

RESILIENT WATER SUPPLY FOR AN UNCERTAIN FUTURE

Dave Taylor
Waurika Lake Master Conservancy District

Waurika Lake provides invaluable benefits

Corp of Engineers (1977)

Purposes:

- **Water Supply**
- **Flood Control**
- **Irrigation**
- **Water Quality**
- **Recreation**
- **Fish & Wildlife**

Water Supply:

- 151,400 AF of storage
- 40,549 AF/YR yield

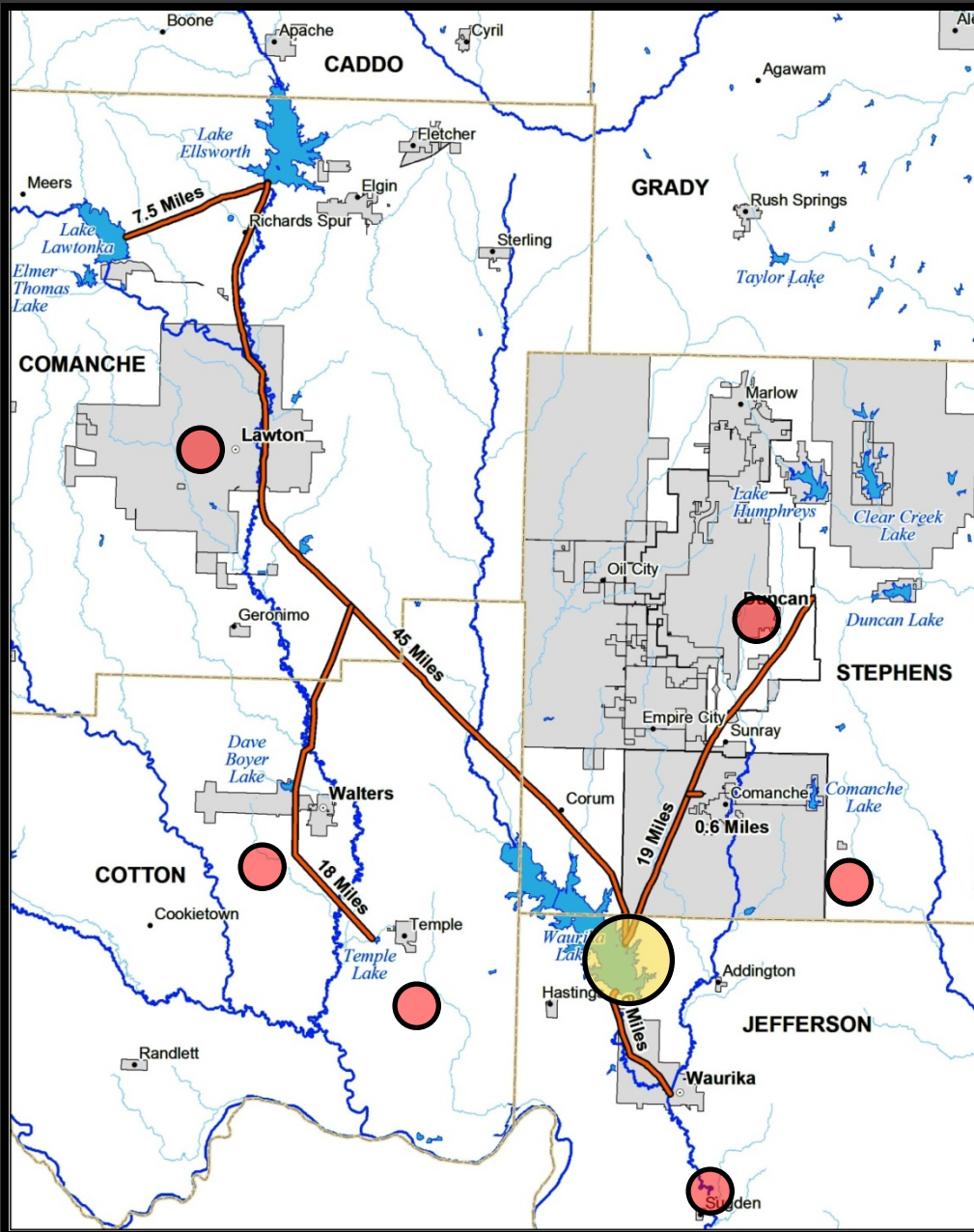


A vital water source.

A prime example of cities working together.

Through the Waurika Lake Master Conservancy District, water is conveyed to member communities through 100 miles of pipeline.

