

Treatment Plant Expansion Feasibility Study



April 12, 2016

What is 1,4-Dioxane (Dioxane)?

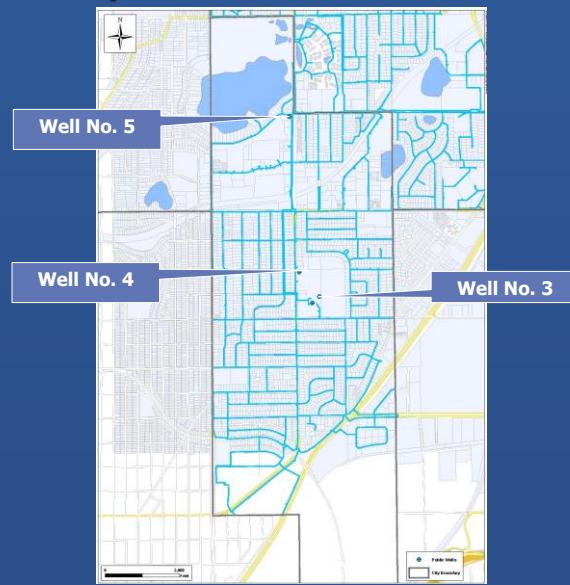
- ▶ Used to stabilize chlorinated solvents
- ▶ Found in small amounts in many personal care products, laundry detergents, and food
- ▶ Considered an emerging contaminant
- ▶ Likely to stay in water once there – it does not break down naturally

