LTU
CITY OF LINCOLN
TRANSPORTATION
AND UTILITIES

WATER 2.0
SECURING LINCOLN'S
SECOND SOURCE

WATER SOURCE ADVISORY COUNCIL MEETING #6

December 20, 2022

WELCOME!

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INTRODUCTIONS

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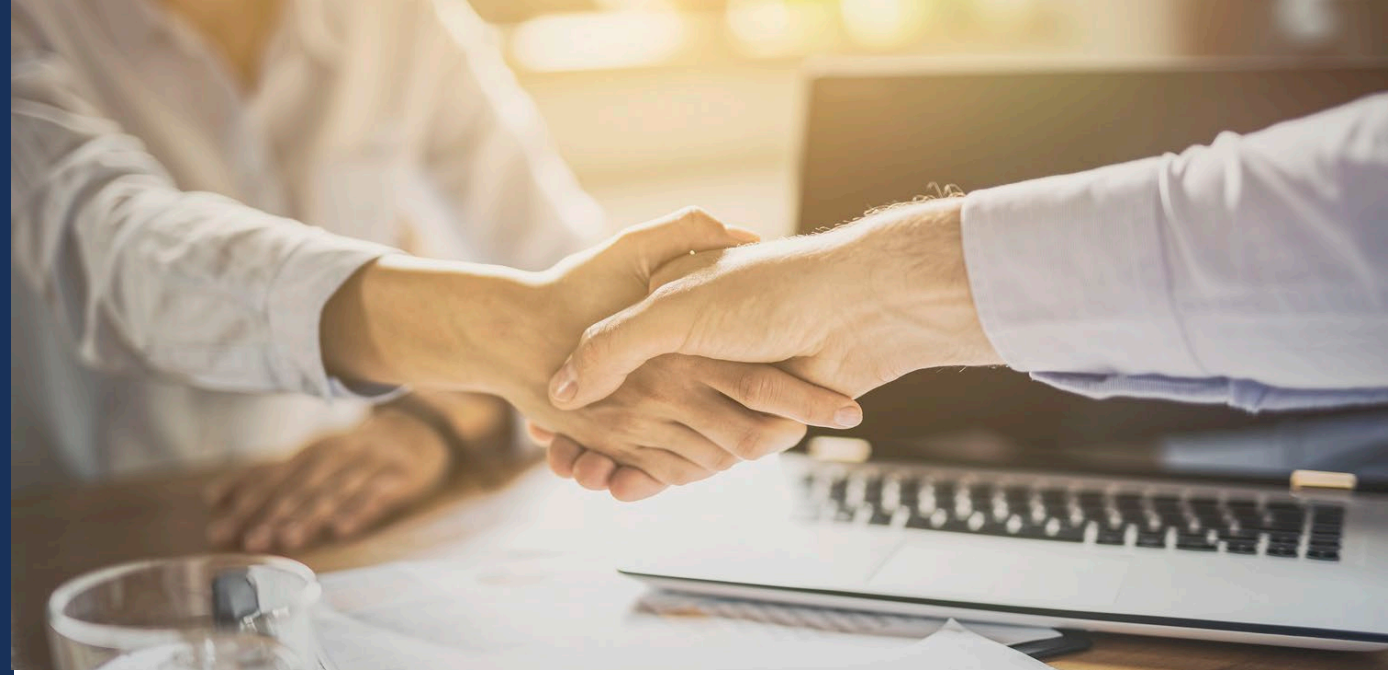
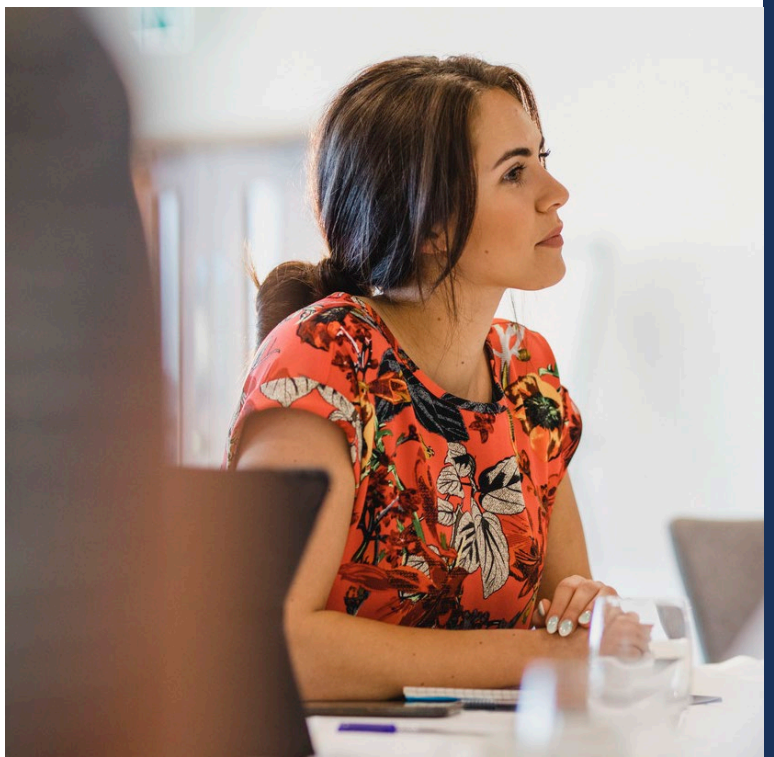
RULES FOR ENGAGEMENT

- The deliberation process will be collaborative
- Everyone’s perspective is valued and respected
- Listen to understand, not to debate
- Be concise
- Be hard on the issues – soft on the people
- Avoid right-wrong paradigms





RULES FOR ENGAGEMENT

- Everyone should have an equal opportunity to participate
- Respect start and finish times
- Provide your full attention
- Full participation is critical
- Ask questions – don’t wait
- Avoid sidebar conversations

THE LEVELS OF CONSENSUS ARE:

1. I can say an unqualified ‘yes’ to the decision. I am satisfied that the decision is an expression of the wisdom of the group.
2. I find the decision perfectly acceptable.
3. I can live with the decision; I’m not especially enthusiastic about it.
4. I do not fully agree with the decision and need to register my view about it. However, I do not choose to block the decision. I am willing to support the decision because I trust the wisdom of the group.
5. I do not agree with the decision and feel the need to stand in the way of this decision being accepted.
6. I feel that we have no clear sense of direction of unity in the group. We need to do more work before consensus can be reached.

Kelsey 1991

AGENDA

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SCHEDULE GOING FORWARD

	OCTOBER		NOVEMBER		DECEMBER		JANUARY
	Discuss Criteria	Score Alternatives	Discuss Criteria	Score Alternatives	Discuss Criteria	Score Alternatives	
Governance					✓	✓	
Environmental Stewardship		✓					
Reliability			✓	✓			
Implementation	✓	✓					
Operations	✓	✓					
Stakeholder Impacts			✓	✓			
Life Cycle Costs					✓	✓	
Final Evaluation and Recommendation							✓

SCORING REFRESHER

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GOVERNANCE CRITERIA

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FINAL EVALUATION CRITERIA

- Reliability
- Governance
  - Regional
  - Autonomous
  - Complexity
- Life Cycle Cost
- Operations
- Implementation
- Environmental Stewardship
- Stakeholder Impacts

GOVERNANCE UPDATE

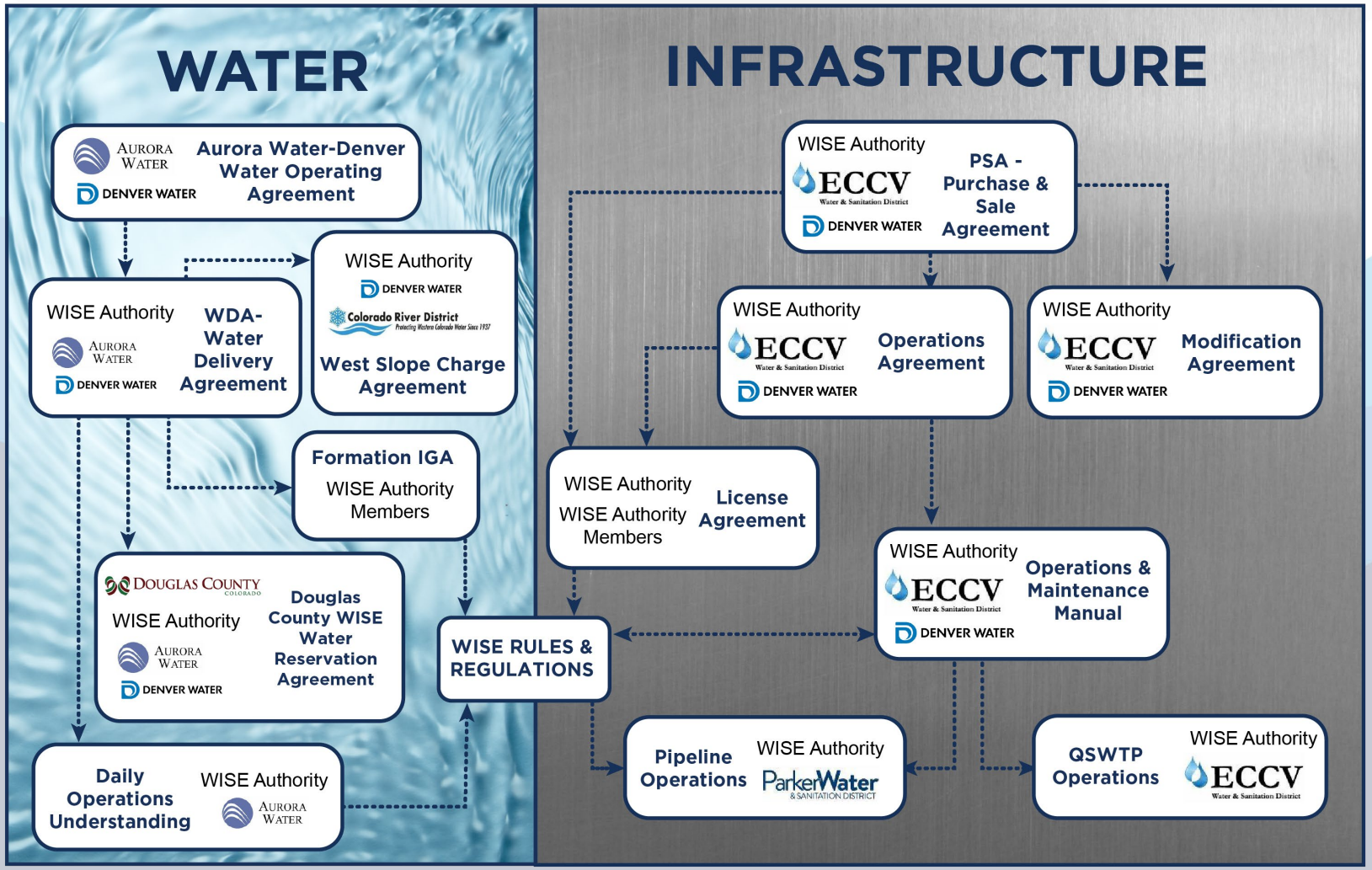
- September 20th – Discussed MUD governance options
- City has had ongoing discussions with MUD
- Met with Denver Water officials to learn about WISE project
- City law conducted research into Joint Public Agencies and Interlocal Agreements

INTERLOCAL PROJECT EXAMPLE - WISE

- WISE – Water Infrastructure and Supply Efficiency
- Involved Denver, Aurora and South Metro water utilities
- Affected over 2 million people
- Numerous interconnected agreements to negotiate, implement and operate WISE

DENVER WATER

WISE AGREEMENT



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SCORING OF ALTERNATIVES:
GOVERNANCE CRITERIA

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ALTERNATIVE B
EXPAND EXISTING WELLFIELD

