Dam Removals

A Discussion of Issues and Impacts

As Presented to:

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Brief History of Low Head Dams

- Initial Use Provided Hydro Power to Local Industries
- Many Located in Smaller Communities
- Many Retrofitted for Hydroelectric Power Generation in the Early 1900's
- Hydropower Considered Unreliable and Could Not Compete

Dam Removal
Receiving More Consideration

- Cost of Ownership - Repair / Modification to Meet Present Standards
- Liability of Ownership / Public Safety
- Environmental Considerations

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Dams Provide Secondary Benefits

- Flood Retention
- Recreational Benefits
- Environmental

  Wetlands, Habitat Diversity, Sediment Deposition

- Community Intangibles

We Are Faced With Making Decisions

- Many Dams are Presently At or Beyond their Design Life and are in Poor Condition
- Public is Demanding More Accountability for Expenditures at Various Levels
- Secondary Environmental Impacts Receiving more Attention

Issues to Consider

- Engineering Considerations :
  - ASCE Guidelines for Retirement of Dams and Hydroelectric Facilities
- Planning Considerations :
  - ASDSO Issues and Considerations Associated with Decommissioning Dams

Planning Considerations

- Impact to Local Park System
- Loss of Identity
- Floodplain Management
- Impacts on Development Potential
- Property Ownership
- Structure Ownership
- Impact to Local Tax Base

Dam Removal Impacts
Two Case Studies

(Courtesy of SEH, Inc.)

- Mill Pond Dam on the Pomme de Terre River
- Frazee Dam on the Otter Tail River

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Appleton Mill Pond
Dam Removal Case History

Pomme de Terre River in Western Minnesota

Provided Power for Local Mill Site

Concrete Rubble Dam

Dam Ht = 17 ft

Dam Length = 157 ft

Size of Reservoir = 57 ac

D.A. = 907 sq. miles

Removed in Winter 1998

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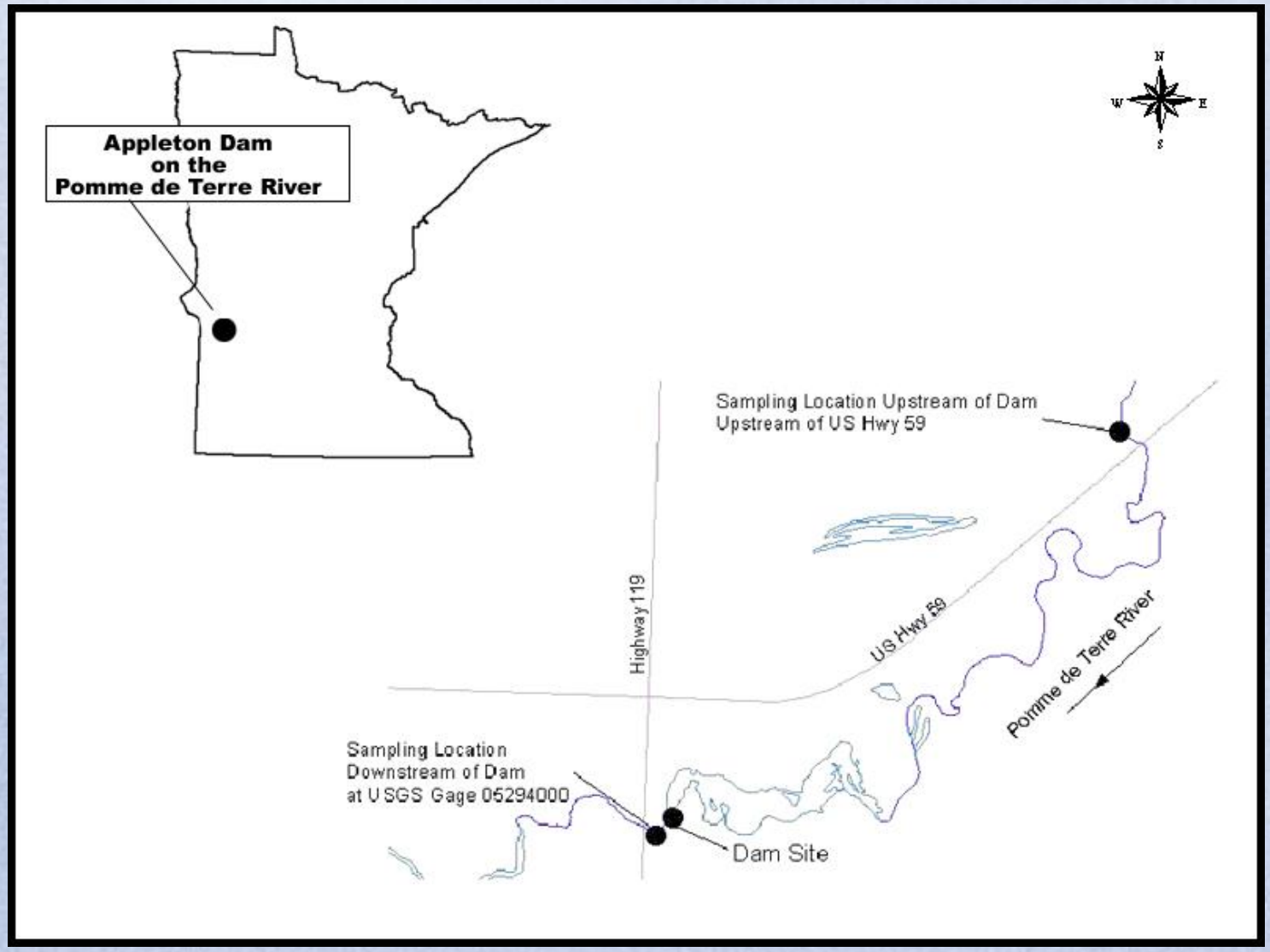
Appleton Dam Location



