# Renewable Water Resources
# Proposed Export from San Luis Valley
# Estimate of Costs and Project Challenges

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**DiNatale Water Consultants**
**February 2022**

DiNatale
WATER CONSULTANTS

# Examples of DiNatale Water Experience applied to this analysis

# Examples DiNatale Water Consultants Water Supply Planning Experience

**Local Supply Planning and Operations**

Integrated Water Resources Plans

Water Conservation Plans

Climate Change Impacts

Raw water system operations and water accounting

**Water Quality**

Raw water quality

Reservoir monitoring

Water quality management

In-lake water quality management

Watershed management

Wildfire impacts

Water Supply Planning and Operations

**Valuations and Financial Analysis**

Water rights valuations

Storage, Pipeline and pump station valuations

Water Rates and Tap Fee Analysis and Recommendations

**State and Regional Planning**

Colorado Statewide Water Supply Initiative

Rio Grande Basin Implementation Plan

Grand River Dam Authority Comprehensive Plan

Oklahoma Comprehensive Water Plan

# DiNatale Water Consultants
# Federal Environmental Impacts Statements and Assessments

**Halligan and Seaman Reservoirs**

**Northern Integrated Supply Project (NISP)**

Third Party Contractor to the Army Corps for Environmental Statement

Omaha District

**Rio Grande Reservoir**

Applicant for Forest Service Environmental Assessment and Corps 404 permit

Rio Grande National Forest

Corps Albuquerque District

Federal Environmental Permitting and Federal Guidance

**Lake Ralph Hall (Texas)**

Third Party Contractor to the Army Corps for Environmental Statement

Southwest District

**EIS Planning for the Army Corps**

Hydrologic Modeling Guidelines for Federal EIS's

Risk and Reserve Assessment/Water Supply Planning Criteria for Federal EIS's

(For the Army Corps)

# DiNatale Water Consultants - some past and current Clients

- City of Grand Junction
- City of Santa Fe
- City of Oklahoma City
- Town of Erie
- East Cherry Creek Water and Sanitation District
- Arapahoe County Water and Wastewater Authority
- United Water and Sanitation District
- Cherokee Metro District
- Rio Grande Basin Roundtable
- Conejos Water Conservancy District
- San Luis Valley Irrigation District
- Bijou Irrigation District
- Grand River Dam Authority
- Colorado Water Conservation Board
- Oklahoma Water Resources Board
- Archdiocese of Denver
- Ranchers, farmers, golf courses and developers
- Past experience include work for Castle Pines North, Castle Rock, Douglas County, South Metro Water Supply Authority, Farmers Reservoir Irrigation Company

# Criteria for Screening the San Luis Valley Export and other Alternatives

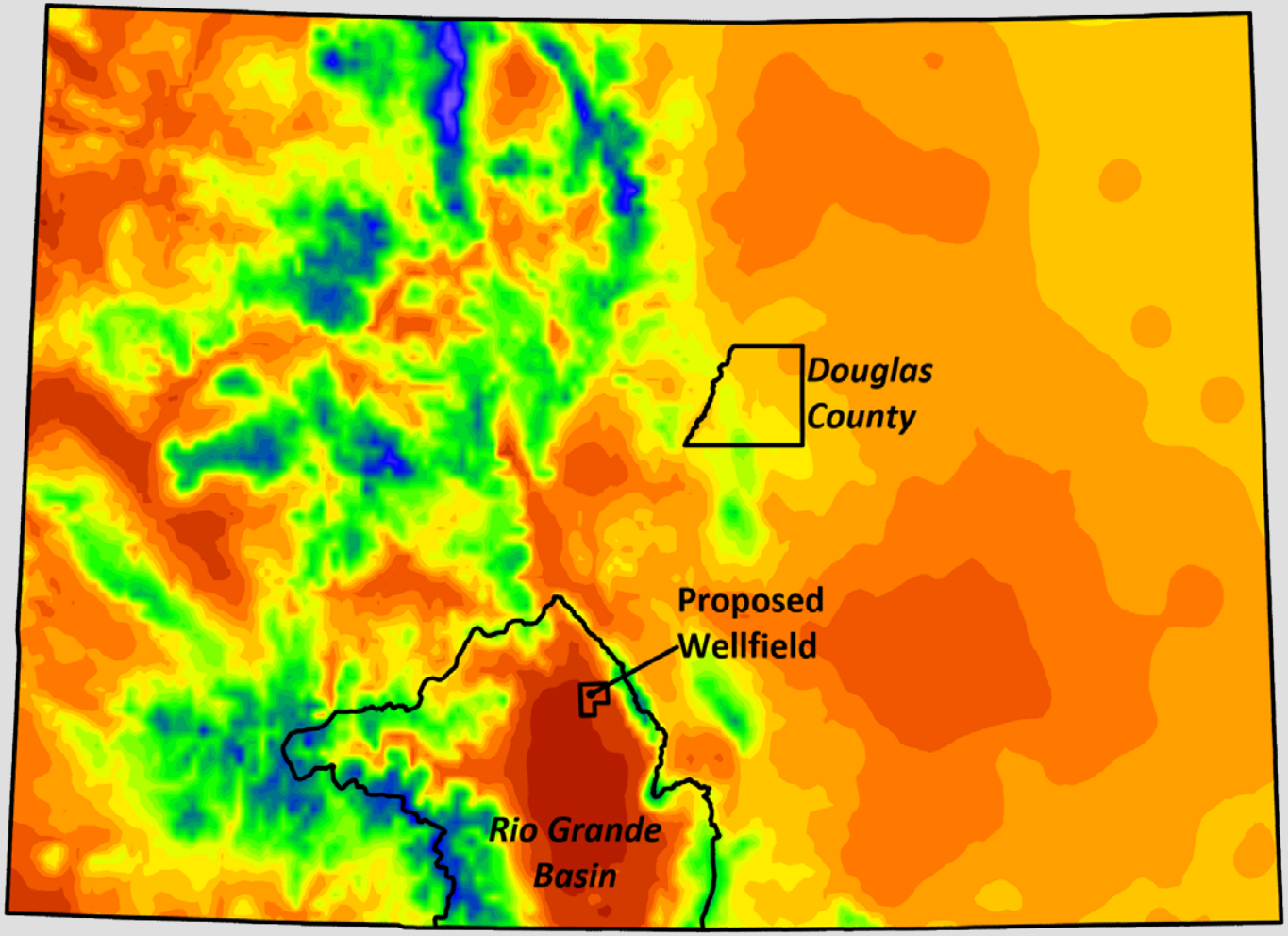
- Water Court Risks – can it be decreed with acceptable terms?
- Reliability of Supply – long range aquifer sustainability
- Raw water losses – transit, evaporation and seepage
- Environmental impacts and Ability to Permit
- Infrastructure Requirements
- Capital and Operations and Maintenance Costs
- Political Considerations

