

USR RESOURCES LLC



**INTRODUCTION
TO
ULTRA SHORT RADIUS DRILLING**

September 2024



INTRODUCTION

Untapped oil and gas reserves can be accessed by combining a low-cost surface equipment package and unique Ultra-Short Radius (USR) sidetracking technology. This combination of fit for purpose equipment and USR technology provided by USR Drilling allows access to reserves in a cost-effective manner. The key deliverables are increased production and improved ultimate recovery.

We have the package to surgically remove these low volume left behind reserves by installing super perforations that are:

- ❑ **3-7/8" in diameter**
- ❑ **Up to 1500' drainholes**
- ❑ **At the desired depth**
- ❑ **In the desired direction**

WHAT IS ULTRA SHORT RADIUS DRILLING?



DEFINITION

BUR : $100^{\circ}/100$ ft to $230^{\circ}/100$ ft

ROC : 25 to 57 ft

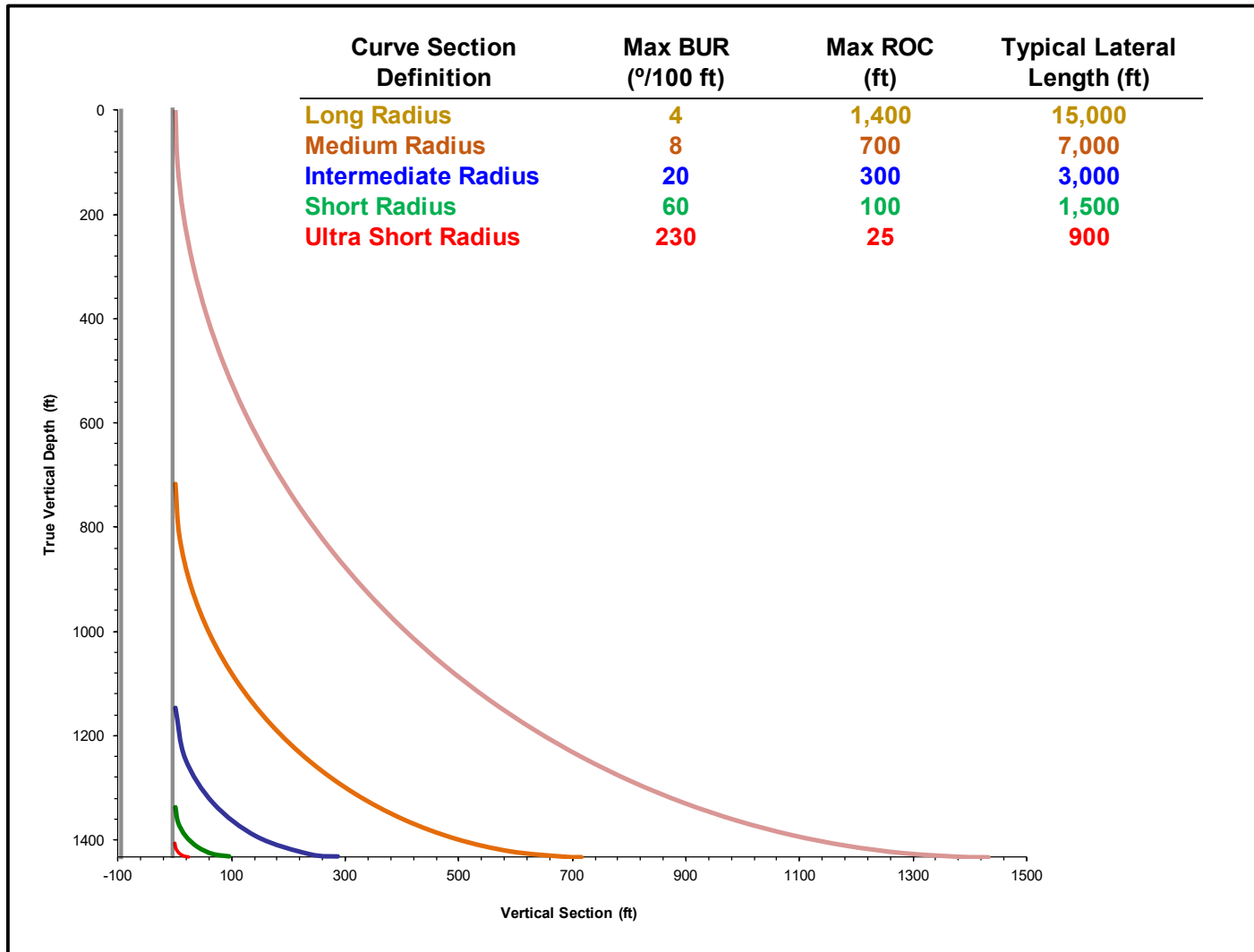
OUR APPROACH

Slim Hole Drilling with hole sizes and down hole tools that permit

- High BUR
- Steering
- Directional Surveying
- Completion



DEFINITION of USRD





USR RESOURCES LLC

- ❑ Controls and manages USR Drilling and USR Energy.
- ❑ Owns all drilling equipment and the USR Technology.
- ❑ Grants exclusive territorial licenses to qualified companies to deploy the USR Technology.
- ❑ Holds a minority interest in the local joint venture licensee company and is involved in its management and development.
- ❑ Provides licensees with:
 - ❑ necessary drilling equipment,
 - ❑ on the job training and technical and engineering support required to evaluate, plan, drill and complete a USR well for a minimum of six months or until the licensee can function independently of USRR and
 - ❑ ongoing technical support when needed.



DAQING CHENPING

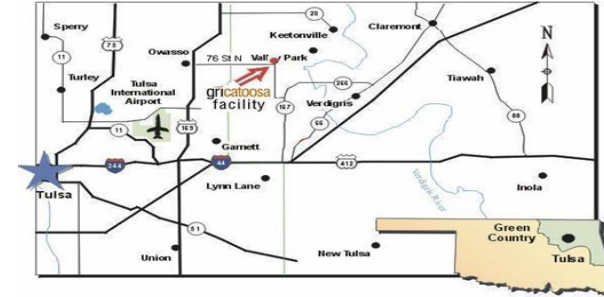
- ❑ Daqing Chenping Drilling Technology Service Co. Ltd. (“Chenping”) is the joint venture company established in 2019 by USRR and its partner Daqing Guoping Petroleum Engineering Technology Services Co., Ltd.
- ❑ Chenping holds an exclusive license to operate USR Equipment and utilize the USR Technology in drilling ultra-short radius wells in China.
- ❑ As of July 2020 Chenping has drilled more than 160 USR wells for PetroChina in the Daqing oilfield in Heilongjiang Province, China and has an ongoing contract to drill USR wells.
- ❑ Chenping plans to expand its operations to other fields.





USR DRILLING LLC

- ❑ USR DRILLING (USRD) is the premier provider of Ultra-Short Radius and Short Radius horizontal drilling services to the oil and gas industry.
- ❑ USRD personnel were directly involved in the development of USR prototype tools at Amoco Production Company Drilling Research Center near Catoosa, Oklahoma in the late 80's early 90's.
- ❑ USRD is the only directional drilling company in the world that provides Ultra Short Radius drilling services.
- ❑ USRD employs highly experienced drilling personnel and offers unique problem solving well intervention technologies.
- ❑ Over the past 35 years USRD personnel have more than a thousand wells in the US, Africa, China, India, Turkey, Oman, Yemen, Indonesia, Myanmar and Pakistan. New drilling and completion technologies have been introduced to improve the Company's capabilities and operational efficiency.





USR ENERGY LLC

USR ENERGY (USRE) participates with industry partners on a Drill for Equity basis by providing equipment and services in return for a working interest in a project.

USRE's focus is to:

- ❑ participate in the acquisition and development of producing and non-producing oil and gas properties in the USA and
- ❑ successfully and profitably re-develop these properties by applying USRR's proprietary Ultra-Short Radius sidetracking technology to exploit remaining reserves.



USR OFFICES



USR Group of Companies
Three Riverway, Suite 1750
Houston, Texas 77056



**Daqing Chenping Drilling Technology Service
Co. Ltd.**

Rm 300, Building C4
Daqing Service Outsourcing Industrial Park
No. 6-2 Xinfeng Road, Daqing Development Zone
Heilongjiang Province, China



OUR EXPERIENCE AND EXPERTISE

Management, drilling and engineering personnel possess, on average, more than 30 years of experience with USRD. This experience has led to several industry firsts:

- Drilling horizontal wells utilizing air hammers;
- Drilling with Titanium Drill Pipe (TDP);
- Running an articulated and rotatable sand screen through a 29' radius and 600' lateral;
- Drilling two world record wells.

Our expertise is the re-entry of existing wellbores to exploit bypassed reserves in mature fields. We deploy proprietary well-intervention technologies that were specifically designed to exploit remaining reserves, increase production from marginal wells, restore production from shut-in wells, and reduce water production.

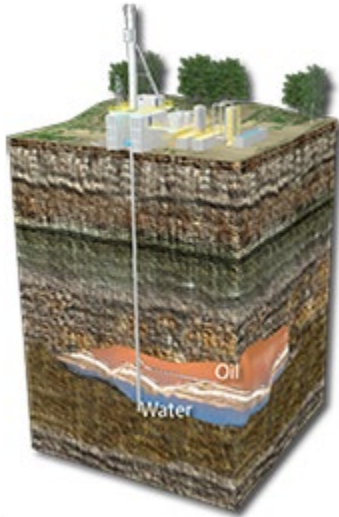


HISTORY OF THE USR TECHNOLOGY

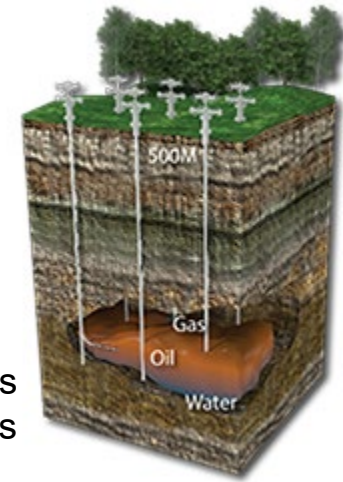
2021-Present	<ul style="list-style-type: none"> Completed 160th well in China. Service Contract for 4 years executed with OMV Petrom in Romania. Four wells drilled to date. Feasibility Study concluded for Genel and Sinopec for work with TAQTAQ in Iraq. USR Technology License issued for Uzbekistan. Additional Licenses currently being negotiated for multiple countries.
2019-2020	<ul style="list-style-type: none"> Completed 70th well in China. Instituted Remote Supervision of Drilling Operations to support China. Issued first Non-exclusive USR Technology License for the US.
2016-2018	<ul style="list-style-type: none"> Issued First USR Technology License for China. Drilled 8 USR wells in Illinois and Texas. Completed 7th well in Myanmar Completed 19th well in Gabon.
2013-2015	<ul style="list-style-type: none"> Completed 15th well in Gabon. Completed 8th well in Pakistan. Completed 4th well in Myanmar.
2012	<ul style="list-style-type: none"> Completed 8th Well in W. Africa for Perenco Gabon in OBA, Olende and Niungo Fields Drilled a World Record well with a Reach to Radius Ratio of 32:1 and Longest USR lateral length of 430 m (Gabon) Began development of new generations of Titanium DP and Composite DP
2010-2011	<ul style="list-style-type: none"> Drilled first two wells in Indonesia for Citic Seram. Drilled 2 wells for Pertamina Java EP. Drilled first First USR well in African Continent for Perenco Gabon. Drilled 8th well for Oxy Oman, Safah Field
2009-2010	<ul style="list-style-type: none"> Completed 7 well campaign for Oxy Oman, Safah field Drilled a World Record well with a Reach to Radius Ratio of 25:1
2007 - 2008	<p>First USR well completed with articulated and rotatable sand screen "SnakeScreen™". Acquired TDP with two designs improvements based on USRD field data input.</p>
2007	Developed USR mud motors to reduce drillpipe RPM's and to steer in thin targets. Began running a hybrid string combining S-135 and one or two joints of TDP as non-mag.
2006 – 2007	Drilled USR wells in Turkey and India. Replaced Composite Drill Pipe with Titanium Drill Pipe.
2005 - 2006	Drilled in Rima field of PDO Oman. Built 30 ft ROC fixture to fatigue test drill pipe to be run in USR wells.
2004 – 2005	Drilled multi-lateral "fishbone" wells for PDO, Oman. Introduced USR to Indonesian Operators.
2001 - 2003	Completed five well trial successfully for PDO, Oman. USR chosen as one of Five Mature Technologies for worldwide deployment by Shell's Global Implementation Team (GIT).
1994 - 2001	<p>Drilled 170 USR wells in various fields in the United States with a number of milestones:</p> <ul style="list-style-type: none"> 2000 - First ever horizontal well drilled with air hammer 1999 - First ever well drilled with Titanium Drill Pipe 1995 - First USR well drilled Under Balanced using USRDS's Low Cost RSS tools
1990 - 1994	Drilled more than 200 Ultra Short Radius (USR) test wells at Amoco's Catoosa Drilling Research Center.



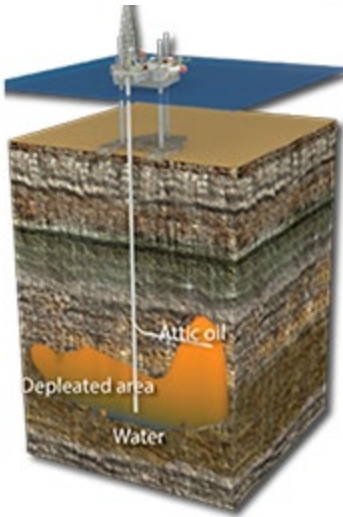
APPLICATIONS



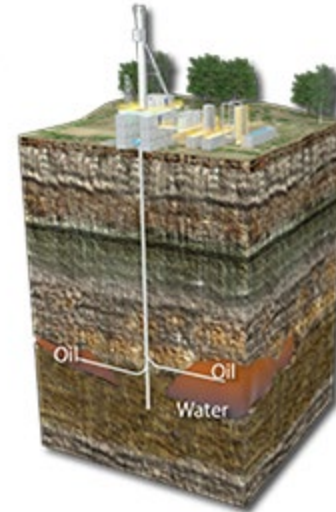
1. Sidetracks from Vertical Wells with Water Coning



2. Sidetracks from Vertical Wells in Tightly Spaced Fields



3. Exploitation of Attic Oil From Vertical or Horizontal Wells



4. Sidetracks into Channel Sands with Surrounding Shale

5. Sidetracks from Vertical Wells with Near Wellbore Damage
6. Alternative to Hydraulic Fracturing
7. Sidetracks from Water Injectors to Increase Injection Rates and Improve Sweep Efficiency
8. Sidetracks with conventional deviated well followed by USR drain hole to avoid water coning



