carusllc.com

CORROSION CONTROL & SEQUESTRATION EXPERTS FOR OVER 40 YEARS

Carus is the leading manufacturer and supplier of phosphate-based corrosion control and sequestration technologies in North America. Our highly trained and experienced support staff will discuss your site to understand your needs and identify the right solution. We offer over 75 blend ratios (zinc-orthophosphates, poly-orthophosphates, and orthophosphates) to match your unique water quality needs. All of our products are NSF certified and certified by our quality department to meet our QA/QC requirements. With dedicated customer support and logistics, we can meet your crucial turn around time needs.

Both our technical service and regional sales teams average over 20 years experience in the industry to ensure optimal performance of our products.

CARUS™ 8600
WATER TREATMENT CHEMICAL SOLVES LEAD ISSUE MORE EFFECTIVELY THAN PHOSPHORIC ACID

BACKGROUND

A city located in the United States was investigating high lead levels in their system with lead levels of 17 ppb which is over the United States Environmental Protection Agency (US EPA) action level of 15 ppb. During the investigation, the city also changed their coagulant from ferric sulfate to poly-aluminum chloride to reduce the iron fouling on their membrane system.

This switch caused the lead levels to spike in their system to a high of 27 ppb but eliminated the iron fouling on their membrane system reducing their down time and chemicals required to clean the membranes. Based on the benefits to the treatment system from the changes, the city decided to explore different phosphate blends for lead corrosion control.

The water system treats water from a nearby lake through conventional treatment followed by membrane filtration and pumps an average of 18 MGD.

WATER QUALITY DATA			
pH	7.70 - 7.80	**Iron**	0.02 mg/L
Hardness	140 mg/L	**Manganese**	0.01 mg/L

CONCLUSIONS & OBSERVATIONS

The corrosion control study results showed that the CARUS 8600 water treatment chemical provided better treatment than the phosphoric acid product with the following results:

- Lead corrosion rates were 0.26 mpy with orthophosphate and were lowered to 0.07 mpy with CARUS 8600
- Copper corrosion rates were 0.53 mpy with orthophosphate and were lowered to 0.26 mpy with CARUS 8600
- Mild Steel corrosion rates were 4.20 mpy with orthophosphate and were lowered to 3.33 mpy with CARUS 8600

Based on the results of the corrosion control study, the city applied CARUS 8600 to the finished water and this resulted in:

- Lead levels dropping from 27 ppb to 5 ppb in 1 year
- By keeping their new coagulant it resulted in less membrane fouling

CARUS™ 8500
WATER TREATMENT CHEMICAL SOLVES CORROSION ISSUE

BACKGROUND

A city located in the Midwest of the United States exceeded the lead compliance rule of greater than 15 ppb lead. There was discoloration on plumbing fixtures, and long hydrant flushing times greater than 30 minutes. This resulted in United States Environmental Protection Agency (US EPA) mandated monitoring of lead and quarterly testing of lead dissolution throughout the distribution system.

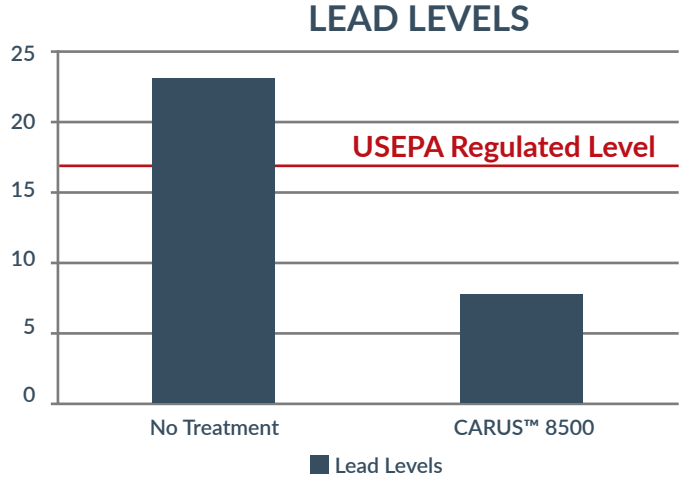
The city was using three wells located in confined deep aquifers and treating an average of approximately 1.1 MGD to over 2,000 connections or a population of 7,500. All three well systems have radium removal systems using a Hydrous Manganese Oxide process filtered through anthracite/sand mixed pressure filters. All filtered water is fluoridated, chlorinated and pumped directly into elevated storage prior to being sent to the distribution system. All wells are monitored and controlled by a computer system at the plant for maintaining consistent water pressure

WATER QUALITY DATA			
pH	7.30 - 7.50	**Iron**	0.10 - 0.50 mg/L
Hardness	280 - 340 mg/L	**Manganese**	0.01 - 0.05 mg/L

CONCLUSIONS & OBSERVATIONS

Within 60 days of using CARUS 8500 water treatment chemical, the superintendent observed color control on plumbing fixtures, and first draw lead samples tested were all within 95% of 15 ppb meeting the USEPA regulation.