SCORING SHEET – Governance Criteria

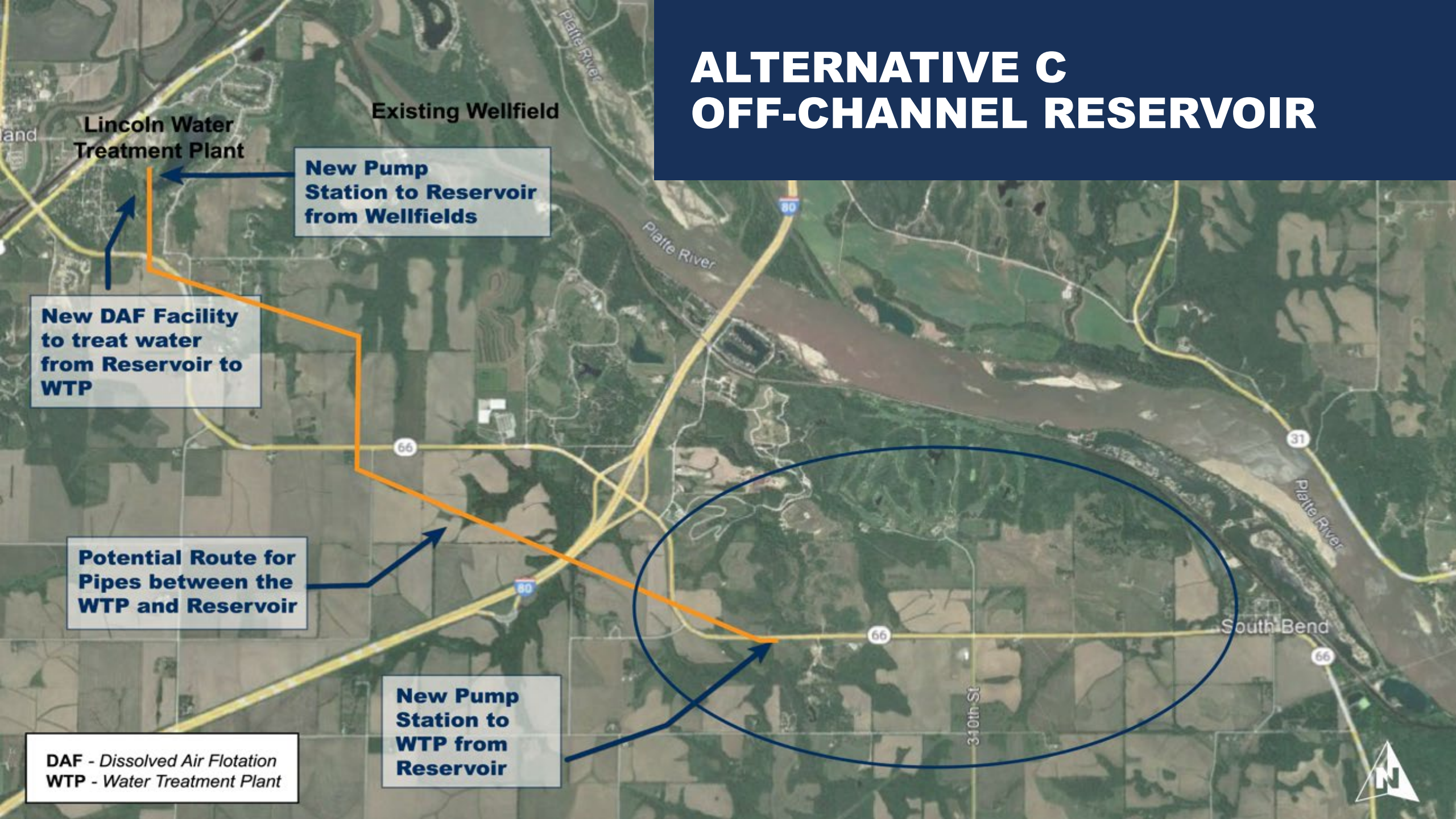
WATER 2.0
SECURING LINCOLN'S SECOND SOURCE

Alternative B - Expand Existing Wellfield

Score (1-5) _____

Regional Impacts	Overview and Facts	Notes
Does this alternative provide the opportunity to serve neighboring communities?	• Yes, opportunity to serve new development and growing communities in the I-80 corridor. • Communities that could be served include Ashland, Greenwood and Waverly. Combined population is approximately 8,200 people.	
Autonomy		
Does this alternative require a contractual relationship that reduces Lincoln's decision making independence?	• A contractual relationship would be necessary only if Lincoln elects to serve as a water supplier. • An agreement to serve as a wholesale supplier would not require a reduction in decision making independence.	
Complexity		
If a contractual relationship is required, how complex would the agreement need to be?	• Terms of a wholesale supply agreement would generally be straight forward. • Lincoln would be under no obligation to enter into an agreement and could elect not to be a supplier.	

ALTERNATIVE C
OFF-CHANNEL RESERVOIR



SCORING SHEET – Governance Criteria

WATER 2.0
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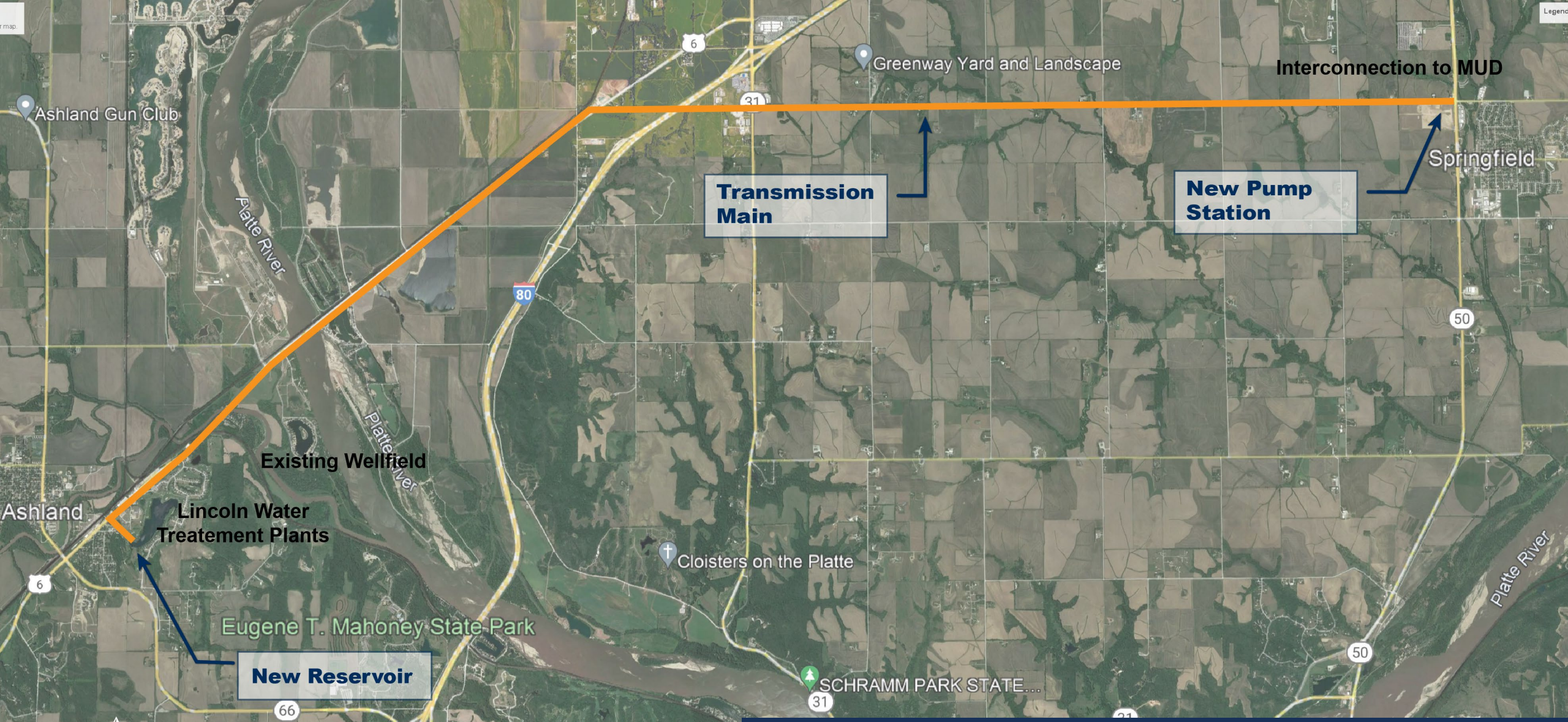
Alternative C - Off-Channel Reservoir

Score (1-5) _____

Regional Impacts	Overview and Facts	Notes
Does this alternative provide the opportunity to serve neighboring communities?	• Yes, opportunity to serve new development and growing communities in the I-80 corridor. • Communities that could be served include Ashland, Greenwood and Waverly. Combined population is approximately 8,200 people.	
Autonomy		
Does this alternative require a contractual relationship that reduces Lincoln's decision making independence?	• A contractual relationship would be necessary only if Lincoln elects to serve as a water supplier. • An agreement to serve as a wholesale supplier would not require a reduction in decision making independence.	
Complexity		
If a contractual relationship is required, how complex would the agreement need to be?	• Terms of a wholesale supply agreement would generally be straight forward. • Lincoln would be under no obligation to enter into an agreement and could elect not to be a supplier.	



ALTERNATIVE D
MUD INTERCONNECT

SCORING SHEET – Governance Criteria

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Alternative D - Omaha MUD Interconnect

Score (1-5) _____

Regional Impacts	Overview and Facts	Notes
Does this alternative provide the opportunity to serve neighboring communities?	• This alternative assumes a joint public agency supplier agreement between Lincoln and MUD. • Would provide opportunity to serve as a wholesale supplier to new development and growing communities in the I-80 corridor. • Ability to provide water service along transmission main alignment between interconnect and Ashland treatment plant. • Communities that could be served include Ashland, Greenwood and Waverly. Combined population is approximately 8,200 people.	
Autonomy		
Does this alternative require a contractual relationship that reduces Lincoln's decision making independence?	• An agreement would be required to establish and set terms for the joint public agency. • The joint public agency would serve as wholesale supplier to MUD, LWS and other customers. • Wholesale supply agreements with neighboring communities would be through the joint public agency. LWS and MUD would share decision making authority. • LWS would retain autonomy for treatment and distribution.	
Complexity		
If a contractual relationship is required, how complex would the agreement need to be?	• A joint public agency agreement would be significantly more complex than a typical wholesale supply agreement.	

