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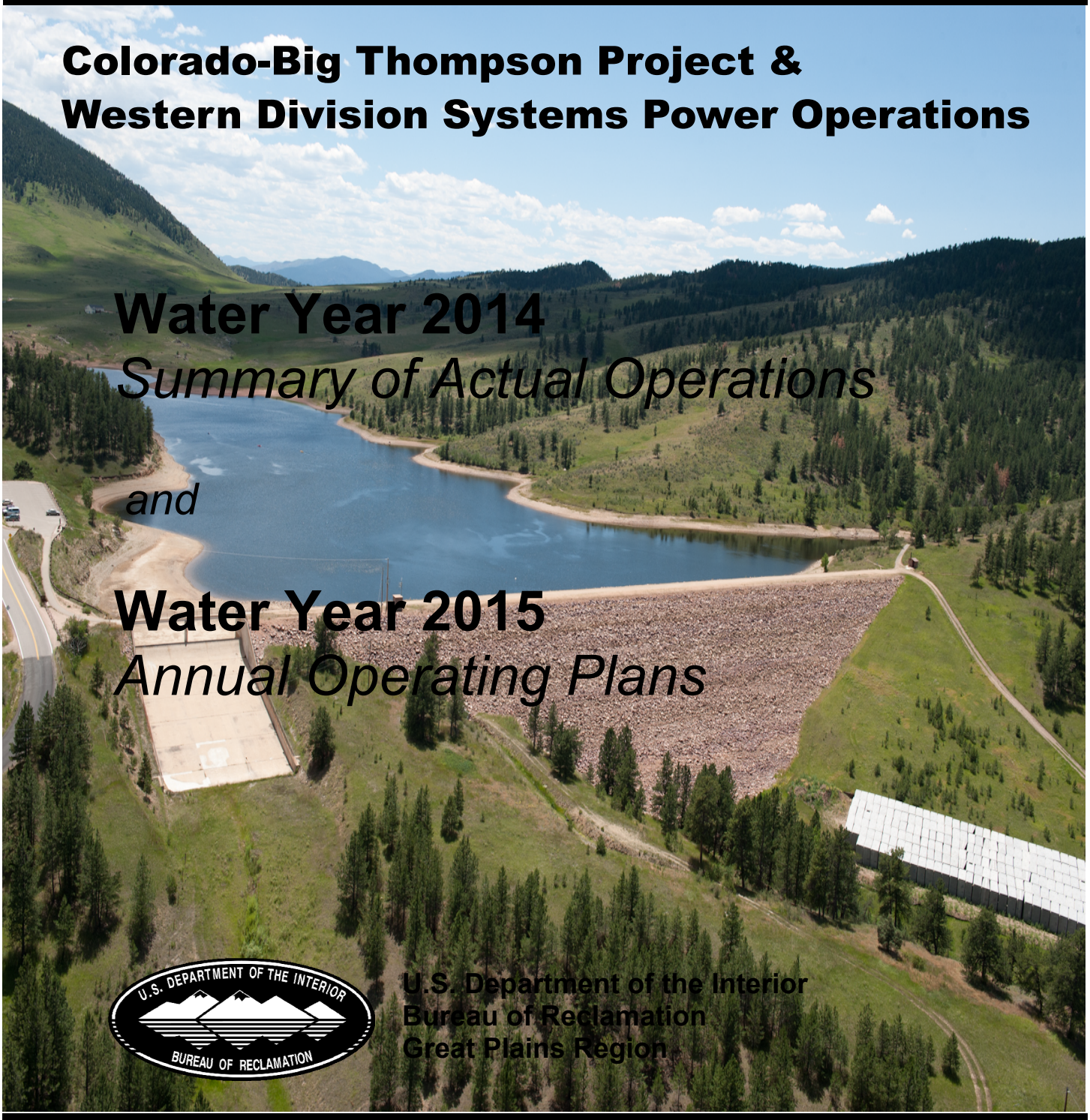
Managing Water in the West

Annual Operating Plans



Colorado-Big Thompson Project & Western Division Systems Power Operations

Water Year 2014

Summary of Actual Operations

and

Water Year 2015

Annual Operating Plans

U.S. Department of the Interior
Bureau of Reclamation
Great Plains Region

This report is the 63rd Annual Report for the Colorado-Big Thompson Project. Its purpose is to inform interested parties of the coordinated operation of the project. The report has two main parts: one which describes the actual operation of the project during water year (WY) 2014 and the plan of operation for WY 2015, while the other presents the hydropower operations for WY 2014 and the forecast for WY 2015.

