

City of Enid Alternate Water Supply



Public Meetings
April 11 and 13, 2017





Purpose of Tonight's Meeting

- Introduce the Project
 - Five Major Infrastructure Components
- Give an Overview of the Program Development Process
 - Study
 - Design
 - Environmental Assessment
- Discuss the Next Steps
- Obtain Input from the Public

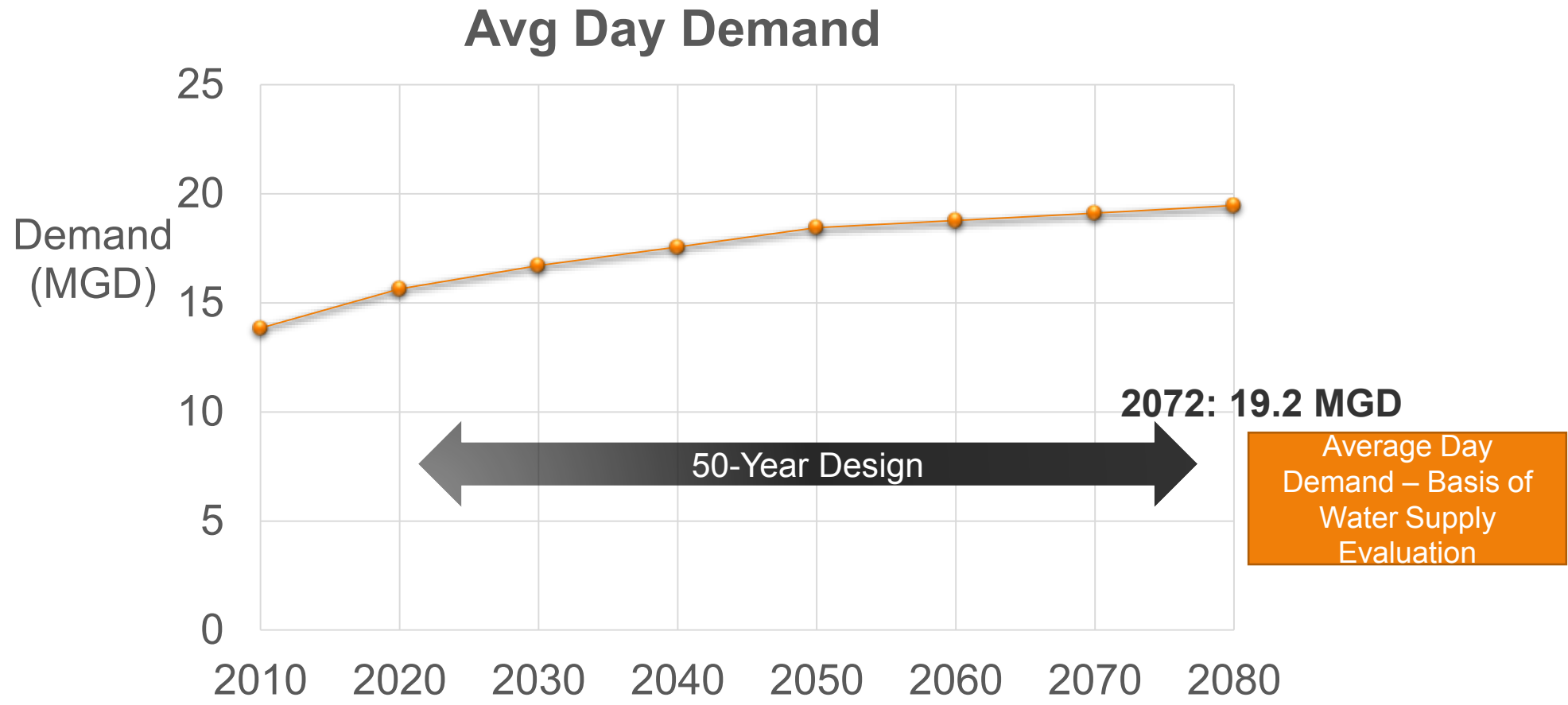


What is the Purpose of the Project?

- To Provide an Alternate Source of Drinking Water to Supplement the City's Current Supply
- To Reduce the Demand on the Groundwater Well Fields
- Diversification of the Water Supply Increases the Reliability of that Supply



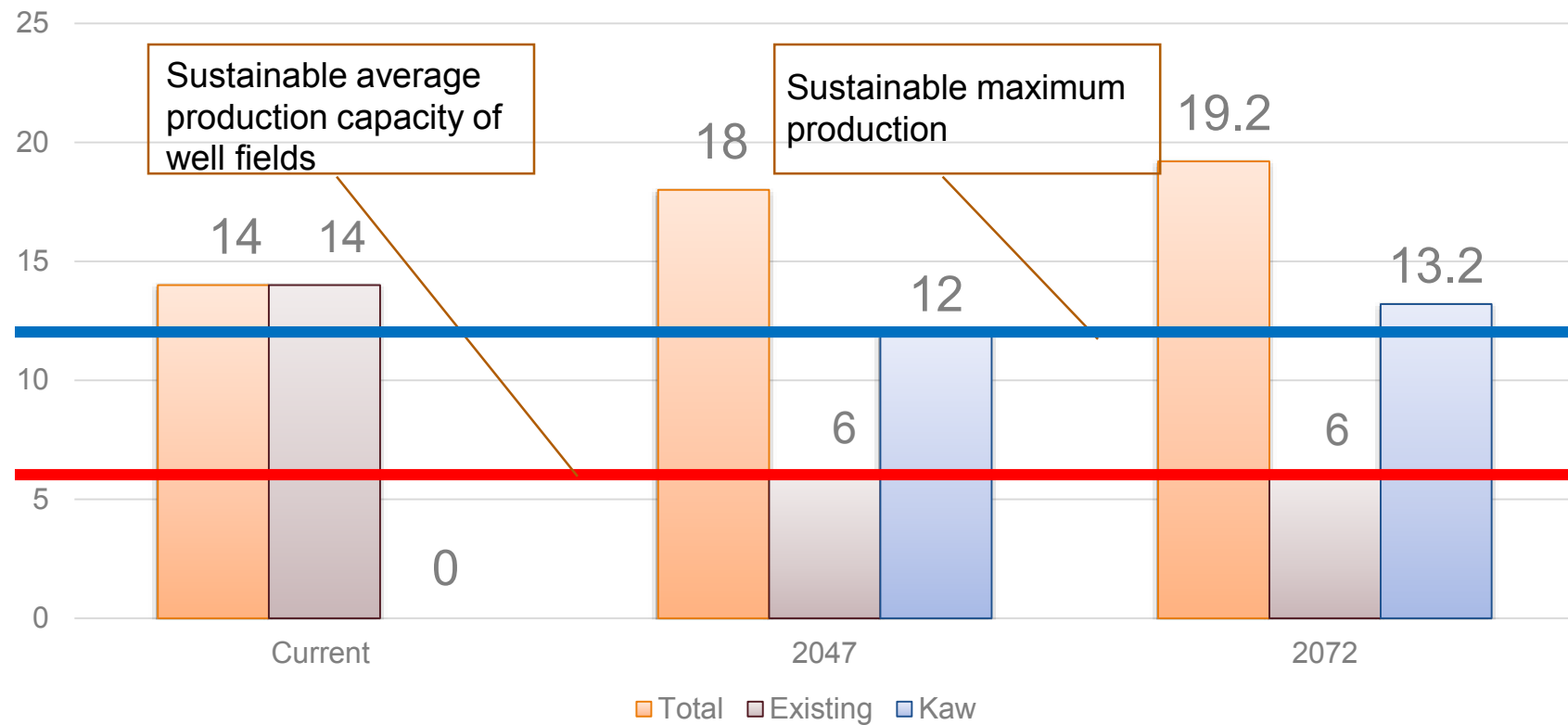
Water Demand Projections



50-year Water Transition Plan



AVERAGE Day Demand by Source
MGD

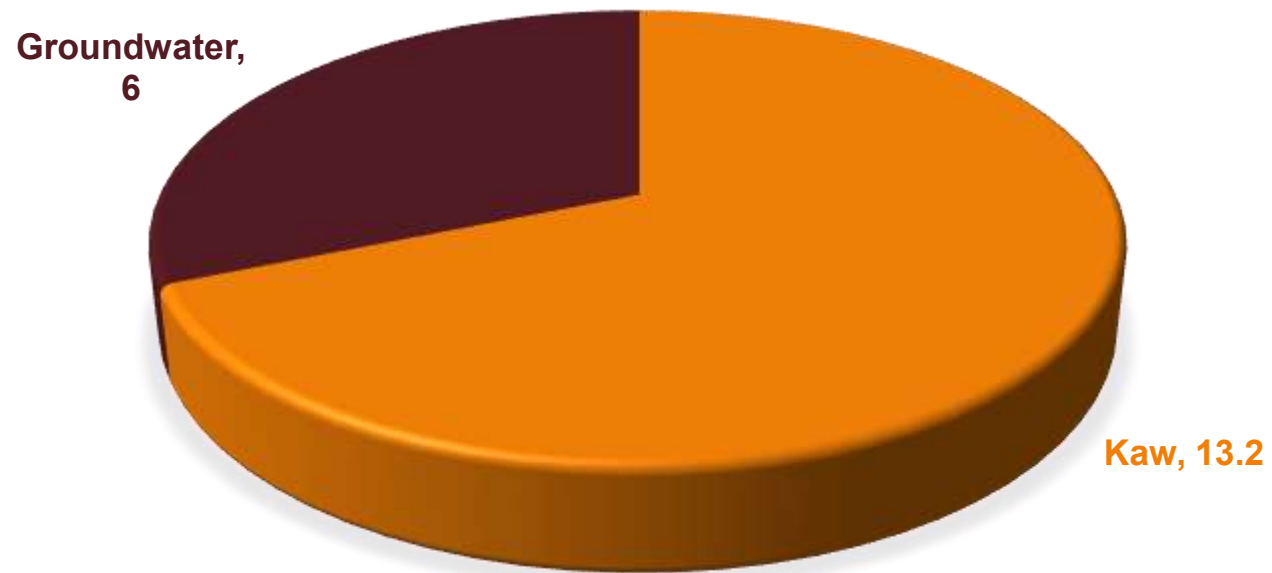


NOTE: Sustainable production based on Enid Water Master Plan. Official aquifer study and EPS falls under the authority of OWRB.

