

SPDSS Memorandum Final

To: Ray Alvarado and Ray Bennett
From: LRE, Erin Wilson and Rick Parsons
Subject: Task 3 – Identify Key Diversion Structures
Notes from Water District 4 Meeting
Date: October 27, 2004

Introduction

This memorandum provides notes from the January 7, 2004 meeting with the Water District 4 Water Commissioner. Meetings are being held with Water Commissioners in each Water District in the SPDSS study area. The objectives of these meetings are 1) to develop an initial basin understanding; 2) to determine which irrigation structures should be included as “Key Structures” in future detailed modeling efforts, and 3) to determine which reservoirs and diversions warrant more detailed investigation and technical documentation. These objectives support both Task 3 – Identify Key Diversion Structures and Task 5 – Identify Key Storage Reservoirs and Develop Operating Memoranda. Information in this memorandum is believed to be accurate. However, this information should not be relied upon in any legal proceeding.

Approach

Prior to the meeting, potential key structures for District 4 were identified using the following procedure outlined in the SPDSS Scope of Work:

- 1) Identify net absolute water rights per structure. Select initial key structure cutoff value based on the 85 percent recommendation (SPDSS Feasibility Study, October 2001) for each Water District.
- 2) Determine average annual diversion data for structures during three average hydrologic years, one year each during the 1950s, the 1970s and the 1990s. Add additional structures to the key list that diverted an average of 1,000 acre-feet (af) per year on the main stem during any of the representative years. Note that this step will allow the inclusion of larger diversion structures having active water rights during the earlier years of the study that were subsequently transferred to other ditches or other uses.
- 3) Review readily available straight-line diagrams and include additional structures as appropriate, based on water rights and location.

Table 1, provided at the end of this memorandum, summarizes the initial list of key diversion structures, the total of their decreed water rights, the period of record of

available diversion records, their average annual diversions for the period of record and the water source. In addition, as noted in the comment line, it includes new structures added during the interviews, or structures that were removed and will be modeled in an aggregated fashion. Table 1 generally lists structures in upstream to downstream order. On-going Task 3 efforts include review of irrigated acreage, water rights, and diversion records. It is expected that the key structure list shown in Table 1 will be further refined during these, and model development, efforts.

The interview with the Water Commissioner and the Division Engineer was intended to determine additional structures that should be considered key based on seniority, water administration or basin operations (including structures with supplemental reservoir water). Prior to the meeting, a brief description of the purpose and goals of the interview was provided to the Water Commissioner, Fred Renner. The following is a summary of the meeting agenda:

- 1) Review straight-line diagrams for accuracy.
- 2) Develop a list of major projects, reservoirs, and ditches in the Water District, including names of knowledgeable contact people.
- 3) Gather information on dry-up points on the river, calling rights, augmentation plans and administration specific to the Water District.
- 4) Gather general information on the preliminary list of irrigation diversions selected to included in future detailed modeling efforts (key structures) and solicit input on their final inclusion.
- 5) Develop information on reservoirs, such as owner entities, ditches that get reservoir deliveries, assigned delivery losses, etc.

David Ellington, Division 1, developed a preliminary straight-line diagram of Water District 4. In addition, LRE developed maps of the Water District to facilitate the discussions. Maps displayed reservoirs, diversion headgate locations, and canal layouts on a quad-sheet background.

Meeting Attendance

The meeting was held at the Division 1 offices in Greeley. The following people attended part or all of the meeting:

Jim Hall – Division 1 Engineer
Fred Renner– District 4 Water Commissioner
David Ellington – Division 1
Ray Bennett – SEO Denver
David Nettles – Division 1
Erin Wilson – Leonard Rice Engineers

Meeting Notes

Fred Renner was Water District 4 deputy water commissioner from 1983-1987, then Hydrographer until he became the water commissioner in 2002.

