

A New Emergency Overflow Dechlorination Strategy

Adam Feffer
Water Quality Engineer
San Jose Water Company
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- Bring awareness to liability utilities face from chlorinated discharges
- Explain challenges in addressing this problem
- Share our solution to the problem
- Share test results and conclusions

- Disinfectant Chlorine or Chloramine residual protects drinking water quality
- Chlorine and chloramines are toxic to fish and other wildlife
- Mandatory minimum penalties from Water Board exist for chlorinated discharges



http://cdn2.hubspot.net/hub/15602/file-13265990-jpg/images/dpd_test-resized-600.jpg



https://encrypted-tbn3.gstatic.com/images?q=tbn:ANd9GcQQ26_zLfQ4uGPP8A1lnBpn7OVKA CxXyUmpkHOrKzXYV6nPhsDRdw



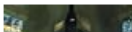
https://mctaxpayer.files.wordpress.com/2013/07/flying_money.jpg

\$3M fine proposed against San Jose water company



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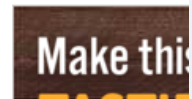
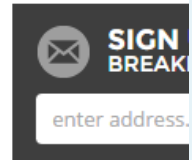
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 **BOOM! U.S. military turns**

By - Associated Press - Tuesday, November 18, 2014

SAN MATEO, Calif. (AP) - State water regulators have proposed a record-setting \$3 million penalty against a San Jose water company for a leak of chemically treated drinking water that killed dozens of fish.

The San Jose Mercury News reports (<http://bit.ly/1yIKhLI>) Tuesday that the California Regional Water Quality Control Board will decide whether



- This wasn't even us!!!
- Discharges happen
- Utilities are expected to be proactive in protecting against damage to the environment

You can't know the volume or rate of an unplanned discharge

- Can't feed liquid chemical without a dose rate
- Overfeeds can kill fish too
- Electrical systems need calibration/pm

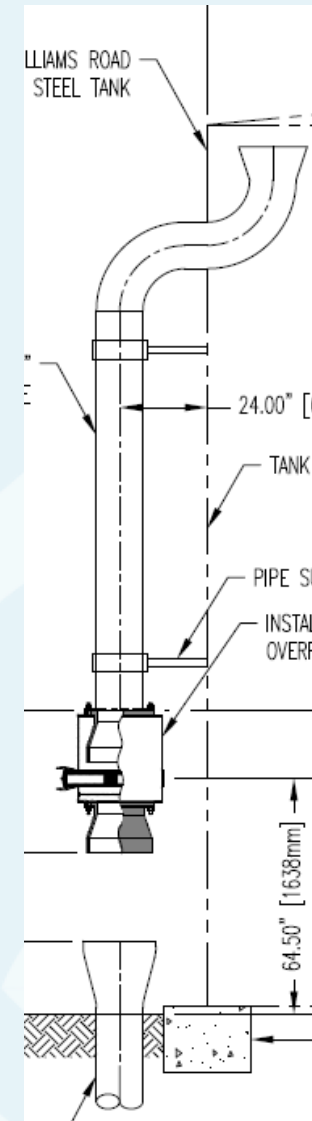
Mechanical saturation system solves some problems

Vitamin C is not harmful- overdosing no concern

Tablets degrade very quickly at atmosphere and are expensive to replace

Partnership with Tideflex
(Redvalve) to create dry, stable
atmosphere to extend tablet life

