

Water Supply Impacts of the Northern Integrated Supply Project (NISP)

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Prepared for: Save the Poudre: Poudre Waterkeeper

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Introduction

This report preliminarily evaluates the potential impacts of the Northern Integrated Supply Project (Army Corp of Engineers, 2008) on Cache la Poudre and South Platte River water supplies. The Northern Integrated Supply Project's (NISP) sponsors propose constructing Glade Reservoir north of Ft. Collins and changing operations of certain existing canals and reservoirs. The twelve project participants include water districts and growing municipalities along the Front Range between Fort Collins and Longmont, and east to Fort Morgan¹. The Northern Colorado Water Conservancy District acting by and through the Northern Integrated Supply Project Water Activity Enterprise (District) is planning and would implement the new water supply project.

Save the Poudre: Poudre Waterkeeper sponsored this technical evaluation to better understand the implications of NISP project diversions with respect to other agricultural, municipal, and environmental interests. This report is not an opinion on water rights injury. The Northern Colorado Water Conservancy District was awarded conditional water rights for Glade Reservoir and the decree includes certain terms and conditions meant to prevent injury. Nonetheless, there are questions regarding the water supply and water right impacts associated with diversions by the proposed project.

The main conclusion of this work is not startling. The NISP diversions would diminish stream flows and water supplies available to existing Cache la Poudre and South Platte River water users. The reason is that the Glade Reservoir water rights (originally adjudicated in 1980) have water right priorities senior to many existing water users. In part, certain Colorado water users on the Cache la Poudre and South Platte Rivers will be "taking the hit" at times when NISP diverts.

Water diversions by rights adjudicated after 1980 located upstream of the confluence of the North Fork of the Cache la Poudre and the Cache la Poudre River would be subject to curtailment when the NISP project water storage rights place a "call". Examples of rights potentially impacted in this area include a junior storage right for Milton Seamen Reservoir, rights associated with the Poudre Hatchery Ponds, the Greeley Filters Pipeline, and North Poudre Supply Canal.

Anytime the project is storing water supplies (i.e., the project's water rights are in priority), then stream flows and water supplies are diminished downstream of the point of diversion. In this situation, the project potentially impacts existing absolute rights that are junior to and downstream of Glade Reservoir. Junior rights located downstream of the NISP diversion include certain priorities in the Bijou Canal, Riverside Canal, Tremont Ditch, North Sterling Canal, Liddle Ditch, Peterson Ditch, Harmony 1 Ditch, Bijou Kiowa Creek Recharge A, Bijou Milliron Draw Recharge A, Riverside/Equus Ponds, Pioneer Ditch Recharge System, and Riverside Headly Recharge Ponds.

¹ Erie, Lafayette, Left Hand Water District, Eaton, Severance, Windsor, Fort Morgan, Morgan County Quality Water District, Central Weld County Water District, Evans, Fort Collins-Loveland Water District, and Fort Lupton

At this time, there is insufficient information to quantify NISP's impact on existing water supplies and water users. In some years the project's diversions may be zero and in other years, tens of thousands of acre-feet. The Army Corp of Engineers is revising the "technical platform" (hydrologic and water rights model) that may quantify the timing and amounts of the impacts.

Discussion

The following paragraphs describe the technical analysis leading up to the report's results and conclusions. Information used in the analysis includes:

- State Engineer diversion records, call records, and water right databases,
- Phone interviews with the Water Commissioner responsible for the Poudre River,
- Stream flow records from the USGS and Colorado DNR, and
- The Draft Environmental Impact Statement, Northern Integrated Supply Project.

NISP Water Rights

The NISP water rights are all conditional water rights with the earliest appropriations associated with the circa 1980 Grey Mountain Reservoir project (HDR, 2008). NCWCD owns a 7/8 share in the Grey Mountain Reservoir conditional storage rights (220,000 AF maximum storage), with a priority date of May 2, 1980. In 2006, Northern received a new decree for the proposed Glade Reservoir as an alternate point of storage for the Grey Mountain rights (Case Number 2003CW405).

In addition, the NISP contemplates operations in conjunction with Galeton Reservoir and the other South Platte Water Conservation Project facilities. According to the Draft EIS, most of the SPWCP South Platte River conditional rights² have an appropriation date of December 11, 1992. These rights include 35,989 acre-feet of storage at Galeton Reservoir, 5 surface water diversion rights, and 13 appropriative rights of exchange.

Existing Absolute Water Rights Junior to Glade Reservoir

This analysis identifies absolute³ water rights that are junior to the Glade Reservoir storage water right. The evaluation sorts through the State Engineer water right decree database and lists the name, amount, priority, and maps the location of the junior water rights. This evaluation develops preliminary lists and maps of the potentially impacted water rights.

² One relatively unique aspect of the SPWCD rights is a provision allowing the use and reuse of native water to extinction. In other words, the Galeton Reservoir project's yield is nearly 100% depletive to the South Platte River.

³ Water rights that have been beneficially used and adjudicated in a water court decree.

The cursory analysis screened diversion, reservoir, and well water right databases. The State databases include terms of use⁴ regarding the quality and accuracy of the data. Consequently, any particular water right may need validation through evaluating the decree, diversion records, and other pertinent information. Nonetheless, taken as a whole, the data provides sufficient information to develop this technical evaluation.

The State “tabulates” all water right decrees, essentially ranking each water right by the date of the appropriation with the earliest appropriation first. The water rights database⁵ includes an “administration number” corresponding to the rank (seniority or priority) of the water right. The first step sorted the database by administration number and listed all records with administration numbers less than that of the Glade Reservoir storage right.

The next step screened out records for water rights not located in the Cache la Poudre River basin or in the South Platte from Greeley to the Colorado-Nebraska state line (i.e., Districts 1, 3, and 64). Diversions by Glade Reservoir may only potentially affect water rights in these areas. All records coded as an exempt, “non-tributary”, or “not non-tributary” groundwater water right were removed. The final step sorted the remaining water rights by water source and then by water right name resulting in the list of water rights included as Appendix A.

The Appendix provides a summary table of the water rights in Districts 1, 3, and 64 that are junior to the Glade Reservoir storage right. However, diversion by the Glade Reservoir storage right may not impact certain junior water rights because of the location, timing of diversions, water use, or other extenuating factor. Additional geographic analyses developed maps and refined the list of potentially impacted water rights.

