

SINCLAIR UNIT NO. 7 - WATERFLOOD NO. 26

Waterflood Progress Report 2020

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:



TUNDRA OIL & GAS

Date: 2021-08-26

## Introduction

Sinclair Unit No. 7 Enhanced Oil Recovery (EOR) Waterflood was approved under Waterflood Order No. 26 effective July 1, 2013 with Tundra Oil and Gas (Tundra) as operator. The Unit area contains wells in 2.5 sections in Township 8 Range 29 W1 as shown in the figure below. The Unit contains 56 wells. 41 producers, 11 injectors, and 4 abandoned/suspended/other.

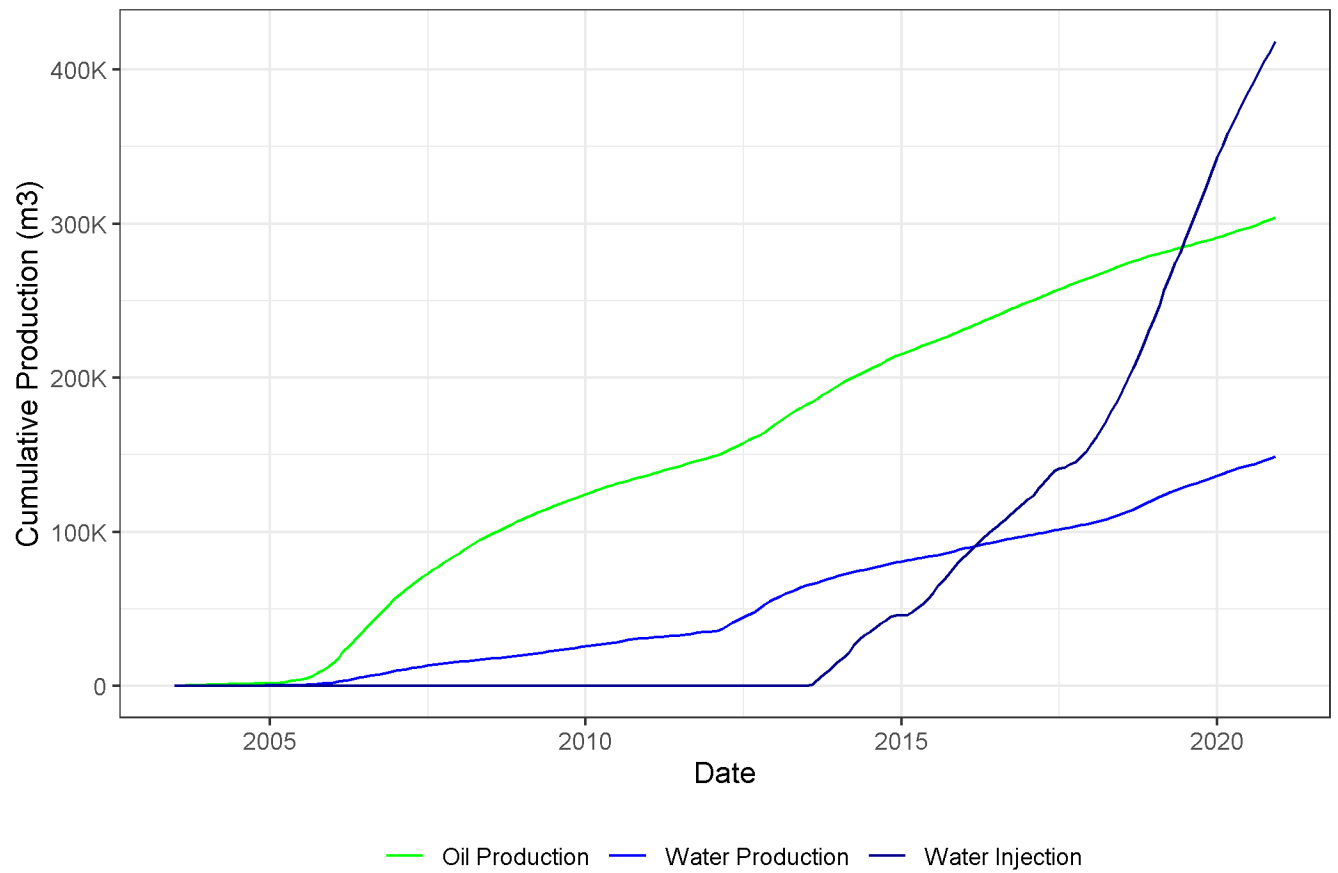
## Monthly oil and water production rates, injection rate, GOR and WOR

