Artificial Lift R&D Council

Gas Lift in Vaca Muerta Plan, Implementation and Lessons Learned

- Presenters

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XENON LIFT SERVICES

ALRDC Gas Lift Workshop
June 7th-11th 2021

AGENDA

Artificial Lift R&D Council

- WHO WE ARE
- WHAT WE WANTED
- PLANNING
- FROM DRAFT TO REAL
- CONCLUSIONS
- LESSONS LEARNT

WHO WE ARE

Artificial Lift R&D Council

- **Vista Oil and Gas** is an independent operator, with its main assets in Vaca Muerta.

- Our investment thesis is to develop its high-return shale oil drilling **inventory of up to 550 wells spanning 134,000 Vaca Muerta acres**,

WHO WE ARE

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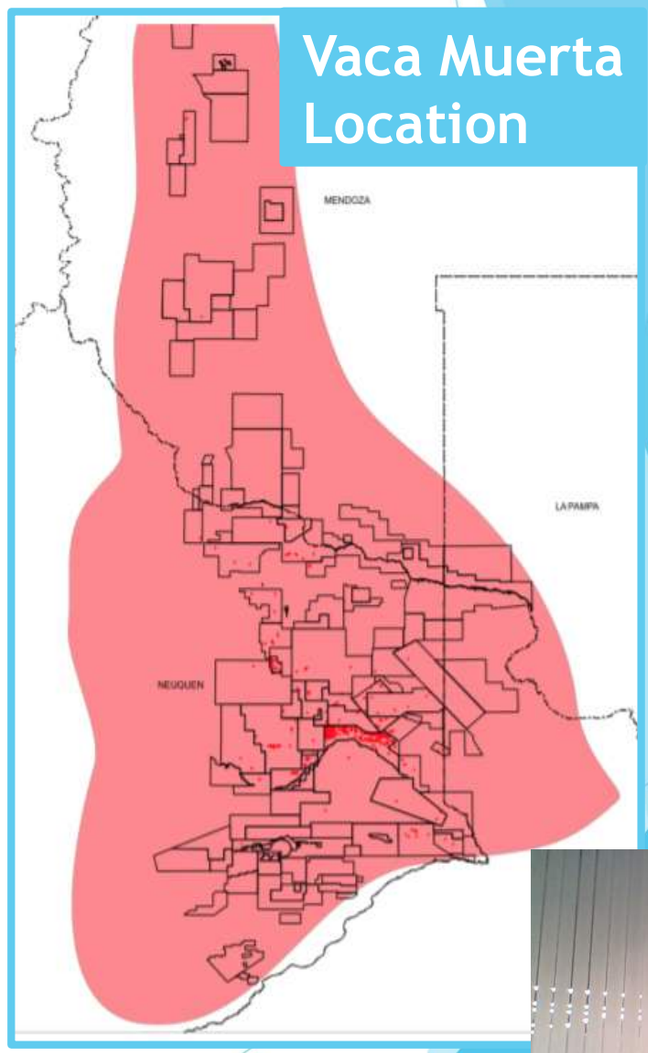

