Red River Valley Water Supply Project

GARRISON DIVERSION

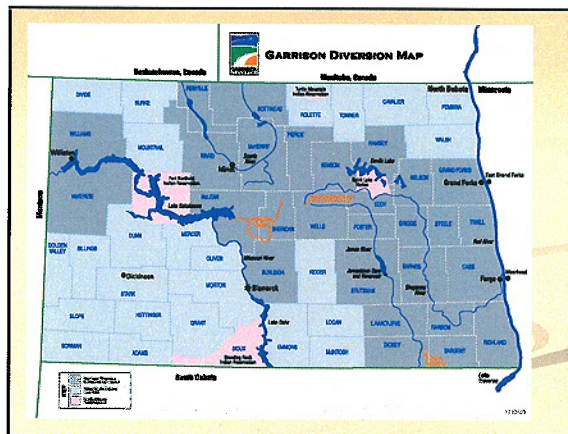GARRISON DIVERSION MAP

Garrison Diversion Mission

"Provide a reliable, high quality, affordable water supply for the benefit of North Dakota"

Red River Valley Water Supply Project

Authorized by the Dakota Water Resources Act

Mandated an EIS with joint leadership between the federal government and the State of North Dakota.

*MR&I   *Streamflow Augmentation   *Groundwater Recharge

Current Status of Project

Final Needs & Options Report –
Released November 2005
Draft EIS –
Released December 2005
Supplemental Draft EIS –
Released January 31, 2007
Final EIS –
Released Fall 2007 *(anticipated)*

The Region

- 13 eastern North Dakota counties
- 3 Minnesota cities:
  - East Grand Forks
  - Moorhead
  - Breckenridge

Facts about the Region

Population

- **42.4 %** of North Dakota's population resides in the Red River Valley

- Current Red River Valley population – **315,522**

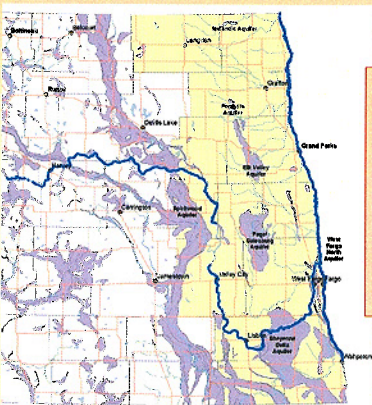- Predicted 2050 population – **479,252**

•Tax Revenue

- **52%** of ND sales & use tax collections are derived from the 13 Red River Valley counties (Source: 2004 North Dakota Sales and Use Tax Statistical Report)


Industrial Water Use

Projected Agricultural Water Use
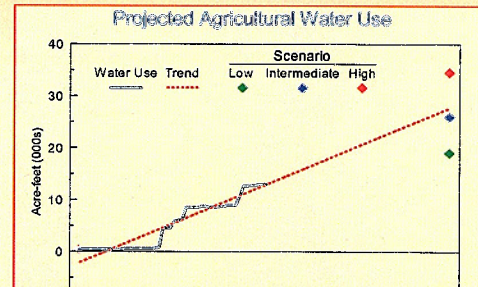
Studies show if a water supply shortage is greater than 15% industries will leave the area.
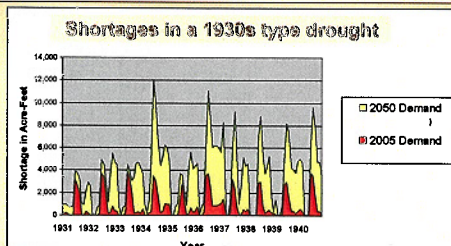

Project Area – Existing Water Supplies

Facts about the Region

Drought frequency and climatic study research concludes that a drought such as the one that occurred in the 1930s is likely to happen again before 2050.

Red River - 1910

The Problem

Shortages in a 1930s type drought

- 2050 Demand
- 2005 Demand
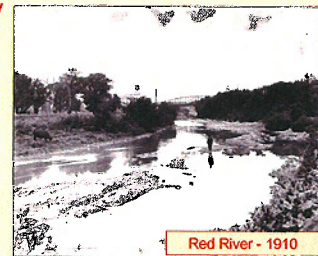
If a 1930s type drought hit the Red River Valley today, with current water demands, the Red River Valley would be short water every year, with a worst monthly shortage of 46%.


The Impact - If We Do Nothing

Consequences of No Action

- 55,000 ac-ft shortage (41%)
- $20.7 billion impact of a 10-year 1930s-type drought
- Lake Ashtabula does not maintain 28,000 ac-ft Fish & Wildlife Conservation Pool
- Extreme low flows in Sheyenne & Red Rivers
- Invasive species threat continues
  - Great Lakes shipping
  - Numerous existing pathways

3 Pronged Solution

- Supplemental Water Supply Project
- Water Conservation Measures
- Drought Management Plans
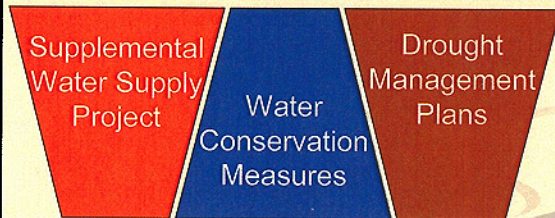
Potential Water Supplies