2072 Average Day Water Demand

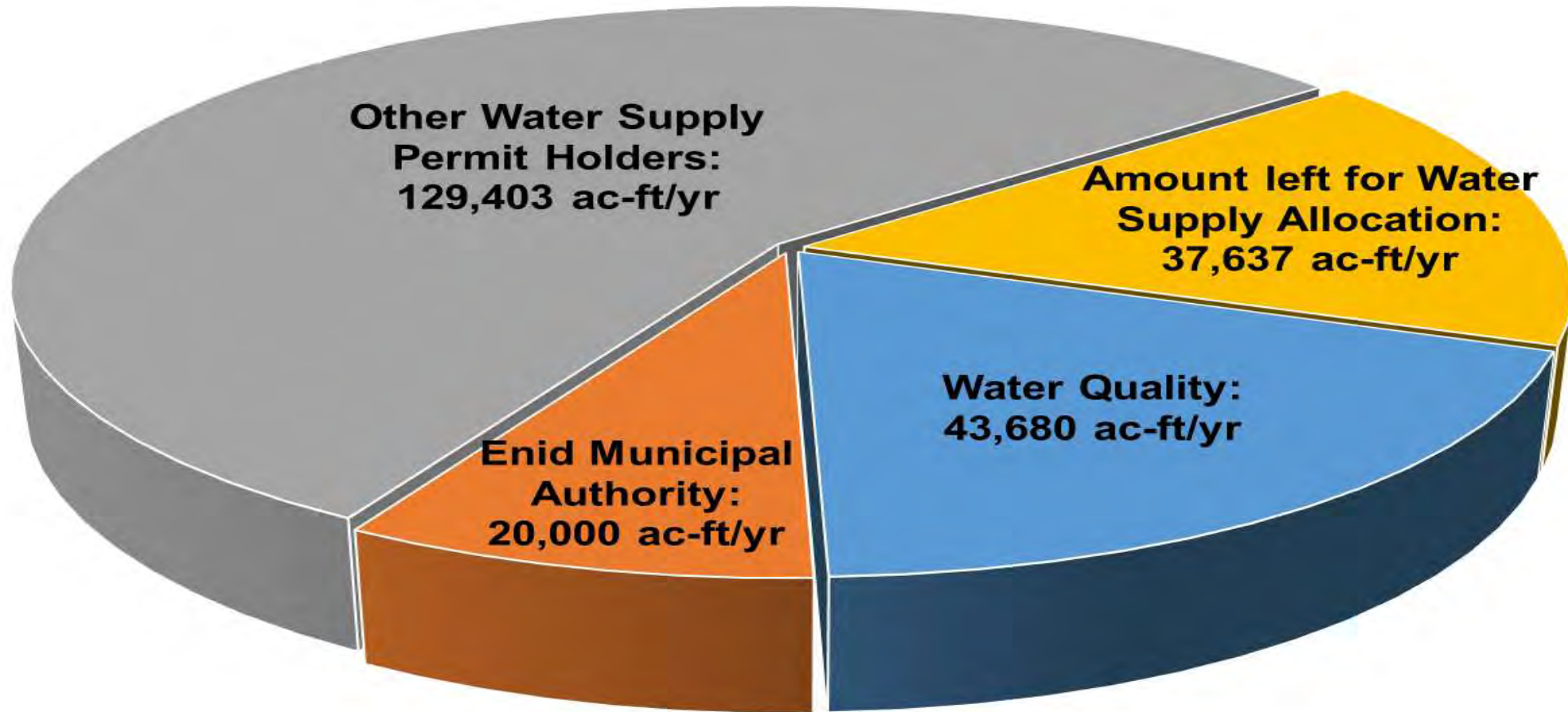


MILLION GALLONS PER DAY

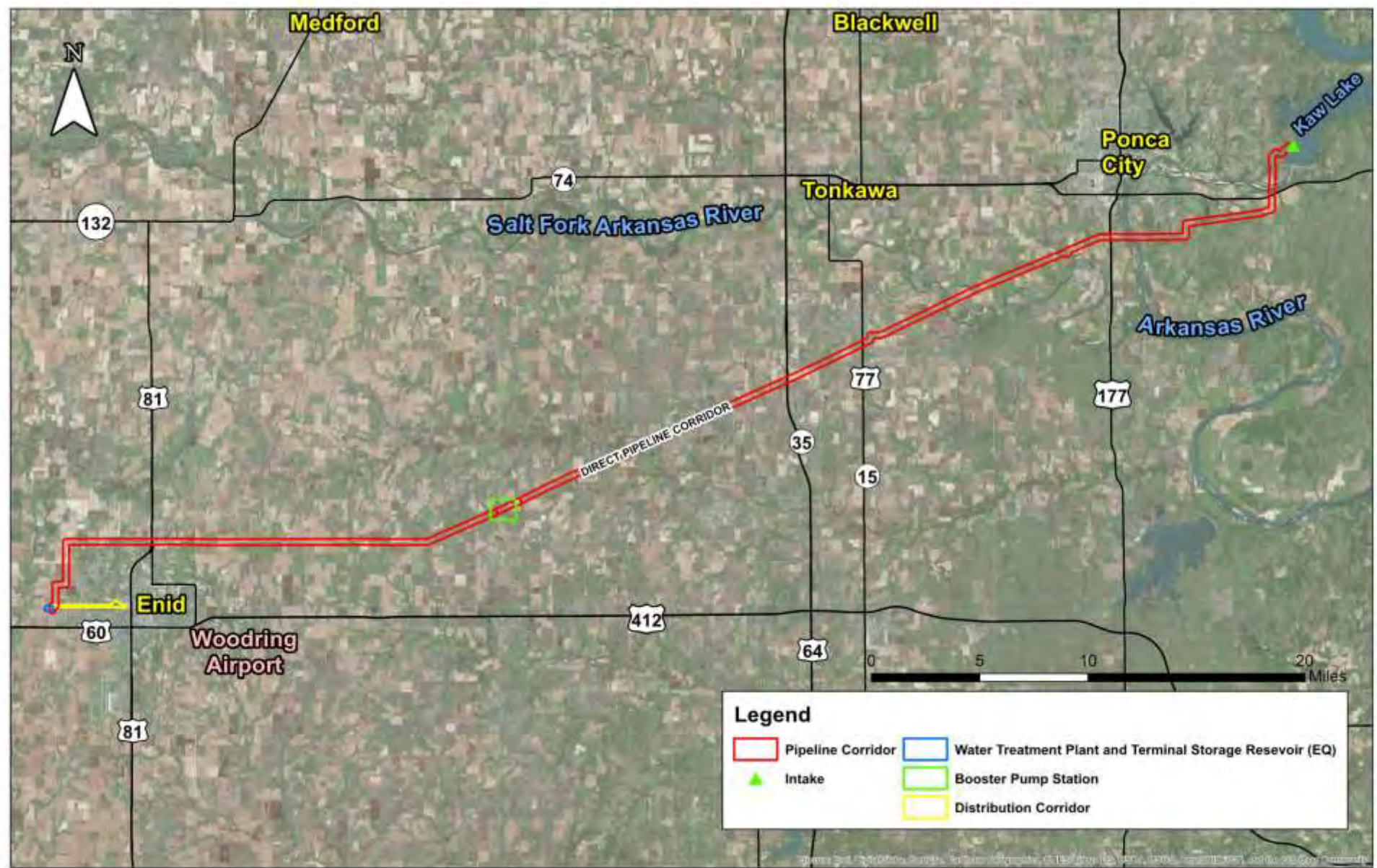




Enid's water rights are anticipated to have minor impacts on lake levels during normal periods