Tables 1 – 3 and Figures 1 – 3 include the absolute water rights most likely to experience water supply impacts a result of NISP diversions. The lists include 79 river diversion rights, 54 reservoir rights totaling approximately 26,000 acre-feet of storage, and approximately 280 wells.

Preliminary Review of the Division 1, Districts 1, 3, and 64 Call Records

The State publishes “call” records that, in part, describe the historical administration of the South Platte River. The call essentially divides adjudicated water rights between rights that are in priority and may legally divert and rights that are out-of-

⁴ <http://cdss.state.co.us/DNN/Home/tabid/36/ctl/Terms/Default.aspx>

⁵ 100719_Water Rights - NetAmt_HB downloaded at:
<http://www.dwr.state.co.us/HBGuestExport/HBGuestExport.aspx> accessed July 2010

priority and may not divert. The State's call record⁶ database provides an indication of the potential timing of diversions by the proposed Glade Reservoir.

A technical memorandum⁷ (Leonard Rice, 2006) accompanies the South Platte call record database summary and includes a succinct explanation of administration in Division 1:

"The Water Commissioner evaluates the natural flow of water in the river and the demand for that water from senior water rights. Based on the demands from water right holders and available natural flow of water, the Water Commissioner sets the location and priority date of a valid call. Upstream water rights holders junior to the call are curtailed.

In the South Platte River basin, there are two basic types of calls - standard and bypass. When a standard call is placed, any right junior to the senior, calling right and located upstream is curtailed completely. Multiple calls can be active in the river basin at the same time; the upstream calls are always more senior than the downstream calls.

A bypass call operates when an upstream junior water right can divert a portion of its water right while bypassing a sufficient amount past its headgate to satisfy a downstream senior water right. The priority date of the call at the downstream structure is the priority date of the water right of the ditch passing a portion of the water right amount. All users with rights junior to the call date upstream of the senior downstream ditch are called out. In other water divisions in the state, the ditch passing a portion of its water is sometimes called the "swing ditch".

Most days of the year, the Glade Reservoir storage right would be out-of-priority. In the winter months, the project's right would be out-of-priority because Cache la Poudre (aka Timnath) and Fossil Creek Reservoirs are typically storing winter water supplies and controlling administration of the Cache la Poudre River (above Boxelder Creek). During the irrigation season, senior "direct" irrigation rights (1920 or earlier) primarily control the river before and after the seasonal run-off. As a result, the Glade Reservoir storage right may only have opportunity to divert during and near the "peak" of the spring run-off.

This work reviewed the State's database of call records affecting District 3 for the period May 2000 - November 2009 (Appendix B). Since May 2000 and during the months of May – July, there have been only 66 days when the records indicate that the Glade Reservoir storage right would have been in priority. The call records indicate that the Glade Reservoir storage right may rarely divert in months other than May, June and July.

⁶ Although the Division 1 call record goes back to April 1950, this analysis focuses on the more recent period from January 1, 2000 to April 20, 2010 because it represents recent administration and water supply operations.

⁷ ftp://dwrftp.state.co.us/cdss/swm/tm/SPDSSTask%207-1_20061115.pdf

Conclusions

The NISP diversions would diminish stream flows and water supplies available to existing Cache la Poudre and South Platte River water users.

At this time, there is insufficient information to quantify NISP's exact impact on existing water supplies and water users. The Army Corp of Engineers is revising the "technical platform" (hydrologic and water rights model) that may help quantify the timing and amounts of the impacts.

Examples of rights potentially impacted in the Cache la Poudre River basin include a junior storage right for Milton Seamen Reservoir, rights associated with the Poudre Hatchery Ponds, the Greeley Filters Pipeline, and North Poudre Supply Canal.

Potentially impacted rights located downstream of the NISP diversion include certain priorities in the Bijou Canal, Riverside Canal, Tremont Ditch, North Sterling Canal, Liddle Ditch, Peterson Ditch, Harmony 1 Ditch, Bijou Kiowa Creek Recharge A, Bijou Milliron Draw Recharge A, Riverside/Equus Ponds, Pioneer Ditch Recharge System, and Riverside Headly Recharge Ponds.

References

Army Corps of Engineers, 2008. Final Northern Integrated Supply Project, Environmental Impact Statement Water Resources Technical Report, February 2008. HDR Engineering, Inc.

Army Corps of Engineers, 2008. Northern Integrated Supply Project, Draft Environmental Impact Statement, July 30, 2008.
<https://www.nwo.usace.army.mil/html/od-tl/eis/nisp.deis.exec-summary.apr08.pdf>

Colorado Decision Support System,
<http://cdss.state.co.us/DNN/Stations/tabid/74/Default.aspx>, call chronology, water rights database, accessed July 2010.