Project Coordination

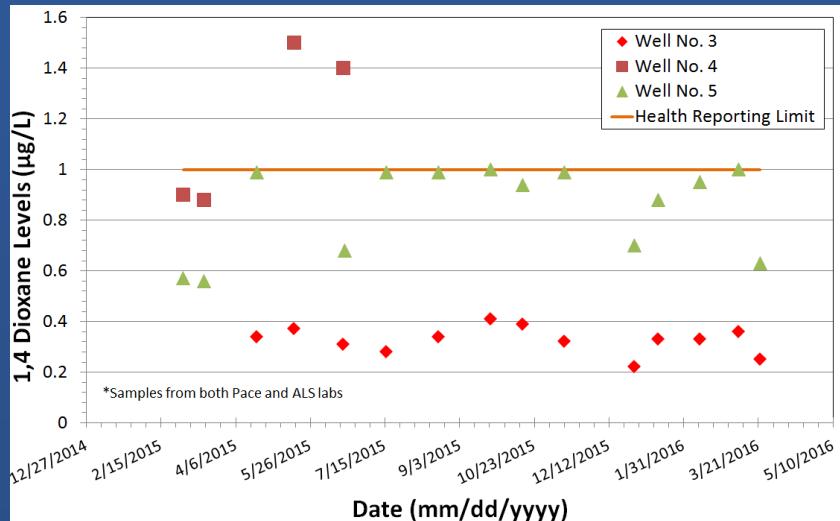
- ▶ US Army
- ▶ MPCA
- ▶ MDH



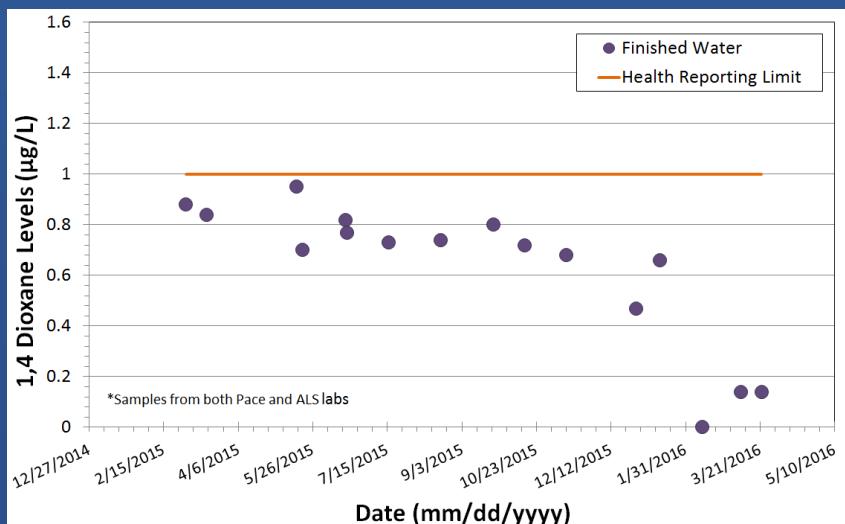
City Well Location Map



Dioxane Sampling Results



Dioxane Sampling Results



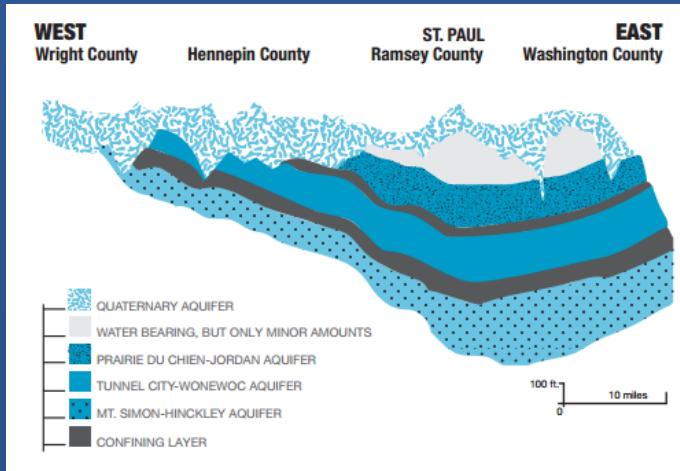
Options to Address Dioxane

- ▶ **Option 1** – Blend City wells
- ▶ **Option 2** – Construct deeper Mount-Simon
Hinckley wells
- ▶ **Option 3** – Purchase water from Minneapolis
- ▶ **Option 4** – Purchase water from St. Paul Regional
Water Services
- ▶ **Option 5** – Implement treatment for Dioxane

Options to Address Dioxane

- ▶ Primary Focus – Options 3 and 5
- ▶ During initial screening, Options 1 and 4 were eliminated from further consideration:
 - Did not provide a long term solution – blending
 - Similar to Option 3 with a considerable increase in cost and implementation timeline.

Option 2 – Construct Deeper Mount-Simon Hinckley Wells



Source: MetCouncil Groundwater Digest

Option 2 – Construct Deeper Mount-Simon Hinckley Wells

Advantages

- ▶ Currently no TCE or Dioxane
- ▶ Better confined
- ▶ City control over water production and costs to customers

Option 2 – Construct Deeper Mount-Simon Hinckley Wells

Disadvantages

- ▶ Radium
- ▶ Larger well pumps
- ▶ Groundwater interference with New Brighton
- ▶ DNR moratorium – permit challenges
- ▶ Increased timeline for implementation

Option 2 – Construct Deeper Mount-Simon Hinckley Wells

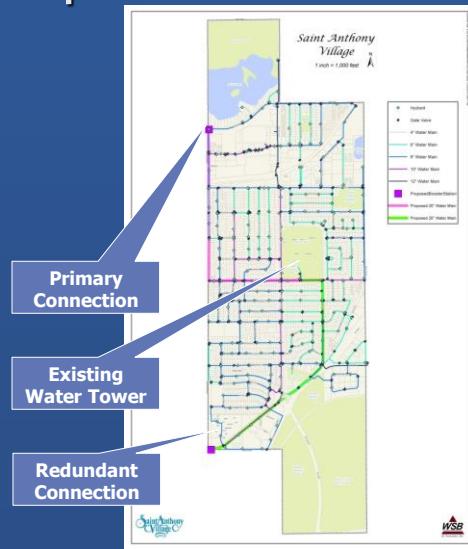
Estimated Capital Cost	Finance Cost (4% Interest)	Estimated Annual O&M Cost (3.5% Inflation Rate)	20-Year Cost of Purchasing/Producing Water	Total 20-Year Cost
\$7,115,600	\$3,356,000	\$2,812,300	\$4,954,000	\$18,237,900

** Costs above include 4% bond financing and 3.5% inflation for yearly operation and maintenance costs.*

Option 3 – Purchase Water from Minneapolis

Advantages

- ▶ Less responsibility
- ▶ Water already softened
- ▶ Redundancy in water supply
- ▶ Less reliance on aquifers



Option 3 – Purchase Water from Minneapolis

Disadvantages

- ▶ Loss of control on water costs
- ▶ Differences in water quality for customers
 - Seasonal fluctuations
 - Disinfection byproducts
- ▶ Surface water susceptibility to spills and risk of drought
- ▶ Age of Minneapolis distribution system
- ▶ Need to increase water rates
- ▶ Need 2 connections to Minneapolis for redundancy

Option 3 – Purchase Water from Minneapolis

Estimated Capital Cost	Finance Cost (4% Interest)	Estimated Annual O&M Cost (3.5% Inflation Rate)	20-Year Cost of Purchasing/Producing Water	Total 20-Year Cost
\$9,480,300	\$4,471,200	\$4,487,800	\$17,472,000	\$35,911,300

* Costs above include 4% bond financing and 3.5% inflation for yearly operation and maintenance costs.