Install inline with existing tank
overflow



Our Solution

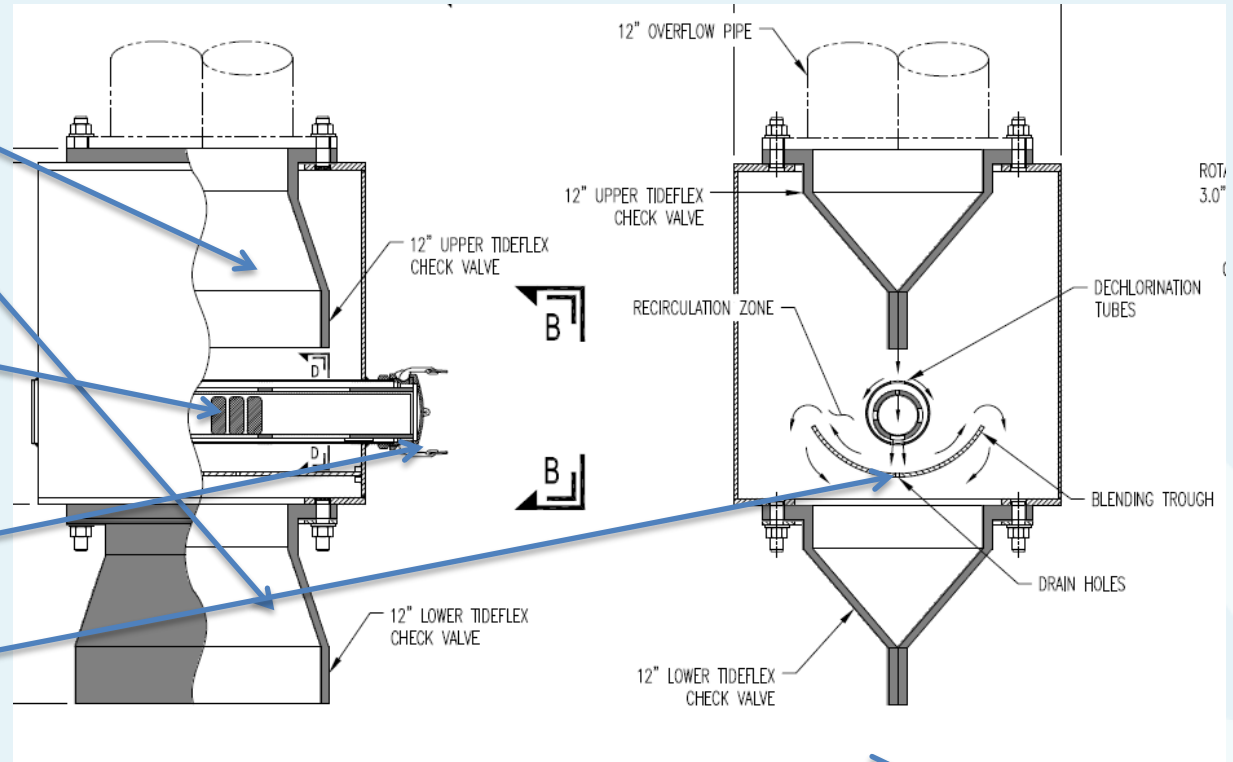
Dual Duck billed valves

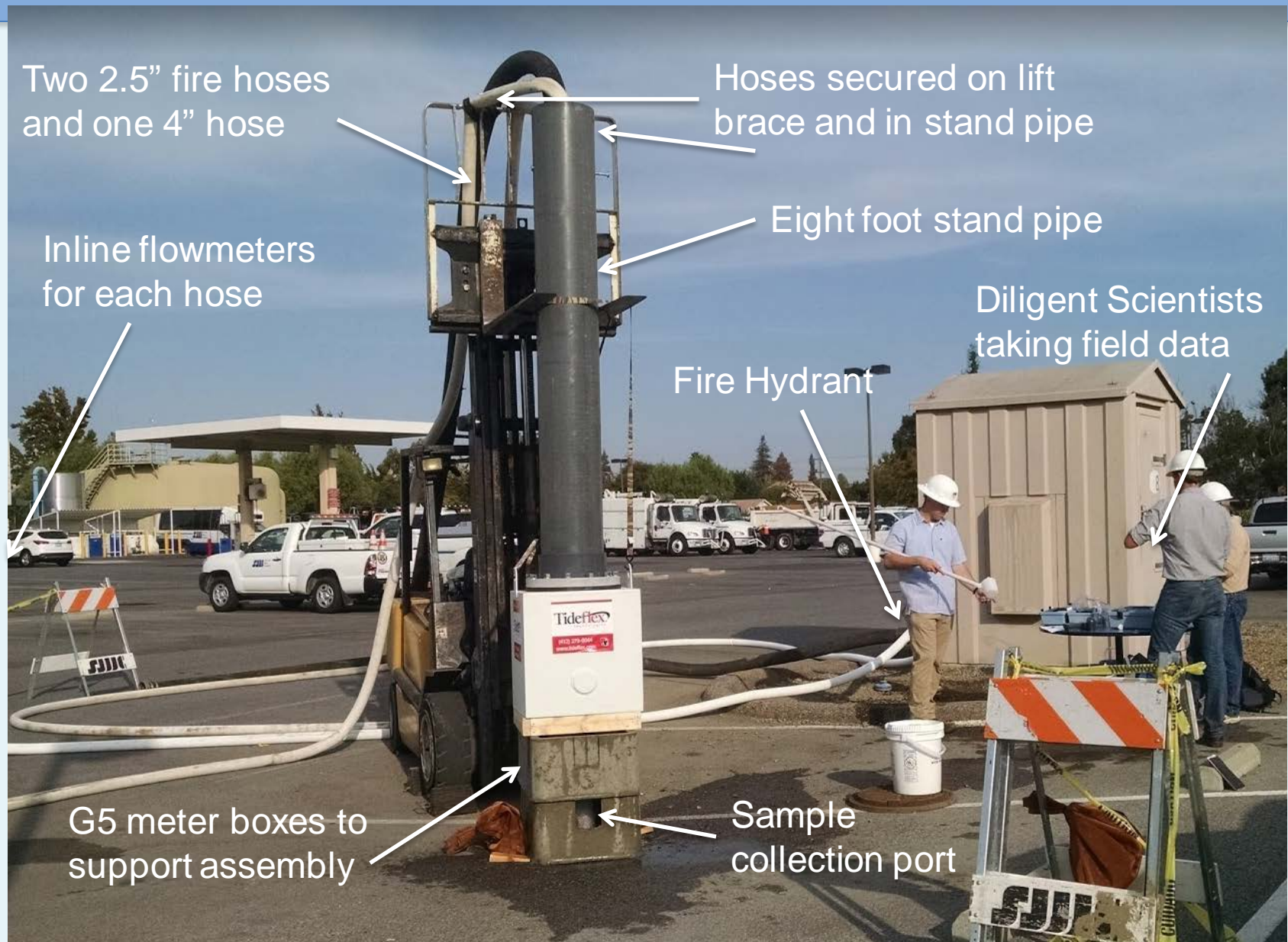
Screened cylindrical cylinder for 25 tablets