USR VS CONVENTIONAL SIDETRACK

USR SIDETRACK

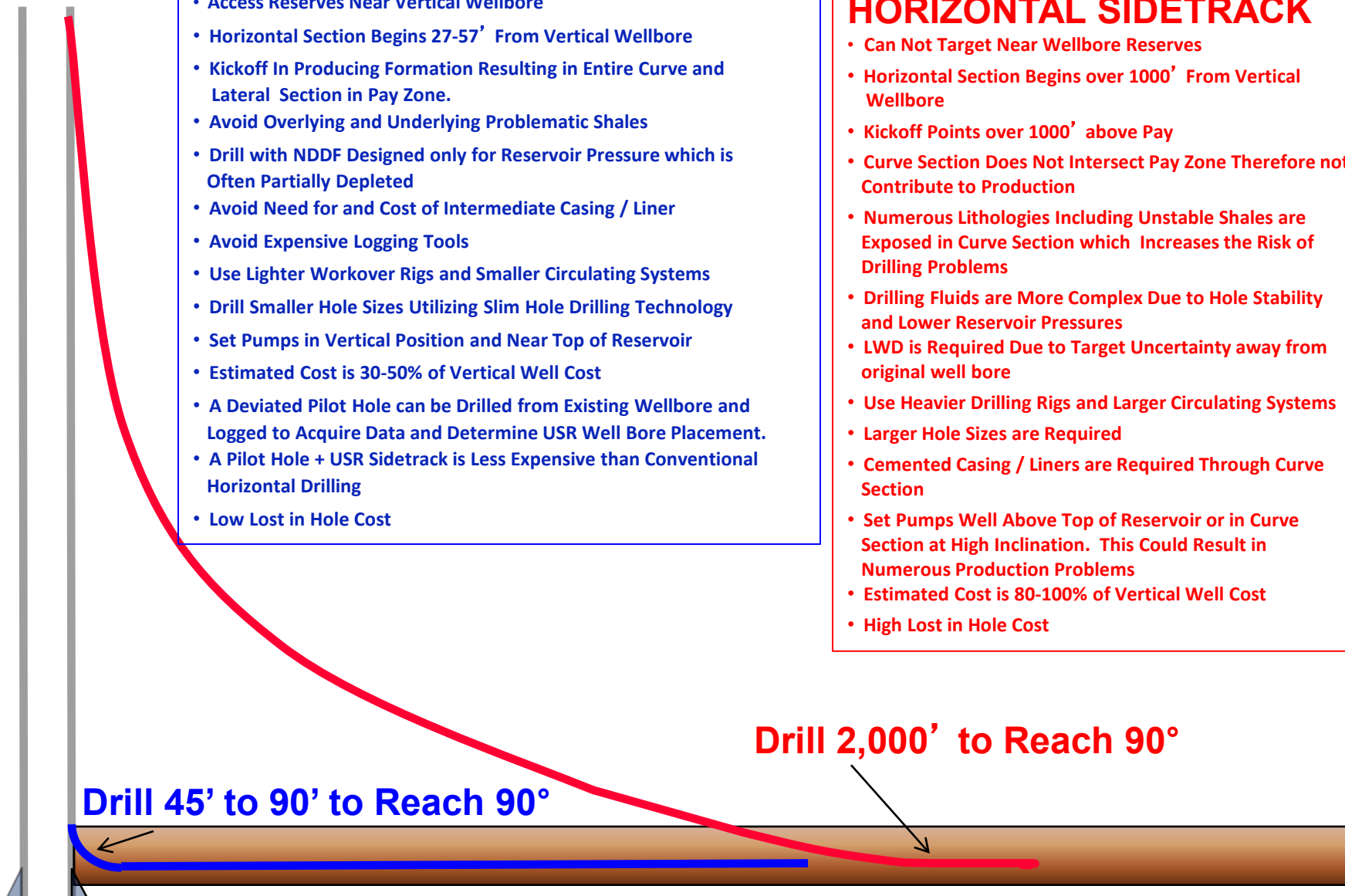
- Access Reserves Near Vertical Wellbore
- Horizontal Section Begins 27-57' From Vertical Wellbore
- Kickoff In Producing Formation Resulting in Entire Curve and Lateral Section in Pay Zone.
- Avoid Overlying and Underlying Problematic Shales
- Drill with NDDF Designed only for Reservoir Pressure which is Often Partially Depleted
- Avoid Need for and Cost of Intermediate Casing / Liner
- Avoid Expensive Logging Tools
- Use Lighter Workover Rigs and Smaller Circulating Systems
- Drill Smaller Hole Sizes Utilizing Slim Hole Drilling Technology
- Set Pumps in Vertical Position and Near Top of Reservoir
- Estimated Cost is 30-50% of Vertical Well Cost
- A Deviated Pilot Hole can be Drilled from Existing Wellbore and Logged to Acquire Data and Determine USR Well Bore Placement.
- A Pilot Hole + USR Sidetrack is Less Expensive than Conventional Horizontal Drilling
- Low Lost in Hole Cost

CONVENTIONAL HORIZONTAL SIDETRACK

- Can Not Target Near Wellbore Reserves
- Horizontal Section Begins over 1000' From Vertical Wellbore
- Kickoff Points over 1000' above Pay
- Curve Section Does Not Intersect Pay Zone Therefore not Contribute to Production
- Numerous Lithologies Including Unstable Shales are Exposed in Curve Section which Increases the Risk of Drilling Problems
- Drilling Fluids are More Complex Due to Hole Stability and Lower Reservoir Pressures
- LWD is Required Due to Target Uncertainty away from original well bore
- Use Heavier Drilling Rigs and Larger Circulating Systems
- Larger Hole Sizes are Required
- Cemented Casing / Liners are Required Through Curve Section
- Set Pumps Well Above Top of Reservoir or in Curve Section at High Inclination. This Could Result in Numerous Production Problems
- Estimated Cost is 80-100% of Vertical Well Cost
- High Lost in Hole Cost

Drill 45' to 90' to Reach 90°

Drill 2,000' to Reach 90°





WHAT CONSTITUTES A GOOD USR CANDIDATE

- ❑ LOW RECOVERY FACTOR = REMAINING RESERVES
- ❑ LOW WELL DENSITY = SUFFICIENT PRESSURE
- ❑ GOOD RESERVOIR DATA = BETTER TARGET IDENTIFICATION
- ❑ LOW PERMEABILITY = POOR CONNECTIVITY
- ❑ SUFFICIENT WELL RECORDS = LOWER RISK
- ❑ 5 1/2" CASING OR LARGER
- ❑ LESS THAN 10,000' DEPTH
- ❑ BAREFOOT COMPLETION



CASE HISTORIES

SOME EXAMPLES

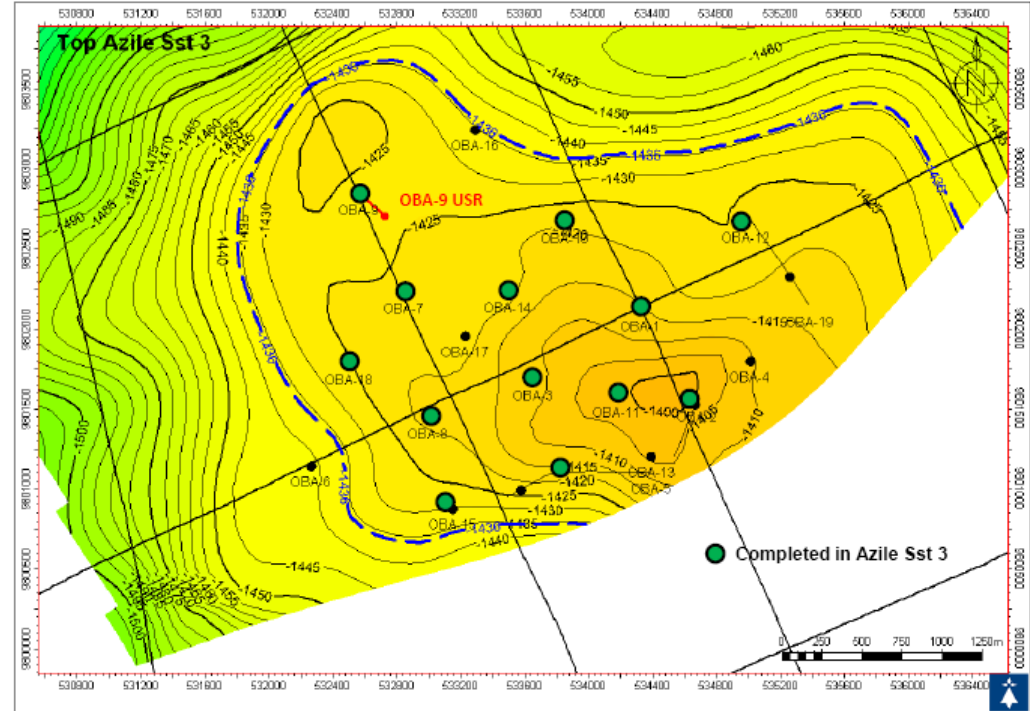
FOR ADDITIONAL CASES, SEE SEPARATE PRESENTATION



Case 1 – Horizontal Drain Trial

HISTORY :

- Appraisal well for the field northwestern extension
- 7 Workovers to test Dolomite and Sst
- Converted to water injector with disappointing 50 bwpd injecting rate
- Converted back to producer from Sst 3 and 4 with 130 bopd, 22% watercut
- Vertical well log shows 4 m net pay, 24% porosity, 60 mD perm

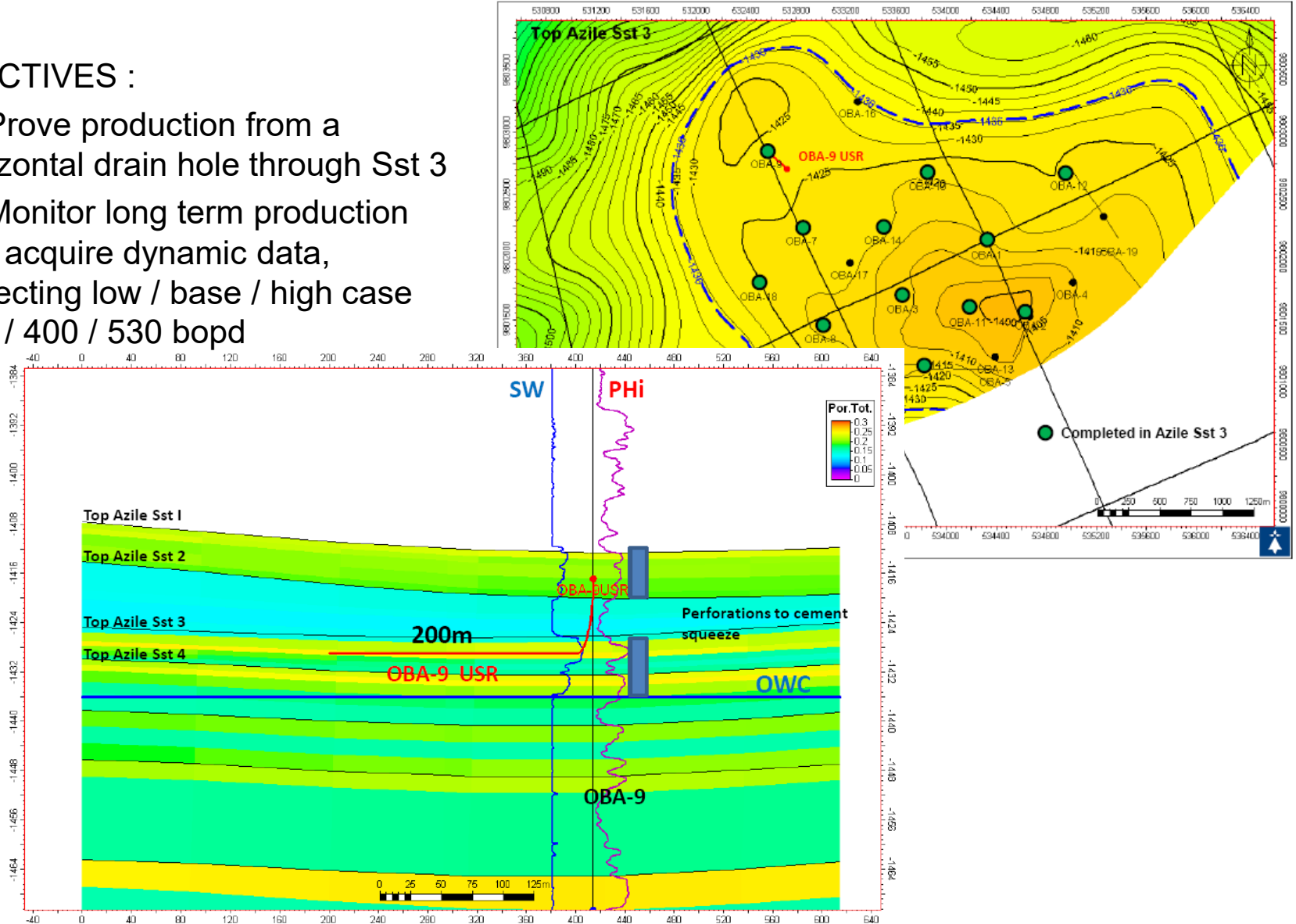




Case 1 – Horizontal Drain Trial

OBJECTIVES :

- To Prove production from a horizontal drain hole through Sst 3
- To Monitor long term production and acquire dynamic data, expecting low / base / high case 320 / 400 / 530 bopd





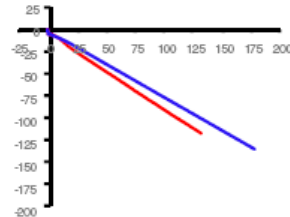
Case 1 – Horizontal Drain Trial

RESULTS :

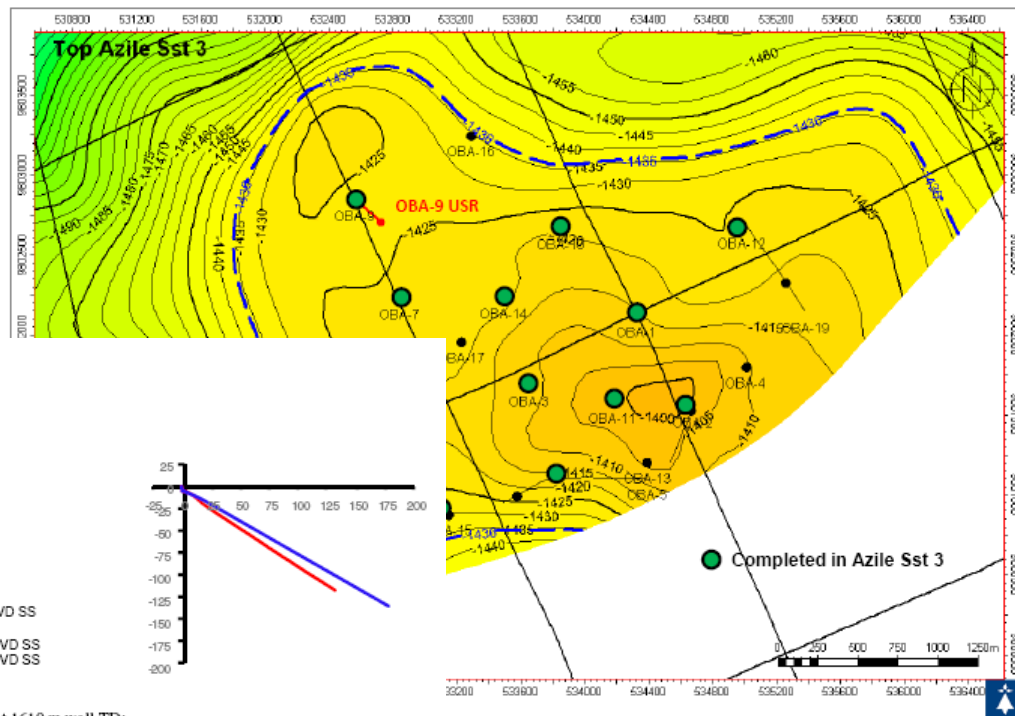
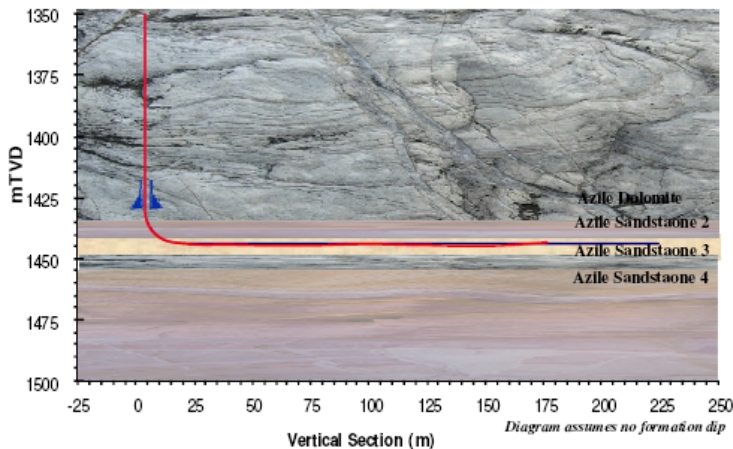
- Production increase from 130 bopd, 22% watercut to **750 bopd, nil Water**
- Total 620 bopd incremental oil at “flat” decline rate



