



Everest Canadian Resources

McKay River Thermal Project

Scheme No. 11461 Performance Report

June 29, 2020





- 4.1 Project background**
- 4.2 Subsurface Overview Related to Resource Evaluation and Recovery**
- 4.3 Surface Operations, Compliance, and Issues Not Related to Resource Evaluation and Recovery**



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PROJECT BACKGROUND



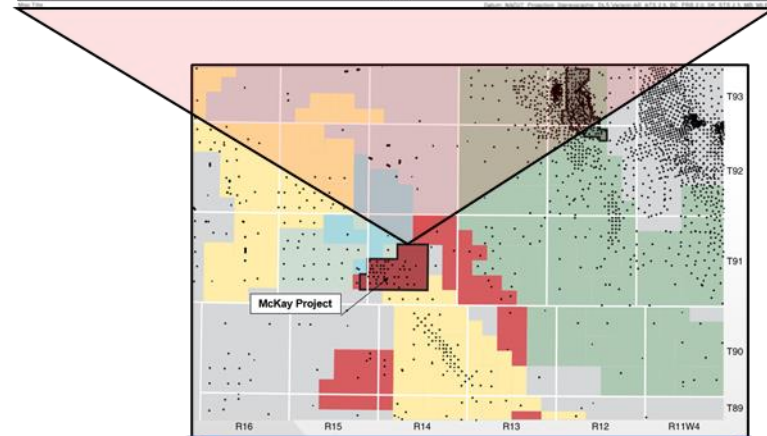
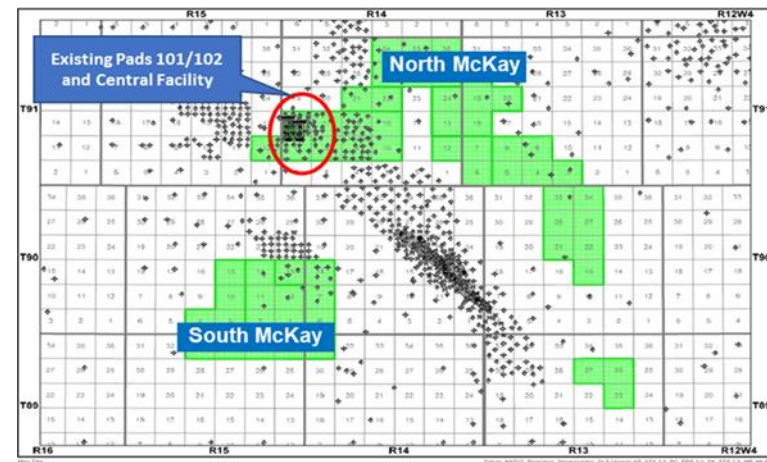


- McKay River Project was previously owned and operated by Southern Pacific Resource Corp.
 - November 2010 - Receives project approval:
 - *EPEA Approval No. 255245-00-00*
 - *Oil Sands Conservation Act Approval No. 11461*
 - *Approved Capacity 12,000 bbl/d oil treating*
 - In January 2015, Southern Pacific Resources, previous owner of STP – McKay, was granted protection under the CCAA and subsequently entered Receivership in June 2015
 - Due to the depressed commodity price environment and high operating costs at the time, production was shut-in, and the Receiver initiated and completed a warm-hibernation program by August 2015
- Project was officially transferred to Everest Canadian Resources on February 2019



PROJECT BACKGROUND

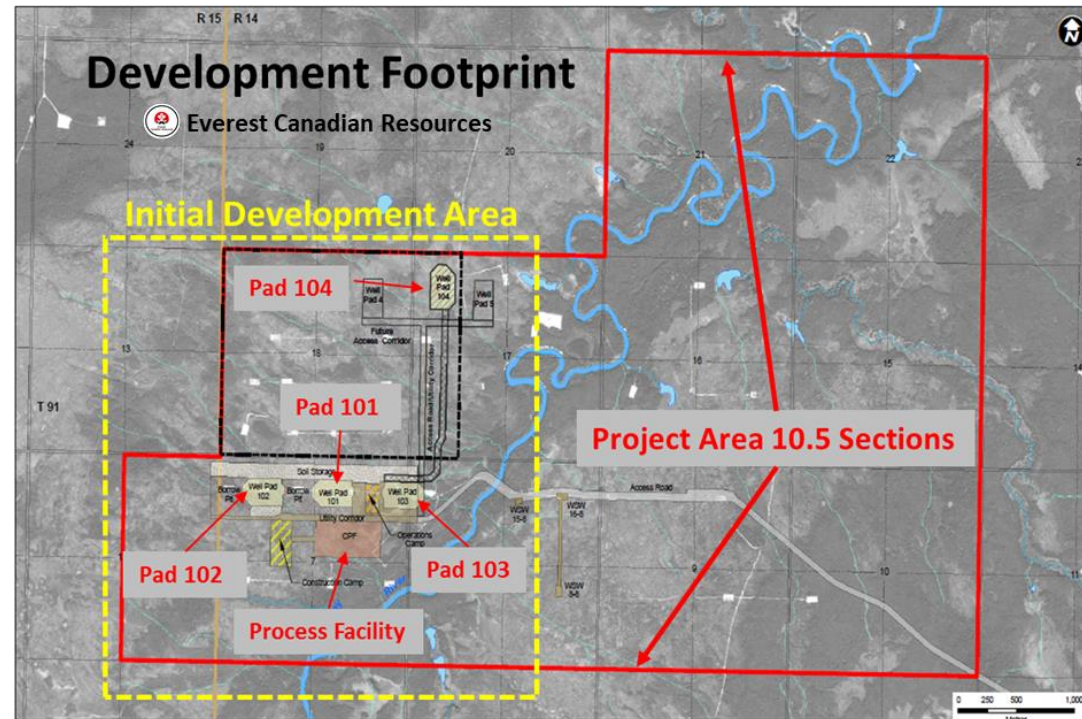
- Everest Canadian Resources (ECR) – McKay is a 12,000 bpd Name Plate, Steam-Assisted-Gravity-Drainage (“SAGD”) facility.
- Located 45 km northwest of Fort McMurray on an approved 10.5 section development area within a larger acreage block
- Project Area is 10.5 sections in Township 91, Range 14, W4M and Township 91, Range 15, W4M
- Development Area is 1.25 Sections in Township 91, Range 14, W4M



PROJECT BACKGROUND



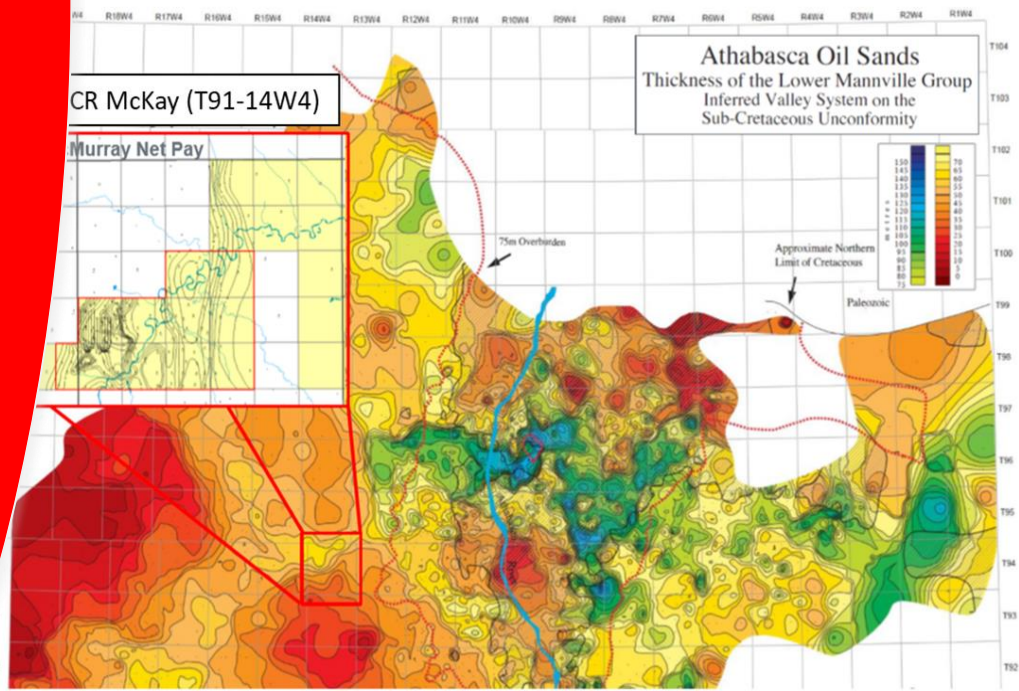
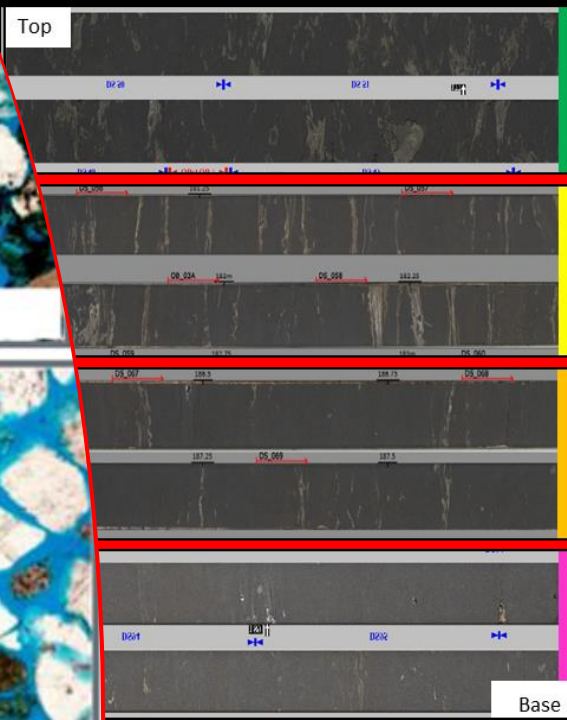
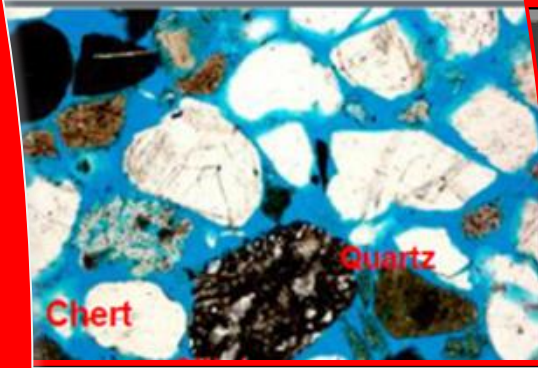
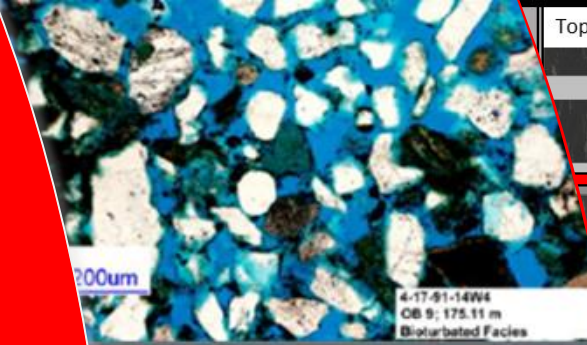
- Current approved development includes four well pads (101 to 104)
- The initial development is west of the Mackay River and includes well pads 101 & 102
- Process Facility existing capacity of 12,000 bbl/d oil and 37,400 bbl/d steam





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SUBSURFACE



4.2 SUBSURFACE

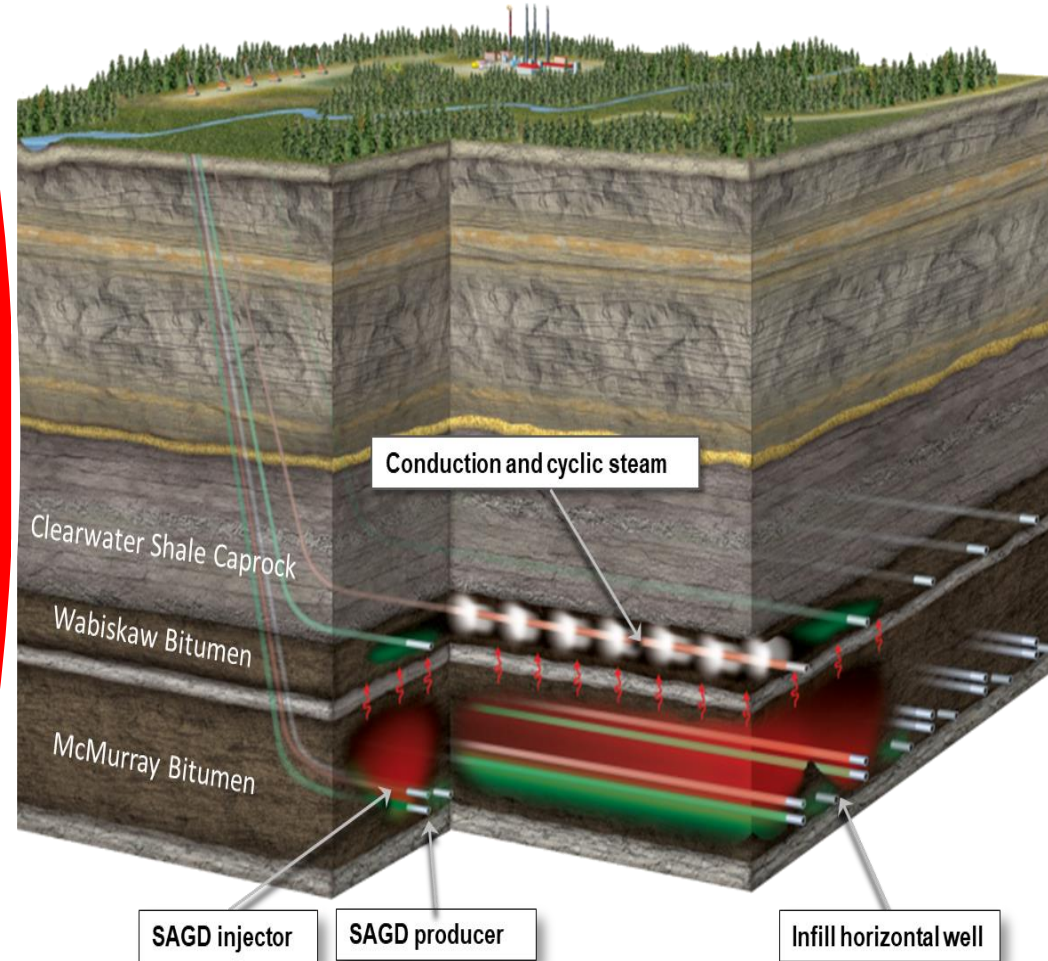
- 1. PROJECT BACKGROUND**
- 2. GEOLOGY & GEOSCIENCE**
- 3. HEAVE MONITORING & CAPROCK**
- 4. DRILLING & COMPLETIONS**
- 5. OBSERVATION WELLS**
- 6. SCHEME PERFORMANCE**
- 7. SUBSURFACE FUTURE PLANS**



