JOPLIN CITY COUNCIL
INFORMAL MEETING
MONDAY, JUNE 6, 2022
5TH FLOOR COUNCIL CHAMBERS
602 S. MAIN ST.
5:15 P.M.

This meeting can be livestreamed at http://www.joplinmo.org/182/Video-Multimedia

AGENDA

1. Southwest Missouri Water Coalition Update

Notice posted at 12:13 pm. on this 2nd day of June 2022. (RSMo 610.020)

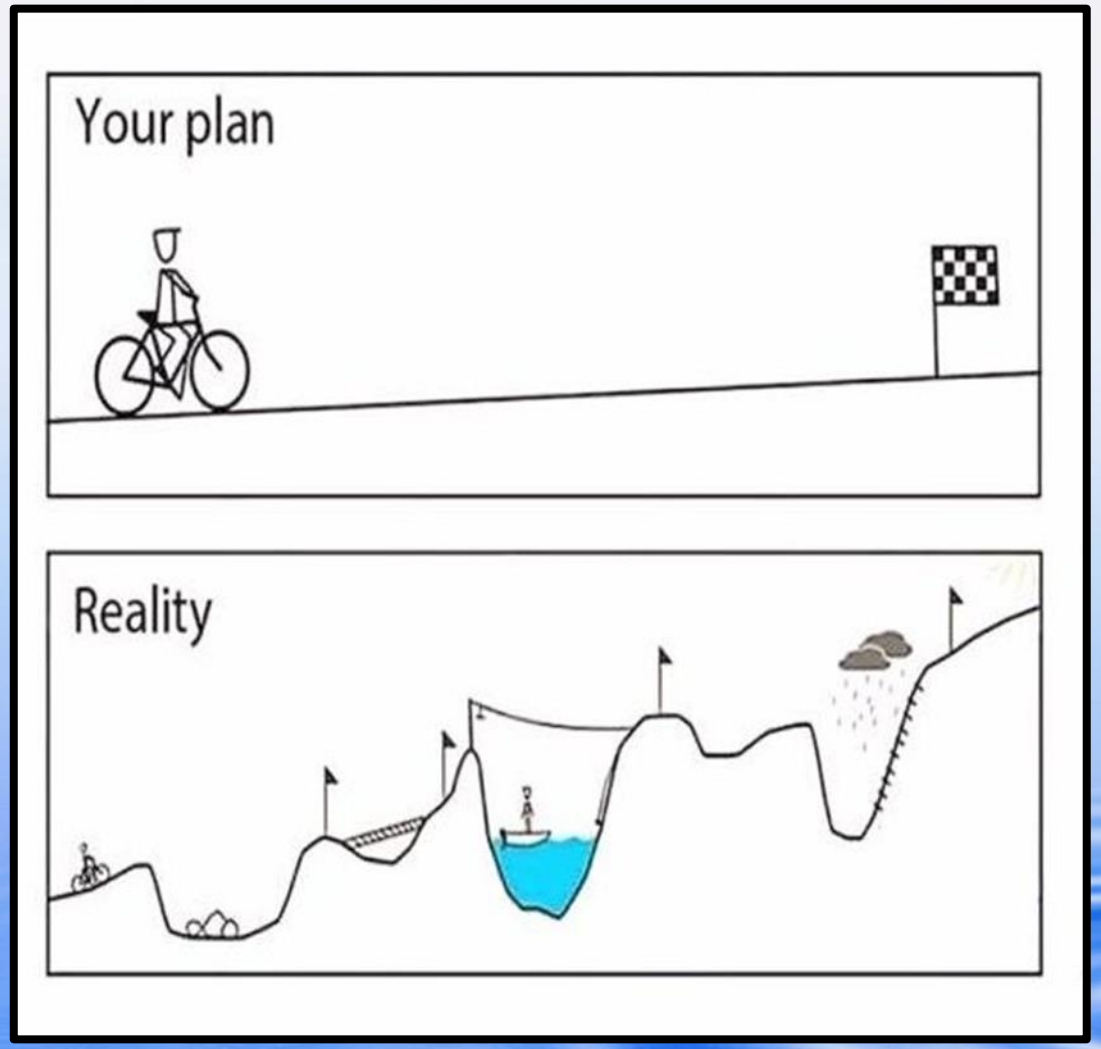
Ad Omnia Parata

Securing Our Future

Steps To



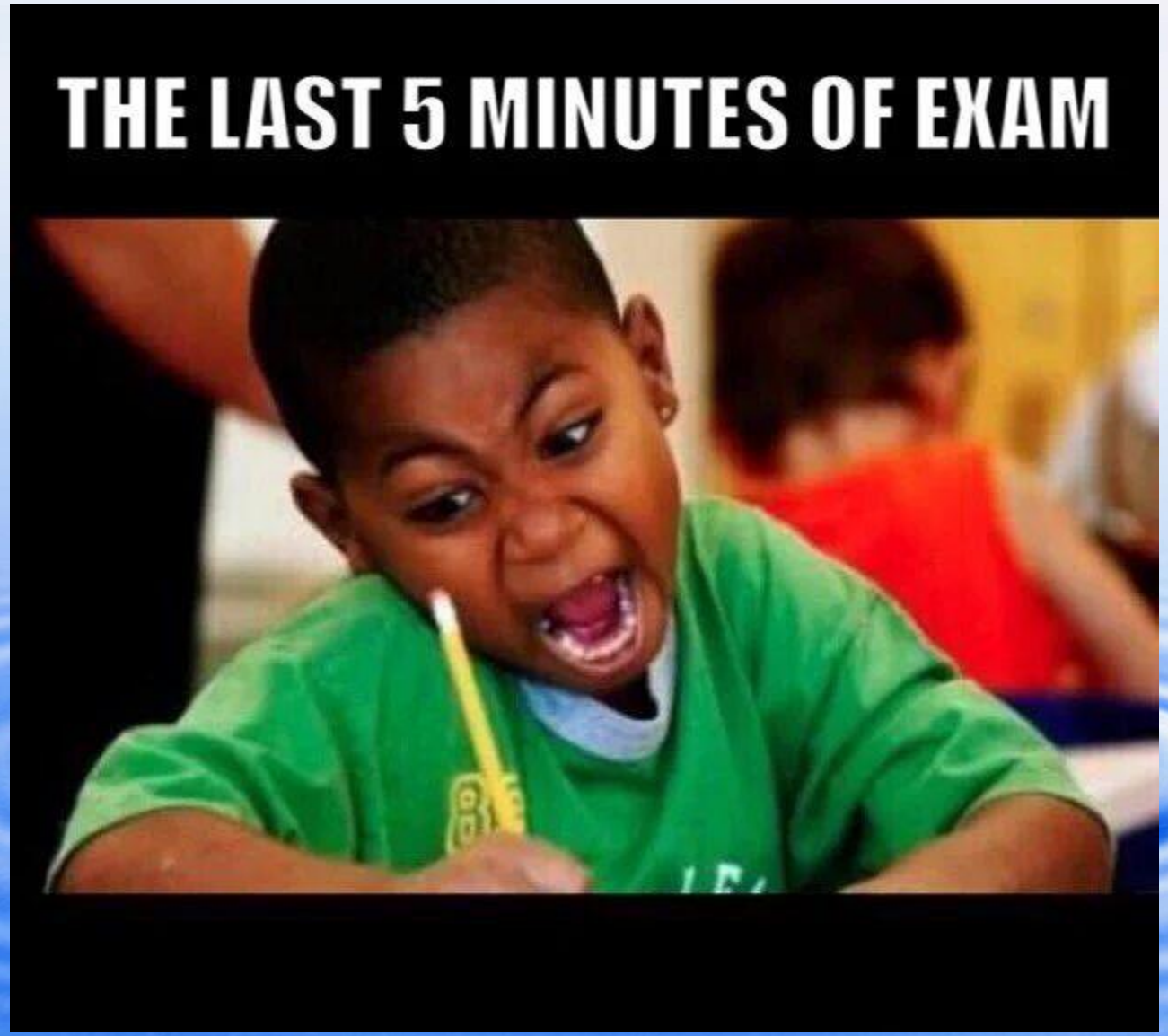
Building a Foundation

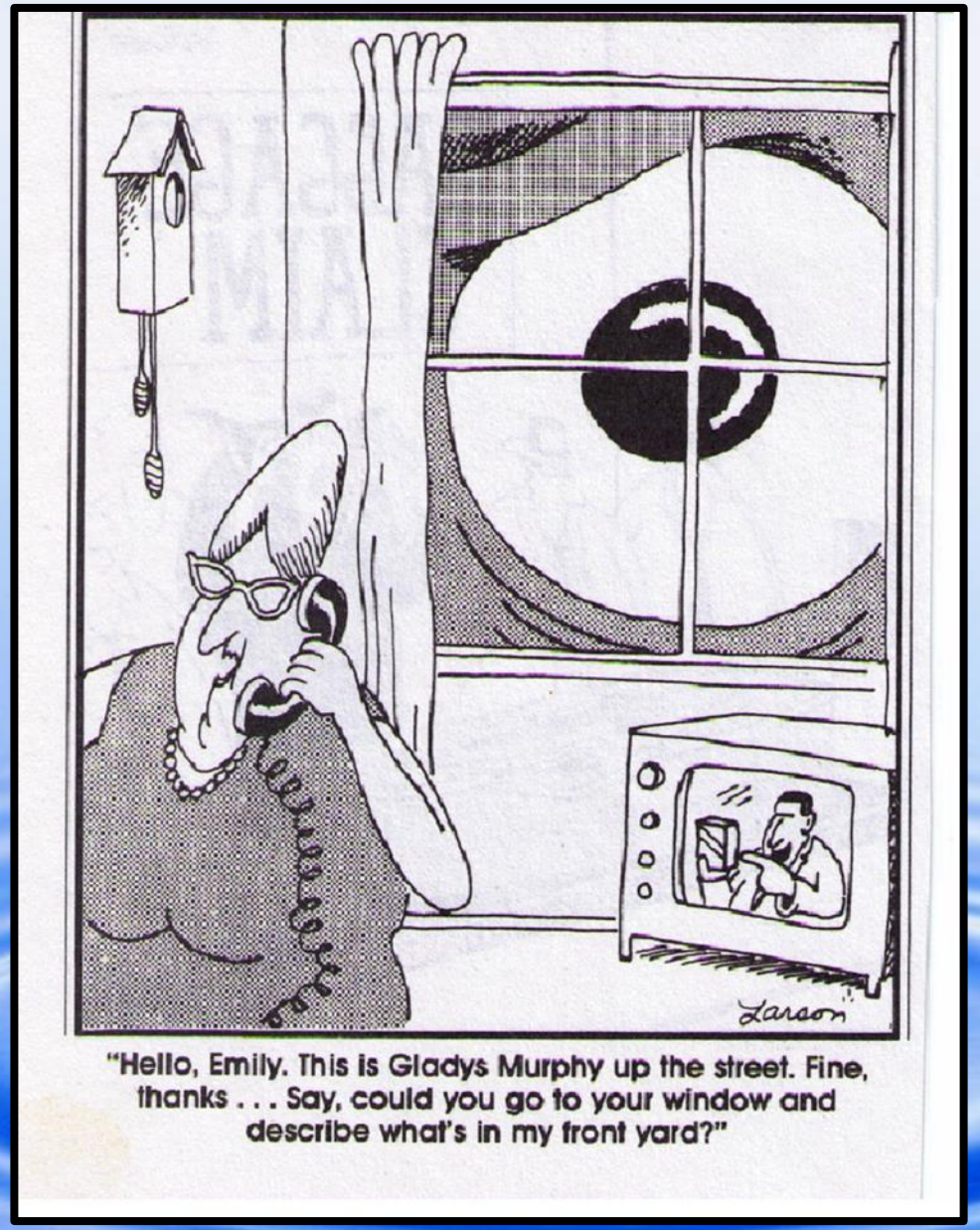


WHY?



“If you want it bad—you get it bad.”





"Hello, Emily. This is Gladys Murphy up the street. Fine, thanks . . . Say, could you go to your window and describe what's in my front yard?"

Introduction



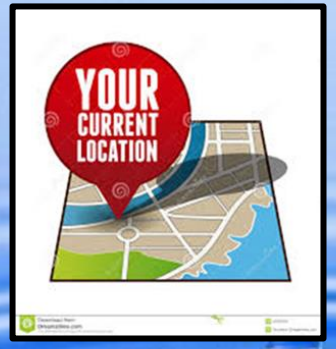
- Who?
- What ?
- Why?

VALUE

- Where we've been



- Where we're at

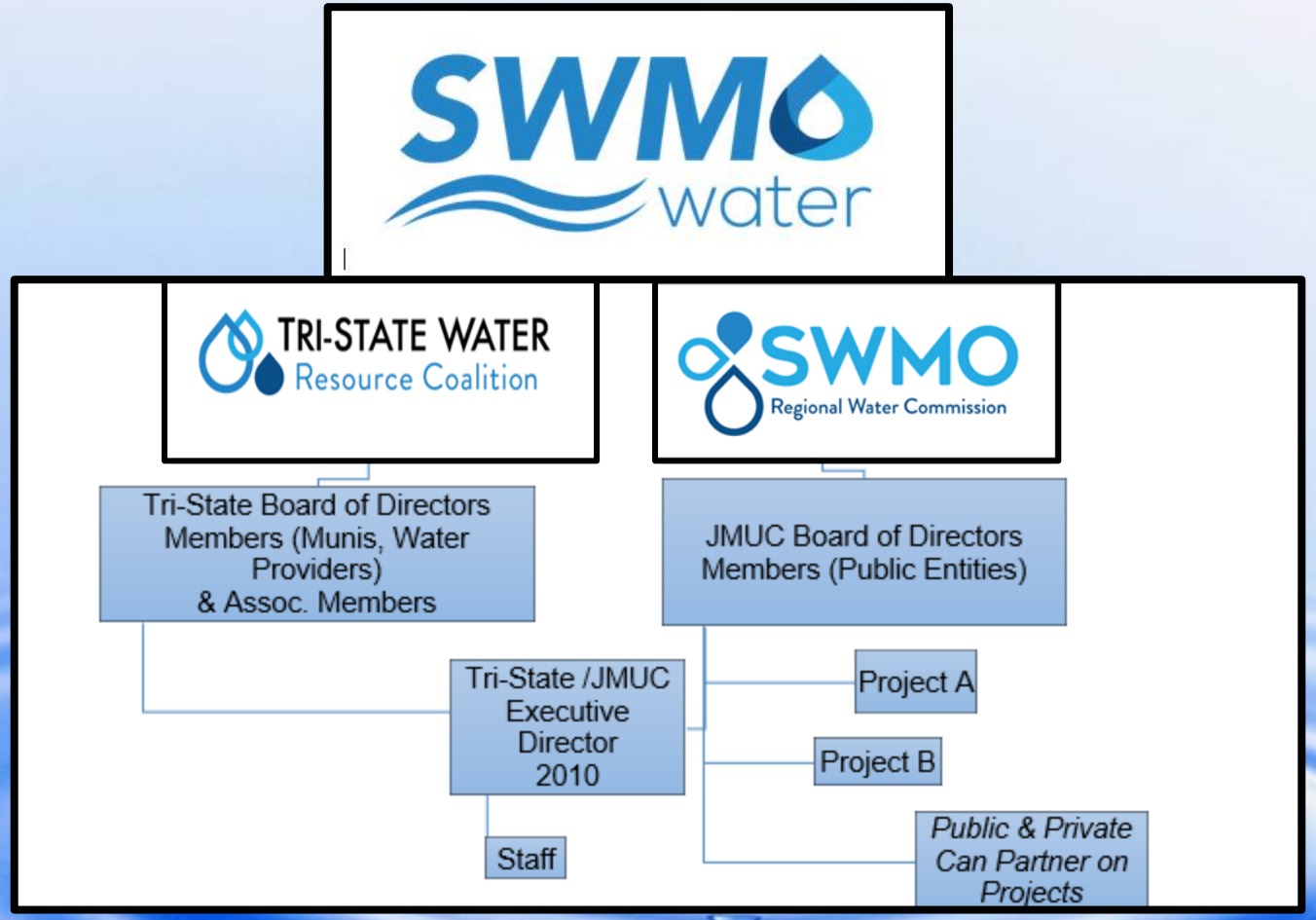


NOW

- Next Steps



Who Is SWMO Water?



Members

- Carthage*
- Branson
- Cassville
- Joplin*
- Monett*
- Mt Vernon*
- Nixa*
- Springfield*
- Empire Electric
- Greene County
- Jasper County
- Missouri American Water Company
- Stone County

* JMUC members

800,000 people



What?

