

# One Water Utilities Struggle with a Changing Water Source

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# Background

- The Coos Bay-North Bend Water Board
- Upper Pony Reservoir and Merritt Lake Reservoir
- Upper Pony Creek Dam enlargement project
- Manganese begins

# Manganese Etiology

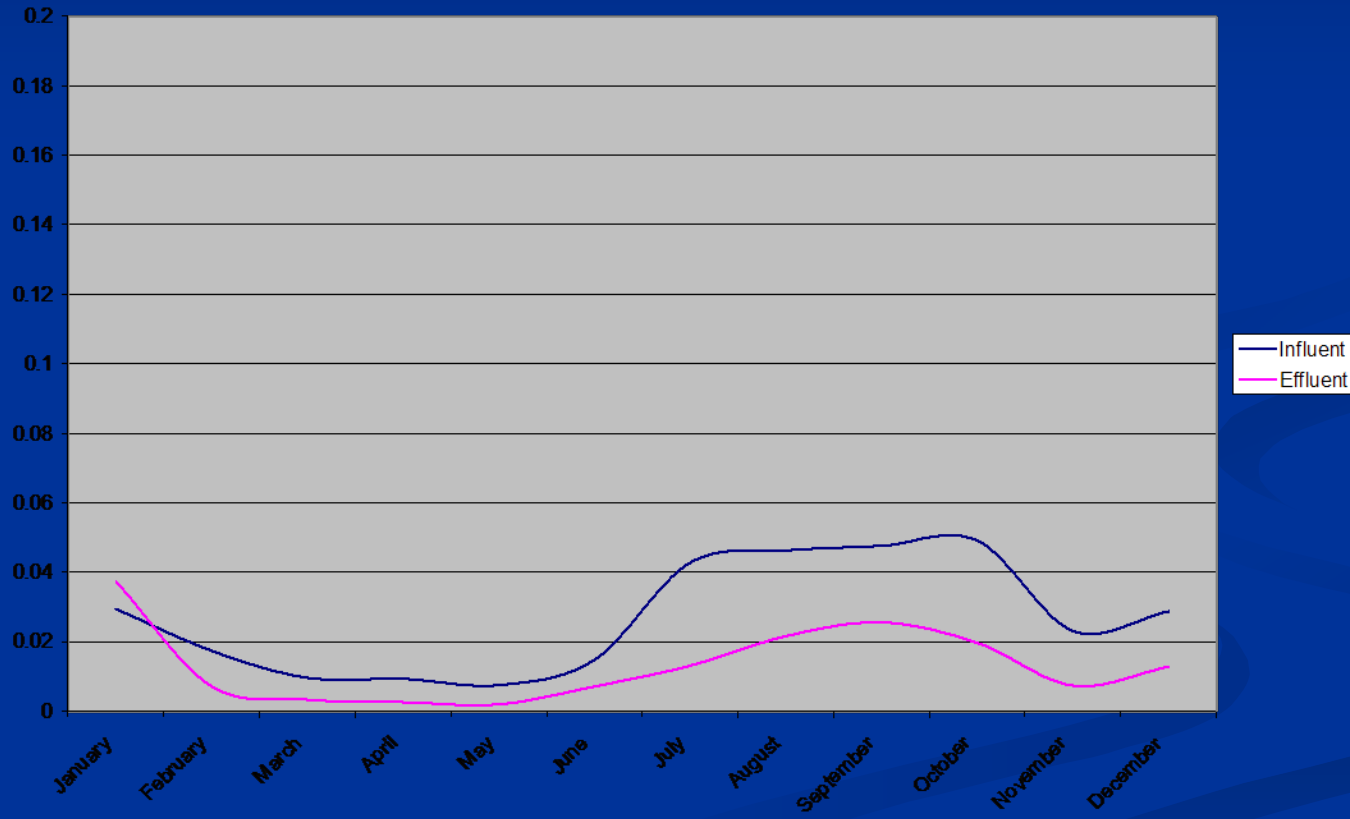
- Manganese in the Earth
- Manganese and the human body
- Environmental Protection Agency Standards