Option 5 – Implement Treatment for Dioxane

Advantages

- ▶ Physically destroys and removes Dioxane from the environment
- ▶ Reduces risk to others downstream
- ▶ Fits within existing treatment process
- ▶ Maintain control of water cost and utility rates
- ▶ Utilize all existing wells
- ▶ Enhanced disinfection and TCE removal

Option 5 – Implement Treatment for Dioxane

Disadvantages

- ▶ Additional operator training
- ▶ Upfront capital expenditure
- ▶ Reliant on single equipment vendor
- ▶ Dependent on ability of AOP system to treat other contaminants that emerge



Option 5 – Implement Treatment for Dioxane

Estimated Capital Cost	Finance Cost (4% Interest)	Estimated Annual O&M Cost (3.5% Inflation Rate)	20-Year Cost of Purchasing/Producing Water	Total 20-Year Cost
\$7,177,600	\$3,385,200	\$1,080,200	\$4,954,000	\$16,597,000

* Costs above include 4% bond financing and 3.5% inflation for yearly operation and maintenance costs.

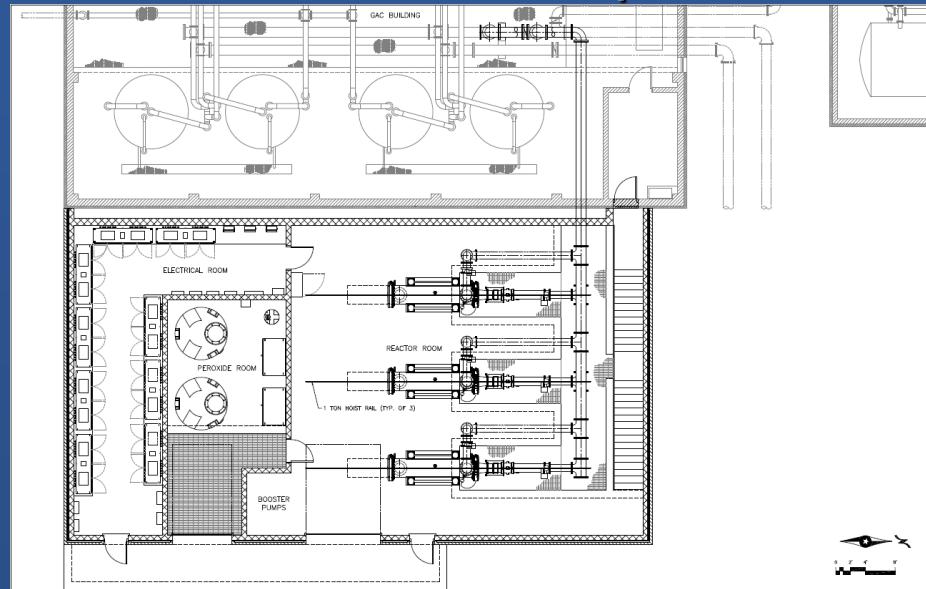
Project Costs / Recommendation

Option	Estimated Capital Cost	Finance Cost (4% Interest)	Estimated Annual O&M Cost (3.5% Inflation Rate)	20-Year Cost of Purchasing / Producing Water	Total 20-Year Cost
2	\$7,115,600	\$3,356,000	\$2,812,300	\$4,954,000	\$18,237,900
3	\$9,480,300	\$4,471,200	\$4,487,800	\$17,472,000	\$35,911,300
5	\$7,177,600	\$3,385,200	\$1,080,200	\$4,954,000	\$16,597,000

* Costs above include 4% bond financing and 3.5% inflation for yearly operation and maintenance costs.

Recommendation: Option 5

Treatment Plant Expansion



Treatment Plant Expansion



Treatment Plant Expansion



Treatment Plant Expansion



Project Schedule

■ Council Accept Feasibility/Order Plans/ Authorize Ad for Bid	April 12, 2016
■ Receive Bids/Award Contract	August 2016
■ Begin Construction	October 2016
■ Start-Up	August 2017

Questions?