ALTERNATIVE E
MISSOURI RIVER SURFACE WATER INTAKE TO ASHLAND

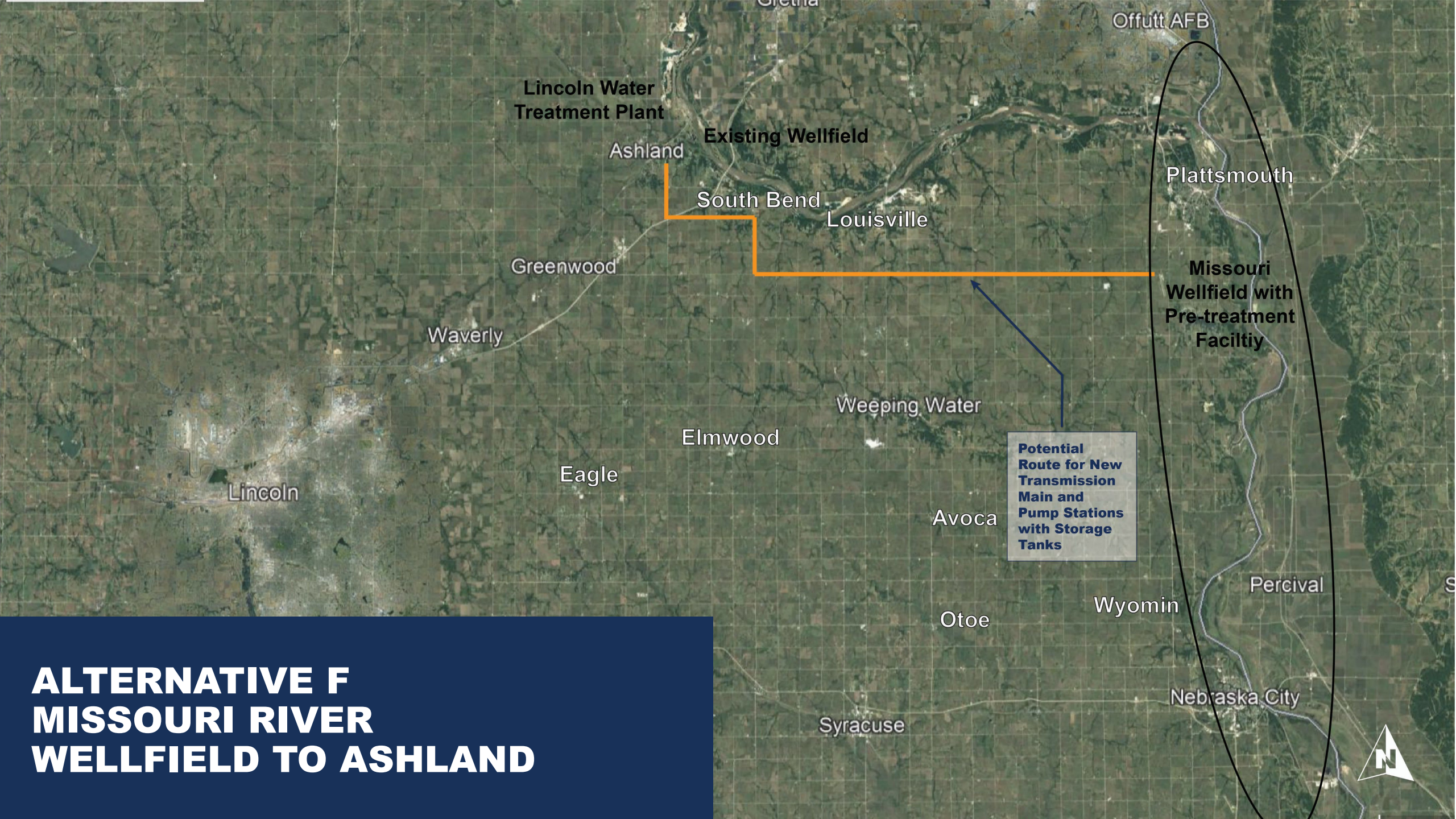
SCORING SHEET – Governance Criteria

WATER 2.0
SECURING LINCOLN'S SECOND SOURCE

Alternative E - Missouri River Surface Water Intake to Ashland

Score (1-5) _____

Regional Impacts	Overview and Facts	Notes
Does this alternative provide the opportunity to serve neighboring communities?	• Would provide opportunity to serve new development and growing communities in the I-80 corridor. • Communities that could be served include Ashland, Greenwood and Waverly. Combined population is approximately 8,200 people	
Autonomy		
Does this alternative require a contractual relationship that reduces Lincoln's decision making independence?	• A contractual relationship would be necessary only if Lincoln elects to serve as a water supplier. • An agreement to serve as a wholesale supplier would not require a reduction in decision making independence.	
Complexity		
If a contractual relationship is required, how complex would the agreement need to be?	• Terms of a wholesale supply agreement would generally be straight forward. • Lincoln would be under no obligation to enter into an agreement and could elect not to be a supplier.	



ALTERNATIVE F
MISSOURI RIVER WELLFIELD TO ASHLAND

SCORING SHEET – Governance Criteria

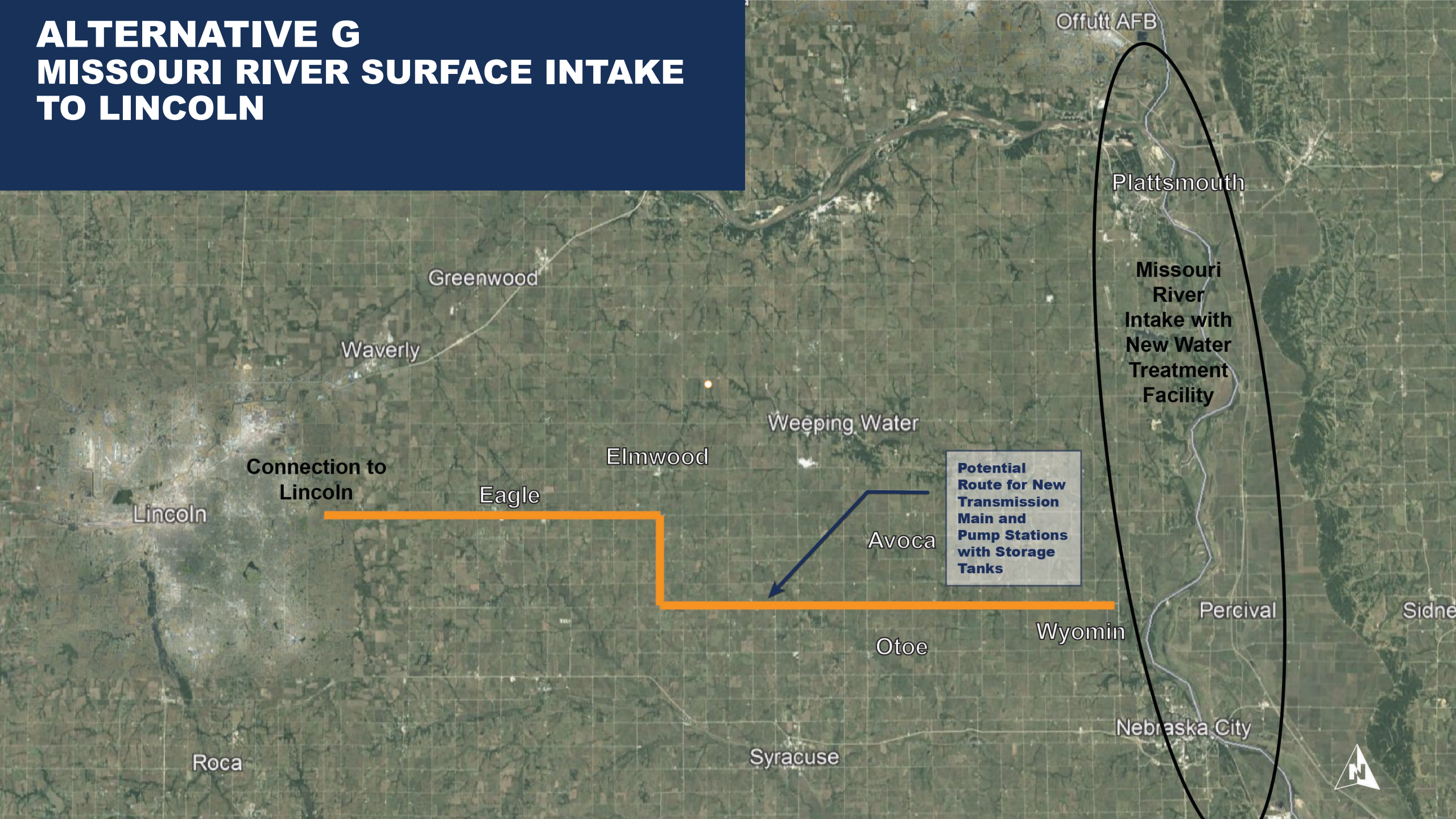
WATER 2.0
SECURING LINCOLN'S SECOND SOURCE

Alternative F - Missouri River Wellfield to Ashland

Score (1-5) _____

Regional Impacts	Overview and Facts	Notes
Does this alternative provide the opportunity to serve neighboring communities?	• Would provide opportunity to serve new development and growing communities in the I-80 corridor. • Communities that could be served include Ashland, Greenwood and Waverly. Combined population is approximately 8,200 people	
Autonomy		
Does this alternative require a contractual relationship that reduces Lincoln's decision making independence?	• A contractual relationship would be necessary only if Lincoln elects to serve as a water supplier. • An agreement to serve as a wholesale supplier would not require a reduction in decision making independence.	
Complexity		
If a contractual relationship is required, how complex would the agreement need to be?	• Terms of a wholesale supply agreement would generally be straight forward. • Lincoln would be under no obligation to enter into an agreement and could elect not to be a supplier.	

ALTERNATIVE G
MISSOURI RIVER SURFACE INTAKE TO LINCOLN



SCORING SHEET – Governance Criteria

WATER 2.0
SECURING LINCOLN'S SECOND SOURCE

Alternative G - Missouri River Surface Water Intake to Lincoln

Score (1-5) _____

Regional Impacts	Overview and Facts	Notes
Does this alternative provide the opportunity to serve neighboring communities?	• Allows for a larger geographic area to be potentially served. • Would provide opportunities to serve communities along finished water transmission main as well those between Ashland and Lincoln. • Communities that could be served include, but not limited to Otoe, Avoca, Syracuse, Unadilla, Elmwood and Eagle, Ashland, Greenwood and Waverly. Combined population is approximately 12,600 people.	
Autonomy		
Does this alternative require a contractual relationship that reduces Lincoln's decision making independence?	• A contractual relationship would be necessary only if Lincoln elects to serve as a water supplier. • An agreement to serve as a wholesale supplier would not require a reduction in decision making independence.	
Complexity		
If a contractual relationship is required, how complex would the agreement need to be?	• Terms of a wholesale supply agreement would generally be straight forward. • Lincoln would be under no obligation to enter into an agreement and could elect not to be a supplier.	

ALTERNATIVE H
MISSOURI RIVER WELLFIELD TO LINCOLN

SCORING SHEET – Governance Criteria

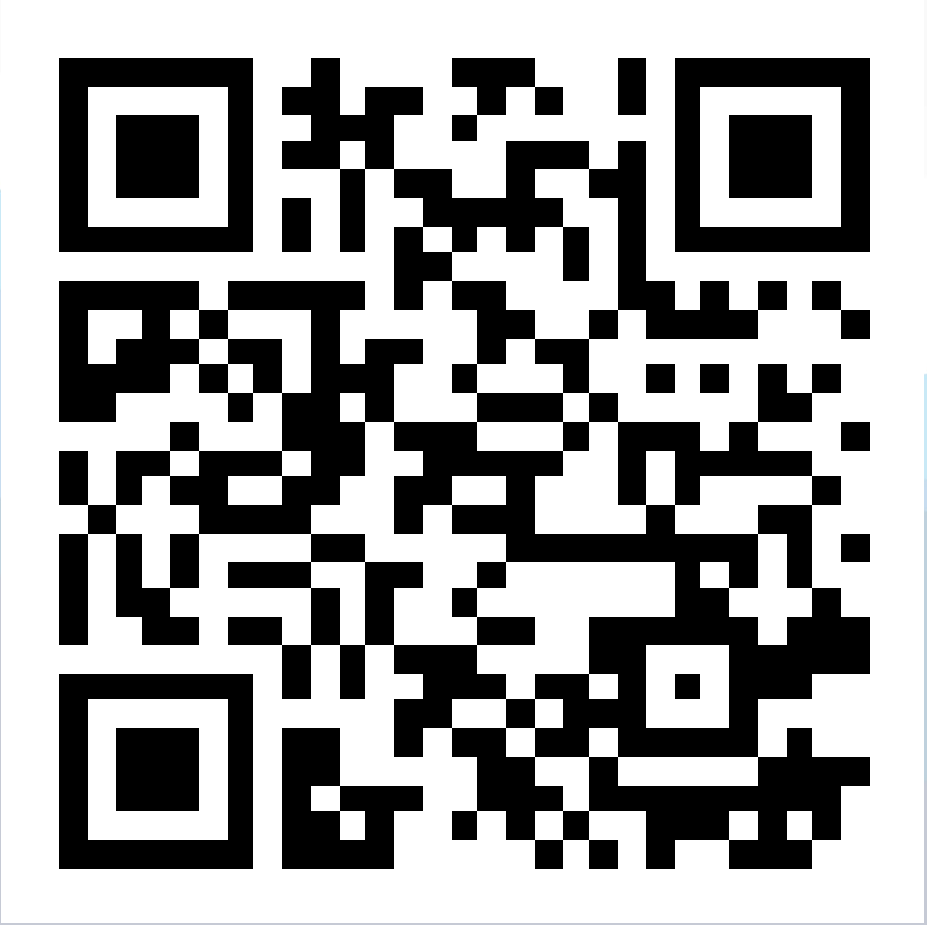
WATER 2.0
SECURING LINCOLN'S SECOND SOURCE

