

City of Brighton Water Resources Review and Water Acquisition Planning

City Council Study Session

February 11, 2020

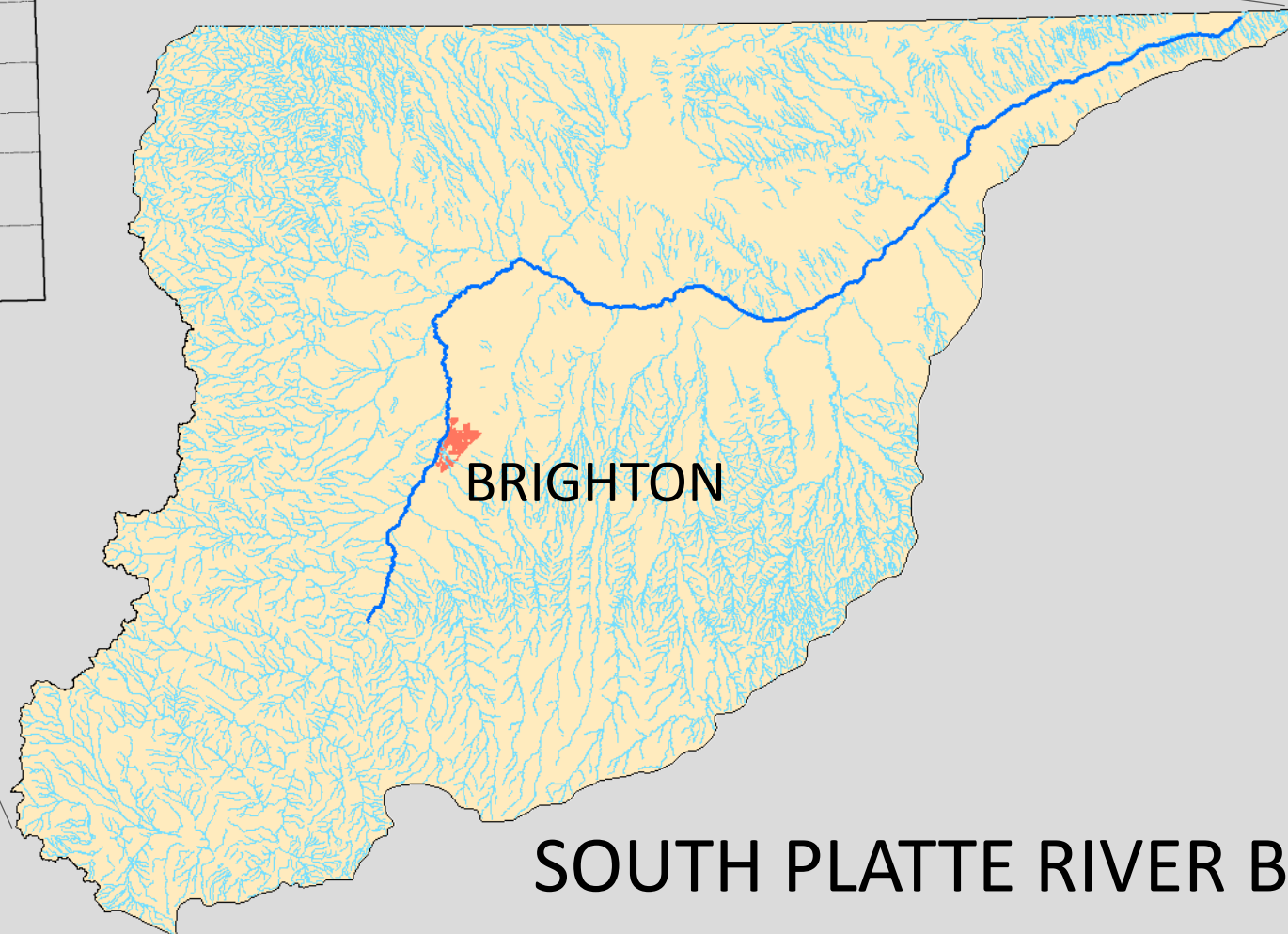
“Whiskey’s for drinking, water’s for fighting”



