

LARIMER COUNTY | Community Development

P.O. Box 1190, Fort Collins, Colorado 80522-1190, Planning (970) 498-7683 Building (970) 498-7700, Larimer.org

MEMO

To: Larimer County Planning Commission
From: Community Development Staff
Date: July 15, 2020
RE: 3rd Addendum to Staff Report for NISP 1041
File #20-ZONE2657

Attached to this memo please find the following information which has been received by the staff since the packet for the July 8th meeting:

- Updated Citizen comments – 4.
- Several handouts from NISP WAE.
- JPEG map of the power line to be relocated.





Rob Helmick <helmicrp@co.larimer.co.us>

Planning Commission

1 message

Larimer.org <noreply@larimer.org>
 Reply-To: Tom Sale <tsale@engr.colostate.edu>
 To: pcboard@larimer.org

Tue, Jul 14, 2020 at 12:30 PM

Submitted on Tuesday, July 14, 2020 - 12:30pm

Submitted by user: Anonymous

Submitted values are:

Emailing (to) pcboard@larimer.org
 Subject Planning Commission
 Your Name Tom Sale
 Phone
 Your Email tsale@engr.colostate.edu
 Confirm Email tsale@engr.colostate.edu
 Message
 Hello Planning Commission

1) Thanks for your effort with the NISP 1041 hearing

2) I pulled the following questions from my comments of 4.29.20(provided to Rob Helmick and the County Commissioners) that you may want to consider in meeting with Northern on 7.15.20

Best Regards, Tom Sale

Regarding: Comments on Northern Integrated Supply Project (NISP) 1041 Permit

Siting

Fault Questions:

- Why is it that neither the North Fork or Bellvue Faults have ever been mentioned in public NISP documents to date?
- What contingency plans are available to address fault-controlled leakage under the dams, what are the associated costs (e.g. following work on the North Dam on Horsetooth), and are the related costs being shared with participants and lending agencies?
- In your recent multiple year (undocumented?) drilling programs were “subsurface voids” encountered that could lead to severe seepage losses and/or washout under the Glade Dam? Have the results from recent subsurface investigations been shared with the public?

Seepage Loss Questions:

- Given up to 400 feet of water over the conductive sandstone beds, and the likelihood of large seepage losses, how can you advocate that Glade is a suitable site for a reservoir?
- The county requires groundwater models for projects where groundwater issues exist. What types of groundwater modeling has been conducted for Glade and have the results been shared with the public?
- Per Northern's recent public open house on NISP, there are NO plans to place a seepage control liner in Glade (as was ultimately required at the North Dam on Horsetooth). If a liner were required how would it effect the costs for NISP and are the parties that will cover the cost aware of the associated risks?
- Given effective subsurface water storage alternatives, how much money could be saved by eliminating seepage losses?

Munroe Ditch Questions:

- The proposed steel pipeline in cement will see dynamic vertical stresses. What kind of foundations are required, what are the costs for the submerged conveyance, are the costs currently included in the estimates provided to the participants?
- How do you plan on dealing with large volumes of water flowing into the submerged tunnels when they become submerged drains?

- Given prior experience with collapsing formations due to exposure to fresh water in the vicinity of Glade, why would the Munroe Ditch Tunnels not collapse when they become submerged drains?
- Are there any successful engineering precedents for the proposed submerged conveyance of the Munroe Ditch through Glade?
- How will you safely remove sediments that will inevitably fill the submerged pipeline?
- What are the anticipated costs of the submerged conveyance, its maintenance, and its periodic replacement?
- Are the costs for the submerged Munroe Ditch conveyance through Glade included in current estimates of the cost for NISP and are the related cost/concerns being shared with participants and lending agencies?
- What is Northern's contingency plan given the likelihood of the Munroe Ditch conveyance failing?

Pushing the Missile Site Chlorinated Solvent Plume into Domestic Drinking Water Wells Fault Questions:

- Why did Northern install 20 plus monitor wells in the missile site plume?

- Were water samples collected from the wells?

- o If yes, when will the data be made available? One might think that if the news was good, we would already know the results.

- o If no, isn't it in the best interest of protection to human health and to the environment, to accurately sample the wells and share the results prior to any approval of the NISP 1041 Permit?

- What are the contingency plans for adverse impact to domestic water supplies?

- Is it appropriate to proceed with a decision on the NISP 1041 Permit absent public documentation of the water quality in Northern's 20+ monitoring wells in the vicinity of the missile plume?

Off the Main Stem of the Cache La Poudre Questions:

- How will NISP capture peak flows if the diversion from the Cache La Poudre River is constrained by the hydraulic capacity of the diversion?
- Why should NISP be approved if there are lower cost/less harmful alternatives for surface water storage projects that the project proponents can participate in?
- How will NISP get the required electrical power to the pumps at the forebay?
- Has Northern provided the required information for approval of an 80 MW power line?
- How will required power lines impact the aesthetic of the views in Pleasant Valley and the new recreational facilities?

Alternatives

Mining Water Losses from Antiquated Water Storage and Transmission Infrastructure Question:

- Given a viable alternative that is less damaging, low risk and suited to uncertain times – why should the (NISP) 1041 Permit be approved if it is, in contrast, severe in its impacts, more costly, and poorly suited to the State's current conditions?

Subsurface Water Storage Question:

- Given all that is happening with Subsurface Water Storage in Colorado, and Dr. Sale's comments, why would you dismiss Subsurface Water Storage?

Conservation Questions:

- How can Northern justify requesting further surface water diversions, billions of dollars from Colorado's residents, and destruction of Larimer's County's limited wild lands when so much can still be done with conservation?

Privacy Setting

This form was submitted from a /contact email link on larimer.org.

June 01, 2020
Larimer County Board of County Commissioners
Larimer County Planning Staff
200 West Oak Street, Suite 3100
PO Box 1190
Fort Collins, CO 80521

RE: NISP 1041 Permit Application; Project No. 20-ZONE 2657

Dear Commissioner Johnson, Commissioner Kefalas, Commissioner Donnelly, and Planning Commission:

I am writing to express my opposition to the Northern Integrated Supply Project NISP and encourage the Larimer County Planning Commission and County Commissioners to reject the 1041 County permit for the project. Let me explain why I do not support this project and encourage you to reject the permit.

This annual spring “rise” on the Cache la Poudre River is a sacred event, a living pulse of water that lasts just about a month but refreshes and re-nourishes the entire river ecology. As the Poudre reaches Fort Collins these floodwaters spill the banks, filling secondary channels where frogs, birds, and fish rear and lay eggs. Fresh layers of sediments drop out over the floodplains, nourishing the deep, lush cottonwood forests and marshes.

Something unique about the Poudre is that despite roughly 2/3 of the flow already diverted out, there is still enough of a spring “rise” to flood the banks, clean out the river of lingering sediments, redeposit nutrients, and refresh the ecology. This is rare, nearly all of the rivers and creeks along Colorado’s Front Range have been dammed or diverted where the natural rhythm of the spring “rise” is gone, turning the echoing drumbeat of the river into a muted whine.

The Poudre still has its spring heartbeat, but not for long if the Northern Colorado Water Conservancy District builds their gluttonous Northern Integrated Supply Project (NISP). If this project is built it will take 71% of the water out of the river during the spring “rise”, flat-lining the river and putting it on life support.

My expertise is in river restoration and geomorphology, it's my job to know how river and stream mechanics respond to changes in flow. A major problem that NISP would have on the river is that by reducing the spring “rise”, the river will not be able to redistribute and transport sediments out of the river channel where they can deposit onto floodplains and wetlands. By functionally limiting the peak flow and eliminating the annual flushing effect, those sediments will stack up in the channel year after year, eventually raising the channel higher and higher to a point that will create regular flooding problems. The annual flush is needed to improve hydraulic conveyance and move sediments downstream. Not allowing this annual pulse will create a clog, similar to a blood clot.

Additionally, if NISP were built and the sediments are not annually flushed out with large spring pulses, the water quality will greatly suffer. This will occur because the sediment and nutrients trapped in the channel will decompose and consume oxygen levels within the water, thereby decreasing dissolved oxygen available for fish and other wildlife. The annual spring “rise” is not “extra unused water”, it's the force that cleans the river environment, flushing sediments and nutrients out and distributing them on floodplains.

Taking the last of the peak flow and storing it behind a dam to feed sprawling suburbs, while turning the river into a putrid algae-filled ditch, is not a good starting point.

This is not my vision for the Poudre River or the Northern Colorado region. Instead, my vision is to keep the wild character of the river, meet growing water needs, and retain the farmland and rustic character of the region. We don't need another river-destroying boondoggle like NISP that creates more urban sprawl. We need intelligent planning, water conservation, recycling, water sharing agreements between cities and farms, and water efficiency upgrades. These solutions have been done in places like Las Vegas where water use has gone down even though growth has skyrocketed. These methods are common and would be significantly cheaper than a billion-dollar dam, paid for by ratepayers.

Only 35 years ago, a 415 ft tall dam was proposed along highway 14 near the mouth of the Poudre Canyon. The Grey Mountain Reservoir proposal was pushed by Northern Water, the same agency pushing NISP. Thankfully Grey Mountain Dam was rejected by Larimer County, and I hope that NISP will be defeated too, but only with your help in rejecting the 1041 County Permit.

Please stand with the river and all the constituents in Larimer County that do not want to see our beloved river put on life support to feed the growth of cities in other Counties.

Thank you,

Preston Brown

Fort Collins, CO.

May 22, 2020
Larimer County Board of County Commissioners
Larimer County Planning Staff
200 West Oak Street, Suite 3100
PO Box 1190
Fort Collins, CO 80521

RE: NISP 1041 Permit Application; Project No. 20-ZONE 2657

Dear Planning Commission, Commissioner Johnson, Commissioner Kefalas, Commissioner Donnelly, and Planning Staff:

My name is Ken McCullough, I am a life-long resident of Larimer County and a third-generation alfalfa farmer. My 45-acre farm is irrigated with water diverted directly out of the Cache la Poudre River via a canal operated by the Larimer and Weld Irrigation Company. This canal is located just east of Taft Hill Road and is downstream of the diversion point for the proposed Glade Reservoir. As someone with deep ties to the agricultural economy and rural culture of the Fort Collins area, I am opposed to the Northern Integrated Supply Project (NISP) being pushed by the Northern CO. Water District. For many reasons, I urge you as Commissioners and County Staff to oppose this God-awful project. Let me explain why I am so strongly opposed to this project and believe you should be too.

My farm diverts about 30-acre feet of water from the river annually, primarily June through September. This is a reliable water right, although my water rights are not senior to many upstream and downstream users, I have never suffered from an inadequate supply when I needed it most. There have been many years when I don't get my full 30-acre feet, but my alfalfa operation has always received enough water, even in the driest years of 2000-2006, to get a reliable crop and stay in the black. After review of the NISP project and discussions with others in the agricultural economy, including leadership Larimer and Weld Irrigation Company, the NISP project will not benefit me at all, in fact, it could make me lose my farm.

The NISP project does not supply any new additional water to irrigators, agricultural users, or farmers in Larimer County. However, the water diverted into Glade Reservoir would be water that is *already* allocated and exists in paper water rights with farms in Larimer and Weld Counties. A major problem with NISP is that the water to be stored in Glade would need to be purchased in order to be allocated to the project, which it isn't, and unless Northern Water and NISP customers purchase thousands of acres of farmland, that water will never make it to Glade except for years with incredibly exceptional runoff. Since most of the water NISP is hoping to capture is already allocated for downstream users, NISP would need to purchase the farmland where the water rights are held in order to divert and eventually sell that water to customers. This issue was pointed out in the 2018 Final Environmental Impact Statement for the NISP project produced by the United States Army Corps of Engineers. Despite this incredibly problematic detail, Northern Water thinks they can purchase these farms eventually over the next 30-40 years. Frankly, that is unrealistic, this is a billion-dollar pipe dream that won't likely operate at full capacity unless billions of more dollars are sourced to purchase farmland.

The issue I fear most that could jeopardize my farm is if Northern Water begins purchasing farmland and water rights in Larimer and Weld Counties. If farms are purchased for their water rights, the value of the

farmland will skyrocket because the water rights associated with the land will be “developed” and stored behind a dam and made available for urban users instead of kept in the river. This would result in a major *negative* economic incentive for farmers to sell their land and water rights to NISP in order to “cash out”. Farmers would of course have to sell their land willingly but imagine if a big fat “green carrot” was dangled in front of a working-class family? We all know what will happen, the pressure to sell the land for cash would be too overwhelming for most, and the multi-generation farms will be turned over for a quick buck.

Developers would then be able to buy the land from NISP and turn the land into homes and subdivisions, knowing that the farmland being paved over and has fed the Country for generations and will forever be lost.

My biggest fear about NISP is that if it were successful, which is unlikely, it would incentivize the development of Larimer and Weld Counties rich farmlands and rural charters, resulting in appalling urban sprawl and will contribute to the loss of a stable and reliable agricultural economy. At best NISP would waste billions of dollars and never become operational, but at worst, it would turn our beautiful rich agricultural lands into cement cul-de-sacs and parking lots.

My family and I have weathered through many years of drought, lost revenue, pest diseases, broken equipment, labor disputes, and market swings, but we've always kept our heads above water. However, I see NISP as the grim reaper, a sign of danger coming to turn my farm and our neighbors' farms into lawns and asphalt driveways, forever destroying the traditions we have established in Larimer County.