# Reservoir Stratification

- Seasonal Changes
- Depth Sampling

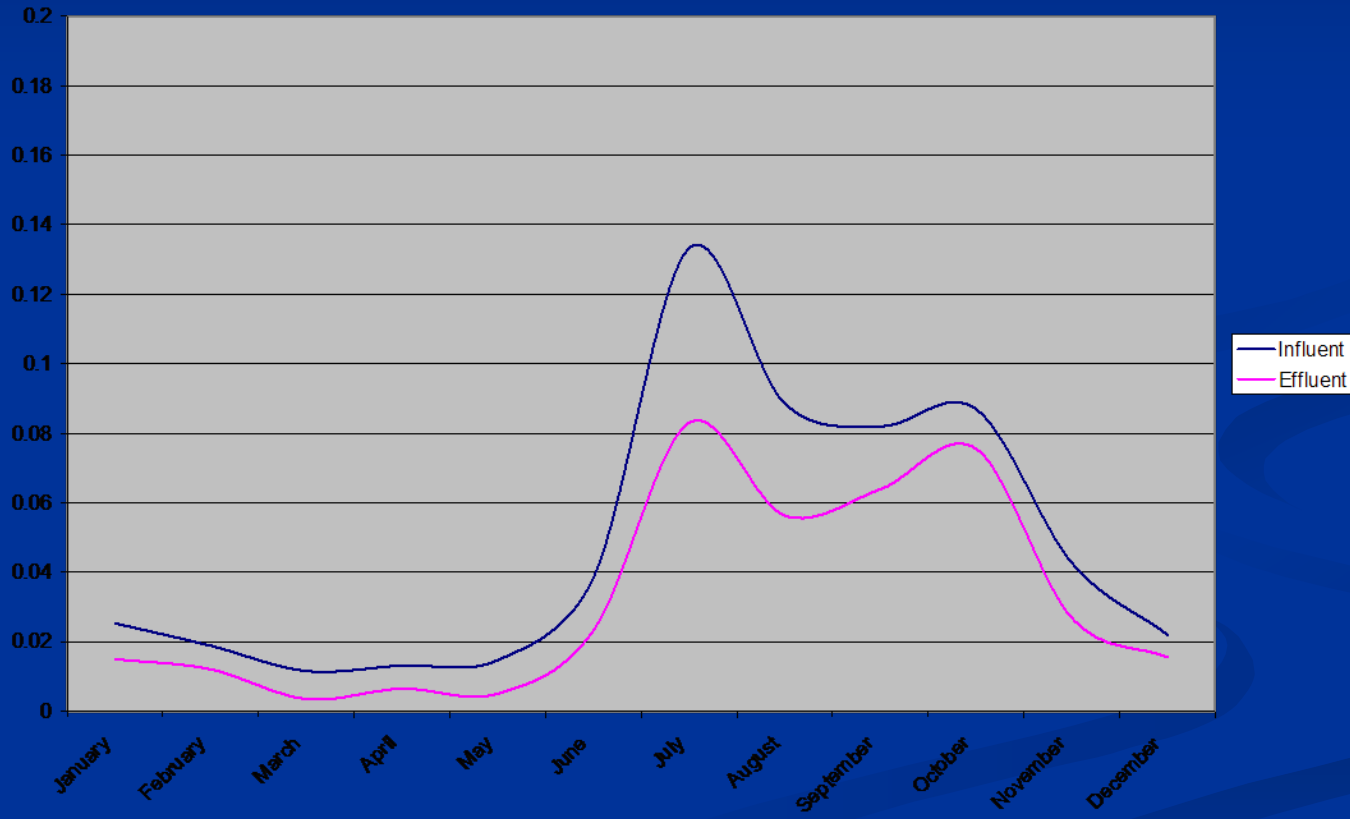
# In The Beginning

2002 Manganese

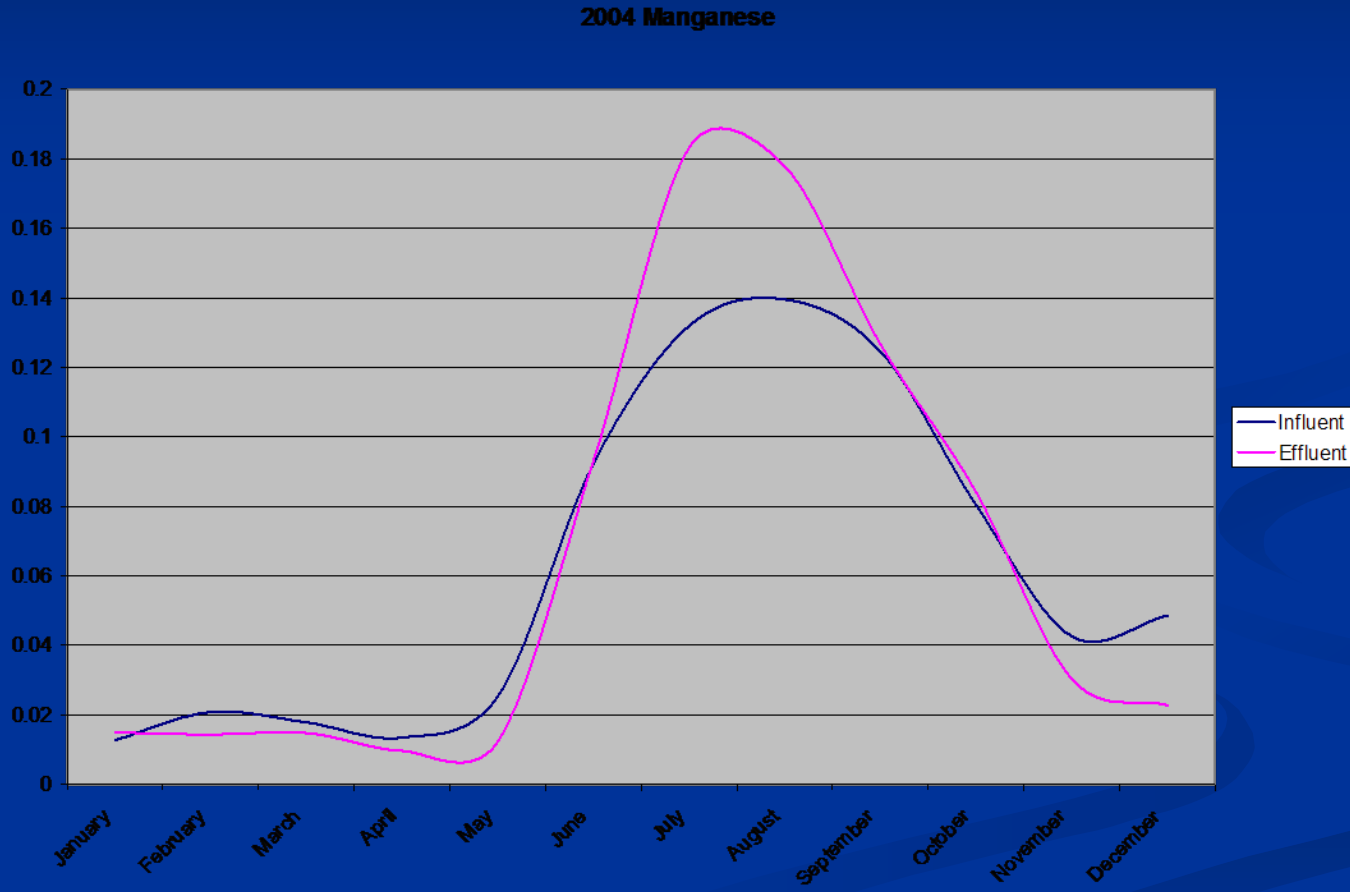


# 2003

2003 Manganese

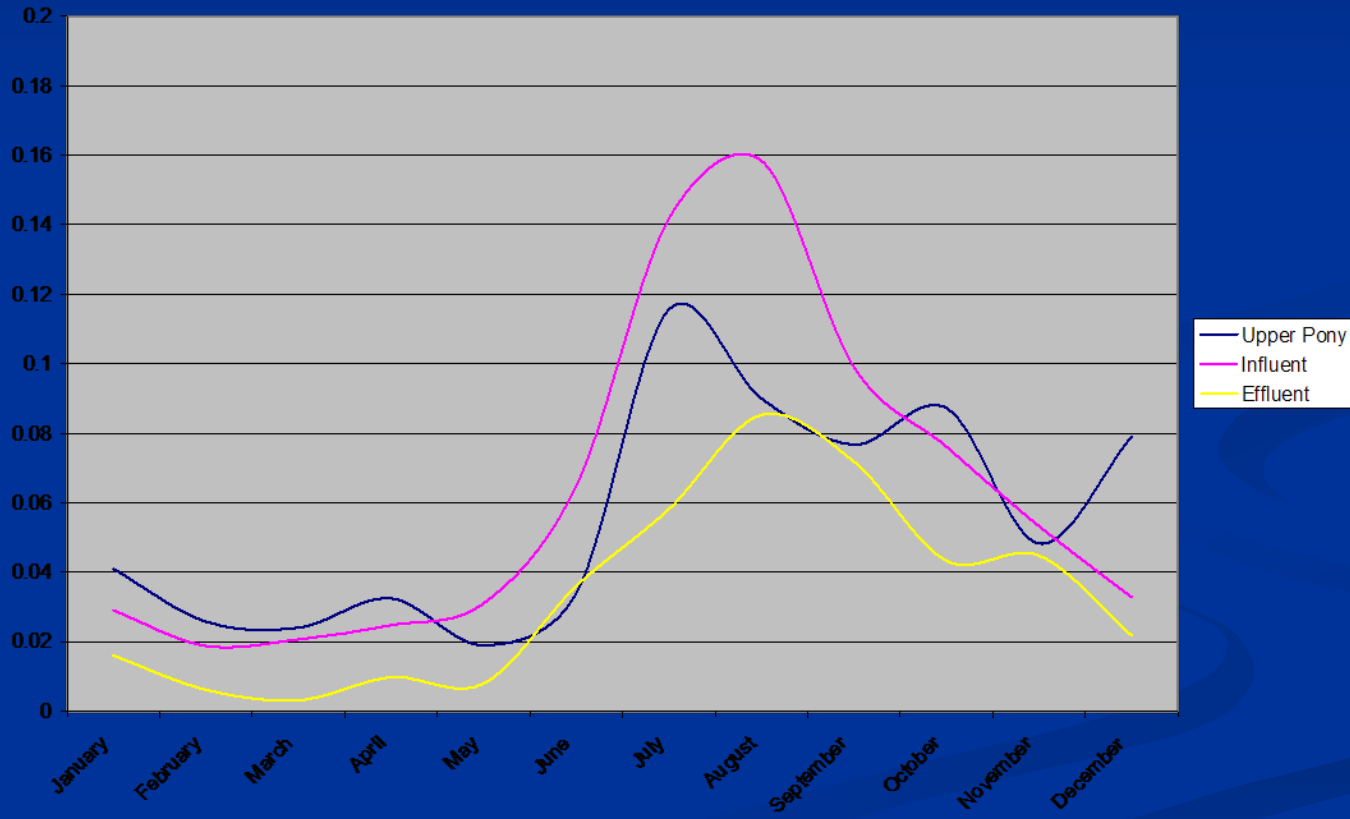


# 2004 – Pre Chlorination



# 2005 – pH Adjustment

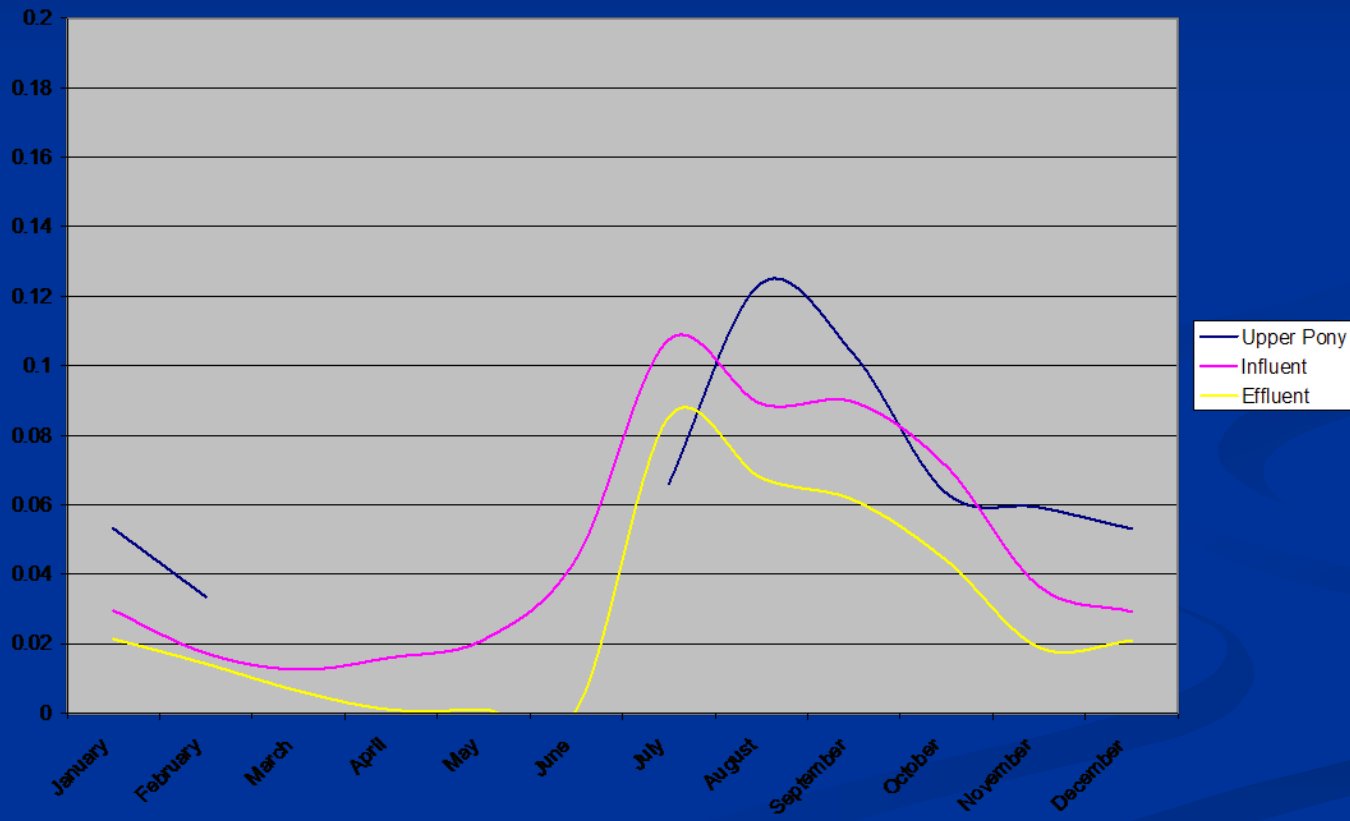
Maganese 2005





