Norman Utilities Authority

2060 Strategic Water Supply Plan

Public Meeting #2

October 17, 2012

AGENDA

- Project overview and update on progress
- What water supply options were considered?
- Supply option screening
- Feedback and discussion on supply option screening

Project Overview and Update on Progress

Public Meeting 1 (June 2012)

- Basis of Planning
  - Develop demand projections
  - Document water conservation & reuse opportunities
  - Identify supply options
  - Develop criteria for decision-making

Public Meeting 2 (tonight)

- Phase 1 – Individual Water Supply Options

Public Meetings 3 and 4

- Phase 2 – Future Water Supply Portfolios

Water Planners Speak a Different Language…

- Water Use Types
  - Municipal & Industrial (Public Water Supply)
  - Potable vs. Non-potable
  - City water service vs. domestic wells

All the water uses connected to the municipal system – Residential, Commercial, Industrial, Irrigation, Firefighting…

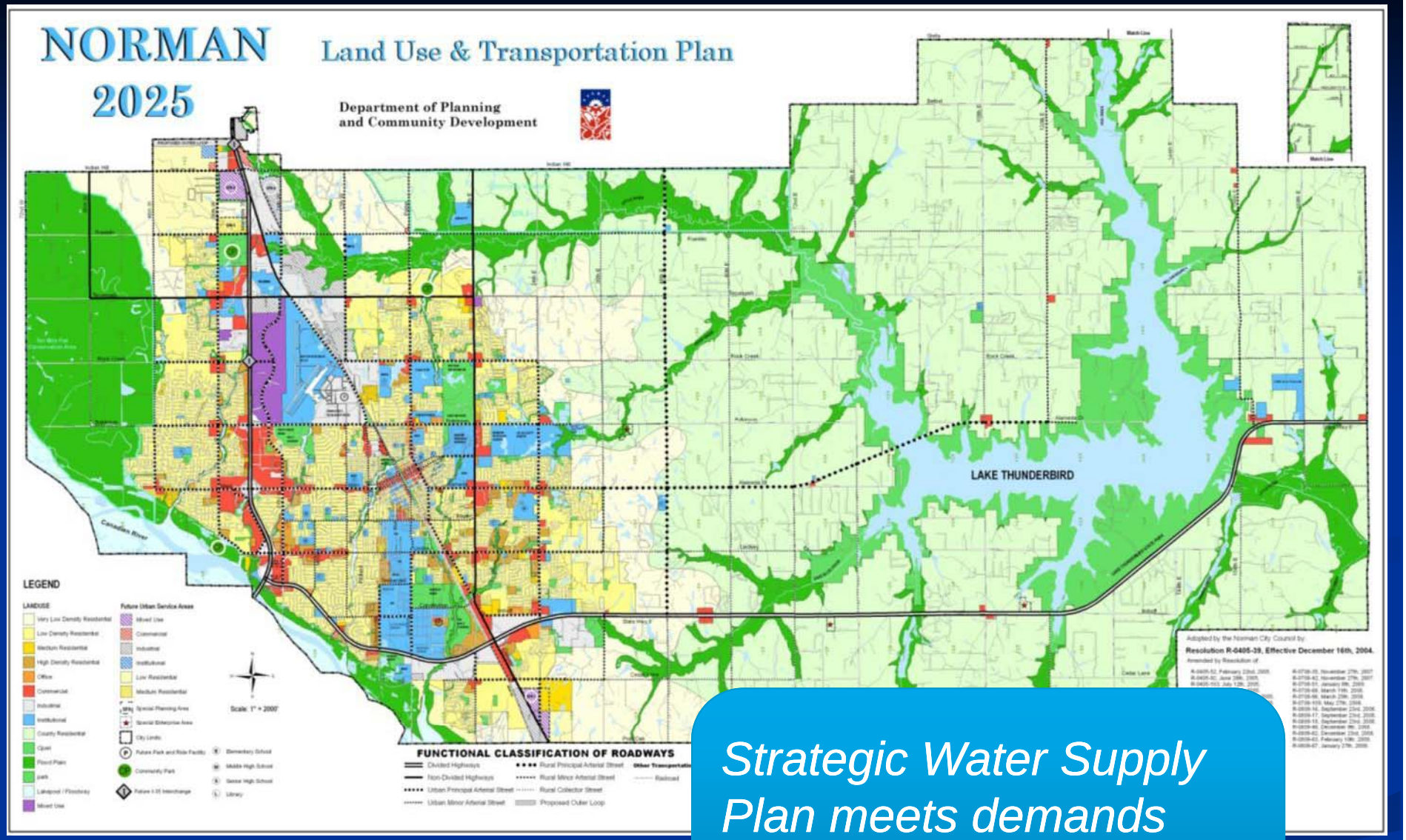
- Measurement
  - acre-foot
  - acre-feet per year (AFY)
  - million gallons per day (mgd)
  - gallons per capita per day (gpcd)

1 acre-foot = 325,851 gallons

<u>2011 Norman use</u>:

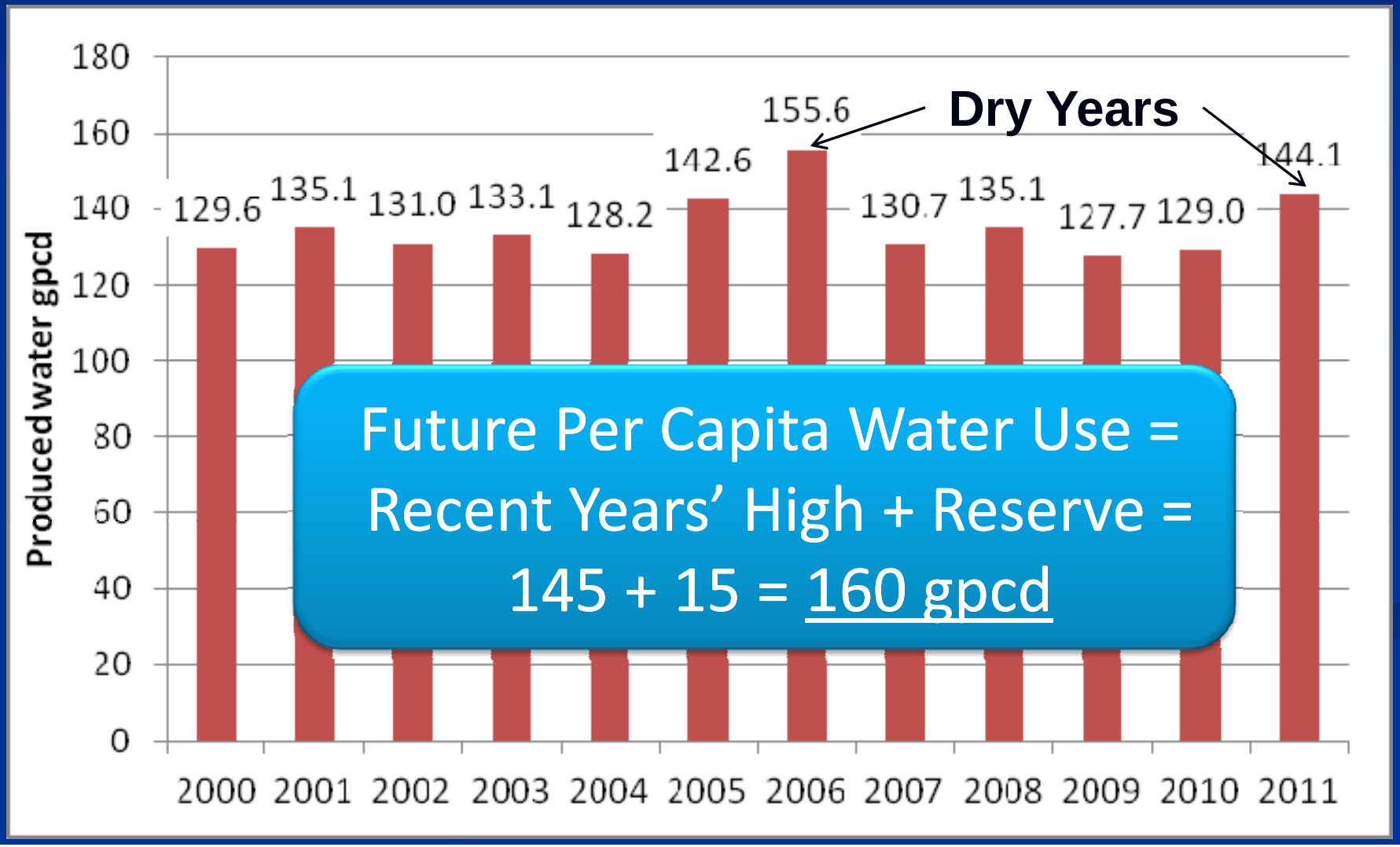
- 15,400 AFY
- 13.9 mgd on average
- 23.9 mgd peak day (Aug. 5, 2011)

Per-capita use includes residential AND industrial AND commercial



Strategic Water Supply Plan meets demands based on City of Norman adopted land use plans