This is not the future I want to leave my daughter, who will inherit the farm and be the first woman in the family to run it. I want her to have the same lifestyle and traditions that my grandfather had when he came to Larimer County in 1910 to farm alfalfa and corn. As someone who is trying to find their way in this chaotic world and walk tall as a steady and honorable person, I find myself feeling helpless and in utter despair if NISP were built. That's why I am writing, to urge you to hear my story and see my perspective as a farmer who wishes the best for his home. Please stand with me and do not issue a 1041 permit for the Northern Integrated Supply Project.

Sincerely,

Ken McCullough

Laporte, Colorado



With boom in visitation comes safety concerns for recreators at Horsetooth Reservoir

Kevin Duggan, Fort Collins Coloradoan Published 7:00 a.m. MT July 3, 2020 | Updated 4:08 p.m. MT July 3, 2020

Fans of Horsetooth Reservoir have taken to heart the message that it's OK to enjoy the great outdoors during the coronavirus pandemic.

Crowds flocked to the reservoir west of Fort Collins as well as other sites managed by Larimer County Natural Resources as they reopened in spring to boating, camping and hiking. The surge in visitation has carried over to summer.

And with the people have come problems with safety and parking, county officials say.

Parking issues in the Horsetooth area came to a head in mid-June as hundreds of vehicles pulled over along sections of Centennial Drive and county roads 38E and 23 during weekends because the reservoir's parking lots were full.

Any spot that wasn't signed "no parking" had a parked car, said Senior Ranger Luke Brough during a recent meeting with the county commissioners.

Pay up: [State wildlife areas require licenses for all users \(/story/sports/outdoors/2020/06/30/new-rule-requires-colorado-hunting-fishing-license-on-larimer-public-lands-watson-lake-poudre-river/5349078002/\)](#)

Vehicles lined both sides of the narrow-shouldered roads, and cars sped through even as cyclists rode along and paddleboarders and kayakers hauled gear across the roads to reach the water.

Given the dangerous circumstances, Brough said "it was a miracle" no one was seriously injured.

"It was a blessing at the end of the day to say no one got ran over," he said.

Placing 40 temporary no-parking signs along the county roads plus stepped up traffic enforcement by Larimer County sheriff's deputies and the Colorado State Patrol helped calm the situation.

But the crowding is a sign of things to come as the region grows and more people seek outdoor recreation spots.

Visitation is booming



Cars fill a pullout along Centennial Drive near Horsetooth Reservoir over Memorial Day weekend in Fort Collins, Colo. on Saturday, May 23, 2020. (Photo: Bethany Baker / The Coloradoan)

A visitor count conducted two years ago found 1.2 million people visited the Horsetooth area, which covers the reservoir and Horsetooth Mountain Open Space, said Mark Caughlan, manager of the Horsetooth District, in an interview.

"That's a tremendous amount of people to run through a fairly small park area," Caughlan said.

The number seems to have increased. As of mid-June, visitation to the reservoir and open space was up 40% from a year ago, Caughlan said.

On weekends, parking lots at the reservoir are full by 9 a.m. Latecomers might have to wait in line more than an hour to launch their boats. Some weekdays can be as busy as Saturdays and Sundays.

[Buy Photo](#)



A sign that reads "No Parking" is located along Shore Access Road beside Horsetooth Reservoir in Fort Collins, Colo. on Wednesday, July 1, 2020. (Photo: Bethany Baker / The Coloradoan)

Through mid-June, boat inspectors checking for invasive aquatic species had conducted 8,300 inspections. By that time a year ago, they had done 3,500 inspections.

About half of the visitors have come from outside the county, Caughlan said. Many visitors come from Weld County.

Guide: [Summer fun in Larimer County during a pandemic \(/story/life/2020/06/23/coronavirus-summer-things-to-do-fort-collins-colorado-covid-19/3235464001/\)](#)

Carter Lake near Loveland has seen a similar boom in visitation, as have other recreation facilities along the Front Range.

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Horsetooth Reservoir sees rise in visitation from boaters, campers

At Boyd Lake State Park in Loveland, waits to get in the park and launch a boat can exceed two hours, Park Manager Eric Grey told the commissioners.

The park has 1,200 parking spaces. When those spaces fill, traffic is stacked at entry points, where variable message boards advise drivers on the potential lengths of wait times.

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Traffic coming in from the south backs up along Boise Avenue toward McKee Medical Center. The backup can hamper emergency vehicle access and the ability of residents to park in front of their houses.

"In the past four years, we only had that happen five times," Grey said. "We had it happen six times this spring."

Safety issues a concern

In anticipation of the crowding, Larimer County Natural Resources hired its full contingent of 15 seasonal rangers even though the potential impact of the pandemic was not clear. The department has four year-round rangers.

Caughlan said he's grateful to have the help. On busy days, rangers run from service call to service call, often focusing on traffic mitigation rather than "doing real ranger work."

"We're doing the best job we can to address public safety, to address visitor needs, to make sure to protect the resources," he said. "As you can imagine, it's difficult at best with these visitation numbers to manage those."

During major events, such as a June 20 medical emergency at Satanka Bay in which a 36-year-old man suffered a heart attack and died, park resources get spread thin, Brough told the commissioners.

Without rangers keeping track of things, parking lots, boat ramps and other facilities at the reservoir can become chaotic.

Accident: [Climber seriously injured in Horsetooth fall \(/story/news/2020/06/29/colorado-climber-airlifted-after-fall-near-fort-collins/3279557001/\)](#)

"Once that bottle is open, it's a continuous flow and we can't contain it," he said.

Water safety is a major concern at the reservoir, Caughlan said.

Visitors should heed regulations limit swimming to designated areas. Inflatable tubes, mattresses and other toys are not allowed outside swim areas.

In 2019, a record 18 people drowned in Colorado lakes. This year, the state has already seen 15 drownings, he said.

"We just want people to make good decisions and wear life jackets," he said.

Cliff diving is prohibited at Horsetooth Reservoir, but it still happens. People risk serious injuries from hitting rocks hidden beneath the surface.

The reservoir's elevation can go down 6 inches in a day as water is pulled from the reservoir for irrigation. People may not realize that a location where they dived before might be 3 to 4 feet shallower a week later, Caughlan said.

Options for crowd management



Satanka Bay at Horsetooth Reservoir is crowded with boats and paddleboards in mid-June 2020. (Photo: Mark Caughlan)

With so many people vying to get on the water at Horsetooth Reservoir, officials are looking into options for managing crowds. That could include hiring additional rangers.

Potential remedies include setting up a reservation system for boat launching for entering the park.

"Imagine what it's going to be like 10 years from now," Caughlan said. "We're going to have to start implementing some of the entry processes other agencies are trying."

Caughlan said Horsetooth hit its capacity about 10 years ago. There is little room for expansion.

Officials plan to "harden" the park's infrastructure, such as paving roads and parking facilities, to keep up with the impact of having so many visitors.

At the same time, they want to preserve the area's natural resources to provide good visitor experiences.

Opinion: [Ease up on Estes Park tourists \(/story/news/2020/06/27/opinion-estes-park-rejects-message-targeting-out-state-tourists/3260113001/\)](/story/news/2020/06/27/opinion-estes-park-rejects-message-targeting-out-state-tourists/3260113001/)

The demand for recreational facilities has been growing for several years, Grey told the commissioners. The surge this spring and summer continues that trend.

"I think this is kind of a wake-up call," Grey said. "Our population is not shrinking, and if we don't have places to send people, we're going to be seeing these problems moving forward in the next several years."

Kevin Duggan is a senior columnist and reporter. Contact him at kevinduggan@coloradoan.com (mailto:kevinduggan@coloradoan.com). Support his work and that of other Coloradoan journalists by purchasing a digital subscription today (https://offers.coloradoan.com/specialoffer?gps-source=CPNEWS&utm_medium=onsite&utm_source=news&utm_campaign=NEWSROOM&utm_content=KEVINDUGGAN).

Read or Share this story: <https://www.coloradoan.com/story/news/2020/07/03/colorado-fort-collins-horsetooth-reservoir-rise-visitation-boaters-camping/3254523001/>

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**Rob Helmick <helmicrp@co.larimer.co.us>**

NISP

1 message

David Marvin <dmarvin55@gmail.com>

To: Helmicrp@larimer.org

Tue, Jul 14, 2020 at 11:10 AM

Mr. Helmic,

The NISP pipeline may be routed through Cooperslew Open Space, immediately adjacent to Boxelder Estates in Larimer County. I have attached a letter that addresses our concerns. I have also sent an email with the letter to the Planning Commission Board.

Let me know if you have any questions.

--

Dave Marvin

 **letter to planning commission on NISP.pdf**
45K

To: Larimer County Planning Commission and Larimer County Commissioners
From: Cooperslew Open Space Association
Regarding: NISP Pipeline
Date: July 14, 2020

Dear Planning Commission Board and Commissioners,

Cooperslew Open Space Association is a Colorado non-profit entity that was formed for the purpose of acquiring and maintaining as Open Space a narrow five-acre strip of land immediately adjacent to the east side of Boxelder Estates, Larimer County, Colorado. The Association recently received notice that a portion of the pipeline for NISP could be placed within Cooperslew Open Space along its entire length from north to south.

The construction of the pipeline within Cooperslew Open Space is of particular concern, as follows:

1. When you consider the surface disturbance that will result from installing a 54-inch pipeline, most of Cooperslew Open Space will be impacted. Consequently, the enjoyable use of Cooperslew by its current members (pedestrian use and riding horses) will cease, both during construction and potentially for a long time after reclamation.
2. Reestablishing grasses on areas disturbed by construction will be a slow process, particularly since Cooperslew Open Space is not irrigated. This will further hinder/delay use of the area by members and may also impose an extraordinary expense on Cooperslew Open Space Association to control weeds until revegetation is successful, and to amend and reseed areas where it is not.
3. Drainage tiles underlay the entire Boxelder Estates subdivision, and from what we know, Cooperslew Open Space. Pipeline construction has the potential to damage a portion of these tiles and thereby negatively affect drainage and potentially the groundwater irrigation wells in the area.
4. Construction noise and dust will impact Boxelder Estates, especially the Boxelder properties immediately adjacent to Cooperslew Open Space.
5. Until revegetation efforts are successful, the aesthetics of Cooperslew Open Space will change dramatically because the current healthy grassland will be substantially disturbed by construction activity. This will be of major consequence to Boxelder homeowners immediately adjacent to the Open Space and could negatively affect property values.
6. The roads within Boxelder Estates are private and maintained by the Boxelder Estates Homeowners Association. If NISP plans to use these roads for access to the pipeline ROW during construction, the impact to traffic flow and road surfaces in the subdivision would be substantial and unacceptable.

Thank you for considering our concerns.

Respectfully,

David W. Marvin
President, Cooperslew Open Space Association

Documents Outlining Project Mitigation

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

**APPENDIX A – FISH AND WILDLIFE MITIGATION
AND ENHANCEMENT PLAN SUMMARY TABLES**

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Resources Involved	
				Mitigation	Cost Capitalized Cost ³
Aquatic Life and Stream Morphology					
AG-01	Stream Channel and Habitat Improvement Plan	Fund stream channel and habitat improvement plan	Compensation for accelerated degradation of channel geomorphology, increased flooding risk downstream of I-25, reduced Poudre River flows, reduced aquatic habitat, reduced water availability for riparian vegetation, reduced habitat for riverine special status species, increased water temperature and DO concentrations; Enhanced and accelerated channel restoration, aquatic habitat, riparian vegetation, riverine special status species, temperature and DO concentrations	\$1,000,000 ^a	
AG-02	Stream Channel and Habitat Improvements	Construct stream channel improvements (2.4 miles)		\$1,800,000 ^b	
AG-03	Poudre River Adaptive Management Program	Implement and fund Poudre River Adaptive Management Program in coordination with other Poudre River stakeholders	Enhanced and accelerated channel restoration, aquatic habitat, riparian vegetation, riverine special status species, temperature and DO concentrations	\$5,930,000 ^a	
AG-04	Poudre Valley Canal Diversion Structure Reconstruction	Reconstruct Poudre Valley Canal with improvements in sediment diversion, fish passage, and boating safety	Minimization of reduced sediment transport capabilities; enhance Poudre River connectivity for aquatic migration, enhance boater safety	\$300,000 ^b	
Wetlands					
Water Quality					
Terrestrial Wildlife					
Stream Morphology					
Special Status Species					
Riparian Vegetation/Wetlands					
Recreation					
Aquatic Life					
Enhancement¹					
Compensation					
Minimization					
Avoidance					
Other					

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Resources Involved		Mitigation	Cost Note ⁴	Capitalized Cost ³
				Recreation	Other			
AG-05	Multi-Objective Diversion Structure Retrofits	Construct multi-objective diversion structure retrofits that include fish passage, low flow conveyance and flow monitoring capabilities (4 sites)	Enhance Poudre River connectivity for aquatic migration, monitor and administer flow releases					\$1,200,000 b
AG-06	Glade Reservoir Fishery	Establish and maintain recreational cool water fishery at Glade Reservoir	Enhance regional recreational opportunities				x	\$4,070,000 a
AG-07	SPWCP Diversion Construction	Construct SPWCP diversion to avoid fish entrainment and allow fish passage	Avoidance and minimization of entrainment of fish in SPWCP diversion structure and decreased fish migration past diversion				x	\$300,000 b
AG-08	Galetton Reservoir Native Fish Rearing	Make Galetton Reservoir available to CPW for raising native warmwater fish for reintroduction	Compensation for reduced habitat availability and quality for native warmwater fish				x	\$100,000 a
AG-09	Galetton Reservoir Fish Screening	N/A ⁶						
Streamflow Commitments								
FW-01	Avoid Monroe Canal Diversions	Avoid NISP-related diversions through Monroe Canal	Avoidance of reduced Poudre River flows, reduced aquatic habitat, reduced river-based boating days, increased water quality concentrations				x	