# 2006 - Aeration

Manganese 2006



# 2007 – New Upper Pony Reservoir Surface Intake and Wet Lands bypass



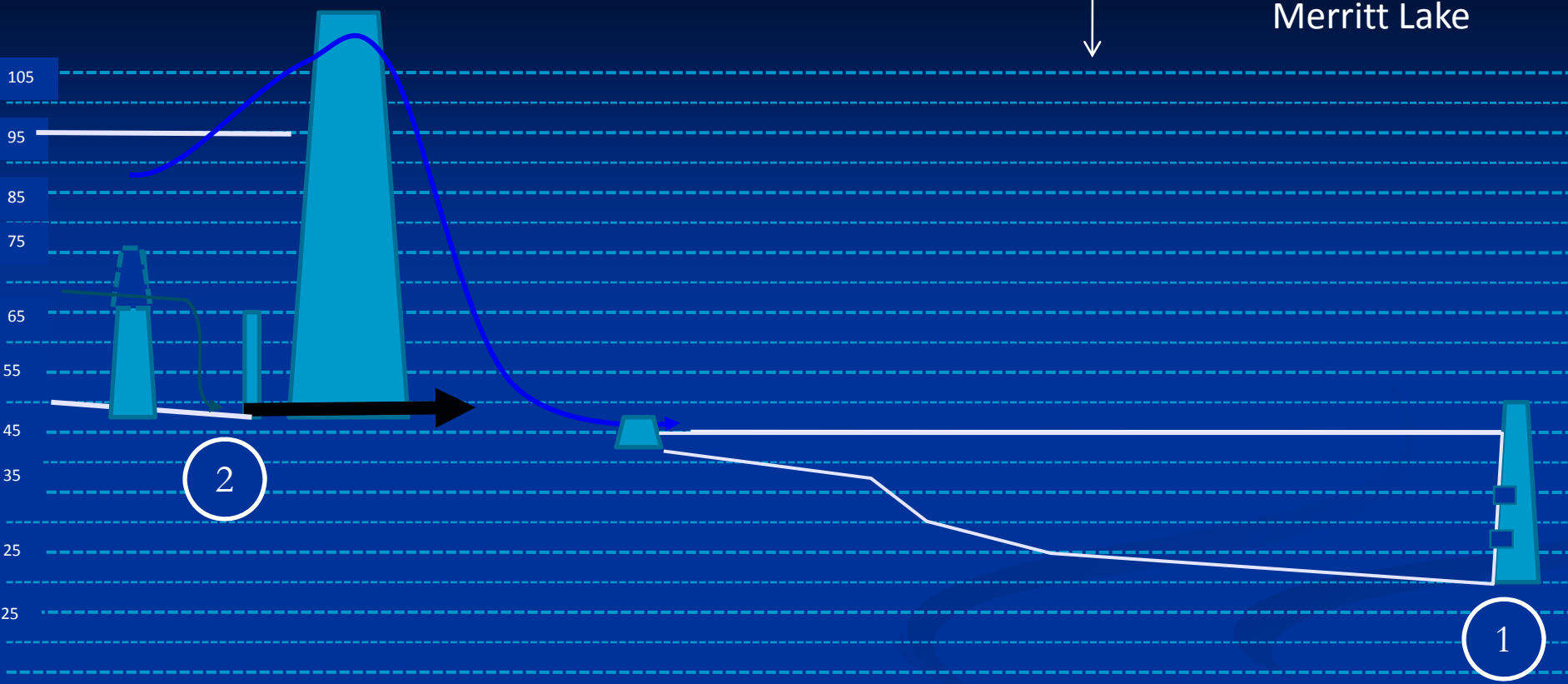
# View of Water Shed



"Arm @ Boat Ramp"

Upper Lake

Merritt Lake



# Getting Outside Help

- Summer of 2007
- Manganese and problems in the distribution
- Taste and odor complaints
- Media attention
