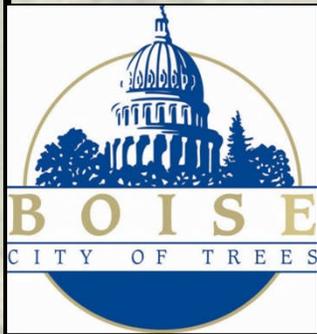


# Innovative Approach to Maximize Nutrient Reduction in the Lower Boise River Watershed

2011 PNCWA Nutrient Workshop  
September 18, 2011  
Vancouver, Washington



Robbin Finch, Water Quality Manager  
Boise City Public Works

# Outline

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- The Watershed
- Trading/Offset
- Lower Boise River Opportunity

# The Watershed

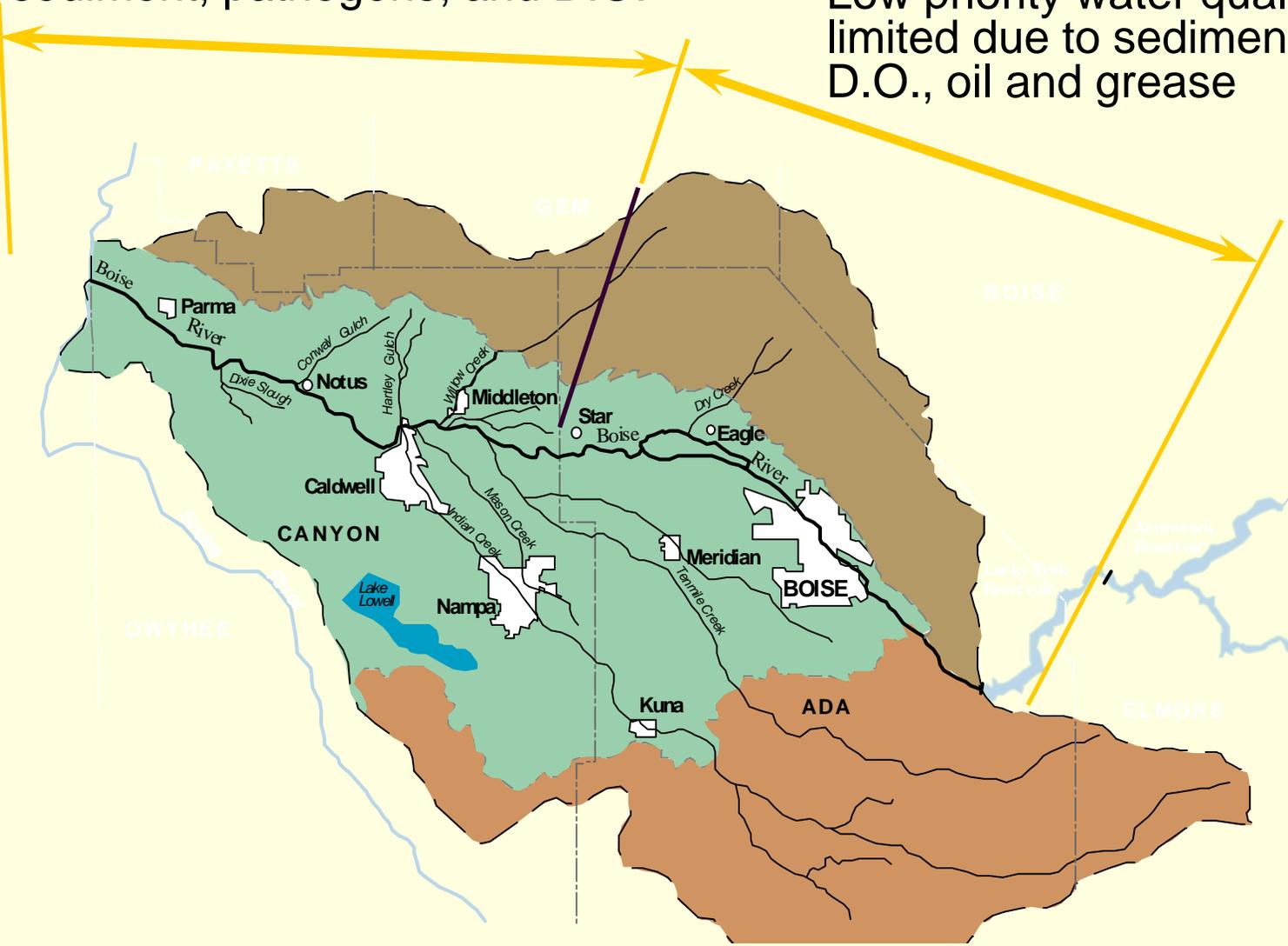


- 1,290 sq mile watershed
- 2<sup>nd</sup> USBR Irrigation Project
  - 3 major dams, 1 MAF of storage
  - 286,000 Acres Irrigated Ag
    - 75 % flood irrigated, 25% sprinkler
    - 75 major diversions or returns/inputs in 64 river miles
  - 5 million kg/yr Phosphorus applied annual
    - 95% for ag purposes (USGS 2006)
- 1/3 of state population, rapidly urbanizing
  - 10 WWTFs,
    - 74 MGD capacity,
    - 50 MGD discharge



High priority water quality-limited due to nutrients, temperature, sediment, pathogens, and D.O.

Low priority water quality-limited due to sediments, D.O., oil and grease