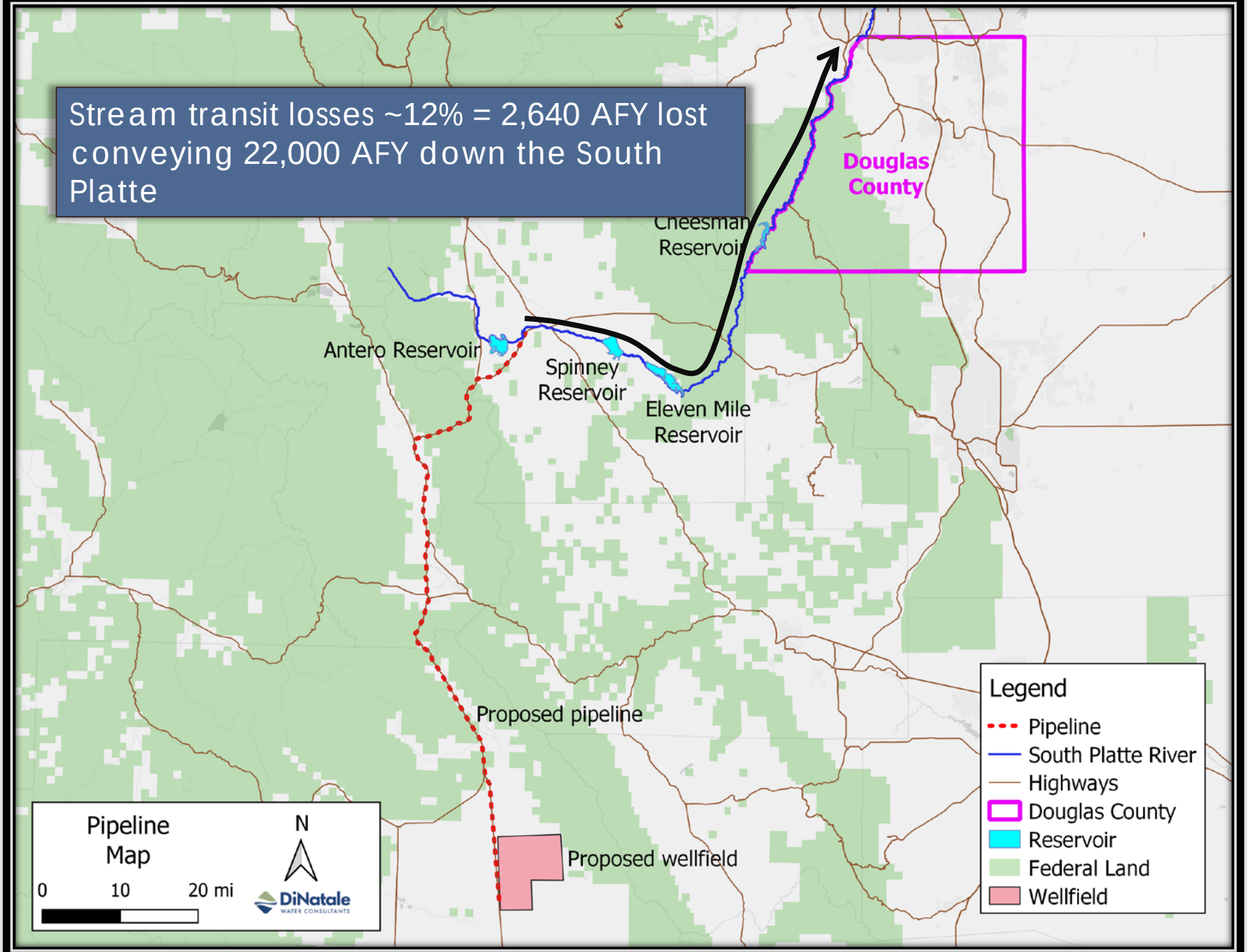
# Water Supply Considerations

## *Water Court and Supply Reliability*

- All previous Confined Aquifer export proposals have failed to receive Water Court approval
- Anti-speculation requires an end user for water
  - Douglas County is not an end user
- Aquifer sustainability rules limit pumping
- Recharge of aquifer and replacement of pumping depletions at required locations will be difficult
- Lagged pumping depletions from retired wells – decades of owed water
- Concentrated aquifer pumping at northeast part of aquifer may not be sustainable or accomplished without injury
- Discharge of confined aquifer water to surface streams – arsenic and other chemicals may require expensive treatment
- River transit losses of ~12% delivering down the South Platte or Arkansas rivers
- Terminal raw water storage requirements in Douglas County

