Antero Resources

ANTERO RESOURCES: **MAINTENANCE CAPEX**

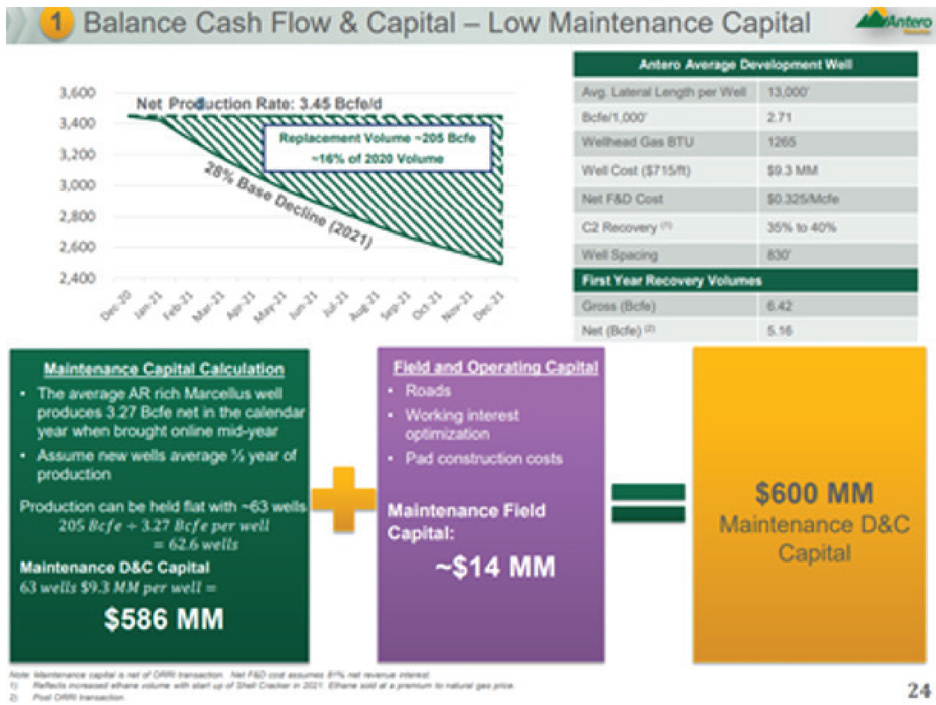
We have had ongoing questions about their maintenance capex guidance, which has been moved lower to $600mm. We have problems getting to a number anywhere close to and think maintenance capex could be much higher. Our range is $1.3bn - $1.8bn. Since the magnitude of the delta is so large, we think it is time to expect a curveball, rather than just a miss.

People should be considering why Antero is guiding so optimistically, and we suggest the RBL balance might be driving Antero's decisions.

Note: please contact us directly to discuss assumptions and model output.

Friezo Loughrey Oil Well Partners (FLOW)
www.flowoilwell.com

ANTERO'S GUIDANCE



We have difficulty with most of the numbers on this page, including base decline, but the single well recovery volumes of **6.42 BCFE gross at 12 months and 3.27 BCFE net at 6 months** are the biggest source of our challenge. Furthermore, the "back of the napkin" methodology the company presents in the green field is sloppy – they have the software to forecast this more precisely.

Our maintenance capital was calculated on a 3 stream basis assuming shrink of 0.60 and yield of 0.059 BBL/SCF. Our analysis was calculated with a quarterly well-addition cadence. There are many ways we can adjust our model, but we think it is more important to investigate whether Antero's guidance is plausible, achievable, and whether it comes at a future cost.

The following charts validate our own work at a high level and identify areas where we could be wrong. We will let you decide.

