Optimizing the Drilling Efficiency and Corrosion Control of Clear Brine Drilling Fluids through the Automated Measurements of Fluids' Properties.

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NEWPARK DRILLING FLUIDS
THE CLEAR FLUIDS EXPERTS

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Automation

- Automation describes a wide range of technologies that reduce human intervention in processes.
- It is applicable in the drilling fluids industry.

Why Automation

- Cheaper labor costs and improved efficiency.
- It replaces physical and monotonous work.
- Increased consistency.
- Ability to work in hazardous environment and even in extreme temperatures.
- They aid decisions.

Market Drivers

New Normal

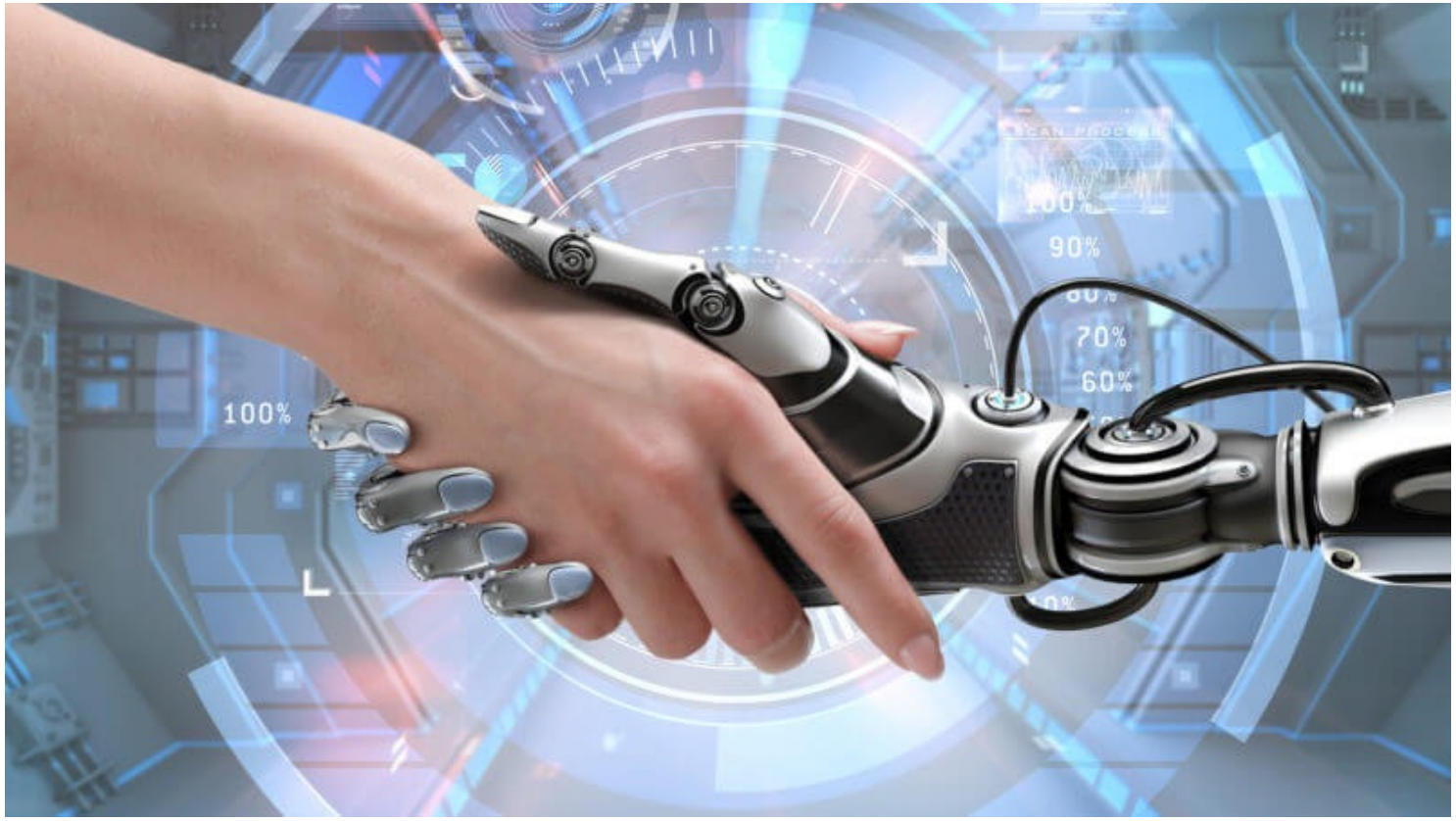
- Doing more with less
- Fewer People on Rigs
- Reliance on Remote Operations Centers

