# Kansas Water Plan Implementation Workshops

Summer Local Consult

June 2024

# Building a Future for Today and Tomorrow's Kansans

# Where we are today

Hundreds of Kansans provide input for the Kansas Water Plan

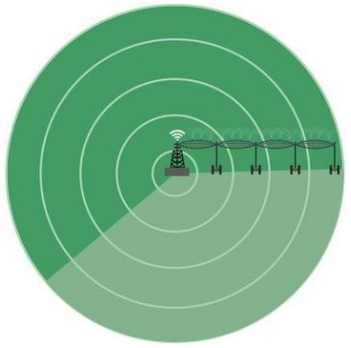
2022 Kansas Water Plan Released Creating a **Vision** for Kansas

Governor & Bipartisan Legislators support funding the Water Plan

**Today:** Implement the Water Plan & Establish Ongoing, Dynamic process

# Average Annual Water Usage in Kansas by Category

**83%**

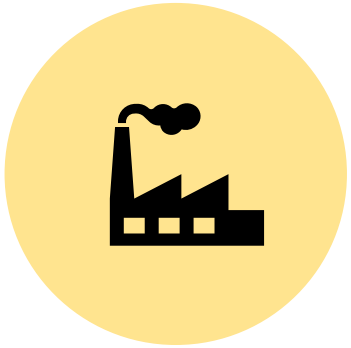


**Irrigation Farming**

**11%**

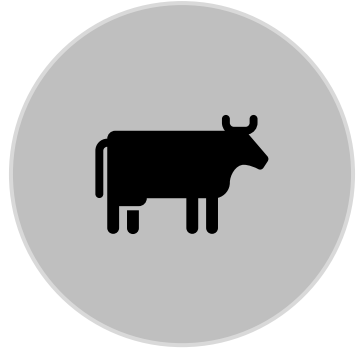
**Municipal**

**3%**



**Industrial**

**1%**

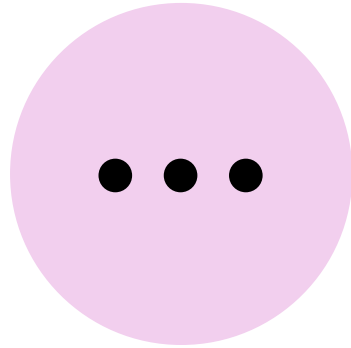


**Stock Water**

**1%**

**Recreational**

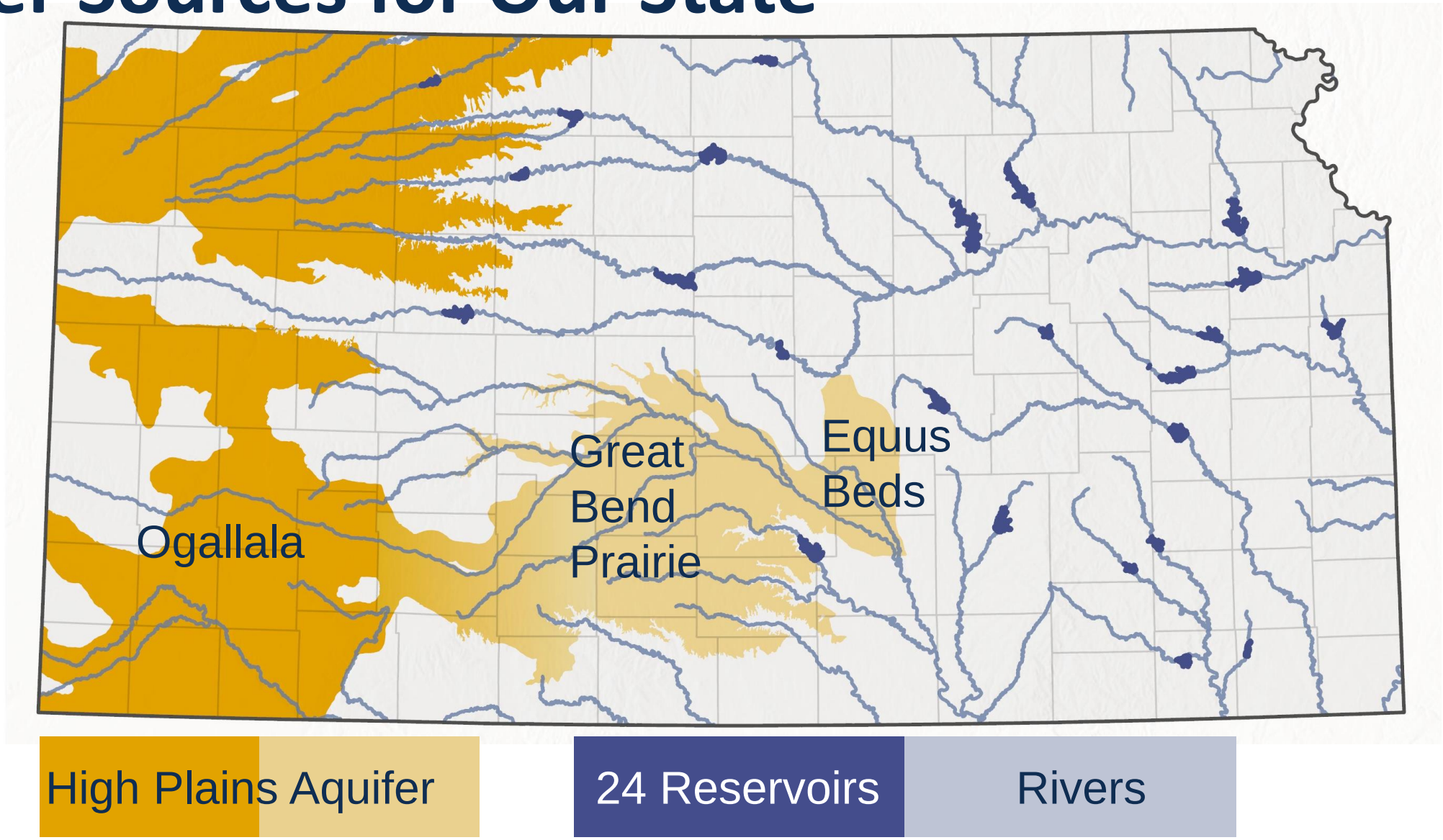
**1%**



**Miscellaneous**

Source: Kansas Department of Ag, 2019

# Water Sources for Our State



# Kansas Water Plan Vision: 5 Guiding Principles

1. Conserve and Extend the High Plains **Aquifer**

2. Secure, Protect and Restore Our Kansas **Reservoirs**

3. Improve the State' s **Water Quality**

4. Reduce Our Vulnerability to Extreme Events

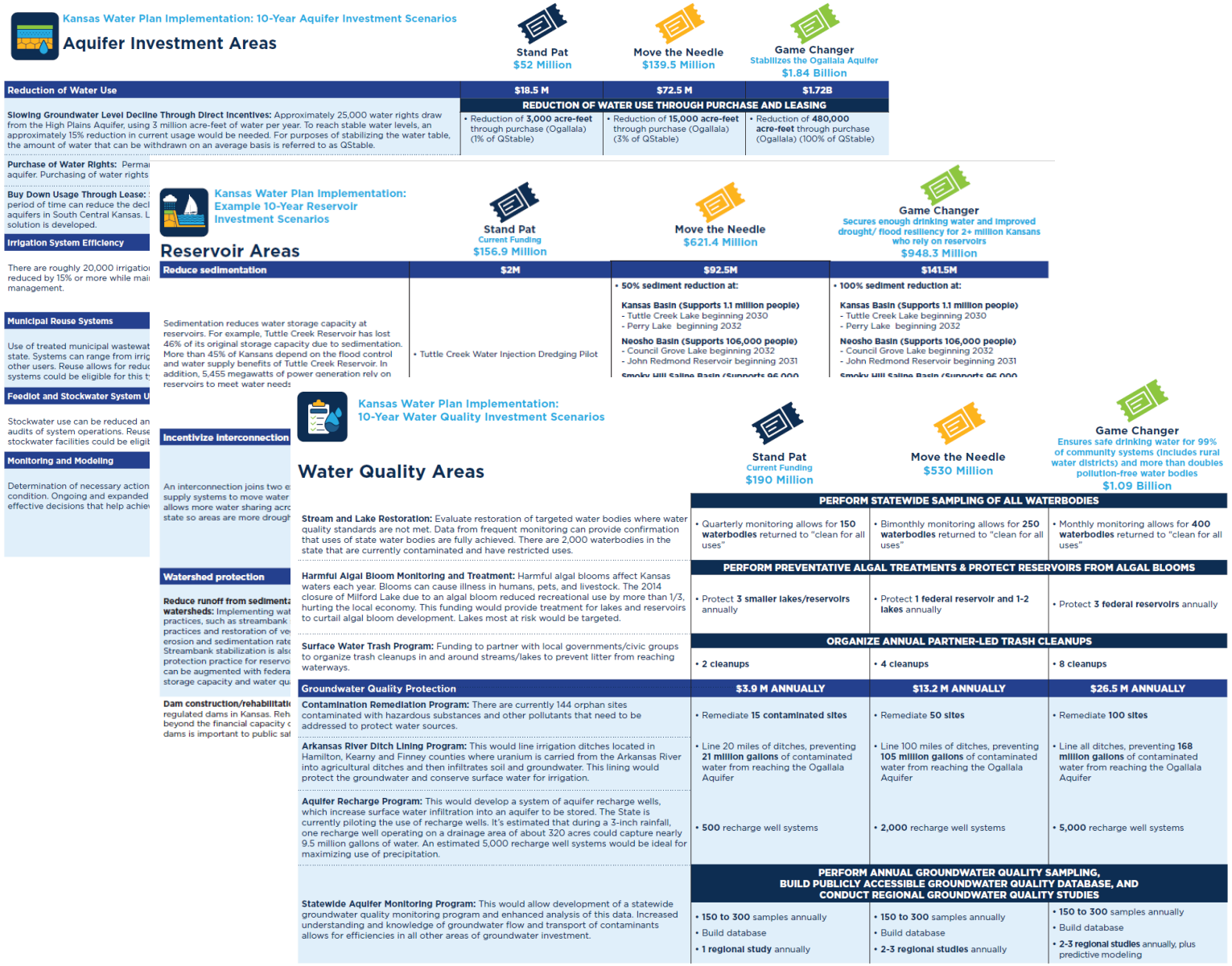
5. Increased Awareness of Kansas Water Resources

**Embedded within these 3.**

## We are organizing around the big 3

# Investment Scenario Handouts for each Guiding Principle:

1. Aquifer
2. Reservoir
3. Water Quality



Kansas Water Plan Implementation: 10-Year Aquifer Investment Scenarios

## Aquifer Investment Areas

| | Stand Pat $52 Million | Move the Needle $139.5 Million | Game Changer Stabilizes the Ogallala Aquifer $1.84 Billion |
|---|---|---|---|
| **Reduction of Water Use** | **$18.5 M** | **$72.5 M** | **$1.72B** |
| **Slowing Groundwater Level Decline Through Direct Incentives:** Approximately 25,000 water rights draw from the High Plains Aquifer, using 3 million acre-feet of water per year. To reach stable water levels, an approximately 15% reduction in current usage would be needed. For purposes of stabilizing the water table, the amount of water that can be withdrawn on an average basis is referred to as QStable. | **REDUCTION OF WATER USE THROUGH PURCHASE AND LEASING** | | |
| | • Reduction of **3,000 acre-feet** through purchase (Ogallala) (1% of QStable) | • Reduction of **15,000 acre-feet** through purchase (Ogallala) (3% of QStable) | • Reduction of **480,000 acre-feet** through purchase (Ogallala) (100% of QStable) |
| **Purchase of Water Rights:** Permai aquifer. Purchasing of water rights | | | |
| **Buy Down Usage Through Lease:** period of time can reduce the decl aquifers in South Central Kansas. L solution is developed. | | | |
| **Irrigation System Efficiency** | | | |
| There are roughly 20,000 irrigatio reduced by 15% or more while mai management. | | | |
| **Municipal Reuse Systems** | | | |
| Use of treated municipal wastewat state. Systems can range from irrig other users. Reuse allows for reduc systems could be eligible for this t | | | |
| **Feedlot and Stockwater System U** | | | |
| Stockwater use can be reduced an audits of system operations. Reuse stockwater facilities could be eligit | | | |
| **Monitoring and Modeling** | | | |
| Determination of necessary action condition. Ongoing and expanded effective decisions that help achie | | | |

Kansas Water Plan Implementation: Example 10-Year Reservoir Investment Scenarios

## Reservoir Areas

| | Stand Pat Current Funding $156.9 Million | Move the Needle $621.4 Million | Game Changer Secures enough drinking water and improved drought/ flood resiliency for 2+ million Kansans who rely on reservoirs $948.3 Million |
|---|---|---|---|
| **Reduce sedimentation** | **$2M** | **$92.5M** | **$141.5M** |
| Sedimentation reduces water storage capacity at reservoirs. For example, Tuttle Creek Reservoir has lost 46% of its original storage capacity due to sedimentation. More than 45% of Kansans depend on the flood control and water supply benefits of Tuttle Creek Reservoir. In addition, 5,455 megawatts of power generation rely on reservoirs to meet water needs | • Tuttle Creek Water Injection Dredging Pilot | • **50% sediment reduction at:**<br>**Kansas Basin (Supports 1.1 million people)**<br>- Tuttle Creek Lake beginning 2030<br>- Perry Lake beginning 2032<br>**Neosho Basin (Supports 106,000 people)**<br>- Council Grove Lake beginning 2032<br>- John Redmond Reservoir beginning 2031<br>**Smoky Hill Saline Basin (Supports 96,000** | • **100% sediment reduction at:**<br>**Kansas Basin (Supports 1.1 million people)**<br>- Tuttle Creek Lake beginning 2030<br>- Perry Lake beginning 2032<br>**Neosho Basin (Supports 106,000 people)**<br>- Council Grove Lake beginning 2032<br>- John Redmond Reservoir beginning 2031<br>**Smoky Hill Saline Basin (Supports 96,000** |
| **Incentivize interconnection** | | | |
| An interconnection joins two e supply systems to move water allows more water sharing acro state so areas are more drough | | | |
| **Watershed protection** | | | |
| **Reduce runoff from sediment watersheds:** Implementing wat practices, such as streambank practices and restoration of ve erosion and sedimentation rate Streambank stabilization is also protection practice for reservo can be augmented with federa storage capacity and water qu | | | |
| **Dam construction/rehabilitati** regulated dams in Kansas. Reh beyond the financial capacity dams is important to public sa | | | |

