

Perchlorate Proficiency Testing

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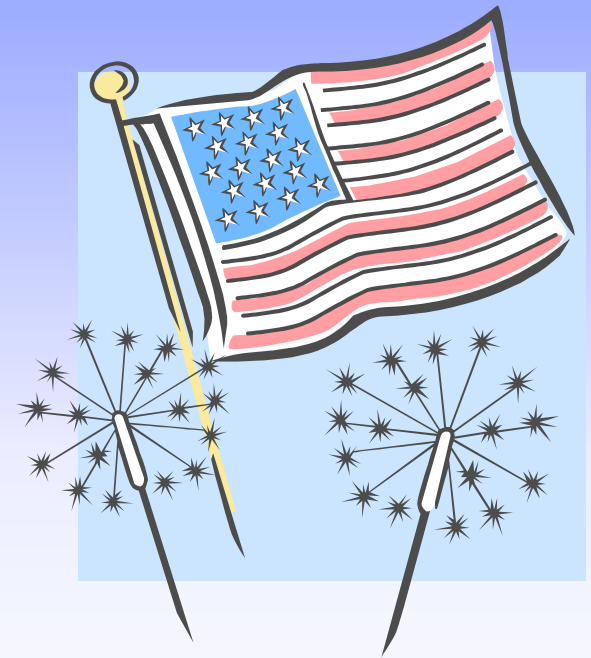


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Overview

➤ “Regular” PT Studies

➤ Low-Level Projects



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PT Studies

➤ Drinking Water Perchlorate

- Initiated in 2000
- California published requirements
 - 10 – 18 $\mu\text{g}/\text{L}$