Water Supply Impacts of the Northern Integrated Supply Project

Table 1 – Diversion Water Rights Junior to Glade Reservoir Storage Right

Structure ID Code	Water Right Name	Stream Source	Adjudication Date	Appropriation Date	Administration Number	Use Type Code	Absolute Amount Rate (cfs)	Absolute Amount Volume (acre-feet)
301398	AQUACULTURE DWNSTRM DIVR	CACHE LA POUDRE RIV	12/31/1990	2/23/1990	51188.00000	6	2	0
301396	AQUACULTURE TIGER RUN DV	CACHE LA POUDRE RIV	12/31/1990	2/23/1990	51188.00000	6	2	0
300774	BENSON-DUBARD DITCH	CACHE LA POUDRE RIV	12/31/1992	6/16/1992	52032.00000	1	1	0
300934	CANAL 3 DITCH	CACHE LA POUDRE RIV	12/31/1996	11/4/1994	53325.52903	0	2.5	0
300744	EAST RIGDEN FLUME	CACHE LA POUDRE RIV	12/31/1989	11/27/1901	50769.18958	0	10.6	0
300808	FLOCKHART PUMP	CACHE LA POUDRE RIV	12/31/1990	1/28/1987	51134.50066	0	2	0
300908	GREELEY FLTRS PL	CACHE LA POUDRE RIV	12/31/1987	6/24/1961	50038.40717	0	15.5	0
300785	HART DITCH	CACHE LA POUDRE RIV	12/31/1990	1/28/1987	51134.50066	0	0.15	0
301573	JO DEE PL 3	CACHE LA POUDRE RIV	12/31/1992	4/13/1990	51864.51237	0	3.72	0
300905	NORTH POUDRE SUPPLY CNL	CACHE LA POUDRE RIV	12/31/1998	8/6/1998	54274.00000	0	18.3	0
300502	POUDRE HATCHERY POND DIVERSION	CACHE LA POUDRE RIV	12/31/2004	12/31/1948	56247.36159	0	31	0
300835	POUDRE HIGH SCH PUMP	CACHE LA POUDRE RIV	12/31/2003	9/1/1963	55882.41516	1	0.947	0
301378	RAWHIDE PIPELINE	CACHE LA POUDRE RIV	12/31/1982	6/22/1982	48385.00000	0	1.6	0
300822	SIMPSON LAKE PUMP	CACHE LA POUDRE RIV	12/31/1998	9/1/1998	54300.00000	0	3	0
300807	SWIFT STOCK DIVR	CACHE LA POUDRE RIV	12/31/1996	11/17/1969	53325.43785	9	0.013	0
302134	WATSON LK DIVERSION WEIR	CACHE LA POUDRE RIV	12/31/1985	7/10/1962	49308.41098	6	50	0
300932	WILLIAM R JONES DITCH	CACHE LA POUDRE RIV	12/31/1988	12/18/1987	50403.50390	0	21.42	0
300769	BEN DELATOUR TPS DITCH	ELKHORN CREEK	12/31/1989	11/3/1989	51076.00000	56	1	0
300967	CORAL ROCK DITCH 3	ELKHORN CREEK	12/31/1989	11/3/1989	51076.00000	56	1	0
300752	BRINKHOFF PL	MANHATTAN CREEK	12/31/1988	12/31/1983	50403.48942	1	0.05	0
300793	BERLIER A DIVR	RABBIT CREEK	12/31/1993	7/31/1989	52230.50981	179	0.214	0
300792	BERLIER B DIVR	RABBIT CREEK	12/31/1993	7/31/1989	52230.50981	179	0.214	0
300791	BERLIER C DIVR	RABBIT CREEK	12/31/1993	7/31/1989	52230.50981	179	0.214	0
300790	BERLIER D DIVR	RABBIT CREEK	12/31/1993	7/31/1989	52230.50981	179	0.214	0
300789	BERLIER E DIVR	RABBIT CREEK	12/31/1993	7/31/1989	52230.50981	179	0.214	0
300794	BERLIER F DIVR	RABBIT CREEK	12/31/1993	3/31/1991	52230.51589	179	0.214	0
300788	BERLIER G DIVR	RABBIT CREEK	12/31/1993	7/31/1989	52230.50981	179	0.214	0
300815	J D WAGNER DITCH 1	RABBIT CREEK	12/31/1997	7/29/2010	53691.10958	1	2.5	0
301393	MOEN EAST PUMPING PLANT	SHEEP DRAW	12/31/1990	10/23/1990	51430.00000	1	0.9	0
300834	PEREZ STOCK DIVR	SHEEP DRAW	12/31/1999	12/12/1991	54421.51845	9	0.033	0
300765	SANBORN STRONG DITCH/PL	SHEEP DRAW	12/31/1991	7/29/2010	51499.15083	1	6	0
301059	SOUTH FORK PIPELINE	SOUTH PINE CREEK	12/31/1988	12/15/1987	50403.50387	0	4.09	0
100507	BIJOU CANAL	SOUTH PLATTE RIVER	12/31/1986	3/1/1986	49733.00000	0	75	0
102061	BIJOU GOEDERT RCHRG A	SOUTH PLATTE RIVER	12/31/1995	12/6/1995	53300.00000	0	0	1854
102036	BIJOU KIOWA CR RCHRG A	SOUTH PLATTE RIVER	12/31/1981	3/7/1982	48278.00000	0	0	3605.54
102042	BIJOU LOST CR E POND	SOUTH PLATTE RIVER	12/31/1986	6/2/1986	49826.00000	0	0	60
102043	BIJOU LOST CR W POND	SOUTH PLATTE RIVER	12/31/1986	6/2/1986	49826.00000	0	0	150
102068	BIJOU MCQWD RCHRG POND 1	SOUTH PLATTE RIVER	12/31/1994	2/7/1994	52633.00000	0	0	130
102035	BIJOU MILLIRON DRAW RCHG A	SOUTH PLATTE RIVER	12/31/1981	12/17/1981	48198.00000	0	0	2400