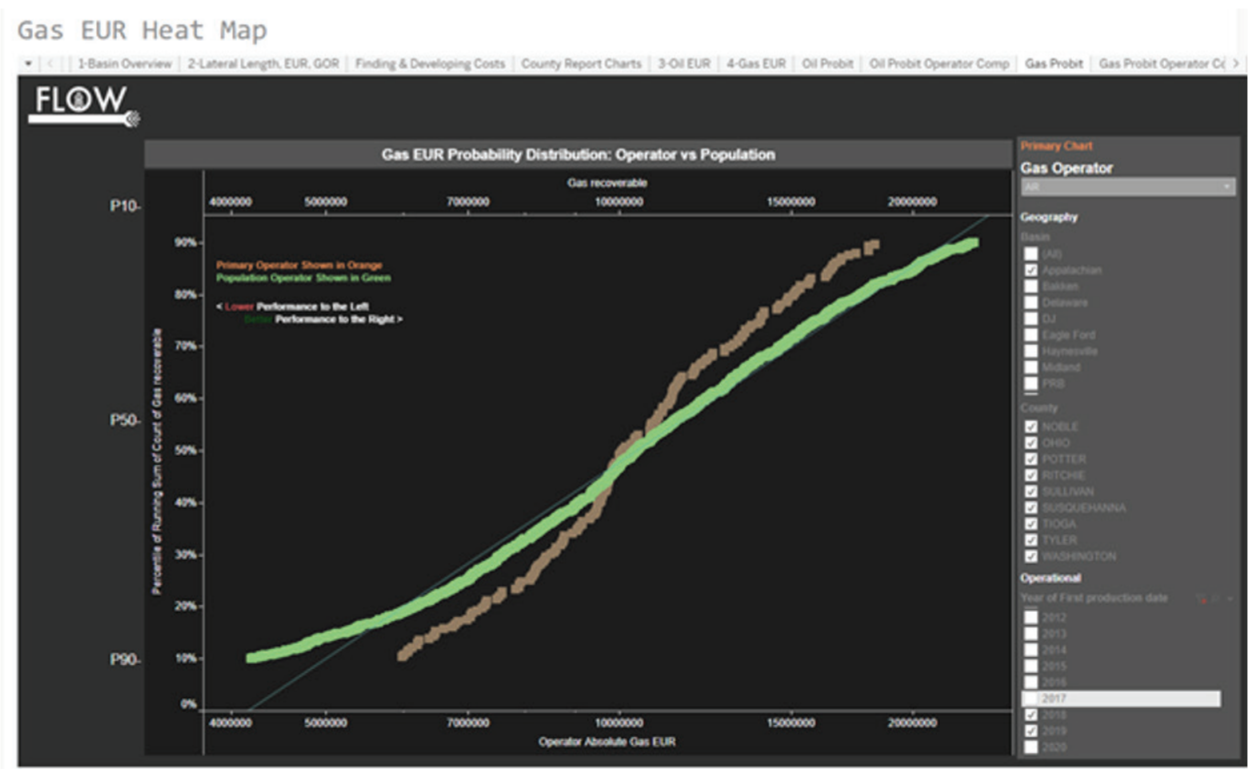
01/ WELL PERFORMANCE

When we calculated our $1.3bn-1.8bn maintenance capex, we started by grounding the analysis in the distribution of our EURs since 2017.

The "Probit" Chart is useful because we can see the median well is a 10 BCF forecast, in line with all of Appalachia, and that AR's best wells fall short of the overall upper quartile. Basin-wide, the upper quartile reflects the 17-20B well operators like to present. At FLOW we are comfortable with this set grounding our truth around a 10 BCF median.

We have invested heavily in gas forecasting data science, and our EURs are lower than everyone's, because they need to be to backtest corporate declines and reflect what actually happens.

AR in tan; All basin wells in green; it is better to be to the right.



02/ TYPE CURVE

To create a type curve, we used our module at the full basin level. Antero operates in two concentrated areas and this simplification is a reasonable starting point to calculate replacement volumes. We could torture this part of the analysis, but chose simplicity.

If Antero "pulls levers" like higher IP rates, extra long laterals, and prime locations, today's benefit could quickly become tomorrow's problem.

Unsurprisingly when we generate a forecast, we arrive at an 11.3B type curve.

The vulnerability in locking down precision in our analysis will become NGL yields, but right now, we want to test whether guidance is reasonable.

Here is the company's Utica type curve set from 2018. We cannot get to their EURs.