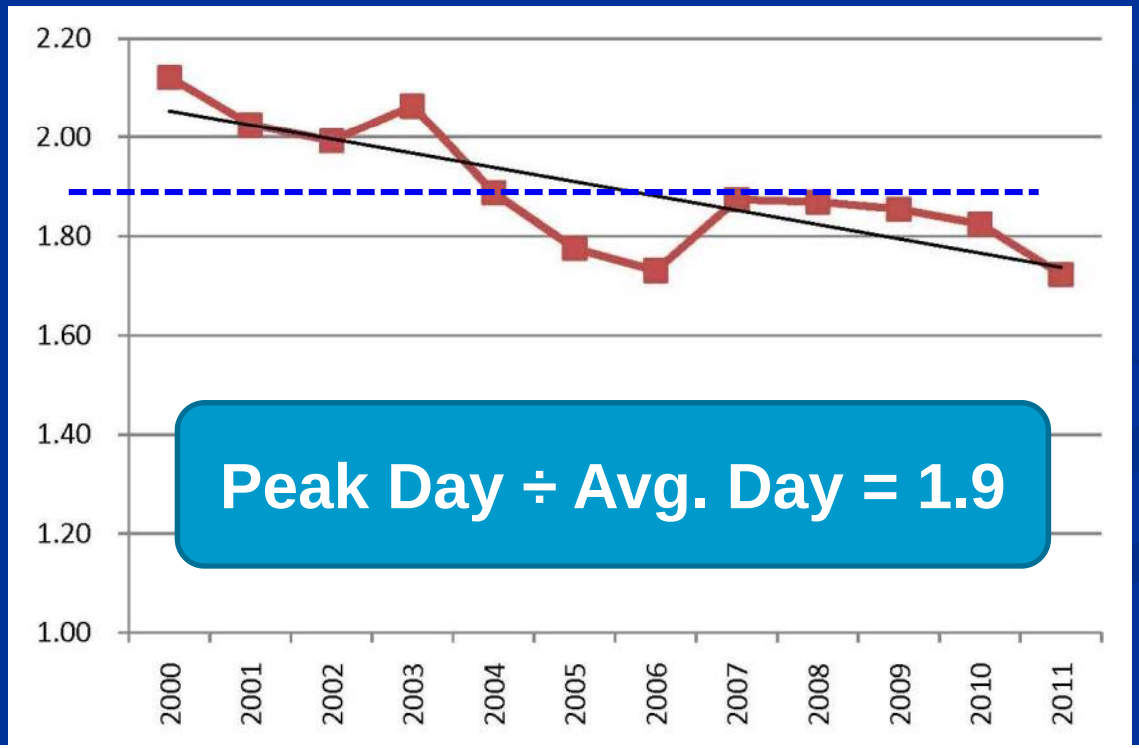
Historical Per-Capita Water Use in Norman



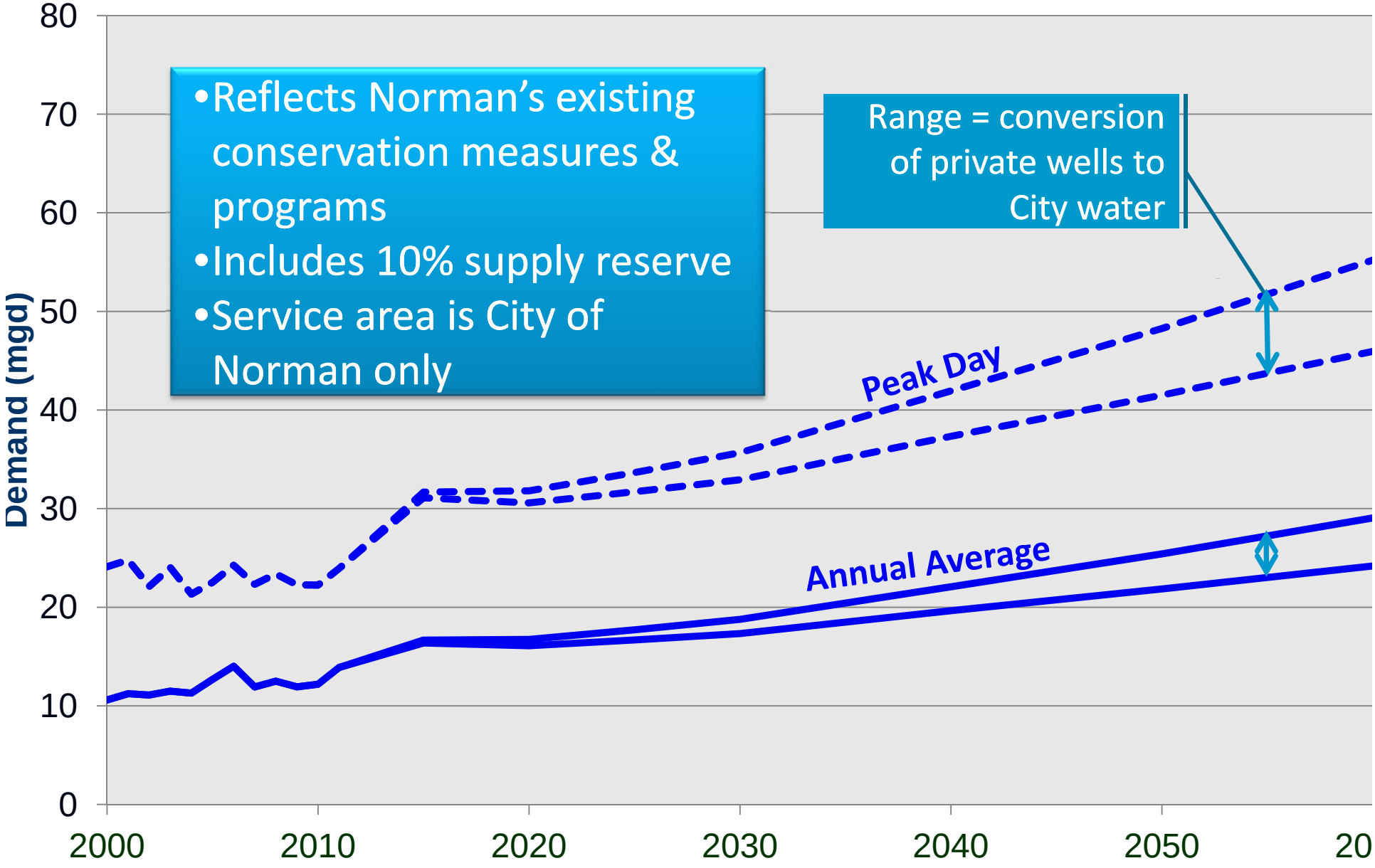
Future Per Capita Water Use = Recent Years' High + Reserve = 145 + 15 = <u>160 gpcd</u>

Historical Daily Peaking Factors

- Decreasing trend due to:
  - Reuse & non-potable conversion projects
  - Conservation measures



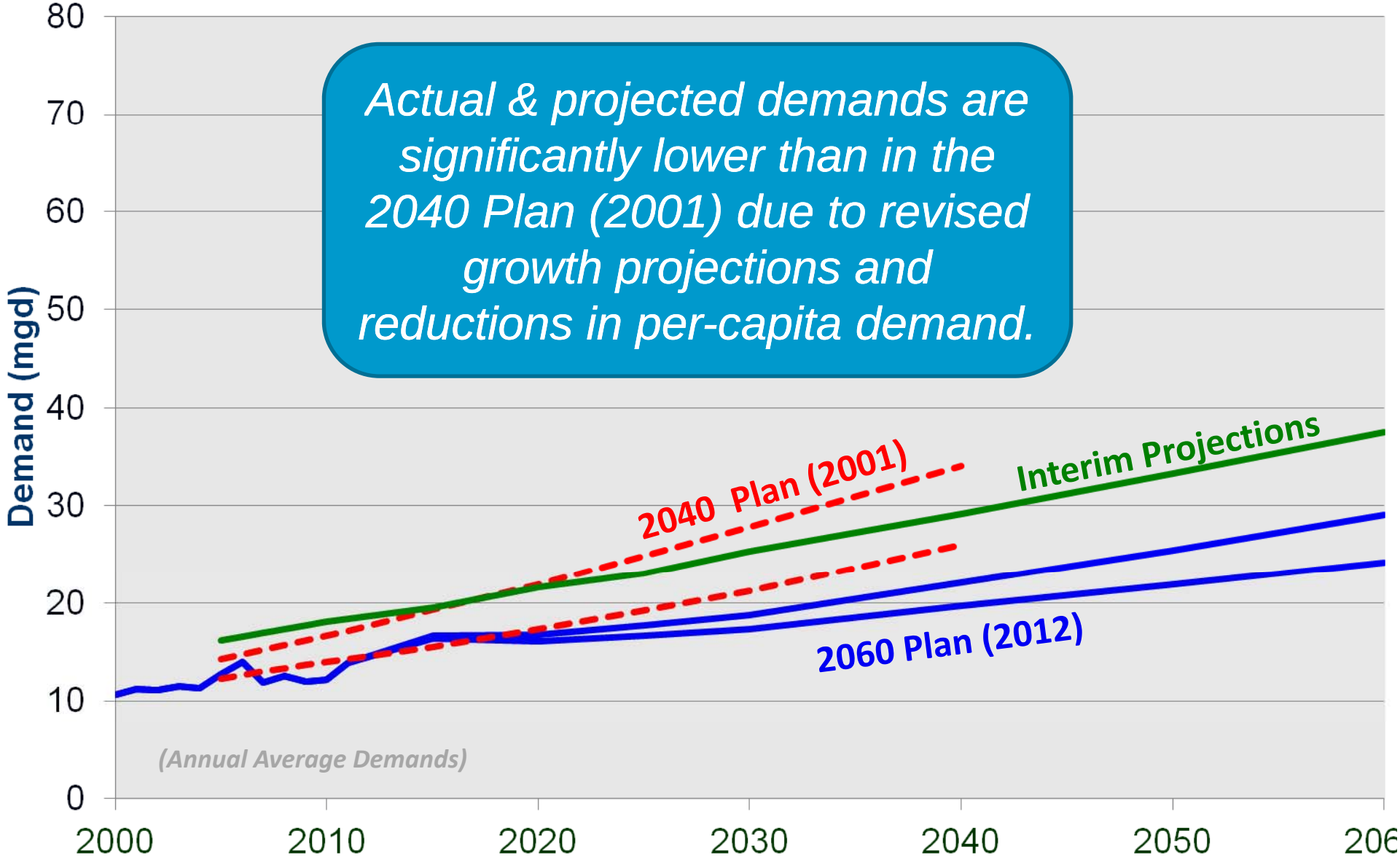
Projected Water Use



- Reflects Norman's existing conservation measures & programs
- Includes 10% supply reserve
- Service area is City of Norman only