Camlocked chamber access

Blending trough

Air gap



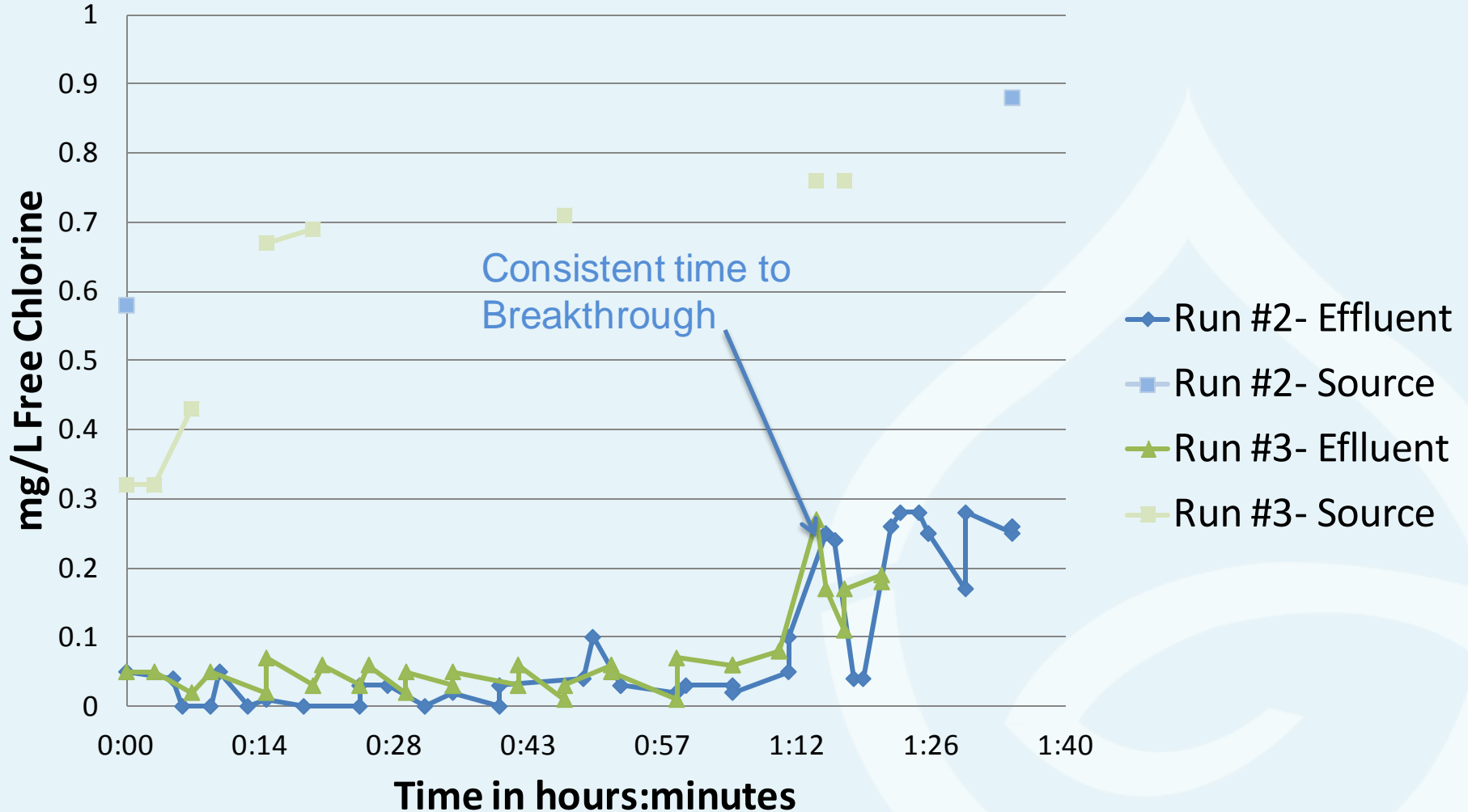


Test approach: Simulate discharge and measure time to breakthrough

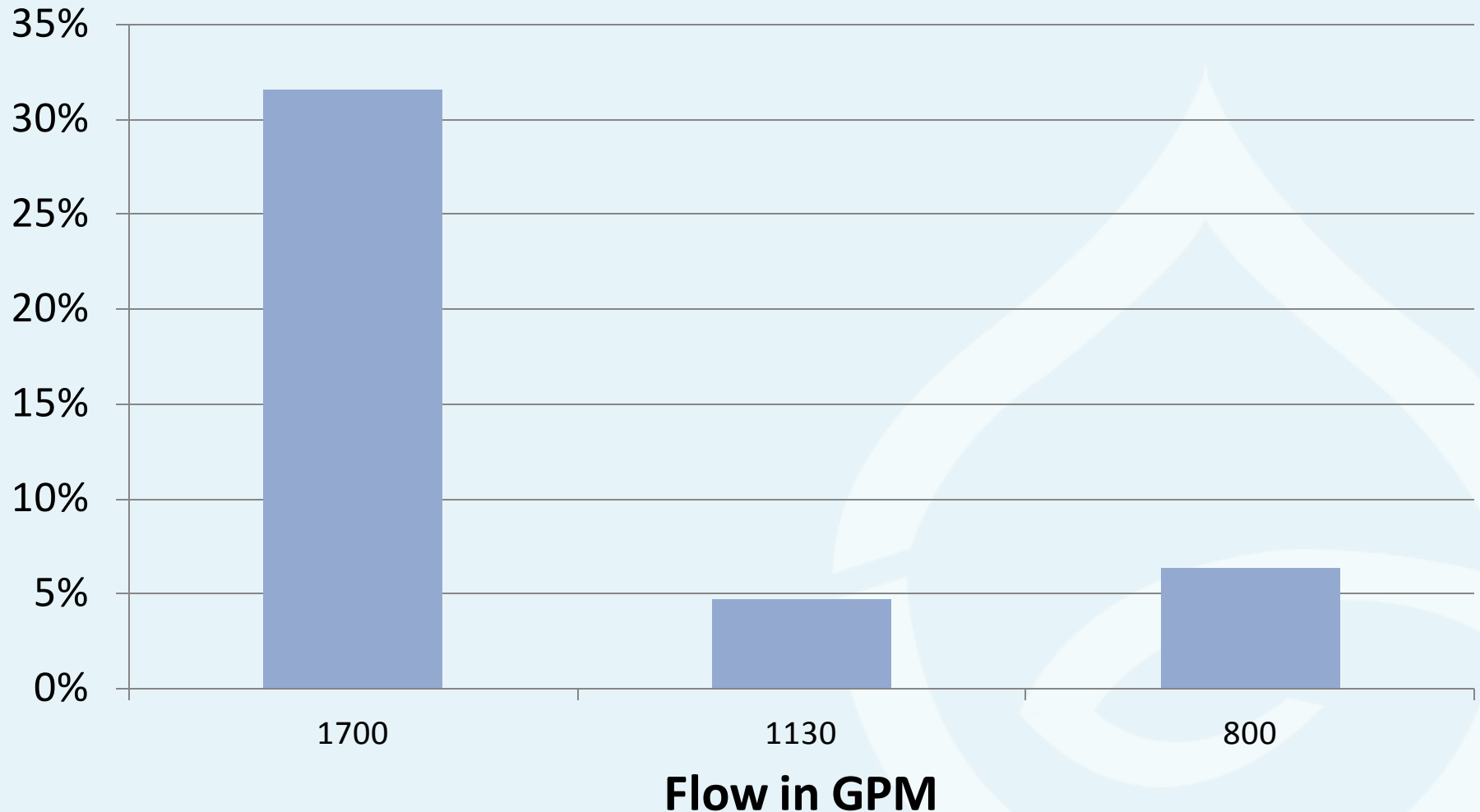
- Chlorinated source water
- Maximize flow
- Monitor every five minutes
- Test fast and slow dissolve tabs
- Test different rates to extrapolate higher flows
- Control test for removal without tabs