| MONTH    | Cal Day Oil<br>m3/d | Cal Day Water<br>m3/d | Cal Day Injection<br>m3/d | WOR  | GOR |
|----------|---------------------|-----------------------|---------------------------|------|-----|
| JAN 2020 | 33.77               | 40.45                 | 279.52                    | 1.20 | 0   |
| FEB 2020 | 35.42               | 46.36                 | 268.14                    | 1.31 | 0   |
| MAR 2020 | 37.59               | 45.61                 | 251.48                    | 1.21 | 0   |
| APR 2020 | 36.94               | 41.62                 | 237.40                    | 1.13 | 0   |
| MAY 2020 | 36.87               | 31.96                 | 221.87                    | 0.87 | 0   |
| JUN 2020 | 30.60               | 25.70                 | 219.00                    | 0.84 | 0   |
| JUL 2020 | 35.20               | 29.10                 | 212.19                    | 0.83 | 0   |
| AUG 2020 | 37.89               | 28.66                 | 215.68                    | 0.76 | 0   |
| SEP 2020 | 43.89               | 37.54                 | 225.57                    | 0.86 | 0   |
| OCT 2020 | 41.25               | 43.38                 | 209.13                    | 1.05 | 0   |
| NOV 2020 | 41.08               | 39.61                 | 201.63                    | 0.96 | 0   |
| DEC 2020 | 42.53               | 39.08                 | 206.77                    | 0.92 | 0   |
| Average  | 37.75               | 37.42                 | 229.03                    |      |     |

## Year summary of produced oil, gas, water and fluid injected

| Categories           | m3      |
|----------------------|---------|
| Oil Production       | 13,822  |
| Water Production     | 13,684  |
| Gas Production       | 0       |
| Water Injection      | 83,780  |
| Cumulative Oil       | 303,838 |
| Cumulative Water     | 148,746 |
| Cumulative Injection | 418,109 |

Cumulative Production and Injection



## Monthly Wellhead Pressure

All readings are in kPa

| UWI                   | JAN   | FEB   | MAR   | APR   | MAY   | JUN   | JUL   | AUG   | SEP   | OCT   | NOV   | DEC   | Average |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| 102.01-23-008-29W1.00 | 6,567 | 6,571 | 6,571 | 6,573 | 6,374 | 6,565 | 6,578 | 6,575 | 6,578 | 6,575 | 6,575 | 6,570 | 6,556   |
| 102.04-15-008-29W1.00 | 77    | 903   | 1,676 | 3,243 | 2,617 | 2,961 | 2,989 | 2,986 | 2,979 | 2,977 | 2,971 | 3,141 | 2,460   |
| 102.05-15-008-29W1.00 | 5,493 | 5,466 | 5,468 | 5,469 | 5,395 | 5,473 | 5,476 | 5,472 | 5,471 | 5,462 | 5,472 | 5,472 | 5,466   |
| 102.08-14-008-29W1.00 | 6,559 | 6,566 | 6,372 | 6,214 | 6,214 | 6,214 | 6,214 | 6,214 | 6,214 | 6,214 | 6,214 | 4,562 | 6,148   |
| 102.09-14-008-29W1.00 | 6,569 | 6,531 | 6,573 | 6,572 | 6,497 | 6,565 | 6,575 | 6,578 | 6,573 | 6,564 | 6,565 | 6,568 | 6,561   |
| 102.16-14-008-29W1.00 | 6,567 | 6,560 | 6,568 | 6,452 | 6,156 | 6,433 | 6,568 | 6,303 | 6,438 | 6,454 | 6,545 | 6,565 | 6,467   |
| 103.01-14-008-29W1.00 | 6,566 | 6,549 | 6,560 | 6,565 | 6,415 | 6,571 | 6,466 | 6,569 | 6,561 | 6,560 | 6,561 | 6,571 | 6,543   |
| 103.05-15-008-29W1.00 | 2,359 | 2,826 | 2,974 | 2,971 | 2,815 | 2,981 | 2,984 | 2,983 | 2,978 | 2,959 | 2,976 | 2,972 | 2,898   |
| 103.08-14-008-29W1.00 | 6,563 | 6,566 | 6,569 | 6,570 | 6,509 | 6,574 | 6,578 | 6,574 | 6,534 | 6,562 | 6,569 | 6,564 | 6,561   |
| 103.12-09-008-28W1.00 | 2,946 | 2,976 | 3,083 | 3,006 | 3,006 | 2,543 | 2,979 | 3,884 | 4,938 | 4,968 | 5,071 | 5,350 | 3,729   |
| 104.12-15-008-29W1.00 | 5,469 | 5,469 | 5,472 | 5,472 | 5,387 | 5,495 | 5,478 | 5,477 | 5,475 | 5,463 | 5,470 | 5,469 | 5,466   |