Kansas Water Plan Implementation: 10-Year Water Quality Investment Scenarios

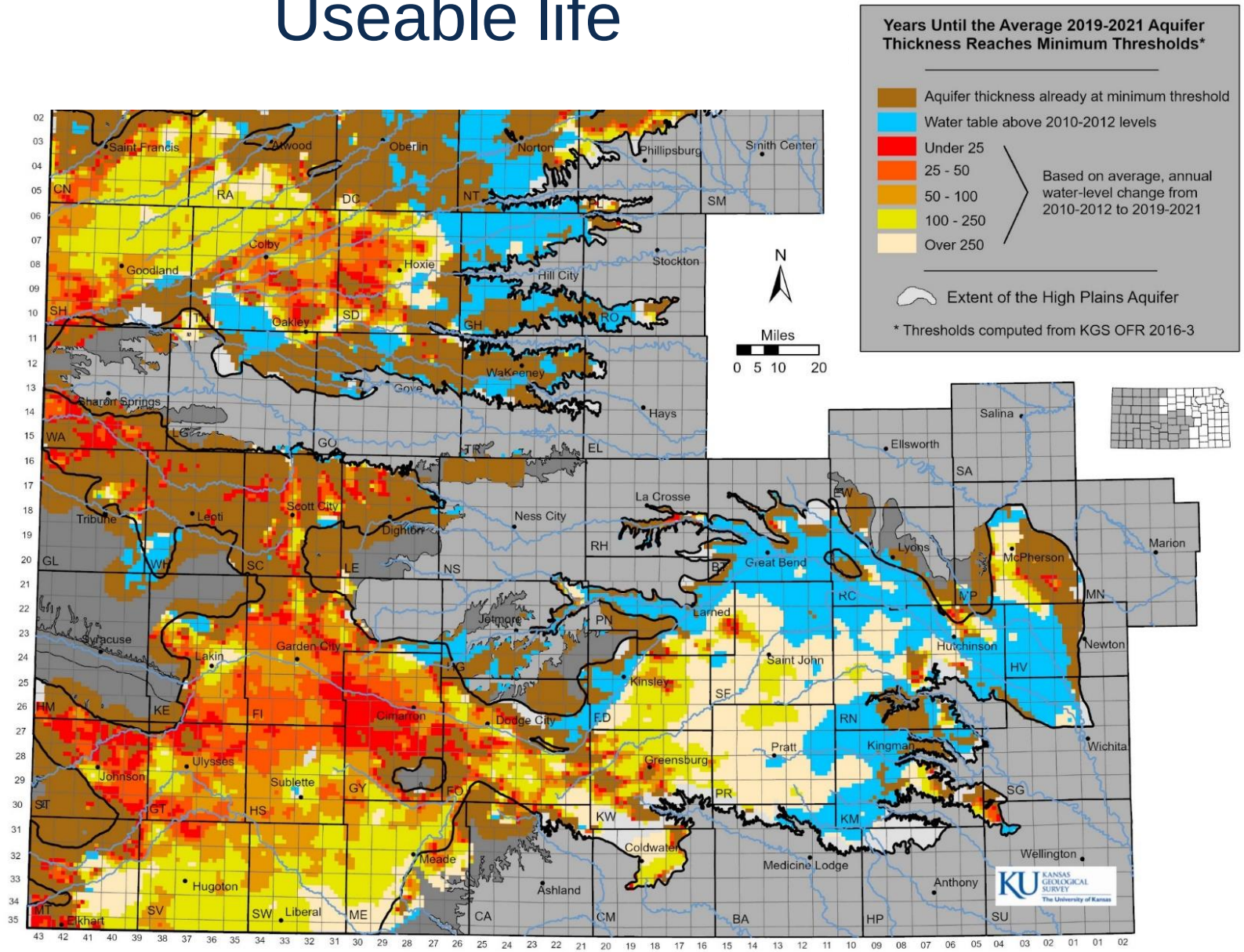
## Water Quality Areas

| | Stand Pat Current Funding $190 Million | Move the Needle $530 Million | Game Changer Ensures safe drinking water for 99% of community systems (includes rural water districts) and more than doubles pollution-free water bodies $1.09 Billion |
|---|---|---|---|
| | **PERFORM STATEWIDE SAMPLING OF ALL WATERBODIES** | | |
| **Stream and Lake Restoration:** Evaluate restoration of targeted water bodies where water quality standards are not met. Data from frequent monitoring can provide confirmation that uses of state water bodies are fully achieved. There are 2,000 waterbodies in the state that are currently contaminated and have restricted uses. | • Quarterly monitoring allows for **150 waterbodies** returned to "clean for all uses" | • Bimonthly monitoring allows for **250 waterbodies** returned to "clean for all uses" | • Monthly monitoring allows for **400 waterbodies** returned to "clean for all uses" |
| | **PERFORM PREVENTATIVE ALGAL TREATMENTS & PROTECT RESERVOIRS FROM ALGAL BLOOMS** | | |
| **Harmful Algal Bloom Monitoring and Treatment:** Harmful algal blooms affect Kansas waters each year. Blooms can cause illness in humans, pets, and livestock. The 2014 closure of Milford Lake due to an algal bloom reduced recreational use by more than 1/3, hurting the local economy. This funding would provide treatment for lakes and reservoirs to curtail algal bloom development. Lakes most at risk would be targeted. | • Protect **3 smaller lakes/reservoirs** annually | • Protect **1 federal reservoir and 1-2 lakes** annually | • Protect **3 federal reservoirs** annually |
| | **ORGANIZE ANNUAL PARTNER-LED TRASH CLEANUPS** | | |
| **Surface Water Trash Program:** Funding to partner with local governments/civic groups to organize trash cleanups in and around streams/lakes to prevent litter from reaching waterways. | • **2 cleanups** | • **4 cleanups** | • **8 cleanups** |
| **Groundwater Quality Protection** | **$3.9 M ANNUALLY** | **$13.2 M ANNUALLY** | **$26.5 M ANNUALLY** |
| **Contamination Remediation Program:** There are currently 144 orphan sites contaminated with hazardous substances and other pollutants that need to be addressed to protect water sources. | • Remediate **15 contaminated sites** | • Remediate **50 sites** | • Remediate **100 sites** |
| **Arkansas River Ditch Lining Program:** This would line irrigation ditches located in Hamilton, Kearny and Finney counties where uranium is carried from the Arkansas River into agricultural ditches and then infiltrates soil and groundwater. This lining would protect the groundwater and conserve surface water for irrigation. | • Line 20 miles of ditches, preventing **21 million gallons** of contaminated water from reaching the Ogallala Aquifer | • Line 100 miles of ditches, preventing **105 million gallons** of contaminated water from reaching the Ogallala Aquifer | • Line all ditches, preventing **168 million gallons** of contaminated water from reaching the Ogallala Aquifer |
| **Aquifer Recharge Program:** This would develop a system of aquifer recharge wells, which increase surface water infiltration into an aquifer to be stored. The State is currently piloting the use of recharge wells. It's estimated that during a 3-inch rainfall, one recharge well operating on a drainage area of about 320 acres could capture nearly 9.5 million gallons of water. An estimated 5,000 recharge well systems would be ideal for maximizing use of precipitation. | • **500** recharge well systems | • **2,000** recharge well systems | • **5,000** recharge well systems |
| | **PERFORM ANNUAL GROUNDWATER QUALITY SAMPLING, BUILD PUBLICLY ACCESSIBLE GROUNDWATER QUALITY DATABASE, AND CONDUCT REGIONAL GROUNDWATER QUALITY STUDIES** | | |
| **Statewide Aquifer Monitoring Program:** This would allow development of a statewide groundwater quality monitoring program and enhanced analysis of this data. Increased understanding and knowledge of groundwater flow and transport of contaminants allows for efficiencies in all other areas of groundwater investment. | • **150 to 300** samples annually<br>• Build database<br>• **1 regional study** annually | • **150 to 300** samples annually<br>• Build database<br>• **2-3 regional studies** annually | • **150 to 300** samples annually<br>• Build database<br>• **2-3 regional studies** annually, plus predictive modeling |

# Aquifer

- Estimated usable life varies across aquifer
- Counties reliant on the aquifer account for **$57 billion in economic output** annually for Kansas

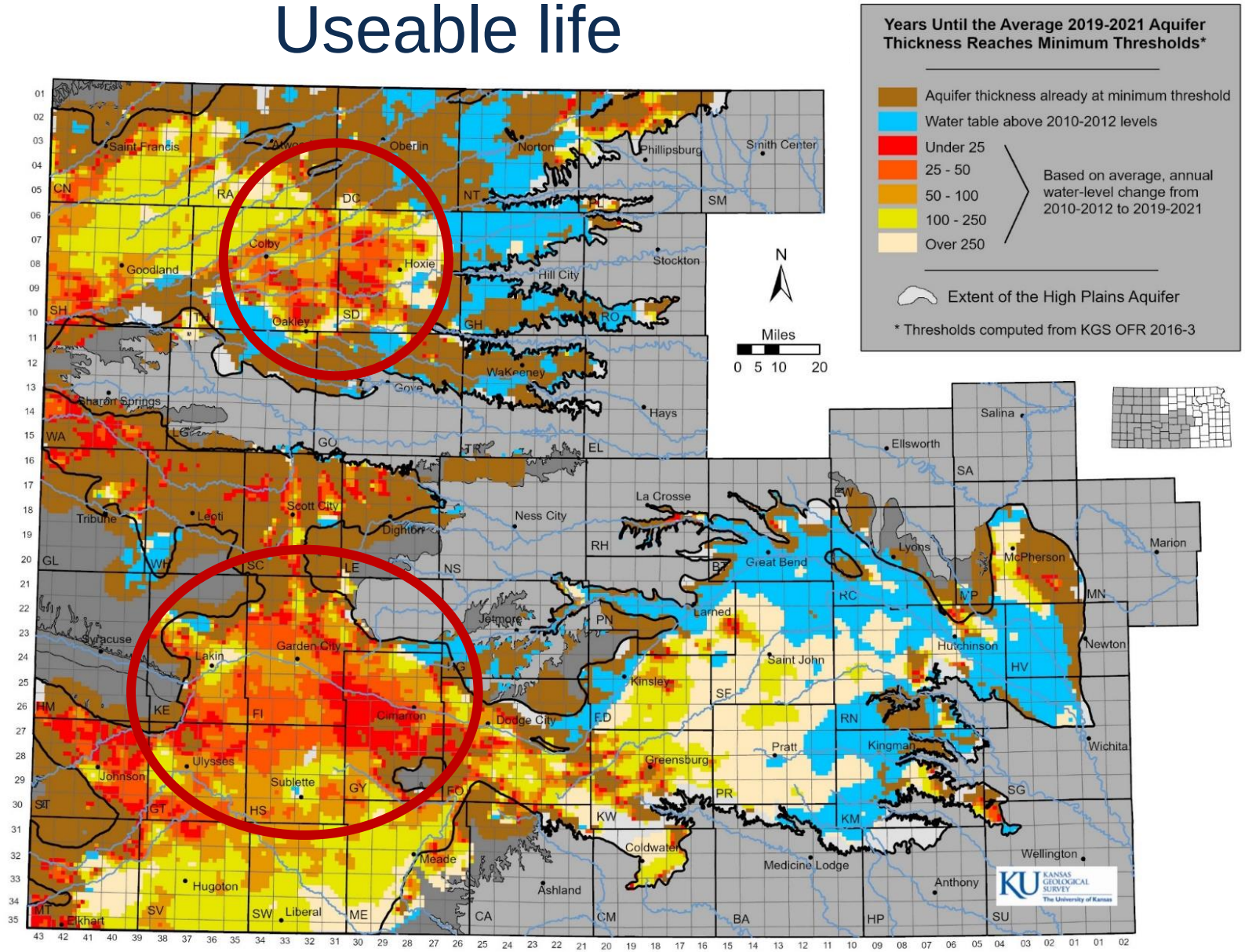
## Useable life



# Aquifer

- Estimated usable life varies across aquifer
- Counties reliant on the aquifer account for **$57 billion in economic output** annually for Kansas
- Without decreasing usage, **some communities could vanish within a <u>generation or two.</u>**

## Useable life



# Aquifer: How Example Investment Strategies Connect to Key Challenge

| Challenge: | Invest. Strategies to Address: |
|---|---|
| Need to **conserve water** for **future generations** | **Make major water usages** (irrigation, feedlots, municipal systems) **more efficient** through **technology upgrades and reuse systems.** |
| | Limit water usage by **purchasing water rights.** |
| | Enhanced **monitoring of water conditions** lets us track usage better and make effective decisions. |

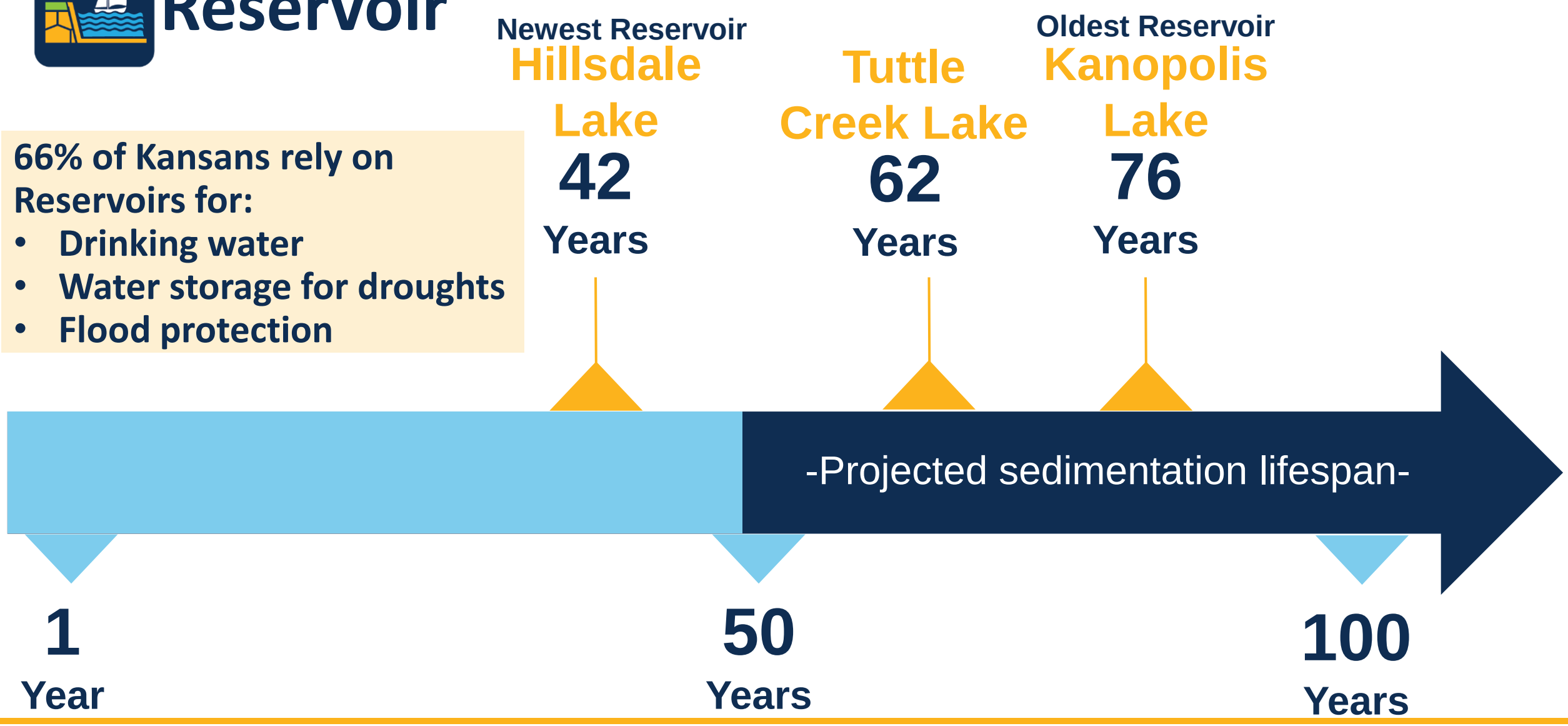
*More strategies on the handout.