Digitalization

- Decision Support Systems
- Automated Processes
- Real Time

Human Intervention in Automation

- Human involvement is still very critical to the success of Automation.
- There is something called the paradox of automation which says that the more efficient the automated system, the more crucial the human contribution of the operators.
- Think of Automation as a partnership rather than a competition



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What is Wilson ?

Wilson is a collection of 4 probes that carry out automated and real-time measurements of important clear brine fluids' properties.

What does Wilson Majorly Measure ?

- Dissolved Oxygen
- pH
- Solids Content
- Conductivity
- Temperature

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Wilson Probes

Conductivity Probe

pH Probe

Dissolved Oxygen Probe

Turbidity probe

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Over 50 WELLS

6 FLUID TYPES

2 YEARS OF DATA

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WEST TEXAS

WILSON WENT FOR A SWIM

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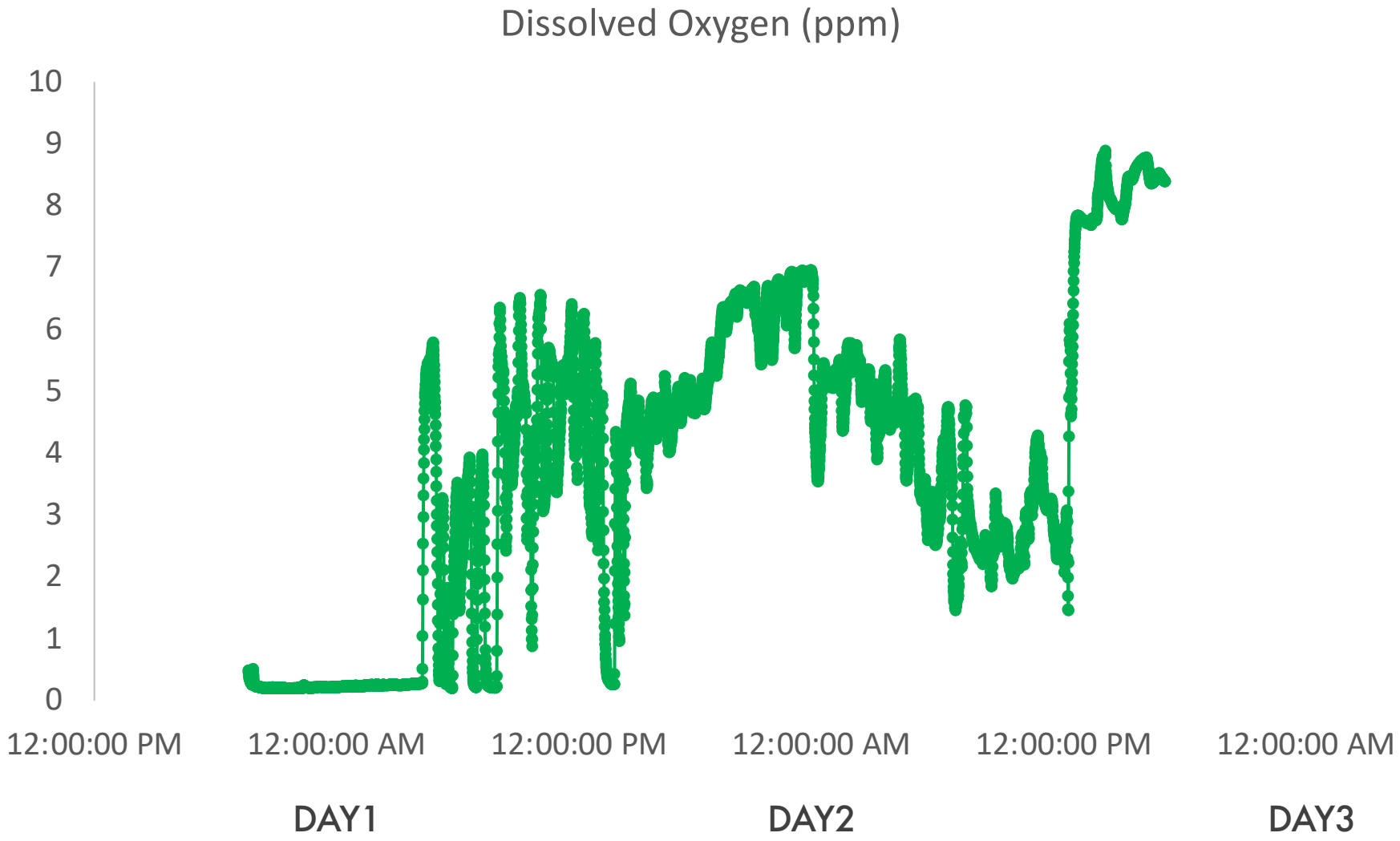
WEST TEXAS