- **Objective-develop a quality water resource to meet the needs of the region.**







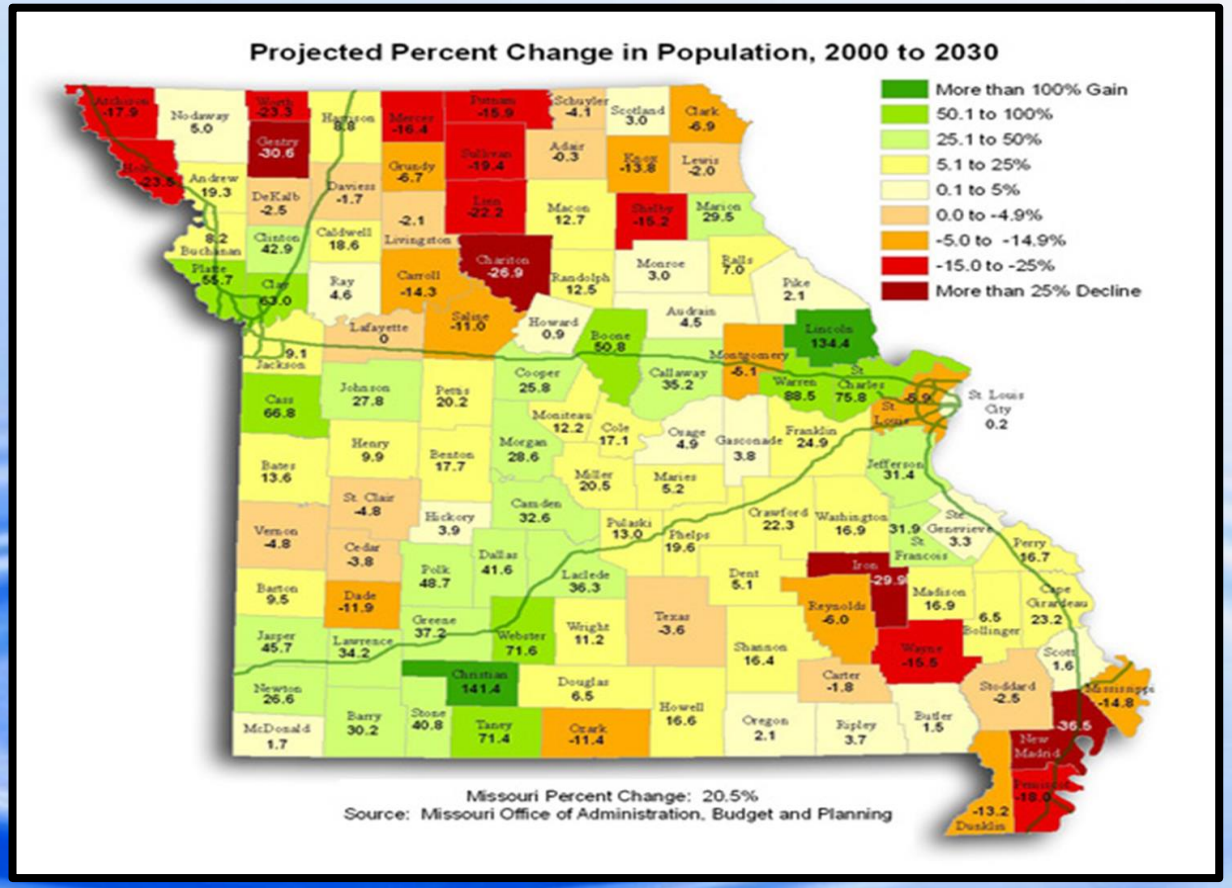


Why?

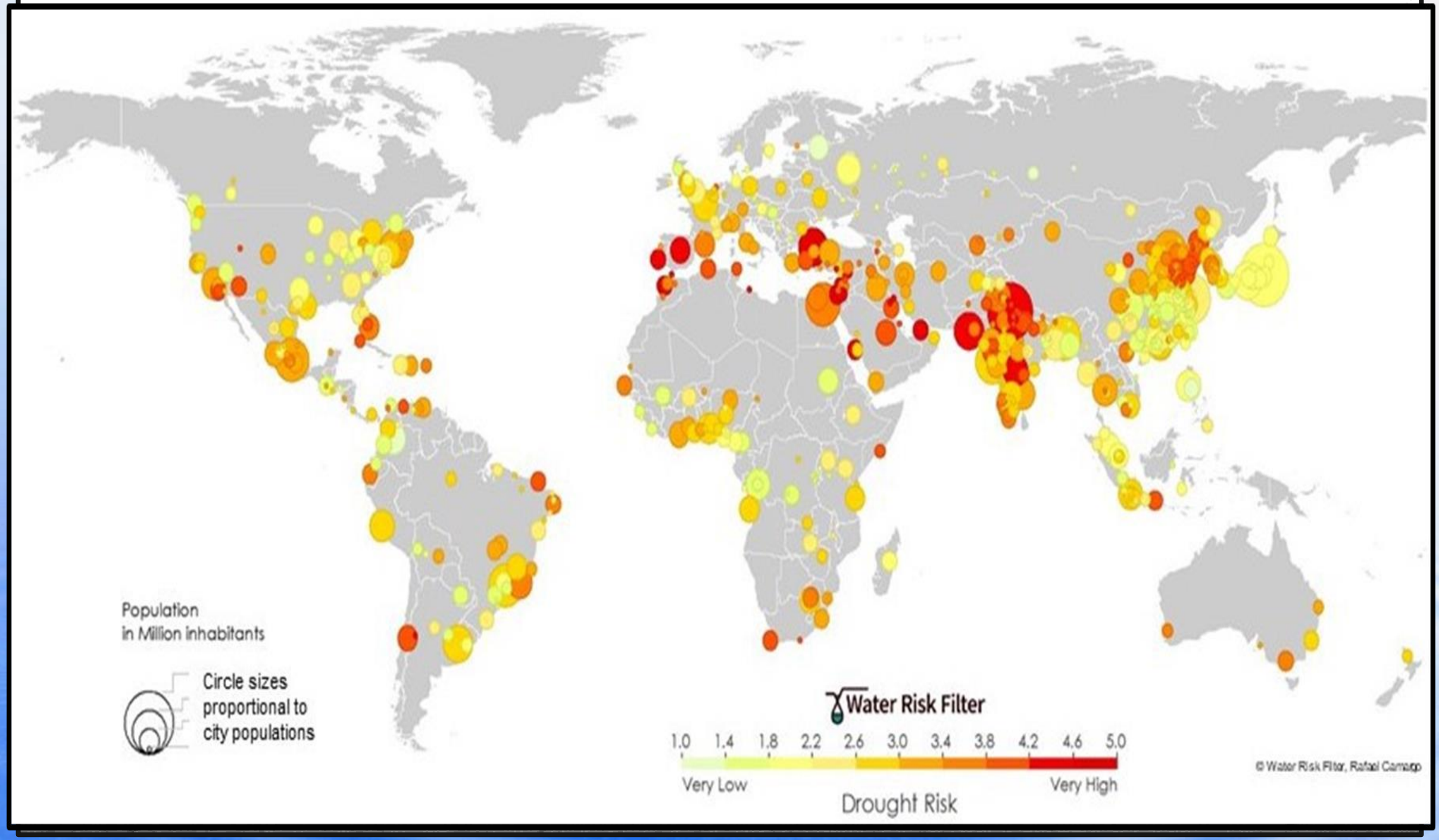
- Finite Resource
- Regional Growth
- Economy
- Life
- The Time is NOW





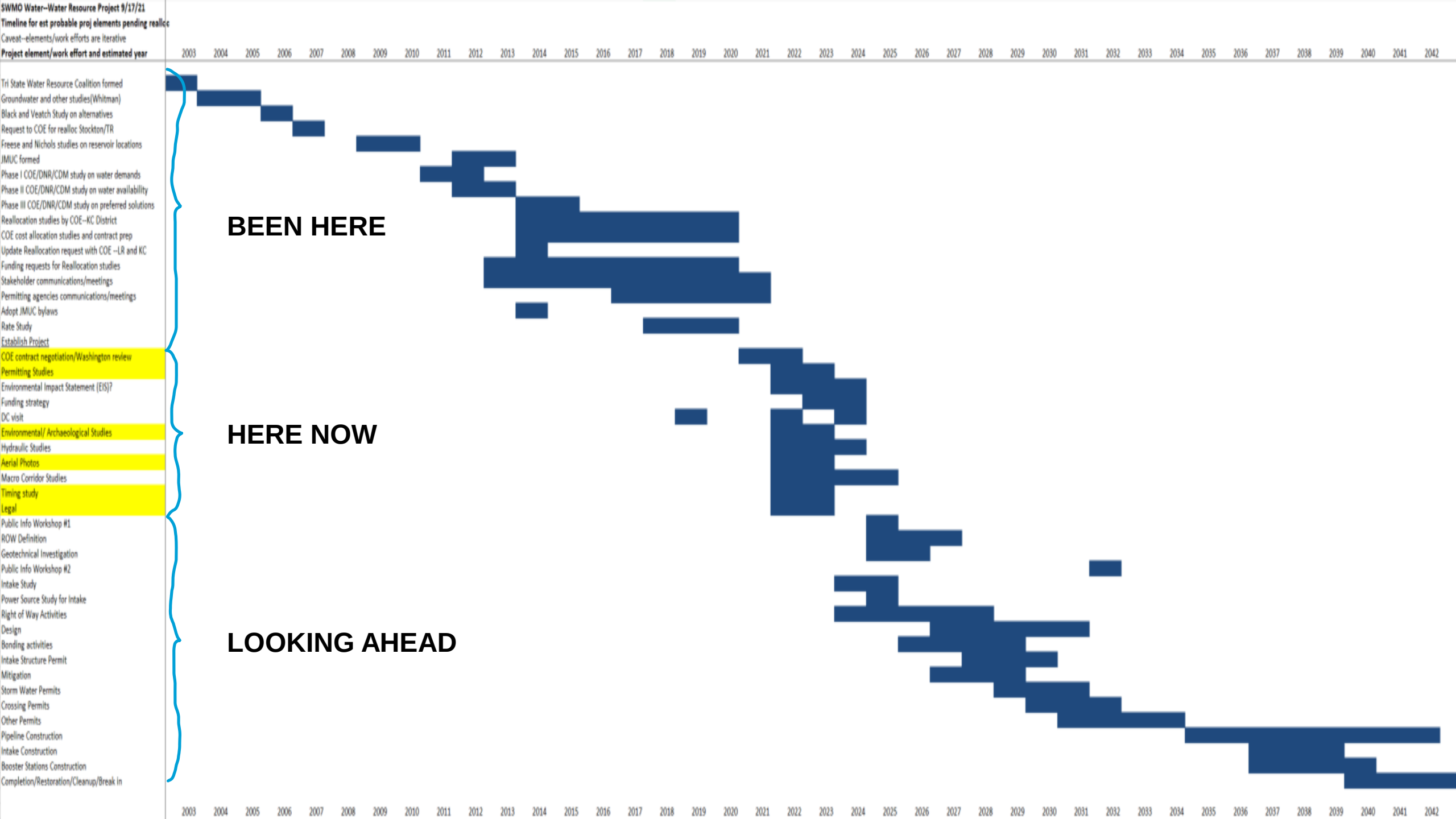

Projected Percent Change in Population, 2000 to 2030
More than 100% Gain
50.1 to 100%
25.1 to 50%
5.1 to 25%
0.1 to 5%
0.0 to -4.9%
-5.0 to -14.9%
-15.0 to -25%
More than 25% Decline
Missouri Percent Change: 20.5%
Source: Missouri Office of Administration, Budget and Planning


NO WATER
VALLEY FARMS
=NO JOBS
Families Protecting The Valley .com


Population
in Million inhabitants
Circle sizes
proportional to
city populations
Water Risk Filter
1.0 1.4 1.8 2.2 2.6 3.0 3.4 3.8 4.2 4.6 5.0
Very Low
Very High
Drought Risk
© Water Risk Filter, Rafael Camargo

SWMO Activities




SWMO Water--Water Resource Project 9/17/21
Timeline for est probable proj elements pending realloc
Caveat--elements/work efforts are iterative
Project element/work effort and estimated year
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042
Tri State Water Resource Coalition formed
Groundwater and other studies(Whitman)
Black and Veatch Study on alternatives
Request to COE for realloc Stockton/TR
Freese and Nichols studies on reservoir locations
JMUC formed
Phase I COE/DNR/CDM study on water demands
Phase II COE/DNR/CDM study on water availability
Phase III COE/DNR/CDM study on preferred solutions
Reallocation studies by COE--KC District
COE cost allocation studies and contract prep
Update Reallocation request with COE --LR and KC
Funding requests for Reallocation studies
Stakeholder communications/meetings
Permitting agencies communications/meetings
Adopt JMUC bylaws
Rate Study
Establish Project
COE contract negotiation/Washington review
Permitting Studies
Environmental Impact Statement (EIS)?
Funding strategy
DC visit
Environmental/ Archaeological Studies
Hydraulic Studies
Aerial Photos
Macro Corridor Studies
Timing study
Legal
Public Info Workshop #1
ROW Definition
Geotechnical Investigation
Public Info Workshop #2
Intake Study
Power Source Study for Intake
Right of Way Activities
Design
Bonding activities
Intake Structure Permit
Mitigation
Storm Water Permits
Crossing Permits
Other Permits
Pipeline Construction
Intake Construction
Booster Stations Construction
Completion/Restoration/Cleanup/Break in
BEEN HERE
HERE NOW
LOOKING AHEAD
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042

Timeline



2003



2022



2050

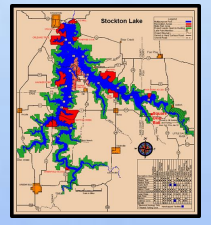
Where We've Been



2003
- Groundwater Study
- TRI-STATE WATER Resource Coalition Formed

2005
- Study on Water Source Alternatives

2007
- Reallocation Request to COE



2012
- Joint Municipal Utility Commission (JMUC) Formed

2014
- Updated Reallocation Request
- Established JMUC Bylaws
- Reallocation Studies by COE

2016
- Updated Reallocation Request

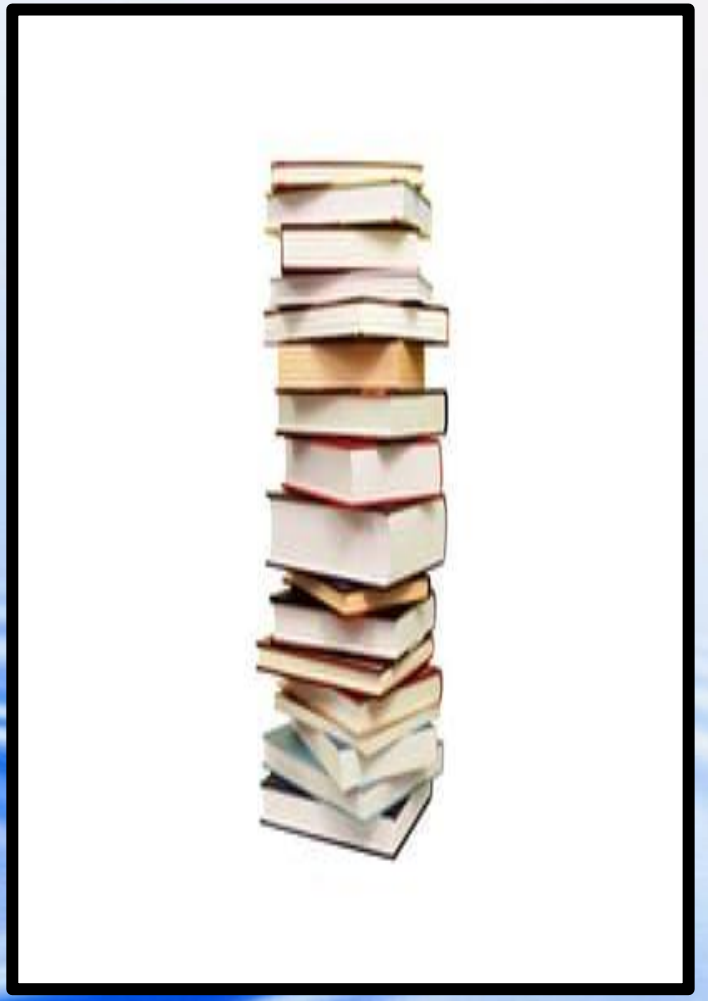
2017
- Rate Study

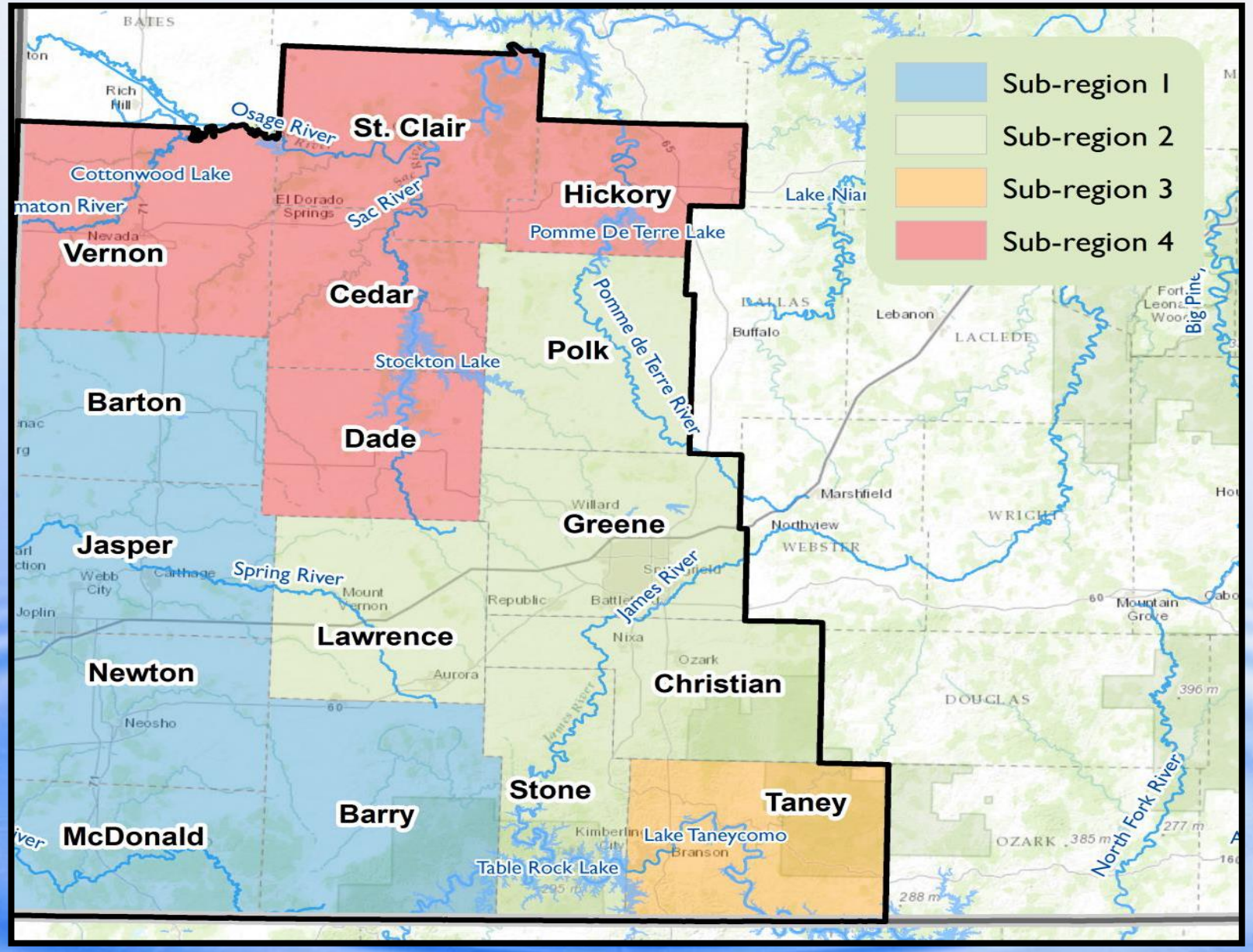
2020

2010 - 2018: Phased Corp of Engineers (COE) Studies

Studies, Studies, Studies

- 2003 GW Studies
- 2006 Water Supply Study
- 2007 Demand Data Collection
- 2007 Request Reallocation
- 2008 Reservoir Screening Study
- 2012 COE Phase I Water Resource Study
- 2013 COE Phase II Water Resource Study
- 2014-Current-Stockton Reallocation Study
- 2014 Update Reallocation Request
- 2016 Technical Memo Summary of Phases
- 2016 Update Reallocation Request
- 2017 Technical Memo Delivery Systems , Hydraulics
- 2014-2018 COE Phase III Water Resource Study
- 2018 Rate study, Economic Impact, Staging