Project Overview





Program Process



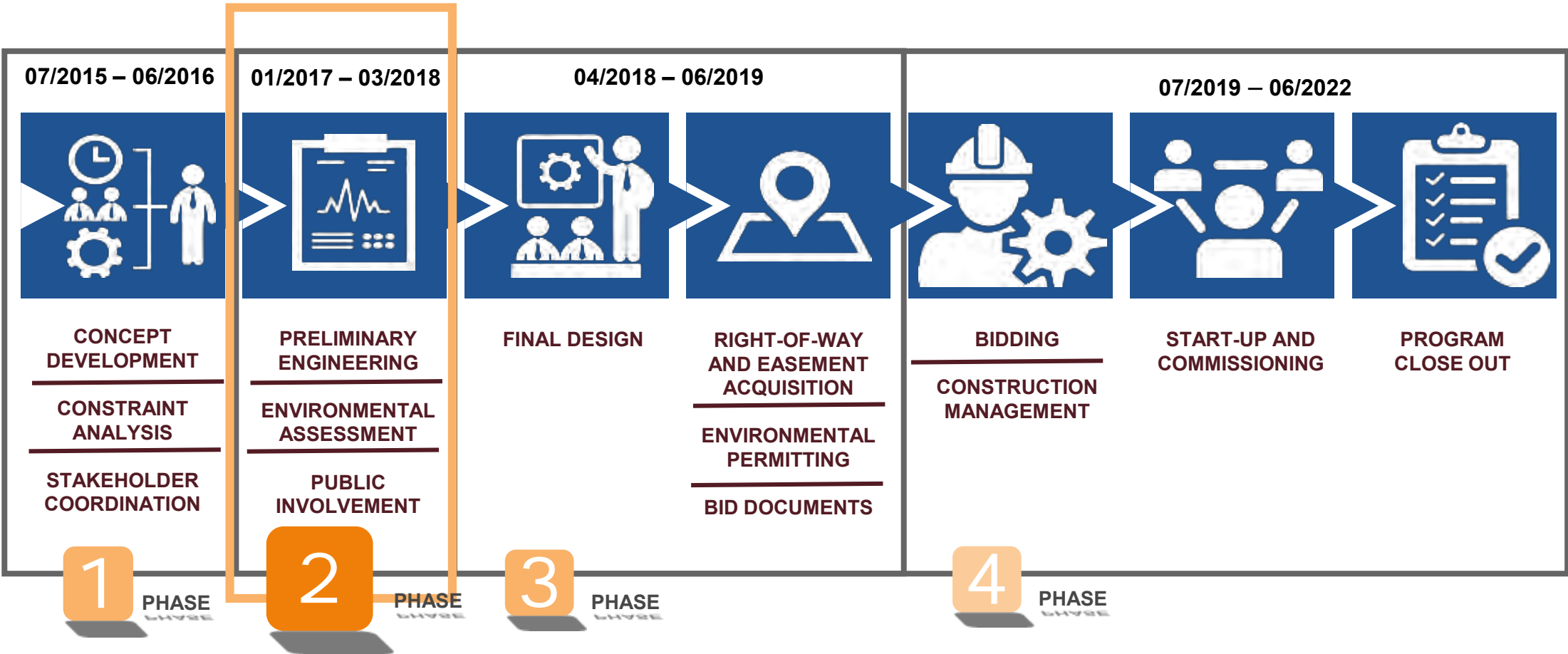
- Phase 1 – Concept Development - COMPLETE
 - Looked at Alternatives for all Components
 - Constraint analysis (Reconnaissance Level)
 - Agency and Partner Coordination
 - Identified Preferred Alternative
- Phase 2 – Preliminary Engineering and Environmental Assessment
 - Conduct Survey, Environmental Studies, Geotechnical Testing
 - Additional Agency and Public Involvement
 - Preliminary Engineering
 - Environmental Assessment
- Phase 3 – Final Design
- Phase 4 – Construction





Full Program Timeline

We are Here!





Intake Alternatives

- In-Lake Pumping Alternatives
 - Locations:
 - #1 – Kaw Lake Earthen Dam
 - #2 – Southwestern Shoreline
 - #3 – Central-western Shoreline



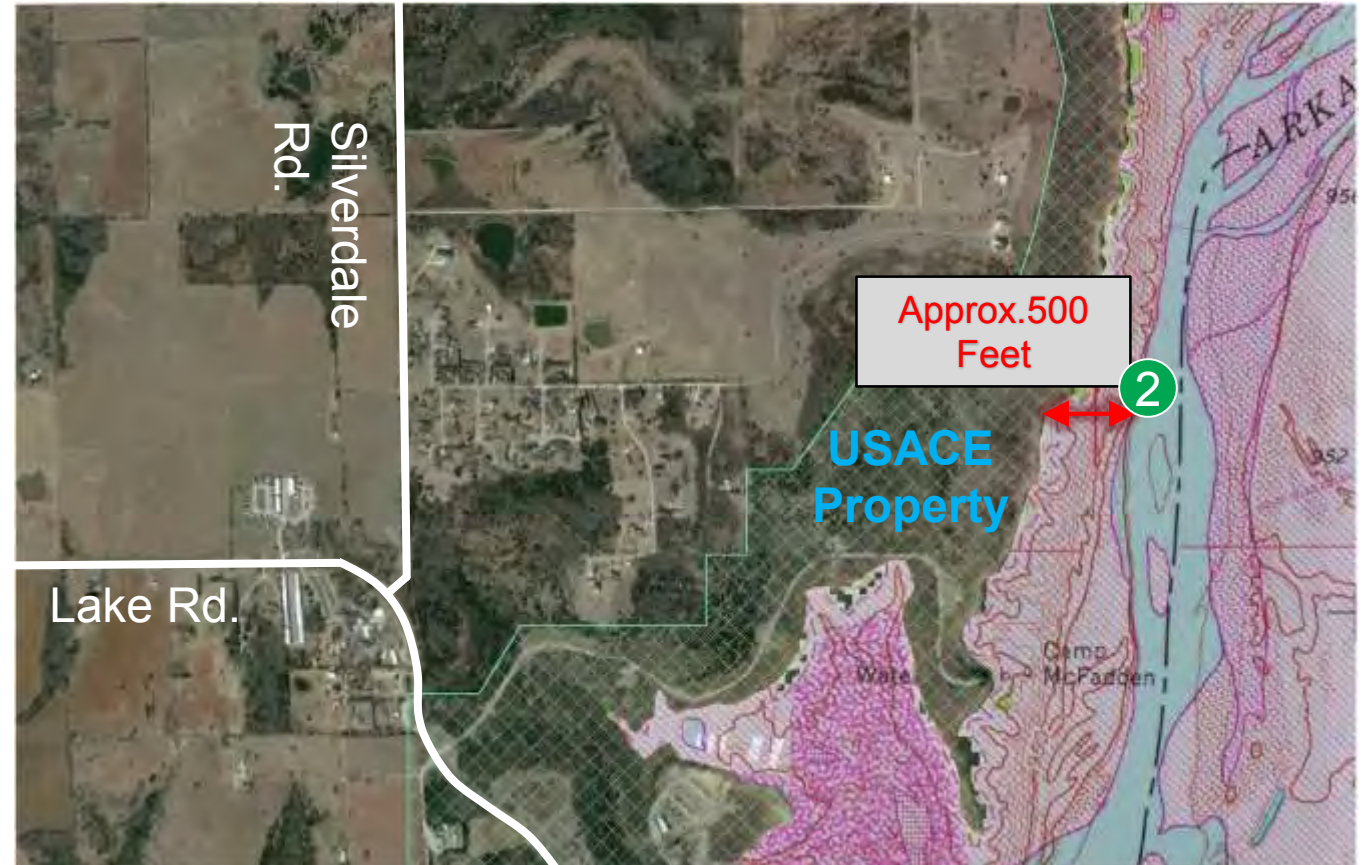
Intake Alternatives – Evaluation Criteria

- Located for Anticipated Best Water Quality
- Multi-Level Intake
- Underwater Screening
- Protection and Security
- 100-Year Flood Elevation
- Operations & Maintenance
- Provisions for Future Expansion
- Environmental Considerations
- Compatible with Our New Neighbors



