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FIELD DEVELOPMENT
Consultants

MARCH 2021 UPDATE

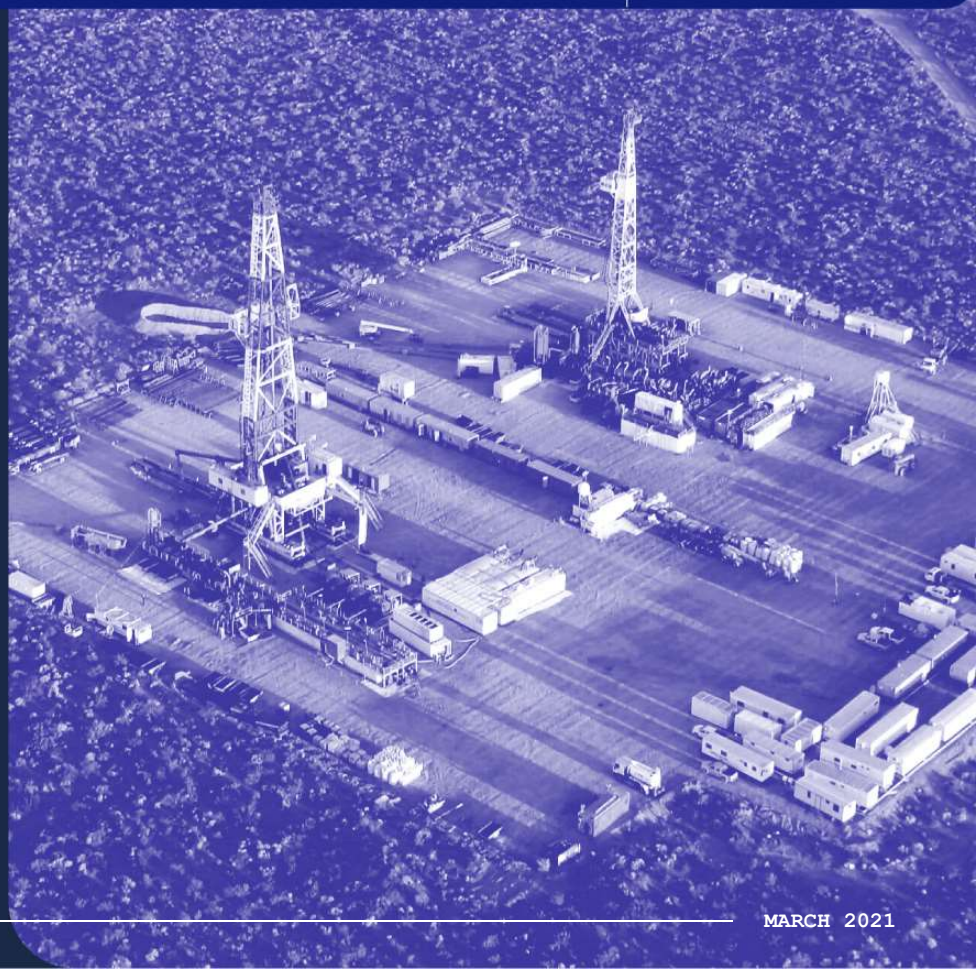
ANALYSIS OF VACA MUERTA OIL WELLS 2014-2020

Source: S.E.N.
(National Secretariat of Energy)

Outline of the report

Part I: Vaca Muerta Evolution (2014 – 2020)

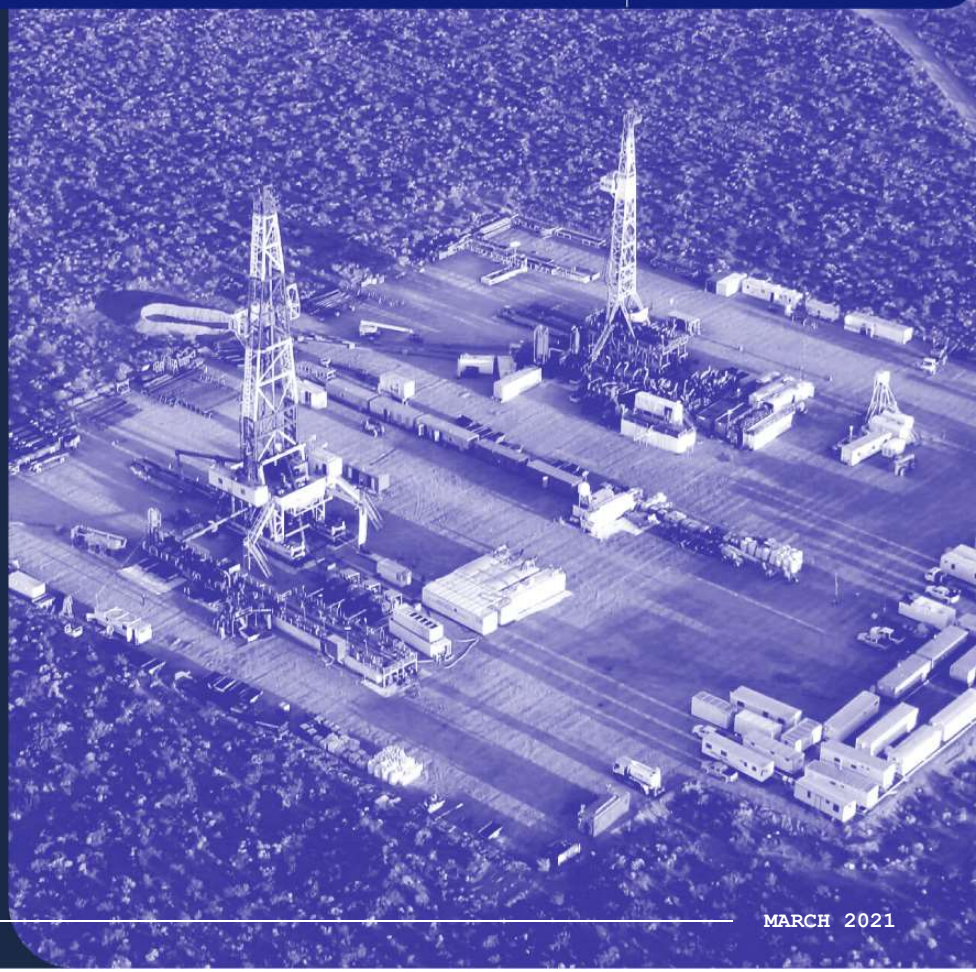
- Activity of main companies in Vaca Muerta.
- Oil production by drilling campaign and production forecasts (annual basis).
- Evolution of lateral lengths and number of fractures of horizontal wells per campaign.
- Evolution of well productivity per campaign. Well economics evaluation per campaign.
- Productivity statistics analysis. Type well per campaign. Estimated ultimate recovery (EUR) calculations per campaign.
- Calculation of the economic well per campaign.
- Summary and conclusions.



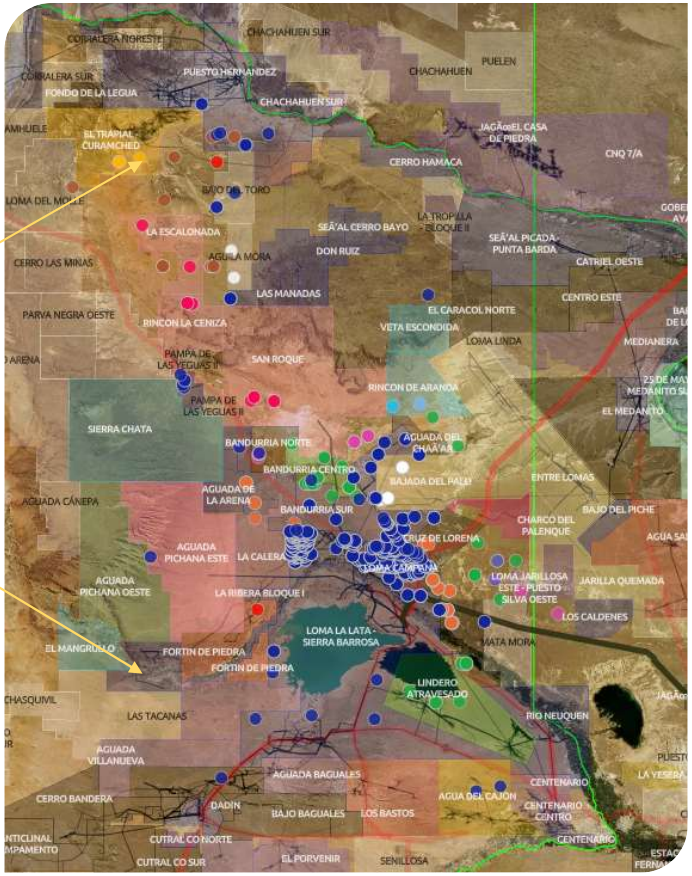
Outline of the report

Part II: Vaca Muerta. A Value Creation Story

- Value of the Proved Developed Producing Reserves.
- Value of Vaca Muerta Oil Acreage.
- Summary and conclusions.



Introduction



Vaca Muerta is a shale formation encompassing areas of Neuquén, Mendoza and Rio Negro provinces.

- Located in an underpopulated flat plateau close to Neuquén city.
- Originally discovered and de-risked by YPF.
- World class operators such as Exxon, Shell, Chevron, Total, Equinor and Petronas set foot on the acreage.
- Infrastructure close to existent pipelines.
- Yearly round drilling capability.
- Water and sand availability.

Introduction

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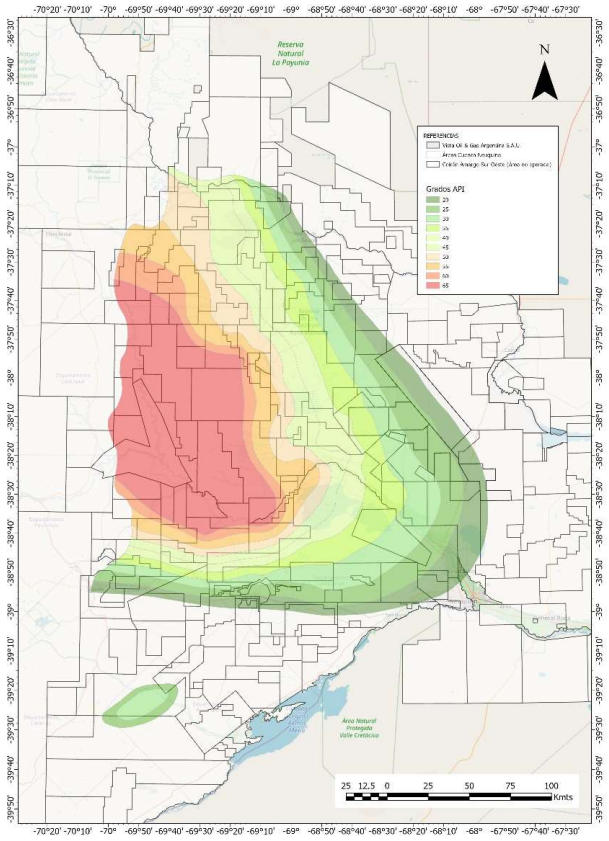
Vaca Muerta in numbers:

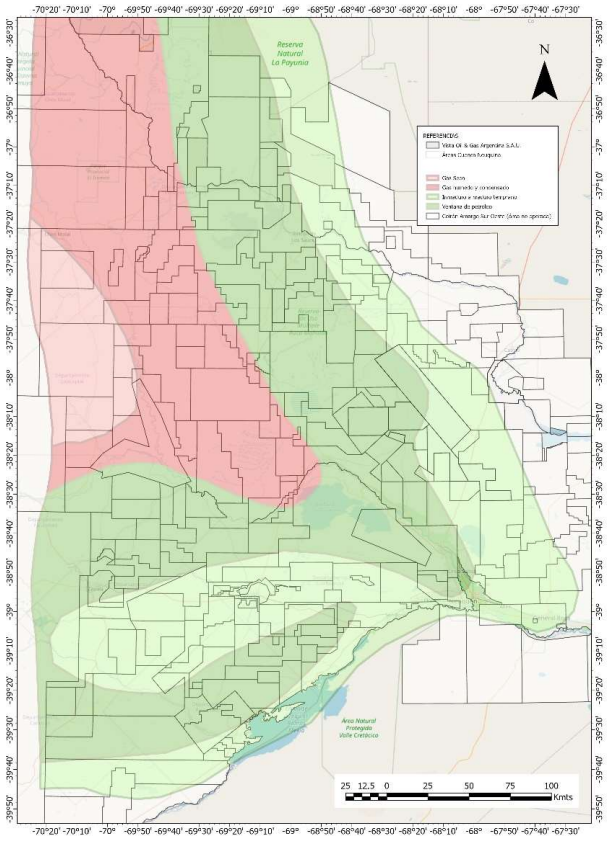
- Acreage: 7 ~ 8 million acres
- Oil window: 40%
- Oil Resources: ~20 billion barrels (Oil window)
- Gas Resources: ~350 TCF (Gas window)
- World Class resource compared to all of the US Shale Plays
- 3 Landing zones (HC Kitchen, TOC, S2C)

	TOC (%)	Thickness (ft)	Reservoir Pressure (psi)
desired	*>2*	*>30*	*High*
Vaca Muerta	3 - 10 ✓	100 – 1,100 ✓	4,500 – 9,500 ✓
Barnett	4 - 5	200 - 300	2,000 – 5,500
Haynesville	0.5 - 4	200 - 300	7,000 – 12,000
Marcellus	2 - 12	30 - 200	2,000 – 5,500
Eagle Ford	3 - 5	100 - 330	4,500 – 8,500
Wolfcamp	3	650 – 1,000	4,600

API Gravity



Hydrocarbon Generation Window



Introduction

Vaca Muerta vs Permian

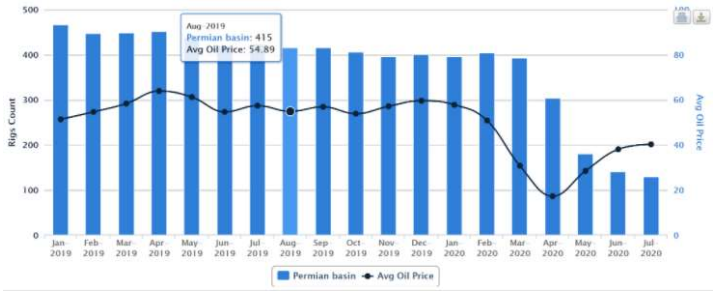
VM Acreage:

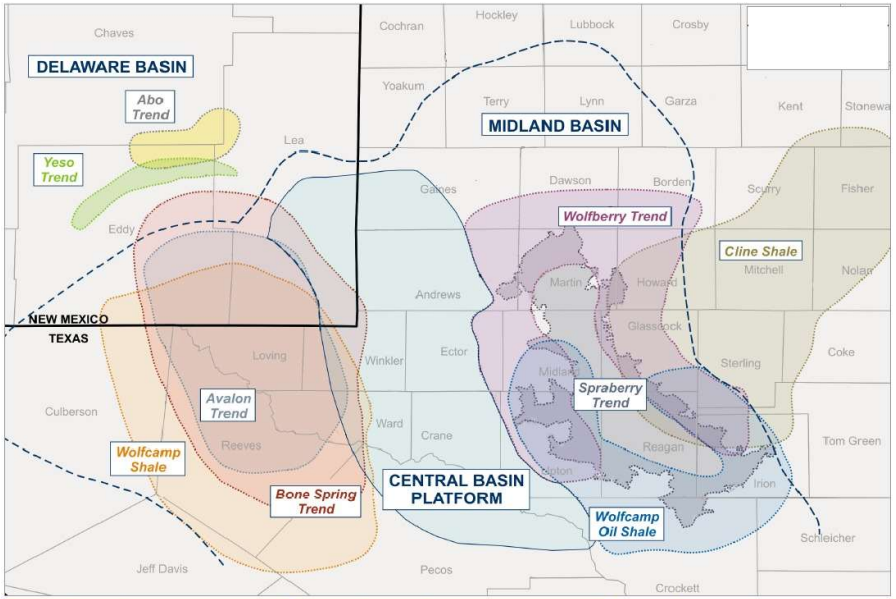
- 6 ~ 8 million acres
- 20 billion barrels of resources
- 350 TCF of gas resources
- 20 drilling rigs

Permian Acreage:

- Midland Basin 5.6 million acres
- Delaware Basin 6.1 million acres
- 33 billion barrels of resources
- 118 TCF of gas resources
- 125 drilling rigs before COVID crisis

Permian Basin (Rig Count vs Oil Price)



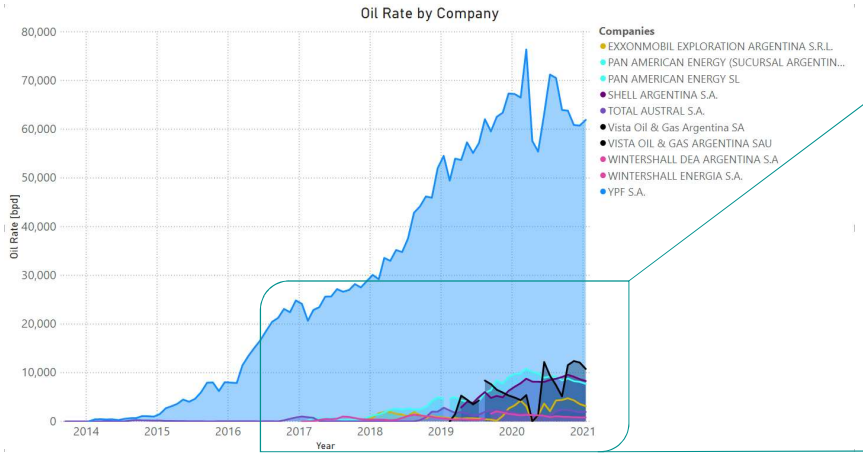


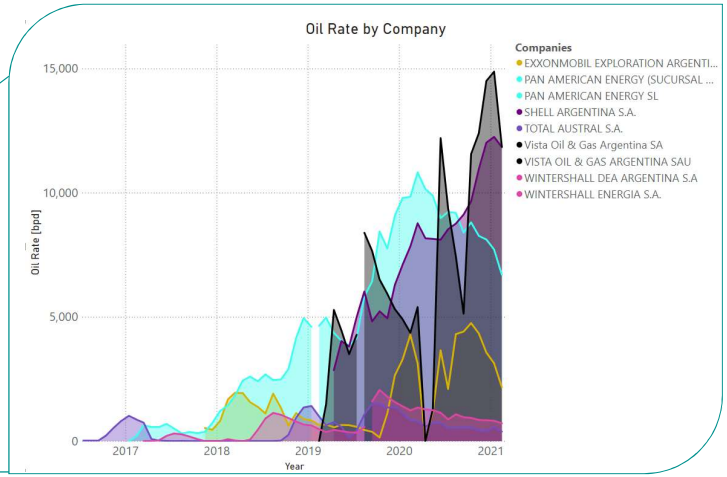
PERIOD	SERIES	DELAWARE BASIN FORMATION
GUADALAUPE	DELAWARE GROUP	LAMAR BELL CANYON
		CHERRY CANYON
		BRUSHY CANYON
LEONARD		UPPER AVALON SHALE
		LOWER AVALON SHALE
		1ST BONE SPRING
		2ND BONE SPRING
		3RD BONE SPRING
WOLFCAMP		WOLFCAMP
PENN		PENNSYLVANIAN

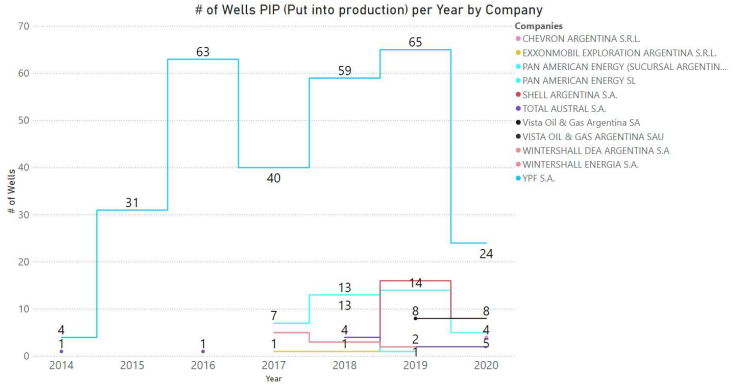
PERIOD	SERIES	CENTRAL PLATFORM FORMATION
GUADALAUPE	WHITE-HORSE	TANSILL
		YATES
		7 RIVERS
		QUEEN
		GRAYBURG
		SAN ANDRES
	WARD	GLORIETA
LEONARD	YESO	PADDOCK
		BLINEBRY
		TUBB
		DRINKARD
		ABO
WOLFCAMP		WOLFCAMP / HUECO / BURSUM
PENN		PENNSYLVANIAN

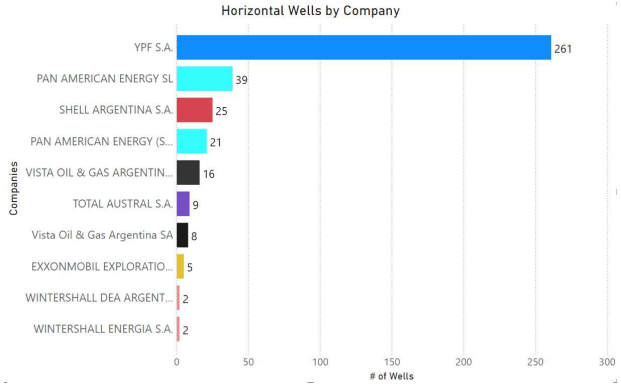
PERIOD	SERIES	MIDLAND BASIN FORMATION
GUADALAUPE	WHITE-HORSE	TANSILL
		YATES
		7 RIVERS
		QUEEN
		GRAYBURG
		SAN ANDRES
	WARD	GLORIETA
	CLEAR FORK	UPPER LEONARD
LEONARD		UPPER SPRABERRY
		LOWER SPRABERRY
		DEAN
WOLFCAMP		WOLFCAMP
PENN		PENNSYLVANIAN

Activity of main companies in VM (2014-2020)



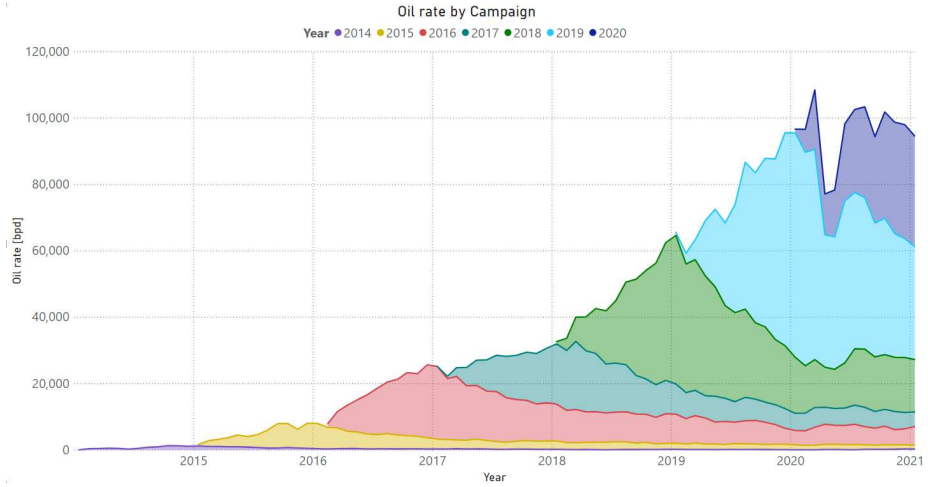


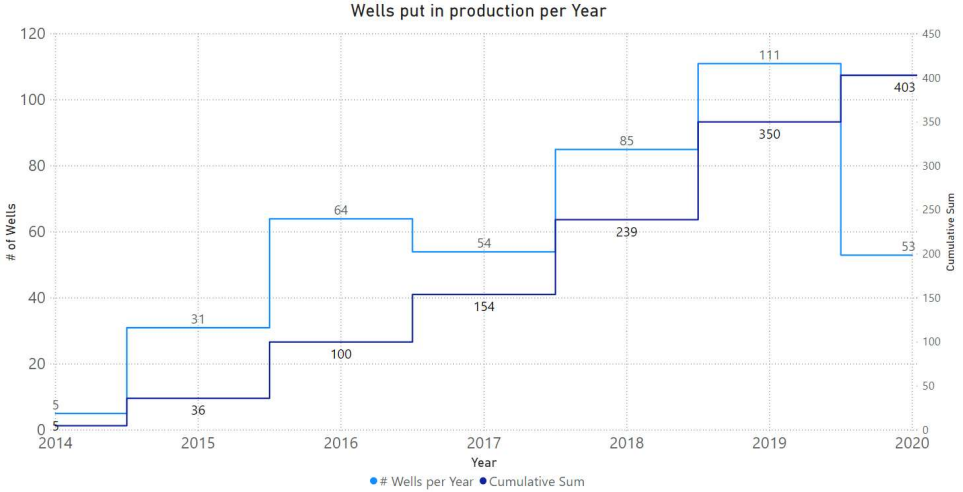




YPF is the leader in the development of Vaca Muerta.