HIGH CORROSION RESULTS DESPITE EVERY MUD CHECK BEING IN THE RIGHT SPECIFICATIONS



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WEST TEXAS

"FOAM PARTY"

WE COULDN'T UNDERSTAND WHY WE WEREN'T GETTING DECENT CORROSION RESULTS WHEN ALL READINGS AND REPORTS LOOKED GOOD

CONTAMINANTS

LOSSES

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WEST TEXAS

"FOAM PARTY"

Controlled the oxygen and foaming problems which resulted in the reduction of Corrosion rate.

15.3mpy

103.9mpy

Oxygen pitting

Fluid Erosion

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MONTNEY FORMATION

SENT WILSON TO A CLIENT WHO WAS NEW TO BRINE – WE FOUND MORE THAN WE THOUGHT WE WOULD

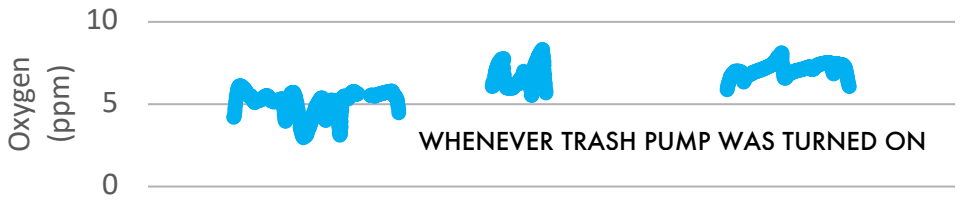
WHAT DID WILSON HELP DO IN THIS SPECIFIC CASE ?

- Improve their operational setup
- Led to less NPT working in a tight hole - $$
- Lowered mud bills - $$$

BC Montney

Wilson helped explain poor corrosion results and appearance of oxygen pitting despite good oxygen readings on mud reports.

Date	Time	Reported 02
Sept 24	7:48	0.28ppm
Sept 25	18:08	0.27ppm
Sept 27	12:56	0.26ppm