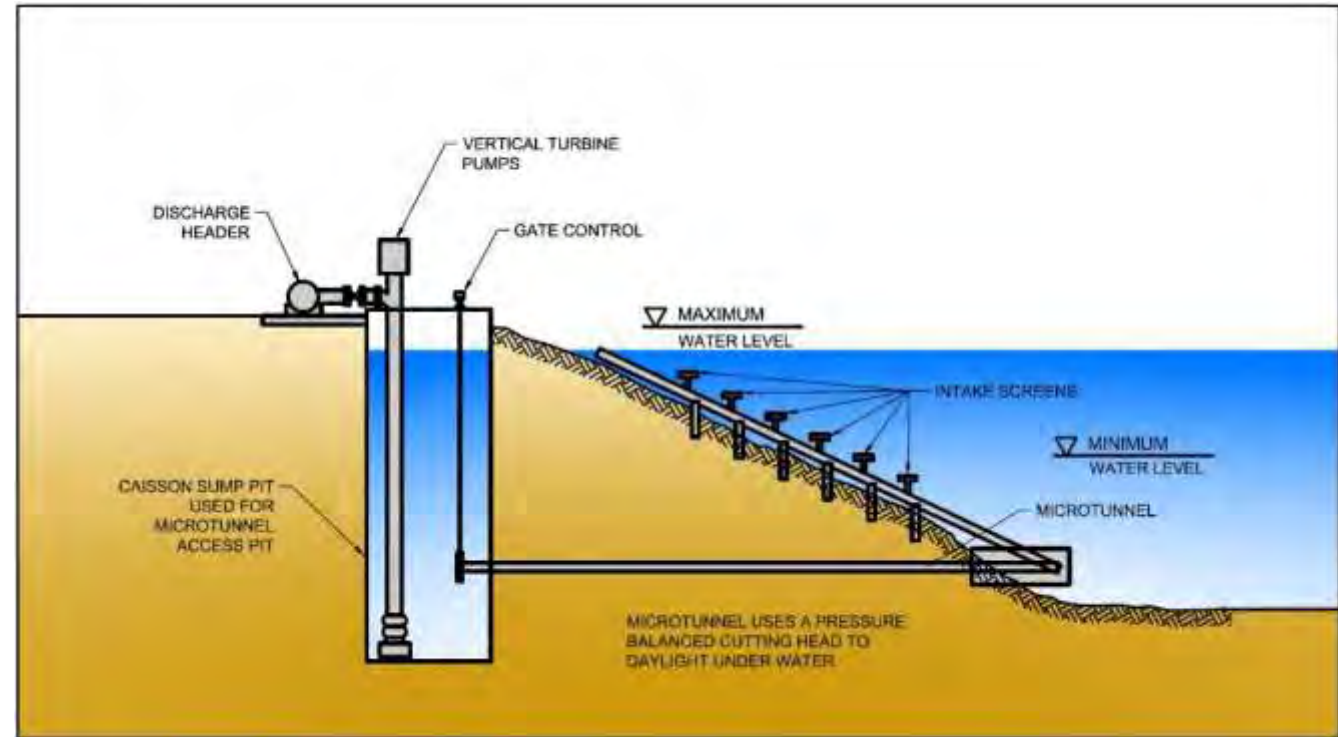
Preferred Intake Alternative

- Site 2 Selected Because:
 - Access to Higher Quality Water
 - Minimal Construction Disruption and Fewer Long-Term Aesthetic Issues
 - Located Away from Kaw Dam and was Preferable to the US Army Corp of Engineers (USACE)



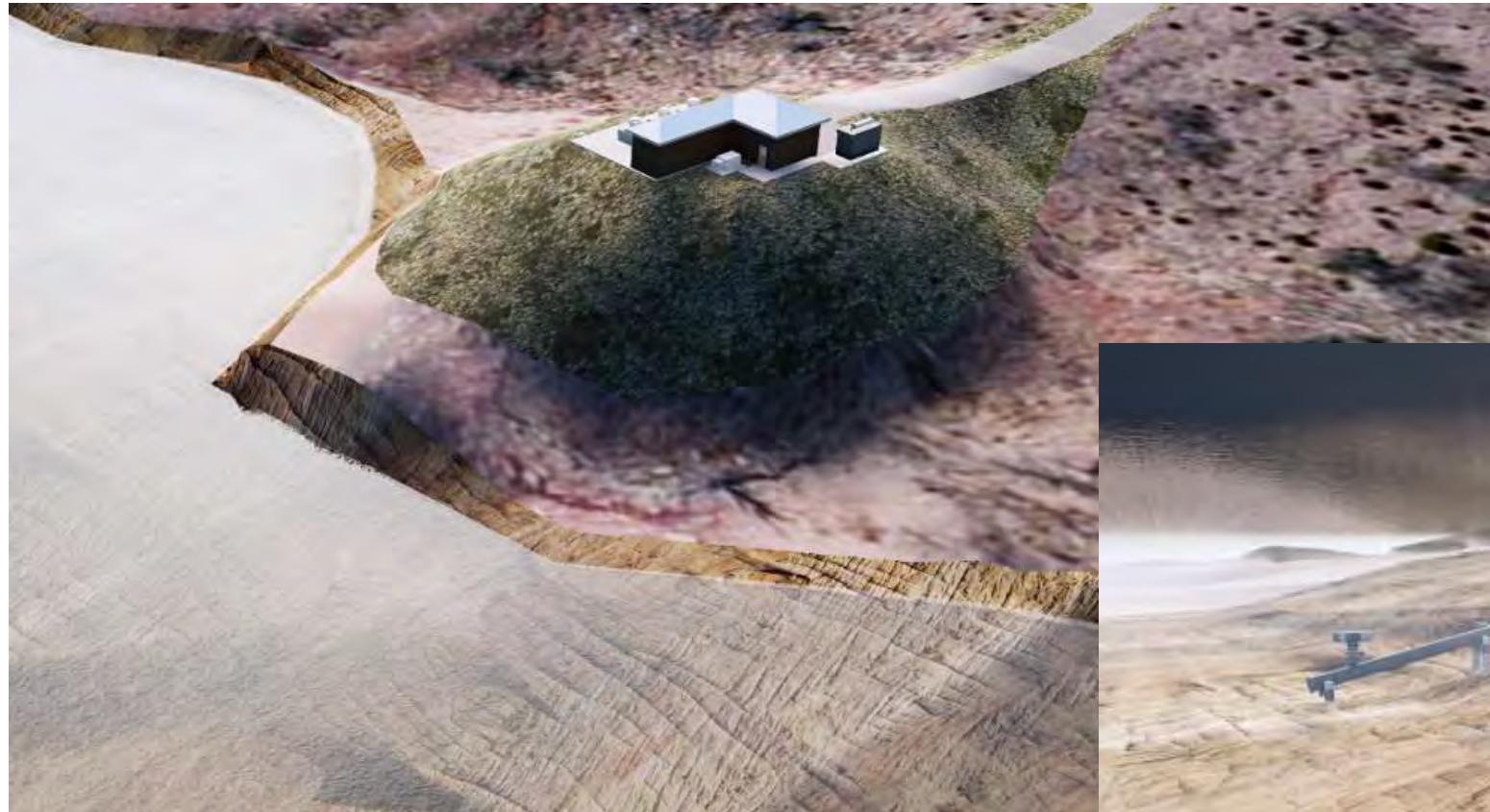
Intake Types – Design Options

- Intake Type Selection
 - Dredged Channel
 - Microtunnel
 - Intake Tower & Conduit
 - Platform
- Intake Type Considerations
 - Potential Construction Challenges
 - Existing Soil Conditions
 - City Input
- Recommended Alternative for Conceptual Design:
 - Microtunnel



Intake Types – Design Options

- Intake Conceptual Designs
 - Microtunnel





Intake Design Coordination & Considerations

- Continuous USACE coordination & communication throughout
- Taking into Consideration Desires of Kaw Lake Users and Nearby Property Owners
- Architectural Team will Incorporate Aesthetic Considerations



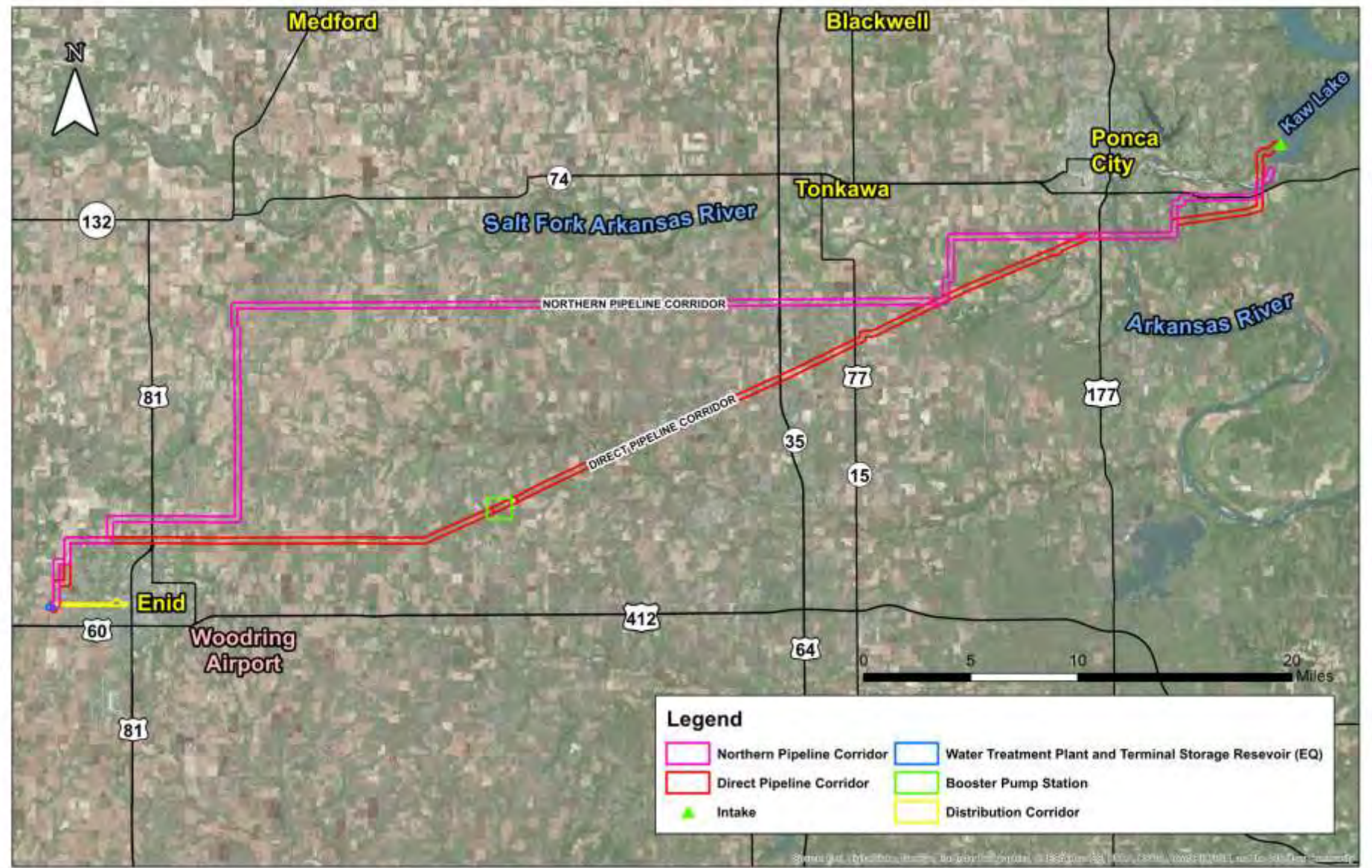
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Pipeline Alternatives