Oil production per annual campaign in VM (Horizontal wells)



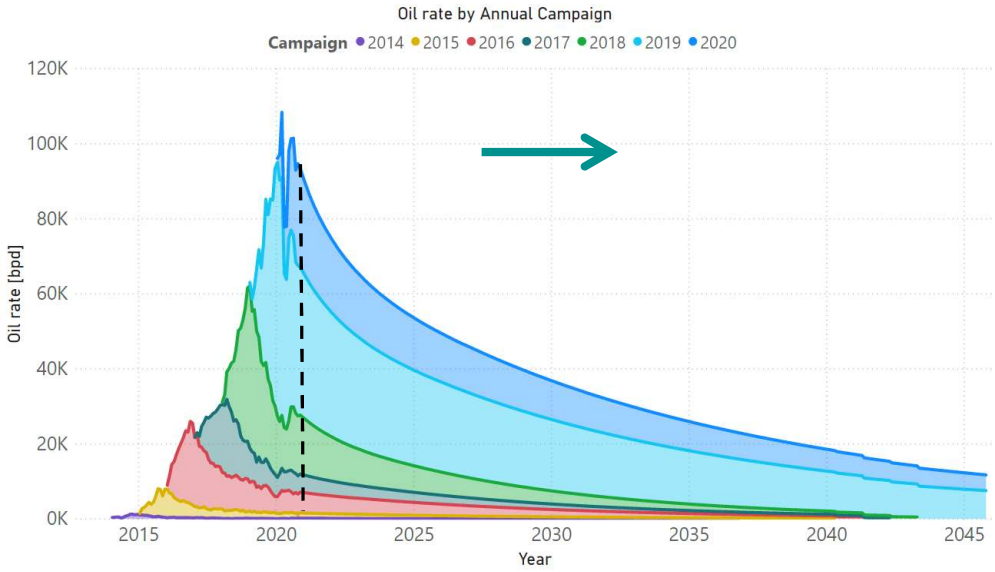


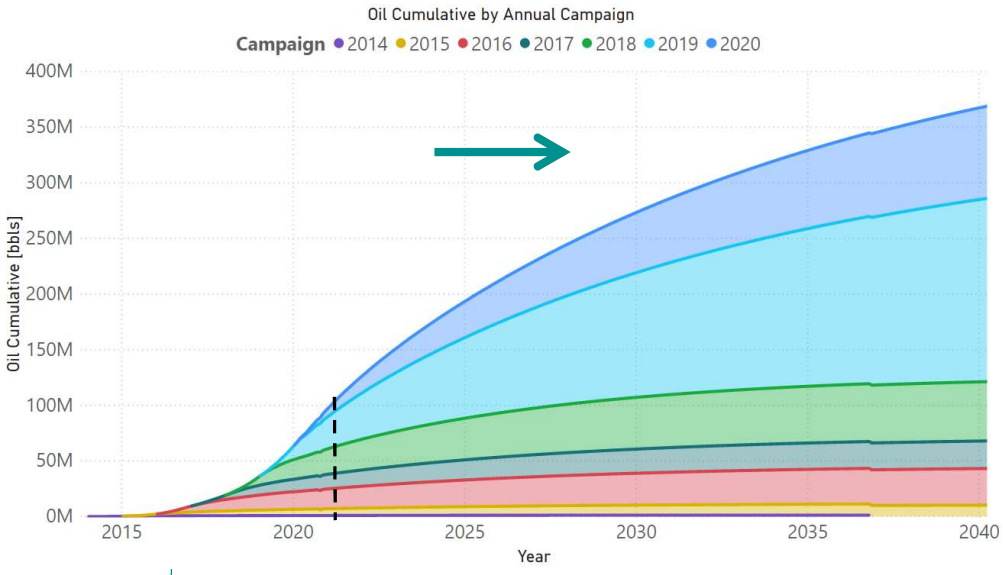
The appetite for VM development pushed the industry to be increasingly efficient. However, results are still diverse in terms of efficiency.

The graph on the left shows Vaca Muerta oil production by annual campaign from 2014 to the current 2020 campaign considering all horizontal wells.

The graph on the right shows, the horizontal wells put into production per year and the evolution of drilled wells.

Oil production forecast by annual campaign in VM (Horizontal wells)



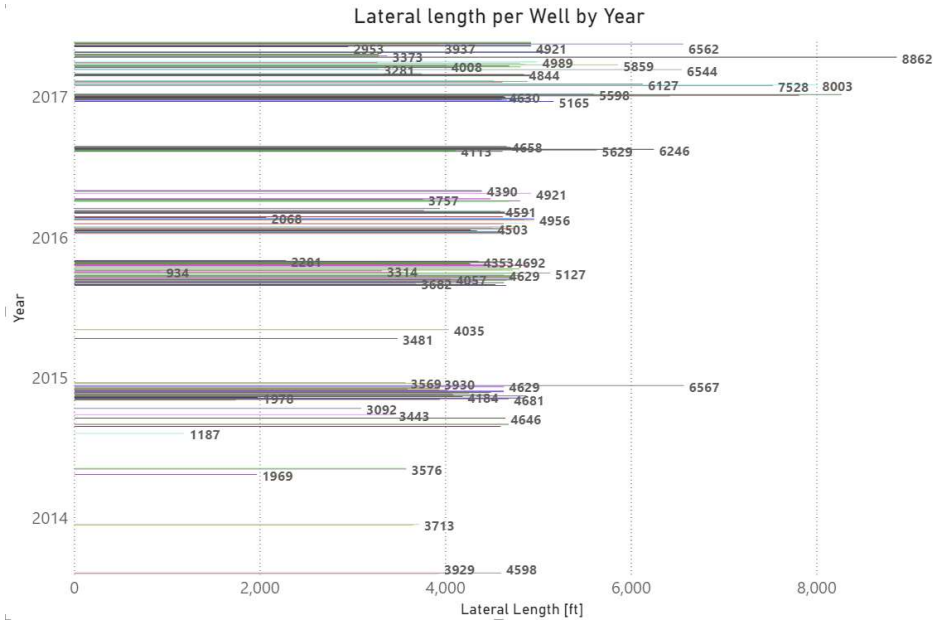


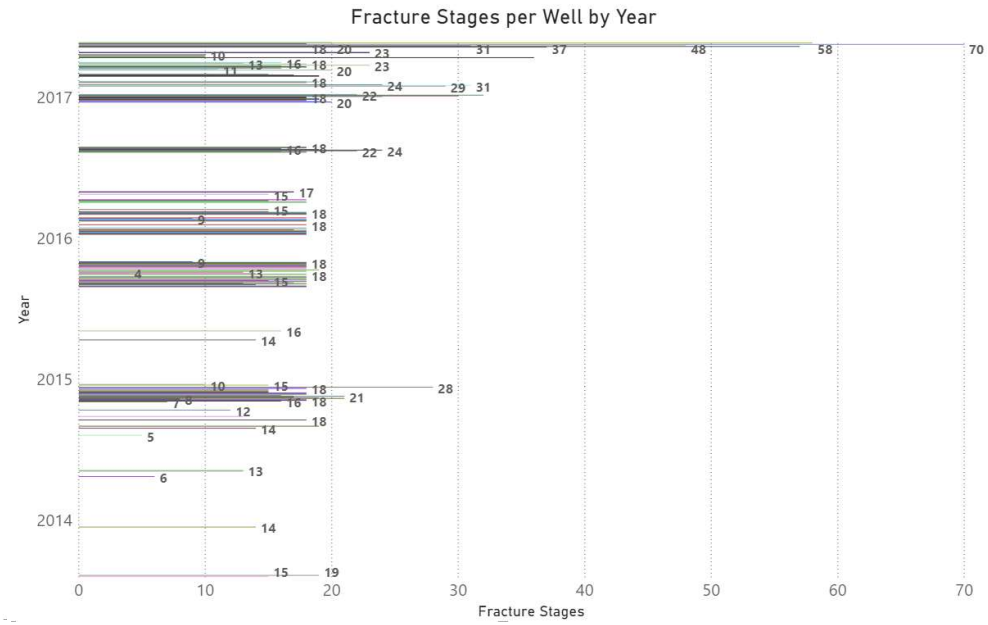
We generated a Production Forecast for each well drilled in Vaca Muerta using an Artificial Intelligence algorithm calculating each well EUR for the different drilling campaigns.

As shown on the right graph, VM will accumulate around 350 MMbbl of oil from the wells drilled up to the study date (February 2020). As regards to the total volume of oil, the 2019 drilling campaign will contribute the most.

Well drilling evolution
Lateral length and # of fractures (2014 - 2017)

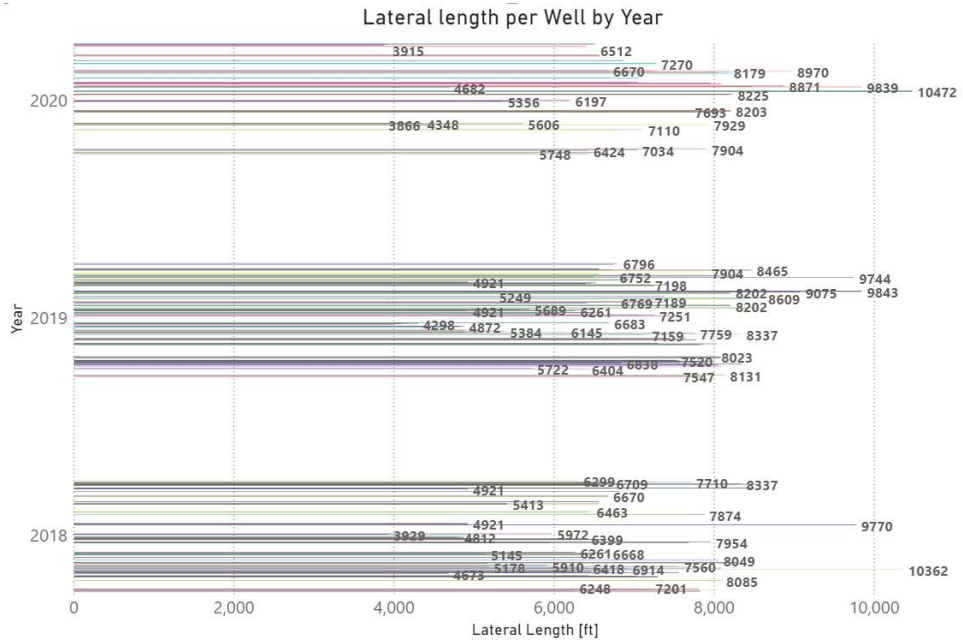
The following graphs show lateral well lengths and number of fractures for each of the existing oil wells per campaign for the years 2014 – 2017.

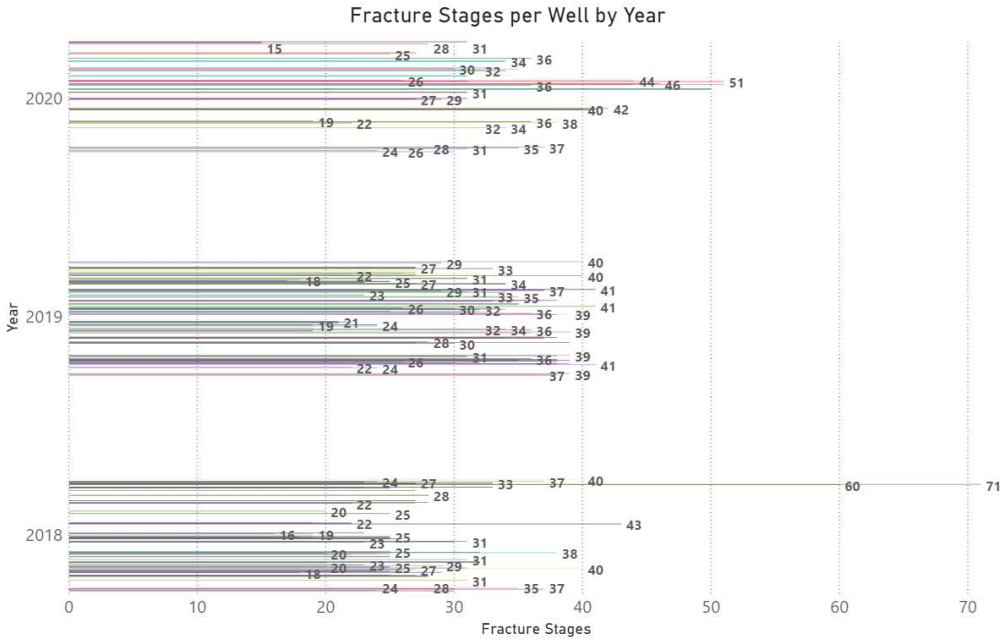




Well drilling evolution
Lateral length and # of fractures (2014 - 2017)

The following graphs show lateral well lengths and number of fractures for each of the existing oil wells per campaign for the years 2018 – 2020.

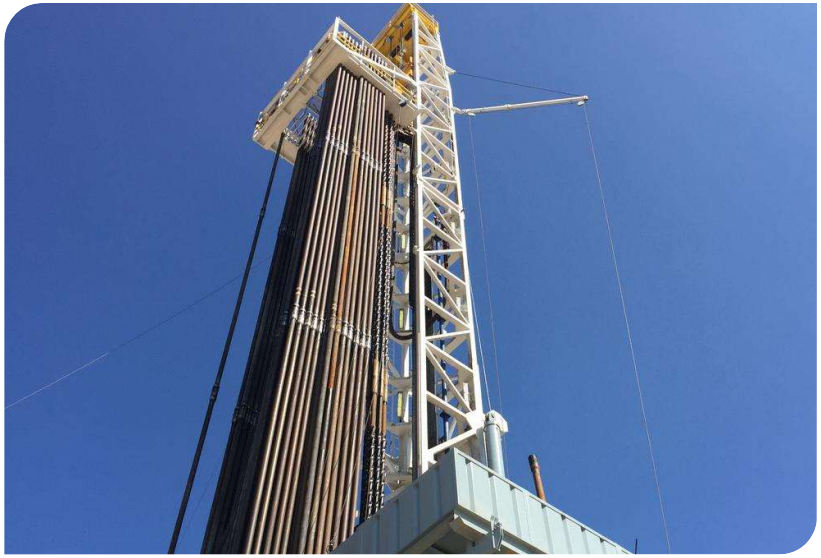




Calculation methodology used for the analysis of Horizontal Oil Wells per campaign (2014 - 2020)

The following slides show the results of the analysis of VM Horizontal oil wells per campaign.
The calculation methodology was as follows:

- We determined the maximum rate per well and the cumulative production at 365 days of production.
- We fitted a modified hyperbolic decline curve for each well and calculated its EUR.
- We calculated the Type Well per campaign and its EUR.
- We performed an economic evaluation of the Type Well.
- The Economic Type Well was calculated for each campaign ("Economic" is a well that makes the NPV@10% equal to zero).
- We determined the number of wells that turned out to be Economic and non-Economic.



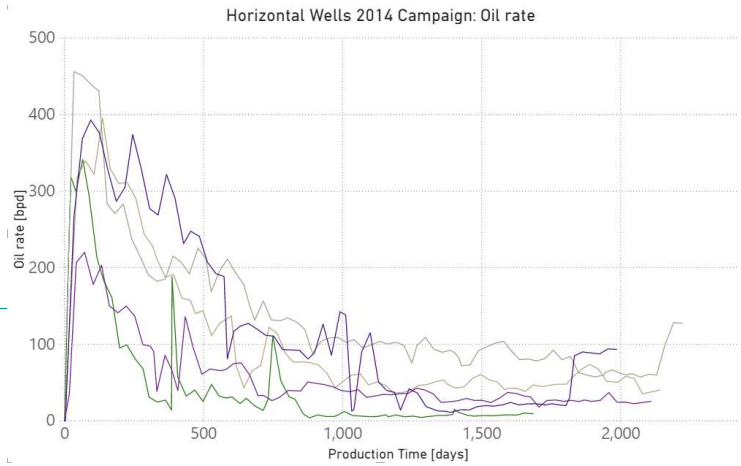
Note: The economic evaluation was simplified and carried out "Before Tax". For the economic evaluation, the historic barrel price series of the Neuquén Basin was taken into account and a future price of 55$/bbl considered. The amounts of the well initial CAPEX and the OPEX were both taken from public sources (presentations to investors of the main companies).

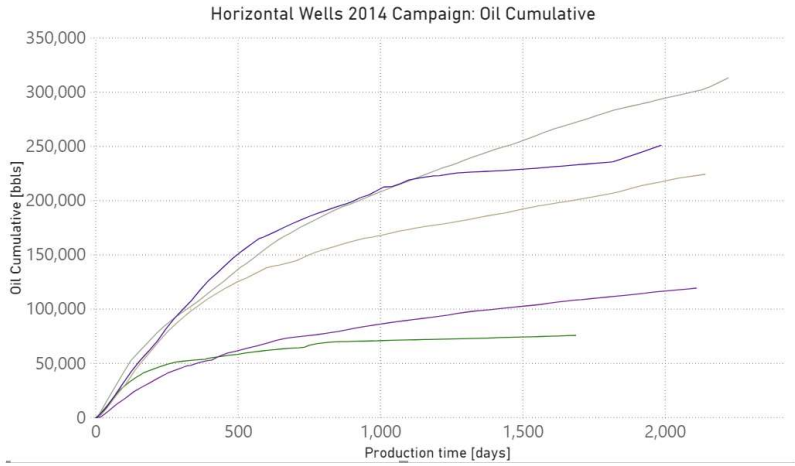
2014 Campaign – 5 Wells (Horizontal Oil Wells)

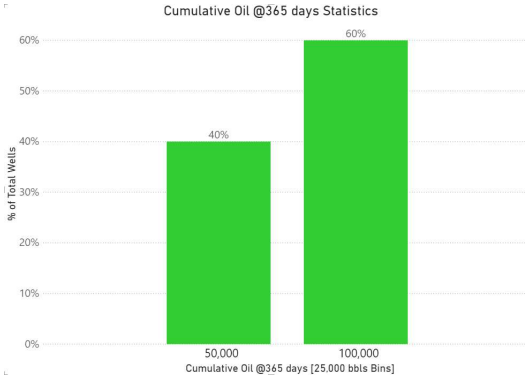
In 2014, 5 horizontal wells were drilled. The average horizontal well length was 3575 ft and the number of fractures was 13.

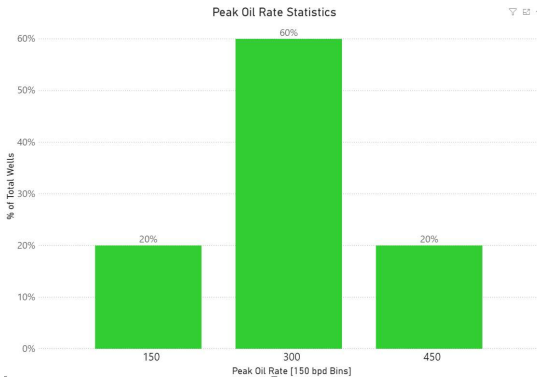
The average maximum rate was above 300 bpd for 80% of the wells.

60% of the wells in this campaign accumulated more than 100 Kbbl of oil at 365 days.

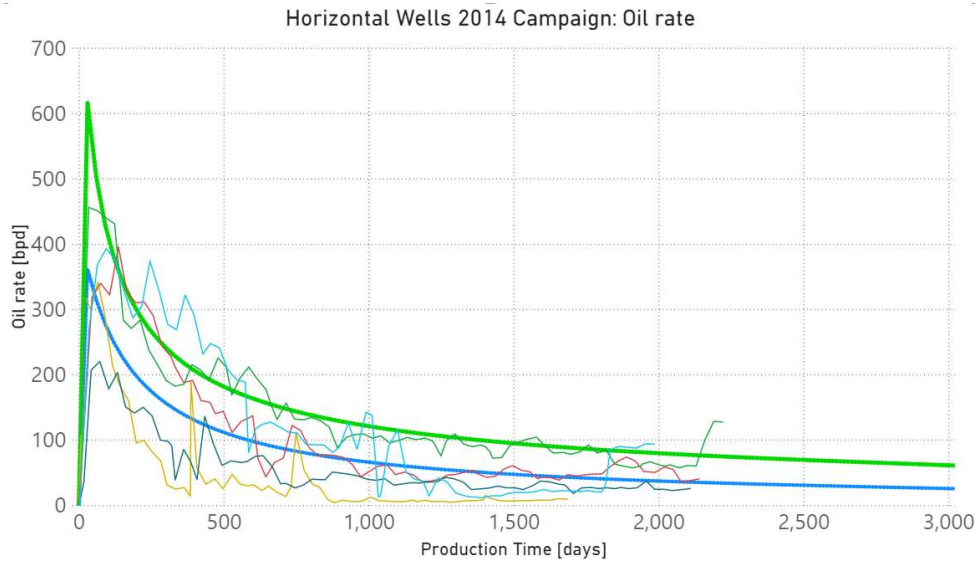


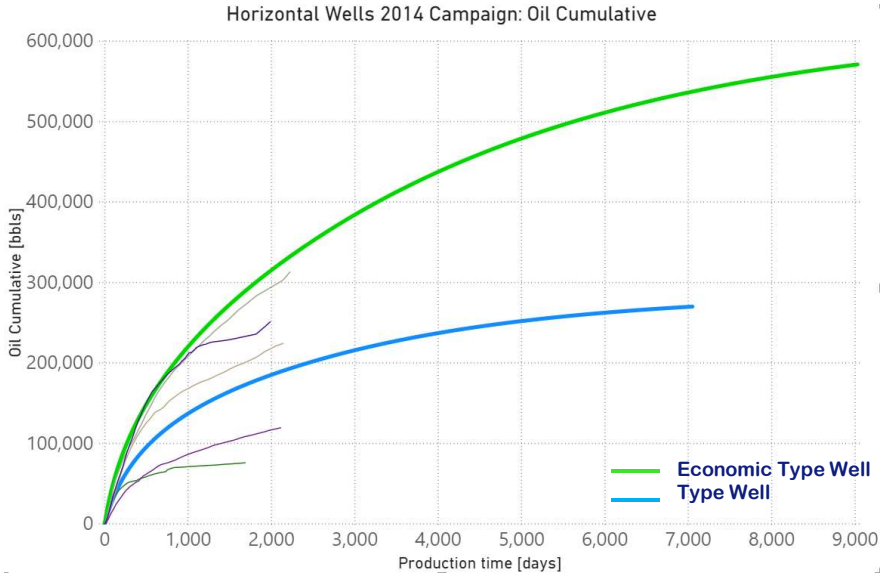






2014 Campaign – 5 Wells
Type Well and Economic Well





The 2014 type well turned out to have a maximum flow rate of 365 bpd, a cumulative production of 86 Kbbl at 365 days and an EUR of 270 Kbbl of oil.