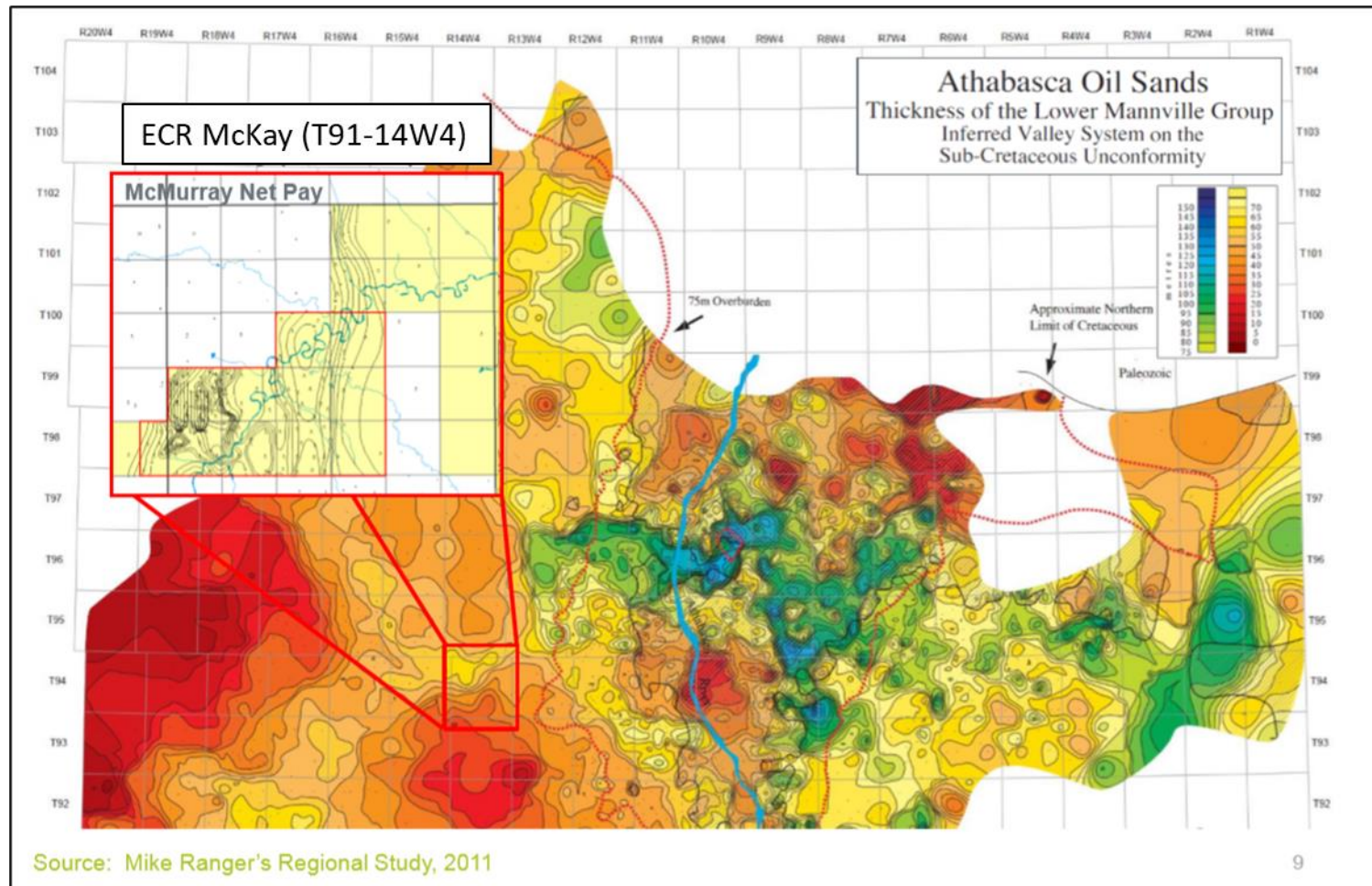
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GEOLOGY & GEOSCIENCE

McKay: Full Bitumen Exploitation Plan



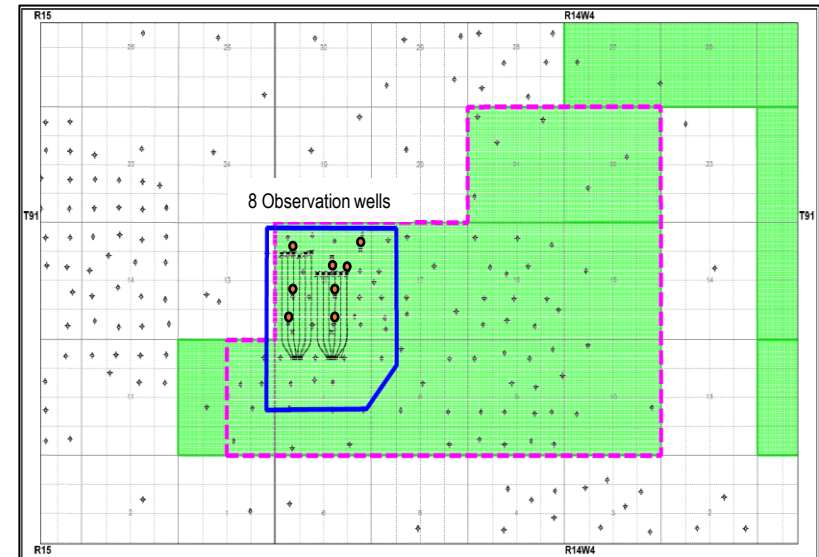
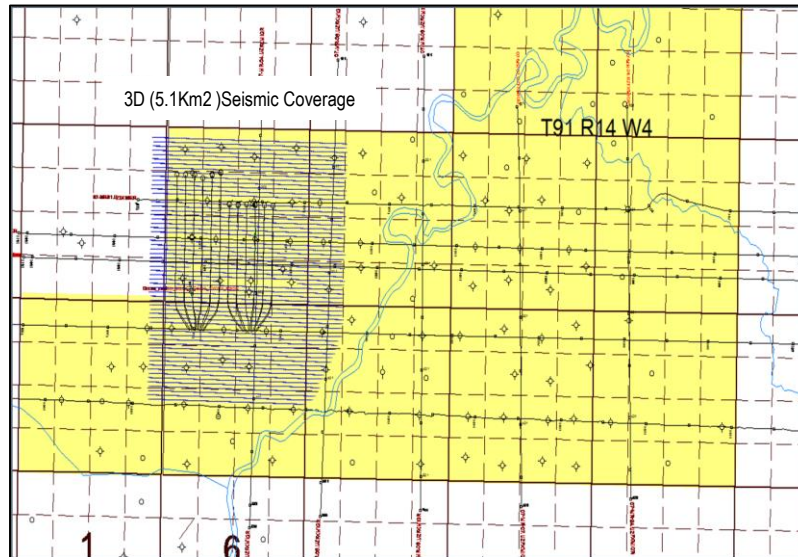
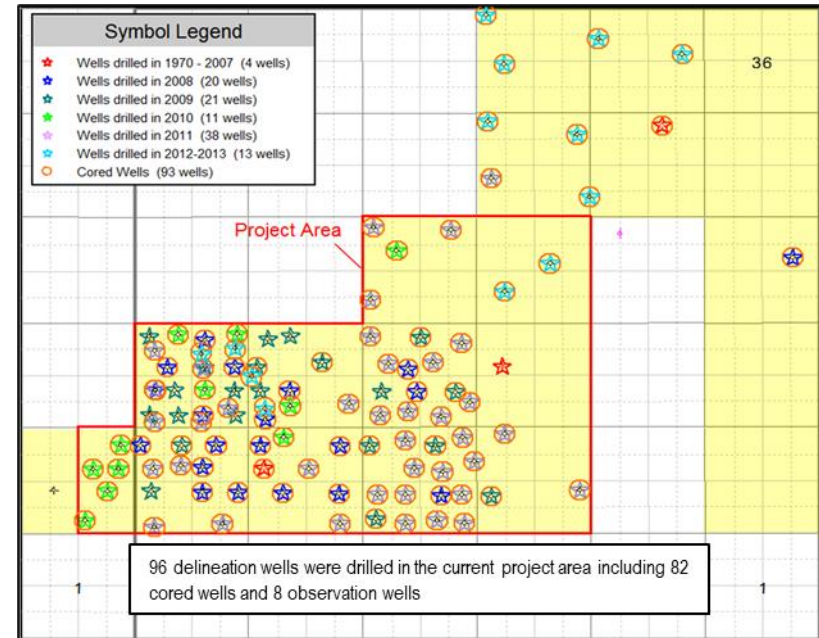
REGIONAL GEOLOGY - MCMURRAY



APPROVAL AREA



- Approval Area
 - 10.5 Sections (27 Km²)
- Approval Area OBIP
 - 579 MMbbl



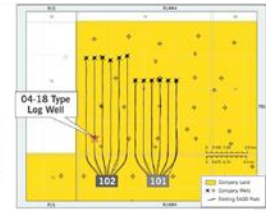
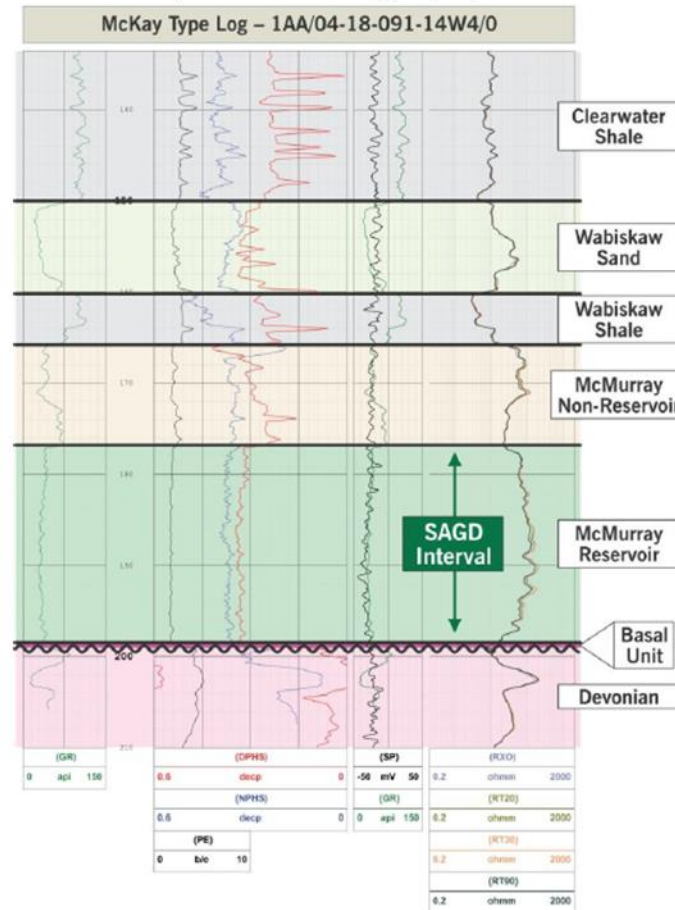
APPROVAL AREA STRATIGRAPHY



Average Reservoir Properties

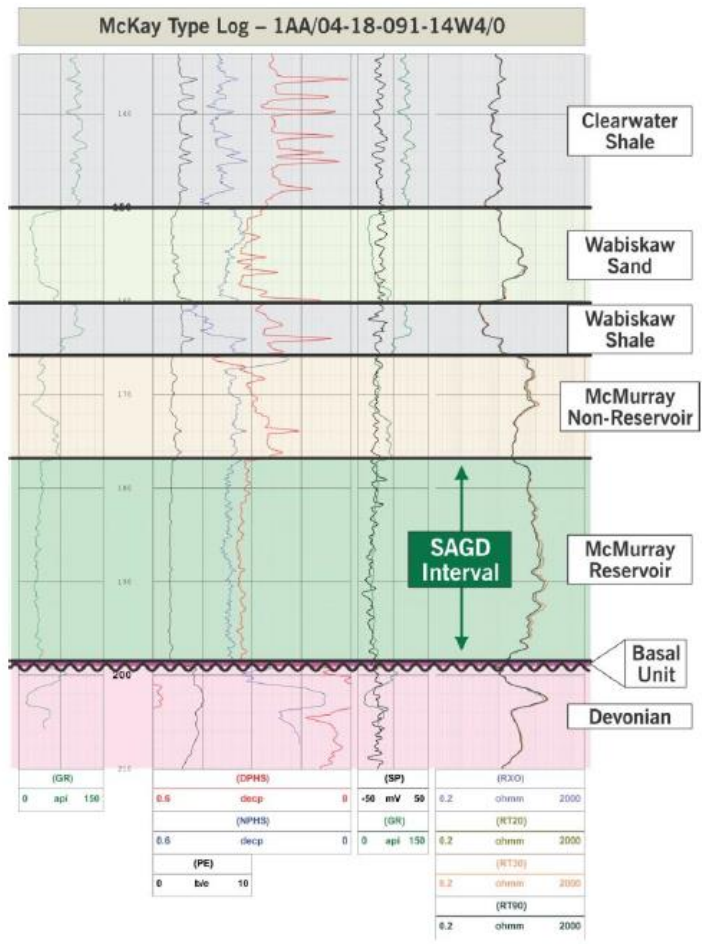
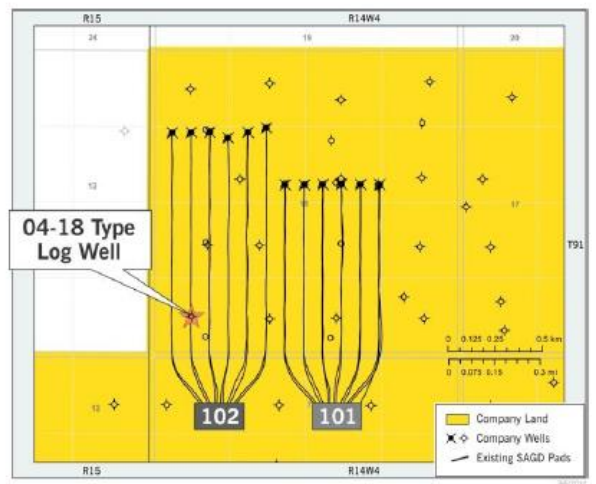
Depth (m TVD)	190
Pay Zone Thickness (m)	17 - 27
Lateral Well Pair Spacing (m)	100
Horizontal Well Length (m)	800 - 1100
Porosity (%)	32
Oil Saturation (%)	74
Original Reservoir Pressure (kPa)	650
Original Reservoir Temperature (°C)	8.5

McKay River Stratigraphy

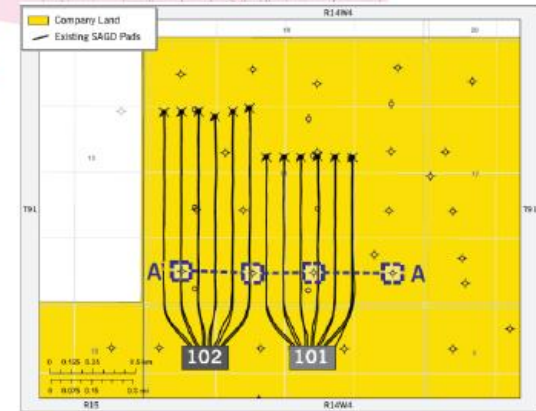
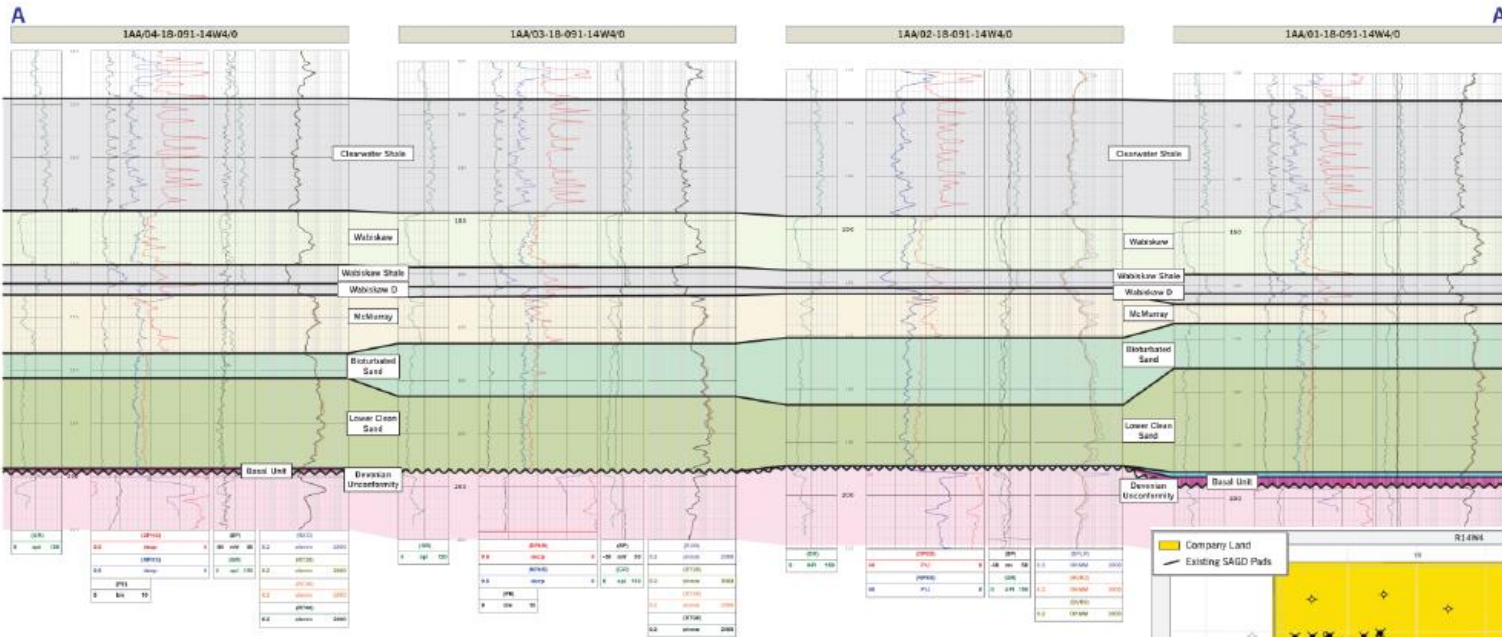