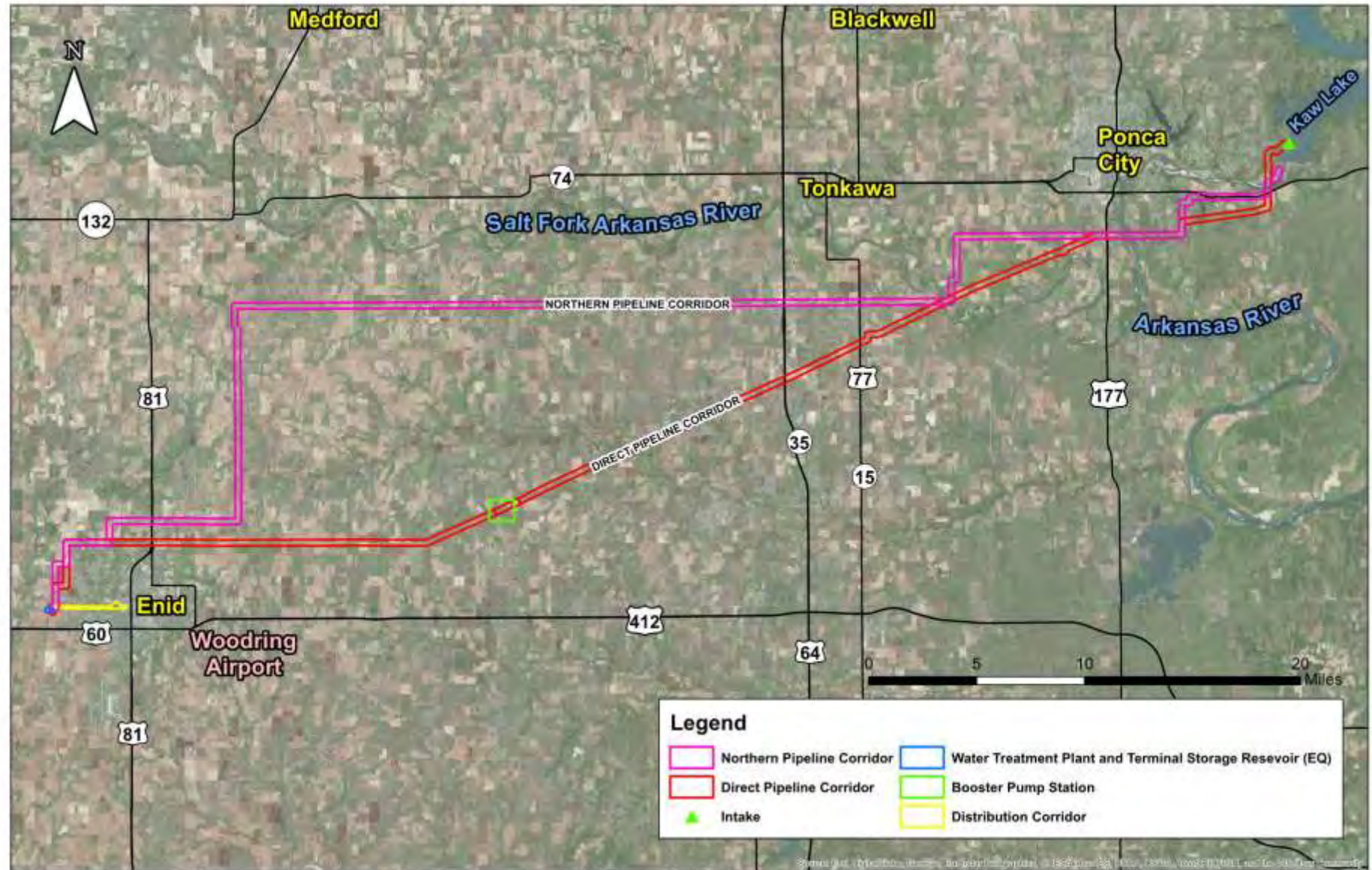
- Three Primary Pipeline Route Alternatives
 - Northern Corridor
 - Direct Corridor
 - Also Considered a Southern Corridor, but was Eliminated Due to Minimal Regional Partnership Opportunities



Pipeline Alternatives – Evaluation Criteria

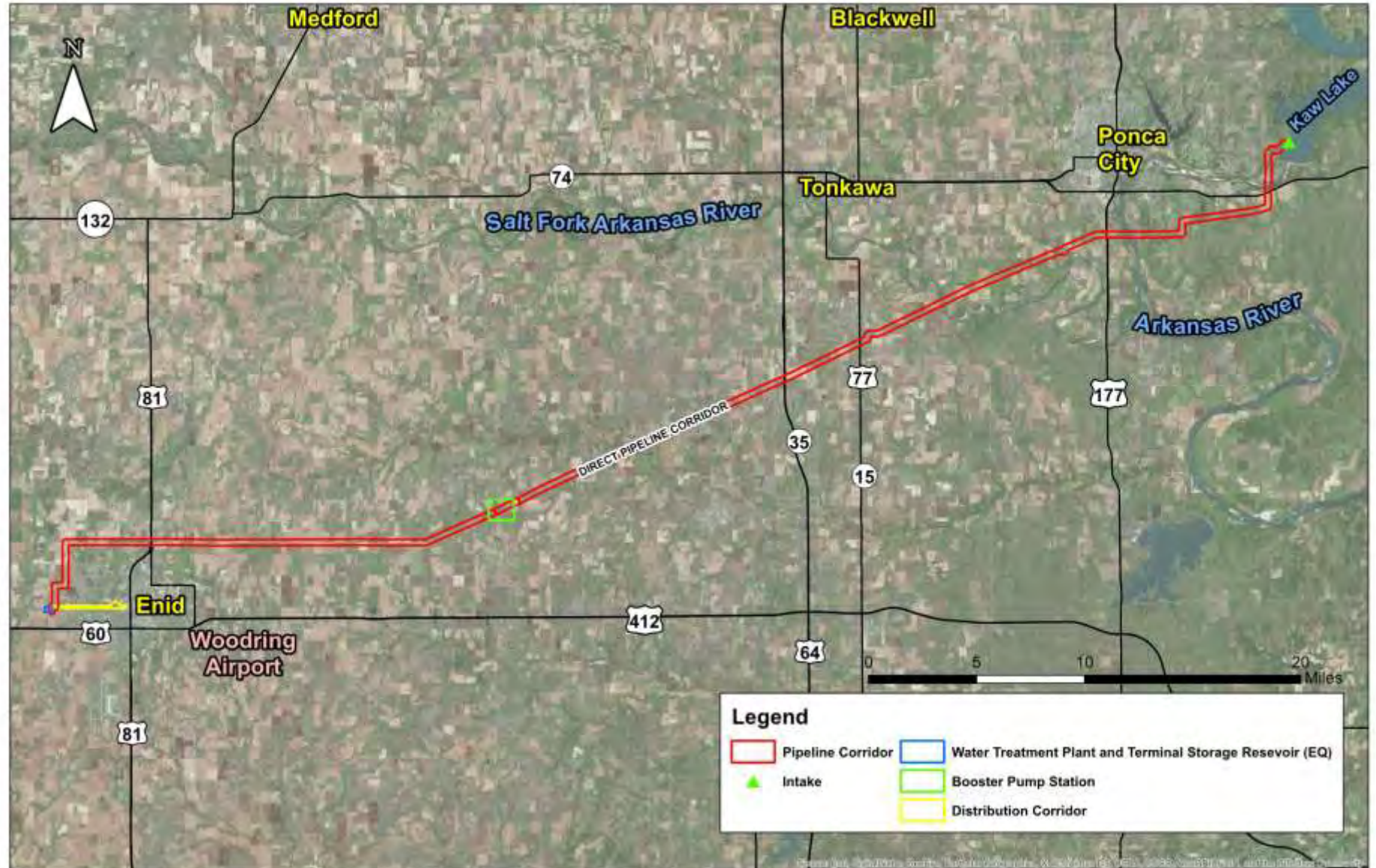


- Distance from Intake to Treatment Plant
- Topography
- Existing Easements
- Environmental Considerations