Alternative H - Missouri River Wellfield to Lincoln

Score (1-5) _____

Regional Impacts	Overview and Facts	Notes
Does this alternative provide the opportunity to serve neighboring communities?	• Allows for a larger geographic area to be potentially served. • Would provide opportunities to serve communities along finished water transmission main as well those between Ashland and Lincoln. • Communities that could be served include, but not limited to Otoe, Avoca, Syracuse, Unadilla, Elmwood and Eagle, Ashland, Greenwood and Waverly. Combined population is approximately 12,600 people.	
Autonomy		
Does this alternative require a contractual relationship that reduces Lincoln's decision making independence?	• A contractual relationship would be necessary only if Lincoln elects to serve as a water supplier. • An agreement to serve as a wholesale supplier would not require a reduction in decision making independence.	
Complexity		
If a contractual relationship is required, how complex would the agreement need to be?	• Terms of a wholesale supply agreement would generally be straight forward. • Lincoln would be under no obligation to enter into an agreement and could elect not to be a supplier.	

SCORING OF ALTERNATIVES:
GOVERNANCE CRITERIA



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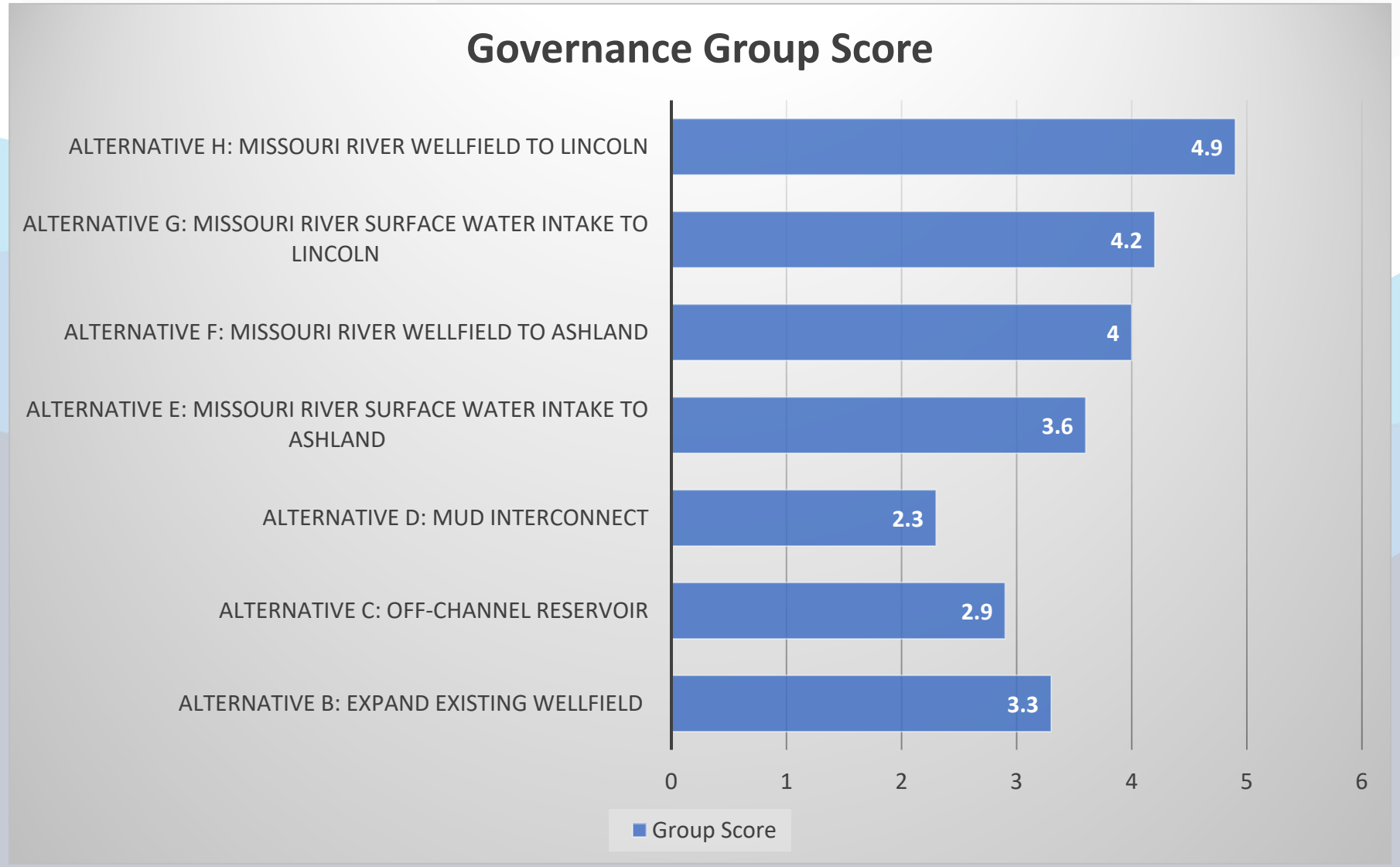
SCORING OF ALTERNATIVES: **GOVERNANCE**



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WATER 2.0 SECURING LINCOLN'S SECOND SOURCE

LIFE CYCLE COST CRITERIA

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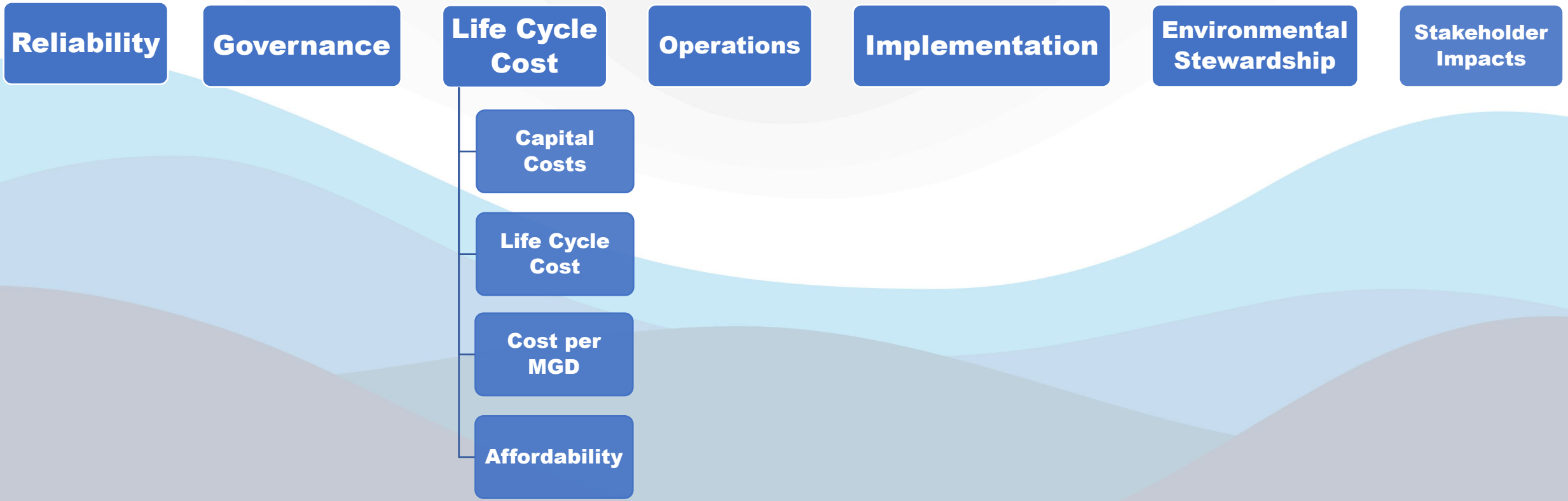
SECOND SOURCE

FINAL EVALUATION CRITERIA



*MGD – Million Gallons Per Day

SCORING OF ALTERNATIVES:
LIFE CYCLE COST

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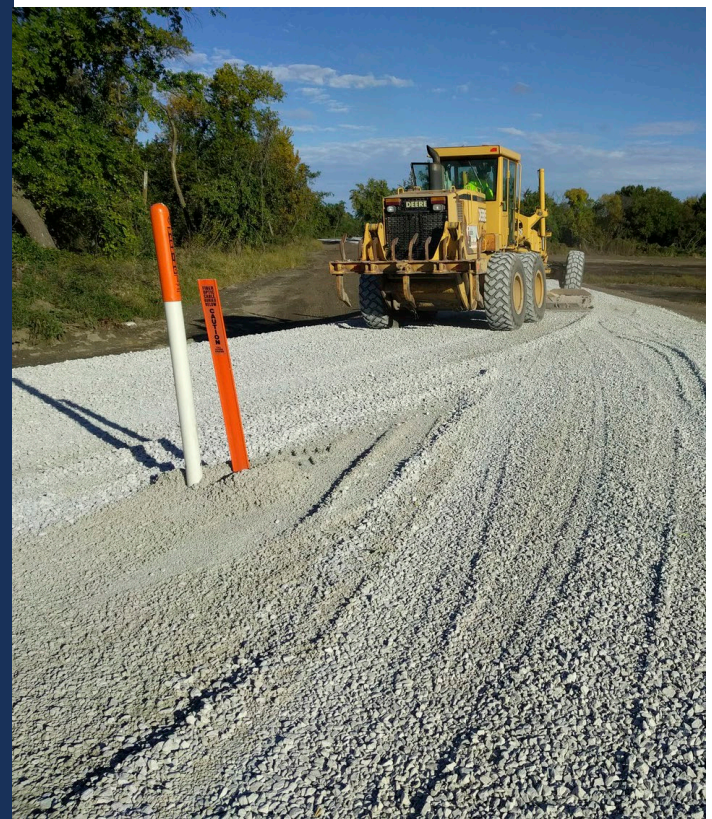
CAPITAL COST

- Opinion of Probable Construction Cost (OPCC)
- Input from Contractors, Vendors, and Material Suppliers
- Reflects current supply chain issues and recent bidding
- Estimate include Facilities, Pipelines, Property/Easements
  - General Requirements – 12%
  - Contingency – 25%
  - Engineering, Legal, Administration – 25%



LIFE CYCLE COST

Important to consider operating and maintenance (O&M) cost over time:

- Staffing
- Electricity
- Chemicals
- Purchase of Water
- Maintenance of Assets

Staffing

- Operators
- Maintenance
- Lab Technician
- Supervisors

CITY OF LINCOLN WATER RATE MODEL AND FINANCIAL METRICS

- The City's existing water rate model was utilized for the financial evaluation of each alternative
- Capital costs, debt service and operating costs were projected for the baseline and each scenario
  - It is assumed that project funding is through bonding and revenue increases.
- The City's existing financial metrics are met for each scenario:
  - Minimum of 180 days of unrestricted cash on hand
  - Minimum of 2.0x debt service coverage