2014 Campaign – 5 Wells Economic Evaluation

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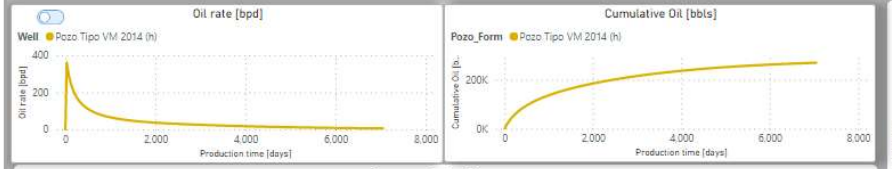
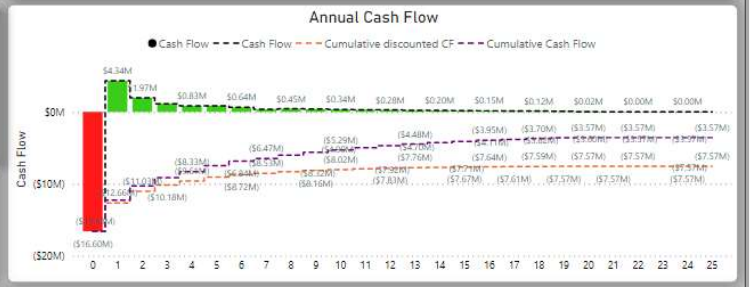
Well Data

Pozo_Form_P	MinDate	Np [m3]	Gp [Mm3/d]	Lateral Length [ft]	Fracture Stages	qo_ef_peak [bpd]	qg_ef_peak [Mm3]	qo_avg [m3/d]	qg_avg [Mm3/d]	EUR [bbls]
Pozo Tipo VM 2014 (h)	Jan 2014	42.929	8.506	3.576	13	361.66				270.015

Selected Parameters

Total Capex	Total Opex [$/bbl]	Oil Price [$/bbl]	Gas Price [$/Mcf]	Royalties	Discount rate
$16,600,000	6.0	55.00	3.5	12.00%	10.00%





Economic Indicators

NPV @Td 10%	Cumulative Cash Flow	IRR	INPV	Repayment Time	Repayment time @Td
($7,567,715)	($3,573,190)	-4.57%	-0.46	26	26

Calendar Date	Year	Annual Oil Volume [bbls]	Annual Gas Volume [MMcf]	Total BOEs [bbl]	Barril Petróleo [$/bbl]	Precio Gas [$/Mcf]	Capex	Revenue Oil	Revenue Gas	Opex [$/bbl]	Annual Opex	Oil Royalties	Gas Royalties	Cash Flow	Cumulative Cash Flow	Net Back	Discounted Cash Flow	Cumulative discounted CF
	0	0	0.00	0	$0.0	$0.0	($16,600,000)	$0	$0	$0.0	$0	$0	$0	($16,600,000)	($16,600,000)		($16,600,000)	($16,600,000)
12/15/2014	1	82,473	69.46	94,047	$79.4	$7.5		$6,545,452	$520,930	$20.0	($1,880,945)	($785,454)	($62,512)	$4,337,472	($12,262,528)	46.12	$3,943,156	($12,656,844)
12/15/2015	2	36,464	40.13	43,151	$74.6	$7.5		$2,720,807	$300,975	$16.0	($690,420)	($326,497)	($36,117)	$1,968,748	($10,293,781)	45.62	$1,627,064	($11,029,780)
12/15/2016	3	25,007	41.20	31,872	$63.2	$3.5		$1,581,292	$144,184	$12.0	($382,463)	($189,755)	($17,302)	$1,135,956	($9,157,825)	35.64	$853,460	($10,176,319)
12/15/2017	4	19,176	32.20	24,542	$56.5	$3.5		$1,083,501	$112,705	$9.0	($220,879)	($130,020)	($13,525)	$831,783	($8,326,042)	33.89	$568,119	($9,608,200)
12/15/2018	5	15,614	25.48	19,861	$65.0	$3.5		$1,014,563	$89,191	$6.0	($119,164)	($121,748)	($10,703)	$852,139	($7,473,902)	42.91	$529,112	($9,079,089)
12/15/2019	6	14,217	21.91	17,868	$54.0	$3.5		$767,722	$76,694	$6.0	($107,210)	($92,127)	($9,203)	$635,875	($6,838,027)	35.59	$358,935	($8,720,154)
12/15/2020	7	11,330	16.21	14,030	$40.1	$3.5		$454,118	$56,726	$6.0	($84,182)	($54,494)	($6,807)	$365,360	($6,472,667)	26.04	$187,487	($8,532,666)
12/15/2021	8	9,955	13.10	12,139	$55.0	$3.5		$547,548	$45,853	$6.0	($72,832)	($65,706)	($5,502)	$449,361	($6,023,305)	37.02	$209,630	($8,323,036)
12/15/2022	9	8,752	10.48	10,499	$55.0	$3.5		$481,382	$36,688	$6.0	($62,995)	($57,766)	($4,403)	$392,906	($5,630,400)	37.42	$166,630	($8,156,405)
12/15/2023	10	7,695	8.29	9,077	$55.0	$3.5		$423,211	$29,022	$6.0	($54,459)	($50,785)	($3,483)	$343,505	($5,286,894)	37.85	$132,436	($8,023,969)
12/15/2024	11	6,765	6.47	7,844	$55.0	$3.5		$372,069	$22,655	$6.0	($47,061)	($44,648)	($2,719)	$300,296	($4,986,598)	38.29	$105,252	($7,918,717)
12/15/2025	12	6,409	5.33	7,297	$55.0	$3.5		$352,513	$18,639	$6.0	($43,781)	($42,302)	($2,237)	$282,833	($4,703,766)	38.76	$90,119	($7,828,598)
12/15/2026	13	5,173	3.64	5,780	$55.0	$3.5		$284,510	$12,752	$6.0	($34,680)	($34,141)	($1,530)	$226,910	($4,476,856)	39.26	$65,728	($7,762,870)
12/15/2027	14	4,548	2.65	4,990	$55.0	$3.5		$250,129	$9,279	$6.0	($29,938)	($30,016)	($1,113)	$198,342	($4,278,514)	39.75	$52,230	($7,710,641)
12/15/2028	15	3,998	1.85	4,306	$55.0	$3.5		$219,903	$6,459	$6.0	($25,835)	($26,388)	($775)	$173,364	($4,105,150)	40.26	$41,502	($7,669,139)
12/15/2029	16	3,515	1.20	3,714	$55.0	$3.5		$193,330	$4,185	$6.0	($22,286)	($23,200)	($502)	$151,527	($3,953,623)	40.79	$32,977	($7,636,162)
12/15/2030	17	3,090	0.68	3,203	$55.0	$3.5		$169,968	$2,367	$6.0	($19,218)	($20,396)	($284)	$132,436	($3,821,187)	41.35	$26,202	($7,609,960)
12/15/2031	18	2,928	0.27	2,973	$55.0	$3.5		$161,034	$949	$6.0	($17,838)	($19,324)	($114)	$124,706	($3,696,480)	41.95	$22,429	($7,587,531)
12/15/2032	19	2,363	0.00	2,363	$55.0	$3.5		$129,969	$0	$6.0	($14,178)	($15,596)	$0	$100,194	($3,596,286)	42.40	$16,383	($7,571,148)
12/15/2033	20	545	0.00	545	$55.0	$3.5		$29,960	$0	$6.0	($3,268)	($3,595)	$0	$23,096	($3,573,190)	42.40	$3,433	($7,567,715)
12/15/2034	21	0	0.00	0	$55.0	$3.5		$0	$0	$6.0	$0	$0	$0	$0	($3,573,190)		$0	($7,567,715)
12/15/2035	22	0	0.00	0	$55.0	$3.5		$0	$0	$6.0	$0	$0	$0	$0	($3,573,190)		$0	($7,567,715)
12/15/2036	23	0	0.00	0	$55.0	$3.5		$0	$0	$6.0	$0	$0	$0	$0	($3,573,190)		$0	($7,567,715)
12/15/2037	24	0	0.00	0	$55.0	$3.5		$0	$0	$6.0	$0	$0	$0	$0	($3,573,190)		$0	($7,567,715)
12/15/2038	25	0	0.00	0	$55.0	$3.5		$0	$0	$6.0	$0	$0	$0	$0	($3,573,190)		$0	($7,567,715)
	Total	270,016	300.54	320,100											($3,573,190)			($7,567,715)

The initial considered investment was 16.6 MMUS$ for a horizontal well length of 3575 ft and 13 fractures. According to the type well production curve, this generated an NPV@10% of -7.5 MMUS$.

The 2014 type well for this level of investment should have produced with a peak rate of 616 bpd, a cumulative production of 129 Kbbl at 365 days and an EUR of 575 Kbbl of oil in order to be Economic.

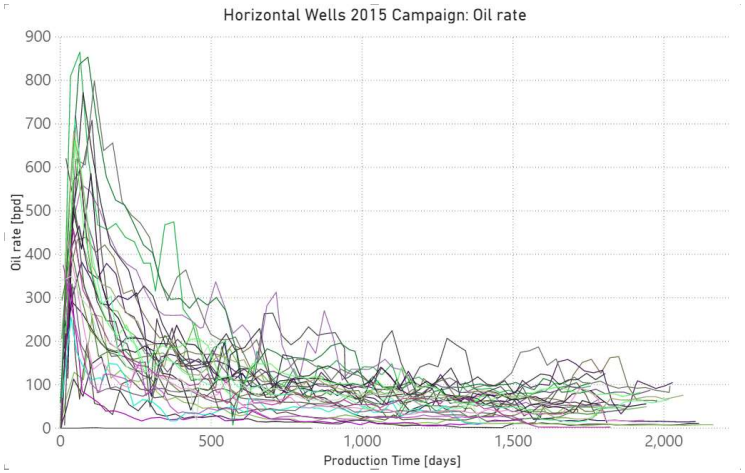
It is important to consider that these horizontal wells had carried additional investments to perform special studies which allowed to "discover" the "Organico" as the first economical landing zone in Vaca Muerta.

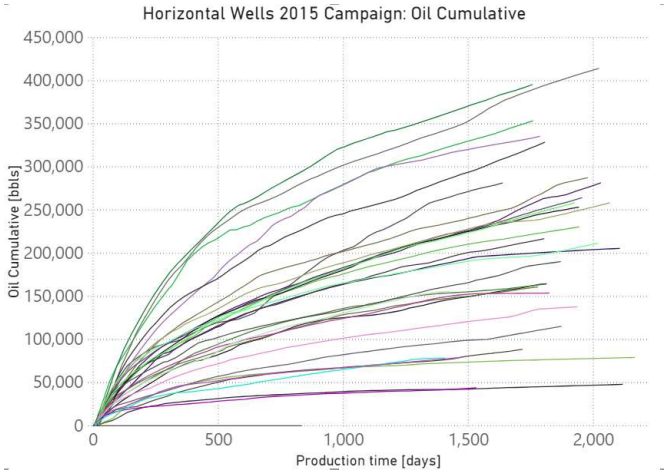
2015 Campaign – 31 Wells (Horizontal Oil Wells)

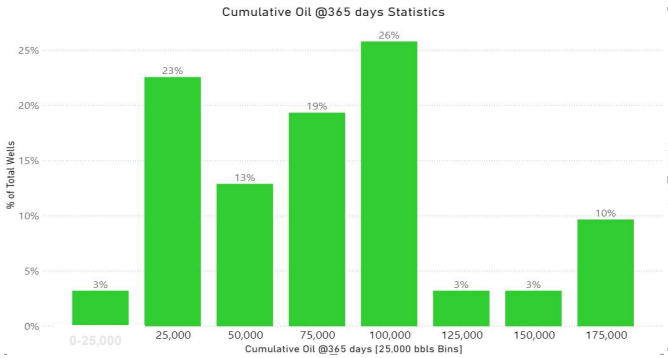
In 2015, 31 horizontal wells were drilled. The average horizontal well length was 4035 ft and the number of fractures grew to 16.

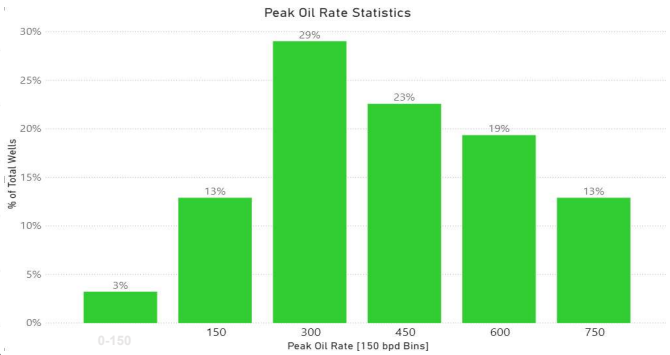
The most frequent maximum oil rate is between 300 and 450 bpd for 50% of the wells, with maximums higher than 750 bpd (13%).

50% of the wells accumulated between 75 and 125 Kbbl of oil after 365 days. To date, the average cumulative of the wells of this campaign is 200 Kbbl.

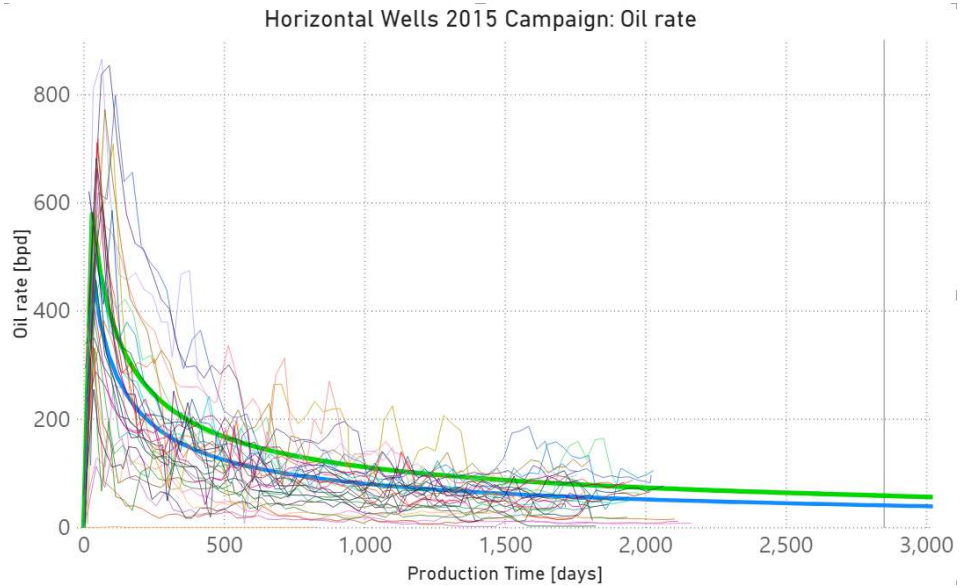


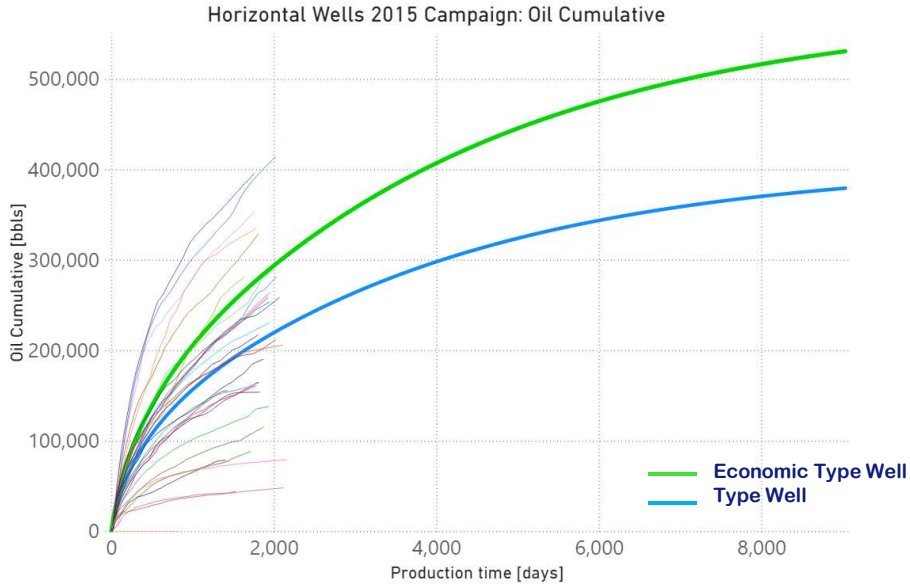






2015 Campaign – 31 Wells
Type Well and Economic Well





The 2015 type well turned out to have a maximum flow rate of 472 bpd, a cumulative production of 93 Kbbl at 365 days and an EUR of 377 Kbbl of oil.

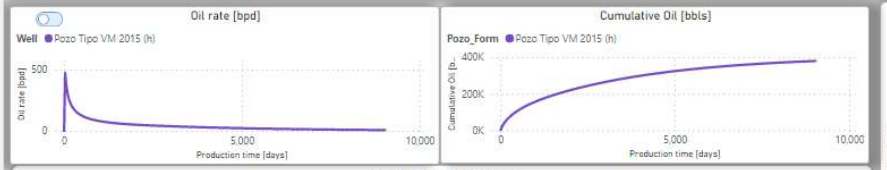
2015 Campaign – 31 Wells Economic Evaluation

Well Data

Pozo_Form_P	MinDate	Np [m3]	Gp [Mm3/d]	Lateral Length [ft]	Fracture Stages	qo_ef_peak [bpd]	qg_ef_peak [Mm3]	qo_avg [m3/d]	qg_avg [Mm3/d]	EUR [bbls]
Pozo Tipo VM 2015 (h)	Jan 2015	60,319	17,517	4,035	16	471.74		6.6	1.95	379,395

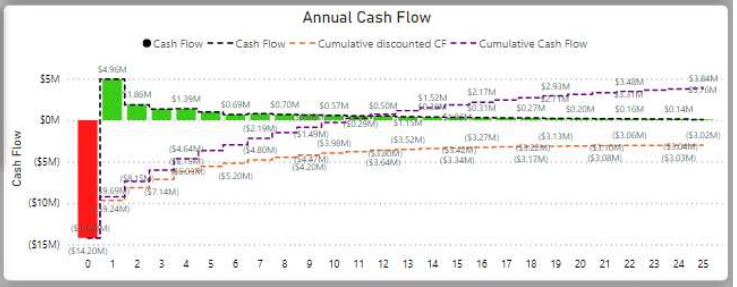
Selected Parameters

Total Capex	Total Opex [$/bbl]	Oil Price [$/bbl]	Gas Price [$/Mcf]	Royalties	Discount rate
$14,200,000	6.0	55.00	3.5	12.00%	10.00%



Economic Indicators

NPV @Td 10%	Cumulative Cash Flow	IRR	INPV	Repayment Time	Repayment time @Td
($3,018,812)	$3,844,594	4.27%	-0.21	11	26