Survey Type : DEFINITIVE
 Vertical Section Origin : N 00.000 m., E 00.000 m.
 Vertical Section Azimuth : 0°
 Reference Datum TVD : RKB Original Drill Floor Elevation
 Tie-in : Surface
 Tie-in Surveys : Gyro Multishot
 Top Azile Sandstone : 1428 m MD ORT
 Top 7' 28# Casing Section Window : 1428 m MD ORT
 KOP - Start 4-1/2" Curve : 1430 m MD ORT
 Top Azile Sst 3 : 1444 m MDORT, 1441 m TVD ORT, 1426 m TVD SS
 Radius of Curvature (DLS) : 12.5 m (140° / 30m)
 Landing - End of 4-1/2" Curve : 1449 m MD ORT, 1443 m TVD ORT, 1426 m TVD SS
 Well TD : 1610 m MDORT, 1443 m TVD ORT, 1426 m TVD SS
 Revision Date : 10-Oct-11
 Report Date : 10-Oct-11



At 1610 m well TD:
1.4 m Above-, 13.1 m Right of Plan

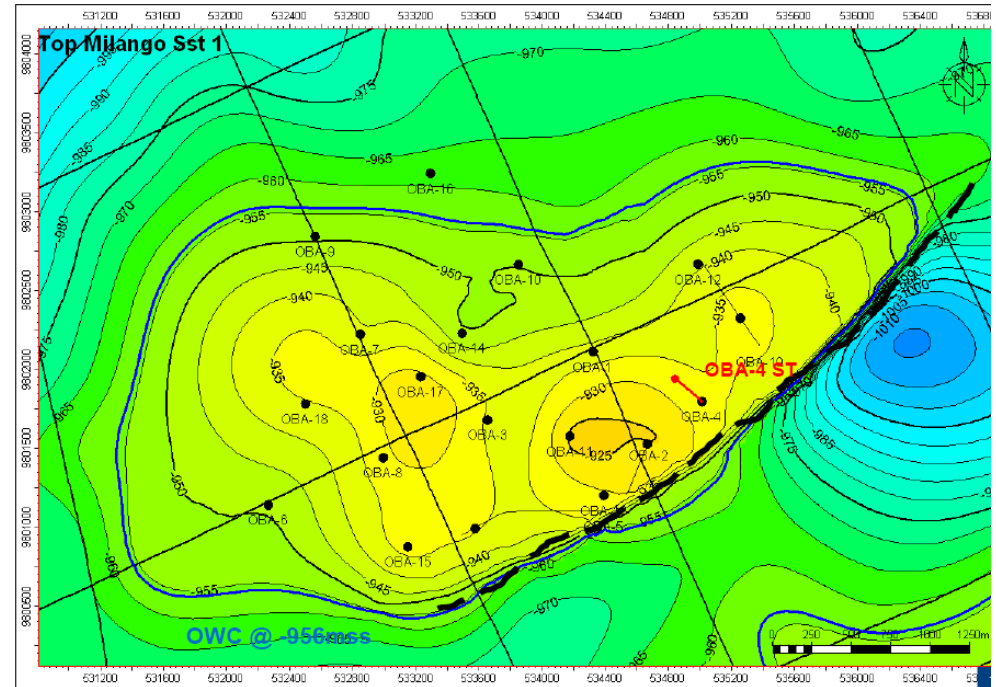




Case 2 – Low Mobility Oil

HISTORY :

- M Sst - high perm (vug), low mobility
- 18° API Oil with high viscosity 253 cP
- Very low PI in vertical well, 20 m perf
- Heavy oil limit production in vertical well - 40 bopd, low water from M Sst

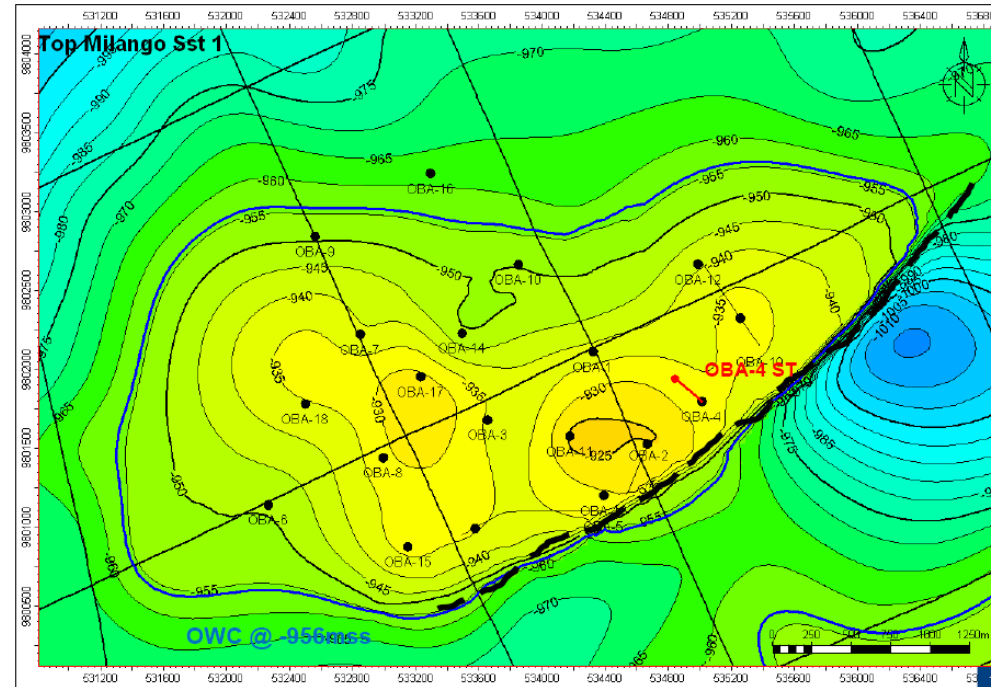




Case 2 – Low Mobility Oil

OBJECTIVES :

- Increase PI by increasing connectivity
- Monitor long term production and obtain dynamic data
- Support further development in M reservoir
- USRD trial with Operator's light rig

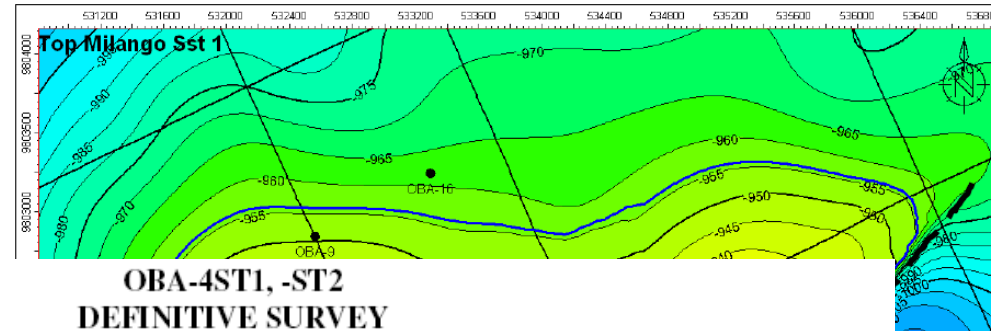




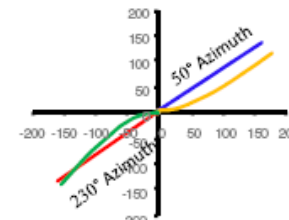
Case 2 – Low Mobility Oil

RESULTS :

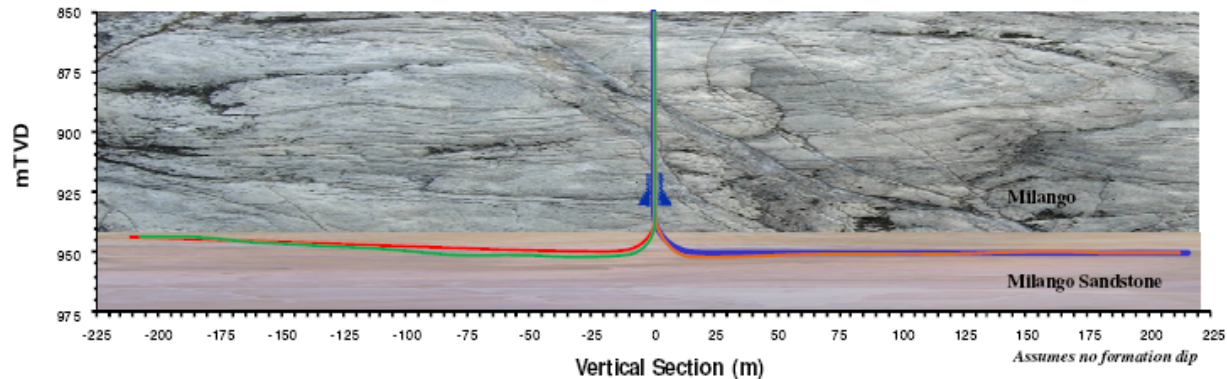
- **6 fold** increase in oil production
- “Open door” to **60 MMstb STOIP**



Survey Type : SURVEY
Vertical Section Origin : N 00.000 m., E 00.000 m.
Vertical Section Azimuth : 50°
Reference Datum TVD : RKB Original Drill Floor Elevation
Tie-in : Gyro Multishot Run Date 15-Oct-11
Top Milango : 834 m MD ORT
9-5/8" Casing Shoe : 894 m MD ORT
Top 4-1/2" Pilot Hole : 930 m MD ORT
Top 7" 29# Casing Section Window : 931 m MD ORT
ST1 KOP – Start 4-1/2" Curve : 933 m MD ORT
ST1 Landing – Start 3-7/8" Lateral : 962 m MD ORT, 952 m TVD ORT, 944 m TVD SS
ST1 ROC, BUR ACTUAL (PLAN) : 17.7 m ROC, 100 deg/30m (17.0 m, 101 deg/30m)
ST1 TD : 1162 m MD ORT, 950 m TVD ORT, 942 m TVD SS
Top 4-1/2" Bypass Pilot Hole : 933 m MD ORT
ST2 KOP – Start 4-1/2" Curve : 936 m MD ORT
ST2 Landing – Start 3-7/8" Lateral : 959 m MD ORT, 951 m TVD ORT, 943 m TVD SS
ST2 ROC, BUR ACTUAL (PLAN) : 15.8 m ROC, 123 deg/30m (13.8 m, 125 deg/30m)
ST2 TD : 1159 m MD ORT, 943 m TVD ORT, 935 m TVD SS
Revision Date : 9-Nov-11
Report Date : 9-Nov-11



- Plan OBA-04ST1 ver 25-Oct-11
- Plan OBA-04ST2 ver 26-Oct-11
- Definitive Survey OBA-04ST1
- Definitive Survey OBA-04ST2

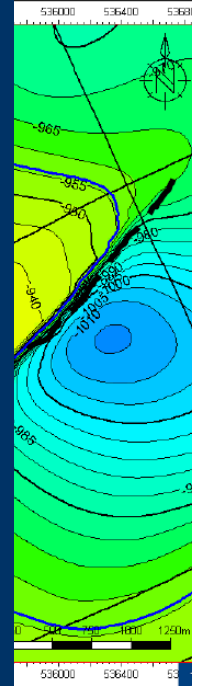
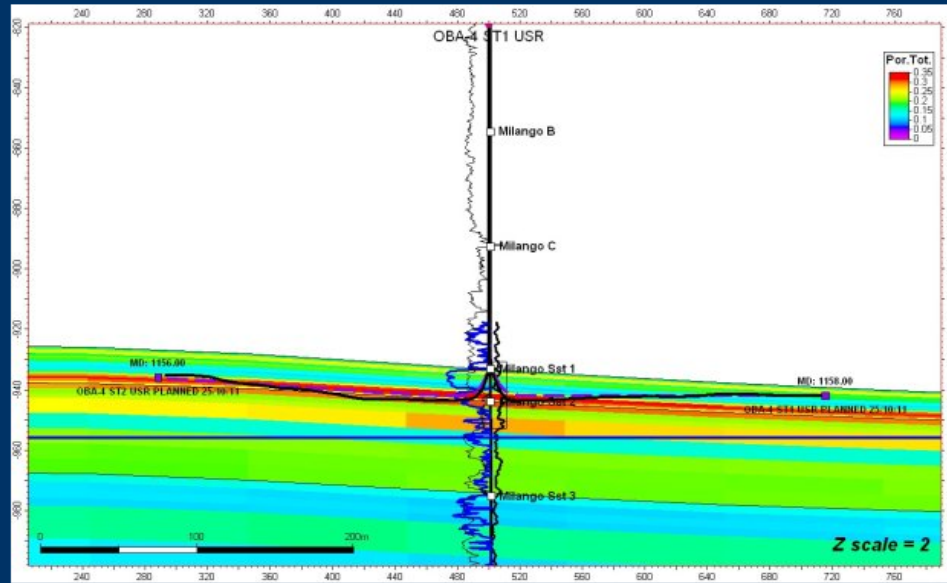




Case 2 – Low Mobility Oil

RESULTS :

- **6 fold** increase in oil production
- “Open door” to **60 MMstb STOIP**



Perenco Gabon Conducts First Ultra Short Radius (USR) Re-Entry in Africa

Perenco Gabon is pleased to announce that wells OBA-09 and OBA-04 have successfully been worked over. Three side tracks, including one two leg multilateral re-entry drilling, were effectively executed using both the H40 rig and ultrashort radius technology.

Both wells are now back in production and showing encouraging results. OBA-4 heavy oil production has increased six fold in the same Milango formation, opening the door for a 60 MMstb STOIP field development.

USR technology allows the placing of multiple 200m horizontal drains by applying very high dog leg (excess of 150deg/30m). This was selected as the most appealing intervention technique as it did not require a powerful rig.

Several alternative applications have already been identified for Gabon where many existing wells are potential candidates for similar work over programmes where Perenco will again be able to improve recovery.

The next two USR wells will use the Perenco Schramm rig on the Olende Dome formation. The objective will be to validate a smaller footprint rig while testing horizontal wells in the Ozouri formation.

This project is a significant achievement for Perenco Gabon and demonstrates Perenco's ability to maintain production plateau by further developing brown field sites using cost effective and innovative methods.