It’s complicated
Everyone needs water today, tomorrow and forever
Levers: purchase, incentives, regulation
Your tax dollars
Kansas way of life and livelihoods

# Reservoir

**66% of Kansans rely on Reservoirs for:**

- **Drinking water**
- **Water storage for droughts**
- **Flood protection**



## Reservoir

## Water Quality

- About a 100 communities vulnerable to similar event as Caney

**Caney Water Crisis: City seeks state of emergency declaration**


The water crisis in Caney could lead to an official state of emergency declaration for the small southeastern Kansas town, its city administrator confirmed.

# Reservoir: How Example Investment Strategies Connect to Key Challenges

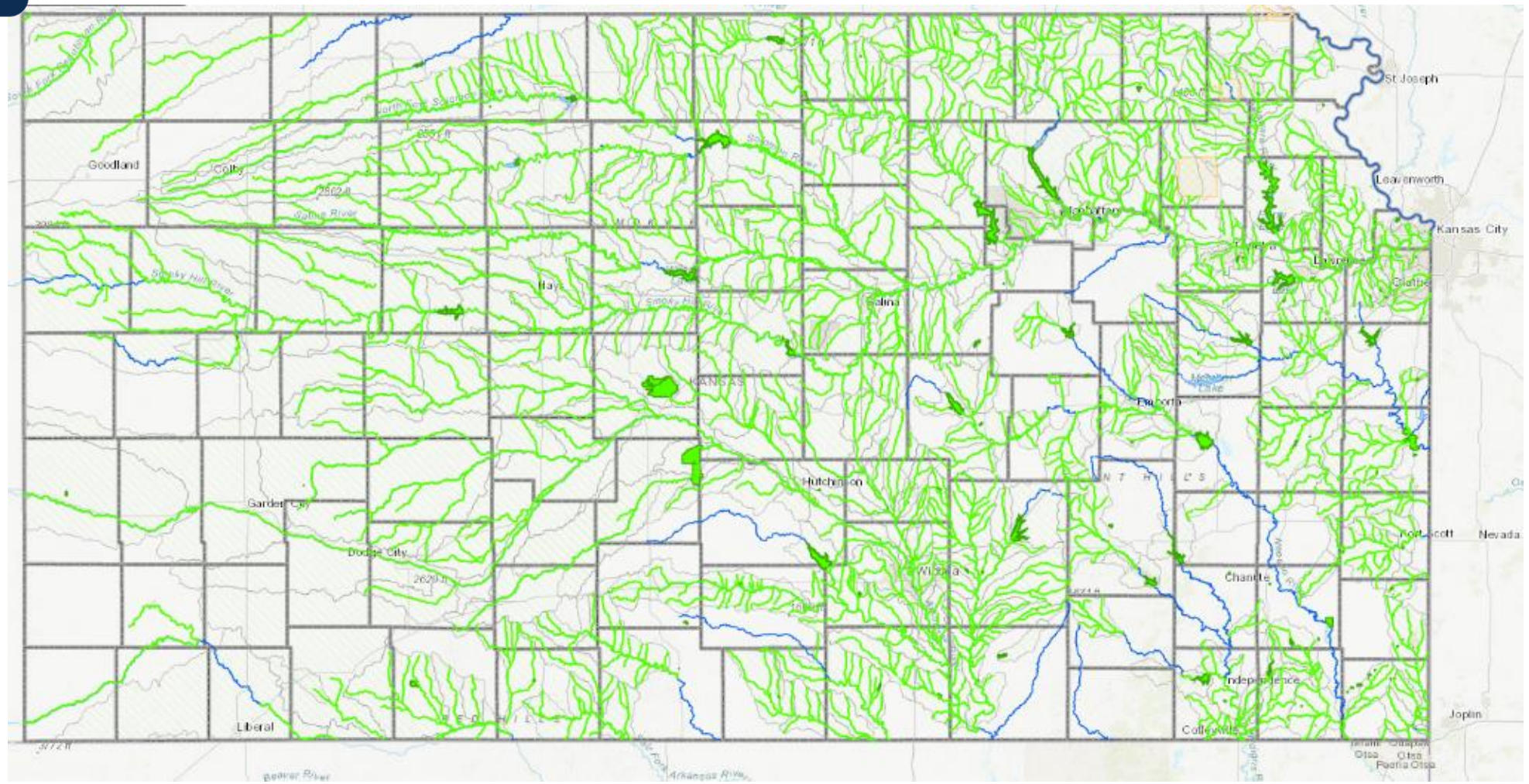
| Challenges: | Invest. Strategies to Address: |
|---|---|
| Need for **water storage** during droughts for **increased resiliency** | Sediment reduction **increasing storage capacity at reservoirs** |
| | Protecting watersheds **prevents sediment from reaching the reservoirs** |
| Need to **connect water systems (**like Caney) to **prevent running out of water** | **Regional interconnection projects connect communities to multiple water sources** |

*More strategies on the handout.

# Water Quality Challenge: Reacting to water contaminants is more costly than protecting waters from contamination

**Kansas Lakes & Reservoirs Drinking Water Conditions prior to Treatment**

# Water Quality Challenge: Green are impaired streams



# Water Quality: How Example Investment Strategies Connect to Key Challenges

| Challenges: | Invest. Strategies to Address: |
|---|---|
| Need to **fix leaky pipes in municipal water systems (**like Caney) to **stop wasting water** | Infrastructure grants to communities to **improve water and sewer systems to save water and meet health compliance standards** |
| **Protecting our water sources from contaminants** | **Protecting watersheds from pollution and stormwater runoff** |
| | **Addressing nitrates in drinking water** |

*More strategies on the handout.

# Seeking Your Input Today in 3 Key Areas

1

## Regional Goals

- Where is there alignment within your region and across the state?

2

## Investment Prioritization

- Why do you value investments in one Guiding Principle over another if forced to choose?

3

## Performance

- How are we managing water in the state? Where could we improve our programs?

All these are in same room.

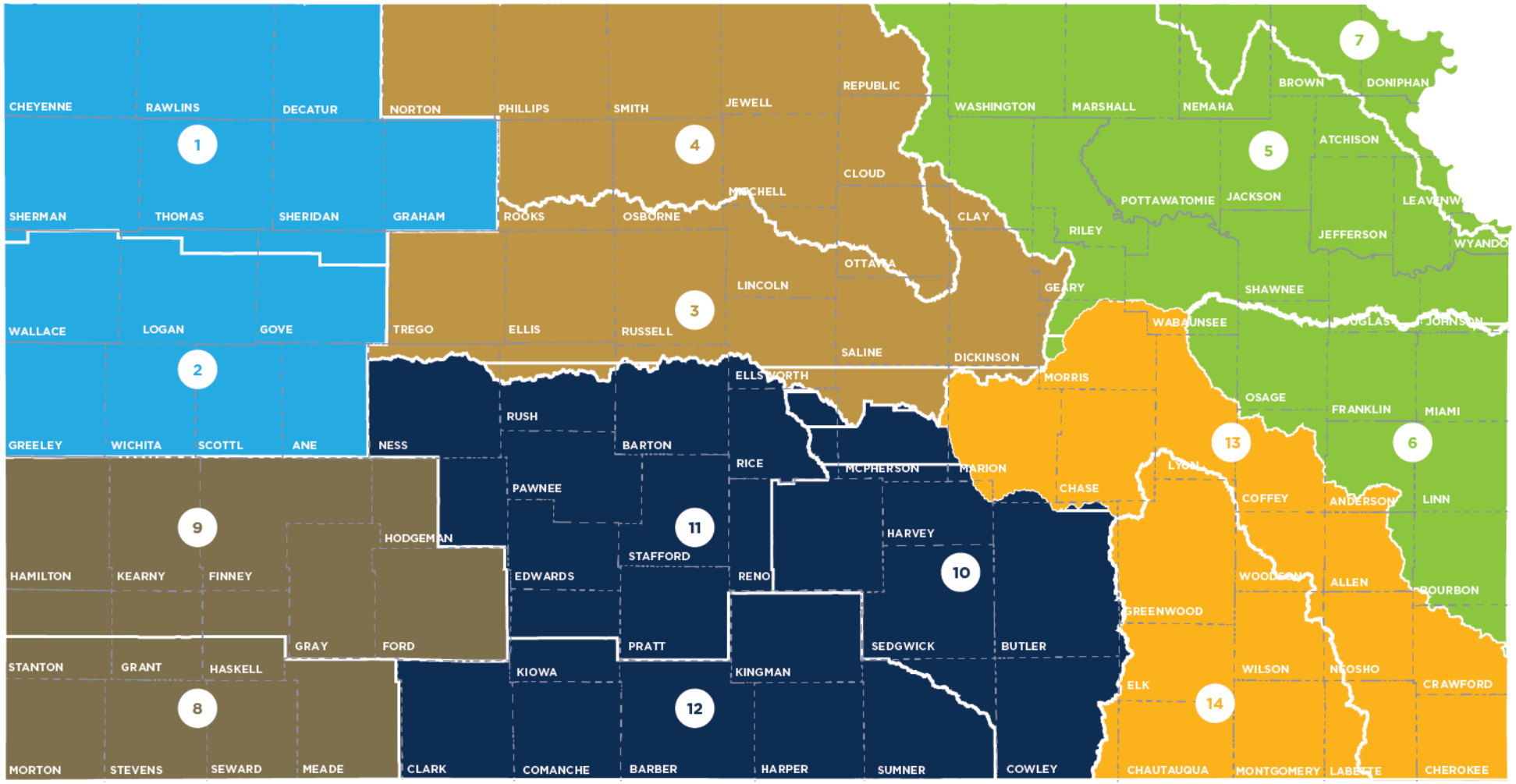
# Breakout Session: Regional Goals Alignment Input Session

# Regional Advisory Committees (RACs) – Local Input to Inform Water Policy

| | |
|---|---|
| Upper Republican | Priorities |
| Upper Smoky Hill | Priorities |
| Upper Arkansas | Priorities |
| Cimarron | Priorities |
| Solomon-Republican | Priorities |
| Smoky-Hill Saline | Priorities |
| Great Bend Prairie | Priorities |
| Red Hills | Priorities |
| Equus-Walnut | Priorities |
| Missouri | Priorities |
| Kansas | Priorities |
| Marias des Cygnes | Priorities |
| Verdigris | Priorities |
| Neosho | Priorities |