Calendar Date	Year	Annual Oil Volume [bbls]	Annual Gas Volume [MMcf]	Total BOEs [bbl]	Barril Petróleo [$/bbl]	Precio Gas [$/Mcf]	Capex	Revenue Oil	Revenue Gas	Opex [$/bbl]	Annual Opex	Oil Royalties	Gas Royalties	Cash Flow	Cumulative Cash Flow	Net Back	Discounted Cash Flow	Cumulative discounted CF
	0	0		0	$0.0	$0.0	($14,200,000)	$0		$0.0	$0	$0		($14,200,000)	($14,200,000)		($14,200,000)	($14,200,000)
12/15/2015	1	93,567	78.80	106,699	$74.6	$7.5		$6,981,676	$591,009	$16.0	($1,707,186)	($837,801)	($70,921)	$4,956,778	($9,243,222)	46.46	$4,506,161	($9,693,839)
12/15/2016	2	41,328	54.87	50,471	$63.2	$3.5		$2,613,342	$192,028	$12.0	($605,652)	($313,601)	($23,043)	$1,863,074	($7,380,149)	36.91	$1,539,730	($8,154,108)
12/15/2017	3	30,275	72.86	42,417	$56.5	$3.5		$1,710,652	$255,020	$9.0	($381,757)	($205,278)	($30,602)	$1,348,035	($6,032,114)	31.78	$1,012,798	($7,141,310)
12/15/2018	4	24,544	63.51	35,127	$65.0	$3.5		$1,594,791	$222,269	$6.0	($210,760)	($191,375)	($26,672)	$1,388,253	($4,643,861)	39.52	$948,196	($6,193,114)
12/15/2019	5	20,936	54.69	30,051	$54.0	$3.5		$1,130,583	$191,426	$6.0	($180,304)	($135,670)	($22,971)	$983,065	($3,660,796)	32.71	$610,406	($5,582,709)
12/15/2020	6	19,862	50.67	28,307	$40.1	$3.5		$796,133	$177,356	$6.0	($169,840)	($95,536)	($21,283)	$686,831	($2,973,966)	24.26	$387,698	($5,195,011)
12/15/2021	7	16,405	40.15	23,096	$55.0	$3.5		$902,285	$140,519	$6.0	($138,574)	($108,274)	($16,862)	$779,094	($2,194,872)	33.73	$399,798	($4,795,212)
12/15/2022	8	14,880	34.65	20,654	$55.0	$3.5		$818,393	$121,272	$6.0	($123,924)	($98,207)	($14,553)	$702,981	($1,491,891)	34.04	$327,946	($4,467,266)
12/15/2023	9	13,501	29.72	18,454	$55.0	$3.5		$742,577	$104,021	$6.0	($110,725)	($89,109)	($12,483)	$634,282	($857,609)	34.37	$268,997	($4,198,269)
12/15/2024	10	12,251	25.36	16,476	$55.0	$3.5		$673,784	$88,754	$6.0	($98,859)	($80,854)	($10,651)	$572,175	($285,434)	34.73	$220,598	($3,977,671)
12/15/2025	11	11,116	21.53	14,703	$55.0	$3.5		$611,365	$75,351	$6.0	($88,220)	($73,364)	($9,042)	$516,089	$230,655	35.10	$180,886	($3,796,785)
12/15/2026	12	10,883	19.56	14,143	$55.0	$3.5		$598,566	$68,462	$6.0	($84,856)	($71,828)	($8,215)	$502,129	$732,784	35.50	$159,994	($3,636,791)
12/15/2027	13	9,078	15.04	11,585	$55.0	$3.5		$499,276	$52,651	$6.0	($69,508)	($59,913)	($6,318)	$416,188	$1,148,972	35.93	$120,555	($3,516,236)
12/15/2028	14	8,237	12.54	10,327	$55.0	$3.5		$453,023	$43,892	$6.0	($61,960)	($54,363)	($5,267)	$375,326	$1,524,298	36.35	$98,835	($3,417,401)
12/15/2029	15	7,474	10.37	9,202	$55.0	$3.5		$411,055	$36,303	$6.0	($55,213)	($49,327)	($4,356)	$338,462	$1,862,760	36.78	$81,025	($3,336,376)
12/15/2030	16	6,781	8.50	8,197	$55.0	$3.5		$372,975	$29,742	$6.0	($49,185)	($44,757)	($3,569)	$305,206	$2,167,966	37.23	$66,422	($3,269,954)
12/15/2031	17	6,153	6.88	7,300	$55.0	$3.5		$338,422	$24,085	$6.0	($43,799)	($40,611)	($2,890)	$275,207	$2,443,173	37.70	$54,448	($3,215,506)
12/15/2032	18	6,024	5.89	7,006	$55.0	$3.5		$331,338	$20,626	$6.0	($42,038)	($39,761)	($2,475)	$267,690	$2,710,863	38.21	$48,146	($3,167,360)
12/15/2033	19	5,025	4.21	5,726	$55.0	$3.5		$276,375	$14,732	$6.0	($34,359)	($33,165)	($1,768)	$221,816	$2,932,679	38.74	$36,269	($3,131,091)
12/15/2034	20	4,559	3.20	5,094	$55.0	$3.5		$250,772	$11,217	$6.0	($30,561)	($30,093)	($1,346)	$199,989	$3,132,668	39.26	$29,727	($3,101,364)
12/15/2035	21	4,137	2.35	4,529	$55.0	$3.5		$227,540	$8,227	$6.0	($27,173)	($27,305)	($987)	$180,302	$3,312,970	39.81	$24,364	($3,076,999)
12/15/2036	22	3,754	1.63	4,025	$55.0	$3.5		$206,461	$5,694	$6.0	($24,150)	($24,775)	($683)	$162,547	$3,475,517	40.38	$19,968	($3,057,031)
12/15/2037	23	3,406	1.02	3,576	$55.0	$3.5		$187,334	$3,560	$6.0	($21,454)	($22,480)	($427)	$146,534	$3,622,050	40.98	$16,365	($3,040,667)
12/15/2038	24	3,335	0.53	3,423	$55.0	$3.5		$183,413	$1,850	$6.0	($20,537)	($22,010)	($222)	$142,494	$3,764,544	41.63	$14,467	($3,026,200)
12/15/2039	25	1,884	0.07	1,897	$55.0	$3.5		$103,635	$262	$6.0	($11,381)	($12,436)	($31)	$80,049	$3,844,594	42.20	$7,388	($3,018,812)
	Total	379,396	618.61	482,484											$3,844,594			($3,018,812)

The initial investment considered was 14.2 MMUS$ for a horizontal well length of 4035 ft and 16 fractures. According to the type well production curve, this generated a NPV@10% of -3 MMUS$.

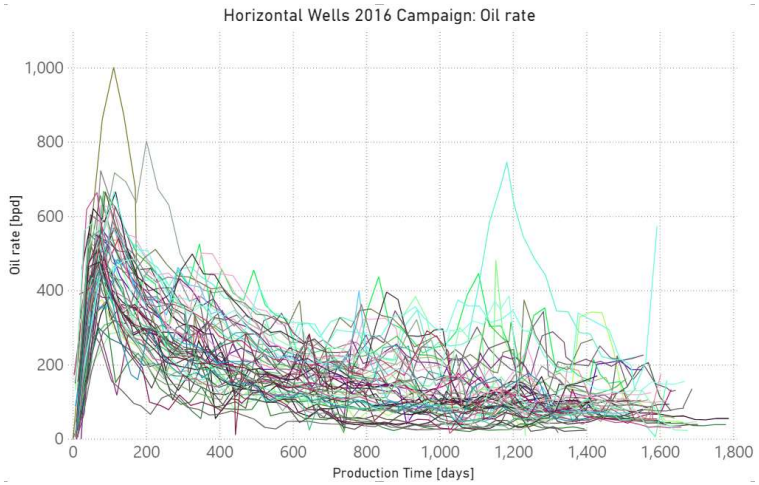
The 2015 type well for this level of investment should have produced with a peak rate of 579 bpd, a cumulative production of 120 Kbbl at 365 days and an EUR of 530 Kbbl of oil in order to be Economic.

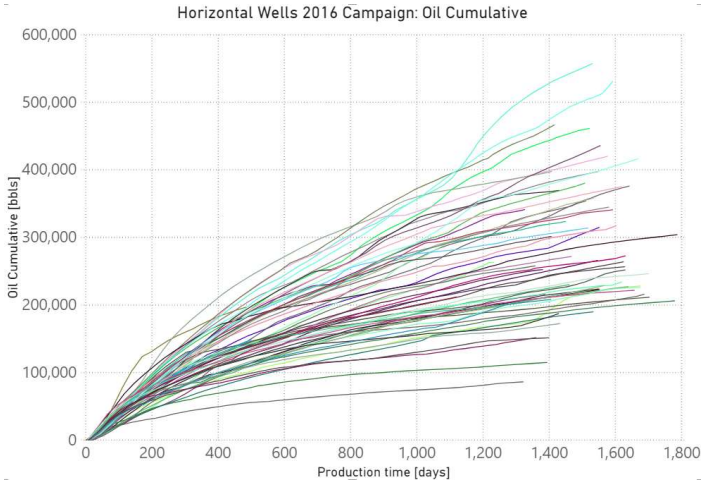
2016 Campaign – 64 Wells (Horizontal Oil Wells)

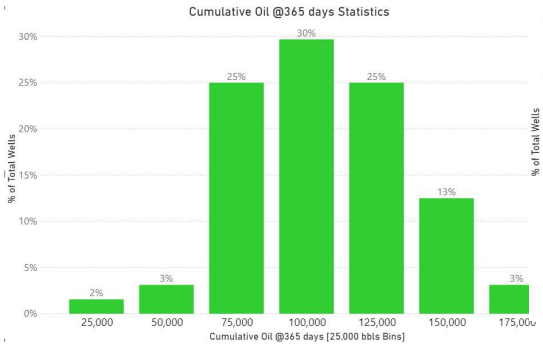
In 2016, 64 horizontal wells were drilled. The average horizontal well length was 4390 ft and the number of fractures grew to 17.

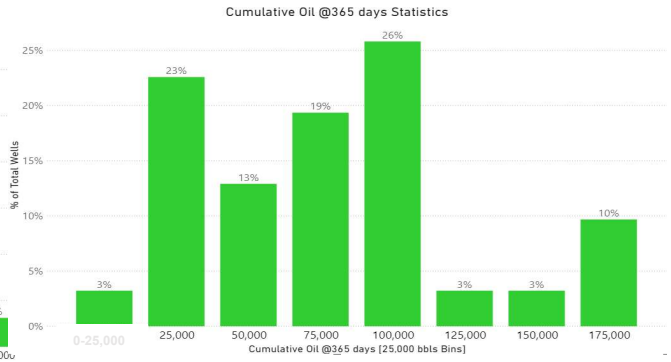
The maximum oil rate increased to values between 450 and 750 bpd for 80% of the wells.

55% of the wells in this campaign accumulated more than 100 Kbbl of oil after 365 days. To date, the average cumulative of the wells is 270 Kbbl.

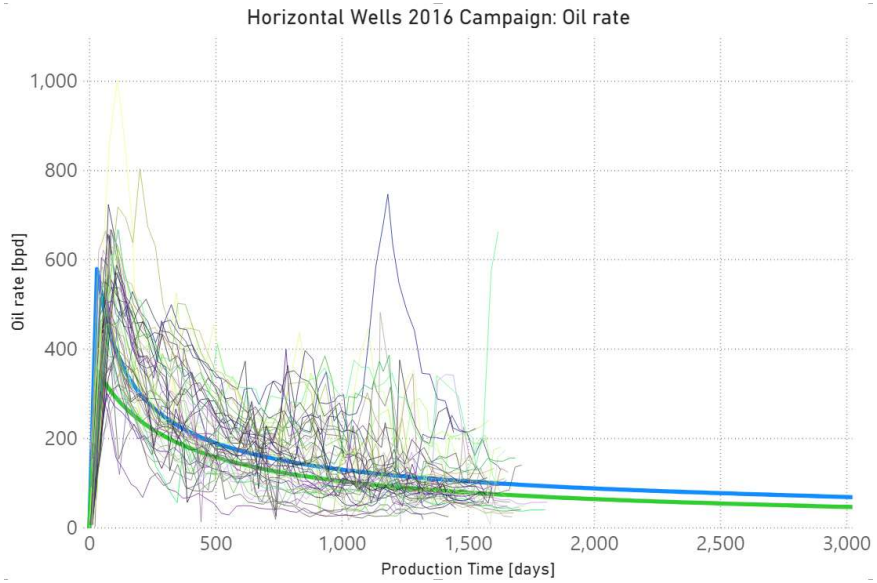


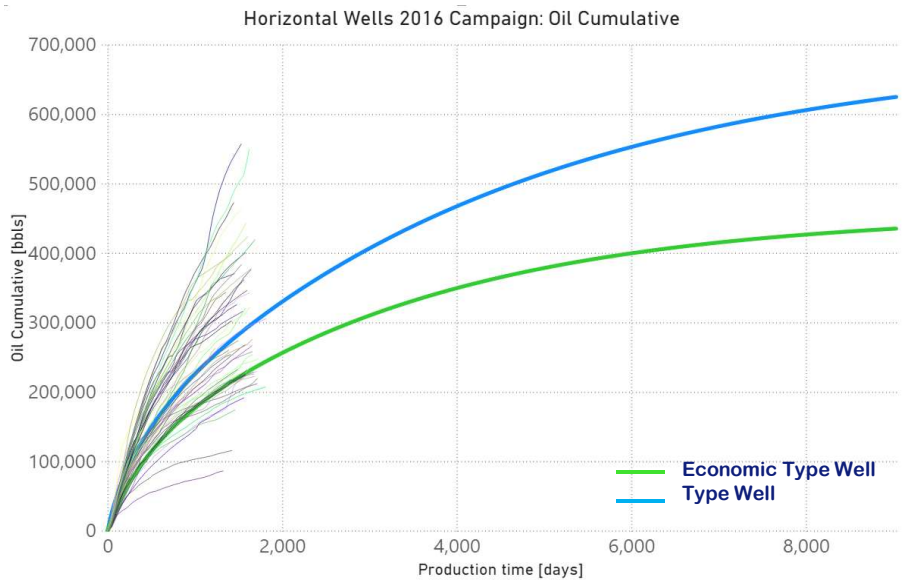






2016 Campaign – 64 Wells
Type Well and Economic Well





The 2016 type well turned out to have a maximum flow rate of 579 bpd, a cumulative production of 127 Kbbl at 365 days and an EUR of 624 Kbbl of oil.

From the 2016 campaign on, the resulting type well became more productive than the type well calculated as Economic (NPV@10% = 0).

2016 Campaign – 64 Wells Economic Evaluation

Well Data

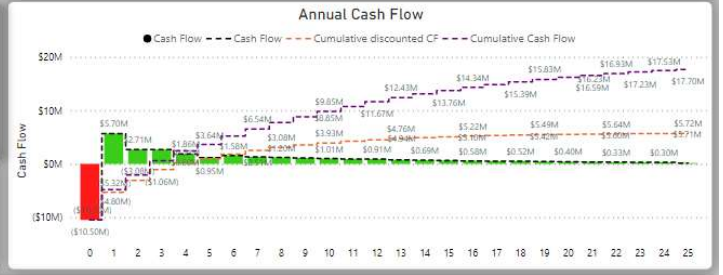
Pozo_Form_P	MinDate	Np [m3]	Gp [Mm3/d]	Lateral Length [ft]	Fracture Stages	qo_ef_peak [bpd]	qg_ef_peak [Mm3]	qo_avg [m3/d]	qg_avg [Mm3/d]	EUR [bbls]
Pozo Tipo VM 2016 (h)	Jan 2016	99,358	25,492	4,390	17	578.66		9.5	2.44	624,943

Selected Parameters

Total Capex	Total Opex [$/bbl]	Oil Price [$/bbl]	Gas Price [$/Mcf]	Royalties	Discount rate
$10,500,000	6.0	55.00	3.5	12.00%	10.00%

Economic Indicators

NPV @Td 10%	Cumulative Cash Flow	IRR	INPV	Repayment Time	Repayment time @Td
$5,721,655	$17,702,076	23.99%	0.54	3	4



Calendar Date	Year	Annual Oil Volume [bbls]	Annual Gas Volume [MMcf]	Total BOEs [bbl]	Barril Petróleo [$/bbl]	Precio Gas [$/Mcf]	Capex	Revenue Oil	Revenue Gas	Opex [$/bbl]	Annual Opex	Oil Royalties	Gas Royalties	Cash Flow	Cumulative Cash Flow	Net Back	Discounted Cash Flow	Cumulative discounted CF
	0	0		0	$0.0	$0.0	($10,500,000)	$0		$0.0	$0	$0		($10,500,000)	($10,500,000)		($10,500,000)	($10,500,000)
12/15/2016	1	127,836	110.59	146,264	$63.2	$3.5		$8,083,577	$387,051	$12.0	($1,755,172)	($970,029)	($46,446)	$5,698,981	($4,801,019)	38.96	$5,180,892	($5,319,108)
12/15/2017	2	63,409	80.51	76,826	$56.5	$3.5		$3,582,819	$281,797	$9.0	($691,435)	($429,938)	($33,816)	$2,709,427	($2,091,592)	35.27	$2,239,196	($3,079,912)
12/15/2018	3	48,360	103.03	65,530	$65.0	$3.5		$3,142,281	$360,620	$6.0	($393,178)	($377,074)	($43,274)	$2,689,375	$597,783	41.04	$2,020,567	($1,059,345)
12/15/2019	4	40,248	89.37	55,141	$54.0	$3.5		$2,173,417	$312,793	$6.0	($330,843)	($260,810)	($37,535)	$1,857,022	$2,454,804	33.68	$1,268,371	$209,025
12/15/2020	5	35,011	77.31	47,895	$40.1	$3.5		$1,403,330	$270,593	$6.0	($287,368)	($168,400)	($32,471)	$1,185,685	$3,640,489	24.76	$736,217	$945,243
12/15/2021	6	33,757	72.25	45,797	$55.0	$3.5		$1,856,620	$252,883	$6.0	($274,783)	($222,794)	($30,346)	$1,581,579	$5,222,069	34.53	$892,760	$1,838,003
12/15/2022	7	28,260	57.81	37,894	$55.0	$3.5		$1,554,291	$202,352	$6.0	($227,366)	($186,515)	($24,282)	$1,318,480	$6,540,548	34.79	$676,589	$2,514,591
12/15/2023	8	25,935	50.40	34,335	$55.0	$3.5		$1,426,449	$176,410	$6.0	($206,009)	($171,174)	($21,169)	$1,204,507	$7,745,056	35.08	$561,912	$3,076,503
12/15/2024	9	23,810	43.71	31,093	$55.0	$3.5		$1,309,538	$152,975	$6.0	($186,560)	($157,145)	($18,357)	$1,100,452	$8,845,507	35.39	$466,699	$3,543,202
12/15/2025	10	21,858	37.72	28,144	$55.0	$3.5		$1,202,209	$132,008	$6.0	($168,862)	($144,265)	($15,841)	$1,005,249	$9,850,757	35.72	$387,567	$3,930,769
12/15/2026	11	20,067	32.39	25,465	$55.0	$3.5		$1,103,677	$113,370	$6.0	($152,788)	($132,441)	($13,604)	$918,213	$10,768,970	36.06	$321,828	$4,252,597
12/15/2027	12	19,887	29.79	24,851	$55.0	$3.5		$1,093,809	$104,256	$6.0	($149,108)	($131,257)	($12,511)	$905,189	$11,674,158	36.42	$288,421	$4,541,018
12/15/2028	13	16,792	23.19	20,656	$55.0	$3.5		$923,572	$81,159	$6.0	($123,938)	($110,829)	($9,739)	$760,225	$12,434,383	36.80	$220,210	$4,761,228
12/15/2029	14	15,416	19.56	18,675	$55.0	$3.5		$847,877	$68,453	$6.0	($112,051)	($101,745)	($8,214)	$694,319	$13,128,702	37.18	$182,836	$4,944,064
12/15/2030	15	14,152	16.37	16,880	$55.0	$3.5		$778,385	$57,282	$6.0	($101,279)	($93,406)	($6,874)	$634,108	$13,762,810	37.57	$151,800	$5,095,864
12/15/2031	16	12,993	13.57	15,253	$55.0	$3.5		$714,589	$47,482	$6.0	($91,520)	($85,751)	($5,698)	$579,103	$14,341,913	37.97	$126,030	$5,221,894
12/15/2032	17	11,928	11.12	13,780	$55.0	$3.5		$656,022	$38,903	$6.0	($82,680)	($78,723)	($4,668)	$528,854	$14,870,767	38.38	$104,631	$5,326,525
12/15/2033	18	11,821	9.63	13,427	$55.0	$3.5		$650,156	$33,721	$6.0	($80,560)	($78,019)	($4,047)	$521,253	$15,392,020	38.82	$93,752	$5,420,277
12/15/2034	19	9,981	6.97	11,142	$55.0	$3.5		$548,968	$24,382	$6.0	($66,853)	($65,876)	($2,926)	$437,695	$15,829,715	39.28	$71,567	$5,491,844
12/15/2035	20	9,163	5.37	10,057	$55.0	$3.5		$503,975	$18,782	$6.0	($60,345)	($60,477)	($2,254)	$399,682	$16,229,397	39.74	$59,410	$5,551,254
12/15/2036	21	8,412	3.98	9,076	$55.0	$3.5		$462,669	$13,937	$6.0	($54,454)	($55,520)	($1,672)	$364,959	$16,594,356	40.21	$49,317	$5,600,571
12/15/2037	22	7,723	2.79	8,187	$55.0	$3.5		$424,749	$9,759	$6.0	($49,124)	($50,970)	($1,171)	$333,243	$16,927,599	40.70	$40,938	$5,641,508
12/15/2038	23	7,090	1.76	7,384	$55.0	$3.5		$389,937	$6,173	$6.0	($44,302)	($46,792)	($741)	$304,275	$17,231,874	41.21	$33,981	$5,675,489
12/15/2039	24	7,026	0.93	7,181	$55.0	$3.5		$386,451	$3,245	$6.0	($43,085)	($46,374)	($389)	$299,847	$17,531,721	41.76	$30,442	$5,705,931
12/15/2040	25	4,011	0.13	4,033	$55.0	$3.5		$220,622	$465	$6.0	($24,201)	($26,475)	($56)	$170,356	$17,702,076	42.24	$15,723	$5,721,655
	Total	624,946	900.24	774,966											$17,702,076			$5,721,655

The initial investment in drilling decreased to 10.5 MMUS$ in 2016 for a horizontal well length of 4390 ft and 17 fractures. According to the production curve of the type well, this generated a NPV@10% of 5.7 MMUS$.

The 2016 type well for this level of investment should have produced with a peak rate of 352 bpd, a cumulative production of 96 Kbbl at 365 days and an EUR of 435 Kbbl of oil in order to be Economic.

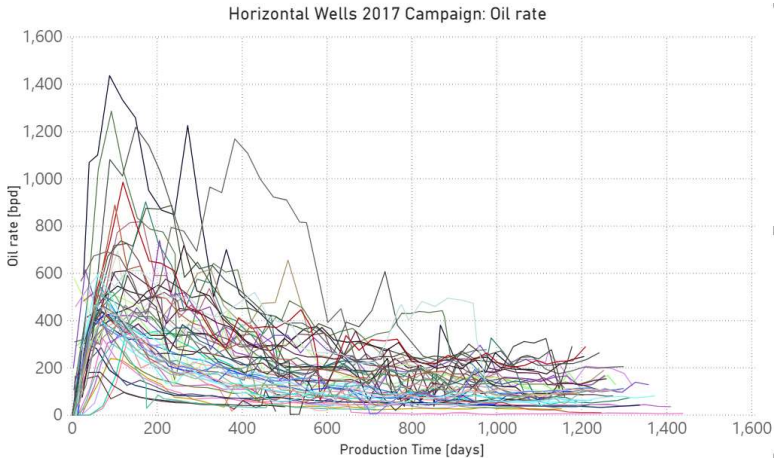
According to this calculation, 56 out of the 64 wells drilled during 2016 met this productivity condition.

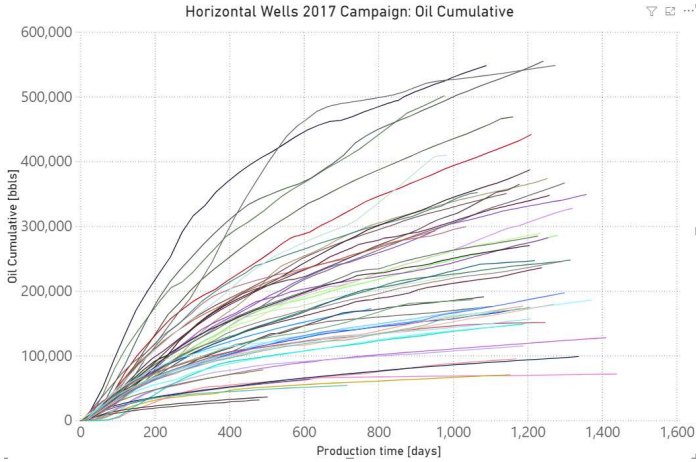
2017 Campaign – 54 Wells (Horizontal Oil Wells)

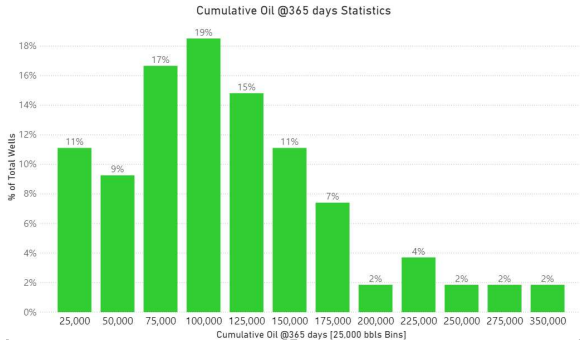
In 2017, the number of horizontal oil wells drilled decreased to 54. The average horizontal well length increased to 5095 ft and the number of fractures grew strongly to 23.

