

Sinclair Unit No. 13

Waterflood Progress Report 2019

January 1st through December 31st 2019

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

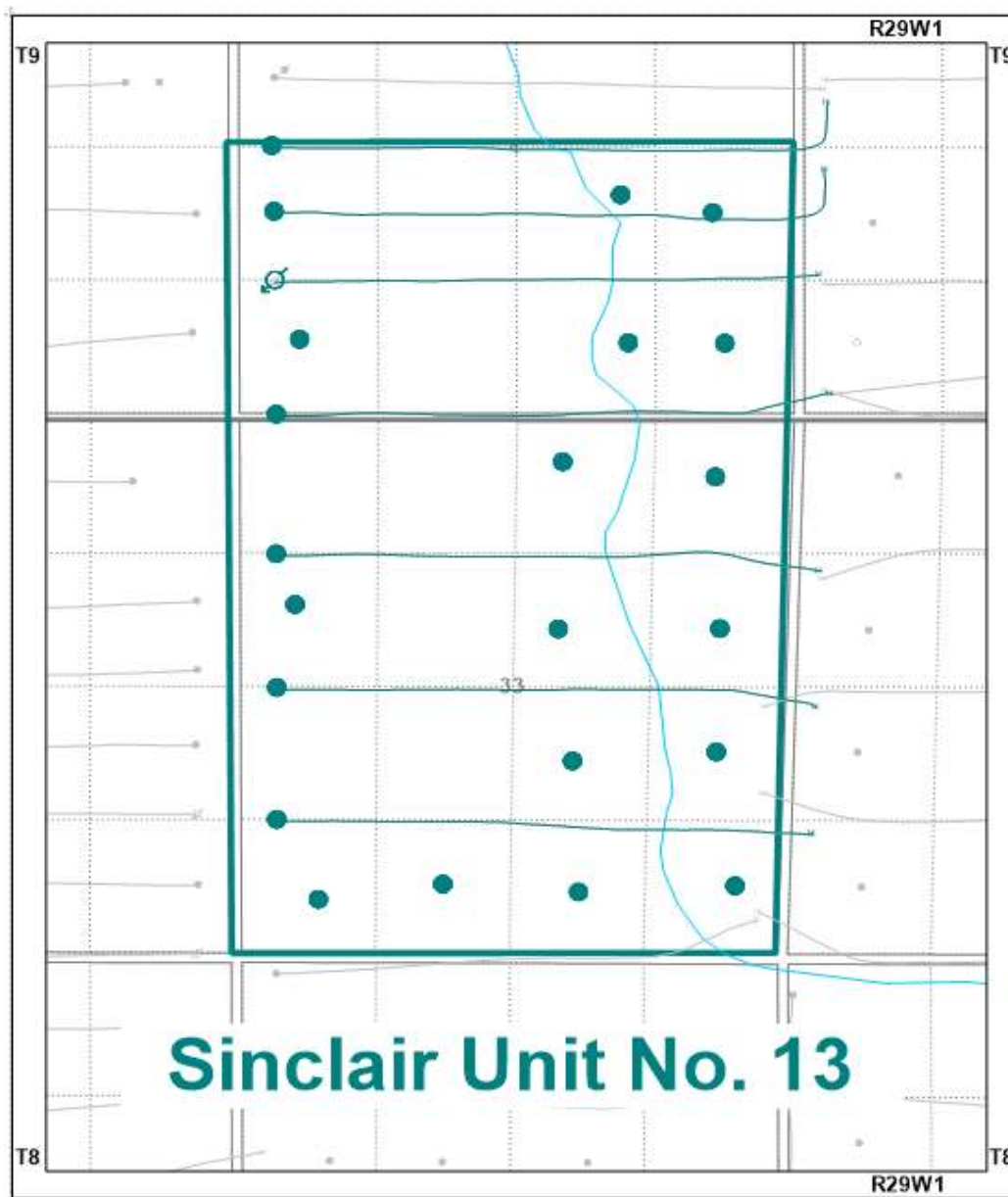
Tundra Oil and Gas

June 10, 2020

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 green, contains 16 producing vertical wells, 6 producing horizontal wells and 1 horizontal injection well, in 24 LSDs in Township 8 & 9 Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit No. 13 Area Outline



Sinclair Unit No. 13

Tundra Oil and Gas (Tundra), as the operator of the Sinclair Unit No. 13 Enhanced Oil Recovery (EOR) project hereby submits the 2019 EOR report as per section 73 of the Drilling and Production Regulations.