Sub-region 1
Sub-region 2
Sub-region 3
Sub-region 4
St. Clair
Hickory
Vernon
Cedar
Polk
Barton
Dade
Greene
Jasper
Lawrence
Newton
Christian
Stone
Taney
Barry
McDonald
Osage River
Sac River
Pomme De Terre Lake
Pomme de Terre River
Stockton Lake
Spring River
James River
Table Rock Lake
Lake Taneycomo
North Fork River
Big Piney
Cottonwood Lake
Lake Niar
BATES
Rich Hill
El Dorado Springs
Nevada
Buffalo
Lebanon
LACLEDE
Marshfield
Northview
WEBSTER
WRIGHT
Willard
Republic
Nixa
Ozark
Aurora
Mount Vernon
Carthage
Webb City
Joplin
Neosho
Kimberling City
Branson
Mountain Grove
DOUGLAS
OZARK
396 m
277 m
385 m
288 m

SWMO Water Needs Out to 2060

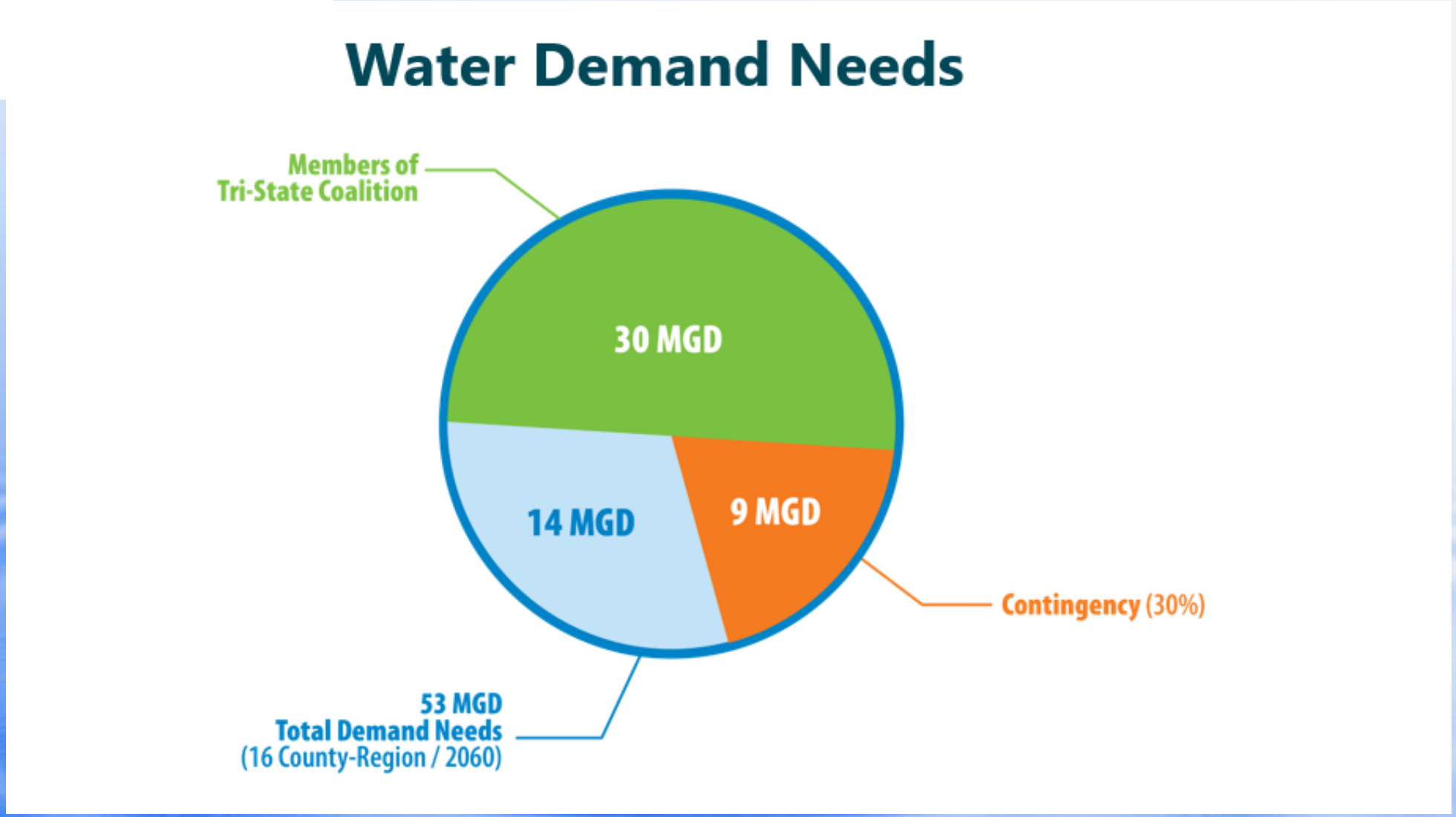


Figure 1.3: Regional Summary Scenario 3 Groundwater and Surface Water Gap in 2040

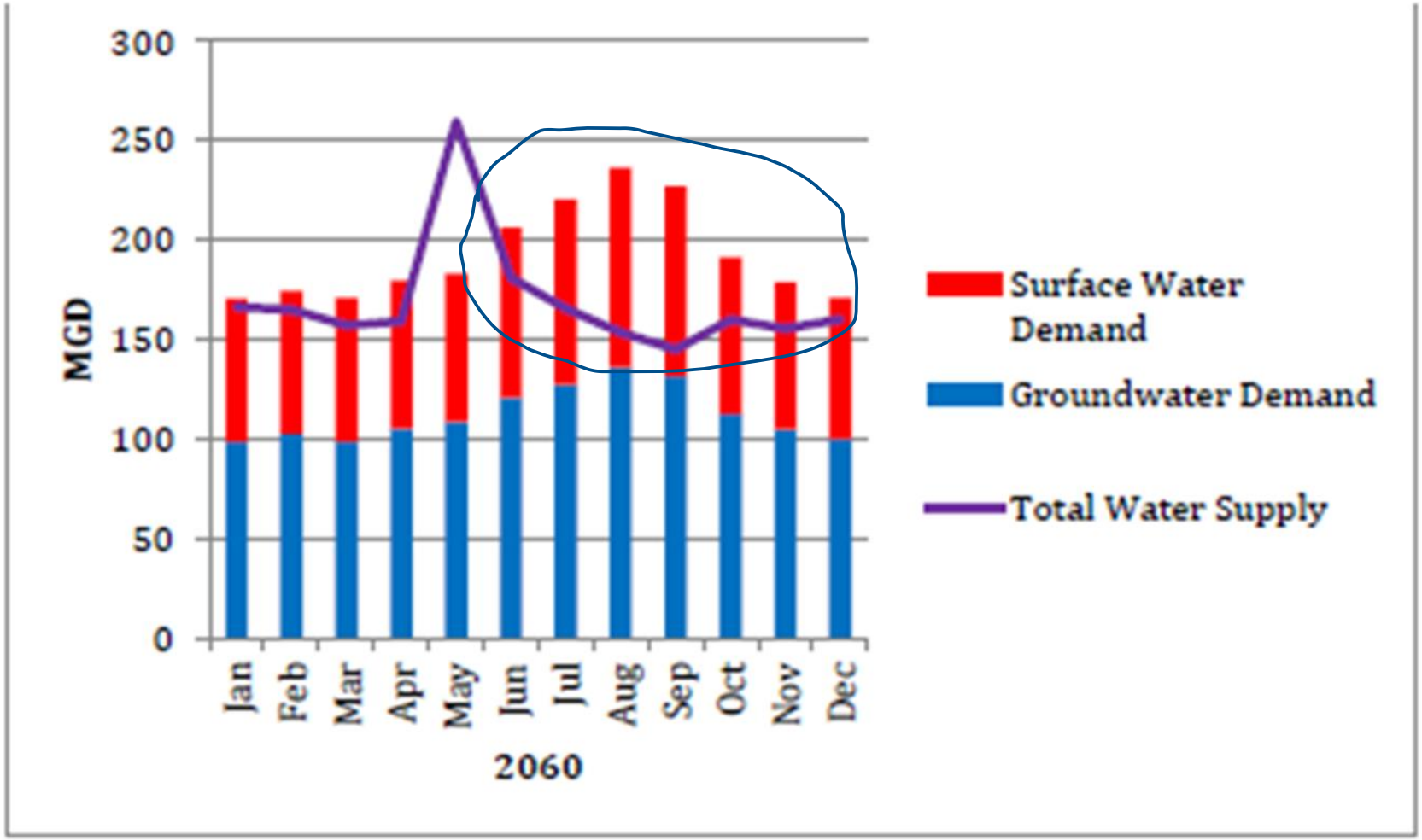
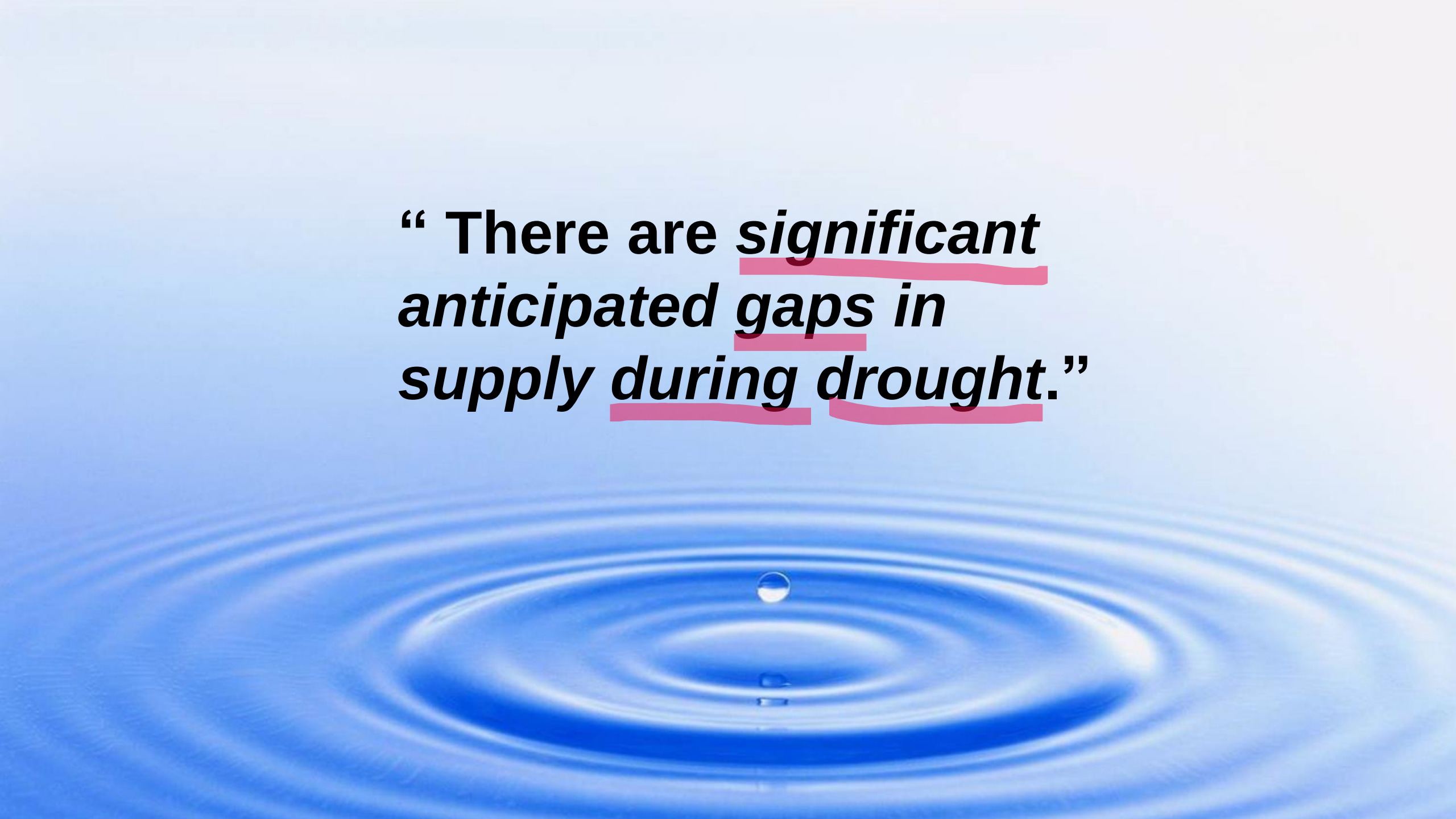
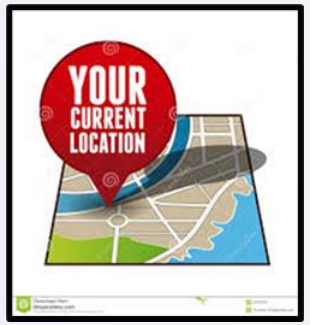


Figure 1.4: Regional Summary Scenario 3 Groundwater and Surface Water Gap in 2060


“ There are *significant anticipated gaps in supply during drought*.”

Here Now



Public Posting Reallocation Report

July 2020

Jan. 2021

Review & Public Comment

Draft Final Report to HQ for review

Summer 2022

Fall 2022

Transmit to Assistant Secretary of Army

Commit to taking water storage

Negotiate COE Contract JMUC Contracts*

2023

Execute Contract*

Begin Pay for Storage

2024

Legal

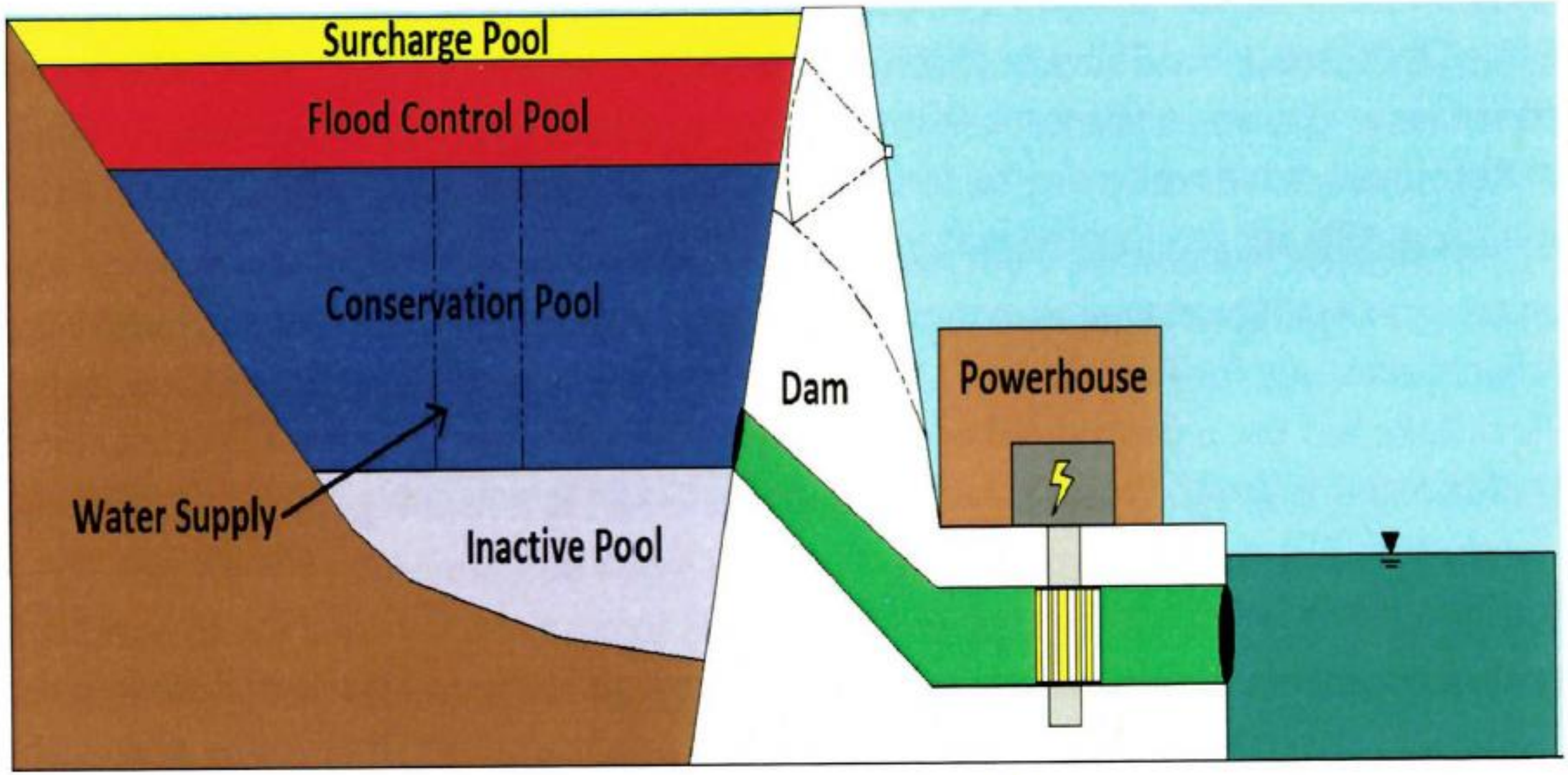




Reallocation
What does that mean?



