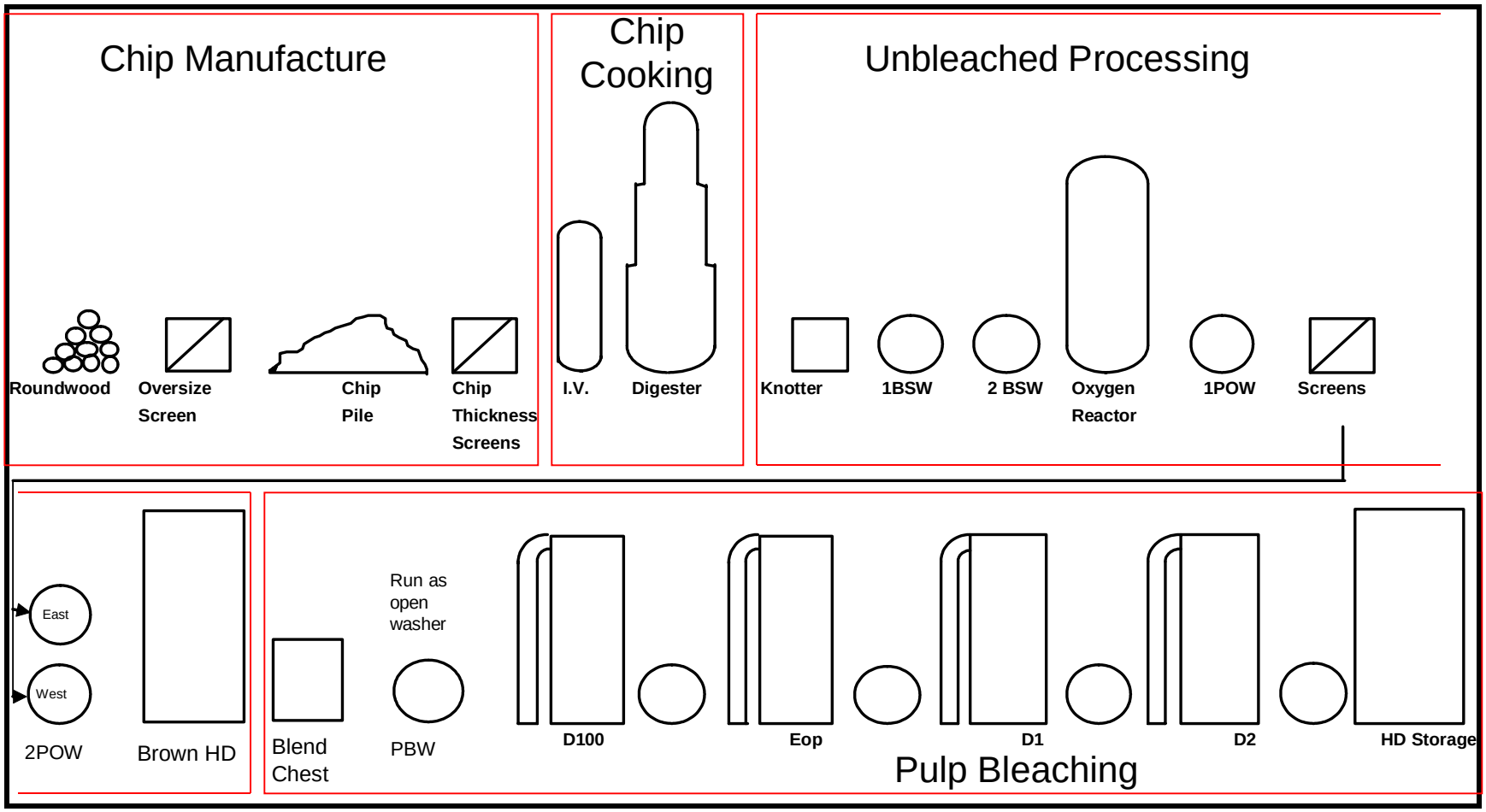
BSW Improvements for ClO2 Reduction

PAPTAC Bleaching Committee Meeting
Fall 2014
Kimberely, BC. Canada

Brian La Brash / Barry Voss Verso Paper - Quinnesec

Quinnesec Fiberline



Opportunity / Issues

- Washer audits in 2013/2014 identified potential opportunities for low cost improvements
  - Automating level control on washers
  - Minimizing by-pass flows between filtrate tanks by improving washer drainage
  - Evaluating post Oxygen Delignification pH target as this pH correlated to pre-bleach washer conductivity and Do acid use
  - Improving shower performance by adjusting showers and keeping clean/unplugged
  - Challenging solids limit from the Evaporators, i.e. send lower solids
- Solids/T to O2D and Bleach Plant were very high

Challenges

- Production shad increased since 1985 from 750 to 1400+ ADTPD and runnability/reliability in Fiberline was high
- Bleaching costs not excessively high, but above benchmark goal
- Previous experience with existing vat level control was poor – washers sealed

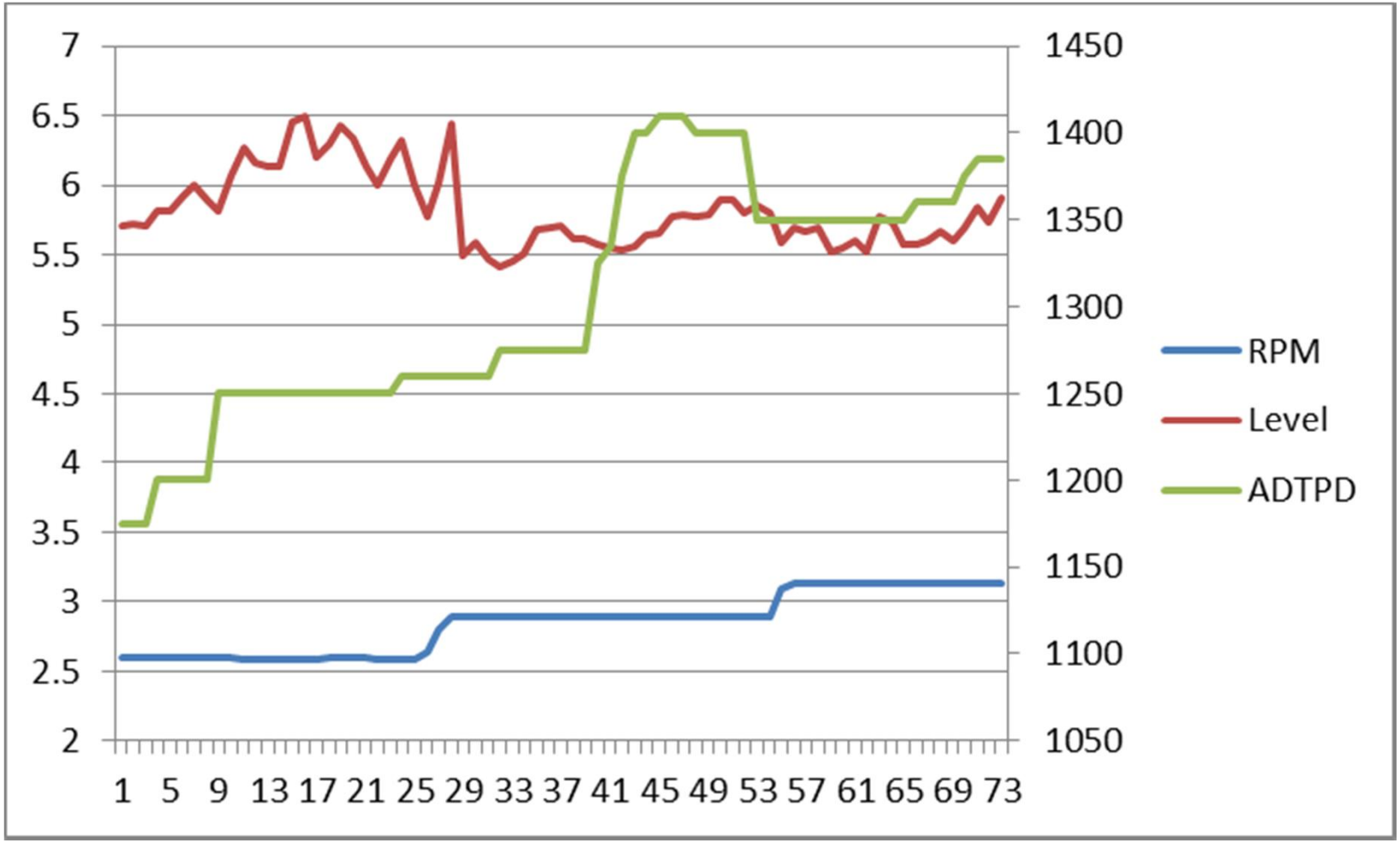
Issues Addressed

- Level control for BSW and POW's
- Trials lowering pH target for O2D
- Lowered solids target 0.5 points