Fight for the Waterhole, Frederic Remington 1903



COLORADO



BRIGHTON

SOUTH PLATTE RIVER BASIN

Water Resource Components

- Water Supply –
 - Brighton's water supply comes from shallow alluvial groundwater wells, contracts, and changed agricultural surface water rights. The shallow groundwater comes from the South Platte River and Beebe Draw Aquifers.
- Water Rights –
 - Colorado is a prior appropriation state, "first in time, first in right." Water use is allowed through Water Court decrees and State permits.
- Reservoirs –
 - Water must be stored when available in times of surplus so that it may be used later in times of need.
- Augmentation Structures –
 - A portion of Brighton's water rights must be returned to the South Platte River and Beebe Draw pursuant to the City's augmentation plans.

Definitions

- Alluvial Well
- Junior/Senior Water Rights
- Augmentation
- Decree
- Consumptive Use
- Exchange

Alluvial Well

- Alluvial
 - General term for deposits resulting from the actions of rivers, such as sediments in river beds and flood plains.
- Alluvial Well
 - Water well constructed in shallow alluvial material – generally unconsolidated clay, silt, sand, and gravel. Alluvial wells are considered to be tributary to the surface stream/river and operate under the prior appropriation system in Colorado.

Junior/Senior Rights

- Prior Appropriation System – “First in time, first in right”
- Seniority based on two dates:
 - Adjudication Date – determined by judicial procedure, the date a water right was awarded or decreed (pre-1969), or December 31 of the year in which the application for the water right was filed (post-1969).
 - Appropriation Date – When intent was established to put the water to beneficial use as against water rights adjudicated/decreed in the same year.

Augmentation

- When water is taken out of priority, such as well pumping, it must be replaced by other water in time, location and amount so as to prevent injury to others. The method of replacement is described in an augmentation plan, and must be approved by water court.
- Brighton has two augmentation plans, one for the South Platte River wells and one for the Beebe Draw wells.
- Brighton can run augmentation water to the South Platte River and Beebe Draw using the following structures:
 - Ken Mitchell Lakes, Ergers Pond, Barr Lake, 124th Avenue Reservoir
 - Fulton Ditch, Fulton Lateral Ditch, Brighton Lateral Ditch

Augmentation

- Brighton diverts water into storage during times of free river or when our water rights are in priority.
- Brighton then releases water to the South Platte River and Beebe Draw for augmentation when required.