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Appleton Dam Before Removal

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Aerial Photo of Appleton Dam's Pool

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Appleton Dam After Removal

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Frazee Dam Removal Case History

Otter Tail River in Northwest Minnesota

Dam Ht = 19 ft

Dam Length = 60 ft

D.A. = 237.7 sq. miles

Removed in Winter 1998

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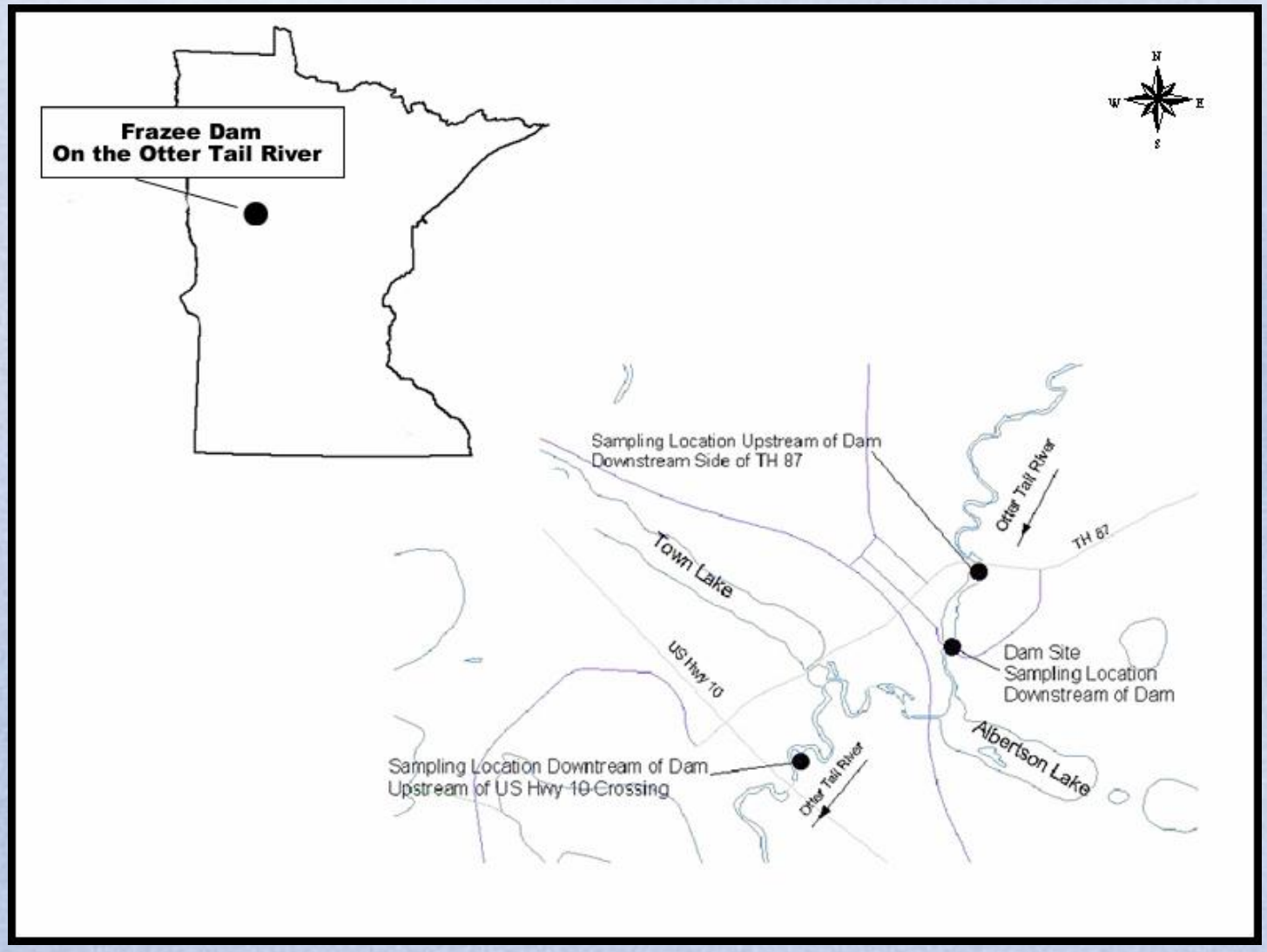
Frazee Dam Location