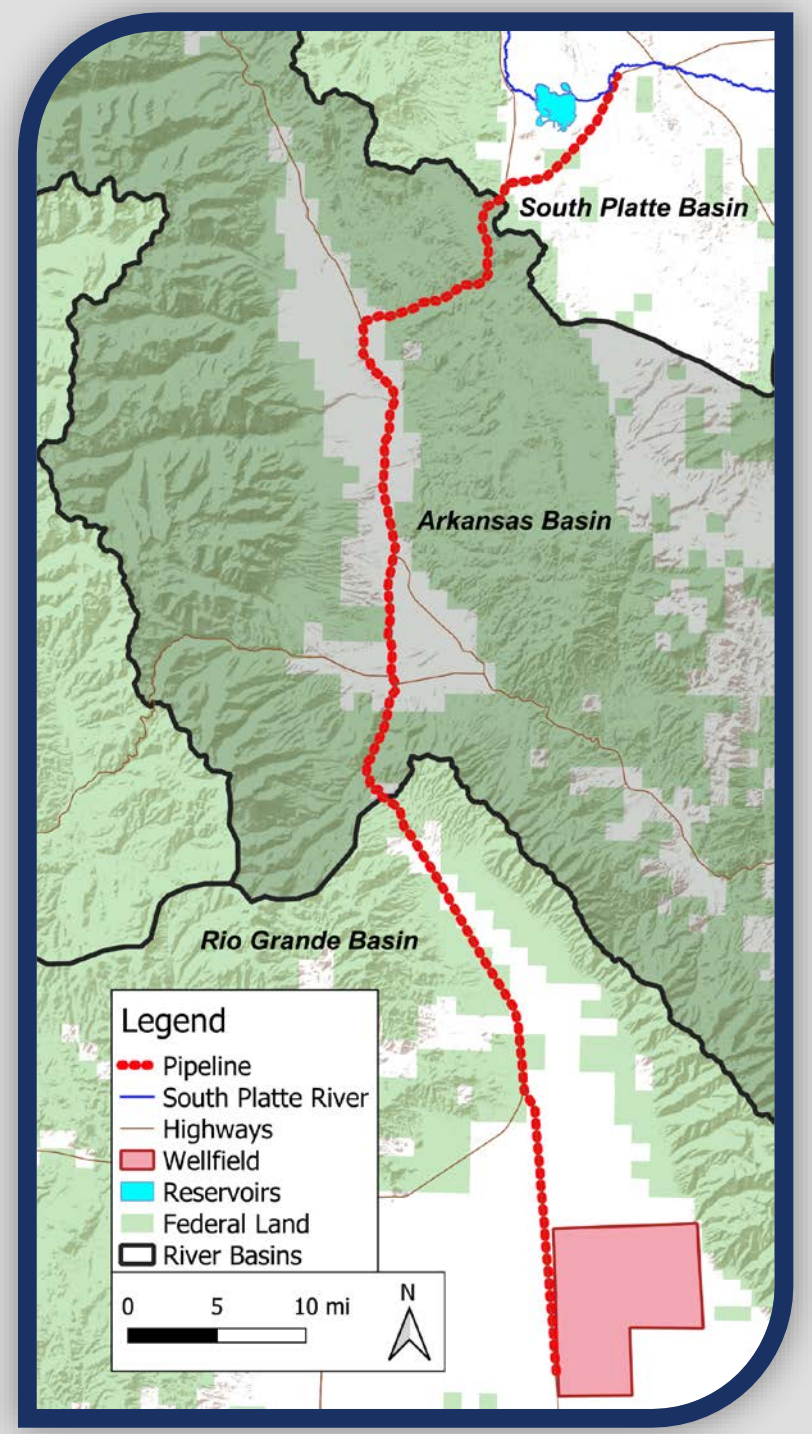
# Aquifer Sustainability
## The SLV receives the least precipitation the state




Stream transit losses ~12% = 2,640 AFY lost conveying 22,000 AFY down the South Platte
Douglas County
Cheesman Reservoir
Antero Reservoir
Spinney Reservoir
Eleven Mile Reservoir
Proposed pipeline
Proposed wellfield
Pipeline Map
N
0
10
20 mi
DiNatale WATER CONSULTANTS
Legend
Pipeline
South Platte River
Highways
Douglas County
Reservoir
Federal Land
Wellfield

# Must cross Federal lands to deliver water out of the San Luis Valley to Arkansas or South Platte Basins

- Permits required from multiple federal and state agencies
- Use of CDOT ROW does not avoid federal nexus

