City of Hillsboro
Water Treatment Plant Replacement Alternatives

Informational Meeting

June 5, 2008 - 7:00 pm

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Outline

- Description of Existing Facilities
- Deficiencies of Existing Facilities
- Past Studies
- Alternatives
- Water Quality Comparison
- Project Cost Comparison
- Advantages of the Alternatives
- Questions

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Existing Water Supply Facilities

- Wells (3 @ 475/250/400 gpm)
- Water Treatment Plant (WTP) (400 gpm in 1966)
- Clearwell (Storage) (20k + 500 k)
- High Service Pumps (2 @ 350 gpm)
- Transmission Lines (6" + 10")

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Well Deficiencies

- Well Spacing
- Age

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WTP Deficiencies

- Quality Issues
- Quantity Issues
- Physical Issues

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Quality Issues

- Does not remove
  - Manganese
  - Sulfates
  - Total Dissolved Solids (TDS)
- Limited Arsenic Removal
- No Hardness Reduction

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Quantity Issues

- 1999 Report
  - Recommended Capacity = 500 gpm
  - Actual Capacity = 400 gpm

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Physical Issues *(Age/Condition)*

- Aged Plant (40 yrs)
- Backwash Disposal Issue
- Inadequate Backwash Rate
- Out Dated Filter Design
- Inadequate Chemical Storage & Feed Areas
- Lack of Clearwell Volume
- Lack of Turn Over in the Clearwell
- Lack of High Service Pumping Capacity

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Transmission Deficiencies

- Capacity
- Age

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Past Studies

1999	Facility Plan Report
2002	Traill Preliminary Engineering Report – Hillsboro, Mayville, Traill
2007	Regional Feasibility Study Report
2008	Addendum to the Regional Feasibility Study
2008	Updated Cost Estimate for Hillsboro WTP Replacement
2008	Plant Tours

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WTP Replacement Alternatives Begin Considered

- Iron/Manganese Removal WTP – Hillsboro Independent
- Membrane WTP - Hillsboro Independent
- Membrane WTP – Regional System

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Iron/Manganese Removal WTP – Hillsboro Independent

- 1 or 2 Additional Wells
- New 500 – 600 gpm WTP
- Remove Only Iron & Manganese
- Additional Clearwell Storage
- New Larger High Service Pumps
- New 12" Transmission Line

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Membrane WTP – Hillsboro Independent

- 1 or 2 New Wells
- New 500 – 600 gpm WTP
- Remove/Reduce Iron, Manganese, Sulfates, TDS, Arsenic
- Reduce Hardness
- Additional Clearwell Storage
- New Larger High Service Pumps
- New 12" Transmission Line

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Membrane WTP – Regional System

- New Wells and Transmission - Traill
- New 1,000 gpm WTP
  - 600 gpm - Hillsboro
  - 400 gpm - Traill
- Remove/Reduce Iron, Manganese, Sulfates, TDS, Arsenic
- Reduce Hardness
- Additional Clearwell Storage
- New Larger High Service Pumps
- New 12" Transmission Line

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Membrane WTP
Regional System Alternative

3 Entities
- Hillsboro
- Mayville
- Traill Rural Water District

3 Phases of Construction

Governed by a Joint Powers Agreement

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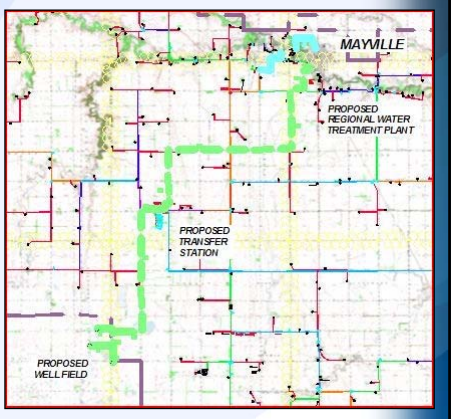
Project Components

Phase 1

- Wellfield Development
- Raw Water Transfer Facility
- Raw Water Transmission to TRWD and Mayville
- TRWD Distribution Improvements (Portland Area)



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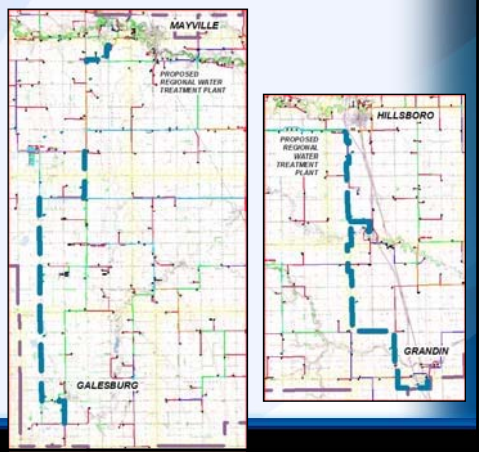
Project Components