Range = conversion of private wells to City water

Projected Water Use



Conservation Savings for Norman (Post 2010)

Oklahoma Comprehensive Water Plan OCWP	Scenario I (mgd)*	Scenario II (mgd) *
2020	0.70	1.6
2030	0.74	1.9
2040	0.77	2.3
2050	0.79	2.5
2060	0.81	2.6

* 60% of OCWP estimates for Cleveland County

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Water Supply Planning Terminology & Process

Source Options (Phase 1)

Source 1

Source 2

Source 3

Source 4

Source 5

...

PUBLIC MTG #1

Screening Criteria

PUBLIC MTG #2

Short-List of Viable Source Options

Supply Portfolios (Phase 2)

Source 3
Source 2
Source 5

Source 1
Source 2
Source 4
...

Source 3
Source 1
Source 5
...

PUBLIC MTG #3

Detailed Evaluation Process

PUBLIC MTG #4

2-3 Preferred Supply Portfolios

In Tonight's Meeting We Will…

Source Options (Phase 1)

Source 1

Source 2

Source 3

Source 4

Source 5

…

Describe the Individual Source Options…

s (Phase 2)

Source 3

Source 1

Source 5

…

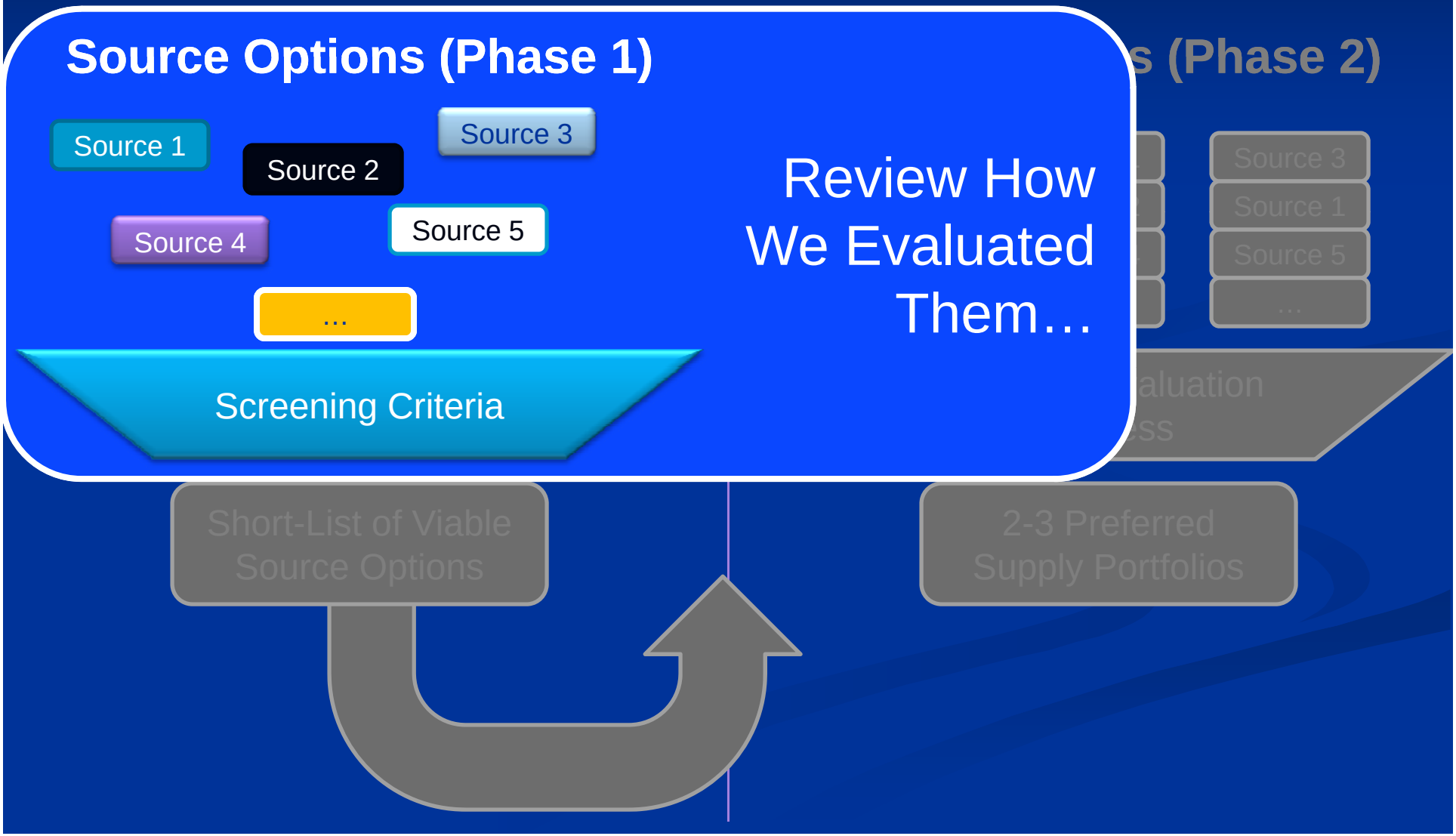
Screening Criteria

Detailed Evaluation Process

Short-List of Viable Source Options

2-3 Preferred Supply Portfolios

In Tonight's Meeting We Will…



In Tonight's Meeting We Will…

Source Options (Phase 1)

Source 1
Source 2
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Supply Portfolios (Phase 2)

Source 3
Source 2
Source 5

Source 1
Source 2
Source 4
…

Source 3
Source 1
Source 5
…

Screening Criteria

Short-List of Viable Source Options

…and Provide Recommendations on Which Source Options are Most Viable

Water Supply Options

- Three general types of sources

  1. Existing supplies
     (under new regulations and yield)
  2. New local supplies
  3. Regional supplies

The most viable and cost-effective supply options will be the "building blocks" for water supply portfolios