Transbasin Diversions

Colorado-Big Thompson (C-BT) deliveries are made to most diverters in District 4, as discussed in the C-BT section, below. There are no other transbasin diversions delivered to District 4.

Compacts and Agreements Affecting District 4 Administration

There are no compacts or agreements that specifically impact the administration in Water District 4.

Stream Gages and General Administration

- The YMCA pipeline is the only diversion on the Wind River. The pool at the outlet of the Adams Tunnel delivers 2 cfs to the Wind River based on an informal agreement. Bypass flows are measured at the Rams Horn Tunnel gage (WINDBYPCO).
- The Division of Water Resources (DWR) Adams Tunnel above Estes Park (09013000, ADATUNCO), Adams Tunnel bypass via the Rams Horn Tunnel (WINDBYPCO) and Big Thompson River at Estes Park above Lake Estes (06733000, BTABESCO) gages are considered good.
- The Fish Creek near Estes Park (06734500, FISHESCO) gage is considered good.
- The DWR Olympus Tunnel (06734900, OLYDAMCO) and Big Thompson River near Estes Park below Lake Estes (06735500, BTBLESCO) gages are considered good.
- The North Fork Big Thompson River near Drake gage (06736000, BTNFDRCO) is considered good.
- The DWR Big Thompson River at Mouth gage (06738000, BTCANYCO) is considered good.
- Northern Colorado Water Conservancy District (NCWCD) gages on the Carter Lake system (above Flatiron Reservoir, below Flatiron Reservoir, and Hansen Feeder Canal Wasteway-06738100) are considered good.
- There is very little administration of diversions on Fish Creek because of minimal water usage. Generally by the time there is a downstream call, Fish Creek is physically out of water.
- There are four main diversions from the North Fork of the Big Thompson River (Bartholf Ditch 2, Bartholf Ditch 1, Kinkaid Ditch and Hershman Ditch 2). Fred calls and lets these ditch owners know when they are in priority. The headgates for these ditches are in poor shape and the ditches have pumps on the river that are decreed as alternate points of diversion.
- Wells are used for domestic use in the upper basin. Augmentation for well use in subdivisions is covered under several plans. The Water Association of the Rockies manages one of the larger augmentation plans.
- Ground water is generally used only to supplement surface water sources in the lower basin (east of Interstate 25). There may be a few wells on the Hillsborough Ditch and the Big Thompson and Platte River Ditch that are used for supplemental water supply.
- For the most part, the larger diversions east of the foothills have continuous records. Smaller diversions upstream from the foothills are observed and recorded by the water commissioner at least monthly.

- Greater than 90 percent of lands in Water District 4 are flood-irrigated. The ~10 percent of sprinkler lands are located east of Interstate 25 and use ditch water through their sprinklers.
- Alfalfa, corn, and sugar beets are typically grown east of Interstate 25. Pasture grass is generally grown west of Interstate 25.
- The following table provides a normal-year river call sequence:

Normal-Year River Call Sequence

Winter	The senior storage right is the Lone Tree Reservoir filled via the Home Supply Ditch, which dries up the river except for 3.44 cfs passed to the City of Loveland. Lake Loveland is filled via the Barnes Ditch, and Ryans Gulch Lake and South Side Reservoir store water from Ryans Gulch.
March 1	Boedecker Reservoir (aka Mariano Lake) begins storing via the George Rist Ditch (storage right is senior to Lake Loveland, but water is generally not available in winter since Buckhorn Creek confluence is below the headgate). Donath Lake under the Loudon Ditch is senior to Boedecker but generally waits until April to start filling and fills in 10 days.
Begin Irrigation Season – mid-April to May 1 st	Direct Right Diversions (South Side Ditch first and then Loveland 202A water and other decrees) come on but District reservoirs still store to the extent possible – Lake Loveland, then Horseshoe Lake, then Boyd Lake.
May 1 st to May 15 th	Direct Right Diversions (Hillsborough Ditch, Big T Manufacturing Ditch, Greeley Loveland Canal, and Buckingham Ditch) begin diverting, but not full decrees because the demand is limited.
Early-June	Runoff – Direct rights in priority, no calls for ~2 weeks. Boyd Lake may fill if not already full.
Late-June until mid-July	Priority 31 (5/18/1876) to 38 (11/1/1877) are calling water rights; Junior ditches use C-BT.
Mid July to End of Irrigation Season (September 20 th to 26 th)	Priority < 20 (5/1/1872) are calling water rights; C-BT use for most ditches.