WHO WE ARE -Vaca Muerta Plays and Prospects

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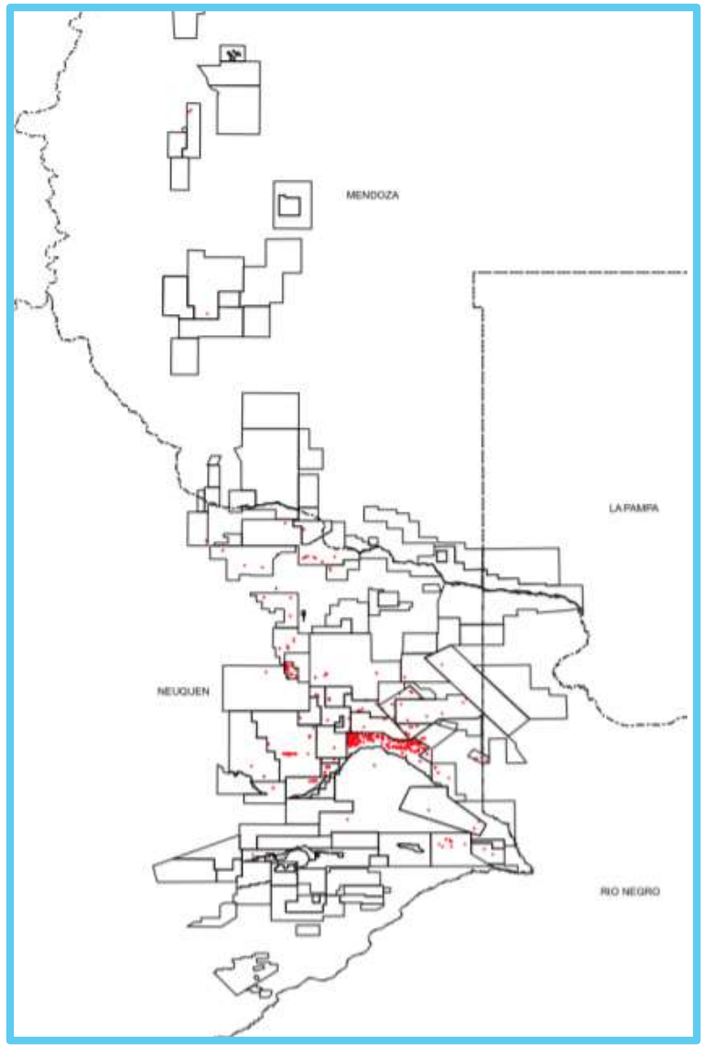
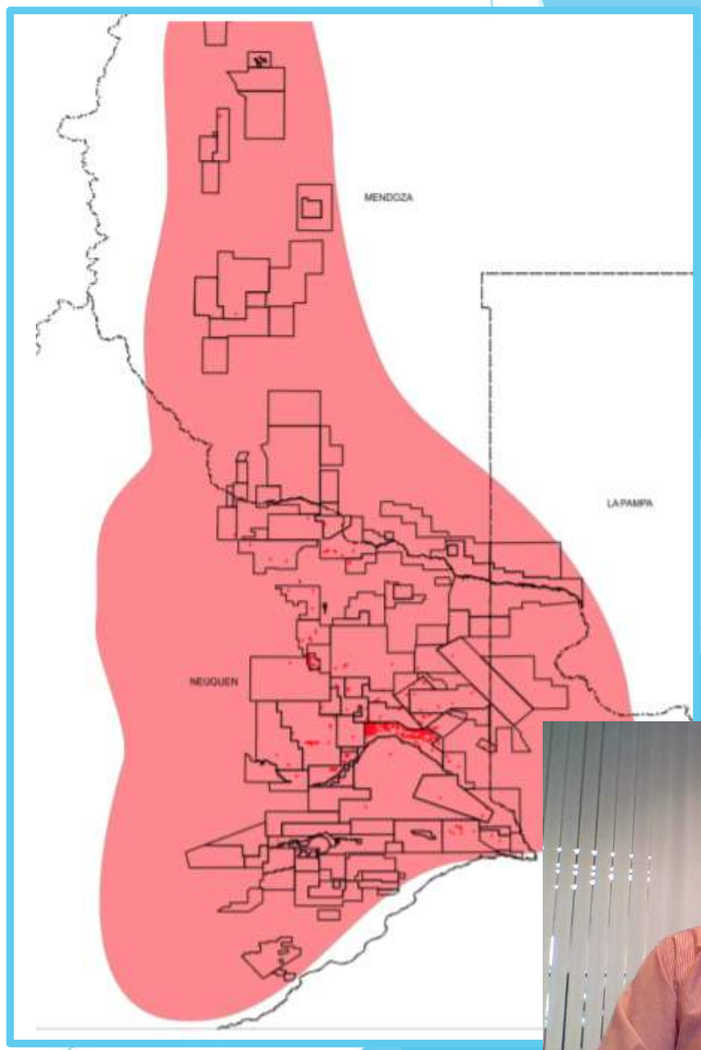
- Vaca Muerta today 1090 wells