## Monthly Injected Volumes

All Volumes are in m3

| UWI                   | JAN   | FEB   | MAR   | APR   | MAY   | JUN   | JUL   | AUG   | SEP   | OCT   | NOV   | DEC   | Total  |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 102.01-23-008-29W1.00 | 450   | 414   | 459   | 433   | 435   | 422   | 383   | 353   | 381   | 388   | 370   | 372   | 4,860  |
| 102.04-15-008-29W1.00 | 1,054 | 1,087 | 1,146 | 1,196 | 1,107 | 995   | 971   | 913   | 832   | 822   | 758   | 824   | 11,705 |
| 102.05-15-008-29W1.00 | 923   | 786   | 783   | 713   | 680   | 640   | 648   | 613   | 577   | 575   | 542   | 543   | 8,023  |
| 102.08-14-008-29W1.00 | 453   | 425   | 217   |       |       |       |       |       |       |       |       | 116   | 1,211  |
| 102.09-14-008-29W1.00 | 297   | 274   | 290   | 289   | 306   | 325   | 343   | 334   | 327   | 326   | 304   | 304   | 3,719  |
| 102.16-14-008-29W1.00 | 641   | 581   | 613   | 567   | 566   | 571   | 619   | 557   | 587   | 593   | 565   | 570   | 7,030  |
| 103.01-14-008-29W1.00 | 113   | 104   | 184   | 172   | 155   | 142   | 137   | 141   | 129   | 130   | 123   | 239   | 1,769  |
| 103.05-15-008-29W1.00 | 1,241 | 1,150 | 1,112 | 974   | 905   | 850   | 851   | 796   | 738   | 725   | 676   | 671   | 10,689 |
| 103.08-14-008-29W1.00 | 380   | 348   | 366   | 349   | 345   | 339   | 353   | 344   | 331   | 336   | 326   | 330   | 4,147  |
| 103.12-09-008-28W1.00 | 504   | 445   | 449   | 409   | 402   | 371   | 367   | 822   | 1,093 | 814   | 709   | 759   | 7,144  |
| 104.12-15-008-29W1.00 | 931   | 737   | 714   | 649   | 618   | 584   | 590   | 563   | 532   | 530   | 501   | 503   | 7,452  |
| Grand Total           | 6,987 | 6,351 | 6,333 | 5,751 | 5,519 | 5,239 | 5,262 | 5,436 | 5,527 | 5,239 | 4,874 | 5,231 | 67,749 |

## Voidage

All Volumes are in m3 Oil Formation Volume Factor (Rm3/Sm3) = 1.071

| MONTH    | Oil   | Water | Injection | Cumulative Oil | Cumulative Water | Cumulative Injection | VRR   | Cumulative VRR |
|----------|-------|-------|-----------|----------------|------------------|----------------------|-------|----------------|
| JAN 2020 | 1,046 | 1,254 | 8,665     | 291,060        | 136,310          | 342,994              | 3.650 | 0.766          |
| FEB 2020 | 1,027 | 1,344 | 7,776     | 292,087        | 137,654          | 350,770              | 3.182 | 0.779          |
| MAR 2020 | 1,165 | 1,414 | 7,796     | 293,252        | 139,068          | 358,566              | 2.929 | 0.791          |
| APR 2020 | 1,108 | 1,249 | 7,122     | 294,360        | 140,317          | 365,688              | 2.924 | 0.803          |
| MAY 2020 | 1,144 | 991   | 6,878     | 295,504        | 141,308          | 372,566              | 3.103 | 0.814          |
| JUN 2020 | 918   | 771   | 6,570     | 296,422        | 142,079          | 379,136              | 3.745 | 0.825          |
| JUL 2020 | 1,091 | 901   | 6,578     | 297,513        | 142,980          | 385,714              | 3.179 | 0.836          |
| AUG 2020 | 1,174 | 888   | 6,686     | 298,687        | 143,868          | 392,400              | 3.117 | 0.846          |
| SEP 2020 | 1,319 | 1,126 | 6,767     | 300,006        | 144,994          | 399,167              | 2.666 | 0.856          |
| OCT 2020 | 1,279 | 1,345 | 6,483     | 301,285        | 146,339          | 405,650              | 2.388 | 0.865          |
| NOV 2020 | 1,232 | 1,189 | 6,049     | 302,517        | 147,528          | 411,699              | 2.411 | 0.873          |
| DEC 2020 | 1,319 | 1,212 | 6,410     | 303,836        | 148,740          | 418,109              | 2.442 | 0.882          |