EXAMPLE OF POOLS AND ALLOCATED STORAGE IN CORPS LAKES



Graphic provided by the Kansas City District, Corps of Engineers

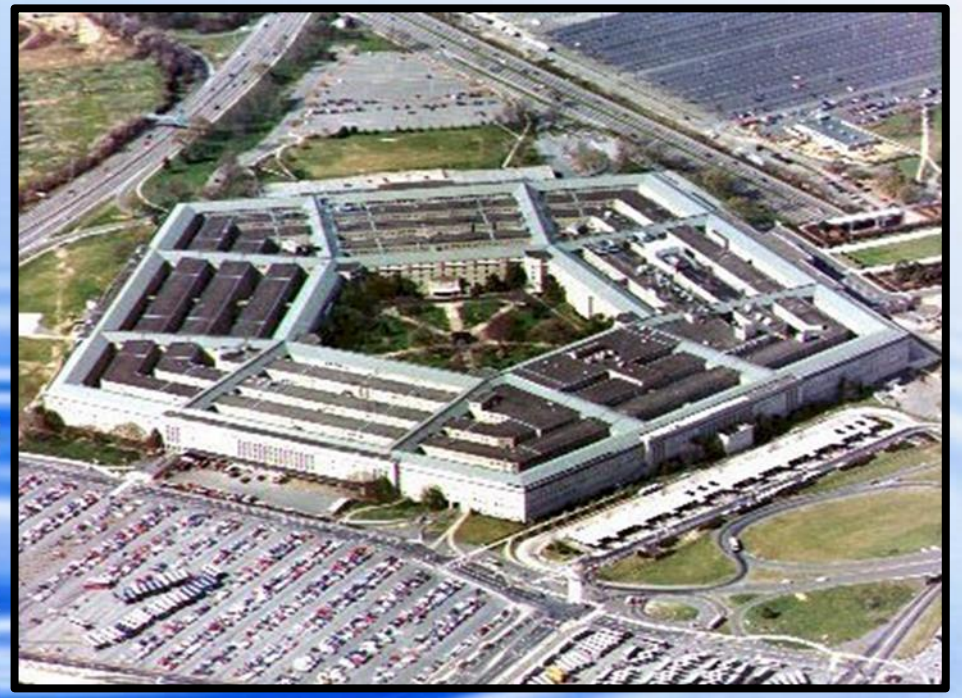
Reallocation of Storage Space for Drinking Water





Southwest Power Administration

Corps of Engineers



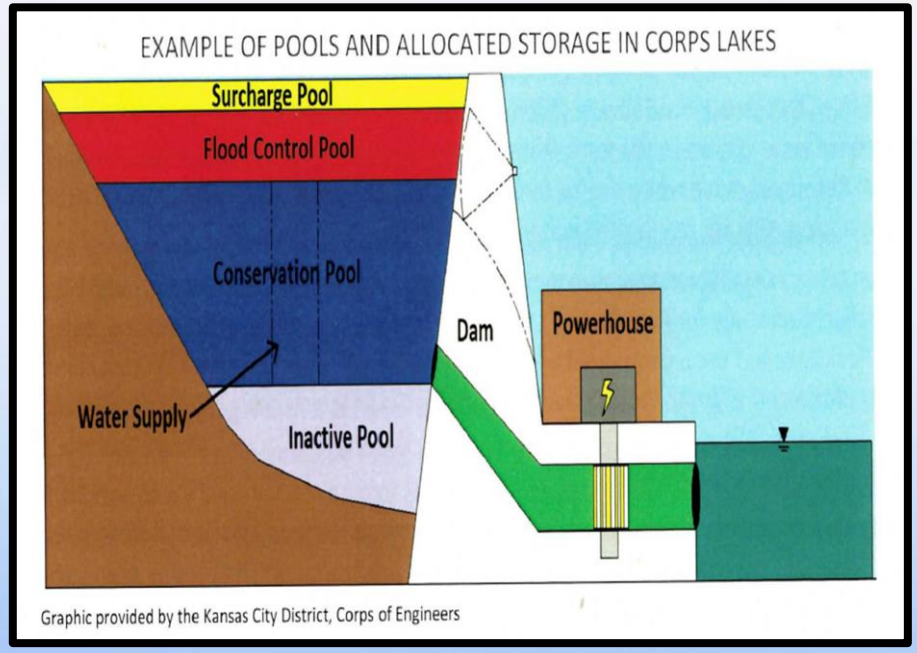
Pentagon Approval

Rate Study



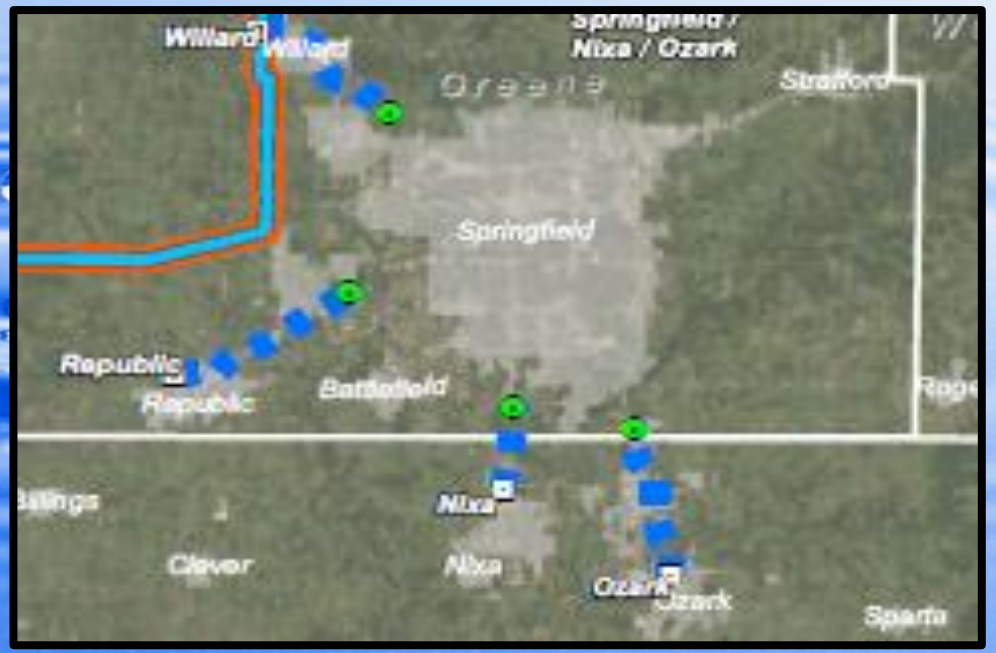





EXAMPLE OF POOLS AND ALLOCATED STORAGE IN CORPS LAKES
Surcharge Pool
Flood Control Pool
Conservation Pool
Water Supply
Inactive Pool
Dam
Powerhouse
Graphic provided by the Kansas City District, Corps of Engineers






Willard
Willard
Springfield /
Nixa / Ozark
Strafford
Springfield
Republic
Republic
Battlefield
Nixa
Clever
Nixa
Ozark
Ozark
Sparta

Reallocation Cost



Table 4-11 Stockton Lake Water Supply Storage Reallocation Annual Costs and Rates

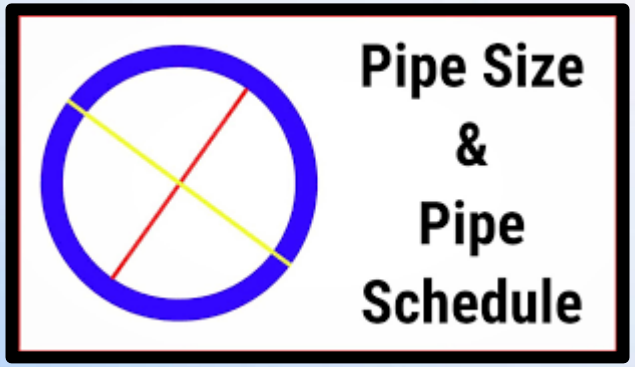
SWMO Water Potential Participants	2060 AVD Annual Water Request (mgd)	Percentage of Total Reallocation Contract	Water Supply Storage Capital Cost per Member	Water Supply Storage Annual Debt Service	Water Supply Storage Rate ($/1,000 gal)	Stockton Lake Annual O&M	Stockton Lake O&M Rate ($/1,000 gal)
Carthage	3	7.7	$2,563,000	$127,000	$0.12	$10,000	$0.01
MO-American	16.6	42.8	$14,183,000	$703,000	$0.12	$58,000	$0.01
Willard	0.8	2.1	$684,000	$34,000	$0.12	$3,000	$0.01
Ozark	1.5	3.9	$1,282,000	$64,000	$0.12	$5,000	$0.01
Monett	1	2.6	$854,000	$42,000	$0.12	$3,000	$0.01
Mount Vernon	0.34	0.9	$291,000	$14,000	$0.12	$1,000	$0.01
Nixa	1	2.6	$854,000	$42,000	$0.12	$3,000	$0.01
Republic	2.5	6.5	$2,136,000	$106,000	$0.12	$9,000	$0.01
CU-Springfield	12	31.0	$10,253,000	$508,000	$0.12	$42,000	$0.01
Total	**39**	**100.0**	**$33,100,000**	**$1,640,000**		**$134,000**	

Notes:

1. Total and subtotal costs are rounded to thousands of dollars.



Rate Study



Max Day Gap **68 mgd**



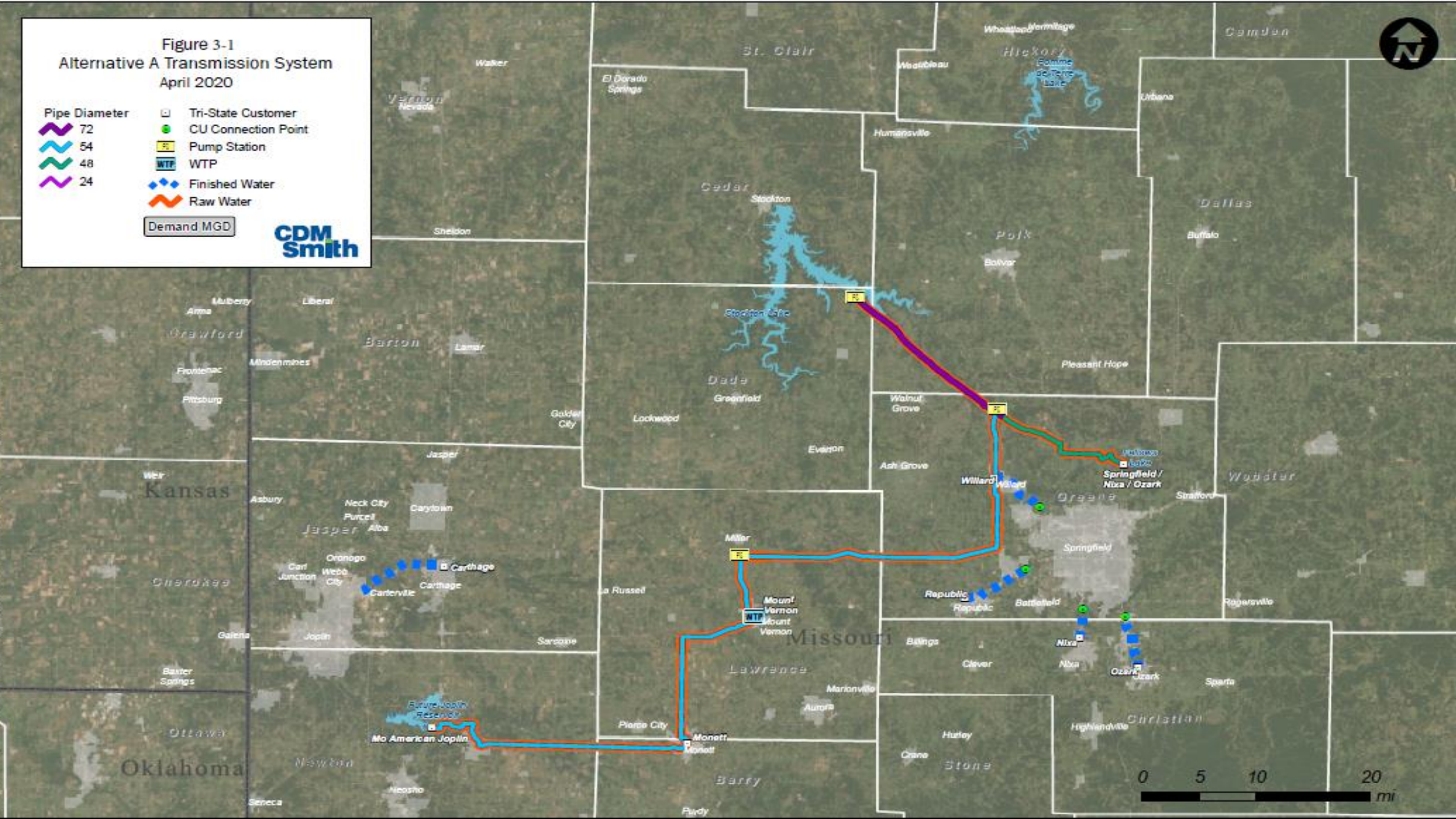


Figure 3-1
Alternative A Transmission System
April 2020
Pipe Diameter
72
54
48
24
Tri-State Customer
CU Connection Point
Pump Station
WTP
Finished Water
Raw Water
Demand MGD
CDM Smith
St. Clair
Hickory
Camden
Vernon
Cedar
Polk
Dallas
Dade
Barton
Crawford
Kansas
Jasper
Cherokee
Oklahoma
Newton
Lawrence
Missouri
Barry
Stone
Christian
Greene
Webster
Stockton
Stockton Lake
Greenfield
Lockwood
Everton
Walnut Grove
Ash Grove
Willard
Springfield / Nixa / Ozark
Springfield
Republic
Battlefield
Nixa
Ozark
Sparta
Rogersville
Miller
Mount Vernon
Monett
Carthage
Carterville
Joplin
Mo American Joplin
Future Joplin Reservoir
Pierce City
Aurora
Marionville
Billings
Clever
Highlandville
Hurley
Crane
Purdy
Sarcoxie
Neosho
Seneca
Galena
Baxter Springs
Weir
Asbury
Neck City
Purcell
Alba
Carytown
Oronogo
Webb City
Carl Junction
Golden City
Mindenmines
Frontenac
Pittsburg
Arma
Mulberry
Liberal
Lamar
Sheldon
Walker
Nevada
El Dorado Springs
Humansville
Urbana
Buffalo
Bolivar
Pleasant Hope
Stratford
Wheatland
Vermitage
Weaubleau
Pomme de Terre Lake
Lake Springfield
La Russell
0 5 10 20 mi