- Comanche
- Duncan
- Lawton
- Temple
- Walters
- Waurika



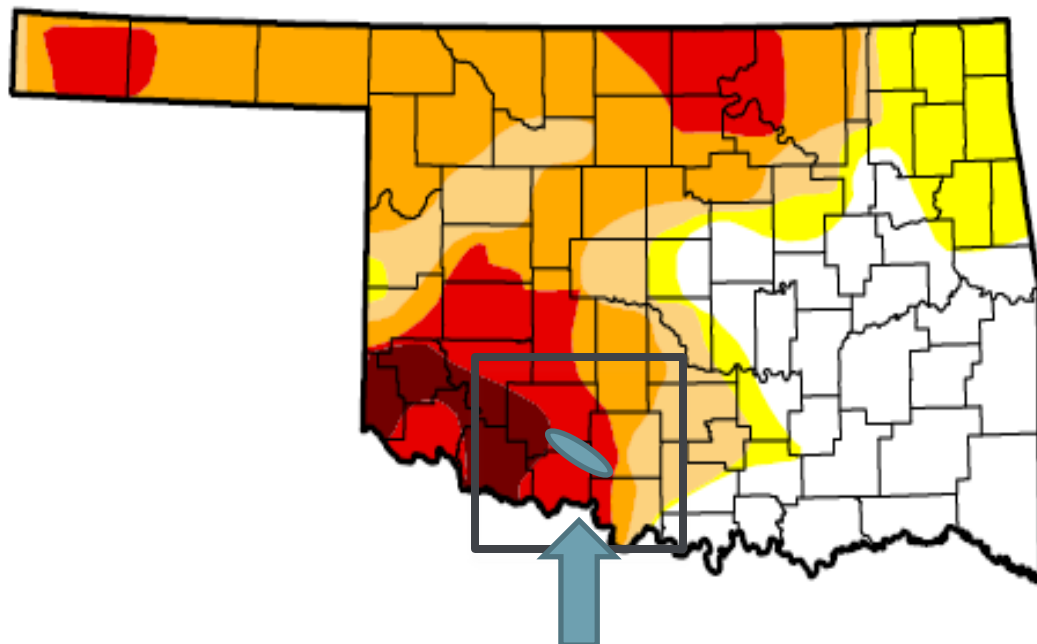
Oklahoma

(Released Thursday, May 7, 2015)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	29.24	70.76	59.05	46.19	17.95	4.03
Last Week 4/26/2015	30.08	69.92	59.29	47.51	24.34	4.13
3 Months Ago 2/3/2015	5.03	94.97	63.11	45.34	22.58	5.69
Start of Calendar Year 12/30/2014	25.63	74.37	62.03	40.84	21.74	5.70
Start of Water Year 9/30/2014	8.55	91.45	73.31	58.13	20.92	4.64
One Year Ago 5/6/2014	6.67	93.33	80.65	65.94	48.86	29.85



~ 250,000 People

Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

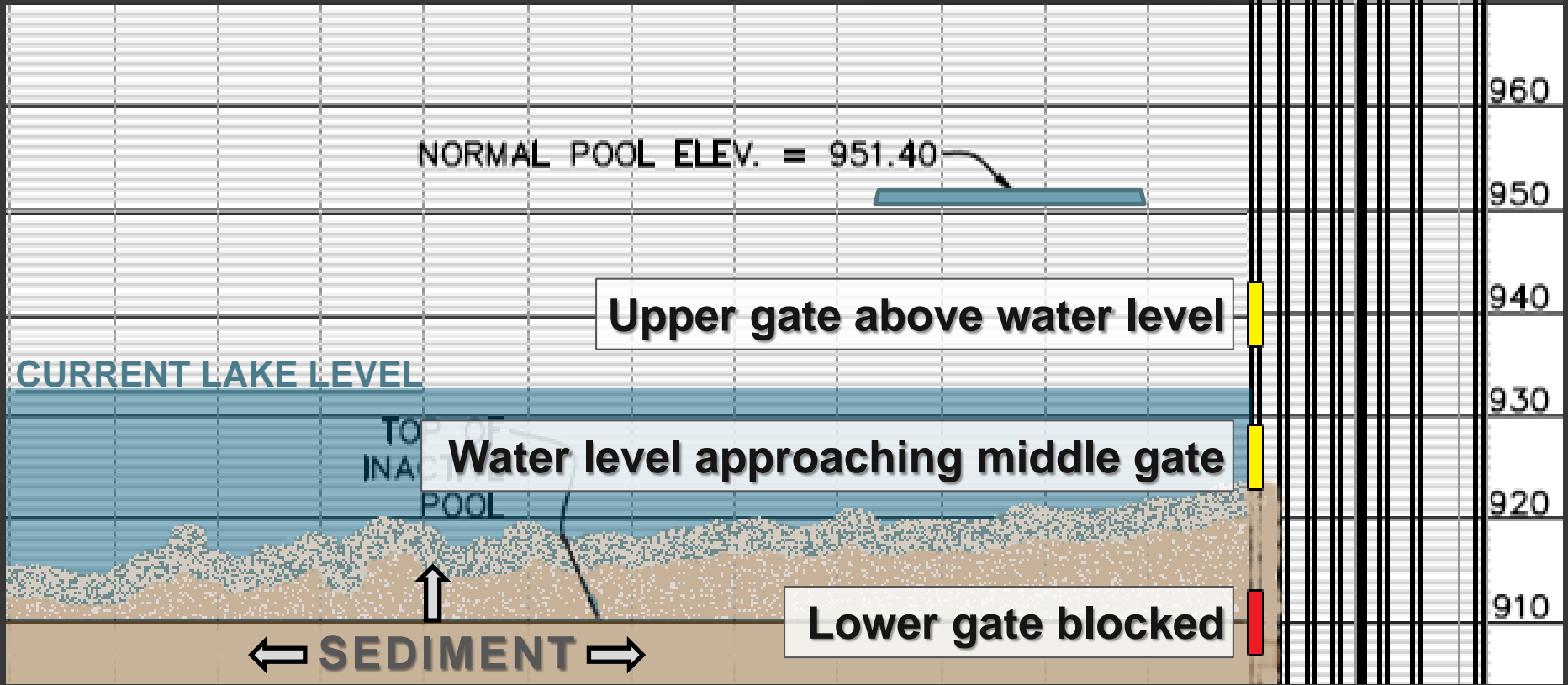
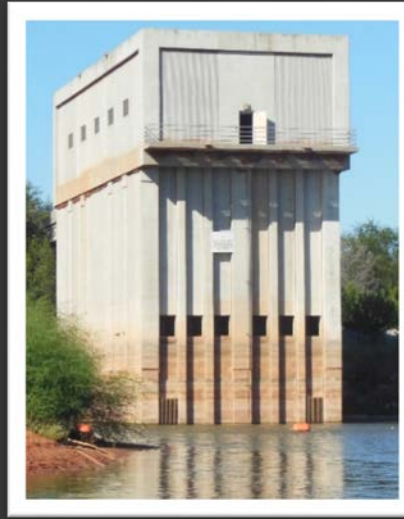
Author:

Mark Svoboda

National Drought Mitigation Center



The Intake Structure: Burning the candle at both ends



Borrowed over \$50 Million 2010 and 2015

1. Final Storage Purchase: \$28 Million
2. Refinance West Conveyance: \$13 Million
3. Dredging, Gates, Pipeline*: \$10 Million

*Project that increased resilience!

Storage and Conveyance Loans

For Both:

1. Hired Bond Counsel
2. Hired Financial Advisor
3. Examined Financing Options
 - Bank Loan
 - WLMCD sell Bonds outright
 - OWRB Loan program
 - State Revolving Fund
 - Financial Assistance program

Storage: OWRB Loan at 3.3%, 30 years,
20 basis points

Conveyance (refinance) BB&T 3%, 25 years,
no reserve

Dredging, Gates, Pipeline

1. Would be “out” of water by 6/2016
2. Project recovers 25,000 acft
3. Added resiliency

Sources:

District Funds \$ 1.0 Million
USBR Grant \$ 0.3 Million
OWRB Loan \$ 9.0 Million

3.2%, 20 basis points, mix of 20 and 25 years

Loan Terms FAP Loans

- Minimum payback 6 months
- Maximum payback 30 years
- Variable or fixed interest rates available
- Up to 10% reserve required
- 1.25x rate covenant required

Necessary and Critical Partnerships:

- Keithline Engineering
- WDB Engineering
- US Army Corps of Engineers
- OWRB, unanimously
- ODEQ
- 5 City Councils, all voted unanimously
- WLMCD Board
- Project Steering Committee
- Bond Counsel and Financial Advisor
- KSWO, Duncan Banner, Lawton
Constitution, Walters and Comanche
Times