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Frazee Dam Before Removal

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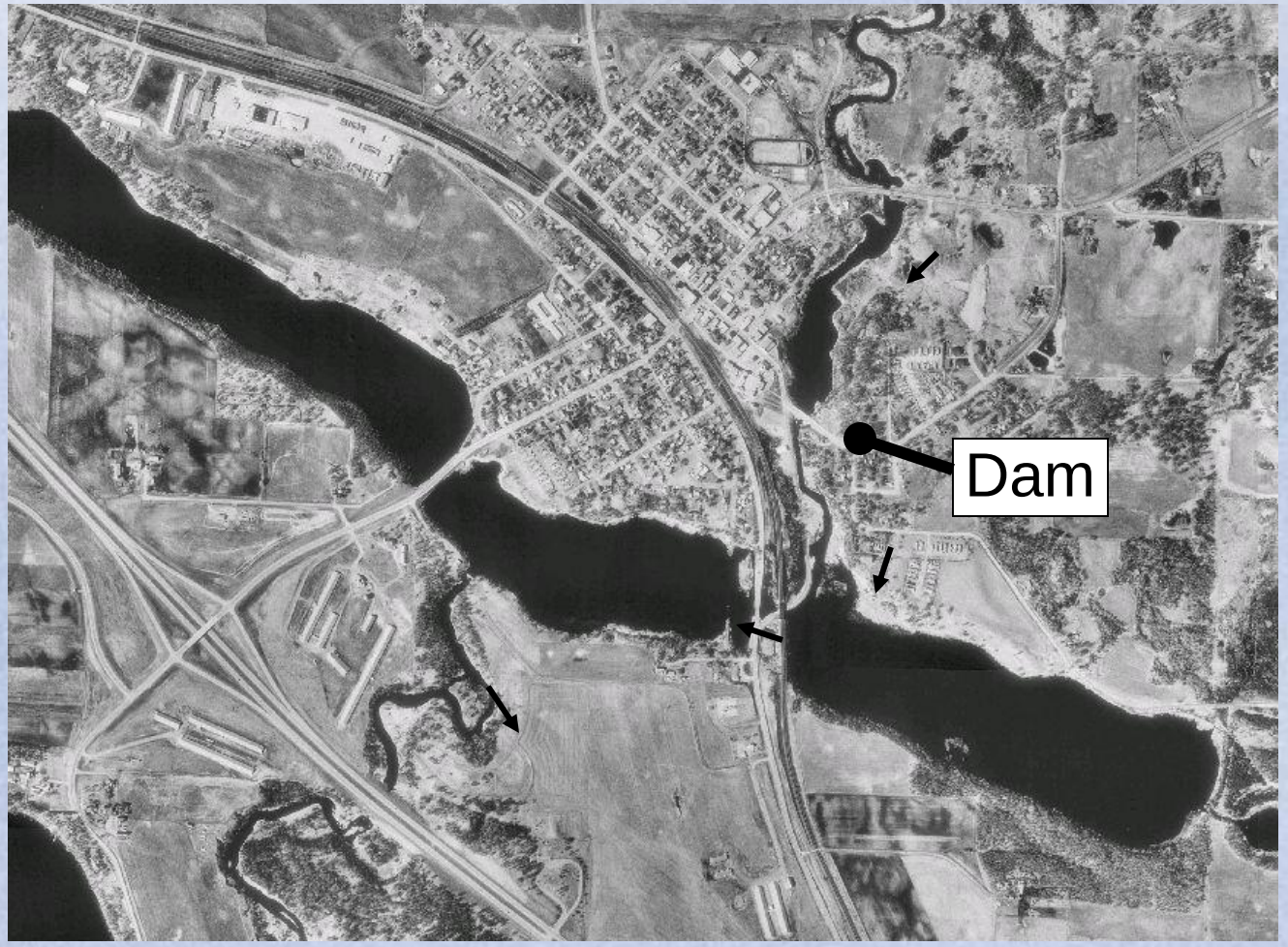
Aerial Photo of Frazee Dam Pool Before Removal



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Frazee Dam Site After Removal

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T.H. 87 Crossing Upstream of Dam Site

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Progression of Frazee Pool