This report meets the requirement of the Stipulation dated October 5, 1955, as amended October 12, 1955, and filed with the United States District Court for the District of Colorado in Civil Action Nos. 2782, 5016, and 5017 for an annual report of the Green Mountain Reservoir Operations and the Agreements in the Stipulation and Agreement of the Orchard Mesa Check Case (Colo. Water Div. 5, 91CW247) dated September 6, 1996, to produce a Historic Users Pool Annual Operating Plan (AOP).

COLORADO-BIG THOMPSON PROJECT
ANNUAL OPERATING PLANS

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DESCRIPTION OF THE COLORADO-BIG THOMPSON PROJECT

The Colorado-Big Thompson Project (C-BT) is one of the largest and most complex natural resource developments undertaken by the Bureau of Reclamation. It consists of over 100 structures integrated into a transmountain water diversion system through which multiple benefits are provided.

The C-BT spreads over approximately 250 miles in the state of Colorado. It stores, regulates, and diverts water from the Colorado River west of the Rocky Mountains, providing supplemental water for irrigation of 720,000 acres of land east of the Rocky Mountains. It also provides water for municipal use, industrial use, hydroelectric power, and water-oriented recreation. Additionally, it provides storage of replacement water to the west slope for agricultural, recreation, and environmental uses including supplemental fish flow. This replacement water ensures that senior water rights on the west slope are not impacted by diversions to the east slope.

Major features of the C-BT include; dams, dikes, reservoirs, powerplants, pumping plants, pipelines, tunnels, transmission lines, substations, and other associated structures (Table 1, Exhibit 1 and Exhibit 2).

Historically, the C-BT has diverted approximately 230,000 acre-feet (AF) of water annually (310,000 AF maximum) from the Colorado River headwaters on the western slope to the South Platte River basin on the eastern slope, for distribution to project lands and communities. The Northern Colorado Water Conservancy District (NCWCD) apportions the water used for irrigation to more than 120 ditches and 60 reservoirs. Twenty-nine communities receive municipal and industrial water from the C-BT. The Western Area Power Administration markets the electric power produced at the six powerplants.

The western portion of the C-BT consists of a series of reservoirs forming a runoff collection system. This system captures runoff from the high mountains and stores, regulates, and conveys the water to Adams Tunnel for delivery to the east slope, passing under the Continental Divide.

Another C-BT west slope feature is Green Mountain Reservoir, a repayment facility used to regulate flows in the Colorado River. Pursuant to authorities in Senate Document 80, (which authorized the C-BT), the 1984 Green Mountain Operating Policy and the agreements in the September 1996 Stipulation and Agreement of the Orchard Mesa Check Case settlement (Case No. 91CW247, Colorado Water Div. 5), the content of the Historic Users Pool (HUP) in Green Mountain Reservoir is evaluated during the summer to determine the availability of water surplus for the needs of historic beneficiaries. If it is determined that surplus water is available, it may be delivered based upon need, first to the federal Grand Valley Powerplant, and then to other uses based on a priority system or on specific agreements.

Irrigation systems on the Colorado River, above the Blue River confluence, were improved to enable continued use of existing rights. Releases are made from Lake Granby to maintain the fishery in the Colorado River.

The C-BT's principal Colorado River storage facilities on the west slope are Lake Granby, Grand Lake, and Shadow Mountain Reservoir. Willow Creek Reservoir located on Willow Creek, a tributary to the Colorado River below Lake Granby, is also a principal C-BT west slope facility. Willow Creek Pumping Plant lifts the water 175 feet. It then flows by gravity via the Willow Creek Feeder Canal to Lake Granby.

Completed in 1953, Willow Creek Reservoir has a total storage capacity of 10,600 AF. The uncontrolled spillway, located at the left abutment, has a maximum flow capacity of 3,200 cubic feet per second (cfs). The Willow Creek Feeder Canal begins at the left abutment and has a capacity of 400 cfs. The canal is used to transfer water to Granby Reservoir. Excess inflow of water into the reservoir is transferred by the Willow Creek Feeder Canal and pumped to Lake Granby for storage.