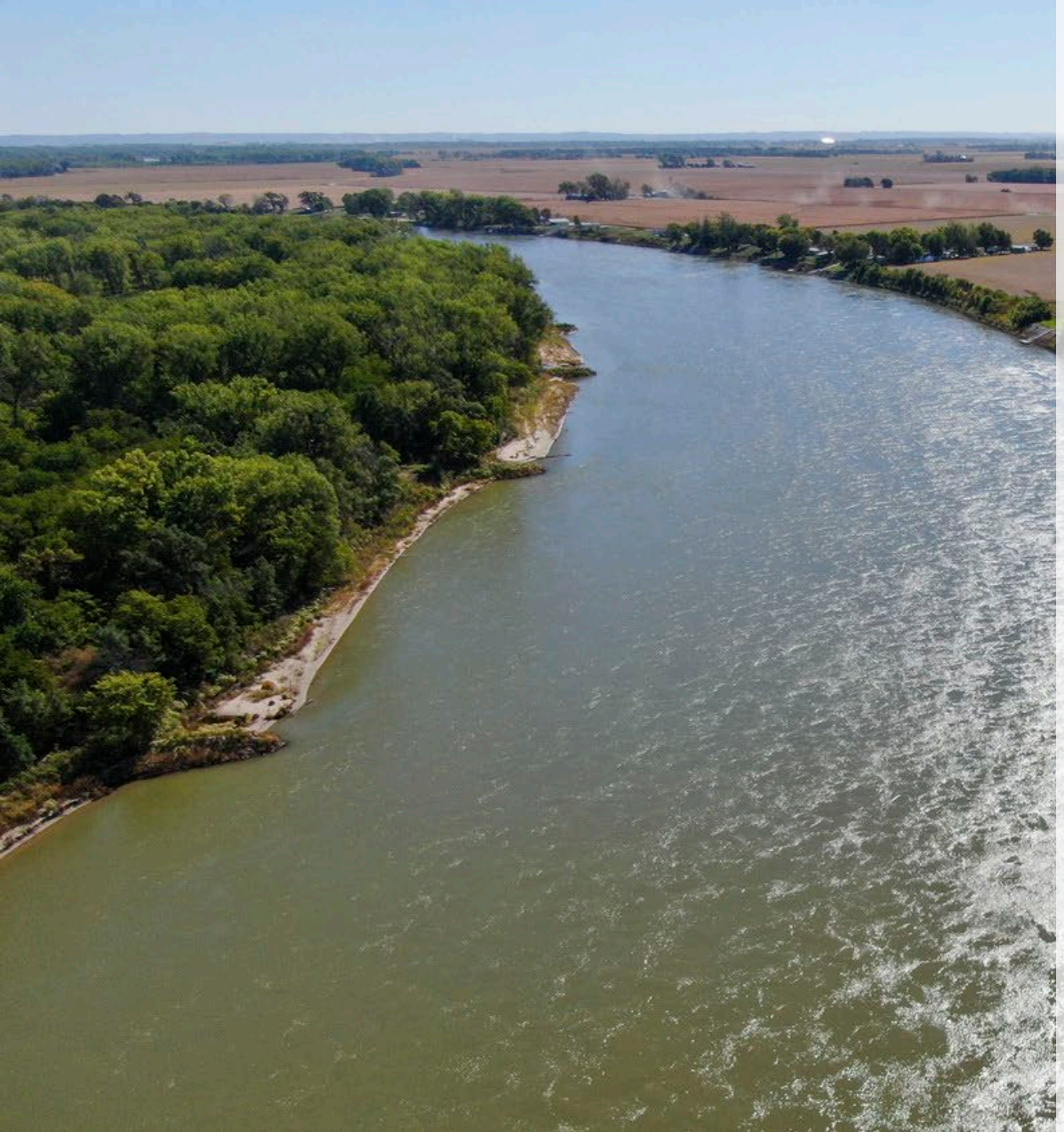
The City's existing model was built recognizing industry best practices and those guidelines are continued to be recognized for the financial evaluation of each alternative.

ALTERNATIVES BEYOND 2075 - OBSERVATIONS

- Basis of Observations
  - Analyses use professional judgment but are speculative
  - Demand projections are conservative which could alter timing
  - Regionalization may be more influential post 2075
  - Technology advancements and water conversation may provide opportunity for less water use
- Supply beyond Year 2075 should consider a combination of upsizing facilities (primarily pipelines) and planning for future expansion
- Example Cost Comparison of 30 MGD (2022 $)

ALTERNATIVES BEYOND 2075
ALTERNATIVE B/C – PLATTE RIVER ALTERNATIVES

- Limiting Factor – Reliability of the Platte River
- Alternatives which place additional reliance on the Platte River are not sustainable



ALTERNATIVES BEYOND 2075
ALTERNATIVE D – MUD INTERCONNECT

- Limiting Factor - Expansion beyond 2075 should be from the Missouri River to be sustainable
  - Most economical would be Missouri River to Platte South and expansion of the treatment and transmission system to Ashland
- Increasing pipe size could have mutual benefit for MUD
- Pipeline corridors can be reserved for future expansion, since corridors are more obtrusive in urban developments
- 30 MGD Expansion Cost = $470M (2022 $)

ALTERNATIVES BEYOND 2075
ALTERNATIVES E/F – MISSOURI RIVER TO ASHLAND

- Limiting Factor - Ultimate capacity at Ashland is 210 MGD
  - Current facilities would be built out by Year 2095
  - After Year 2095 requires new WTP and conveyance to Lincoln
- Upsize pipeline from Missouri River to Ashland (48”→60”) at a cost of ~$75M (2022 $)
- Pipeline corrosion are rural and easier to expand
- 30 MGD Expansion Cost = $225M (2022 $)

ALTERNATIVES BEYOND 2075
ALTERNATIVES G/H – MISSOURI RIVER TO LINCOLN

- Most robust relative to long term supply needs
- Pipeline corridors are rural and easier to expand
- 30 MGD Expansion Cost = $350M (2022 $)

ALTERNATIVES BEYOND 2075 COMPARISON

Alternative	Long Term Supply Capability	Future Pipeline Expansion	Delivery point into LWS Distribution System
B – Expand Wellfield	Negative	Negative	Neutral
C – Off Channel Reservoir	Negative	Negative	Neutral
D – MUD Interconnection	Negative	Negative	Neutral
E/F – MO River to Ashland	Neutral	Positive	Neutral
G/H – MO River to Lincoln	Positive	Positive	Positive

ALTERNATIVE B
EXPAND EXISTING WELLFIELD

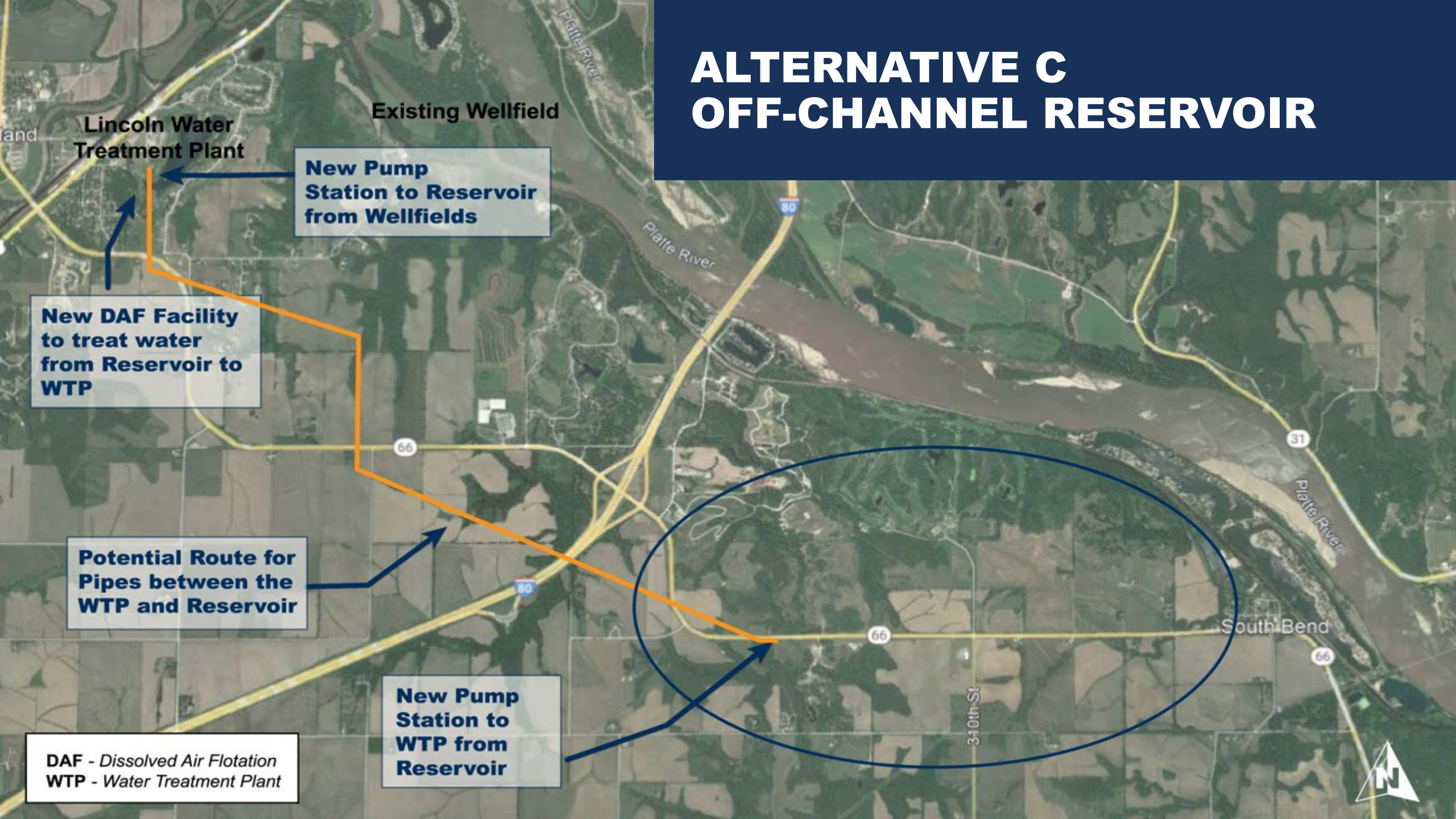
ALTERNATIVE B
EXPAND EXISTING WELLFIELD

Capital Costs	Overview and Facts
What is the capital cost for this alternative?	• $510M
Life Cycle Cost	
What is the capital cost plus the operation and maintenance (O&M) cost for this alternative?	• $710M
Is this alternative capable of being expanded beyond 2075?	• Negative
Capital Cost per MGD	
What is the Capital Cost per Million Gallons per Day (MGD)?	• $12.7M per MGD
Affordability	
Will this alternative be considered affordable under the EPA median household (MHI) guideline (2.5%)?	• Pass

Notes:

1. The capital costs were reduced for components of the alternative that were already included in the City's Capital Improvement Plan (CIP).
2. M means million.
3. The Cost per Million Gallons per Day is based on the 40 MGD for all alternatives.