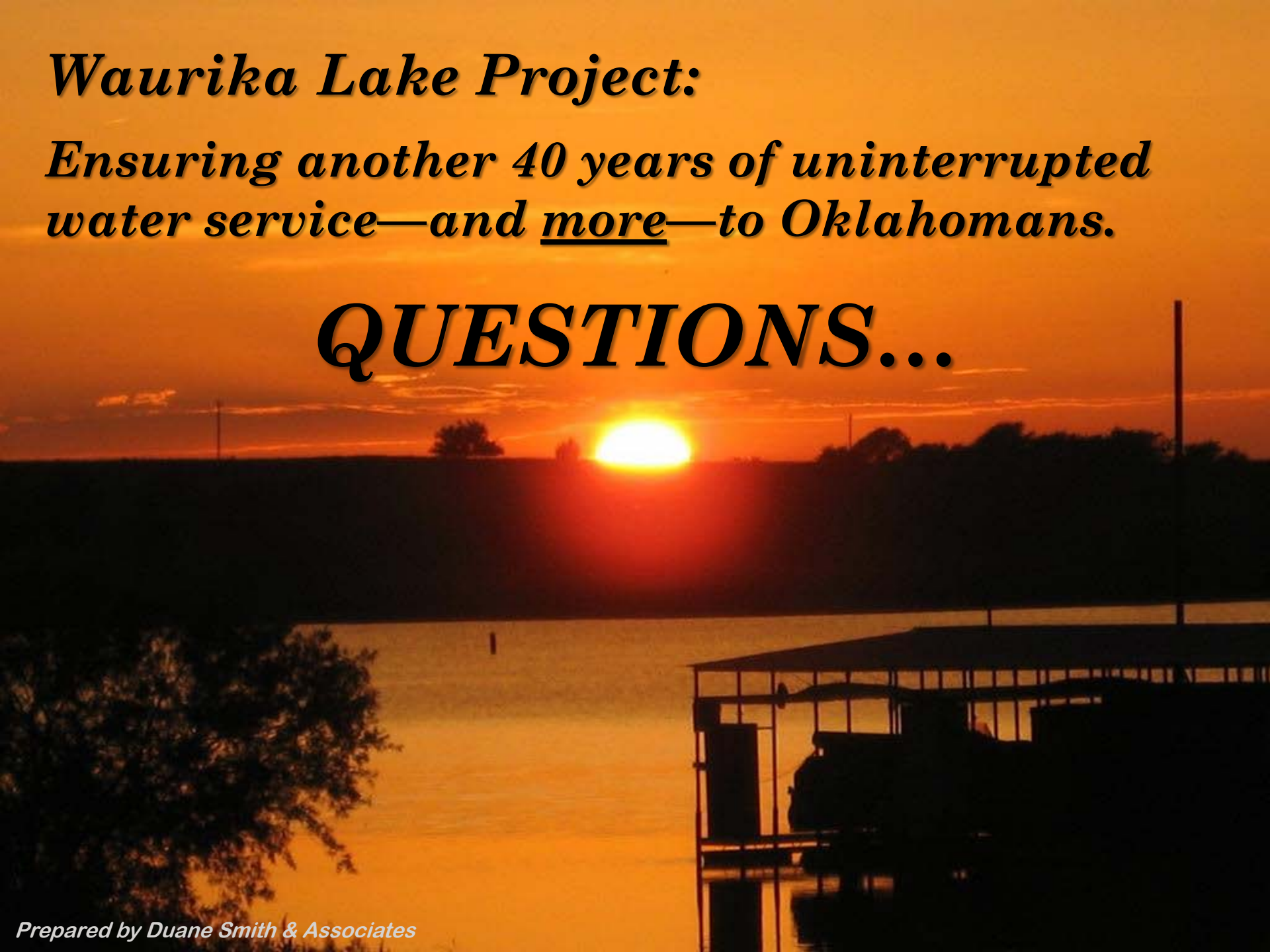
Advice, Pitfalls, needs

1. Start Early
2. Good capital plan
3. Realistic schedule
4. You do not control the markets
5. Good book keeping
6. Audits up to date
7. Do not skimp on auditor costs
8. Permitting, engineering , financing are together
9. City or other approvals are ready
10. Quality Bond Counsel and Financial advice is expensive
11. Get Public Support early and often
12. Be really good friends with all media
13. Spend time with all city managers, councils, engineers
14. Rotary, Kiwanis, Optimist, Ambucs...speak to all!!

Waurika Lake Project:

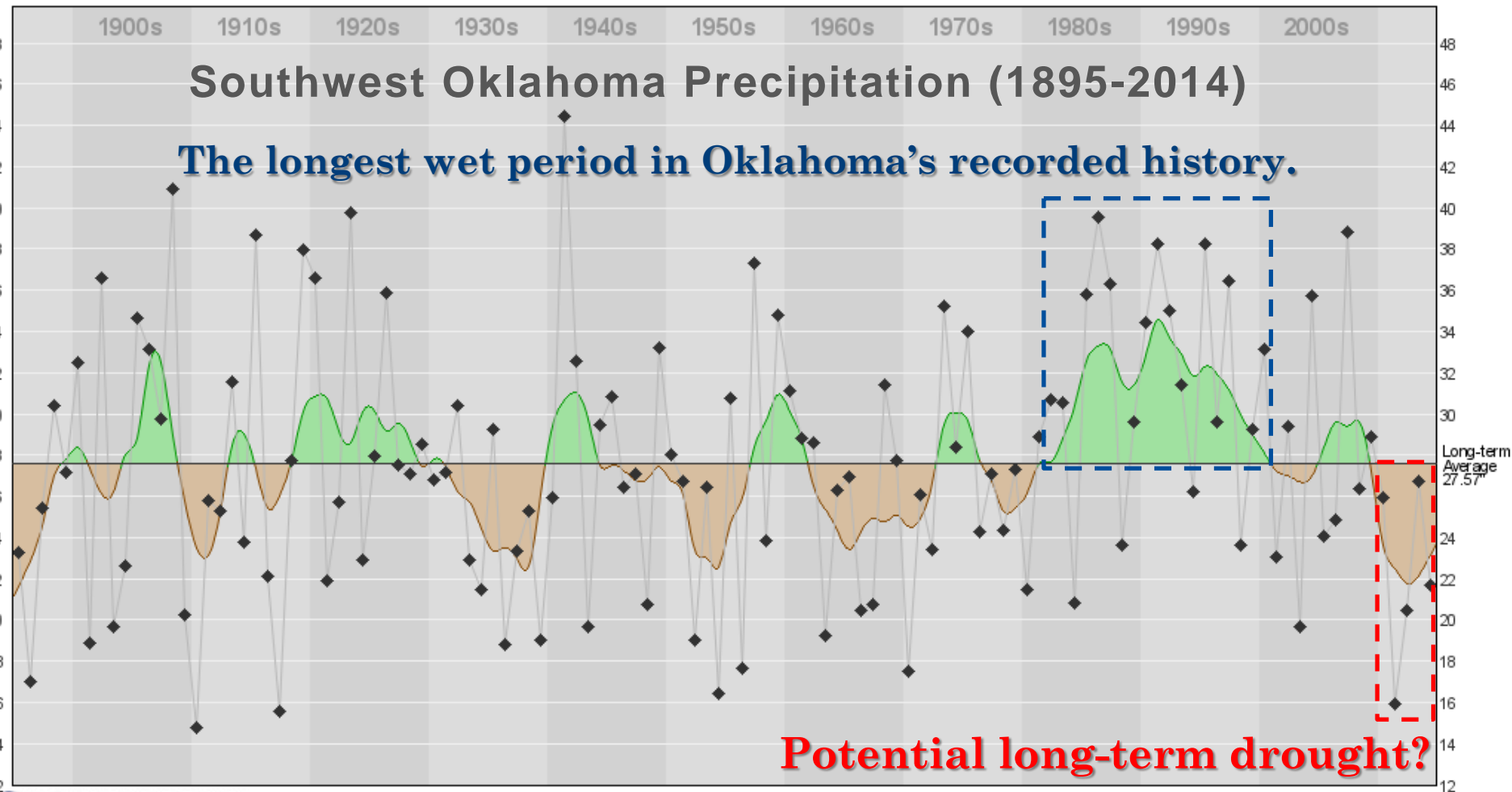
Ensuring another 40 years of uninterrupted water service—and more—to Oklahomans.

QUESTIONS...



