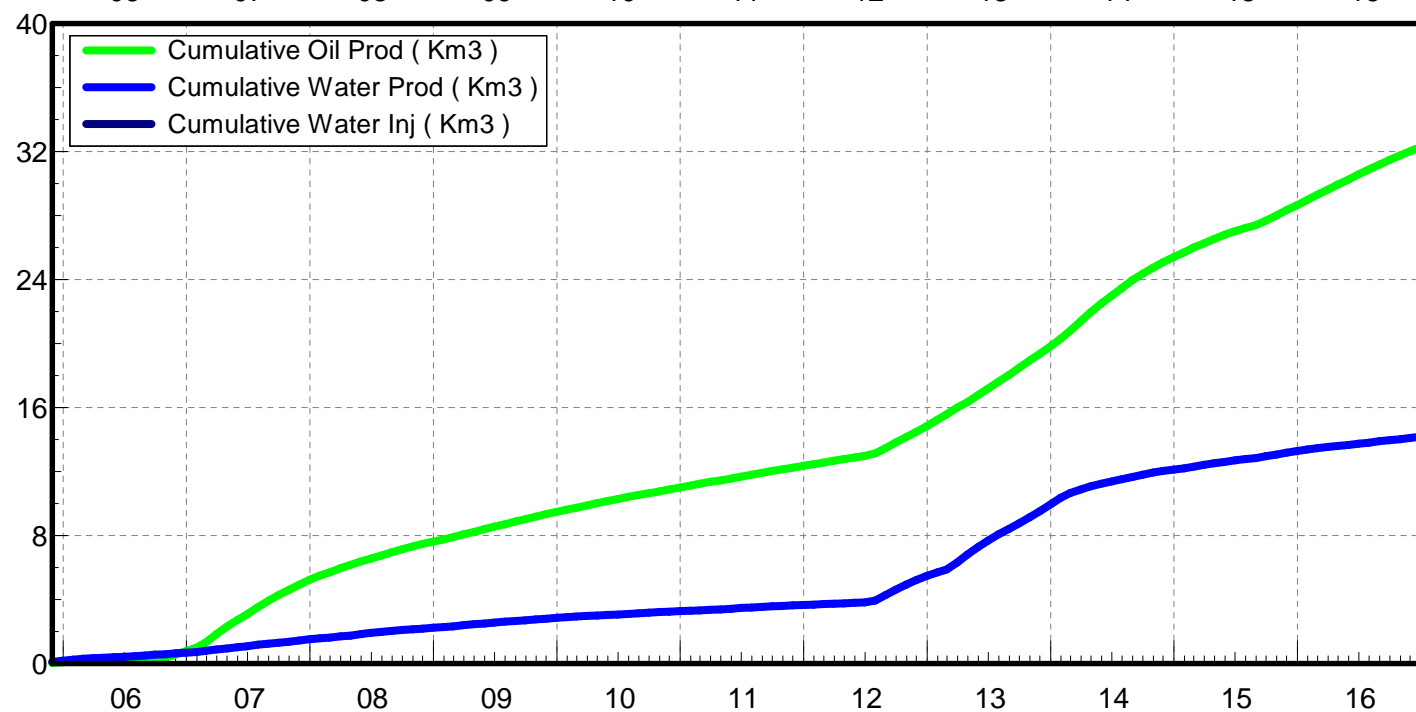