APPROVAL AREA STRATIGRAPHY

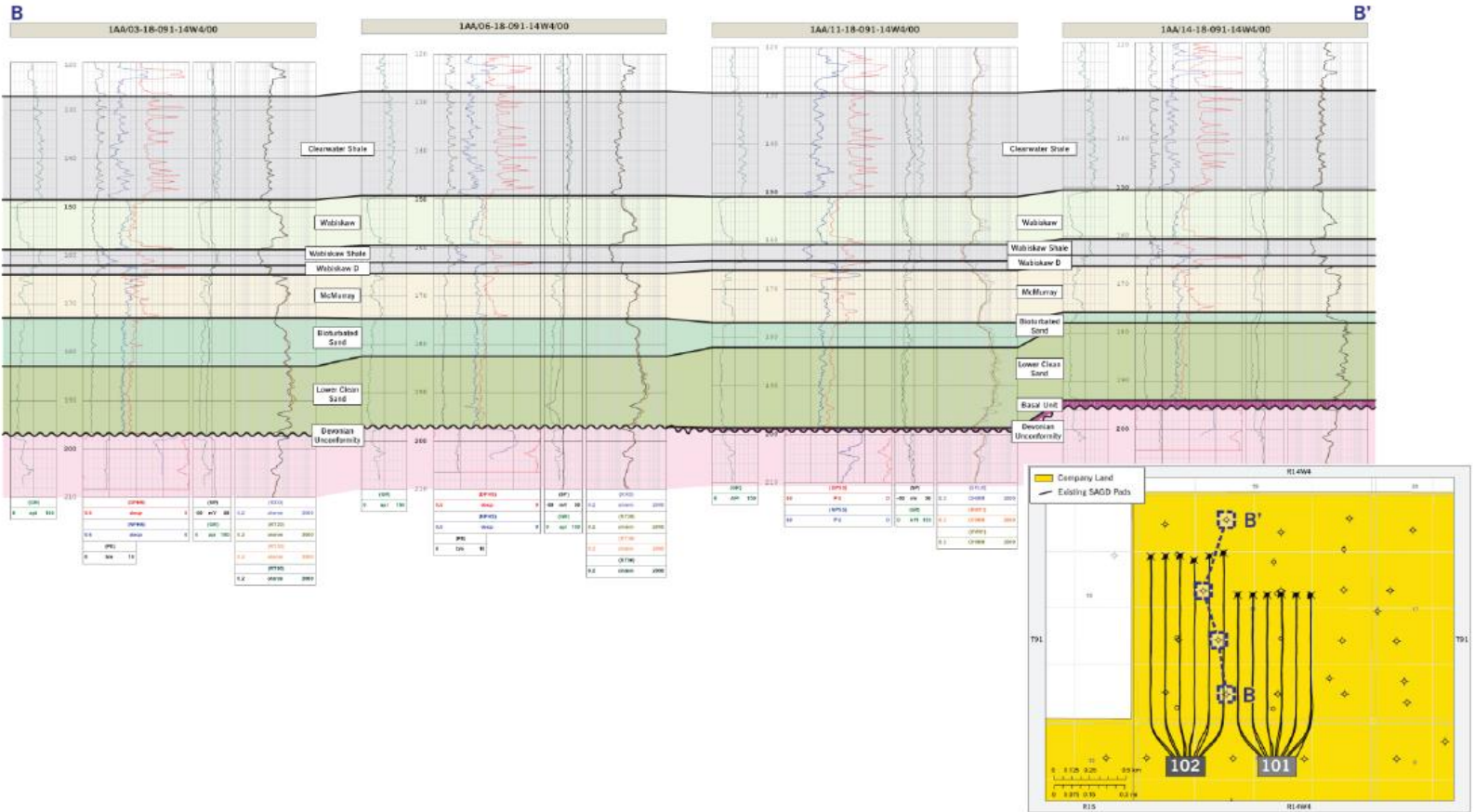
- Upper McMurray in North McKay
 - Estuarine/Deltaic deposits:
The reservoir at STP's North McKay project ranges from a thickly bedded, tidally influenced, sand dominated tidal unit to a slightly brackish-water, sandy embayment.
 - Large continuous sand deposits:
Ichnofossils in these sands include: *Planolites*, *Thalassinoides*, *Asterosoma* with rare *Cylindrichnus*, *Rhizocorralium*



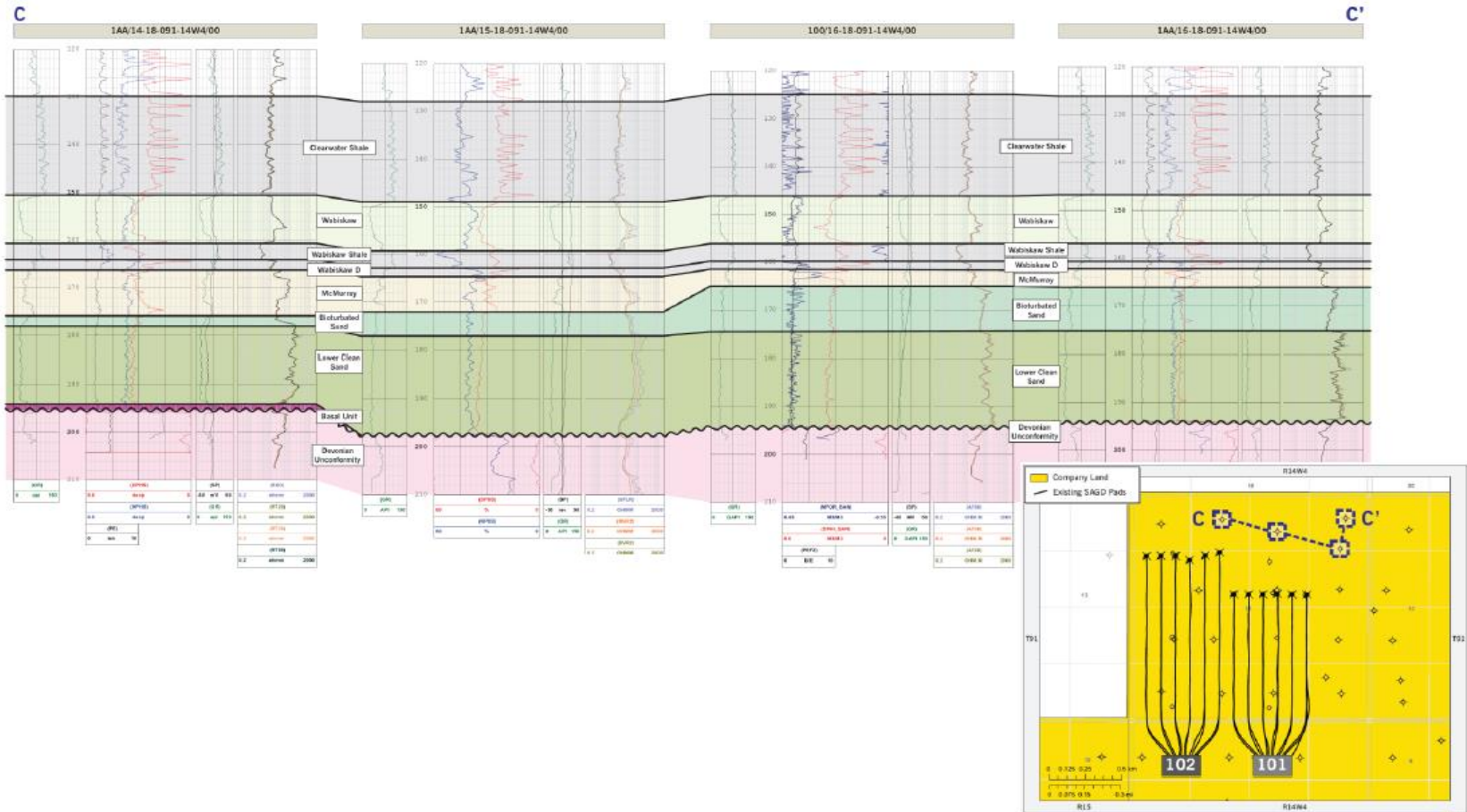
APPROVAL AREA CROSS SECTION



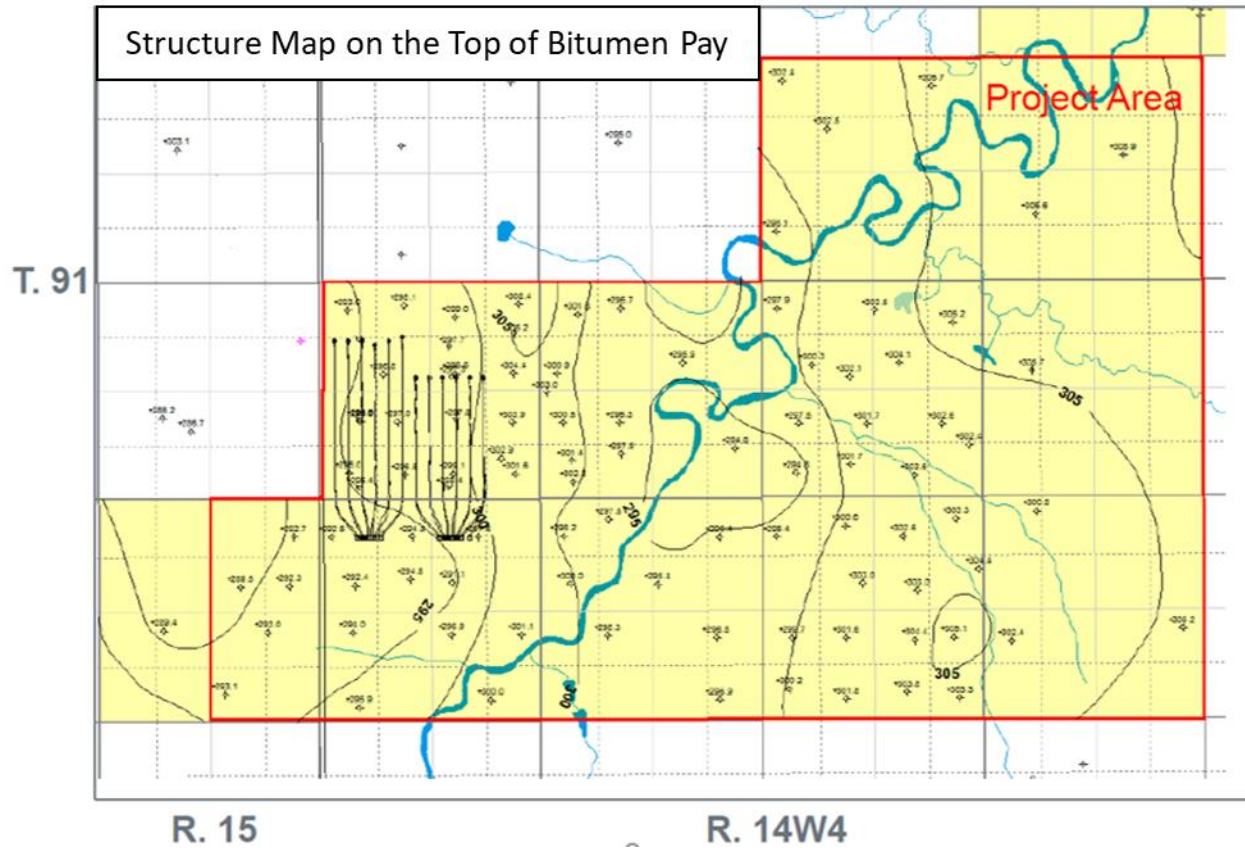
APPROVAL AREA CROSS SECTION



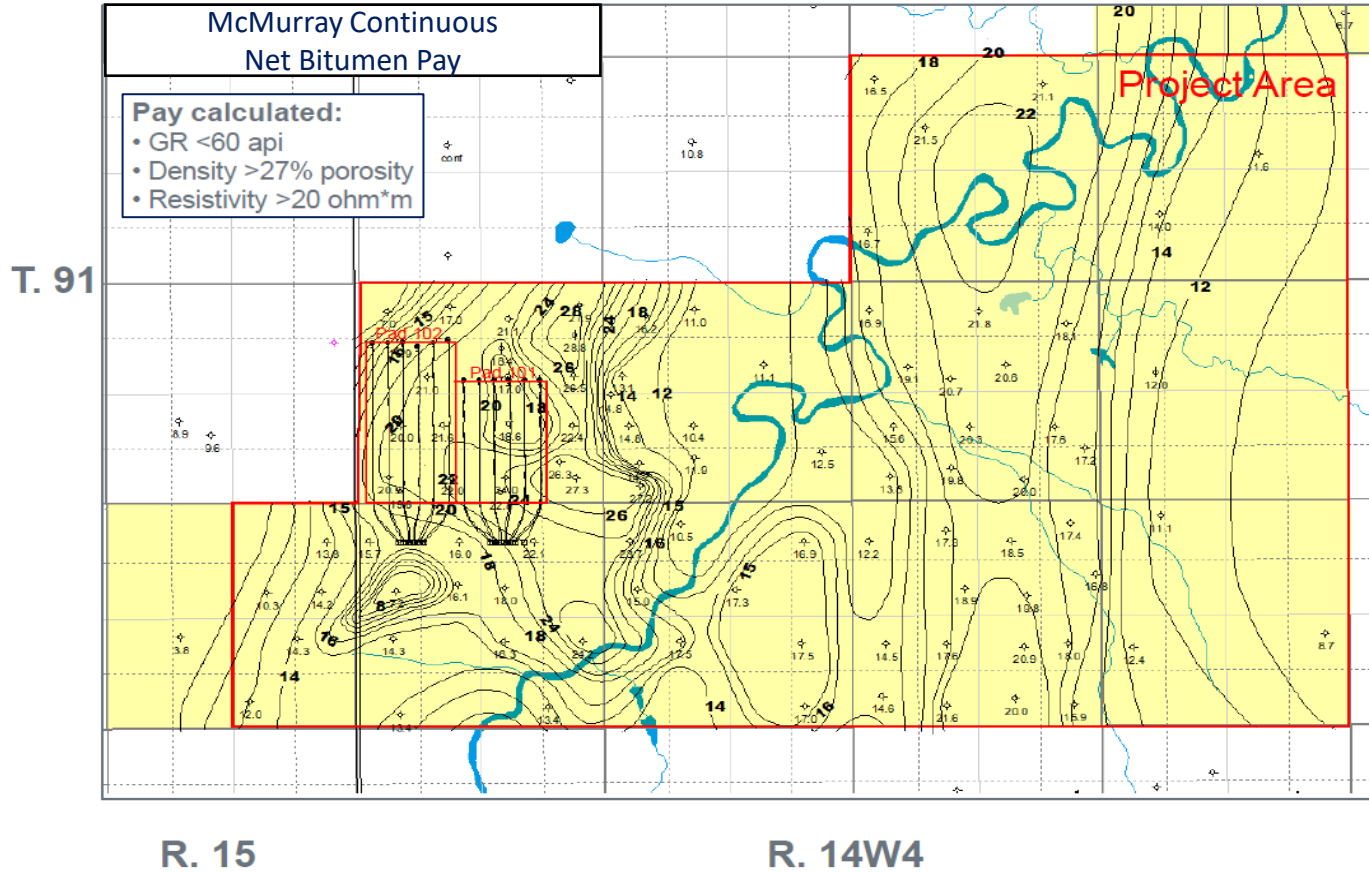
APPROVAL AREA CROSS SECTION



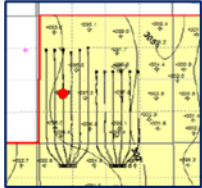
APPROVAL AREA STRUCTURE



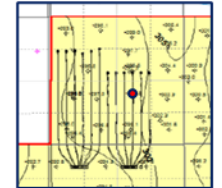
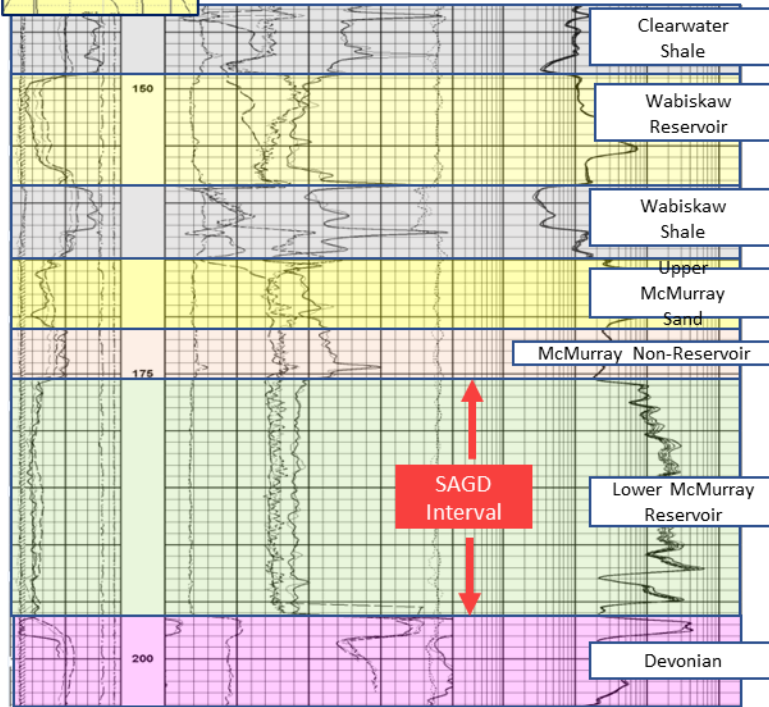
APPROVAL AREA CONTINUOUS NET PAY