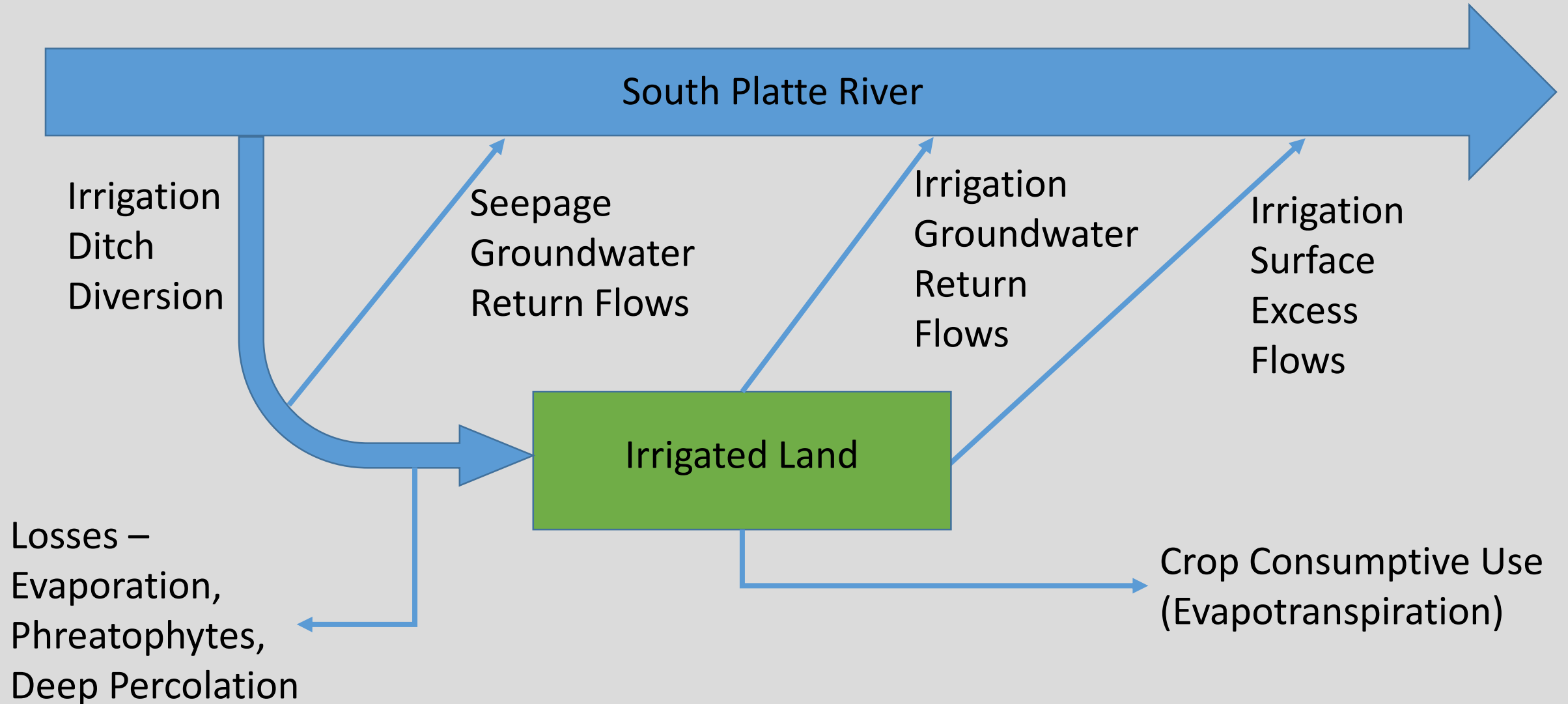


Brighton's 124th Ave Augmentation
Outfall on the South Platte River

Decree

- Decrees are judgements by the Court
- Water Right Decrees can be for:
 - Direct flow rights, such as a ditch diversion or a well
 - Storage rights
 - In-stream flow – Colorado Water Conservation Board for environmental preservation
 - Absolute or Conditional rights
 - Change of water right, for different type of use, point of diversion, place of use, etc.
 - Augmentation Plans and Exchanges of Water
 - Decrees are typically full of terms and conditions that limit the use of the water to prevent injury to other water rights

Consumptive Use



Consumptive Use

- What affects consumptive use?
 - Specific crops grown
 - Evaporation rate and humidity
 - Mean monthly temperature
 - Precipitation
 - Soil type
 - Topography/slope
 - Growing season
 - Irrigation method
 - Daylight hours
 - Study period – wet/dry/average years