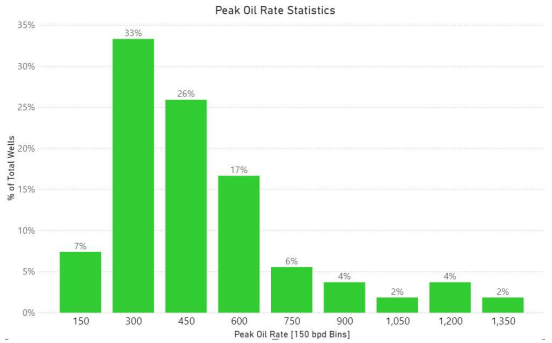
The rise in the number of fractures generated an increase in the average maximum rate to 566 bpd, with 10 % of the wells with peak rates above 900 bpd.

70% of the wells accumulated more than 75 Kbbl of oil after 365 days. The average cumulative of the wells of this campaign is 240 Kbbl.

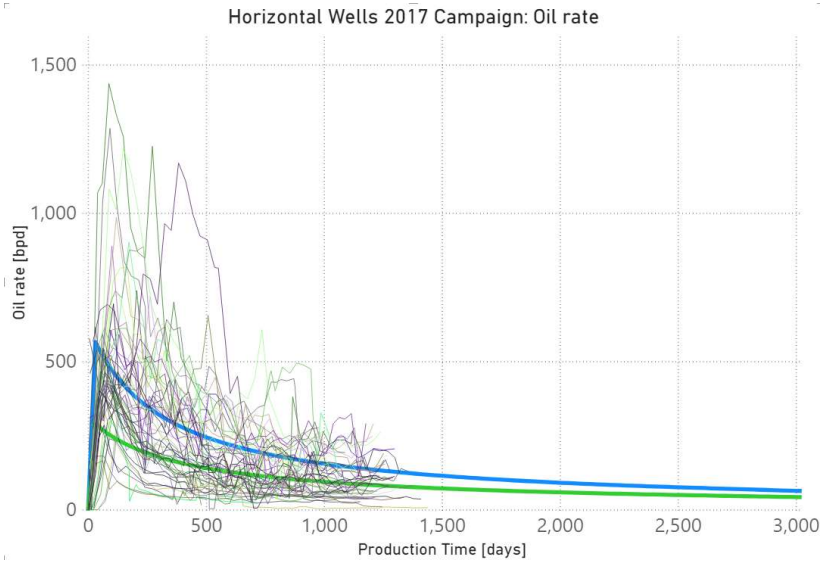


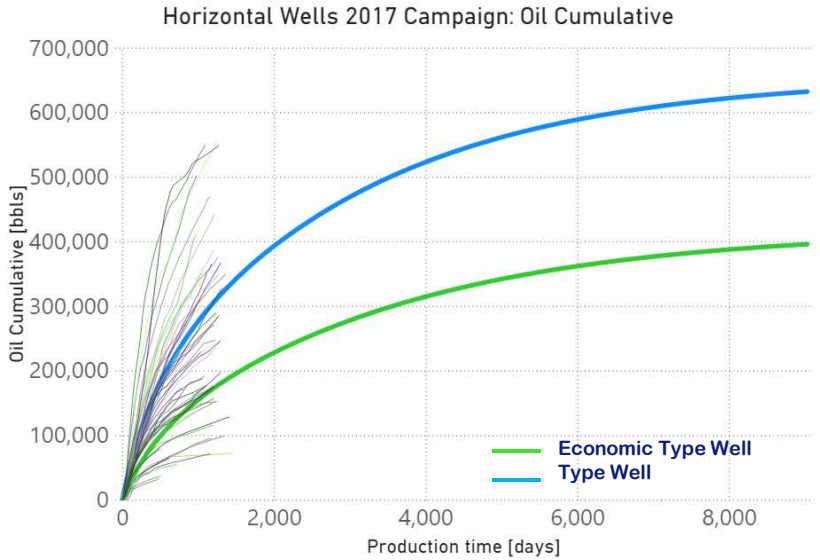






2017 Campaign – 54 Wells
Type Well and Economic Well





The 2017 type well turned out to have a maximum flow rate of 566 bpd, a cumulative production of 152 Kbbl at 365 days and an EUR of 628 Kbbl of oil.

The resulting type well became more productive than the type well calculated as Economic (NPV@10% = 0).

2017 Campaign – 54 Wells Economic Evaluation

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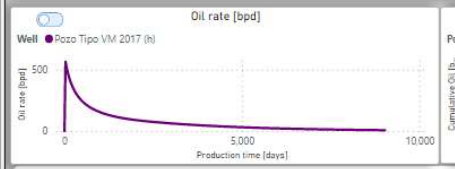
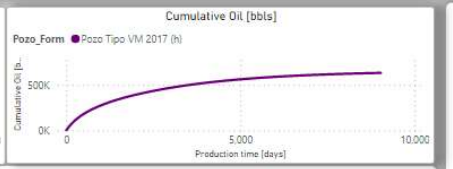
Well Data

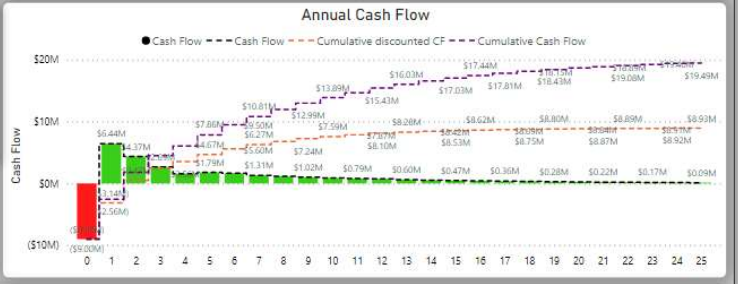
Pozo_Form_P	MinDate	Np [m3]	Gp [Mm3/d]	Lateral Length [ft]	Fracture Stages	qo_ef_peak [bpd]	qg_ef_peak [Mm3]	qo_avg [m3/d]	qg_avg [Mm3/d]	EUR [bbls]
Pozo Tipo VM 2017 (h)	Jan 2017	100,518	26,500	5,095	23	566.08		11.2	2.94	632,239

Selected Parameters

Total Capex	Total Opex [$/bbl]	Oil Price [$/bbl]	Gas Price [$/Mcf]	Royalties	Discount rate
$9,000,000	6.0	55.00	3.5	12.00%	10.00%







Economic Indicators

NPV @Td 10%	Cumulative Cash Flow	IRR	INPV	Repayment Time	Repayment time @Td
$8,930,969	$19,486,677	40.76%	0.99	2	2

Calendar Date	Year	Annual Oil Volume [bbls]	Annual Gas Volume [MMcf]	Total BOEs [bbl]	Barril Petróleo [$/bbl]	Precio Gas [$/Mcf]	Capex	Revenue Oil	Revenue Gas	Opex [$/bbl]	Annual Opex	Oil Royalties	Gas Royalties	Cash Flow	Cumulative Cash Flow	Net Back	Discounted Cash Flow	Cumulative discounted CF
	0	0	0.00	0	$0.0	$0.0	($9,000,000)	$0	$0	$0.0	$0	$0	$0	($9,000,000)	($9,000,000)		($9,000,000)	($9,000,000)
12/15/2017	1	153,088	131.79	175,050	$56.5	$3.5		$8,649,978	$461,262	$9.0	($1,575,448)	($1,037,997)	($55,351)	$6,442,443	($2,557,557)	36.80	$5,856,766	($3,143,234)
12/15/2018	2	81,150	102.51	98,232	$65.0	$3.5		$5,272,937	$358,775	$6.0	($589,395)	($632,752)	($43,053)	$4,366,512	$1,808,955	44.45	$3,608,688	$465,454
12/15/2019	3	58,583	124.77	79,376	$54.0	$3.5		$3,163,572	$436,703	$6.0	($476,256)	($379,629)	($52,404)	$2,691,986	$4,500,941	33.91	$2,022,529	$2,487,983
12/15/2020	4	46,102	102.36	63,160	$40.1	$3.5		$1,847,873	$358,269	$6.0	($378,958)	($221,745)	($42,992)	$1,562,447	$6,063,387	24.74	$1,067,172	$3,555,155
12/15/2021	5	38,130	84.21	52,163	$55.0	$3.5		$2,097,168	$294,727	$6.0	($312,978)	($251,660)	($35,367)	$1,791,888	$7,855,275	34.35	$1,112,622	$4,667,776
12/15/2022	6	35,095	75.13	47,614	$55.0	$3.5		$1,930,203	$262,947	$6.0	($285,685)	($231,624)	($31,554)	$1,644,287	$9,499,562	34.53	$928,157	$5,595,933
12/15/2023	7	28,184	57.67	37,794	$55.0	$3.5		$1,550,113	$201,838	$6.0	($226,764)	($186,014)	($24,221)	$1,314,953	$10,814,515	34.79	$674,779	$6,270,712
12/15/2024	8	24,919	48.44	32,991	$55.0	$3.5		$1,370,561	$169,527	$6.0	($197,946)	($164,467)	($20,343)	$1,157,331	$11,971,847	35.08	$539,904	$6,810,616
12/15/2025	9	22,043	40.47	28,787	$55.0	$3.5		$1,212,359	$141,649	$6.0	($172,723)	($145,483)	($16,998)	$1,018,804	$12,990,650	35.39	$432,072	$7,242,688
12/15/2026	10	19,499	33.65	25,106	$55.0	$3.5		$1,072,418	$117,780	$6.0	($150,638)	($128,690)	($14,134)	$896,736	$13,887,386	35.72	$345,731	$7,588,418
12/15/2027	11	17,248	27.85	21,888	$55.0	$3.5		$948,630	$97,464	$6.0	($131,330)	($113,836)	($11,696)	$789,233	$14,676,620	36.06	$276,621	$7,865,040
12/15/2028	12	16,446	24.64	20,552	$55.0	$3.5		$904,524	$86,237	$6.0	($123,311)	($108,543)	($10,348)	$748,558	$15,425,178	36.42	$238,514	$8,103,554
12/15/2029	13	13,359	18.45	16,433	$55.0	$3.5		$734,724	$64,580	$6.0	($98,601)	($88,167)	($7,750)	$604,787	$16,029,965	36.80	$175,185	$8,278,739
12/15/2030	14	11,817	15.00	14,316	$55.0	$3.5		$649,916	$52,485	$6.0	($85,894)	($77,990)	($6,298)	$532,219	$16,562,183	37.18	$140,150	$8,418,889
12/15/2031	15	10,453	12.09	12,468	$55.0	$3.5		$574,897	$42,320	$6.0	($74,806)	($68,988)	($5,078)	$468,345	$17,030,528	37.56	$112,118	$8,531,007
12/15/2032	16	9,246	9.66	10,856	$55.0	$3.5		$508,537	$33,802	$6.0	($65,133)	($61,024)	($4,056)	$412,125	$17,442,654	37.96	$89,690	$8,620,697
12/15/2033	17	8,179	7.62	9,449	$55.0	$3.5		$449,838	$26,686	$6.0	($56,697)	($53,981)	($3,202)	$362,644	$17,805,297	38.38	$71,747	$8,692,444
12/15/2034	18	7,799	6.36	8,858	$55.0	$3.5		$428,922	$22,258	$6.0	($53,150)	($51,471)	($2,671)	$343,888	$18,149,186	38.82	$61,851	$8,754,296
12/15/2035	19	6,335	4.42	7,072	$55.0	$3.5		$348,404	$15,482	$6.0	($42,430)	($41,808)	($1,858)	$277,789	$18,426,975	39.28	$45,421	$8,799,716
12/15/2036	20	5,603	3.28	6,151	$55.0	$3.5		$308,188	$11,492	$6.0	($36,904)	($36,983)	($1,379)	$244,415	$18,671,390	39.74	$36,331	$8,836,047
12/15/2037	21	4,957	2.35	5,348	$55.0	$3.5		$272,614	$8,218	$6.0	($32,087)	($32,714)	($986)	$215,045	$18,886,435	40.21	$29,059	$8,865,106
12/15/2038	22	4,384	1.58	4,649	$55.0	$3.5		$241,147	$5,546	$6.0	($27,891)	($28,938)	($666)	$189,198	$19,075,633	40.70	$23,242	$8,888,349
12/15/2039	23	3,878	0.97	4,039	$55.0	$3.5		$213,312	$3,382	$6.0	($24,236)	($25,597)	($406)	$166,454	$19,242,087	41.21	$18,589	$8,906,938
12/15/2040	24	3,698	0.49	3,780	$55.0	$3.5		$203,394	$1,713	$6.0	($22,678)	($24,407)	($206)	$157,816	$19,399,903	41.75	$16,022	$8,922,960
12/15/2041	25	2,043	0.07	2,055	$55.0	$3.5		$112,377	$238	$6.0	($12,327)	($13,485)	($29)	$86,774	$19,486,677	42.24	$8,009	$8,930,969
	Total	632,237	935.82	788,186											$19,486,677			$8,930,969

The initial investment in drilling decreased to 9 MMUS$ in 2017 for a horizontal well length of 5095 ft and 23 fractures. According to the production curve of the type well, this generated a NPV@10% of 8.9 MMUS$.

Due to the decrease in the cost of drilling, the 2017 type well should have produced with a peak rate of 289 bpd, a cumulative production of 82 Kbbl at 365 days and EUR of 395 Kbbl of oil in order to be Economic.

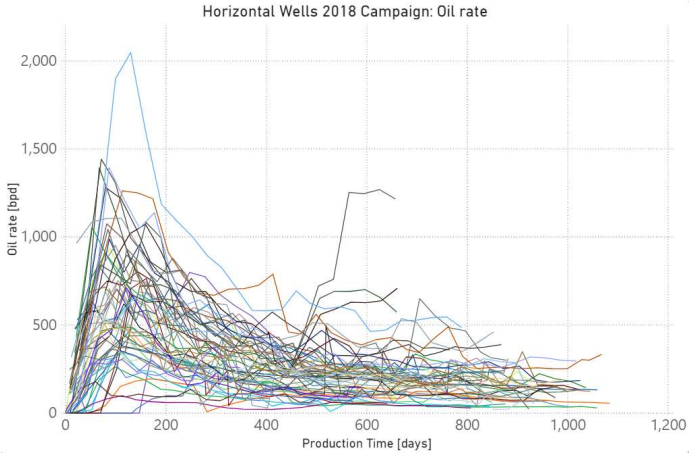
According to this calculation, 40 out of the 54 wells drilled during 2017 met this productivity condition.

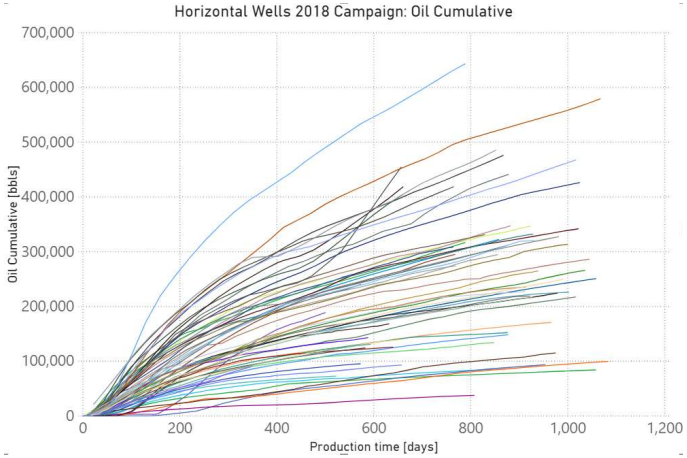
2018 Campaign – 85 Wells (Horizontal Oil Wells)

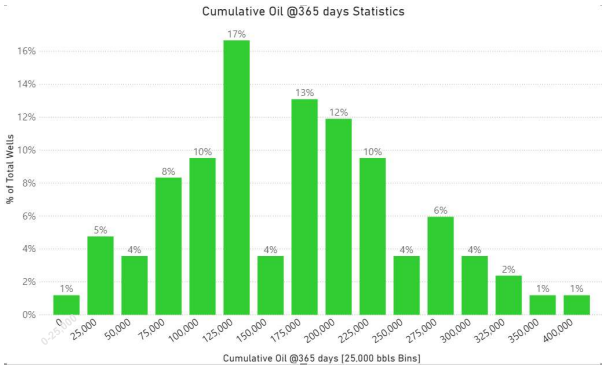
In 2018, the number of horizontal oil wells drilled grew significantly to 84. The average horizontal well length increased to 6670 ft and the number of fractures to 28.

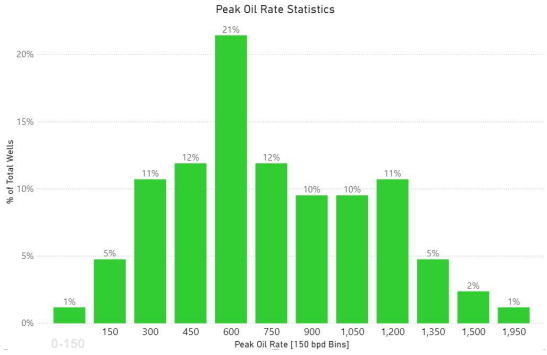
The rise in the number of fractures generated an increase in the average maximum rate to 811 bpd, with 70 % of the wells with peak rates above 600 bpd.

78% of the wells accumulated more than 125 Kbbl of oil after 365 days. To date, the average cumulative of the wells in this campaign is 276 Kbbl.

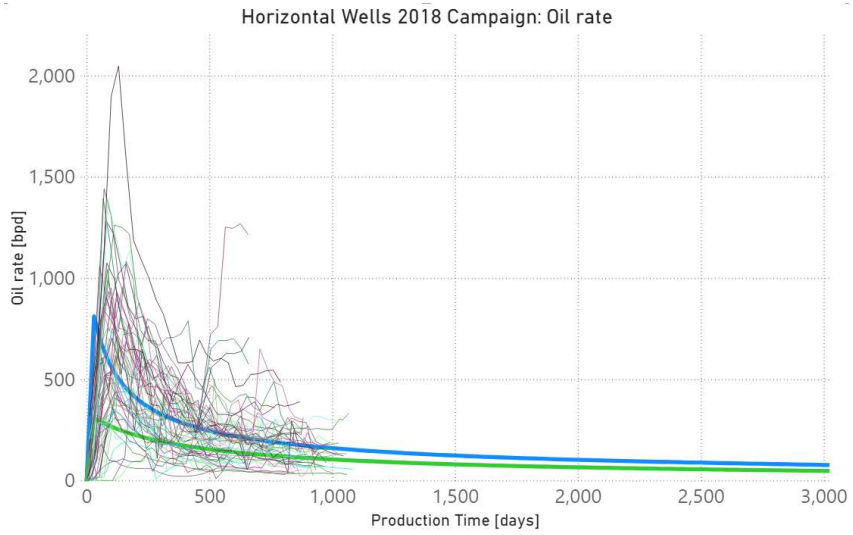


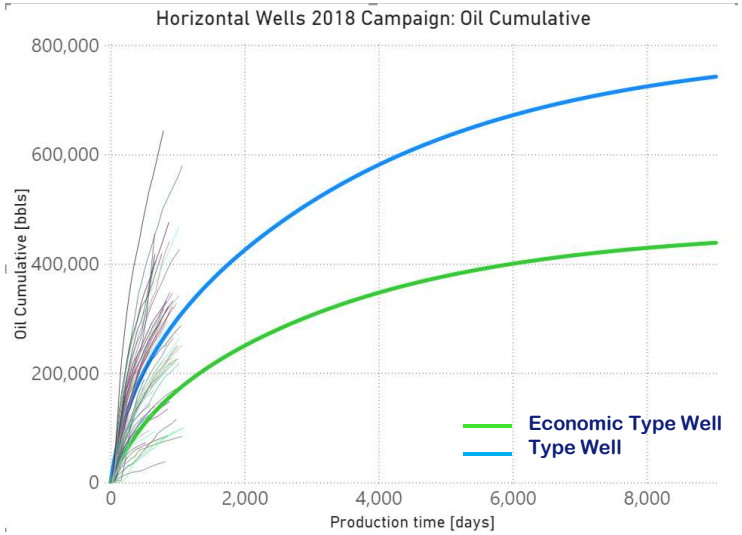






2018 Campaign – 85 Wells
Type Well and Economic Well





The 2018 type well turned out to have a maximum flow rate of 811 bpd, a cumulative production of 175 Kbbl at 365 days and an EUR of 742 Kbbl of oil.