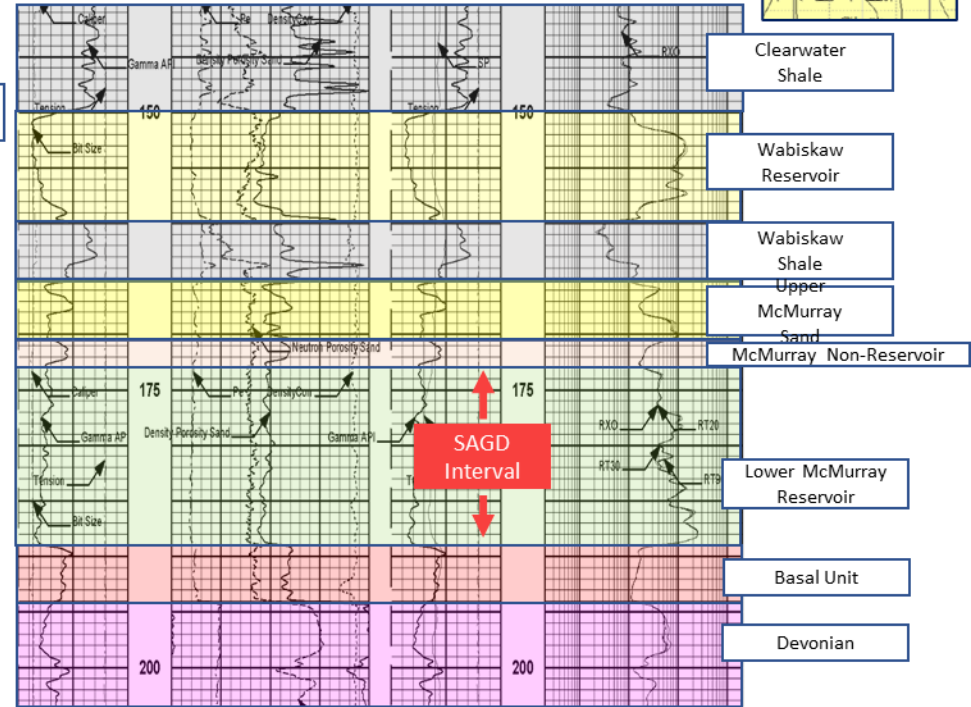
APPROVAL AREA TYPE CURVE



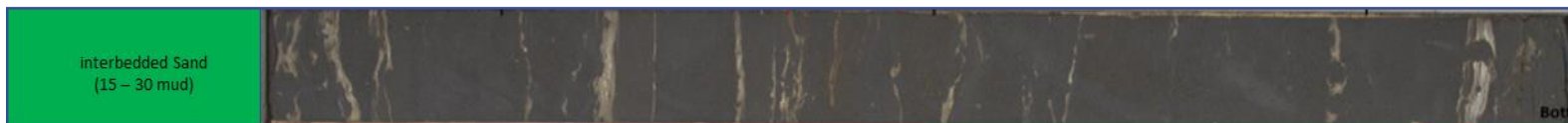
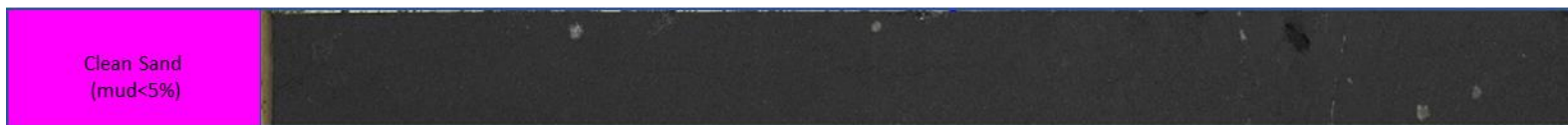
Pad 102
5-18-091-14W4



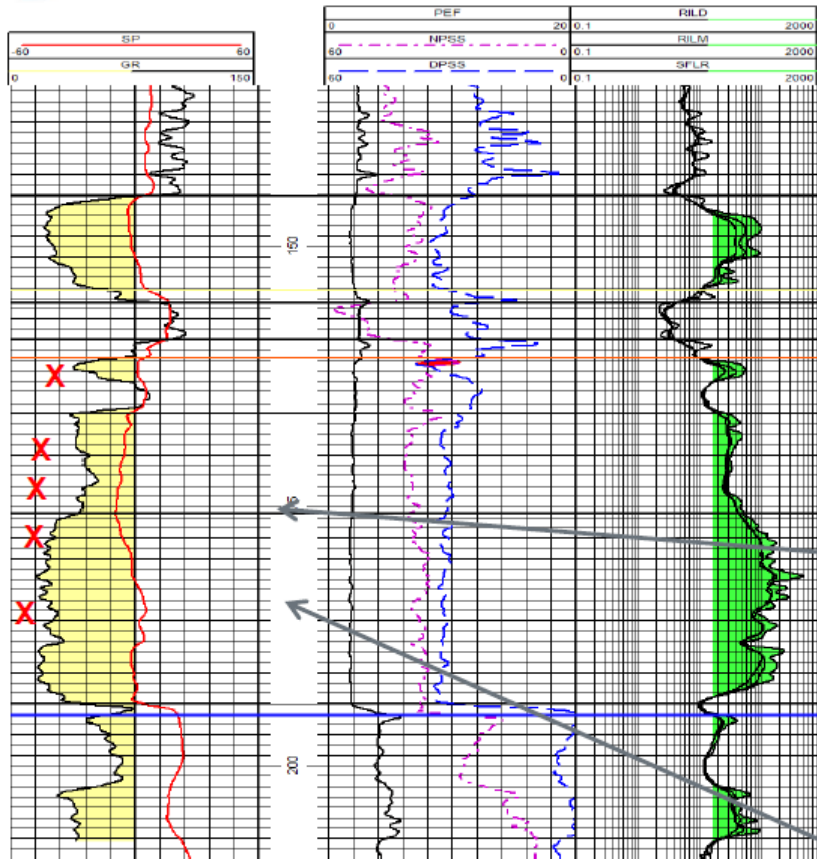
Pad 101
7-18-091-14W4



APPROVAL AREA BITUMEN PAY FACIES SUMMARY



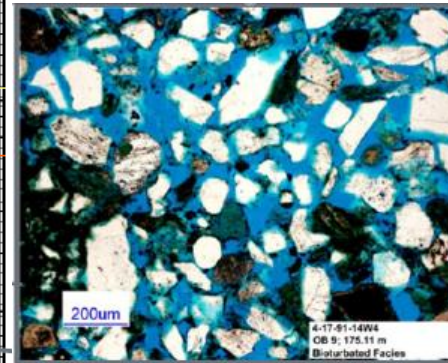
AA/04-17-91-14w4



Core Analysis/Thin Section

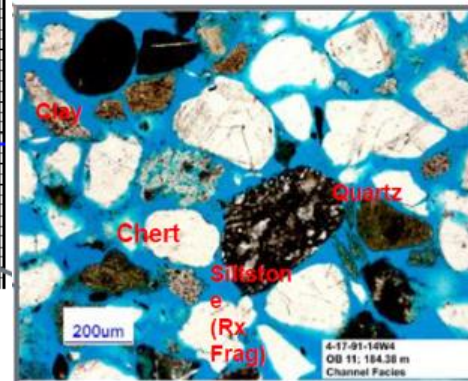
Upper Reservoir (Bioturbated)

- Very Fine to Fine grained (<180 um)
- Moderately sorted, Subangular with elongate grains
- Framework consists of quartz, common chert, siltstones with some feldspars
- Clays are within the microporosity of the chert, but also exist within the pore spaces. Pore space has 10% clay in the pore space.
- XRD: Analysis shows 86% qtz, 4% K-feldspar, 2% Plagioclase, 1% dolomite, 1% pyrite and 6% total clay.



Main Reservoir

- Fine to Medium grained (180-250 um)
- Moderately sorted, Subrounded with elongate and spherical grains
- Framework consists of quartz, chert, siltstones with some feldspars
- Similar clays with less interstitial clay found in the rock matrix.
- XRD: Analysis shows 93% qtz, 2% K-feldspar, 1% pyrite and 4% total clay.

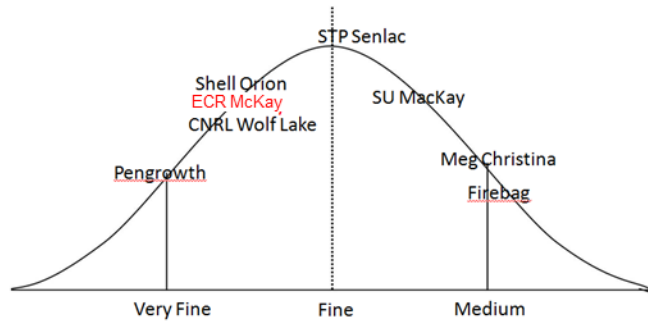


APPROVAL AREA RESERVOIR QUALITY COMPARISON

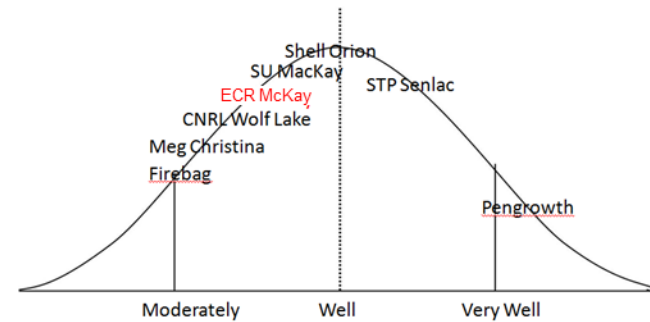


Reservoir Quality Comparison

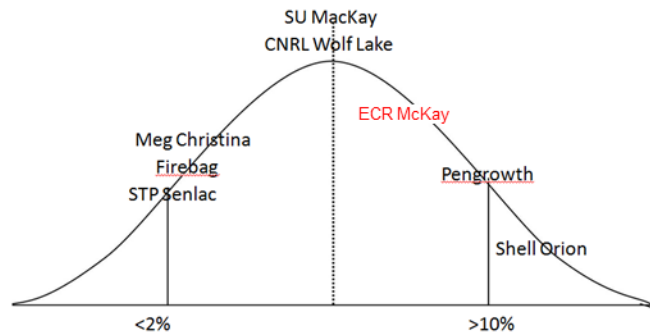
Grain Size



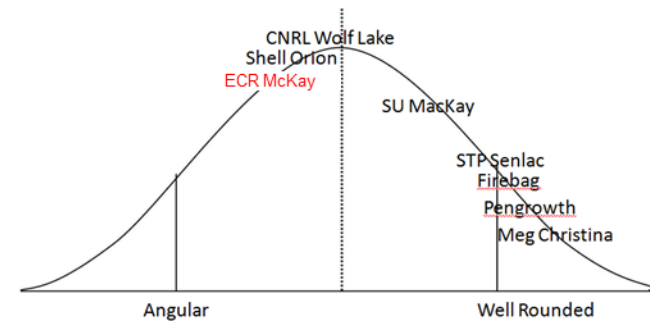
Sorting



Fines Content



Roundness





Pad	# Well Pairs	Drainage Box Area A (m ²)	Average Porosity Ø (%)	Average Saturation So (%)	Average Pay Thickness H (m)	OBIP (10 ⁶ bbl)
Pad 1	6	540,000	32	72	20	15.7
Pad 2	6	720,000	34	73	20	22.6

Porosity = Average porosity from the SAGD reservoir interval

Saturation = Average bitumen saturation from the SAGD reservoir interval

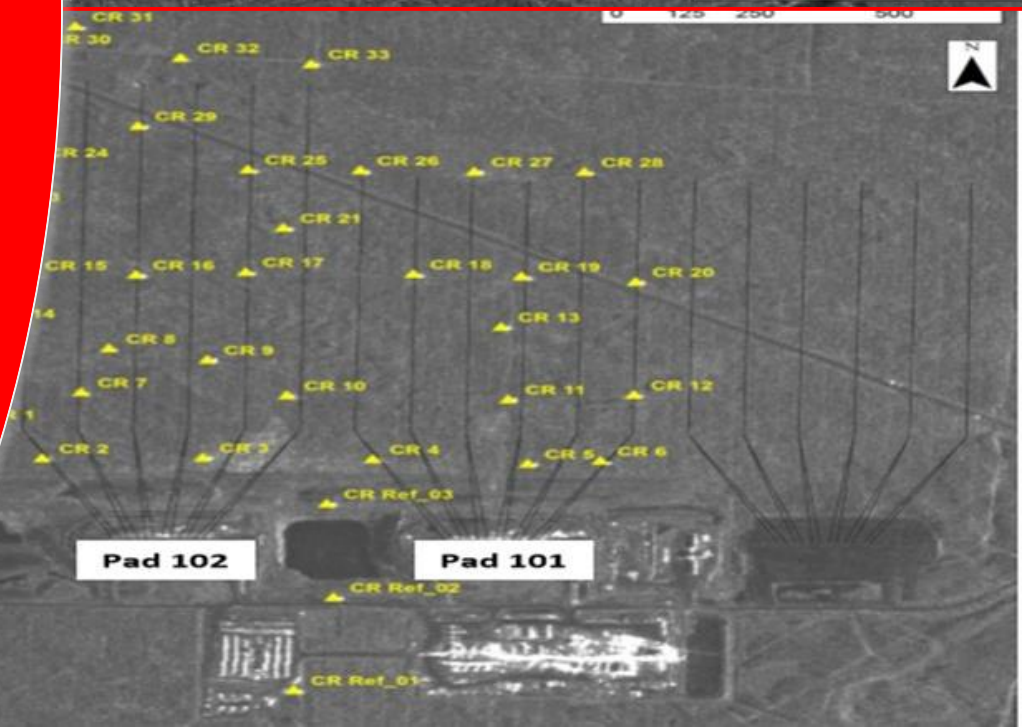
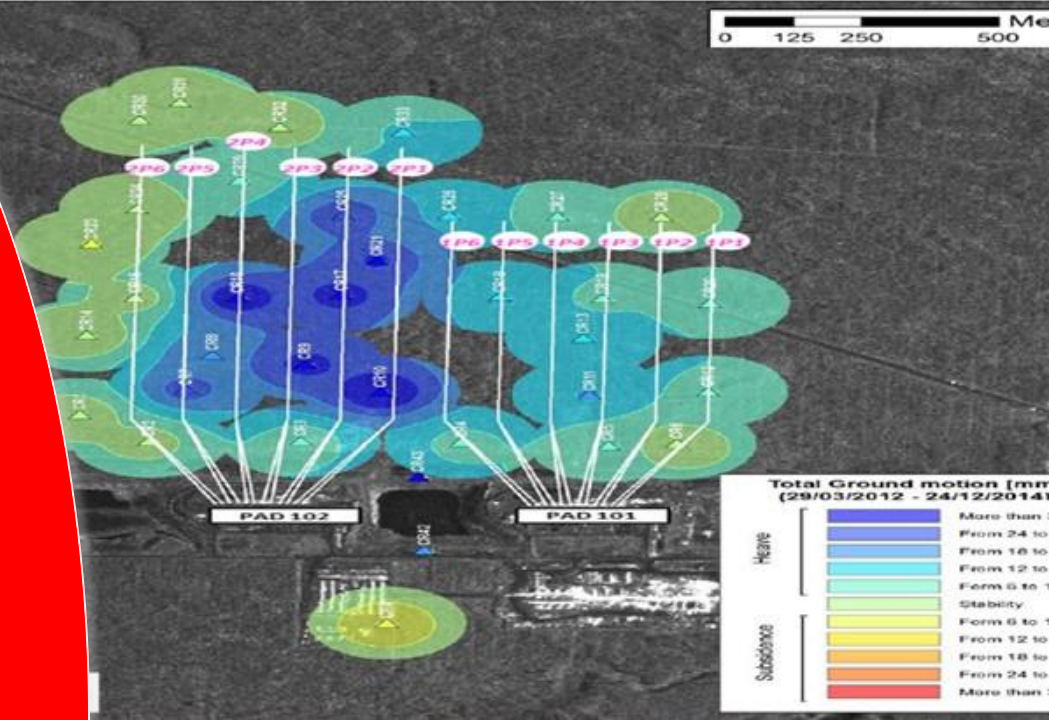
OBIP = Original Bitumen In-Place and measured in 10⁶m³ units and converted to barrels using the factor of 6.29

$$OBIP = A \times H \times \text{Ø} \times S$$



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HEAVE MONITORING & CAPROCK INTEGRITY