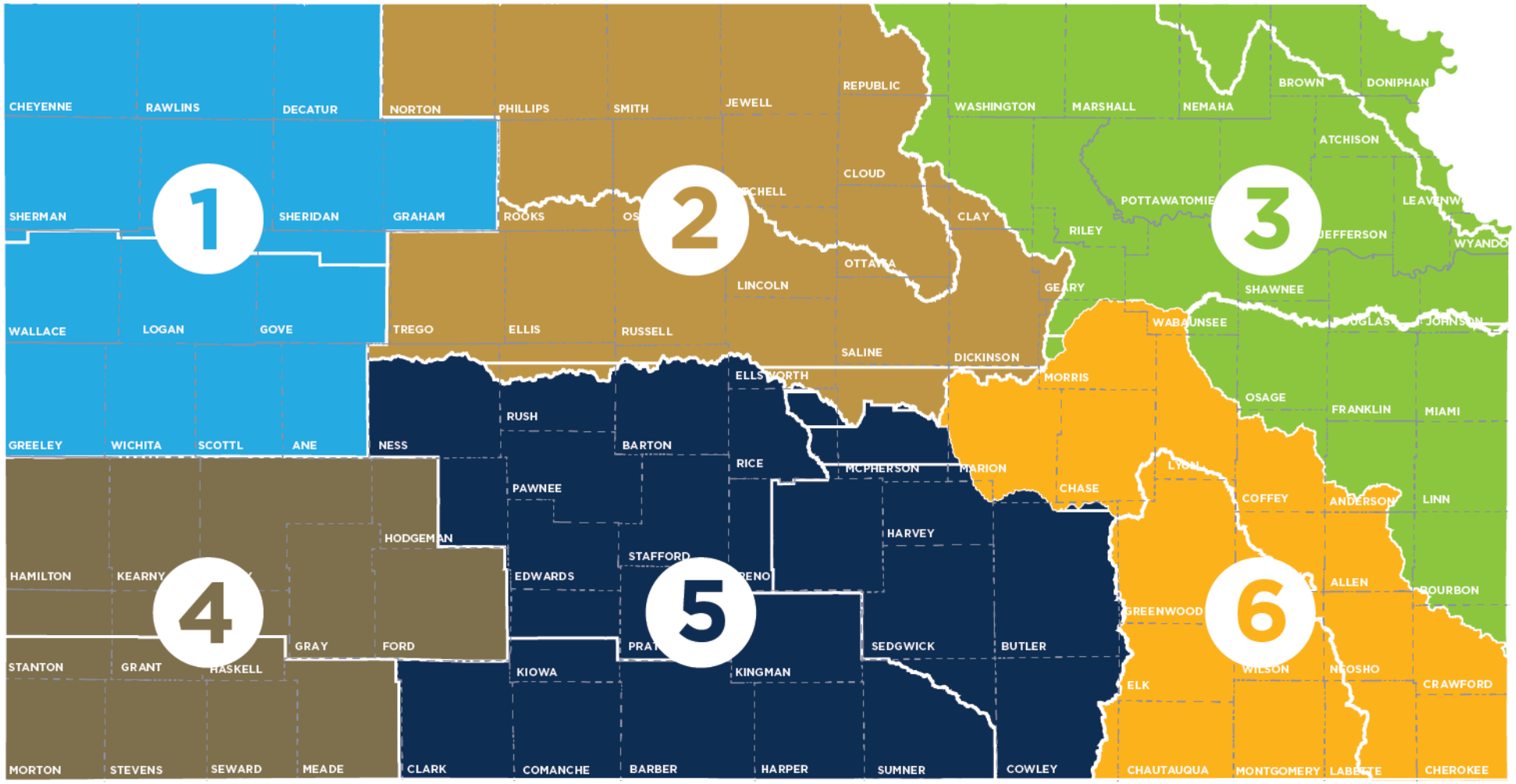
## Kansas Water Plan
## 5 Guiding Principles

# Today we're asking you to broaden out




**From 14 RACs to 6 Regions**

# Today we're asking you to broaden out




**From 14 RACs to 6 Regions**

# Kansas Water Authority Simplified Draft Goals

- **High Plains Aquifer**
  - Halt the decline of the Ogallala
  - Restore and maintain natural streamflow
  - Maximize the economic output of all water users

- **Reservoir**
  - Adequate storage for all climate conditions
  - Promote and incentivize regionalization
  - Promote land management practices to reduce sedimentation

- **Water Quality**
  - All water sources are free of all forms of pollution and contaminants

# Regional Goals Handout

## 2. Compare to Statewide Goals

## 1A. Goals for each RAC in the region listed for comparing similarities

Kansas Water Plan Implementation:
**SOUTH CENTRAL REGION GOALS**

Red Group

### 10 Equus-Walnut

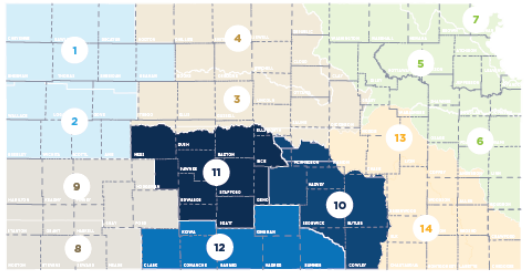
**Goal 1:** Promote sustainable balance of groundwater withdrawals with annual recharge in the Equus Beds Aquifer.

**Goal 2:** Encourage the development and use of comprehensive water supply plans by major water users in the region.

**Goal 3:** Implement watershed protection measures to improve reliability and health of surface water resources in the region.

**Goal 4:** Allocate resources to locate, characterize, prioritize and remediate contamination sites.

**Goal 5:** Increase efforts to establish sustainable, water-conserving agricultural production practices.




### 11 Great Bend Prairie

**Goal 1:** Achieve water use sustainability that includes a reasonable raising or lowering of the water table based on average weather conditions. Evaluate cost-share programs and incentivize conservation.

**Goal 2:** For municipalities and rural water districts: enhance new technology and increase water efficiency to reduce water loss.

**Goal 3:** Enhance monitoring of poor water quality to stop contamination of fresh water sources.

**Goal 4:** Initiate research and development of alternative feed sources and less water-intensive crops. Develop markets for feed wheat and other alternative crops for use feed sources.

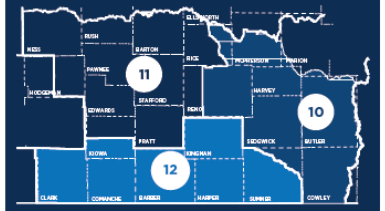
**Goal 5:** Work towards sustainability of watersheds so that flood control capacity is maintained while maintaining streamflow to meet downstream water needs.

### 12 Red Hills

**Goal 1:** Reduce water usage throughout the region with voluntary and incentive-based policies and programs.

**Goal 2:** Increase sources of supply through the use of multipurpose small lakes.

**Goal 3:** Work with Oil & Gas industry to recycle/reuse flow back and production water for regional use.




**Compare/contrast Regional Advisory Committee goals in your region.**

**How are they similar and different?** (Are there language differences? Are there differences in priorities?)

**On a scale of 1 – 5 with 1 being very different and 5 being very similar, how aligned do you think these RAC goals are with each other?**

1 2 3 4 5

## KANSAS WATER AUTHORITY STATEWIDE GOALS

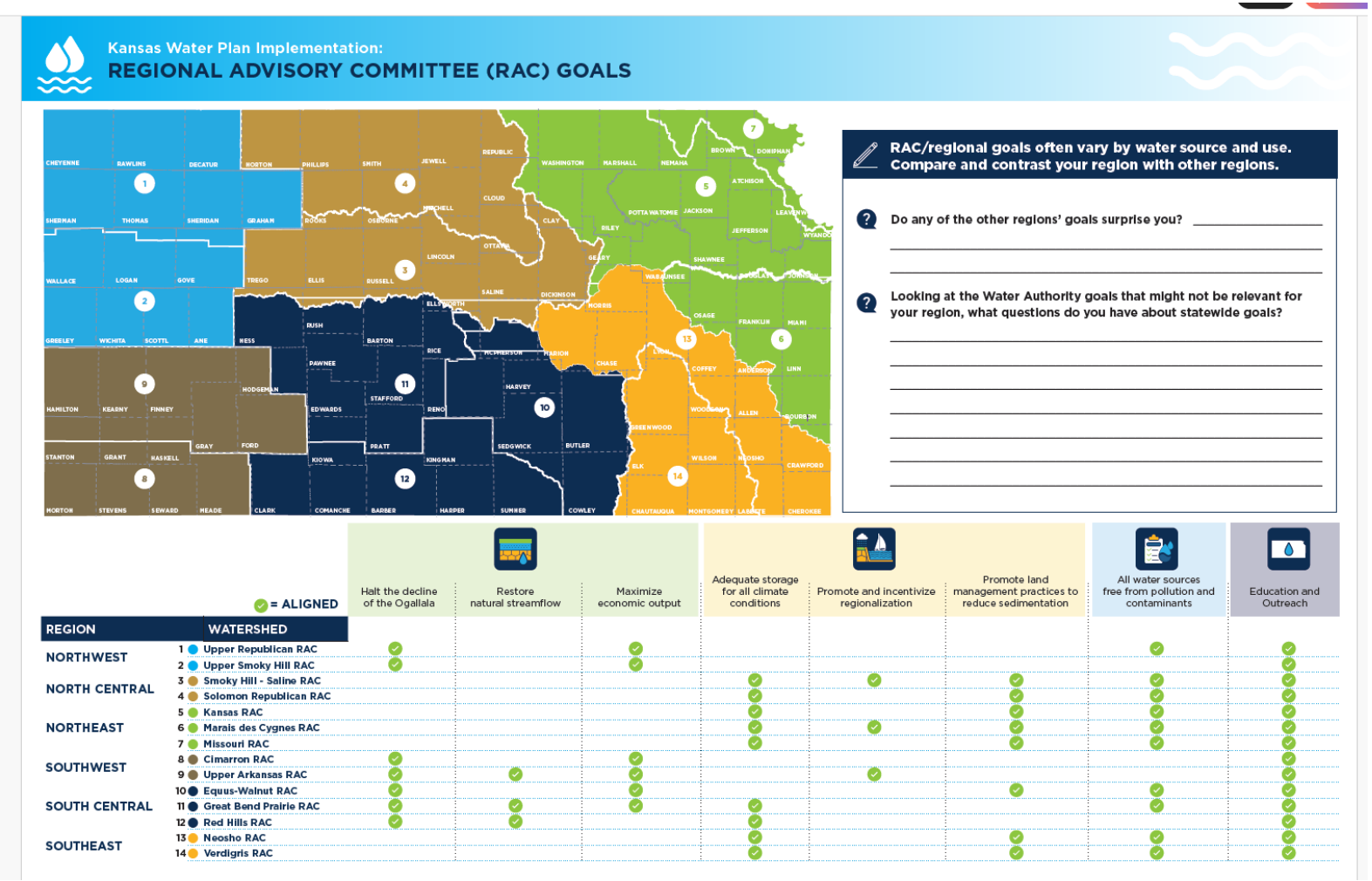
| GOAL AREA | KANSAS WATER AUTHORITY (KWA) SIMPLIFIED STATEWIDE WATER GOALS |
|---|---|
| HIGH PLAINS AQUIFER | • Halt the decline of the Ogallala<br>• Restore and maintain natural streamflow<br>• Maximize the economic output of all water users |
| RESERVOIR | • Adequate storage for all climate conditions<br>• Promote and incentivize regionalization<br>• Promote land management practices to reduce sedimentation |
| WATER QUALITY | • All water sources are free of all forms of pollution and contaminants |
| OVERARCHING | • Education and Outreach |

**How do your priorities compare with the Kansas Water Authority goals?**

Do you see expanding your regional priorities to include those Kansas Water Authority authority goals? **If so which ones?**

## 1B. Rate RAC similarities

# Regional Goals Handout – Page 2



Kansas Water Plan Implementation:
REGIONAL ADVISORY COMMITTEE (RAC) GOALS

**RAC/regional goals often vary by water source and use. Compare and contrast your region with other regions.**

Do any of the other regions' goals surprise you? _____

Looking at the Water Authority goals that might not be relevant for your region, what questions do you have about statewide goals?

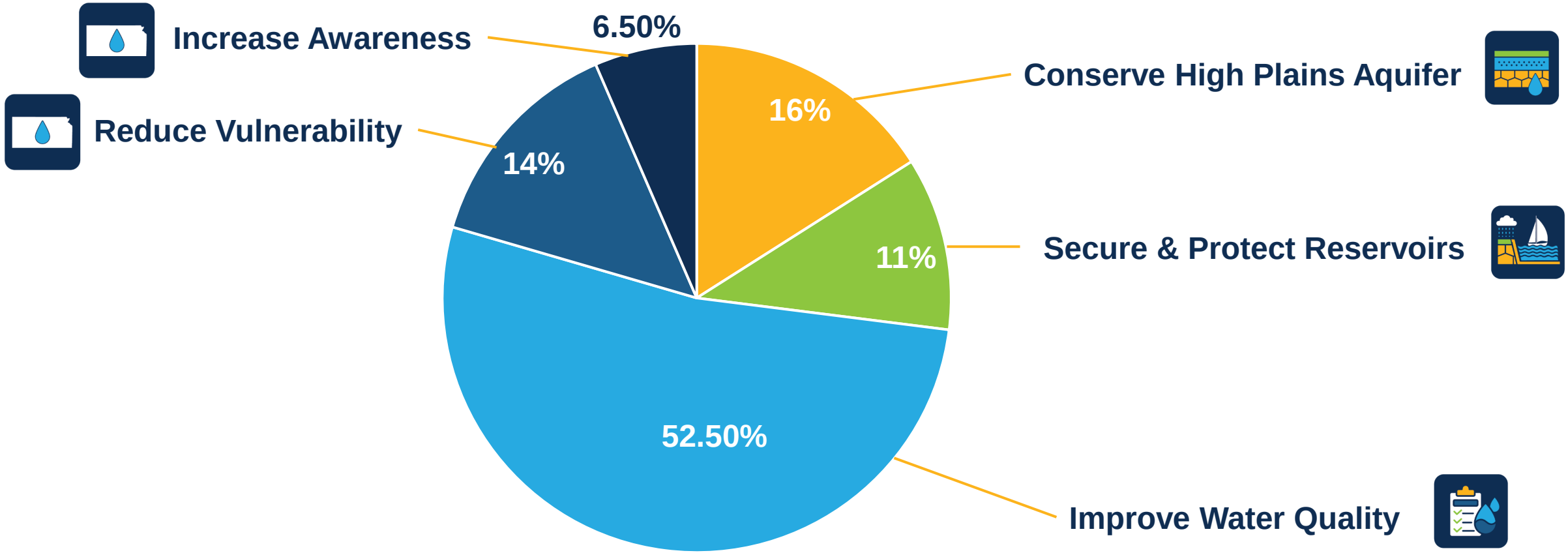
✓ = ALIGNED

| REGION | WATERSHED | Halt the decline of the Ogallala | Restore natural streamflow | Maximize economic output | Adequate storage for all climate conditions | Promote and incentivize regionalization | Promote land management practices to reduce sedimentation | All water sources free from pollution and contaminants | Education and Outreach |
|---|---|---|---|---|---|---|---|---|---|
| NORTHWEST | 1 Upper Republican RAC | ✓ | | ✓ | | | | ✓ | ✓ |
| | 2 Upper Smoky Hill RAC | ✓ | | ✓ | | | | | ✓ |
| NORTH CENTRAL | 3 Smoky Hill - Saline RAC | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 4 Solomon Republican RAC | | | | ✓ | | ✓ | ✓ | ✓ |
| NORTHEAST | 5 Kansas RAC | | | | ✓ | | ✓ | ✓ | ✓ |
| | 6 Marais des Cygnes RAC | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 7 Missouri RAC | | | | ✓ | | ✓ | ✓ | ✓ |
| SOUTHWEST | 8 Cimarron RAC | ✓ | | ✓ | | | | | ✓ |
| | 9 Upper Arkansas RAC | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| SOUTH CENTRAL | 10 Equus-Walnut RAC | ✓ | | ✓ | | | ✓ | ✓ | ✓ |
| | 11 Great Bend Prairie RAC | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | 12 Red Hills RAC | ✓ | ✓ | | ✓ | | | | ✓ |
| SOUTHEAST | 13 Neosho RAC | | | | ✓ | | ✓ | ✓ | ✓ |
| | 14 Verdigris RAC | | | | ✓ | | ✓ | ✓ | ✓ |