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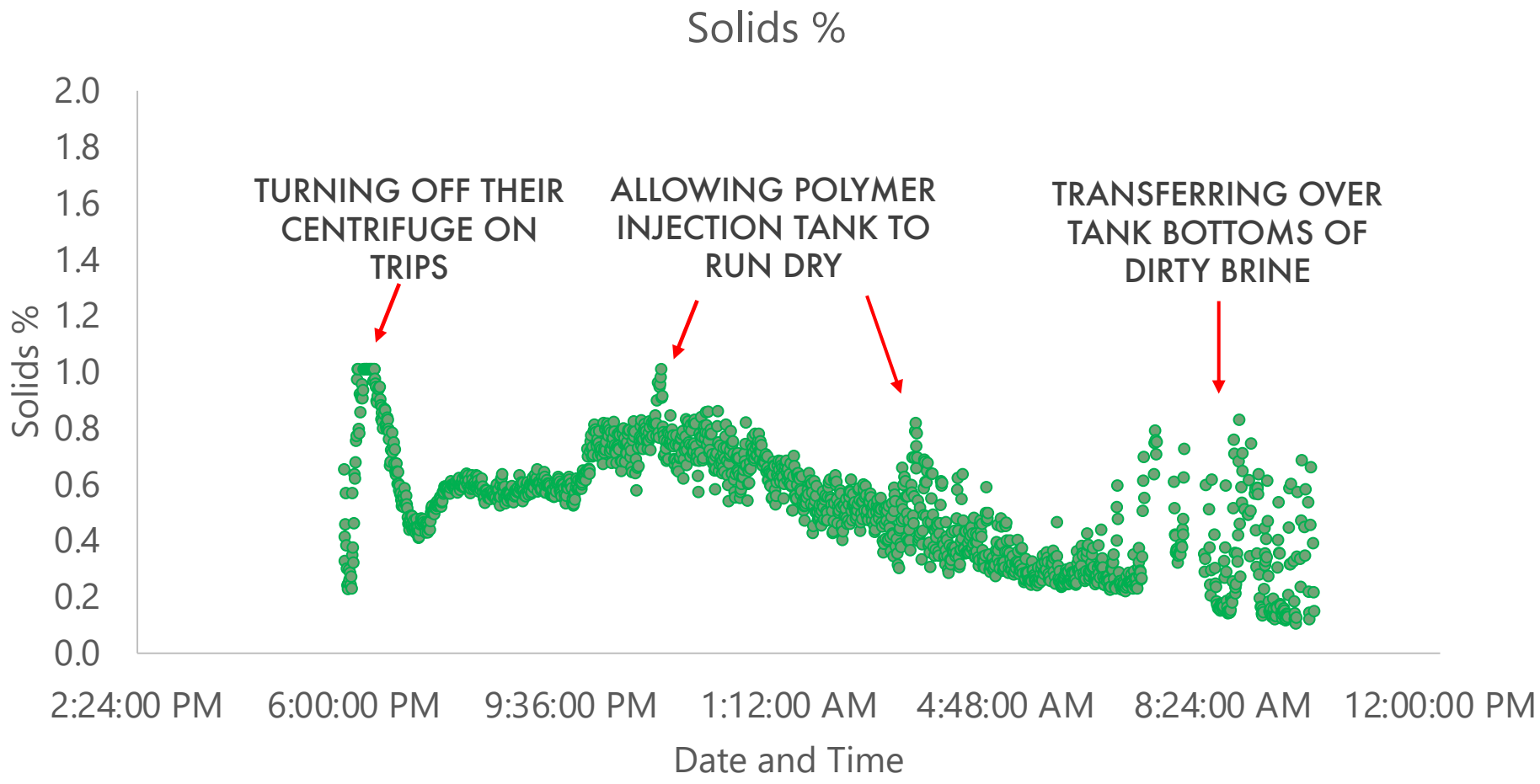
BC Montney