Exchange

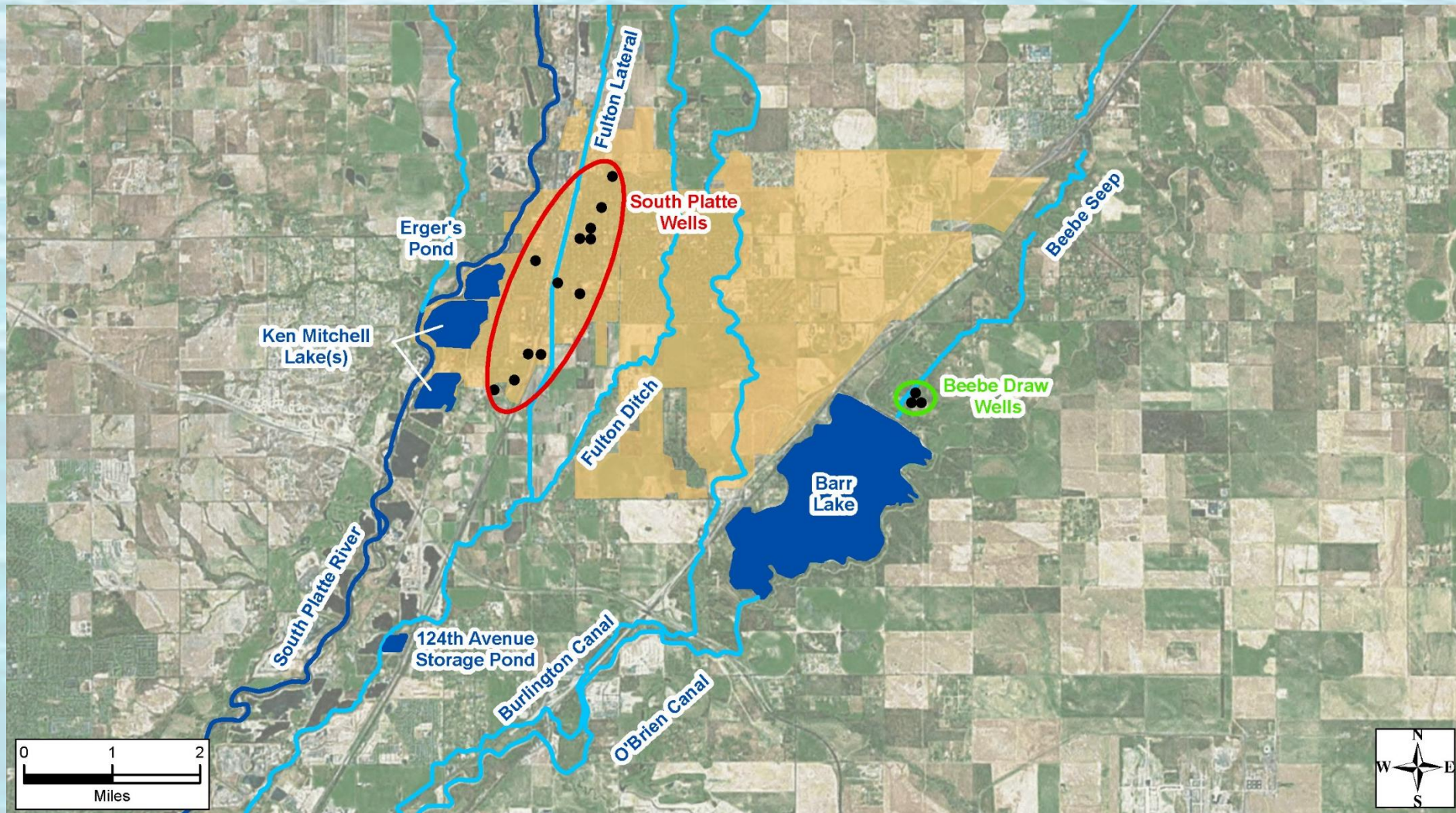
- Water provided at one point on a stream and diverted at another. For example, water may be released from a downstream reservoir in exchange for diverting water above the reservoir.



Water Supply

- 6 operational potable system wells near the South Platte River, treated at the reverse osmosis plant.
- 3 operational potable system wells in the Beebe Draw, treated at the green sand filtration plant. These wells and plant only operate from spring through late summer. A 4th well has been constructed and will be going online soon.
- 1.8 MGD treated potable water purchased from Westminster.
- 7 operational South Platte River Alluvium wells used for non-potable irrigation. Some ditch shares are also used for irrigation supply.
- Operation of the wells causes a depletion to the river system. If the wells are operated out of priority, water must be replaced through an augmentation plan.
- In addition to well water and changed share rights, Brighton has other agreements to trade, purchase and/or lease water to use for augmentation or direct consumption.