- Peak spring flows generally 1,200 cfs – 1,500 cfs at the canyon mouth for about 2 weeks (generally early-June).
- Most years, Lone Tree Reservoir fills under its senior storage decree. Other reservoirs in the Big Thompson and Little Thompson basins need runoff to fill completely. Boyd Lake will not fill if not full at end of runoff. The Handy Ditch system reservoirs are similar as they have storage rights junior to Boyd Lake.
- Little Thompson River storage occurs during the runoff. Ish Reservoir's 1st decree, then Culver Reservoir, then Ish Reservoir's 2nd decree.
- All reservoirs typically fill based on the one-fill rule, including C-BT supplies.
- In general, ditch irrigation service areas do not overlap in District 4. There are numerous exchanges between canals and storage where an upstream ditch diverts in exchange for downstream reservoir releases.
- Direct diversion water rights on the Big Thompson are generally senior to rights on the main stem South Platte River; therefore main stem calls don't affect administration during the irrigation season.
- Most of the Big Thompson storage rights are senior to South Platte storage rights. However, Big Thompson storage rights are generally junior to South Platte direct flow rights. Therefore, if a direct flow right call is placed on the South Platte River in the spring, diversion on the Big Thompson River will go to direct flow rights instead of storage.
- Potential dry-up points on the Big Thompson River during irrigation season, include downstream of Big T Manufacturing Ditch, Greeley Loveland Canal, Handy Ditch, Hillsborough Ditch, and Big Thompson and Platte Ditch. Winter dry-up points include Home Supply Ditch and Barnes Ditch.
- The Big Thompson River is considered a gaining river. During an average year, it may gain 30 cfs between the mouth of the canyon and the Greeley Loveland Canal headgate (~2 cfs/mile) and 30 to 35 cfs from Greeley Loveland Canal to the confluence with the South Platte. Gains are from tributary inflow, canal leakage, and ground water returns.
- The Little Thompson River generally loses water to the Osborne Caywood Ditch #1 headgate and gains water below from tributary inflow, canal leakage and ground water returns.

C-BT Water and Municipal Use

- C-BT water use for hydropower generation and deliveries to District 4 C-BT allottees is the major administrative effort in the basin. USBR handles the hydropower generation while NCWCD handles daily orders for supplemental C-BT deliveries. NCWCD notifies Fred of the orders, and Fred makes sure deliveries get to the allottees headgates. C-BT use within District 4 has historically been primarily for irrigation. The cities of Loveland and Greeley are the major C-BT recipients of C-BT water for municipal uses.
- Major C-BT storage units operated by NCWCD include the following:
 - Carter Lake (0404513) ~ 112,200 af capacity
 - Horsetooth Reservoir (0404372) ~ 156,700 af capacity