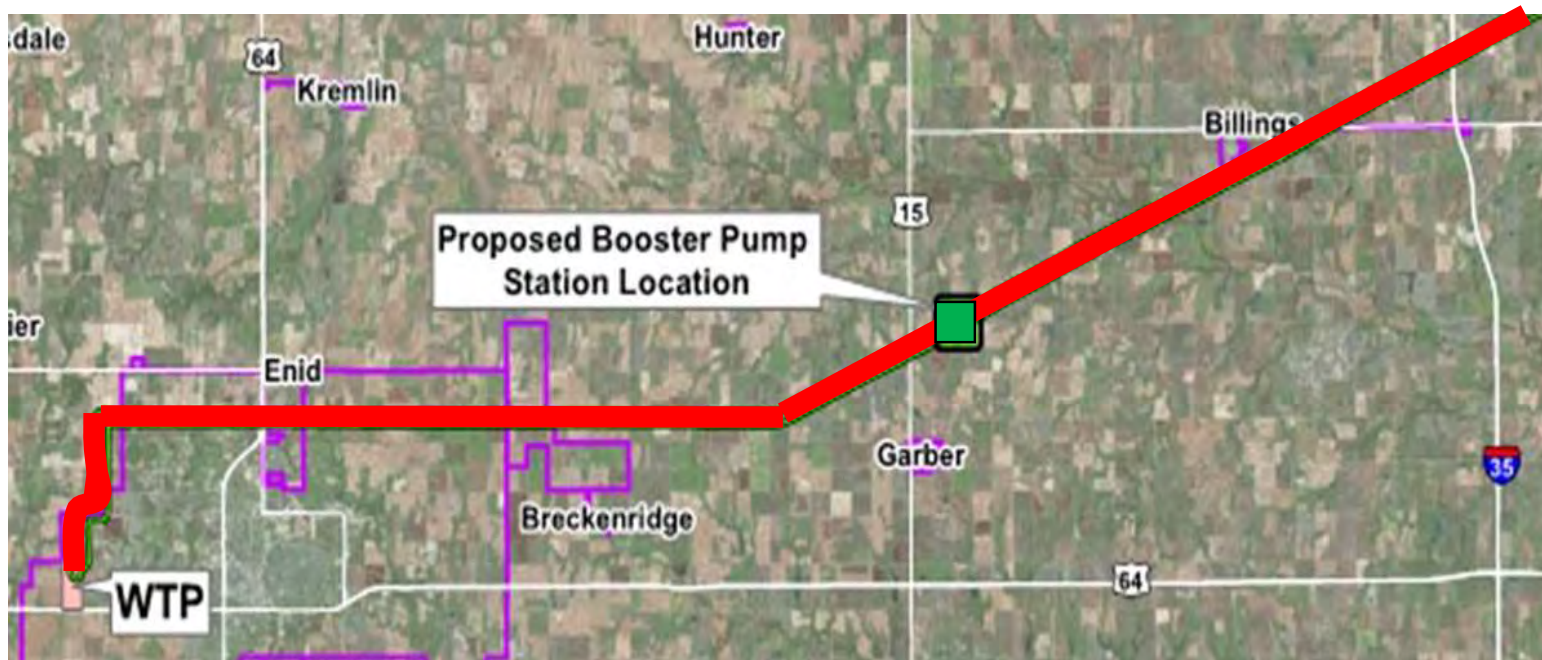
Pipeline Alternatives

- Direct Corridor is the Preferred Route
 - Shortest Distance from Intake to Treatment Plant
 - Partially Follows Existing Powerline Easement
 - Fewest Environmental Concerns



Booster Pump Station

- Needed to “Boost” Pipeline Flow
 - Preliminary Tank sizing (5 million gallons)
 - Preliminary Pump sizing (1,000 HP each; 3 operating + 1 standby)



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Pipeline Design Coordination & Considerations



- Pipe Diameter to Be Determined
- Materials to be Determined
- Currently Studying a ¼ Mile-Wide Corridor
- Exact Alignment and Easement Width is Still to be Determined
- Consider Trenchless Construction at Certain Areas
 - Major Rivers and Streams
 - Roads and Railroads
 - Environmentally Sensitive Areas
- The City Continues to Reach Out to Potential Partners





Terminal Storage Reservoirs



- Emergency Storage (EM)
 - If there are Issues with Intake or Pump Station
 - If Repairs to Pipeline are Needed
- Equalization Storage (EQ)
 - Offset Short-term Peak Demands
 - Optimize Conveyance Costs
 - Improve Treatment Plant Performance
 - Multiple Cells for Redundancy



Two Terminal Storage Reservoirs (TSR) are Needed



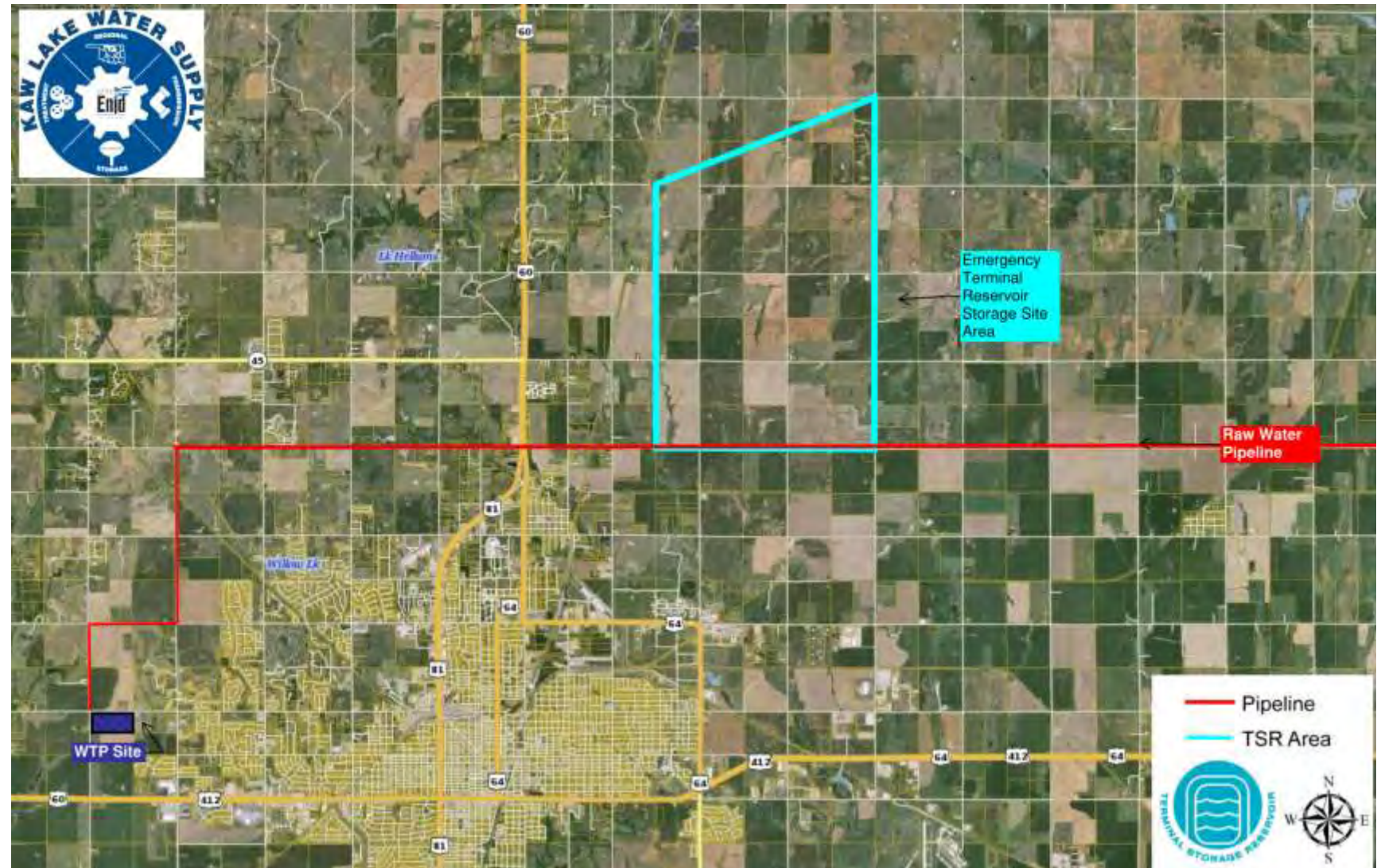
1. Equalization (EQ TSR)

- Two Cells in Series
- Adjacent Pump Station
- Total Storage 64.7 million gallons
- Approximately 20 acres
- To be Located Adjacent to New Water Treatment Plant



2. Emergency (TSR EM)

- Single Cell
- Adjacent Booster Pump Station
- Total Storage 185 Million Gallons
- Approximately 80 Acres
- 10-14 Days of Storage
- Exact Location to be Determined