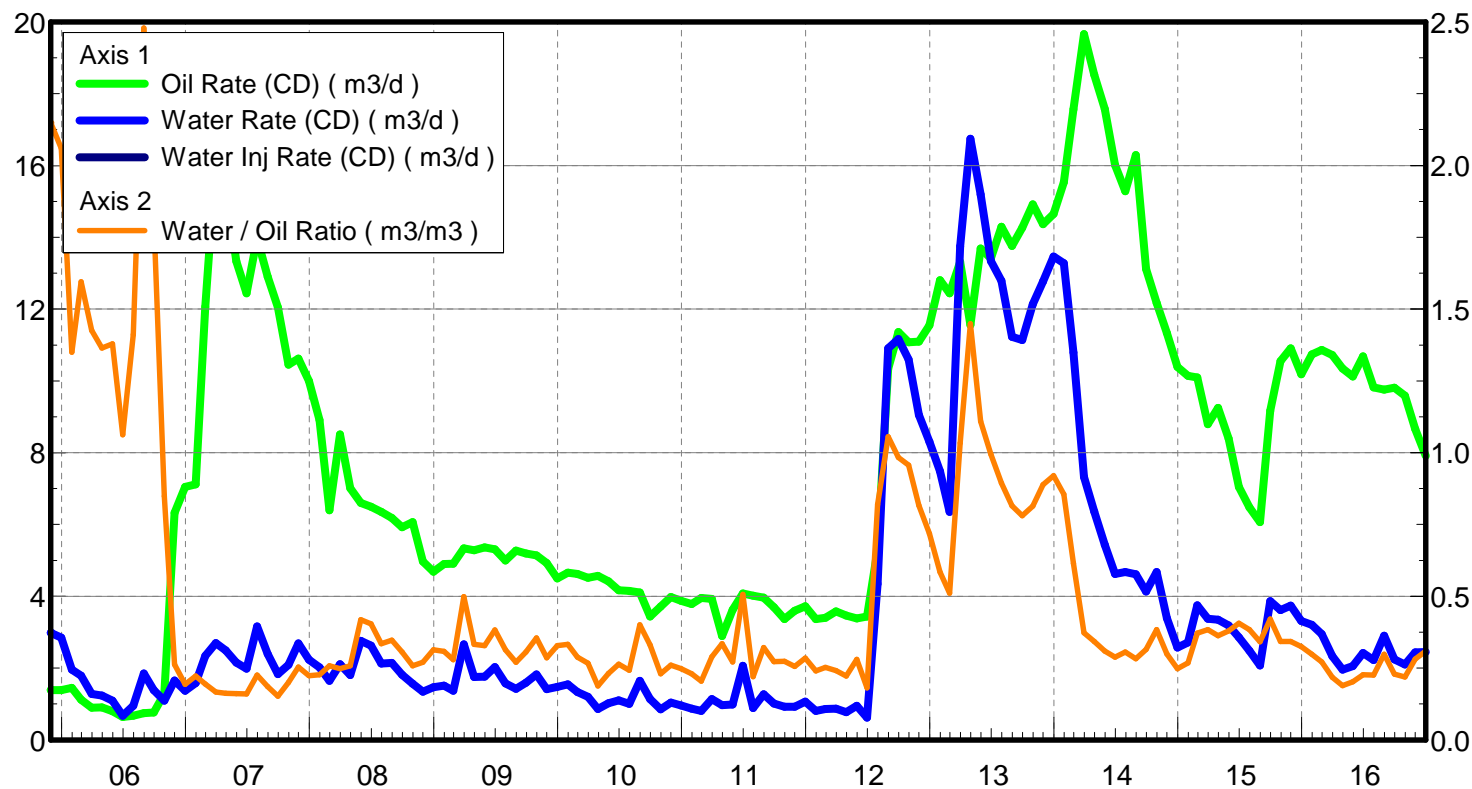
May 30, 2017