SENT UP TO A CLIENT WHO WAS NEW TO BRINE – WE FOUND MORE THAN WE THOUGHT WE WOULD



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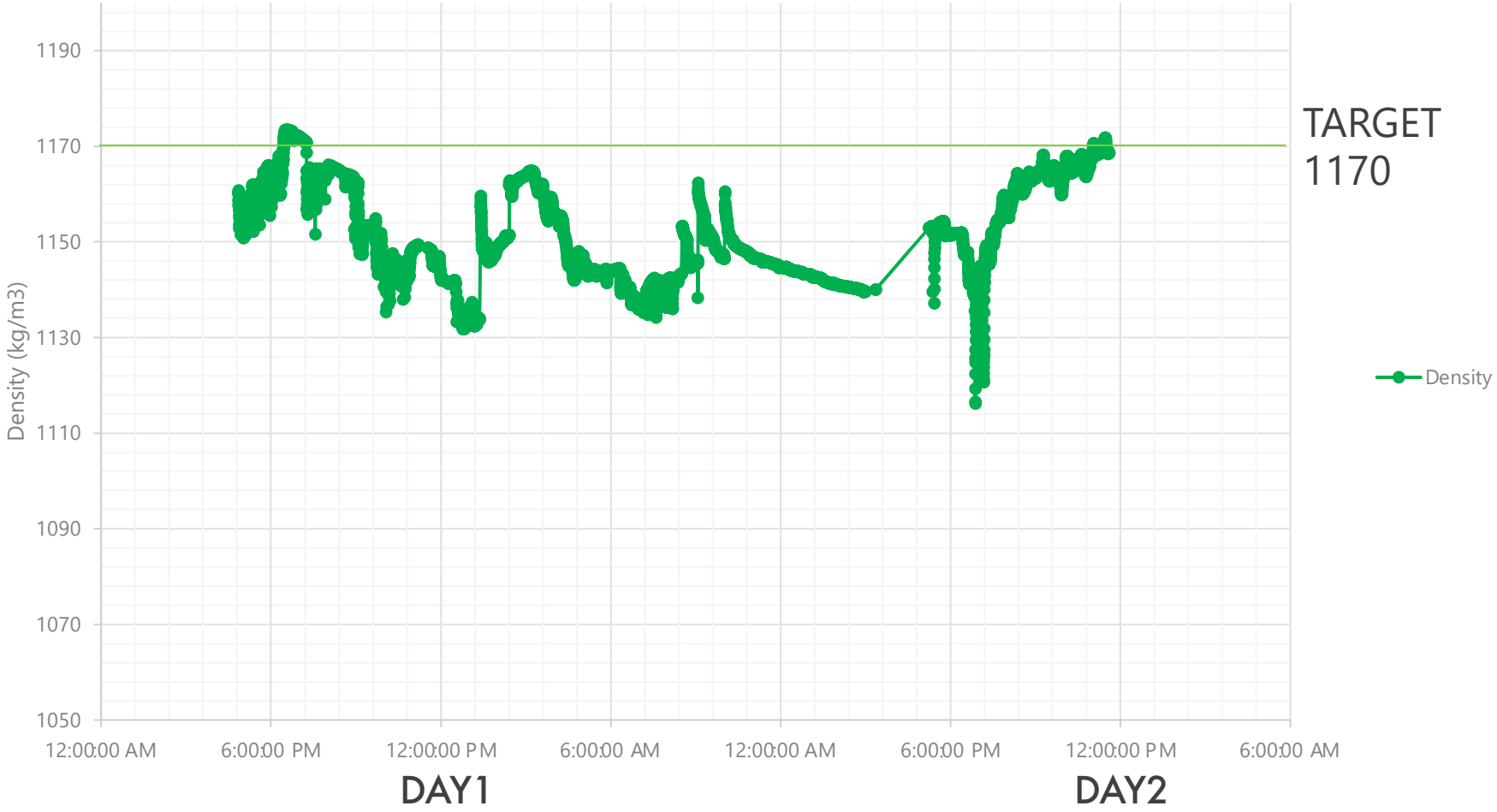
BC Montney

HOLE INSTABILITY

- Surprised to learn they weren't running the right density very often and Wilson showed why.
- Fresh water slowly makes it way in through floc polymer injection tanks, transfers and cleanings.
- They were also using fresh water sweeps to clear out an RSS.