- Needs & Options Report studied:
  - Minnesota groundwater
  - Lake of the Woods
  - Red Lake River
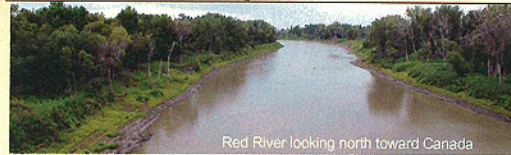 - North Dakota groundwater
  - Devils Lake
  - Missouri River

GDU Import to Sheyenne River

Would link the GDU Principal Supply Works to the Sheyenne River via a buried pipeline to meet shortages.

North Dakota's Preferred Alternative

Cost $659.8 million

Boundary Waters Treaty Compliance

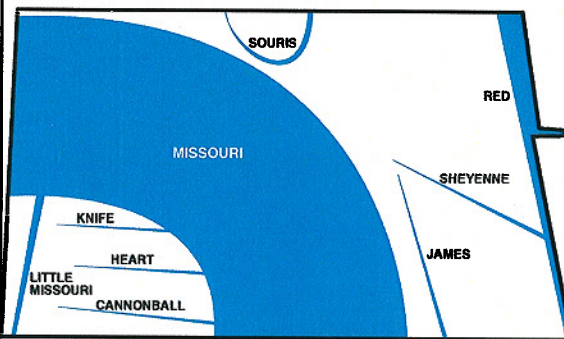Red River looking north toward Canada

- Canada's recommendation
  - Media filtration
  - Ultraviolet disinfection
  - Chlorination and/or Chloramine Disinfection
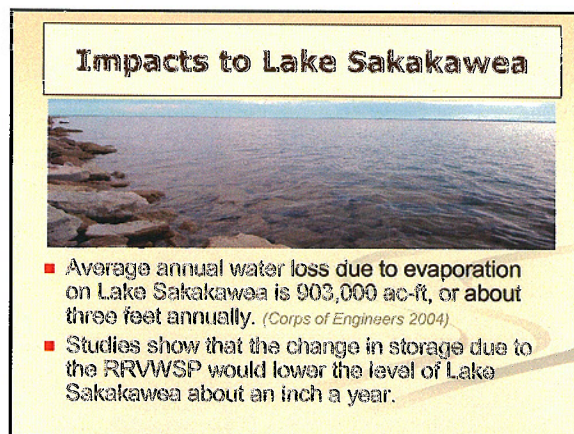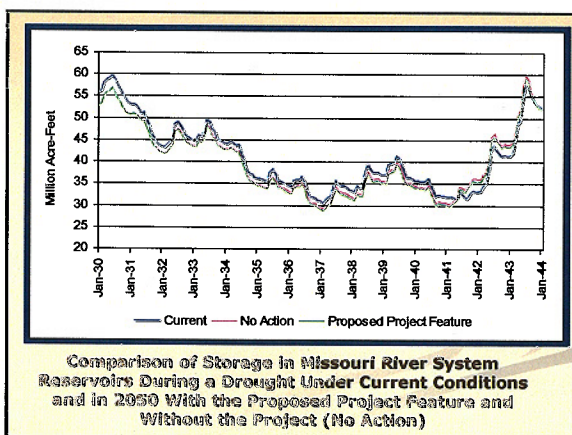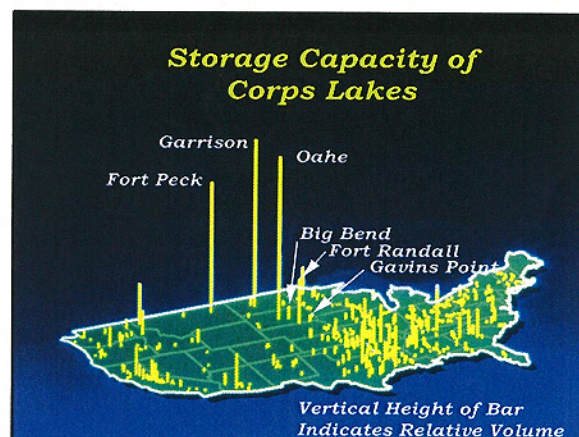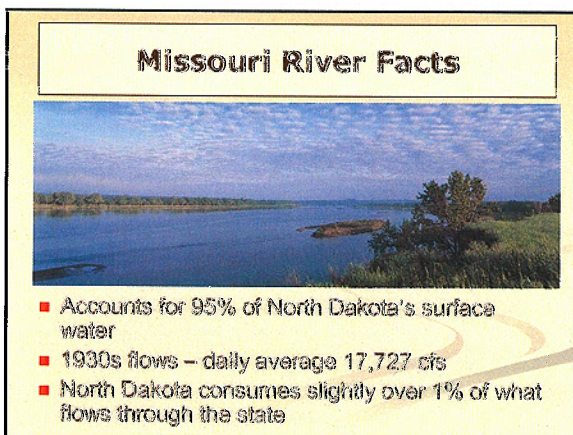- Proposed biota water treatment plant meets these goals