- Unsolicited advice

Spring 2008

Dr. Robert Kortmann  
Ecosystem Consulting Service Inc.

# Suggestions

- Plan 1 –

  - Upper Pony Creek Reservoir - \$25,000

  - Merritt Lake - \$45,000

- Plan 2 –

  - Upper Pony Creek Reservoir - \$270,000

  - Merritt Lake - \$180,000

# Suggestions

## ■ Plan 3

- Monitor both reservoirs closely for changes
- Feed from the bottom of Merritt Lake as long as possible
- Feed from Upper Reservoir until manganese levels rise



# April 2008

- Changing the Merritt Lake Raw Water Intake



# Increased Monitoring

Raw Water Dissolved Oxygen and temperature  
every 4 hours

- Normal DO 14.0 mg/l
- Watching for a drop to

# Increased Monitoring

- Daily Monitoring
  - Manganese
  - Iron
  - Turbidity
  - Color
  - pH
  - Alkalinity
  - Hardness
  - Temperature

# Monthly Monitoring

## ■ Lake Depth Sampling



# Monthly Monitoring

- Samples taken at 5 feet, Mid Column, and 5 feet from the bottom
- Analysis – Dissolved Oxygen, Temperature, Manganese, Nitrate, Ammonia and Total Phosphorus

# Conclusion

- Increased monitoring
- Diligence in the distribution