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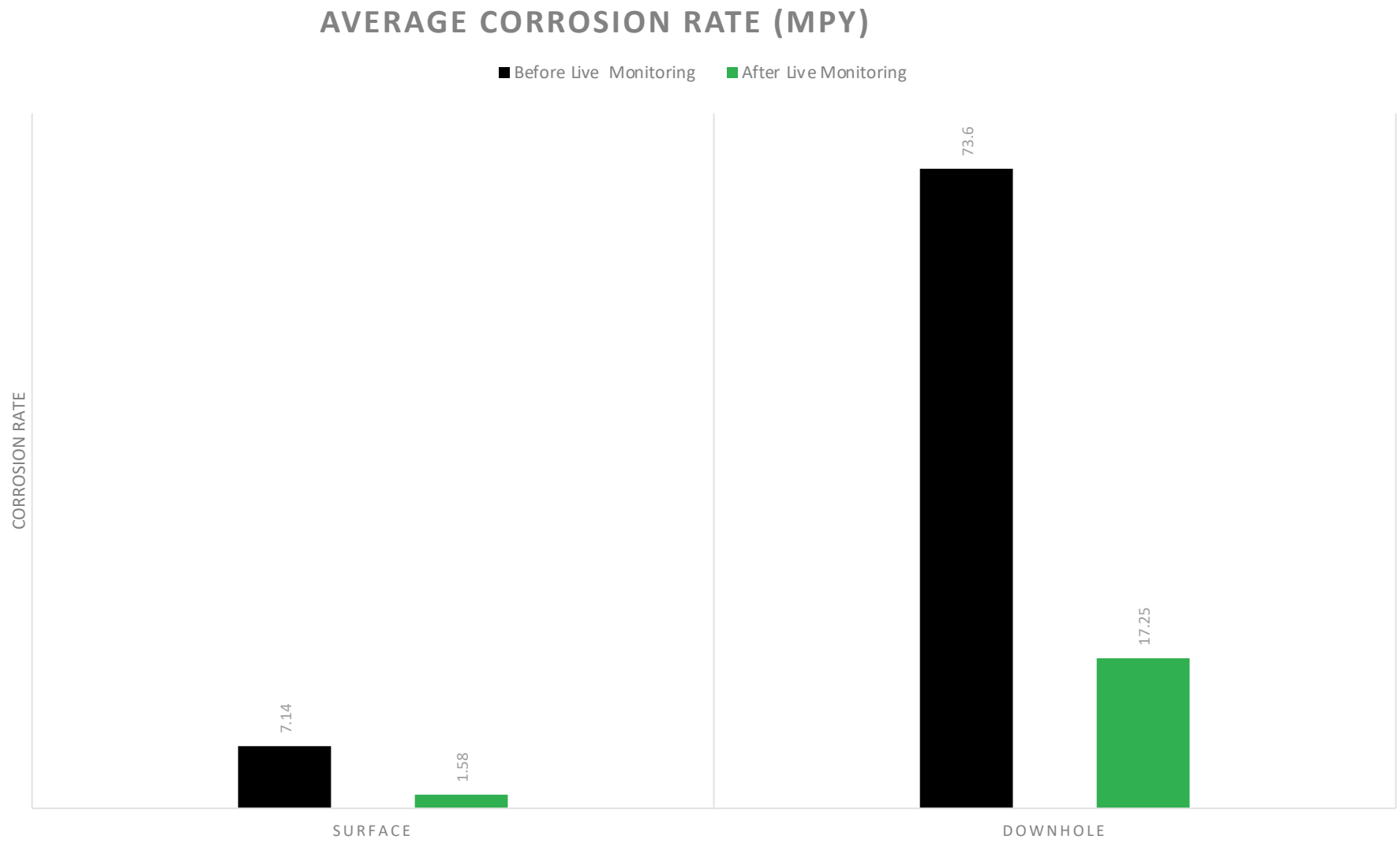
What does this mean for Corrosion in a specific case ?