Wells



Map Source – White Sands Water Engineers

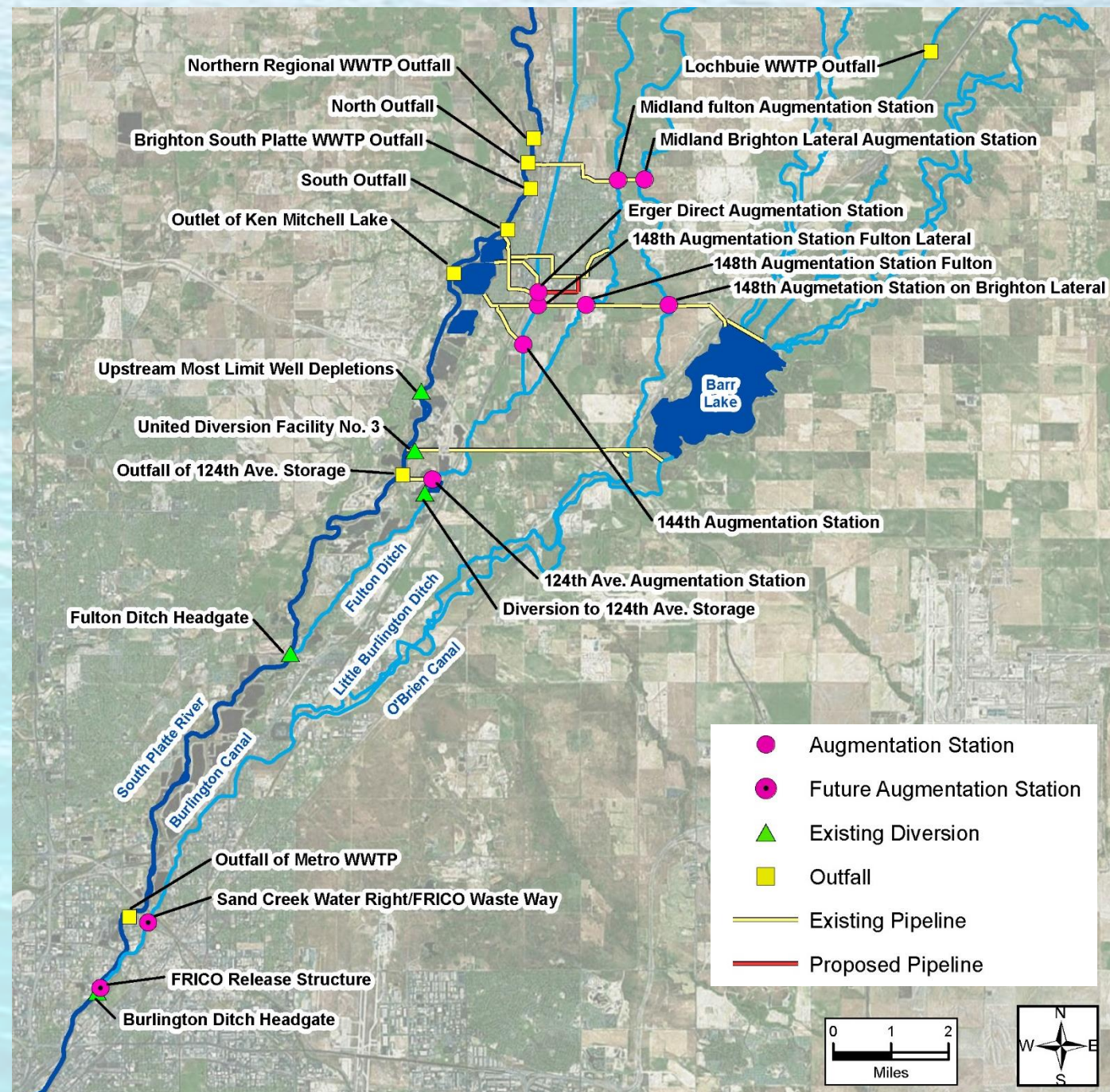
Water Rights

- Brighton's water rights portfolio includes the following ditch shares:
 - 1659.72 shares Fulton Ditch
 - 153.08 shares Burlington-Barr
 - 339.8 shares Burlington-Wellington
 - 159.02 shares FRICO-Barr
 - 13.0 shares FRICO-Milton
- Brighton also has the following direct flow rights, recently acquired from Mt. Carbon Metro District:
 - 3.14 cfs Spickerman Ditch
 - 5.13 cfs Lower Spickerman Ditch
 - 4.675 cfs Robert Lewis Ditch
- Brighton also has decrees for wells, storage reservoirs, exchanges, and augmentation plans.

