

# Northern Petroleum

## Canadian Production Update



May 2014

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# Canadian production play overview



## Size of play

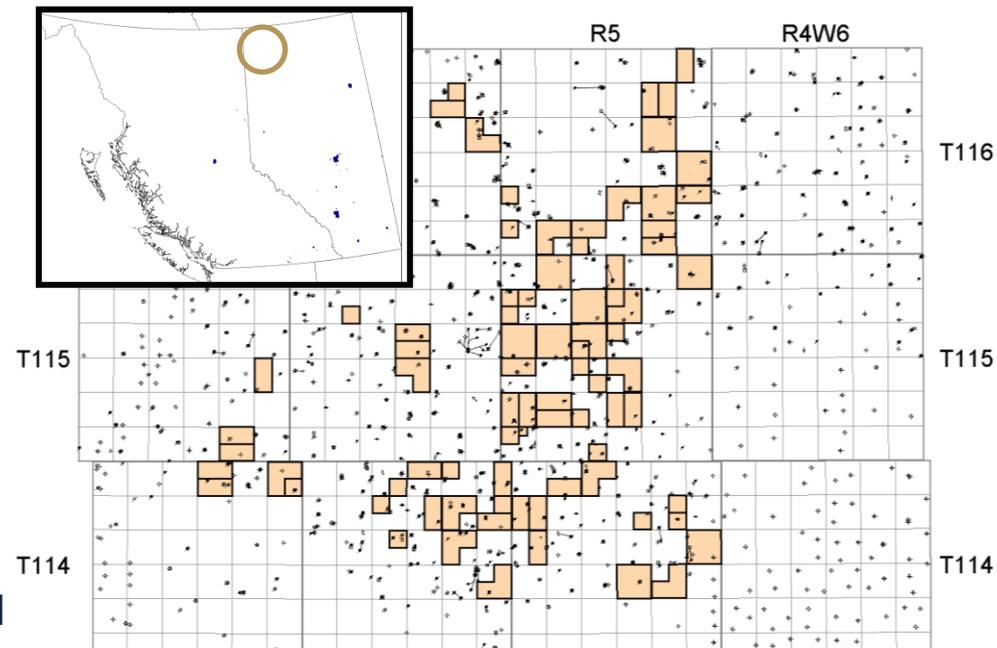
- 26,454 acres in north west Alberta
- Over 100 Keg River carbonate pinnacle reefs containing 101mmbbls of light oil originally-in-place, as calculated by Alberta Energy Regulator
- Reefs originally drilled and produced in the 60s, 70s and 80s, primarily one well per reef
- Total oil recovery to date is only 17%

## Initial target

- Increase primary recovery by at least 5% or 5mmbbls
- Drill new wells into reefs targeting unproduced or 'unswept' oil zones
- Immediate production, cashflow with reserves and core value

## Secondary target

- Evaluate and prove up secondary recovery capability through water flood
- Increase recovery to 35% to 40%



# Operations to date



## Three wells drilled in March and April

### 13-33

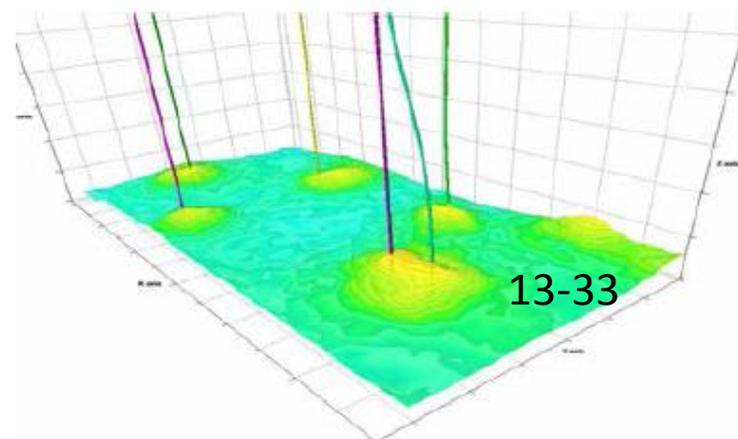
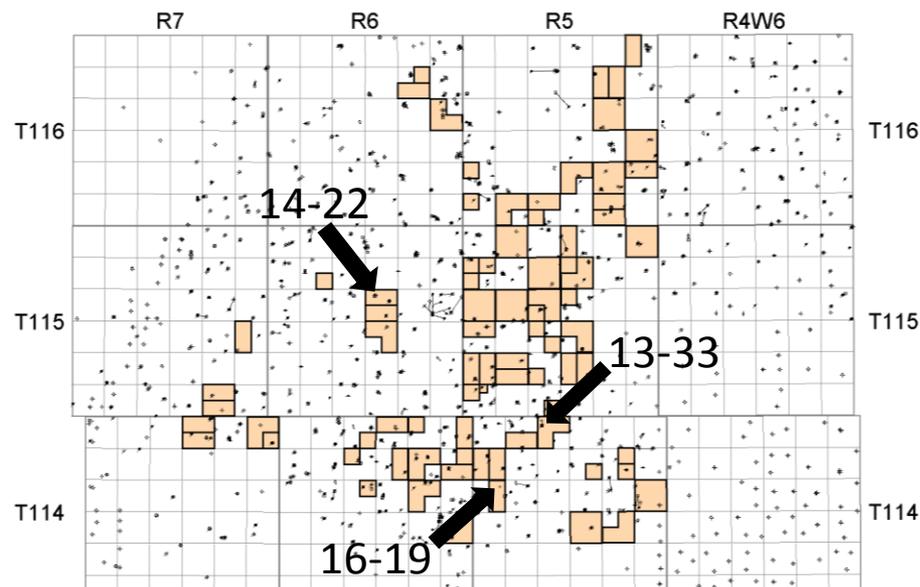
- new well into a previously produced reef
- 15m gross oil column encountered
- ran liner and perforated
- swabbed and put on production

