CONVERSION FROM ALUMINUM SULFATE TO POLY ALUMINUM CHLORIDE

A BRIEF SYNOPSIS
ALUMINUM SULFATE (ALUM)

• ALUM HAS BEEN USED SINCE THE PLANT WAS FIRST PUT IN SERVICE IN 1928
• IT HAS BEEN USED FOR DIFFERENT PURPOSES FOR HUNDREDS IF NOT THOUSANDS OF YEARS
• VERY COMMON IN WATER AND WASTEWATER TREATMENT PLANTS AS A COAGULANT
• IT BRINGS CHARGED PARTICLES IN THE WATER TOGETHER TO MORE EASILY SETTLE OUT OF SOLUTION
ALUMINUM SULFATE (ALUM)

ADVANTAGES
• RELATIVELY CHEAP AND BIDDING IS COMPETITIVE
• OPERATORS ARE FAMILIAR WITH IT

DISADVANTAGES
• INEFFICIENT IN COLDER WATER
• REQUIRES NARROW PH RANGE TO WORK EFFECTIVELY
POLYALUMINUM CHLORIDE (PACL)

- RELATIVELY NEW, HAVING BEEN USED SINCE THE 1970’S
- HAS BECOME MORE COMMON FOR USE IN WATER AND WASTEWATER TREATMENT PLANTS
- USED AS A COAGULANT/FLOCCULANT THE SAME WAY ALUM IS USED
- THERE ARE MANY DIFFERENT TYPES OF PACL DEPENDING ON WATER CHARACTERISTICS
POLYALUMINUM CHLORIDE (PACL)

ADVANTAGES
• USE LESS VOLUME OF CHEMICAL
• LESS DEPENDENT ON SOURCE WATER PH
• WORKS EFFICIENTLY IN COLDER WATER
• REACTS WITH WATER QUICKLY
• MARKET IS BECOMING MUCH MORE COMPETITIVE

DISADVANTAGES
• USUALLY MORE EXPENSIVE PER VOLUME
• REQUIRES LOWER PH THAN OUR SOURCE WATER
OUR COAGULANT STUDY

OVER A YEAR OF JAR TESTING (MAY 2015-MAY 2016)

• TRIED MULTIPLE TYPES OF POLYALUMINUM CHLORIDES, SOME WITH POLYMER ADDED
• VARIOUS RAW WATER CONDITIONS AND SOURCE WATER BLENDS
• DETERMINE WHICH PACL SETTLES OUT THE BEST/FASTEST
• FOUND TWO PACL TYPES THAT HAD THE BEST SETTLING/ORGANIC REMOVAL
TRIAL RUN WITH DF-801

• MANUFACTURED BY USALCO WHICH IS OUR CURRENT SUPPLIER OF ALUM
• BEGAN IN DECEMBER 2016 AND JUST CONCLUDED
• EXTREMELY GOOD SETTLEABILITY UNDER VARIOUS RAW WATER CONDITIONS
• GOOD FILTER EFFLUENT TURBIDITY (BETTER THAN ALUM)
• OVERALL EXCELLENT TREATMENT (BETTER THAN ALUM)
• ONLY CONCERN WAS WITH FILTER CLOGGING (INCREASED LOSS OF HEAD)
WHERE DO WE GO FROM HERE?

- WITH VARIOUS TYPES OF PACL OUT THERE, ANOTHER MIGHT BE BETTER SUITED FOR THIS SOURCE WATER
  - ONE THAT DOESN’T AFFECT THE FILTERS AS MUCH
  - DELPAC 2020 IS A POPULAR PRODUCT THAT MIGHT WORK BETTER OVERALL
    - NO POLYMER IN DELPAC 2020
    - MANY PLANTS USE THE PRODUCT WITH GREAT SUCCESS
    - IT PERFORMED BETTER THAN ALUM IN JAR TESTING

- NEED ACID ADDITION TO LOWER RAW PH ESPECIALLY DURING THE SUMMER MONTHS
CONCLUSION

- PACL SEEMS LIKE THE BEST OPTION FOR TREATMENT
- WITH INCREASED WATER DEMAND, CONSISTENT WATER PRODUCTION IS CRITICAL
- WILL REQUIRE A CAPITAL IMPROVEMENT FOR ACID ADDITION
- WE HAVE BEEN AND WILL CONTINUE TO CLOSELY MONITOR CORROSION POTENTIAL
- THERE IS POTENTIAL FOR COST SAVINGS, ESPECIALLY DURING WINTER MONTHS

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<tr>
<th></th>
<th>Alum</th>
<th>DF-801</th>
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<tr>
<td><strong>Coagulant</strong></td>
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<td><strong>Yearly Cost, based on 2016 Production of 3896 MG</strong></td>
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