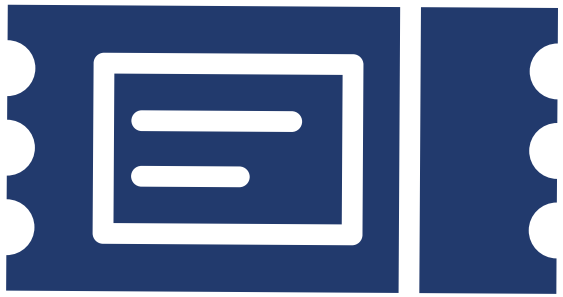
**3. Shows how RAC goals compare across regions**

# Investment Scenario Input Session

# Average Annual State Investment by Guiding Principle

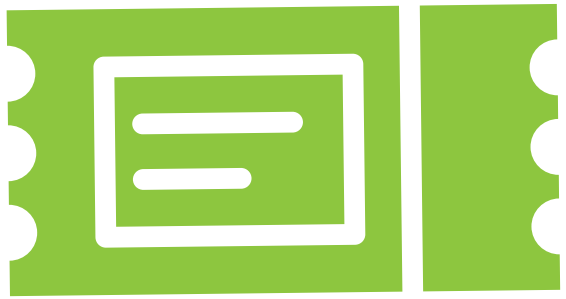


# Investment Scenario Prioritization Exercise



Stand Pat

Move the Needle

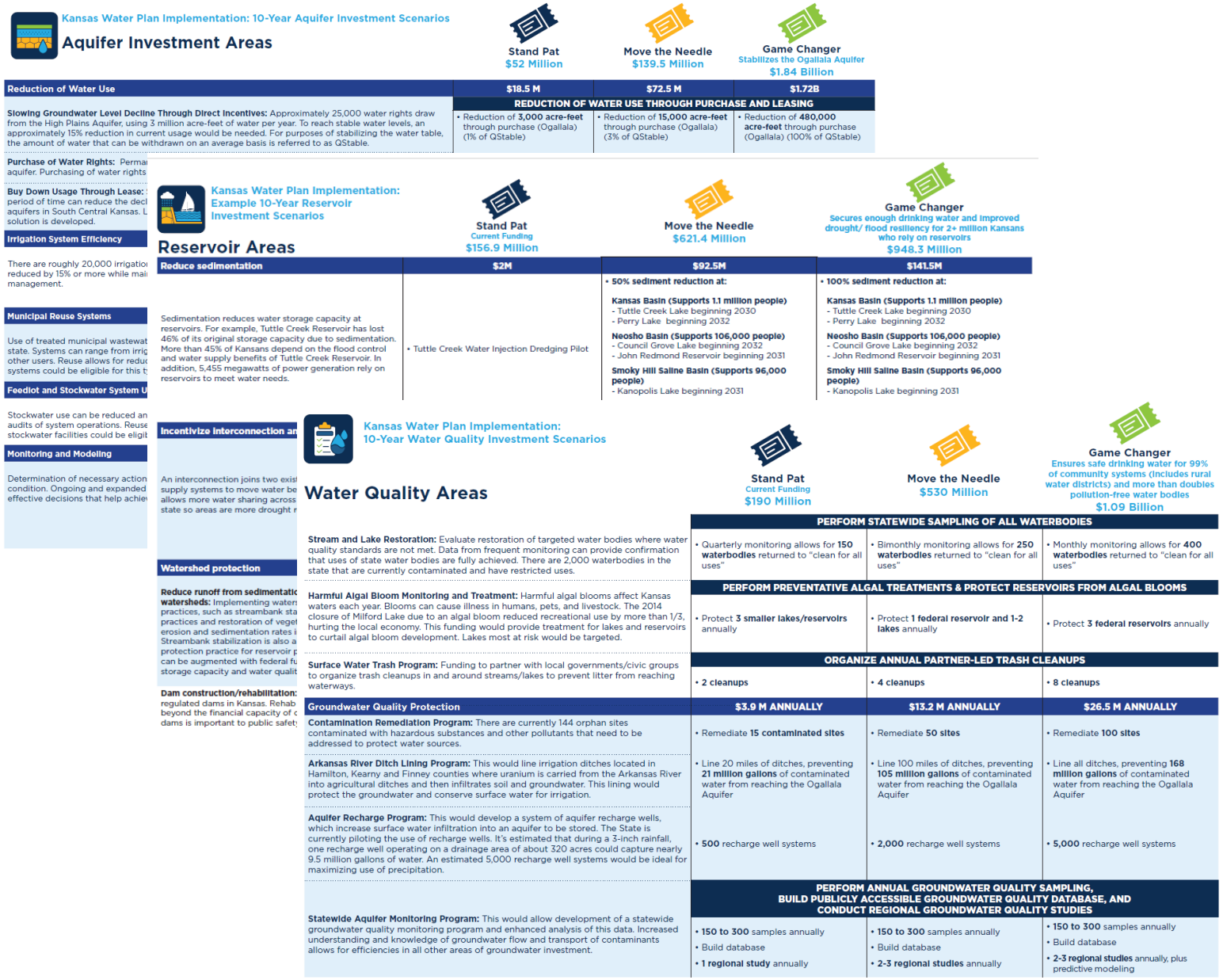


Game Changer

**Each participant gets one chip for each investment level; each participant will put his/her chip in the respective bucket and guided through a facilitated discussion to explore why he/she invested in the ways that they did.**

# Scenario Handouts for each Guiding Principle:

1. Aquifer
2. Reservoir
3. Water Quality



Kansas Water Plan Implementation: 10-Year Aquifer Investment Scenarios

## Aquifer Investment Areas

| | Stand Pat $52 Million | Move the Needle $139.5 Million | Game Changer Stabilizes the Ogallala Aquifer $1.84 Billion |
|---|---|---|---|
| **Reduction of Water Use** | **$18.5 M** | **$72.5 M** | **$1.72B** |
| | **REDUCTION OF WATER USE THROUGH PURCHASE AND LEASING** | | |
| **Slowing Groundwater Level Decline Through Direct Incentives:** Approximately 25,000 water rights draw from the High Plains Aquifer, using 3 million acre-feet of water per year. To reach stable water levels, an approximately 15% reduction in current usage would be needed. For purposes of stabilizing the water table, the amount of water that can be withdrawn on an average basis is referred to as QStable. | • Reduction of **3,000 acre-feet** through purchase (Ogallala) (1% of QStable) | • Reduction of **15,000 acre-feet** through purchase (Ogallala) (3% of QStable) | • Reduction of **480,000 acre-feet** through purchase (Ogallala) (100% of QStable) |
| **Purchase of Water Rights:** Perma… aquifer. Purchasing of water rights… | | | |
| **Buy Down Usage Through Lease:** … period of time can reduce the decl… aquifers in South Central Kansas. L… solution is developed. | | | |
| **Irrigation System Efficiency** | | | |
| There are roughly 20,000 irrigatio… reduced by 15% or more while mai… management. | | | |
| **Municipal Reuse Systems** | | | |
| Use of treated municipal wastewat… state. Systems can range from irrig… other users. Reuse allows for reduc… systems could be eligible for this t… | | | |
| **Feedlot and Stockwater System U…** | | | |
| Stockwater use can be reduced an… audits of system operations. Reuse… stockwater facilities could be eligit… | | | |
| **Monitoring and Modeling** | | | |
| Determination of necessary action… condition. Ongoing and expanded… effective decisions that help achie… | | | |

Kansas Water Plan Implementation: Example 10-Year Reservoir Investment Scenarios

## Reservoir Areas

| | Stand Pat Current Funding $156.9 Million | Move the Needle $621.4 Million | Game Changer Secures enough drinking water and improved drought/ flood resiliency for 2+ million Kansans who rely on reservoirs $948.3 Million |
|---|---|---|---|
| **Reduce sedimentation** | **$2M** | **$92.5M** | **$141.5M** |
| Sedimentation reduces water storage capacity at reservoirs. For example, Tuttle Creek Reservoir has lost 46% of its original storage capacity due to sedimentation. More than 45% of Kansans depend on the flood control and water supply benefits of Tuttle Creek Reservoir. In addition, 5,455 megawatts of power generation rely on reservoirs to meet water needs. | • Tuttle Creek Water Injection Dredging Pilot | • **50% sediment reduction at:**<br>**Kansas Basin (Supports 1.1 million people)**<br>- Tuttle Creek Lake beginning 2030<br>- Perry Lake beginning 2032<br>**Neosho Basin (Supports 106,000 people)**<br>- Council Grove Lake beginning 2032<br>- John Redmond Reservoir beginning 2031<br>**Smoky Hill Saline Basin (Supports 96,000 people)**<br>- Kanopolis Lake beginning 2031 | • **100% sediment reduction at:**<br>**Kansas Basin (Supports 1.1 million people)**<br>- Tuttle Creek Lake beginning 2030<br>- Perry Lake beginning 2032<br>**Neosho Basin (Supports 106,000 people)**<br>- Council Grove Lake beginning 2032<br>- John Redmond Reservoir beginning 2031<br>**Smoky Hill Saline Basin (Supports 96,000 people)**<br>- Kanopolis Lake beginning 2031 |
| **Incentivize interconnection ar…** | | | |
| An interconnection joins two exis… supply systems to move water be… allows more water sharing across… state so areas are more drought r… | | | |
| **Watershed protection** | | | |
| **Reduce runoff from sedimentatio… watersheds:** Implementing water… practices, such as streambank sta… practices and restoration of veget… erosion and sedimentation rates i… Streambank stabilization is also a… protection practice for reservoir p… can be augmented with federal fu… storage capacity and water qualit… | | | |
| **Dam construction/rehabilitation:** … regulated dams in Kas. Rehab … beyond the financial capacity of … dams is important to public safet… | | | |

Kansas Water Plan Implementation: 10-Year Water Quality Investment Scenarios

## Water Quality Areas

| | Stand Pat Current Funding $190 Million | Move the Needle $530 Million | Game Changer Ensures safe drinking water for 99% of community systems (includes rural water districts) and more than doubles pollution-free water bodies $1.09 Billion |
|---|---|---|---|
| | **PERFORM STATEWIDE SAMPLING OF ALL WATERBODIES** | | |
| **Stream and Lake Restoration:** Evaluate restoration of targeted water bodies where water quality standards are not met. Data from frequent monitoring can provide confirmation that uses of state water bodies are fully achieved. There are 2,000 waterbodies in the state that are currently contaminated and have restricted uses. | • Quarterly monitoring allows for **150 waterbodies** returned to "clean for all uses" | • Bimonthly monitoring allows for **250 waterbodies** returned to "clean for all uses" | • Monthly monitoring allows for **400 waterbodies** returned to "clean for all uses" |
| | **PERFORM PREVENTATIVE ALGAL TREATMENTS & PROTECT RESERVOIRS FROM ALGAL BLOOMS** | | |
| **Harmful Algal Bloom Monitoring and Treatment:** Harmful algal blooms affect Kansas waters each year. Blooms can cause illness in humans, pets, and livestock. The 2014 closure of Milford Lake due to an algal bloom reduced recreational use by more than 1/3, hurting the local economy. This funding would provide treatment for lakes and reservoirs to curtail algal bloom development. Lakes most at risk would be targeted. | • Protect **3 smaller lakes/reservoirs** annually | • Protect **1 federal reservoir and 1-2 lakes** annually | • Protect **3 federal reservoirs** annually |
| | **ORGANIZE ANNUAL PARTNER-LED TRASH CLEANUPS** | | |
| **Surface Water Trash Program:** Funding to partner with local governments/civic groups to organize trash cleanups in and around streams/lakes to prevent litter from reaching waterways. | • **2 cleanups** | • **4 cleanups** | • **8 cleanups** |
| **Groundwater Quality Protection** | **$3.9 M ANNUALLY** | **$13.2 M ANNUALLY** | **$26.5 M ANNUALLY** |
| **Contamination Remediation Program:** There are currently 144 orphan sites contaminated with hazardous substances and other pollutants that need to be addressed to protect water sources. | • Remediate **15 contaminated sites** | • Remediate **50 sites** | • Remediate **100 sites** |
| **Arkansas River Ditch Lining Program:** This would line irrigation ditches located in Hamilton, Kearny and Finney counties where uranium is carried from the Arkansas River into agricultural ditches and then infiltrates soil and groundwater. This lining would protect the groundwater and conserve surface water for irrigation. | • Line 20 miles of ditches, preventing **21 million gallons** of contaminated water from reaching the Ogallala Aquifer | • Line 100 miles of ditches, preventing **105 million gallons** of contaminated water from reaching the Ogallala Aquifer | • Line all ditches, preventing **168 million gallons** of contaminated water from reaching the Ogallala Aquifer |
| **Aquifer Recharge Program:** This would develop a system of aquifer recharge wells, which increase surface water infiltration into an aquifer to be stored. The State is currently piloting the use of recharge wells. It's estimated that during a 3-inch rainfall, one recharge well operating on a drainage area of about 320 acres could capture nearly 9.5 million gallons of water. An estimated 5,000 recharge well systems would be ideal for maximizing use of precipitation. | • **500** recharge well systems | • **2,000** recharge well systems | • **5,000** recharge well systems |
| | **PERFORM ANNUAL GROUNDWATER QUALITY SAMPLING, BUILD PUBLICLY ACCESSIBLE GROUNDWATER QUALITY DATABASE, AND CONDUCT REGIONAL GROUNDWATER QUALITY STUDIES** | | |
| **Statewide Aquifer Monitoring Program:** This would allow development of a statewide groundwater quality monitoring program and enhanced analysis of this data. Increased understanding and knowledge of groundwater flow and transport of contaminants allows for efficiencies in all other areas of groundwater investment. | • **150 to 300** samples annually<br>• Build database<br>• **1 regional study** annually | • **150 to 300** samples annually<br>• Build database<br>• **2-3 regional studies** annually | • **150 to 300** samples annually<br>• Build database<br>• **2-3 regional studies** annually, plus predictive modeling |