Spring Before Removal

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Progression of Frazee Pool
Fall Before Removal

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Progression of Frazee Pool
Winter During Removal

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Progression of Frazee Pool
Spring After Removal

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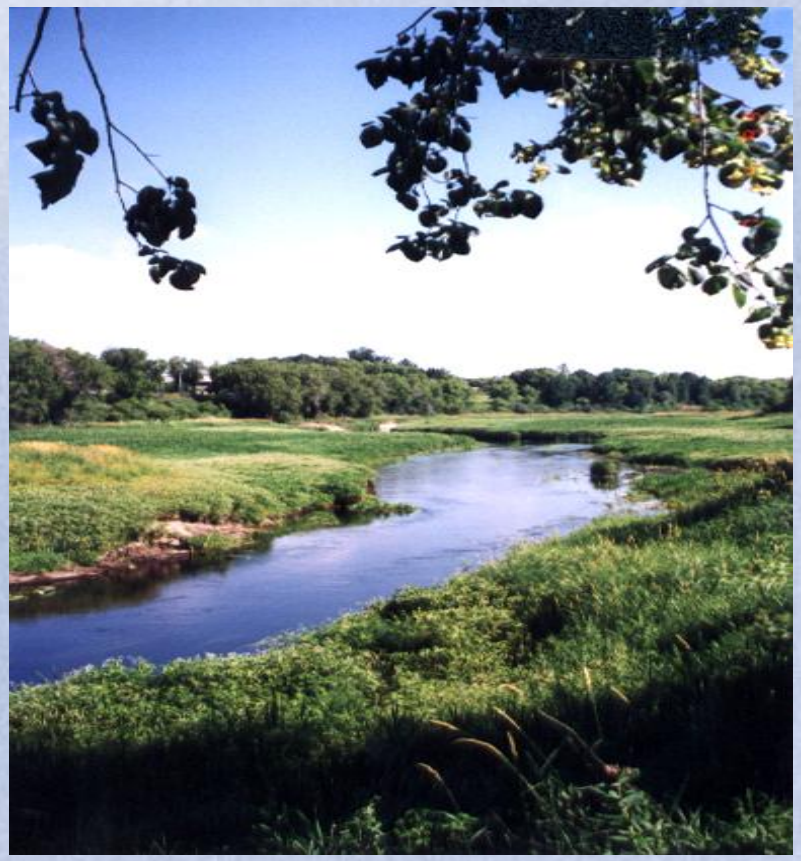
Progression of Frazee Pool
Summer After Removal