2018 Campaign – 85 Wells Economic Evaluation

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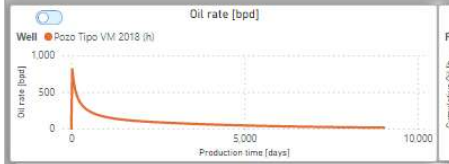
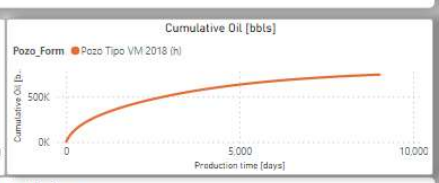
Well Data

Pozo_Form_P	MinDate	Np [m3]	Gp [Mm3/d]	Lateral Length [ft]	Fracture Stages	qo_ef_peak [m3/d]	qg_ef_peak [Mm3]	qo_avg [m3/d]	qg_avg [Mm3/d]	EUR [bbls]
Pozo Tipo VM 2018 (h)	Jan 2018	118,038	27,626	6,670	28	129.00		13.1	3.07	742,437

Selected Parameters

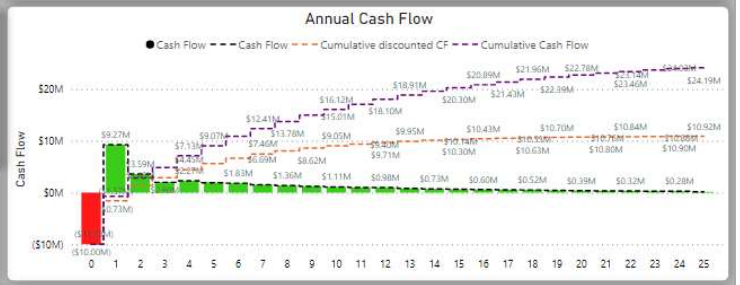
Total Capex	Total Opex [$/bbl]	Oil Price [$/bbl]	Gas Price [$/Mcf]	Royalties	Discount rate
$10,000,000	6.0	55.00	3.5	12.00%	10.00%





Economic Indicators

NPV @Td 10%	Cumulative Cash Flow	IRR	INPV	Repayment Time	Repayment time @Td
$10,918,494	$24,185,389	45.51%	1.09	2	2



Calendar Date	Year	Annual Oil Volume [bbls]	Annual Gas Volume [MMcf]	Total BOEs [bbl]	Barril Petróleo [$/bbl]	Precio Gas [$/Mcf]	Capex	Revenue Oil	Revenue Gas	Opex [$/bbl]	Annual Opex	Oil Royalties	Gas Royalties	Cash Flow	Cumulative Cash Flow	Net Back	Discounted Cash Flow	Cumulative discounted CF
	0	0	0.00	0	$0.0	$0.0	($10,000,000)	$0	$0	$0.0	$0	$0	$0	($10,000,000)	($10,000,000)		($10,000,000)	($10,000,000)
12/15/2018	1	175,166	147.52	199,750	$65.0	$3.5		$11,381,839	$516,329	$6.0	($1,198,498)	($1,365,821)	($61,959)	$9,271,890	($728,110)	46.42	$8,428,991	($1,571,009)
12/15/2019	2	81,675	96.14	97,696	$54.0	$3.5		$4,410,540	$336,493	$6.0	($586,178)	($529,265)	($40,379)	$3,591,211	$2,863,101	36.76	$2,967,943	$1,396,934
12/15/2020	3	60,151	113.86	79,125	$40.1	$3.5		$2,411,006	$398,515	$6.0	($474,751)	($289,321)	($47,822)	$1,997,627	$4,860,728	25.25	$1,500,847	$2,897,781
12/15/2021	4	48,833	96.99	64,995	$55.0	$3.5		$2,685,830	$339,448	$6.0	($389,972)	($322,300)	($40,734)	$2,272,273	$7,133,001	34.96	$1,551,993	$4,449,774
12/15/2022	5	41,668	82.56	55,427	$55.0	$3.5		$2,291,732	$288,975	$6.0	($332,560)	($275,008)	($34,677)	$1,938,461	$9,071,462	34.97	$1,203,632	$5,653,406
12/15/2023	6	39,524	76.03	52,194	$55.0	$3.5		$2,173,819	$266,112	$6.0	($313,166)	($260,858)	($31,933)	$1,833,973	$10,905,435	35.14	$1,035,230	$6,688,635
12/15/2024	7	32,633	60.05	42,640	$55.0	$3.5		$1,794,813	$210,168	$6.0	($255,838)	($215,378)	($25,220)	$1,508,545	$12,413,981	35.38	$774,122	$7,462,758
12/15/2025	8	29,587	51.74	38,208	$55.0	$3.5		$1,627,288	$181,074	$6.0	($229,251)	($195,275)	($21,729)	$1,362,107	$13,776,088	35.65	$635,433	$8,098,191
12/15/2026	9	26,835	44.33	34,223	$55.0	$3.5		$1,475,945	$155,157	$6.0	($205,337)	($177,113)	($18,619)	$1,230,033	$15,006,121	35.94	$521,654	$8,619,845
12/15/2027	10	24,340	37.80	30,638	$55.0	$3.5		$1,338,678	$132,292	$6.0	($183,830)	($160,641)	($15,875)	$1,110,623	$16,116,744	36.25	$428,193	$9,048,038
12/15/2028	11	22,076	32.07	27,421	$55.0	$3.5		$1,214,177	$112,252	$6.0	($164,523)	($145,701)	($13,470)	$1,002,734	$17,119,478	36.57	$351,452	$9,399,490
12/15/2029	12	21,605	29.13	26,458	$55.0	$3.5		$1,188,265	$101,940	$6.0	($158,751)	($142,592)	($12,233)	$976,630	$18,096,108	36.91	$311,184	$9,710,675
12/15/2030	13	18,013	22.39	21,744	$55.0	$3.5		$990,742	$78,361	$6.0	($130,467)	($118,889)	($9,403)	$810,344	$18,906,452	37.27	$234,728	$9,945,403
12/15/2031	14	16,338	18.66	19,447	$55.0	$3.5		$898,600	$65,299	$6.0	($116,683)	($107,832)	($7,836)	$731,548	$19,637,999	37.62	$192,639	$10,138,042
12/15/2032	15	14,819	15.42	17,389	$55.0	$3.5		$815,028	$53,986	$6.0	($104,335)	($97,803)	($6,478)	$660,397	$20,298,397	37.98	$158,094	$10,296,136
12/15/2033	16	13,441	12.63	15,546	$55.0	$3.5		$739,228	$44,212	$6.0	($93,273)	($88,707)	($5,305)	$596,153	$20,894,550	38.35	$129,740	$10,425,876
12/15/2034	17	12,190	10.23	13,894	$55.0	$3.5		$670,477	$35,788	$6.0	($83,367)	($80,457)	($4,295)	$538,147	$21,432,697	38.73	$106,469	$10,532,346
12/15/2035	18	11,930	8.75	13,389	$55.0	$3.5		$656,169	$30,635	$6.0	($80,334)	($78,740)	($3,676)	$524,053	$21,956,750	39.14	$94,256	$10,626,601
12/15/2036	19	9,947	6.25	10,989	$55.0	$3.5		$547,095	$21,872	$6.0	($65,932)	($65,651)	($2,625)	$434,760	$22,391,510	39.56	$71,087	$10,697,688
12/15/2037	20	9,022	4.76	9,815	$55.0	$3.5		$496,214	$16,647	$6.0	($58,888)	($59,546)	($1,998)	$392,429	$22,783,939	39.98	$58,332	$10,756,020
12/15/2038	21	8,183	3.49	8,764	$55.0	$3.5		$450,064	$12,204	$6.0	($52,584)	($54,008)	($1,465)	$354,212	$23,138,151	40.42	$47,865	$10,803,885
12/15/2039	22	7,422	2.41	7,824	$55.0	$3.5		$408,207	$8,444	$6.0	($46,944)	($48,985)	($1,013)	$319,709	$23,457,860	40.86	$39,275	$10,843,160
12/15/2040	23	6,732	1.51	6,983	$55.0	$3.5		$370,242	$5,278	$6.0	($41,898)	($44,429)	($633)	$288,560	$23,746,419	41.32	$32,226	$10,875,386
12/15/2041	24	6,588	0.78	6,719	$55.0	$3.5		$362,341	$2,741	$6.0	($40,311)	($43,481)	($329)	$280,961	$24,027,380	41.82	$28,525	$10,903,910
12/15/2042	25	3,721	0.11	3,740	$55.0	$3.5		$204,665	$389	$6.0	($22,438)	($24,560)	($47)	$158,009	$24,185,389	42.25	$14,584	$10,918,494
	Total	742,439	975.60	905,018											$24,185,389			$10,918,494

The initial investment in drilling increased to 10 MMUS$ in 2018 for a horizontal well length of 6670 ft and 28 fractures. According to the production curve of the type well, this generated a NPV@10% of 10.9 MMUS$.

Due to the increase in the cost of drilling, the 2018 type well should have produced with a peak rate of 309 bpd, a cumulative production of 89 Kbbl at 365 days and EUR of 438 Kbbl of oil in order to be Economic.

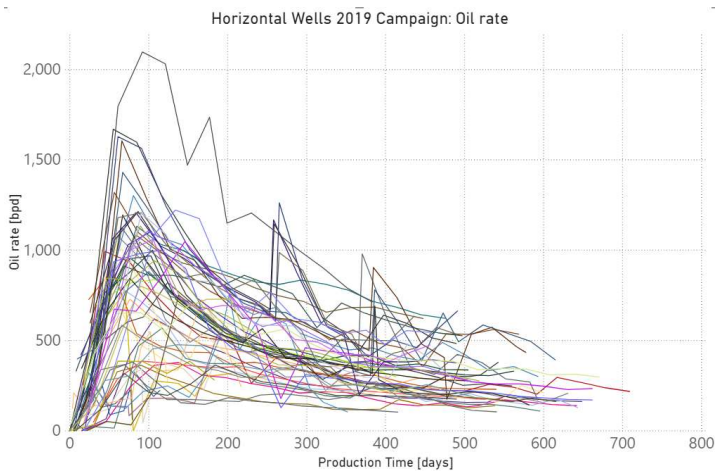
According to this calculation, 70 of the 85 wells drilled during 2018 met this productivity condition.

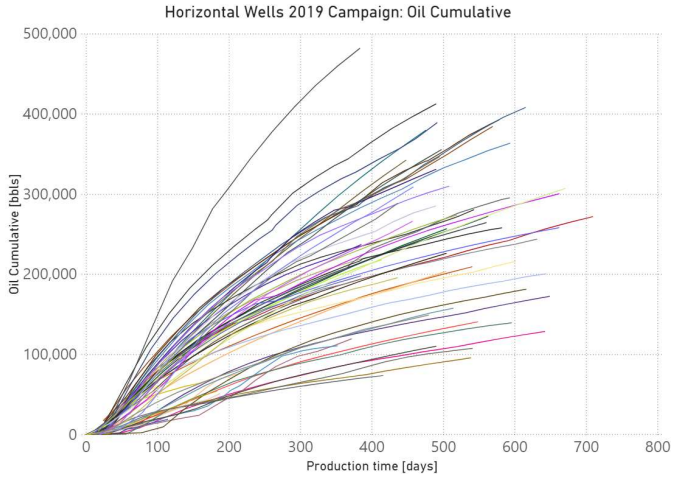
2019 Campaign – 111 Wells (Horizontal Oil Wells)

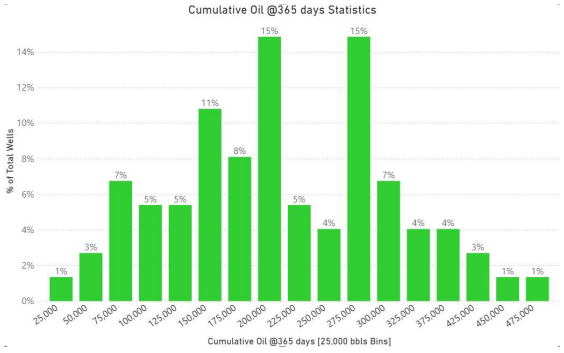
In 2019, the number of horizontal oil wells drilled grew to 111. The average horizontal well length increased to 6939 ft and the number of fractures to 31.

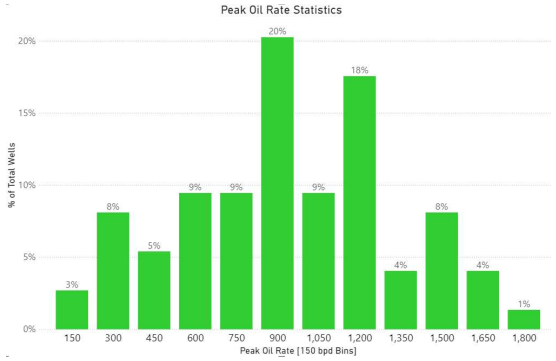
The rise in the number of fractures generated an increase in the average maximum rate to 918 bpd, with 70 % of the wells with peak rates above 900 bpd.

65% of the wells accumulated more than 200 Kbbl of oil after 365 days. The average cumulative of the wells of this campaign is 232 Kbbl.

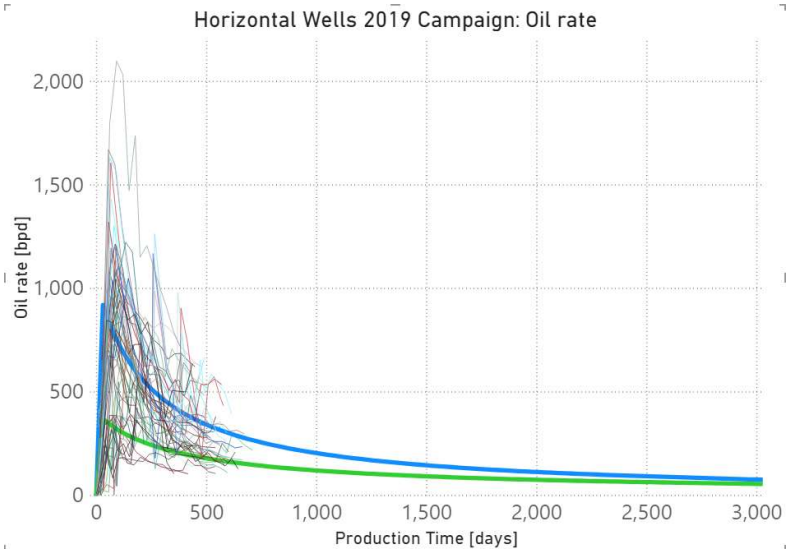


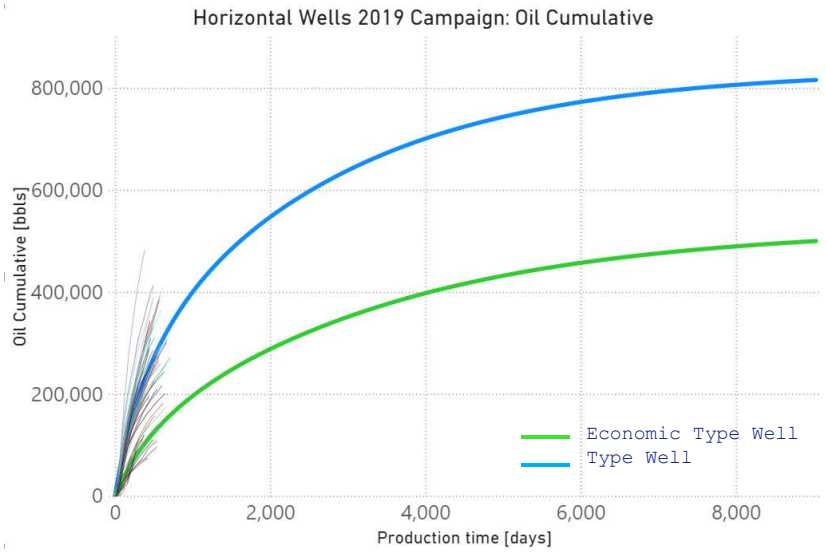






2019 Campaign – 111 Wells
Type Well and Economic Well





The 2019 type well turned out to have a maximum flow rate of 918 bpd, a cumulative production of 232 Kbbl at 365 days and an EUR of 811 Kbbl of oil.

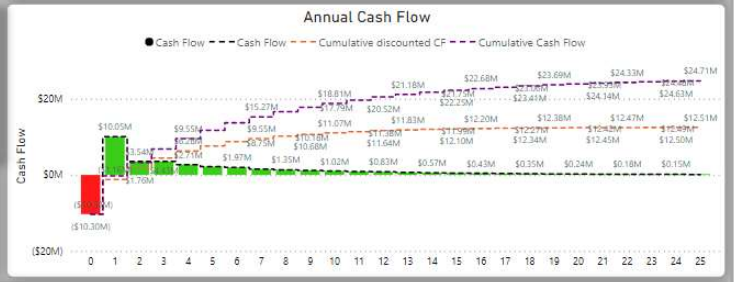
2019 Campaign – 111 Wells Economic Evaluation

Well Data

Pozo_Form_P	MinDate	Np [m3]	Gp [Mm3/d]	Lateral Length [ft]	Fracture Stages	qo_ef_peak [m3/d]	qg_ef_peak [Mm3]	qo_avg [m3/d]	qg_avg [Mm3/d]	EUR [bbls]
Pozo Tipo VM 2019 (h)	Jan 2019	129,737	28,420	6,939	31	146.00		14.4	3.16	816,021

Selected Parameters

Total Capex	Total Opex [$/bbl]	Oil Price [$/bbl]	Gas Price [$/Mcf]	Royalties	Discount rate
$10,300,000	6.0	55.00	3.5	12.00%	10.00%



Economic Indicators

NPV @Td 10%	Cumulative Cash Flow	IRR	INPV	Repayment Time	Repayment time @Td
$12,509,709	$24,714,263	51.85%	1.21	2	2

Calendar Date	Year	Annual Oil Volume [bbls]	Annual Gas Volume [MMcf]	Total BOEs [bbl]	Barril Petróleo [$/bbl]	Precio Gas [$/Mcf]	Capex	Revenue Oil	Revenue Gas	Opex [$/bbl]	Annual Opex	Oil Royalties	Gas Royalties	Cash Flow	Cumulative Cash Flow	Net Back	Discounted Cash Flow	Cumulative discounted CF
	0	0	0.00	0	$0.0	$0.0	($10,300,000)	$0	$0	$0.0	$0	$0	$0	($10,300,000)	($10,300,000)		($10,300,000)	($10,300,000)
12/15/2019	1	232,325	195.66	264,930	$54.0	$3.5		$12,545,795	$684,813	$6.0	($1,589,583)	($1,505,495)	($82,178)	$10,053,352	($246,648)	37.95	$9,139,411	($1,160,589)
12/15/2020	2	111,874	125.07	132,717	$40.1	$3.5		$4,484,212	$437,756	$6.0	($796,301)	($538,105)	($52,531)	$3,535,031	$3,288,383	26.64	$2,921,513	$1,760,924
12/15/2021	3	77,152	132.32	99,202	$55.0	$3.5		$4,243,338	$463,120	$6.0	($595,212)	($509,201)	($55,574)	$3,546,471	$6,834,854	35.75	$2,664,516	$4,425,441
12/15/2022	4	58,861	104.90	76,341	$55.0	$3.5		$3,237,343	$367,140	$6.0	($458,048)	($388,481)	($44,057)	$2,713,897	$9,548,751	35.55	$1,853,628	$6,279,069
12/15/2023	5	47,557	84.16	61,581	$55.0	$3.5		$2,615,631	$294,554	$6.0	($369,489)	($313,876)	($35,346)	$2,191,474	$11,740,225	35.59	$1,360,733	$7,639,801
12/15/2024	6	42,928	73.58	55,189	$55.0	$3.5		$2,361,021	$257,521	$6.0	($331,134)	($283,323)	($30,902)	$1,973,183	$13,713,408	35.75	$1,113,811	$8,753,612
12/15/2025	7	33,918	55.54	43,174	$55.0	$3.5		$1,865,493	$194,403	$6.0	($259,045)	($223,859)	($23,328)	$1,553,664	$15,267,073	35.99	$797,275	$9,550,887
12/15/2026	8	29,568	45.99	37,232	$55.0	$3.5		$1,626,246	$160,961	$6.0	($223,391)	($195,150)	($19,315)	$1,349,351	$16,616,424	36.24	$629,482	$10,180,370
12/15/2027	9	25,790	37.89	32,103	$55.0	$3.5		$1,418,432	$132,601	$6.0	($192,619)	($170,212)	($15,912)	$1,172,290	$17,788,714	36.52	$497,166	$10,677,535
12/15/2028	10	22,494	31.06	27,670	$55.0	$3.5		$1,237,174	$108,712	$6.0	($166,021)	($148,461)	($13,045)	$1,018,359	$18,807,072	36.80	$392,621	$11,070,156
12/15/2029	11	19,620	25.34	23,843	$55.0	$3.5		$1,079,078	$88,702	$6.0	($143,058)	($129,489)	($10,644)	$884,589	$19,691,661	37.10	$310,043	$11,380,200
12/15/2030	12	18,436	22.10	22,118	$55.0	$3.5		$1,013,962	$77,346	$6.0	($132,710)	($121,675)	($9,281)	$827,641	$20,519,302	37.42	$263,712	$11,643,911
12/15/2031	13	14,757	16.31	17,474	$55.0	$3.5		$811,613	$57,076	$6.0	($104,845)	($97,394)	($6,849)	$659,602	$21,178,904	37.75	$191,063	$11,834,975
12/15/2032	14	12,871	13.07	15,049	$55.0	$3.5		$707,899	$45,739	$6.0	($90,292)	($84,948)	($5,489)	$572,909	$21,751,813	38.07	$150,865	$11,985,839
12/15/2033	15	11,226	10.39	12,958	$55.0	$3.5		$617,438	$36,365	$6.0	($77,746)	($74,093)	($4,364)	$497,601	$22,249,415	38.40	$119,122	$12,104,961
12/15/2034	16	9,792	8.18	11,155	$55.0	$3.5		$538,537	$28,640	$6.0	($66,931)	($64,624)	($3,437)	$432,185	$22,681,599	38.74	$94,056	$12,199,017
12/15/2035	17	8,540	6.37	9,602	$55.0	$3.5		$469,719	$22,295	$6.0	($57,611)	($56,366)	($2,675)	$375,361	$23,056,960	39.09	$74,263	$12,273,280
12/15/2036	18	8,025	5.24	8,898	$55.0	$3.5		$441,374	$18,327	$6.0	($53,385)	($52,965)	($2,199)	$351,151	$23,408,111	39.47	$63,158	$12,336,438
12/15/2037	19	6,423	3.59	7,022	$55.0	$3.5		$353,292	$12,562	$6.0	($42,129)	($42,395)	($1,507)	$279,822	$23,687,933	39.85	$45,753	$12,382,191
12/15/2038	20	5,603	2.63	6,040	$55.0	$3.5		$308,146	$9,195	$6.0	($36,243)	($36,977)	($1,103)	$243,017	$23,930,950	40.23	$36,123	$12,418,314
12/15/2039	21	4,887	1.85	5,195	$55.0	$3.5		$268,768	$6,483	$6.0	($31,172)	($32,252)	($778)	$211,049	$24,141,999	40.62	$28,519	$12,446,833
12/15/2040	22	4,262	1.23	4,468	$55.0	$3.5		$234,423	$4,315	$6.0	($26,806)	($28,131)	($518)	$183,283	$24,325,282	41.02	$22,516	$12,469,349
12/15/2041	23	3,718	0.74	3,841	$55.0	$3.5		$204,467	$2,594	$6.0	($23,047)	($24,536)	($311)	$159,167	$24,484,450	41.44	$17,775	$12,487,124
12/15/2042	24	3,493	0.37	3,555	$55.0	$3.5		$192,128	$1,296	$6.0	($21,330)	($23,055)	($156)	$148,884	$24,633,333	41.88	$15,116	$12,502,240
12/15/2043	25	1,906	0.05	1,915	$55.0	$3.5		$104,842	$178	$6.0	($11,488)	($12,581)	($21)	$80,929	$24,714,263	42.27	$7,469	$12,509,709
	Total	816,024	1,003.63	983,273											$24,714,263			$12,509,709

The initial investment in drilling was of 10.3 MMUS$ in 2019 for a horizontal well length of 6939 ft and 31 fractures. According to the production curve of the type well, this generated a NPV@10% of 12.5 MMUS$.

The 2019 type well should have produced with a peak rate of 368 bpd, a cumulative production of 104 kbbl at 365 days and EUR of 500 kbbl of oil in order to be Economic.

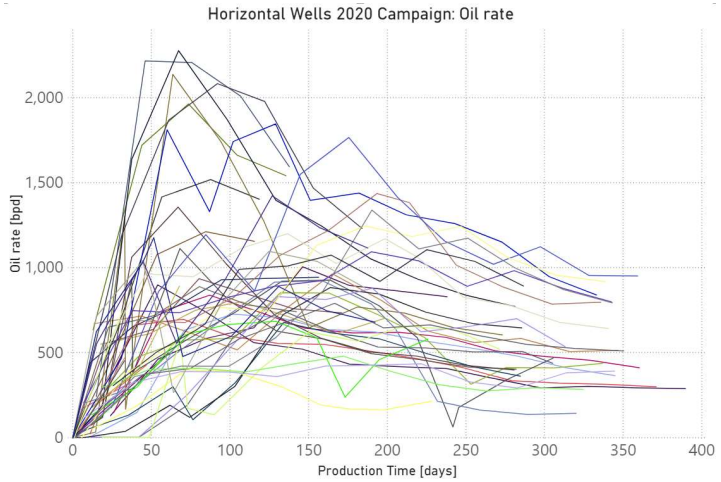
According to this calculation, 92 out of the 111 wells drilled during 2019 met this productivity condition.