6400522	BRAVO DITCH	SOUTH PLATTE RIVER	12/31/1996	8/20/1996	53558.00000	0	46.4	0
6402514	CHAMBERS CONDON RCHRG A	SOUTH PLATTE RIVER	12/31/1995	10/31/1993	52960.52534	0	0	277.4
6400631	CURLEE PUMP STATION 1	SOUTH PLATTE RIVER	12/31/2003	4/11/2003	55983.00000	0	4.75	0
100514	FT MORGAN CANAL	SOUTH PLATTE RIVER	12/31/2000	12/29/2000	55150.00000	0	10.9	0
6400511	HARMONY DITCH 1	SOUTH PLATTE RIVER	12/31/1996	9/30/1985	53325.49581	1	350	0
6400520	ILIFF PLATTE VALLEY D	SOUTH PLATTE RIVER	12/31/2003	12/23/2002	55882.55874	0	4.4	0
6400502	LIDDLE DITCH	SOUTH PLATTE RIVER	12/31/1997	2/4/1997	53726.00000	0	7	0
6400518	LONE TREE DITCH	SOUTH PLATTE RIVER	12/31/1981	3/12/1981	47918.00000	0	27	0
6402001	LONE TREE RECHARGE POND	SOUTH PLATTE RIVER	12/31/1981	3/12/1981	47918.00000	0	0	1130
102022	LOWER P & B WIND RCHRG POND	SOUTH PLATTE RIVER	12/31/1982	2/24/1982	48267.00000	0	0	130
100518	LOWER PLATTE BEAVER D	SOUTH PLATTE RIVER	12/31/1982	12/31/1982	48577.00000	0	322	0
102019	LOWR P & B ESCHEN RCHRG BASIN 1	SOUTH PLATTE RIVER	12/31/1982	12/31/1982	48577.00000	0	0	239
107520	NAT HOG FARMS IRR PUMP 1	SOUTH PLATTE RIVER	12/31/1990	5/30/1989	51134.50919	0	4.563	0
100687	NORTH STERLING CANAL	SOUTH PLATTE RIVER	12/31/1996	5/8/1996	53454.00000	0	294	0
6400533	PAWNEE DITCH	SOUTH PLATTE RIVER	12/31/1995	12/22/1995	53316.00000	0	77	0
6402212	PAWNEE VANDEMOER E R A	SOUTH PLATTE RIVER	12/31/2004	4/1/2004	56339.00000	0	4.1	0
6400504	PETERSON DITCH	SOUTH PLATTE RIVER	12/31/1990	5/2/1989	51134.50891	0	35	0
102003	PIONEER DITCH RECHRG SYS	SOUTH PLATTE RIVER	12/31/1981	6/30/1977	47847.46567	0	0	986
6400632	QUINT PUMP STATION 2	SOUTH PLATTE RIVER	12/31/2003	12/10/2002	55882.55861	0	4.5	0
100503	RIVERSIDE CANAL	SOUTH PLATTE RIVER	12/31/1986	6/17/1986	49841.00000	0	1000	0
103344	RIVERSIDE HEADLEY RCHRG POND 1	SOUTH PLATTE RIVER	12/31/1990	8/10/1990	51356.00000	0	0	116.4
103345	RIVERSIDE HEADLEY RCHRG POND 2	SOUTH PLATTE RIVER	12/31/1990	8/10/1990	51356.00000	0	0	41.6
103346	RIVERSIDE HEADLEY RCHRG POND 3	SOUTH PLATTE RIVER	12/31/1990	8/10/1990	51356.00000	0	0	17.6
103347	RIVERSIDE HEADLEY RCHRG POND 4	SOUTH PLATTE RIVER	12/31/1990	8/10/1990	51356.00000	0	0	9.2
103348	RIVERSIDE HEADLEY RCHRG POND 5	SOUTH PLATTE RIVER	12/31/1990	8/10/1990	51356.00000	0	0	2.1
103349	RIVERSIDE HEADLEY RCHRG POND 6	SOUTH PLATTE RIVER	12/31/1990	8/10/1990	51356.00000	0	0	3.5
102048	RIVERSIDE NAT FARMS P 1	SOUTH PLATTE RIVER	12/31/1988	11/4/1988	50712.00000	0	0	368
102031	RIVERSIDE SUBLETTE RCHG P 1-21	SOUTH PLATTE RIVER	12/31/1989	3/11/1985	50769.49378	0	0	815
102049	RIVERSIDE/EQUUS POND 1	SOUTH PLATTE RIVER	12/31/1988	3/3/1988	50466.00000	0	0	570
102050	RIVERSIDE/EQUUS POND 2	SOUTH PLATTE RIVER	12/31/1988	3/3/1988	50466.00000	0	0	240
102047	RIVERSIDE/EQUUS POND 3	SOUTH PLATTE RIVER	12/31/1988	3/3/1988	50466.00000	0	0	400
6400531	SCHNEIDER DITCH	SOUTH PLATTE RIVER	12/31/2003	1/13/2003	55895.00000	0	14.3	0
6402000	SCHUMAN'S SOUTH RCHRG LK	SOUTH PLATTE RIVER	12/31/1986	3/1/1986	49733.00000	0	0	100
6400535	SOUTH PLATTE DITCH	SOUTH PLATTE RIVER	12/31/2003	3/21/1997	55882.53771	0	39.4	0
6402278	SOUTH PLATTE VANDENMORE R A	SOUTH PLATTE RIVER	12/31/2004	4/1/2004	56339.00000	0	4.05	0
6400530	SPRINGDALE DITCH	SOUTH PLATTE RIVER	12/31/2003	1/6/2003	55888.00000	0	30.6	0
6400528	STERLING IRR CO DITCH 1	SOUTH PLATTE RIVER	12/31/2003	3/20/2003	55961.00000	0	22.3	0
100519	TREMONT DITCH	SOUTH PLATTE RIVER	12/31/1981	6/30/1977	47847.46567	0	69	0
300972	BARNES PUMPING PLANT	SPRING CREEK	12/31/1982	8/31/1962	48212.41150	19	0.2	0
301291	MOORE POND PL	SPRING CREEK	12/31/1982	8/31/1981	48212.48090	1	2	0