- 35 Corner reflectors were installed in 2012
- The Surface monitoring started in March 2012
- Based on historical, between 2012 and 2015, cumulative movement of the surface since SAGD operations started was insignificant, ranged between -10 mm (subsidence) and 38 mm (heave).
- Everest did not conduct Heave or other surface monitoring between February 2019 and May 2020.

- No change in Caprock integrity
- AER approved Maximum Operating Pressure (MOP) of 2,450 kPa.
- McKay met all AER conditions and information requests and received approval in 2011
- Caprock integrity studies was focused on:
 - Core and geological log evaluations
 - No fault planes observed on logs or in core.
 - No borehole breakouts/drilling induced fractures observed from 17 HMI logs.
 - Laboratory testing (reservoir & geomechanical)
 - Low permeability caprock.
 - Geomechanical properties derived from lab testing.
 - Mini-frac testing for characterizing in situ stress state
 - Mini-frac tests conducted at 2 wells.
 - Geomechanical simulation (Taurus Reservoir Solutions)
 - 2,450 kPa operating pressure is conservative



MINI-FRAC TESTS AND FRACTURE PRESSURE

- Mini-Frac Tests
 - Mini-frac tests completed at wells 5-16 and 1-18
 - Stress gradient results are consistent and similar to those expected in the Athabasca Oil Sands.
 - Vertical stress gradient is ~21.5 kPa/m.

- Fracture Pressure
 - Assessment of minimum fracture pressure (S_{min}) at the base of the Clearwater Formation using mini-frac test results.
 - S_{min} from both wells 5-16 and 1-18 were consistent.
 - S_{min} fracture pressure at the base of the Clearwater Formation caprock was between ~2,860 kPa and ~ 3,020 kPa.

Well	5-16-91-14W4	Date	March 2009
Depth (m TVD)	Lithology	Minimum Stress (kPa)	Minimum Stress Gradient (kPa/m)
126	Clearwater Shale	2520	20.0
140	Clearwater Shale	2760	19.7
155	Wabiskaw Shale	2710	17.5
174	McMurray Sandstone	2900	16.7

Well	1-18-91-14W4	Date	April 2011
Depth (m TVD)	Lithology	Minimum Stress (kPa)	Minimum Stress Gradient (kPa/m)
131	Clearwater Shale	No Breakdown	
138	Clearwater Shale	2900	21.0
147	Wabiskaw Sandstone	3060	20.8
156	Wabiskaw Shale	3250	20.8
164	Upper McMurray Sandstone	3300	20.1
186	McMurray Sandstone	3060	16.5

Well	Depth to Caprock Base (m)	Fracture Gradient (kPa/m)	S_{min} Fracture Pressure (kPa)
5-16	145	19.7	2857
1-18	144	21.0	3024



- Clearwater Formation:
 - 6 vertical, nested observation wells measuring pressure and temperature.
- Wabiskaw Member:
 - 1 horizontal well measuring temperature and pressure
- Surface heave monitoring program.
- Blanket Gas system to monitor bottomhole injection pressures.



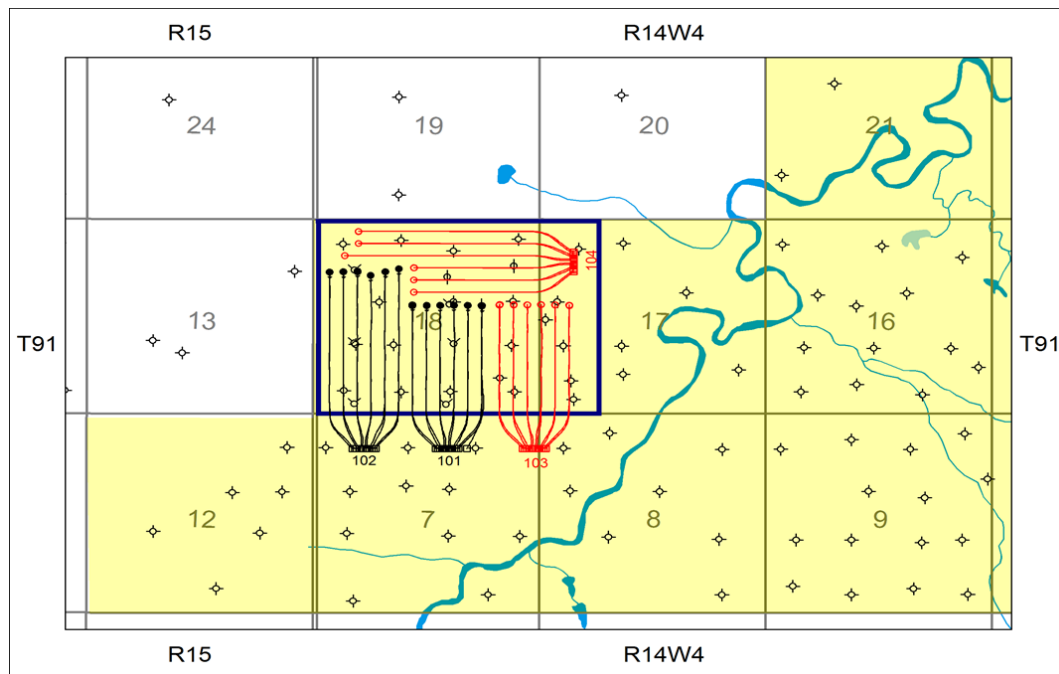
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DRILLING & COMPLETIONS



WELL LAYOUT

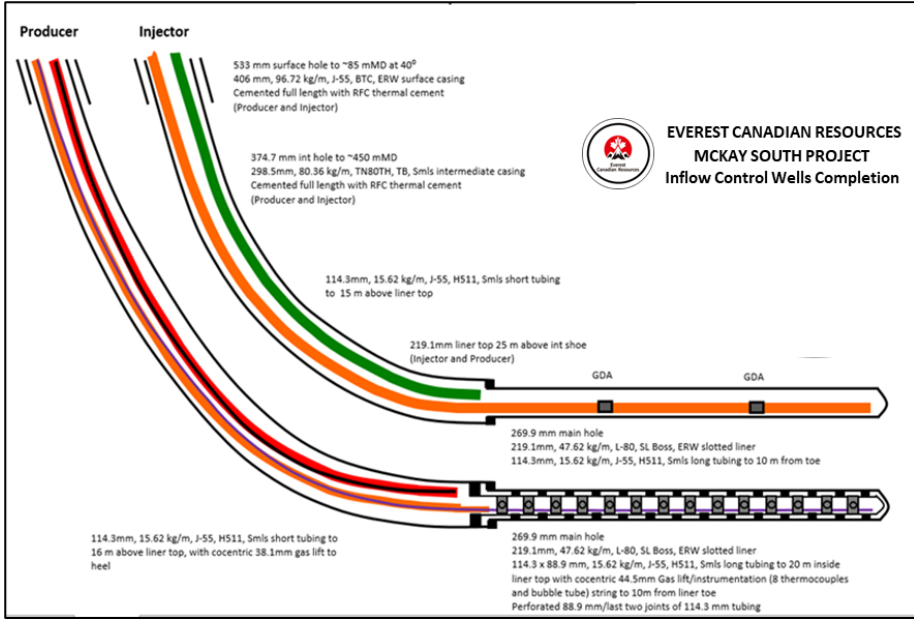
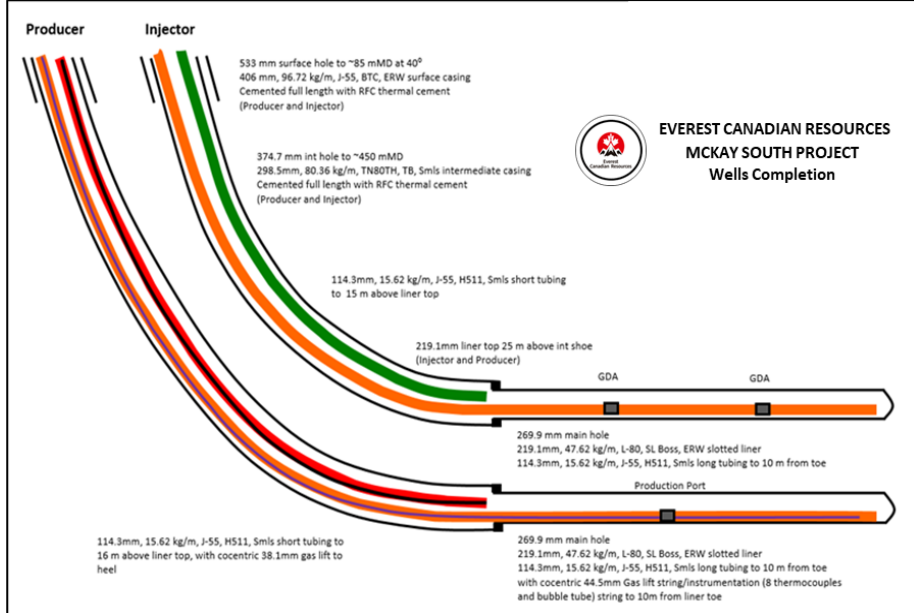
- Approved Development area outlined in blue
- Drilled to date (black):
 - Pad 101 (6 pairs) → 800 m Hz
 - Pad 102 (6 pairs) → ~ 1,000 m Hz
 - Wabiskaw observation well (lies above 1P1)
- Approved Pads (red):
 - Pad 103 (6 pairs)
 - Pad 104 (6 pairs)





WELLS COMPLETION SCHEMATICS

- Initial Wells completion design
 - Six installations in production wells
 - All production wells are equipped for gas lift
 - Coil tubing with temperature instrumentation is run to toe.



- ICD Installation Producer (Gas Lift)
 - Six installations in production wells
 - All production wells are equipped for gas lift
 - Coil tubing with temperature instrumentation is run to toe.

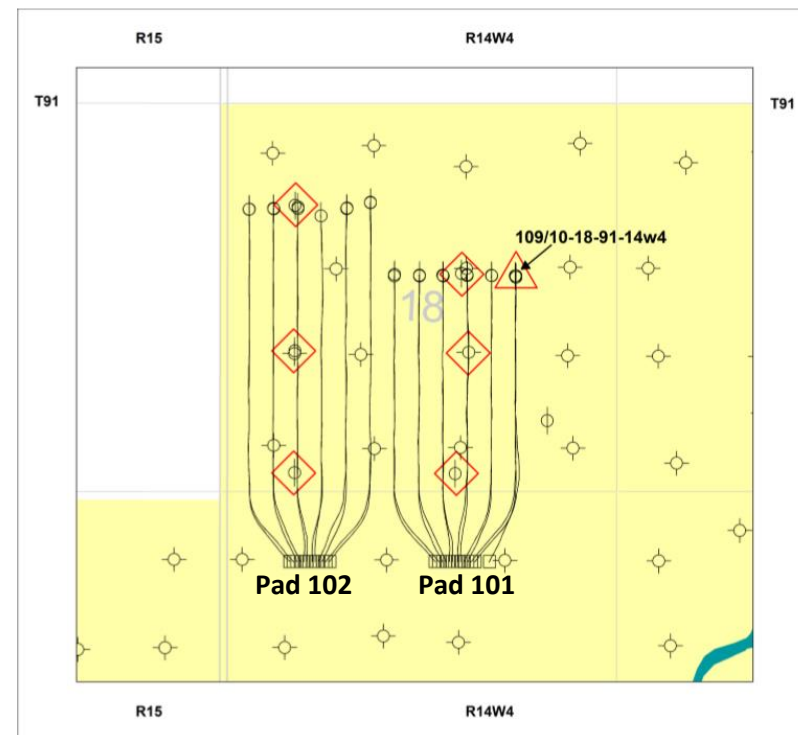


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OBSERVATION WELLS

OBSERVATION WELLS

- 6 Vertical, Nested Observation Wells:
 - Pressure and temperature measurements extending from McMurray to Clearwater Formations
 - 10-18 and 12-18 wells have experienced 1 TC failure each. 5-18 has experienced 4 TC failures.
- Horizontal Observation Well:
 - Wabiskaw Member
 - Temperature/Pressure measurements

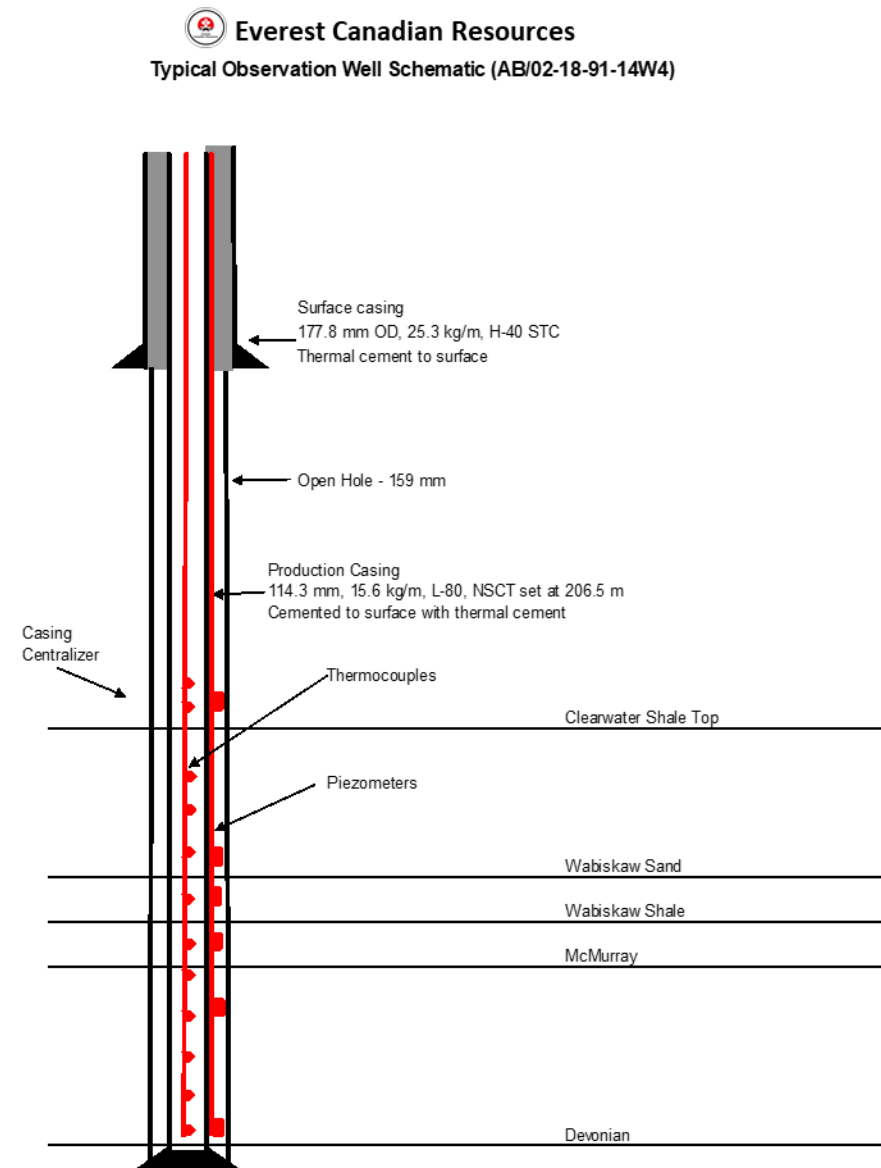


Well	Temperature	Pressure
AB/2-18-91-14W4	12 temperature points	6 pressure points
AB/4-18-91-14W4	12 temperature points	6 pressure points
AB/5-18-91-14W4	12 temperature points	6 pressure points
AA/7-18-91-14W4	11 temperature points	5 pressure points
AB/10-18-91-14W4	12 temperature points	6 pressure points
AA/12-18-91-14W4	12 temperature points	6 pressure points
09/10-18-914-14W4	High Temperature Fibre	