Operator: TUNDRA_OIL_&_GAS_LIMITED

Oil Rate (CD) : 9.59 m3/d

Water Rate (CD) : 2.60 m3/d

Water Inj Rate (CD) : * m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 00/05-33-008-29Inj Set: SinclairUnit#13

Water Formation Vol Factor : 1.00150 m3/m3

May 30, 2017

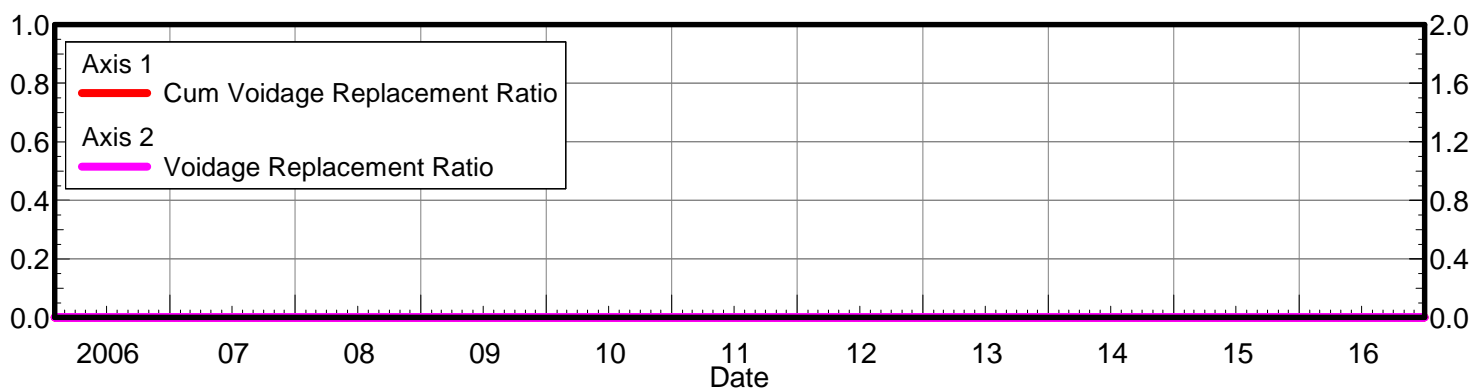
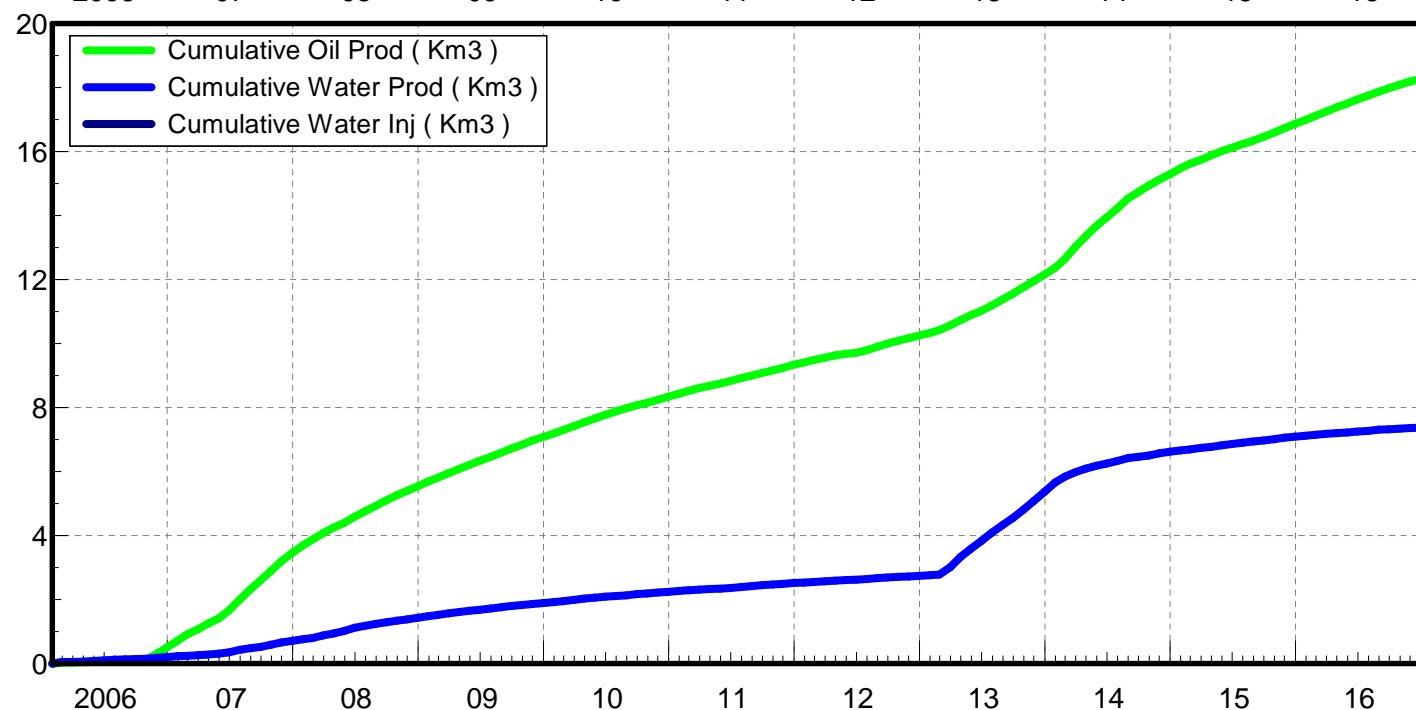
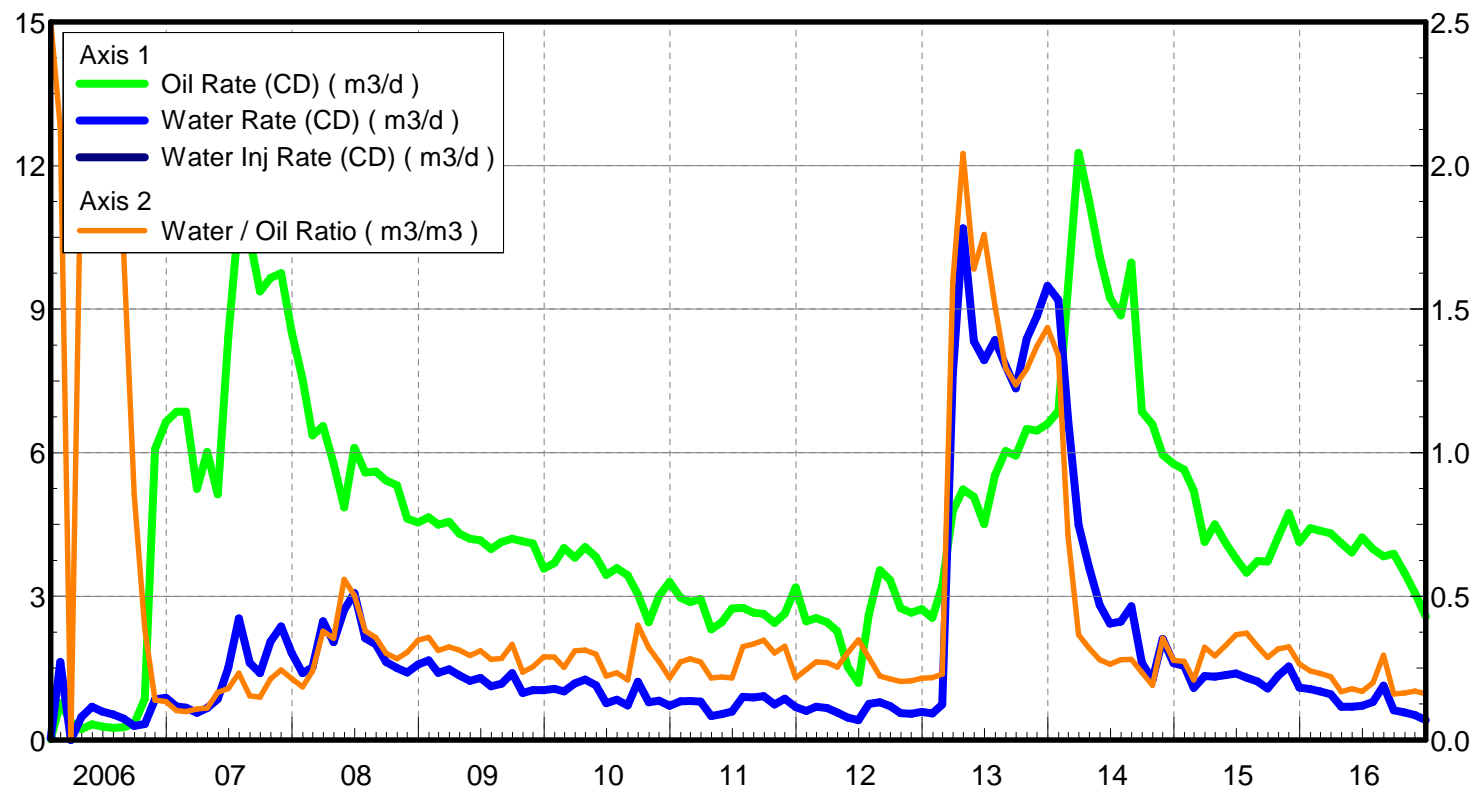
Water / Oil Ratio : 0.23 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Oil Rate (CD) : 3.96 m3/d