Overview of Changes - BSW

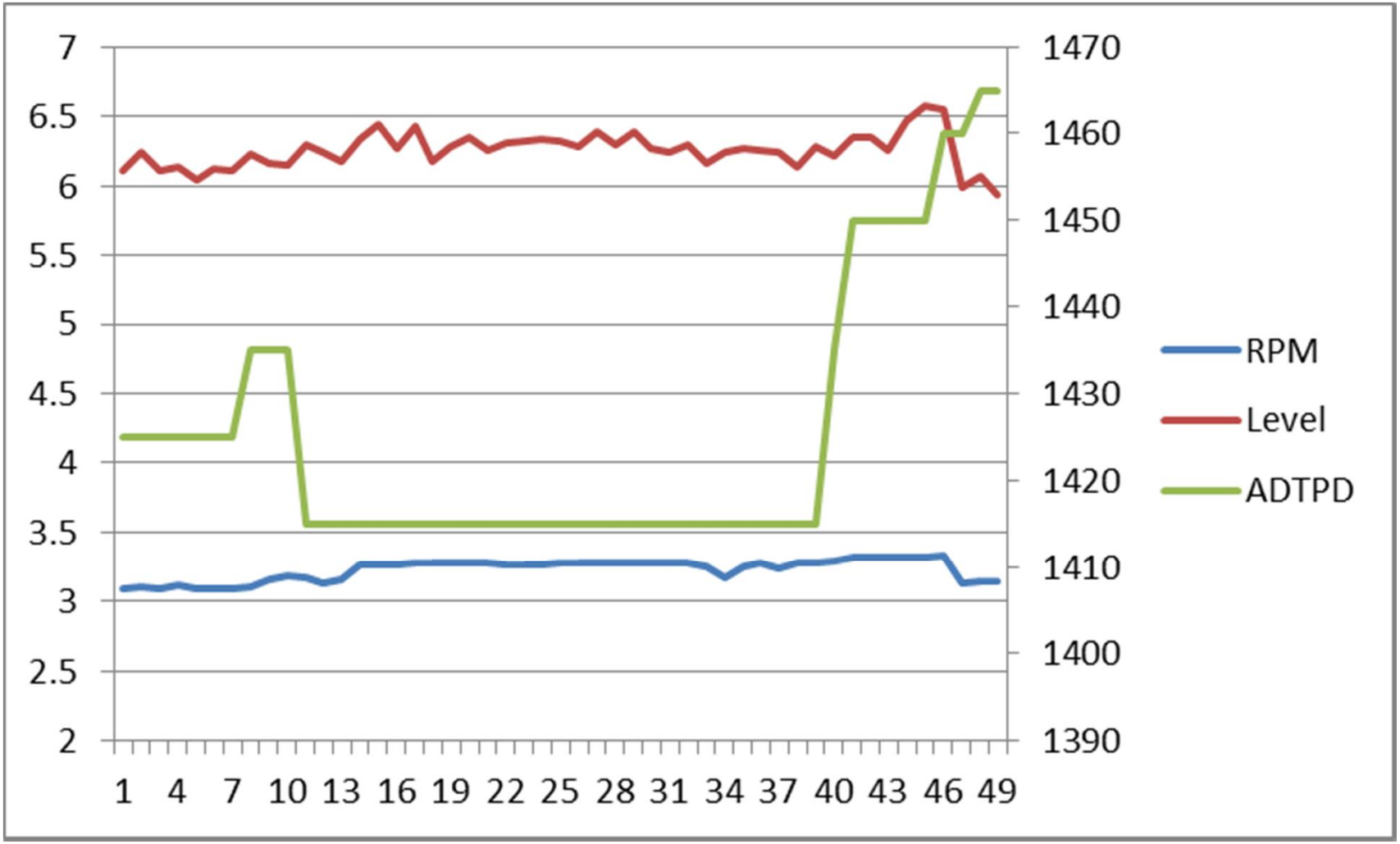
- Washer Controls (Concept from Buckman)
  - Drums in speed control with vat dilution varying in a defined range depending upon level. Clamps on both.
  - Minimizing by-passing of filtrate between tanks as washer drainage improved due to maximizing vat dilution flow (lower vat consistency)
- Taking advantage of improved drainage to run additional showers to new solids target

Prior to Washer Controls



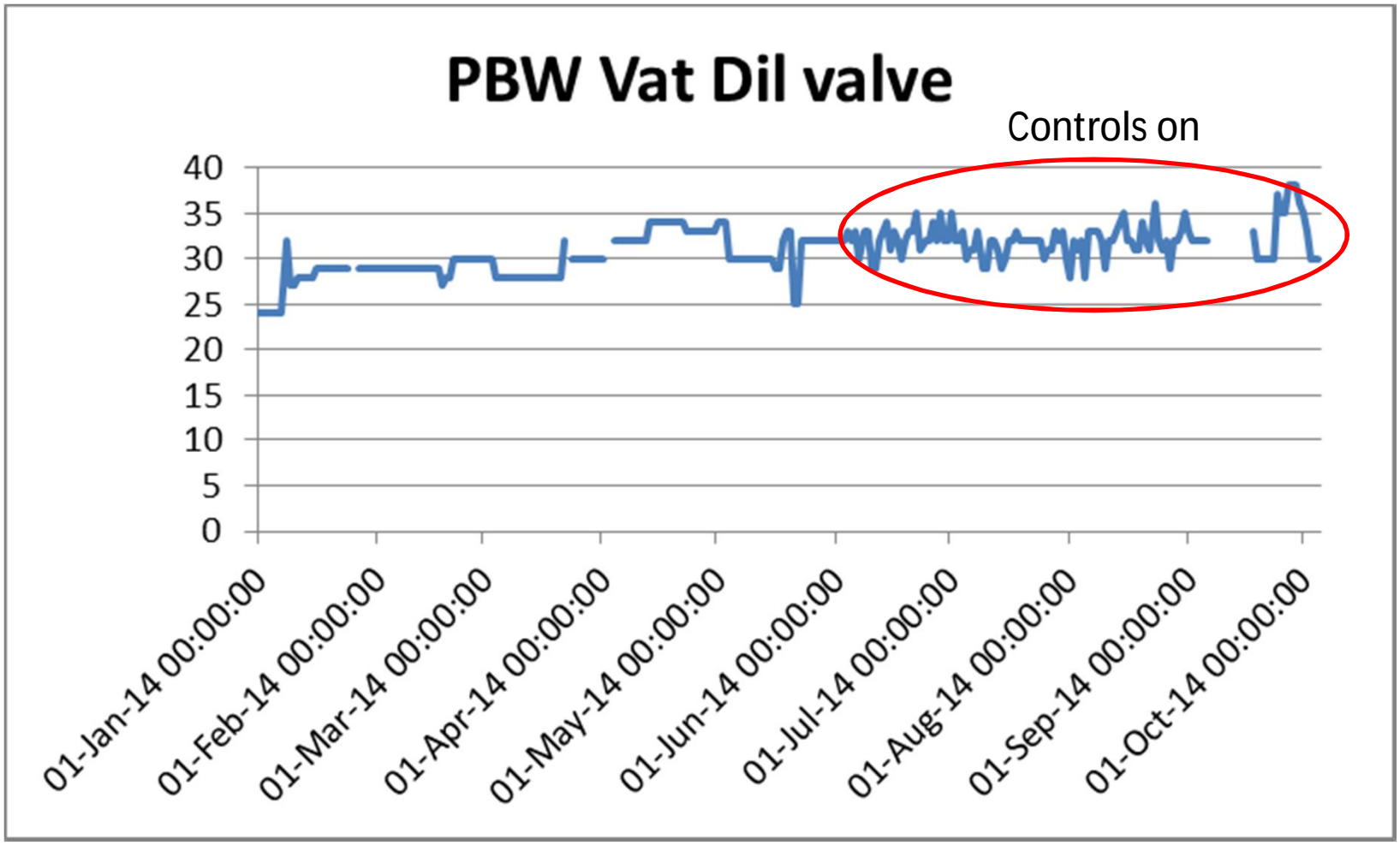
Vat dilution valve seldom changed. Sometimes drum speed, sometimes not.