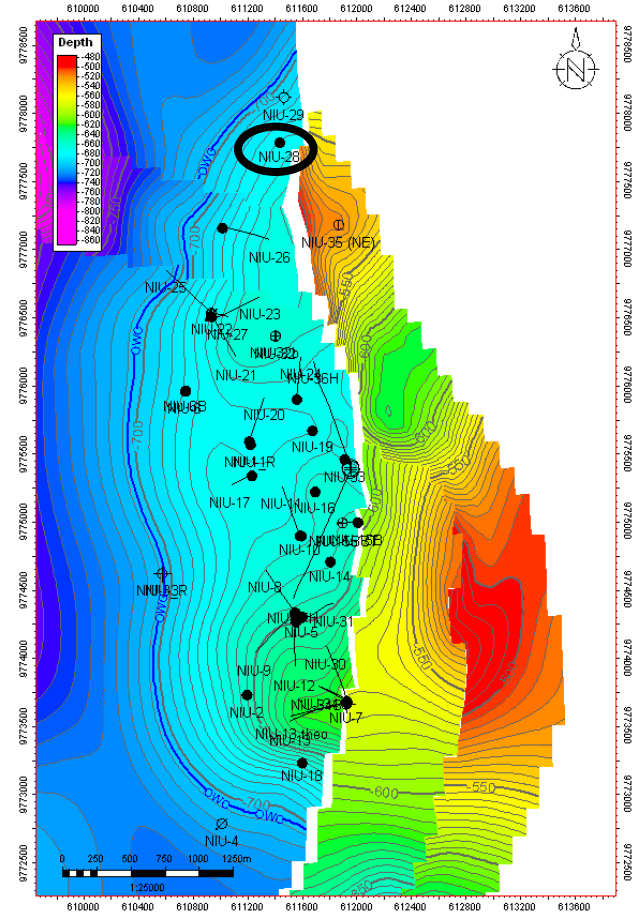
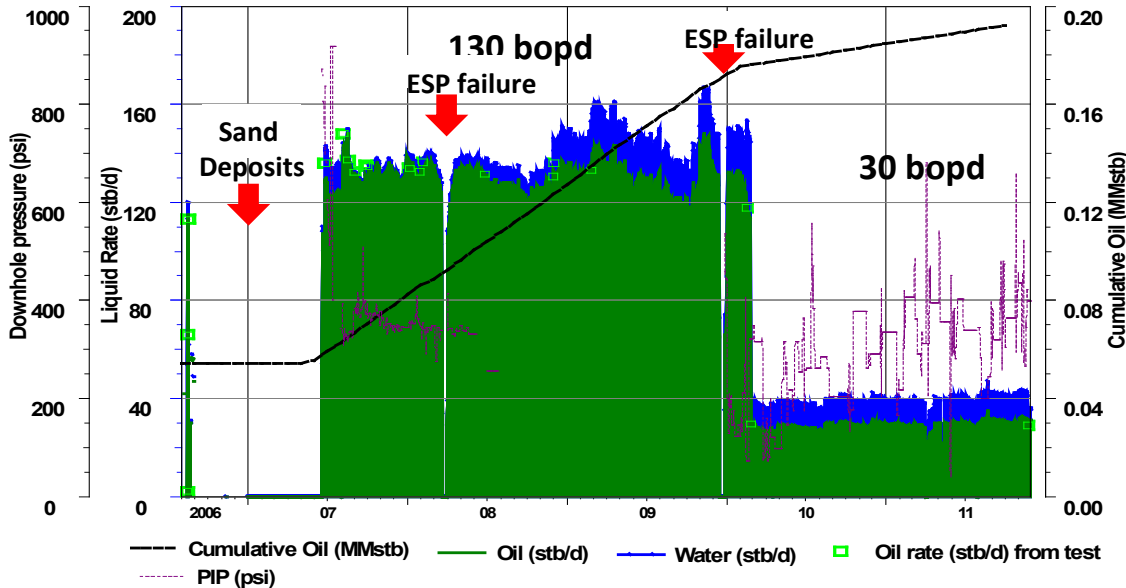


Case 3 - Improve Recovery

HISTORY :

- Field – Active aquifer drive, constant increase in water cut
- High water encroachment tendency
- 23% Recovery factor suggests remaining field potential
- Well drilled as appraisal to assess field's north extension
- Low PI – 0.4 stb/d/psi (3 to 10+ stb/d/psi field average)
- 30 bopd the lowest producer in the field (decreased from 600 bopd initial)

Last tested Oil Rate (bopd): 29.000
 Last tested WC (%): 14.706
 Cumulative Oil (MMstb): 0.192
 Cumulative Water (MMstb): 0.016
 Cumulative Gas (MMscf): 49.877

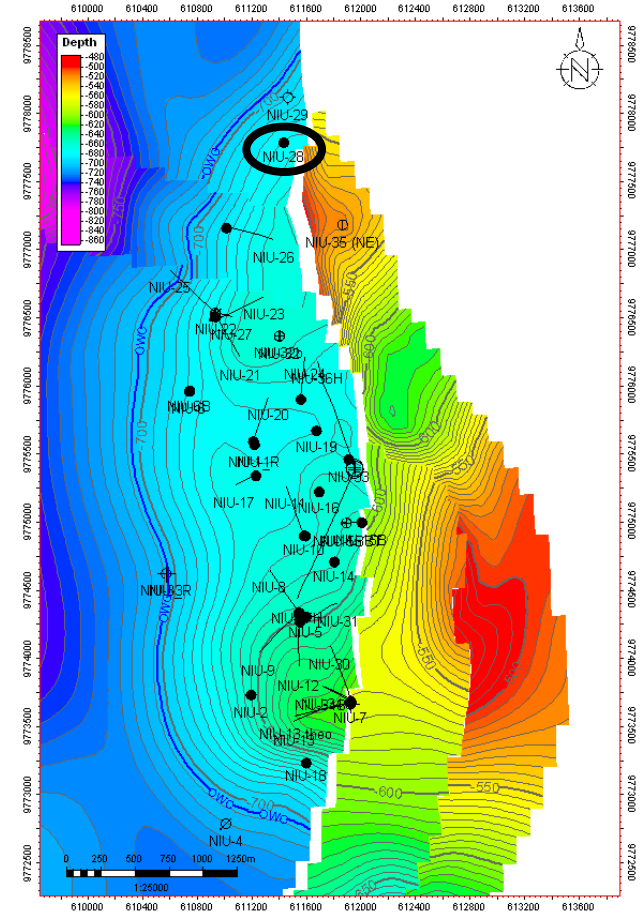




Case 3 – Improve Recovery

OBJECTIVES :

- To improve recovery with a horizontal drain hole
- To delay water piercing
- To monitor long term production



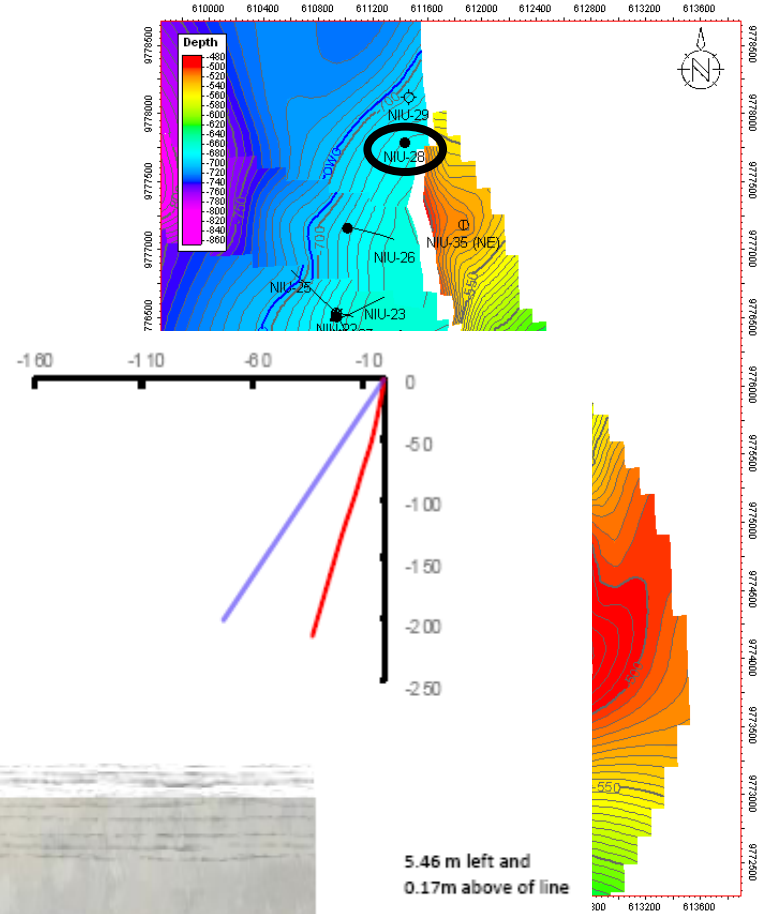
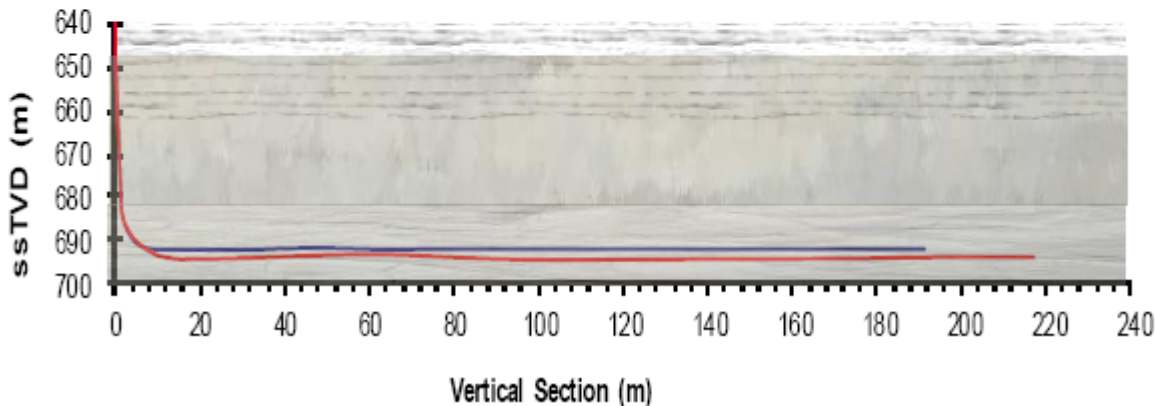


Case 3 – Improve Recovery

RESULTS :

- **600 bopd** pre-initial rate
(at sub-optimal flow condition)

Survey Type : DEFINITIVE
 Vertical Section Origin : N 00.000 m., E 00.000 m.
 Vertical Section Azimuth : 190°
 Reference Datum TVD : RKB Original Drill Floor Elevation
 Tie-in : Surface
 Tie-in Surveys : Gyro Multishot
 Top Vembo Shale : 648.4 m ssTVD
 7" 29# Casing Shoe: 681.3 m ssTVD
 KOP – Start 4-1/2" Curve : 727.1m MD, 681.9 m ssTVD
 Radius of Curvature 12.0m Planned, 13.1m Actual
 Dogleg Severity (DLS) : 4.76 deg/m
 LP-Start of 3-7/8" Lateral: 747m MD, 694.3m ssTVD
 Well TD: 950m MD, 693.84m ssTVD
 Ending Azimuth & Inclination: 189° & 90°
 Total USRD Drain hole : 222.9 m
 Lateral Section Length : 200m
 Report Date: 28-Sep-12

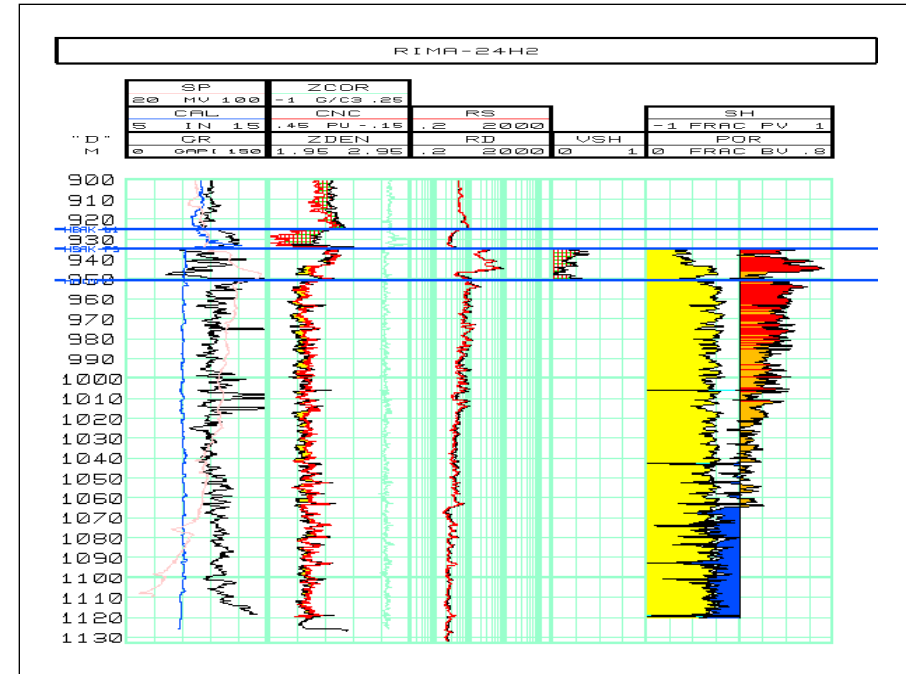




Case 4 – Water Coning

HISTORY :

- Water coning due to bottom water drive. Well is 100% watercut
- Bypassed oil in unswept area 15 m from reservoir top. Last interpretations est. 1.04 MMstb STOIP recoverable
- Not recoverable with conventional horizontal profile. Need 11 m TVD build section
- Densely faulted, structural compartments and faulted blocks requiring high degree of trajectory control. Need max 200 m lateral section
- Ideal application for USR horizontal drilling

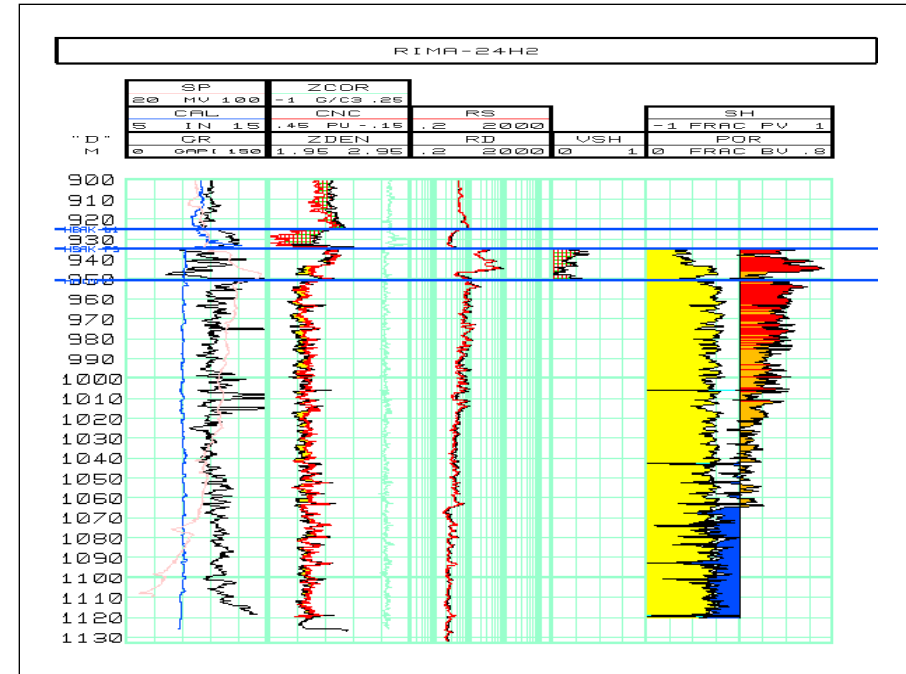




Case 4 – Water Coning

OBJECTIVES :

- Access bypassed oil from shut-in or high watercut wells using USR horizontal drilling technique
- Step away from coning radius (80 m)
- Replace existing infill wells with USR horizontal drain hole where possible
- Maximize oil delivery by reactivating shut-in wells