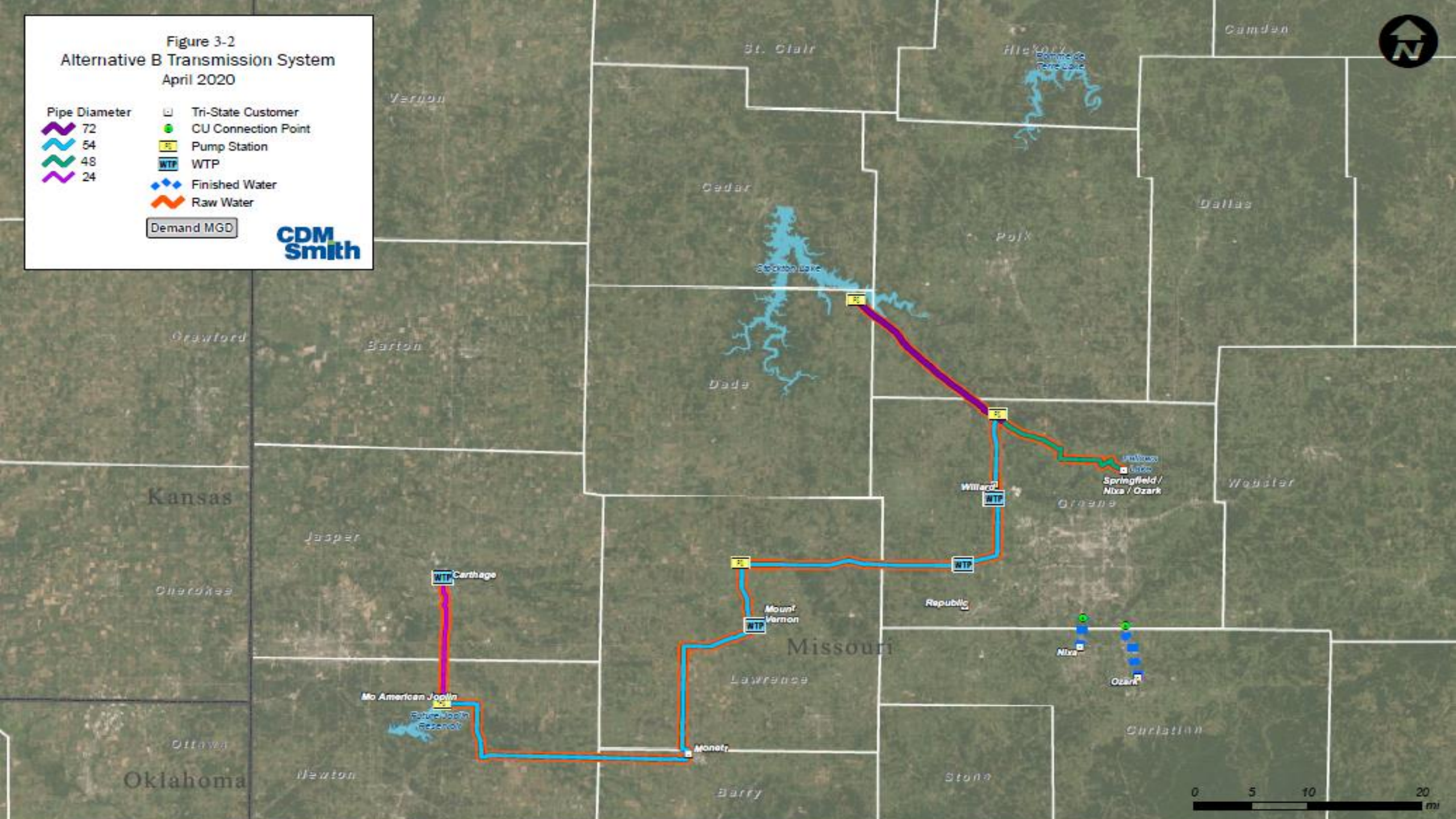


Figure 3-2
Alternative B Transmission System
April 2020
Pipe Diameter
72
54
48
24
Tri-State Customer
CU Connection Point
Pump Station
WTP
Finished Water
Raw Water
Demand MGD
CDM Smith
St. Clair
Hickory
Camden
Vernon
Cedar
Dallas
Polk
Stockton Lake
Crawford
Barton
Dade
Kansas
Jasper
Cherokee
Willard
Springfield / Nixa / Ozark
Greene
Webster
Carthage
Mount Vernon
Republic
Missouri
Nixa
Ozark
Lawrence
Mo American Joplin
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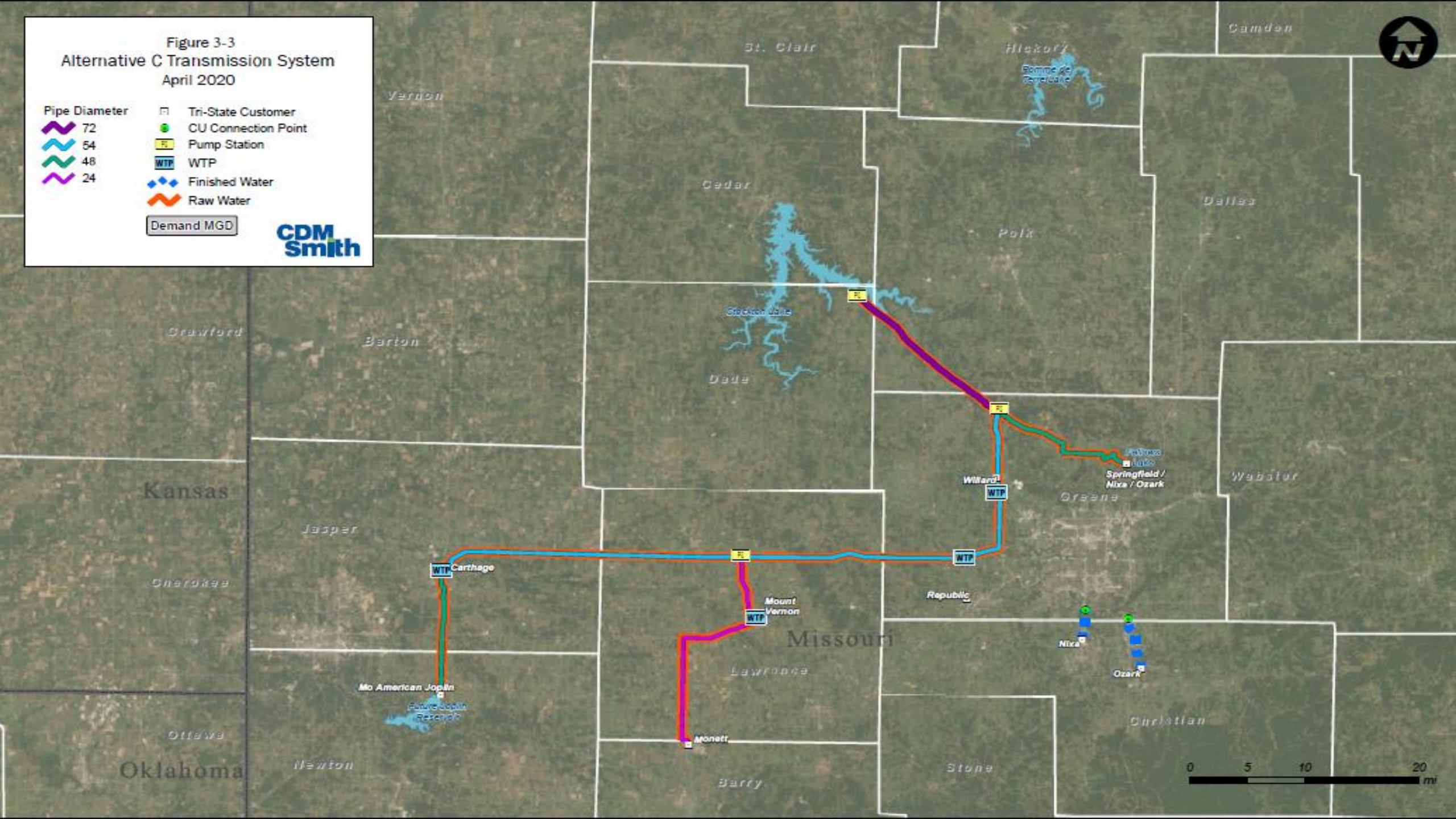
Figure 3-3
Alternative C Transmission System
April 2020
Pipe Diameter
72
54
48
24
Tri-State Customer
CU Connection Point
Pump Station
WTP
Finished Water
Raw Water
Demand MGD
CDM Smith
St. Clair
Hickory
Camden
Vernon
Cedar
Polk
Dallas
Crawford
Barton
Dade
Stockton Lake
Kansas
Jasper
Webster
Greene
Willard
Springfield / Nixa / Ozark
Carthage
Cherokee
Mount Vernon
Republic
Missouri
Nixa
Ozark
Mo American Joplin
Lawrence
Christian
Ottawa
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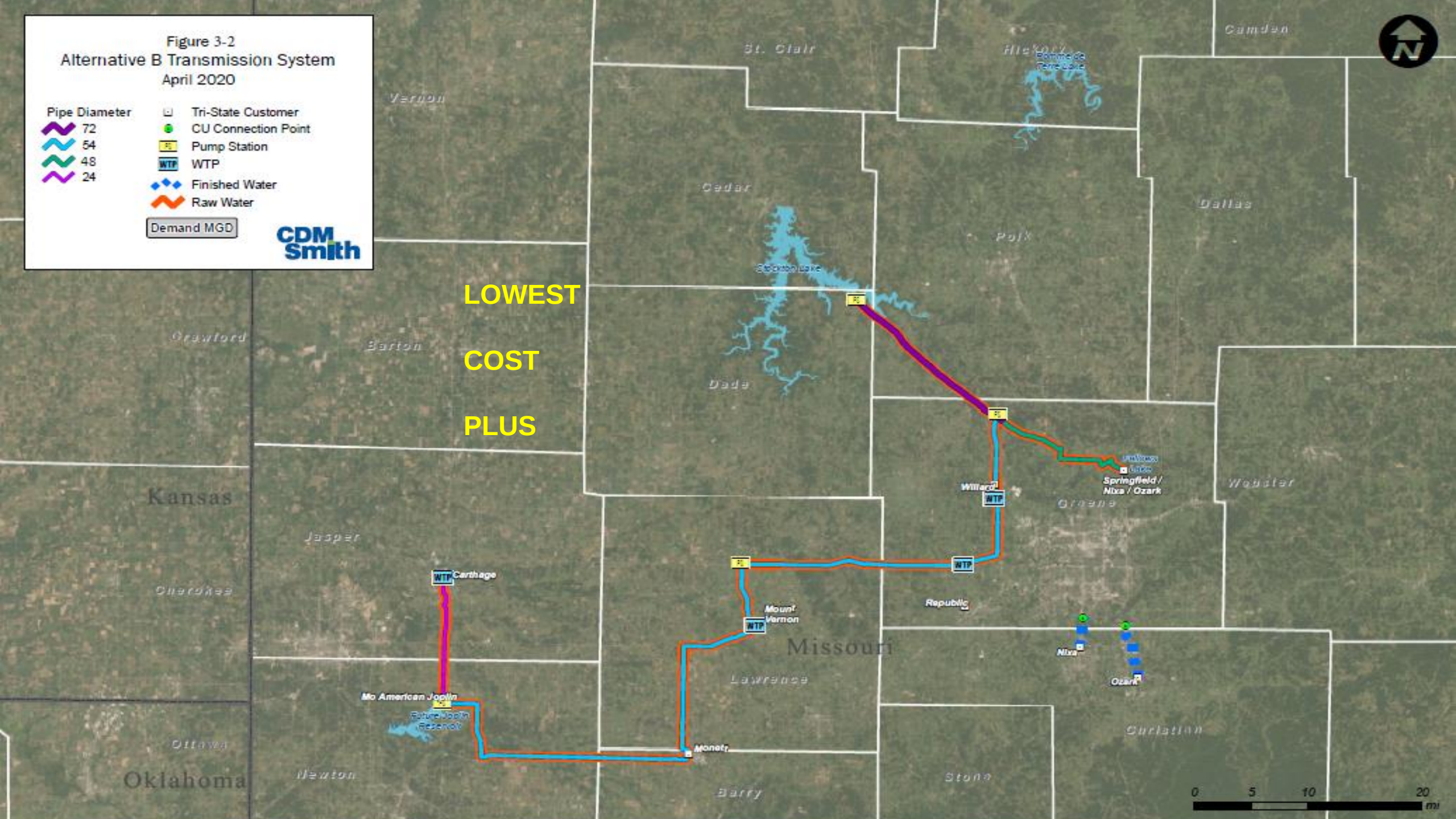
Figure 3-2
Alternative B Transmission System
April 2020
Pipe Diameter
72
54
48
24
Tri-State Customer
CU Connection Point
Pump Station
WTP
Finished Water
Raw Water
Demand MGD
CDM Smith
LOWEST
COST
PLUS
St. Clair
Vernon
Cedar
Polk
Dallas
Crawford
Barton
Dade
Kansas
Jasper
Cherokee
Webster
Greene
Springfield / Nixa / Ozark
Willard
Republic
Carthage
Mount Vernon
Missouri
Lawrence
Nixa
Ozark
Mo American Joplin
Future Joplin Reservoir
Monett
Ottawa
Oklahoma
Newton
Barry
Stone
Christian
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mi

Regional Economic Impact Analysis

Table 5-3 Direct, Indirect, and Induced Economic Output, Value Added, and Jobs Associated with Project Construction and Engineering Costs in the 16-County Region

Expenditures	Total Economic Output	Total Value Added	Total Jobs
Construction	$1,086,000,000	$585,000,000	7,810
Engineering/Legal/Administration	$75,000,000	$46,000,000	567
Total	**$1,161,200,000**	$631,000,000	8,377

Note: Job estimates include both full- and part-time employment. This evaluation assumes that the economic activity and economic impacts would be incurred in a one-year time period.





Water Infrastructure Financial Assistance Available in Missouri



Looking Ahead



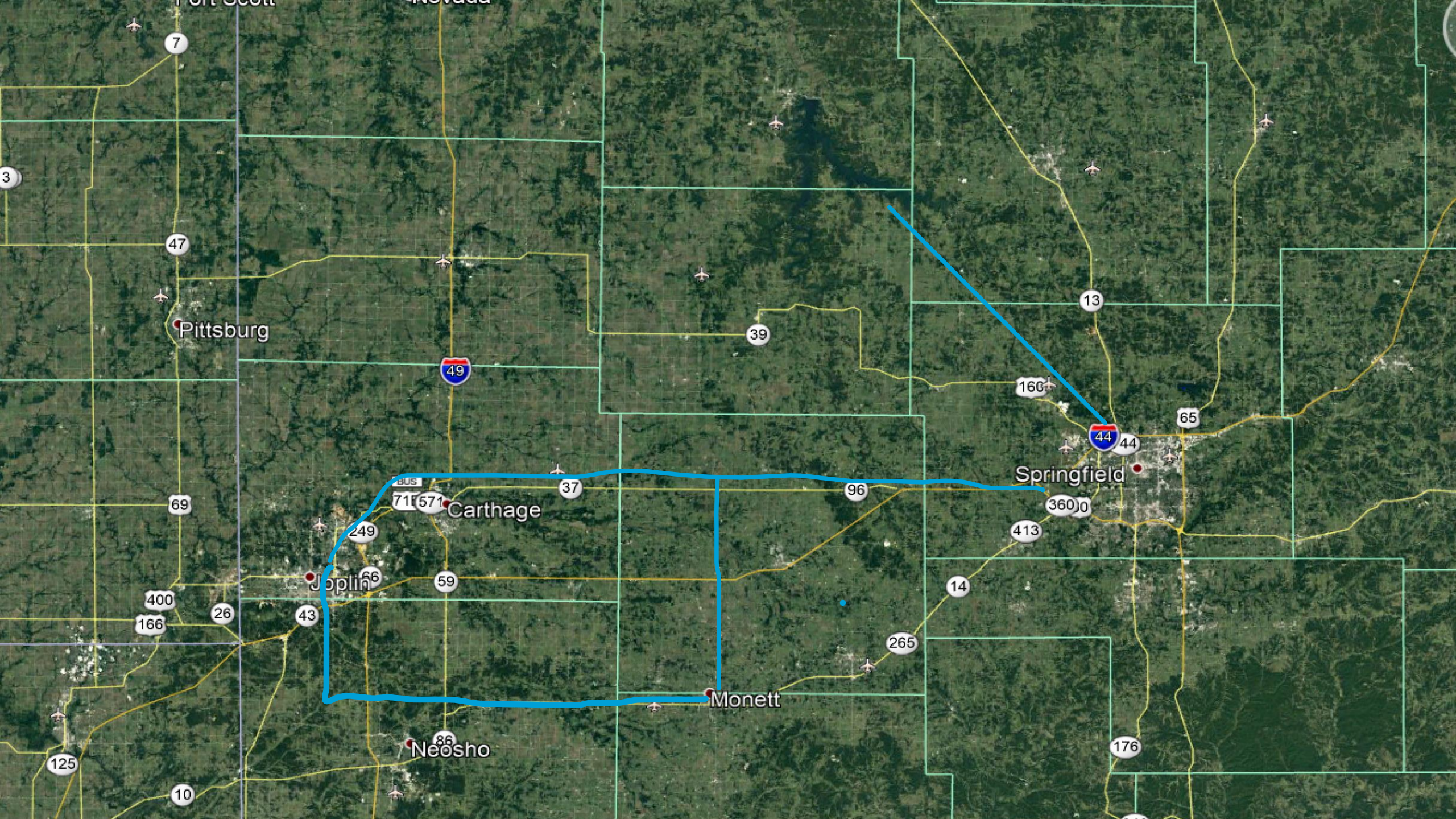
2022
- Aerial Photography Corridor Studies
- Environmental Archeological Studies

2024
- ROW Definition
- Intake Study
- Geotechnical Studies

2025
- Power Source Study

2025
- Permits (2025-2035)
- Public Info Workshops(2025-2035)
- ROW Activities (2030-2035)
- Mitigation (2030-2040)
- Design – Pipe, Pumps, Tanks (2025-2035)
- Construction (2030-2045)