After Washer Controls

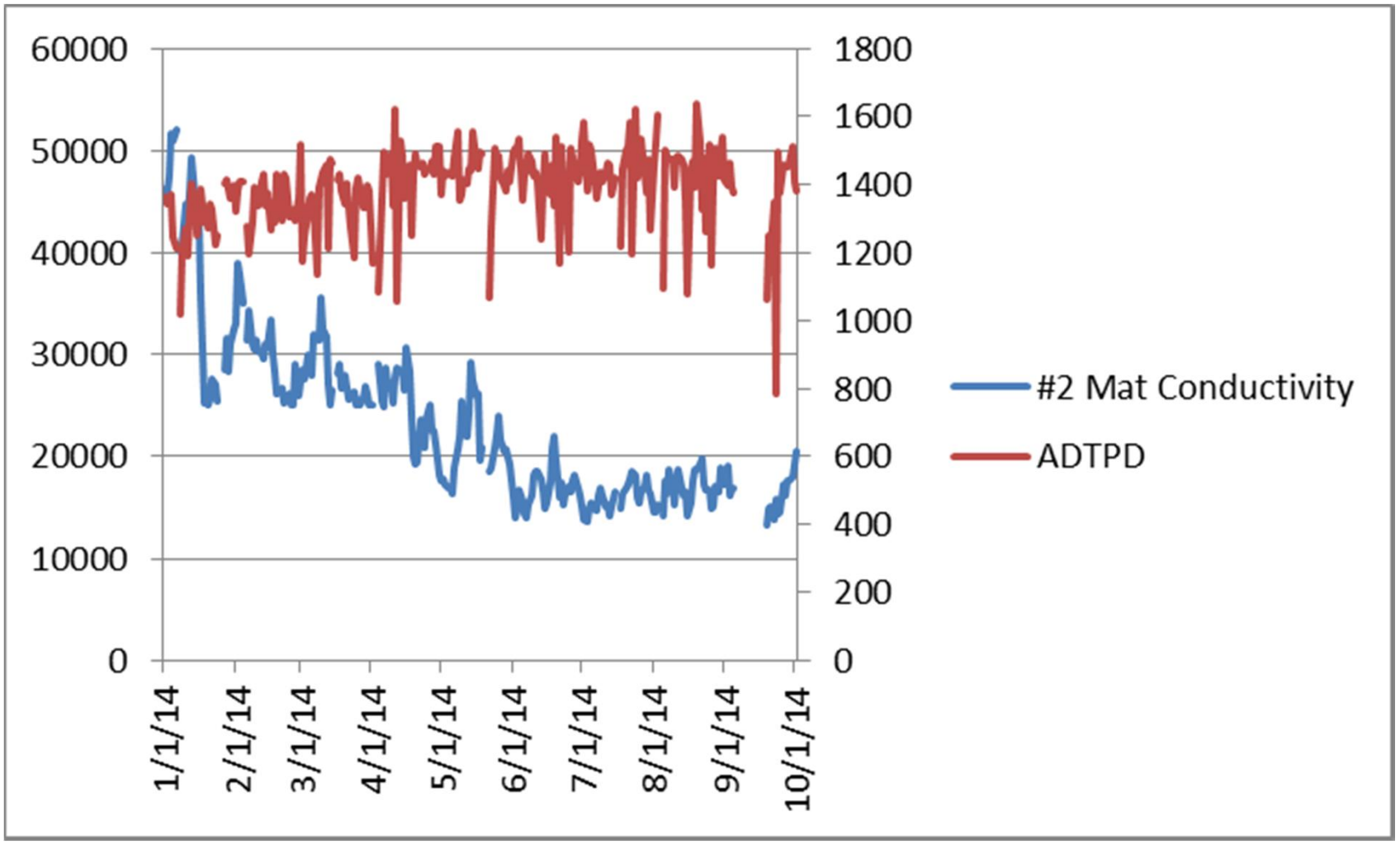


Vat dilution and drum speed manipulated to maintain level

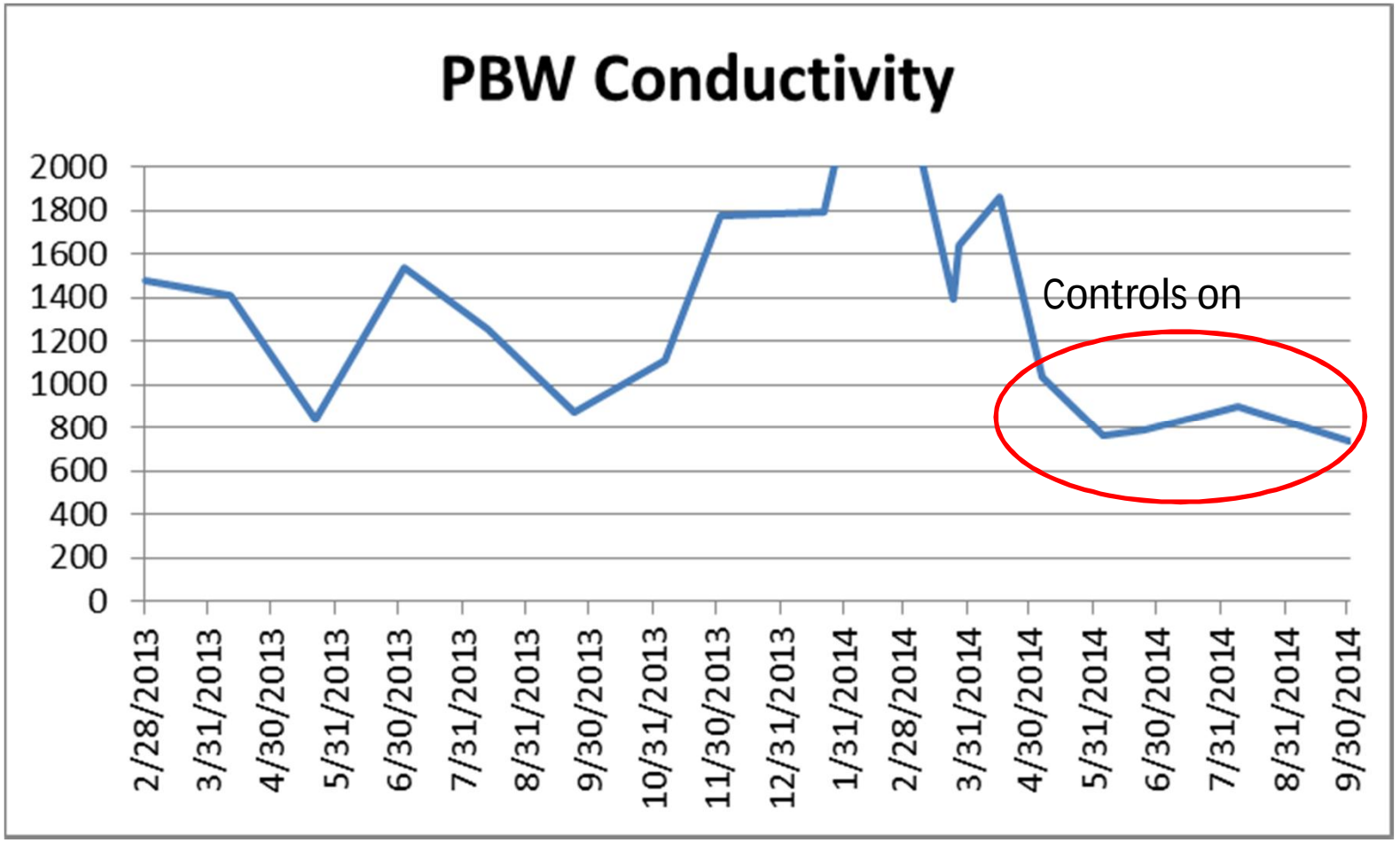
Pre-Bleach Washer Vat Dilution



Impact on Pre-O2D Carryover