Single Well Economics: Utica – In Ethane Rejection

Antero

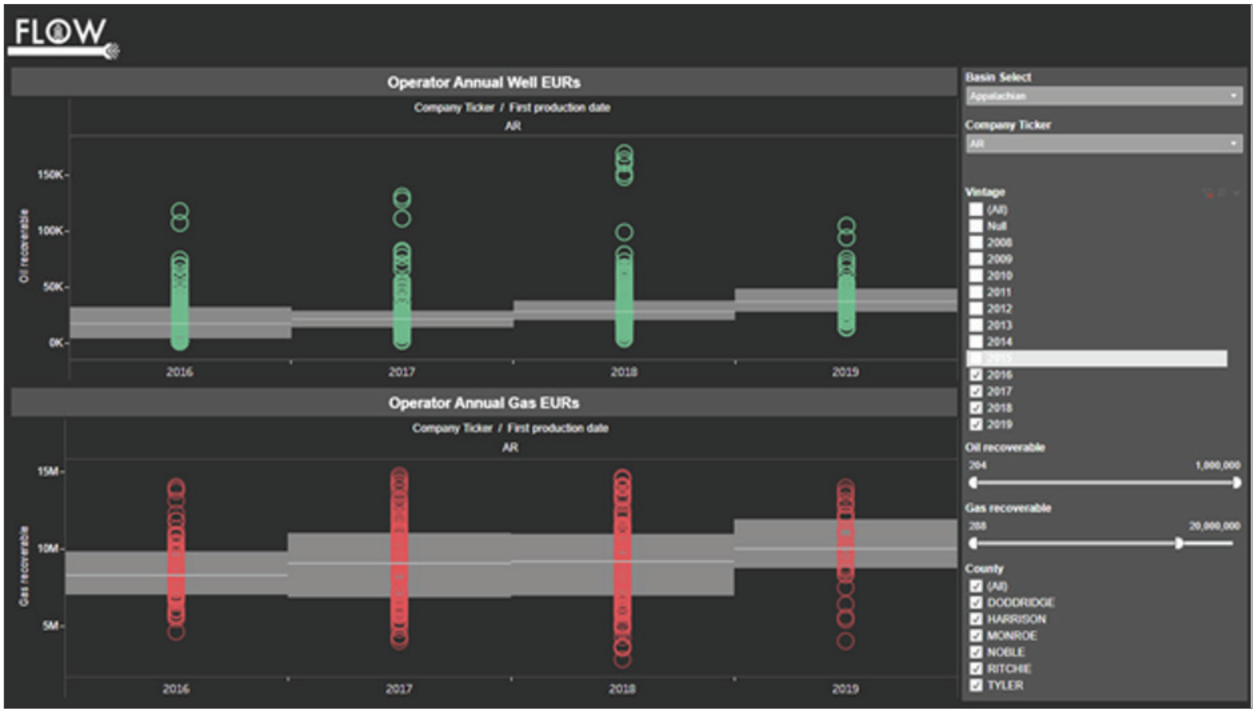
Classification	Condensate	Highly-Rich Gas/ Condensate	Highly-Rich Gas	Rich Gas	Dry Gas
Modeled BTU	1275	1235	1215	1175	1050
EUR (Bcfe):	13	25	29	28	26
EUR (MMBoe):	2.2	4.2	4.8	4.6	4.4
% Liquids	40%	30%	21%	16%	0%
Well Cost ($MM):	$10.8	$11.5	$12.2	$12.2	$12.2
Bcfe/1,000':	1.1	2.1	2.4	2.3	2.2
Net F&D ($/Mcfe)[1]:	$1.03	$0.57	$0.53	$0.55	$0.57
Net Direct Operating Expense ($/Mcfe):	$1.18	$1.32	$1.44	$1.47	$0.85
Transportation Expense ($/Mcfe):	$0.04	$0.05	$0.05	$0.06	$0.07
Pre-Tax NPV10 ($MM):	$8.8	$17.9	$12.1	$8.4	$8.6
Pre-Tax Half Cycle ROR:	59%	139%	58%	39%	36%
Payout (Years):	1.7	0.4	1.8	2.1	2.6
Gross Core Locations in BTU Regime:	206	27	22	102	187