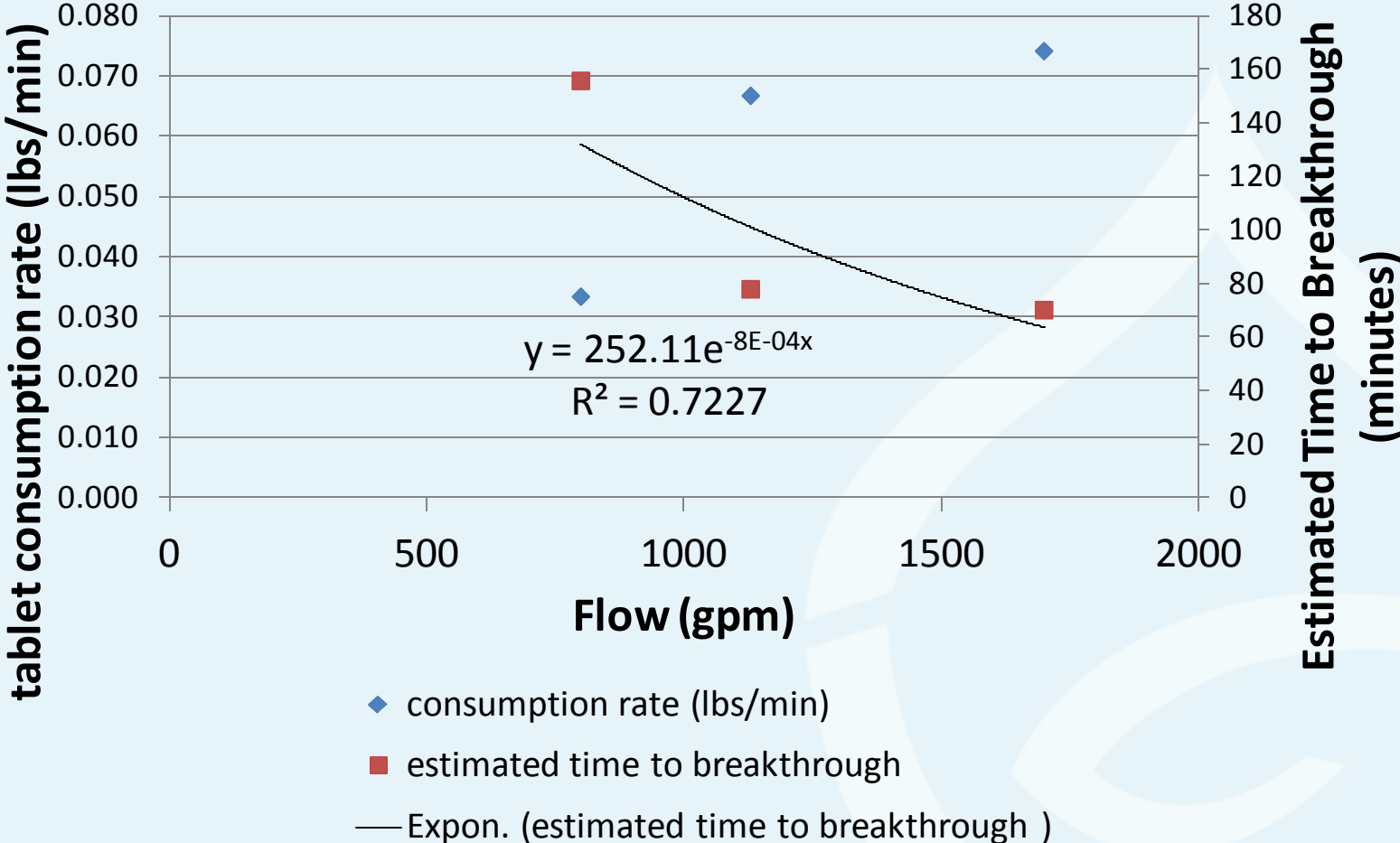
Chlorine Breakthrough Curve at 1700 gpm (Slow tabs)