BACKUP SLIDES

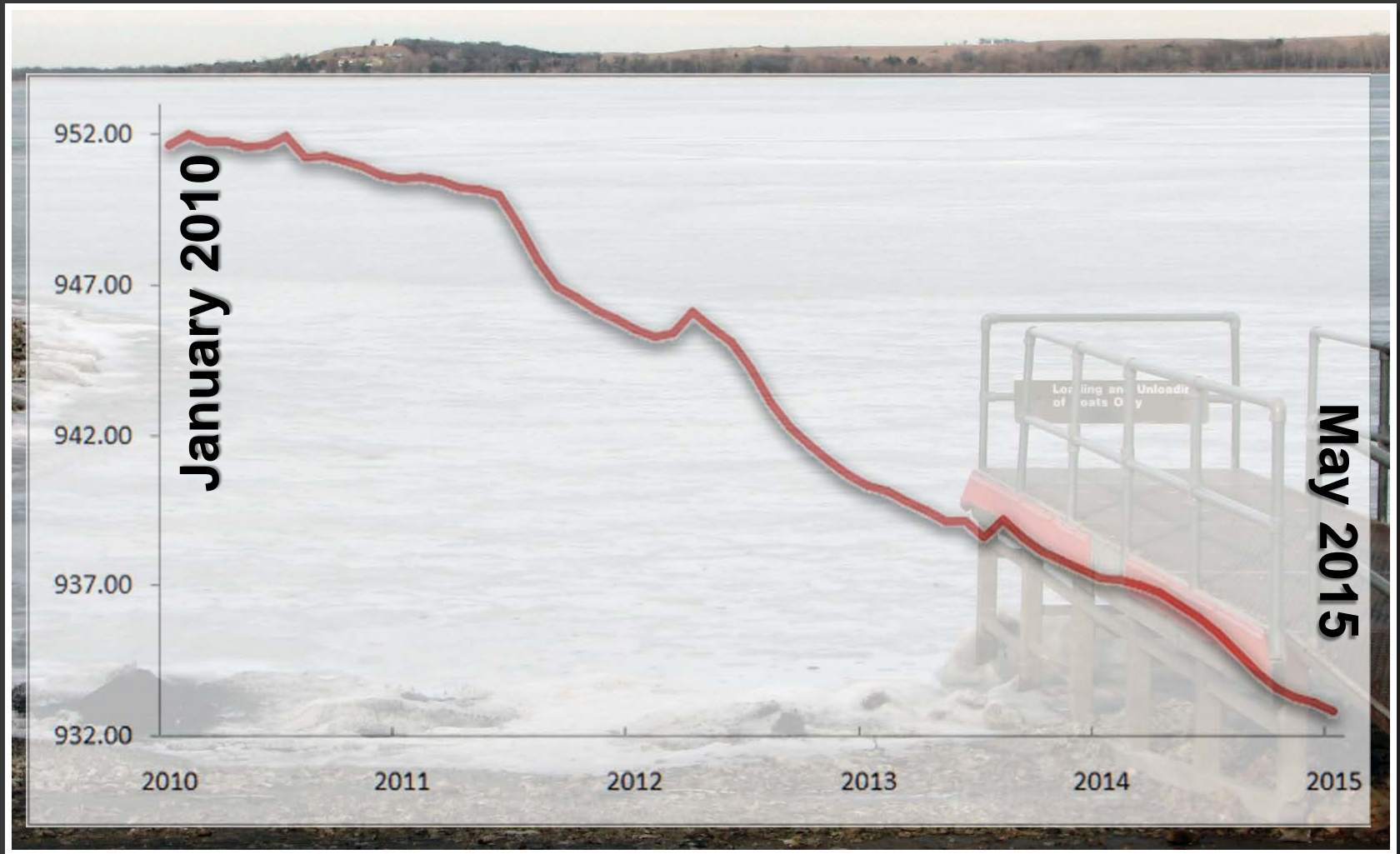
Drought: the new normal?



OKLAHOMA CLIMATOLOGICAL SURVEY Annual Precipitation History with 5-year Tendencies
OK-CD7 (7-Southwest): 1895-2014

Wetter periods Drier periods
◆ Annual precipitation value

Waurika Lake's future ability to provide water supply is in jeopardy.



Waurika Lake Levels
January 2010 - Current

*Waurika Lake's future ability to provide water supply is **still** in jeopardy.*