- Lake Estes (0404128) ~ 6,400 af capacity
 - Flatiron Reservoir
- No losses are assigned to C-BT deliveries at or above the Hillsborough Ditch. C-BT deliveries below the Hillsborough Ditch, usually to the South Platte are assigned a 10 percent loss.
- C-BT water is delivered to Mary's Lake via the Adams Tunnel, which is then delivered down to Lake Estes after passing through a power plant. Native water in Lake Estes is 'skimmed' off for hydropower generation through the Olympus Tunnel (550 cfs capacity). Minimum releases from Lake Estes to the river are 25 cfs to 75 cfs, by agreement, and native water is generally used to meet these requirements. Water from the Olympus Tunnel is conveyed to Pinewood Reservoir for power generation on the way to Flatiron Reservoir. This storage water, along with water delivered from Carter Lake to Flatiron Reservoir, is conveyed to the Flatiron Hydropower generating station. Outflows from the Flatiron power plant can be conveyed both north and south via the Hansen Feeder Canal. Native water released through Olympus Tunnel is accounted for and returned at the tri-furcation either through the power plant or the wasteway, if the power plant capacity (390 cfs) is exceeded.
- C-BT water and native water delivered from Lake Estes to the Big Thompson River can be turned out for power generation through Dille Tunnel (75 cfs capacity). Outflows return about 3 miles downstream.
- C-BT water is generally delivered to junior agricultural users in mid-July and to all agricultural users in August, September, and sometimes into October for storage.
- Big Thompson irrigators that have C-BT units include the following, listed generally from upstream to downstream:
 - Handy Ditch
 - Home Supply Ditch
 - South Side Ditch
 - George Rist Ditch
 - Louden Ditch
 - Big Barnes Ditch
 - Greeley Loveland Canal
 - City of Evans runs its C-BT water through the Greeley Loveland Canal
 - Big Thompson Manufacturing Ditch
 - Big Thompson and Platte River Ditch, although it rarely calls for this water
- The Handy Ditch receives water from Carter Lake directly down Dry Creek into the ditch company's Hertha Reservoir. In addition to deliveries attributable to its own C-BT shares, the Handy Ditch Company is entitled to 190 af per year of water from Carter Lake as compensation for the interception of Dry Creek flows by the C-BT system. Dry Creek ends at Hertha Reservoir for all practical purposes.
- Carter Lake and Horsetooth Reservoir have native storage decrees that are able to store some flows during wet years.
- The **City of Loveland** conveys raw water to their filter plant via include Green Glade Ridge Reservoir (0403659 ~ 6,800 af capacity) and the City of Loveland Pipeline (0400511).
 - The City of Loveland can take C-BT water directly from the Hansen Feeder Canal to Green Glade Ridge Reservoir, which ultimately feeds into the City's

filter plant. The reservoir is located north of the river and west of the hogback. The Loveland Pipeline, which diverts off the north side of the river using a river dam shared with the Home Supply Ditch headgate, delivers direct water to the City's filter plant and is used as an alternate point for 202A and CBT water.

- The City of Loveland has a number of transfers, including the "202A" transfers, which includes water changed to municipal uses from the following ditches:
 - South Side Ditch
 - Louden Ditch
 - Big Barnes Ditch
 - George Rist Ditch (Buckingham Ditch)
 - Greeley Loveland Canal
 - Big Thompson Manufacturing Ditch
 - Farmers Ditch
 - Home Supply Ditch
- The City of Loveland's 202A decrees specify dates when they can start taking direct diversions. Return flow obligations for the transfers are met by waste water returns from the treatment plant, which discharges upstream of Hillsborough Ditch.
- The **City of Greeley**'s water supply includes sources from both the Poudre and Big Thompson Rivers. Their Big Thompson River supply comes from their shares in the Greeley Loveland Irrigation Company and is treated at the Boyd Potable Treatment Plant before being piped to the city. Water can be delivered for treatment directly from Boyd Lake or Lake Loveland. This source is used by Greeley to provide summer peaking supplies.

Ditch Specific Information – Upper Big Thompson River

- **Wind River** is the recipient of bypass flows from the Adams Tunnel. With the exception of the YMCA, there are no diversions from Wind River.
- **Lake Estes** (0404128 ~ 6,400 af) receives C-BT water in addition to native flows from Fish Creek and the Big Thompson River. Fred tracks native versus C-BT water in the lake although these historical data are probably not digitized.
- The town of **Estes Park** receives C-BT water via a pipeline from Mary's Lake and from Glacier Creek under an augmentation plan.