# Boise/Mason Creek Confluence



# Lower Boise Watershed Council

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- Initiated in 1992
- Includes all stakeholders (Muni and Industrial PS, NPS, Irrigators, NGOs...)
- Chemical, physical, biological monitoring
  - USGS (1994-present)
- Build trust and understanding between stakeholders
- Improve knowledge/understanding of the watershed
  - Designated Watershed Advisory Group for TMDLs
- <http://www.lowerboisewatershedcouncil.org/>

# Lower Boise Regulatory Driver

- Snake River Hells Canyon TMDL (2004)
  - Phosphorus Target: 70 ug/l, May - September
    - TP Reduction Targets
      - **Boise River: 77%**
      - Upstream Snake: 24%
      - Other tribs: 30-87%
      - Ag Drains to Snake: 85%



# What is Trading/Offset?

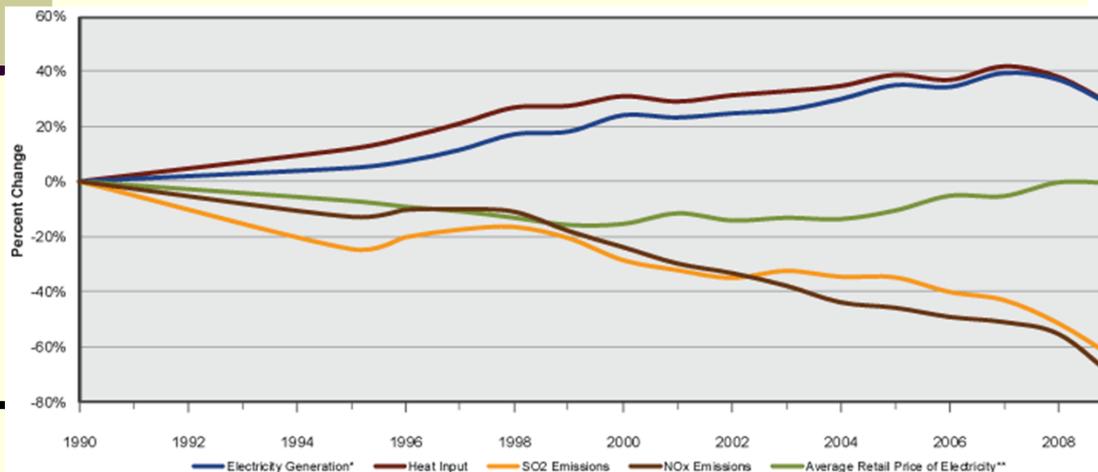
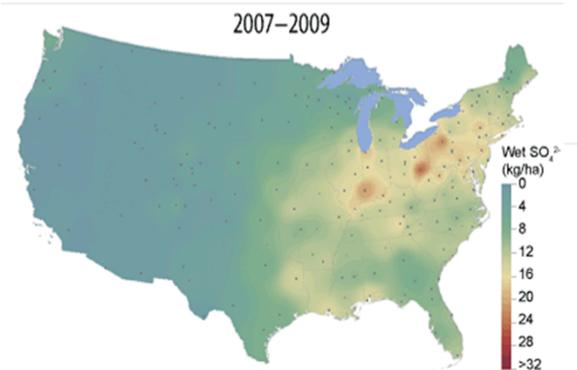
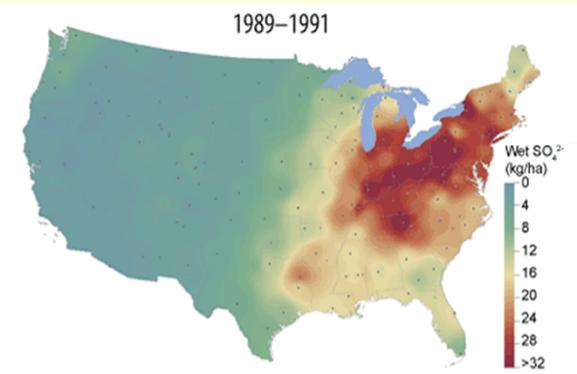
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*A source facing higher pollution reduction costs compensates another source for achieving equivalent, less costly reductions.*