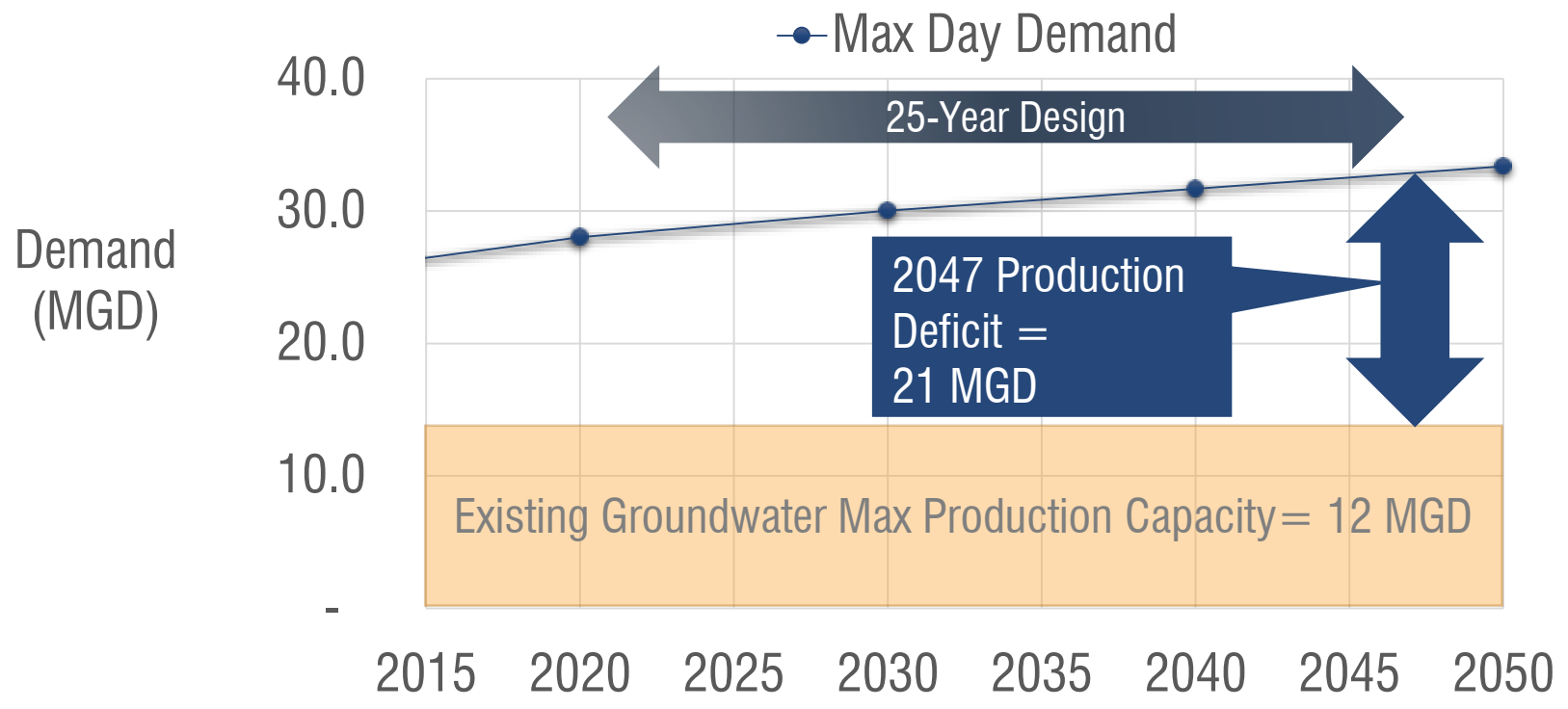






Water Treatment Plant

- A New Water Treatment Plant will be Constructed to Supplement the Existing Groundwater Supply
- The New Water Treatment Plant Will Have a Design Flow of 21 MGD (Million Gallons/Day)



Studied Six Treatment Options

- Developed Several Key Water Quality Goals to Drive Treatment Selection

- Safe Drinking Water Act
- Hardness
- Odor
- Taste

		Evaluation Criteria				Total Weighted Score (1 to 100 scale, higher score is favorable)
		Water Quality	Environmental Impact	Operability	Cost	
Weighting Factor		30	10	20	40	
Alternative	Alternative 1 – Conventional Treatment w/ Ozone	27	10	14	39	90
	Alternative 3 – Lime Softening w/ Ozone	26.5	6	10	40	82.5
	Alternative 5 – Pre-treatment, Microfiltration, Nanofiltration	25	5	13.5	23	66.5
	Alternative 6 – Conventional Treatment w/ Nanofiltration	25	5	13.5	24	67.5

Water Treatment Plant Site has been Selected



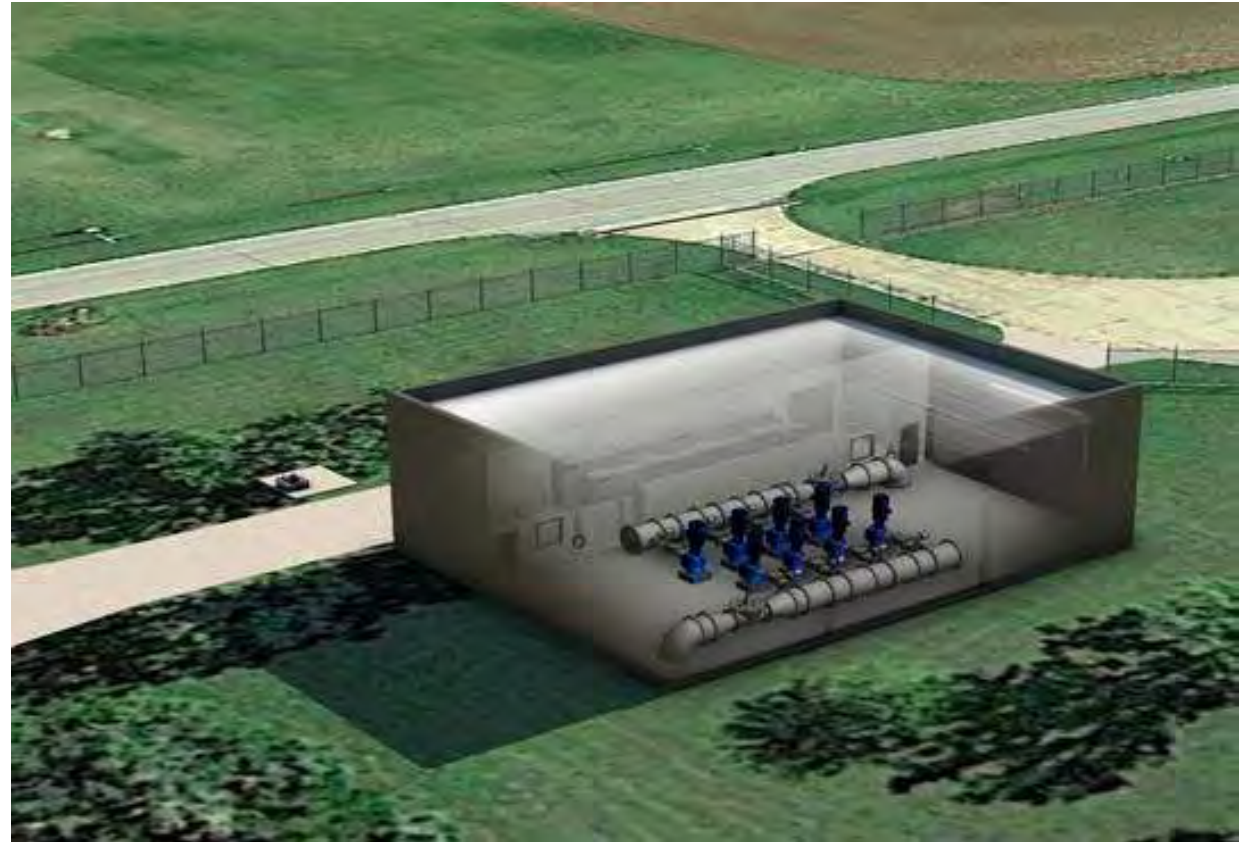
- Adjacent to Existing City Ground Storage and Pump Station
 - Consideration of Aesthetics and Sustainable Design
 - Lighting
 - Landscaping



