Ewart Unit No. 4

Waterflood Progress Report 2019

January 1st through December 31st 2019

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:

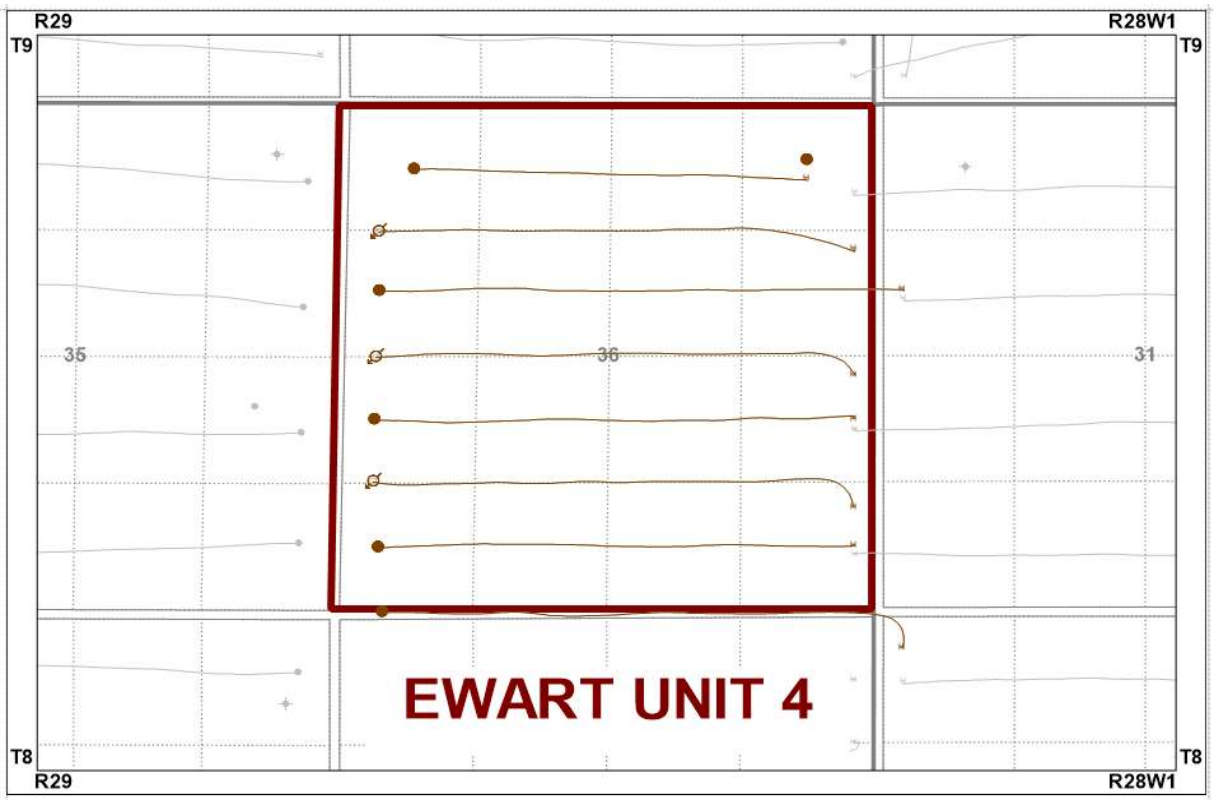
Tundra Oil and Gas

May 26, 2020

INTRODUCTION

Ewart Unit No. 4 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Waterflood Order No. 43, effective February 1, 2015 with Tundra Oil and Gas (Tundra) as Operator. The Unit area contains 1 abandoned vertical well and 5 horizontal producing wells and 3 horizontal injectors in 16 LSDs in Township 8 Range 29 W1 as shown in the figure below.

Figure 1: Ewart Unit No. 4 Area Outline



Ewart Unit No. 4

Tundra Oil and Gas (Tundra), as the operator of the Ewart Unit No. 4 Enhanced Oil Recovery (EOR) project hereby submits the 2019 EOR report as per section 73 of the Drilling and Production Regulations.