Water Supply Impacts of the Northern Integrated Supply Project

Table 2: Reservoir Water Rights Junior to Glade Reservoir

Structure			Adjudication	Appropriation	Administration	Use Type	Absolute	Absolute
ID Code	Water Right Name	Stream Source	Date	Date	Number	Code	Rate	Amount
							(cfs)	(acre-feet)
303408	83RD AVE RES	CACHE LA POUDRE RIV	12/31/1994	5/17/1994	52732.00000	0	0	164.2
303002	ANDRIJESKI POND	CACHE LA POUDRE RIV	12/31/2004	10/15/2003	56247.56170	0	0	42
303402	BRIAN RES	CACHE LA POUDRE RIV	12/31/1990	1/28/1987	51134.50066	0	0	35
301395	FT COLLINS NATURE C DAM	CACHE LA POUDRE RIV	12/31/1986	2/18/1986	49722.00000	0	55	0
301388	FT COLLINS POWER PLNT	CACHE LA POUDRE RIV	12/31/1986	12/31/1986	50038.00000	0	30	0
303345	JO DEE RES 1	CACHE LA POUDRE RIV	12/31/1992	4/13/1990	51864.51237	0	0	289.5
303344	JO DEE RES 2	CACHE LA POUDRE RIV	12/31/1992	8/24/1909	51864.21785	0	0	20
303347	MEADOW BROOK LAKE	CACHE LA POUDRE RIV	12/31/1995	12/31/1963	52960.41637	0	0	30.92
303567	PARKWOOD LAKE	CACHE LA POUDRE RIV	12/31/1986	3/26/1986	49758.00000	15	0	112.5
303302	POUDRE HATCHERY FISH POND 1	CACHE LA POUDRE RIV	12/31/2004	12/31/1948	56247.36159	0	0	1.7
303301	POUDRE HATCHERY POND	CACHE LA POUDRE RIV	12/31/2004	12/31/1948	56247.36159	0	0	16
303303	POUDRE HATCHERY SETTLING POND 1	CACHE LA POUDRE RIV	12/31/2004	12/31/1948	56247.36159	0	0	3.6
303827	POUDRE HIGH SCH POND	CACHE LA POUDRE RIV	12/31/2003	9/1/1963	55882.41516	0	0	1.7
303799	ROCKBRIDGE LAKE	CACHE LA POUDRE RIV	12/31/2002	11/30/1990	55517.51468	0	0	893
303401	SARAH RES	CACHE LA POUDRE RIV	12/31/1990	1/28/1987	51134.50066	0	0	11
303803	SIEBRING RES	CACHE LA POUDRE RIV	12/31/1988	12/18/1987	50403.50390	0	0	1388.3
303389	SIMPSON LAKE	CACHE LA POUDRE RIV	12/31/1998	9/1/1998	54300.00000	0	0	236
303433	WESTMOOR LAKE	CACHE LA POUDRE RIV	12/31/1996	11/4/1994	53325.52903	0	0	18.8
303472	RUNNELS POND	GORDON CREEK	12/31/1983	12/16/1983	48927.00000	0	0	3
303332	LAKU LANDING SKI LAKES 1 & 2	GROUNDWATER	12/31/2000	11/30/2000	55121.00000	0	0.177	0
103871	PAWNEE RAW WTR RES 1	GROUNDWATER	12/31/1982	6/2/1977	48212.46539	0	0	5734
103823	RR RES	GROUNDWATER	12/31/1987	12/3/1987	50375.00000	0	0	19
303331	SWIFT PONDS 53418-F	GROUNDWATER	12/31/1998	11/29/1995	54056.53293	56	0.29	0
303565	KICKAPOO LAKE	LONE PINE CREEK	12/31/1985	7/31/1981	49308.48059	0	0	1.69
303562	MAGIC SKY RES	LONE PINE CREEK	12/31/1985	12/31/1985	49673.00000	0	0	3.47
303572	LAKE SUNYATA	MANHATTAN CREEK	12/31/1989	12/1/1989	51104.00000	0	0	2.78
303713	MILTON SEAMAN RES	N FK CAC LA POUDRE R	12/31/1987	6/28/1965	50038.42182	0	0	680
303424	DEER LAKE NO 2	N FK LONE PINE CR	12/31/1982	6/15/1982	48378.00000	0	0	9.5
303412	FOX ACRES RES NO 1	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	29.7
303413	FOX ACRES RES NO 2	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	64.5
303414	FOX ACRES RES NO 3	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	49.2
303417	FOX ACRES WEST LAKE	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	6.2
303420	LAKE 15	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	2.4
303415	LOWER FOX ACRES RES 3	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	4.1
303427	LOWER LETITIA LAKE	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	13.6
303425	MIDDLE LETITIA LAKE	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	4
303418	MIRROR LAKE	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	19.8
303419	ROBINSON DRAW LAKE	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	15.3
303411	SOUTH FOX ACRES RES	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	5.2
303416	UPPER FOX ACRES RES 3	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	6.9
303426	UPPER LETITIA LAKE	NORTH PINE CREEK	12/31/1982	6/15/1982	48378.00000	0	0	6.4
303817	KLEINHANS RANCH POND	RABBIT CREEK	12/31/2003	4/19/2002	55882.55626	19	0	3
303438	SHEEP DRAW RES	SHEEP DRAW	12/31/1991	7/29/2010	51499.16175	1	0	35
303431	EAST R OF 'SOUTH 60' R	SOUTH PINE CREEK	12/31/1981	11/30/1977	47847.46720	0	0	7.99
303430	MIDDLE R OF 'SOUTH 60' R	SOUTH PINE CREEK	12/31/1981	11/30/1977	47847.46720	0	0	12.34
303568	SWANSON RES	SOUTH PINE CREEK	12/31/1989	12/31/1935	50769.31410	569	0	19.07
103007	DAHMSSTALTON POND	SOUTH PLATTE RIVER	12/31/2006	12/31/1913	56978.23375	56	0	2
6403792	GANDER POND 1	SOUTH PLATTE RIVER	12/31/1987	5/27/1987	50185.00000	0	0	2.25
6403906	JULESBURG RES	SOUTH PLATTE RIVER	12/31/1996	9/30/1985	53325.49581	1	0	8079
103651	RIVERSIDE RES	SOUTH PLATTE RIVER	12/31/1988	3/3/1988	50466.00000	0	0	3000
103400	VANCIL RES	SOUTH PLATTE RIVER	12/31/1986	6/17/1986	49841.00000	0	0	5050
6403913	WATCHORN EAST WILDLIFE P	SOUTH PLATTE RIVER	12/31/1998	3/17/1998	54132.00000	0	0	7.5
6403917	WATCHORN MID WILDLIFE P	SOUTH PLATTE RIVER	12/31/1998	3/17/1998	54132.00000	0	0	14
6403918	WATCHORN WEST WILDLIFE P	SOUTH PLATTE RIVER	12/31/1998	3/17/1998	54132.00000	0	0	4