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NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Resources Involved	
				Mitigation	Avoidance Minimization Compensation Enhancement ¹ Recreation Aquatic Life Riparian Veg/Wetlands Special Status Species Stream Morphology Terrestrial Wildlife Water Quality Wetlands Other
FW-02	Curtail Diversions for Non-Consumptive Water Rights	Curtail NISP diversions for existing Poudre River non-consumptive water rights (5-50 cfs), including those for Bellvue Fish Hatchery at Watson Lake	Avoidance and minimization of reduced Poudre River flows below Poudre Valley Canal diversion, reduced aquatic habitat, reduced water availability for riparian vegetation, reduced habitat for riverine special status species, increased water quality concentrations and DO, reduced river recreational value, nonuse value impacts; enhancement of low flows in conveyance refinement reach	⁵ c	
FW-03	Summer and Winter Diversion Curtailments	Curtail diversions when flow is less than 50 cfs during the summer, and 25 cfs during the winter		x	x
FW-04	Conveyance Refinement - Poudre River Intake	Convey 18 cfs (winter) to 25 cfs (summer) of deliveries to NISP participants by releasing from Glade Reservoir to the Poudre River, and rediverting at Timnath Inlet; prior to full buildup, convey a minimum of 35% of NISP deliveries through Poudre River Intake	\$24,520,000 ^b	x	x
FW-05	Poudre River Flow Augmentation Program	Assist with securing Flow Augmentation Protection for the Poudre River	⁵ c	x	x

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Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Resources Involved	
				Mitigation	Avoidance
FW-06	Glade Reservoir Enlargement for Water Quality Purposes	N/A ⁶			
FW-07	Ramp Hansen Supply Canal Releases	Work with CPW and water commissioner to ramp Hansen Supply Canal releases	Enhancement of aquatic habitat		
FW-08	Peak Flow Operations Program	Curtail SPWCP exchanges for peak 3 days each year. Bypass Grey Mountain water rights based on Tier (see text for details): <ul style="list-style-type: none">• Tier 1 (>76% full and likely to fill) - bypass during peak 3 days each year• Tier 2 (>76% full, not likely to fill; >50% full) - bypass during peak 2 days to meet 2,800 cfs for Tier 2a; bypass up to 1,200 ac-ft for Tier 2b• Tier 3 (<50% full) - no bypass, except bypass for peak 1 day if 2,800 cfs flow trigger has not been met in previous 3 years (see text for detailed tier classifications and actions)	Avoidance and minimization of reduced sediment transport capability, reduced aquatic habitat		
FW-09	Ramp NISP Diversions at PVC	Limit changes in NISP diversions at the PVC headgate to no more than 500 cfs in 24 hours.	Avoidance and minimization of impacts on aquatic species.		

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Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Mitigation		Resources Involved	
				Capitalized Cost ³	Cost Note ⁴	Mitigation	Cost
Noxious Weeds							
NW-01	Noxious and Invasive Weed Control Plan	Develop and implement noxious weed control plan during construction	Avoidance and minimization of potential spread of noxious weeds during construction activities.				
Recreation							
RC-01	Glade Reservoir Recreation	Allow public access to Glade Reservoir fishery; investigate opportunities for recreation management and develop management plan that may include motorized boating, fishing and camping	Enhanced regional recreational opportunities	\$200,000 ^a			
RC-02	Glade Reservoir and State Land Hunting Access	Provide replacement access to State Trust Lands near Glade Reservoir and allow hunting access adjacent to Glade Reservoir	Compensation for inundation of existing access to State Trust Lands west of Glade Reservoir, reduced hunter access and game harvest near Glade Reservoir	5 ^c			
RC-03	Glade Reservoir Recreation and Wildlife Adaptive Management Plan	Provide habitat for affected wildlife species while allowing the public to have reasonable access for recreation throughout the area	Enhanced regional recreational opportunities	5 ^c			
RC-04	Mitanî-Tokuyasu State Wildlife Area	Replace facilities at Mitanî-Tokuyasu State Wildlife Area	Compensation for loss of land and impact on facilities at Mitanî-Tokuyasu State Wildlife Area due to construction of SPWCP infrastructure, wildlife impacts at Galeton Reservoir	\$50,000 ^b			
RC-05	Land Acquisition in Confluence Area	Provide partial funding for land acquisition in Poudre - South Platte confluence area		\$500,000 ^a			

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Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Mitigation		Resources Involved	
				Capitalized Cost ³	Cost Note ⁴	Other Wetlands	Water Quality
RC-06	Glade Reservoir Poudre River Recreator Parking	Construct parking lot at Glade Reservoir complex for use by Poudre River recreators	Compensation for drive-by traffic at Ted's Place; enhanced regional recreational opportunities	\$40,000	b		x
RC-07	Glade Reservoir Visitor's Center	Construct Visitor's Center at Glade Reservoir	Compensation for loss of prime farmland, geologic construction disturbance, other general minor environmental effects	\$940,000	a	x	x
Riparian Vegetation							
RV-01	Riparian Vegetation - Cottonwood Regeneration Areas	Develop cottonwood regeneration areas in 3 specific reaches (58 acres) and adjacent to channel and habitat improvement reaches (2.4 miles)	Compensation for accelerated decline of plains cottonwood, increased water temperatures	\$130,000	b	x	x
RV-02	Riparian Vegetation - Channel Improvements	Reconnect channel to floodplain in channel and habitat improvement reaches, re-establish connection with backwater sloughs in Windsor area	Compensation for adverse effects on plant communities sensitive to alluvial groundwater levels	\$280,000	b	x	x
Special Status Species							
SS-01	Prebble's S	N/A ⁷	Conduct surveys for bald eagles and nests; meet CPW buffer requirements; take actions according to Bald Eagle and Golden Eagle Protection Act and Migratory Bird Treaty Act (MTBA)	Avoidance and minimization of, and compensation for, potential effects to bald eagle	⁵ c	x	x
SS-02	Bald Eagle					x	x
SS-03	Colorado Butterfly Plant		Conduct surveys of Colorado butterfly plant for 2 years prior to construction, implement conservation measures if needed	Avoidance of and compensation for potential effects to Colorado butterfly plant	⁵ c	x	x

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Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Resources Involved	
				Mitigation	Avoidance
SS-04	Ute Ladies'-Tresses Orchid	Conduct surveys for Ute ladies'-tresses orchid for 2 years prior to construction, implement conservation measures if needed	Avoidance of and compensation for potential effects to Ute ladies'-tresses orchid	⁵ c	x
SS-05	Platte River Target Species	Offset depletions through membership in SPWRAP	Compensation for effects to Platte River target species	\$1,550,000 ^b	x
SS-06	Black-Footed Ferret	Reevaluate and resurvey prairie dog colonies potentially impacted during construction	Avoidance and minimization of, and compensation for, potential impacts to black-footed ferret	⁵ c	x
SS-07	Black-Tailed Prairie Dog	Relocate black-tailed prairie dogs prior to construction, follow CDOT guidelines	Avoidance and minimization of potential impacts to black-tailed prairie dog	⁵ c	x
SS-08	Swift Fox	Survey for swift fox den sites, coordinate conservation measures with CPW	Avoidance and minimization of, and compensation for, potential impacts to swift fox	⁵ c	x
SS-09	Burrowing Owl	Resurvey prairie dog colonies for proposed disturbances, coordinate with CPW for any burrowing owls found	Avoidance and minimization of, and compensation for, potential impacts to burrowing owl	⁵ c	x
SS-10	Other Riparian Species	Implement proposed mitigation for wetlands and riparian habitat to benefit these species.	Compensation for potential impacts to common gartersnake, northern leopard frog, smoky-eyed brown butterfly, two-spotted skipper, American currant	⁵ c	x
SS-11	Bell's Twinpod	Conduct surveys in potential habitat prior to construction, reestablish populations where impacts are unavoidable	Avoidance and minimization of, and compensation for, potential impacts to Bell's twinpod	⁵ c	x
SS-12	Townsend's Big-Eared Bat	Protect entrance to existing cave	Avoidance of potential impacts to Townsend's Big-Eared Bat	⁵ c	x

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Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Mitigation		Resources Involved												
				Capitalized Cost ³	Cost Note ⁴	Other	Wetlands	Water Quality	Terrrestrial Wildlife	Stream Morphology	Special Status Species	Riparian Veg/Wetlands	Recreation	Aquatic Life	Enhancement ¹	Compensation	Minimization	Avoidance
Terrestrial and Avian Wildlife																		
TW-01	U.S. 287 - Big Game Underpass and Fencing	Construct one big-game underpass, and identify other crossings that could potentially be designed to accommodate wildlife movement	Compensation for potential impacts to big game migration in the area inundated by Glade Reservoir and affected by U.S. 287 realignment; enhanced opportunities for big-game migration across U.S. 287 corridor, enhanced habitat protection west of Glade Reservoir	\$500,000	b													
TW-02	U.S. 287 - Big Game Movement Adaptive Management Plan	Monitor road kills for 10 years and implement adaptive management actions as needed		\$280,000	a													
TW-03	Migrating Birds and Raptors - Surveys and No Work Zones	Survey and mark active nests to establish no-work zones during breeding seasons in accordance with MBTA	Avoidance and minimization of, and compensation for, potential effects on migrating birds, raptors, amphibians, reptiles and other wildlife															
TW-04	Migrating Birds and Raptors - Vegetation Clearing	Conduct vegetation clearing during nonbreeding season, when possible in accordance with MBTA																
TW-05	Migrating Birds and Raptors - Buffer Zones	Follow CPW recommended buffer zones and seasonal restrictions within certain distances of nest sites for raptors in accordance with MBTA. Follow MBTA regulations and permits for incidental or unavoidable takes																

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Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Resources Involved		Mitigation	Cost Note ⁴
				Capitalized Cost ³	Other		
TW-06	Wildlife Habitat - Glade Reservoir Conservation Mitigation	Conserve approximately 1,080 acres of land owned or required for purchase surrounding Glade Reservoir as wildlife habitat using a conservation easement or other legal instrument; see TW-07 for additional commitments	Compensation for loss of winter range big-game habitat at Glade Reservoir	\$2,920,000 b			
TW-07	Wildlife Habitat - Glade Reservoir Conservation Enhancement	Acquire and conserve approximately 300 acres of additional land surrounding Glade Reservoir as wildlife habitat using a conservation easement or other legal instrument; engage in conserving additional land west of Glade for big-game habitat, allow use of Glade conserved land for GOCCO match, and consent to GOCCO requirements	Enhancement of regional big-game habitat at Glade Reservoir	\$810,000 a			
Water Quality							
WQ-01	Glade Reservoir - Multi-Level Outlet Tower	Construct multi-level outlet tower at Glade Reservoir to convey Poudre River releases	Avoidance and minimization of potential increases in temperature, DO, copper, manganese, nutrients and selenium, and other conservative constituents especially during times of reduced flows; enhancement of temperature and DO (through introduction of cooler water) in Poudre River	\$1,000,000 b		x	
WQ-02	Glade Reservoir - Release Structure Aeration	Construct Glade Reservoir release structures with baffling to provide aeration		\$200,000 b	x	x	

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Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Resources Involved	
				Mitigation	Cost Note ⁴
WQ-03	Eaton Draw Water Quality Wetlands	Construct approximately 10 acres of wetlands in Eaton Draw to reduce ambient water quality concentrations in Lower Poudre River	Compensation for potential increased WQ concentrations in Poudre River near Greeley, increased sedimentation in lower Poudre, direct impacts to 0.3 acres of wetlands at Galton Reservoir; enhancement of WQ concentrations in Poudre River near Greeley	\$1,340,000 b	
WQ-04	Streamflow and Water Quality Monitoring	Establish/enhance streamflow and water quality monitoring network	Compensation for general water quality effects, monitoring required to implement provisions of this mitigation plan	\$2,310,000 b	
WQ-05	Coalition for the Poudre River Watershed	Provide funding and participate in Coalition for the Poudre River Watershed	Enhancement of general water quality, aquatics, vegetation, noxious weeds, recreation, riparian resources	\$750,000 b	
WQ-06	Stream Temperature Mitigation	Reduce or curtail NISP diversions if and as necessary to prevent new or exacerbated temperature standard exceedances	Avoidance and minimization of potential increases in stream temperature, DO	⁵ C	x
WQ-07	Mercury Bioaccumulation Mitigation	Support monitoring and management by CPW, provide Fish Consumption Advisory Signage as needed	Mitigation for potential bioaccumulation of mercury in fish tissue in Glade Reservoir and Glade Reservoir forebay	\$220,000 a	x
				Total	\$53,240,000

Notes:

¹ Green shaded rows indicate that the measure is entirely an enhancement measure. Green shading in Enhancement column only indicates the mitigation measure has an enhancement component.

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Table A1. Mitigation and Enhancement Plan Summary Table - By Mitigation Action Item

Measure No.	Mitigation and/or Enhancement Measure ¹	Mitigation and/or Enhancement Commitment ²	Resource Considerations (see Table A.2 for complete list of mitigated effects; see text for description of enhanced resources)	Mitigation		Resources Involved	
				Avoidance	Minimization	Capitalized Cost ³	Cost Note ⁴

² The description of mitigation commitments is at a summary level - see text for details of the commitment. The text shall take precedent over any discrepancies between this table and the text.