Water Resource Structures



Brighton's Ken Mitchell Cell 1 Diversion Structure on South Platte River



Map Source – White Sands Water Engineers

Current Reservoir Capacity

- Ken Mitchell Cell 1 – 3500 AF
 - Fully functional
- Ken Mitchell Cell 3 – 2700 AF
 - Leased to FRICO, needs inlet/outlet works
- Erger's Pond – 1500 AF
 - Fully Functional
- 124th Ave Reservoir – 1000 AF
 - Limit Use
- Soda Lakes (Bear Creek) – 27 AF
 - Used with recently purchased Mt. Carbon rights



Erger's Pond
construction complete
and
Filled during summer 2019

Water Rights Acquisition

- Growth
 - Stay far enough ahead of growth to allow for:
 - New acquisitions to make it through water court
 - Funding and construction of any needed infrastructure
- Drought Protection
 - Reactive – Conservation & prioritizing uses at time of drought
 - Proactive – Sufficient supply, alternative supply, sufficient storage

Water Rights Acquisition

- Brighton acquires new water rights through two methods:
 - Water dedication from developers
 - Direct purchase by the City
- First priority is additional shares of ditches already in Brighton's system.
- Secondary priority is other water that Brighton can put to use reasonably quickly through existing infrastructure owned by other cities or water districts.
- Third priority is other water for long-term planning, which may require significant time and/or infrastructure costs to put to use.