### 14-22

- re-entry of a suspended well shut-in for over 20 years
- up-hole zones cemented
- Keg River zone swabbed and then put on production

### 16-19

- exploration well drilled into a new reef
- 22m gross oil column encountered
- dry oil produced on MDT test from oil zone
- completed open hole with inflatable packer above oil / water contact
- swabbed and put on production



# Production results



- All three wells put on production throughout April with oil trucked and sold locally

## 13-33

- cleaned up to a very low water cut
- high rate test produced a sustainable 230 bbls/d
- will be placed on a long term production rate of 150 bbls/d

## 14-22

- produced at a high rate but drew gas in
- restricted to 50 bbls/d
- steadily declining water cut, now below 40%

## 16-19

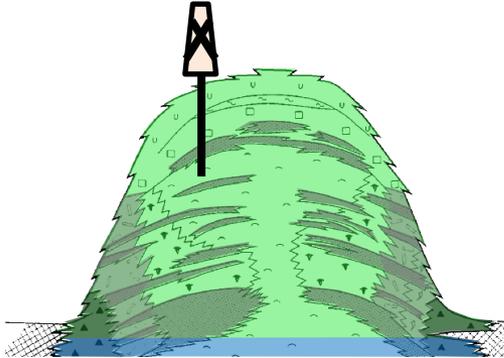
- production initiated as expected, but water increased back to high level
- indicates failure of inflatable packer used to isolate lower water zone
- will be recompleted with a cemented liner (as per 13-33) and put on production
- MDT tests indicates the well should produce at a very low water cut once recompleted



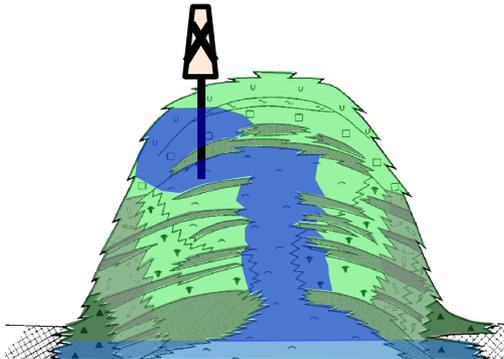
# Development focus – unswept oil



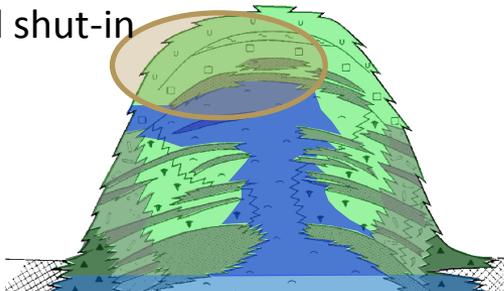
Conditions when drilled in 60s & 70s



Well waters out in 80s



Partial re-equilibration after extended shut-in



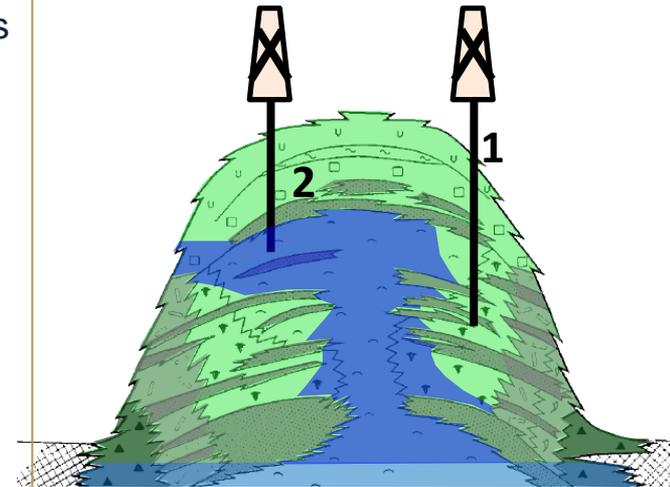
- Drilling and production results support both

1. new wells into old reefs targeting unswept oil
2. re-entering old wells and putting back on production

- Higher productivity and reduced drilling risk with new wells offsets the slightly higher cost versus re-entries

- Immediate development focusing on new wells to replicate the success of 13-33

- Water flood will now be evaluated in tandem with primary development



1. New wells to target unswept oil at the edge of the reef
2. Re-entry of old wells