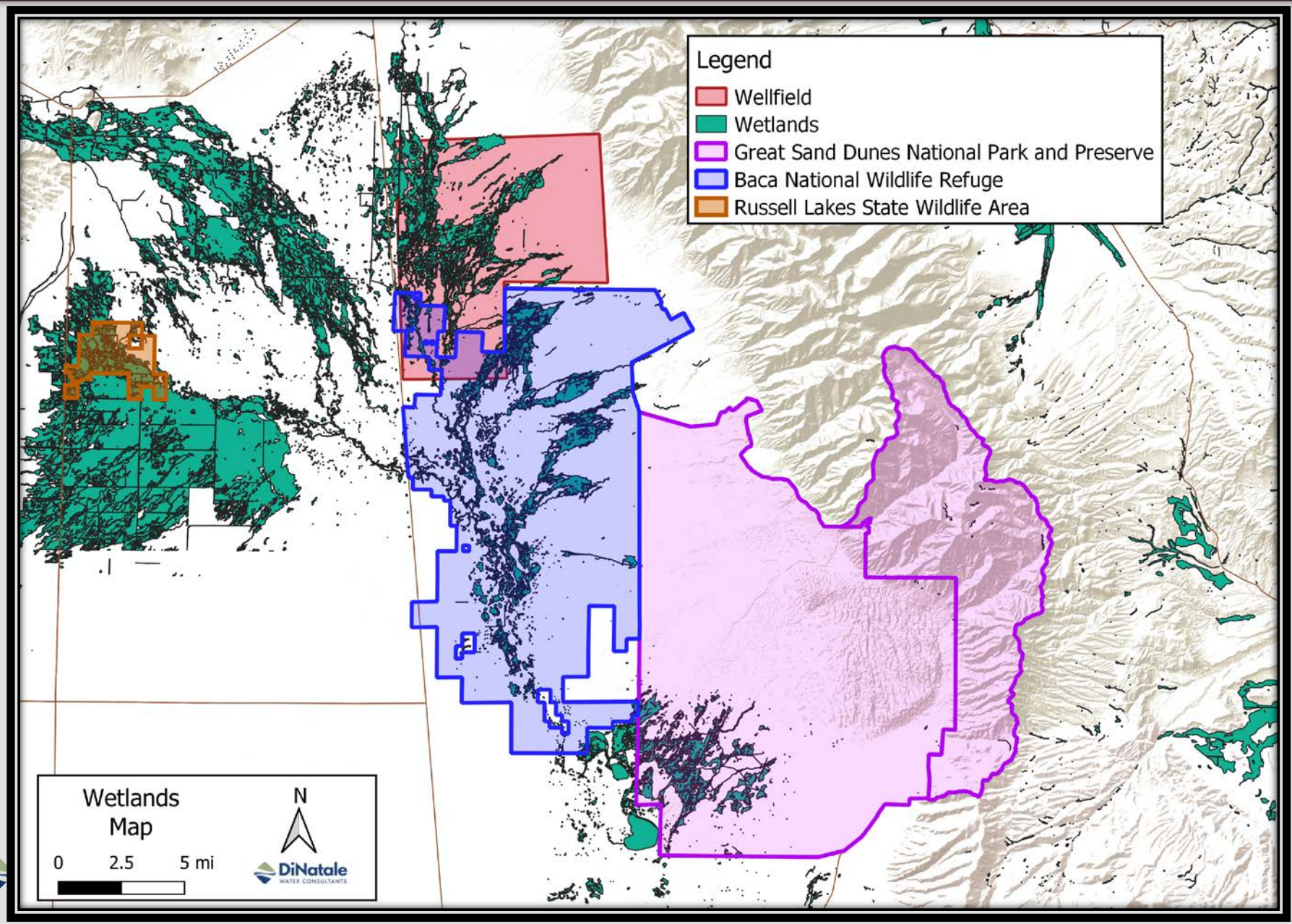


# Federal Permitting

A project of this size requires a full Environmental Impact Statement

- Permitting could take 10 to 20 years with an uncertain outcome
- NEPA requires full alternatives analysis
- Public Law 102-575 “Wirth Amendment” requirements on environmental review for impacts to Great Sand Dunes NP, Baca National Wildlife Refuge and Closed Basin Project
- 404b permitting requires Corps to authorize the Least Environmentally Damaging Practicable Alternative (LEDPA)
- Unlikely that this project would be the LEDPA for Douglas County given the environmental impacts compared to South Platte alternatives
- ECCV Northern Pipeline, Parker, and Castle Rock projects are existing or advanced planning in-basin projects with capacity to deliver additional water

# Pumping will impact wetlands and Federal and State parks and wildlife areas



# Arkansas Delivery Alternative

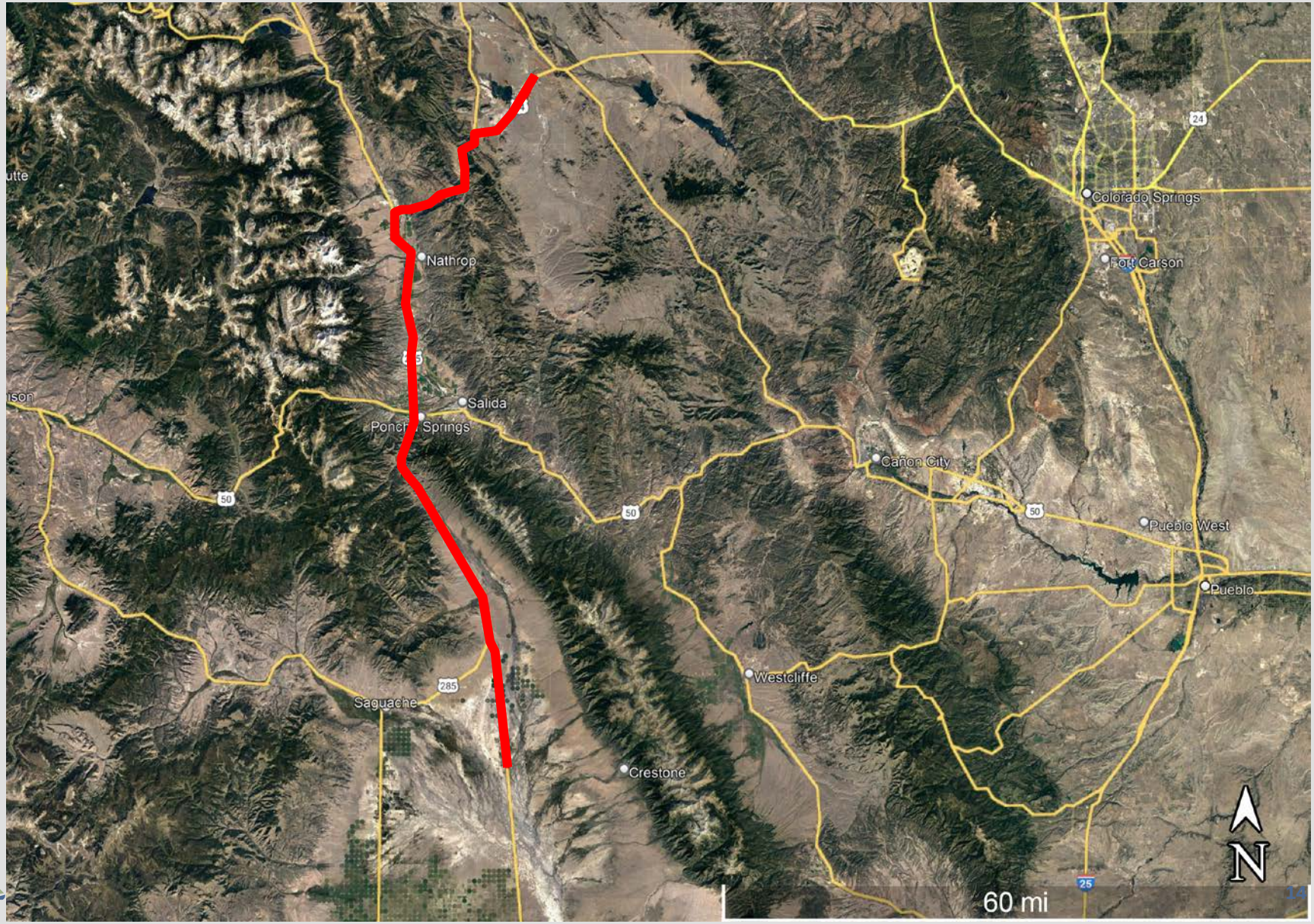
Requires approval of Cities of Aurora or Colorado Springs to use their Arkansas River water delivery infrastructure