Ditch Specific Information – Big Thompson River (Below Hansen Feeder Canal)

- **Handy Ditch** (0400521) is a senior ditch on the river and utilizes the following storage units for late season deliveries
 - Hertha Reservoir (0404166) ~ 1,700 af capacity
 - Welch Reservoir (0404146) ~ 6,705 af capacity
 - Loveland Reservoir (0404133) ~ 2,200 af capacity

The Town of Berthoud has the senior water right in the Handy Ditch and receives this water via a pipeline from Welch Reservoir to Berthoud Reservoir. The Town of Berthoud also has an alternate point of diversion for this right directly from Carter Lake that required they leave 1.6 cfs in the ditch to account for ditch loss. The Handy Ditch tails into Home Supply Ditch which carries the water to Handy Ditch users.

- **Home Supply Ditch** (0400524) diverts from the south side of the river below the Handy Ditch. The two ditches can irrigate the same lands to the north and east of Berthoud (above Lone Tree Reservoir). The Home Supply Ditch conveys water to the following storage units:

- Lone Tree Reservoir aka Farwell Reservoir (0404137) ~ 9,179 af capacity, with the senior storage right on the river (1881 appropriation date)
- Lon Hagler Reservoir (0404136) ~ 5,300 af capacity
- Boedecker Reservoir aka Mariano Lake (0404134) ~ 5,800 af capacity, is owned by the Home Supply Ditch Company but filled via the George Rist Ditch (0400520). Lon Hagler Reservoir releases are conveyed to Boedecker Reservoir by pipeline. The Home Supply Ditch can release Boedecker Reservoir water to the river above the Greeley Loveland Canal to several downstream ditches (including Hillsborough, Greeley Loveland, Big Thompson, Farmers) in exchange for out-of-priority diversions at its headgate.

The Home Supply Ditch serves the Town of Johnstown via a pipeline out of Lone Tree Reservoir.

- **South Side Ditch** (0400543) diverts for irrigation purposes and to fill South Side Reservoir (0404142, 700 af capacity). The South Side Ditch can release reservoir water to the river above the Farmers Irrigation Canal in exchange for out-of-priority diversions at its headgate.
- **Louden Ditch** (0400530) diverts for irrigation purposes and can fill Rist Benson Reservoir (0404138, 520 af capacity), and Donath Reservoir (0404116, 1,148 af capacity). Releases from Rist Benson Reservoir flow directly to Big Barnes Ditch and are exchanged for diversions at the Loudon Ditch headgate. The City of Loveland is a Loudon Ditch shareholder and can use the ditch to operate exchanges. Some of the return flows from lands irrigated under the Loudon Ditch go to Fossil Creek and the Poudre River.
- **George Rist Ditch** (0400520) is partially owned by Loveland and used to irrigate a golf course, irrigate pasture on ~35 acre horse properties, as a carrier to Buckingham Ditch, and to deliver 202A water. The ditch can divert to Buckingham Reservoir aka Rist Reservoir (0404139) ~300 af capacity and Boedecker Reservoir, the latter via the Home Supply Ditch storage right in Boedecker Reservoir.
- The **Greeley Loveland Canal** (0400532) is owned and operated by the Greeley Loveland Irrigation Company based in Greeley. The canal is commonly referred to as the Loveland Greeley Canal to the west of Interstate 25 and referred to as the Greeley Loveland Canal to the east of Interstate 25. **Big Barnes Ditch** aka Chubbuck Ditch (0400501) is owned by the Greeley Loveland Irrigation Company and is used to fill the following reservoirs for the benefit of shareholders in the different reservoir companies that irrigate under the Greeley Loveland Canal and associated laterals:
 - Lake Loveland (0404131) ~ 12,700 af capacity. Owned by the Lake Loveland Company.