Water Rate (CD) : 0.79 m3/d

Water Inj Rate (CD) : * m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 02/12-33-008-29Inj Set: SinclairUnit#13

Water Formation Vol Factor : 1.00150 m3/m3

May 30, 2017

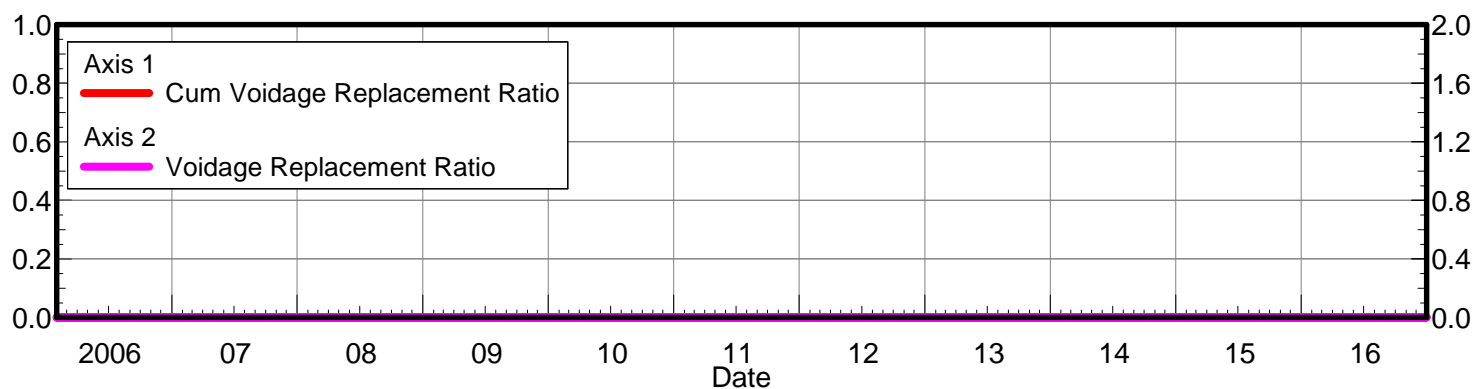
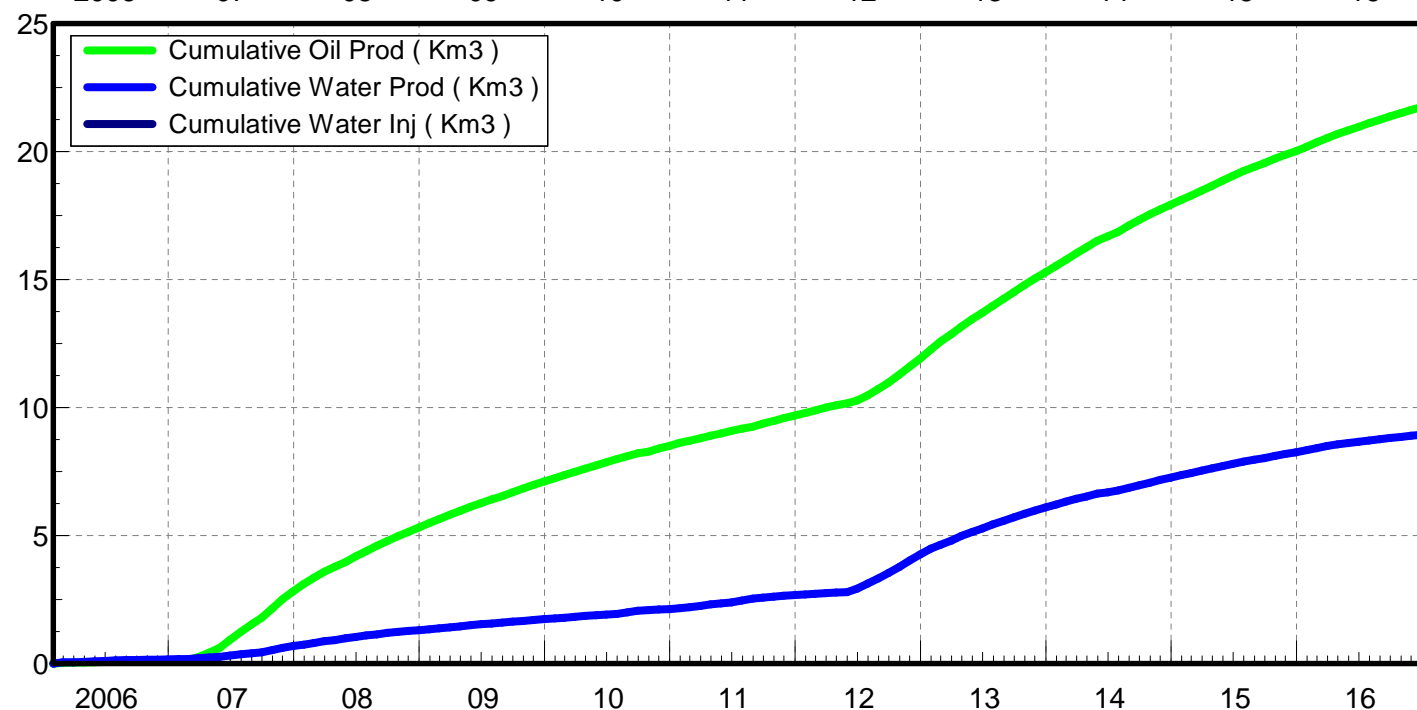
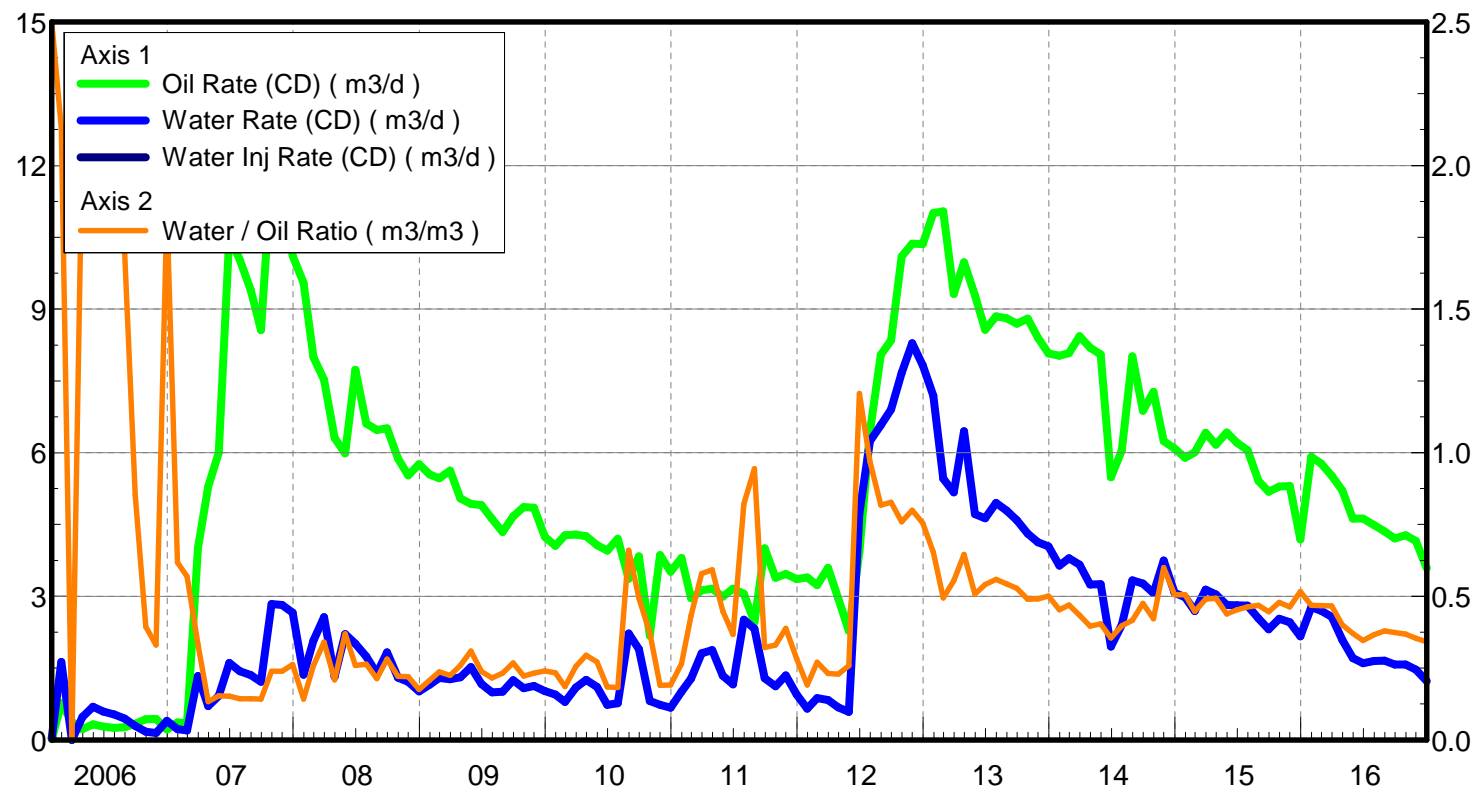
Water / Oil Ratio : 0.30 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Oil Rate (CD) : 3.51 m3/d

Water Rate (CD) : 1.17 m3/d

Water Inj Rate (CD) : * m3/d



Oil Formation Vol Factor : 1.07100 m3/m3

Pattern: 02/04-04-009-29Inj Set: SinclairUnit#13

Water Formation Vol Factor : 1.00150 m3/m3

May 30, 2017

Water / Oil Ratio : 0.61 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Oil Rate (CD) : 2.51 m3/d

Water Rate (CD) : 1.31 m3/d

Water Inj Rate (CD) : * m3/d