Colorado Springs Southern Delivery System (SDS) pipeline requires significant infrastructure to convey from Colorado Springs to Douglas County

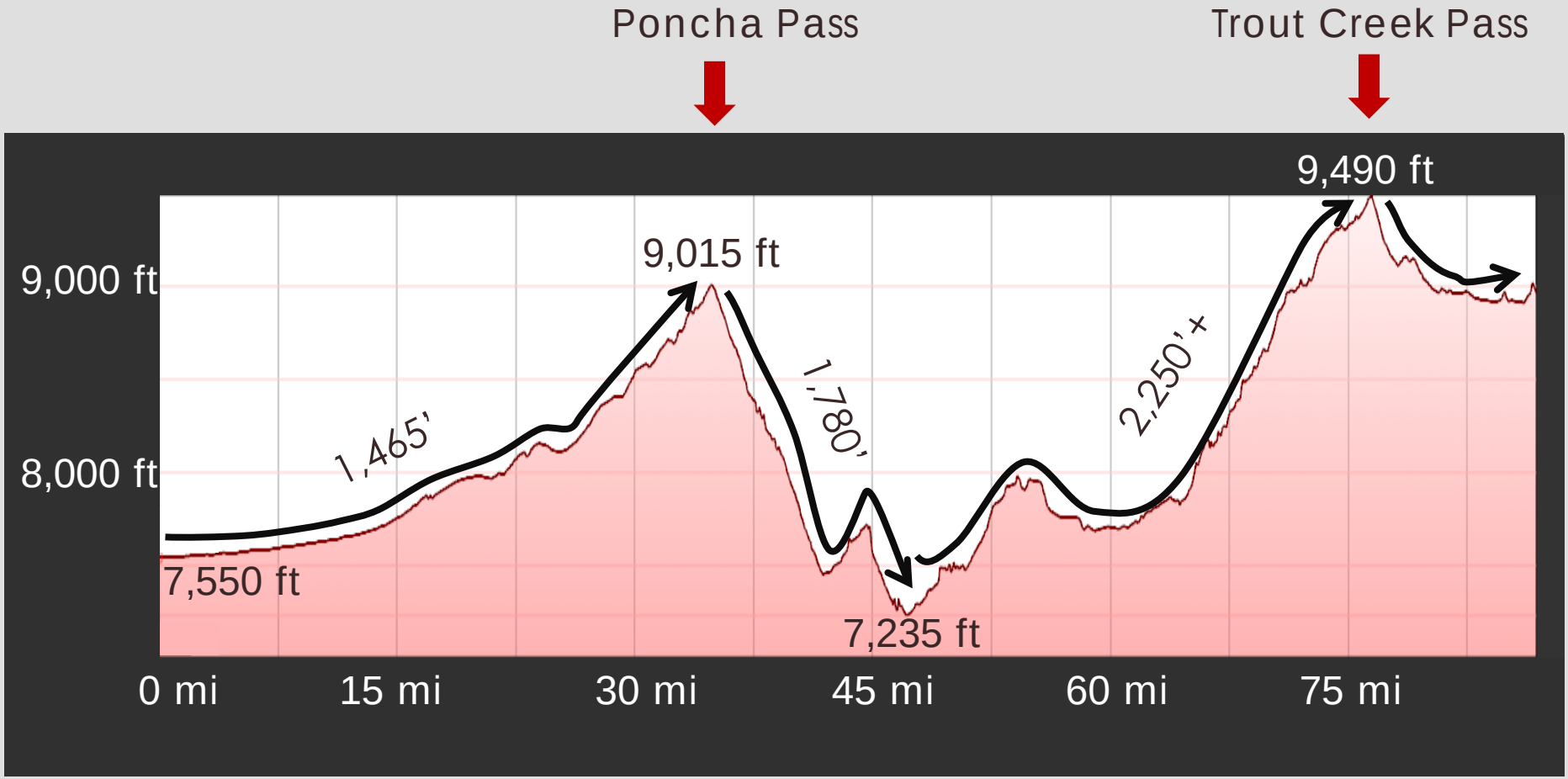
Potential for Colorado Springs SDS permits to be reopened if a new source of water is conveyed that was not analyzed in the EIS

Not a feasible alternative unless Aurora or Colorado Springs indicate willingness to transfer SLV water from the Arkansas basin to the South Platte