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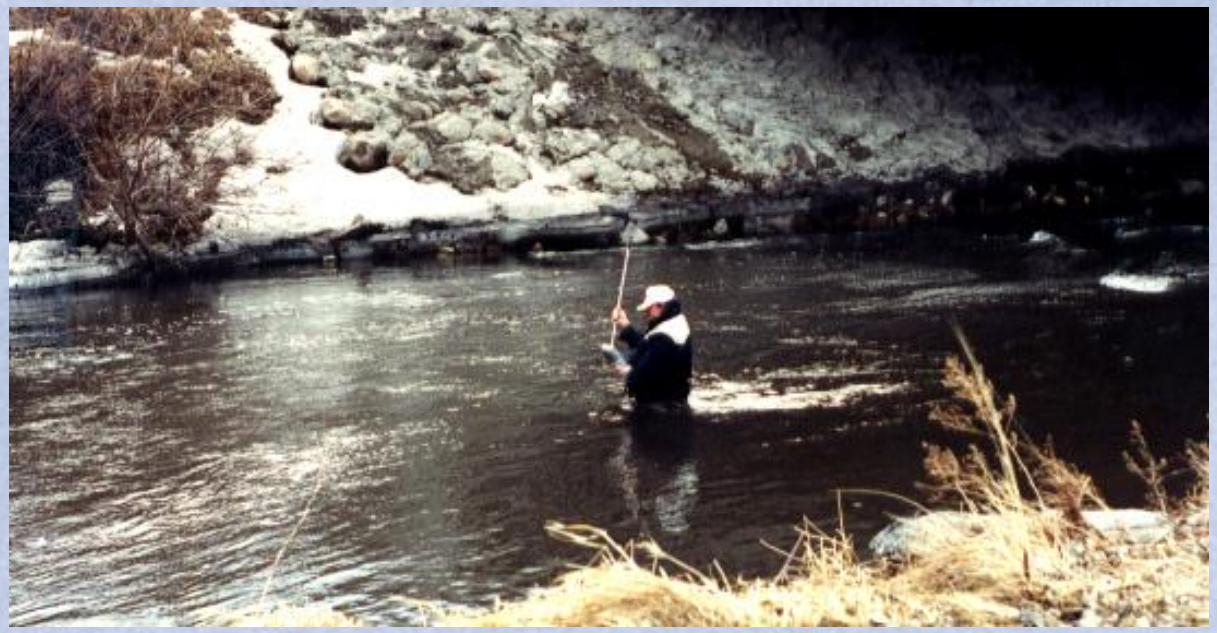
Impact of Dam Removal on Water Quality Was Measured

- Total Suspended Solids (TSS) Concentrations were Measured Using a Depth Integrated Sampler



