Sinclair Unit No. 18

Waterflood Progress Report 2018

January 1st through December 31st 2018

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

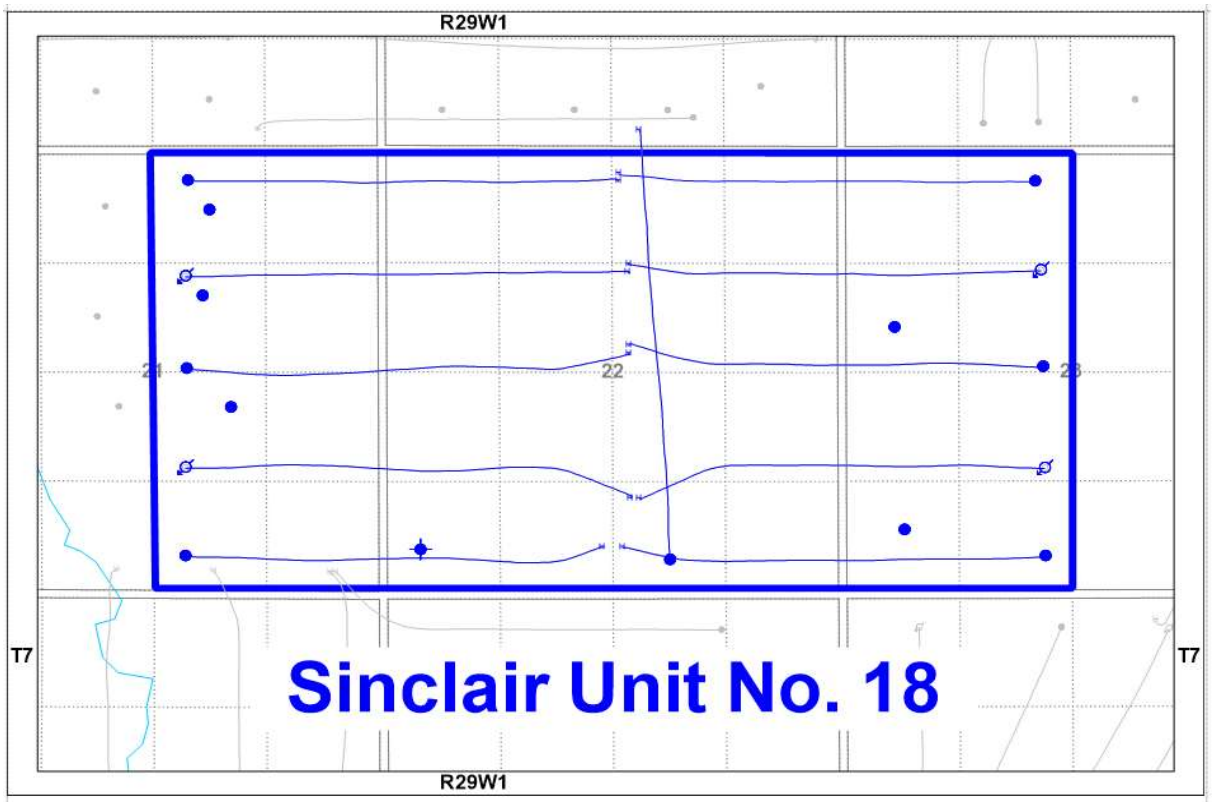
Tundra Oil and Gas

May 29, 2019

INTRODUCTION

Sinclair Unit No. 18 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Waterflood Order No. 59 effective September 1, 2017 with Tundra Oil and Gas (Tundra) as Operator. The EOR project area contains 1 abandoned well, 12 producing wells and 4 horizontal injectors in 2 Sections in Township 7, Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit No. 18 Area Outline



Sinclair Unit No. 18

Tundra Oil and Gas (Tundra), as the operator of the Sinclair Unit No.18 Enhanced Oil Recovery (EOR) project hereby submits the 2018 EOR report as per section 73 of the Drilling and Production Regulations.