## Workovers

| UWI                   | Date       | Description              |
|-----------------------|------------|--------------------------|
| 100.02-15-008-29W1.00 | 2020-12-17 | Rigless Acid Stimulation |
| 100.06-14-008-29W1.00 | 2020-12-19 | Rigless Acid Stimulation |
| 100.08-14-008-29W1.00 | 2020-12-19 | Rigless Acid Stimulation |
| 100.11-14-008-29W1.00 | 2020-12-19 | Rigless Acid Stimulation |
| 100.13-15-008-29W1.00 | 2020-12-19 | Rigless Acid Stimulation |
| 100.15-15-008-29W1.00 | 2020-12-19 | Rigless Acid Stimulation |
| 103.01-14-008-29W1.00 | 2020-12-08 | Rigless Acid Stimulation |
| 103.01-23-008-29W1.00 | 2020-12-15 | Rigless Acid Stimulation |

## Well List

| UWI                   | Type       | Status    |
|-----------------------|------------|-----------|
| 100.10-09-008-28W1.00 | Vertical   | Producing |
| 103.12-09-008-28W1.00 | Horizontal | Injection |
| 100.01-14-008-29W1.00 | Vertical   | Producing |
| 103.01-14-008-29W1.00 | Horizontal | Injection |
| 100.02-14-008-29W1.00 | Vertical   | Producing |
| 100.03-14-008-29W1.00 | Vertical   | Producing |
| 100.04-14-008-29W1.00 | Vertical   | Producing |
| 100.05-14-008-29W1.00 | Vertical   | Producing |
| 100.06-14-008-29W1.00 | Vertical   | Producing |
| 100.07-14-008-29W1.00 | Vertical   | Producing |
| 100.08-14-008-29W1.00 | Vertical   | Producing |
| 102.08-14-008-29W1.00 | Horizontal | Injection |
| 103.08-14-008-29W1.00 | Horizontal | Injection |
| 100.09-14-008-29W1.00 | Vertical   | Producing |
| 102.09-14-008-29W1.00 | Horizontal | Injection |
| 100.10-14-008-29W1.00 | Vertical   | Producing |
| 100.11-14-008-29W1.00 | Vertical   | Producing |
| 100.12-14-008-29W1.00 | Vertical   | Producing |
| 102.12-14-008-29W1.00 | Horizontal | Producing |
| 100.13-14-008-29W1.00 | Vertical   | Producing |
| 100.14-14-008-29W1.00 | Vertical   | Producing |
| 102.14-14-008-29W1.00 | Horizontal | Producing |
| 100.15-14-008-29W1.00 | Vertical   | Abandoned |
| 100.16-14-008-29W1.00 | Vertical   | Abandoned |
| 102.16-14-008-29W1.00 | Horizontal | Injection |
| 100.01-15-008-29W1.00 | Vertical   | Producing |
| 100.02-15-008-29W1.00 | Vertical   | Producing |
| 100.03-15-008-29W1.00 | Vertical   | Producing |
| 100.04-15-008-29W1.00 | Vertical   | Producing |
| 102.04-15-008-29W1.00 | Horizontal | Injection |
| 100.05-15-008-29W1.00 | Vertical   | Producing |
| 102.05-15-008-29W1.00 | Horizontal | Injection |
| 103.05-15-008-29W1.00 | Horizontal | Injection |
| 100.06-15-008-29W1.00 | Vertical   | Producing |
| 100.07-15-008-29W1.00 | Vertical   | Producing |
| 100.08-15-008-29W1.00 | Vertical   | Producing |
| 100.09-15-008-29W1.00 | Vertical   | Producing |
| 100.10-15-008-29W1.00 | Vertical   | Producing |
| 100.11-15-008-29W1.00 | Vertical   | Producing |
| 102.12-15-008-29W1.00 | Vertical   | Producing |
| 104.12-15-008-29W1.00 | Horizontal | Injection |
| 100.13-15-008-29W1.00 | Vertical   | Producing |
| 100.14-15-008-29W1.00 | Vertical   | Producing |

| UWI                   | Type       | Status    |
|-----------------------|------------|-----------|
| 100.15-15-008-29W1.00 | Vertical   | Producing |
| 100.16-15-008-29W1.00 | Vertical   | Producing |
| 100.01-23-008-29W1.00 | Vertical   | Producing |
| 102.01-23-008-29W1.00 | Horizontal | Injection |
| 103.01-23-008-29W1.00 | Horizontal | Producing |
| 100.02-23-008-29W1.00 | Vertical   | Producing |
| 100.03-23-008-29W1.00 | Vertical   | Producing |
| 100.04-23-008-29W1.00 | Vertical   | Producing |
| 100.05-23-008-29W1.00 | Vertical   | Producing |
| 100.06-23-008-29W1.00 | Vertical   | Producing |
| 100.07-23-008-29W1.00 | Vertical   | Producing |
| 100.08-23-008-29W1.00 | Vertical   | Producing |
| 102.07-22-009-29W1.02 | Vertical   | Producing |