

Daly Unit #14
2019 Annual EOR Report

Executive Summary

In 2019, oil production from Daly Unit #14 was 8 m³/d (50 bbl/d), totaling 2.9 10³m³ (18.3 mbbl). Annual production declined by 29.3% from 2018 to 2019 based on average yearly production. If you compare December 2018 to December 2019 the unit would have an incline in production of 92.2%, due to the drilling of two new horizontal wells. Cumulative oil production from Daly Unit #14 was 60.7 10³m³ (381.7 mbbl) at the end of 2019.

In December 2019, there were 17 active oil producers and one active injection well. In 2019 two horizontal wells were drilled.

Discussion

The first development in this unit occurred in 1994 with the deepening of existing vertical producers in the Lodgepole, Daly Unit #13, into the Bakken formation. Further wells were deepened to the Bakken throughout the years, continuing until 2009 where there were a maximum of 11 wells in the unit. In 2014, Corex continued to develop the unit through horizontal multistage fractured wells, drilling two wells in the Bakken formation in the southern portion of the unit. In 2017, Corex drilled one horizontal Bakken well within the unit. In 2019, two wells were drilled in the unit. With continued development and primary production, it was determined that it would be beneficial to implement a waterflood, with further conversions as development continues.

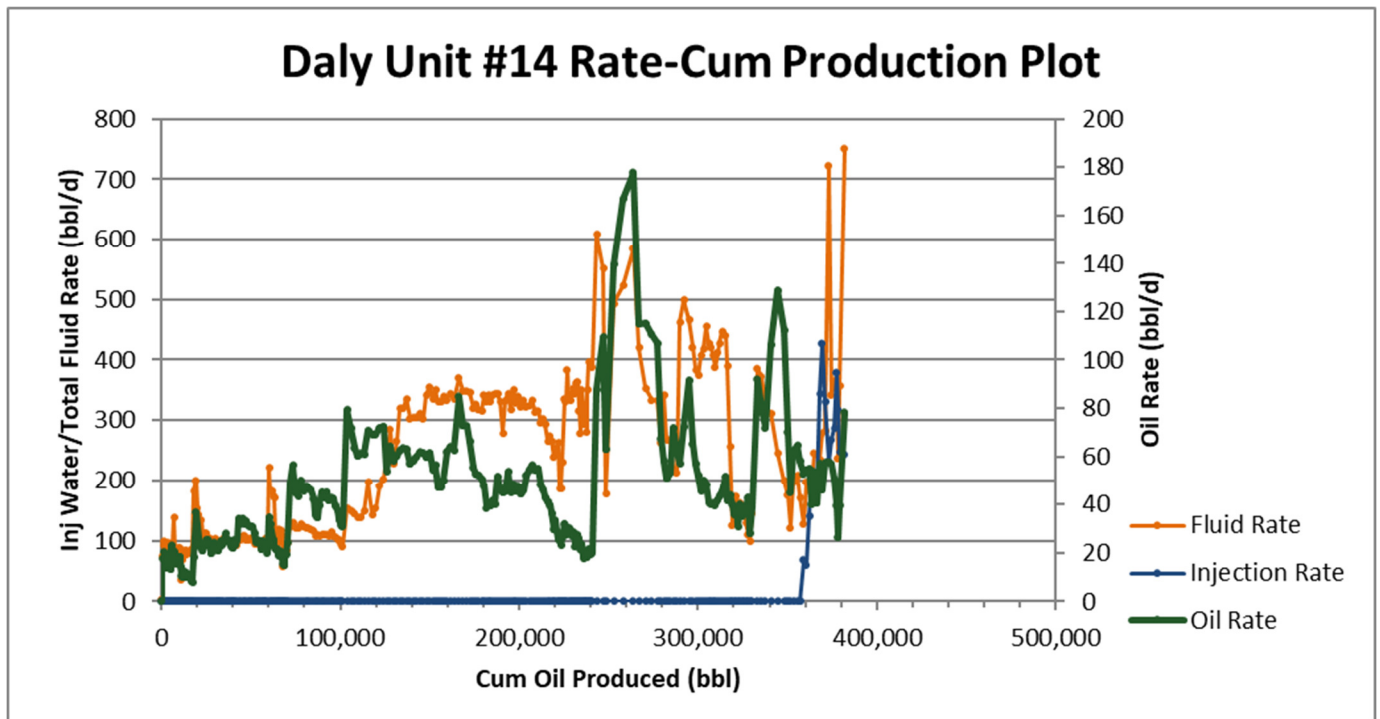
In September 2018, the 104/04-25-009-29W1/00 well was converted to injection. Thus far, it is too early to see any response to the conversion. The waterflood may have a more muted response as there is only one well under injection.