Boundary Waters Treaty Compliance

Manitoba Water Stewardship Biota Water Treatment Goals		
Parameter	Treated Water Goals for Biota Prior to Inter-basin Transfer	Comments
Turbidity	<0.3 NTU	This is necessary to ensure effectiveness of disinfection against viruses.
Disinfection-resistant Protozoa such as *Myxobolus cerebralis*	2.5 log (99.5%) removal	This should be achieved in a minimum of two separate barriers including filtration followed by ultraviolet (UV) disinfection.
Other Protozoa with similar characteristics as *Giardia* and *Cryptosporidium*	4 log (99.99%) total removal/inactivation with a minimum of 2.5 log by removal	This should be achieved in three separate barriers with disinfection achieved by UV and chlorination or ozonation.
Viruses	4 log (99.99%) inactivation	This can be achieved through disinfection.

Average Discharge of Principal Rivers in North Dakota

SOURIS
RED
MISSOURI
SHEYENNE
KNIFE
JAMES
HEART
LITTLE MISSOURI
CANNONBALL

Missouri River System Overview

Drainage Area = 529,000 sq. mi.
Rocky Mountains - 56,000 sq. mi.
Great Plains - 370,000 sq. mi.
Central Lowlands - 90,000 sq. mi.
Spans - 10 states and 2 provinces
Mainstem Reservoirs - 6

Missouri River Annual Average Streamflow (CFS)

74 years of record (1929-2003)

Missouri River Facts

- Accounts for 95% of North Dakota's surface water
- 1930s flows – daily average 17,727 cfs
- North Dakota consumes slightly over 1% of what flows through the state

Storage Capacity of Corps Lakes

Fort Peck   Garrison   Oahe   Big Bend   Fort Randall   Gavins Point

Vertical Height of Bar Indicates Relative Volume

Comparison of Storage in Missouri River System Reservoirs During a Drought Under Current Conditions and in 2050 With the Proposed Project Feature and Without the Project (No Action)

Legend: Current — No Action — Proposed Project Feature

Impacts to Lake Sakakawea

- Average annual water loss due to evaporation on Lake Sakakawea is 903,000 ac-ft, or about three feet annually. *(Corps of Engineers 2004)*
- Studies show that the change in storage due to the RRVWSP would lower the level of Lake Sakakawea about an inch a year.

RRVWSP Water Use:
A North Dakota Perspective

Average annual Missouri River flows available at Bismarck	= 16,700,000 ac-ft
Less RRVWSP	80,000 ac-ft
NAWS	15,000 ac-ft
SWPP	6,800 ac-ft
Missouri River flows unused	= 16,598,200 ac-ft

Leaves 99.67% in system for other water uses

ND Regional Water Systems

North West Area Water Supply Project
Turtle Mountain Indian Reservation
Fort Berthold Indian Reservation
Devils Lake Nation
Red River Valley Water Supply Project
Southwest Pipeline Project
Standing Rock Indian Reservation
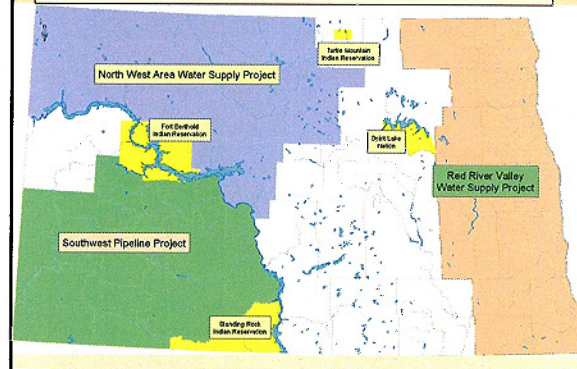
Next Steps

Fall 2007 – EIS complete

Record of Decision (anticipated)

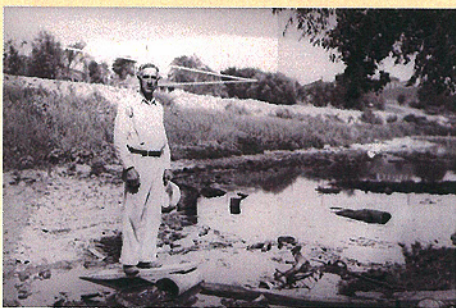2010 –Three years to construct

Start of construction (best case)

Red River ~ 1910

Red River Valley Water Supply Project

Red River ~ 1936

Red River Valley Water Supply Project

Red River ~ 1988

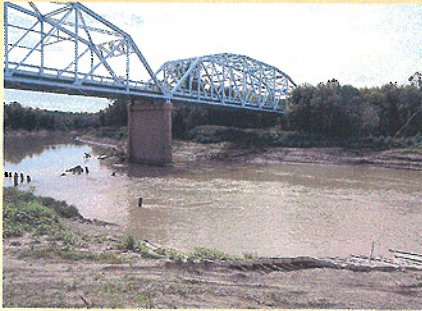**Red River Valley Water Supply Project**

Red River ~ 2004

Red River Valley Water Supply Project

Questions?