- Market-based tool to solve air or water quality problems
- Voluntary, flexible, stimulates innovation
- Cost effective pollution reduction
- Operates within existing programs
  - EPA and Idaho support trading/offsets

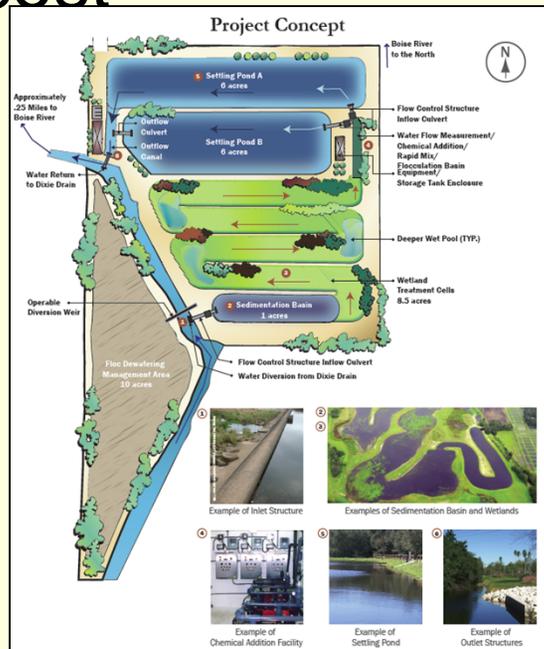
# Trading/Offset Success

- Clean Air Act “Cap and Trade”
  - Acid Rain Program: 1990 SO<sub>2</sub> trading
    - 50% SO<sub>2</sub> reduction with 40% increase power generation
  - 2009 SO<sub>2</sub> Market
    - Value: \$1.1 billion
    - Price: \$61 per ton
    - 2,716 Transactions



# Dixie Trade/Offset Opportunity

- Point Source + NPS Improvements to meet water quality goal
- Better environmental result at same / lower cost



# Dixie Drain Concept / Timeline

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## ■ Timeline

- Dec 2009: Purchase 49 acres on Dixie Drain
- Spring 2010: Preliminary Design
- July 2010: Site Visit by EPA, DEQ, ICL, and Congressional Delegation
- March 2010–present: drain and groundwater data collection
- July-Sept 2010 and 2011: Jar and Pilot Testing

