Comments on the Northern Integrated Supply Project (NISP) 1041 Permit

Follows 42 pages of comment provided to Larimer County Commissioners on 4.29.20 TSale@engr.colostate.edu



Dr. Tom Sale

July 8, 2020

Time allotments provided by

Dr. Sally Sutton, Dr. Joe Scalia, Dr. Jens Blotevogel, Patrick Haas, and Dr. Andrea Hanson

Qualification

 Full Professor, Civil and Environmental Engineering, Colorado State University, Fort Collins, CO.

• Degrees

- BA Chemistry and Geology Miami of Ohio
- MS in Watershed Hydrology University of Arizona
- PhD Agricultural Engineering Colorado State University
- **Professional Geologist** (WY-1954 since 1994).

• Career

- 20 years of water resource consulting engineering
- 20 years of experience in academia
- plus \$30 million in research funding
- Live 1 mile west of the proposed site of the Glade Reservoir
- Active kayaker on the Cache La Poudre River for the last quarter century.



Review criteria for approval of all 1041 permit. -

1. The proposal is consistent with the master plan and applicable intergovernmental agreements affecting land use and development.

2. The applicant has presented reasonable **Siting** and design **alternatives** or

explained why no reasonable alternatives are available.

3. The proposal conforms with adopted county standards, review criteria and mitigation requirements concerning environmental impacts, including but not limited to those contained in the Code.

4. The proposal will not have a significant adverse affect on or will adequately mitigate significant adverse affects on the land or its natural resources, on which the proposal is situated and on lands asjacent to the proposal.

5. The proposal will not adversely affect any sites and structures listed on the State or National Registers of Historic Places.

6. The proposal will not negatively impact public health and safety.

7. The proposal will not be subject to significant risk from natural hazards including floods, wildfire or geologic hazards.

8. Adequate public facilities and services are available for the proposal or will be provided by the applicant, and the proposal will not have a significant adverse effect on the capability of local government to provide services or exceed the capacity of service delivery systems.

9. The applicant will mitigate any construction impacts to county roads, bridges and related facilities. Construction access will be re-graded and re-vegetated to minimize environmental impacts.

10. The benefits of the proposed development outweigh the losses of any natural resources or reduction of productivity of agricultural lands as a result of the proposed development.

11. The proposal demonstrates a reasonable balance between the costs to the applicant to mitigate significant adverse affects and the benefits achieved by such mitigation.

12. The recommendations of staff and referral agencies have been addressed to the satisfaction of the county commissioners.

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Siting – Serious Flaws

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Siting



Two major faults pass under the proposed dam site

North Fork and Bellvue Faults

Leakage through rubblized rock along faults seems likely to lead to dissolution of soluble limestone and gypsum beds. Underflow far more severe than that observed at the North Horsetooth Dam seems certain. No discussion of the faults below the proposed dam are presented in the EIS.



GEOLOGIC MAP OF THE LAPORTE QUADRANGLE, LARIMER COUNTY, COLORADO By William A. Braddock, Jon J. Connor, Gordon A. Swann, and Duane D. Wohllord

• Implications

- 1) Leakage of water along faults
 - Dam won't hold water
 - All the additional \$s thrown at grouting won't matter
- 2) Dissolution of soluble limestone and gypsum beds
 - Water losses will progressively get WORSE (like the North Dam on Horsetooth)
 - Large unplanned future expenditures are likely
- 3) Risk to Human Health
 - La Porte, Fort Collins...

Could the Army Corp of Engineers approve a dam built on two major faults if the EIS doesn't include the word FAULT?

Should the project participants buy a dam built on FAULTS given economic and human safety risk?

Should Larimer County approve a dam built on FAULTS given safety issues?

Could the Army Corp of Engineers approve a dam built on two major faults given the fact that the EIS doesn't include the word FAULT?

Should the proj FAULTS given ec



uy a dam built on an safety risk?

Should Larimer County going to approve a dam built on FAULTS given safety issues?

Underlying Rock Won't Hold Water

Large water losses are likely to occur into the underlying transmissive sandstone beds. Subsurface leakage will drive dissolution of limestone and gypsum beds leading to washouts and possible dam failure. Northern has spent more than a year collecting geologic data none of which has been shared with the public. Evidence of solutions zones abound. No details regarding the geologic setting is included in any of the EIS's



2019 NPIC Annual Report



Munroe Ditch – North Poudre Irrigation Company



A submerged air filled pipe and tunnel under Glade



It is not a matter of if the submerged pipeline or tunnels through glade will fail, it is simply a question when.