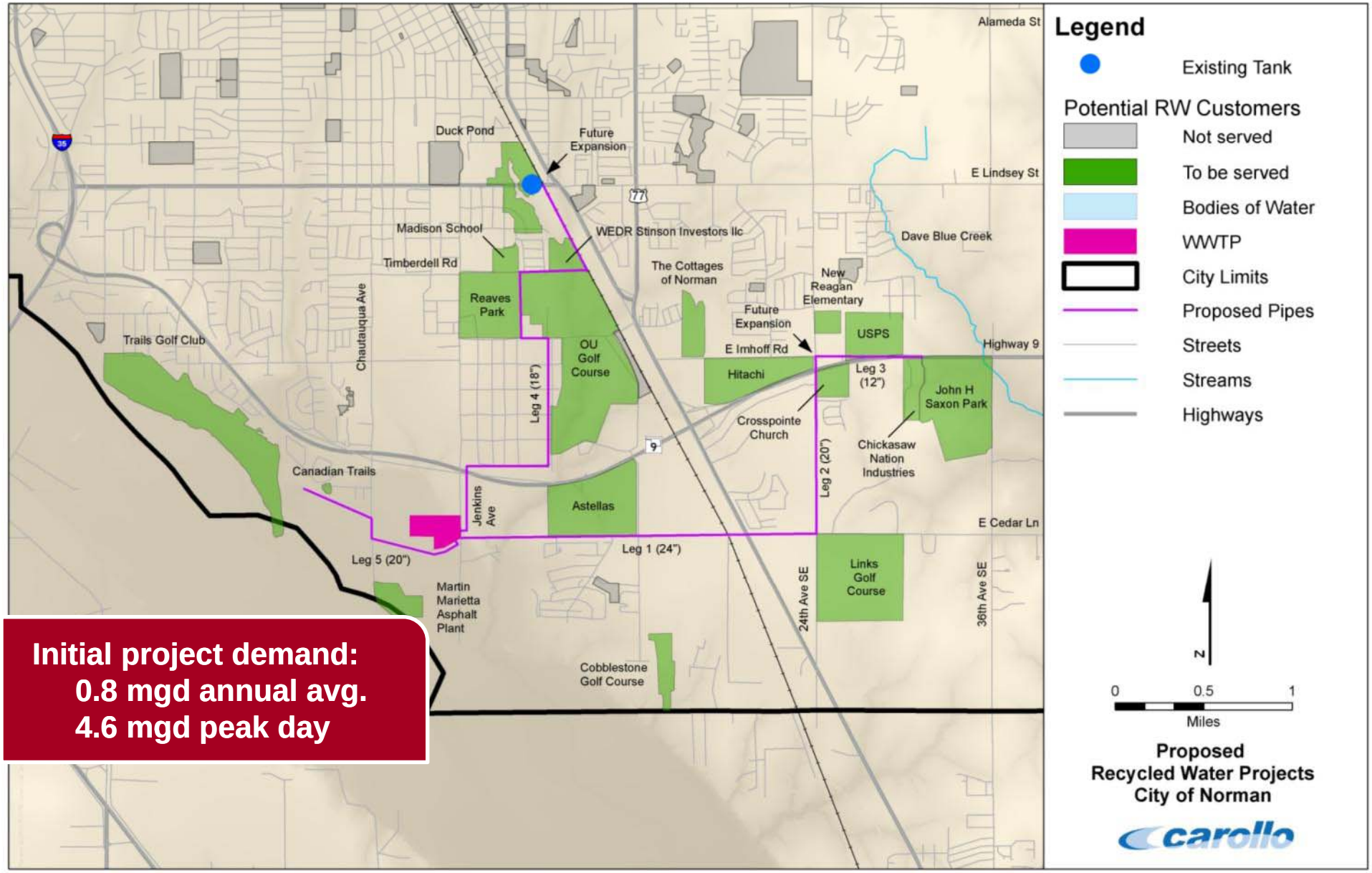
Existing Supplies

- All existing sources will be considered in Phase II (with modifications for regs)
  - Lake Thunderbird
  - Garber-Wellington Aquifer Wells
  - Intermittent purchase of OKC treated water
- Water Conservation
  - Significant measures already in place
  - Implement specific measures from 2011 Conservation Plan and OCWP (State Plan)

New Local Supplies

- Direct Non-potable Reuse
  - Irrigation and industrial uses of treated wastewater effluent
  - Water quality per ODEQ regulations
  - Expand upon existing use at OU Golf Course
  - Significant future northern expansion possible

Non-potable Reuse (Phase 1)



Initial project demand:
0.8 mgd annual avg.
4.6 mgd peak day

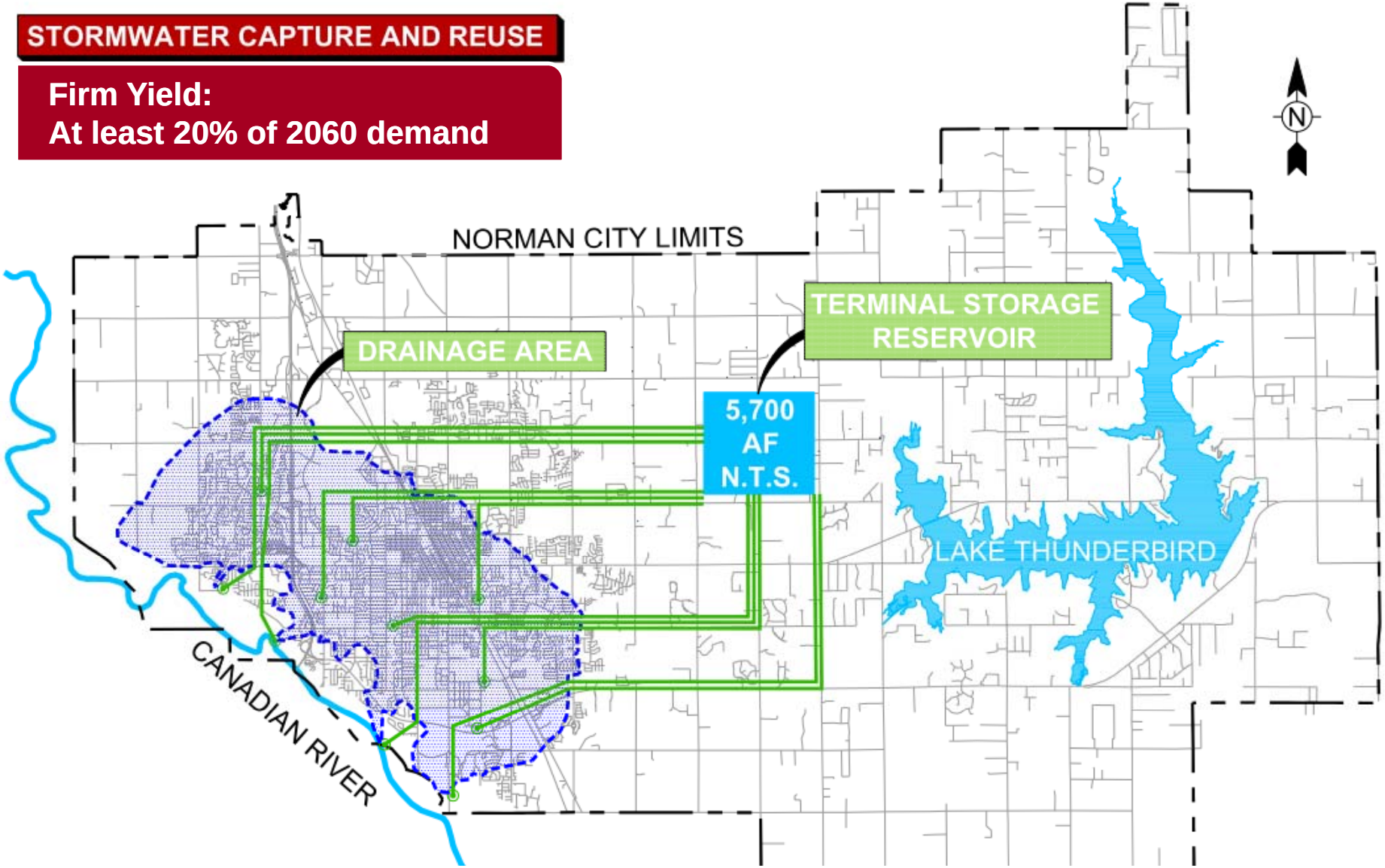
New Local Supplies (cont.)

- Lake Thunderbird Augmentation
  - Evaluation will be completed following publication of COMCD study
- Stormwater Capture and Reuse
  - Capture and storage of stormwater from South Canadian drainage basin
  - Terminal reservoir and new treatment plant
    - Possible use of Lake Thunderbird instead of separate reservoir