# Dixie Slough



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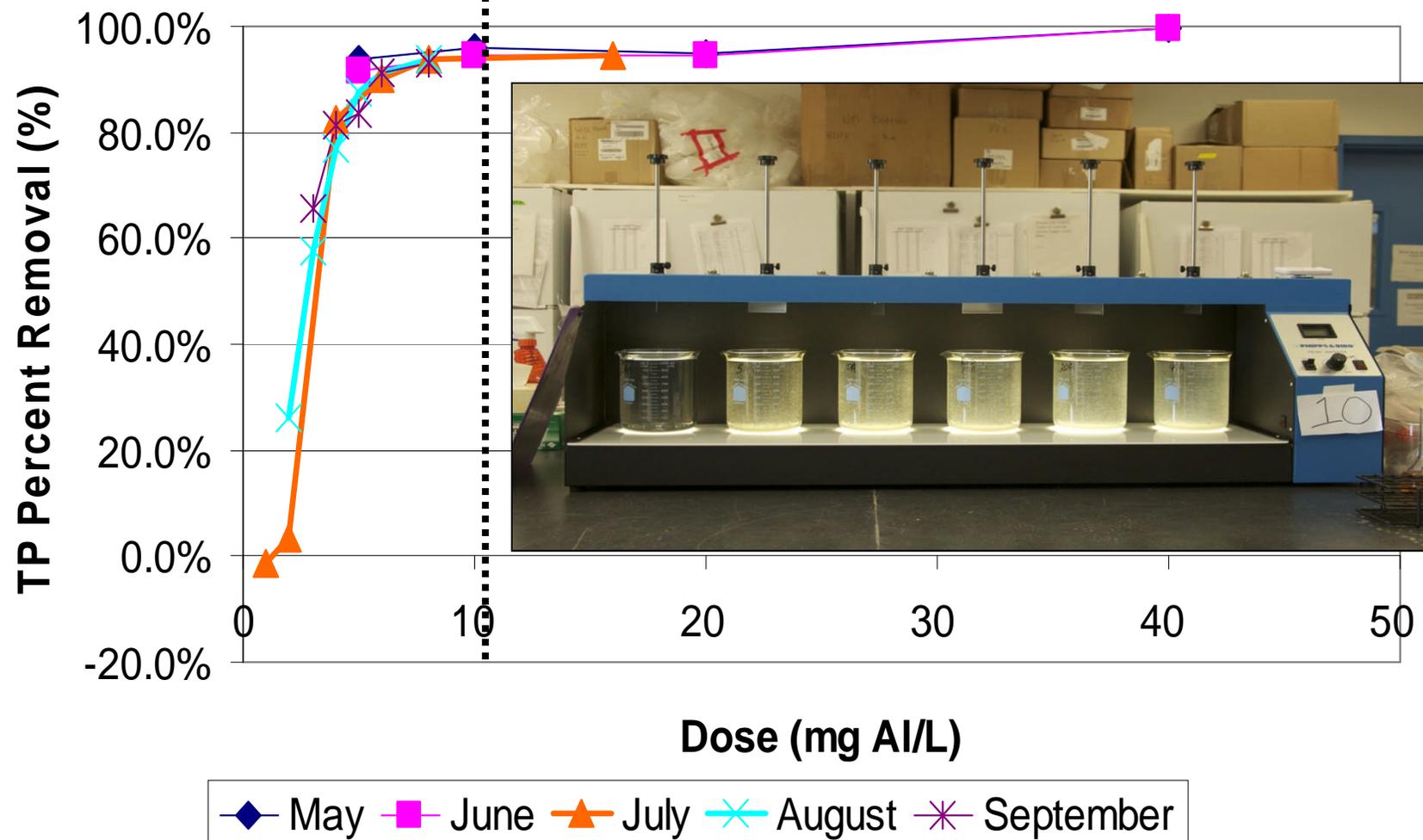
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# Project Concept