ALTERNATIVE C
OFF-CHANNEL RESERVOIR



ALTERNATIVE C
OFF-CHANNEL RESERVOIR

Capital Costs	Overview and Facts
What is the capital cost for this alternative?	• $920M
Life Cycle Cost	
What is the capital cost plus the operation and maintenance (O&M) cost for this alternative?	• $1,140M
Is this alternative capable of being expanded beyond 2075?	• Negative
Capital Cost per MGD	
What is the Capital Cost per Million Gallons per Day (MGD)?	• $23.0M per MGD
Affordability	
Will this alternative be considered affordable under the EPA median household (MHI) guideline (2.5%)?	• Pass

Notes:

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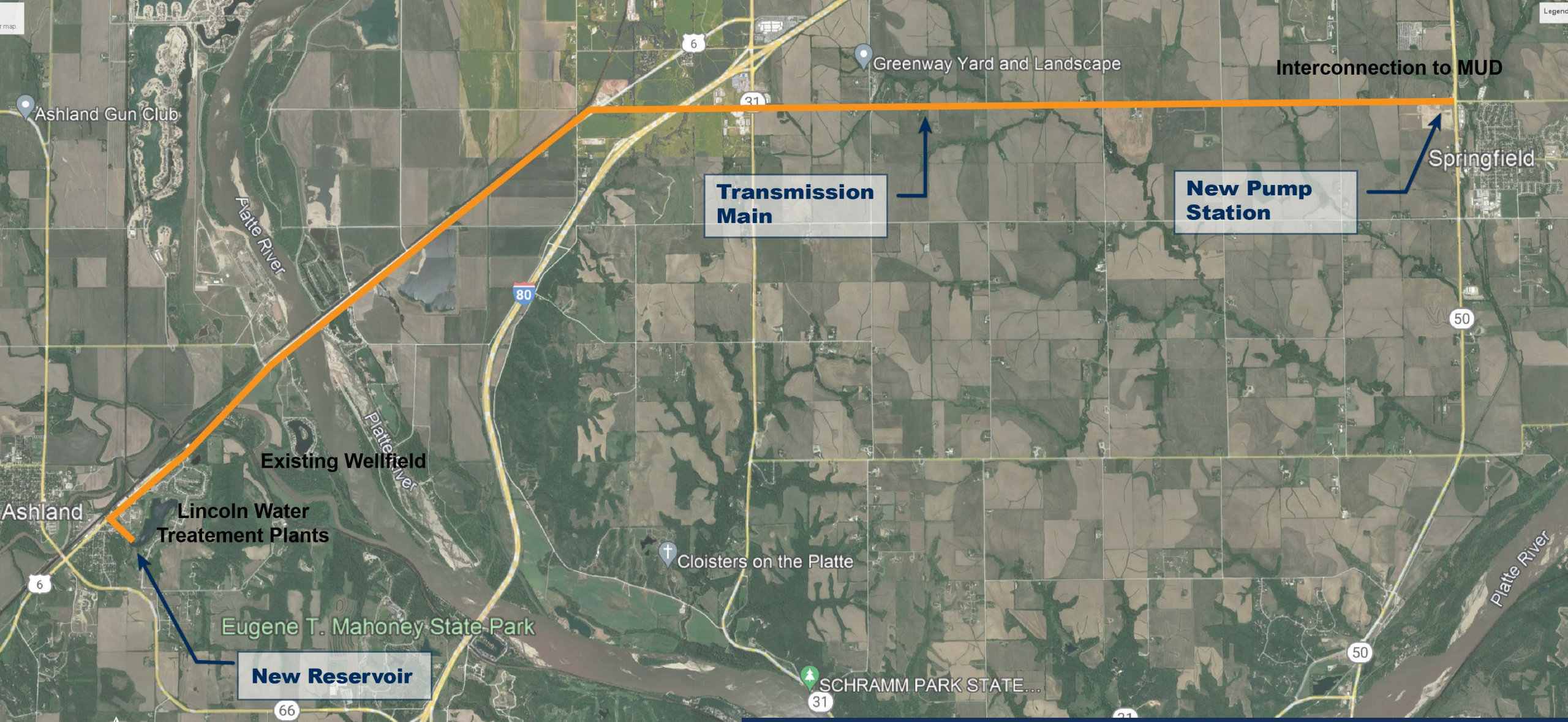
2. M means million.
3. The Cost per Million Gallons per Day is based on the 40 MGD for all alternatives.



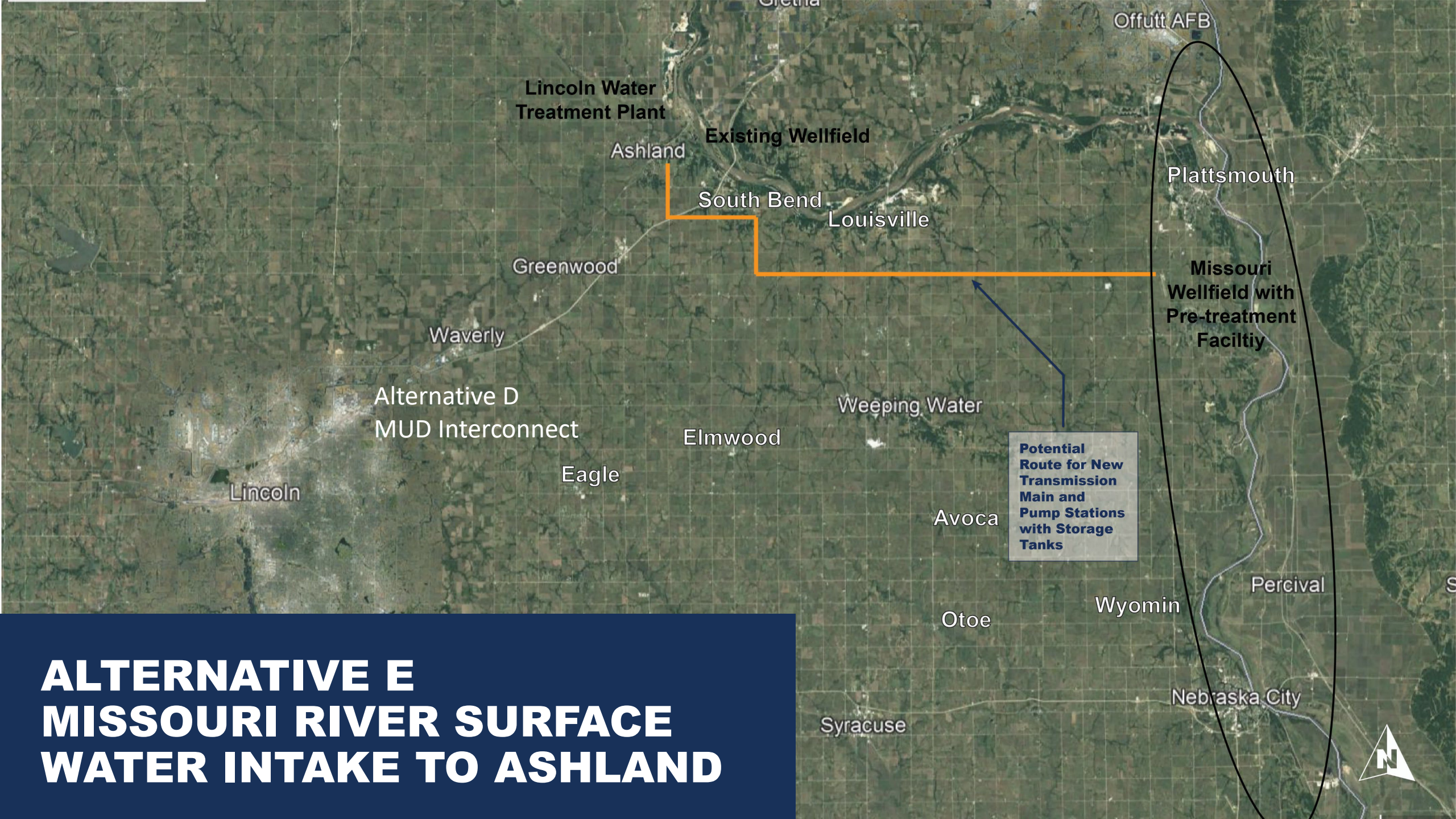
ALTERNATIVE D
MUD INTERCONNECT

ALTERNATIVE D
MUD INTERCONNECT

Capital Costs	Overview and Facts
What is the capital cost for this alternative?	• $830M
Life Cycle Cost	
What is the capital cost plus the operation and maintenance (O&M) cost for this alternative?	• $1,390M
Is this alternative capable of being expanded beyond 2075?	• Neutral
Capital Cost per MGD	
What is the Capital Cost per Million Gallons per Day (MGD)?	• $20.7M per MGD
Affordability	
Will this alternative be considered affordable under the EPA median household (MHI) guideline (2.5%)?	• Pass

Notes:

1. The capital costs were reduced for components of the alternative that were already included in the City's Capital Improvement Plan (CIP).
2. M means million.
3. The Cost per Million Gallons per Day is based on the 40 MGD for all alternatives.



ALTERNATIVE E
MISSOURI RIVER SURFACE WATER INTAKE TO ASHLAND

ALTERNATIVE E
MISSOURI RIVER SURFACE WATER INTAKE TO ASHLAND

Capital Costs	Overview and Facts
What is the capital cost for this alternative?	• $870M
Life Cycle Cost	
What is the capital cost plus the operation and maintenance (O&M) cost for this alternative?	• $1,150M
Is this alternative capable of being expanded beyond 2075?	• Positive
Capital Cost per MGD	
What is the Capital Cost per Million Gallons per Day (MGD)?	• $21.7M per MGD
Affordability	
Will this alternative be considered affordable under the EPA median household (MHI) guideline (2.5%)?	• Pass

Notes:

1. The capital costs were reduced for components of the alternative that were already included in the City's Capital Improvement Plan (CIP).
2. M means million.
3. The Cost per Million Gallons per Day is based on the 40 MGD for all alternatives.

ALTERNATIVE F
MISSOURI RIVER WELLFIELD TO ASHLAND

ALTERNATIVE F
MISSOURI RIVER WELLFIELD TO ASHLAND

Capital Costs	Overview and Facts
What is the capital cost for this alternative?	• $830M
Life Cycle Cost	
What is the capital cost plus the operation and maintenance (O&M) cost for this alternative?	• $1,100M
Is this alternative capable of being expanded beyond 2075?	• Positive
Capital Cost per MGD	
What is the Capital Cost per Million Gallons per Day (MGD)?	• $20.8 per MGD
Affordability	
Will this alternative be considered affordable under the EPA median household (MHI) guideline (2.5%)?	• Pass

Notes:

1. The capital costs were reduced for components of the alternative that were already included in the City's Capital Improvement Plan (CIP).
2. M means million.
3. The Cost per Million Gallons per Day is based on the 40 MGD for all alternatives.

ALTERNATIVE G
MISSOURI RIVER SURFACE INTAKE TO LINCOLN

ALTERNATIVE G
MISSOURI RIVER SURFACE INTAKE TO LINCOLN

Capital Costs	Overview and Facts
What is the capital cost for this alternative?	• $1,050M
Life Cycle Cost	
What is the capital cost plus the operation and maintenance (O&M) cost for this alternative?	• $1,420M
Is this alternative capable of being expanded beyond 2075?	• Positive
Capital Cost per MGD	
What is the Capital Cost per Million Gallons per Day (MGD)?	• $26.2M per MGD
Affordability	
Will this alternative be considered affordable under the EPA median household (MHI) guideline (2.5%)?	• Pass

Notes:

1. The capital costs were reduced for components of the alternative that were already included in the City's Capital Improvement Plan (CIP).
2. M means million.
3. The Cost per Million Gallons per Day is based on the 40 MGD for all alternatives.