Phase 2

- TRWD Distribution Improvements
  - Galesburg Area
  - Grandin Area



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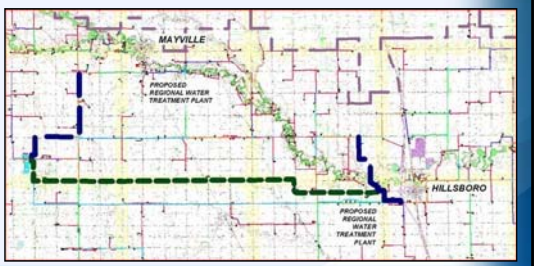
Project Components

Phase 3

- Additional Wellfield Development
- Raw Water Transmission to Hillsboro
- Mayville WTP Improvements
- TRWD & Hillsboro Joint WTP
- TRWD Additional Distribution Improvements



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Water Quality Comparison

Constituent	Max. Level mg/l	Hillsboro Existing mg/l (gr/gal)	Fe/Mn Removal WTP Hillsboro Independent mg/l (gr/gal)	Membrane* WTP Hillsboro Independent mg/l (gr/gal)	Membrane* WTP Regional System mg/l (gr/gal)
Sodium	20	114	114	30 - 40	2 - 5
Sulfate	250	354	354	75 - 85	50 - 60
Iron**	0.3	0.02	0	0	0
Manganese**	0.05	0.23	0	0	0
Arsenic***	10	7	7	2 - 3	3 - 5
TDS	500	938	938	240 - 260	100 - 120
Hardness	< 50	546 (31.7)	546 (31.7)	50 – 86 (3 – 5)	50 – 86 (3 – 5)

* Single Array Units; Assume 80% Water Recovery; Assume 15% By-pass Flow
**Iron and Manganese must be removed prior to RO Treatment due to fouling potential
***Arsenic concentrations provided in µg/l

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Project Cost Comparison

Description	Fe/Mn Removal WTP Hillsboro Independent	Membrane WTP Hillsboro Independent	Membrane WTP Regional System
TOTAL PROJECT COST	$2,685,067	$6,803,162	$8,023,008
PROJECT COSTS NON-ELIGIBLE FOR MR&I GRANT	$2,685,067	$6,803,162	$0
TOTAL MR&I GRANT [1]	$0	$0	$5,616,106
TOTAL LOAN REQUIRED	$2,685,067	$6,803,162	$2,406,902
ANNUAL DEBT SERVICE EXPENSE: (DWSRF 20 Year Term at 3.0%)	$180,479	$457,279	$161,782
RESERVE EXPENSE: (20% of Debt Service Expense)	$36,096	$91,456	$32,356
TOTAL ANNUAL DEBT SERVICE & RESERVE:	$216,574	$548,735	$194,138
PROJECT RELATED USER COSTS			
MONTHLY USER COST - PROJECT	$25.07	$63.51	$22.47
INCREASED MONTHLY O&M USER COST - PROJECT	$0	$5.63	$5.63
TOTAL INCREASED MONTHLY PROJECT RELATED COSTS	**$25.07**	**$69.14**	**$28.09**
EXISTING USER COSTS			
AVERAGE MONTHLY USER COST - EXISTING	$16.00	$16.00	$16.00
TOTAL PROJECTED MONTHLY USER COST	**$41.07**	**$85.14**	**$44.09**

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Advantages of Fe/Mn Removal WTP Hillsboro Independent

- Removal of Iron & Manganese
- Least Costly Alternative

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Advantages of Membrane WTP Hillsboro Independent

- Removal of Iron and Manganese
- Less Sodium
- Better Tasting (Sulfates, TDS, and Hardness)
- Does Not Have a Laxative Effect (Sulfates)
- Reduced Salt Usage (home softening)
- Potentially Eliminate Home Softening
- Better Arsenic Removal
- Better Capability For Handling Future Regulations
- Most Expensive Alternative

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Advantages of Membrane WTP Regional System

- Removal of Iron and Manganese
- Less Sodium
- Better Tasting (Sulfates, TDS, and Hardness)
- Does Not Have a Laxative Effect (Sulfates)
- Reduced Salt Usage (Home Softening)
- Potentially Eliminate Home Softening
- Better Arsenic Removal
- Better Capability For Handling Future Regulations
- Future Tie Into Red River Valley Water Supply Project
- Free Up Existing Well Capacity For Industry
- Potentially Lower Operation and Maintenance Costs
- Second Least Costly Alternative

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QUESTIONS?

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