³ Capitalized cost is the sum of the capital cost plus any annual operations and maintenance costs capitalized over the life of the commitment, or 50 years for those commitments that are perpetual.

⁴ Cost notes:

a = cost is a firm not-to-exceed monetary commitment in this amount, see text for details.

b = approximate implementation or construction cost of this commitment

c = implementation cost has not been quantified.

⁵ Implementation cost has not been quantified.

⁶ AC-09 and FW-06 were not carried forward to final mitigation plans - see text for explanation.

⁷ Because Preble's Meadow Jumping Mouse habitat mitigation is covered under federal statute with specific jurisdictional requirements, these mitigation activities are not further covered under this State FWMEP.

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²	Mitigation Measure No.
1	Surface Water	<p>Poudre River</p> <ul style="list-style-type: none"> - Average diversion of 35,100 AFY at Poudre Valley Canal (Poudre Valley Canal) to Glade Reservoir. - Flows in 1.48 mile river reach between Poudre Valley Canal and Hansen Supply Canal would be greater (average 8,200 AFY) than No Reclamation Action Option. - Due to exchanges with CB-T, average reduction of 7,700 AFY in releases to Poudre River at Hansen Supply Canal. - Flows in Poudre River downstream of Hansen Supply Canal essentially same for Reclamation Action and No Reclamation Action Options due to releases from Glade Reservoir for Reclamation Action Option. - Diversions would primarily reduce peak flows during May and June in years with average to above average flows. - Reduced flows between Poudre Valley Canal and Larimer-Weld and New Cache headgates due to direct flow and storage exchanges during April–October (irrigation season). - Flow augmentation program would release water from Glade Reservoir to maintain flow of 10 cfs at downstream side of Larimer-Weld Canal headgate from November 1 through April 30 and September 1 through September 30. <p>South Platte River</p> <ul style="list-style-type: none"> - Average diversion of 28,400 AFY just downstream of confluence of Poudre and South Platte Rivers. - Diversions would be limited to a maximum of 200 cfs and could occur in all months when water rights are in priority. - Change in flow would be less than 10% of average monthly flows at Kersey Gage. <p>Horseshoe Reservoir</p> <p>Variations in water levels would be similar to existing conditions.</p> <p>Carter Lake</p> <p>Variations in water levels would be similar to existing conditions.</p>	FW-01; FW-02; FW-03; FW-04; FW-05; FW-08
	Surface Water Quality		
2	Poudre and South Platte River Constituents	Ammonia and total phosphorus increases may be measurable below WWTPs due to reduced river flows, may exceed standard at some locations in Segment 12 of Poudre River and 1b on South Platte River (standards are exceeded under Current Conditions for these nutrients).	WQ-03; WQ-04
3	Metals	Increases and decreases in metal concentrations due to flow changes may not be measurable. Medium chance of copper and dissolved manganese standard exceedance in Segment 10 of Poudre River. Medium chance of exceeding total phosphorus standard and a high potential for continued exceedance of selenium standard in Segment 11 of Poudre River. Iron, ammonia, total phosphorus, and selenium concentrations currently exceed standards in Segment 12 of Poudre River and likely to remain above standards. Iron, total phosphorus, and sulfate concentrations remain above standard in Segment 1b of South Platte River. Ammonia and dissolved manganese have a medium chance of exceeding standard in Segment 1b of South Platte River.	FW-03; WQ-01; WQ-04; WQ-07

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Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects	Mitigation Measure No.
4	Temperature	Adverse effects on stream temperature possible in sensitive reaches of Segment 10 and Segment 11 including key months of July and August. Flow augmentation program would provide net benefit in parts of Segments 10 and 11 (from 0.37 miles upstream of Larimer County Canal to Timnath Inlet headgate) in key months of March and September.	AG-01; AG-02; FW-04; WQ-01; WQ-02; WQ-04; WQ-06
5	Dissolved Oxygen	Diversions at Poudre Valley Canal could exacerbate occasionally observed DO issues in July and August in Segment 11. Flow augmentation would likely provide DO benefit November through April and in September. Aeration of releases from Glade Reservoir should also help maintain DO concentrations within standards.	WQ-02; WQ-04
<i>Larimer-Weld and New Cache Canal</i>			
6	Crop Yield	Elevated salinity and selenium concentrations in Galeton Reservoir releases to canals would result in decrease in crop yields where water used for irrigation.	SE-01; SE-02
Channel Morphology and Sediment Transport			
7	Change in flow regime	<p>Mean flow reduced 20-30% mid-April to mid-July. Duration of flows at or above 1,000 cfs reduced 30-35%. 2% flow reduced 10-30%. 10-year flood peak reduced up to 21%.</p> <p><i>Laporte Reach:</i> 1, 2, and 5% exceedance flows reduced 11-26%. Lower flows (10 and 25% flows) reduced 16-28%.</p> <p><i>Fort Collins Reach:</i> Winter low flows increased up to 35% from flow augmentation. 1, 2, and 5% flows reduced 13-47%. Lower flows (10 and 25% flows) reduced 12-41%. 2-year flood reduced 19-36% in Fort Collins and upper Timnath reaches. 25-year flood reduced up to 10% in Fort Collins.</p> <p><i>Timnath, Windsor, Greeley Upstream, Greeley Channelized, and Greeley Reaches:</i> Impact greatest on 5% exceedance flows, reduced 25-42%. Impact on floods up to 25-year flood reasonably uniform, with 2, 10, and 25-year flood peaks all reduced 16-21%.</p>	AG-01; AG-02; FW-08

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²	Mitigation Measure No.
8	<i>Fining of surficial material</i>	<p>At 55% of cross sections duration of flows that flush river bed fines reduced 5-50%. For remaining 45% of cross sections no flushing or no change in duration of flushing flows.</p> <p><i>Laporte Reach:</i> 15 flushing events under Current Conditions lasting 132 days total reduced to 10 flushing events lasting 94 days total (26-year period of record)</p> <p><i>Fort Collins Reach:</i> 23 flushing events under Current Conditions lasting 325 days total reduced to 16 flushing events lasting 222 days total (26-year period of record)</p> <p><i>Timnath, Windsor, Greeley Upstream, Greeley Channelized, and Greeley Reaches:</i> 18 flushing events under Current Conditions lasting 292 days total for Windsor reach reduced to 19 flushing events lasting 218 days total (26-year period of record)</p>	AG-01; AG-02; AG-04; FW-08
9	<i>Loss of morphologic complexity</i>	<p>Duration of bed material movement reduced on average 21% and up to 40% in some locations. Temporal variability of habitats reduced throughout. Spatial variability reduced downstream of I-25.</p> <p><i>Laporte Reach:</i> Channel has barely responded to historical changes in flow regime over last two centuries. Any change predicted to be similarly constrained by lack of sediment supply.</p> <p><i>Fort Collins Reach:</i> Effective discharge of 2,000 cfs remains unchanged from Current Conditions hydrology. Channel capacity similar unless quantity or size distribution of available sediment changes. Current channel still undergoing slow adjustment in response to historical changes in flow regime. Any change would be incremental to that existing response.</p> <p><i>Timnath, Windsor, Greeley Upstream, Greeley Channelized, and Greeley Reaches:</i> Complexity of in-channel morphologic features already low in reaches downstream of I-25 from sand deposition smothering bed and reducing magnitude and frequency of pool and riffle sequences. Further channel contraction would exacerbate this condition.</p>	AG-01; AG-02; FW-08

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Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects	Mitigation Measure No.
10	Channel contraction	<p>Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option)²</p> <p>Sediment transport potential reduced throughout river. Capability of river to move bed material reduced 12-31% (upstream of I-25) and 8-18% (downstream of I-25). Propensity toward channel contraction throughout system but mainly downstream of I-25 where material of relevant size fraction available for deposition and bio-geomorphic feedback loops would prevail. Likely acceleration of channel contraction would lead to increased frequency of flooding downstream of I-25.</p> <p><i>Laporte Reach:</i> Channel capacity similar to Current Conditions unless quantity or size distribution of available sediment changes.</p> <p><i>Fort Collins Reach:</i> Channel capacity similar under Current Conditions unless quantity or size distribution of available sediment changes.</p> <p><i>Timnath Reach:</i> Channel contraction would occur as extension of processes already underway by deposition on bars, islands, riffles, and channel margins.</p>	AG-01; RV-02; FW-08
11	South Platte River	Minor effects to river morphology and sediment transport. Channel-forming flows (1.5-year peak flows of 3,858 cfs) would be reduced from ~ 3% to less than 1% of the time. Scouring flows equivalent to 25-year peak flows would continue to occur.	N/A
12	Ground Water	Minimal effects to ground water from reduced river flows and associated changes in river stage. Greatest changes would be within 50 feet of Poudre River. Minimal seepage from reservoir to alluvium could increase water availability to vegetation. No impacts on ground water quality.	
13	Geology	Disturbance from construction activities and excavation of sand, gravel, and bedrock for Glade Dam and Galleton Dam embankments, foundation, and rip rap. Excavation and removal of Paleozoic and Mesozoic sedimentary rocks associated with the U.S. 287 realignment. Excavation and removal of Paleozoic and Mesozoic sedimentary rocks associated with the U.S. 287 realignment.	GC-04; RC-07
14	Prime Farmland if irrigated (acres lost)	686	RC-07
15	Permanent impacts on all vegetation (acres)	3,895	N/A

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Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects		Mitigation Measure No.
		Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²	Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²	
16	<i>Permanent impacts on native plant communities (acres)</i>	2,857		N/A
17	<i>Irrigated agricultural lands dry up (acres)</i>	0		N/A
Noxious Weeds		Increased distribution and cover by noxious weeds due to construction disturbance. Periods of prolonged low water levels at Glade and Galeton Reservoirs would allow for noxious weeds to colonize the drawdown area to construction disturbance. Periods of prolonged low water levels at Glade and Galeton Reservoirs would allow for noxious weeds to colonize the drawdown area.		
		NW-01		
18	<i>Noxious Weeds</i>			
Wetlands and Other Waters				
19	<i>Wetlands (permanent direct effects) (acres)</i>	44		WL-01; WL-02; WQ-03
20	<i>Wetlands (temporary direct effects) (acres)</i>	8		GC-01
21	<i>Wetlands from irrigation dry-up (permanent indirect effects) (acres)</i>	0		N/A
22	<i>Wetlands from Pouare Valley Canal lining (permanent indirect effects) (acres)</i>	0		N/A
23	<i>River flow changes (indirect effects) (acres)</i>	9		RV-01; RV-02
24	<i>Waters (permanent direct effects) (acres)</i>	12		GC-01
25	<i>Waters (temporary direct effects) (acres)</i>	3		GC-01
Riparian Resources				
26	<i>Riparian shrubland and woodland (permanent direct effects) (acres)</i>	112 (inundation and construction)		AG-01; RV-01
27	<i>Riparian shrubland and woodland (temporary direct effects) (acres)</i>	8		AG-01; RV-01; GC-01

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FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects		Mitigation Measure No.					
		Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²							
Wildlife									
<i>Mule Deer</i>									
28	Overall Range (acres)	Permanent – 3,995		TW-01; TW-02; TW-06					
29		Temporary – 782							
30	Winter Range (acres)	Permanent – 3,789							
31		Temporary – 647							
32	Winter Range Permanent Local Effect (%)		16						
33	Severe Winter Range (acres)	Permanent – 228		RC-05					
34		Temporary – 173							
35	Winter Concentration Area (acres)	Permanent – 70							
36		Temporary – 152							
<i>White-Tailed Deer</i>									
37	Overall Range (acres)	Permanent – 2,057		RC-05					
38		Temporary – 582							
39	Winter Range (acres)	Permanent – 416							
40		Temporary – 192							
41	Winter Range Permanent Local Effect (%)		8						
42	Concentration Area (acres)	Permanent – 421		RC-05					
43		Temporary – 203							
<i>Pronghorn</i>									
44	Overall Range (acres)	Permanent – 2,256		RC-05					
45		Temporary – 335							
46	Winter Range (acres)	Permanent – 2,256							
47		Temporary – 295							
48	Winter Range Permanent Local Effect (%)		25						
49	Severe Winter Range (acres)	Permanent – 2,254		RC-05					
50		Temporary – 256							
51	Winter Concentration Area (acres)	Permanent – 1,928							
52		Temporary – 204							
53	Winter Concentration Area Permanent Local Effect (%)		31						

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row Elk	Resource	Summary of Effects		Mitigation Measure No.
		Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²		
54	Overall Range (acres)	Permanent – 2,043		TW-01; TW-02;
55		Temporary – 386		TW-06
56	Overall Range Permanent Local Effect (%)		18	
57				
58	Winter Range (acres)	Permanent – 186		
59		Temporary – 101		
60	Severe Winter Range (acres)	Permanent – 2		
61		Temporary – 8		
62	Winter Concentration Area (acres)	Permanent – 124		
63		Temporary – 75		
64	Winter Concentration Area Permanent Local Effect (%)		13	
65	<i>Migratory birds and raptors, amphibians and reptiles, and other wildlife (acres)</i>	<i>Loss of 44 acres of wetlands, 12 acres of aquatic habitat, 537 acres of shrublands, 29 acres of riparian woodlands, and 2,929 acres of grassland habitat.</i> <i>Mortality and nest destruction could occur during construction.</i> <i>Temporary impacts include disturbance of vegetation and increased noise and human presence.</i> <i>Reductions in streamflows on Poudre and South Platte Rivers not anticipated to cause loss of riparian and/or wetland habitat. 9 acres of wetland habitat along banks could experience change in species composition.</i>		TW-03; TW-04; TW-05
Aquatic Biological Resources				
<i>Poudre River Fish, Macroinvertebrates, Periphyton, and Plants</i>		<i>Fish:</i> Minor adverse impact to adult trout due to Reduced runoff flows, negligible impacts to other species/life stages <i>Macroinvertebrates:</i> Minor adverse impact with changes in species composition due to reduced peak flows <i>Periphyton and Plants:</i> Minor adverse impact with increases in filamentous green algae due to reduced peak flows		
66	Segment A			AG-01; AG-02; AG-04; FW-02; FW-03; FW-04; FW-08; FW-09