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CA-Compliant PT Studies

➤ Methods

- 95% Ion Chromatography
- 5% LC/MS or IC/MS methods

➤ Failure Rates

- 12%
- No failures yet among non-314 methods



CA-Compliant Studies

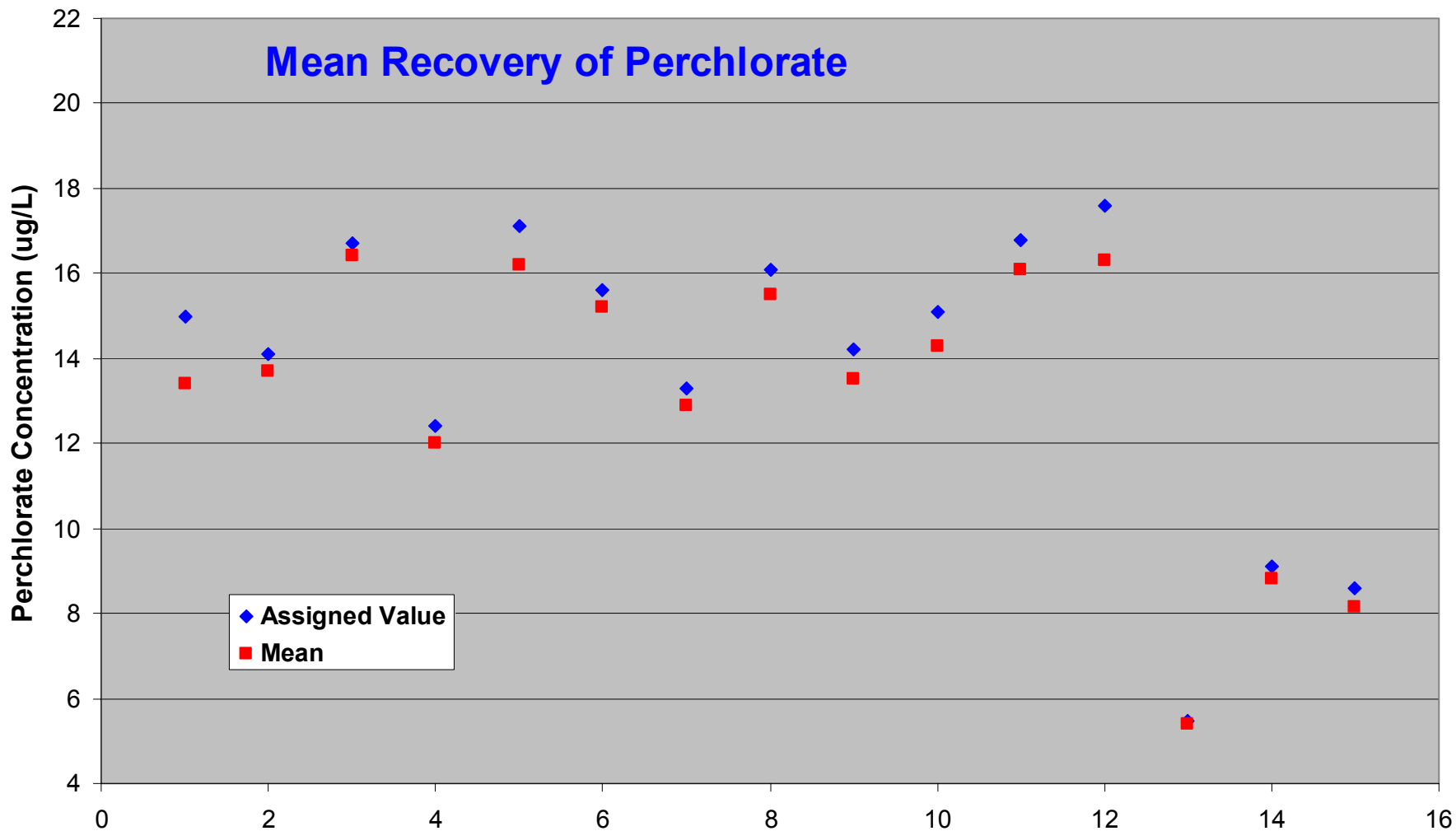