# Proposed Pipeline Terrain is Extremely Challenging

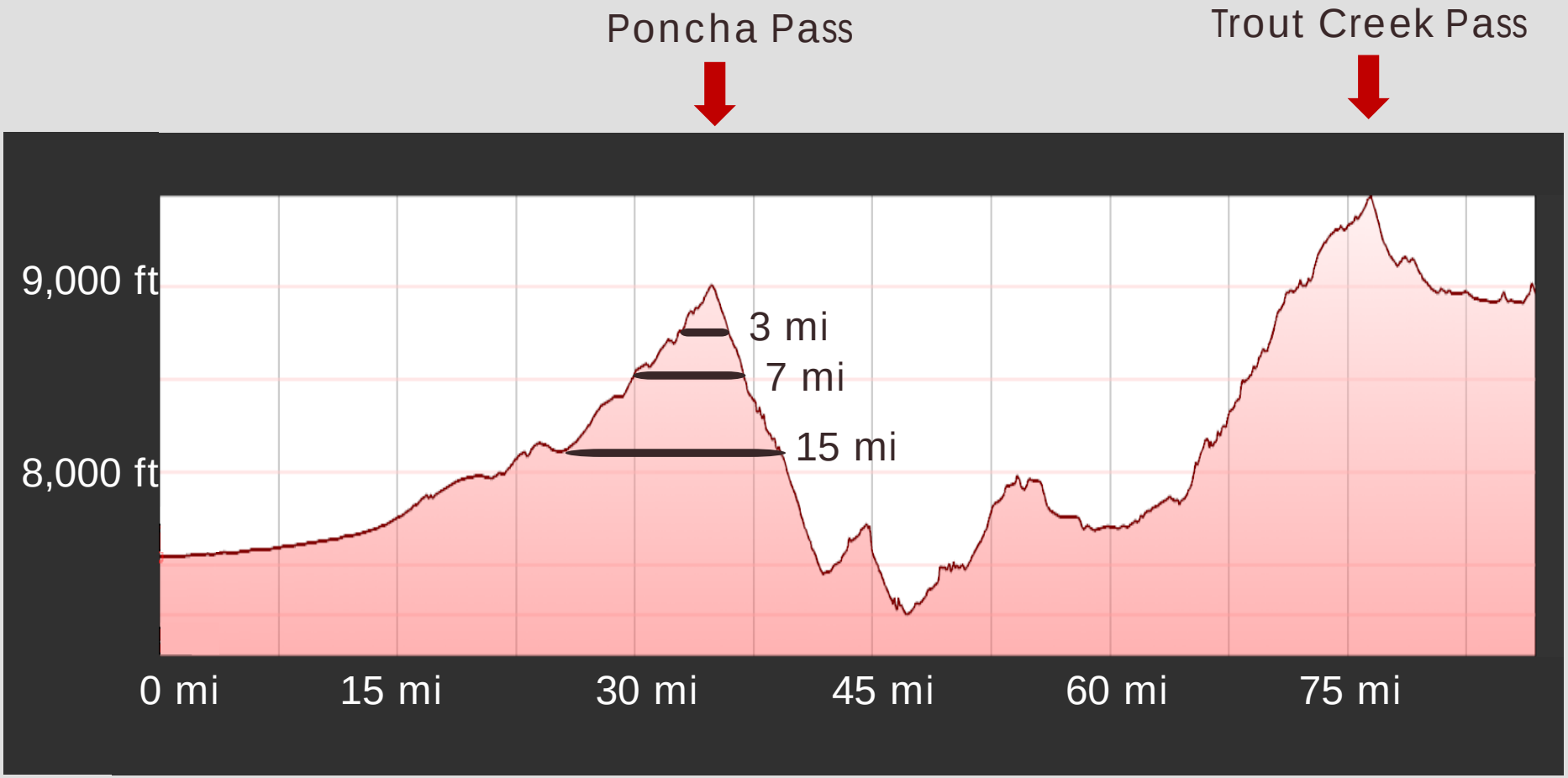


# Renewable Water Resources Pipeline Profile
# US Hwy 285 Alignment




- Elevation gain: 5,759 ft
- Elevation loss: 4,344 ft

# Renewable Water Resources Pipeline Profile Tunneling under Poncha Pass Option



# Tunneling

- Microtunneling with a remotely operated boring machine only feasible for distances up to a few thousand feet
  - Costs in vicinity of $2,000/ft
  - Not feasible to micro-tunnel Poncha Pass

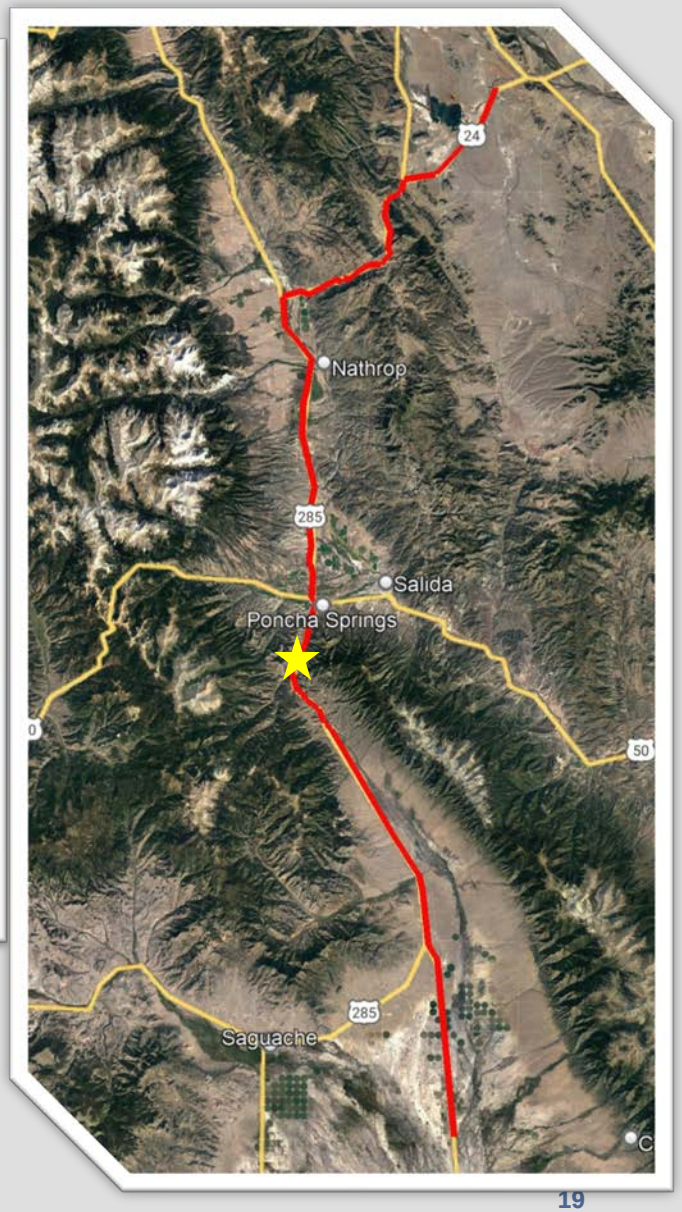
- More conventional tunneling needed for longer distances
  - Larger bore required for equipment and operators
  - Highly variable costs, but estimated at $8,000 to 10,000/ft = $40-50 million/mile
  - Not cost-effective for a 36”pipeline