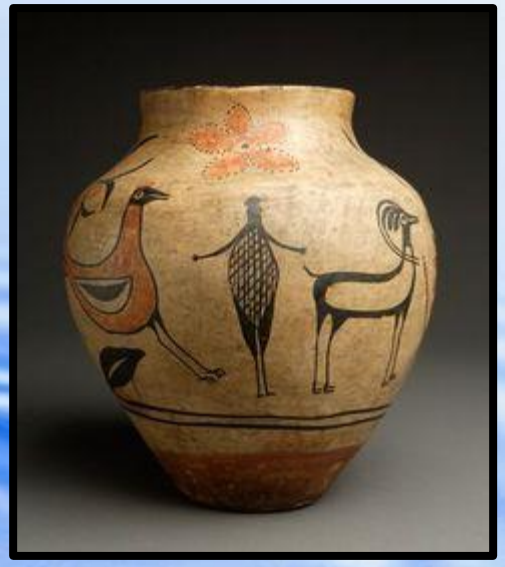
2050



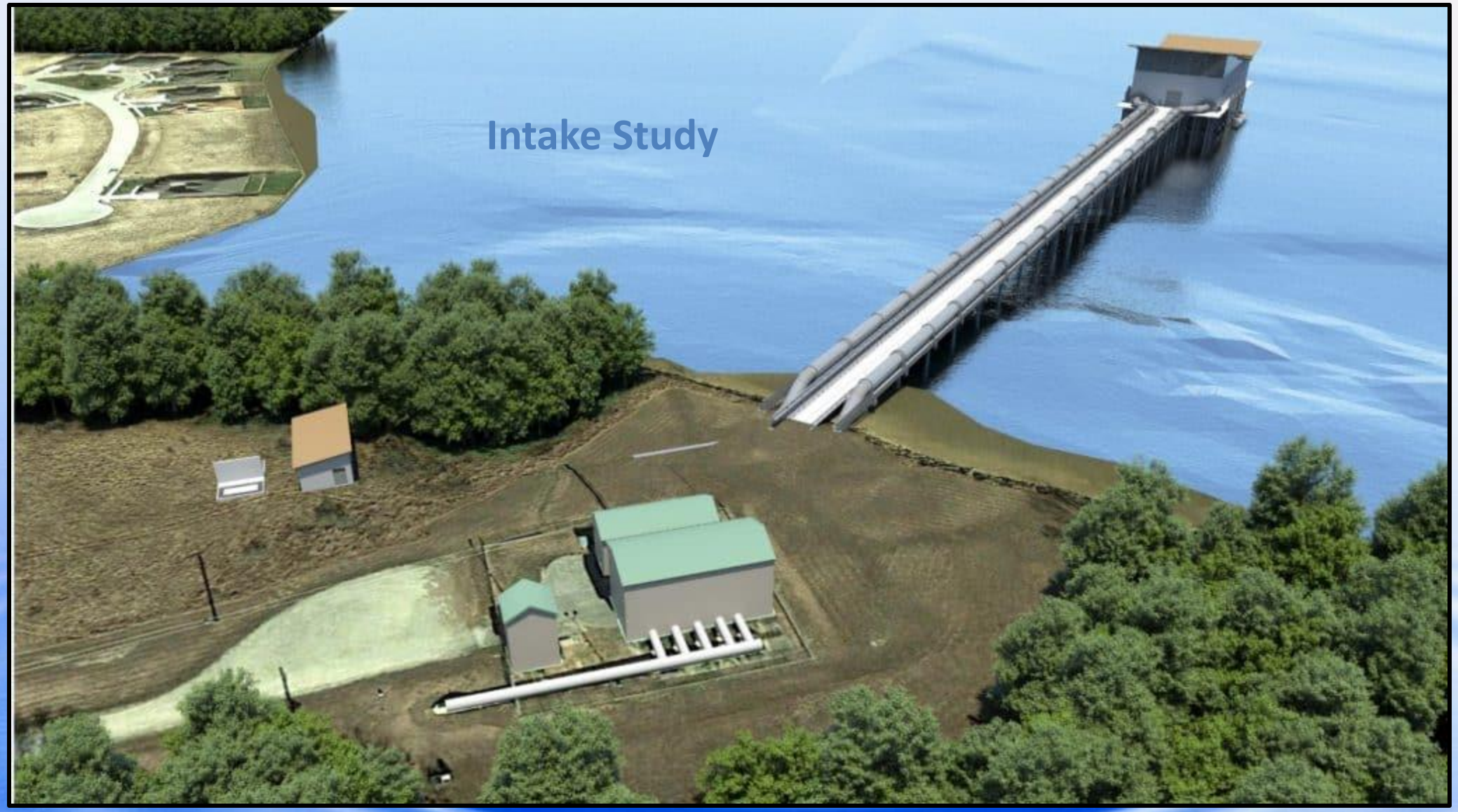
Pittsburg
Carthage
Joplin
Monett
Neosho
Springfield
7
47
49
39
13
160
44
65
37
96
360
413
14
265
69
400
166
26
43
59
249
571
125
10
176



Environmental Archeological Studies

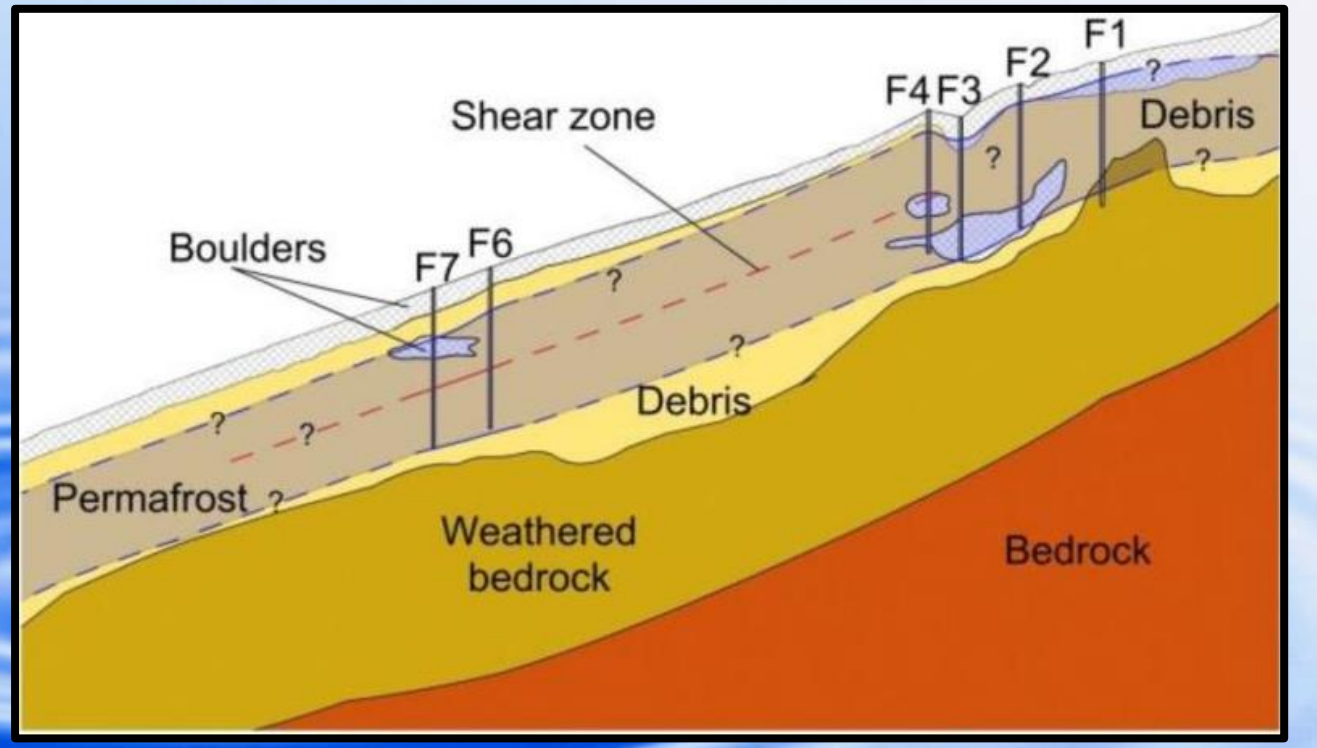



25' TEMPORARY
50' PERMANENT


Intake Study

Geotechnical Studies






UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

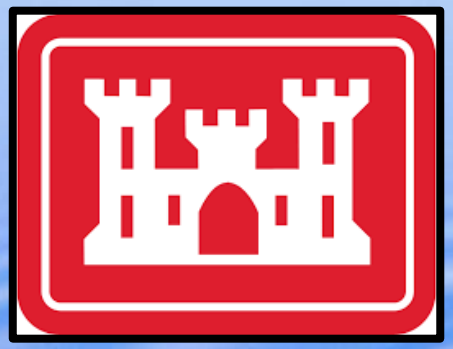

PHILLIPS
66

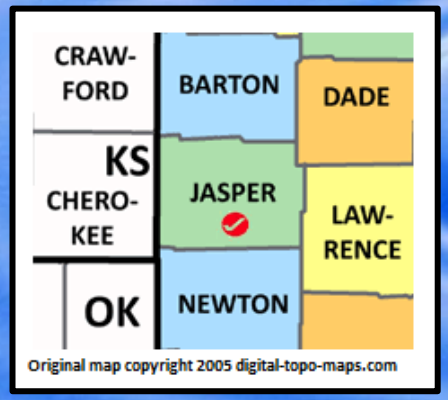

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES


MISSOURI
STATE PARKS


PERMITS
INSPECTIONS
LICENSES
CODES


CONSERVATION
DEPARTMENT
MISSOURI




CRAW-
FORD
BARTON
DADE
KS
CHERO-
KEE
JASPER
LAW-
RENCE
OK
NEWTON
Original map copyright 2005 digital-topo-maps.com


MoDOT

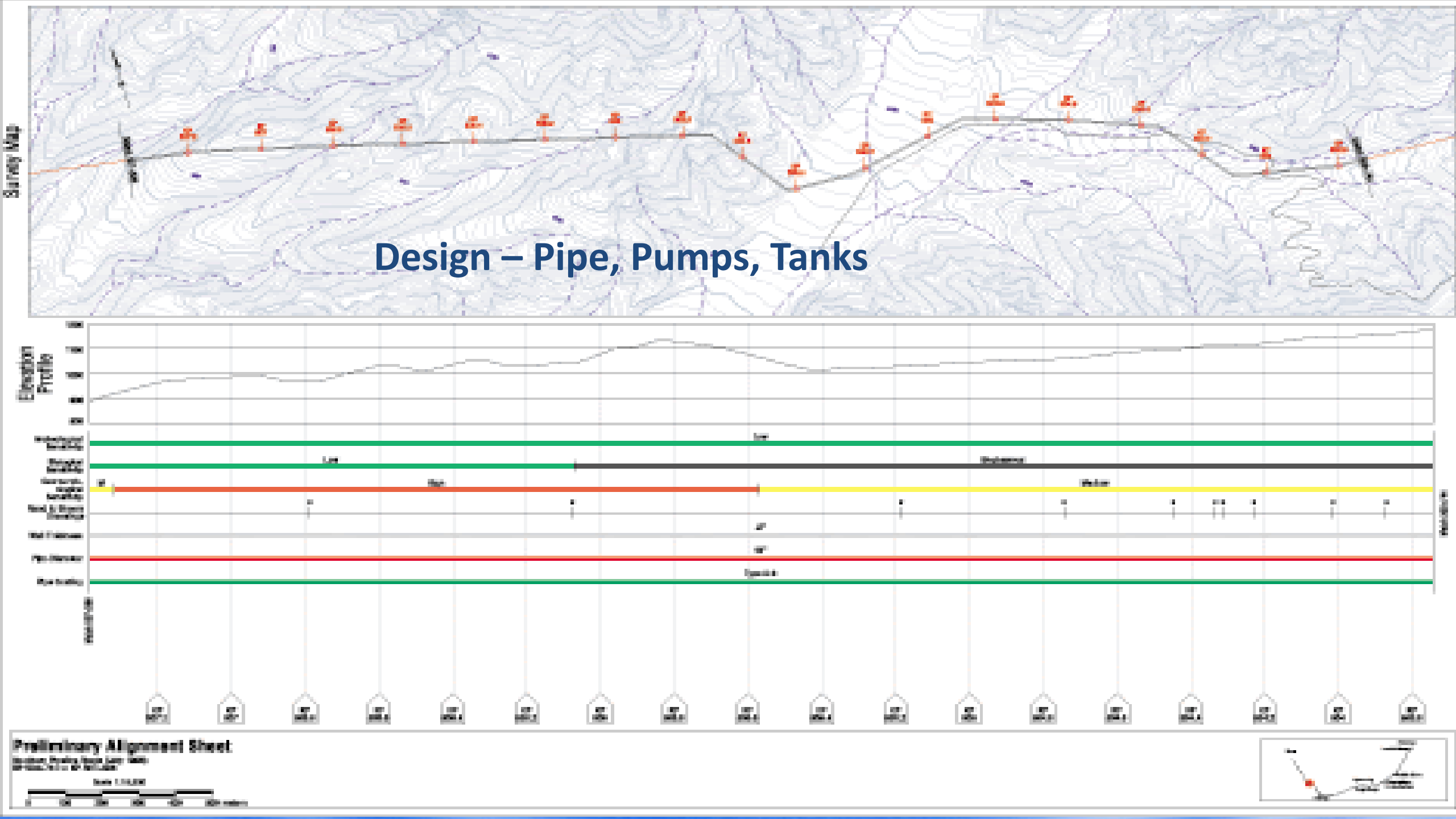

BURLINGTON
NORTHERN

ROW Activities



Mitigation





Design – Pipe, Pumps, Tanks









CONTRACT

FOR WATER STORAGE SPACE

PERPETUAL

SPECIFIED YIELD

TRACK IT

LUMP SUM OR ANNUAL INSTALLMENTS ($36 Million)

SHARE OPERATING COSTS

CONTRACT NO: DACW41-94-L-0001

WATER STORAGE CONTRACT
BETWEEN THE UNITED STATES OF AMERICA
AND
THE BOARD OF PUBLIC UTILITIES
OF THE CITY OF SPRINGFIELD, MISSOURI
FOR
WATER STORAGE SPACE IN STOCKTON LAKE, MISSOURI

THIS CONTRACT, entered into this 12th day of October, 1993, by and between THE UNITED STATES OF AMERICA (hereinafter called the "Government") represented by the Contracting Officer executing this contract, and the Board of Public Utilities of the City of Springfield, Missouri (hereinafter called the "User");

WITNESSETH THAT:

WHEREAS, the Flood Control Act of 1954 (Public Law 83-780, 83rd Congress), authorized the construction, operation, and maintenance of Stockton Lake on the Sac River, Missouri, (hereinafter called the "Project"); and

WHEREAS, the User desires to contract with the Government for the use of storage added to the Project by action of the Assistant Secretary of the Army for Civil Works for municipal and industrial water supply, and for payment of the cost thereof in accordance with the provisions of the Water Supply Act of 1958, as amended (43 U.S.C. 390b-f); and

WHEREAS, the User is empowered to contract with the Government and is vested with all necessary powers of accomplishment of the purposes of this contract, including those required by Section 221 of the Flood Control Act of 1970 (42 U.S.C. 1962d-5d) (as amended);

NOW THEREFORE, the Government and the User agree as follows:

ARTICLE 1 - Water Storage Space.

a. Project Construction. The Government, subject to the directions of Federal law and any limitations imposed thereby, shall modify the Project so as to include therein space for the storage of water by the User.

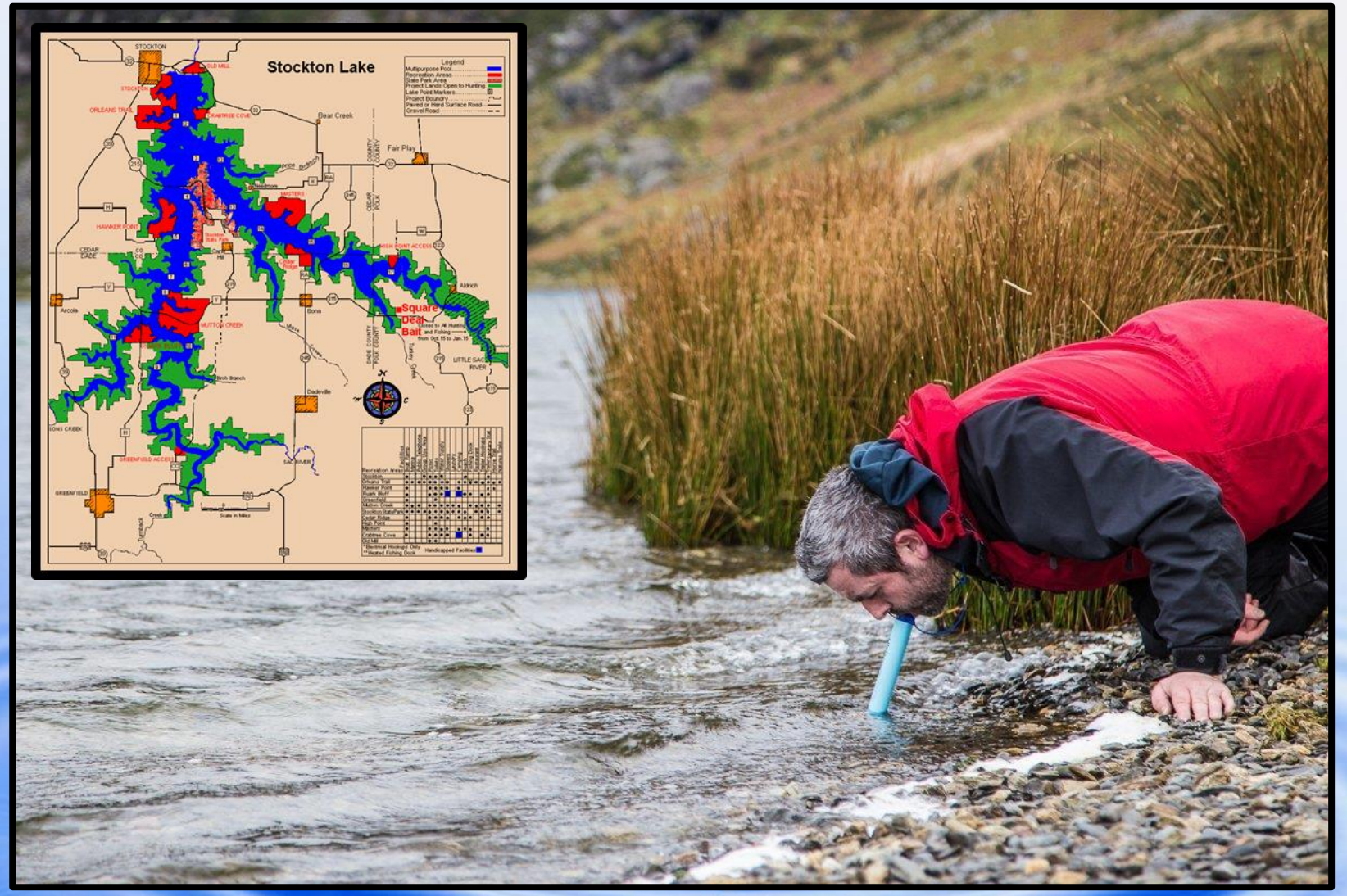
b. Rights of User.

(1) The User shall have the right to utilize an undivided 7.63 percent (estimated to contain 50,000 acre-feet after adjustment for sediment deposits) of the usable storage space in the Project between elevations 830.0 feet National Geodetic Vertical Datum and 867.0 feet above National Geodetic Vertical

What are the “hurdle” steps?