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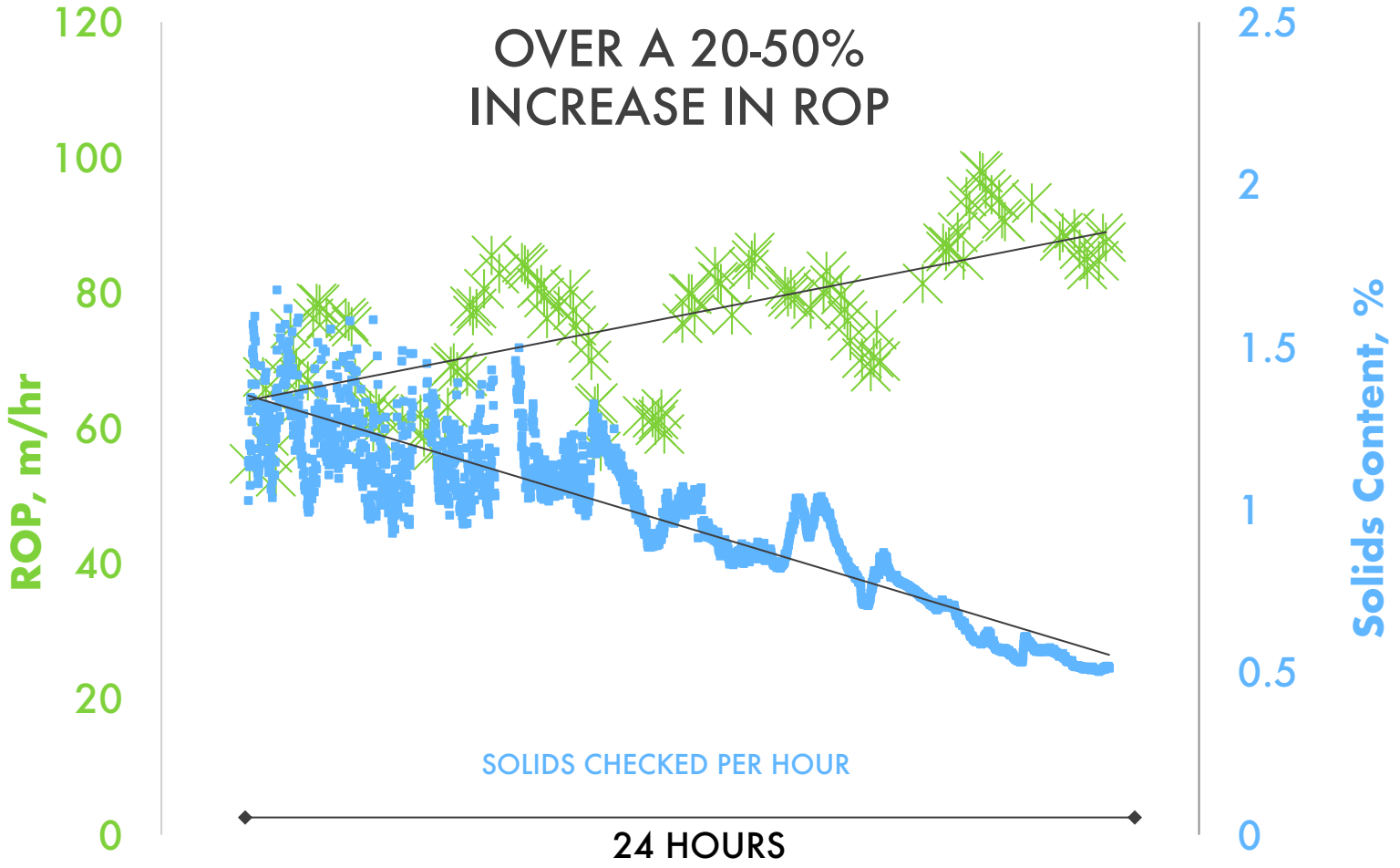
SOLIDS

- WE ARE CONVINCED THAT SOLIDS CONTENT IS THE MAJOR ENEMY AGAINST BRINE.
- THE PROBLEM COMES IN ACTUALLY GETTING QUALITY DATA ON SOLIDS CONTENT.