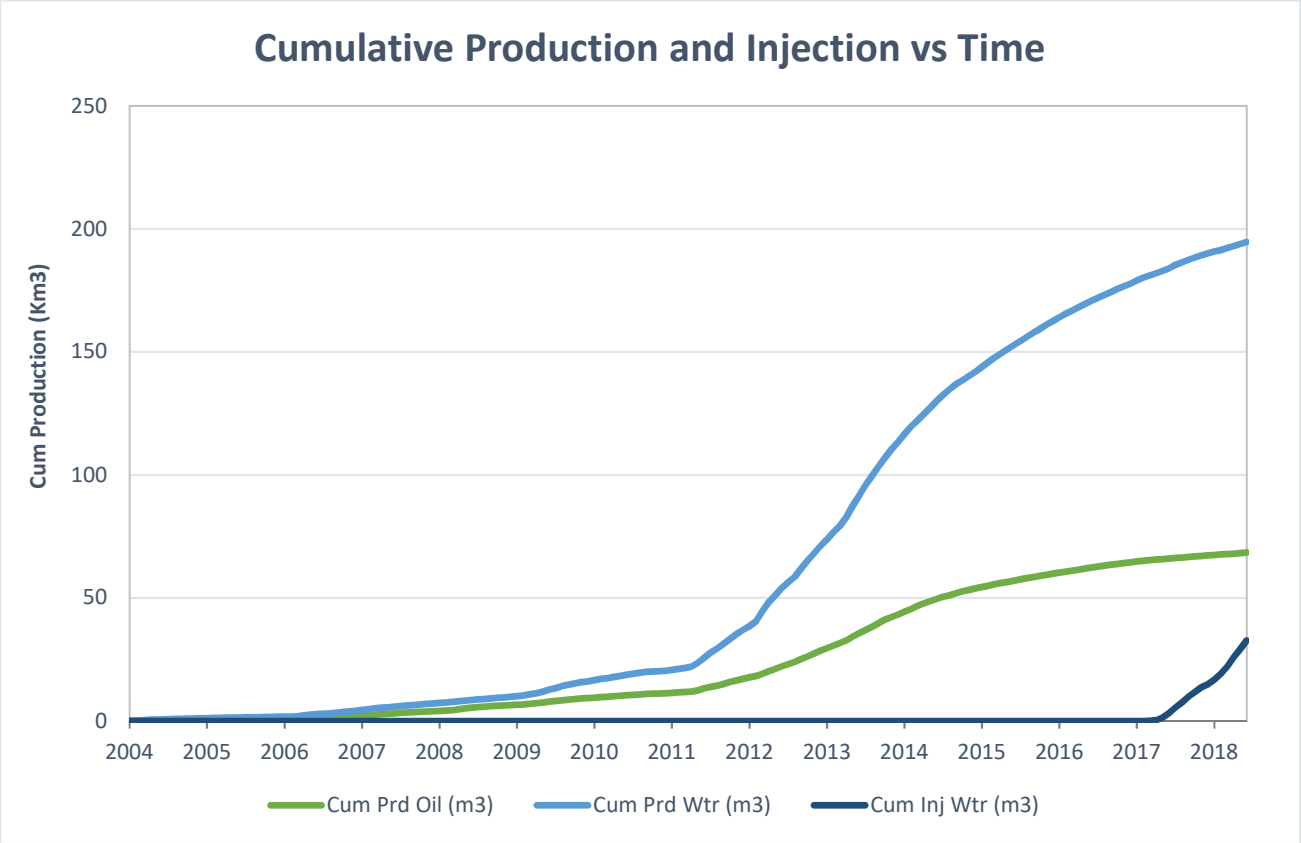
a) Monthly oil and water production rates, injection rate, GOR and WOR

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-2018	6.56	43.25	74.71	6.60	0
Feb-2018	6.98	37.46	76.21	5.37	0
Mar-2018	7.39	35.49	72.65	4.80	0
Apr-2018	7.16	30.95	63.53	4.32	0
May-2018	6.96	26.15	62.55	3.76	0
Jun-2018	6.27	23.68	37.50	3.77	0
Jul-2018	6.01	24.46	59.68	4.07	0
Aug-2018	5.65	23.55	78.03	4.17	0
Sep-2018	5.27	22.61	103.13	4.29	0
Oct-2018	5.86	26.74	120.03	4.56	0
Nov-2018	9.04	28.94	107.80	3.20	0
Dec-2018	8.15	27.83	113.68	3.42	0

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

2018 PRODUCTION	
Produced Oil (m^3)	2,472
Produced Gas (m^3)	0
Produced Water (m^3)	10,666
Fluid Injected (m^3)	29,514
CUMULATIVE PRODUCTION	
Produced Oil (m^3)	68,513
Produced Water (m^3)	194,676