- Vaca Muerta Full Develop 80.000 wells @ 8,000 ft of horizontal length



WHO WE ARE -Vaca Muerta GOR Map

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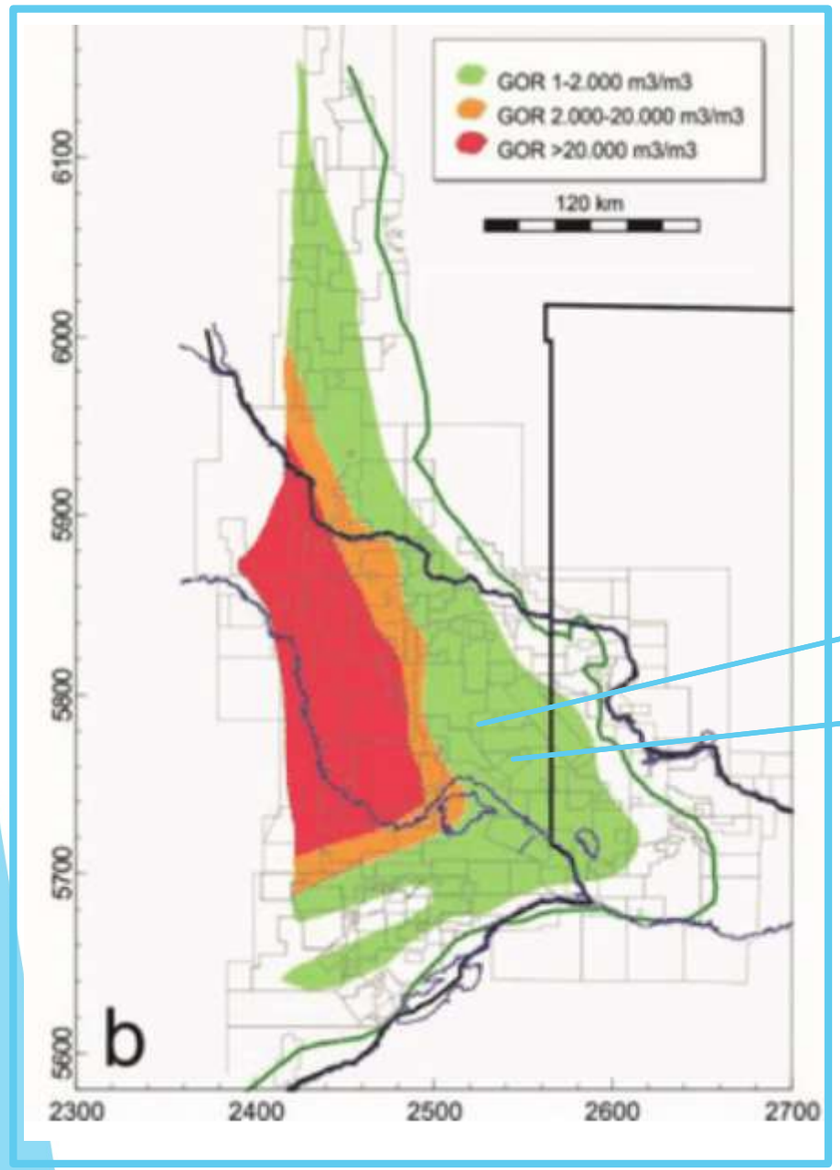