# Tunneling through Poncha Pass

| Tunneling Length | Pumping Lift Saved | Cost |
|---|---|---|
| 3 mi | 250 ft | $120 - 150 M |
| 7 mi | 500 ft | $ 280 - 350 M |
| 15 mi | 900 ft | $ 600 - 750 M |

Tunneling is not cost-effective for a 22,000 AFY project

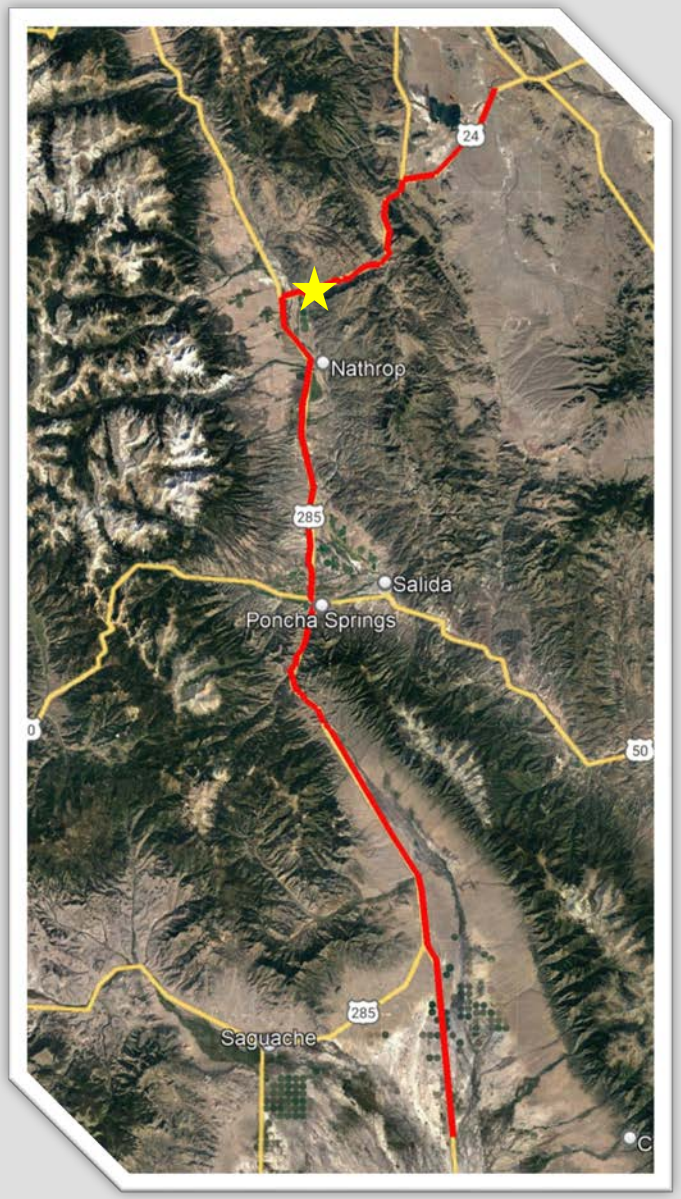
# Hwy 285 going over Poncha Pass




- Minimal shoulder
- Steep drop offs and hill slopes
- No easy pipeline corridor
- Forest Service land

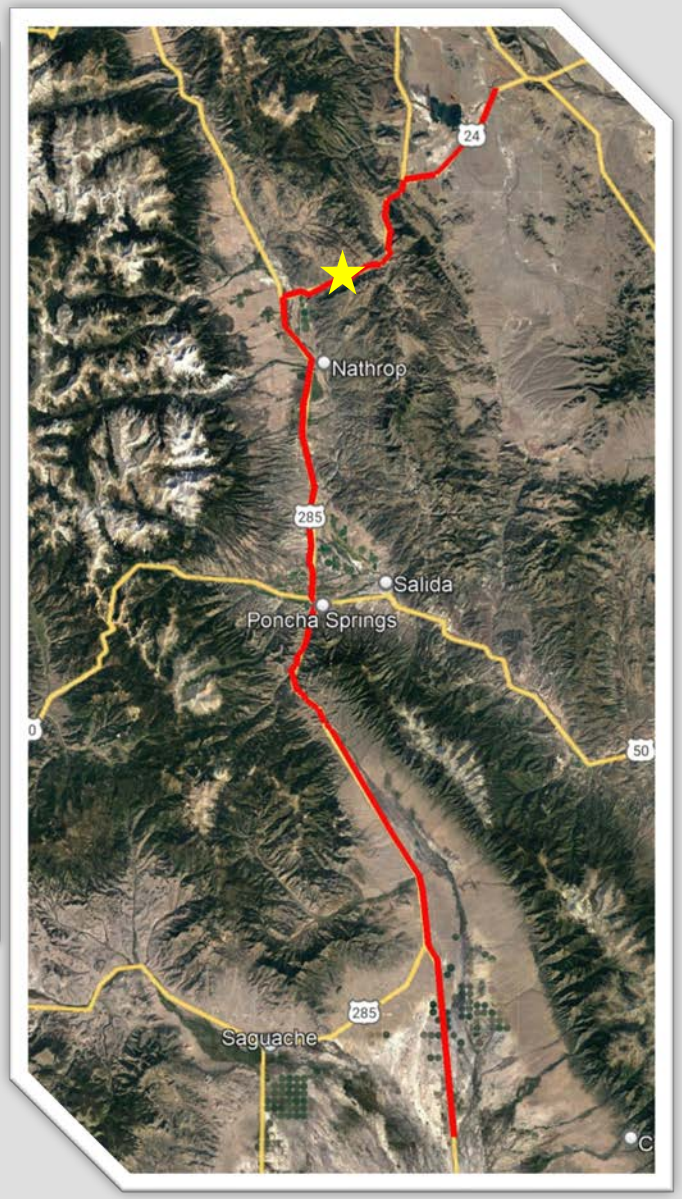
https://www.flickr.com/photos/kenlund/15835465007/in/photostream/