Cumulative Volumes	Condensate		Highly-Rich Gas/ Condensate		Highly-Rich Gas		Rich Gas		Dry Gas	
	Gas (Mmcf)	Oil (Bbl)	Gas (Mmcf)	Oil (Bbl)	Gas (Mmcf)	Oil (Bbl)	Gas (Mmcf)	Oil (Bbl)	Gas (Mmcf)	Oil (Bbl)
Year 1	1,600	129	4,300	110	5,600	6	5,400	0	5,500	0
Year 2	2,300	153	5,800	127	7,700	8	7,500	0	8,200	0
Year 3	2,800	166	6,900	138	9,100	9	8,800	0	10,000	0
Year 4	3,300	176	7,700	146	10,200	10	9,900	0	11,400	0
Year 5	3,600	186	8,400	152	11,100	11	10,800	0	12,500	0
Year 10	5,000	219	10,900	175	14,500	14	14,100	0	16,500	0
Year 20	6,700	258	14,000	202	18,700	19	18,200	0	21,200	0

Note: SWE cost assumptions reflect average costs per Mcfe on the first five years of the life of a well.
F&D cost is defined as current D&C cost per 1,000' lateral divided by net EUR per 1,000' lateral assuming 81% NRI in Utica. Please see "Antero Definitions" and "Antero Non-GAAP Measures" in the Appendix.

APPENDIX | SINGLE WELL ECONOMICS 73

To sanity-check the discrepancy between their forecasts and our type curve, we can dig into individual wells. We do not see any 20B wells in their prior cohorts (the red circles are individual well forecasts; they top out around 15 BCF).