All produced water from the Daly Unit #14 was disposed through the use of a disposal well outside of the unit. Source water from outside the unit is used for all injection. The average injection rate within the unit is 45.7 m³/d (288 bbl/d). The producing WOR of the unit is 7.6 m³/m³.

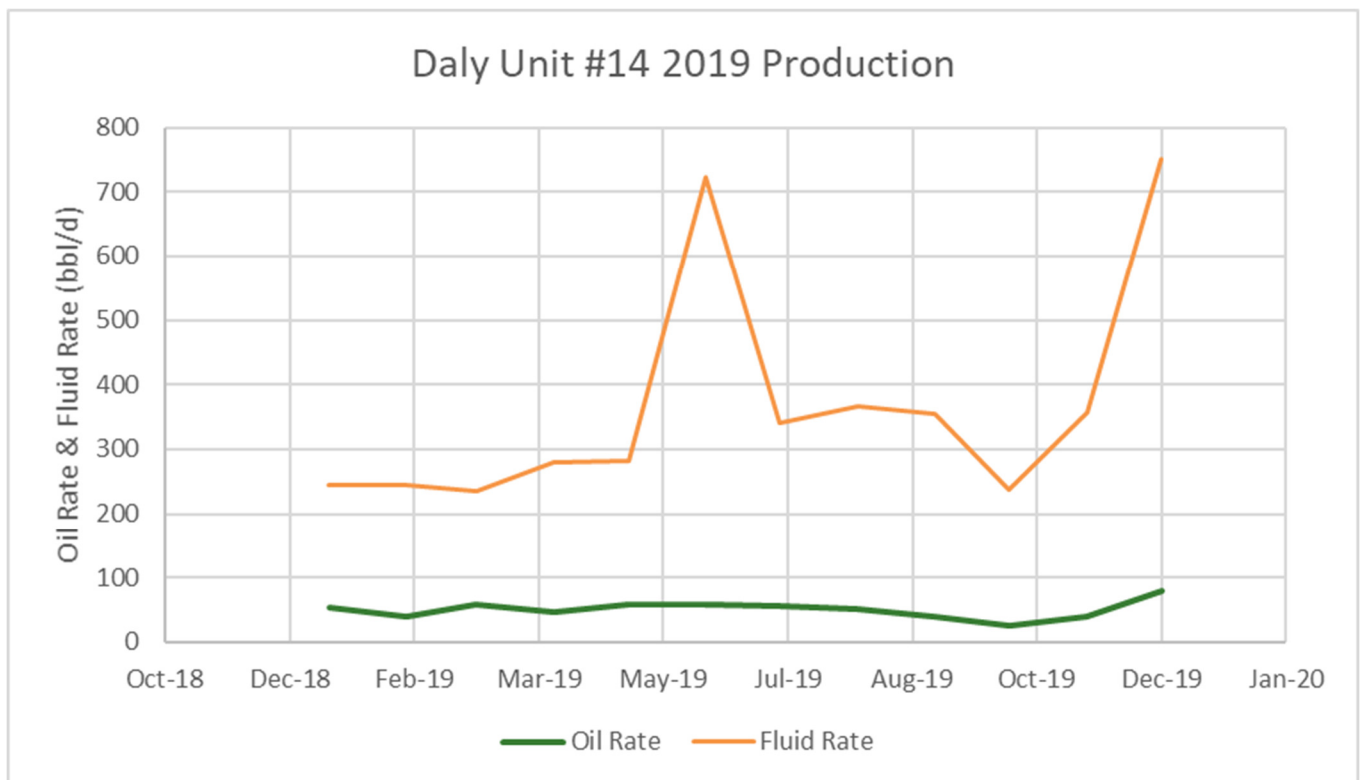
Activities of note within the Daly Unit #14 in 2019:

- September 2019, drill the 104/05-25-009-29W1/00 horizontal well in the Bakken.
- September 2019, drill the 104/12-25-009-29W1/00 horizontal well in the Bakken.