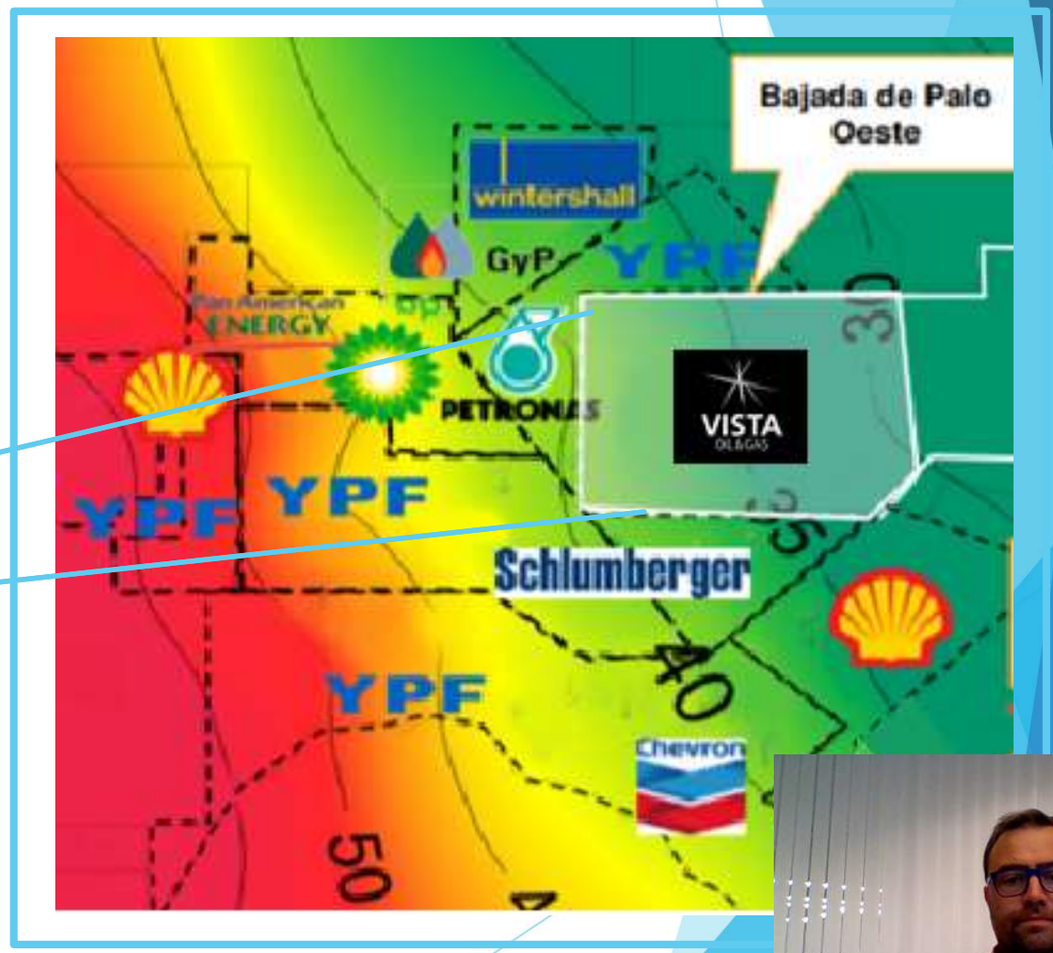

WHAT WE WANTED

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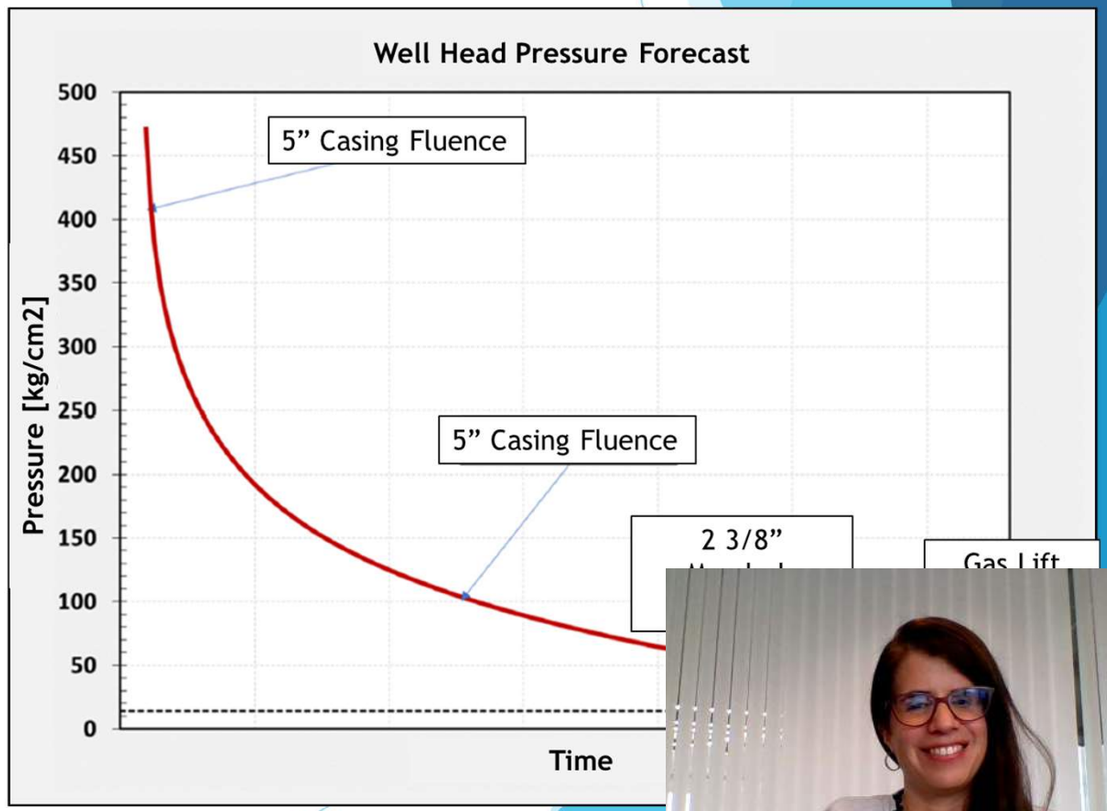
- Exploitation Philosophy

  "The EUR conservation is more important than NPV accelaration."

- Choke Management for Transient Period*.

- Gas Lift implementation after Transient Period.