Pre-Bleach Washer Conductivity



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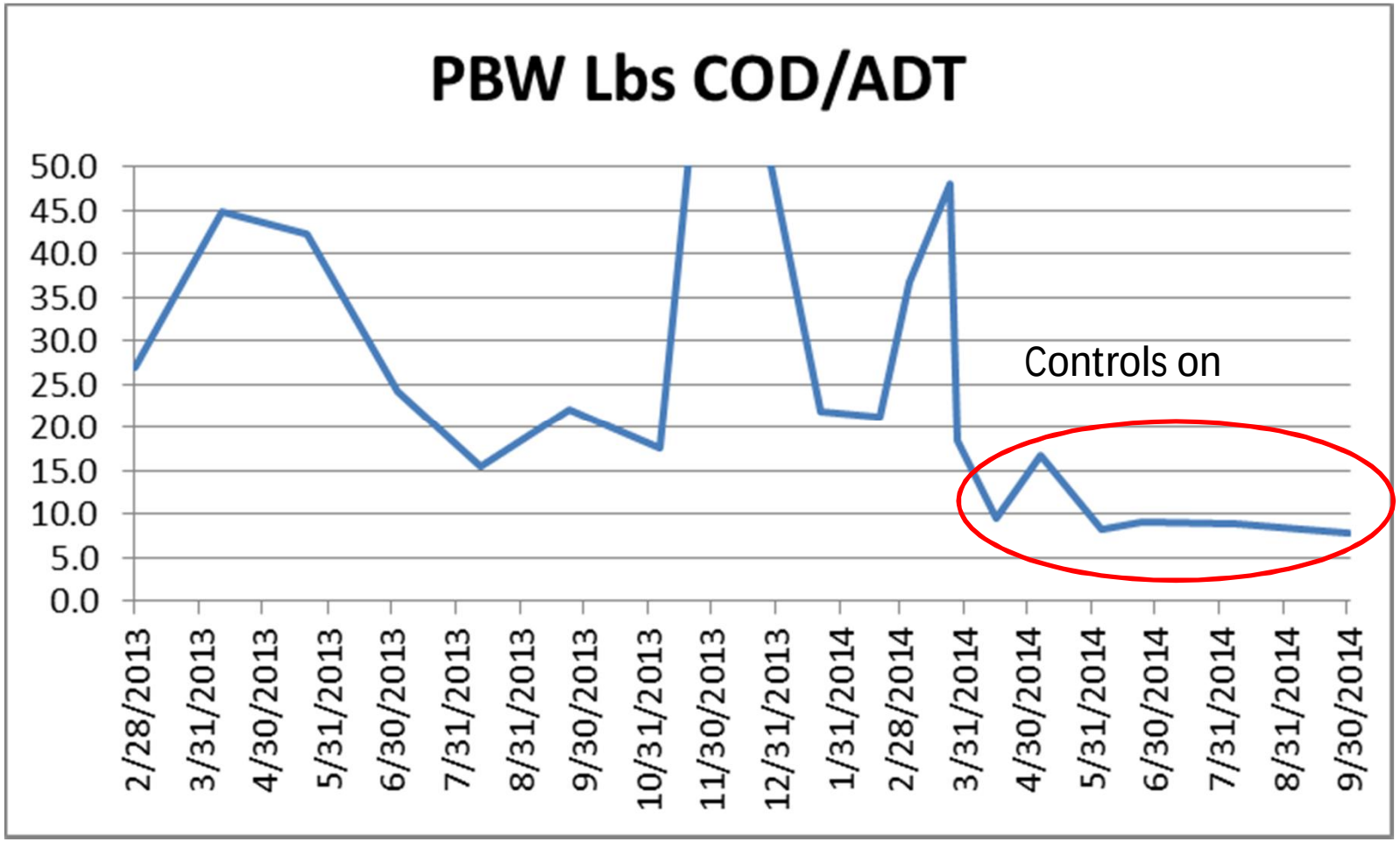
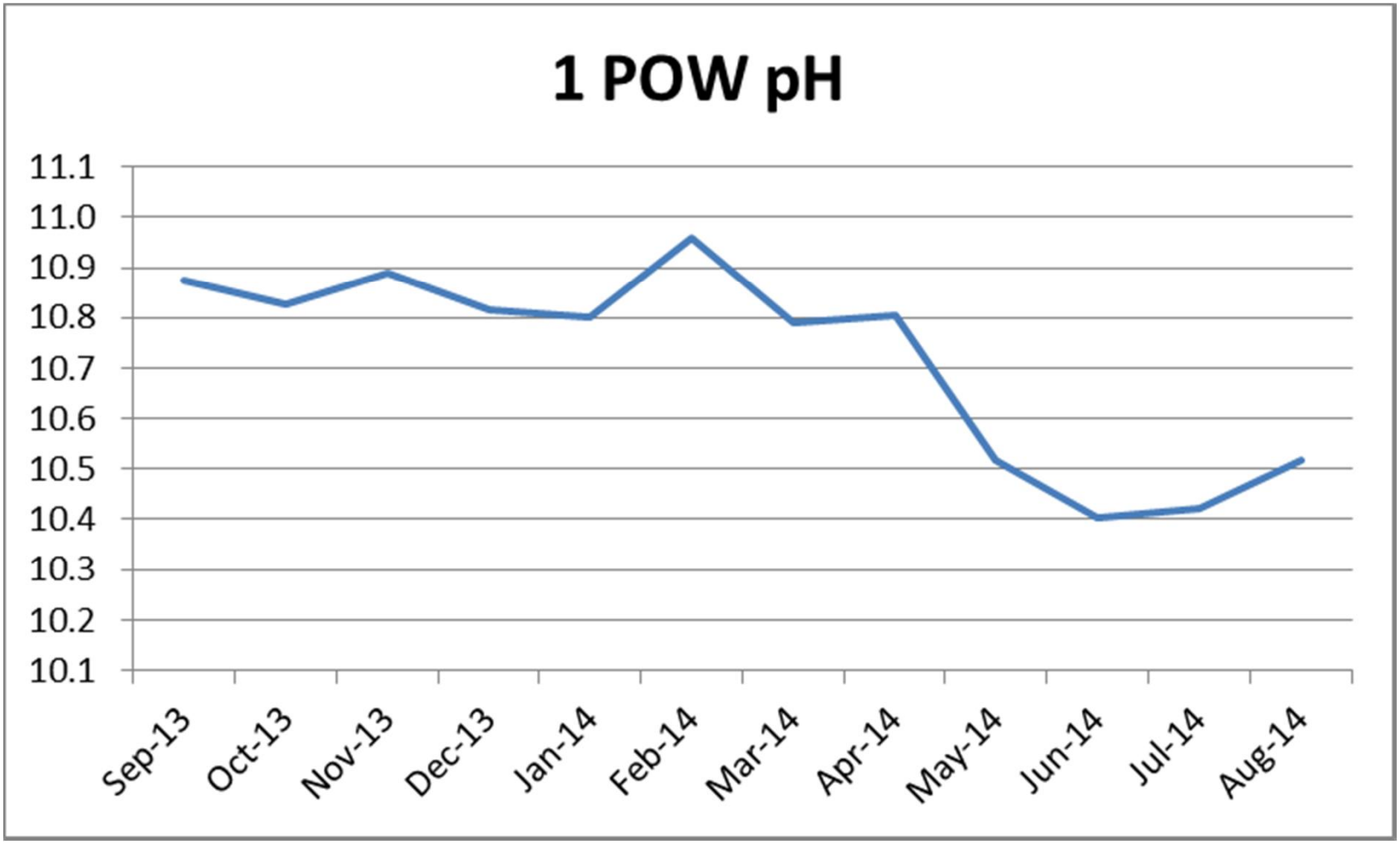
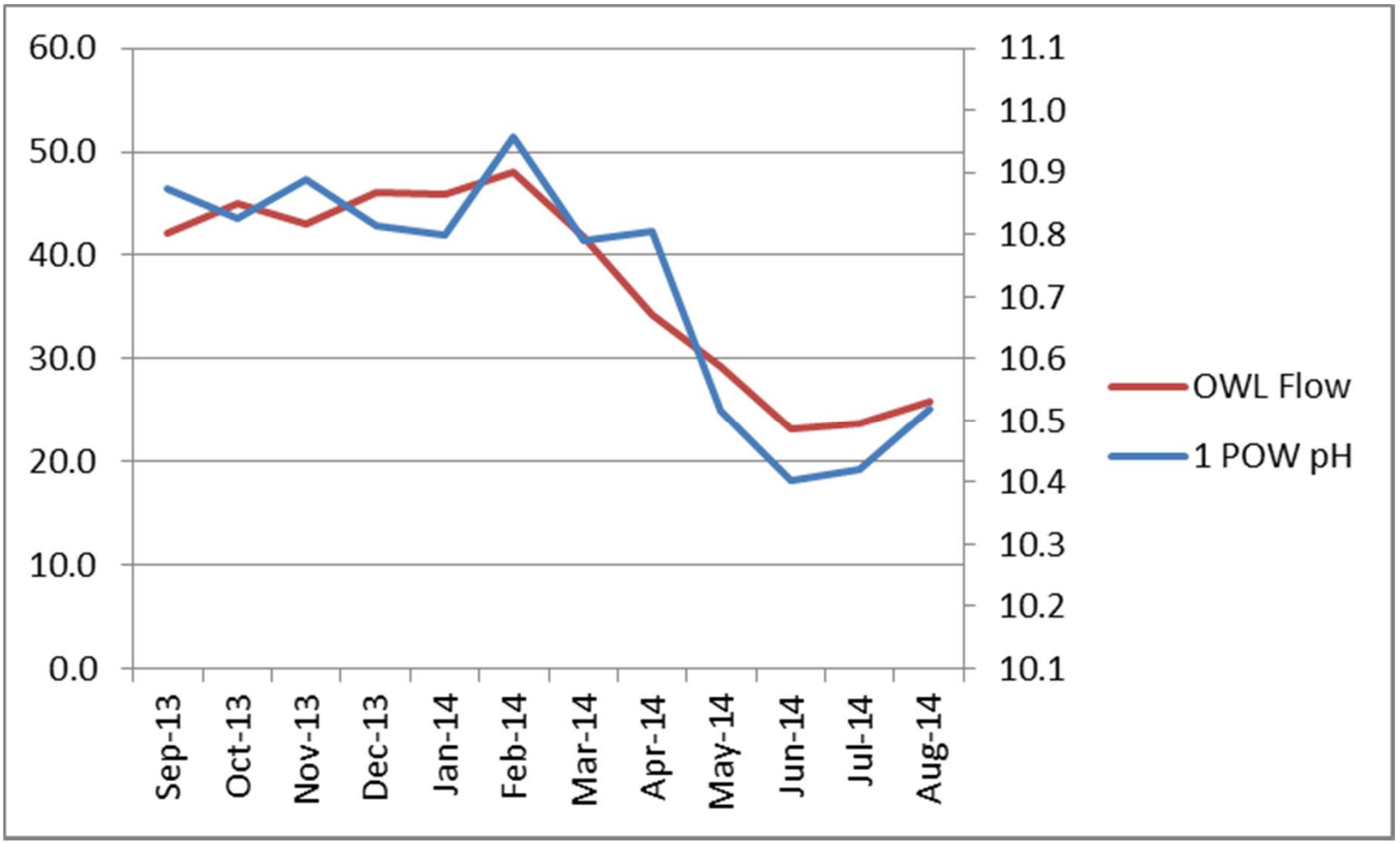