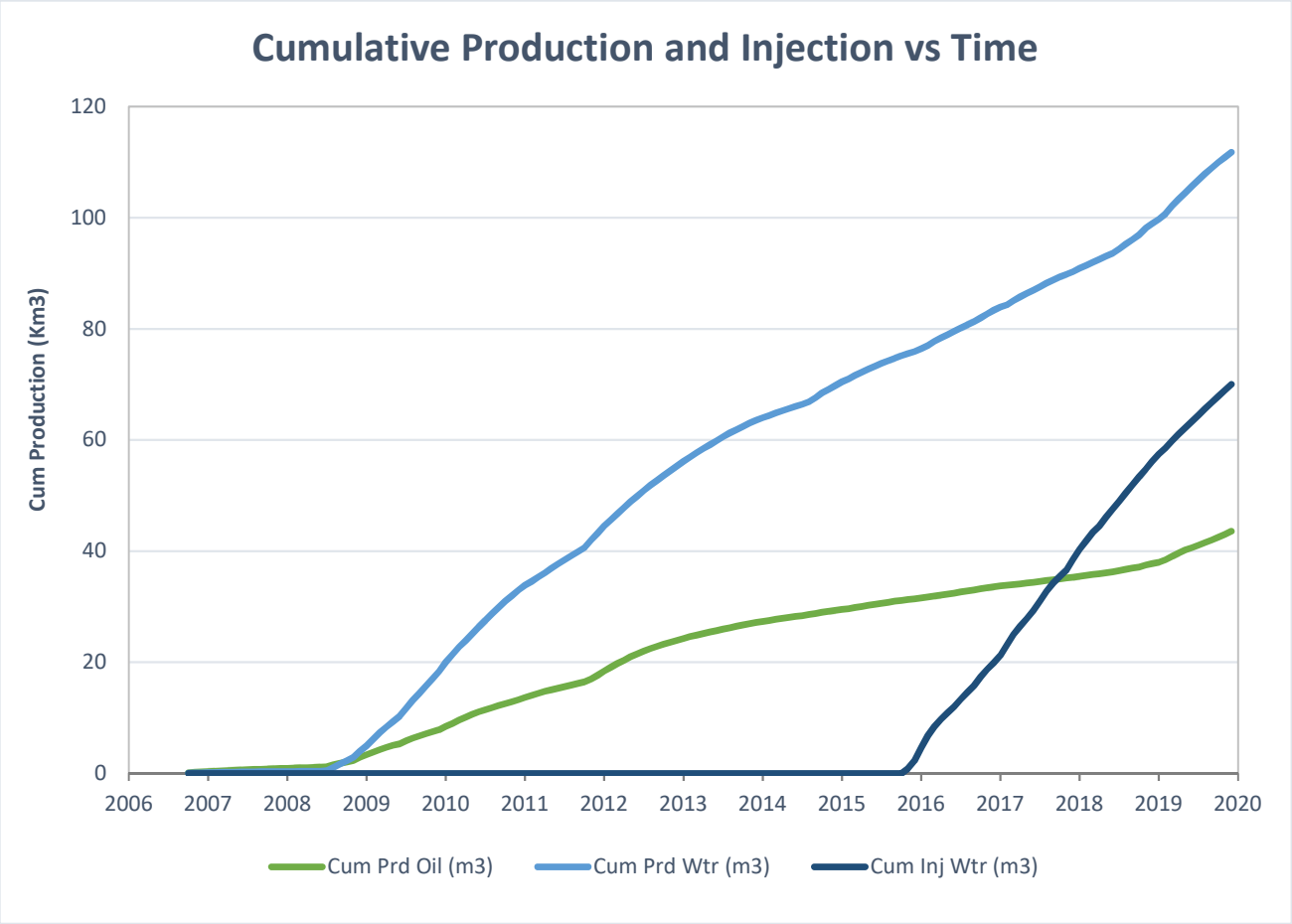
a) Monthly oil and water production rates, injection rate, GOR and WOR

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	7.49	25.25	42.97	3.37	0
Feb-2019	15.44	34.84	38.64	2.26	0
Mar-2019	20.51	46.18	42.55	2.25	0
Apr-2019	19.50	40.89	39.83	2.10	0
May-2019	18.83	36.28	38.00	1.93	0
Jun-2019	12.67	39.29	37.16	3.10	0
Jul-2019	14.25	38.02	37.07	2.67	0
Aug-2019	15.45	35.37	36.93	2.29	0
Sep-2019	15.14	33.18	37.47	2.19	0
Oct-2019	16.87	33.46	35.90	1.98	0
Nov-2019	17.27	31.01	36.13	1.80	0
Dec-2019	17.62	29.21	35.06	1.66	0