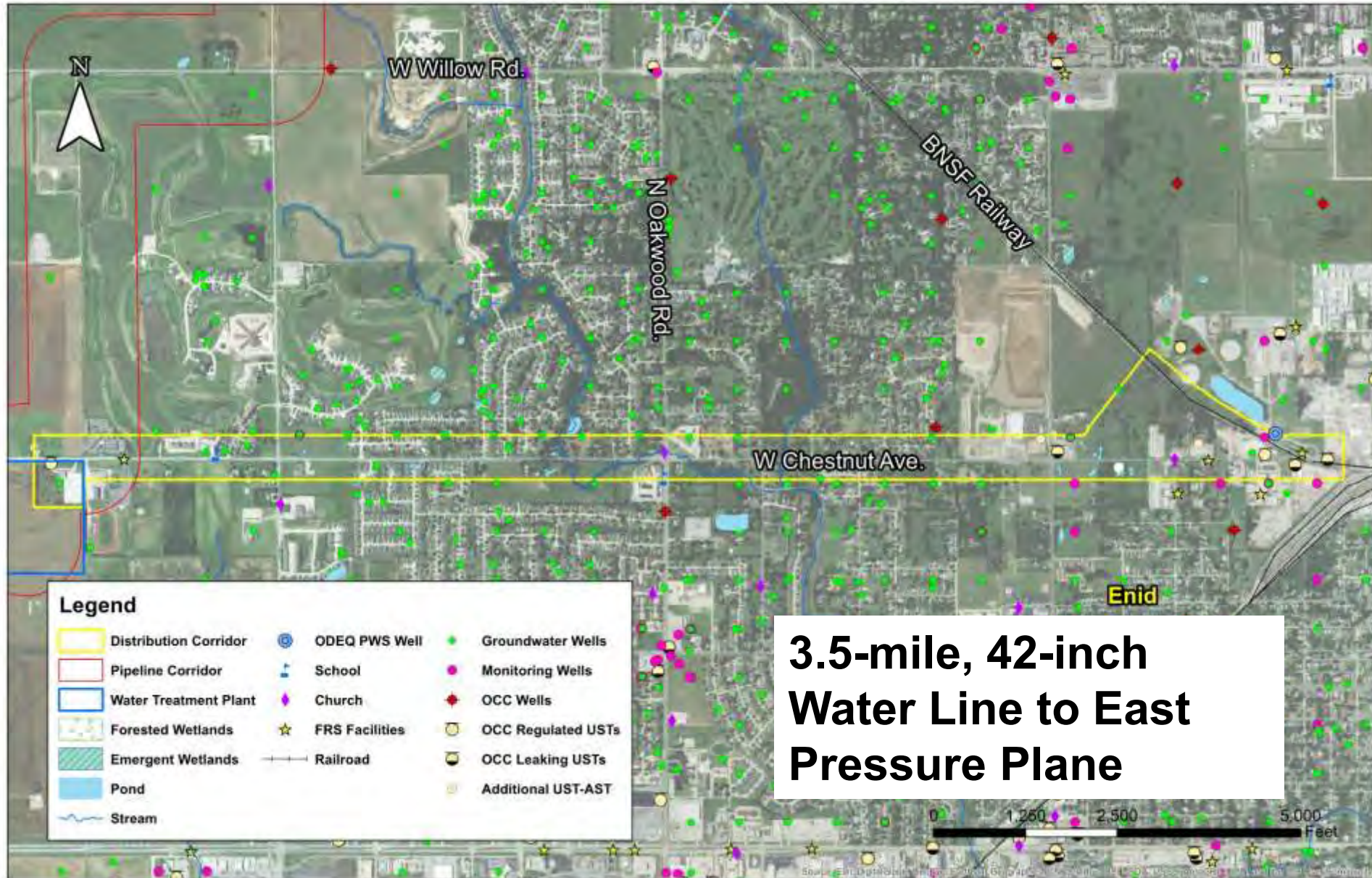


Distribution System

- Treated Kaw Lake Water will be Blended with the Existing Treated Groundwater Prior to Distribution
- The Distribution System Conveys the Treated Water to the Existing City Network
 - All Water Will be Distributed from the New Treatment Plant Site



Proposed Distribution Route





A Detailed Environmental Assessment (EA) of the Project will be Completed



- Federal Permits are Anticipated to be Required for the Project
- The City will Comply with All Federal Requirements under the National Environmental Policy Act (NEPA) and other Federal Environmental Regulations
- An Environmental Assessment Will be Prepared in Coordination with the U.S. Army Corps of Engineers (USACE)



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U.S. Army Corps of Engineers Jurisdiction



- USACE Regulates Work in Waters of the U.S.
- USACE Permits will Be Required for Construction
 - Clean Water Act (Section 404) – Discharge of Dredge/Fill Material
 - Rivers and Harbors Act (Section 408) – Alteration of USACE Public Works Project (e.g. Kaw Lake)
- The Environmental Assessment Will Serve as the Decision Document for the USACE to Issue Permits



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The Environmental Assessment Will Consider



- Effects of the Project On:
 - Kaw Lake – functions and users
 - Private and Tribal Property
 - Economic Activity (e.g. Farming and Ranching)
 - Land Use
 - Roads and Railroads
 - Potentially Contaminated Sites
 - Natural and Cultural Resources
 - Streams and Wetlands
 - Habitat for Threatened and Endangered Species
 - Archaeological and Historic Resources





The City Will Complete Detailed Environmental Studies in Support All Federal Regulations

- Water and Wetland Delineations
 - According to USACE requirements
- Archaeological and Historic Survey
 - Identify sites listed in or eligible for listing in the National Register of Historic Places
 - USACE will consult with the State Historic Preservation Officer and Indian Tribes
- Threatened and Endangered Species Habitat Assessment
 - Identify habitat for listed species and assess the impacts of the project
 - USACE will consult with the US Fish and Wildlife Service





The Project Includes Consultation with Native American Tribes

- Tribes Have Been Included in Project Planning From the Beginning
- Many Tribes Have Concerns about Properties with Traditional Religious or Cultural Importance
- The City has and will Continue to Meet with Tribes at Their Request and will Make Every Effort to Avoid Significant Sites
- The USACE will Conduct Formal Government-to-Government Consultation with Tribes



Public Involvement is an Important Part of the EA



- The City has Solicited Input from State and Federal Agencies, Elected and Local Officials, and Native American Tribes
- Tonight's Meeting is to Gather Input from the Public
 - Public Input will be Incorporated into the Design Process Wherever Feasible and Practical



What to Expect if the Project Crosses Your Property



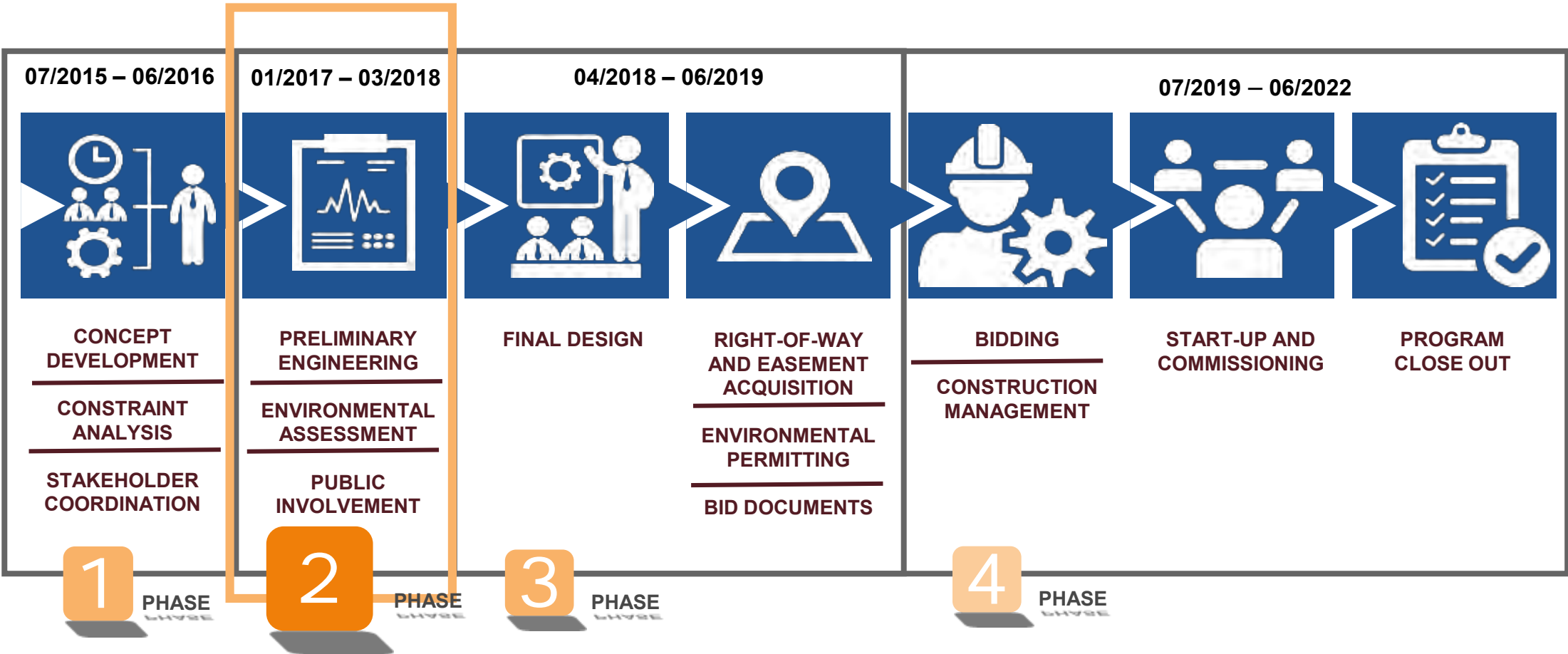
- The City intends to acquire permanent easements that will allow them to construct and maintain the pipeline
- With an easement, you still own, maintain, and retain use of the land as you do presently
- Potential restrictions within the easement may include placement of permanent structures or activities that could damage the pipeline (e.g. drilling)
- Fencing is normally acceptable as long as there is access
- Any damages caused by the construction or operation of the pipeline will be restored to the same condition or better than existing
- During the next phase of the project, expected to occur in 2018, the City's right-of-way agents will be contacting individual property owners to discuss the acquiring the needed easements
- Construction is expected to begin in 2019





Full Program Timeline

We are Here!



Public Feedback

- Are There Things we Need to be Aware of or Try to Avoid?
- What Feedback do you Have for the City and the Design Teams?
- Comment forms are available and use is encouraged.

THANK YOU FOR COMING!



- Please Submit your Comments by **April 27, 2017**

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