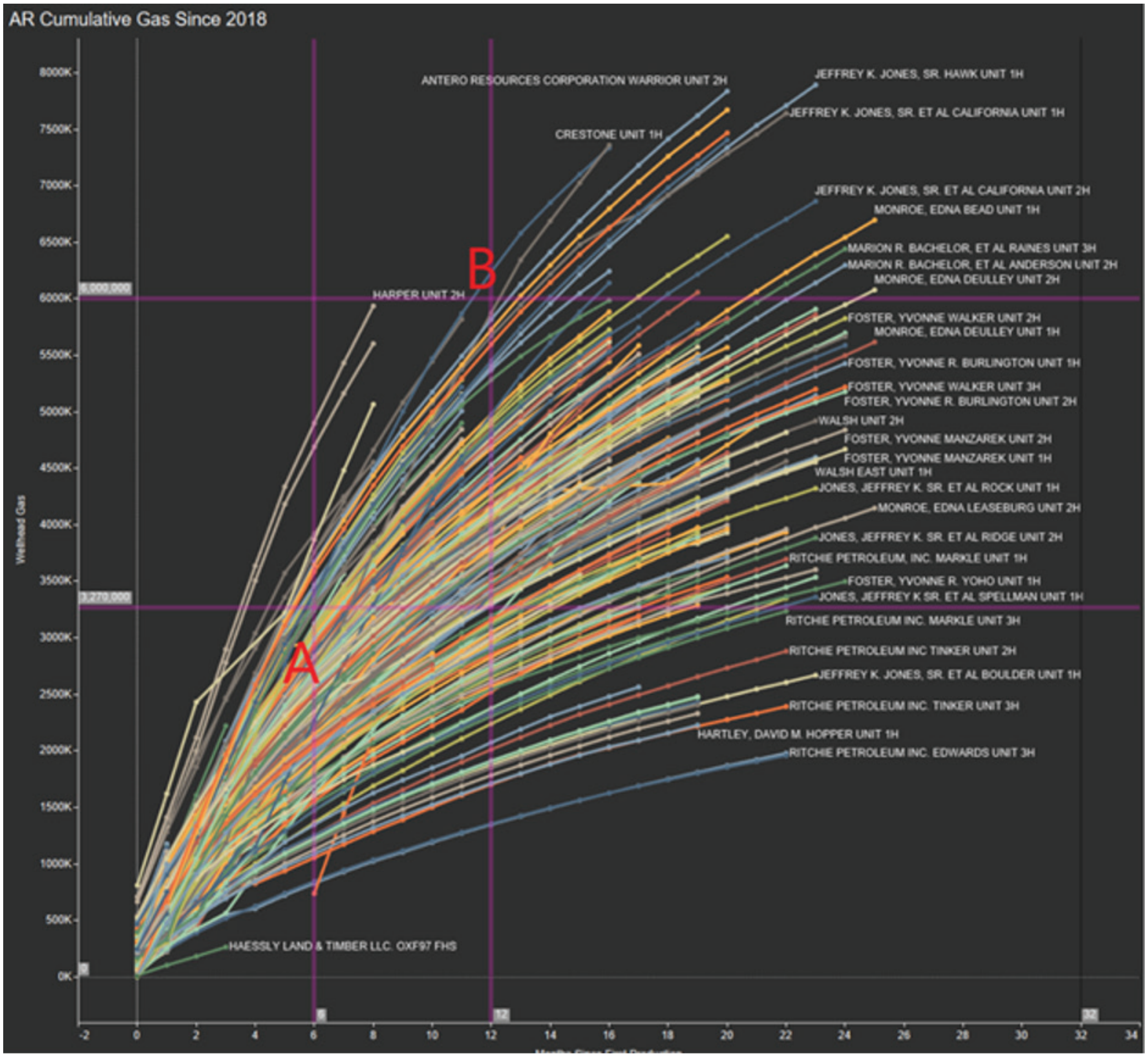


When fitting an EUR, we require 5 months of post-peak filtered data. For younger wells, it's anyone's guess how the well will season. However, sometimes it is worth-while to guess.