Granby Reservoir is located on the upper Colorado River, and was completed in 1950. The reservoir stores the flow of the Colorado River and water pumped from Willow Creek Reservoir. The reservoir has a total storage capacity of 539,800 AF. Flows through the spillway are controlled by two radial gates with a total release capacity of 11,500 cfs.

Granby Pumping Plant lifts the water 99 feet from Lake Granby to Granby Pump Canal. The canal conveys the water 1.8 miles to Shadow Mountain Lake, which also intercepts flows from the North Fork of the Colorado River. Shadow Mountain Lake connects with Grand Lake to make a single body of water, from which diversions flow into Adams Tunnel to be conveyed to the eastern slope. The Granby Pumping Plant has three units with a combined installed capacity of 1,200 cfs.

Emerging from Adams Tunnel into the East Portal Reservoir, the water flows across Aspen Creek Valley in a siphon and then under Rams Horn Mountain through a tunnel. At this point, it enters a steel penstock and falls 205 feet to Mary's Lake Powerplant. This powerplant is located on the west shore of Mary's Lake. The water is conveyed between Mary's Lake and Estes Powerplant, through Prospect Mountain Conduit and Prospect Mountain Tunnel.

Lake Estes is located on the Big Thompson River, and is formed by Olympus Dam, completed in 1949. It serves as an afterbay for the Estes Powerplant. The storage in Lake Estes and the forebay storage in Mary's Lake enable the Estes Powerplant to meet daily variations in energy demand. Lake Estes has a total capacity of 3,100 AF. It captures the discharge of Estes Powerplant, and inflow coming from the Big Thompson River. It also regulates river flow below the dam, and releases water to the Foothills Power System via Olympus Tunnel (550 cfs capacity). The Estes Powerplant has three hydroelectric units with a total capacity of 45 megawatts. The combined flow capacity for the three units is 1,300cfs. The spillway, located

on the right abutment, has five radial gates with a total discharge capacity of 21,200 cfs. The center gate has been automated, and is operated remotely from the Casper Control Center (CCC). During the winter months, C-BT water is diverted through Adams and Olympus Tunnels and routed through the Foothills Power System to terminal storage at Carter and Horsetooth Reservoirs. This entire operation is controlled remotely from the CCC.

Water from Lake Estes and the Big Thompson River is conveyed by Olympus Siphon and Tunnel, and Pole Hill Tunnel and Canal, to a penstock through which the water drops 815 feet to Pole Hill Powerplant. The flow is then routed through Pole Hill Powerplant afterbay, Rattlesnake Tunnel, Pinewood Lake, Bald Mountain Pressure Tunnel, and eventually dropped 1,055 feet through two penstocks to Flatiron Powerplant. This powerplant discharges into Flatiron Reservoir, which regulates the water for release to the foothills storage and distribution system. The afterbay storage in Flatiron Reservoir and the forebay storage in Pinewood Lake enable Flatiron Powerplant to regulate power releases to meet daily power loads.

Flatiron Reservoir pump/turbine lifts water as much as 297 feet, and delivers it through Carter Lake Reservoir Pressure Conduit and Tunnel to Carter Lake Reservoir. When the flow is reversed, the unit acts as a turbine-generator and produces electricity, discharging back into Flatiron Reservoir.

The Saint Vrain Supply Canal delivers water from Carter Lake Reservoir to the Little Thompson River, St. Vrain Creek, and Boulder Creek Supply Canal. The latter delivers water to Boulder Creek and Boulder Reservoir. The South Platte Supply Canal, diverting from Boulder Creek, delivers water to the South Platte River.

The Charles Hansen Feeder Canal (CHFC) transports water from Flatiron Reservoir to the Big Thompson River and Horsetooth Reservoir. The canal crosses the Big Thompson River in a siphon above the river and canyon highway. Water from the Big Thompson River can be diverted into the canal by Dille Diversion Dam one mile up the canyon mouth and used for power generation at Big Thompson Powerplant.

