Recent Work

- Experiments with high pH, aluminum, chorine and no *Natural Organic Matter (NOM)*
  - Substances making up NOM protect metal piping
- Indication of initiating pitting in lab for the first time
- Impact of higher pH contradicts conventional scientific wisdom
  - Higher pH generally less corrosive to copper
What Does This Mean?

• U.S. EPA requirements may promote leaks
  – Increased NOM removal
  – Higher pH for lead/copper leaching
• Statewide / National problem
  - Senate Bill 54 - creation of statewide task force
  - Dr. Edwards is receiving calls from utilities / customers across the county
• Met with EPA officials on 4/18
  - EPA agreed to look into issue
    -- Possible workshop with AWWARF and others
• While we do not know what causes pitting, utilities have sometimes identified water chemistry changes that can reduce pitting frequency.

• Possible approaches include:
  - Increase or decrease pH and alkalinity
  - Increase or decrease disinfectant dose
  - Dosing of corrosion inhibitors (influence corrosion)
  * Uncertainty in approaches
Corrosion Inhibitors

• Corrosion “inhibitors” are safe chemicals that can be added to water and which influence corrosion

• Most common are silicates and phosphates

• Corrosion inhibitors do not necessarily inhibit corrosion
  – Not a guarantee -- may help
What are Phosphates?

- NSF / FDA approved
- On average, people consume 1,000 - 1,500 milligrams per day
- Occurs naturally in meat and dairy
- Additive in many foods and beverages
  - cheese; cakes; cookies; breads; crackers; breakfast cereals; butter; chocolates; and soft drinks.
  - Some soft drinks contain **500 times** more phosphate per liter than we intend to use.
Phosphates in Water

- Approx. 50% of all utilities nationwide have been safely using phosphates to control corrosion
  - Many since the passage of EPA’s Lead and Copper Rule
- Locally, this includes: Rockville, MD; Fairfax, VA; Carroll County, MD; Calvert County, MD; Frederick County, MD
Orthophosphate effective in lab test
Yearlong pilot reduced pinhole leak rate in Laurel apartment complex
Apartment management wants to keep using orthophosphate
Additional pH testing reinforces use of this corrosion inhibitor
Strongly recommended by Dr. Edwards
Orthophosphate Systemwide

• Received MDE permission to add during water filtration process
• One part per million (equivalent to one milligram per liter)
• Using in-house staff to expedite construction of interim orthophosphate facilities
  – Summer / Fall ‘03 completion date
  – Permanent facilities will be built in conjunction with ongoing work to upgrade both Water Filtration Plants.
Next Steps

• SPRING ‘03
  – Received MDE approval
  – Reported results / recommendations to Commissioners
  – Reported results / recommendations to County Councils
  – Began work on interim facilities

• Recommendation is to add orthophosphate
  – Summer / Fall ‘03
    • Customer outreach
    • Construct interim orthophosphate facilities
    • Brief Montgomery County Council - June 26
    • Add orthophosphate -- potentially Summer / Fall ‘03
Summary

- Complex problem
- Potential role of Federal water chemistry regulations
- Exact cause unknown
- Orthophosphate may minimize leaks
- Orthophosphate recommended