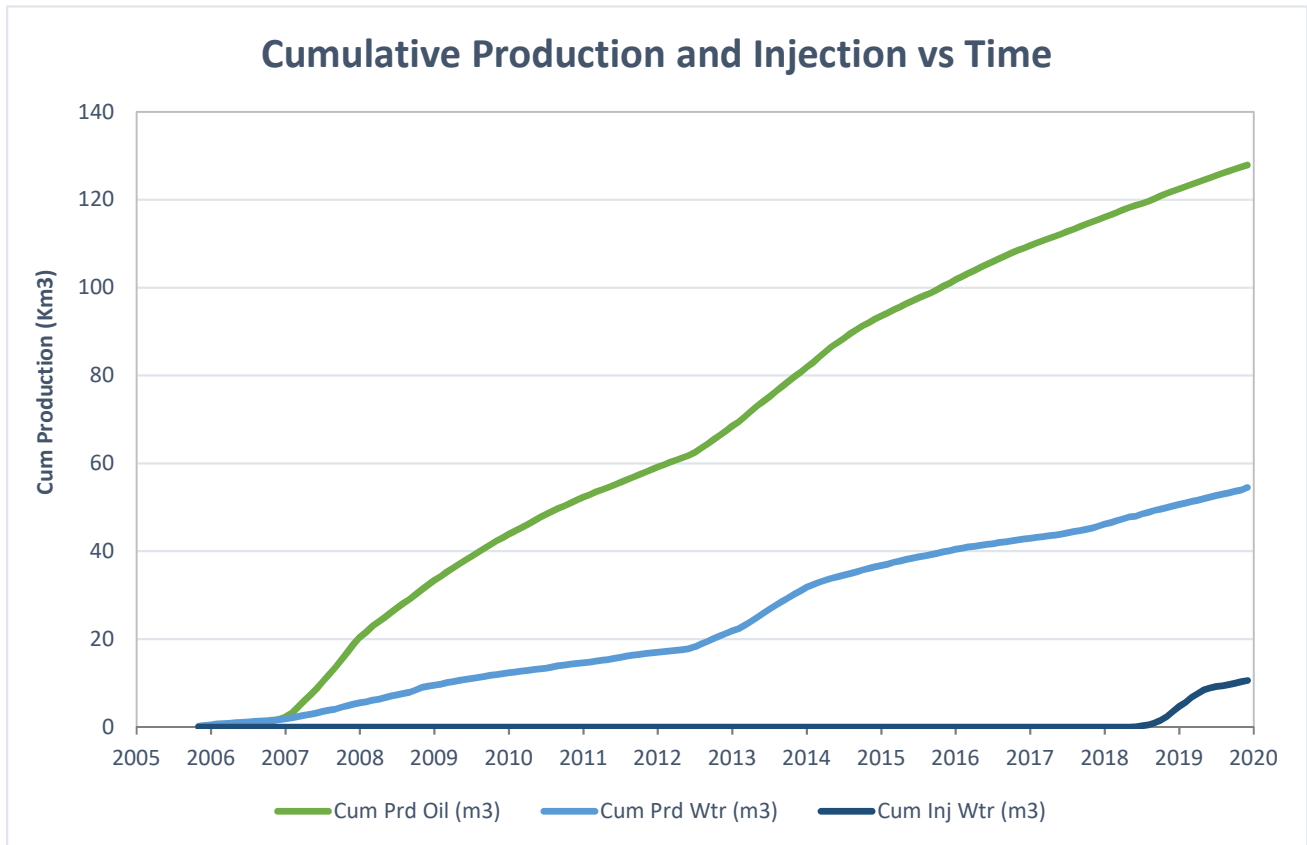
a) Monthly oil and water production rates, injection rate, GOR and WOR

MONTH	Cal Dly Oil m ³ /day	Cal Dly Wtr m ³ /day	Cal Inj Wtr m ³ /day	WOR m ³ /m ³	GOR m ³ /m ³
Jan-2019	17.23	11.62	37.13	0.67	0
Feb-2019	16.14	11.23	31.75	0.70	0
Mar-2019	17.47	10.77	37.78	0.62	0
Apr-2019	17.14	10.96	28.78	0.64	0
May-2019	17.01	11.67	24.82	0.69	0
Jun-2019	16.74	11.55	14.47	0.69	0
Jul-2019	16.58	11.24	12.49	0.68	0
Aug-2019	15.46	9.78	5.82	0.63	0
Sep-2019	15.09	10.73	9.74	0.71	0
Oct-2019	15.16	10.65	9.68	0.70	0
Nov-2019	15.22	10.00	9.78	0.66	0
Dec-2019	15.40	17.93	9.80	1.16	0

b) Cumulative volume of oil, gas and water produced and fluid injected

2019 PRODUCTION	
Produced Oil (m ³)	5,921
Produced Gas (m ³)	0
Produced Water (m ³)	4,205
Fluid Injected (m ³)	7,036
CUMULATIVE PRODUCTION	
Produced Oil (m ³)	127,895
Produced Water (m ³)	54,499

Sinclair Unit No. 13



c) Monthly wellhead injection pressure for each injection well

MONTH	02/04-04 Inj		SU13	
	Inj Water (m ³)	Avg Inj P (kPa)	Inj Water (m ³)	Avg Inj P (kPa)
Jan-2019	1151.0	780	1151.0	780
Feb-2019	889.1	1247	889.1	1247
Mar-2019	1171.3	2678	1171.3	2678
Apr-2019	863.4	2892	863.4	2892
May-2019	769.5	3474	769.5	3474
Jun-2019	434.2	2719	434.2	2719
Jul-2019	387.3	3399	387.3	3399
Aug-2019	180.4	2047	180.4	2047
Sep-2019	292.2	1536	292.2	1536
Oct-2019	300.1	1701	300.1	1701
Nov-2019	293.5	2014	293.5	2014
Dec-2019	303.8	2356	303.8	2356
Total	7035.8		7035.8	
Avg Inj P		2237		2237