TYPICAL VERTICAL WELL



- 12 thermocouples spaced between the Base of McMurray to Clearwater
- 6 piezometers spaced between Base of McMurray to Clearwater
- Instrumentation strapped to outside of casing string



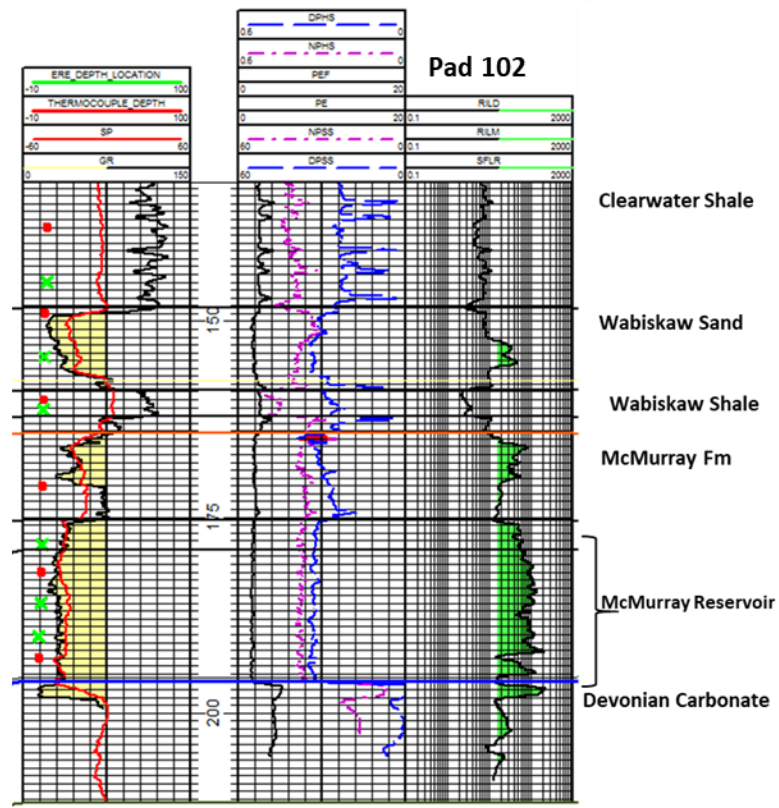
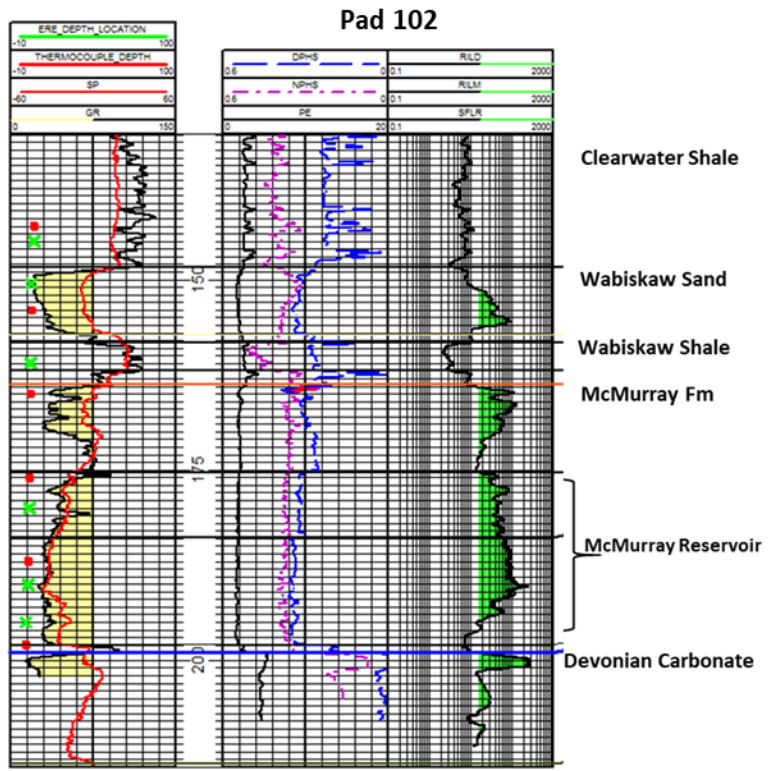


VERTICAL WELL

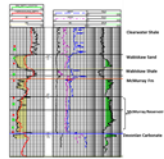
Everest Canadian Resources
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 AB/04-18-091-14W4/0
 RIG_DATE : 3/1/2011

X Pressure Gauge and Thermocouple Location
 ■ Thermocouple Location

Everest Canadian Resources
 ELEV_KB : 472.2
 AB/05-18-091-14W4/0
 RIG_DATE : 2/26/2011



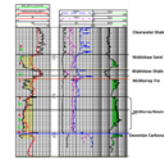
~80m to the West
 2S5 (~187.5m TVD) ●
 2P5 (~194.2m TVD) ●



~20m to the East
 2S4 (~188.3m TVD) ●
 2P4 (~195.5m TVD) ●

AB/4-18-91-14W4

~77m to the West
 2S5 (~186.6m TVD) ●
 2P5 (~192.5m TVD) ●



~23m to the East
 2S4 (~188.6m TVD) ●
 2P4 (~194.8m TVD) ●

AB/5-18-91-14W4

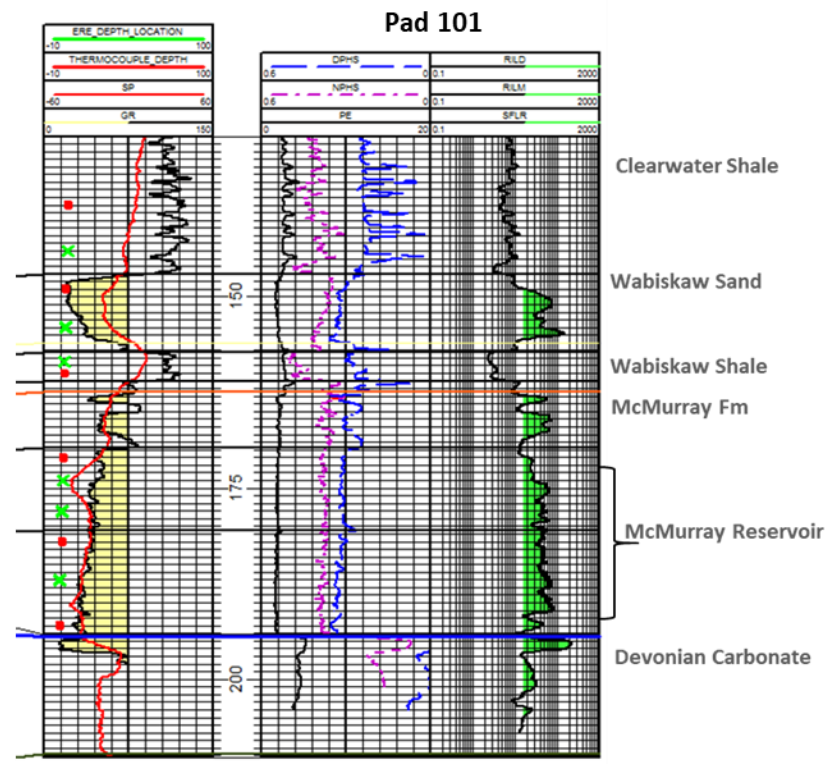
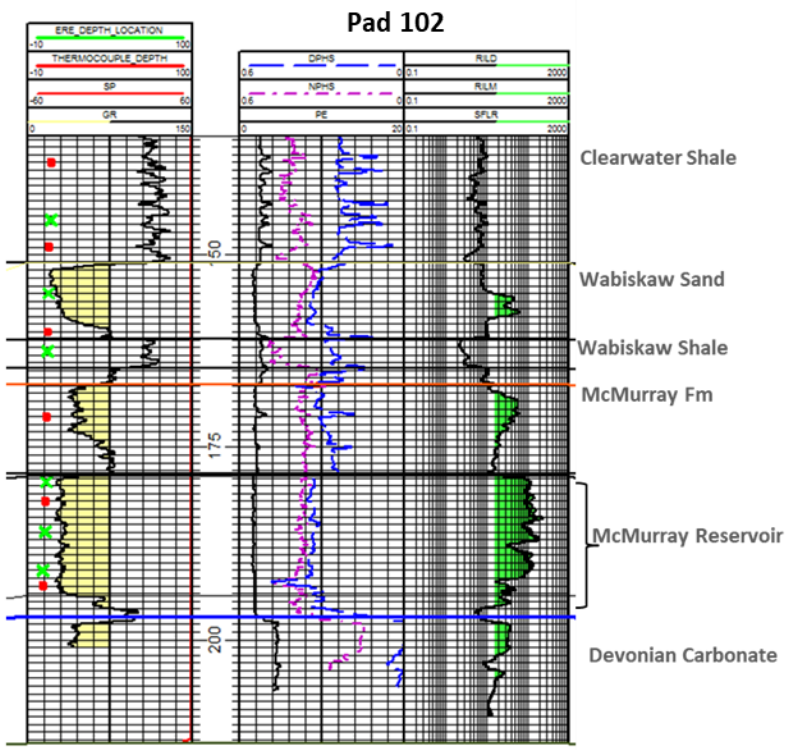


VERTICAL WELL

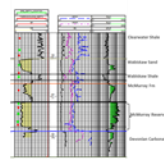
Everest Canadian Resources
 WDBD
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 AA/12-18-091-14W4/0
 RIG_DATE : 2/23/2011

X Pressure Gauge and Thermocouple Location
 ■ Thermocouple Location

Everest Canadian Resources
 WDBD
 ELEV_KB : 469
 AB/02-18-091-14W4/0
 RIG_DATE : 3/6/2011



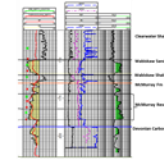
~80m to the West
 2S5 (~185.8m TVD) ●
 2P5 (~191.2m TVD) ●



~20m to the East
 2S4 (~187.7m TVD) ●
 2P4 (~192.3m TVD) ●

AA/12-18-91-14W4

~40m to the West
 1S4 (~186.7m TVD) ●
 1P4 (~193.2m TVD) ●



~60m to the East
 1S3 (~186.5m TVD) ●
 1P3 (~193.5m TVD) ●

AB/2-18-91-14W4

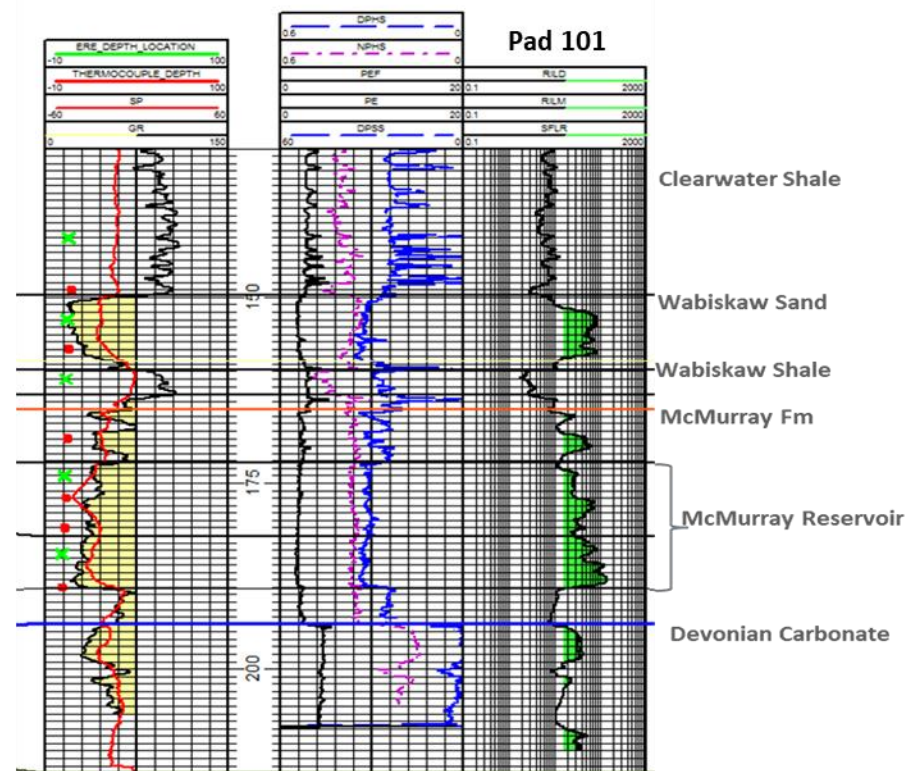
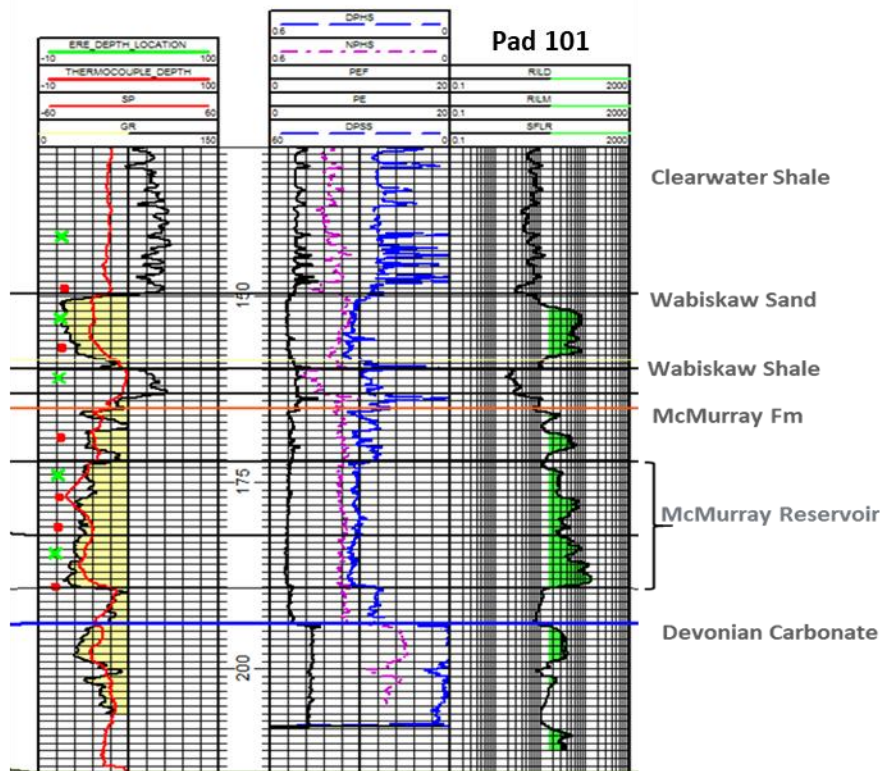
VERTICAL WELL