- Horseshoe Reservoir aka Seven Lakes Reservoir (0404155) ~ 8,300 af capacity. Owned by the Seven Lakes Reservoir Company.
- Boyd Lake (0404110) ~ 49,000 af capacity. Owned by the Greeley Loveland Irrigation Company. The City of Greeley has a filter plant on Boyd Lake that it uses for peaking supplies (May-October) to supplement its main Bellvue treatment plant, located on the Poudre River. The City of Greeley can also pump out of Lake Loveland for municipal supply.
- Water can be transferred from the top reservoir (Lake Loveland) through Horseshoe Reservoir down to the lower reservoir (Boyd Lake) by gravity, although the relative storage priorities are 1) Lake Loveland, 2) Horseshoe Reservoir, 3) Boyd Lake. Operationally, Boyd Lake fills first, then Horseshoe Reservoir, then Lake Loveland.
- **Rist and Goss Ditch** (0400541) water is primarily diverted as an alternate point by the City of Loveland. Some water is run through the ditch under Loveland Ready Mix decree. Total diversions to the City are limited to 290 af between April and October.
- **Big Thompson Ditch** aka Big Thompson Manufacturing Ditch (0400503) is a very senior ditch that runs water for ~12 irrigators.
- **Farmers Ditch** (0400519) delivers water primarily for irrigation. The City of Loveland sometimes runs C-BT water down the ditch to irrigate ball fields.
- **Hillsborough Ditch** (0400523) runs water for irrigation and has the majority of the number one priority water on the Big Thompson. Water is also run through the ditch for other shareholders, including for gravel pit augmentation, recharge ponds, and for the Town of Milliken. Some irrigation return flows accrue to the Little Thompson River. There may be some well users on the ditch.
- **Hill and Brush Ditch** (0400522) runs water exclusively for irrigation purposes.
- **Big Thompson and Platte River Ditch** (0400502) delivers water for irrigation purposes and some augmentation for Central Colorado Water Conservancy District. There may be some well users on the ditch.
- **Evans Town Ditch** (0400517) is used for irrigation of green belts and parks. Note that municipal water for Evans is provided by the City of Greeley.

Ditch Specific Information – Little Thompson River

- Pinewood Springs and Big Elk Meadows are two direct diverters on the Little Thompson River that have a limited physical water supply. Pinewood Springs uses wells and infiltration galleries.
- Most ditches on the Little Thompson River have C-BT units. The larger ditches include the following, listed generally from upstream to downstream:
 - Culver Mahoney Ditch
 - Boulder and Larimer Ditch
 - W R Blower Ditch
 - Eagle Ditch
 - Jim Eglin Ditch
 - Osborne Caywood Ditch – No. 1 water right and dry up point
 - Rockwell Ditch – uses C-BT when called out by South Platte

- Miner Longan – uses C-BT when called out by the South Platte Little Thompson Turn Outs 1 and 2 on the St. Vrain Supply Canal provide C-BT water for Little Thompson River ditches.
- The **Beeline Ditch** at the bottom of the Little Thompson River has no C-BT water and is often called out by the South Platte River ditches during summer months.
- **Boulder Larimer Ditch** (aka Ish Ditch) (0400588) delivers storage water to Ish Reservoir (0404156 aka Boulder Larimer Reservoir, 7,000 af capacity). Shareholders below the reservoir receive water from the Old Ish Ditch and the New Ish Ditch lateral and also receive share water from the Highland Ditch Company via Highland Reservoir No. 2, which stores water in the St. Vrain River basin.
- **Culver Ditch** (0400590) diverts water for irrigation uses and can fill Blue Mountain Reservoir (0404159) ~150 af capacity. A small part of the Culver Ditch is used for augmentation flr Pinewood Springs.