- First Gas Lift Pilot in VOG

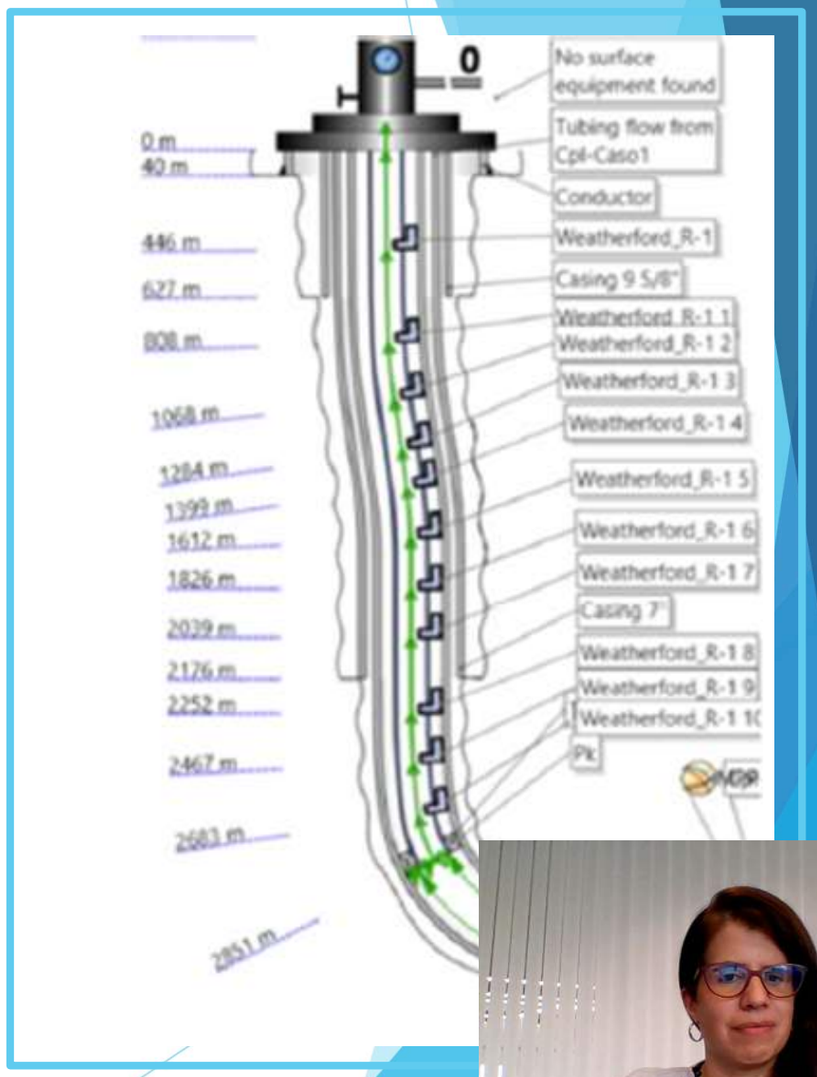


PLANNING - Well Gas Lift Design

Artificial Lift R&D Council

- Conventional Mandrels
- Wet Gas
- 925 psi Gas Pressure Available
- 60°Packer Location

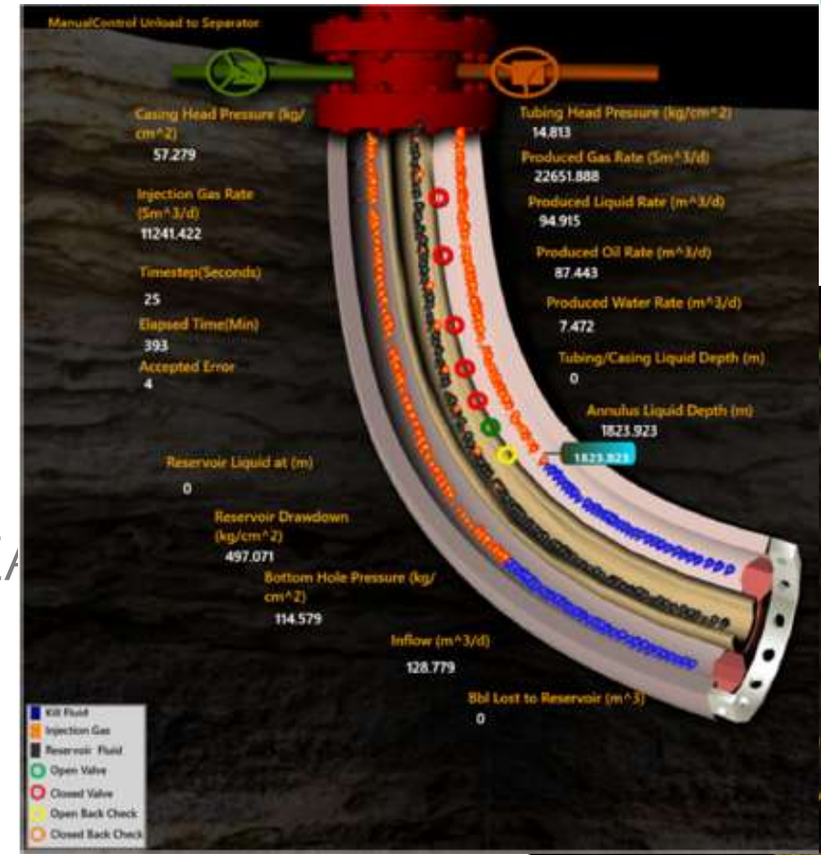
	OIL RATE		WATER		WHP		WCUT
	[m3/day]	[bbl/day]	[m3/day]	[bbl/day]	[Kg/cm2]	[psi]	%
CASE 1	80	503	6	38	35	498	11
CASE 2	64	403	4	25	27	384	8
CASE 3	44	277	1.5	9	14	199	4

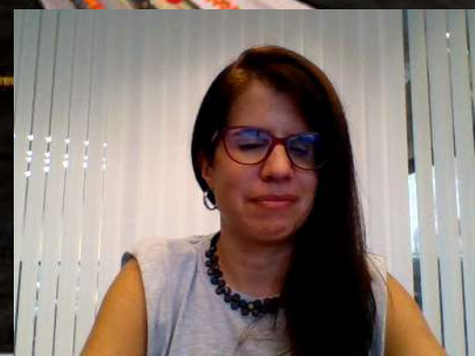


PLANNING - Well Gas Lift Design

Artificial Lift R&D Council

- 925psi DIP 1822m 11Mandrels.
- 1200psi DIP 2822m 8Mandrels.
- Maximum rate 1Mft3/d.
- Optimum rate 250kft3/d.
- Recommended rate 500kft3/d.
- AVOID INESTABLE SLUGGING HEA
- Shallower valves arent needed.