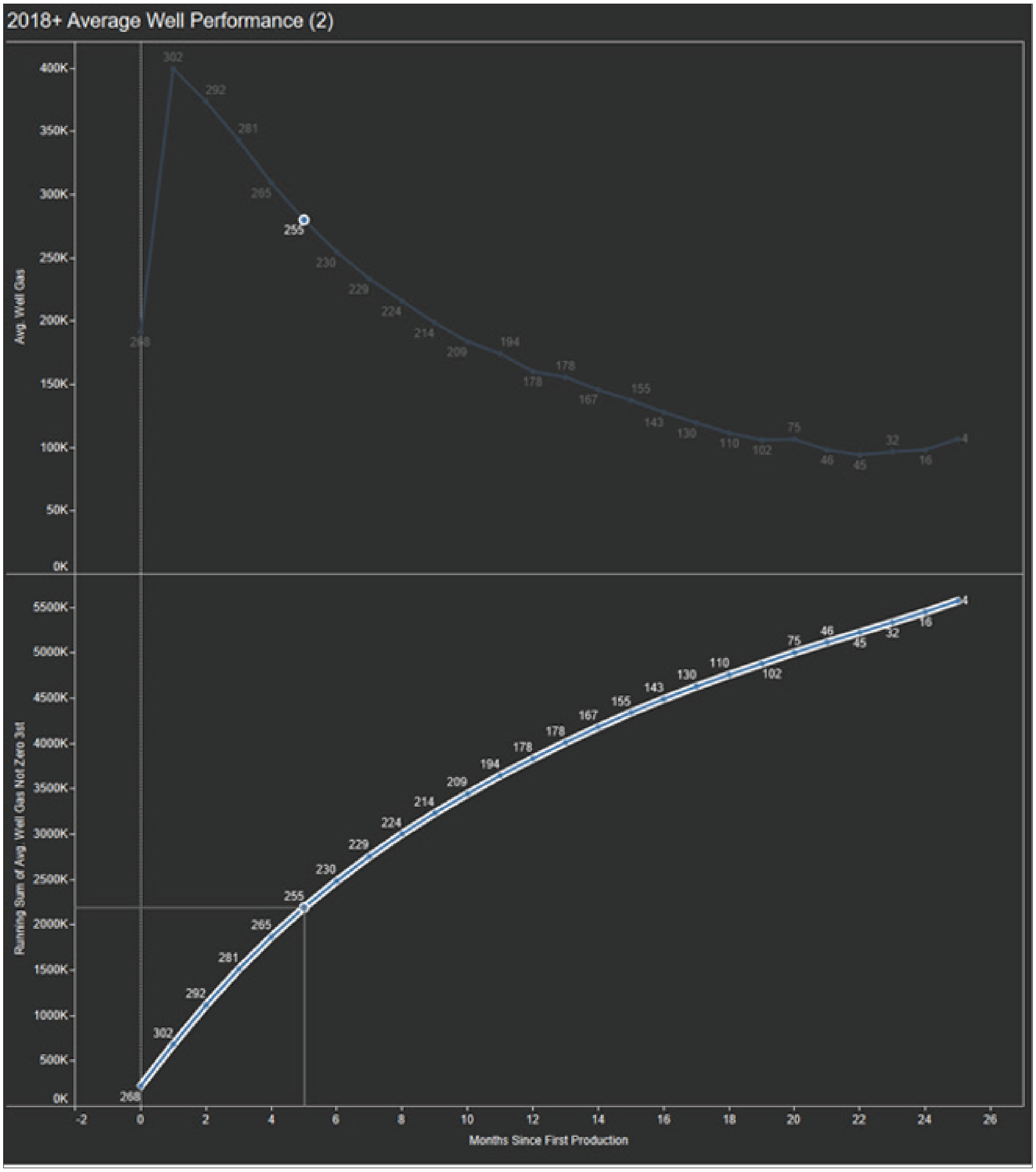
03/ EARLY TIME WELLS

To continue the vetting, we plotted 317 wells since 1/1/2018 to see how many wells could hit the company's recent 6B and 3.27B targets at 12 and 6 months, respectively.

We have simplified the analysis by plotting dry gas from state data. We have not converted for NGLs, so this visual is punitive. However, is it reasonable that if processed, the typical well will hit 3.27 B of equivalents at 6 months at Letter A? This looks like a stretch in our opinion. The 12 month target at Letter B also looks hard to achieve.


AR Cumulative Gas Since 2018
Wellhead Gas
8000K
7500K
7000K
6500K
6000K
5500K
5000K
4500K
4000K
3500K
3000K
2500K
2000K
1500K
1000K
500K
0K
6,000,000
3,270,000
-2
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
A
B
ANTERO RESOURCES CORPORATION WARRIOR UNIT 2H
CRESTONE UNIT 1H
HARPER UNIT 2H
HAESSLY LAND & TIMBER LLC. OXF97 FHS
JEFFREY K. JONES, SR. HAWK UNIT 1H
JEFFREY K. JONES, SR. ET AL CALIFORNIA UNIT 1H
JEFFREY K. JONES, SR. ET AL CALIFORNIA UNIT 2H
MONROE, EDNA BEAD UNIT 1H
MARION R. BACHELOR, ET AL RAINES UNIT 3H
MARION R. BACHELOR, ET AL ANDERSON UNIT 2H
MONROE, EDNA DEULLEY UNIT 2H
FOSTER, YVONNE WALKER UNIT 2H
MONROE, EDNA DEULLEY UNIT 1H
FOSTER, YVONNE R. BURLINGTON UNIT 1H
FOSTER, YVONNE WALKER UNIT 3H
FOSTER, YVONNE R. BURLINGTON UNIT 2H
WALSH UNIT 2H
FOSTER, YVONNE MANZAREK UNIT 2H
FOSTER, YVONNE MANZAREK UNIT 1H
WALSH EAST UNIT 1H
JONES, JEFFREY K. SR. ET AL ROCK UNIT 1H
MONROE, EDNA LEASEBURG UNIT 2H
JONES, JEFFREY K. SR. ET AL RIDGE UNIT 2H
RITCHIE PETROLEUM, INC. MARKLE UNIT 1H
FOSTER, YVONNE R. YOHO UNIT 1H
JONES, JEFFREY K SR. ET AL SPELLMAN UNIT 1H
RITCHIE PETROLEUM INC. MARKLE UNIT 3H
RITCHIE PETROLEUM INC TINKER UNIT 2H
JEFFREY K. JONES, SR. ET AL BOULDER UNIT 1H
RITCHIE PETROLEUM INC. TINKER UNIT 3H
HARTLEY, DAVID M. HOPPER UNIT 1H
RITCHIE PETROLEUM INC. EDWARDS UNIT 3H

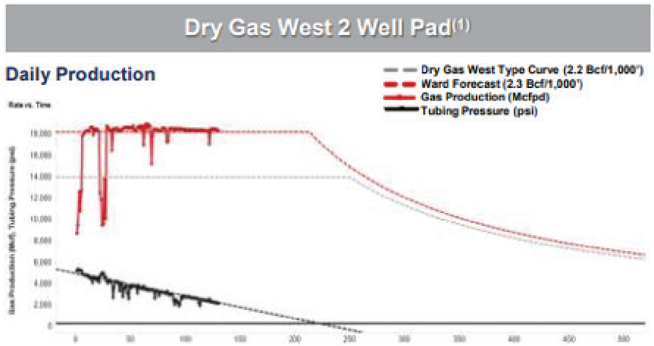
To continuing the sanity check, we applied an 80% tail gas factor and a 0.059 BBL/SCF yield. We dislike using averages that weigh to outlier wells, but even the average approach is not getting us to 3.27 BCFE in 6 months. Instead we land at 2.2B.