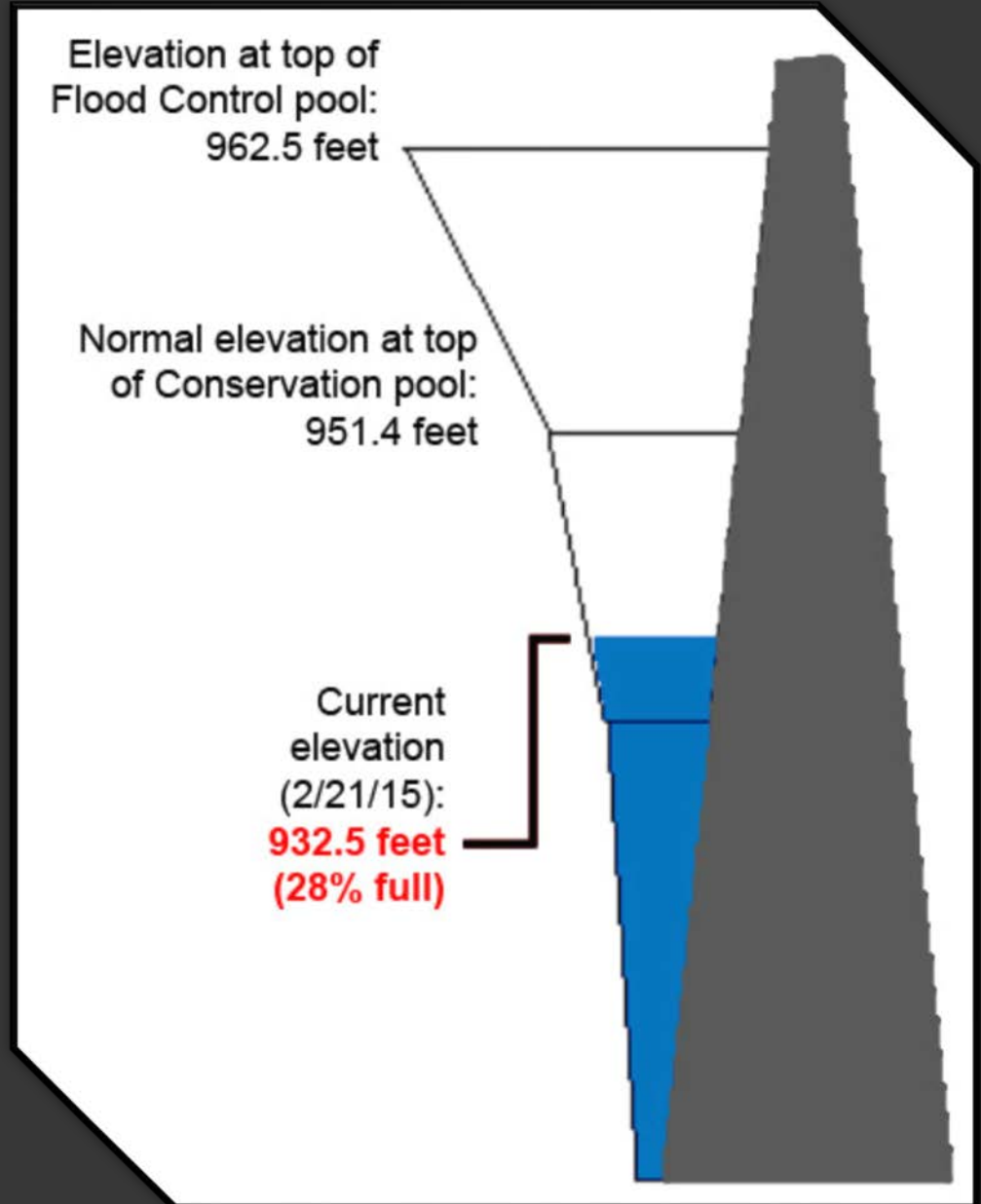


Waurika Lake Levels
January 2010 - Current

But drought is just one of the problems...

While the lake was at 28% full, sedimentation of the intake structure and channel reduced the current amount of available water supply to < 11%.

Less than 12 months of service remained.



Waurika Lake Sediment and Storage Project

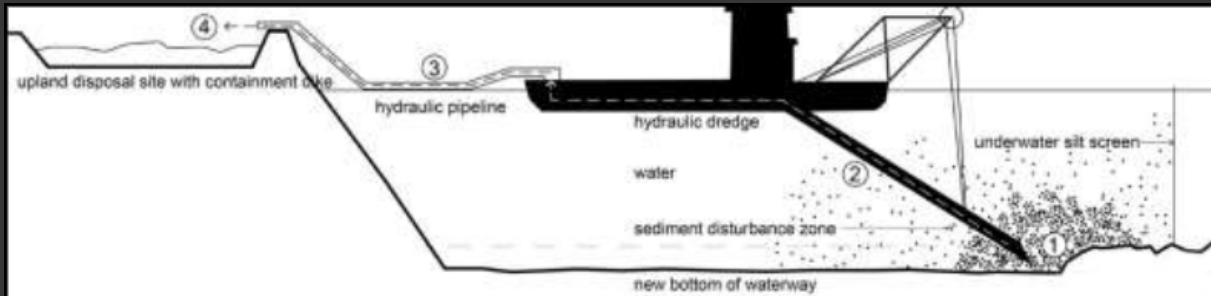
1. Remove sediment from channel!
2. Replace broken and corroded gates.
3. Find most economical way.
4. We shall not go down this pathway again!

Motivating Influences:

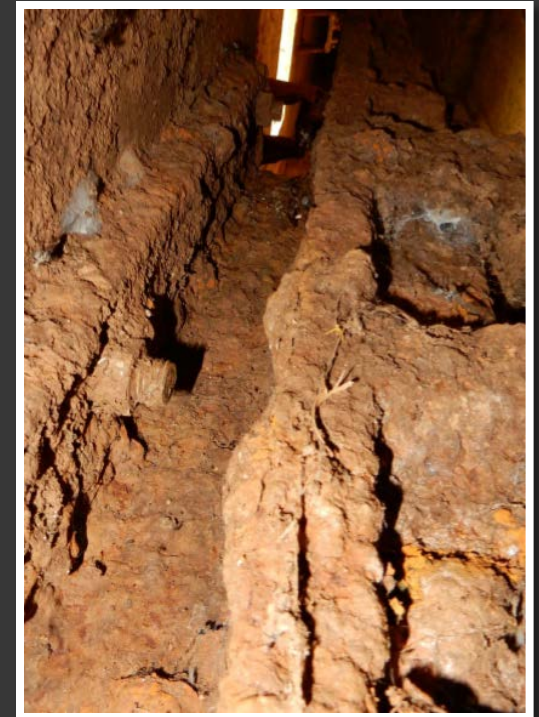
1. We were not going to let 250,000 people run out of water.
2. The project was going to be \$12,000,000 or less.
3. We would provide subsequent generations sufficient documentation.
 1. Design
 2. Design options, i.e. why we chose the design