Water Supply Impacts of the Northern Integrated Supply Project

Table 3: Well Water Rights Junior to Glade Reservoir

Structure ID Code	Water Right Name	Stream Source	Adjudication Date	Appropriation Date	Administration Number	Use Type Code	Absolute Amount Rate (cfs)	Absolute Amount Volume (acre-feet)
107326	KWUA W76-27433-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107327	KWUA W78-27434-F	GROUNDWATER	12/31/1983	7/15/1988	50600.00000	12	0.022	0
107328	KWUA W79-27435-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107330	KWUA W80-27436-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107331	KWUA W81-27437-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107332	KWUA W82-27438-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107329	KWUA W8-27391-F	GROUNDWATER	12/31/1983	6/21/1967	48577.42905	12	0.018	0
107333	KWUA W83-27439-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107334	KWUA W86-25414-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.033	0
107335	KWUA W87-27440-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107336	KWUA W88-25417-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.033	0
107337	KWUA W89-27441-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107339	KWUA W90-27442-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107340	KWUA W91-27443-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107338	KWUA W9-27392-F	GROUNDWATER	12/31/1983	6/21/1920	48577.25739	12	0.027	0
107341	KWUA W94-25413-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.033	0
107342	KWUA W95-27444-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107343	KWUA W96-27445-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107344	KWUA W97-27446-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
107345	KWUA W98-25415-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.027	0
107346	KWUA W99-27447-F	GROUNDWATER	12/31/1983	12/31/1980	48577.47847	12	0.022	0
109960	LAUCK WELL 040482-F	GROUNDWATER	12/31/1994	12/31/1991	52595.51864	1	2.67	0
307772	LIND STOCK WELL 1-65395-F	GROUNDWATER	12/31/2003	4/1/1962	55882.40998	9	0.11	0
107490	LOLOFF WELL	GROUNDWATER	12/31/1981	5/31/1935	47847.31196	38	0.18	0
305324	LONE PINE NORTHSIDE W 56148F	GROUNDWATER	12/31/1985	12/31/1985	49673.00000	28	0.031	0
305523	LORENZ WELL 14728-R	GROUNDWATER	12/31/1992	12/31/1926	51864.28123	1	0.44	0
6406464	LOUSBERG GRAIN W 3-46767	GROUNDWATER	12/31/1995	12/31/1966	52960.42733	0	0.178	0
305007	LOVELAND INDUSTRIES W	GROUNDWATER	12/31/1988	12/31/1964	50403.42003	3	1.11	0
6406743	LOVELL WELL 214677	GROUNDWATER	12/31/2002	12/10/1998	55517.54400	89	0.03	0
6406664	LOWLINE DITCH AUG WELL 1	GROUNDWATER	12/31/2003	2/27/2003	55940.00000	0	4.423	0
6405358	LOWLINE DITCH AUG WELL 2	GROUNDWATER	12/31/2003	9/26/2002	55882.55786	0	3.855	0
305053	LYNNWOOD STREET WELL 14733	GROUNDWATER	12/31/2001	4/11/1963	55152.41373	1	0.045	0
305041	MAGIC SKY WL 2-64087	GROUNDWATER	12/31/2005	2/15/2002	56613.55563	1345789	0.016	0
305040	MAGIC SKY WL 3-64088	GROUNDWATER	12/31/2005	7/18/2005	56812.00000	1345789	0.033	0
6405862	MANUELLO WELL 1-6510-F	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	5.44	0
6406621	MANUELLO WELL 2-49223	GROUNDWATER	12/31/1999	9/30/1971	54421.44467	39	0.033	0
6405863	MANUELLO WELL 2-6509-F	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	3.18	0
6406622	MANUELLO WELL 3-53980-F	GROUNDWATER	12/31/1999	9/30/1950	54421.36797	39	0.089	0
6405864	MANUELLO WELL 3-9322-F	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	6.11	0
6406623	MANUELLO WELL 4	GROUNDWATER	12/31/1999	12/31/1910	54421.22279	39	0.033	0
6405866	MANUELLO WELL 4512-F	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	1.783	0
6406624	MANUELLO WELL 5	GROUNDWATER	12/31/1999	12/31/1940	54421.33237	39	0.033	0
6406625	MANUELLO WELL 6	GROUNDWATER	12/31/1999	12/31/1940	54421.33237	39	0.033	0
6405868	MANUELLO WELL 6-376	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	2.6	0
107540	MARTIN PRODUCE WELL 3	GROUNDWATER	12/31/1982	6/1/1942	48212.33754	3	0.78	0
6405877	MCATEE WELL 3-13651F	GROUNDWATER	12/31/2000	12/31/1928	54786.28854	34	0.781	0
6406629	MCENDAFFER WELL 1-39309	GROUNDWATER	12/31/1999	1/1/1955	54421.38351	9	0.056	0
6406630	MCENDAFFER WELL 3	GROUNDWATER	12/31/1999	1/1/1955	54421.38351	89	0.045	0
106800	MCQWD SEC 28 W 2-43077F	GROUNDWATER	12/31/1993	11/5/1993	52539.00000	2368	1.11	0
107110	MCQWD SEC 28 WELL 38433F	GROUNDWATER	12/31/1989	12/31/1985	50769.49673	12368	0	240.325
6405901	MEIER WELL 1-12702	GROUNDWATER	12/31/2003	7/5/2002	55882.55703	0	2.23	0
6405914	MEYERHOLZ WELL 2-2771F	GROUNDWATER	12/31/2002	7/25/2003	56088.00000	0	3.342	0
107690	MINOR WELL 6230	GROUNDWATER	12/31/1983	12/31/1946	48577.35428	1	1.6	0
107709	MORGAN CTY COMMUNITY C W 1-31867	GROUNDWATER	12/31/1986	12/29/1986	50036.00000	13	0.223	0
107656	NATIONAL HOG F W 1-35063	GROUNDWATER	12/31/1994	4/26/1989	52595.50885	178	0.03	0
107657	NATIONAL HOG F W 2-35062	GROUNDWATER	12/31/1994	4/26/1989	52595.50885	178	0.03	0
109961	NATIONAL HOG F W1-35065F	GROUNDWATER	12/31/1988	9/14/1988	50661.00000	134789	2.67	0
109962	NATIONAL HOG F W2-35064F	GROUNDWATER	12/31/1988	11/28/1988	50736.00000	134789	2.67	0
109963	NATIONAL HOG F W3-37990F	GROUNDWATER	12/31/1991	10/3/1990	51499.51410	134789	3.34	0
109964	NATIONAL HOG F W4-44033F	GROUNDWATER	12/31/1993	6/22/1992	52230.52038	134789	5.57	0
107852	OLD FORT WELL 60139	GROUNDWATER	12/31/1984	4/5/1974	48942.45385	3	0.033	0
6403802	OVERLAND TRAIL POND M-1995-101	GROUNDWATER	12/31/1997	6/29/1993	53691.52410	0	0	70
6406581	OID CEMETERY WELL 43899F	GROUNDWATER	12/31/1994	3/31/1951	52595.36979	1	0.22	0
6406003	PALSER WELL 1-4540F	GROUNDWATER	12/31/2002	7/25/2003	56088.00000	0	3.342	0
6406827	PARK INN WELL 20539RF	GROUNDWATER	12/31/2007	3/3/1986	57343.49735	14	0.111	0
6406828	PARK INN WELL 20540RF	GROUNDWATER	12/31/2007	3/3/1986	57343.49735	14	0.111	0
6406008	PARKER WELL 1-14157	GROUNDWATER	12/31/2003	7/24/2001	55882.55357	0	2.5	0
107914	PARKHILL WELL 53428-F	GROUNDWATER	12/31/1982	1/27/1982	48239.00000	8	0.033	0
6406709	PLATTEVIEW RANCH W 59193-F	GROUNDWATER	12/31/2003	3/30/2003	55971.00000	0	2.9	0