# Hwy 285 about 2 mi east of Johnson Village




- No shoulder
- Cliffs surrounding road, requires blasting
- Forest Service land

# Hwy 285 about 4 mi east of Johnson Village




- Minimal shoulder
- Riparian areas surrounding road
- Forest Service land

# Feasibility-level Capital Cost Estimate

| Cost Component | | Cost |
|---|---|---|
| Wells and collection system | $ | 20,000,000 |
| Pipeline | $ | 410,000,000 |
| Pump stations | $ | 80,000,000 |
| Raw water diversion and storage | $ | 20,000,000 |
| Water treatment and diversion | $ | 110,000,000 |
| Subtotal construction | $ | 640,000,000 |
| Construction contingency at 25% | $ | 160,000,000 |
| Mitigation of construction impacts | $ | 90,000,000 |
| Total construction cost with contingencies | $ | 890,000,000 |
| | | |
| Permitting, engineering, inspection, legal and admin at 25% of total construction | $ | 230,000,000 |
| | | |
| **Total infrastructure capital cost** | **$** | **1,120,000,000** |
| | | |
| Total water pumped | | 22,000 |
| Net water delivered after 12% stream transit loss in South Platte | | 19,360 |
| Cost per net AF delivered - no water rights | $ | 57,900 |
| | | |
| **Water rights through water court and appeal ($19,500/AF pumped)** | **$** | **430,000,000** |
| Water rights cost per net AF delivered | $ | 22,200 |
| | | |
| **Community Fund for San Luis Valley** | **$** | **50,000,000** |
| | | |
| **Total project cost** | **$** | **1,600,000,000** |
| **Total project cost per AF** | **$** | **82,600** |

# History of Reference Prices for Steel
# February 2012 – February 2022


https://tradingeconomics.com/commodity/steel

# Feasibility-level Annual Operating Costs

| Annual Cost Component | unit | Unit cost | No. of units | Annual cost |
|---|---|---|---|---|
| Confined well pumping | million gallons | $ 235 | 7,168 | 1,700,000 |
| Pumping from well collection to South Platte | million gallons | $ 1,478 | 7,168 | $ 10,600,000 |
| Water Treatment | million gallons | $ 2,500 | 6,308 | $ 15,800,000 |
| Augmentation plan operations for depletions | lump sum | | | $ 2,000,000 |
| Pipeline and PS labor and contract maintenance | lump sum | | | $ 2,000,000 |
| Fund for infrastructure replacement | lump sum | 1.5% | $ 876,098,000 | $ 13,100,000 |
| **Total annual cost for O&M only, no infrastructure financing** | | | | **$ 45,200,000** |
| | | | | |
| **Net AF delivered to Water Plant** | | | | **$ 19,360** |
| **$/AF O&M wholesale out of the Water Plant** | | | | **$ 2,300** |
| **$/1,000 gallons wholesale out of the Water Plant** | | | | **$ 7.06** |

# Example Project Financing Scenario

| Item | Cost/ Volume | Notes |
|---|---|---|
| Total Project Capital Cost | $ 1,600,000,000 | Total Project Capital Cost |
| Estimated initial capital cost funded by Douglas County | $ 50,000,000 | An estimate of upfront cash provided by the County |
| Amount to be financed | $ 1,550,000,000 | |
| Bond interest rate | 3.25% | Estimated bond rate |
| Length of bond, years | 30 | Normal borrowing period for infrastructure water supply projects |
| Annual bond payment | $81,700,000 | |
| Annual water delivery, AF | 19,360 | Net water delivered to Water Plant. Assumes no treatment losses |
| **Financing Cost per 1,000 gallons** | **$ 12.95** | Some of this cost could be defrayed by tap fees from new development |
| | | |
| **O&M per 1,000 gallons** | **$ 7.06** | Annual operating, maintenance and replacement costs |
| | | |
| **Cost per 1,000 gallons for O&M and bond payments** | **$ 20.01** | Unit cost per thousand gallons if financing the project through water rates |

The cost does not include capital and O&M costs for transmission and distribution of treated water from the water plant to customers.

# Summary 1 of 2

- SLV export project unlikely to survive lengthy and expensive water court process
- Aquifer may not be sustainable with concentrated volume of pumping at the edge of the aquifer
- Replacement of pumping depletions and recharge of aquifer requires cooperation of Rio Grande basin entities
- Wetlands impacts to Great Sand Dunes National Park, Baca Wildlife Refuge and surrounding areas cannot be mitigated with replacing depletions to the river
- Wirth Amendment requires a higher standard of review to the existing stringent EIS process
- Pipeline conveyance routes are extremely challenging and expensive to construct
- Unlikely to receive federal permits due to other less damaging and practicable alternatives (LEDPA)
- Will Aurora or Colorado Springs risk reopening existing permits and political fallout from conveying SLV water to Douglas County?

# Summary 2 of 2

- What is Douglas County's unmet need that cannot be met under existing South Metro water provider plans?
- Aquifer Storage and Recovery in conjunction with Parker and Castle Rock projects and Rueter-Hess Reservoir could meet unincorporated County needs
- Preservation of Denver Basin aquifers by limiting large water provider pumping may be the best approach for many unincorporated County water users
- How do Douglas County residents to be served by the project finance construction, deliver water to end users and pay the annual O&M?
  - Is this water for new growth and financed by tap fees?
- Project cost estimates, though high, are likely understated
- Project is not financially feasible at 22,000 AFY – infrastructure requires upscaling project to 100,000 AFY for economies of scale
- Water has not yet been proven to be physically and legally available in San Luis Valley

**WATER COURT AND PERMITTING ARE POTENTIAL FATAL FLAWS**

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