To boost our 6 month recovery to 3.2 BCFE, we need to boost the NGL Yield to 0.200 bbl/mcf and maintain a 80% shrink factor. Alternatively using a quick 67% gas guidance ratio would get us to 3.2B. But then we would still miss on capital due to well timing.

04/ PRODUCTION WAITING ON THE BENCH

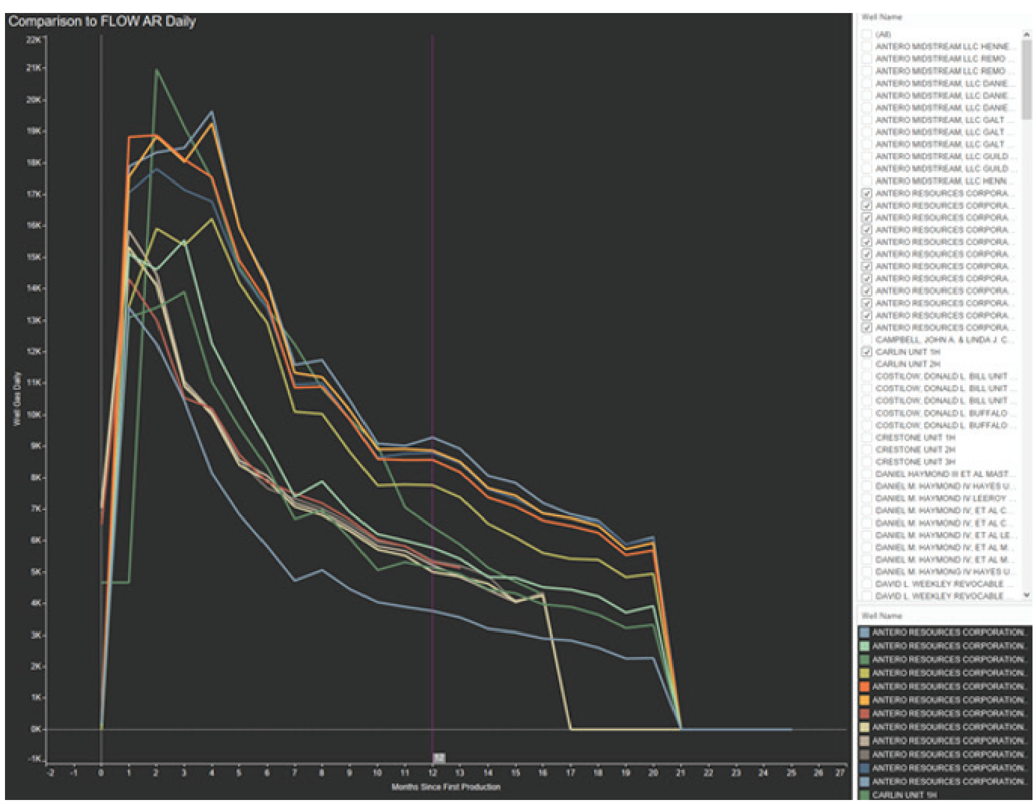
Can the company open the chokes and temporarily hold production at higher levels?



We do not think this is a meaningful lever. At FLOW we do not observe many Appalachian wells choked back to a year (or years) as we are sometimes shown by operators, such as Gulfport to the left.

Most often, we observe partially curtailed wells held back for 3 months. Between 4 and 6 months the wells hit a secondary peak and then drop. We do not think there is much being held back for a situation like this.