Stormwater Capture and Reuse

STORMWATER CAPTURE AND REUSE

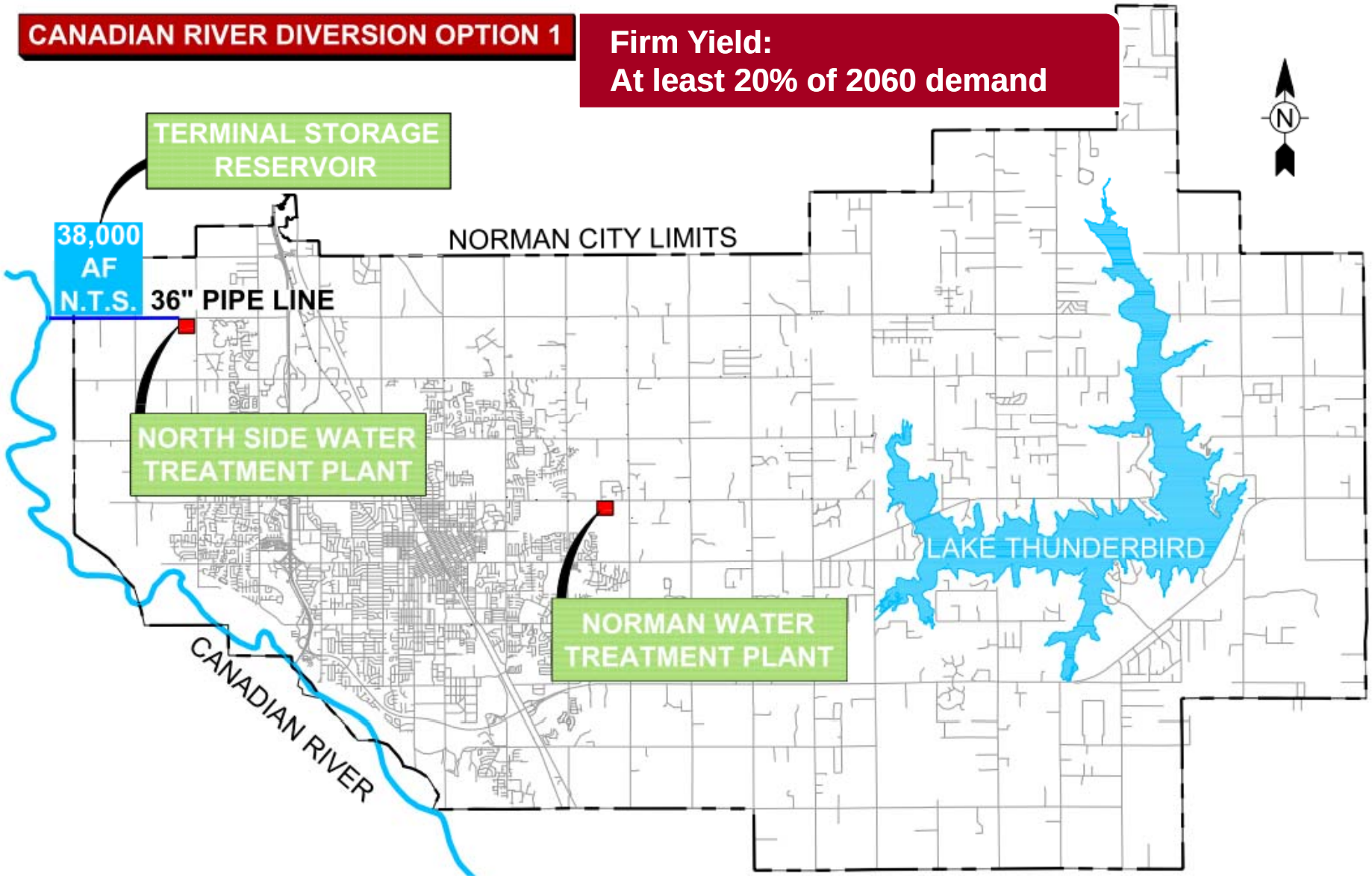
Firm Yield:
At least 20% of 2060 demand



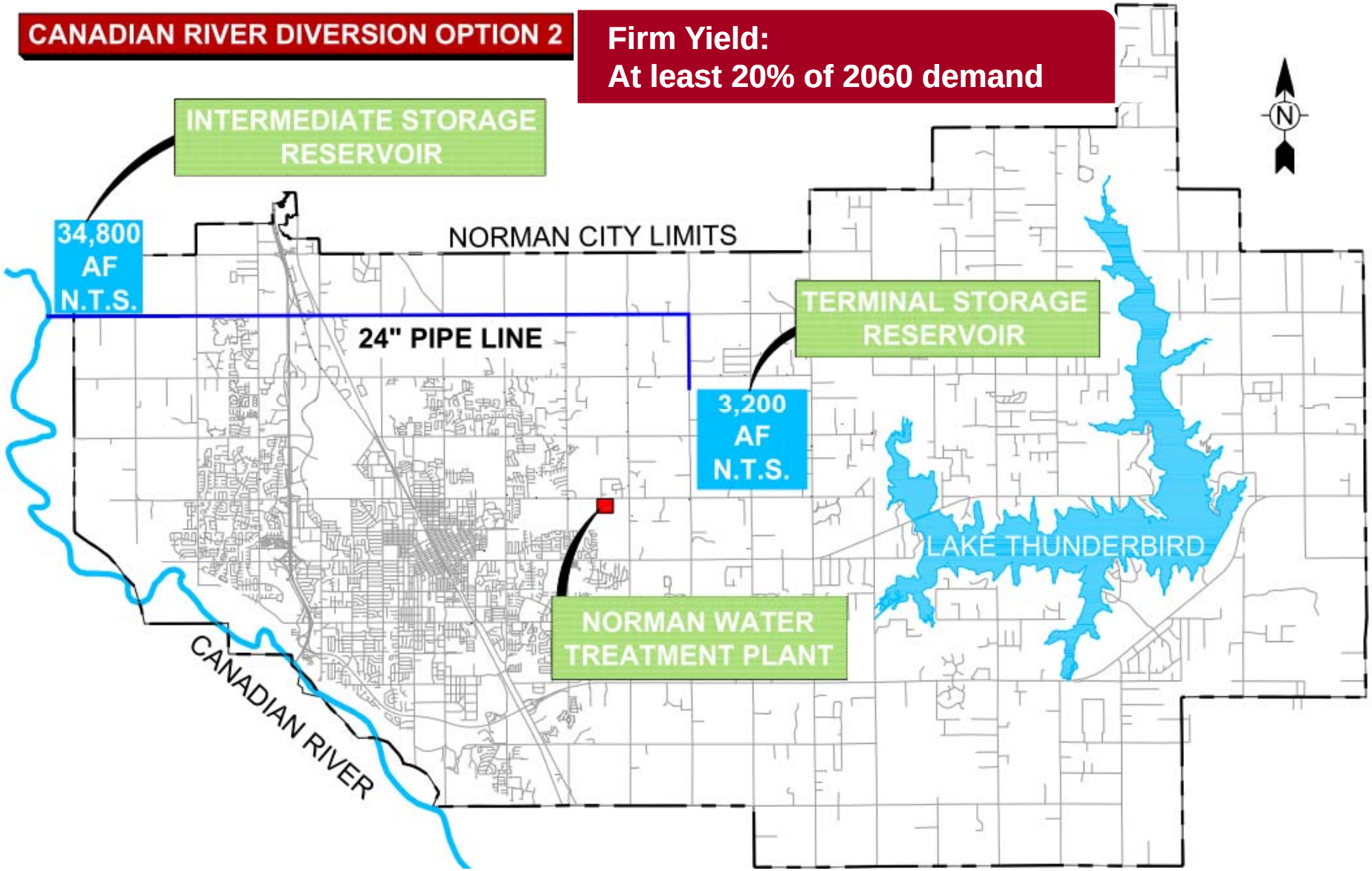
New Local Supplies (cont.)

- Canadian River Diversion
  - Option 1 – With new west side reservoir
  - Option 2 – With new west side reservoir and new east side reservoir
  - Option 3 – With new east side reservoir