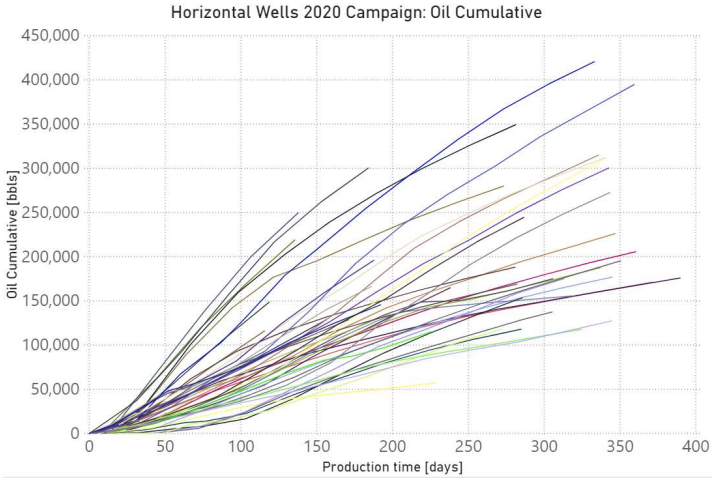
2020 Campaign – 53 Wells (Horizontal Oil Wells)

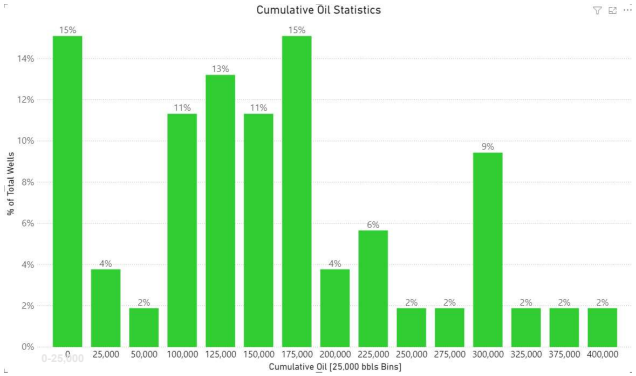
In 2020, the number of horizontal oil wells drilled decreased to 47. The average horizontal well length increased to 7270 ft and the number of fractures to 34.

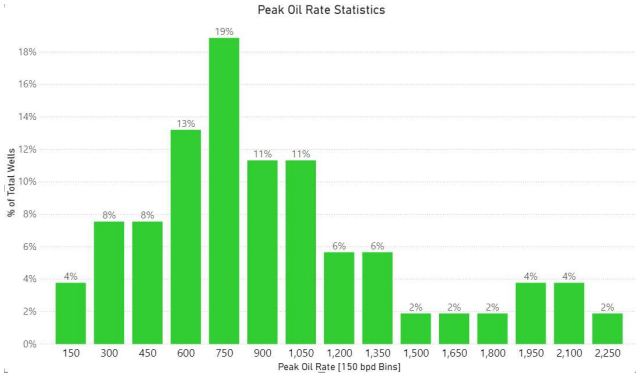
The rise in the number of fractures generated an increase in the average maximum rate to 969 bpd, with 50 % of the wells with peak rates above 900 bpd.

40% of the wells accumulated more than 175 Kbbl of oil.

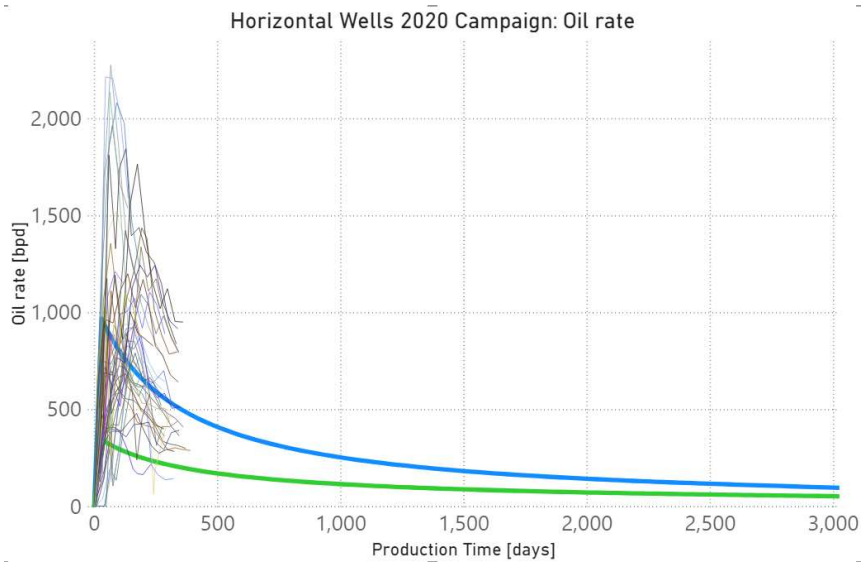


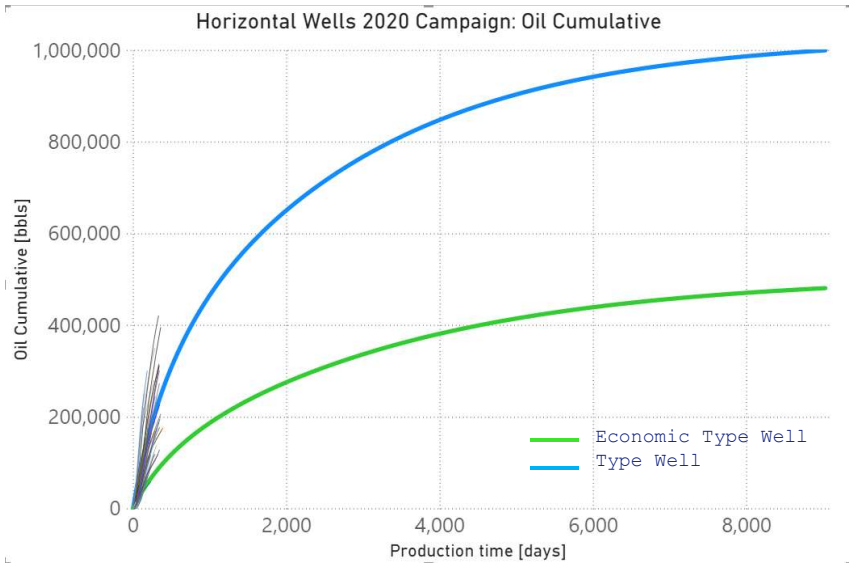






2020 Campaign – 53 Wells
Type Well and Economic Well





The 2020 Type well turned out to have a maximum flow rate of 969 bpd, a cumulative production of 261 Kbbl at 365 days and an EUR of 1 MMbbl of oil.

2020 Campaign – 53 Wells Economic Evaluation

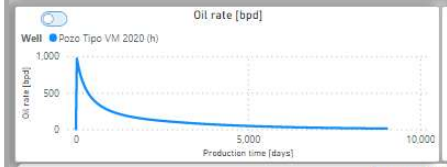
www.fdc-group.com

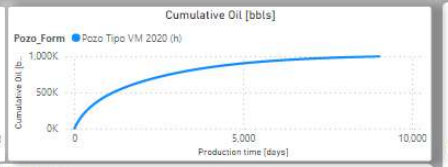
Well Data

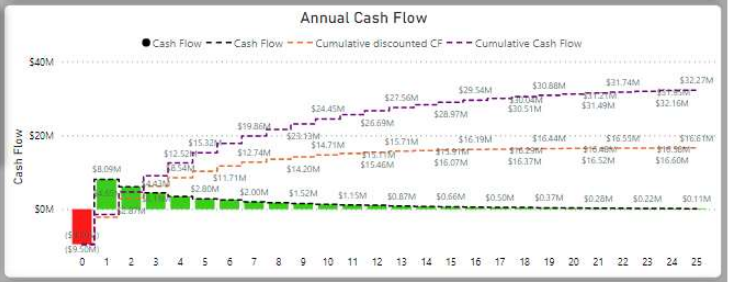
Pozo_Form_P	MinDate	Np [m3]	Gp [Mm3/d]	Lateral Length [ft]	Fracture Stages	qo_ef_peak [m3/d]	qg_ef_peak [Mm3]	qo_avg [m3/d]	qg_avg [Mm3/d]	EUR [bbls]
Pozo Tipo VM 2020 (h)	Jan 2020	158,919	38,210	7,270	34	154.00		17.7	4.20	999,570

Selected Parameters

Total Capex	Total Opex [$/bbl]	Oil Price [$/bbl]	Gas Price [$/Mcf]	Royalties	Discount rate
$9,500,000	6.0	55.00	3.5	12.00%	10.00%







Economic Indicators

NPV @Td 10%	Cumulative Cash Flow	IRR	INPV	Repayment Time	Repayment time @Td
$16,607,339	$32,265,145	60.86%	1.75	2	2

Calendar Date	Year	Annual Oil Volume [bbls]	Annual Gas Volume [MMcf]	Total BOEs [bbl]	Barril Petróleo [$/bbl]	Precio Gas [$/Mcf]	Capex	Revenue Oil	Revenue Gas	Opex [$/bbl]	Annual Opex	Oil Royalties	Gas Royalties	Cash Flow	Cumulative Cash Flow	Net Back	Discounted Cash Flow	Cumulative discounted CF
	0	0	0.00	0	$0.0	$0.0	($9,500,000)	$0	$0	$0.0	$0	$0	$0	($9,500,000)	($9,500,000)		($9,500,000)	($9,500,000)
12/15/2020	1	260,790	219.63	297,391	$40.1	$3.5		$10,453,174	$768,720	$6.0	($1,784,348)	($1,254,381)	($92,246)	$8,090,920	($1,409,080)	27.21	$7,355,382	($2,144,618)
12/15/2021	2	135,203	158.72	161,653	$55.0	$3.5		$7,436,179	$555,519	$6.0	($969,918)	($892,341)	($66,662)	$6,062,776	$4,653,696	37.50	$5,010,559	$2,865,940
12/15/2022	3	95,573	180.85	125,711	$55.0	$3.5		$5,256,500	$632,979	$6.0	($754,264)	($630,780)	($75,958)	$4,428,478	$9,082,174	35.23	$3,327,181	$6,193,122
12/15/2023	4	73,880	146.72	98,331	$55.0	$3.5		$4,063,423	$513,522	$6.0	($589,984)	($487,611)	($61,623)	$3,437,727	$12,519,902	34.96	$2,348,014	$8,541,136
12/15/2024	5	60,184	119.26	80,058	$55.0	$3.5		$3,310,118	$417,416	$6.0	($480,350)	($397,214)	($50,090)	$2,799,880	$15,319,782	34.97	$1,738,505	$10,279,641
12/15/2025	6	54,641	105.13	72,160	$55.0	$3.5		$3,005,259	$367,947	$6.0	($432,960)	($360,631)	($44,154)	$2,535,461	$17,855,243	35.14	$1,431,202	$11,710,843
12/15/2026	7	43,356	79.79	56,652	$55.0	$3.5		$2,384,555	$279,265	$6.0	($339,913)	($286,147)	($33,512)	$2,004,248	$19,859,491	35.38	$1,028,496	$12,739,339
12/15/2027	8	37,924	66.32	48,977	$55.0	$3.5		$2,085,844	$232,136	$6.0	($293,863)	($250,301)	($27,856)	$1,745,960	$21,605,451	35.65	$814,503	$13,553,842
12/15/2028	9	33,190	54.84	42,329	$55.0	$3.5		$1,825,468	$191,934	$6.0	($253,973)	($219,056)	($23,032)	$1,521,341	$23,126,792	35.94	$645,197	$14,199,039
12/15/2029	10	29,047	45.12	36,566	$55.0	$3.5		$1,597,594	$157,909	$6.0	($219,394)	($191,711)	($18,949)	$1,325,449	$24,452,241	36.25	$511,018	$14,710,057
12/15/2030	11	25,421	36.94	31,577	$55.0	$3.5		$1,398,166	$129,289	$6.0	($189,462)	($167,780)	($15,515)	$1,154,699	$25,606,940	36.57	$404,715	$15,114,772
12/15/2031	12	23,971	32.32	29,358	$55.0	$3.5		$1,318,428	$113,136	$6.0	($176,149)	($158,211)	($13,576)	$1,083,627	$26,690,567	36.91	$345,277	$15,460,049
12/15/2032	13	19,256	23.94	23,245	$55.0	$3.5		$1,059,054	$83,784	$6.0	($139,468)	($127,086)	($10,054)	$866,229	$27,556,796	37.27	$250,916	$15,710,965
12/15/2033	14	16,852	19.25	20,059	$55.0	$3.5		$926,852	$67,369	$6.0	($120,357)	($111,222)	($8,084)	$754,558	$28,311,354	37.62	$198,699	$15,909,663
12/15/2034	15	14,748	15.36	17,307	$55.0	$3.5		$811,153	$53,745	$6.0	($103,843)	($97,338)	($6,449)	$657,267	$28,968,620	37.98	$157,344	$16,067,008
12/15/2035	16	12,907	12.13	14,929	$55.0	$3.5		$709,896	$42,471	$6.0	($89,576)	($85,188)	($5,097)	$572,507	$29,541,128	38.35	$124,594	$16,191,602
12/15/2036	17	11,296	9.48	12,876	$55.0	$3.5		$621,280	$33,174	$6.0	($77,253)	($74,554)	($3,981)	$498,667	$30,039,794	38.73	$98,659	$16,290,261
12/15/2037	18	10,652	7.82	11,955	$55.0	$3.5		$585,848	$27,365	$6.0	($71,728)	($70,302)	($3,284)	$467,899	$30,507,693	39.14	$84,156	$16,374,416
12/15/2038	19	8,556	5.38	9,452	$55.0	$3.5		$470,594	$18,823	$6.0	($56,715)	($56,471)	($2,259)	$373,972	$30,881,665	39.56	$61,147	$16,435,564
12/15/2039	20	7,488	3.95	8,146	$55.0	$3.5		$411,850	$13,825	$6.0	($48,878)	($49,422)	($1,659)	$325,715	$31,207,380	39.98	$48,415	$16,483,979
12/15/2040	21	6,553	2.79	7,019	$55.0	$3.5		$360,438	$9,781	$6.0	($42,115)	($43,253)	($1,174)	$283,678	$31,491,059	40.42	$38,334	$16,522,313
12/15/2041	22	5,735	1.87	6,046	$55.0	$3.5		$315,445	$6,531	$6.0	($36,278)	($37,853)	($784)	$247,061	$31,738,120	40.86	$30,350	$16,552,663
12/15/2042	23	5,019	1.13	5,207	$55.0	$3.5		$276,068	$3,940	$6.0	($31,242)	($33,128)	($473)	$215,165	$31,953,285	41.32	$24,029	$16,576,693
12/15/2043	24	4,733	0.56	4,827	$55.0	$3.5		$260,323	$1,975	$6.0	($28,963)	($31,239)	($237)	$201,859	$32,155,144	41.82	$20,494	$16,597,187
12/15/2044	25	2,591	0.08	2,603	$55.0	$3.5		$142,481	$272	$6.0	($15,621)	($17,098)	($33)	$110,001	$32,265,145	42.25	$10,153	$16,607,339
	Total	999,569	1,349.38	1,224,436											$32,265,145			$16,607,339

The initial investment in drilling decreased to 9.5 MMUS$ in 2020 for a horizontal well length of 7270 ft and 34 fractures. According to the production curve of the type well, this generated a NPV@10% of 16.6 MMUS$.

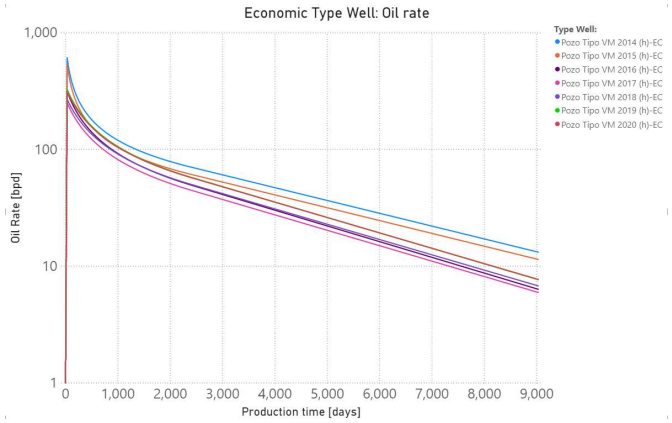
The 2020 Type well should have produced with a peak rate of 344 bpd, a cumulative production of 98 Kbbl at 365 days and EUR of 480 Kbbl of oil in order to be Economic.

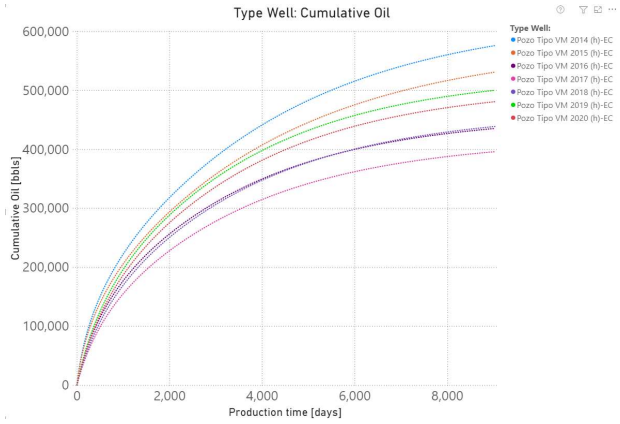
According to this calculation, 51 out of the 53 wells drilled during 2020 met this productivity condition.

VM Economic Type Well per Campaign

Vaca Muerta Economic Type Well by Campaign							
Campaign	# Horizontal Wells	Average Lateral Length [ft]	# Average Fracture Stages	Peak Oil Rate [bpd]	Np@365 days [bbls]	EUR @25 years [bbls]	EUR @25 years [Boes]
2014	5	3,576	13	616	129,049	575,823	690,000
2015	30	4,035	16	579	119,823	530,841	676,000
2016	64	4,390	17	352	96,268	435,310	543,000
2017	54	5,095	23	289	82,357	395,898	494,000
2018	85	6,670	28	309	89,273	438,645	537,000
2019	111	6,939	31	368	104,461	500,049	600,000
2020	53	7,270	34	344	98,719	480,738	590,000

We define the "Economic Type Well" to be that with a production profile making the NPV @ 10% discount rate equal to ZERO. For decline factors, we took the factors used for the wells in the corresponding campaign.

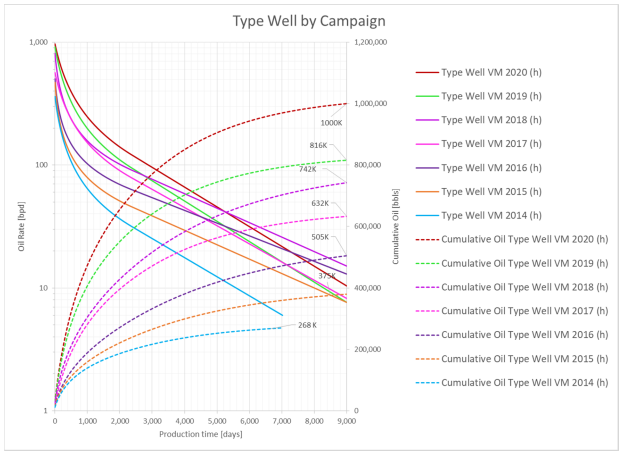


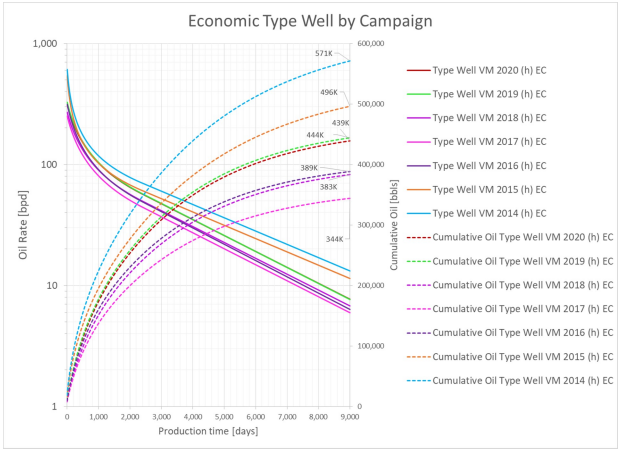


Statistical Summary - Number of Economic Wells drilled per Campaign

Results Summary								
Campaign	**# de Pozos Hztales**	**Average Lateral Length [ft]**	**# Average Fracture Stages**	**Well Cost [MM$]**	**# of Economic Wells**	**# of Non-Economic Wells**	**% Economic Wells**	**% Non-Economic Wells**
2014	5	3,576	13	16.6	0	5	0%	100%
2015	30	4,035	16	14.2	8	22	27%	73%
2016	64	4,390	17	10.5	56	8	88%	13%
2017	54	5,095	23	9.0	40	14	74%	26%
2018	85	6,670	28	10.0	70	15	82%	18%
2019	111	6,939	31	10.3	92	19	83%	17%
2020	53	7,270	34	9.5	51	2	96%	4%
TOTAL	**402**				**317**	**85**	**79%**	**21%**

The table above presents the number of Economic versus Non-Economic wells. Since 2016 the number of Non-Economic wells has been decreasing significantly boosted by the reduction in costs, the increase in lateral length of the wells and the number of Frac Stages. Even though this is a basin average, currently only 4% of wells are Non-Economic.

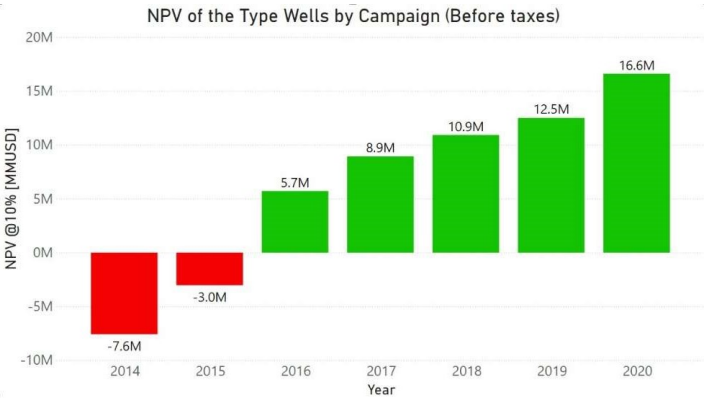


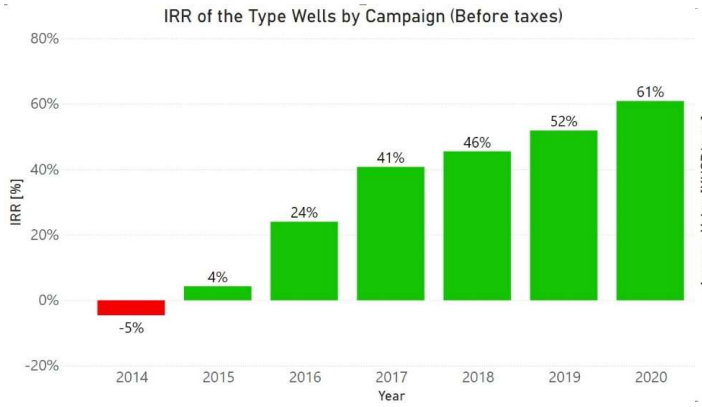


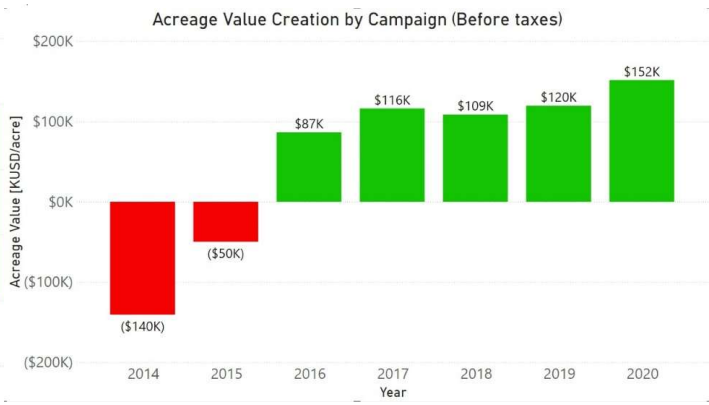
Summary of VM Type Wells per Campaign and their economic results

The table shows the evolution of the main variables of VM horizontal oil wells and their economic result. As of 2020 the Development Cost is below US$10/bbl.