MONTH	Jan-2019	Feb-2019	Mar-2019	Apr-2019	May-2019	Jun-2019	Jul-2019	Aug-2019	Sep-2019	Oct-2019	Nov-2019	Dec-2019
Total m3	1151.0	889.1	1171.3	863.4	769.5	434.2	387.3	180.4	292.2	300.1	293.5	303.8
Daily (m³/d)	37.13	31.75	37.78	28.78	24.82	14.47	12.49	5.82	9.74	9.68	9.78	9.80

2019 AVG. ANNUAL DAILY INJECTION = 19.34 m3/d

CUMULATIVE INJECTION TO Dec 31, 2018 = 3,543 m3

TOTAL 2019 ANNUAL INJECTION = 7,036 m3
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CUMULATIVE INJECTION TO Dec 31, 2019 = 10,579 m3
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d) Summary of the result of any survey of reservoir pressure conducted in 2019. N/A

e) **Date and type of any well servicing.**

Well	Service Description	Date
100.03-33-008-29W1.00	Scale Squeeze	6/19/2019
102.04-04-009-29W1.00	WiW Packer Repair	8/6/2019

f) **Calculations of voidage replacement ratio on a monthly and cumulative basis**

VOIDAGE CALCULATIONS

OIL FORMATION VOLUME FACTOR (Rm3/Sm3) = 1.071

MONTH	Mth Oil Prod (m3)	Cum Oil Prod (Km3)	Mth Water Prod (m3)	Cum Water Prod (Km3)	Mth Water Inj (m3)	Cum Water Inj (Km3)	VRR	Cum VRR
Jan-2019	534.2	122.51	360.3	50.65	1151.0	4.69	1.234	0.026
Feb-2019	452.0	122.96	314.3	50.97	889.1	5.58	1.114	0.031
Mar-2019	541.7	123.50	334	51.30	1171.3	6.75	1.281	0.037
Apr-2019	514.1	124.02	328.8	51.63	863.4	7.62	0.982	0.041
May-2019	527.2	124.54	361.7	51.99	769.5	8.39	0.831	0.045
Jun-2019	502.3	125.05	346.6	52.34	434.2	8.82	0.491	0.047
Jul-2019	514.1	125.56	348.5	52.69	387.3	9.21	0.431	0.049
Aug-2019	479.4	126.04	303.3	52.99	180.4	9.39	0.221	0.050
Sep-2019	452.7	126.49	321.8	53.31	292.2	9.68	0.362	0.051
Oct-2019	469.9	126.96	330.3	53.64	300.1	9.98	0.360	0.053
Nov-2019	456.5	127.42	300	53.94	293.5	10.28	0.372	0.054
Dec-2019	477.3	127.90	555.8	54.50	303.8	10.58	0.285	0.055

g) **An outline of the method used for quality control and treatment of the injected fluid**

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.

h) **A report of any unusual performance problems and remedial measures taken or being considered. N/A**

i) **Any other information necessary to evaluate the project**

j) Well List

Sinclair Unit No. 13 Well List

<i>UWI</i>	<i>Type</i>	<i>Status</i>	<i>Future Plans</i>
100/01-33-008-29W1/0	Vertical	Producing	-
100/02-33-008-29W1/0	Vertical	Producing	-
100/03-33-008-29W1/0	Vertical	Producing	-
100/04-33-008-29W1/0	Vertical	Producing	-
102/04-33-008-29W1/0	Horizontal	Producing	-
100/05-33-008-29W1/0	Horizontal	Producing	-
100/07-33-008-29W1/2	Vertical	Producing	-
100/08-33-008-29W1/0	Vertical	Producing	-
100/09-33-008-29W1/0	Vertical	Producing	-
100/10-33-008-29W1/2	Vertical	Producing	-
100/12-33-008-29W1/0	Vertical	Producing	-
102/12-33-008-29W1/0	Horizontal	Producing	-
100/15-33-008-29W1/2	Vertical	Producing	-
100/16-33-008-29W1/0	Vertical	Commingled	-
100/01-04-009-29W1/0	Vertical	Producing	-
100/02-04-009-29W1/0	Vertical	Producing	-
100/04-04-009-29W1/0	Vertical	Producing	-
102/04-04-009-29W1/0	Horizontal	Injection	-
103/04-04-009-29W1/0	Horizontal	Producing	-
102/05-04-009-29W1/0	Horizontal	Producing	-
103/05-04-009-29W1/0	Horizontal	Producing	-
100/07-04-009-29W1/0	Vertical	Producing	-
100/08-04-009-29W1/0	Vertical	Producing	-