➤ Summary Data

- 17 studies
- 324 data points
- Average recovery: 95.7%
- Average %RSD: 8.0%

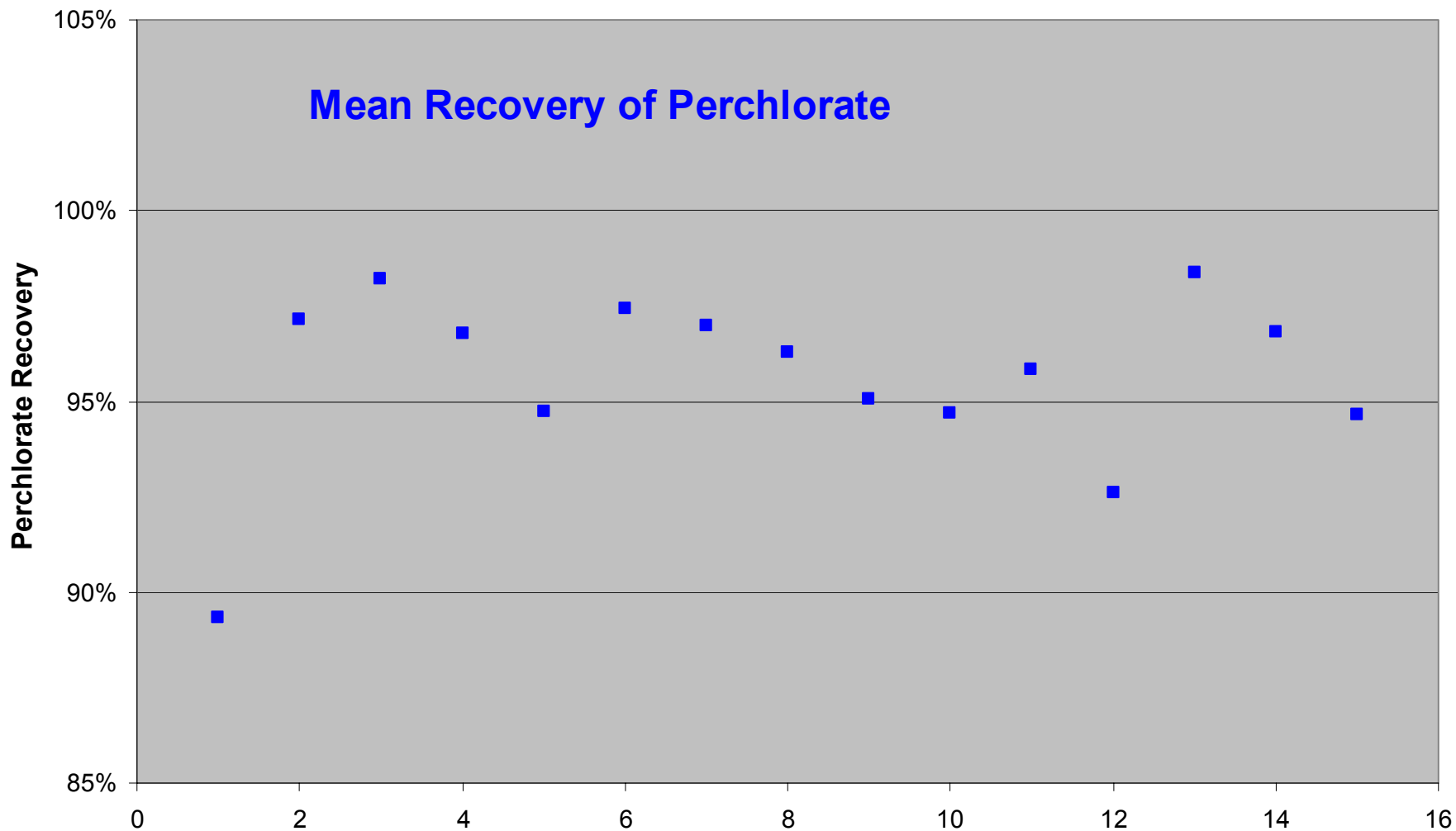


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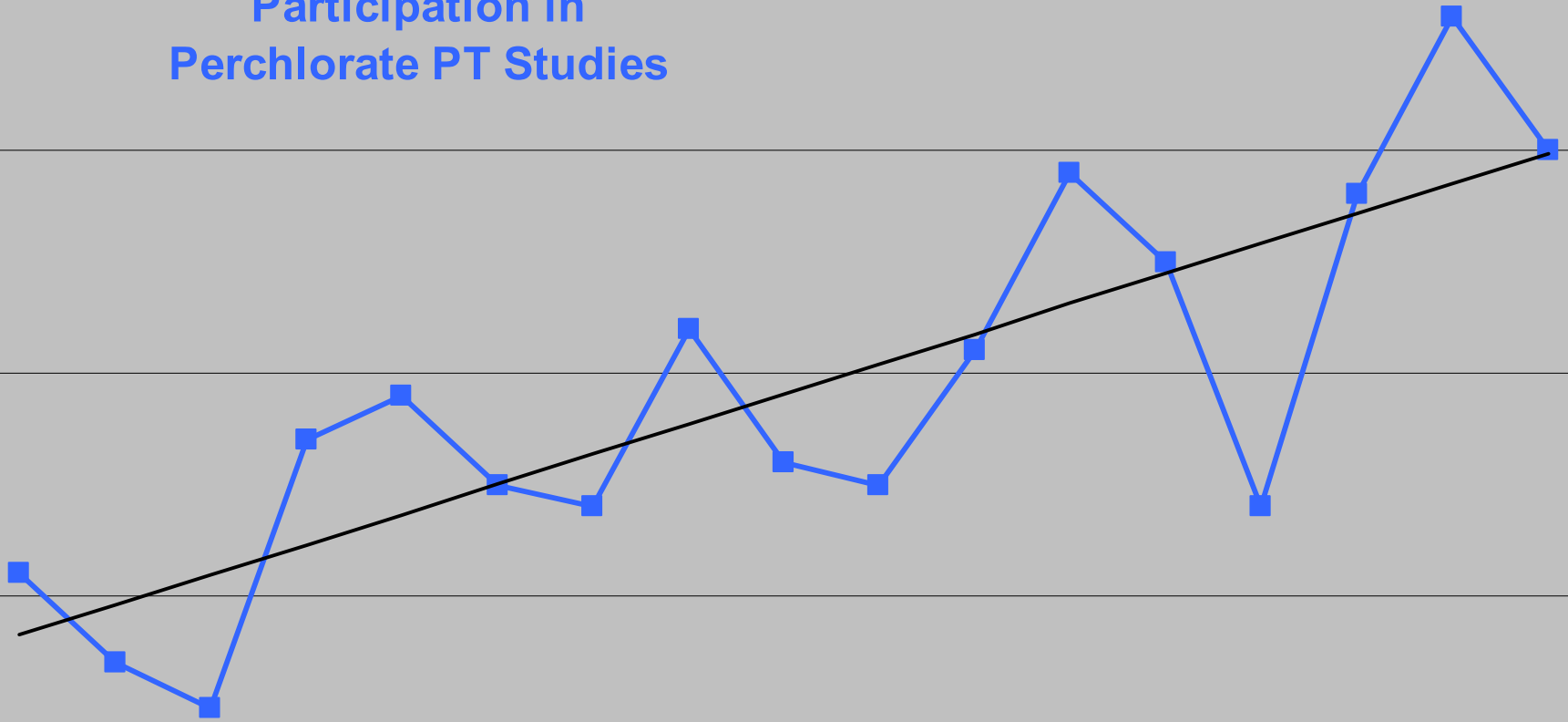
Mean Recovery of Perchlorate