Sinclair Unit No. 18



c) Monthly wellhead injection pressure for each injection well

MONTH	00/11-23 Inj		00/06-23 Inj		02/07-21 Inj		02/10-21 Inj		SU18	
	Inj Water (m^3)	Avg Inj P (kPa)	Inj Water (m^3)	Avg Inj P (kPa)	Inj Water (m^3)	Avg Inj P (kPa)	Inj Water (m^3)	Avg Inj P (kPa)	Inj Water (m^3)	Avg Inj P (kPa)
Jan-2018	1120.0	-96	1196.0	1594	0.0	0	0.0	0	2316.0	749
Feb-2018	1107.0	-96	1027.0	2431	0.0	0	0.0	0	2134.0	1167
Mar-2018	1226.0	-96	1026.0	2944	0.0	0	0.0	0	2252.0	1424
Apr-2018	1120.0	-95	786.0	2996	0.0	0	0.0	0	1906.0	1450
May-2018	1230.0	171	709.0	2991	0.0	0	0.0	0	1939.0	1581
Jun-2018	688.0	258	418.0	2552	19.0	115	0.0	0	1125.0	1189
Jul-2018	867.0	466	551.0	2147	232.0	-66	200.0	-9	1850.0	640
Aug-2018	1212.0	2201	576.0	3046	307.0	-78	324.0	-80	2419.0	1272
Sep-2018	987.0	2576	1019.0	4724	476.0	436	612.0	-61	3094.0	1919
Oct-2018	1168.0	3614	1159.0	5546	653.0	4	741.0	-21	3721.0	2286
Nov-2018	825.0	4343	1090.0	5842	617.0	-15	702.0	-12	3234.0	2539
Dec-2018	622.0	3021	1155.0	6203	869.0	-84	878.0	-95	3524.0	2261
Total	12172.0		10712.0		3173.0		3457.0		29514.0	
Avg Inj P		1356		3585		26		-23		1540

MONTH	**Jan-2018**	**Feb-2018**	**Mar-2018**	**Apr-2018**	**May-2018**	**Jun-2018**	**Jul-2018**	**Aug-2018**	**Sep-2018**	**Oct-2018**	**Nov-2018**	**Dec-2018**
Total m3	2316.0	2134.0	2252.0	1906.0	1939.0	1125.0	1850.0	2419.0	3094.0	3721.0	3234.0	3524.0
Daily (m^3/d)	74.71	76.21	72.65	63.53	62.55	37.50	59.68	78.03	103.13	120.03	107.80	113.68

2018 AVG. ANNUAL DAILY INJECTION =	80.79 m3/d
CUMULATIVE INJECTION TO Dec 31, 2017 =	3,194 m3
TOTAL 2018 ANNUAL INJECTION =	29,514 m3
CUMULATIVE INJECTION TO Dec 31, 2018 =	32,708 m3

d) Summary of the result of any survey of reservoir pressure conducted in 2018. N/A

e) Date and type of any well servicing.

Well	Service Description	Date
100.11-23-007-29W1.00	WiW Packer Repair	12/3/2018
102.07-21-007-29W1.00	WIW Conversion	6/10/2018
102.10-21-007-29W1.00	WIW Conversion	6/21/2018
103.10-21-007-29W1.00	Pump Change/PSN lower	6/13/2018

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-2018	203.3	66.24	1340.8	185.35	2316.0	5.51	1.486	0.021
Feb-2018	195.3	66.44	1048.9	186.40	2134.0	7.64	1.696	0.030
Mar-2018	229.0	66.67	1100.1	187.50	2252.0	9.90	1.674	0.038
Apr-2018	214.7	66.88	928.4	188.43	1906.0	11.80	1.645	0.045
May-2018	215.7	67.10	810.6	189.24	1939.0	13.74	1.862	0.053
Jun-2018	188.2	67.29	710.4	189.95	1125.0	14.87	1.234	0.057
Jul-2018	186.3	67.47	758.3	190.71	1850.0	16.72	1.931	0.064
Aug-2018	175.2	67.65	730.1	191.44	2419.0	19.14	2.636	0.073
Sep-2018	158.2	67.81	678.3	192.12	3094.0	22.23	3.650	0.084
Oct-2018	181.8	67.99	828.9	192.94	3721.0	25.95	3.635	0.098
Nov-2018	271.2	68.26	868.3	193.81	3234.0	29.18	2.791	0.109
Dec-2018	252.6	68.51	862.7	194.68	3524.0	32.71	3.110	0.122

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

The injection water for Sinclair Unit No. 18 is sourced from the 16-32-007-29W1 well (Lodgepole formation). The water is treated at the 03-04-008-29W1 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. 18 Well List

UWI	*Type*	*Status*	*Future Plans*
100/02-21-007-29W1/0	Horizontal	Producing	-
100/07-21-007-29W1/0	Vertical	Producing	-
102/07-21-007-29W1/0	Horizontal	Injection	-
100/10-21-007-29W1/0	Vertical	Producing	-
102/10-21-007-29W1/0	Horizontal	Injection	-
103/10-21-007-29W1/0	Horizontal	Producing	-
100/15-21-007-29W1/0	Vertical	Producing	-
102/15-21-007-29W1/0	Horizontal	Producing	-
100/02-22-007-29W1/0	Horizontal	Producing	-
100/04-22-007-29W1/0	Vertical	Abandoned Zone	-
100/03-23-007-29W1/0	Horizontal	Producing	-
100/04-23-007-29W1/0	Vertical	Producing	-
100/06-23-007-29W1/0	Horizontal	Injection	-
100/11-23-007-29W1/0	Horizontal	Injection	-
102/11-23-007-29W1/0	Horizontal	Producing	-
100/12-23-007-29W1/0	Vertical	Producing	-
100/14-23-007-29W1/0	Horizontal	Producing	-