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²	Mitigation Measure No.
67	Segment B	<p>Fish: Minor to moderate beneficial impact to most species of fish with augmented low flows</p> <p>Macroinvertebrates: Beneficial impact to abundance, minor adverse impact with changes in species composition due to reduced peak flows</p> <p>Periphyton and Plants: Minor adverse impact with increases in filamentous green algae due to reduced peak flows</p> <p>Fish: Negligible impact to most species, moderate adverse impact to trout with reduced runoff flows and higher temperatures</p> <p>Macroinvertebrates: Minor adverse impact with changes in species composition due to reduced peak flows</p> <p>Periphyton and Plants: Minor adverse impact with increases in filamentous green algae due to reduced peak flows</p>	AG-01; FW-03; FW-04; FW-05; RV-01; RV-02; FW-08; FW-09
68	Segment C	<p>Fish: Minor adverse impact for some species with reductions in runoff flows, negligible impact for others</p> <p>Macroinvertebrates: Minor adverse impact with changes in species composition due to reduced peak flows</p> <p>Periphyton and Plants: Minor adverse impact with increases in filamentous green algae due to reduced peak flows</p>	AG-01; FW-03; RV-01; RV-02; FW-08; FW-09
69	Segment D	<p>Fish: Minor adverse impact for most species with reduced runoff flows</p> <p>Macroinvertebrates: Minor adverse impact with changes in species composition due to reduced peak flows</p> <p>Periphyton and Plants: Minor adverse impact with increases in filamentous green algae due to reduced peak flows</p>	AG-01; FW-03; FW-08; FW-09
70	Segment E	<p>Fish: Minor adverse impact for most species with reduced runoff flows</p> <p>Macroinvertebrates: Minor adverse impact with increases in filamentous green algae due to reduced peak flows</p> <p>Periphyton and Plants: Minor adverse impact with changes in species composition due to reduced peak flows</p>	AG-01; FW-03; FW-08; FW-09
71	Segment F	<p>Fish: Minor adverse impact for most species with reduced runoff flows</p> <p>Macroinvertebrates: Minor adverse impact with changes in species composition due to reduced peak flows</p> <p>Periphyton and Plants: Minor adverse impact with increases in filamentous green algae due to reduced peak flows</p>	AG-01; FW-03; FW-08; FW-09
72		<p><i>South Platte River Fish, Macroinvertebrates, Periphyton, and Plants</i></p> <p>Negligible</p>	AG-07

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects		Mitigation Measure No.
		Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²		
73	<i>Preble's meadow jumping mouse</i>	Permanent loss of 53 acres of known Preble's habitat. Temporary disturbance to 24 acres of Preble's habitat. Potential disturbance of Preble's behavior due to increased noise and human presence and physical harm to individual Preble's from construction machinery and future recreational activities at Glade. Changes in flows in Poudre River unlikely to affect Preble's habitat.		SS-01
74	<i>Bald eagle</i>	Permanent impacts of 21 acres and temporary impacts of 13 acres of winter concentration area. Less than 1 acre of nest buffer permanently affected and 8 acres temporarily affected. Pipeline construction impacts could result in nest abandonment or decreased nesting success if conducted during sensitive breeding and nesting periods. Glade Reservoir could provide additional summer foraging habitat, especially if stocked with fish. Galeton Reservoir could provide additional summer foraging habitat.		SS-02
75	<i>Colorado butterfly plant</i> (CBP)	No effect. No known populations occur in study area and is unlikely to occur in study area. Changes in flows in Poudre River unlikely to affect CBP.		SS-03
76	<i>Ute ladies'-tresses orchid</i> (ULTO)	No effect. None found during survey/s of study area. No known populations occur in study areas and is unlikely to occur in SPWCP pipeline study area. Glade to Horsetooth pipeline route less than 1 mile from currently known populations of ULTO. Prior to construction, ULTO habitat assessments and/or final surveys would be conducted for potentially impacted suitable habitat not previously evaluated. Changes in flows in Poudre River unlikely to affect ULTO.		SS-04
77	<i>Black-tailed prairie dog and burrowing owl</i>	Permanent impacts on 367 acres of prairie dog habitat, mostly from construction of Galeton Reservoir.		SS-07; SS-09
78	<i>Swift fox</i>	Permanent impacts on 1,928 acres of overall swift fox range (0.3 to 1.0 home ranges/pair).		SS-08
79	<i>Common gartersnake and northern leopard frog</i>	Permanent loss of 44 acres of wetland habitat, 11 acres of aquatic habitat, and 28 acres of riparian woodland habitat (gartersnake only). Temporary impacts on 8 acres of wetland habitat, 3 acres of aquatic habitat, and 8 acres of riparian woodland (gartersnake only).		SS-10
80	<i>Smokey-eyed brown butterfly, two-spotted skipper, and American currant</i>	No effect.		SS-10
81	<i>Bell's twinpod</i>	Permanent loss of 29 acres and temporary impacts on 45 acres from western realignment of U.S. 287.		SS-11
82	<i>Brassy minnow and common shiner</i>	No effect		N/A
83	<i>Iowa darter</i>	Negligible except Segment B, which would be moderate beneficial		FW-03; FW-04

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects		Mitigation Measure No.
		Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²		
84	<i>Boating (kayaking and canoeing)</i>	If Glade is managed for recreation, new flat water boating opportunities would exist, a major beneficial effect. No public access planned at Galeton Reservoir. Poudre River Segment A: Negligible effects. Poudre River Segment B: Moderate to major effects with 3 to 7 fewer boating days per month (total of 19 fewer days over May-August period) based on target flows of 150 cfs or greater. Poudre River Segments C, D, E, and F: No effects.		FW-02; FW-03; FW-04; RC-06; FW-08
85	<i>Fishing</i>	If Glade is managed for recreation, would provide a new fishery, a major beneficial effect. No public access planned at Galeton Reservoir. Poudre River Segment A: Reductions in habitat for brown and rainbow trout would be a minor adverse effect on fishing. Poudre River Segment B: Augmented winter flows would result in minor beneficial effects on recreational fishing. Poudre River Segments C, D, E, and F: Negligible effects.		AG-02; FW-02; FW-03; FW-04; RC-06; FW-08
86	<i>Hunting</i>	Loss of 340 acres of Poudre River State Trust Land, which is managed for hunting and fishing by CPW. Construction of Glade Reservoir may improve habitat, therefore improving hunting opportunities. Loss of 21 acres of Mitani-Tokuyasu SWA. Mule deer and white-tailed deer winter range may be affected at SPWCP forebay, thus affecting nearby big game hunting. Pronghorn winter and severe winter range and mule deer winter range affected at Galeton Reservoir and may have an effect on nearby big game hunting. Construction of Galeton Reservoir may improve waterfowl habitat in area, which may improve nearby hunting opportunities.		RC-02; RC-04; RC-05
87	<i>Other Recreational Activities</i>	Construction of Glade to Horsetooth pipeline would temporarily disrupt dispersed recreational uses along its alignment. Reductions in flows on Poudre River not expected to affect aesthetic qualities of riparian habitat of Poudre River, Poudre River Trail, or natural areas. Construction of Galeton Reservoir may improve habitat in area, which may improve nearby wildlife viewing or photography opportunities. Construction of SPWCP pipelines is not expected to affect recreation resources.		N/A

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²	Mitigation Measure No.
88	Cultural Resources	<p>2 known cultural resources and an estimated 35 NRHP eligible sites affected by construction or Grade Dam and Reservoir and associated facilities or would be inundated by reservoir.</p> <p>7 known cultural resources and 7 unrecorded cultural resources would be affected by western realignment of U.S. 287. Of the known cultural sites, 3 of these are eligible sites, 1 is not eligible, and 3 have not been assessed.</p> <p>15 known cultural resources occur within areas that would be disturbed by construction of Galeton Dam and Reservoir and associated facilities or would be inundated by reservoir. Of these 15 sites, 13 have not had an official determination and may be eligible for listing in NRHP and two are not eligible.</p>	CR-01; CR-02; CR-03
89	Paleontological Resources - U.S. 287	<p>Adverse impacts on subsurface fossils in areas underlain by Class 5 geologic units (Morrison Formation). Adverse impacts on potentially substantial vertebrate, invertebrate, plant, and trace fossils possible in Class 3 geologic units (Niobrara Formation, Benton Group, Dakota Group, Undivided Jelm, and Sundance Formations). Adverse impacts on potentially substantial vertebrate, invertebrate, plant, and trace fossils unlikely but possible in Class 2 geologic units (Lykins Formation). Adverse impacts consist of destruction of fossils by breakage and crushing during construction-related ground disturbance.</p>	CR-04; CR-05
90	Aesthetics and Visual Resources	<p>Change in landscape from terrestrial to open water for Glade and Galeton Reservoirs. Reservoir dams would change current visual character of sites.</p> <p>One-third of Mitani-Tokuyasu SWA would be replaced by Galeton forebay resulting in substantial reduction in scenic quality.</p> <p>Realignment of U.S. 287 would create contrast in scenic quality elements where it cuts through hogback formation.</p>	VS-01
91	Traffic and Transportation	<p>Existing traffic patterns not expected to change so reduced traffic volumes along SH 14 between Overland Trail and Ted's Place. If recreation provided at Glade Reservoir minor seasonal fluctuations in vehicle volumes can be anticipated. reduced traffic volumes along SH 14 between Overland Trail and Ted's Place.</p> <p>If recreation provided at Glade Reservoir minor seasonal fluctuations in vehicle volumes can be anticipated.</p>	GC-03
92	Existing Roadways	<p>7-mile portion of U.S. 287 relocated. New alignment 2.3 miles shorter. Location of Galeton Reservoir would not infringe on or disturb any existing roadways. 2.3 miles shorter. Location of Galeton Reservoir would not infringe on or disturb any existing roadways.</p>	GC-05

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²	Mitigation Measure No.
93	<i>Current Travel Patterns</i>	New U.S. 287 alignment would be about 2.3 miles shorter. Access to Bonner Spring Ranch Road may be affected by realignment and new access would be provided. Pipeline construction would potentially temporarily disrupt some transportation, depending upon alignment.	GC-01; GC-03
94	<i>Site Access</i>	Construction of Galeton Reservoir would require extension an existing roadway or construction of a private drive for purposes of accessing and maintaining facility.	GC-01
	Land Use		
95	<i>Agriculture</i>	Portion of Monroe Canal inundated by Glade Reservoir. Canal would be realigned with Poudre Valley Canal or routed under Glade Reservoir.	GC-01
96	<i>Grazing</i>	Grazing permittee would lose use of District lands at Glade Reservoir. 26 acres of BLM land used for grazing inundated by Glade Reservoir.	GC-01
97	<i>Access</i>	About 36 acres of grazing lease affected on State Land Board lands at Galeton Reservoir site. CSU and Poudre School District access road into State Trust Land inundated. Existing access to Bonner Springs Ranch residential area from south altered by U.S. 287 realignment. Construction of SPWCP forebay would inundate a portion of access road and parking area of Mitaní-Tokuyasu SWA.	RC-02; GC-03; RC-04
98	<i>Utilities</i>	Two towers on Platte River Power Authority 230-kV transmission line relocated. Realignment of four H-frame structures and 0.6 miles of a 69-kV electric transmission line owned by Poudre Valley REA. Proposed Cheyenne-Totem gas pipeline is shown to partially parallel SPWCP pipelines and cross proposed Galeton Reservoir forebay. Thirty-one producing oil and gas wells are within Galeton Reservoir footprint. District would relocate any well that would interfere with reservoir operations. District anticipates all wells would be abandoned by operator before Galeton Reservoir was built.	GC-01; HZ-02
99	<i>Natural Areas</i>	Reservoir Ridge Natural Area temporarily affected during construction of Glade to Horsetooth pipeline.	GC-01
100	<i>Urban/Residential</i>	2 residences inundated during construction of Glade Reservoir and 1 residence located within 500 feet of the reservoir. Construction of Glade to Horsetooth pipeline and other pipelines could potentially affect some urban and residential uses, depending upon final alignments.	LU-01; GC-01