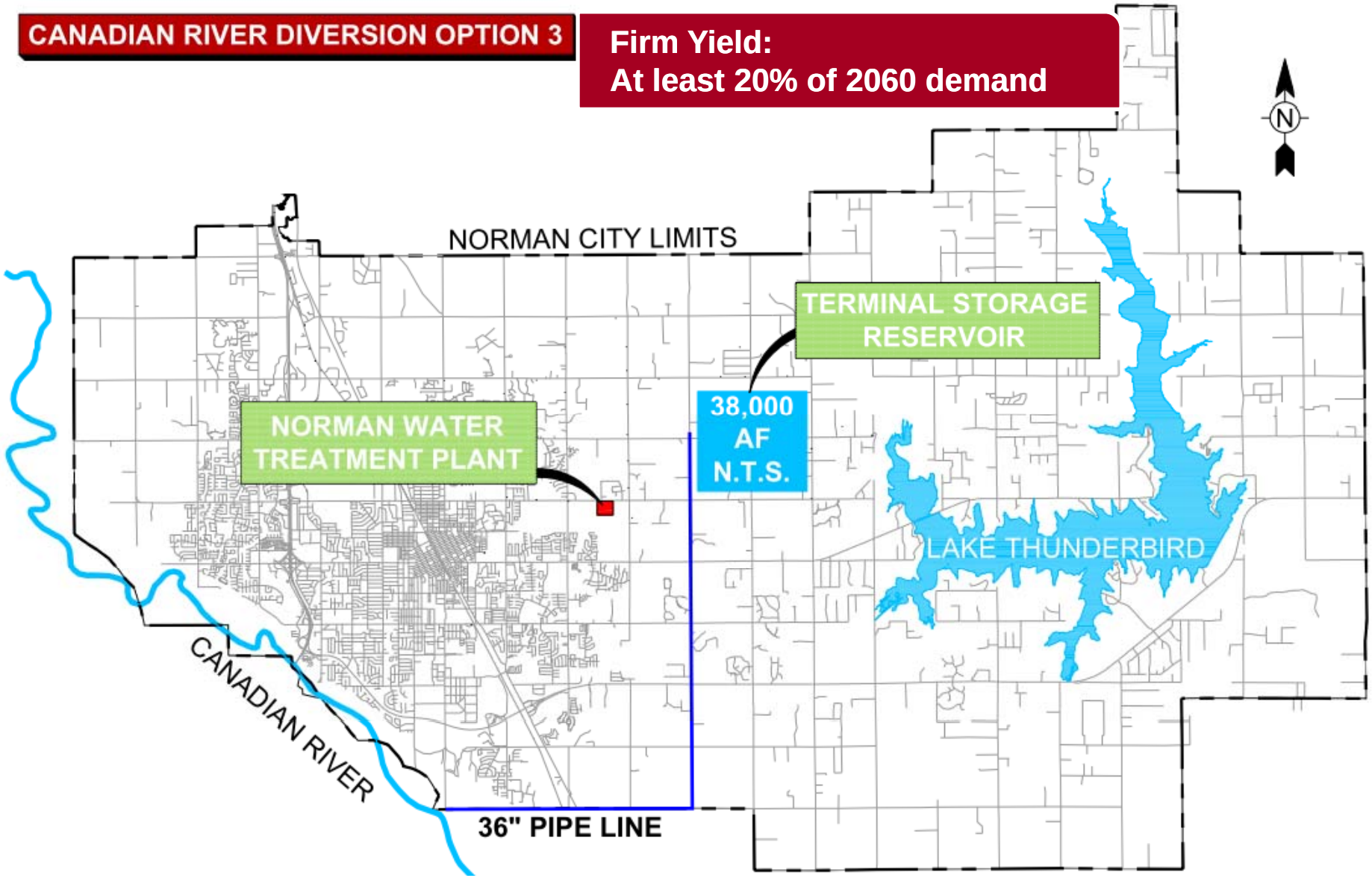
Canadian River Diversion Option 1



Canadian River Diversion Option 2



Canadian River Diversion Option 3



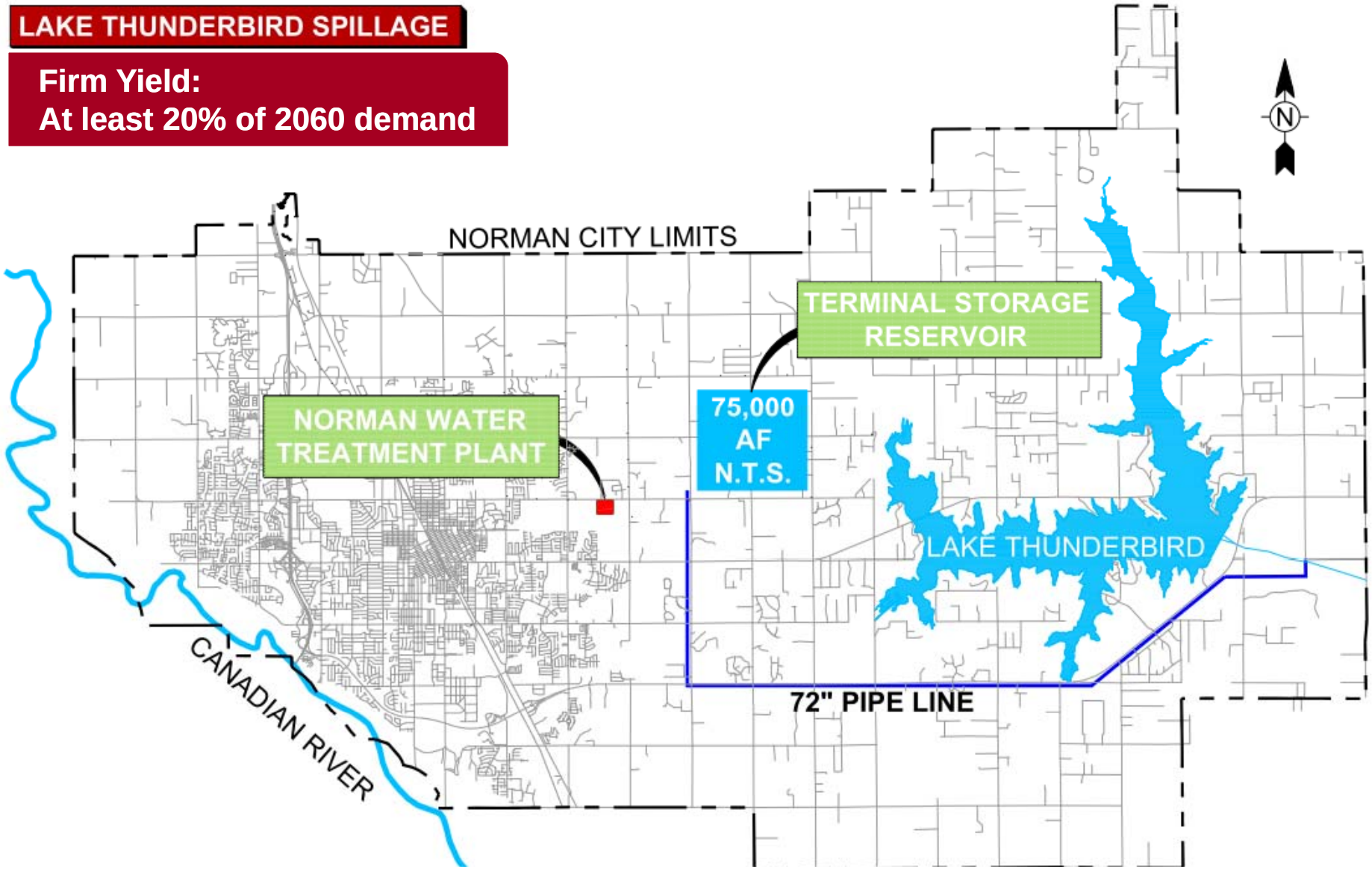
New Local Supplies (cont.)

- Lake Thunderbird Spillage
  - Capture intermittently-available spilled water from downstream of dam
  - Uses terminal storage reservoir

Lake Thunderbird Spillage

LAKE THUNDERBIRD SPILLAGE

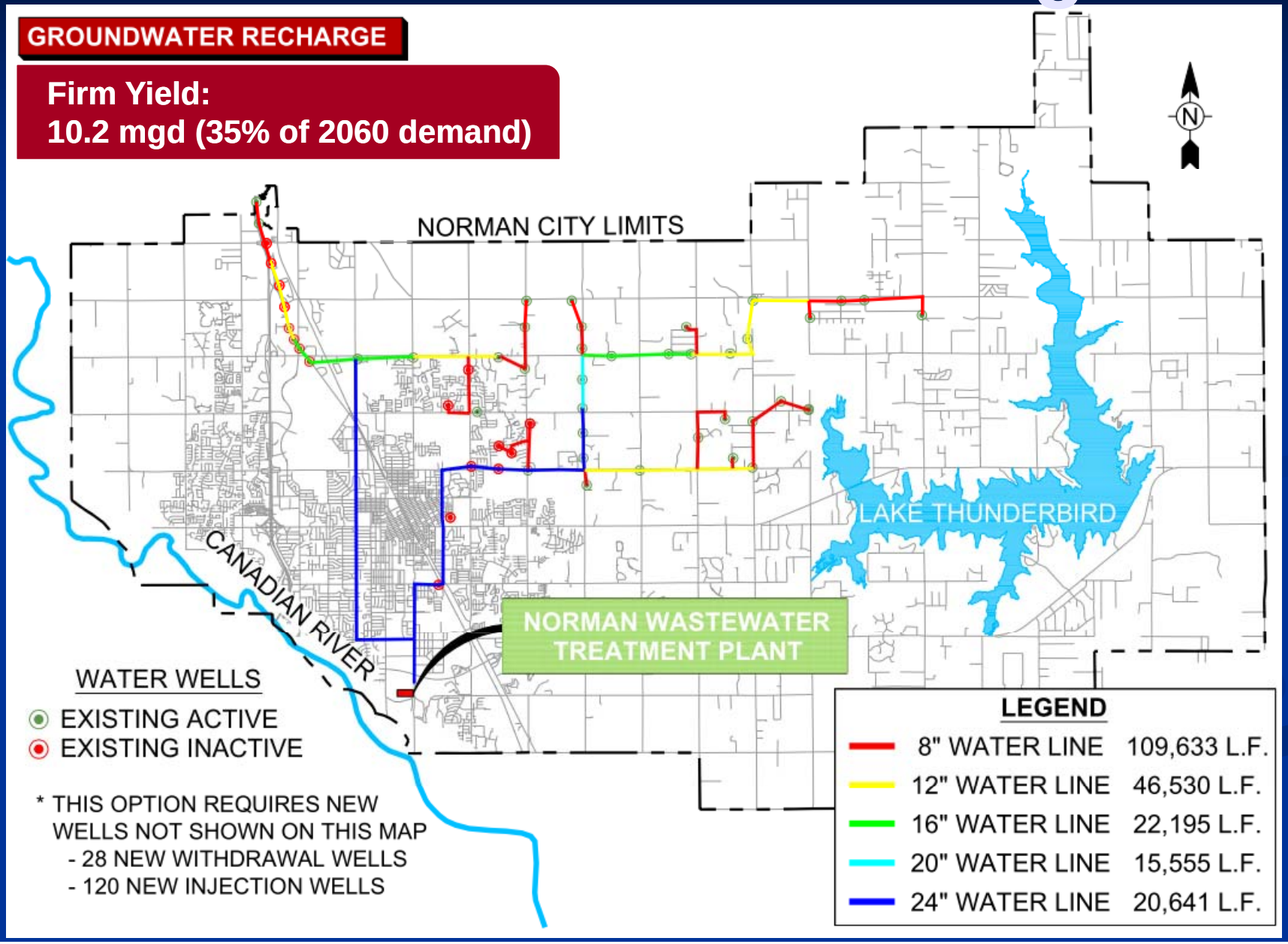
Firm Yield:
At least 20% of 2060 demand



New Local Supplies (cont.)

- Groundwater Recharge
  - Highly treated wastewater effluent suitable for recharge into Garber-Wellington aquifer
  - Firm yield available to Norman 10.2 mgd