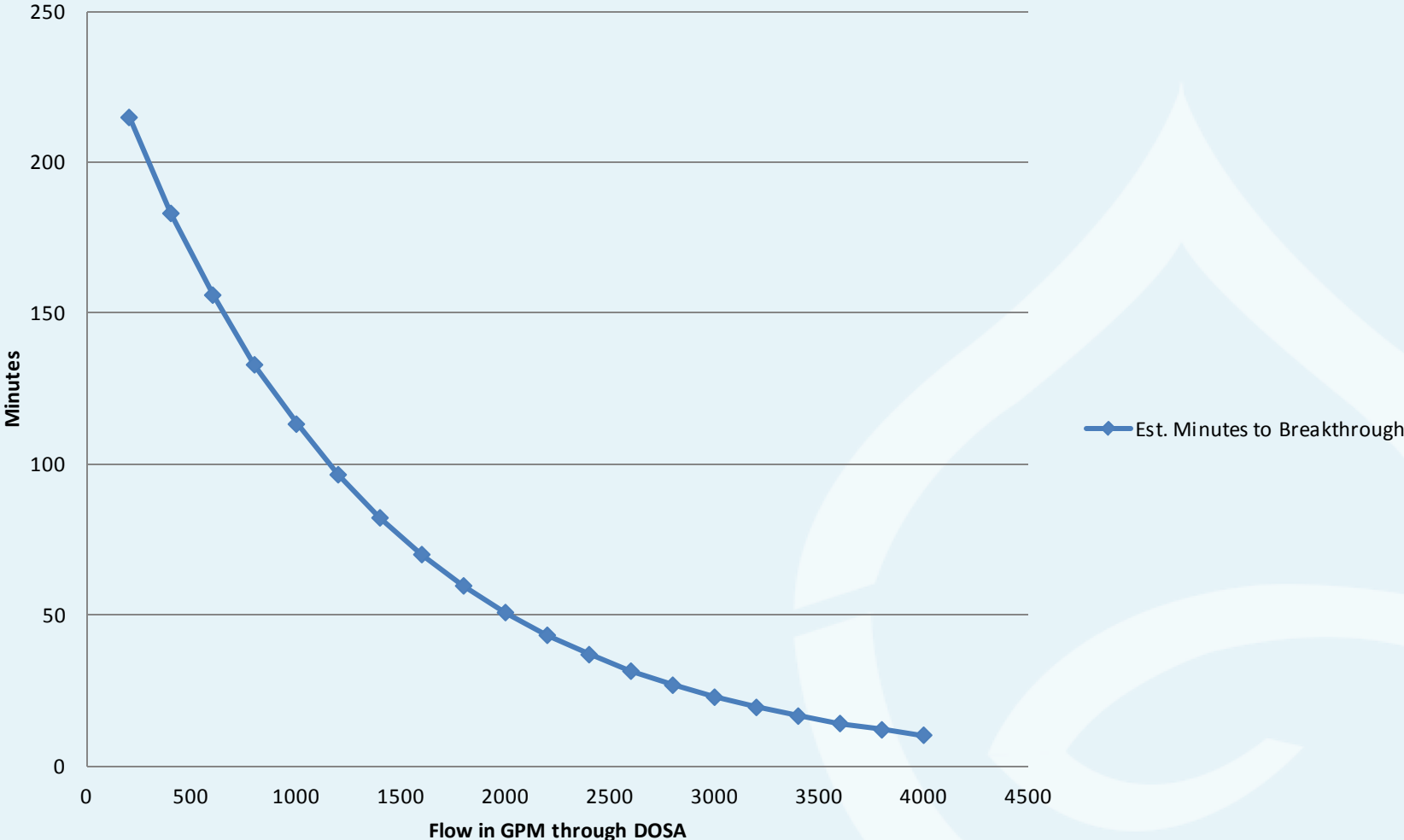
Average Disinfectant Removal Without Tablets



Flow Capacity Extrapolation



Est. Minutes to Breakthrough



With DOSA we can

- Rely on ~70 minutes of dechlorination at 1700 gpm
- Change out tablets less frequently (annually?)

Next Steps

- Testing chloramine removal
- Testing in-situ
- Testing higher flows



QUESTIONS/COMMENTS?

Adam Feffer
Water Quality Engineer
San Jose Water Company
Adam_Feffer@SJWater.com



baywork.org