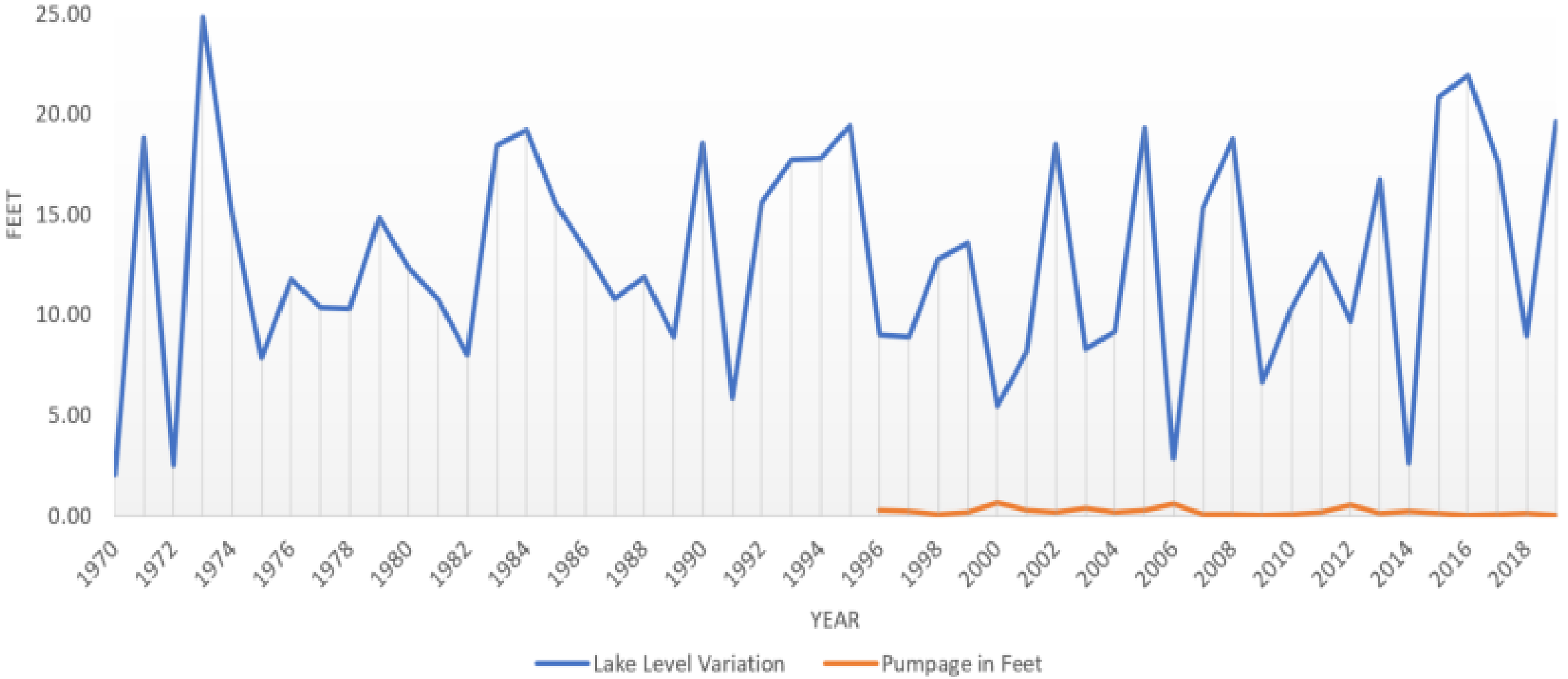





Stockton Lake
Legend
Multipurpose Pool
Recreation Areas
State Park Area
Project Lands Open to Hunting
Lake Point Markers
Project Boundary
Paved or Hard Surface Road
Gravel Road
STOCKTON
OLD MILL
ORLEANS TRAIL
CRABTREE COVE
Bear Creek
Fair Play
MASTERS
HAWKER POINT
CEDAR DADE
HIGH POINT ACCESS
Aldrich
Arcola
MUTTON CREEK
Bona
Square Deal Bait
LITTLE SAC RIVER
Birch Branch
Dadeville
SONS CREEK
GREENFIELD ACCESS
SAC RIVER
GREENFIELD
Scale in Miles



Lake level variation compared to pumpage in feet





Cost vs Value of Water

1 gallon – 17 cents



Internet for a day-$2





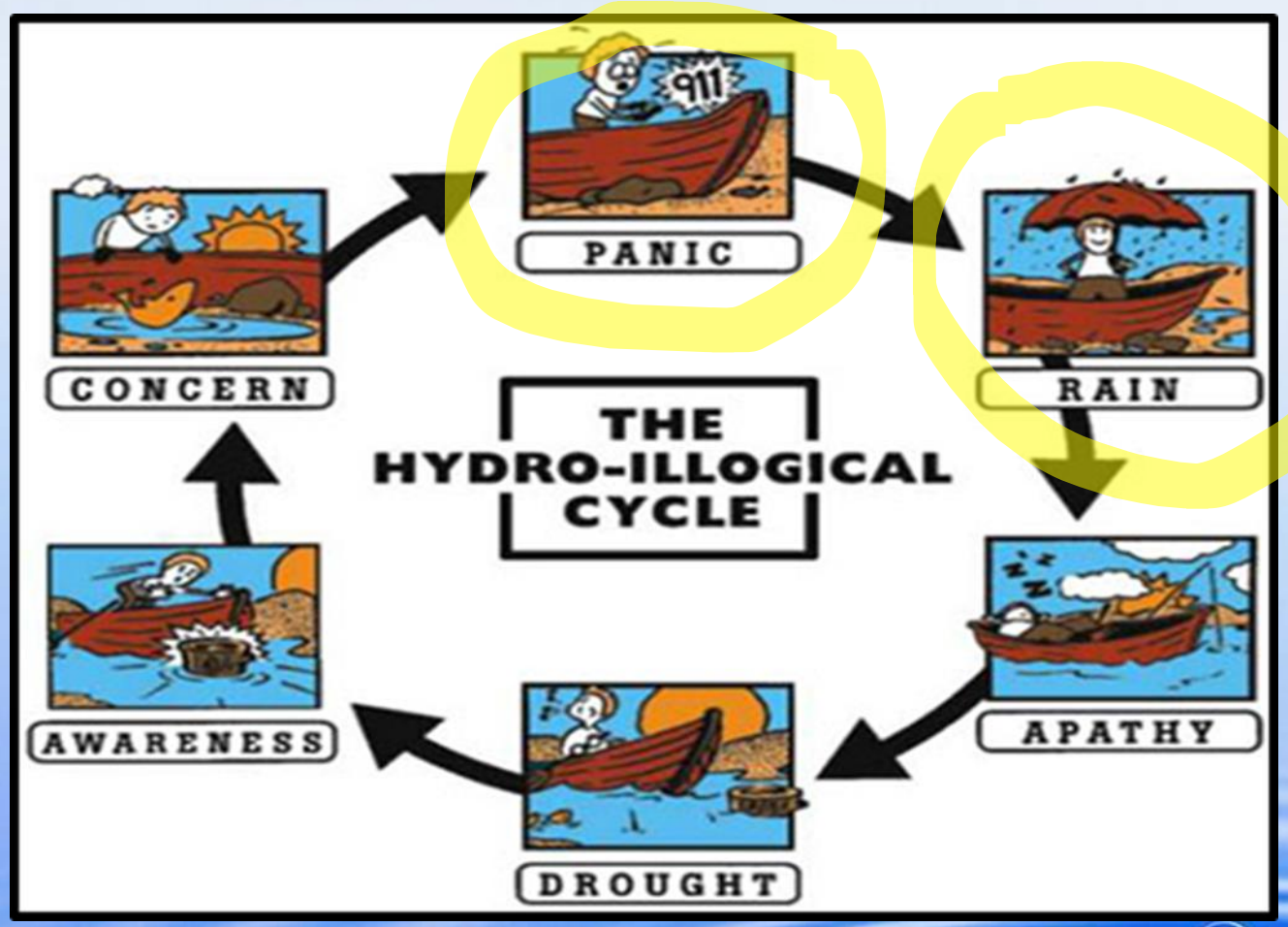
20 gallons-14.8 cents

1 gallon-$11-12



1 gallon-$2-3







"We know the worth of water when the well runs dry."









Megadrought

158,000 acres

BILL CLARK/CQ-ROLL CALL/GETTY IMAGES



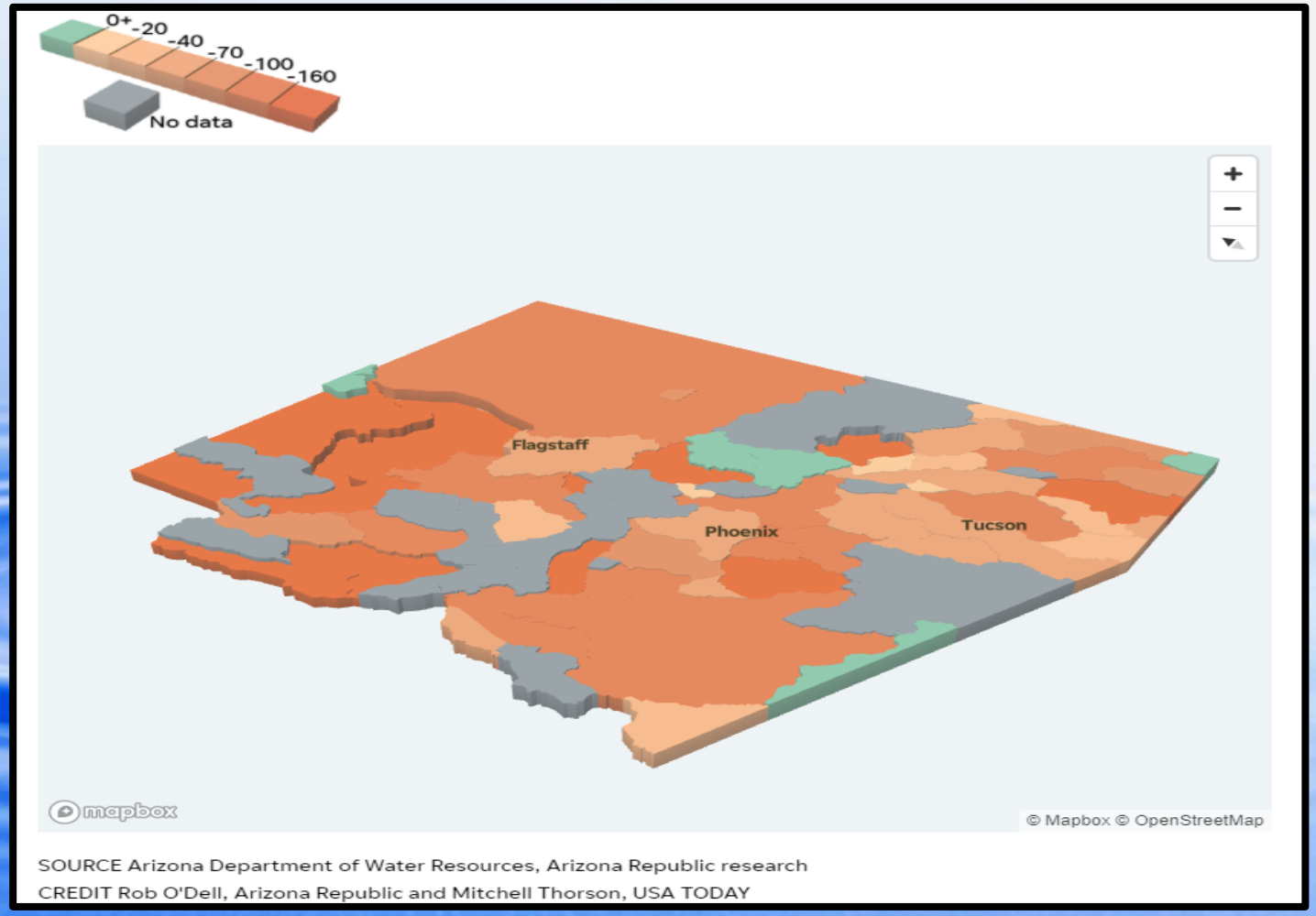








Change in average groundwater levels in feet since the 1950s ▼



SOURCE Arizona Department of Water Resources, Arizona Republic research
CREDIT Rob O'Dell, Arizona Republic and Mitchell Thorson, USA TODAY





“The days of utilizing native groundwater for development in Pinal are over. It’s done.” Those who want to develop in Pinal, he said, “will need to bring their own, non-groundwater supplies.” I think if we don't allow ourselves to play out worst-case scenarios, that's putting our head in the sand.”

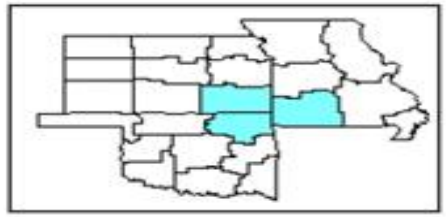
Arizona DNR Deputy Director





Ya—but is it really ever going to happen here?





Annual Average Precipitation 1895-2020

Long-term average: 40.18”

5 yr. running mean

Precipitation (in.)

65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00

1927
1973
1985
2008
2019
1901
1936
1952
1963
1980

Wet Period
Dry Period

Data Source: Missouri Climate Center/NOAA

1895 1900 1905 1910 1915 1920 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020

Year

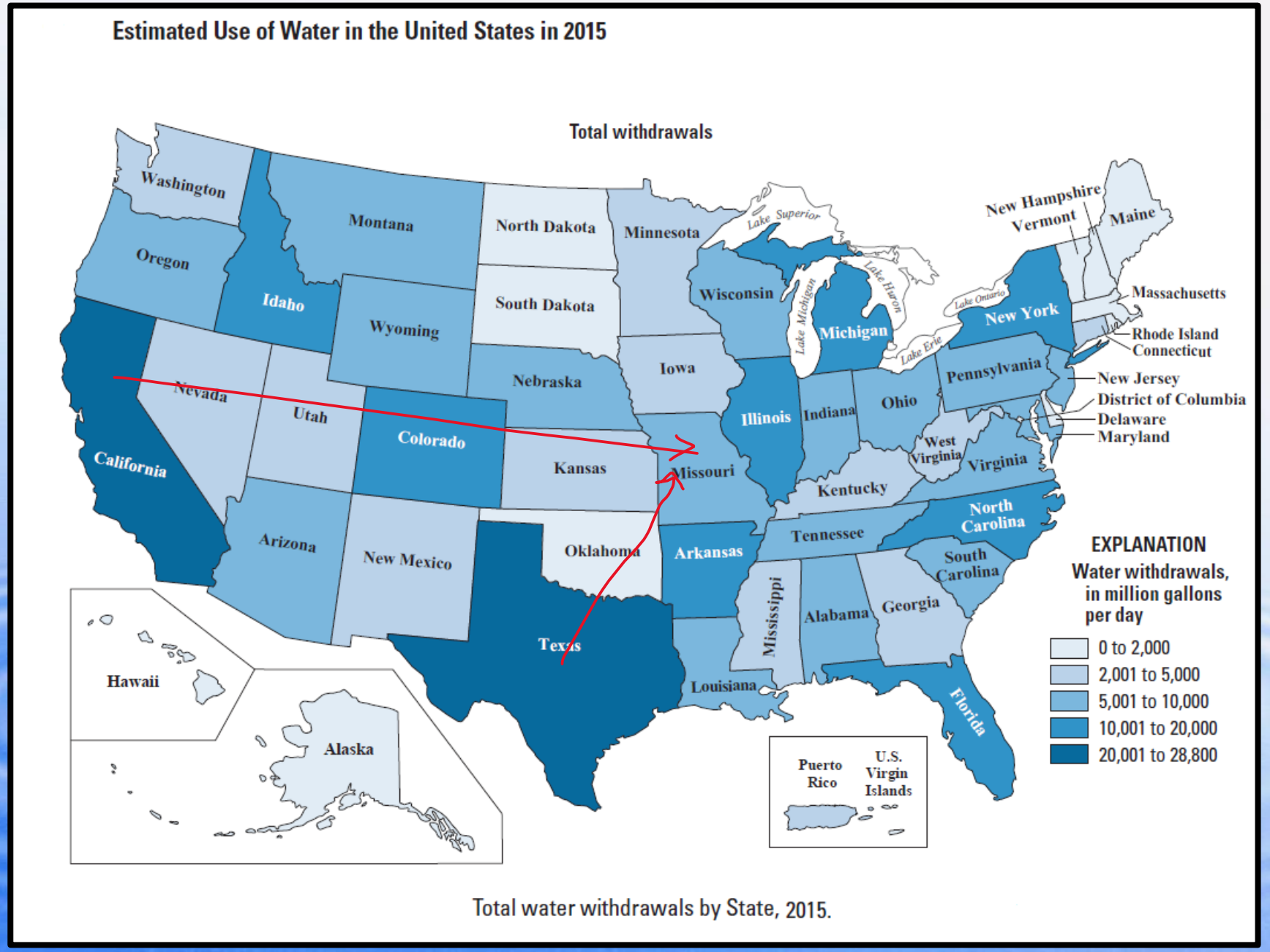

40
YEARS


COP24



“Such a strain on water resources, especially in the Western United States, will likely pose additional challenges as people begin to relocate away from the coasts to the interior of the country.”

Journal of Environmental Economics and Management





How much is it going to cost to do this?

How much is it going to cost NOT to do this?



Since 1980, droughts have cost the U.S. an estimated $249 billion.

SOURCE: NOAA

Each entity will has an important decision to make



What is YOUR next step?