Recommended Detailed Documentation

Technical memoranda should be developed and included in the Basin Information Report for each of the following key structures in District 4:

- Home Supply Ditch
- City of Loveland
- Greeley Loveland Ditch
- Boulder Larimer Ditch (aka Ish Ditch)
- City of Greeley

WATER DISTRICT 4

Structure	Name	Decree (cfs)	Period of Record	Avg. Ann. Div. (af)	Source	Comment	Key?
0400501	BARNES DITCH	3021.78	1949 - 2003	35,538	BIG THOMPSON RIVER	Feeder to reservoirs and lands under Loveland Greeley Canal	Yes
0400502	BIG T PLATTE R DITCH	95.00	1949 - 2003	9,703	BIG THOMPSON RIVER		Yes
0400503	BIG THOMPSON D MFG	57.89	1949 - 2003	4,693	BIG THOMPSON RIVER		Yes
0400510	CARTER LAKE SUP CNL		1974 - 1980	1,388	BIG THOMPSON RIVER	Reported under Hansen Feeder	No
0400511	LOVELAND PIPELINE	131.34	1949 - 2003	5,712	BIG THOMPSON RIVER		Yes
0400517	EVANSTOWN DITCH	29.28	1949 - 2003	7,950	BIG THOMPSON RIVER		Yes
0400518	ESTES PARK, CITY OF		1973 - 2003	1,330	BIG THOMPSON RIVER	Administrative node that includes all sources diverted to City	Yes
0400519	FARMERS IRR CANAL	74.08	1949 - 2003	5,592	BIG THOMPSON RIVER		Yes
0400520	GEORGE RIST DITCH	712.79	1949 - 2003	4,860	BIG THOMPSON RIVER		Yes
0400521	HANDY DITCH	2470.98	1949 - 2003	17,398	BIG THOMPSON RIVER		Yes
0400522	HILL BRUSH DITCH	27.00	1949 - 2003	1,972	BIG THOMPSON RIVER		Yes
0400523	HILLSBOROUGH DITCH	284.25	1949 - 2003	16,685	BIG THOMPSON RIVER		Yes
0400524	HOME SUPPLY DITCH	1581.40	1939 - 2003	31,610	BIG THOMPSON RIVER		Yes
0400525	HORSETOOTH SUP CNL		1951 - 1980	10,050	BIG THOMPSON RIVER	Reported under Hansen Feeder	No
0400530	LOUDEN DITCH	939.57	1949 - 2003	14,284	BIG THOMPSON RIVER		Yes
0400532	LOVELAND GREELEY CANAL	839.97	1949 - 2003	20,741	BIG THOMPSON RIVER		Yes
0400540	DILLE TUNNEL	391.00	1992 - 1999	1,771	BIG THOMPSON RIVER		Yes
0400541	RIST GOSS DITCH	59.79	1944 - 2003	546	BIG THOMPSON RIVER		Yes
0400543	SOUTH SIDE DITCH	196.05	1950 - 2003	2,472	BIG THOMPSON RIVER		Yes
0400545	BERTHOUD WATER WORKS	7.14	1991 - 2003	1,096	BIG THOMPSON RIVER		Yes
0400546	JOHNSTOWN FILTER PLANT		1996 - 2003	2,139	BIG THOMPSON RIVER	Administrative node that includes all sources diverted to City.	Yes
0400587	BEELINE DITCH	40.00	1949 - 2003	2,388	LITTLE THOMPSON CR		Yes
0400588	BOULD LARIM CO IRR MFG D	2481.72	1949 - 2003	9,948	LITTLE THOMPSON CR		Yes
0400603	W R BLOWER DITCH 1		1949 - 2003	505	LITTLE THOMPSON CR		Yes
0400592	EAGLE DITCH	8.00	1956 - 2003	351	LITTLE THOMPSON CR		Yes