Vaca Muerta Type Well by Campaign											
Campaign	# Horizontal Wells	Average Lateral Length [ft]	# Average Fracture Stages	Peak Oil Rate [bpd]	Np@365 days [bbls]	EUR @25 years [bbls]	EUR @25 years [Boes]	Well Cost [MM$]	Development Cost [$/Boe]	NPV@ 10% [MM$]	IRR [%]
2014	5	3,576	13	365	86,799	270,462	320,000	16.6	51.9	$ (7.5)	-5%
2015	30	4,035	16	472	93,718	377,389	482,000	14.2	29.5	$ (3)	4%
2016	64	4,390	17	579	127,836	624,946	774,886	10.5	13.6	$ 5.7	24%
2017	54	5,095	23	566	152,842	628,981	788,816	9.0	11.4	$ 8.9	41%
2018	85	6,670	28	811	174,857	742,198	905,018	10.0	11.0	$ 10.9	46%
2019	111	6,939	31	918	232,723	811,385	983,273	10.3	10.5	$ 12.5	52%
2020	53	7,270	34	969	261,027	993,790	1,224,436	9.5	7.8	$ 16.6	61%







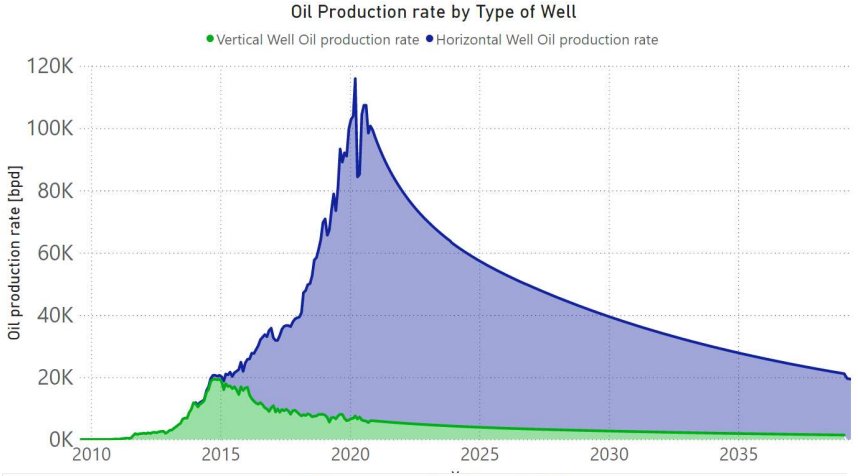
Part I: Summary and Conclusions

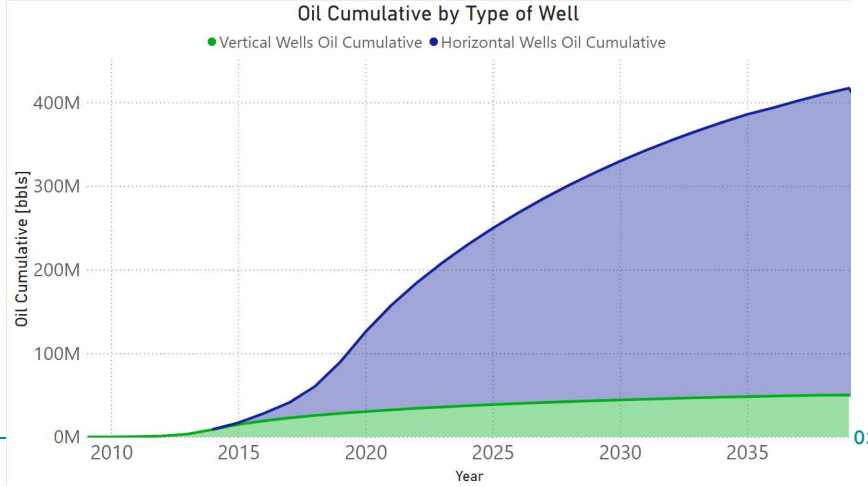
- The Vaca Muerta Play has been “de-risked”. Currently only 5% of drilled wells are considered to be “Non Economical”.
- The lateral length of the wells grew from 3576 ft to 7270 ft.
- Well costs have been reduced throughout the years from 16.6 MM to 10 MM per well ($4640/foot to $1300/foot).
- The number of fracture stages per well has increased from 13 to 34.
- The increase in Frac Stages has improved well productivity since 2014 from 365 bpd to 969 bpd (2.6X).
- EUR per well has grown from 280 Kbbl to 1 MMbbl per well.
- NPV@10% (BT) changed from -7.2 MM$ to + 16.6 MM$ per well.
- The IRR (BT) grew from -5% to 61%.
- The value per acre created with horizontal wells (BT) is 152 K$.

Part II : VM a Value Creation Story

Introduction:

- Prior to the development of Vaca Muerta several boundary conditions existent in the country dominated the problem such as ramping demand of energy, the need of oil by the Lujan de Cuyo refinery operating at its' technical minimums and the need to diminish the import of energy
- Several vertical wells were drilled to define the VM play extension & the thickness of the reservoir, to learn about the best landing zones and to solve the boundary conditions.
- With the arrival of new drilling and fracturing technology Horizontal drilling became the standard for development of the acreage.
- In this report we are presenting the Net Present Value of the Proved Producing Reserves of VM including Vertical & Horizontal wells.
- We calculated the production forecast for ALL of the VM wells and it's EUR.
- The basis for the Economic Evaluation was:
  - Historical Oil & Gas Prices
  - Future Oil price 55$ and 3 $/MCF
  - Historical Capex for Vertical & Horizontal wells
  - Sum of the Production Forecasts





Value of the Proved Developed Producing Reserves of VM

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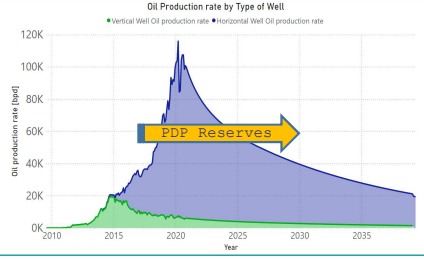

We calculated the value of the PDP reserves of Vaca Muerta (Before Taxes).

Input for the Model:

- Investments: Total amount invested in Wells (Vertical & Horizontal) + 20% in facilities
- Opex: from YPF
- Royalties: 12%
- Oil Price: Historic values from 2014 to 2020. Forecast at 55 $/bbl flat.
- Gas Price: Historic values from 2014 to 2020. Forecast at 3 $/MCF flat.
- Production Forecast of ALL Vertical and Horizontal wells drilled in VM

	OIL				GAS				TOTAL				
Year	Avg Oil Rate	Year Oil Vol	Avg Oil Rate V	Year Oil Vol V	Avg Gas Rate	Year Gas Vol	Avg Gas Rate V	Year Gas Vol V	Avg Oil Rate T	Year Oil Vol T	Avg Gas Rate	Year Gas Vol	Total BOEs
	bpd	Kbbls	bpd	Kbbls	MMCF/d	BCF	MMCF/d	BCF	bpd	Kbbls	MMCF/d	BCF	Kbbls
2012	-	-	2,252	822	-	-	6.72	2.5	2,252	822	7	2	1,231
2013	-	-	6,200	2,263	-	-	17.37	6.3	6,200	2,263	17	6	3,320
2014	787	287	15,103	5,513	4.42	1.6	43.34	15.8	15,890	5,800	48	17	8,705
2015	5,010	1,829	16,472	6,012	28.13	10.3	75.83	27.7	21,482	7,841	104	38	14,165
2016	18,935	6,911	11,817	4,313	106.31	38.8	56.36	20.6	30,752	11,225	163	59	21,120
2017	26,261	9,585	9,626	3,513	147.44	53.8	38.63	14.1	35,887	13,099	186	68	24,419
2018	45,364	16,558	7,828	2,857	254.70	93.0	44.05	16.1	53,192	19,415	299	109	37,589
2019	74,392	27,153	7,000	2,555	417.67	152.5	54.42	19.9	81,392	29,708	472	172	58,427
2020	94,457	34,477	6,370	2,325	530.33	193.6	69.25	25.3	100,827	36,802	600	219	73,276
2021	81,870	29,883	5,554	2,027	459.66	167.8	76.83	28.0	87,424	31,910	536	196	64,546
2022	69,714	25,446	4,973	1,815	391.41	142.9	68.79	25.1	74,687	27,261	460	168	55,256
2023	61,825	22,566	4,344	1,586	347.12	126.7	60.09	21.9	66,169	24,152	407	149	48,924
2024	56,219	20,520	4,103	1,498	315.64	115.2	56.76	20.7	60,322	22,018	372	136	44,672
2025	51,502	18,798	3,769	1,376	289.16	105.5	52.14	19.0	55,271	20,174	341	125	40,936
2026	47,665	17,398	3,484	1,272	267.61	97.7	48.19	17.6	51,149	18,669	316	115	37,881
2027	44,276	16,161	3,237	1,182	248.59	90.7	44.78	16.3	47,514	17,342	293	107	35,189
2028	40,991	14,962	3,021	1,103	230.15	84.0	41.78	15.3	44,012	16,064	272	99	32,607
2029	38,244	13,959	2,817	1,028	214.72	78.4	38.97	14.2	41,061	14,987	254	93	30,420
2030	35,375	12,912	2,628	959	198.61	72.5	36.35	13.3	38,003	13,871	235	86	28,164
2031	33,145	12,098	2,451	894	186.09	67.9	33.90	12.4	35,596	12,993	220	80	26,375
2032	30,980	11,308	2,286	834	173.94	63.5	31.62	11.5	33,265	12,142	206	75	24,646
2033	28,814	10,517	2,132	778	161.77	59.0	29.49	10.8	30,945	11,295	191	70	22,930
2034	26,898	9,818	1,988	726	151.02	55.1	27.50	10.0	28,887	10,544	179	65	21,404
2035	25,119	9,168	1,854	677	141.03	51.5	25.65	9.4	26,973	9,845	167	61	19,985
2036	23,541	8,593	1,729	631	132.17	48.2	23.92	8.7	25,271	9,224	156	57	18,720
2037	21,951	8,012	1,613	589	123.24	45.0	22.31	8.1	23,564	8,601	146	53	17,455
2038	20,538	7,497	1,504	549	115.31	42.1	20.81	7.6	22,043	8,046	136	50	16,326
Total		366,415		46,612		2,057		409		413,027		2,467	824,138

Value of VM Proved Developed Producing Reserves

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	CAPEX			REVENUE				EXPENSES				CASH FLOW		
	Capex H	Capex V	Capex T	Oil Price	Gas Price	Revenue Oil	Revenue Gas	Opex	Yearly Opex	Royalties Oil	Royalties Gas	BT Gross Revenue	Cash Flow	Cum Cash Flow
Year	MMUS$	MMUS$	MMUS$	$/bbl	$/MCF	MMUS$	MMUS$	US$/BOE	MMUS$	MMUS$	MMUS$	MMUS$	MMUS$	MMUS$
		(349)	**(349)**										(349.2)	(349)
		(974)	**(974)**	74.39	7.5	61.1	18.4	17	(20.9)	(7.3)	(2.2)	49.1	(925.3)	(1,275)
2012	(100)	(1,208)	**(1,308)**	76.07	7.5	172.1	47.6	16	(53.1)	(20.7)	(5.7)	140.2	(1,167.8)	(2,442)
2013	(511)	(972)	**(1,484)**	79.4	7.5	460.5	130.7	15	(130.6)	(55.3)	(15.7)	389.7	(1,093.9)	(3,536)
2014	(806)	(90)	**(896)**	74.6	7.5	584.9	284.6	14	(198.3)	(70.2)	(34.2)	566.9	(329.5)	(3,866)
2015	(583)	(44)	**(627)**	63.2	3.5	709.4	207.8	12	(253.4)	(85.1)	(24.9)	553.7	(73.5)	(3,939)
2016	(1,020)	(20)	**(1,040)**	56.5	3.5	740.1	237.7	10	(244.2)	(88.8)	(28.5)	616.3	(423.7)	(4,363)
2017	(1,372)	(45)	**(1,417)**	65	3.5	1,262.0	381.6	9	(338.3)	(151.4)	(45.8)	1,108.1	(308.9)	(4,672)
2018	(604)	(115)	**(719)**	54	3.5	1,604.2	603.1	8	(467.4)	(192.5)	(72.4)	1,475.0	755.8	(3,916)
2019				40.1	3.5	1,475.8	766.0	7	(512.9)	(177.1)	(91.9)	1,459.8	1,459.8	(2,456)
2020				55	3.5	1,755.0	685.4	7	(451.8)	(210.6)	(82.2)	1,695.7	1,695.7	(760)
2021				55	3	1,499.3	503.9	7	(386.8)	(179.9)	(60.5)	1,376.1	1,376.1	616
2022				55	3	1,328.4	445.9	7	(342.5)	(159.4)	(53.5)	1,218.9	1,218.9	1,834
2023				55	3	1,211.0	407.8	7	(312.7)	(145.3)	(48.9)	1,111.8	1,111.8	2,946
2024				55	3	1,109.6	373.7	7	(286.6)	(133.1)	(44.8)	1,018.7	1,018.7	3,965
2025				55	3	1,026.8	345.8	7	(265.2)	(123.2)	(41.5)	942.7	942.7	4,908
2026				55	3	953.8	321.2	7	(246.3)	(114.5)	(38.5)	875.7	875.7	5,783
2027				55	3	883.5	297.8	7	(228.2)	(106.0)	(35.7)	811.3	811.3	6,595
2028				55	3	824.3	277.8	7	(212.9)	(98.9)	(33.3)	756.9	756.9	7,352
2029				55	3	762.9	257.3	7	(197.1)	(91.5)	(30.9)	700.6	700.6	8,052
2030				55	3	714.6	240.9	7	(184.6)	(85.8)	(28.9)	656.2	656.2	8,709
2031				55	3	667.8	225.1	7	(172.5)	(80.1)	(27.0)	613.2	613.2	9,322
2032				55	3	621.2	209.4	7	(160.5)	(74.5)	(25.1)	570.5	570.5	9,892
2033				55	3	579.9	195.5	7	(149.8)	(69.6)	(23.5)	532.5	532.5	10,425
2034				55	3	541.5	182.5	7	(139.9)	(65.0)	(21.9)	497.2	497.2	10,922
2035				55	3	507.3	170.9	7	(131.0)	(60.9)	(20.5)	465.8	465.8	11,388
2036				55	3	473.0	159.4	7	(122.2)	(56.8)	(19.1)	434.3	434.3	11,822
2037				55	3	442.5	149.1	7	(114.3)	(53.1)	(17.9)	406.3	406.3	12,228
2038														
Total	**(4,997)**	**(3,818)**	**(8,815)**			**22,739**	**8,061**		**(6,324)**	**(2,757)**	**(975)**	**21,043**	**12,228**	

Discount Rate	NPV
	MMUS$
10%	$739
IRR %	12%

The cash flow above includes the total CAPEX for Vertical & Horizontal wells plus a 20% amount estimated for Facilities.

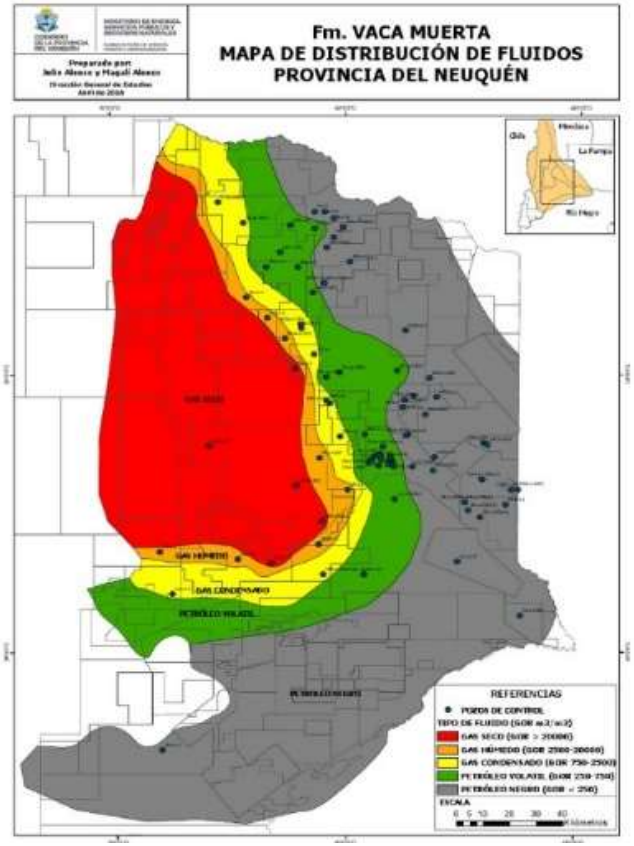
The NPV@10% is 739 MMUS$ equivalent to 2108 MMUS$ of 2021*.

The NPV reflects the Ex-Post Value of the Vaca Muerta project including the "Learning Curve".

** As the economic evaluation was performed since 2012 the NPV@10% of 739 MMUS$ is equivalent 2108 MMUS$ of 2021 using the same interest rate of 10%.*

Value of VM Proved Developed Producing Reserves

- The NPV@10% Before Taxes of the PDP Reserves of VM is 2.1 Billion USD.
- This value represents the Value of the Vaca Muerta project until 2020 and includes the CAPEX for all the Vertical & Horizontal wells made to derisk Vaca Muerta.
- According to 2020 statistics the Average Horizontal Type Well drains 137 acres and the value created per acre equals to US$152,000/acre.
- VM total acreage is approximately 8 million acres with 2.8 million acres located in the Oil Window.
- The projection of value creation for the 2.8 million acres in the Oil Window is equal to US$426 billion considering 1 landing zone.
- We are assuming a linear extrapolation which is very optimistic and we know that NOT all the acreage has the same properties. In compensation our calculations do not include the fact that more than 1 landing zones will be available in the oil window (more likely 2 on average).

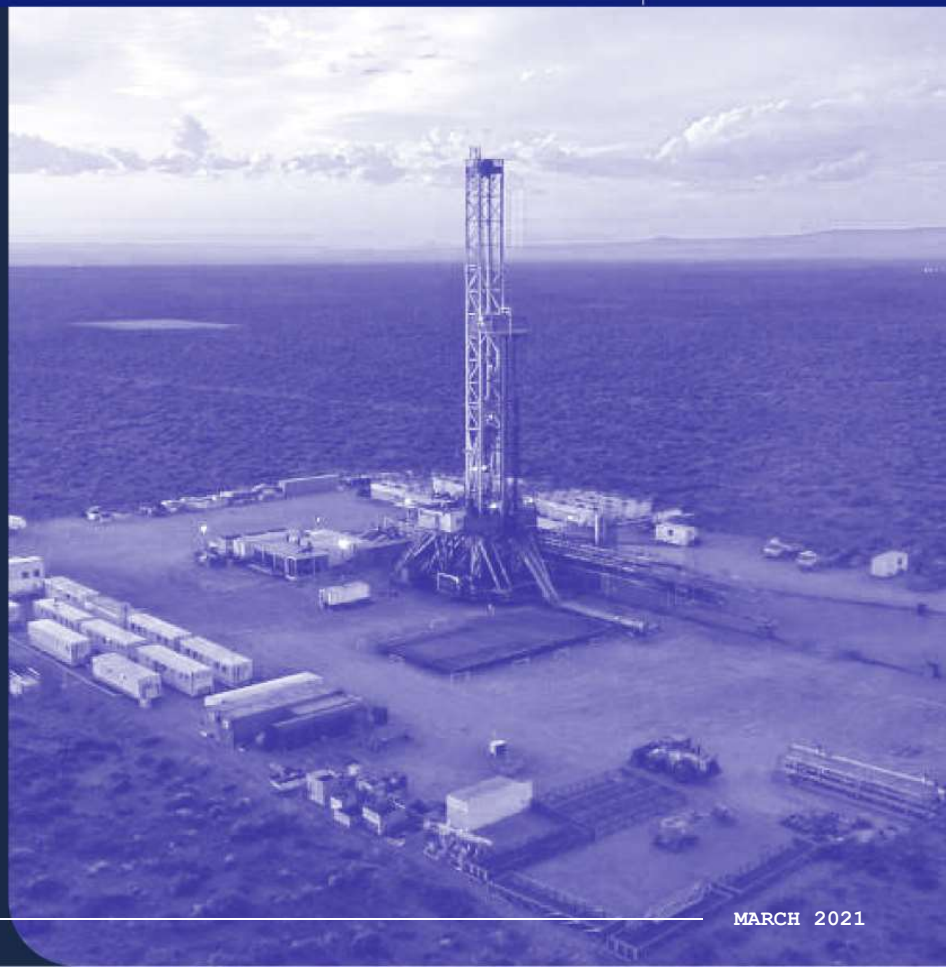


Campaign	# Vertical Wells	Area [has]	Area [acres]
2010	1	13	31
2011	20	251	621
2012	36	452	1,118
2013	112	1,407	3,478
2014	159	1,998	4,937
2015	143	1,797	4,440
2016	15	188	466
2017	8	101	248
2018	4	50	124
2019	9	113	279
2020	23	289	714
Total	530	6,660	16,458

Campaign	# of Horizontal Wells	Average Lateral Length [m]	Area [has]	Area [acres]
2014	5	1,090	109	269
2015	30	1,230	738	1,823
2016	64	1,338	1,713	4,230
2017	54	1,553	1,677	4,143
2018	85	2,033	3,456	8,537
2019	111	2,115	4,695	11,597
2020	53	2,216	2,349	5,802
	402	Total	14,737	36,401

Part II: Summary and Conclusions

- The NPV@10% Before Taxes of the PDP Reserves of VM is 2.1 Billion USD.
- According to 2020 statistics the Average Horizontal Type Well drains 137 acres and the value created per acre equals to US$152,000/acre.
- The projection of value creation for the 2.8 million acres in the Oil Window is equal to US$426 billion considering 1 landing zone.
- Vaca Muerta is the largest “wealth” creation of the last 100 years in Argentina.
- YPF played the pioneer role and paid for the “Learning Curve” as it has always been in the history of Exploration in Argentina (NW basin, Offshore, etc).
- This has been an exceptional project for Argentina even when considering the cost of vertical wells initial campaign.



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