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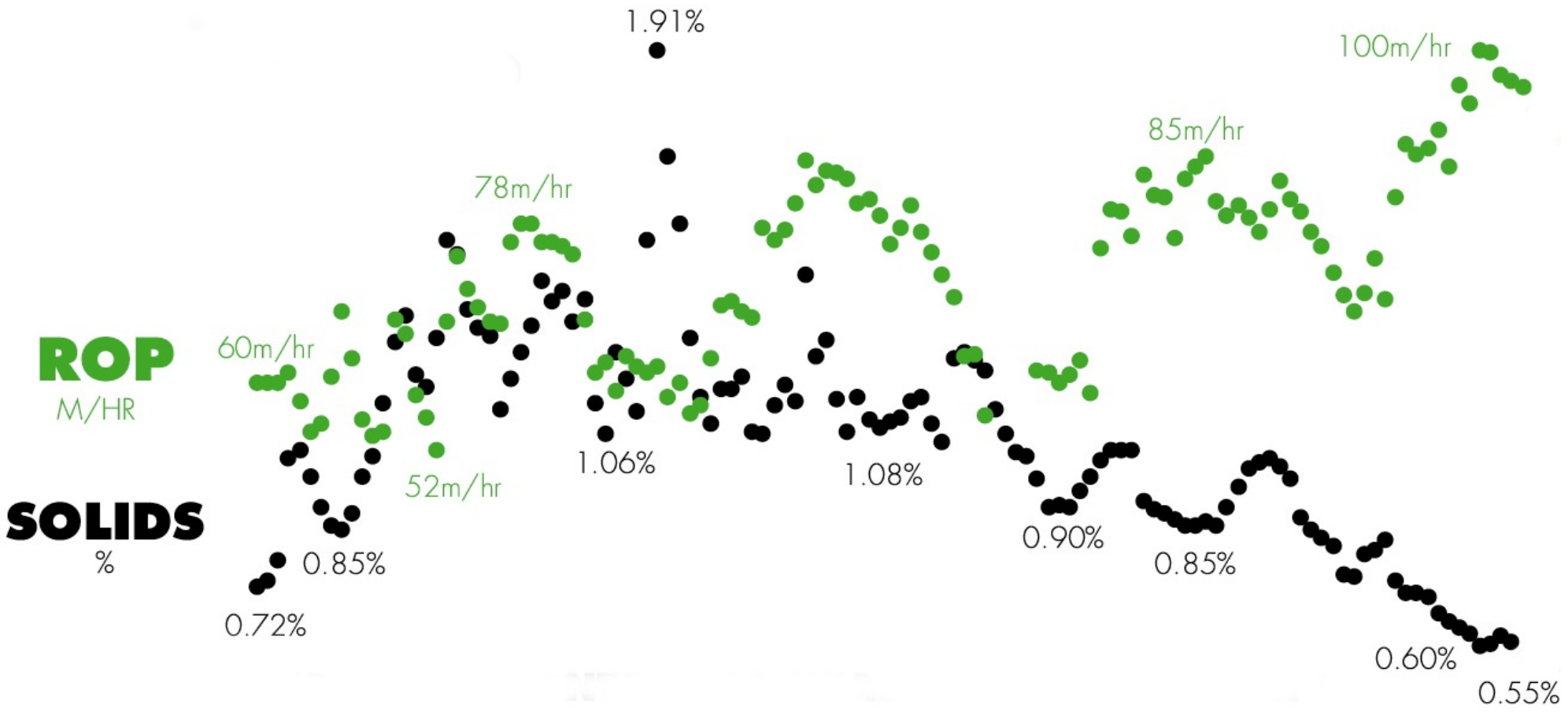
SOLIDS

WHEN THEY ARE MONITORED, THE IMPACTS ARE APPARENT.



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Conclusion

- The result from our case studies showed that ROP was increased by over 20% and the corrosion rates were reduced by up to 60% due to real-time automated fluid measurements.
- These real-time measurements optimize decision-making in fluid compositional and operational setup.
- The incorporation of automated measurements not only improves drilling efficiency but can give answers to previously elusive and unknown questions.

THANK YOU FOR LISTENING!

ANY QUESTIONS ?