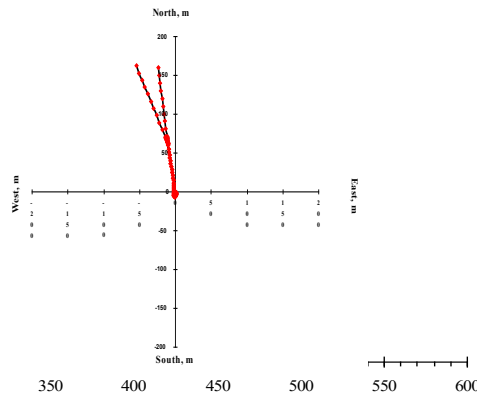
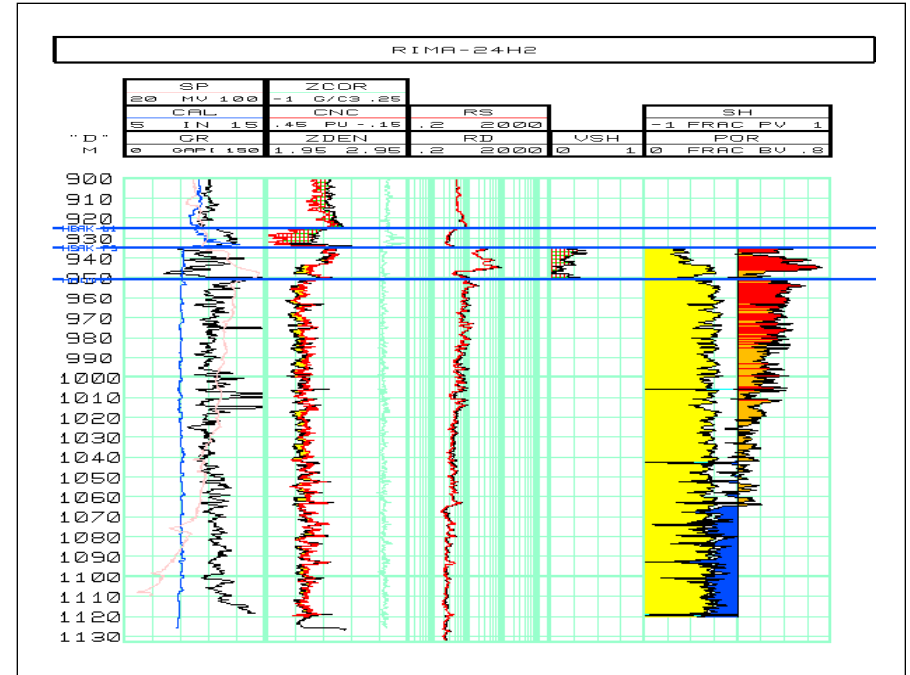
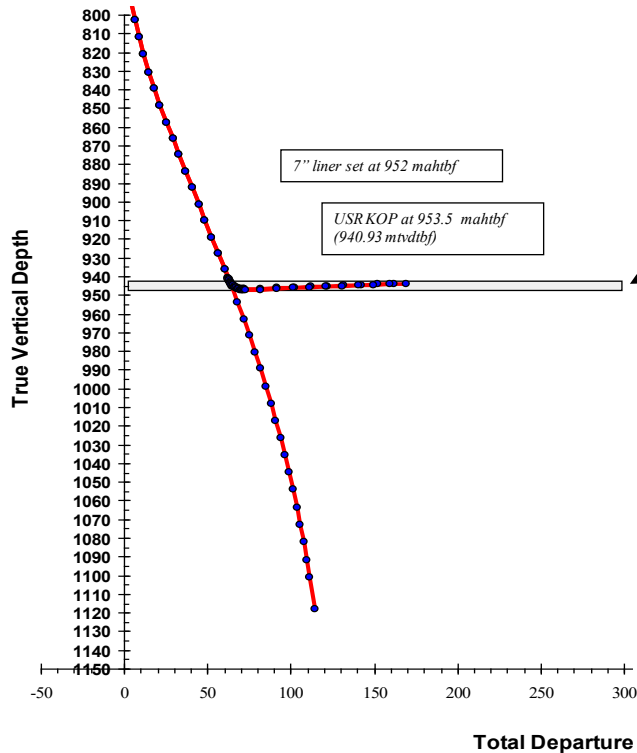




Case 4 – Water Coning

RESULTS :

- 310 bopd
- Low watercut
- Flat decline rate

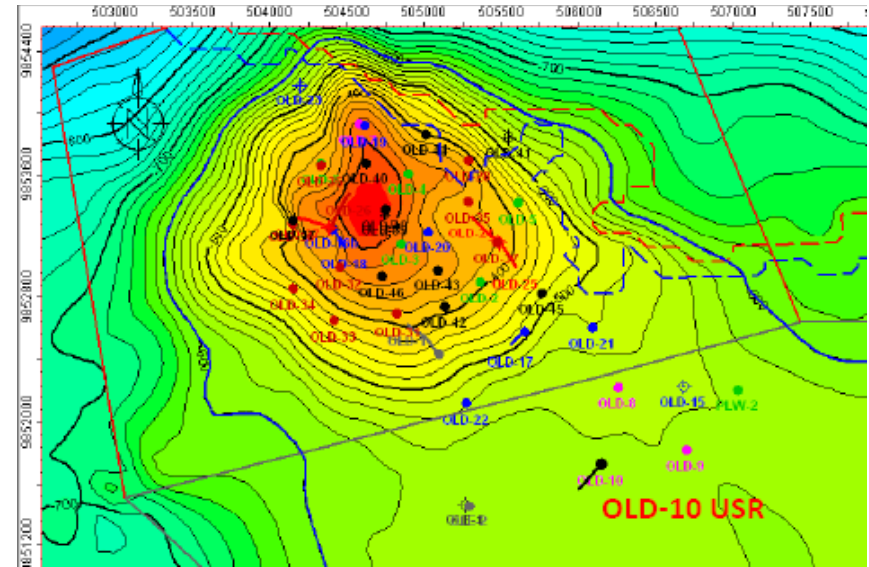




Case 5 – Heavy Oil, High Watercut, Low Perm

HISTORY :

- Low perm (10mD) within highly fractured dome area, low perm and low fracture density in flank areas
- Extremely high oil viscosity 1,300 cP
- Strong edge aquifer drive
- High CO₂ content (highly corrosive when mixed with water)
- Low producing vertical well on the flank
- Challenge to increase or maintain current production plateau. USRD is seen fit to develop both dome and flank areas.

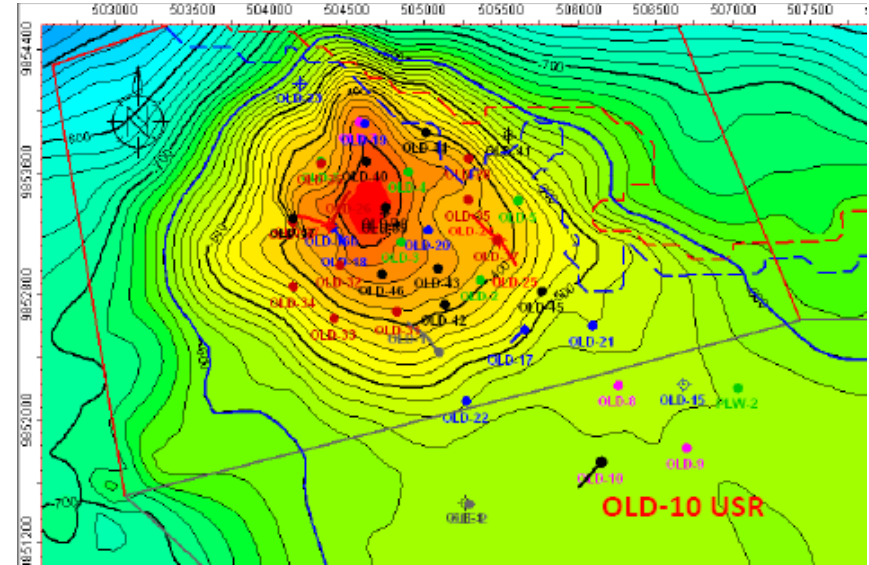




Case 5 – Heavy Oil, High Watercut, Low Perm

OBJECTIVES :

- To increase net reservoir exposure in the flank area with fewer wells
- To reduce water coning and/or fingering effect by reducing drawdown with a horizontal well
- To improve connectivity between the new horizontal wellbore and undrained fracture networks
- To access sweet spots a few meters from the vertical wellbore



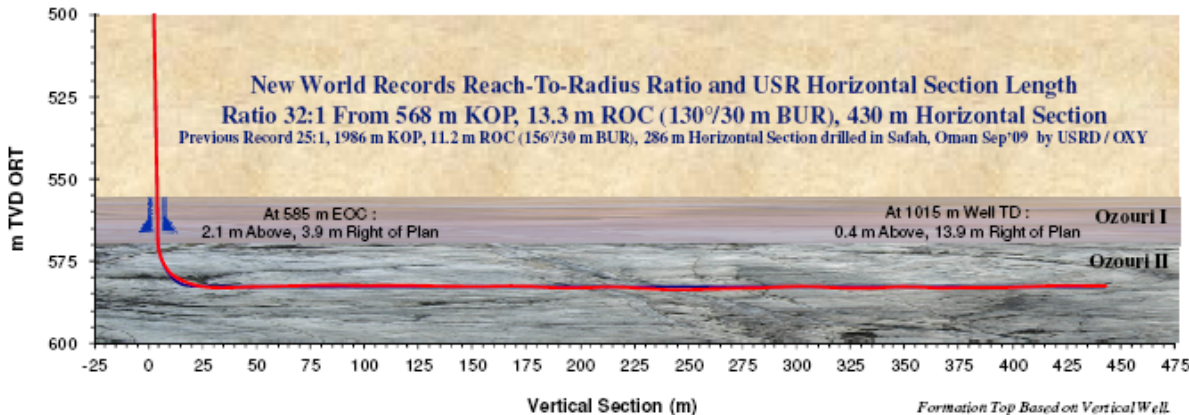
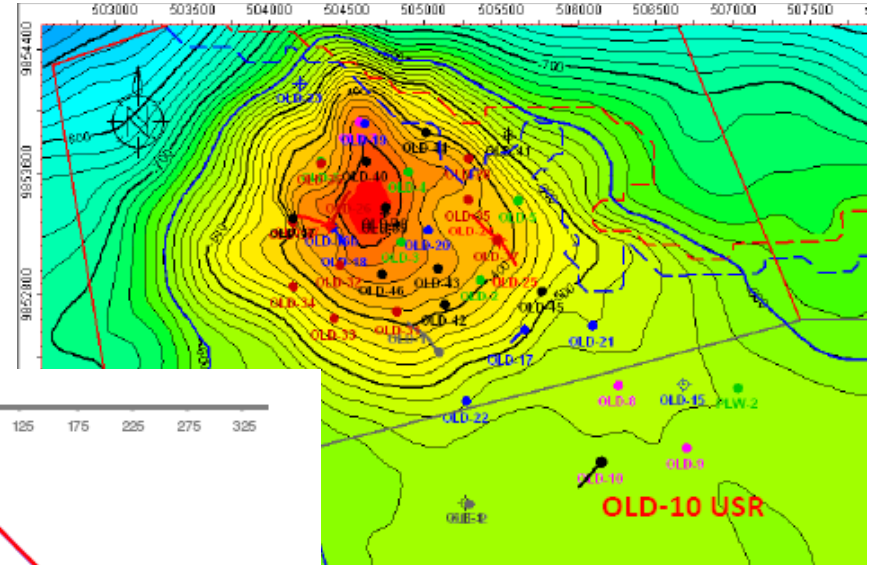
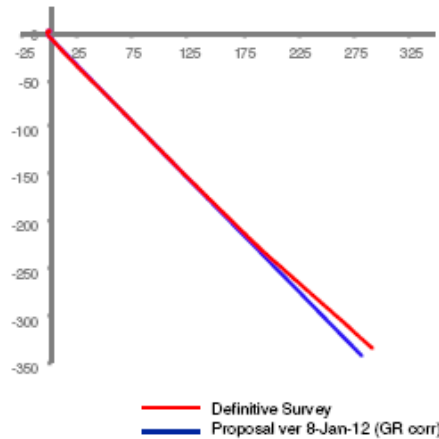


Case 5 – Heavy Oil, High Watercut, Low Perm

RESULTS :

- 185 bopd, low watercut from 35 bopd, 35 bwpd
- USRD trial wells increased from 2 to 5
- World record Reach-to-Radius Ratio

Survey Type : DEFINITIVE
 Vertical Section Origin : N 00.000 m., E 00.000 m.
 Vertical Section Azimuth : 140°
 Reference Datum TVD : ORT - Original Rotary Table Elevation
 Tie-in Surveys : Gyro Multishot 7-Jan-12 at 534 m MD
 7" Casing Shoe : 566 m MD
 KOP – Start 4-1/2" Curve : 568 m MD, 568 m TVD ORT, 561 m ssTVD
 Radius of Curvature (BUR) : 13.3 m (131° / 30m)
 End of 4-1/2" Curve : 585 m MD, 580 m TVD ORT, 573 m ssTVD
 Well TD : 1015 m MD, 582m TVD ORT, 575 m ssTVD
 Revision Date : 18-Jan-12
 Report Date : 18-Jan-12



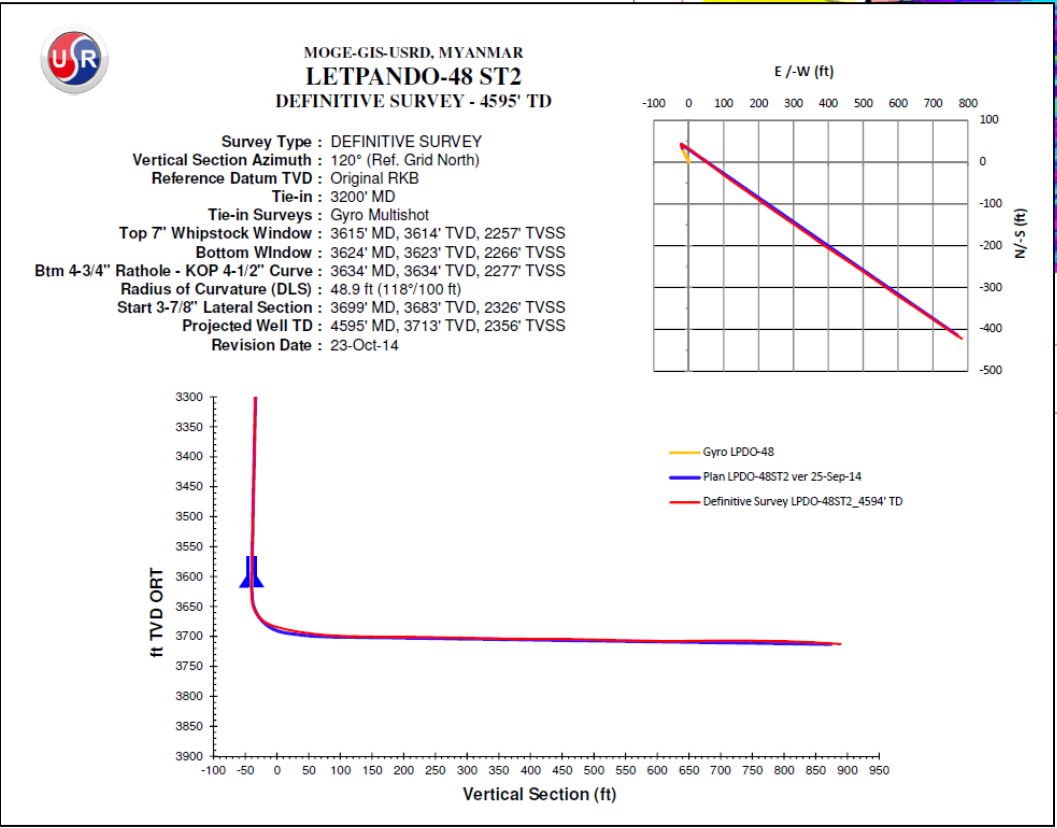
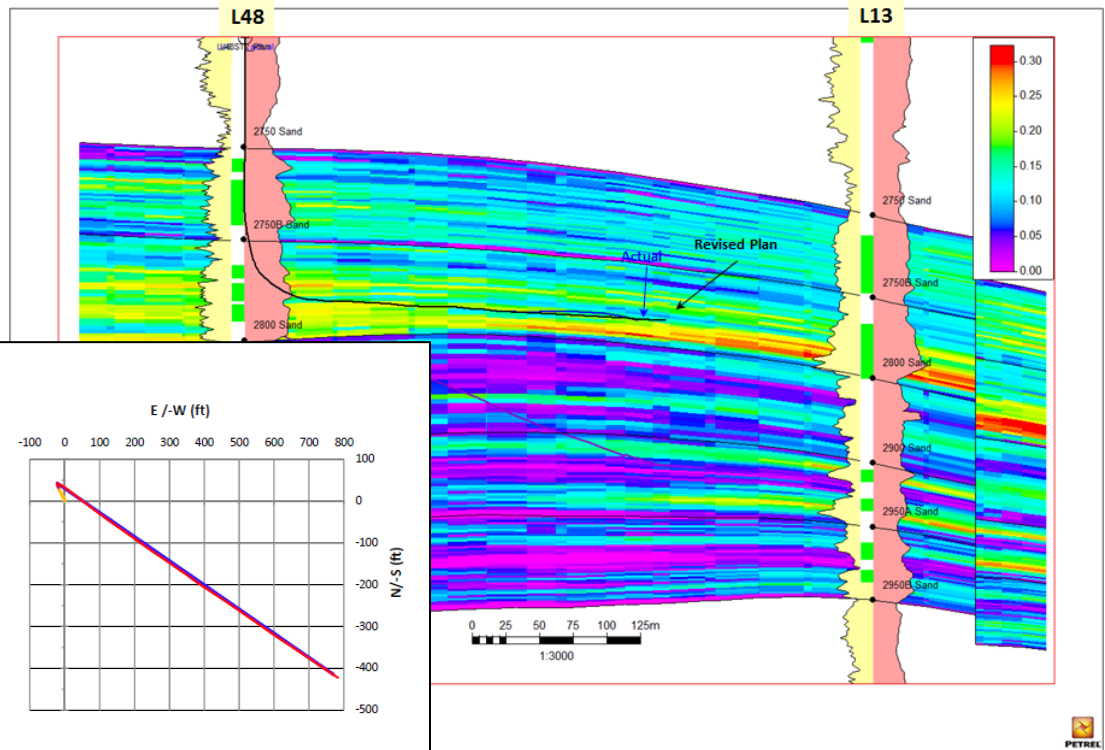
Formation Top Based on Vertical Well.
 Formation dip not reflected in diagram