- 1) Per 2012 fire and 2013 flood, sediments will fill the submerged pipeline Removal of sediment from a submerged pipeline may be impractical simply due to safety alone.
- 2) Sooner of later the submerged pipeline will fail (corrosion or earth movements) and the entire lake will want to drain through the pipe with the only potential solution being plugging the tunnels.
- 3) The unlined tunnel sections will be like a submerged drain potentially collecting 1-10 gpm/foot. In time soluble limestone and gypsum beds will dissolve and the tunnels will collapse.

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Required Power =s 40,000 to 80,000 households \$\$\$ -Operation and Maintenance Costs

1,200 cubic feet / second = 540,000 gal/min



Northern Water's 2019 monitoring wells – Can a permit be issued if important information has not been made public?



What's the plan to protect drinking water and workers



Alternatives

Surface Water – NISP is NOT an Integrated supply project ... If it were it would NEVER be chosen

	NISP (Glade)	Seaman	Halligan
Moving US Highway 287	\$\$\$\$	ZERO	ZERO
Piping the Munroe Ditch Through	\$\$\$\$	ZERO	ZERO
Lifting Water	\$\$\$\$	ZERO	ZERO
Diversion, Forebay, Pump Station	\$\$\$\$	ZERO	ZERO
Leakage Mitigation	\$\$\$\$	\$	\$

Subsurface Water Storage - 99% of all the fresh water on the planet is underground... so why don't we store water underground





Tens of new subsurface water storage project are coming on line Driven by low cost and high efficiency

Reinvest in Colorado - Harvest water losses and reinvest agricultural resources... at a fraction of the cost

WATER HET			
NON CRT STORAGE	2019	2018	2017
Water Season Beginning Storage (April	52,395	49,229*	25,66
2018)*			
Less Ending Storage (Oct. 31, 2019)	32,252	32,250	15,16
Storage Used	20,143	16,979	10,499
	12000000		
CBT PROJECTION INFORMATION			
Carryover Beginning of the Year	8,800	8,800	5,661
CBT Quota Percentage	70%	80%	80%
CBT Water Acre Feet	28,000	32,600	25,661
CBT Water Acro East Hand	17,071	10,580	15,162
Col water Acre Feet Used	10,929	22,020	10,499
DIVERSIONS			
Diversion from N. Fork Poudre	30,390	33,685	22,239
Diversion from Munroe Canal	16,040	37,634	44,955
Municipal Use from Horsetooth	9,114	8,675	8,815
Agricultural Use from Horsetooth (Exchange to Munroe)	14,091	14,240	13,880
Total Diversions*	69.563	94.234	90 990
			03,003
DISTRIBUTION			
Deliveries to Ag Shareholders	25,464	23,832	25 946
Deliveries to Municipal Shareholders	9,114	8,669	8.815
			0,015
Deliveries to Shareholders	34,578	32,507	34,791
OTHER DELIVERIES			
Reservoir #6 WSS	2 000	F 000	
Fossil Creek Preferred	3.458	5,000	4,000
FCP CBT Trade	4.940	5,133	523
Rentals	0	5,415	5,125
		0	0
Other Deliveries	10,398	15 540	-
		15,548	9,648
HAL SOURCES	89,706	94 224	
Total Deliveries*	44.976	23,234	89,889
NPIC Reservoir Use*	14.685	32,507	34,761
Other Deliveries	10.398	16,9/9	10,499
Total Diversions	69.563	15,548	9,648
Total Uses*	09.748	10.000	-
		65,028	54,908
Net Shrink	39.272	20.000	10
Percentage Shrink	47%	29,206	34,981
	11/10	30.01%	38,92%



The North Poudre Irrigation Company lost as much water in 1990 as NISP will yield (39,000 acre ft)...

Recommend denial of NISP 1041 Permit based on Review Criteria 2.

- Flawed siting of the Glade Dam
 - Faults and rock types
 - Water loses (failure or \$\$\$\$\$)
 - Risk to Public Safety
 - Failure of the Munroe Ditch
 - Forebay in a contaminant plume
 - Unique cost driven by siting
- Failure to consider modern alternative that are:
 - Lower cost
 - Faster
 - FAR LESS DAMAGE