ALTERNATIVE H
MISSOURI RIVER
WELLFIELD TO LINCOLN

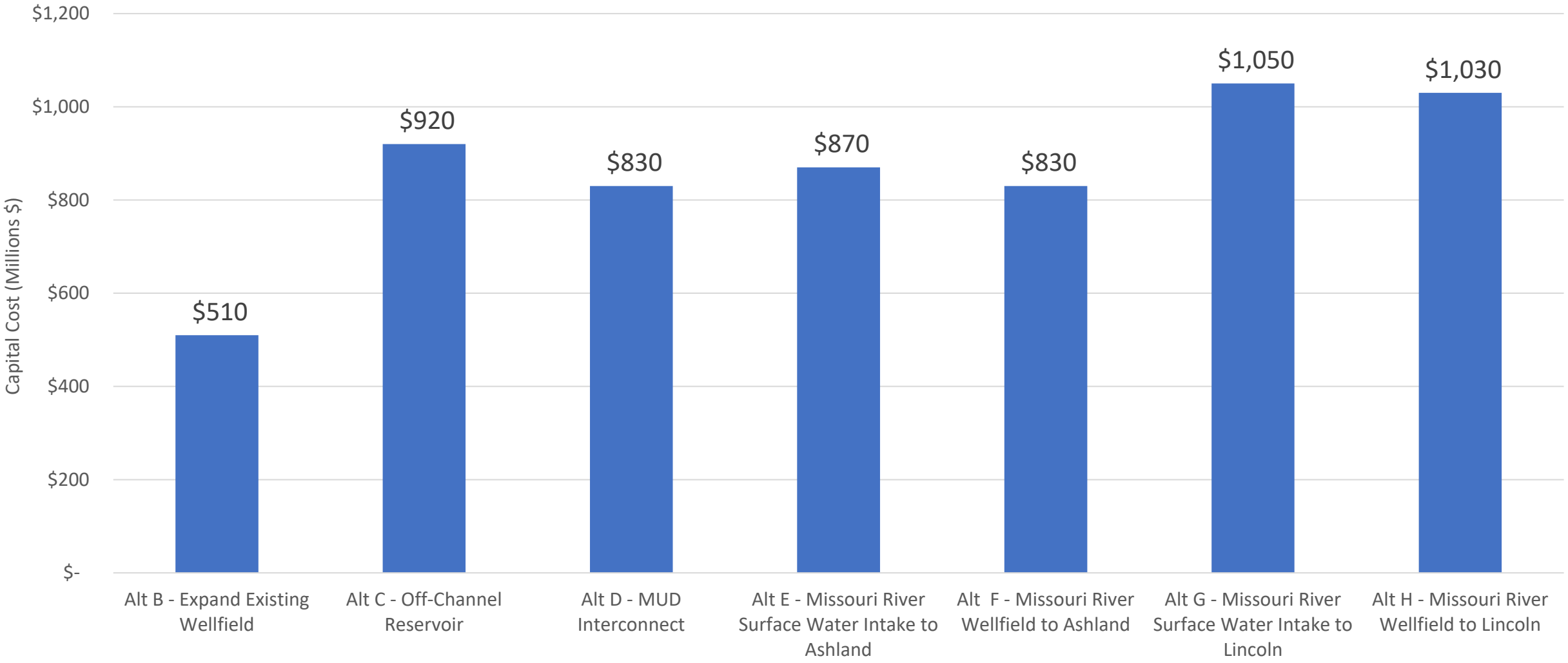
ALTERNATIVE H
MISSOURI RIVER WELLFIELD TO LINCOLN

Capital Costs	Overview and Facts
What is the capital cost for this alternative?	• $1,030M
Life Cycle Cost	
What is the capital cost plus the operation and maintenance (O&M) cost for this alternative?	• $1,390M
Is this alternative capable of being expanded beyond 2075?	• Positive
Capital Cost per MGD	
What is the Capital Cost per Million Gallons per Day (MGD)?	• $25.7M per MGD
Affordability	
Will this alternative be considered affordable under the EPA median household (MHI) guideline (2.5%)?	• Pass

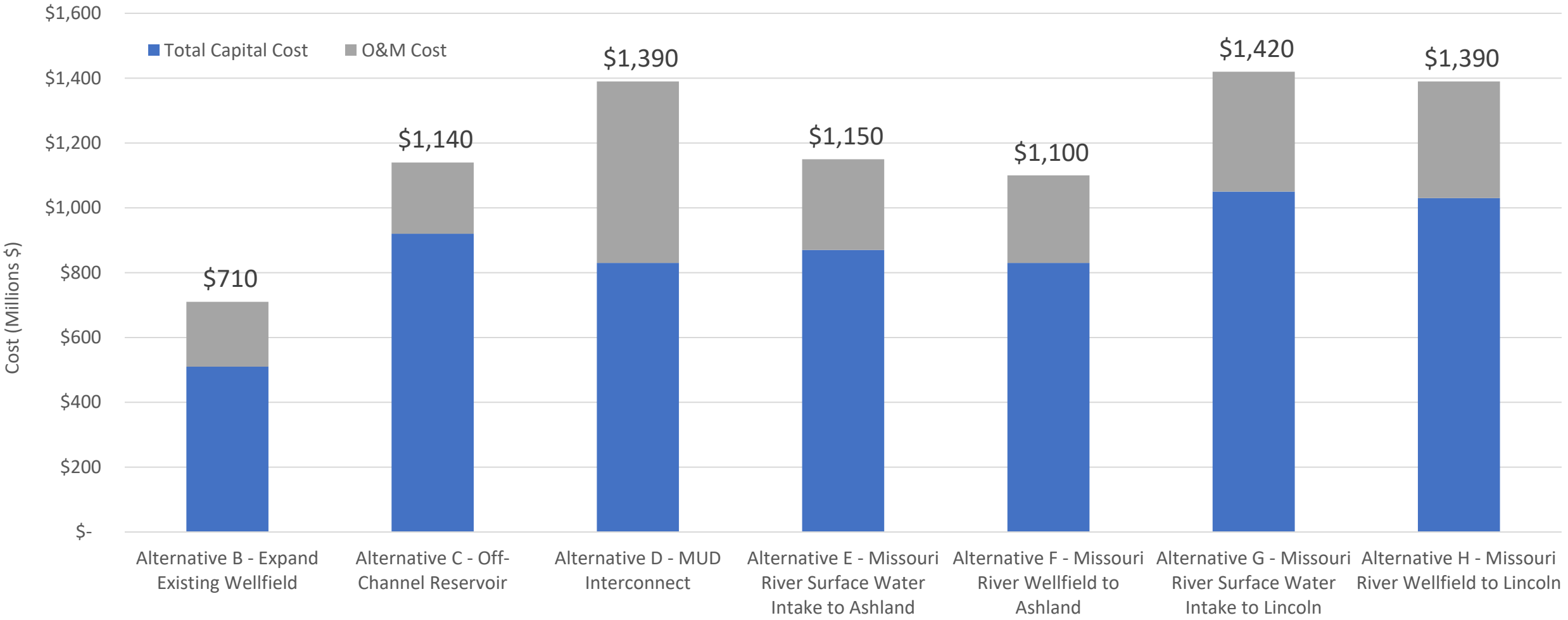
Notes:

1. The capital costs were reduced for components of the alternative that were already included in the City's Capital Improvement Plan (CIP).
2. M means million.
3. The Cost per Million Gallons per Day is based on the 40 MGD for all alternatives.

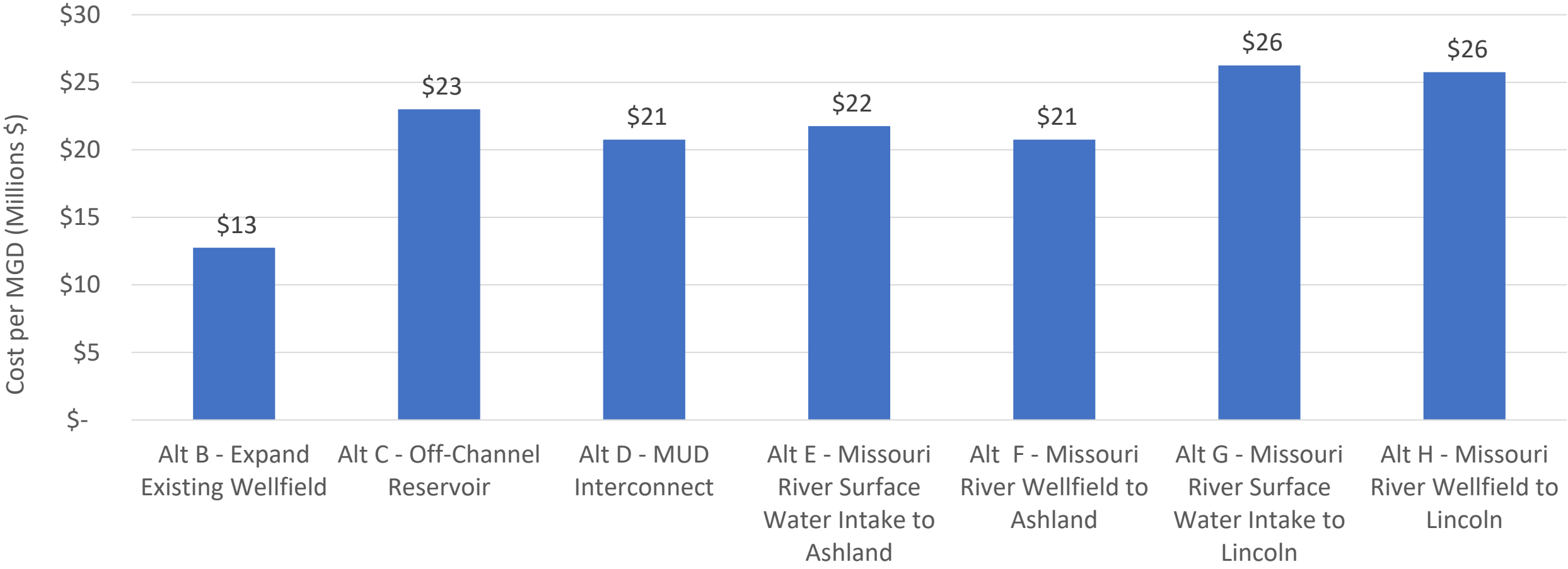
TOTAL CAPITAL COST (2022 $)



TOTAL CAPITAL COST + OPERATION & MAINTENANCE (O&M) COST (2022 $)



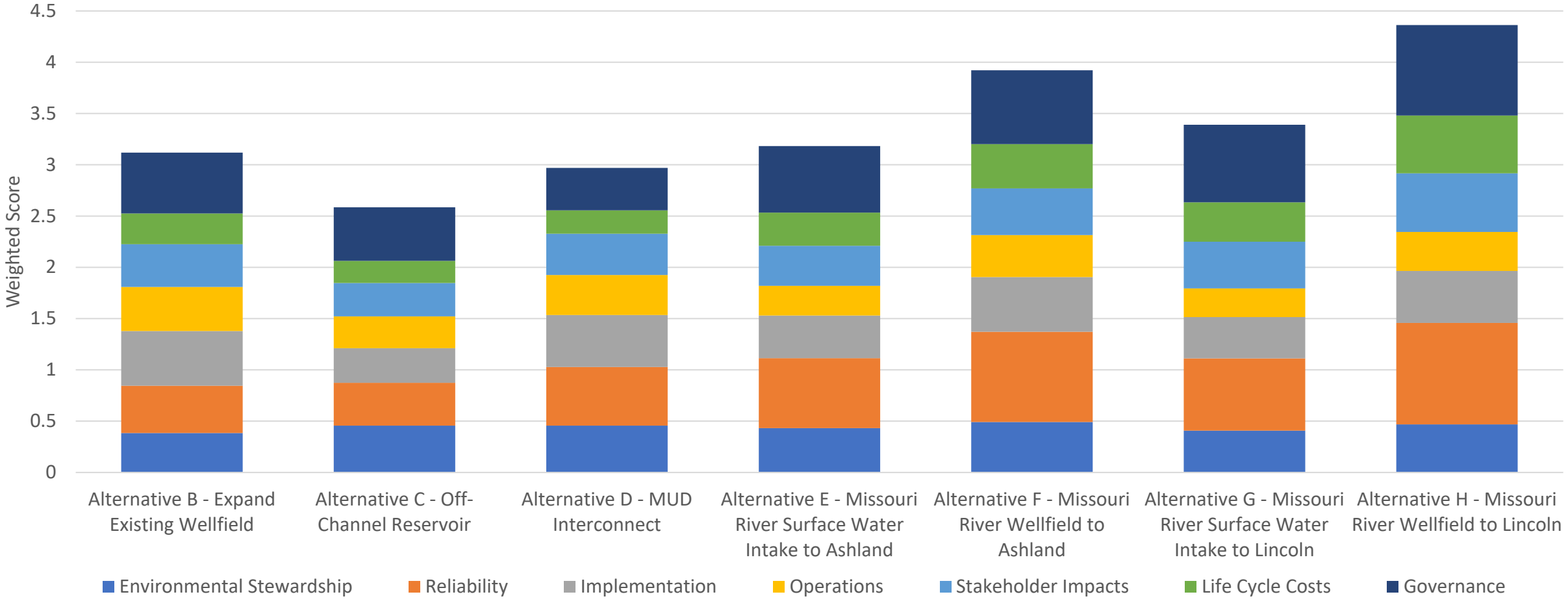
CAPITAL COST PER MGD (2022 $)