# 2010 Jar Testing



# Pilot Study: 2010

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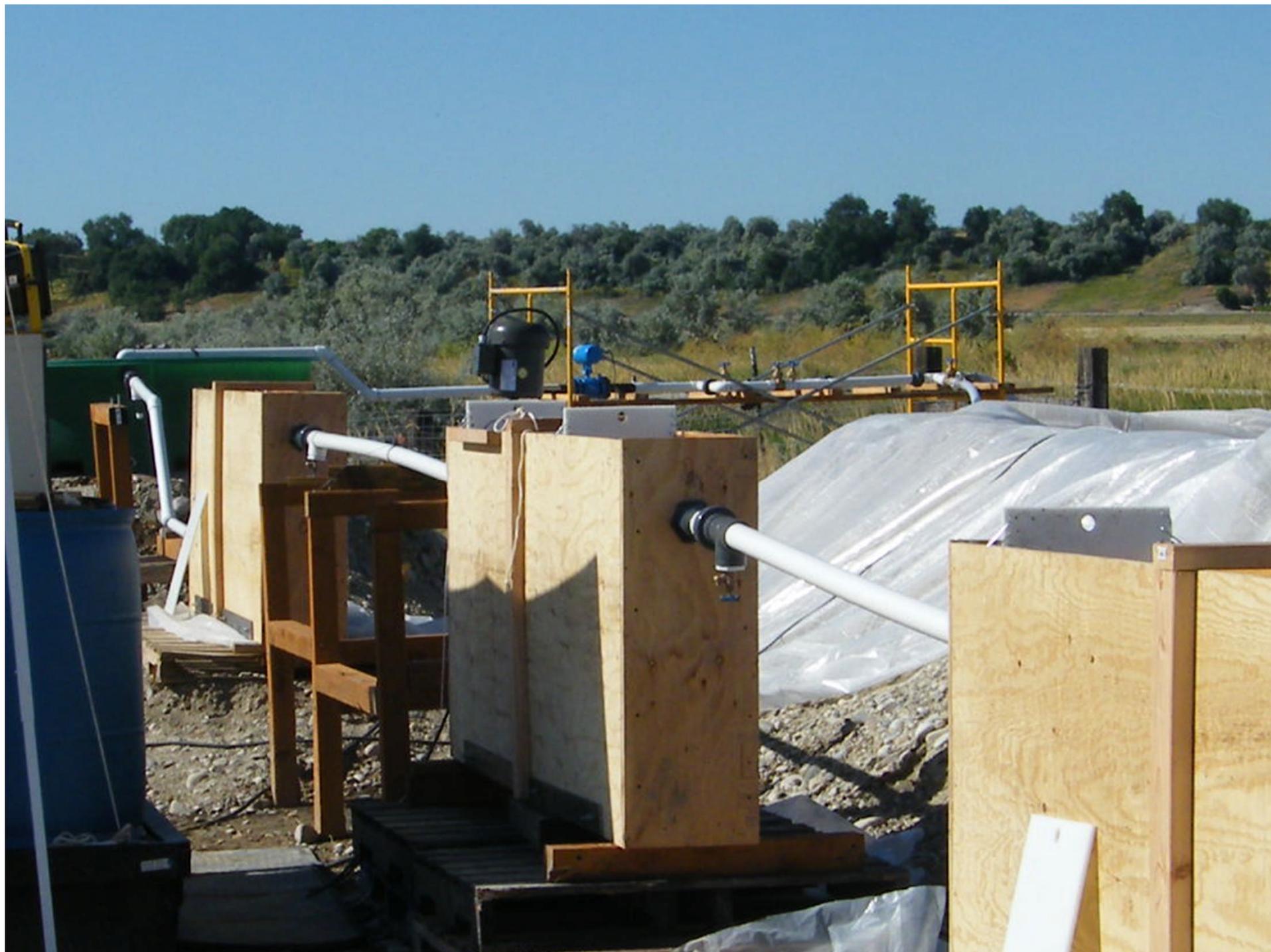
- 12 - 12 hour tests with Alum
- Results:
  - Dissolved P: 72-93 % removal
  - TP: 15-36% (Small floc/poor settlability)



# 2011 Jar and Pilot Tests

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- Jar tested 14 chemicals
- Expanded settling basin
- Pilot Tested 3 best chemicals
  - Alum \$1.10/gallon
  - Polyaluminum Chloride (PAC) \$4.66/gallon
  - Alum + polymer (TFLOC) \$1.68/gallon
- Results (TP removal %)
  - Alum: 18-48% (2 tests)
  - PAC: 64-90+% (12 tests)
  - TFLOC: xx-80% (still testing)