Mean Recovery of Perchlorate

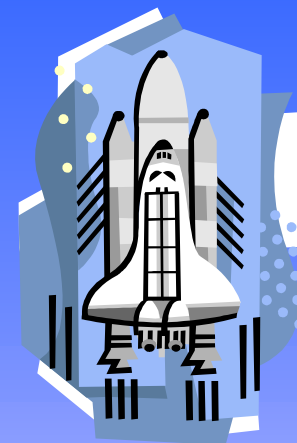


Participation in Perchlorate PT Studies



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PT Studies



➤ USEPA PT Studies

- **Two studies in 2000**
- **Elevated conductivity matrices**
- **73 and 56 laboratories**
- **20.1 and 26.6 µg/L**
- **100% and 97.7% recoveries**



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Low Level Studies

➤ Massachusetts

- **Conducted in May 2004**
- **17 laboratories – all method 314.0**
- **Elevated conductivity matrix**
- **Blank**
 - **1 false positive**
- **1.04 ug/L**
 - **83.2% mean, 15.2% RSD**



Low-Level Studies

➤ ERA single-blind

- Conducted in September 2004
- 10 laboratories
- Methods
 - 314 – 6 labs
 - LC/MS/MS – 4 labs
 - IC/MS/MS – 1 lab



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ERA Single-Blind

- **3 Water samples**
 - **Blank**
 - **0.814 ug/L**
 - **1.13 ug/L**
- **1 Vegetation sample**
 - **Unspiked**



ERA Single-Blind

➤ Water sample matrix

- TDS: 720 mg/L
- Conductivity: 900 umhos/cm



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ERA Single-Blind

➤ Summary Data

- **Blank**
 - All less than results
 - From <0.01 ug/L to <1.0 ug/L



ERA Single-Blind

➤ Summary Data

- **1.13 ug/L**
 - **Mean: 1.05 ug/L**
 - **92.9%**
 - **SD: 0.07 ug/L**
 - **6.4% RSD**



ERA Single-Blind

➤ Summary Data

- **0.814 ug/L**
 - **Mean: 0.740 ug/L**
 - **90.9%**
 - **SD: 0.091 ug/L**
 - **12.2% RSD**



ERA Single-Blind

➤ Method 314.0

- **1.13 ug/L**
 - Mean: 1.06 ug/L, 94.2%
 - SD: 0.075 ug/L, 7.0% RSD
- **0.814 ug/L**
 - Mean: 0.725 ug/L, 89.0%
 - SD: 0.118 ug/L, 16.3%



ERA Single-Blind

➤ LC/MS/MS

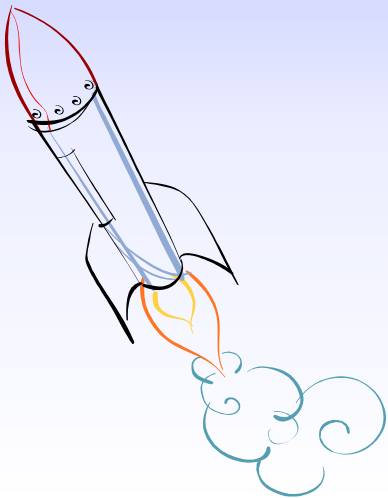
- **1.13 ug/L**
 - Mean: 1.03 ug/L, 91.0%
 - SD: 0.072 ug/L, 7.0% RSD
- **0.814 ug/L**
 - Mean: 0.767 ug/L, 94.2%
 - SD: 0.020 ug/L, 2.6%



ERA Single-Blind

➤ IC/MS/MS

- **1.13 ug/L**
 - Mean: 1.03 ug/L, 91.0%
- **0.814 ug/L**
 - Mean: 0.749 ug/L, 92.0%

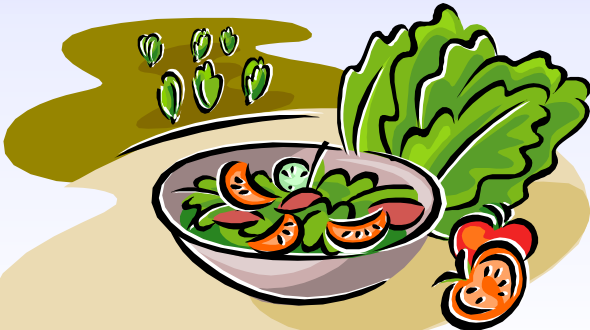


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ERA Single-Blind

➤ Vegetation

- Freeze dried spinach
- Commercial food supplier
- Unspiked



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ERA Single-Blind

➤ Vegetation

- 6 data points
- Mean = 473 ug/kg
- SD = 435 ug/kg



ERA Single-Blind

➤ Vegetation

- 829 ug/kg (IC/MS/MS)
- 986 ug/kg (LC/MS/MS)
- 780 ug/kg (314)
- 84.3 ug/kg (LC/MS/MS)
- 78 ug/kg (LC/MS/MS)
- 79 ug/kg (LC/MS/MS)





Thank You

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