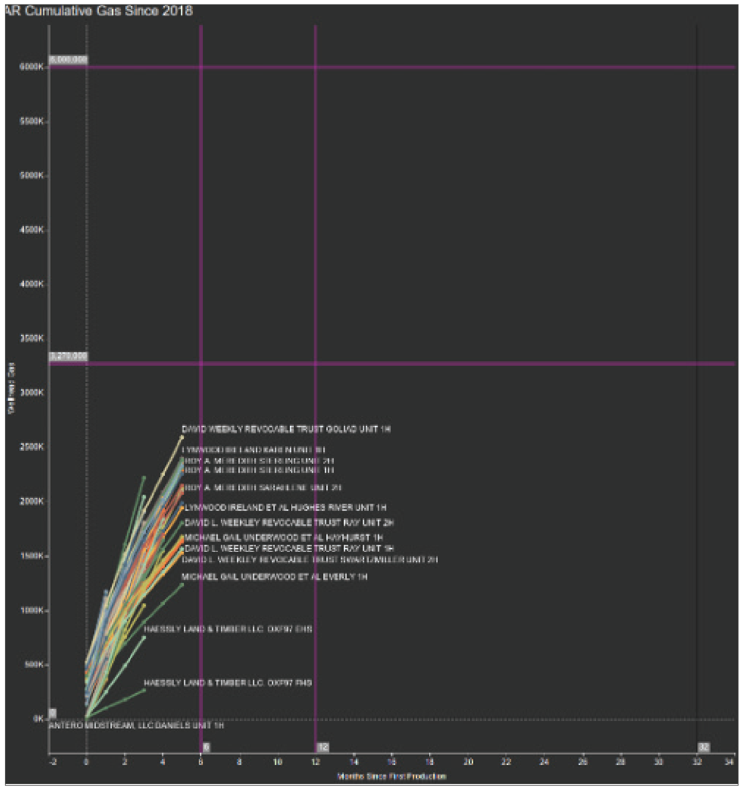
Below is an indicative group of wells at the beginning of the alphabet. This is a pattern we frequently observe.



05/ MORE INITIAL PRODUCTION?

West Virginia data for the last few months just arrived at the state agency.

While we see very strong IP rates early in 2019, we observe a mix of strong and weak wells in Q4 2019 and early 2020.



So, we are struggling. We know areas of this analysis are incomplete and leave us subject to criticism. We would love to determine there's nothing wrong here, but as former portfolio managers, we have a substantial concern about the validity of the capex guidance. Ideally, we are proved wrong, and we get clear direction from the company which we can evaluate. That's not likely though.

Therefore, we are looking for other answers. **The RBL is our key area of concern.** The recent VPP and convertible both improve the lender's position. Meanwhile, the company has not sought to reduce indebtedness with an uptier exchange or a debt for equity swap. This is a hot market for creditor-on-creditor violence; why not participate? Does Antero want to maintain access to the unsecured and equity(-linked) primary markets? FT commitments lower the company's ability to blow-down, so maybe they will need fresh capital. We think the timelines around maintenance guidance and the maturity of the 2021 notes also "sort of" line up. So in our view, credit nuances are now critical, and maintenance capital is part of the game theory.

TOM LOUGHREY, CFA
co-founder

ABOUT THE AUTHORS

Tom has spent over 20 years investing across the oil & gas capital structure at hedge funds: Argent, Raven Rock and Silverback. Tom's search for a product with FLOW's tools and workflow led him to design and lead the development of FLOW's capabilities. Tom started his career in energy investment banking at Salomon Brothers and Credit Suisse after graduation from Dartmouth. Tom received his MBA from UNC.

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MICHAEL FRIEZO
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Michael spent almost 30 years on Wall Street as an energy investment banker and capital markets professional at Deutsche Bank, Credit Suisse and Salomon Brothers. Michael has been focused on the use of big data in oil & gas applications. Michael and Tom decided to combine their efforts to commercialize FLOW. Michael has an MBA from Rice University and a BS from TCU.

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ABOUT FLOW

Friezo Loughrey Oil Well Partners (FLOW) is an analytics company serving investors in the oil and gas sector. FLOW applies big data and cutting-edge petroleum engineering models to address the investor's challenges of identifying value through unbiased, actual well results. FLOW's automation makes the information actionable at market speed. FLOW has been recognized and used as a trusted source by Bloomberg, The Wall Street Journal and the Financial Times.

FLOW

BIG DATA

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