Everest Canadian Resources
 WDBD
 ELEV_KB : 470
 AA/07-18-091-14W4/0
 RIG_DATE : 2/20/2010

X Pressure Gauge and Thermocouple Location
 ■ Thermocouple Location

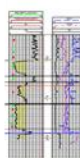
Everest Canadian Resources
 WDBD
 ELEV_KB : 470
 AA/07-18-091-14W4/0
 RIG_DATE : 2/20/2010



~93m to the West

1S4 (~183.5m TVD) ●

1P4 (~189.1m TVD) ●



~14m to the East

1S3 (~184.6m TVD) ●

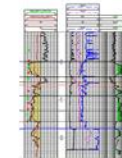
1P3 (~190.8m TVD) ●

AA/7-18-91-14W4

~93m to the West

1S4 (~183.5m TVD) ●

1P4 (~189.9m TVD) ●



~14m to the East

1S3 (~184.0m TVD) ●

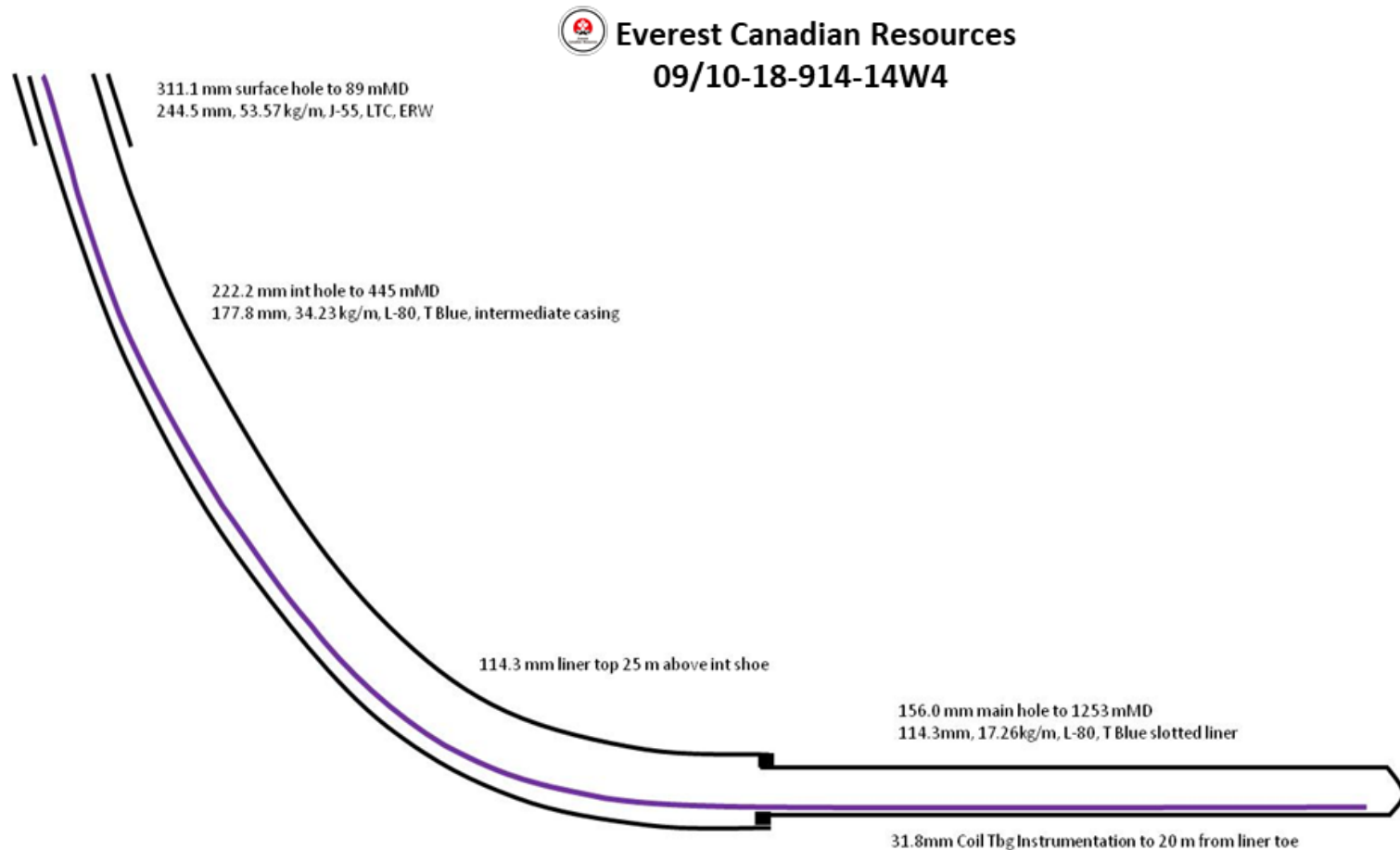
1P3 (~190.0m TVD) ●

AA/7-18-91-14W4

HORIZONTAL WABISKAW OBSERVATION WELL



- Horizontal observation well designed and drilled in Wabiskaw formation for potential future production from zone
- Original Pad101 fiber failed, currently there is no plans to replace failed fiber string





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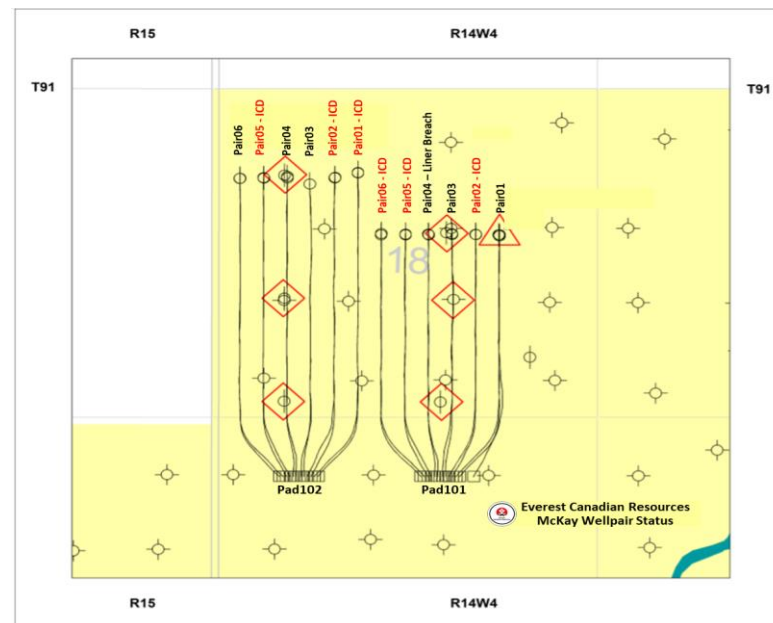
SCHEME PERFORMANCE



WELLPAIR CURRENT STATUS



- Production was shut-in via Warm-Hibernation program by August 2015
- Commissioning and startup process started Pad102
- Pad101 still on hibernation mode



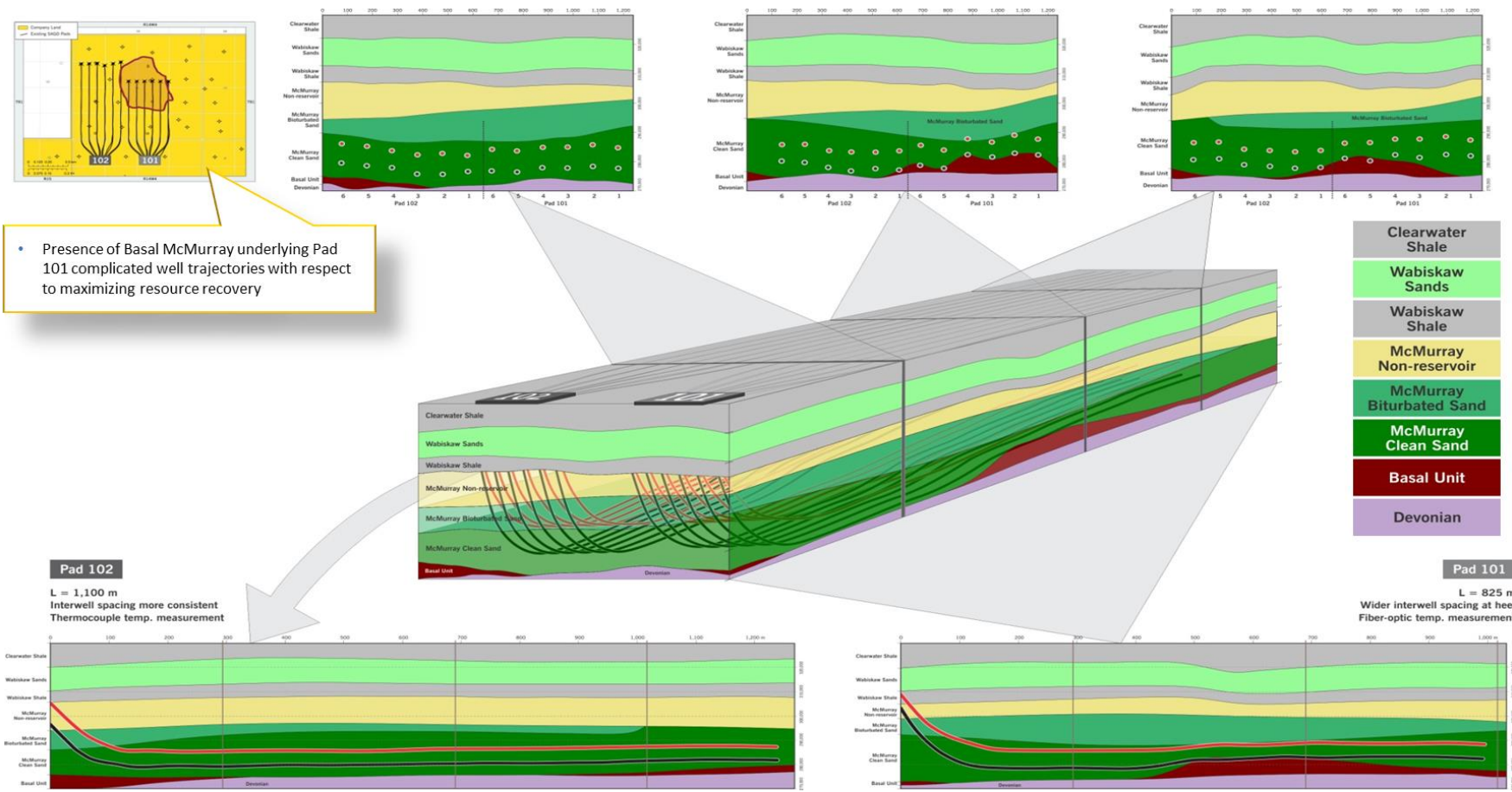
Pad101	
Wellpair	Status
101Pair01	-Wellpair suspended since Mar. 2015
101Pair02	-2013 liner breach → SI for over a year → ICD's installed Oct. 2014 → Bullhead to producer, but not converted to SAGD → Wellpair suspended since Apr. 2015
101Pair03	-No bottom hole temperature measurement → Wellpair suspended since May 2015
101Pair04	-Producer liner breach at toe → Well pair suspended since Nov. 2013
101Pair05	-ICD's installed in Feb. 2014 → Wellpair suspended since May 2015
101Pair06	-ICD's installed Oct. 2014 → Wellpair suspended since May 2015

Pad102	
Wellpair	Status
102Pair01	-ICD's installed in Jan. 2014 → Wellpair suspended since Jun. 2015 → Tested/Restarted (Nov-2019 to Mar-2020)
102Pair02	-ICD's installed in Sep. 2014 → Wellpair suspended since Jun. 2015 → Tested/Restarted (Nov-2019 to Mar-2020)
102Pair03	-Wellpair suspended since Jun. 2015 → Tested/Restarted (Nov-2019 to Mar-2020)
102Pair04	-Liner failure in Jan-13 → Wellpair suspended since May 2015 → Tested/Restarted (Nov-2019 to Mar-2020)
102Pair05	-ICD's installed in June 2014 → Wellpair suspended since May 2015 → Tested/Restarted (Nov-2019 to Mar-2020)
102Pair06	-Wellpair suspended since Jun. 2015 → Tested/Restarted (Nov-2019 to Mar-2020)

WELLPAIR CURRENT STATUS



Pad 101 and 102 Schematic Sections



- Presence of Basal McMurray underlying Pad 101 complicated well trajectories with respect to maximizing resource recovery

Clearwater Shale
Wabiskaw Sands
Wabiskaw Shale
McMurray Non-reservoir
McMurray Biturbated Sand
McMurray Clean Sand
Basal Unit
Devonian

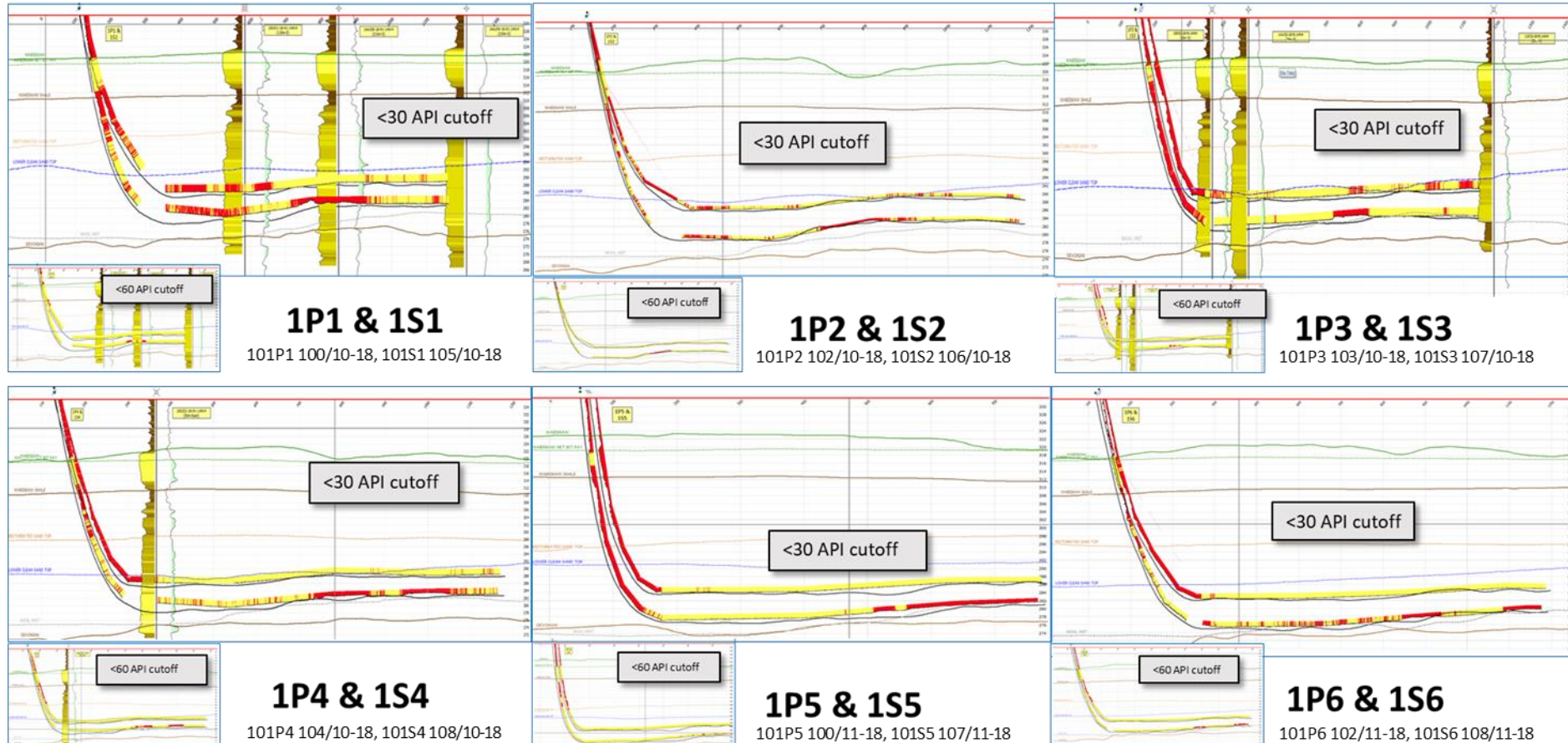
Pad 102
 L = 1,100 m
 Interwell spacing more consistent
 Thermocouple temp. measurement