Case 6 – Low Perm, Low Pressure

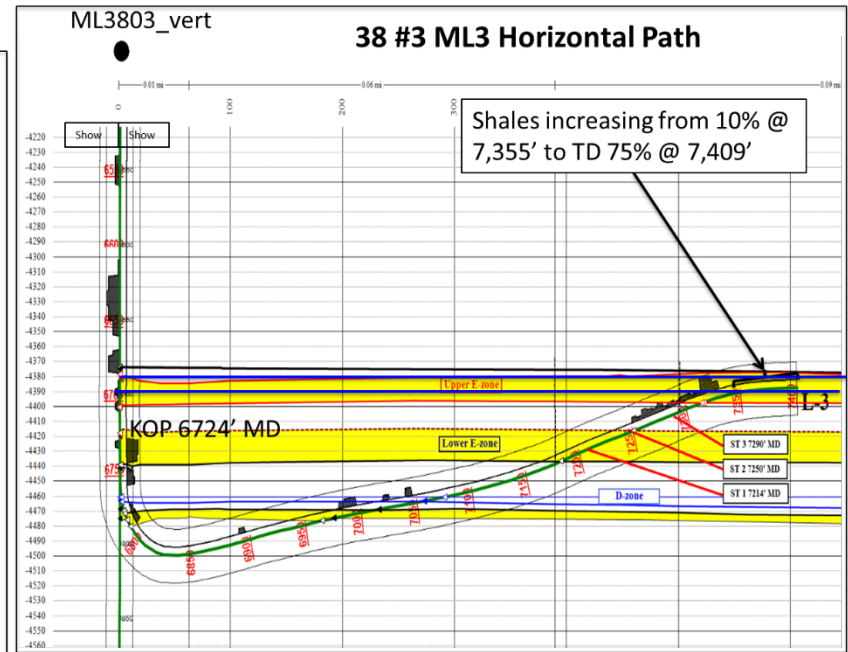
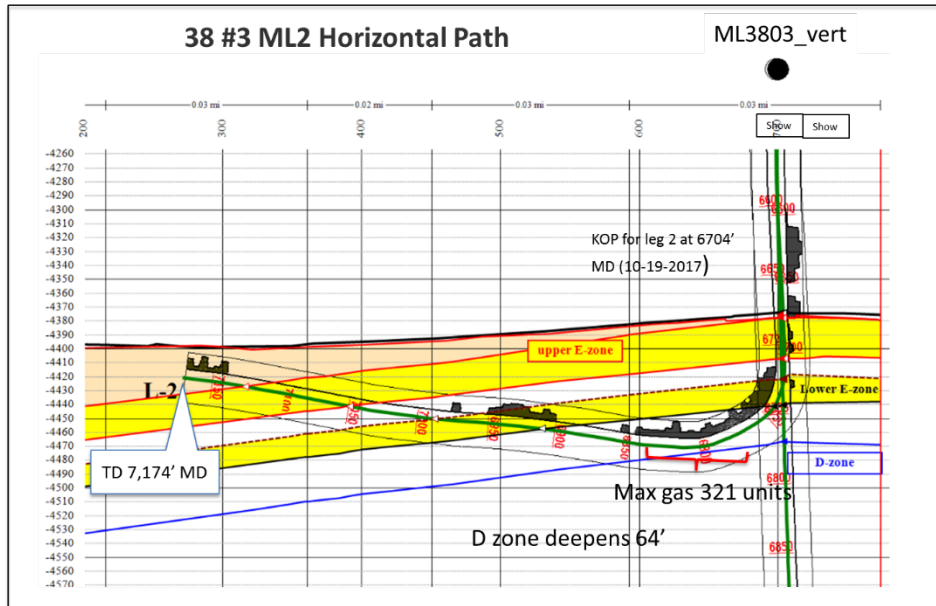
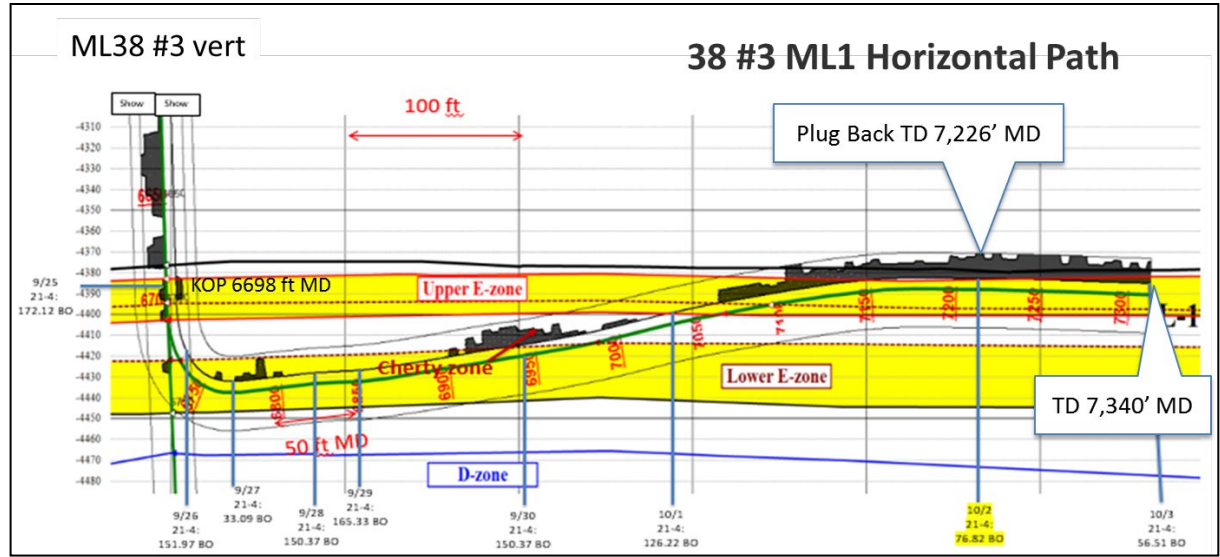
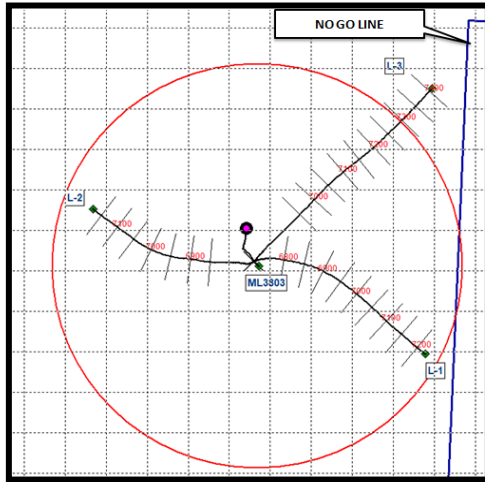
RESULTS :

- Before- 0 bopd (shut-in)
- After- 31 bopd





Case 7 – Fractured Carbonate





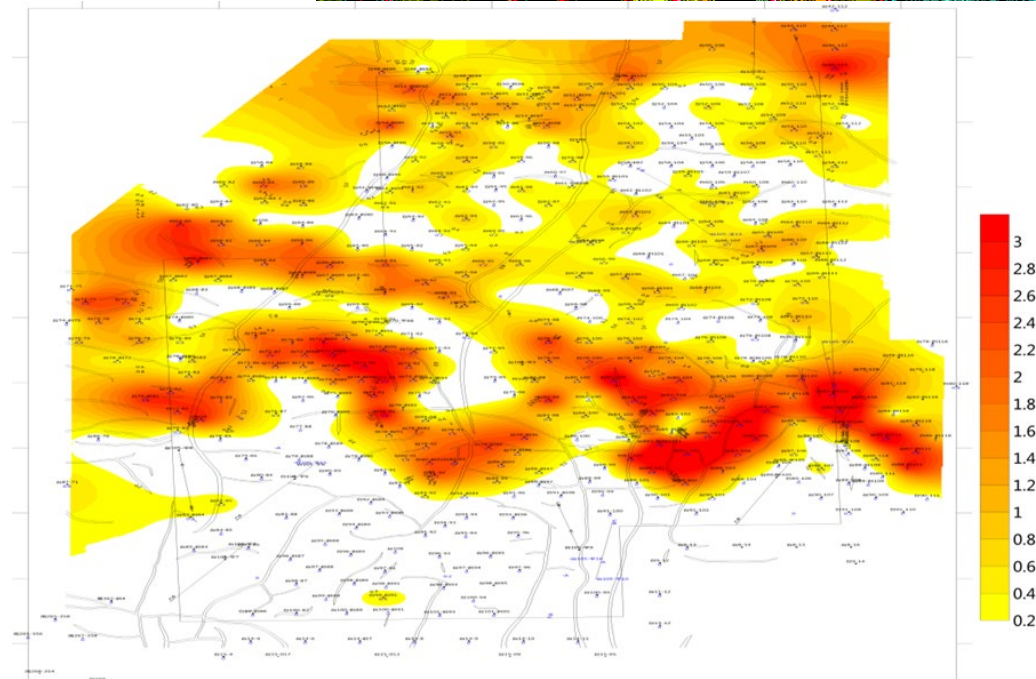
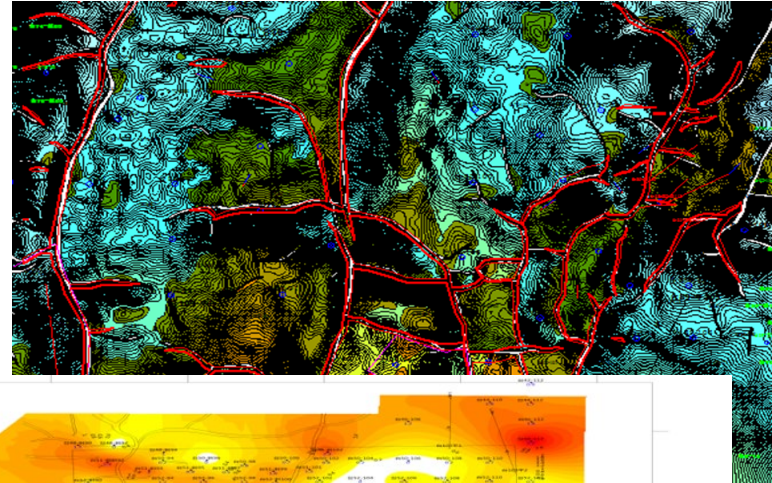
Case 8 – Bypassed Reserve Recovery

First five USR wells in Block #1 of Field #1

FIELD OVERVIEW (Block #1 of Field #1):

- 5.26 MMbbls reserve over 19.35 km² oil bearing area
- 212 development wells
- 264,076 bbl per well average controlled reserve (300m x 300m square pattern)
- 2.81m effective thickness PI sandstone layer (mainly PI4, PI5)
- 20.8% effective porosity
- 60% oil saturation
- 1,000 mD permeability

Structure map at Top of PI Reservoir



PI52 sand unit thickness distribution map (2.8m maximum)



Case 8 – Bypassed Reserve Recovery

First five USR wells in Block #1 of Field #1

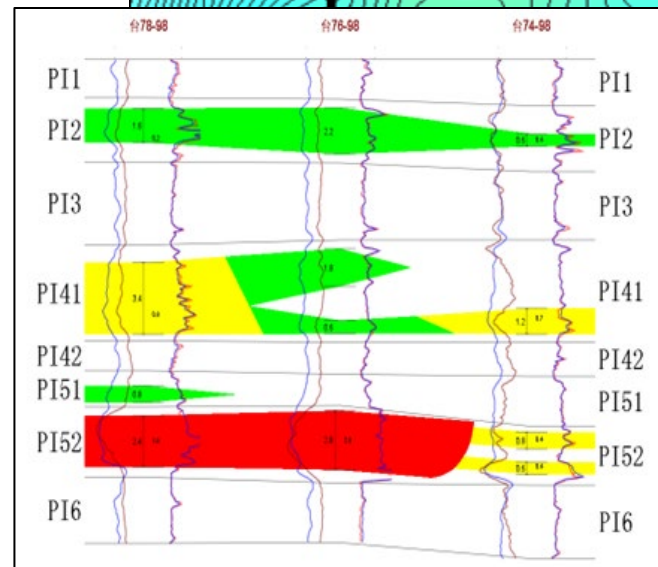
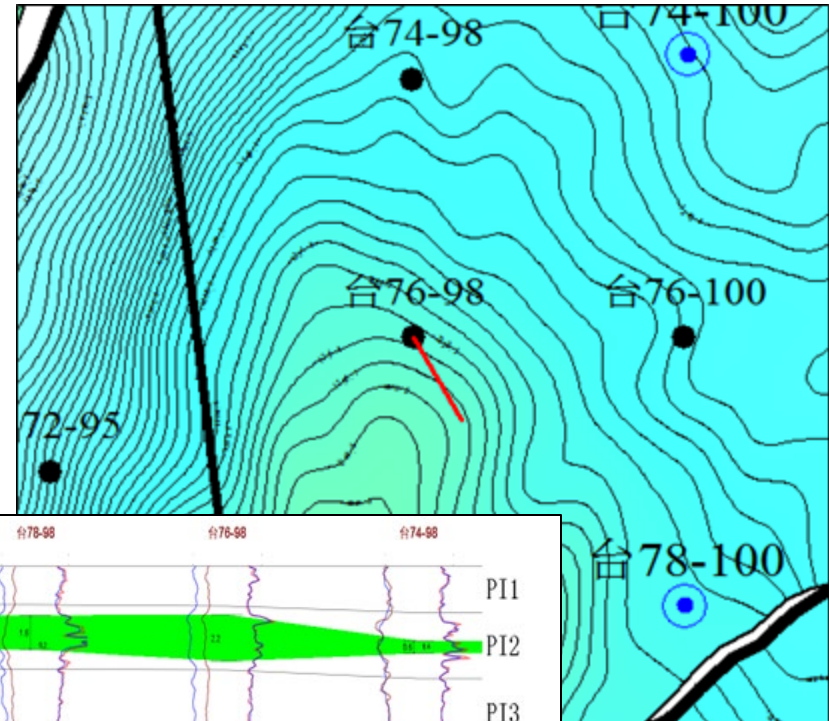
WELL HISTORY (Well #1 to #5):

- Low recovery factors attributed to rapid decline in individual wells, due to the fault development and incomplete water flooding pattern.
- Significant oil reserves remaining in near-fault area, not exposed to flood front.
- Unsuccessful fracking to increase water injection to flood out the remaining oil.

USR OBJECTIVES (Well #1 to #5):

- To place horizontal wells toward residual oil-rich area by using USR drilling technology from existing wells (re-entry sidetrack).
- To increase drainage area and increase oil production.