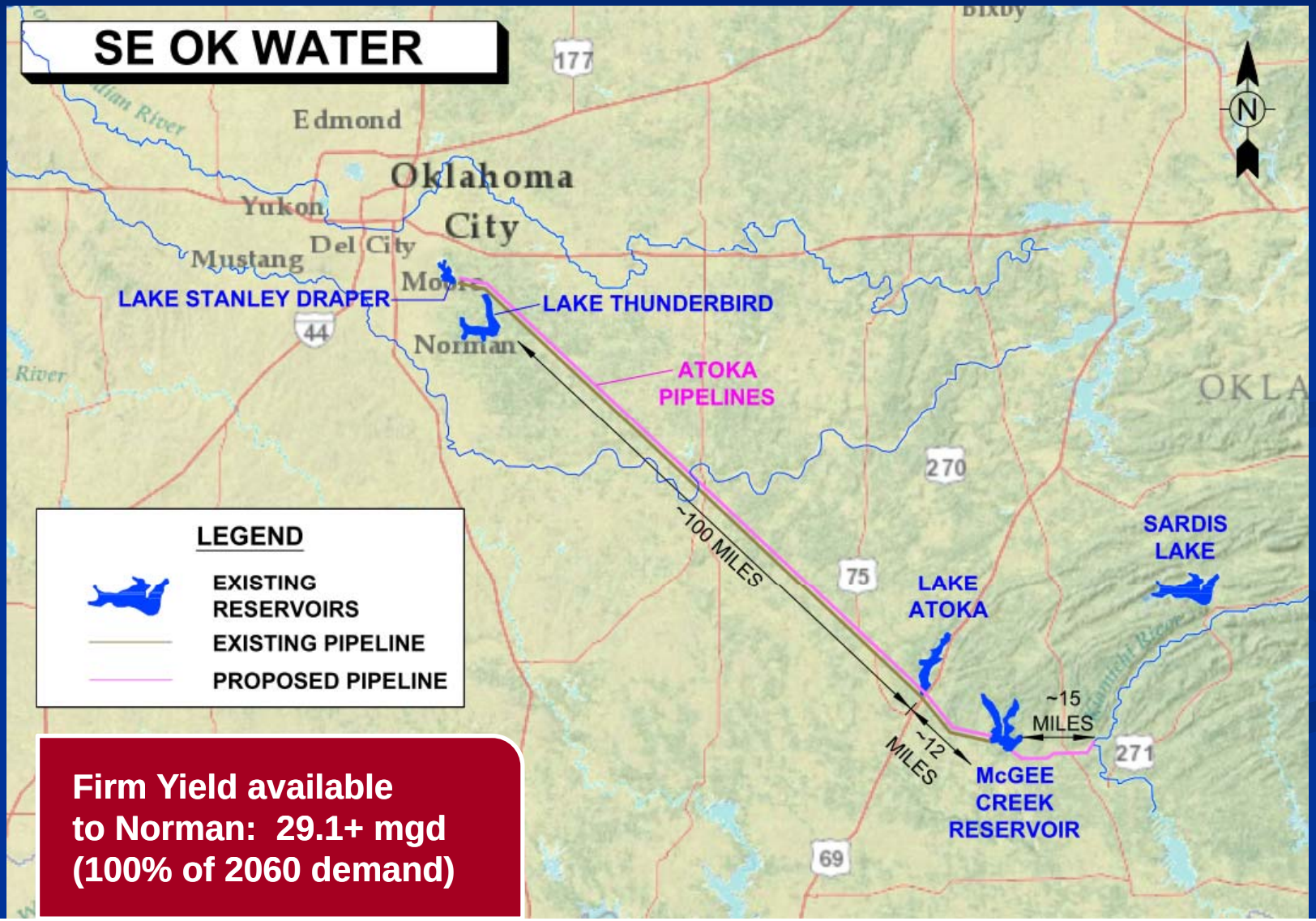
Groundwater Recharge



Regional Supply Options

- Purchase bulk treated water from OKC
  - Regional treatment (OKC Draper WTP) of southeast Oklahoma water
- Purchase bulk raw water from OKC
  - Local treatment (in Norman) of southeast Oklahoma water
  - Uses terminal reservoir

Bulk Treated Water or Raw Water from OKC

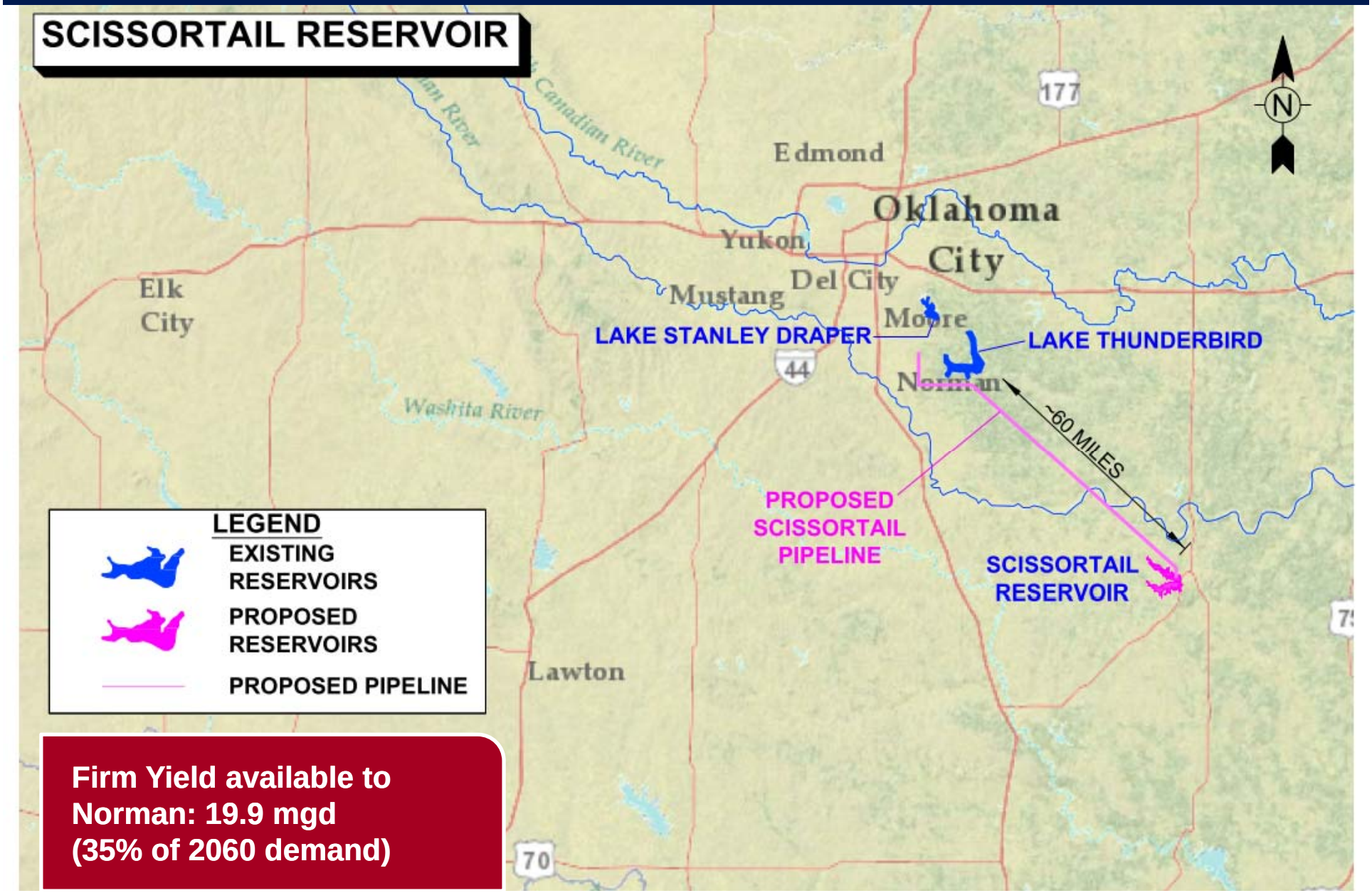


Firm Yield available to Norman: 29.1+ mgd (100% of 2060 demand)

Regional Supply Options (cont.)

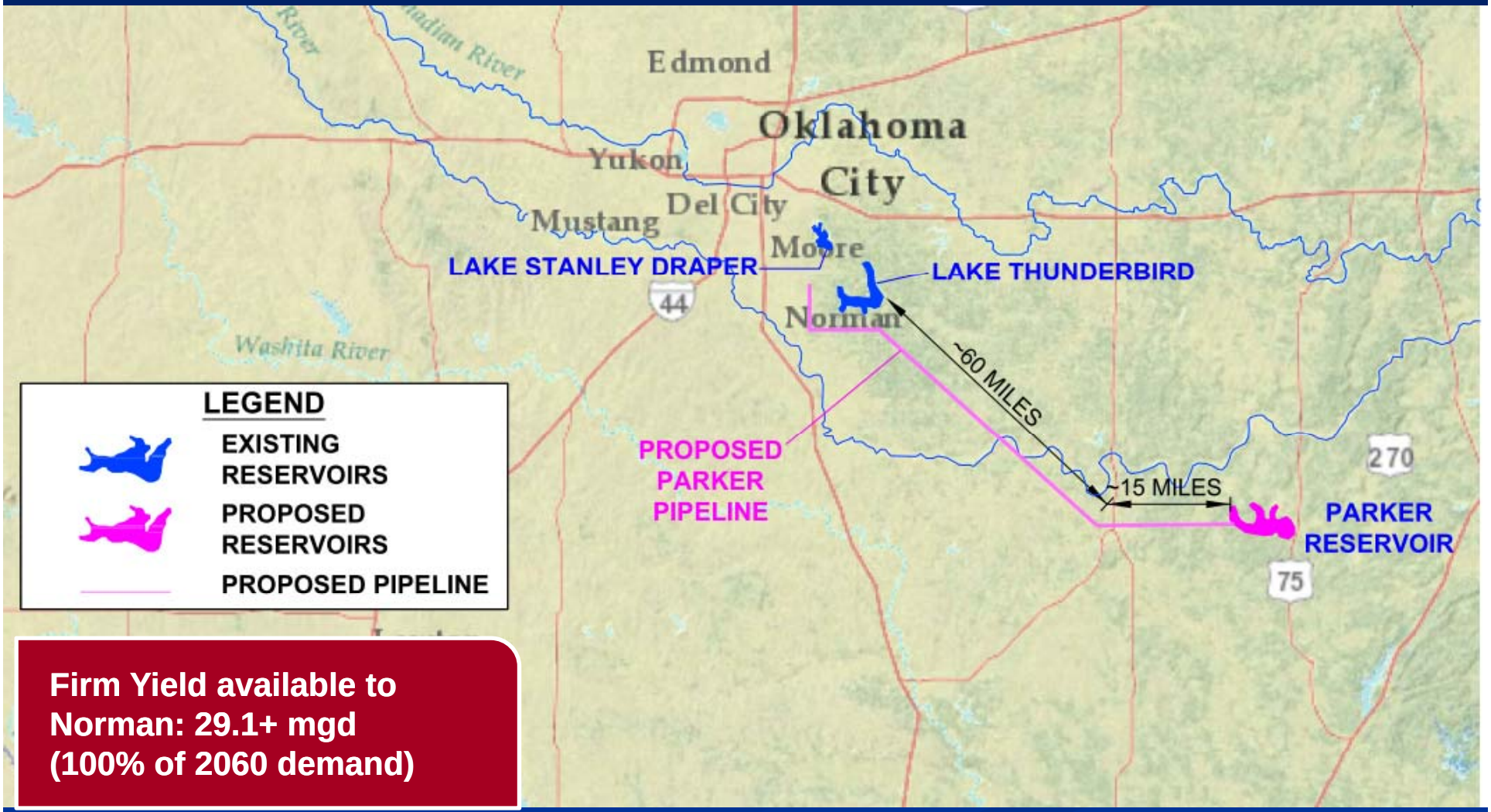
- Scissortail Reservoir
  - New reservoir 3 miles west of Ada
  - Uses terminal reservoir
  - Firm yield available to Norman 19.9 mgd
    - Assumes 28.6 mgd firm yield of reservoir, of which 8.7 mgd is allocated to Ada
- Parker Reservoir
  - New reservoir 15 miles east of Ada
  - Uses terminal reservoir
  - Firm yield available to Norman 29.1+ mgd
    - Assumes no allocation to others, 41 mgd firm yield of reservoir