PLANNING - Well Gas Lift Design

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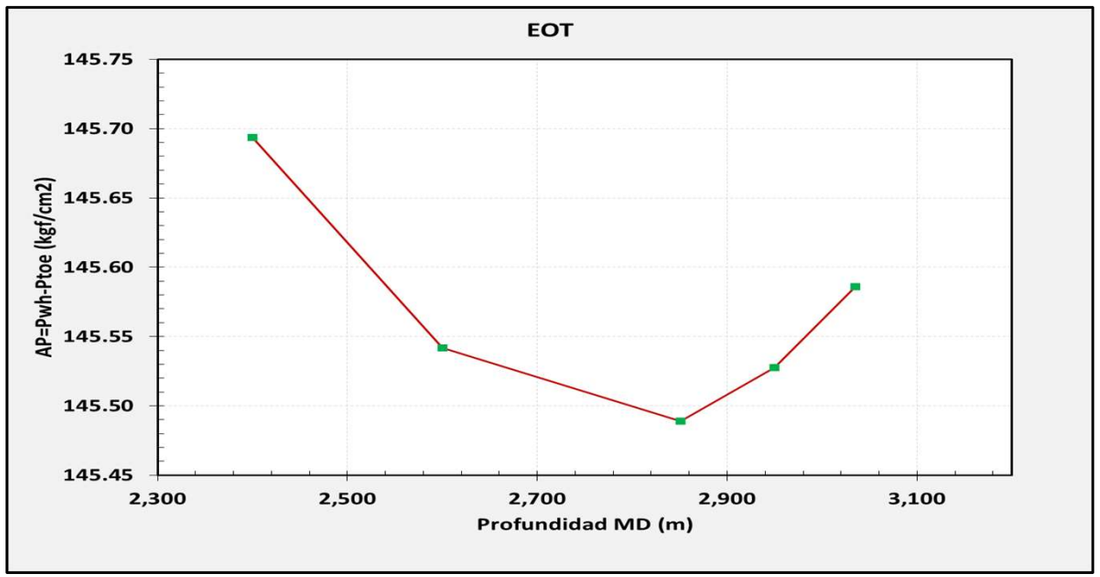
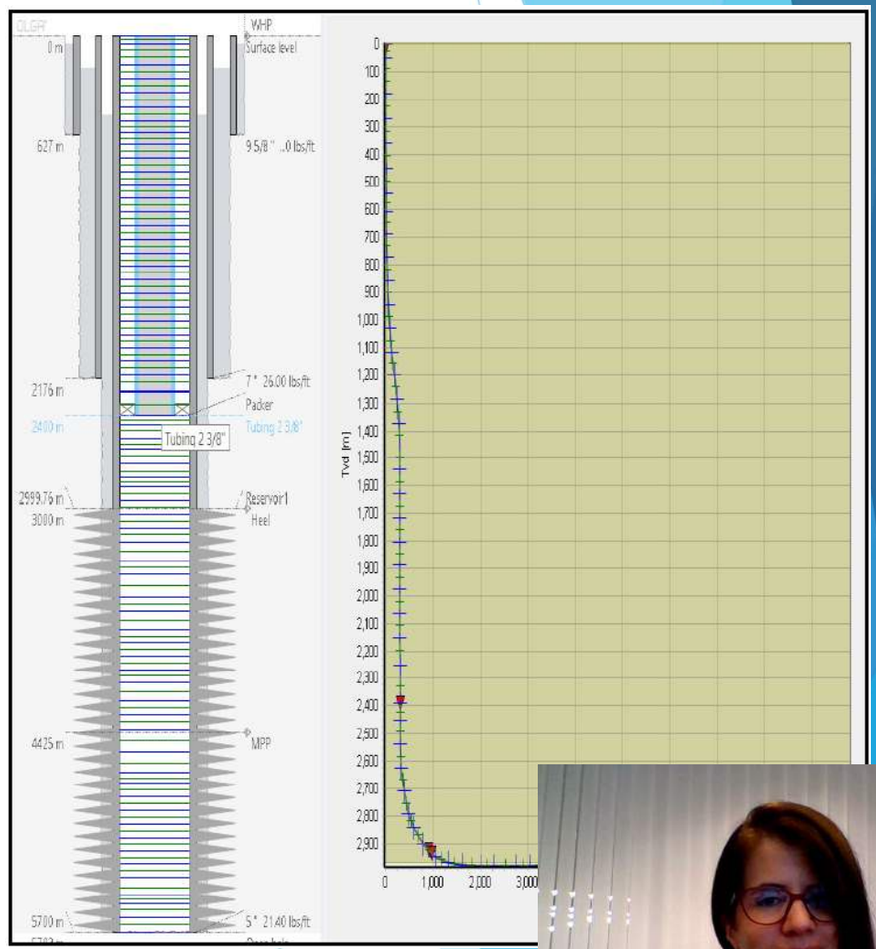
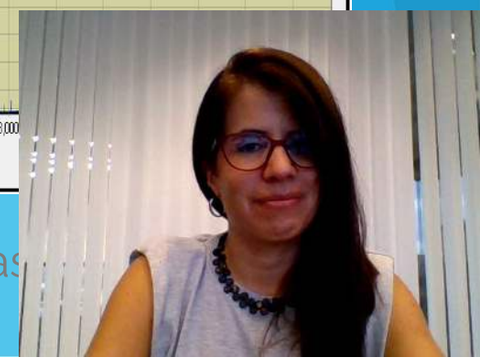
EOT Location*

- Olga simulation.
- Delta of pressure is negligible.
- 45˚ optimum.