One year later: The first draw lead samples taken were all less than 7.5 ppb, well below the 15 ppb action level. The hydrant flushing times were reduced from 30 minutes to less than five minutes maintaining color control in the distribution system.



AQUA MAG®
BLENDED PHOSPHATE SOLVES CALCIUM BUILD-UP ISSUES

DISTRIBUTION MAINS

Before | After One Year

BACKGROUND

A city located in the United States was treating 1.3 MGD of ground water with a lime softening process and were having calcification of the rapid sand filter beds. This issue caused the plant to have to acid clean the filters periodically to keep them in working order. The distribution system was having periodic dirty (red) water issues, heavy tuberculation on the distribution mains, reduced flows, and a high chlorine demand which all led to customer complaints

WATER QUALITY DATA			
pH	8.35	**Iron**	0.10 mg/L
Hardness	125 mg/L	**Manganese**	0.01 mg/L

CONCLUSIONS & OBSERVATIONS

The plant started applying AQUA MAG blended phosphate at a dosage of 1.3 mg/L as total phosphate prior to the filters. This treatment resulted in:

- Lowered customer complaints
- Less discolored water
- Chlorine demand decreased 37%
- Average flow improvement of 65% (after 1 year)
- Electric pumping cost decreased 12%
- Filter backwash frequency decreased 5X+
- Calcium deposits removed from filter

AQUA MAG® 9100
BLENDED PHOSPHATE SOLVES COLOR ISSUES & REDUCES COMPLAINTS

BACKGROUND

A mid-western city was using a blended 50/50 ratio phosphate product in a contractual agreement for one year with little to no color control causing discoloration on plumbing fixtures. Long hydrant flushing times greater than 30 minutes were required, and they continued to have scale formation on the Packed Tower Aeration (PTA) media resulting in quarterly shut downs for acid cleaning and 10 -15 customer complaints per month (over 100/year).

The city was using seven community water supply wells consisting of deep sandstone aquifers treating an average of approximately 3.8 MGD to 7,225 direct services and three satellite service regions serving a population of 23,500. One well system has a PTA process for Volatile Organic Compound (VOC) removal before it is pumped into ground storage. The other two well systems are pumped directly into ground-level reservoirs, and the remaining wells are pumped directly into the distribution system. All of the wells are monitored and controlled by a computer system at the plant for maintaining steady water pressure.

WATER QUALITY DATA			
pH	7.3 - 7.5	**Iron**	0.10 - 0.25 mg/L
Hardness	340 - 490 mg/L	**Manganese**	0.01 - 0.03 mg/L

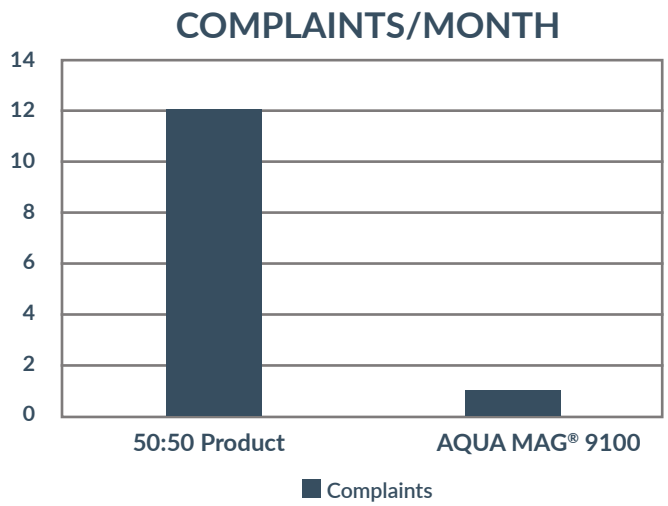
Hydrant Flushing Due to Color Issues

CONCLUSIONS & OBSERVATIONS

Within 5 days of using AQUA MAG 9100 blended phosphate, the superintendent observed color control on the plumbing fixtures. Complaints were reduced to 2 within the first month.