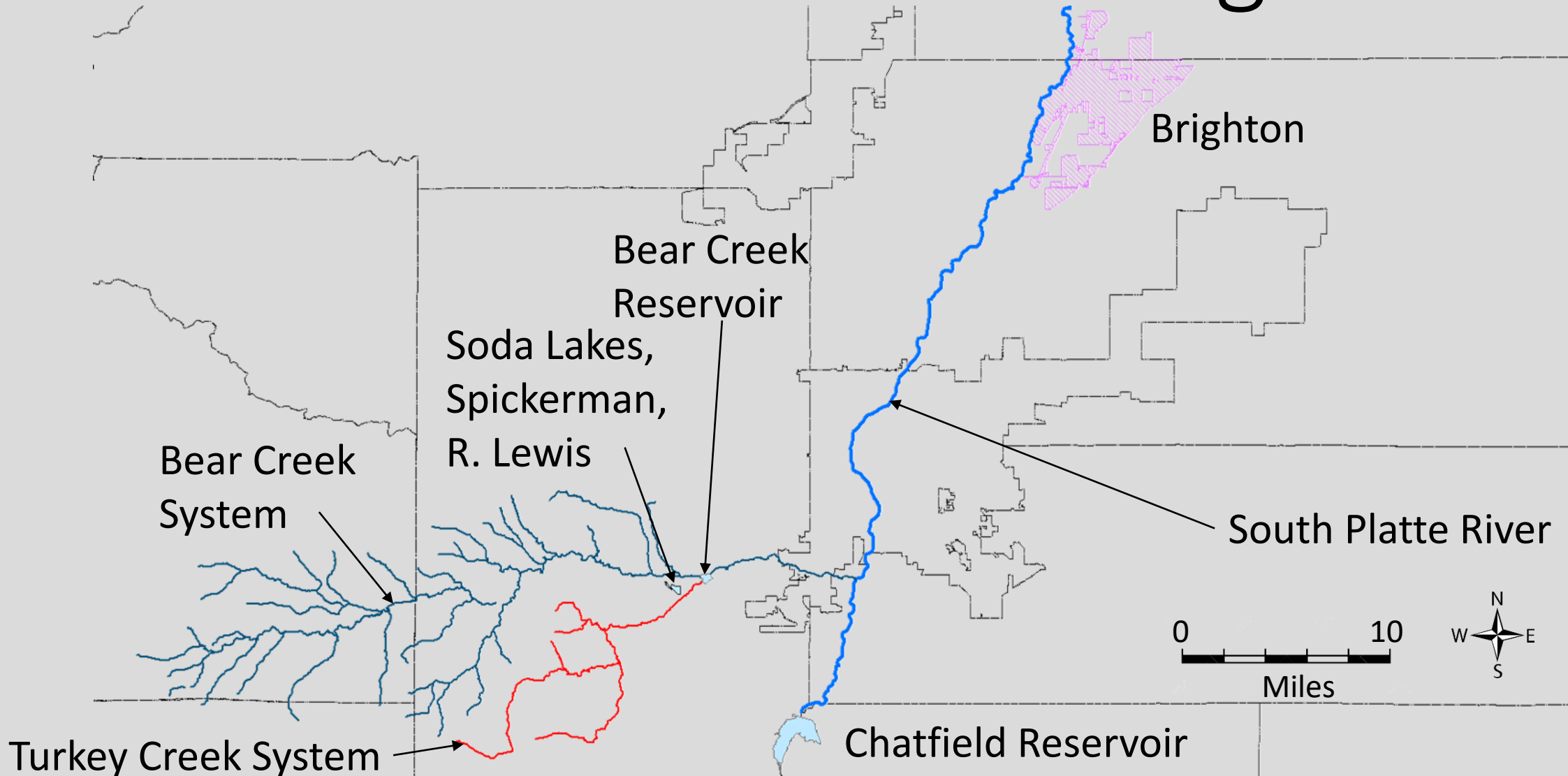
Water Rights Acquisition

- Cost
 - As with real estate, the value is all about location, location, location.
 - Recent ditch share sales in Brighton area have been about \$30,000 - \$35,000 per acre-foot of consumptive use water (as opposed to an agricultural yield).
 - Currently the City requires water dedication of approximately $\frac{1}{4}$ acre-foot per Single Family Equivalent (SFE) for depletions based on a variety of water use factors for the development.
 - What does \$1 million buy?
 - About 50 acre-feet of consumptive use water.
 - Covers approximately 200 homes, varies with specifics of each development.

Water Rights Acquisition

- Recent Example
 - Mt Carbon Metropolitan District (Bear Creek/Turkey Creek)
 - Robert Lewis Ditch Rights
 - Spickerman/Lower Spickerman Ditch Rights
 - Soda Lakes Storage
 - Currently going through a change case (18CW3195)

Mt Carbon Water Rights



Facilities For Bear Creek and Turkey Creek Water Rights



Photo Source – White Sands Water Engineers



Map Source – White Sands Water Engineers

Mt Carbon Water Rights Acquired

Water Right	Source	Priority Date	Amount of Total Acquired by Brighton	Avg. Annual Consumptive Use (AF) at Brighton ¹
Robert Lewis	Bear Creek	10/01/1865	4.675 out of 17.0 cfs	125
Spickerman	Turkey Creek	11/01/1862	3.14 out of 10.61 cfs	19
Lower Spickerman	Turkey Creek	06/01/1865	5.13 out of 9.32 cfs	1
Soda Lakes Storage Right	Bear Creek	02/11/1893 & 10/31/1945	6.5 out of 400 shares	N/A ²
Total			12.945 cfs	145 AF

1. Reflects a 17% Transit Loss from Bear Creek Lake to Brighton
2. Soda Lakes Rights are not being changed by Brighton

Process for Acquiring and Using Water Rights – Mt Carbon Example

- Diligence Investigation

- System

- How would Brighton use the rights? How can it be integrated into Brighton's existing system?
 - What are the Road Blocks? Risks? Can these be mitigated? How?
 - Can Brighton Expand into the System Further?

- Specific Rights

- Are there previous decrees or engineering reports?
 - Are there any site-specific issues identified in the field?
 - How was the water used historically?
 - How much water will the rights provide to Brighton?
 - How much water will Brighton need to return to the River, and where?