Daly #14 – Rate vs Cum Oil Production



Daly #14 – Rate vs Time



2019 Reservoir Pressure Surveys

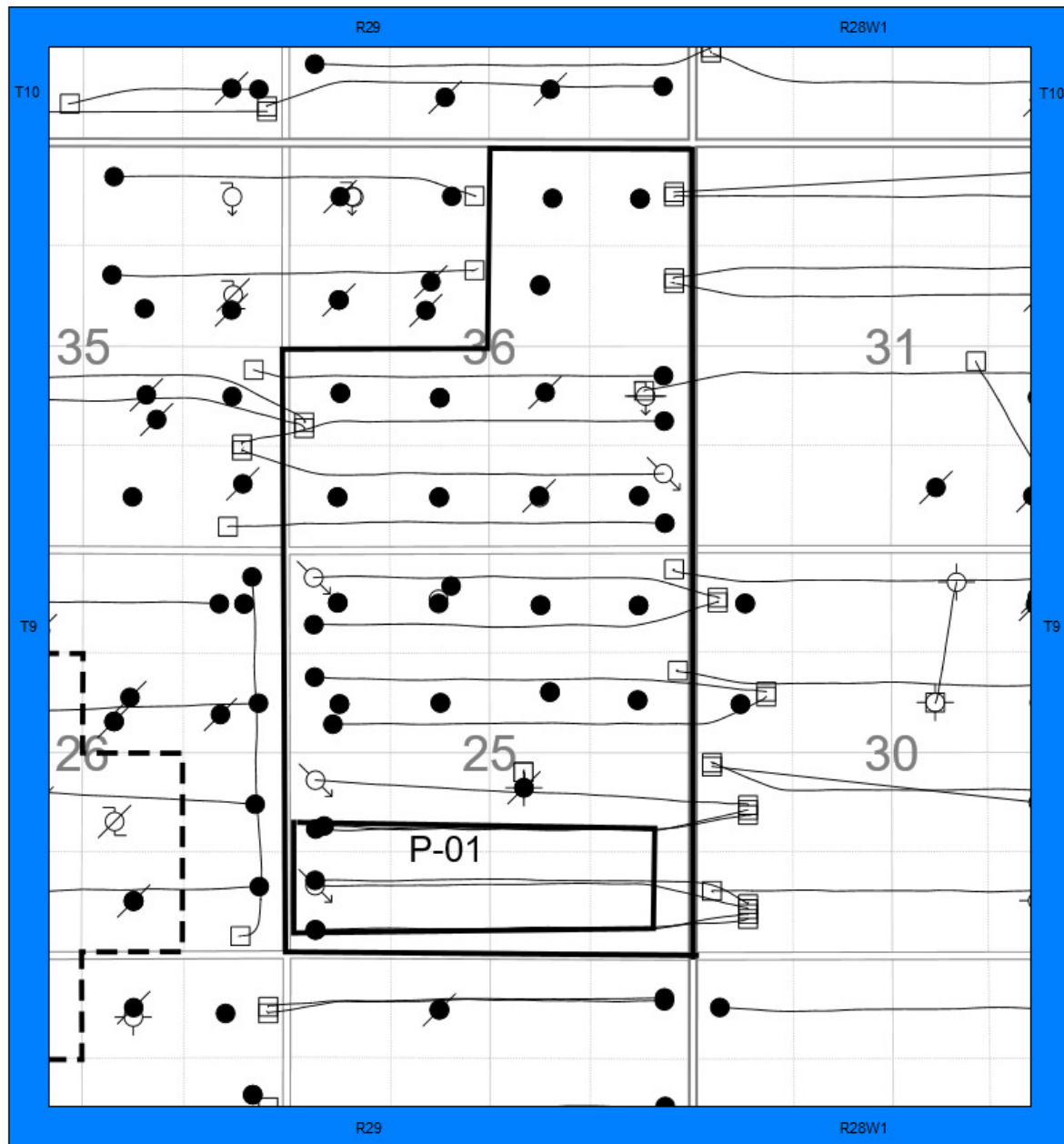
In 2019, no pressure surveys were conducted in Daly Unit #14. There are also no recent recorded pressures within the unit. The estimated initial reservoir pressure for the Bakken is 9,500 kPaa. Thus far, due to minimal production out of the Bakken for the majority of the unit it is likely that most of the unit is near initial reservoir pressure. With further development, due to the inter well spacing it is likely that the average reservoir pressure will drop below the initial reservoir pressure relatively quickly. Therefore, implementing a waterflood will be advantageous. With the recent conversion of a well to injection the pressure in the depleted area will be increasing from its current state.

The VRR within the one pattern in 2019 averaged 1.94, indicating that voidage is being replaced. The cumulative VRR for the pattern at year end was 0.35. An oil formation volume factor of 1.06 rm^3/sm^3 and a water formation volume factor of 1.04 rm^3/sm^3 were used in the VRR calculations.