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects	Mitigation Measure No.
101	Industry	Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ² No impact to industry.	N/A
Socioeconomic Resources			
<i>Study area</i>			
102	Water Rates/Affordability	Minor impact on rates and affordability for some Participants.	RC-07
103	Population growth	No effect.	N/A
<i>Poudre River Communities</i>			
104	Recreation Resources	Major impact on boating recreational value in Fort Collins. Moderate impact on recreational value of Poudre River Trail in Fort Collins. No effect on fishing recreation values.	FW-02; FW-03; FW-04
105	Property Values	No effect in Fort Collins. Potential minor effects downstream of I-25 due to changes in flood risks.	AG-01
106	Water/Wastewater Treatment Costs	No effect.	N/A
107	Other Socioeconomic Effects	Likely no additional effect on Fort Collins economy/economic development. Potential major impact on nonuse values associated with Poudre River for Fort Collins residents.	FW-03; FW-04
<i>Broader Study Area</i>			
108	Regional Recreation Resources	Major benefit from recreation at Glade Reservoir.	N/A
109	Irrigated Agriculture-Related Economy	No effect under average conditions. Minor effect under potential worst-case conditions due to increased salinity associated with the SPWCP ditch exchange.	SE-02
110	Road Relocation Effects	Moderate to major impact on gasoline station and campground at Ted's Place. No net effect on value of residential properties.	RC-06
111	Construction Effects	Construction stimulus paid for by regional residents over future years. No net effect.	N/A
112	Agricultural-related economy	Estimated annual impact on agricultural-related economic output in the study area of approximately \$34 million and an estimated reduction in agriculture-related employment of about 291 jobs associated with growth onto agricultural lands and their conversion to municipal uses.	N/A
Hazardous Sites			
113	Hazardous Sites	Proposed Glade Reservoir forebay located near Atlas "E" Missile Site 13 and known TCE plume associated with missile site. Currently no detectable TCE within footprint of proposed forebay. Soil containing TCE not expected within proposed footprint of forebay. As contaminant mass continues to naturally attenuate TCE plume will continue to decrease in size.	HZ-01

NORTHERN INTEGRATED SUPPLY PROJECT
FISH AND WILDLIFE MITIGATION AND ENHANCEMENT PLAN

Table A2. Mitigation and Enhancement Plan Summary Table - By SDEIS Resource Effect¹

Row	Resource	Summary of Effects		Mitigation Measure No.
		Alternative 2 (Proposed Action Glade and SPWCP – Reclamation Action Option) ²	Alternative 287 would occur in localized areas	
114	Noise	Increased noise associated with reservoir and pipeline construction and realignment of U.S. 287 would occur in localized areas temporarily.		GC-01
Air Quality				
115	Air Quality	Same as Alternative 1.		AQ-01; GC-01
Energy Use/Greenhouse Gases				
116	Energy Use/Greenhouse Gases	Electrical energy used to pump water up to reservoirs and for conveyance of water and for SPWCP exchange; includes additional pumping of water to Carter Lake. Projected annual electricity requirements at full utilization = 48,135,987 Kwh Projected annual carbon dioxide emissions at full utilization (English tons) = 37,259		EG-01
Construction Duration				
117	Construction Duration	6 years.		GC-01; GC-02; GC-03; GC-04
Other CPW Effects ³				
118	Townsend's big-eared bat	The inundation by Glade Reservoir of approximately seven miles of U.S. Highway 287, includes the 'loss' by flooding of the State Land Board parcel (T9N, R70W, S36) which contains a known roost site for the Townsend's big-eared bat (<i>Corynorhinus townsendii</i>), a State Species of Special Concern. CPW suggests that further ground surveys for additional roost sites should be conducted across the area to be inundated, and compensatory mitigation for loss of these sites should be considered if the project is approved.		SS-12

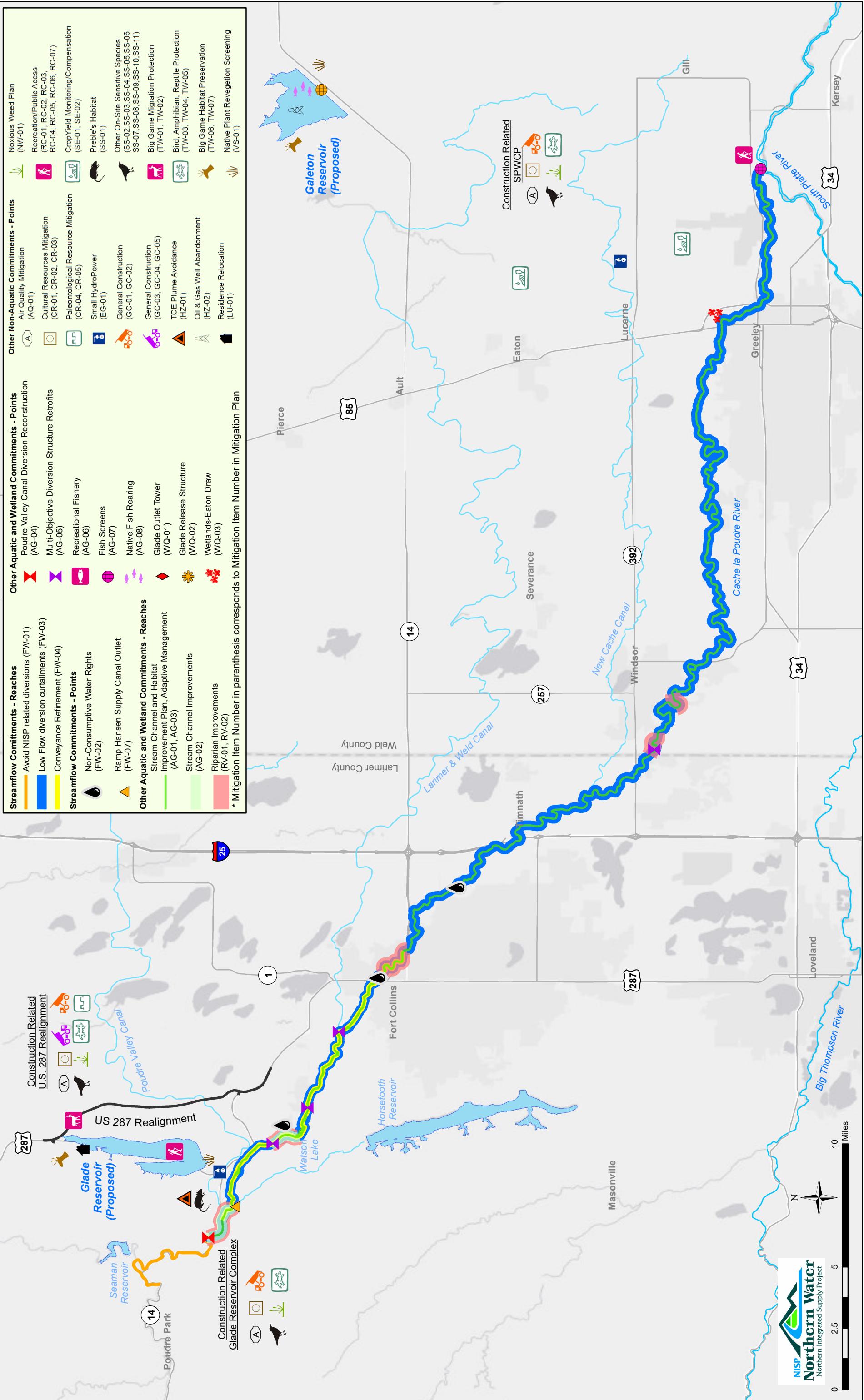
Notes:

¹ Source of table is SDEIS Table 4-109 for Alternative 2 (Northern Water's Preferred Alternative)

² Dark gray shading indicates those effects from SDEIS 4-109 that are not covered under this Fish and Wildlife Mitigation and Enhancement Plan (SDEIS Appendix F) for mitigation information on these items.

³ Effects were not included in the SDEIS, but were comments and/or proposed mitigation measures by CDNR.

NISP Mitigation Plan Summary Map



Handouts from NISPWAE

Northern Water and the NISP participants are also exploring various options to keep supplies in the ditch systems and available for these exchanges, to help ensure a **WaterSecure** future for Northern Colorado.

To avoid water permanently leaving farms in the New Cache and Larimer & Weld systems, **Northern Water and the NISP participants are exploring purchases of land and water from willing sellers** in the two systems, as well as looking at various other avenues to keep water on the farms. This will help ensure those supplies remain available for the NISP exchanges. Rather than "buy-and-dry," this is an **outside-the-box, "buy-and-supply" approach** to address tightening supplies.

Farms in the New Cache and Larimer & Weld systems purchased by Northern Water and the NISP participants will remain in production through:

- **Limited land-use easements on the property**
- **Lease-back agreements**
- **Other arrangements that will require continued irrigation on those farms operations to private ownership.**

Furthermore, the purchase of any irrigated lands will be done with the goal to eventually **return the operations to private ownership**.

We are also exploring agreements in which New Cache and Larimer & Weld shareholders could be compensated for giving Northern Water and the NISP participants first priority in buying their land and water assets if they are planning to sell them in the future.



Water quality questions addressed

Water quality and agronomy experts have examined the water quality issues, and with proper water blending, no impacts on crop yields would occur in nearly all anticipated operating conditions, and only minor impacts on specific crops in some instances. NISP participants would certainly factor any such impacts on crops into mitigation and compensation packages, and Northern Water will also continue monitoring water quality long into the future to address any potential issues.



We encourage anyone who wants to learn more to go to www.gladereservoir.org, or contact **Greg Dewey** at Northern Water at **970-622-2300** or **gdewey@northernwater.org**.

NISP: Striving to develop a **WaterSecure** future for Northern Colorado's communities and farms



Collaborating in a shift away from the 'buy-and-dry' approach that has stressed our agriculture communities As part of a long-term strategy that's consistent with the goals and principles established in the Colorado Water Plan, Northern Water and the NISP participants are working to implement various measures – including a collaborative effort with the New Cache and Larimer & Weld ditch systems – that will provide supplemental water to approximately 500,000 residents in Northern Colorado while also helping preserve tens of thousands of irrigated farm acres.

Without these innovative approaches, the region is on pace to see hundreds of thousands of irrigated acres dried up by mid-century.

NISP at a glance

Once constructed, the **Northern Integrated Supply Project** will consist of:

- **Glade Reservoir** northwest of Fort Collins, which will divert water from the Poudre River
 - **Galeton Reservoir** east of Ault, which will store water piped from the South Platte River
 - Pipelines, pump plants and other infrastructure needed for operations
- 40,000 acre-feet** of additional water will be made available annually for **15 rapidly growing communities and water districts** across northern Colorado

A key component of NISP will be **water substitutions and exchanges**, in which Northern Water and the NISP participants will work with the New Cache and Larimer & Weld ditch systems. NISP will provide new water supplies to the ditch systems in order to allow Glade Reservoir to store water, by exchange, for the communities in need of those supplies.

- In return, the NISP participants will provide **compensation for the two participating ditch systems, including:**
- Monetary payments
 - Additional water supplies from **Galeton Reservoir**
 - Ditch-system improvements

The NISP exchanges: A win-win for the farms

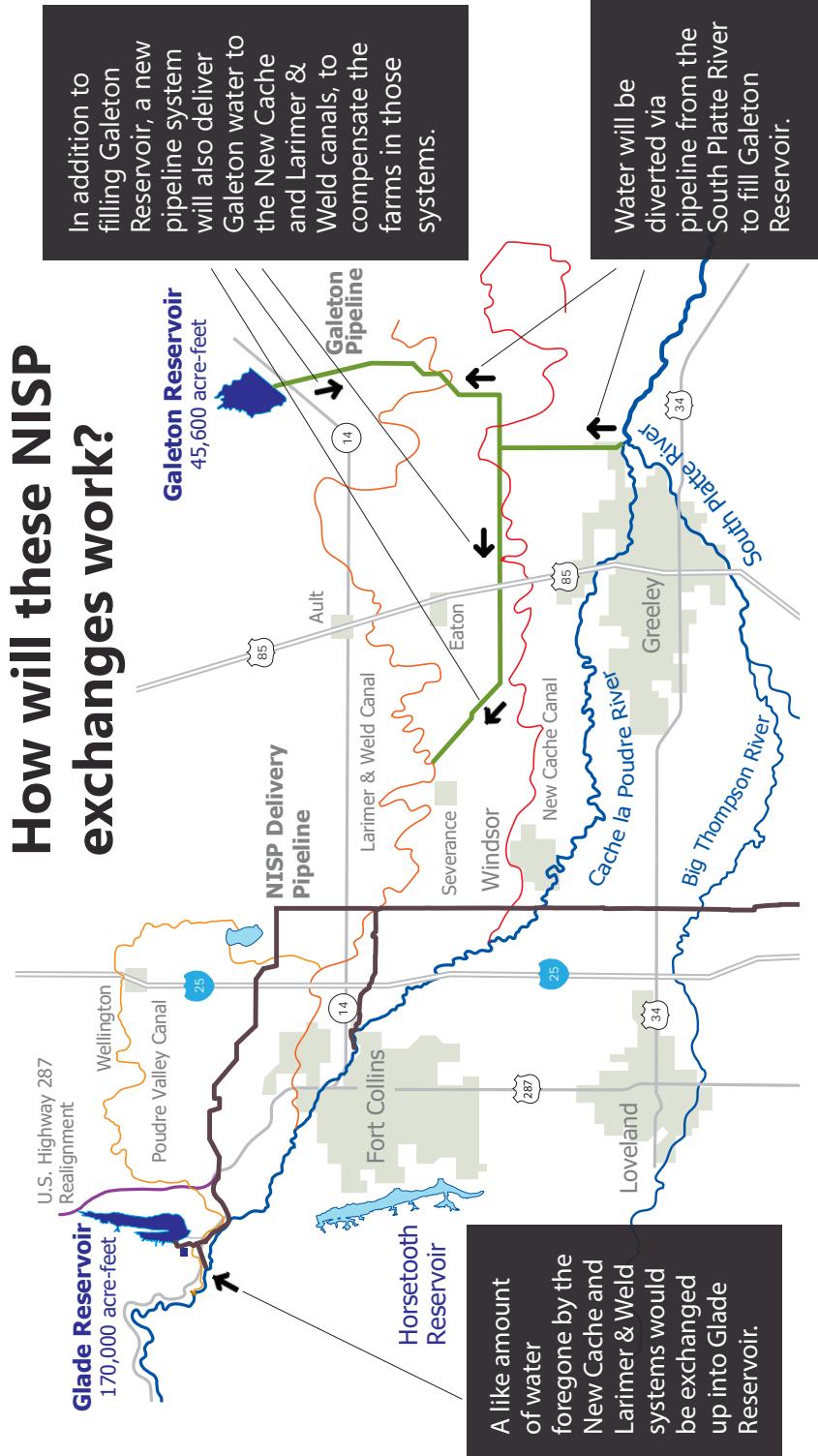
The NISP water exchanges are designed to be a win-win for the farms in the two ditch systems, in that:

• **Shareholders maintain control of their water, and water will continue flowing to the farms**

- Compensation from the NISP participants will **enhance the long-term viability of those ag operations**
- The ditch systems will receive additional water later in **the growing season**
- These exchanges will **not reduce the value of their water shares**
- These exchanges have been adjudicated and approved by the water court, and will **not subject the two systems' water rights to a change case**

Furthermore, **without NISP**, the communities participating in the project will most likely be left to purchase more water from existing farms and ranches – needing to **dry up over 64,000 acres** of irrigated farm ground to attain the amount of water that NISP would provide.