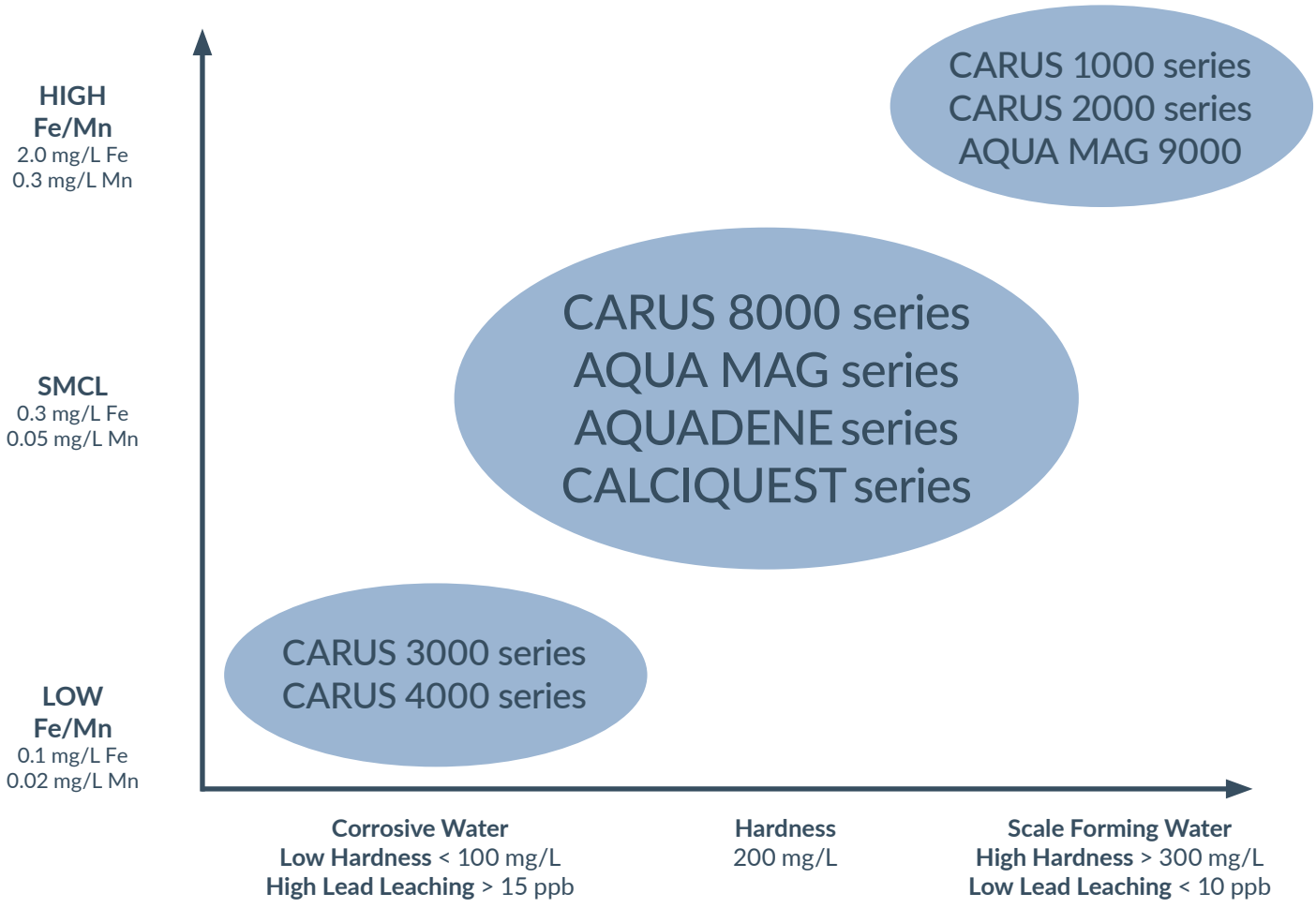
One year later: color control is established resulting in less than 7 complaints per year, PTA preventative maintenance cleaning is down to once per year, hydrant flushing times are now less than five minutes.

Color Control After Using AQUA MAG 9100



PHOSPHATE PRODUCT SELECTION GUIDE

Includes CARUS™ Water Treatment Chemicals, AQUA MAG® Blended Phosphates, AQUADENE® Blended Phosphates, & CALCIQUEST® Liquid Water Treatment Chemical



CARUS®

PROVIDING ENVIRONMENTAL SOLUTIONS GLOBALLY

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