Pad 101
 L = 825 m
 Wider interwell spacing at heel
 Fiber-optic temp. measurement

WELLPAIR CURRENT STATUS



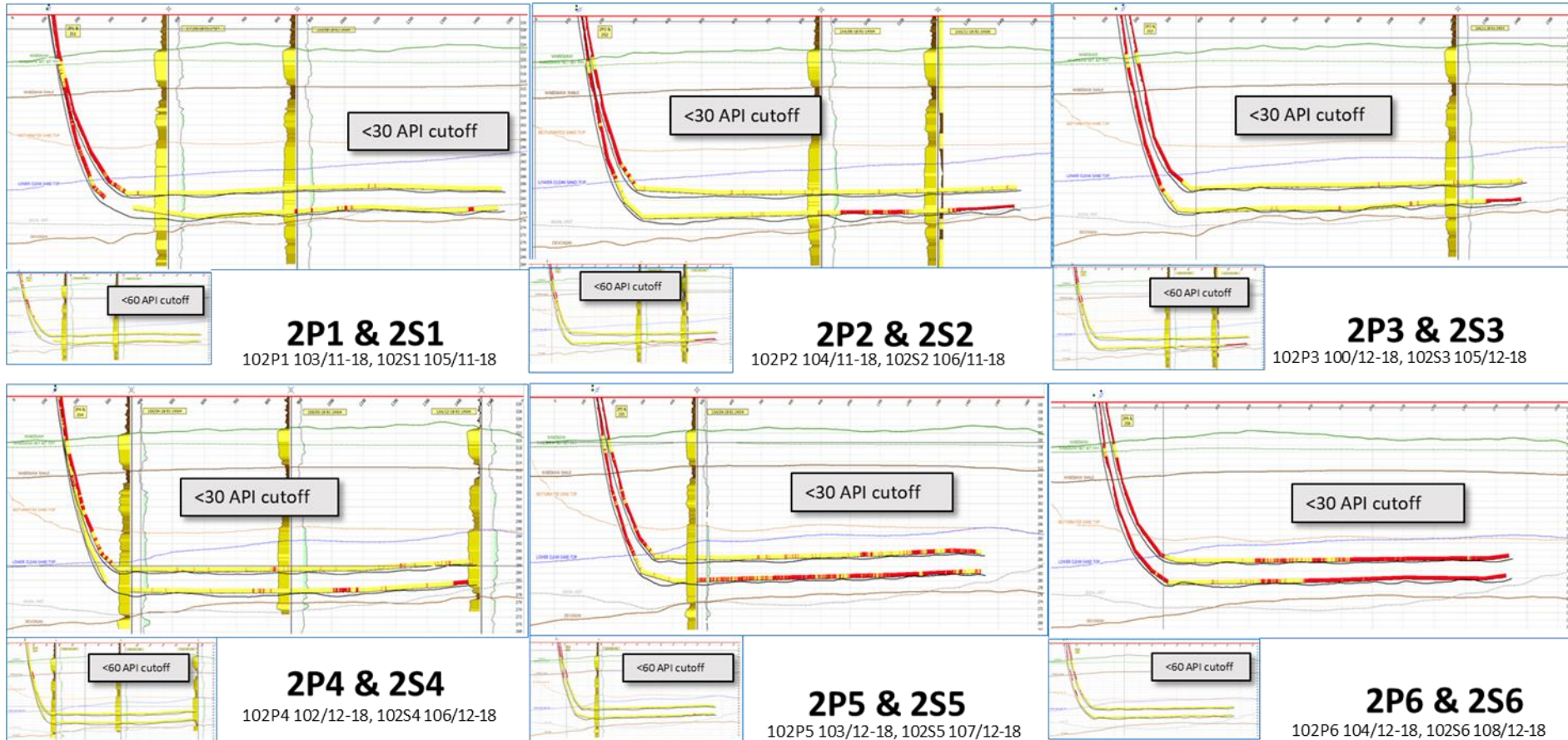
Pad 101 Schematic Sections



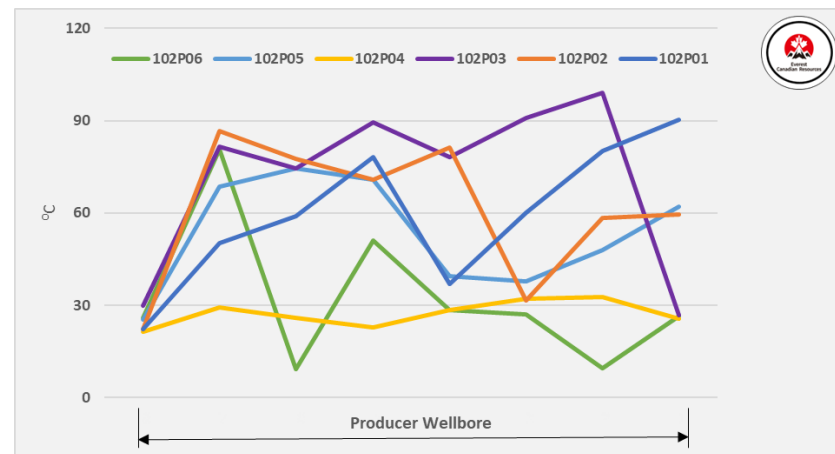
WELLPAIR CURRENT STATUS



Pad 102 Schematic Sections



- Pad102
 - Commissioning and startup process started on November 2019
 - All wellpairs were inspected, serviced, and Pressure Tested as per AER Directive D013
 - Verified and Validated:
 - Wellpair string integrity
 - Temperatures (TCs) and Pressures
 - Surface → Well → Reservoir connectivity
 - Average Producers downhole temperature before restart (Feb 2020)



- On February 2020 and after the warmup phase was completed, the steam ramp up phase was started but, due to COVID-19 this phase has been temporarily suspended since March 2020



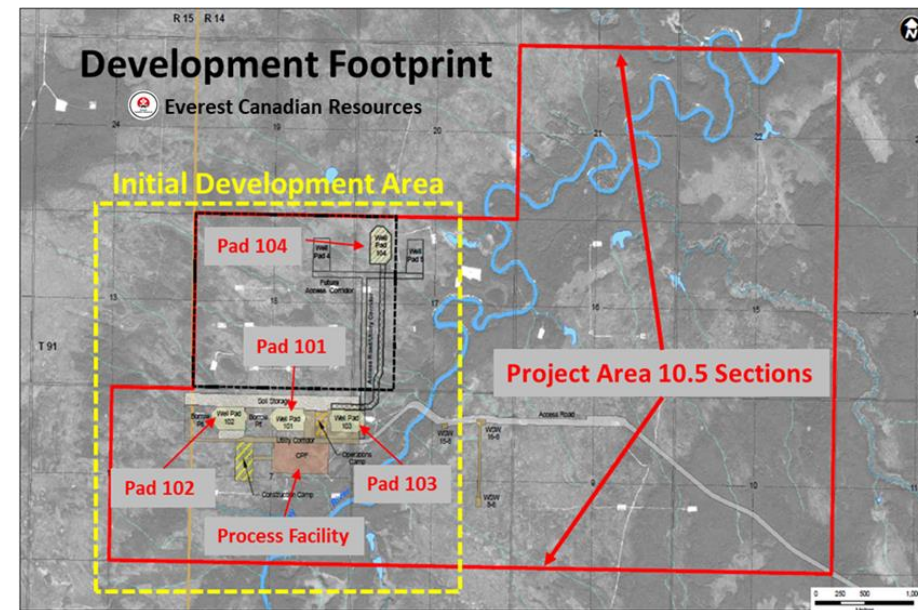
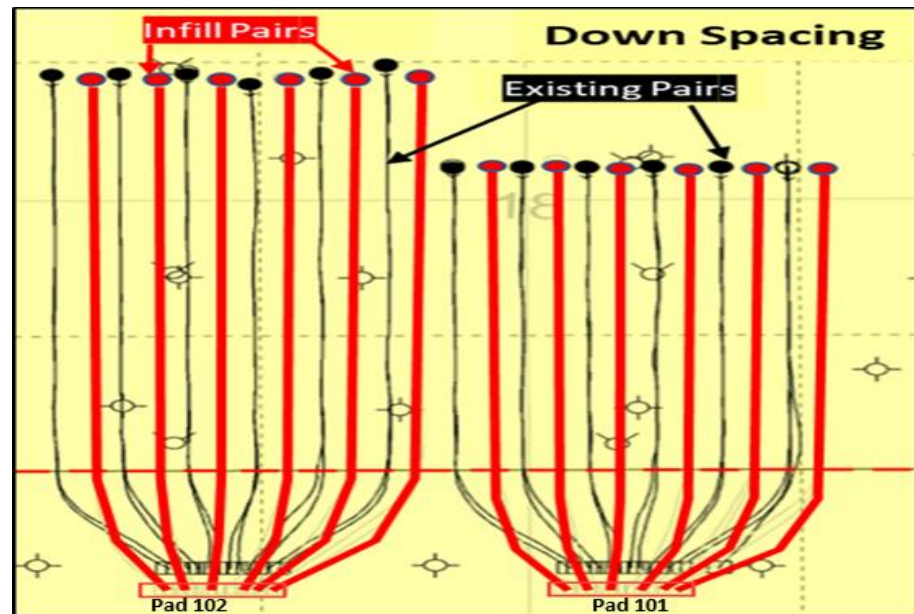
Everest Canadian Resources

SUBSURFACE FUTURE PLANS

SUBSURFACE FUTURE PLANS



- Q3 2020 resume and continue with Pad 102 and Pad 101 wellpairs warmup, startup and rampup throughout 2020 and into 2021 until target reservoir Pressure is reached
- Drilling Plans Medium to Long Term
 - Pads 101 and 102 Downspacing
 - Down-spacing amendment application fully approved by AER
 - Capacity for 12 additional well pairs (infills) on existing Pads 101 and 102
 - Pads 103 and 104 are currently approved (with 100 m spacing/Six Pairs), an amendment will be submitted to the AER to reduce spacing increase well count





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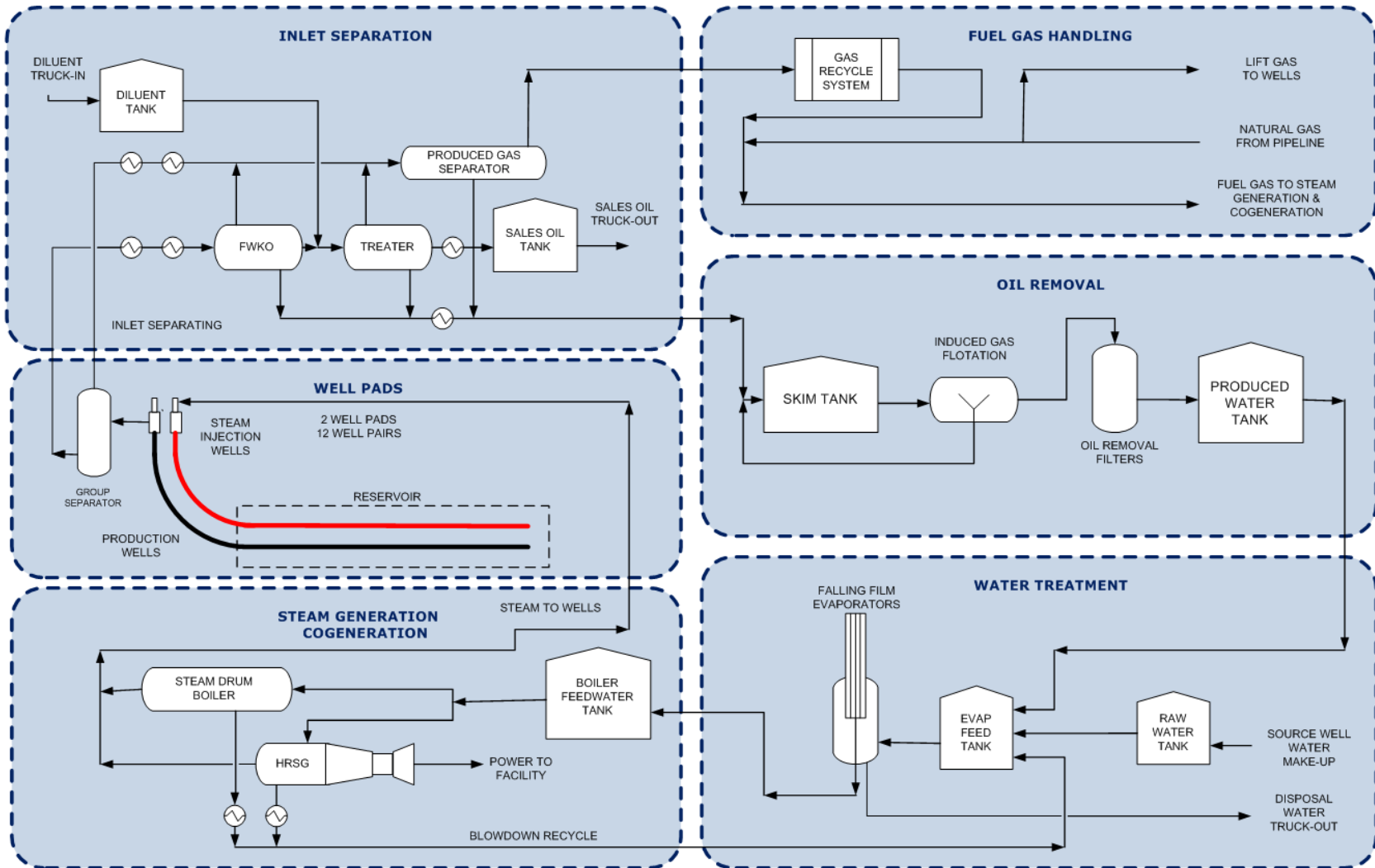
SURFACE FACILITIES & ENVIRONMENTAL



4.3 SURFACE FACILITIES & ENVIRONMENTAL

- 1. FACILITY PLOT PLAN**
- 2. FACILITY SCHEMATIC**
- 3. MEASUREMENT AND REPORTING**
- 4. WATER SOURCES & USES**
- 5. ENVIRONMENTAL SUMMARY**
- 6. SURFACE FUTURE PLANS**

SIMPLIFIED FACILITY SCHEMATIC



- General
 - Main EPEA approvals have been transferred to Everest
 - The project is not yet fully operational, therefore:
 - MARP approved: March 2011 → Annual 2020 MARP report and update will be submitted in February 2021
 - Review of Controls for EPAP Declaration will be completed, and the declaration will be submitted February 2021.
- Well Production / Injection Volumes
 - Well production will be prorated from bulk scheme production using intermittent test data via dedicated test separators on Pads 101 and 102. (6 pairs per separator)
 - Wells will meet or exceed the current minimum well test requirements per Directive 17
 - Manual samples will be taken to determine bitumen, water, solids and chloride content and have proven reliable and repeatable.

- *Water Act* licence amendment No. 00262149-02-00 was granted on April 06, 2020 extending the licence expiry date to April 5, 2025
- Fresh Water Uses - make-up water for the project to be drawn from the McKay Channel Empress Formation. Details on the Water Act license are as follows:

Licence No. 00262149-02-00	
8-8-91-14-W4M	853 m ³ / day
16-8-91-14-W4M	2,401 m ³ / day
15-8-91-14-W4M	2,475 m ³ / day
Daily Maximum Diversion	5,729 m ³ / day
Annual Maximum Diversion	419,750 m ³

- AER Commercial Scheme Approval No. 11461 - no compliance issues
- EPEA Approvals all main approvals have been transferred to Everest:
 - EPEA Approval 255245-00-00
 - EPEA Approval 255245-00-01
 - EPEA Approval 255245-00-02
 - EPEA Approval 287052-00-00
- Water Act Diversion Licence Amended No. 00262149-02-00 – extended to April 5, 2025 - no compliance issues
- EPEA approval 287052-00-00 (Wastewater System) – The Wastewater treatment facilities will be commissioned in Q3-2020. Currently, all influent have been hauled and managed by a third-party service contractor.



- Everest Canadian Resources top priority is to re-establish safe, compliant and steady-state operations
- Plans include but not limited to:
 - CPF
 - Continue with commissioning and rampup
 - Pursue optimization opportunities
 - Wellpads
 - 102 wellpad → Resume startup and rampup
 - 101 wellpad → Commission, startup and rampup