Scissortail Reservoir



Firm Yield available to Norman: 19.9 mgd (35% of 2060 demand)

Parker Reservoir

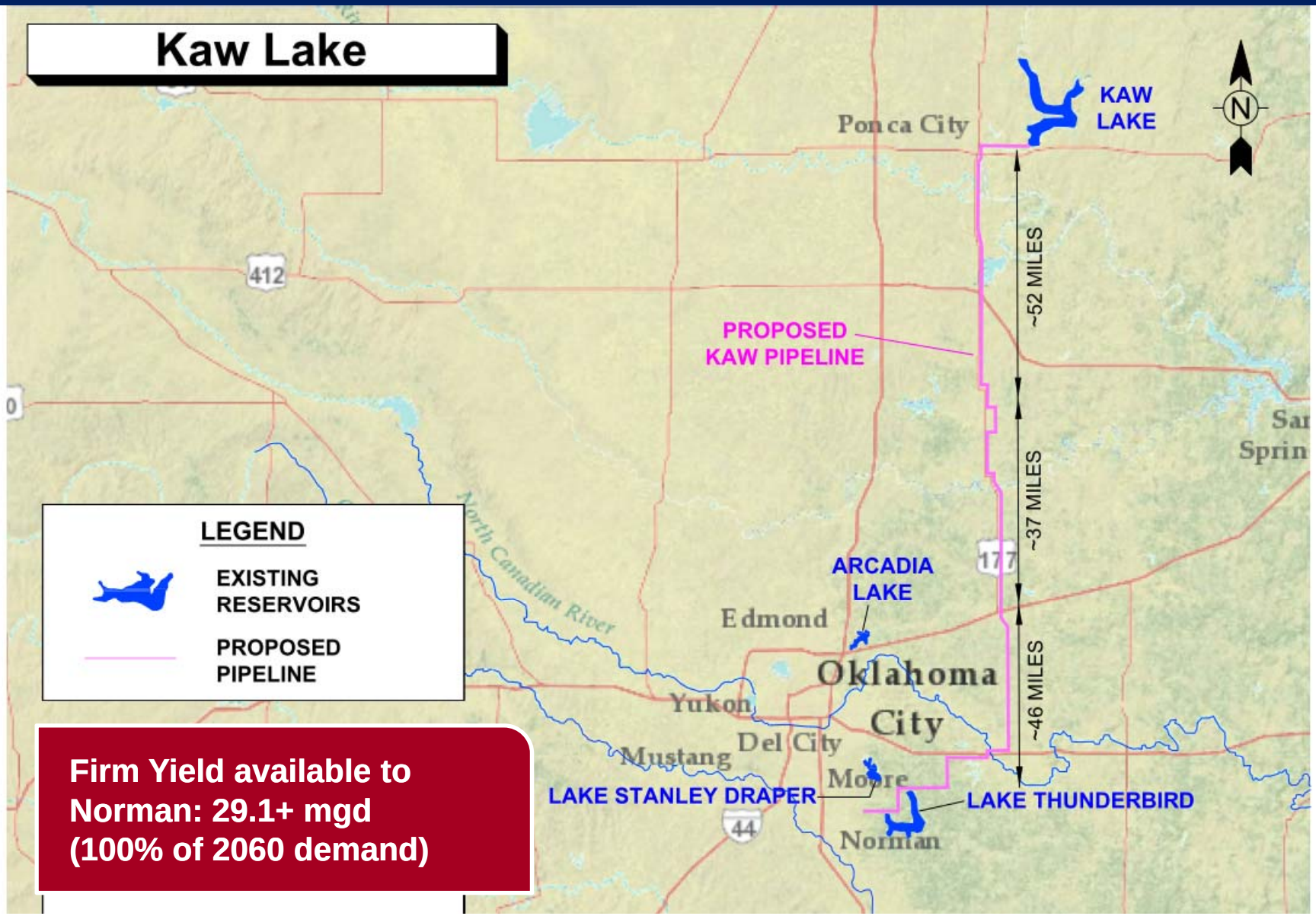


Firm Yield available to Norman: 29.1+ mgd (100% of 2060 demand)

Regional Supply Options (cont.)

- Kaw Lake
  - Convey water from Kaw Lake (shared infrastructure with Stillwater)
  - Uses terminal reservoir
  - Firm yield available to Norman potentially >29.1 mgd*
    - Firm yield of reservoir is 166.9 mgd
    - 126.2 mgd allocated to others (existing permits)
    - * 57.1 mgd pending permits to others
    - * Not all pending permits expected to go through

Kaw Lake



Firm Yield available to Norman: 29.1+ mgd (100% of 2060 demand)

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Source Options (Phase 1)

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Screening Criteria

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Detailed Evaluation Process

2-3 Preferred Supply Portfolios

Criteria for Detailed Evaluations

- Affordability
- Long-Term Supply Reliability Phasing Potential
- Timely Implementation and Certainty
- Efficient Use of Water Resources
- Environmental Stewardship
- Treated Water Quality Aesthetics
- Community Values (Recreation, Aesthetics, and Property Rights)

Relative Comparison of Individual Source Options

SUPPLY AVAILABILITY

RELIABILITY

CERTAINTY & TIMELINESS

COST-EFFECTIVENESS

- Quantitative (supply avail. & cost)
- Qualitative (reliability & certainty)
  - Scored from 1 (worst) to 5 (best)

Relative Comparison of Supply Sources (cont.)

Source Name	Percent of 2060 demand	Long-term reliability	Implement-ation status and issues	Capital cost ($/AFY of firm yield)
Lake Thunderbird Spillage	20% +	2	1	$86,000
Groundwater Recharge	35%	4	1	$34,000
Canadian River Diversion Option 1	20% +	1	2	$39,000
Direct Non-potable Reuse	5% (+ peak)	4	5	$22,000
Stormwater Capture and Reuse	20% +	2	2	$188,000
Bulk Treated Water from OKC	100%	5	4	$12,000
Bulk Raw Water from OKC	100%	5	4	$14,000
Scissortail Reservoir	68%	3	3	$18,000
Parker Reservoir	100%	4	3	$19,000
Kaw Lake	100%	5	4	$18,000

Relative Comparison of Supply Sources (cont.)

Source Name	Percent of 2060 demand	Long-term reliability	Implement-ation status and issues	Capital cost ($/AFY of firm yield)
Groundwater Recharge	35%	4	1	$34,000
Canadian River Diversion Option 1	20% +	1	2	$39,000
Direct Non-potable Reuse	5% (+ peak)	4	5	$22,000
Bulk Treated Water from OKC	100%	5	4	$12,000
Bulk Raw Water from OKC	100%	5	4	$14,000
Scissortail Reservoir	68%	3	3	$18,000
Parker Reservoir	100%	4	3	$19,000
Kaw Lake	100%	5	4	$18,000

Relative Comparison of Supply Sources (cont.)

Source Name	Percent of 2060 demand	Long-term reliability	Implemen-tation status and issues	Annual firm yield	Capital cost (2012 $M)	Capital cost ($/AFY of firm yield)
Groundwater Recharge	35%	4	1	10.2 mgd (11,500 AFY)	$384	$34,000
Direct Non-potable Reuse	5% (+ peak)	4	5	0.8 mgd (850 AFY)	$37	$22,000
Bulk Treated Water from OKC	100%	5	4	29.1 mgd (32,700 AFY)	$407	$12,000
Bulk Raw Water from OKC	100%	5	4	29.1 mgd (32,700 AFY)	$441	$14,000
New Out of Basin Reservoir	100%	4	3	19.9+ mgd (22,300+ AFY)	$630*	$19,000*
Kaw Lake	100%	5	4	29.1 mgd (32,700 AFY)	$588	$18,000

* Some cost savings may be possible if Norman partners with others to develop supply source

Supply Sources Recommended for Portfolio Development

- Existing:
  - Lake Thunderbird
  - Garber-Wellington Aquifer Wells
  - Conservation
- New Local:
  - Groundwater recharge
  - Direct non-potable reuse
  - Lake Thunderbird augmentation (pending results of COMCD study)
- Regional:
  - Bulk treated water from OKC
  - Bulk raw water from OKC
  - New out of basin reservoir
  - Kaw Lake

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