WATER DISTRICT 4

Structure	Name	Decree (cfs)	Period of Record	Avg. Ann. Div. (af)	Source	Comment	Key?
0400596	JIM EGLIN DITCH		1949 - 2003	495	LITTLE THOMPSON CR		Yes
0400599	MINER LONGAN DITCH	48.80	1949 - 2003	572	LITTLE THOMPSON CR		Yes
0400600	OSBORNE CAYWOOD DITCH	8.12	1949 - 2003	771	LITTLE THOMPSON CR		Yes
0400601	ROCKWELL D ROCKWELL P P	21.00	1949 - 2003	869	LITTLE THOMPSON CR		Yes
0400602	SUPPLY LATERAL DITCH	58.59	1949 - 2003	1,531	LITTLE THOMPSON CR		Yes
0400632	LONGAN DITCH	5.70			SEEPAGE	On Straight Line Diagram No Divn Records	No
0400661	ESTES PARK WTR CO PL		1968 - 1971	11,152	FALL RIVER		No
0400691	HANSEN FEEDER CNL FLOW N		1996 - 1998	83,216	COLORADO RIVER		Yes
0400692	ST VRAIN SUPPLY CANAL				TRANSBASIN WATER		Yes
0400702	GREELEY FLTR PLNT/BOYD L		1995 - 2000	10,910	BIG THOMPSON RIVER	City Demand represented as Key, satisfied from Poudre & Big Thompson	Yes
0400705	BIJOU D		1951 - 1976	7,423	SOUTH PLATTE RIVER		No
0400706	HERHOLD DITCH		1951 - 1981	2,990	FISH CREEK		No
0400534	MARIANA DITCH		1968 - 2003	335	BIG THOMPSON RIVER		No
0400535	MARIANA OUTLET		1969 - 1981	8,136	BIG THOMPSON RIVER		No
0400551	A G PEARSON PL		1996 - 1999	12	WIND RIVER		No
0400561	BLACK CANNON DITCH		1989 - 1999	221	BLACK CANNON		No
0400568	BARTHOLF DITCH 1		1989 - 1990		N FORK BIG THOMPSON		No
0400569	BARTHOLF DITCH 2		1989 - 1990		N FORK BIG THOMPSON		No
0400571	HERSHMAN DITCH 2		1989 - 1990		N FORK BIG THOMPSON		No
0400572	KINKAID DITCH		1989 - 1990		N FORK BIG THOMPSON		No
0400574	BUCKHORN HIGHLINE DITCH		1949 - 2003	543	BUCKHORN CREEK		No
0400578	KIRCHNER DITCH		1949 - 2003	195	BUCKHORN CREEK		No
0400580	PERKINS DITCH		1949 - 2003	496	BUCKHORN CREEK		No
0400582	UNION DITCH		1949 - 1995	659	BUCKHORN CREEK		No
0400583	VICTORY IRR CNL		1949 - 2003	666	BUCKHORN CREEK		No
0400634	RYAN GULCH OUTLET		1969 - 1981	1,059	BEAVER CREEK		No
0400641	HUPPE DITCH		1999 - 2000		SEEPAGE		No
0400662	BACON RES. OUTLET		1977 - 1981	397	SEEPAGE		No
0400707	RIST BENSON OUTLET		1976 - 1981		BIG THOMPSON RIVER	Reservoir outlet	No

WATER DISTRICT 4

Structure	Name	Decree (cfs)	Period of Record	Avg. Ann. Div. (af)	Source	Comment	Key?
0400718	ARKINS BUCKHORN PUMP		1985 - 1991	5	BUCKHORN CREEK		No
0400730	BUCKINGHAM DITCH		1999 - 2003	447	BIG THOMPSON RIVER	Diverts off George Rist	No
0401001	BIG T PWR PLNT AT CANYON		1997 - 1998		BIG THOMPSON RIVER		No
0401499	LOUDEN/MCKEAN PUMP		1995 - 2000	45	BIG THOMPSON RIVER		No
0401629	WELDON SPG		1994 - 1999	55	SPRINGS		No