2019 Well Servicing

UWI	Unit	Licence	Start Date	Operation	Objective
104/05-25-009-29W1/00	DU#14	11322	2019-08-26	Construction	Construction
104/05-25-009-29W1/00	DU#14	11322	2019-09-19	Drilling	Drilling - original
104/05-25-009-29W1/00	DU#14	11322	2019-10-15	Completion/Workover	Initial Completion
104/05-25-009-29W1/00	DU#14	11322	2019-11-12	Facilities	Equip & Tie-In
100/04-25-009-29W1/00	DU#14	9658	2019-05-28	Completion/Workover	Pump Repair
104/12-25-009-29W1/00	DU#14	11331	2019-08-22	Construction	Construction
104/12-25-009-29W1/00	DU#14	11331	2019-09-24	Drilling	Drilling - original
104/12-25-009-29W1/00	DU#14	11331	2019-10-15	Completion/Workover	Initial Completion
104/12-25-009-29W1/00	DU#14	11331	2019-11-12	Facilities	Equip & Tie-In
100/10-36-009-29W1/02	DALY UNIT 13 & 14	3707	2019-07-18	Completion/Workover	Pump Repair
100/05-25-009-29W1/00	DU#14	9542	2019-06-07	Completion/Workover	Pump Repair
100/05-25-009-29W1/00	DU#14	9542	2019-11-23	Completion/Workover	Pump Repair
104/04-25-009-29W1/00	DU#14	10718	2019-12-29	Completion/Workover	Acid Treatment