Kansas Water Plan Implementation: 10-Year Aquifer Investment Scenarios

# Aquifer Investment Areas

| | Stand Pat<br>$52 Million | Move the Needle<br>$139.5 Million | Game Changer<br>Stabilizes the Ogallala Aquifer<br>$1.84 Billion |
|---|---|---|---|
| **Reduction of Water Use** | **$18.5 M** | **$72.5 M** | **$1.72B** |
| **Slowing Groundwater Level Decline Through Direct Incentives:** Approximately 25,000 water rights draw from the High Plains Aquifer, using 3 million acre-feet of water per year. To reach stable water levels, an approximately 15% reduction in current usage would be needed. For purposes of stabilizing the water table, the amount of water that can be withdrawn on an average basis is referred to as QStable. | **REDUCTION OF W ATER USE THROUGH PURCHASE AND LEASING** | | |
| | • Reduction of **3,000 acre-feet** through purchase (Ogallala) (1% of QStable) | Reduction of **15,000 acre-feet** through purchase (Ogallala) (3% of QStable) | • Reduction of **480,000 acre-feet** through purchase (Ogallala) (100% of QStable) |
| **Purchase of Water Rights:** Permanent purchase of the water right can reduce the long-term decline of the aquifer. Purchasing of water rights will be focused on the Ogallala Aquifer in the western third of the state. | | | |
| | • Reduction of **4,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (5% of needed for full stream restorations in SC Kansas) | Reduction of **10,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (12% of needed for full stream restorations in SC Kansas) | • Reduction of **20,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (25% of needed for full stream restorations in SC Kansas) |
| **Buy Down Usage Through Lease:** State buy down of water use through leasing of water rights for a specific period of time can reduce the decline of the aquifer or associated streams in the Great Bend and Equus Beds aquifers in South Central Kansas. Leasing is primarily an option to achieve reduced use while a permanent solution is developed. | | | |
| **Irrigation System Efficiency** | **$18 M** | **$40 M** | **$80 M** |
| There are roughly 20,000 irrigation center pivots in Kansas. Research has shown that water use can be reduced by 15% or more while maintaining the same level of profitability with improved technology and management. | **COST SHARE ON TE HNOLOGY UPGRADES FOR IRRIGATION SYSTEMS** | | |
| | • **3,000 systems** (15%) | **6,000 systems** (30%) | • **10,000 systems** (50%) |
| | **IRRIGATION SYSTEM AUDITS** | | |
| | • **1,500 systems** (8%) | **5,000 systems** (25%) | • **15,000 systems** (75%) |
| **Municipal Reuse Systems** | **$8 M** | **$12 M** | **$16 M** |
| Use of treated municipal wastewater can serve as an additional water source in water-limited areas of the state. Systems can range from irrigation of community areas to partnerships with industries, farmers, and other users. Reuse allows for reduced pumping and leaves more water in the aquifer. Roughly 100 municipal systems could be eligible for this type of improvement in Western KS. | **COST SHARE TO ASSIST I DESIGN/IMPLEMENTATION OF WATER REUSE SYSTEMS** | | |
| | • **20 communities** (20%) | **30 communities** (30%) | • **40 communities** (40%) |
| **Feedlot and Stockwater System Upgrades** | **$5 M** | **$7.5 M** | **$12.5 M** |
| Stockwater use can be reduced and efficiency improved through technology, better management and audits of system operations. Reuse of livestock wastewater can extend the life of the aquifer. Just under 60 stockwater facilities could be eligible for this type of improvement in Western KS. | **COST SHARE TO ASSIST W ITH TECHNOLOGY, WATER MGMT. AND REUSE SYSTEMS** | | |
| | • **20 feedlots/dairies** (35%) | **30 feedlots/dairies** (55%) | • **50 feedlots/dairies** (90%) |
| **Monitoring and Modeling** | **$2 M** | **$7.5 M** | **$15 M** |
| Determination of necessary actions is dependent on accurate information about usage and the aquifer condition. Ongoing and expanded monitoring as well as development of analytical tools is critical to making effective decisions that help achieve sustainability. | **MAINTAIN CURRENT MONI ORING OF 1,400 ANNUAL WELL MEASUREMENTS, PLUS** | | |
| | • Monitoring of **24 index wells**<br>• Groundwater model updates on a **10-year rotation** | Expand to **40 index wells**<br>Groundwater model updates on a **5-year rotation**<br>**Limited** aerial electromagnetic mapping | • Expand to **750 index wells**<br>• **Annual** groundwater model updates<br>• Aerial electromagnetic mapping of **entire High Plains Aquifer** |

*Both "Stand Pat" and "Move the Needle" will result in continued depletion of the aquifer without additional water use regulation. The "Game Changer" option anticipates no additional regulation for water use reductions.*

**Each Principle has 3 investment level scenarios**

**Stand Pat:** what can occur with current funding levels in 10 years

Kansas Water Plan Implementation: 10-Year Aquifer Investment Scenarios

# Aquifer Investment Areas

| | Stand Pat<br>$52 Million | Move the Needle<br>$139.5 Million | Game Changer<br>Stabilizes the Ogallala Aquifer<br>$1.84 Billion |
|---|---|---|---|
| **Reduction of Water Use**<br>**Slowing Groundwater Level Decline Through Direct Incentives:** Approximately 25,000 water rights draw from the High Plains Aquifer, using 3 million acre-feet of water per year. To reach stable water levels, an approximately 15% reduction in current usage would be needed. For purposes of stabilizing the water table, the amount of water that can be withdrawn on an average basis is referred to as QStable.<br>**Purchase of Water Rights:** Permanent purchase of the water right can reduce the long-term decline of the aquifer. Purchasing of water rights will be focused on the Ogallala Aquifer in the western third of the state.<br>**Buy Down Usage Through Lease:** State buy down of water use through leasing of water rights for a specific period of time can reduce the decline of the aquifer or associated streams in the Great Bend and Equus Beds aquifers in South Central Kansas. Leasing is primarily an option to achieve reduced use while a permanent solution is developed. | **$18.5 M**<br>**REDUCTION OF WATER USE THROUGH PURCHASE AND LEASING**<br>• Reduction of **3,000 acre-feet** through purchase (Ogallala) (1% of QStable)<br>• Reduction of **4,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (5% of needed for full stream restorations in SC Kansas) | **$72.5 M**<br>**REDUCTION OF WATER USE THROUGH PURCHASE AND LEASING**<br>• Reduction of **15,000 acre-feet** through purchase (Ogallala) (3% of QStable)<br>• Reduction of **10,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (12% of needed for full stream restorations in SC Kansas) | **$1.72B**<br>**REDUCTION OF WATER USE THROUGH PURCHASE AND LEASING**<br>• Reduction of **480,000 acre-feet** through purchase (Ogallala) (100% of QStable)<br>• Reduction of **20,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (25% of needed for full stream restorations in SC Kansas) |
| **Irrigation System Efficiency**<br>There are roughly 20,000 irrigation center pivots in Kansas. Research has shown that water use can be reduced by 15% or more while maintaining the same level of profitability with improved technology and management. | **$18 M**<br>**COST SHARE ON TECHNOLOGY UPGRADES FOR IRRIGATION SYSTEMS**<br>• **3,000 systems** (15%)<br>**IRRIGATION SYSTEM AUDITS**<br>• **1,500 systems** (8%) | **$40 M**<br>**COST SHARE ON TECHNOLOGY UPGRADES FOR IRRIGATION SYSTEMS**<br>• **6,000 systems** (30%)<br>**IRRIGATION SYSTEM AUDITS**<br>• **5,000 systems** (25%) | **$80 M**<br>**COST SHARE ON TECHNOLOGY UPGRADES FOR IRRIGATION SYSTEMS**<br>• **10,000 systems** (50%)<br>**IRRIGATION SYSTEM AUDITS**<br>• **15,000 systems** (75%) |
| **Municipal Reuse Systems**<br>Use of treated municipal wastewater can serve as an additional water source in water-limited areas of the state. Systems can range from irrigation of community areas to partnerships with industries, farmers, and other users. Reuse allows for reduced pumping and leaves more water in the aquifer. Roughly 100 municipal systems could be eligible for this type of improvement in Western KS. | **$8 M**<br>**COST SHARE TO ASSIST IN DESIGN/IMPLEMENTATION OF WATER REUSE SYSTEMS**<br>• **20 communities** (20%) | **$12 M**<br>**COST SHARE TO ASSIST IN DESIGN/IMPLEMENTATION OF WATER REUSE SYSTEMS**<br>• **30 communities** (30%) | **$16 M**<br>**COST SHARE TO ASSIST IN DESIGN/IMPLEMENTATION OF WATER REUSE SYSTEMS**<br>• **40 communities** (40%) |
| **Feedlot and Stockwater System Upgrades**<br>Stockwater use can be reduced and efficiency improved through technology, better management and audits of system operations. Reuse of livestock wastewater can extend the life of the aquifer. Just under 60 stockwater facilities could be eligible for this type of improvement in Western KS. | **$5 M**<br>**COST SHARE TO ASSIST WITH TECHNOLOGY, WATER MGMT. AND REUSE SYSTEMS**<br>• **20 feedlots/dairies** (35%) | **$7.5 M**<br>**COST SHARE TO ASSIST WITH TECHNOLOGY, WATER MGMT. AND REUSE SYSTEMS**<br>• **30 feedlots/dairies** (55%) | **$12.5 M**<br>**COST SHARE TO ASSIST WITH TECHNOLOGY, WATER MGMT. AND REUSE SYSTEMS**<br>• **50 feedlots/dairies** (90%) |
| **Monitoring and Modeling**<br>Determination of necessary actions is dependent on accurate information about usage and the aquifer condition. Ongoing and expanded monitoring as well as development of analytical tools is critical to making effective decisions that help achieve sustainability. | **$2 M**<br>**MAINTAIN CURRENT MONITORING OF 1,400 ANNUAL WELL MEASUREMENTS, PLUS**<br>• Monitoring of **24 index wells**<br>• Groundwater model updates on a **10-year rotation** | **$7.5 M**<br>**MAINTAIN CURRENT MONITORING OF 1,400 ANNUAL WELL MEASUREMENTS, PLUS**<br>• Expand to **40 index wells**<br>• Groundwater model updates on a **5-year rotation**<br>• **Limited** aerial electromagnetic mapping | **$15 M**<br>**MAINTAIN CURRENT MONITORING OF 1,400 ANNUAL WELL MEASUREMENTS, PLUS**<br>• Expand to **750 index wells**<br>• **Annual** groundwater model updates<br>• Aerial electromagnetic mapping of **entire High Plains Aquifer** |

*Both "Stand Pat" and "Move the Needle" will result in continued depletion of the aquifer without additional water use regulation. The "Game Changer" option anticipates no additional regulation for water use reductions.*

**Each Principle has 3 investment level scenarios**

**Move the Needle:** Increased progress over 10 years with more funding

Kansas Water Plan Implementation: 10-Year Aquifer Investment Scenarios

# Aquifer Investment Areas

| | Stand Pat<br>$52 Million | Move the Needle<br>$139.5 Million | Game Changer<br>Stabilizes the Ogallala Aquifer<br>$1.84 Billion |
|---|---|---|---|
| **Reduction of Water Use** | **$18.5 M** | **$72.5 M** | **$1.72B** |
| | **REDUCTION OF WATER USE THROUGH PURCH SE AND LEASING** | | |
| **Slowing Groundwater Level Decline Through Direct Incentives:** Approximately 25,000 water rights draw from the High Plains Aquifer, using 3 million acre-feet of water per year. To reach stable water levels, an approximately 15% reduction in current usage would be needed. For purposes of stabilizing the water table, the amount of water that can be withdrawn on an average basis is referred to as QStable. | • Reduction of **3,000 acre-feet** through purchase (Ogallala) (1% of QStable) | • Reduction of **15,000 acre-feet** through purchase (Ogallala) (3% of QStable) | • Reduction of **480,000 acre-feet** through purchase (Ogallala) (100% of QStable) |
| **Purchase of Water Rights:** Permanent purchase of the water right can reduce the long-term decline of the aquifer. Purchasing of water rights will be focused on the Ogallala Aquifer in the western third of the state. | • Reduction of **4,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (5% of needed for full stream restorations in SC Kansas) | • Reduction of **10,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (12% of needed for full stream restorations in SC Kansas) | • Reduction of **20,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (25% of needed for full stream restorations in SC Kansas) |
| **Buy Down Usage Through Lease:** State buy down of water use through leasing of water rights for a specific period of time can reduce the decline of the aquifer or associated streams in the Great Bend and Equus Beds aquifers in South Central Kansas. Leasing is primarily an option to achieve reduced use while a permanent solution is developed. | | | |
| **Irrigation System Efficiency** | **$18 M** | **$40 M** | **$80 M** |
| | **COST SHARE ON TECHNOLOGY UPGRADES FOR I RIGATION SYSTEMS** | | |
| There are roughly 20,000 irrigation center pivots in Kansas. Research has shown that water use can be reduced by 15% or more while maintaining the same level of profitability with improved technology and management. | • **3,000 systems** (15%) | • **6,000 systems** (30%) | • **10,000 systems** (50%) |
| | **IRRIGATION SYSTEM AUDITS** | | |
| | • **1,500 systems** (8%) | • **5,000 systems** (25%) | • **15,000 systems** (75%) |
| **Municipal Reuse Systems** | **$8 M** | **$12 M** | **$16 M** |
| | **COST SHARE TO ASSIST IN DESIGN/IMPLEMENTATION F WATER REUSE SYSTEMS** | | |
| Use of treated municipal wastewater can serve as an additional water source in water-limited areas of the state. Systems can range from irrigation of community areas to partnerships with industries, farmers, and other users. Reuse allows for reduced pumping and leaves more water in the aquifer. Roughly 100 municipal systems could be eligible for this type of improvement in Western KS. | • **20 communities** (20%) | • **30 communities** (30%) | • **40 communities** (40%) |
| **Feedlot and Stockwater System Upgrades** | **$5 M** | **$7.5 M** | **$12.5 M** |
| | **COST SHARE TO ASSIST WITH TECHNOLOGY, WATER M MT. AND REUSE SYSTEMS** | | |
| Stockwater use can be reduced and efficiency improved through technology, better management and audits of system operations. Reuse of livestock wastewater can extend the life of the aquifer. Just under 60 stockwater facilities could be eligible for this type of improvement in Western KS. | • **20 feedlots/dairies** (35%) | • **30 feedlots/dairies** (55%) | • **50 feedlots/dairies** (90%) |
| **Monitoring and Modeling** | **$2 M** | **$7.5 M** | **$15 M** |
| | **MAINTAIN CURRENT MONITORING OF 1,400 ANNUAL W LL MEASUREMENTS, PLUS** | | |
| Determination of necessary actions is dependent on accurate information about usage and the aquifer condition. Ongoing and expanded monitoring as well as development of analytical tools is critical to making effective decisions that help achieve sustainability. | • Monitoring of **24 index wells**<br>• Groundwater model updates on a **10-year rotation** | • Expand to **40 index wells**<br>• Groundwater model updates on a **5-year rotation**<br>• **Limited** aerial electromagnetic mapping | • Expand to **750 index wells**<br>• **Annual** groundwater model updates<br>• Aerial electromagnetic mapping of **entire High Plains Aquifer** |