Well #5 – Top structure PI52 target layer

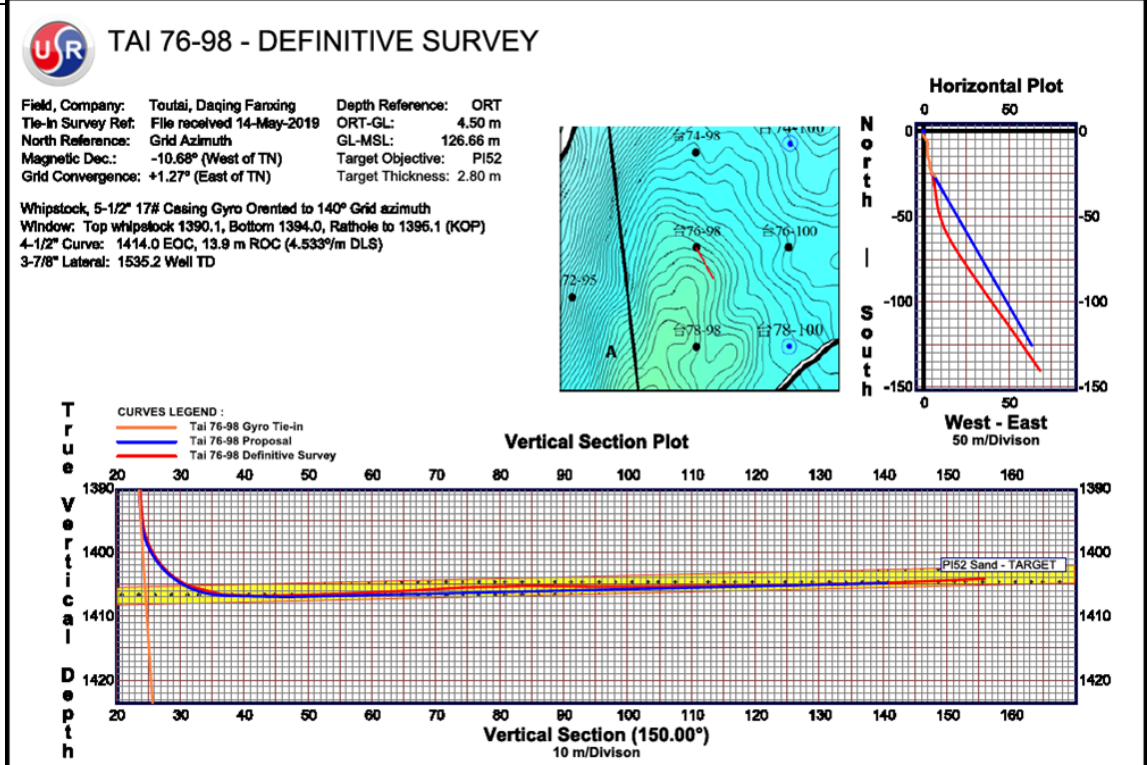
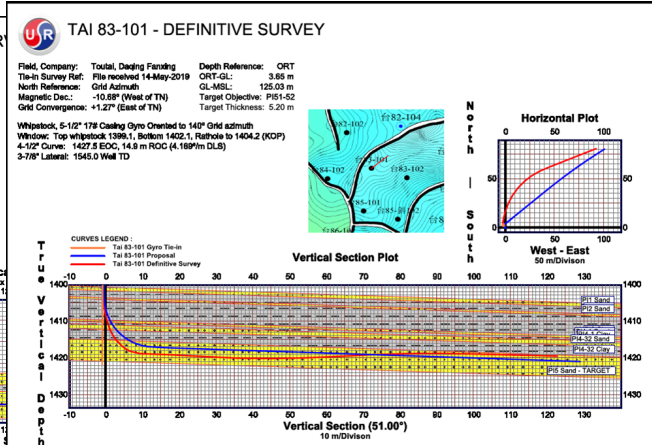
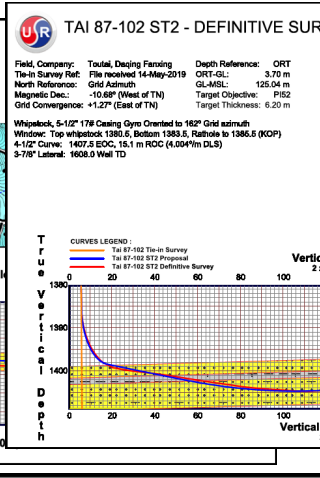
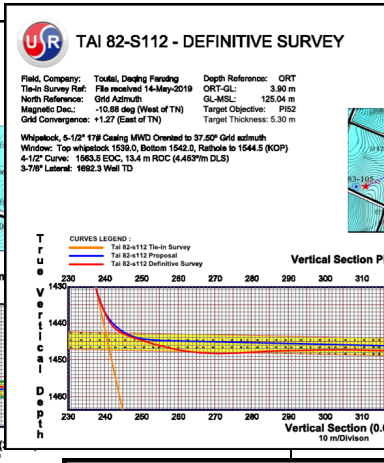
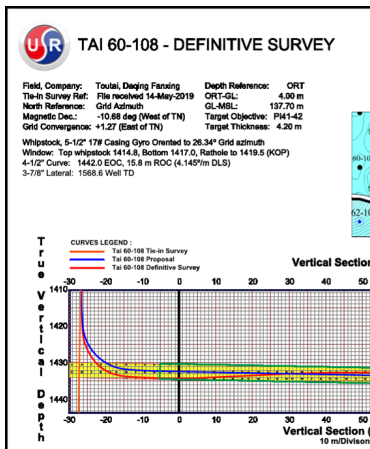


Well #5 – X Section



Case 8 – Bypassed Reserve Recovery

First five USR wells in Block #1 of Field #1





Case 8 – Bypassed Reserve Recovery

First five USR wells in Block #1 of Field #1

PRODUCTION RESULTS (Well #1 to #5):

- 117,515 bbl cum. from Jul-Aug 2019 to Aug 2023 (production is ongoing)
- Electrical usage (beam pump) pre-USR 88.3 kWh/tonne vs post-USR 27.6 kWh/tonne

USR Drilling Sequence No.	ORIGINAL WELL							USR RE-ENTRY SIDETRACK (Prod. Data as at Aug 2023)					
	LAST PRODUCTION			CUMULATIVE				USR Completion Date	Lateral Length (m)	Water %	Liquid Energy Consumption kWh/tonne	Daily Oil tonne/day BOPD	Cum. Incremental Oil Production tonne bbl
Original Well Last Production Date	OWR %	Daily Oil tonne/day BOPD	Liquid Energy Consumption kWh/tonne	Cum. Water Production tonne bbl	Cum. Oil Production tonne bbl	% Recovery of 264,076 bbl/well Reserve							
1	2019	0%	0.4 3	112.5	366 2,302	10,946 79,633	30%	11 Jul 2019	127	15%	18.8	7.0 51	3,775.5 27,466
2	2019	21%	1.5 11	42.1	1,011 6,359	10,508 76,446	29%	23 Jul 2019	129	6%	17.1	8.0 58	3,121.4 22,708
3	2019	20%	2.4 18	28.3	6,663 41,910	16,487 119,944	45%	2 Aug 2019	201	22%	42.9	8.7 63	3,882.7 28,246
4	2019	0%	0.3 2	166.7	0	12,561 91,382	35%	12 Aug 2019	130	9%	23.0	7.8 57	2,348.7 17,086
5	2019	33%	0.4 3	91.7	2,101 13,215	11,449 83,292	32%	27 Aug 2019	121	15%	36.4	11.9 87	3,025.4 22,009
					TOTAL:	450,697				TOTAL:		316	117,515

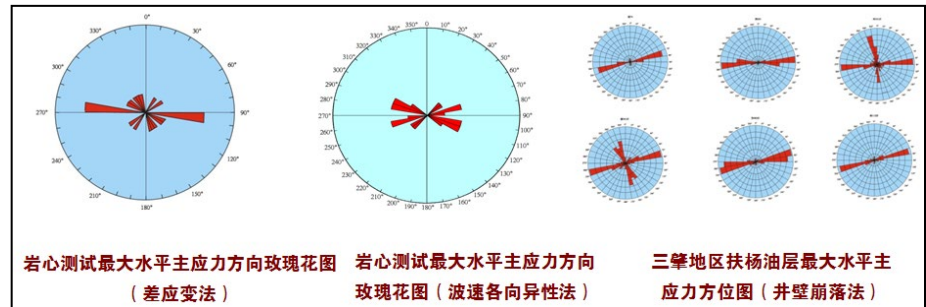
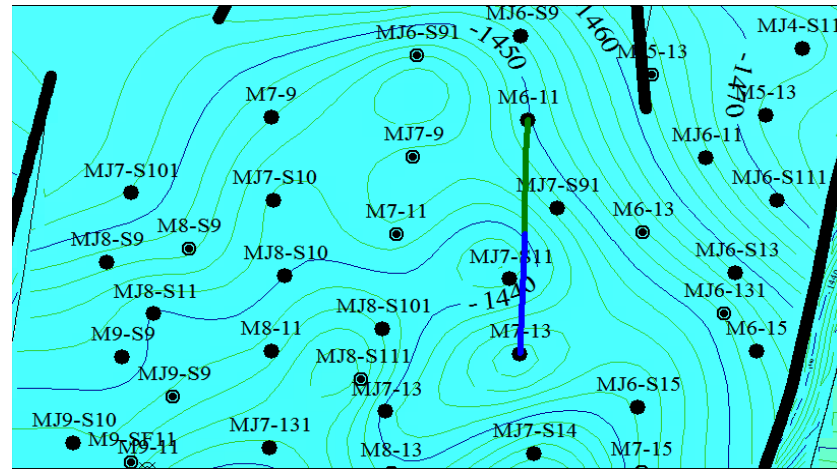


Case 9 – Geothermal “U-Shape” Wells

USR wells #111, #112 in Block #38 (oilfield)

FIELD OVERVIEW:

- Frigid surface climate, 3°C annual average, -20°C coldest month, -37°C extreme, 225 days sub-zero.
- Reservoir temperature 75.6°C - 94.4°C, average 5.153°C/100m belongs to the high geothermal gradient as the heat source.
- Target is sand-mudstone, fluvial delta settlement with river sandstone as the effective reservoir.
- 12% effective porosity.
- 1.0 mD average air permeability.
- Maximum principal stress direction 80°-110° Gaz (near east-west).
- Micro fracture permeability reaches 84 times of the matrix.
- Two vertical wells near to production plant and village were selected for geothermal test wells.





Case 9 – Geothermal “U-Shape” Wells

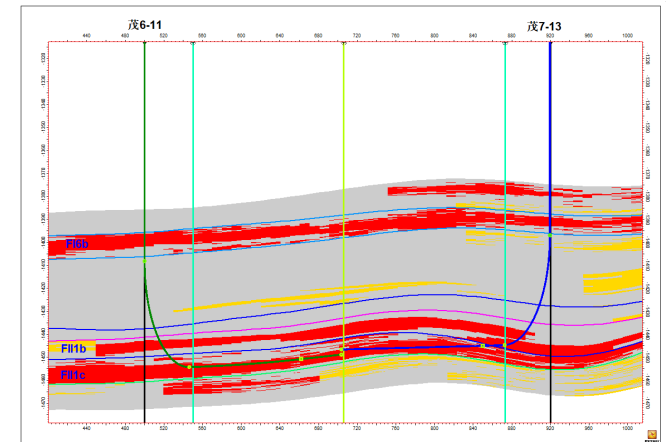
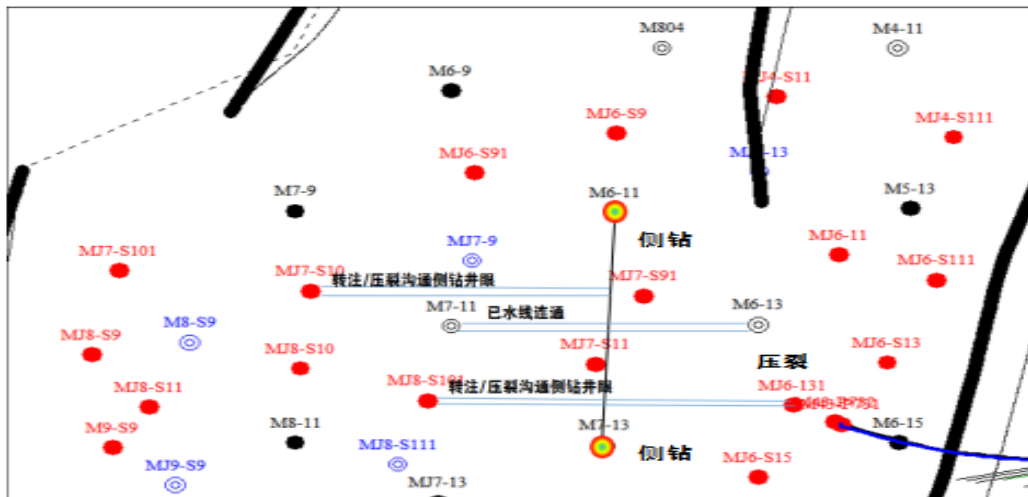
USR wells #111, #112 in Block #38 (oilfield)

WELL SELECTION CRITERIA:

- Reservoir development with sufficient thickness meeting volumetric requirement with good connectivity, no-fault and east-west fracture development.
- Formation temperature relatively high, as the heat source.

SELECTED WELLS:

- Target is FII1b-FII1c sand-mudstone, fluvial delta settlement with river sandstone as the effective reservoir.
- Two vertical wells #111, #112 (2.7-4.3m effective, 5.8-7.8m gross thickness), near to production plant and village were selected for geothermal test wells.