*SPE-181228 “A metodology of End os Tubing Location Optimizacón for horizontal Shale Gas Wells with and without Deliquification”

FROM DRAFT TO REAL

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Gas Lift Well Design

- Packer @30˚
- 1st PAD Chemical injection @900m, 8Mandrels.
- High Temperatures closed shallower valves.
- Hybrid Design: Shallower mandrels for High Rates High Wcut. Deeper Mandrels for Low Rates Low Wcuts.
- 2nd PAD Chemical injection @1100m, 11Mandrels.
- Shallower Mandrels are neccessary for Frac Hits.

FROM DRAFT TO REAL

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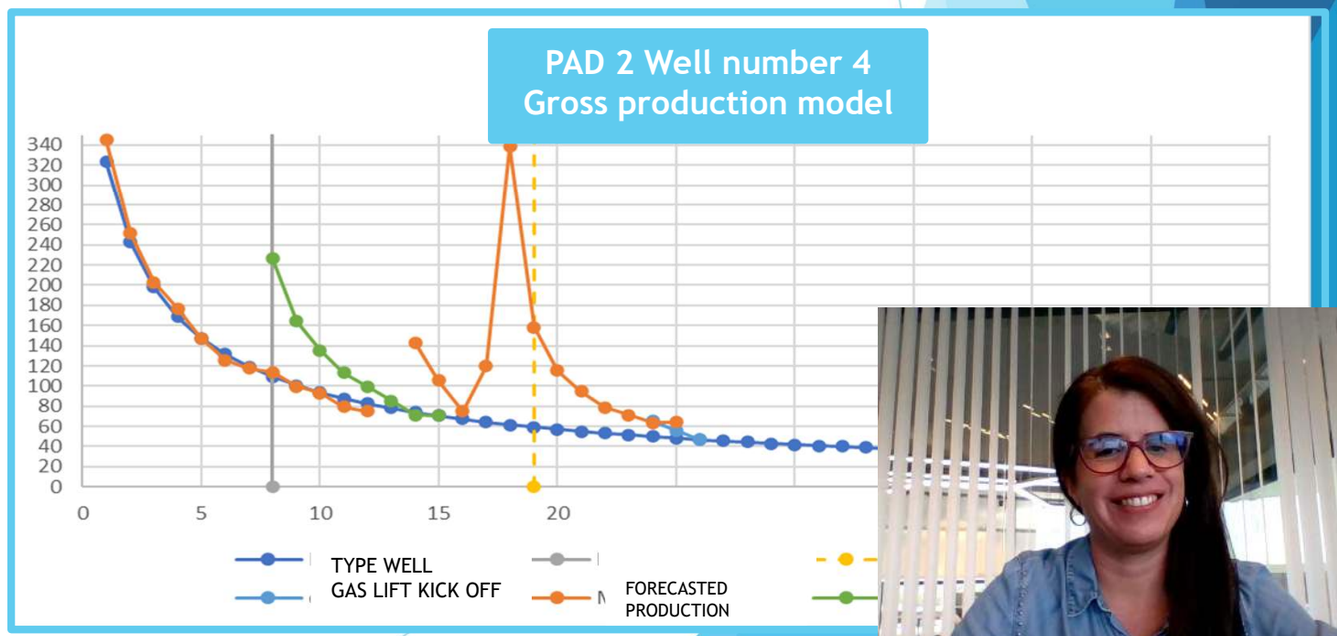
Gas Lift Implementation

- 1st PAD Mandrels@9th month and GLI@18th month.
- 2nd PAD Mandrels-GLI@9th month: “Early Gas Lift”.
- Both accelerated 5 to 7% of 5year production.
- “Early Gas Lift” increased NPV.