Reduction in Post O2D pH

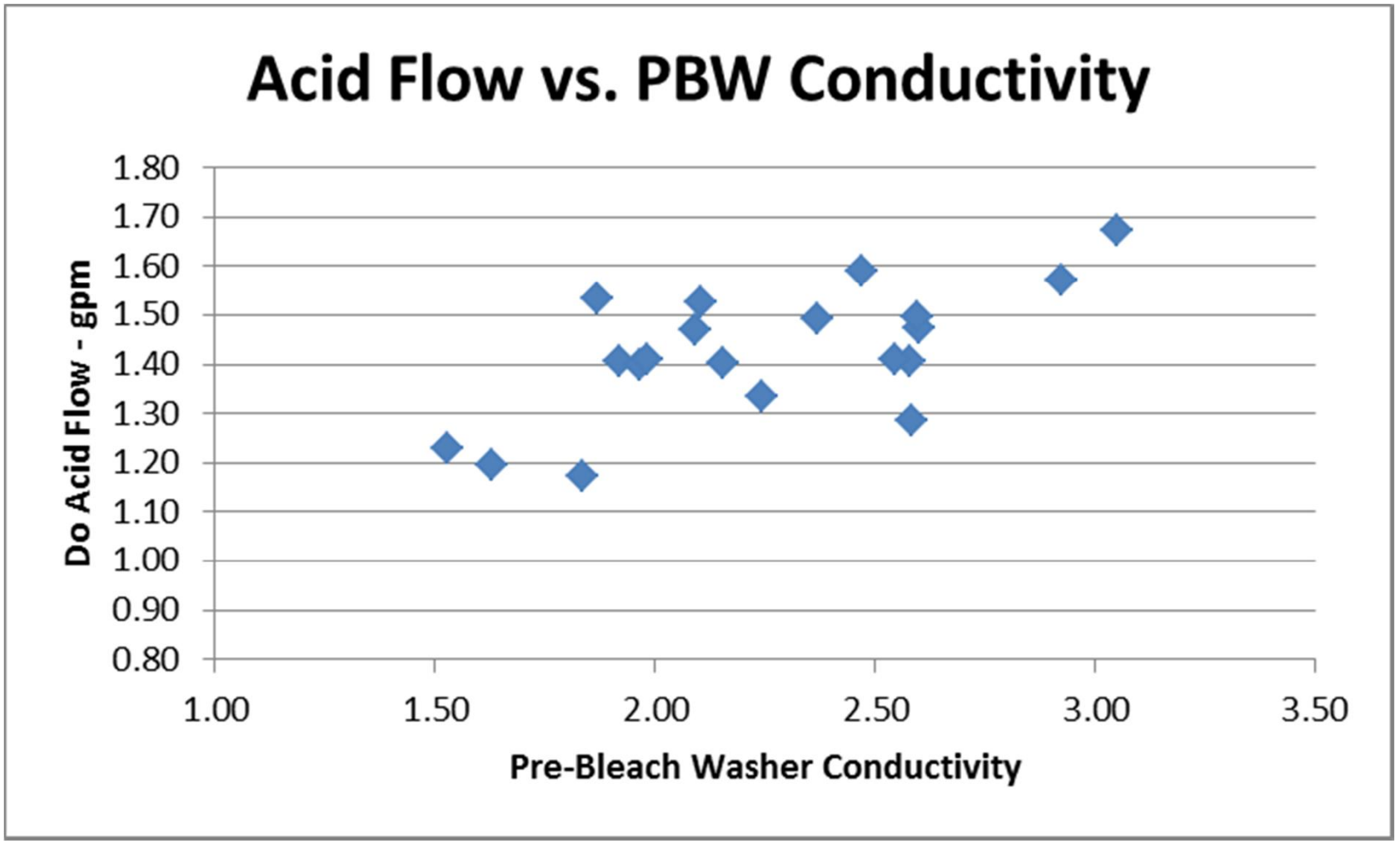


Reduction in OWL Flow

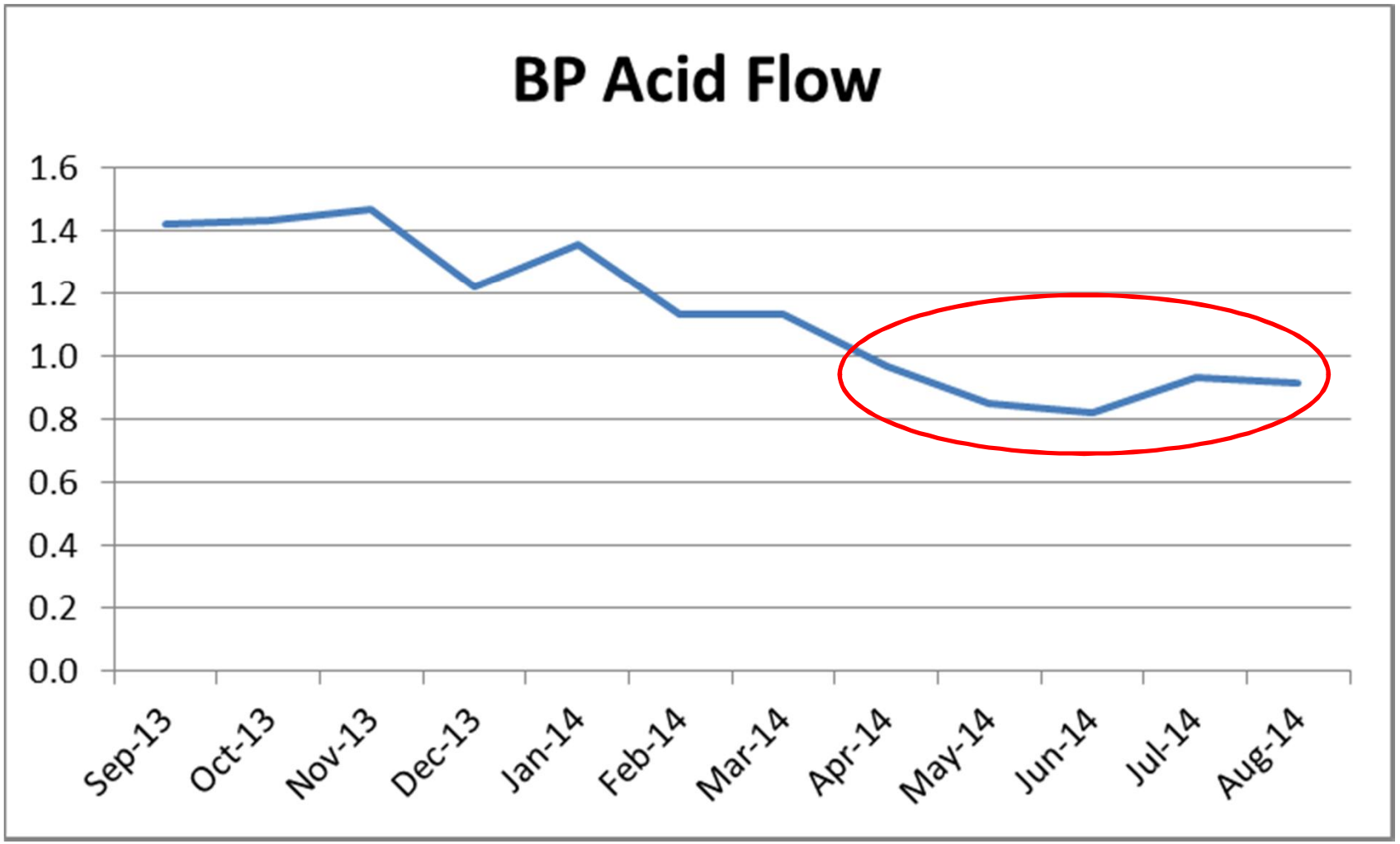


Note: using 1 gpm caustic to help maintain 0 sulfidity from WL Oxidizer. The flow reduction is a combination of the 1 gpm of caustic and the pH target reduction.