Water Supply Impacts of the Northern Integrated Supply Project

Table 3: Well Water Rights Junior to Glade Reservoir (continued)

6406698 PONCETTA WELL 1-35809-F	GROUNDWATER	12/31/2002	10/29/1984	55517.49245	1	1.337
6406082 PROPST WELL 04428-F	GROUNDWATER	12/31/2003	2/28/2002	55882.55576	0	3.676
6406089 PROPST WELL 5-0598	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	3.899
6406747 PYLE WELL 120137	GROUNDWATER	12/31/2002	6/2/1981	55517.48000	89	0.03
6406101 RAMEY WELL 1-9057-F	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	1.114
6406105 RAMEY WELL 2-6630-F	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	1.114
6406127 REESE WELL 1-4491	GROUNDWATER	12/31/2003	7/10/2002	55882.55708	0	1.56
6406140 RICE WELL 10824	GROUNDWATER	12/31/2003	7/24/2001	55882.55357	0	1.7
6406143 RICHARDS WELL 0350	GROUNDWATER	12/31/2003	7/10/2002	55882.55708	0	1.85
307488 RMDC KITCHEN WELL 62334	GROUNDWATER	12/31/1981	7/7/1972	47847.44748	3	0.002
307487 RMDC LAUNDRY WELL 61925	GROUNDWATER	12/31/1981	7/5/1972	47847.44746	3	0.022
305712 RMDC WELL 12-48173	GROUNDWATER	12/31/1997	12/29/1989	53691.51132	0	0.007
305491 RMDC WELL 3-31507-F	GROUNDWATER	12/31/1989	4/22/1987	50769.50150	13578	0.017
305489 RMDC WELL 5-32516-F	GROUNDWATER	12/31/1989	10/12/1987	50769.50323	13578	0.033
6406164 ROOK WELL 2-19554F	GROUNDWATER	12/31/2003	7/5/2002	55882.55703	0	2.01
107430 ROTHE BROS WELL 22297-F	GROUNDWATER	12/31/1985	1/31/1964	49308.41668	1	1.78
108201 RUSCH WELL 6878-F	GROUNDWATER	12/31/1981	3/10/1965	47847.42072	1	1.97
6406179 SANGER BROS WELL 2-16151	GROUNDWATER	12/31/2003	7/5/2002	55882.55703	0	0.8
6406180 SANGER BROS WELL 3-3366F	GROUNDWATER	12/31/2003	7/5/2002	55882.55703	0	2.34
6406635 SCEWUA WELL 1A	GROUNDWATER	12/31/1998	10/8/1997	54056.53972	8	0
6406749 SCHECK WELL 120138	GROUNDWATER	12/31/2002	6/2/1981	55517.48000	89	0.03
108302 SCHMIDT WELL 8408	GROUNDWATER	12/31/2005	4/27/1955	56613.38467	1	0.02
6406746 SCHNORR WELL 240113	GROUNDWATER	12/31/2002	4/16/2002	55623.00000	89	0.03
6406585 SCHURE WELL 1	GROUNDWATER	12/31/1998	7/17/1961	54056.40740	17	0.045
108331 SEGELKE WELL 8485	GROUNDWATER	12/31/1986	5/23/1986	49816.00000	1	0.7
109898 SEIBER WELL 62759-F	GROUNDWATER	12/31/2001	9/12/1997	55152.53946	1389	0.111
6406601 SESSIONS WELL 1	GROUNDWATER	12/31/1998	6/24/1997	54056.53866	78	0.033
6406602 SESSIONS WELL 2	GROUNDWATER	12/31/1998	6/24/1997	54056.53866	78	0.033
6406603 SESSIONS WELL 3	GROUNDWATER	12/31/1998	6/24/1997	54056.53866	78	0.033
6405064 SHERWIN WELL 2-20893	GROUNDWATER	12/31/2003	12/19/2002	55882.55870	0	2.7
6406245 SITTNER WELL 3-19555F	GROUNDWATER	12/31/2003	7/5/2002	55882.55703	0	1.6
305620 SKATE WELL 1649-R	GROUNDWATER	12/31/2001	9/30/1953	55152.37893	1	1.55
6406250 SMART LAND WELL 3-8785	GROUNDWATER	12/31/2003	2/28/2002	55882.55576	0	2.785
6406255 SMITH WELL 2249-F	GROUNDWATER	12/31/2002	4/3/2001	55517.55245	0	6.684
6406276 SONNENBERG WELL 10-9579F	GROUNDWATER	12/31/2003	3/26/2003	55967.00000	0	4.456
6406279 SONNENBERG WELL 11-10789	GROUNDWATER	12/31/2003	3/26/2003	55967.00000	0	3.342
6406316 SONNENBERG WELL 36-30513	GROUNDWATER	12/31/2001	4/28/1998	55152.54174	0	0
6406330 SONNENBERG WELL 47-6683F	GROUNDWATER	12/31/2003	12/27/2002	55882.55878	0	5.56
6406332 SONNENBERG WELL 48-6684F	GROUNDWATER	12/31/2003	12/27/2002	55882.55878	0	5.56
6406353 SPARKS WELL 3-3833-F	GROUNDWATER	12/31/1996	11/22/1962	53325.41233	1	2.01
6406354 SPARKS WELL 4-6678	GROUNDWATER	12/31/1996	5/31/1954	53325.38136	1	0.27
6406706 SPRINGDALE D CO AUG W 59322	GROUNDWATER	12/31/2003	3/28/2003	55969.00000	0	6.462
109322 STEWART WELL 1-27480F	GROUNDWATER	12/31/1984	12/31/1952	48942.37620	1	1.09
6405071 STIEB WELL 1-5316-F	GROUNDWATER	12/31/2003	8/16/2002	55882.55745	0	3.11
305606 STONEGATE STABLE WELL	GROUNDWATER	12/31/1994	12/31/1960	52595.40542	0	0.033
6406654 STROMBERGER E RCHRG W 4 58703	GROUNDWATER	12/31/2003	11/22/2002	55882.55843	0	6.44
6406655 STROMBERGER E RCHRG W 5 58704	GROUNDWATER	12/31/2003	11/22/2002	55882.55843	0	6.66
6406656 STROMBERGER E RCHRG W 6	GROUNDWATER	12/31/2003	11/22/2002	55882.55843	0	6.66
109945 SUBLETTE WELL 1	GROUNDWATER	12/31/1989	3/11/1985	50769.49378	1	3.33
6406751 SUNNY SLOPE WELL 31415	GROUNDWATER	12/31/2002	2/9/1998	55517.54096	0	0.07
6406707 TOYNE AUG WELL	GROUNDWATER	12/31/2003	3/31/2003	55972.00000	0	3.56
6406745 TRAHARN WELL 1	GROUNDWATER	12/31/2002	6/2/1981	55517.48000	89	0.03
6405085 VONSEGGERN WELL 1-042452	GROUNDWATER	12/31/1993	12/31/1950	52230.36889	37	0.312
6405086 VONSEGGERN WELL 2-042451	GROUNDWATER	12/31/1993	12/31/1950	52230.36889	37	0.446
110067 WESTERN SUGAR W 1- 61262	GROUNDWATER	12/31/2003	12/31/2003	56247.00000	34	6
6406527 WILLIAMSON WELL 1-2087-F	GROUNDWATER	12/31/2003	7/10/2002	55882.55708	0	1.78
6406531 WOODHAMS WELL 1-R-6522	GROUNDWATER	12/31/2003	7/10/2002	55882.55708	0	2.01
6406533 YOUNG WELL 1-12991-F	GROUNDWATER	12/31/2003	5/1/1991	55882.51620	1	2.75
108435 JENSEN TEAGUE AUG W 2-60616F	SOUTH PLATTE RIVER	12/31/2003	5/6/2003	56008.00000	0	3.507
109719 NAT HOG FARMS IRR PUMP 2	SOUTH PLATTE RIVER	12/31/1996	3/21/1996	53406.00000	0	1.67