*Both "Stand Pat" and "Move the Needle" will result in continued depletion of th quifer without additional water use regulation. The "Game Changer" option anticipates no additional regulation for water use reductions.*

**Each Principle has 3 investment level scenarios**

**Game Changer:** Major progress in 10 years with substantially more funding

Kansas Water Plan Implementation: 10-Year Aquifer Investment Scenarios

# Aquifer Investment Areas

| | Stand Pat<br>$52 Million | Move the Needle<br>$139.5 Million | Game Changer<br>Stabilizes the Ogallala Aquifer<br>$1.84 Billion |
|---|---|---|---|
| **Reduction of Water Use** | **$18.5 M** | **$72.5 M** | **$1.72B** |
| | **REDUCTION OF WATER USE THROUGH PURCHASE AND LEASING** | | |
| **Slowing Groundwater Level Decline Through Direct Incentives:** Approximately 25,000 water rights draw from the High Plains Aquifer, using 3 million acre-feet of water per year. To reach stable water levels, an approximately 15% reduction in current usage would be needed. For purposes of stabilizing the water table, the amount of water that can be withdrawn on an average basis is referred to as QStable. | • Reduction of **3,000 acre-feet** through purchase (Ogallala) (1% of QStable) | • Reduction of **15,000 acre-feet** through purchase (Ogallala) (3% of QStable) | • Reduction of **480,000 acre-feet** through purchase (Ogallala) (100% of QStable) |
| **Purchase of Water Rights:** Permanent purchase of the water right can reduce the long-term decline of the aquifer. Purchasing of water rights will be focused on the Ogallala Aquifer in the western third of the state. | • Reduction of **4,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (5% of needed for full stream restorations in SC Kansas) | • Reduction of **10,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (12% of needed for full stream restorations in SC Kansas) | • Reduction of **20,000 acre-feet** annually through leasing (Big Bend & Equus Beds) (25% of needed for full stream restorations in SC Kansas) |
| **Buy Down Usage Through Lease:** State buy down of water use through leasing of water rights for a specific period of time can reduce the decline of the aquifer or associated streams in the Great Bend and Equus Beds aquifers in South Central Kansas. Leasing is primarily an option to achieve reduced use while a permanent solution is developed. | | | |
| **Irrigation System Efficiency** | **$18 M** | **$40 M** | **$80 M** |
| | **COST SHARE ON TECHNOLOGY UPGRADES FOR IRRIGATION SYSTEMS** | | |
| There are roughly 20,000 irrigation center pivots in Kansas. Research has shown that water use can be reduced by 15% or more while maintaining the same level of profitability with improved technology and management. | • **3,000 systems** (15%) | • **6,000 systems** (30%) | • **10,000 systems** (50%) |
| | **IRRIGATION SYSTEM AUDITS** | | |
| | • **1,500 systems** (8%) | • **5,000 systems** (25%) | • **15,000 systems** (75%) |
| **Municipal Reuse Systems** | **$8 M** | **$12 M** | **$16 M** |
| | **COST SHARE TO ASSIST IN DESIGN/IMPLEMENTATION OF WATER REUSE SYSTEMS** | | |
| Use of treated municipal wastewater can serve as an additional water source in water-limited areas of the state. Systems can range from irrigation of community areas to partnerships with industries, farmers, and other users. Reuse allows for reduced pumping and leaves more water in the aquifer. Roughly 100 municipal systems could be eligible for this type of improvement in Western KS. | • **20 communities** (20%) | • **30 communities** (30%) | • **40 communities** (40%) |
| **Feedlot and Stockwater System Upgrades** | **$5 M** | **$7.5 M** | **$12.5 M** |
| | **COST SHARE TO ASSIST WITH TECHNOLOGY, WATER MGMT. AND REUSE SYSTEMS** | | |
| Stockwater use can be reduced and efficiency improved through technology, better management and audits of system operations. Reuse of livestock wastewater can extend the life of the aquifer. Just under 60 stockwater facilities could be eligible for this type of improvement in Western KS. | • **20 feedlots/dairies** (35%) | • **30 feedlots/dairies** (55%) | • **50 feedlots/dairies** (90%) |
| **Monitoring and Modeling** | **$2 M** | **$7.5 M** | **$15 M** |
| | **MAINTAIN CURRENT MONITORING OF 1,400 ANNUAL WELL MEASUREMENTS, PLUS** | | |
| Determination of necessary actions is dependent on accurate information about usage and the aquifer condition. Ongoing and expanded monitoring as well as development of analytical tools is critical to making effective decisions that help achieve sustainability. | • Monitoring of **24 index wells**<br>• Groundwater model updates on a **10-year rotation** | • Expand to **40 index wells**<br>• Groundwater model updates on a **5-year rotation**<br>• **Limited** aerial electromagnetic mapping | • Expand to **750 index wells**<br>• **Annual** groundwater model updates<br>• Aerial electromagnetic mapping of **entire High Plains Aquifer** |

*Both "Stand Pat" and "Move the Needle" will result in continued depletion of the aquifer without additional water use regulation. The "Game Changer" option anticipates no additional regulation for water use reductions.*

**10-Year Investment Numbers**

# For Today

## Why

You made the investment choices you did

Pressing challenges?
Best buy?

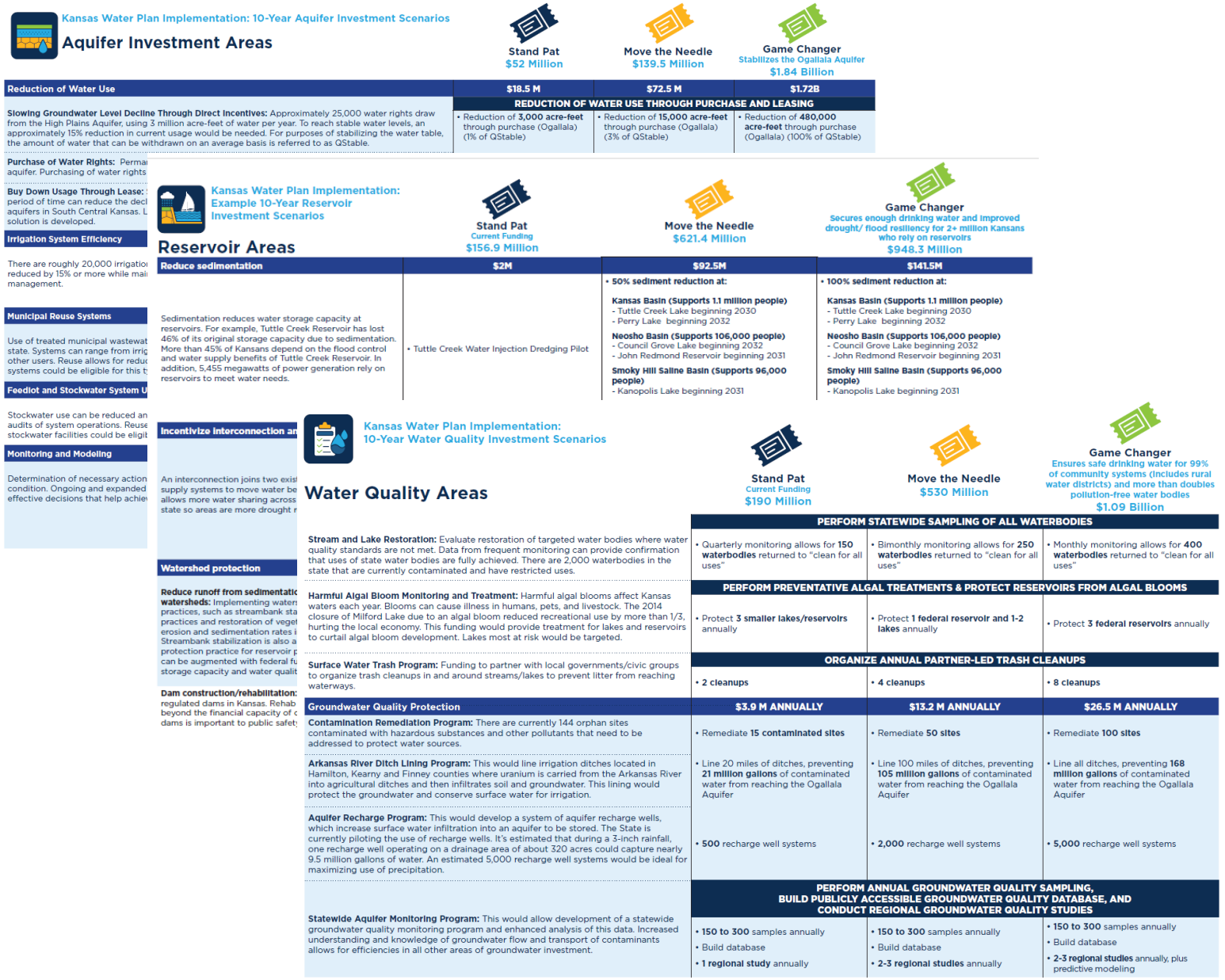
## How

You chose to invest your tickets.

# Disclaimer:

These are example investment strategies.

We also want your feedback on how to improve these scenarios too.



Kansas Water Plan Implementation: 10-Year Aquifer Investment Scenarios

## Aquifer Investment Areas

| | Stand Pat $52 Million | Move the Needle $139.5 Million | Game Changer Stabilizes the Ogallala Aquifer $1.84 Billion |
|---|---|---|---|
| **Reduction of Water Use** | **$18.5 M** | **$72.5 M** | **$1.72B** |
| | **REDUCTION OF WATER USE THROUGH PURCHASE AND LEASING** | | |
| **Slowing Groundwater Level Decline Through Direct Incentives:** Approximately 25,000 water rights draw from the High Plains Aquifer, using 3 million acre-feet of water per year. To reach stable water levels, an approximately 15% reduction in current usage would be needed. For purposes of stabilizing the water table, the amount of water that can be withdrawn on an average basis is referred to as QStable. | • Reduction of **3,000 acre-feet** through purchase (Ogallala) (1% of QStable) | • Reduction of **15,000 acre-feet** through purchase (Ogallala) (3% of QStable) | • Reduction of **480,000 acre-feet** through purchase (Ogallala) (100% of QStable) |
| **Purchase of Water Rights:** Perma aquifer. Purchasing of water rights | | | |
| **Buy Down Usage Through Lease:** period of time can reduce the decl aquifers in South Central Kansas. L solution is developed. | | | |
| **Irrigation System Efficiency** | | | |
| There are roughly 20,000 irrigatio reduced by 15% or more while mai management. | | | |
| **Municipal Reuse Systems** | | | |
| Use of treated municipal wastewat state. Systems can range from irrig other users. Reuse allows for reduc systems could be eligible for this t | | | |
| **Feedlot and Stockwater System U** | | | |
| Stockwater use can be reduced an audits of system operations. Reuse stockwater facilities could be eligit | | | |
| **Monitoring and Modeling** | | | |
| Determination of necessary action condition. Ongoing and expanded effective decisions that help achie | | | |

Kansas Water Plan Implementation: Example 10-Year Reservoir Investment Scenarios

## Reservoir Areas

| | Stand Pat Current Funding $156.9 Million | Move the Needle $621.4 Million | Game Changer Secures enough drinking water and improved drought/ flood resiliency for 2+ million Kansans who rely on reservoirs $948.3 Million |
|---|---|---|---|
| **Reduce sedimentation** | **$2M** | **$92.5M** | **$141.5M** |
| Sedimentation reduces water storage capacity at reservoirs. For example, Tuttle Creek Reservoir has lost 46% of its original storage capacity due to sedimentation. More than 45% of Kansans depend on the flood control and water supply benefits of Tuttle Creek Reservoir. In addition, 5,455 megawatts of power generation rely on reservoirs to meet water needs. | • Tuttle Creek Water Injection Dredging Pilot | • **50% sediment reduction at:**<br>**Kansas Basin (Supports 1.1 million people)**<br>- Tuttle Creek Lake beginning 2030<br>- Perry Lake beginning 2032<br>**Neosho Basin (Supports 106,000 people)**<br>- Council Grove Lake beginning 2032<br>- John Redmond Reservoir beginning 2031<br>**Smoky Hill Saline Basin (Supports 96,000 people)**<br>- Kanopolis Lake beginning 2031 | • **100% sediment reduction at:**<br>**Kansas Basin (Supports 1.1 million people)**<br>- Tuttle Creek Lake beginning 2030<br>- Perry Lake beginning 2032<br>**Neosho Basin (Supports 106,000 people)**<br>- Council Grove Lake beginning 2032<br>- John Redmond Reservoir beginning 2031<br>**Smoky Hill Saline Basin (Supports 96,000 people)**<br>- Kanopolis Lake beginning 2031 |
| **Incentivize interconnection ar** | | | |
| An interconnection joins two exis supply systems to move water be allows more water sharing across state so areas are more drought r | | | |
| **Watershed protection** | | | |
| **Reduce runoff from sedimentatio watersheds:** Implementing water practices, such as streambank sta practices and restoration of vege erosion and sedimentation rates i Streambank stabilization is also a protection practice for reservoir p can be augmented with federal fu storage capacity and water qualit | | | |
| **Dam construction/rehabilitation:** regulated dams in Kansas. Rehab beyond the financial capacity of dams is important to public safet | | | |