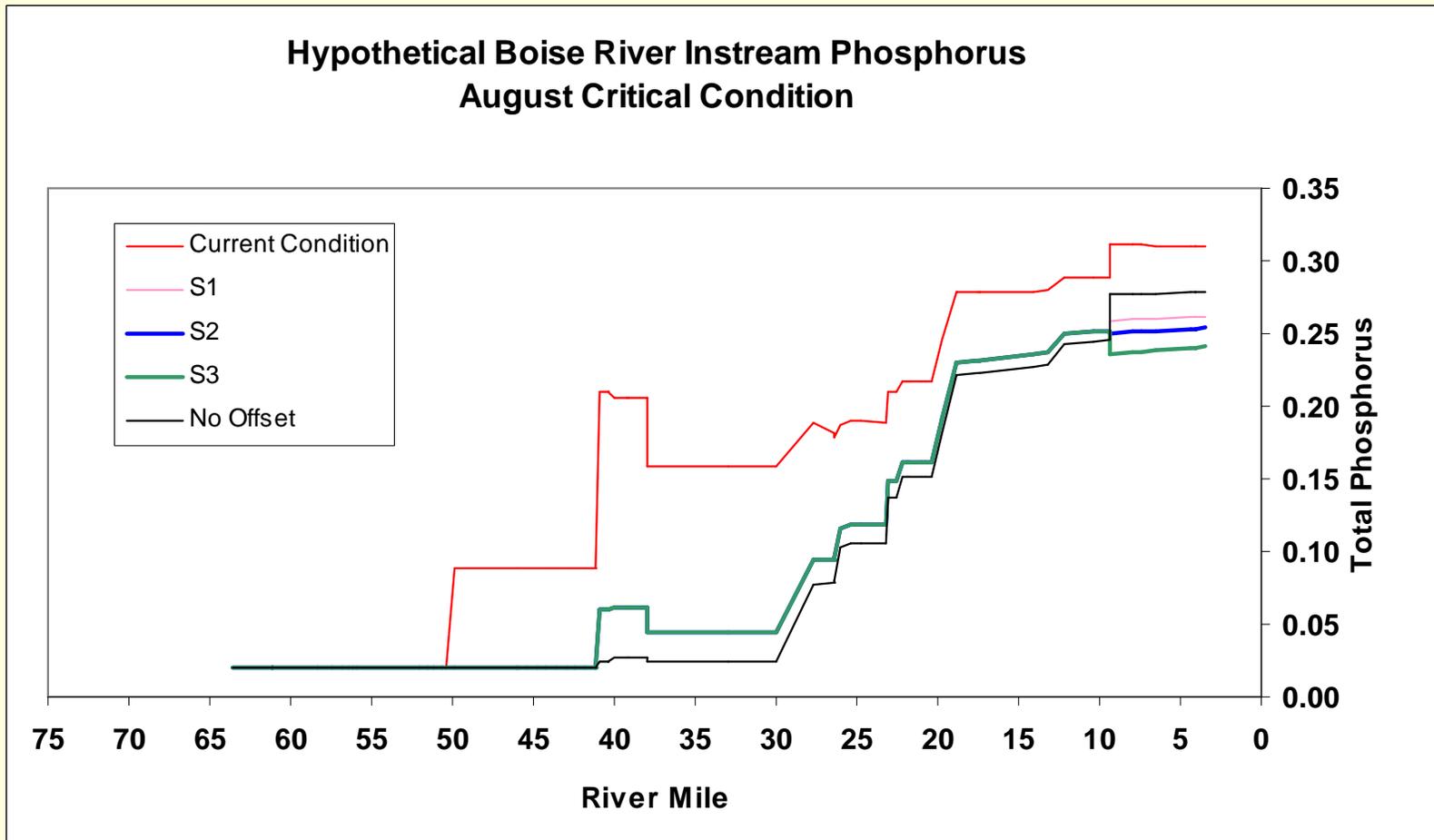


# NPDES Permits

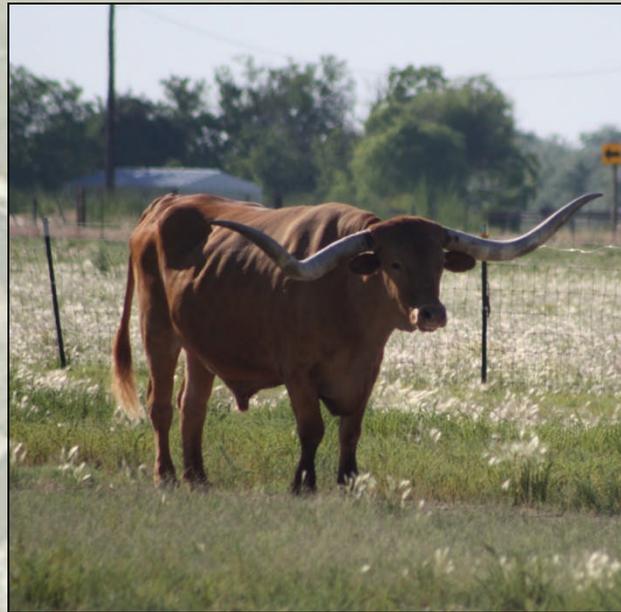
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- Current permits issued in 1999
- New permits: 2011/2
  - 70 ug/l TP limit (~98.8% reduction)
- City hopes to meet Phosphorus target using treatment + offset
  - 90-95% reduction at WWTF
  - 3-8% at Dixie Drain
- Better Environmental Result
  - Much lower concentration and load from Boise to the Snake
  - No local impacts in river below the WWTFs

# End of Pipe v Treat + Trade/Offset



Questions?



Boise River Rd