Process for Acquiring and Using Water Rights – Mt Carbon Example

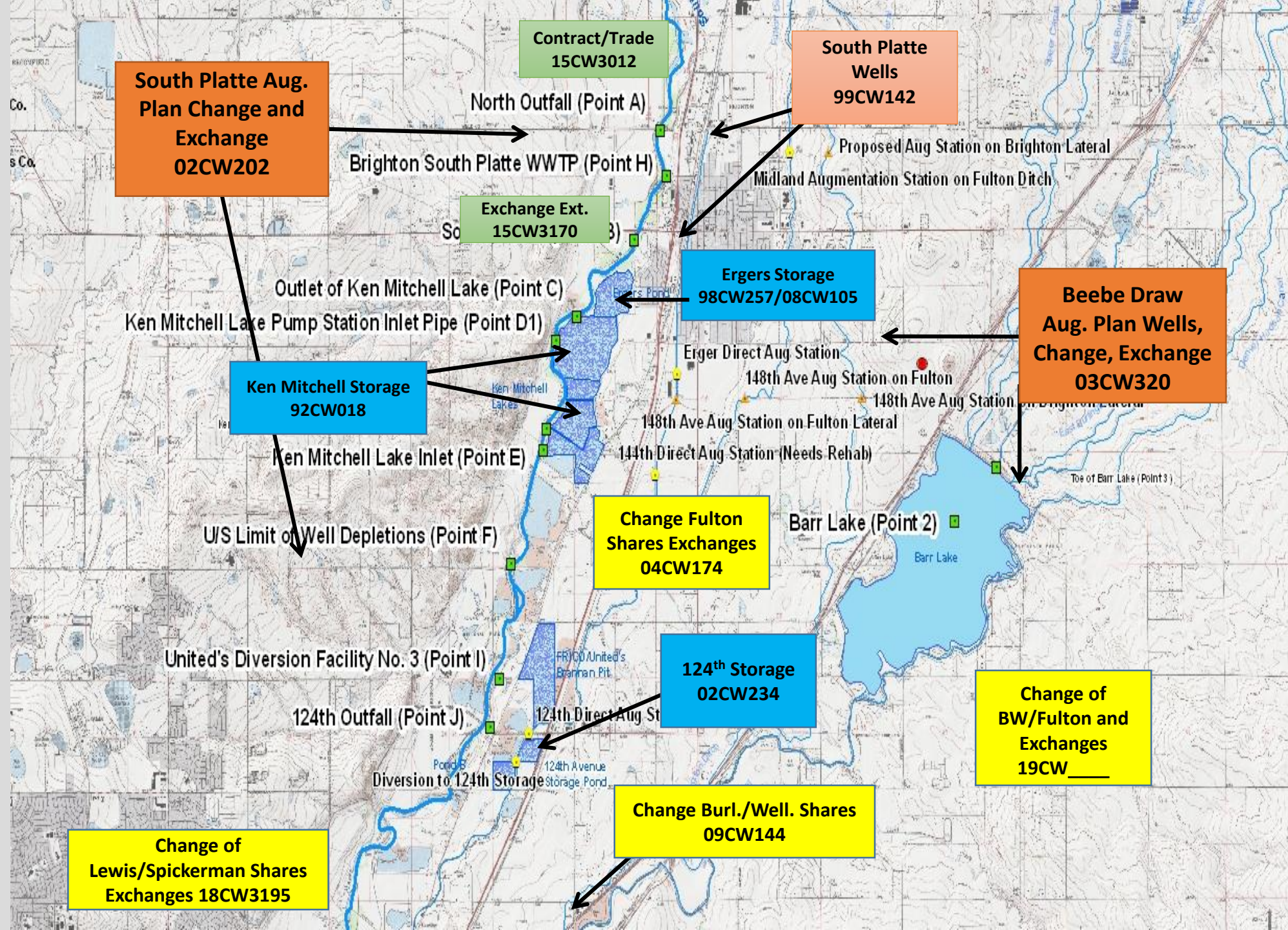
- Preparation for Use
 - Third Party Agreements
 - Additional Opportunities
 - Coordination with Interested Parties
 - Installation of Necessary Equipment and Facilities
 - Preparation of Terms and Conditions to Prevent Injury to Others
 - State Approval for Temporary Use (5-Years)
 - Court Approval for Long-Term Uses



Photo Source – United States Geological Survey

Water Court

- Ditch shares must be “changed” in water court from agricultural irrigation use to municipal and augmentation uses.
- The historic consumptive use from irrigation must be quantified based on the actual historic use of the specific shares being changed.
- Other water right holders may object to the change if they believe the change may harm their water rights.
- A water court change case can take two to three years or longer, depending on the complexity of the case and the objections raised by others.





Questions?