Impact of PBW Conductivity on Do Acid Use

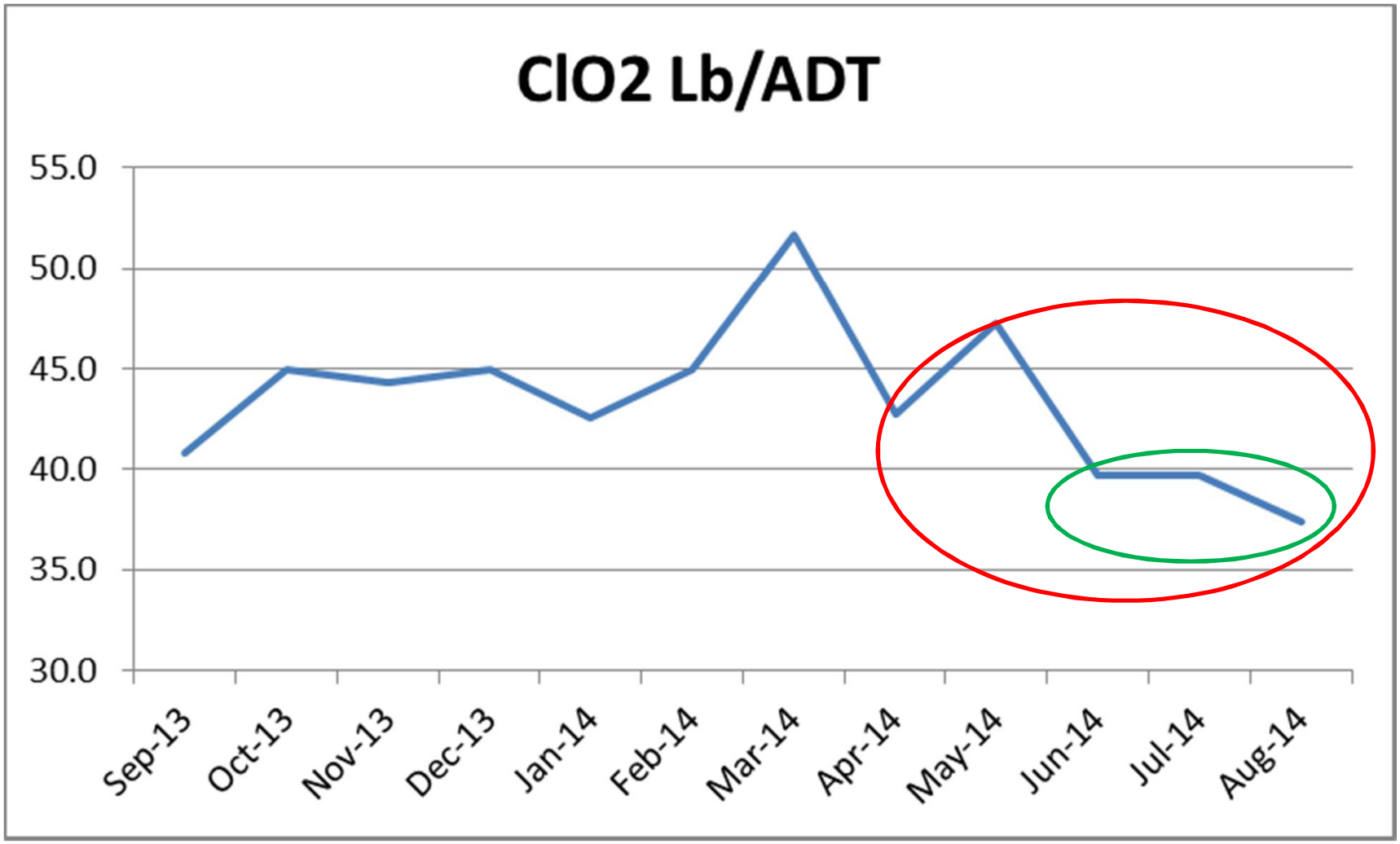


Impact on Do Acid Consumption



Acid use is down even though Do CLO2 use has also decreased

Impact on ClO2 Use



ClO2 use to the same final brightness has been reduced at record production rates

Summary

- The level controls installed are working well and the concept will be transferred to the bleach washers
- Solids control work is next
- ClO2 usage has been significantly reduced as a result of less carryover to the Bleach Plant.
- Being challenged to try things again and not to accept the status quo were the keys to the success for this improvement. We had been successful at making tons, but not efficient tons with the equipment we already had.

Acknowledgements

- Wally McDonald – Verso
- Doug Weber – Verso Quinnesec
- Ed Zychowski – Verso Quinnesec
- Mark Schroen – Buckman
- Jim Gelhoff – Buckman
- Joe Marcy – Buckman
- Central Lab – Verso Quinnesec

Verso Jay, ME Mill Washer Projects – Softwood Line

October 2014

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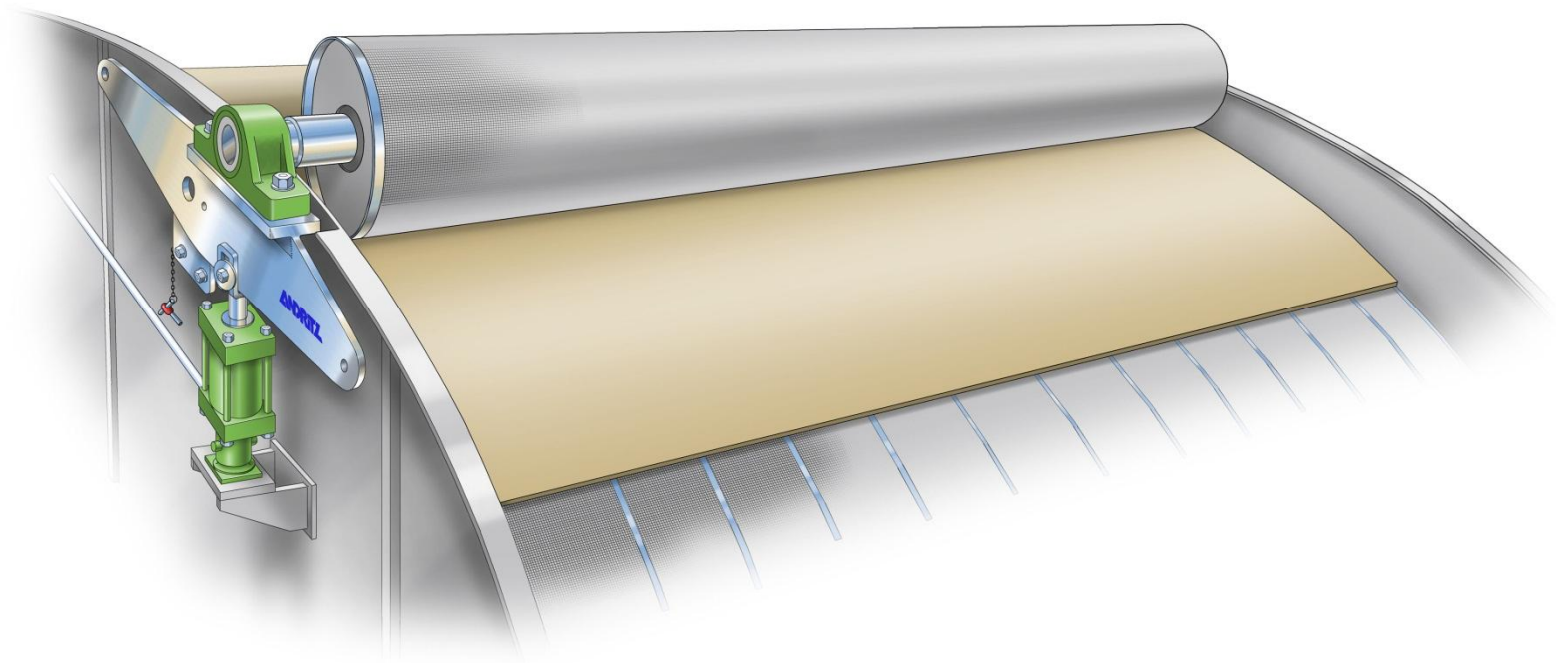
Wally McDonald - Verso Paper

Vacuum Washer Technology

Andritz Maxton™ Roll



Decker Maxton Roll

Maxton Roll Video.mov

Decker Maxton Roll

- Two parallel deckers -900 tpd softwood (450 tpd each) - 11.5’x20’ pipe washer
- Maxton roll installed on one decker
- Equipment cost / Installed cost - $70k / $100k
- Actual savings +1.5-2% mat consistency improvement and 30-40% COD reduction - estimate $150k savings ClO2/NaOH
- Project highlighted the importance of dilution washing from to running optimum vat consistency - B&Ts
  - To fully optimize Maxton roll needed to reduce vat consistency by increasing max speed on washer drum