How will these NISP exchanges work?



About 25,000 acre-feet would be exchanged annually between the ditch companies and NISP participants.

This is NOT an alternative transfer method, or ATM, as they're often called. **Farms participating in the NISP exchanges will receive water each and every year.**

- With this arrangement, the New Cache and Larimer & Weld shareholders could **receive more water for irrigation than they currently receive**.
- NISP is expected to receive its Record of Decision from the Army Corps of Engineers in 2020, and following final design and construction, **the exchanges could be operational by about 2027.**

The approximately 90,000 irrigated acres under the New Cache and Larimer & Weld systems are estimated to provide **more than \$300 million in agricultural production annually**.

All of northern Colorado will benefit from keeping more irrigated acres in production.
Our agriculture industry employs thousands of local residents and feeds even more, while our farms and ranches also offer quality-of-life and environmental enhancements with open space and wildlife habitat
– all of which Northern Water and the NISP participants want to preserve for future generations.

NISP'S 401 Water Quality Certification

As part of NISP's approval process, the State of Colorado granted a 401 Water Quality Certification to the project in January 2020. The state concluded that no significant water quality degradation is expected because of NISP, and

"the commitments for mitigation and water quality improvement measures are sufficient to result in positive net effects."

The 401 Water Quality Certification was issued following the State's year-long review of an extensive NISP application, which considered public comments.

The certification outlines 30 conditions in which Northern Water and the NISP participants will implement a wide array of measures and processes to ensure, for years to come, that the project's operations won't negatively affect the Poudre River's health, and that any potential impacts can be mitigated.

The commitments outlined in the NISP 401 Certification include long-term **MONITORING, REPORTING and MODELING**, to help maintain and even enhance the health of the Poudre River.



The NISP participants are committed to contributing millions of dollars in **FUNDING** to implement these efforts, as well as others, so the Poudre River can continue serving as a reliable and safe water supply for years to come.

Learn more at
gladerereservoir.org

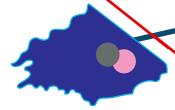


NISP's 401 Water Quality Monitoring Commitments

- Temperature monitoring sites (12)
- Arsenic and copper monitoring sites (5)
- E. coli monitoring sites (3)
- Aquatic life monitoring sites (4)
- Nutrient monitoring sites (4)
- Mercury fish tissue sampling sites (2)
- New reservoir routine monitoring sites (6)
(2 forebay sites, 2 reservoir sites and 2 river sites)

Some of these sites will remain in operation for decades.

Galeton Reservoir



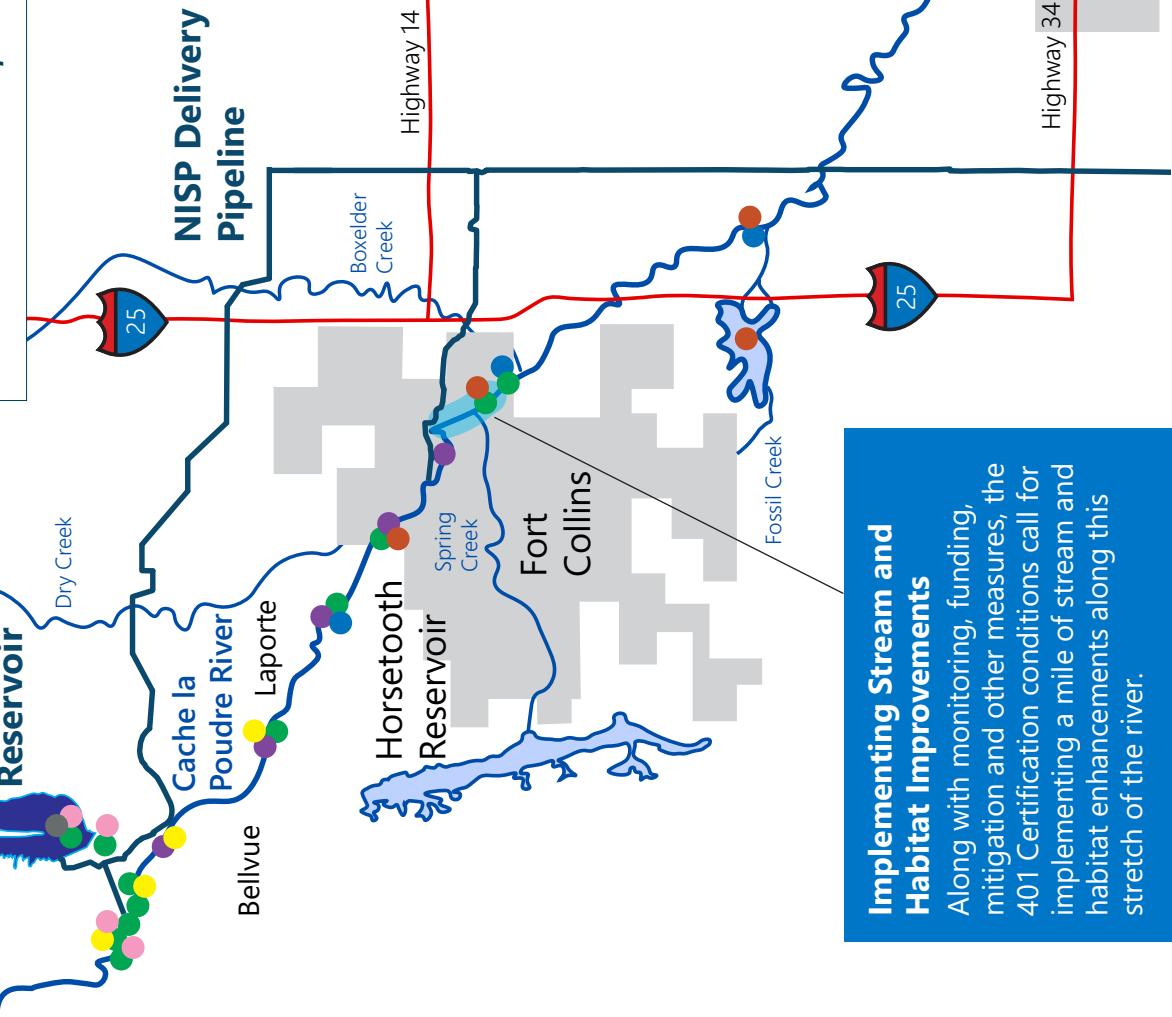
Galeton Pipeline

Funding for New Water Quality Enhancement Opportunities

As part of NISP's 401 Water Quality Certification commitments, the NISP participants will contribute \$1.5 million for E. coli reduction measures and studies, and \$925,000 for nutrient reduction measures and studies.

Building Upon Poudre River Health Commitments Already In Place

Many of these 401 Water Quality Certification commitments come in addition to extensive ongoing measures. Northern Water, for example, already collects about 250 samples each year as part of its regular Poudre River monitoring efforts, with an annual cost of approximately \$450,000.



Implementing Stream and Habitat Improvements

Along with monitoring, funding, mitigation and other measures, the 401 Certification conditions call for implementing a mile of stream and habitat enhancements along this stretch of the river.

NISP's Adaptive Management Program



As part of measures outlined in NISP's 401 Water Quality Certification and its Fish and Wildlife Mitigation and Enhancement Plan, an Adaptive Management program will be implemented, in which Northern Water will collaborate on river health initiatives with Colorado Parks and Wildlife, the Colorado Water Quality Control Division, and other partners.

An unprecedented opportunity for collaboration focused on the health of the Poudre River

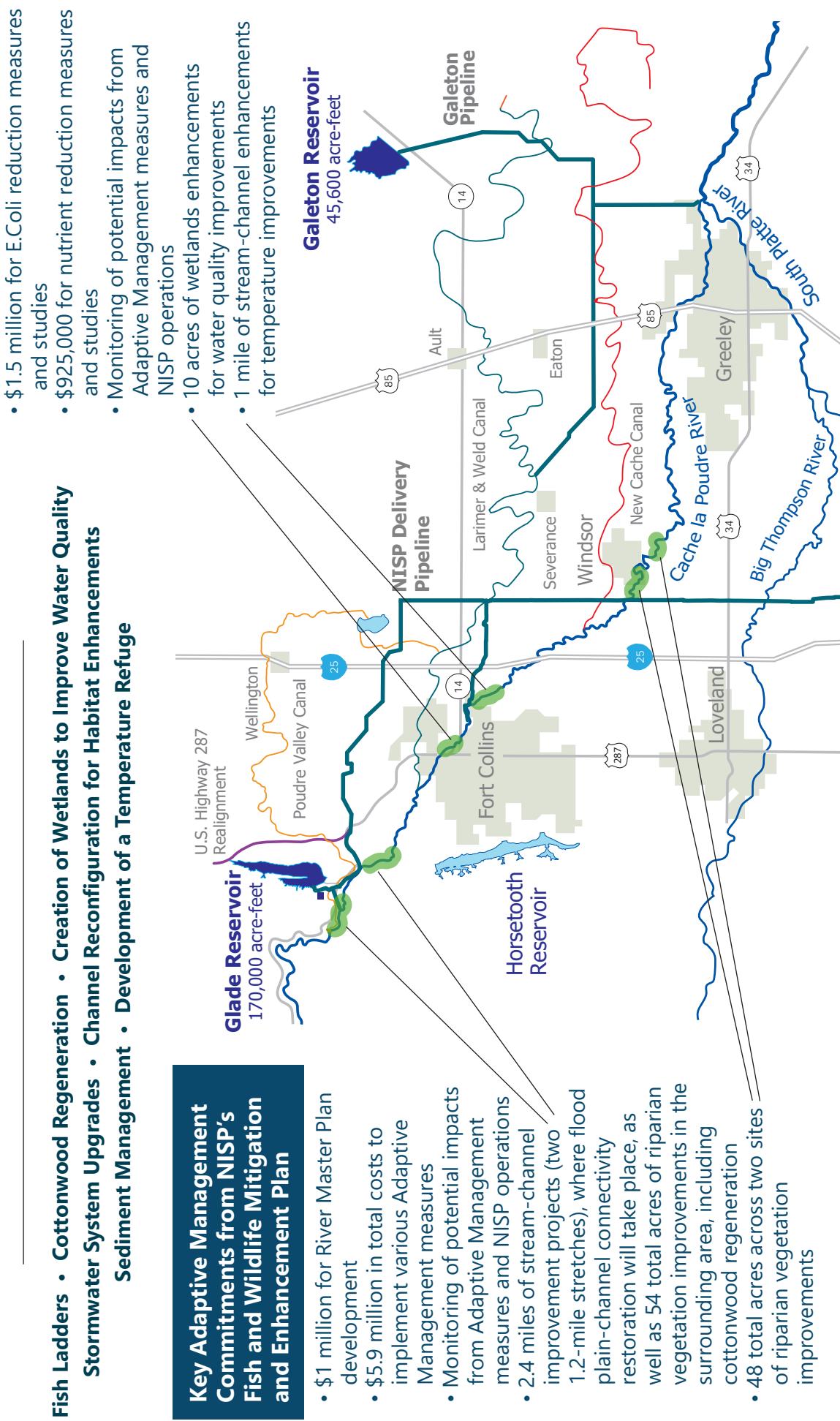
Learn more at gladereservoir.org

The Northern Integrated Supply Project is a water-storage endeavor that will help rapidly growing Front Range communities meet their future water needs, while also implementing protections for the environment and wildlife, creating new recreation opportunities, and helping preserve our local farms. Additionally, through this Adaptive Management program, NISP will also implement an array of components that will help further develop an ecologically vibrant and resilient Poudre River corridor, by utilizing existing and new partnerships in a holistic approach to the river's health.

- Improved Water Quality
- Enhanced Poudre River Recreation
- Increased Flood Resilience
- Better Aquatic Health
- Improved Wildlife Habitat

The Adaptive Management program's various monitoring, funding, mitigation and enhancement measures will be **implemented across a 42-mile stretch of the Poudre River**, from its mouth at the canyon to its confluence with the South Platte River.

Key Adaptive Management Commitments from NISP's 401 Water Quality Certification



The measures identified in the Adaptive Management program only account for a portion of the NISP components that will benefit the region's watershed and ecosystem. Through all of its various programs, NISP is all together committing nearly \$60 million toward mitigation and enhancement for the local environment and wildlife.