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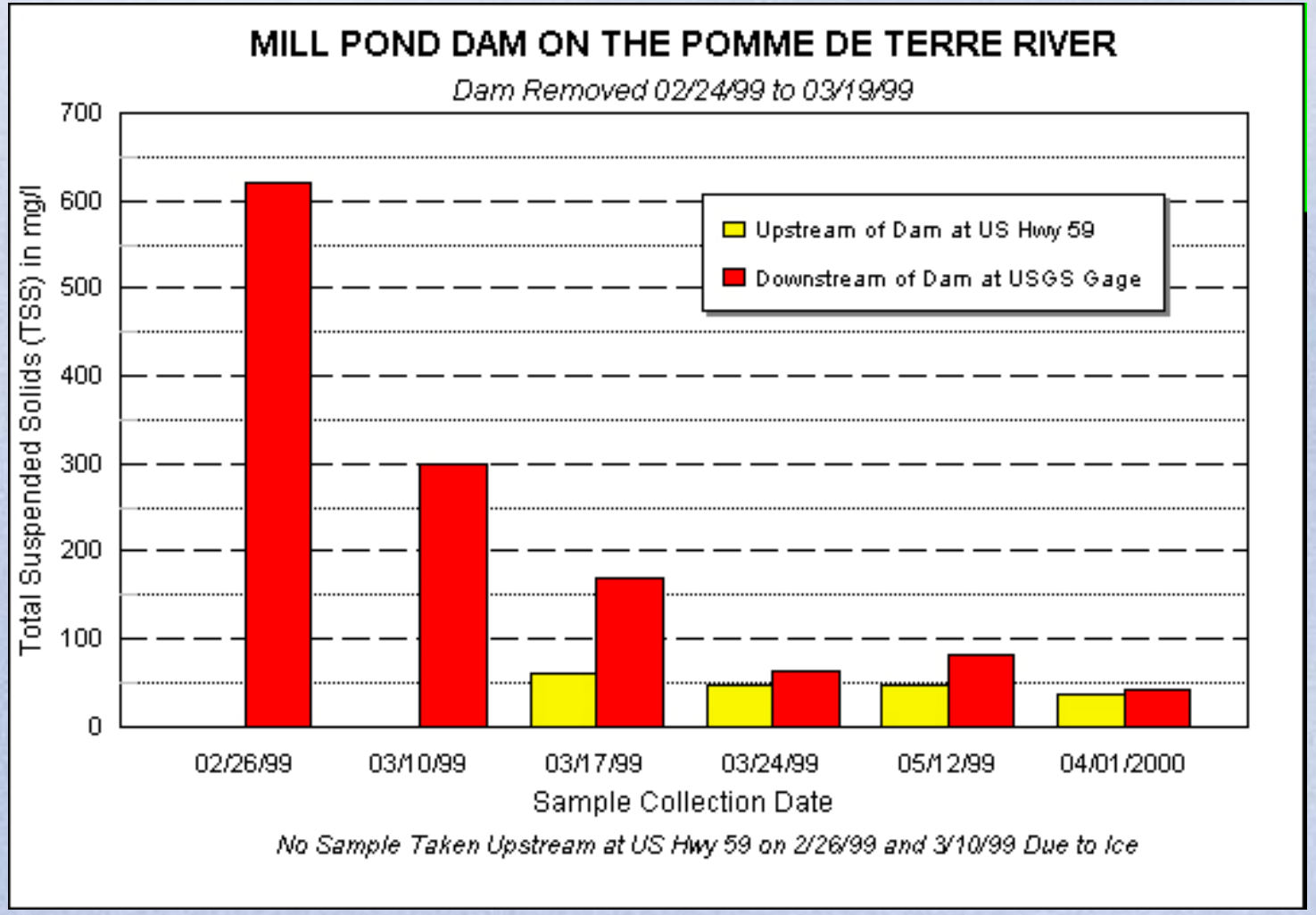
Results of Water Quality Sampling