The Remedies

Dredge Channel



Add Alternate Intake

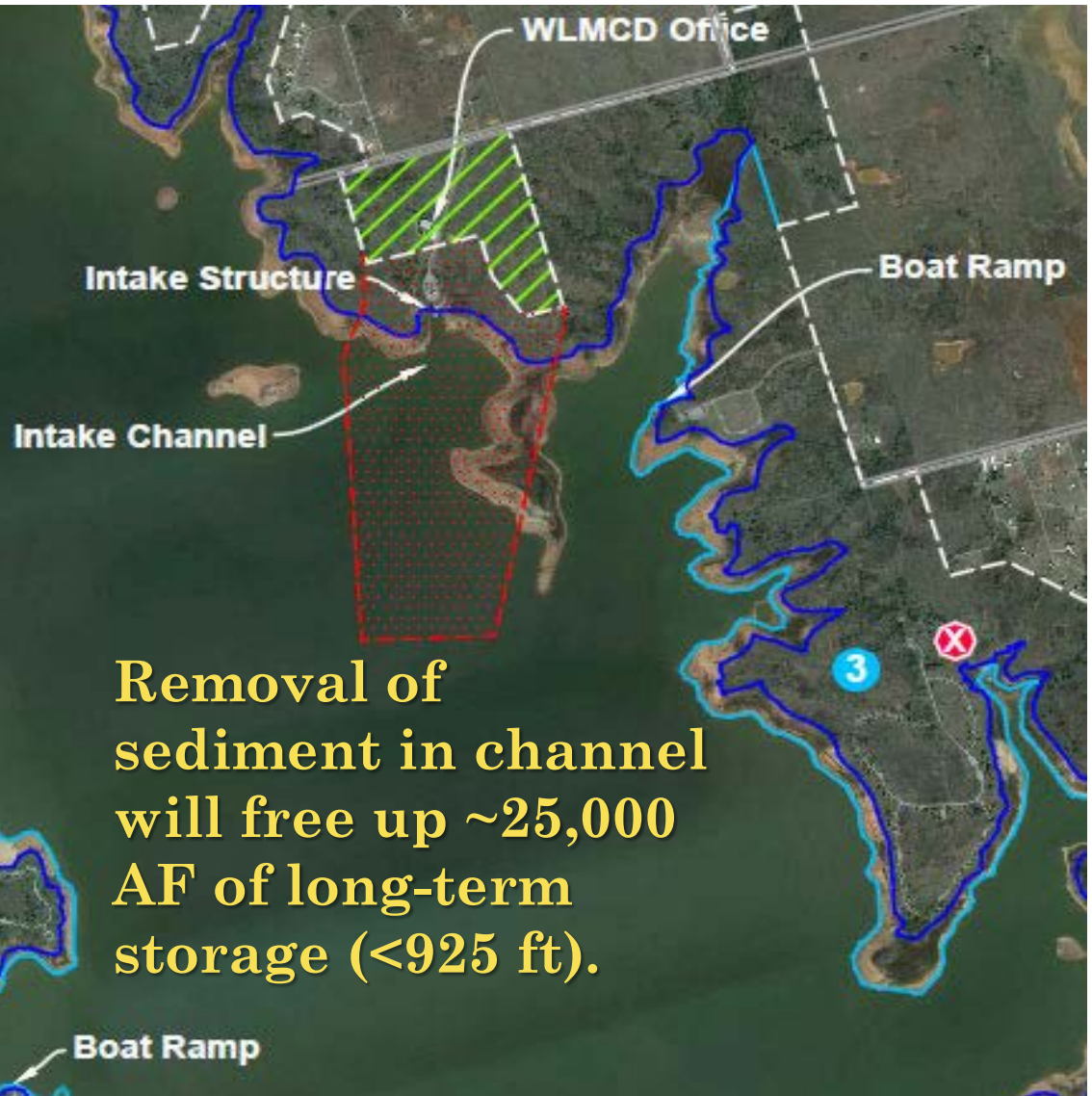


Replace Old Gates

REMEDY 1:

DREDGE THE INTAKE CHANNEL

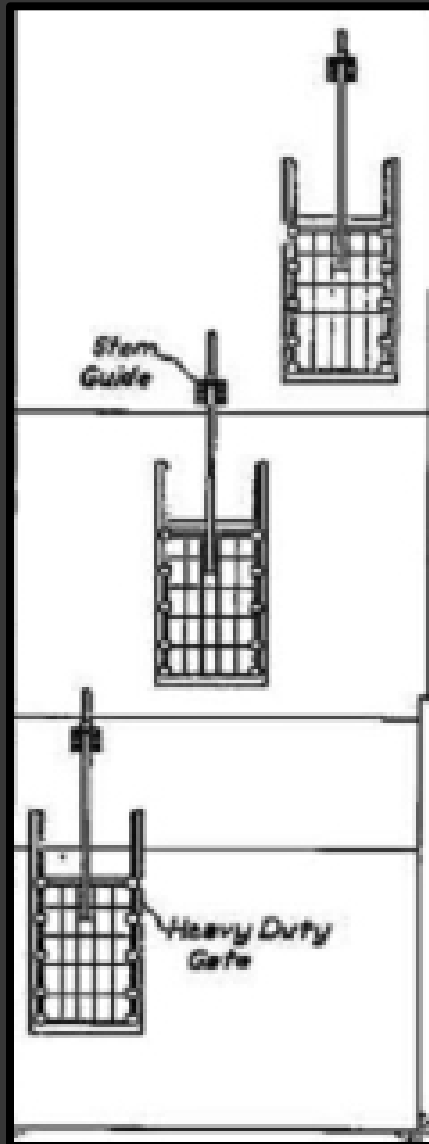
Deeper channel and improved infrastructure will allow access to lake's entire conservation pool.