Notes:

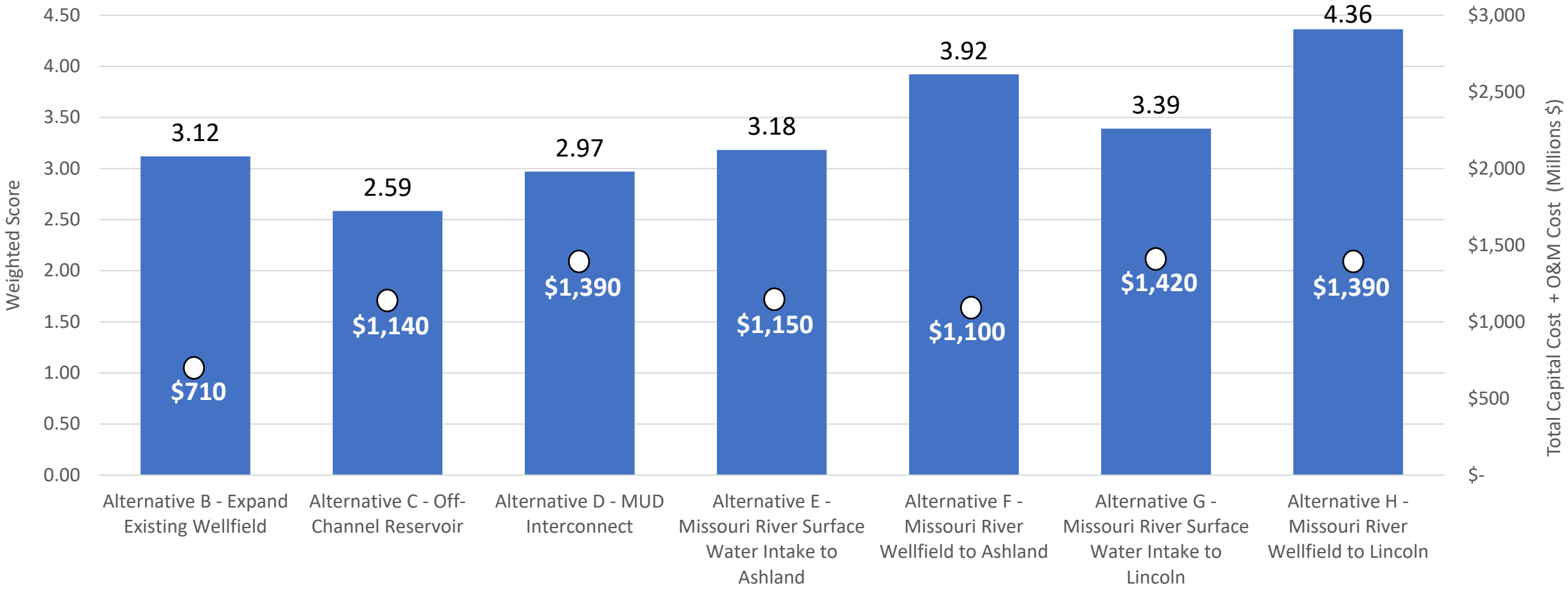
1. The Cost per Million Gallons per Day is based on the 40 MGD for all alternatives.

WEIGHTED SCORING TO DATE



VALUE

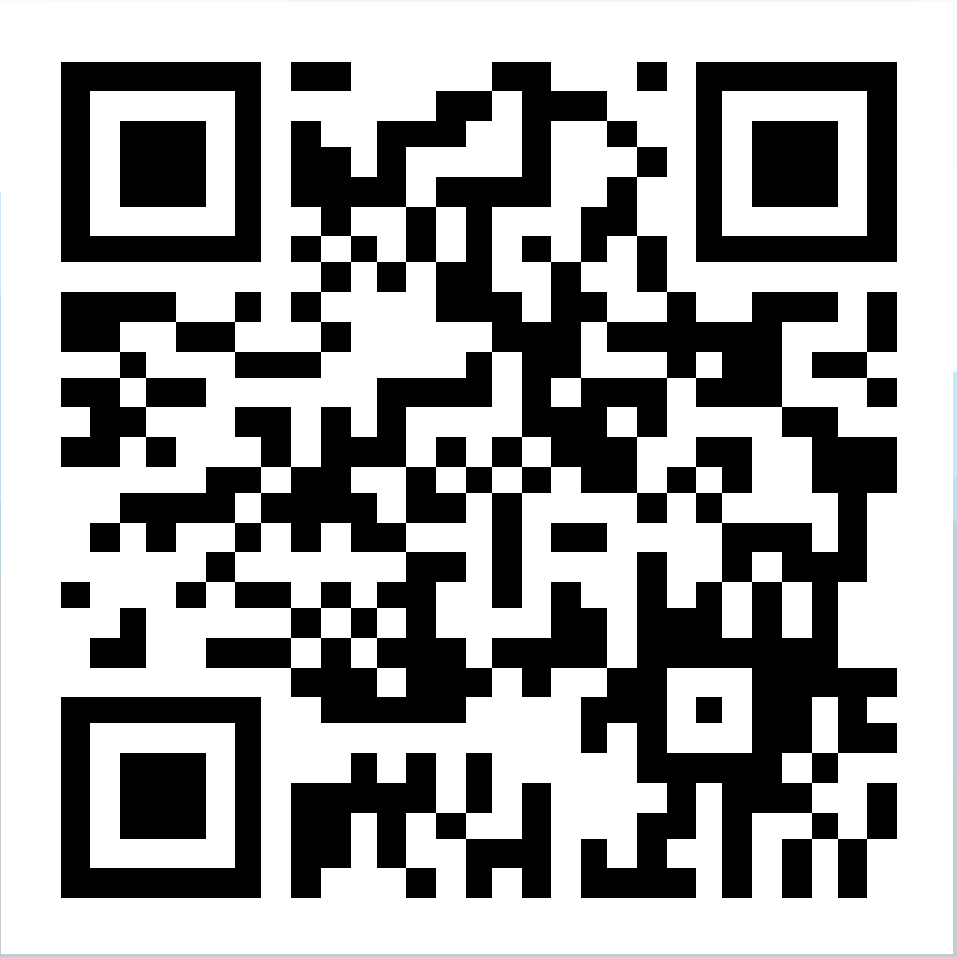
WEIGHTED TOTAL SCORES TO DATE AND COSTS



AFFORDABILITY OF SECOND SOURCE

- Affordability based on comparison to EPA Median Household Income (MHI) of 2.5%.
- All of the Alternatives evaluated “Pass”.
- Anticipate this will improve with additional funding sources and financing mechanisms.

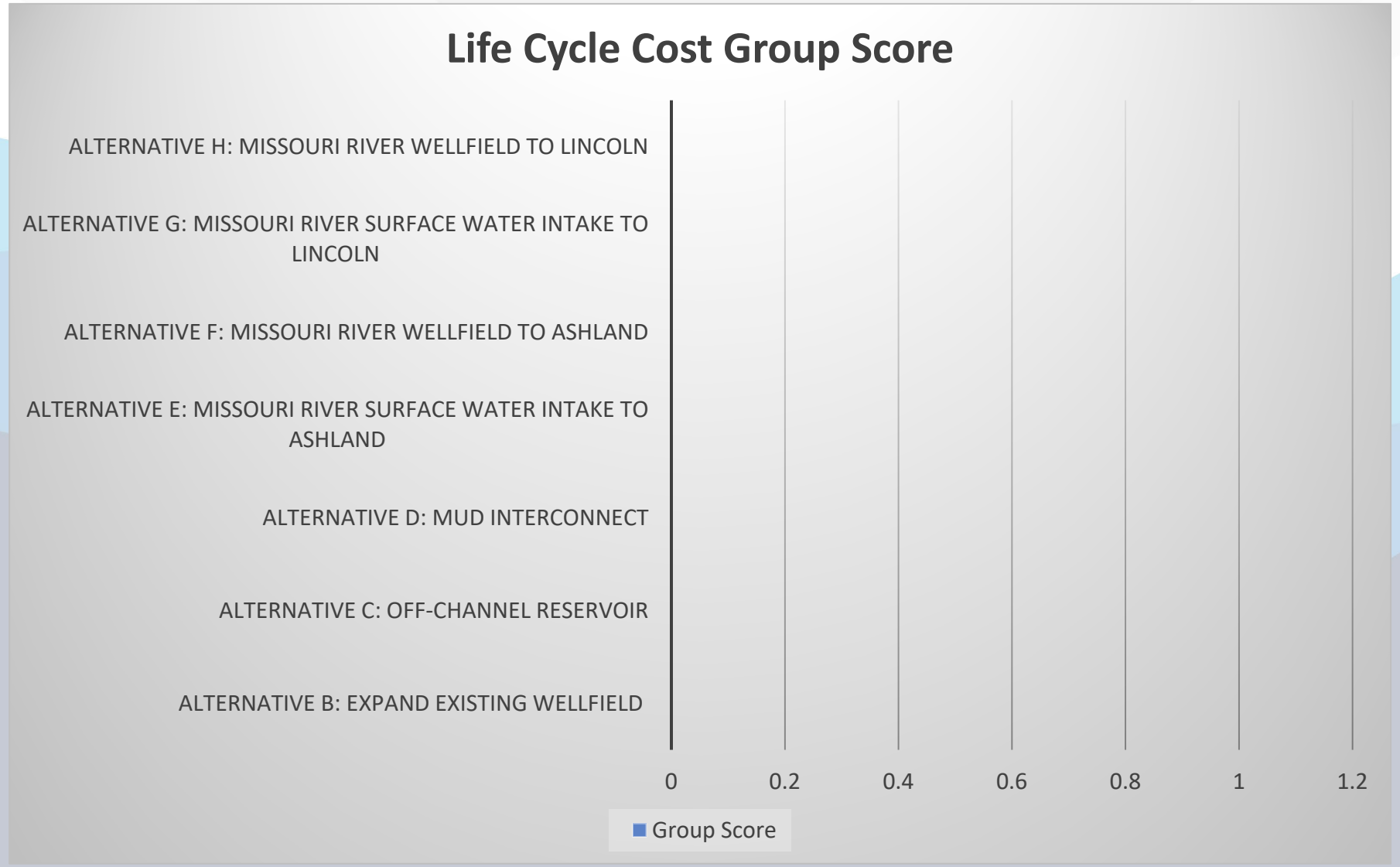
SCORING OF ALTERNATIVES:
LIFE CYCLE COST



LTU
CITY OF LINCOLN TRANSPORTATION AND UTILITIES

WATER 2.0
SECURING LINCOLN'S SECOND SOURCE

SCORING OF ALTERNATIVES:
LIFE CYCLE COST



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WATER 2.0 SECURING LINCOLN'S SECOND SOURCE

MUD INTERCONNECT OPTIONS

- MUD Developed Capital Costs for 10 MGD, 25 MGD, and 40 MGD Alternatives
  - Cost of Infrastructure within MUD's System
  - MUD Impact Fees
- Cost of Infrastructure to Connect the Two Systems were Added
- Resulting Capital Costs
  - 10 MGD – $280,000,000
  - 25 MGD – $498,000,000
- Time to Implement 8 to 11 Years
- Additional Capital Costs to Expand to 40 MGD Are Not Included

COMBINATION OF ALTERNATIVES

- Discussion of combinations at January meeting?

CLOSING THOUGHTS