FROM DRAFT TO REAL

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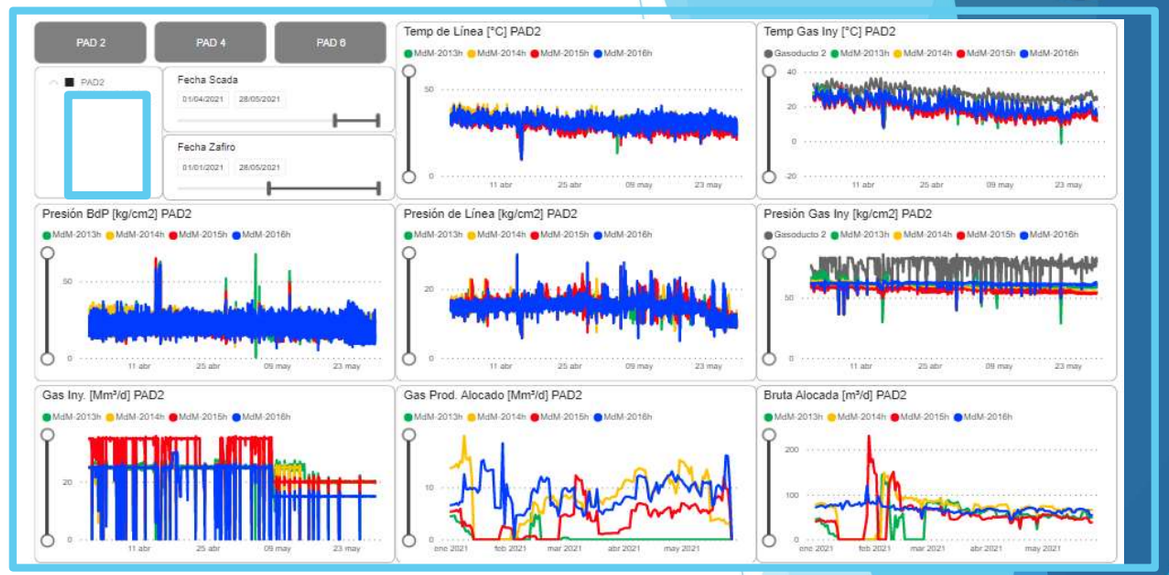
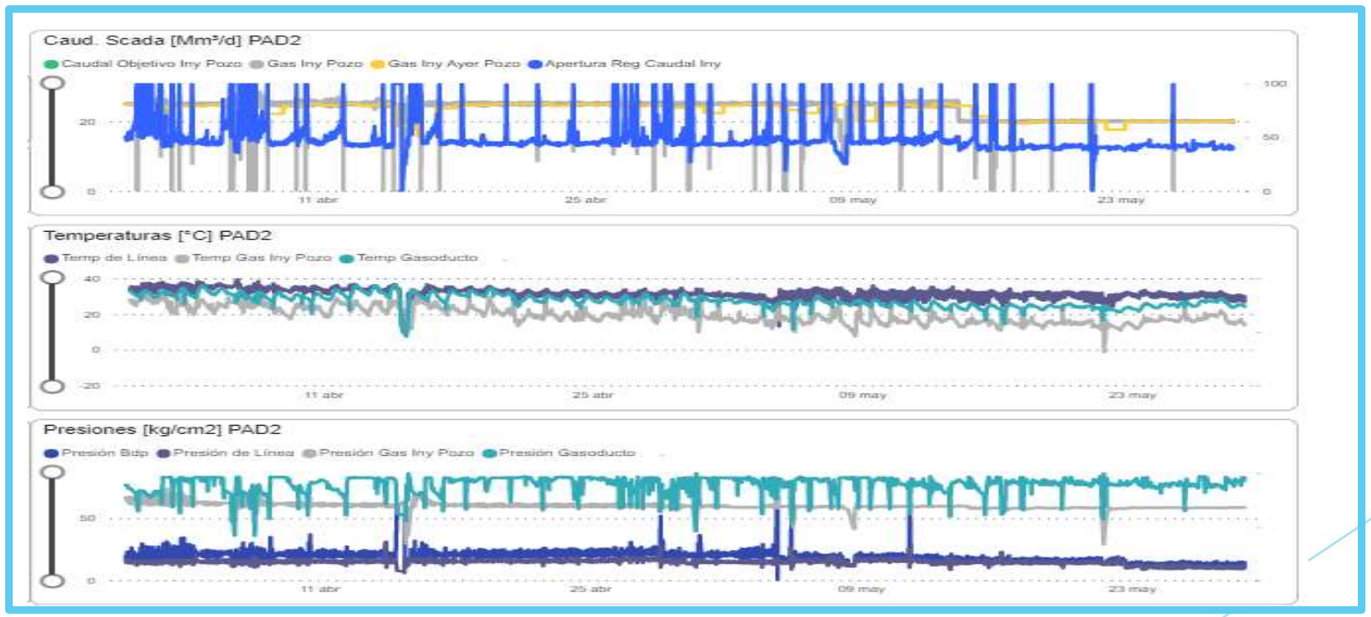
Gas Lift Implementation

- Gas Lift Monitoring Dashboards.
- Gas Lift Optimization.
- Gas Injection Rate remotely controlled.





FROM DRAFT TO REAL

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Gas Lift Implementation

- Gas Lift Gathering Design.
- Gas Lift Flowmeter.
- Gas Injection Rate Automated Flow control valve.

CONCLUSIONS

- 30° Packer Location rather than 60°.
- EUR is conservated with Choke Management.
- Gas Lift accelerates production.
- Shallower valves are needed for Early gas lift & Frac Hits.
- Hybrid Design:
  - High Rates-High Temperatures-Hight Wcut
  - Low Rates-Low Temperatures-Low Wcut

LEASSONS LEARNT

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- GLI accelerated oil recovery in parent wells post frac-hit.
- 5 to 7% of production accelerated with GLI.
- “Early gas lift” 9th month increases NPV and IRR.

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