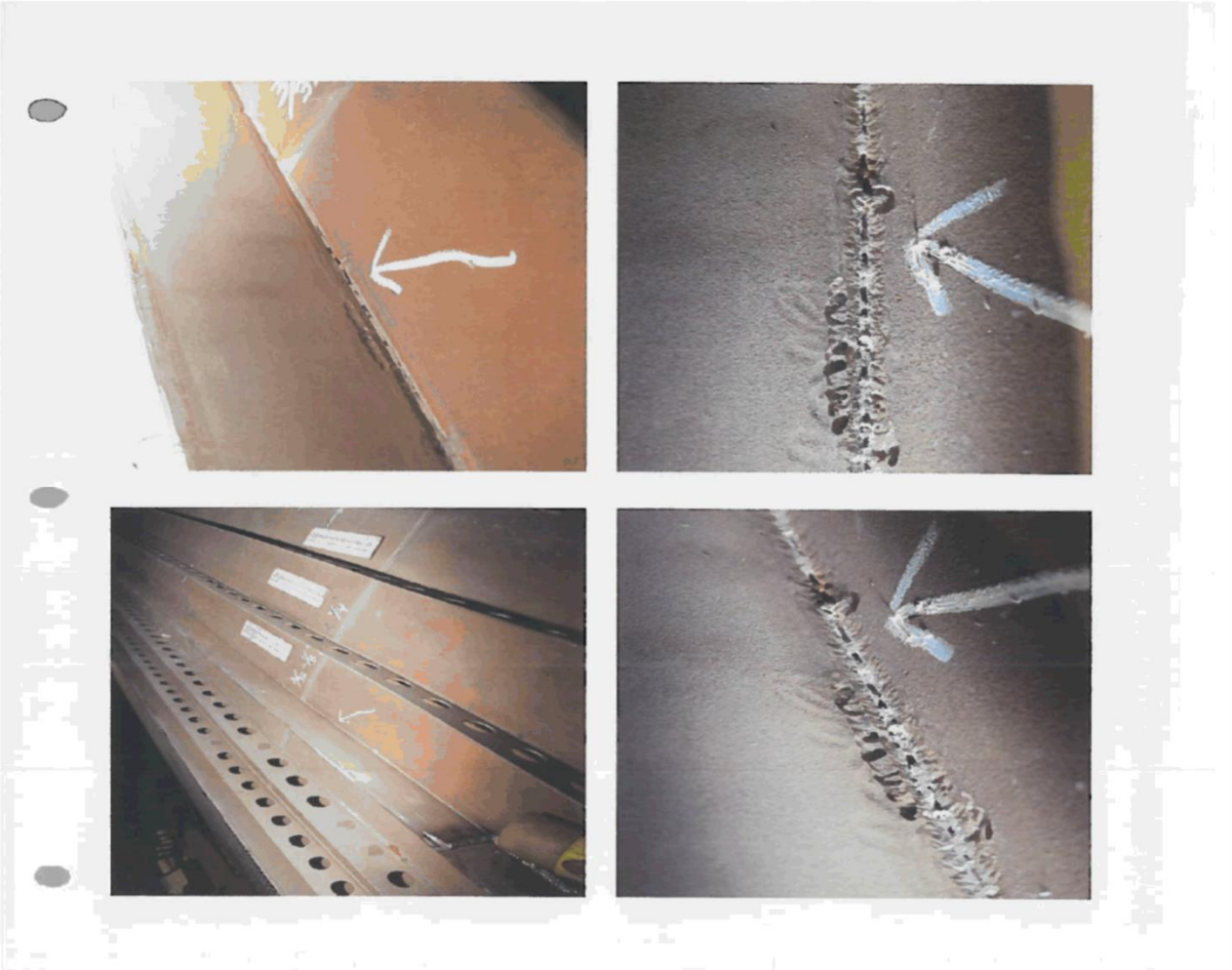
Decker Maxton Roll

Washer	Comment	Vat Cons (%)	Mat Cons (%)	COD lb/ton pulp	Est Cost Impact $
#1 Decker	*Baseline Oct 2013*	1.58	10.7	10.22	
#1 Decker	Maxton roll up	1.18	12.06	8.93	
#1 Decker	Maxton roll down (20 psi)	*1.18*	12.95	6.56	
#1 Decker	Maxton roll down (5 psi)	0.91	13.84	6.08	
	Overall improvement from project baseline		29.3%	-40.5%	$150,000/yr
	Roll up / down improvement		14.8%	-31.9%	$100,000/yr

Bleach Plant D1 Drum

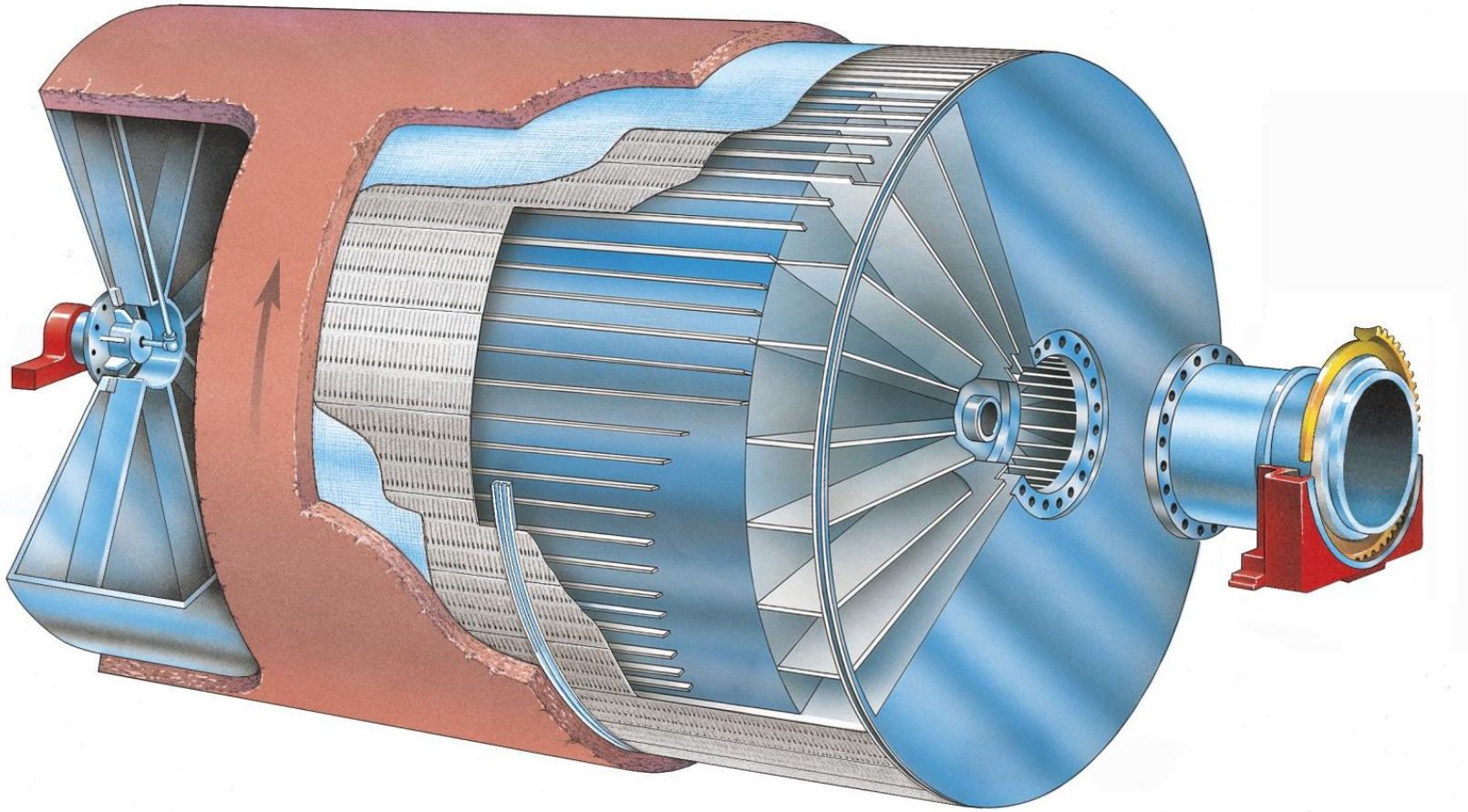
- Original drum – 11.5’x20’GL&V corrudeck III
- Replaced due to corrosion / drum failure
  - Original installed 1995 254 smo / hastelloy c276 welds
  - Severe corrosion of welds
- New drum – Andritz Bmax
  - 6% molybdenum
- Gas free valve
- Equipment cost / Installed cost - $750k / $900k
- Actual consistency improvement of 2-3%
  - Baseline mat consistency 9-10% (<5” Hg vac)
  - After project mat 12.5-13.5% (~10” Hg vac)