Kansas Water Plan Implementation: 10-Year Water Quality Investment Scenarios

## Water Quality Areas

| | Stand Pat Current Funding $190 Million | Move the Needle $530 Million | Game Changer Ensures safe drinking water for 99% of community systems (includes rural water districts) and more than doubles pollution-free water bodies $1.09 Billion |
|---|---|---|---|
| | **PERFORM STATEWIDE SAMPLING OF ALL WATERBODIES** | | |
| **Stream and Lake Restoration:** Evaluate restoration of targeted water bodies where water quality standards are not met. Data from frequent monitoring can provide confirmation that uses of state water bodies are fully achieved. There are 2,000 waterbodies in the state that are currently contaminated and have restricted uses. | • Quarterly monitoring allows for **150 waterbodies** returned to "clean for all uses" | • Bimonthly monitoring allows for **250 waterbodies** returned to "clean for all uses" | • Monthly monitoring allows for **400 waterbodies** returned to "clean for all uses" |
| | **PERFORM PREVENTATIVE ALGAL TREATMENTS & PROTECT RESERVOIRS FROM ALGAL BLOOMS** | | |
| **Harmful Algal Bloom Monitoring and Treatment:** Harmful algal blooms affect Kansas waters each year. Blooms can cause illness in humans, pets, and livestock. The 2014 closure of Milford Lake due to an algal bloom reduced recreational use by more than 1/3, hurting the local economy. This funding would provide treatment for lakes and reservoirs to curtail algal bloom development. Lakes most at risk would be targeted. | • Protect **3 smaller lakes/reservoirs** annually | • Protect **1 federal reservoir and 1-2 lakes** annually | • Protect **3 federal reservoirs** annually |
| | **ORGANIZE ANNUAL PARTNER-LED TRASH CLEANUPS** | | |
| **Surface Water Trash Program:** Funding to partner with local governments/civic groups to organize trash cleanups in and around streams/lakes to prevent litter from reaching waterways. | • **2 cleanups** | • **4 cleanups** | • **8 cleanups** |
| **Groundwater Quality Protection** | **$3.9 M ANNUALLY** | **$13.2 M ANNUALLY** | **$26.5 M ANNUALLY** |
| **Contamination Remediation Program:** There are currently 144 orphan sites contaminated with hazardous substances and other pollutants that need to be addressed to protect water sources. | • Remediate **15 contaminated sites** | • Remediate **50 sites** | • Remediate **100 sites** |
| **Arkansas River Ditch Lining Program:** This would line irrigation ditches located in Hamilton, Kearny and Finney counties where uranium is carried from the Arkansas River into agricultural ditches and then infiltrates soil and groundwater. This lining would protect the groundwater and conserve surface water for irrigation. | • Line 20 miles of ditches, preventing **21 million gallons** of contaminated water from reaching the Ogallala Aquifer | • Line 100 miles of ditches, preventing **105 million gallons** of contaminated water from reaching the Ogallala Aquifer | • Line all ditches, preventing **168 million gallons** of contaminated water from reaching the Ogallala Aquifer |
| **Aquifer Recharge Program:** This would develop a system of aquifer recharge wells, which increase surface water infiltration into an aquifer to be stored. The State is currently piloting the use of recharge wells. It's estimated that during a 3-inch rainfall, one recharge well operating on a drainage area of about 320 acres could capture nearly 9.5 million gallons of water. An estimated 5,000 recharge well systems would be ideal for maximizing use of precipitation. | • **500** recharge well systems | • **2,000** recharge well systems | • **5,000** recharge well systems |
| | **PERFORM ANNUAL GROUNDWATER QUALITY SAMPLING, BUILD PUBLICLY ACCESSIBLE GROUNDWATER QUALITY DATABASE, AND CONDUCT REGIONAL GROUNDWATER QUALITY STUDIES** | | |
| **Statewide Aquifer Monitoring Program:** This would allow development of a statewide groundwater quality monitoring program and enhanced analysis of this data. Increased understanding and knowledge of groundwater flow and transport of contaminants allows for efficiencies in all other areas of groundwater investment. | • **150 to 300** samples annually<br>• Build database<br>• **1 regional study** annually | • **150 to 300** samples annually<br>• Build database<br>• **2-3 regional studies** annually | • **150 to 300** samples annually<br>• Build database<br>• **2-3 regional studies** annually, plus predictive modeling |

# Algal Bloom Lesson: Nimble approach is key

**“Honestly, I care more about the good of the lake than my businesses. They’ve got to figure something out.”**

- Increased investment allows for us to try out more solutions
- Dynamic input process allows us to adjust our investments as we go based on what we learn.

# Programs Evaluation Input Session

## Provide your feedback on State of Kansas water programs!

Provide comments on implementation of the 2022 Kansas Water Plan and share feedback on any of the State's water programs listed below at: www.surveymonkey.com/r/waterprograms OR scan the QR code.

### Aquifer

**KS Water Office**
- KS Water Authority
- State Water Plan Dev.
- Regional Advisory Committees
- Drought Monitoring and Response
- Assessment and Evaluation
- HB 2302 Grant Programs
- High Plains Aquifer Partnerships
- Conservation Assistance for Water Users

**KDA: Division of Water Resources**
- Water Rights Permits
- Local Enhancement Management Area
- Multi-Year Flex Accounts
- Interstate Water Issues
- Water Use Database
- Subbasin Water Resources Management

**KDA : Conservation**
- Streambank Stabilization
- Buffer Incentive Program
- Conservation Districts
- Conservation Reserve Enhancement Program
- Irrigation Technology Initiative
- Water Resources Cost Share Program

### Quality

**KS Water Office**
- Regional Advisory Committees
- Drought Monitoring and Response
- Assessment and Evaluation
- HB 2302 Grant Programs
- Arbuckle Study
- Chloride Plume Remediation
- Water Quality Partnerships
- Stream Gaging
- Conservation Assistance for Water Users
- Reservoir and Water Quality Research

**KS Dept of Commerce**
- Community Development Block Grants
- Water & Wastewater Infrastructure

**KS Corporation Comm**
- Protection of Usable Water during well operation & plugging
- Oil & Gas Advisory Committee
- Well Spill Database

**KDWP**
- Aquatic Invasive Species

**KDA : Conservation**
- Conservation Districts
- Water Resources Cost Share
- Nonpoint Source Pollution Assistance
- Buffer Incentive Program
- Water Supply Restoration
- Riparian and Wetland Protection Program
- Soil Health Initiative
- Conservation Reserve Enhancement Program
- Streambank stabilization Program
- Crop & Livestock Research

**KDHE**
- Total Maximum Daily Load Initiatives
- Public Water Supply Loans and Program
- Harmful Algae Bloom Monitoring
- Water Quality Standards
- Contamination Remediation
- Drinking Water Protection Program
- Storage Tank Regulation
- Superfund Oversight
- Cleanup Program
- Groundwater Quality Monitoring Program
- Orphan Sites Program
- Small Town Infrastructure
- Stream Trash Removal
- Watershed Management
- Livestock Waste Management
- Clean Water Act Certification
- Drinking Water Testing
- Watershed Restoration and Protection Strategies (WRAPS)
- Hazardous Waste Management
- Solid Waste Management

### Reservoir

**KS Water Office**
- Reservoir Protection Initiative
- Drought Monitoring
- Reservoir Operations
- HB 2302 Grant Programs
- Reservoir and Water Quality Research
- Stream Gaging
- Water Injection Dredging
- Water Quality Partnerships

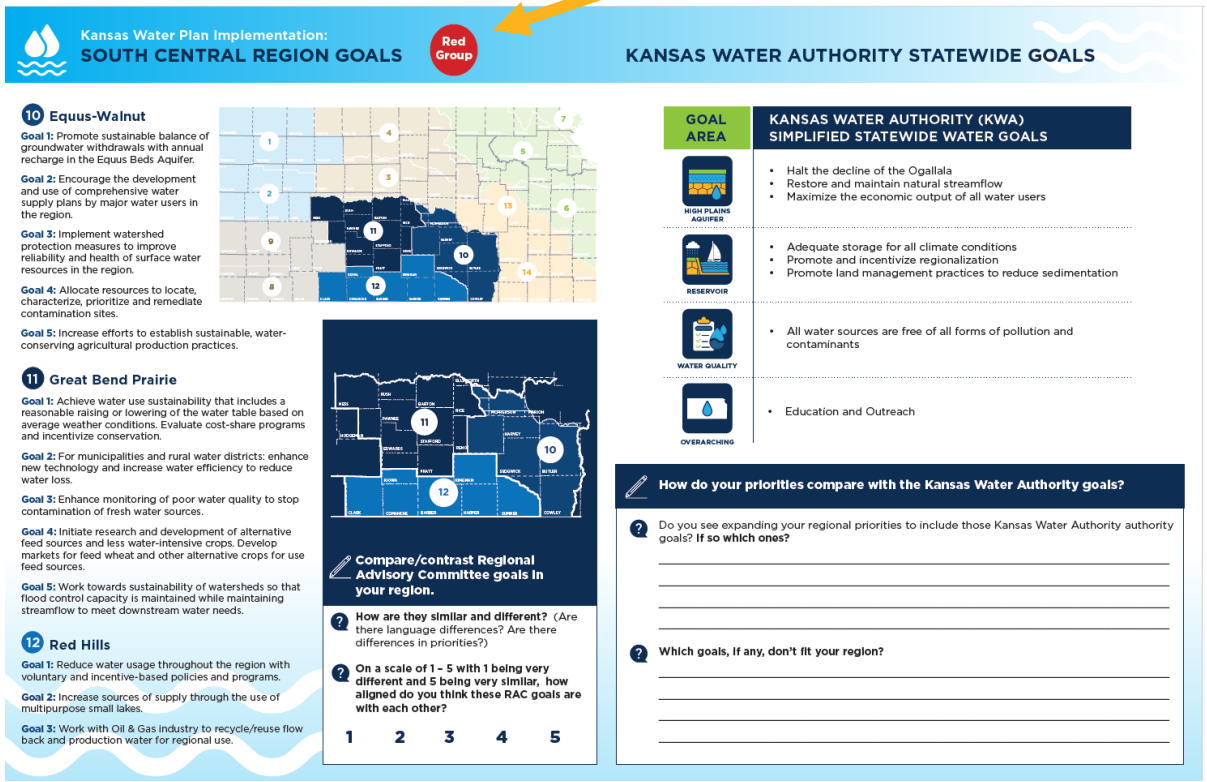
**KDA : Conservation**
- Soil Health Initiative
- Watershed Dam Construction/Rehabilitation
- Nonpoint Source Pollution Assistance
- Riparian and Wetland Protection Program
- Soil Health Initiative
- Streambank stabilization Program
- Water Resources Cost Share Program

**KDA: Division of Water Resources**
- Watershed Districts
- Dam Permitting
- Floodplain Zoning
- Dam Safety
- Water Rights Permits
- Local Enhancement Management Area
- Multi-Year Flex Accounts
- Interstate Compacts

1. Do you have experience with any of these programs? If so, which ones?
2. Rate on scale of 1 – 5 with 1 being not very effective and 5 being very effective. What have you observed or experienced to provide that rating?
3. When you think about effective state programs, what are some of the key attributes to make them effective (easy to understand, flexible to use, incentive program)?
4. Are there programs you'd like to see changed?
5. Are there new water programs you think the state should offer? If so, what would that program include or focus on?

# Breakout Group Assignments & Locations

Group assignment found on Regional handout here



Kansas Water Plan Implementation:
SOUTH CENTRAL REGION GOALS

Red Group

KANSAS WATER AUTHORITY STATEWIDE GOALS

**10 Equus-Walnut**

**Goal 1:** Promote sustainable balance of groundwater withdrawals with annual recharge in the Equus Beds Aquifer.

**Goal 2:** Encourage the development and use of comprehensive water supply plans by major water users in the region.

**Goal 3:** Implement watershed protection measures to improve reliability and health of surface water resources in the region.

**Goal 4:** Allocate resources to locate, characterize, prioritize and remediate contamination sites.

**Goal 5:** Increase efforts to establish sustainable, water-conserving agricultural production practices.

**11 Great Bend Prairie**

**Goal 1:** Achieve water use sustainability that includes a reasonable raising or lowering of the water table based on average weather conditions. Evaluate cost-share programs and incentivize conservation.

**Goal 2:** For municipalities and rural water districts: enhance new technology and increase water efficiency to reduce water loss.

**Goal 3:** Enhance monitoring of poor water quality to stop contamination of fresh water sources.

**Goal 4:** Initiate research and development of alternative feed sources and less water-intensive crops. Develop markets for feed wheat and other alternative crops for use feed sources.

**Goal 5:** Work towards sustainability of watersheds so that flood control capacity is maintained while maintaining streamflow to meet downstream water needs.

**12 Red Hills**

**Goal 1:** Reduce water usage throughout the region with voluntary and incentive-based policies and programs.

**Goal 2:** Increase sources of supply through the use of multipurpose small lakes.

**Goal 3:** Work with Oil & Gas industry to recycle/reuse flow back and production water for regional use.

| GOAL AREA | KANSAS WATER AUTHORITY (KWA) SIMPLIFIED STATEWIDE WATER GOALS |
|---|---|
| HIGH PLAINS AQUIFER | • Halt the decline of the Ogallala<br>• Restore and maintain natural streamflow<br>• Maximize the economic output of all water users |
| RESERVOIR | • Adequate storage for all climate conditions<br>• Promote and incentivize regionalization<br>• Promote land management practices to reduce sedimentation |
| WATER QUALITY | • All water sources are free of all forms of pollution and contaminants |
| OVERARCHING | • Education and Outreach |

**Compare/contrast Regional Advisory Committee goals in your region.**

**How are they similar and different?** (Are there language differences? Are there differences in priorities?)

**On a scale of 1 – 5 with 1 being very different and 5 being very similar, how aligned do you think these RAC goals are with each other?**

1 2 3 4 5

**How do your priorities compare with the Kansas Water Authority goals?**

Do you see expanding your regional priorities to include those Kansas Water Authority authority goals? **If so which ones?**

**Which goals, if any, don't fit your region?**

- Red
- Blue
- Green
- Purple
- Yellow

# Facilitator Summary for Each Group



40

# Next Steps

- Today was the start of the conversation – not the end of it
- Stay tuned for Fall Local Consult to build on today's feedback
- Follow our progress here: kwo.ks.gov
- Additional comments can be submitted here:

“Water is for everyone.”

A shared resource AND a shared responsibility