Two reservoirs that will help Northern Colorado meet its future water needs

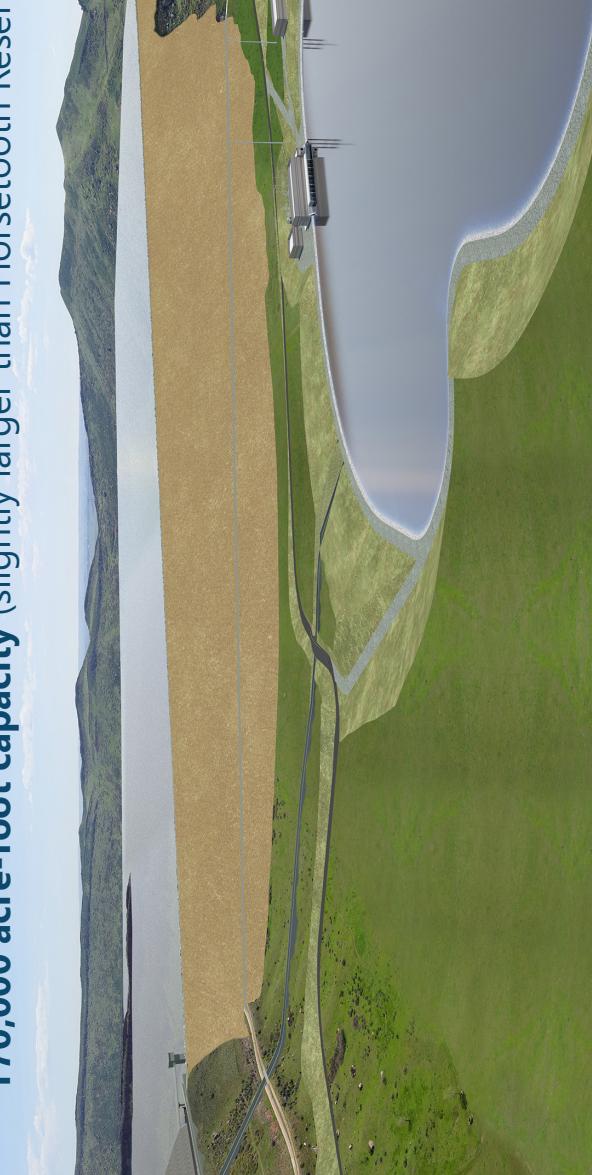
NISP will supply 15 water providers with **40,000 acre-feet** of new, reliable water supplies. Northern Water is pursuing permitting, design and construction of this estimated **\$1.2 billion project** on behalf of the participants, who will be providing water to nearly half a million residents by 2050.

The project's main components include:

- Two new reservoirs (Glade Reservoir northwest of Fort Collins, and Galeton Reservoir northeast of Greeley)
- Pipelines to deliver water to the participants and for water exchanges with two irrigation companies
- Five pump plants

Glade Reservoir

5 miles long • 280 feet at its deepest
170,000 acre-foot capacity (slightly larger than Horsetooth Reservoir)



- Glade will be located northwest of Fort Collins near the intersection of U.S. Highway 287 and State Highway 14.
- The reservoir will divert water from the Poudre River during mostly high-flow times.
- The project will use the already existing Poudre Valley Canal near the canyon mouth to divert water from the river to the Glade Reservoir forebay. As part of NISP, the PVC's diversion structure will be upgraded.
- The reservoir site is divided by U.S. Highway 287, and therefore, about seven miles of the highway will be relocated to the east.

Bringing new recreation opportunities to the region

In addition to needed water storage and environmental-protection measures, NISP will bring new recreation opportunities to Northern Colorado, with a recreation concept plan that calls for **motorized and non-motorized boating, fishing, camping, hiking and biking** at **Glade Reservoir**.

Growing communities taking diverse steps to meet future demands

Central Weld County Water District • Dacono • Eaton • Erie
Evans • Firestone • Fort Collins-Loveland Water District • Fort Lupton
Fort Morgan • Frederick • Lafayette • Left Hand Water District
Morgan County Quality Water District • Severance • Windsor

These 11 fast-growing communities and four water districts **currently serve water to about 250,000 residents, with that expected to double by 2050.** In addition to NISP, they are embracing conservation efforts, reuse and other opportunities to meet their future water demands, **having already collectively reduced their per capita water consumption by nearly 30 percent** since 2000.

A project that aligns with the goals of the Colorado Water Plan

The Colorado Water Plan reinforced the necessity of additional water storage to help meet the state's future water gap. The gap is the difference between the estimated future water demands and existing supplies by the year 2060.

The Colorado Water Plan identifies the need for 400,000 acre-feet of additional storage statewide. NISP can play a role in meeting a portion of the impending water gap in Colorado.

The plan also identifies water conservation and increased water transfers between the agricultural and municipal sectors as additional solutions to help meet the impending gap.

Galeton Reservoir

2 miles long • 85 feet at its deepest
45,600 acre-foot capacity

- This reservoir will be located east of Ault and northeast of Greeley.
- Water will be diverted from the South Platte River downstream from Greeley at high flow times.
- Galeton Reservoir water will be delivered to the Larimer-Weld and New Cache ditch companies in exchange for a portion of the Poudre River water they currently use. (About half of NISP's planned diversion from the Poudre River includes water that's already been diverted for decades by these two ditch companies.)

A project that will also help protect local farms

In order to fill Galeton Reservoir, NISP will strategically utilize water exchanges with the Larimer-Weld and New Cache ditch companies in Weld County, both of which have senior rights on the Poudre River. In return, the NISP participants will provide compensation for the two participating ditch companies, including:

- **Monetary payments**
- **Additional water supplies from Galeton Reservoir**
- **Ditch-system improvements**
- **Additionally, the ditch-company shareholders will maintain control of their water and water will continue flowing to their farms and ranches, while the compensation from the NISP participants will enhance the long-term viability of those ag operations.**

Furthermore, without NISP, the communities participating in the project will most likely be left to purchase more water from existing farms and ranches — needing to dry up more than 64,000 acres of irrigated farmland to attain the amount of water that NISP would provide.

Current status and upcoming timeline

2017 – Approval of Fish and Wildlife Mitigation and Enhancement Plan
2018 – Final Environmental Impact Statement released
2020 – Anticipated 401 Water Quality Certification Permit from the State of Colorado
2020 – Anticipated Record of Decision and 404 Permit from the U.S. Army Corps of Engineers
2019-2022 – Project design to be finalized
2023-2027 – Anticipated construction dates
2028 – First water stored in Glade Reservoir

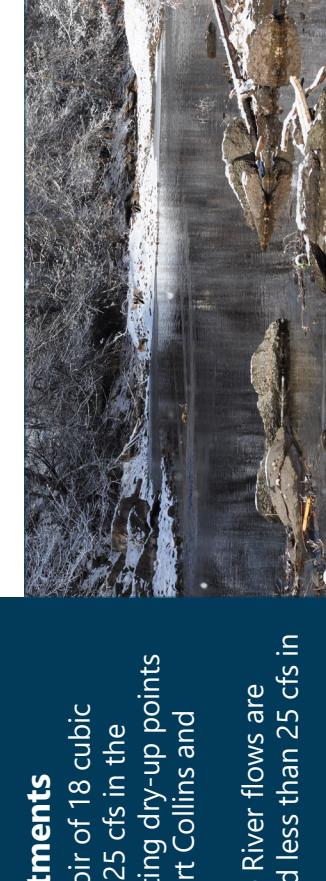
A project that will help maintain the Poudre River's streamflows and protect our environment and wildlife

The NISP Fish and Wildlife Mitigation and Enhancement Plan – approved by the Colorado Parks and Wildlife Commission, Colorado Water Conservation Board and Gov. John Hickenlooper in 2017 – includes an array of components that will benefit our environment and local wildlife. Northern Water has also made additional environmental commitments in its Conceptual Mitigation Plan that are included in the Final Environmental Impact Statement.

Overall, NISP is committing nearly \$60 million toward mitigation and enhancement for the local environment and wildlife. These measures include:

Streamflow Commitments

- Water releases from Glade Reservoir of 18 cubic feet per second in the winter and 25 cfs in the summer, which will eliminate existing dry-up points in the river through downtown Fort Collins and improve streamflows year-round.
- Curtailing diversions when Poudre River flows are less than 50 cfs in the summer and less than 25 cfs in the winter.



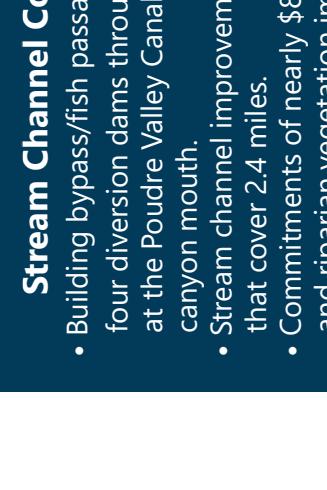
Flushing Flow Commitments

- Commitments in which Glade Reservoir won't divert Poudre River water during peak flows in 2/3 of years, and will bypass diversions for up to three days – equivalent to as much as 6,000 acre-feet in most years.
- The project's streamflow commitments will result in little to no diversions during peak flow conditions in 90 percent of years.



Stream Channel Commitments

- Building bypass/fish passage structures at four diversion dams through Fort Collins and at the Poudre Valley Canal diversion at the canyon mouth.
- Stream channel improvements on two reaches that cover 2.4 miles.
- Commitments of nearly \$8 million for channel and riparian vegetation improvements.



NISP Endorsements

With NISP bringing so many benefits to the region, the project has earned support from numerous entities and individuals.

PUBLIC OFFICIALS

- U.S. Sen. Cory Gardner • U.S. Rep. Ken Buck • State Sen. Randy Baumgardner
- State Sen. John Cooke • State Sen. Don Coram • State Sen. Kevin Grantham • State Sen. Cheri Jahn
- State Sen. Kevin Lundberg • State Sen. Vicki Marble • State Sen. Kevin Priola • State Sen. Jerry Sonnenberg
- State Rep. Jon Becker • State Rep. Perry Buck • State Rep. Steve Humphrey • State Rep. Hugh McKean
- State Rep. Bob Rankin • State Rep. Lori Saine • State Rep. Yeulin Willett
- Former U.S. Sen. Hank Brown • Don Ament, former state agriculture commissioner



Northern Integrated Supply Project

LOCAL PUBLICATIONS

- Erie Review • Fort Collins Coloradoan • Greeley Tribune
- Lafayette News • Longmont Times-Call • Loveland Reporter-Herald • Loveland Times
- Fort Morgan Times • Lost Creek Guide • Windsor Beacon
- Evans Area Chamber • Greeley Chamber • Windsor Chamber
- Berthoud Area Chamber • Fort Lupton Chamber • Mead Area Chamber • Windsor Chamber
- Northern Colorado Legislative Alliance • Poudre Valley REA • Upstate Colorado Economic Development Group • Weld County Builders Association Inc. • Weld County Council

CHAMBERS OF COMMERCE

- Erie Review • Fort Morgan Times • Lost Creek Guide • Loveland Reporter-Herald • Loveland Times
- Evans Area Chamber • Greeley Chamber • Windsor Chamber
- Berthoud Area Chamber • Fort Lupton Chamber • Mead Area Chamber • Windsor Chamber
- Northern Colorado Legislative Alliance • Poudre Valley REA • Upstate Colorado Economic Development Group • Weld County Builders Association Inc. • Weld County Council

BUSINESS ORGANIZATIONS

- Accelerate Colorado • Action 22 • Associated General Contractors of Colorado
- Colorado Association of Commerce & Industry • Colorado Contractors Association
- Fort Collins Board of REALTORS • Front Range District, Colorado Counties, Inc.
- Morgan County Economic Development Corporation • Northern Colorado Home Builders Association
- Northern Colorado Legislative Alliance • Poudre Valley REA • Progressive 15 • United Power
- Upstate Colorado Economic Development Group • Weld Community Development Group
- Weld County Builders Association Inc. • Weld County Council

COUNTY COMMISSIONS

- Morgan County Commissioners • Weld County Commissioners

AGRICULTURE ORGANIZATIONS

- Colorado Farm Bureau • Rocky Mountain Farmers Union • Colorado Livestock Association
- Colorado Corn Growers Association • Colorado Cattlemen's Association
- Rocky Mountain Agribusiness Association • Western Sugar Cooperative
- Colorado Sugarbeet Growers Association • Boulder-St. Vrain Valley County Farm Bureau
- Colorado Egg Producers Association • Larimer County Farm Bureau • Weld County Farm Bureau

WEST SLOPE ORGANIZATIONS

- Colorado River District • Club 20 • Southwestern Water Conservation District • Ute Water Conservancy District

CONSERVATION DISTRICTS

- Boulder Valley Conservation District • Big Thompson Conservation District • Fort Collins Conservation District
- Lower South Platte Water Conservancy District • St. Vrain & Left Hand Water Conservancy District

WATER DISTRICTS

- Central Colorado Water Conservancy District • Northern Colorado Water Conservancy District

The Northern Integrated Supply Project:

A water-storage project that will help rapidly growing Front Range communities meet their future water needs, while also implementing protections for the environment and wildlife, creating new recreation opportunities, and helping preserve our local farms and ranches.

- Wildlife habitat conservation covering about 1,400 acres around Glade Reservoir.
- Wetlands and endangered species mitigation.
- Recreation/fishery benefits at Glade Reservoir.



Picture of the Power Line Area