Bleach Plant D1 Drum



Vacuum Washer Technology

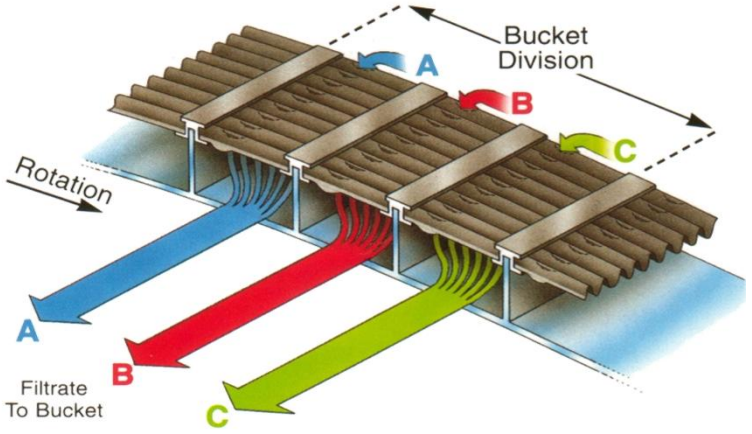
Andritz BMax



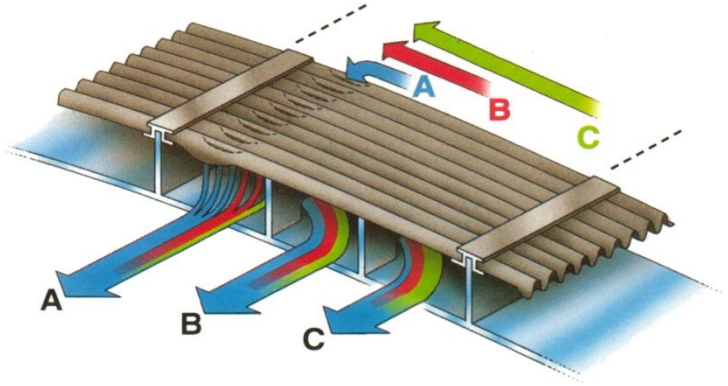
Vacuum Washer Technology

Decks

New washer
Maxton Deck

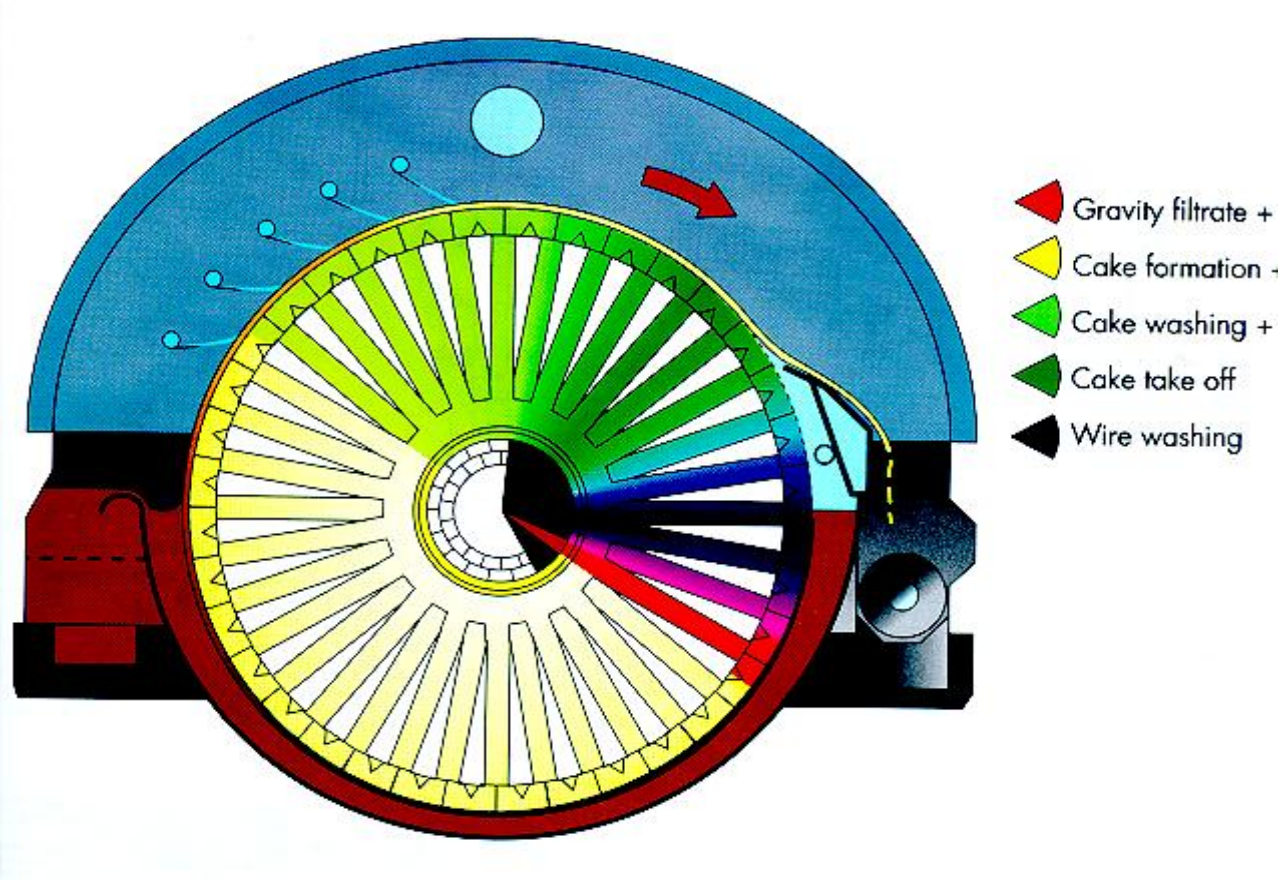


Orginal
Corrugated Deck



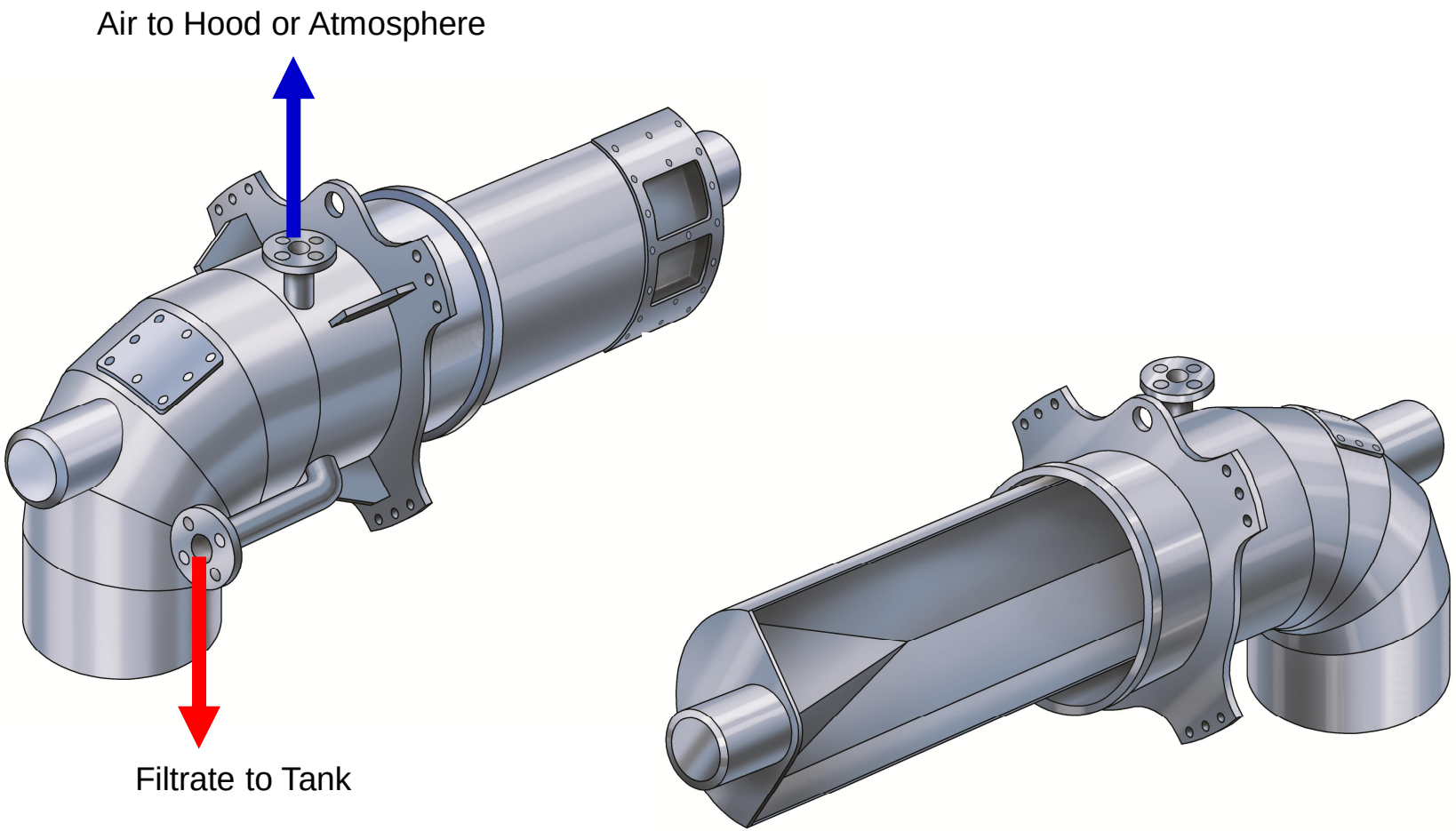
Vacuum Washer Technology

Andritz GasFree™ Valve



Vacuum Washer Technology

GasFree™ Valve



Possible future projects based on these results

- Maximize dilution washing in all washers – we call B&Ts
  - Run optimum vat consistency
  - Ensure washers are in auto level control
  - Display calculated consistency on DCS
  - Evaluate any drum speed limitations
- Consider “laydown” rolls on pre-bleach deckers and washers prior to O2 delignification
- Evaluate drum and valve technologies to improve performance