- **May have planned and have adequate source water for 25-30 years.**
- **It takes that long to develop the next source.**
- **The next source--regional.**





Conclusions



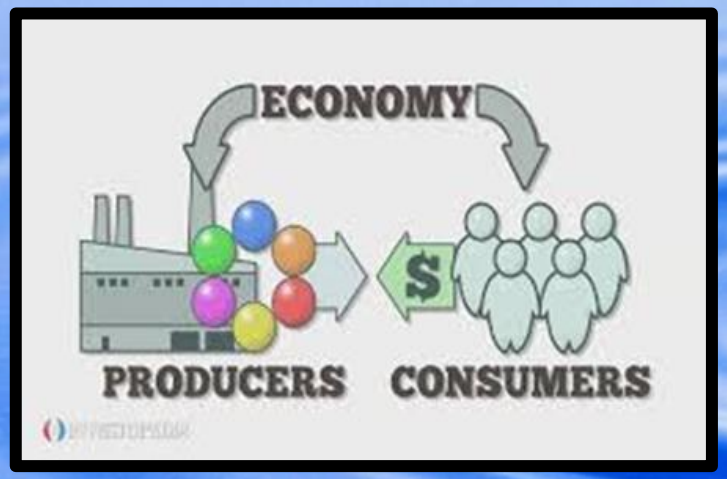





Next
Tomorrow
Later
NOW

Predicting the Future
No-Win

Ensuring the Future
Win-Win







Mitigation

On the fly

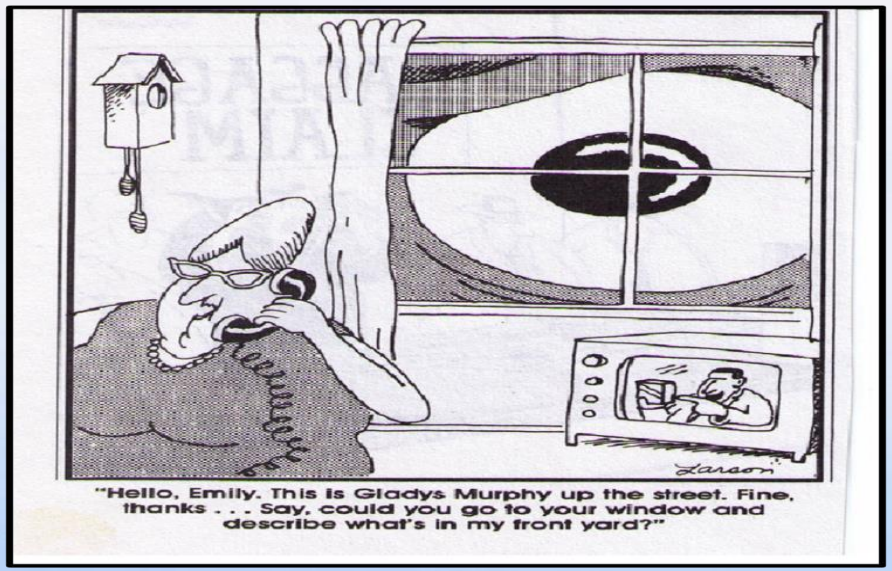


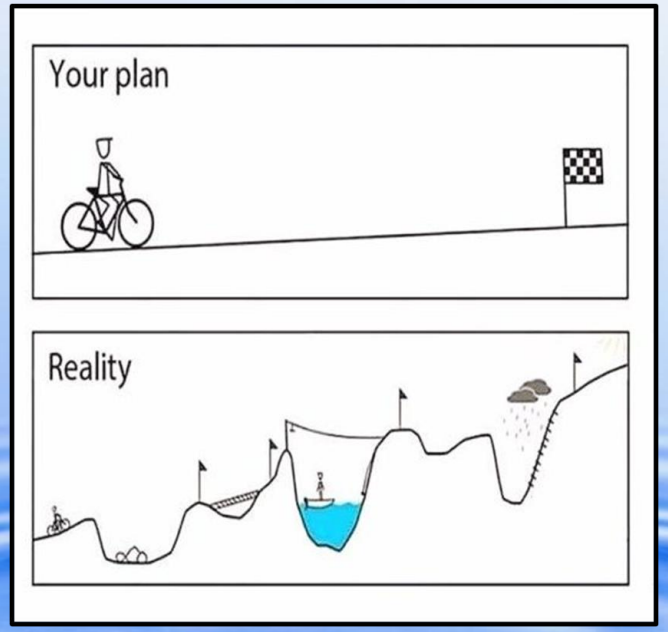
Drought Prepared



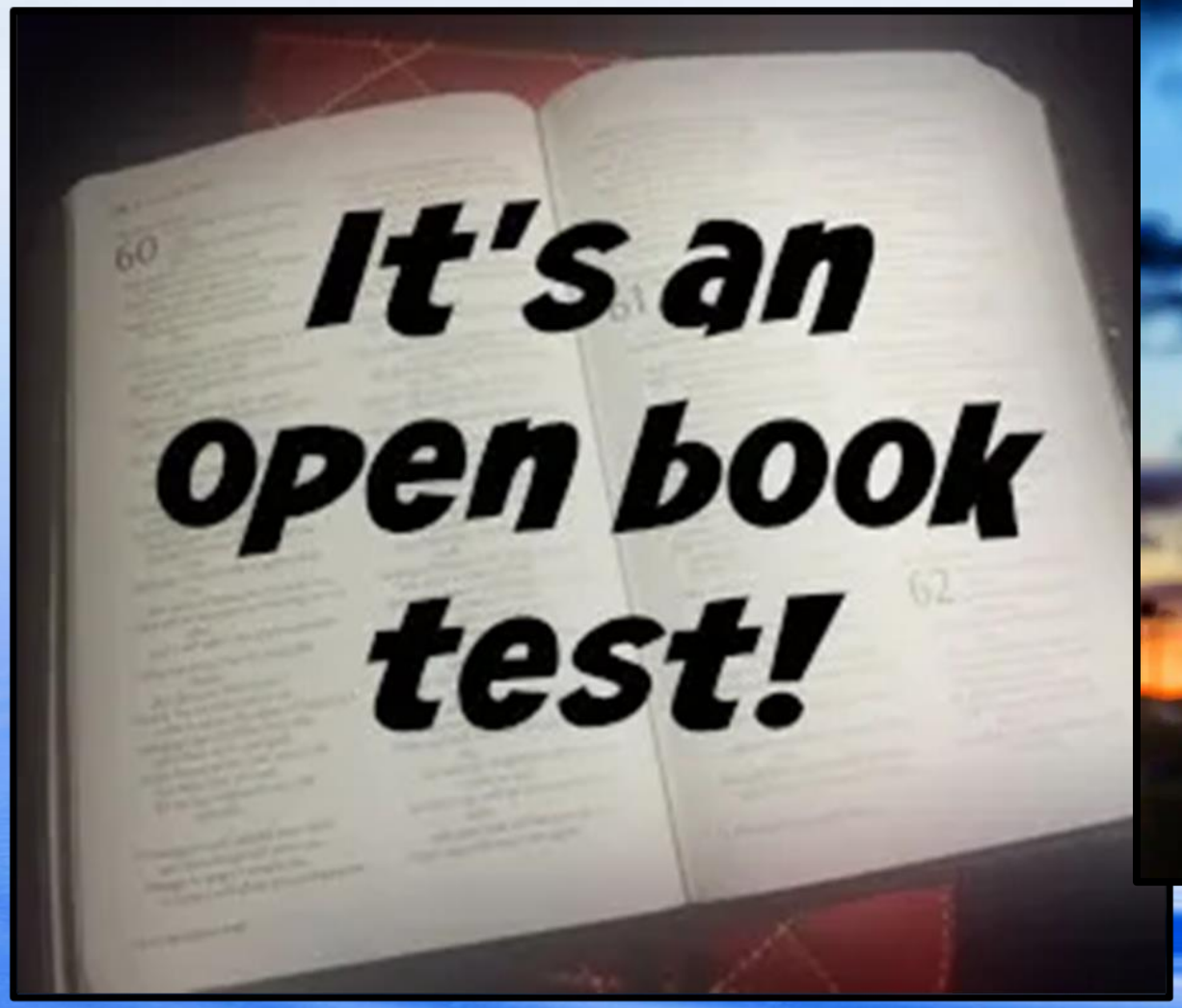
Drought Prepared



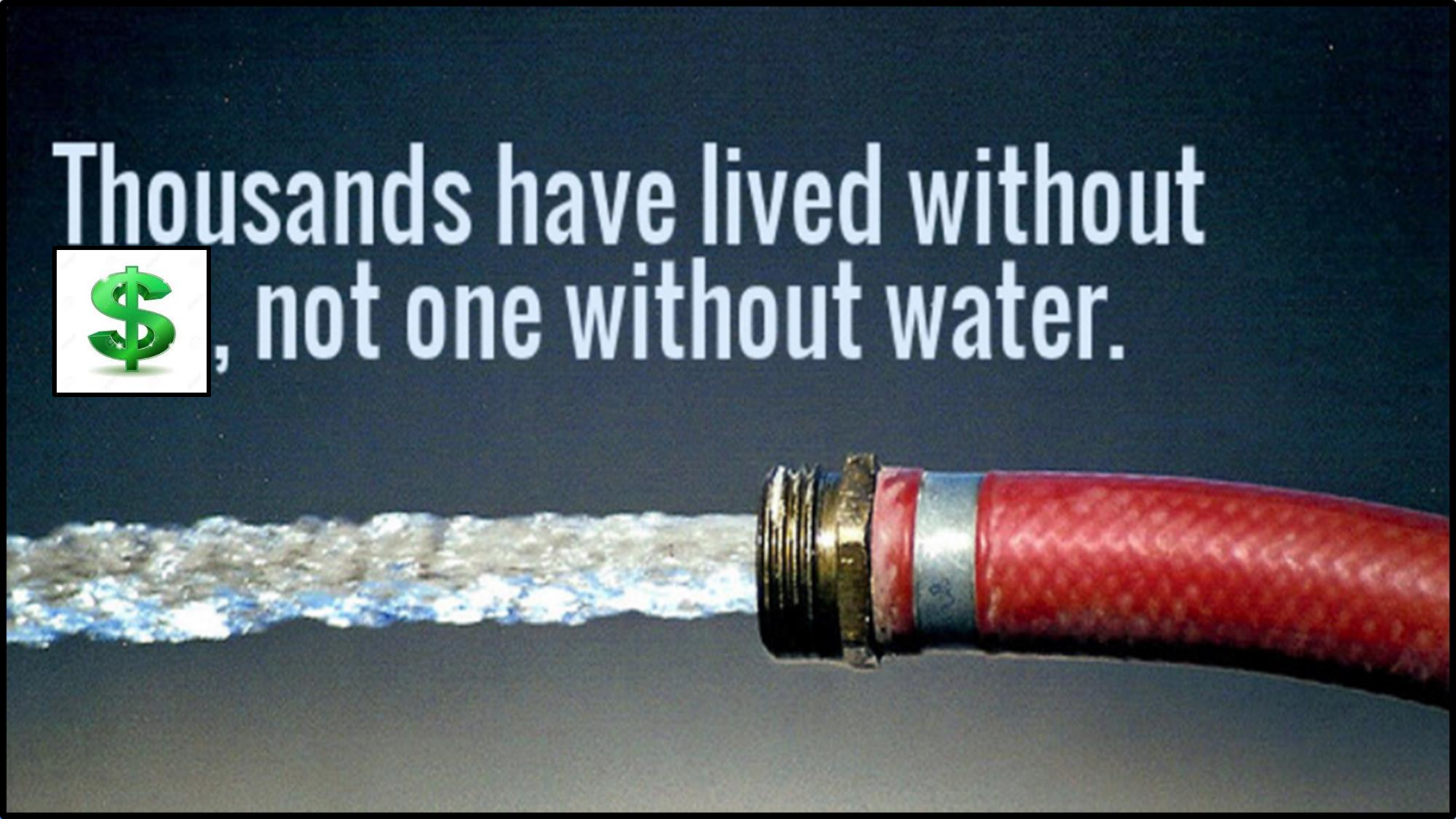

"Hello, Emily. This is Gladys Murphy up the street. Fine, thanks . . . Say, could you go to your window and describe what's in my front yard?"


Your plan
Reality


I WAS IN A HURRY THIS MORNING...


It's an
open book
test!




Thousands have lived without
, not one without water.

SOUTHWEST MISSOURI



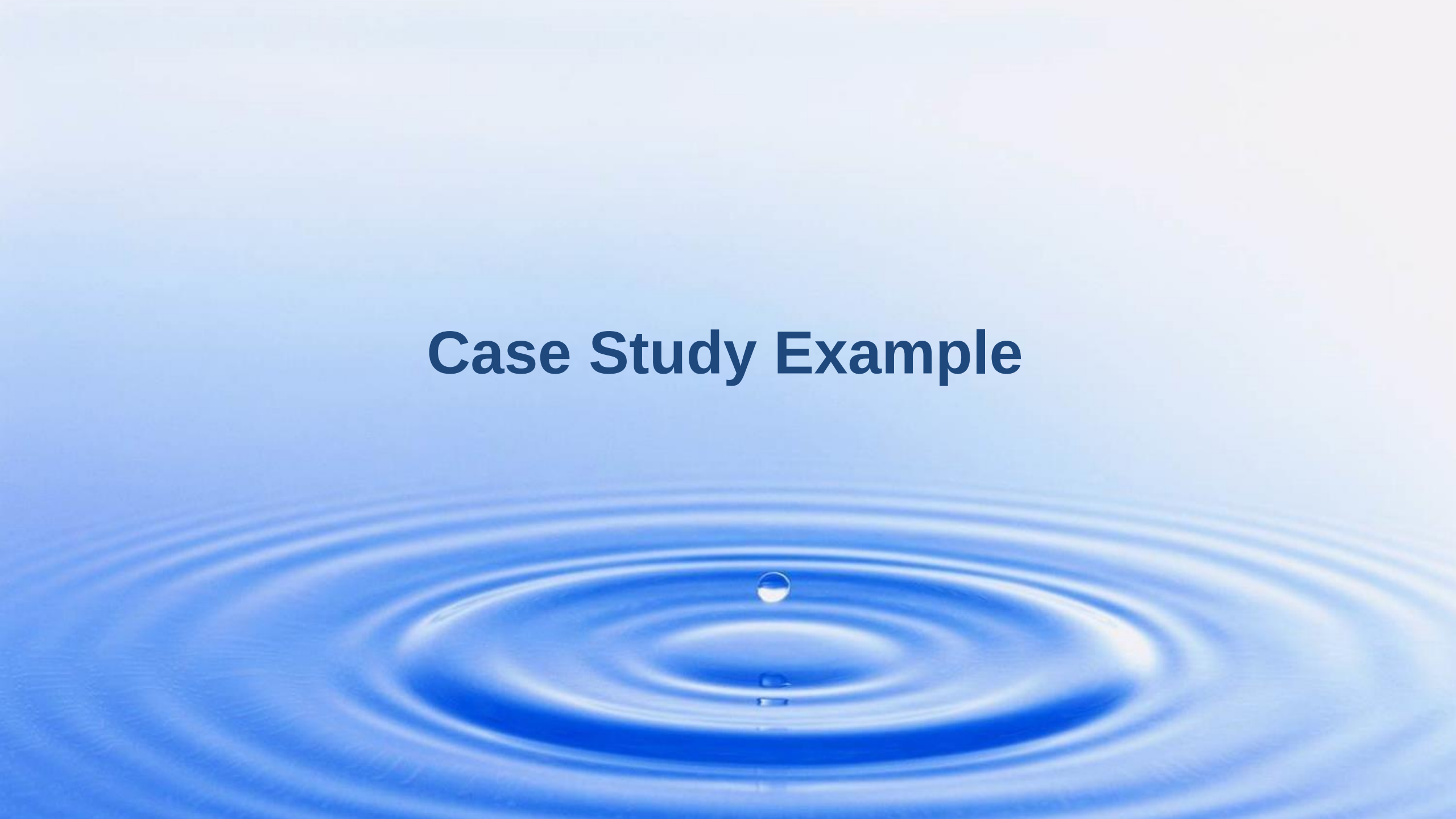




Securing Water For Our Future



Case Study Example




THE CITY COULD RUN OUT OF
WATER BY MARCH 2018.

★ Cape Times, Thursday, April 26, 1990

City will run out of water 'in 17 years'

By BARRY STREEK
Political Staff

WATER supplies for the Cape Town area are expected to dry up in 17 years' time, the Water Research Commission (WRC) disclosed yesterday.

"It is estimated that known fresh water supplies for the Cape Town metropolitan area will be fully committed by the year 2007," it said in its annual report tabled in Parliament yesterday.

"Thereafter the reclamation of purified sewage effluent to augment supplies is a distinct possibility."

The commission is also conducting major research into the pollution of water by industry, particularly from pulp effluents.

The report said research and recommendations had been published about pollution problems in industries such as textiles, hides and skins, fish, fruit and vegetables and abattoirs.

A national survey of industrial water and waste water was being conducted to establish a data base containing information on water intake, raw materials, products, effluent quality and the amount of industrial waste from all types of industries using more than 150 cubic metres of water a day.

On water supplies, the commission reported that a survey was launched by the University of Cape Town's Department of Community Health to establish early baseline data.

"This was done by establishing a data bank consisting primarily of information on mortality rates, morbidity as seen by general practitioners and birth defects."

This research would provide the basis and model for future comparative health studies in other geographic areas.

The commission said effluents from bleaching processes using chlorine and other bleaches were the biggest contributors to environmental pollution caused by pulp factories.

"These types of effluent are becoming increasingly unacceptable worldwide for discharge to sewage systems or to the environment because of their toxic content.

"In South Africa the position is even more critical because no bleaching process effluents may be discharged by inland pulp factories after 1990."

The commission said 12 million animals were slaughtered at almost 300 abattoirs, which resulted in about 80 000 tons of kraal manure and 170 000 tons of stomach contents.

The commonest methods of disposing of the manure were to use it as a soil conditioner, to dump it at disposal sites or even to discharge it into sewers.

"These methods are unsuitable and unacceptable, specially from a hygiene point of view.

"Furthermore, disposal costs are increasing while the number of disposal sites are decreasing.

"More acceptable methods of disposal are urgently required, of which composting looks promising," the commission said.

Stockton Lake Storage Allocations

Storage Began December 12, 1969 Current Capacity Table Use Began Sept. 1, 2019

50,000 AF of MP space reallocated to water supply in 1993. All contracted to Springfield, all in service as of 2013.