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

2019 PRODUCTION	
Produced Oil (m^3)	5,812
Produced Gas (m^3)	0
Produced Water (m^3)	12,864
Fluid Injected (m^3)	13,923
CUMULATIVE PRODUCTION	
Produced Oil (m^3)	43,583
Produced Water (m^3)	111,783

Ewart Unit No. 4



c) Monthly wellhead injection pressure for each injection well

MONTH	03/12-36 Inj		02/12-36 Inj		02/05-36 Inj		EU4	
	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-2019	440.0	6538	327.0	6514	565.0	6527	1332.0	6526
Feb-2019	389.0	6558	209.0	6257	484.0	6524	1082.0	6446
Mar-2019	421.0	6471	372.0	6449	526.0	6448	1319.0	6456
Apr-2019	395.0	6548	315.0	6550	485.0	6529	1195.0	6542
May-2019	387.6	6259	320.7	6478	469.8	6422	1178.1	6386
Jun-2019	368.4	6225	311.3	6245	435.2	6163	1114.9	6211
Jul-2019	378.6	6368	328.5	6396	442.1	6270	1149.2	6345
Aug-2019	376.4	6387	329.5	6344	438.9	6314	1144.8	6348
Sep-2019	369.0	6512	326.0	6520	429.0	6477	1124.0	6503
Oct-2019	366.0	6464	327.0	6453	420.0	6420	1113.0	6446
Nov-2019	347.0	6562	320.0	6551	417.0	6545	1084.0	6553
Dec-2019	357.0	6470	317.0	6450	413.0	6428	1087.0	6449
Total	4595.0		3803.0		5525.0		13923.0	
Avg Inj P		6447		6434		6422		6434

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	1332.0	1082.0	1319.0	1195.0	1178.1	1114.9	1149.2	1144.8	1124.0	1113.0	1084.0	1087.0
Daily (m^3/d)	42.97	38.64	42.55	39.83	38.00	37.16	37.07	36.93	37.47	35.90	36.13	35.06

2019 AVG. ANNUAL DAILY INJECTION =	38.14 m3/d
CUMULATIVE INJECTION TO Dec 31, 2018 =	56,095 m3
TOTAL 2019 ANNUAL INJECTION =	13,923 m3
CUMULATIVE INJECTION TO Dec 31, 2019 =	70,018 m3

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

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	232.3	38.00	782.9	99.70	1332.0	57.43	1.291	0.409
Feb-2019	432.3	38.44	975.5	100.68	1082.0	58.51	0.752	0.412
Mar-2019	635.7	39.07	1431.6	102.11	1319.0	59.83	0.624	0.416
Apr-2019	585.0	39.66	1226.7	103.34	1195.0	61.02	0.645	0.419
May-2019	583.7	40.24	1124.6	104.46	1178.1	62.20	0.673	0.422
Jun-2019	380.0	40.62	1178.7	105.64	1114.9	63.32	0.703	0.425
Jul-2019	441.9	41.06	1178.6	106.82	1149.2	64.47	0.696	0.428
Aug-2019	479.1	41.54	1096.5	107.91	1144.8	65.61	0.711	0.430
Sep-2019	454.1	42.00	995.5	108.91	1124.0	66.73	0.759	0.434
Oct-2019	522.9	42.52	1037.3	109.95	1113.0	67.85	0.697	0.436
Nov-2019	518.2	43.04	930.3	110.88	1084.0	68.93	0.730	0.439
Dec-2019	546.3	43.58	905.4	111.78	1087.0	70.02	0.729	0.442

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

The injection water for Ewart Unit No. 4 is sourced from the 02/14-30-007-28W1 well (Mannville formation). The water is treated at the 04-01-008-29W1 filtration plant where it is filtered to 0.1 microns and has scale inhibitor and biocide 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

Ewart Unit No. 4 Well List

UWI	*Type*	*Status*	*Future Plans*
100/04-36-008-29W1/0	Horizontal	Producing	-
103/04-36-008-29W1/0	Horizontal	Producing	-
100/05-36-008-29W1/0	Horizontal	Producing	-
102/05-36-008-29W1/0	Horizontal	Injection	-
100/12-36-008-29W1/0	Horizontal	Producing	-
102/12-36-008-29W1/0	Horizontal	Injection	-
103/12-36-008-29W1/0	Horizontal	Injection	-
102/13-36-008-29W1/0	Horizontal	Producing	-
100/16-36-008-29W1/0	Vertical	Producing	-