Figure 1 – Potentially Impacted Water Rights - Diversions

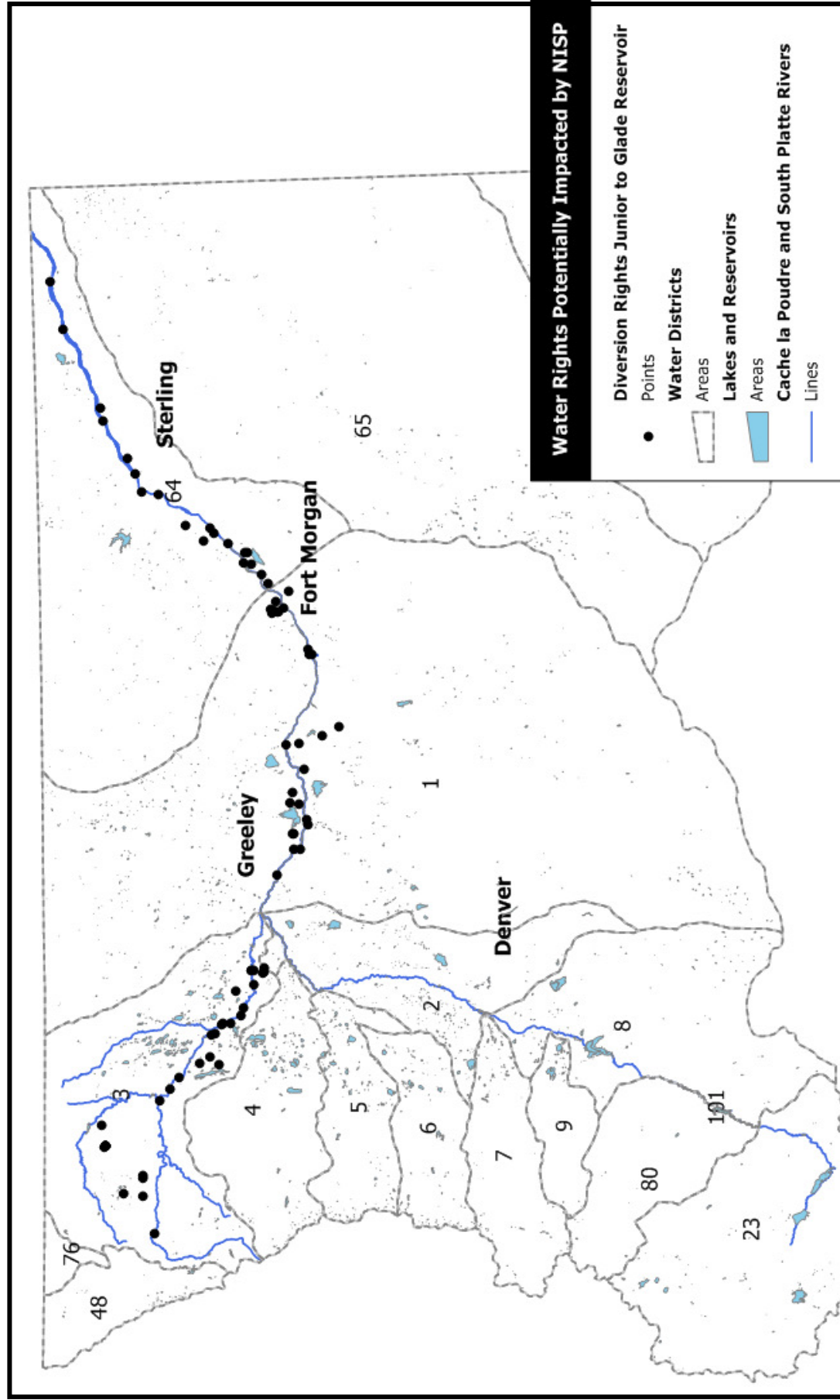


Figure 2 – Potentially Impacted Water Rights - Reservoir Storage