Removal of sediment in channel will free up ~25,000 AF of long-term storage (<925 ft).

REMEDY 2:

REPLACE INTAKE GATES



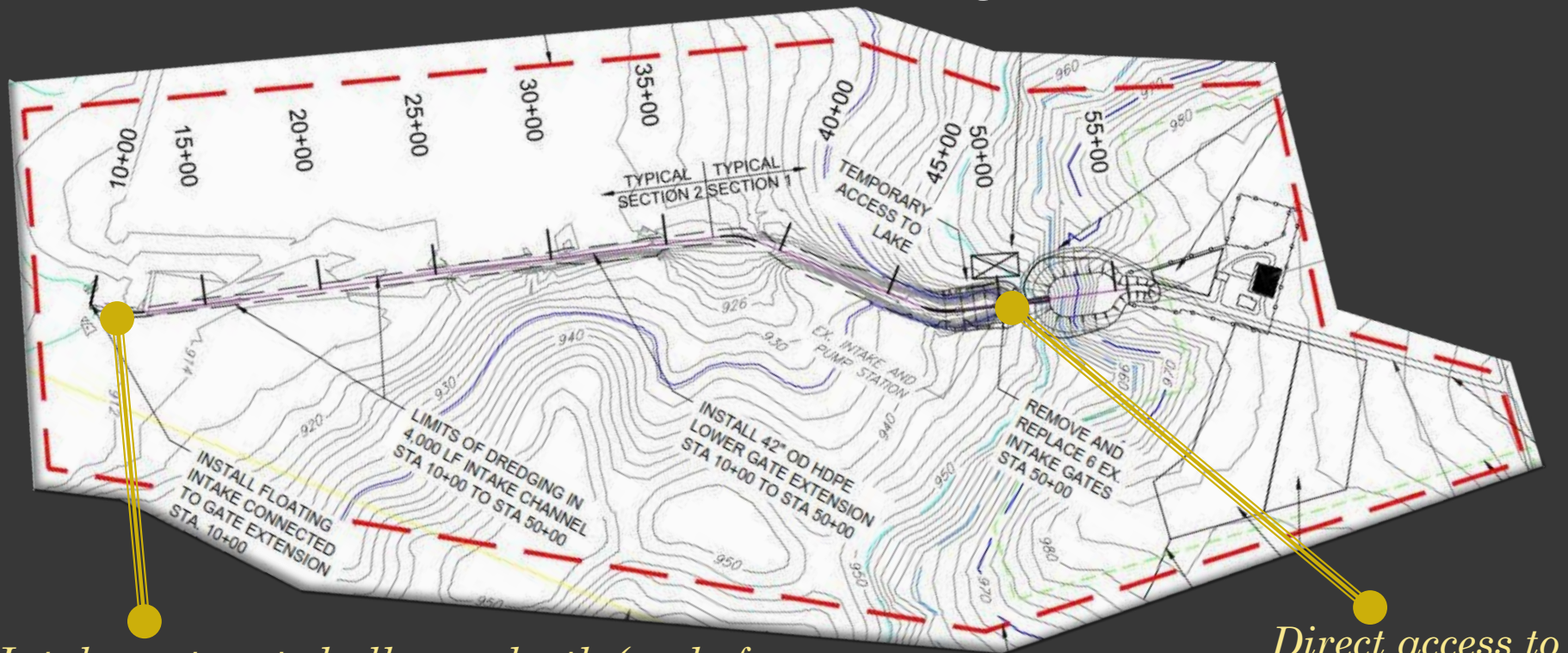
Replace corroded, leaking intake gates with stainless steel (much more resistant to corrosion); improve maintenance.

Necessary regardless of drought, but the opportunity is now as the lake's critically low level facilitates access, perhaps saving millions of dollars.

REMEDY 3:

ALTERNATE INTAKE STRUCTURE

Construct additional floating intake and pipeline along intake channel to allow unhindered long-term access between available water and existing intake structure.



Intake water at shallower depth (and of better quality) through new floating structure

Direct access to current intake gate

ESTIMATED BUDGET



Maintenance Preparation,
Monitoring & Management:
\$1,500,000

Maintenance Dredging & Related
Activities:
\$4,400,000

Intake Structure Repair & Lower
Gate Extension:
\$5,800,000

Post Maintenance Operations:
\$300,000

Total = \$12 million

ACTUAL BIDS



Local Contractor
Experienced Diver
Experienced Dredger
Gate Cost
Pipe Cost

Maintenance Preparation,
Monitoring & Management:
\$1,240,000

Maintenance Dredging & Related
Activities:
\$3,800,000

Intake Structure Repair & Lower
Gate Extension:
\$4,800,000

Post Maintenance Operations:
\$360,000

Total = \$10.2 million