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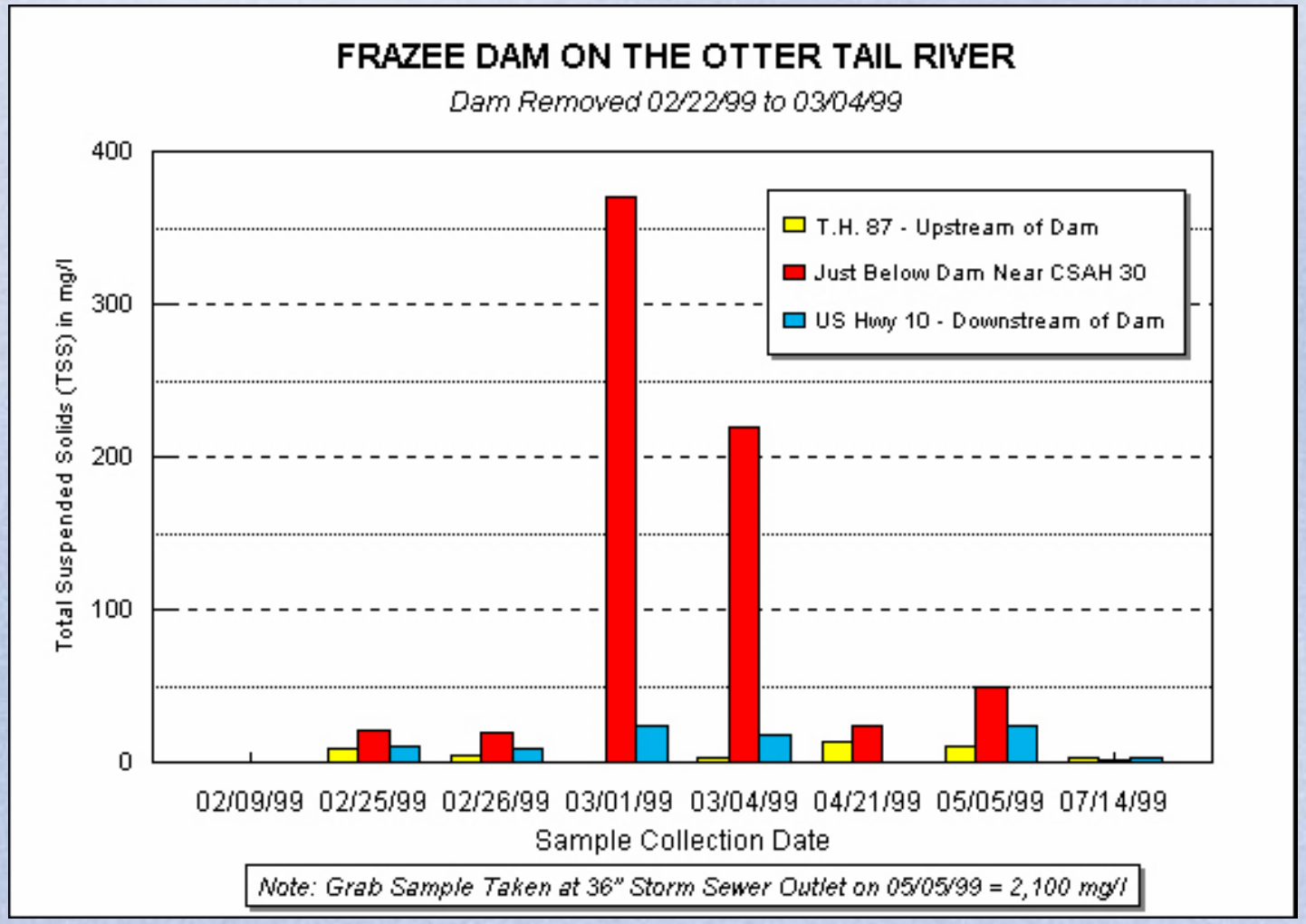
Results of Water Quality Sampling



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Comparison of Measured TSS Values

- A Grab Sample Taken At Frazee (2,100 mg/l)

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Conclusions

- Dam Removal is Gaining More Attention as an Alternative to Repair and/or Reconstruction
- Engineering Considerations are Part of the Removal
- Planning Considerations are Part of the Removal
- The Physical Conditions After Removal Must be Fully Explored when Considering Removal (Not Only What's Lost)
- Measured Values During Two Dam Removals Indicate the Impact to In-Stream TSS Concentrations are Short-Term and Stabilize Quickly After the Removal

Thank You.

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