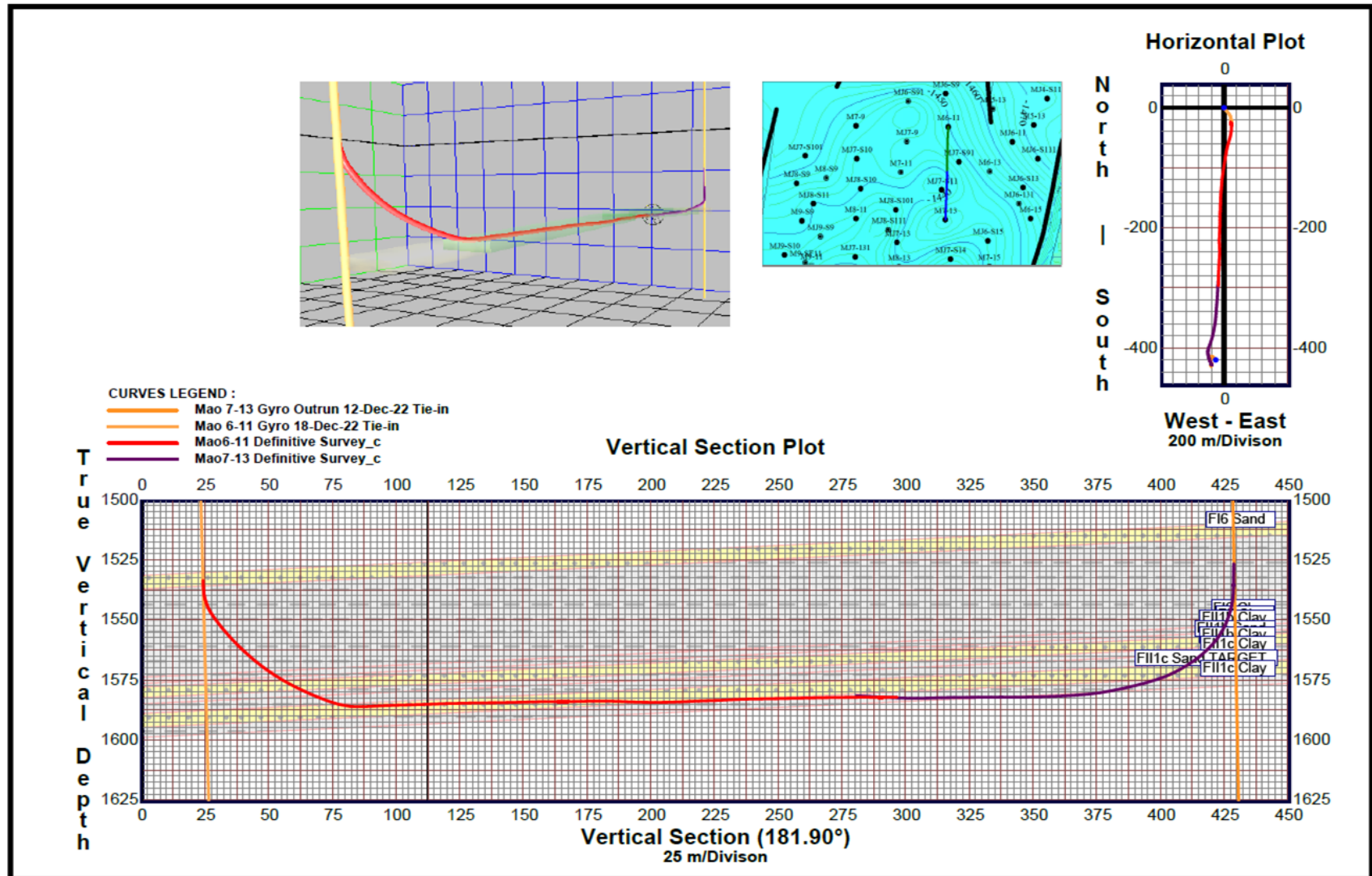




Case 9 – Geothermal “U-Shape” Wells

USR wells #111, #112 in Block #38 (oilfield)

Well intersection assisted by Magnetic Ranging Technology (3rd Party)





Case 9 – Geothermal “U-Shape” Wells

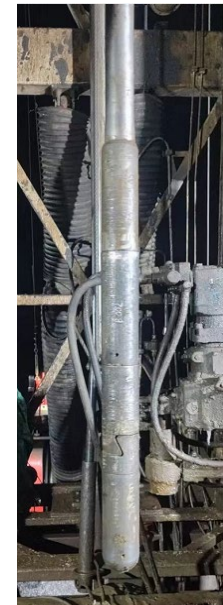
USR wells #111, #112 in Block #38 (oilfield)

Well intersection assisted by Magnetic Ranging Technology (3rd Party)

- Enables drillers to more accurately position wells in relation to one another.
- Uses one well as a magnetic target, and the well being drilled ranges its distance to the target.
- Passive Magnetic Ranging (PMR) estimates the distance and direction from the position of the MWD in the drilling well to a target well with the presence of a casing, liner, BHA (fish), or any drilling equipment.

DRILLING WELL
USR MWD on W/LINE WET CONNECT

TARGET WELL
GYRO-MAGNETIC MWD





Case 9 – Geothermal “U-Shape” Wells

USR wells #111, #112 in Block #38 (oilfield)

RESULTS:

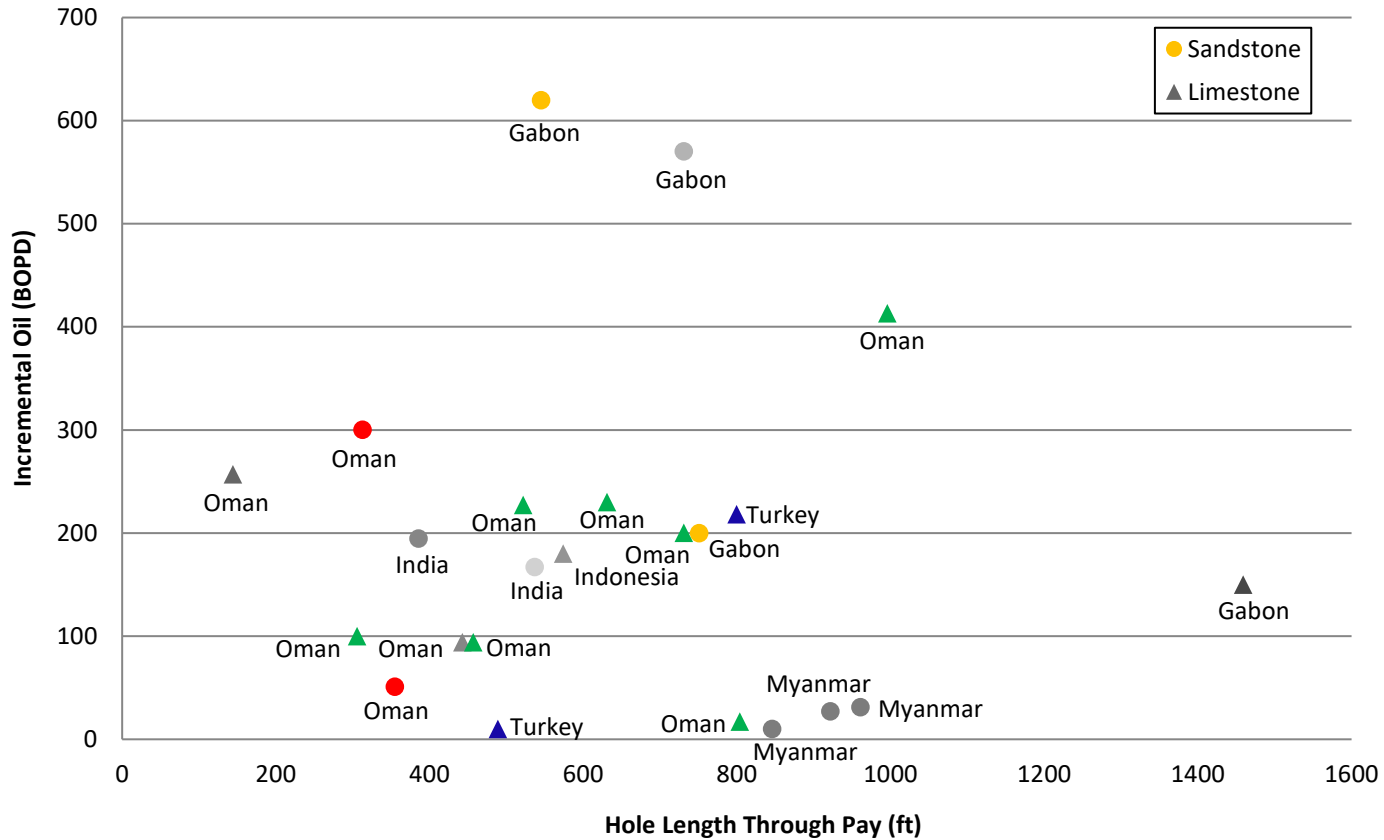
注采井统计表

Geothermal U-Shape Well Mao7-13, Mao6-11

分类	日期 date:	8.25	8.26	8.27	8.28	8.29	8.30	8.31
Water Injecting Well 注入井	注入压力 (MPa) inject pressure	8.0	7.6	7.2	7.5	6.6	7.0	6.9
	注入排量 (m ³ /h) inject rate	9.0	9.0	9.2	9.3	8.0	9.6	9.8
	注入温度 (°C) water temp	32	32	32	31	31	31	33
Water Producing Well 采出井	采出排量 (m ³ /h) production	8.0	8.6	8.5	9.0	9.0	8.7	8.7
	采出温度 (°C) return temp	54	55	52	52	52	52	52



Incremental Oil (BOPD) vs Hole Length Thru Pay (ft)



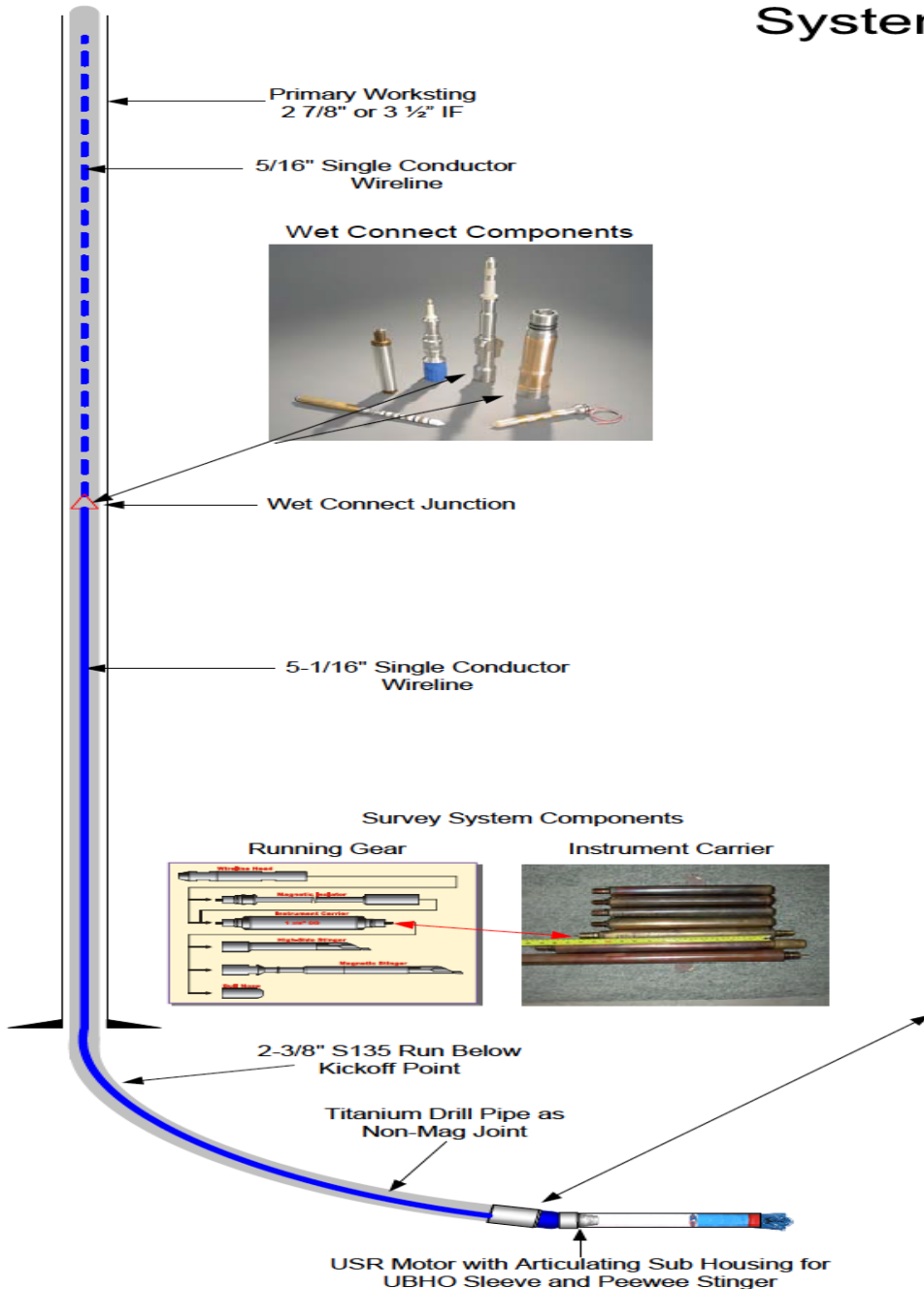


Well	Length Thru Pay (ft)	BOPD Increase	Lithology
Rima 14	355	51	Sst
Rima 24	313	300	Sst
Yibal 392	144	257	Lst
Daleel 4	443	94	Lst
Geleky 83	386	195	Sst
Balol 141	537	167	Sst
Selmo 22	800	218	Dol. Lst
Selmo 36	489	10	Dol. Lst
Safah 99	457	94	Lst
Safah 111	631	230	Lst
Safah 93	996	413	Lst
Safah 113	306	100	Lst
Safah 114	731	200	Lst
Safah 27	804	17	Lst
Safah-52	522	227	Lst
East Nief-1	574	180	Lst
OBA-9	545	620	Sst
OBA-4	751	200	Sst
OLD-10	1459	150	Sil. Cst, Dol. Lst
NIU-28	731	570	Sst
LPDO-7	846	10	Sst
LPDO-61	922	27	Sst
LPDO-48ST2	961	31	Sst



SUB-SURFACE EQUIPMENT PACKAGE

USR Lateral Drilling and Surveying System



FIRST "SNAKE SCREEN" COMPLETION RUN IN A USR WELL IN INDIA





USRD SURFACE EQUIPMENT PACKAGE



350 HP RIG





CARRIER ON RIG RAMP





MUD PUMPS





AGITATOR MOTORS ON MUD TANKS



SOLIDS CONTROL AND SUCTION TANKS





SOLIDS CONTROL SYSTEM





USRD WORKSHOP





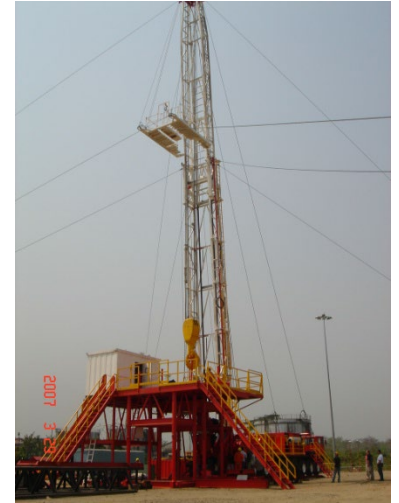
LIGHT DUTY RIG



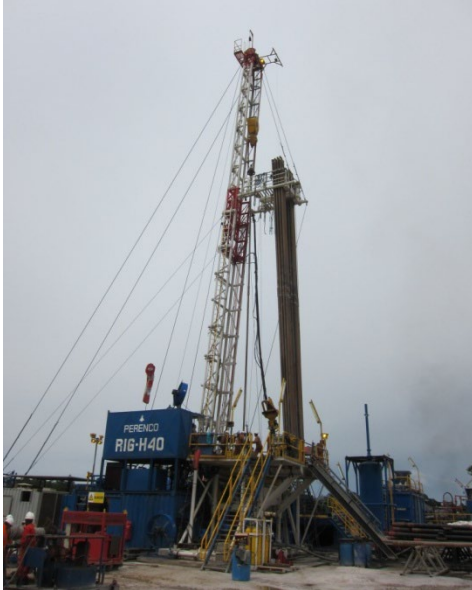
Schramm 94 klbs (750 HP Chain Drive) Single



Schramm with sub-structure (tiled, USRD from slant well)



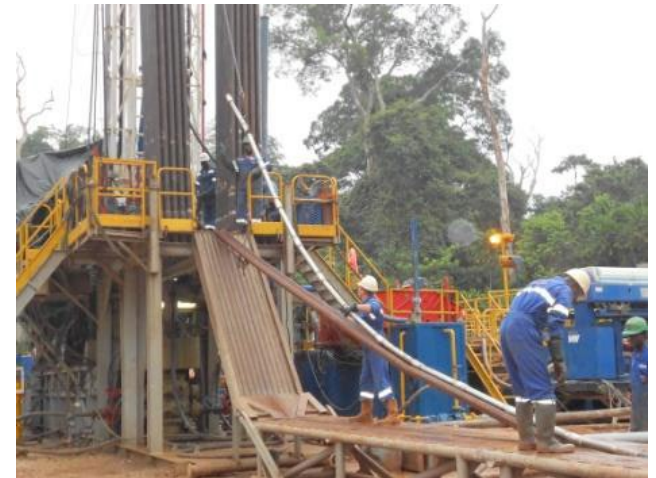
ZJ20 350klbs 600 HP Double



Ideco H40 Rambler – 400 HP Double



Rig H40 with USRD Workshop



HRI 80T 350 HP Single



DRILL STRING DRIVE

POWER SWIVEL

- Bowen 2.5C

- Static Load Rating 170,000 lbs
- 100 RPM Rating 90,000 lbs
- Max Torque 3,975 ft-lbs
- Max Circ Press 5,000 psi

- Bowen S-3.5

- Static Load Rating 240,000 lbs
- 100 RPM Rating 130,000 lbs
- Max Torque 8,000 ft-lbs
- Max Circ Press 5,000 psi