Daly #14 Waterflood Pattern Map

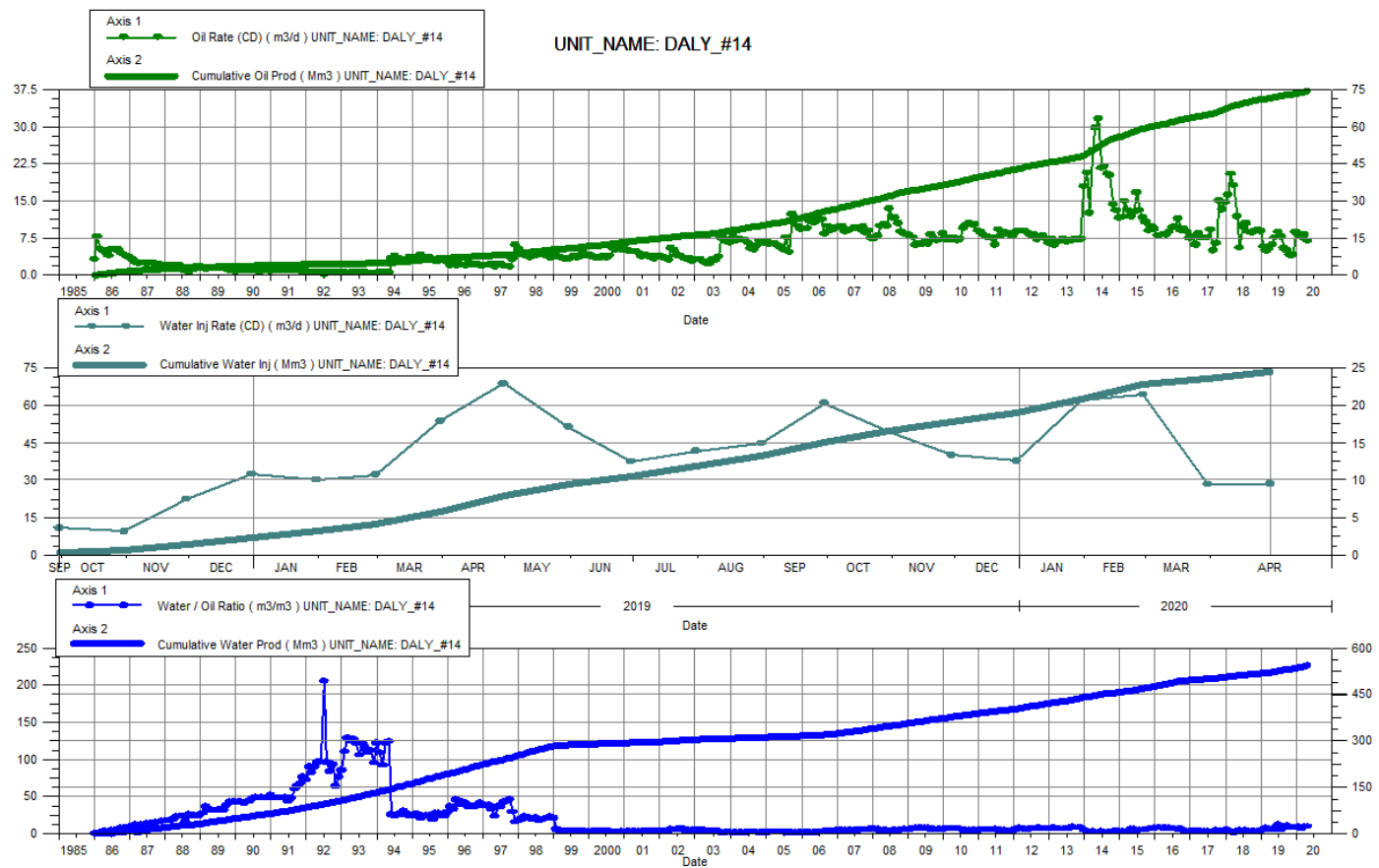


Daly #14 Waterflood Pattern Table

Pattern	Well
P-01	104/04-25-009-29W1/00

Total for Daly #14

Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPa
1-31-2019	5.84	71.30	33.08	517.55	30.26	3.23	5.67	0.78	0.01	11.94
2-28-2019	4.97	71.44	33.76	518.49	32.18	4.13	6.80	0.83	0.01	6,999.86
3-31-2019	5.36	71.61	32.05	519.48	53.81	5.80	5.98	1.43	0.01	8,584.19
4-30-2019	6.22	71.79	38.15	520.63	68.93	7.87	6.14	1.55	0.01	8,587.07
5-31-2019	7.64	72.03	37.36	521.79	51.45	9.46	4.89	1.14	0.02	8,600.06
6-30-2019	8.82	72.30	106.03	524.97	37.47	10.59	12.03	0.33	0.02	8,405.60
7-31-2019	7.77	72.54	46.45	526.41	41.81	11.88	5.97	0.77	0.02	8,618.65
8-31-2019	5.53	72.71	52.58	528.04	44.84	13.27	9.52	0.77	0.02	8,619.00
9-30-2019	5.07	72.86	51.19	529.57	61.03	15.10	10.10	1.08	0.03	8,619.00
10-31-2019	4.08	72.99	33.62	530.62	49.61	16.64	8.23	1.31	0.03	8,619.00
11-30-2019	4.16	73.11	34.49	531.65	40.03	17.84	8.30	1.03	0.03	8,619.00
12-31-2019	8.67	73.38	66.26	533.71	37.81	19.01	7.64	0.50	0.03	8,619.00



Daly No. 14

Pattern P-01 - 04/04-25-009-29W1/0

Date	Oil Rate (CD) m3/d	Cum Oil Prod Mm3	Water Rate (CD) m3/d	Cum Water Prod Mm3	Water Inj Rate (CD) m3/d	Cum Water Inj Mm3	Water Oil Ratio m3/m3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio	Water Inj Pressure kPg
1-31-2019	2.15	12.45	16.61	33.16	30.26	3.23	7.72	1.61	0.07	11.94
2-28-2019	1.62	12.50	16.57	33.63	32.18	4.13	10.24	1.77	0.09	6,999.86
3-31-2019	1.42	12.54	14.20	34.07	53.81	5.80	10.00	3.44	0.12	8,584.19
4-30-2019	0.84	12.57	20.35	34.68	68.93	7.87	24.22	3.25	0.17	8,587.07
5-31-2019	0.47	12.58	19.28	35.28	51.45	9.46	40.67	2.60	0.20	8,600.06
6-30-2019	0.77	12.61	45.06	36.63	37.47	10.59	58.77	0.82	0.21	8,405.60
7-31-2019	0.59	12.63	27.08	37.47	41.81	11.88	46.13	1.51	0.24	8,618.65
8-31-2019	0.73	12.65	33.54	38.51	44.84	13.27	46.01	1.31	0.26	8,619.00
9-30-2019	0.67	12.67	33.18	39.50	61.03	15.10	49.52	1.80	0.29	8,619.00
10-31-2019	0.94	12.70	24.66	40.27	49.61	16.64	26.18	1.94	0.31	8,619.00
11-30-2019	0.59	12.71	21.96	40.93	40.03	17.84	37.23	1.77	0.33	8,619.00
12-31-2019	0.47	12.73	25.41	41.71	37.81	19.01	53.58	1.46	0.35	8,619.00