C-BT water deliveries and water diverted from the Big Thompson River for power generation purposes, are dropped through a chute from the feeder canal ahead of the siphon crossing, or are passed through the Big Thompson Powerplant to convert the available head to electricity.

Horsetooth Reservoir is located west of Fort Collins and is formed by Horsetooth Dam at the north end; Soldier, Dixon, and Spring Canyon Dams on the east; and Satanka Dike. An outlet at Soldier Canyon Dam supplies water to the city of Fort Collins, three rural water districts, Colorado State University, and the Dixon Feeder Canal for irrigation. The principal outlet from Horsetooth Reservoir is through Horsetooth Dam into the Charles Hansen Supply Canal. This canal delivers water to a chute discharging into the Cache La Poudre River and to a siphon crossing the river to supply the Windsor Reservoir and Canal Company. A turnout from the Supply Canal supplies the city of Greeley municipal water works. Water delivered to the river

replaces, by exchange, water diverted upstream to the North Poudre Supply Canal, which conveys it to the North Poudre Irrigation Company System.

SUMMARY OF OPERATIONS FOR WATER YEAR 2014

Review of Water Year 2014 Most-Probable Plan

The C-BT Most-Probable Annual Operating Plan (AOP 2014) for October 2014 was developed considering the effects of historical average runoff values, the expected demands and depletions of the NCWCD and Denver Water, pool levels recorded at the end of Water Year (WY) 2013, other average values, special operations such as previously planned system outages and maintenance schedules, and an assumed NCWCD quota of 70 percent.

The AOP 2014 assumed diversions through the Adams Tunnel totaling 242,800 AF during WY 2014. Most of that water was planned to be diverted between December 2013 through May 2014, leaving sufficient capacity within the system to convey Big Thompson River skim water used for power generation, and possibly Big Thompson River priority water during the late spring and early summer months.

The skim operation, according to the AOP 2014, could convey a total estimated volume of 44,500 AF of water. The skim volume, combined with an estimated 13,700 AF of C-BT water to be delivered through the trifurcation at the Big Thompson River canyon mouth, could potentially keep the Big Thompson Powerplant generating power from April through September 2014.

The Green Mountain Reservoir operational plan was developed considering the effects of upstream operations at Dillon Reservoir, forecasted depletions provided by Denver Water, average runoff values, anticipated system outages and planned special operations. Green Mountain Reservoir began the WY 2014 with an initial content of 107,059 AF. That content was expected to drop to 70,000 AF by late March, before rebounding and reaching a full pool by early July. According to the plan, the reservoir would physically fill in WY 2014 assuming a volume of inflow after depletions totaling 264,000 AF and depletions from Denver Water totaling 109,700 AF. The plan did not account for the Coordinated Reservoir Operations (CROS) in the spring, or the Grand Lake Water Clarity Initiative in August 2014.

The operations at Granby Reservoir are highly dependent on the runoff conditions on both sides of the Continental Divide. The conditions on the east slope have a direct effect on the diversions through the Adams Tunnel. The diversions through the Adams Tunnel affect the pumping operations at the Farr Pumping Plant, and consequently the reservoir levels at Granby Reservoir.

Granby Reservoir began the year with 371,018 AF in storage. Based on the diversion plans for the Adams Tunnel presented in the AOP 2014, the reservoir content was expected to drop to 242,100 AF by the end of April before rising to reach 401,000 AF by the end of July. Under the AOP 2013 Granby Reservoir was expected to finish the year with a storage content of 374,000 AF. The Farr Plant pumping volume to Shadow Mountain was expected to total 181,100 AF for the entire WY, with the bulk of the pumping operation taking place between

December and late April. Windy Gap pumping to Granby Reservoir was planned to total 20,000 AF during WY 2013. Meanwhile, pumping from Willow Creek to Granby was planned to total 40,900 AF, from April through July.

Carter Reservoir began the year with 49,912 AF of water in storage. Based on the AOP 2014 pumping to Carter Reservoir was to resume in late December, and continue through early May, with no interruptions. Another pumping operation was planned for September. A total of 94,900 AF of water were planned to be pumped to Carter Reservoir during WY 2014. The 2013 AOP also assumed 5,900 AF of water stored at Carter Lake, which could be used for power generation at Flatiron Powerplant Unit 3 during October 2013 to satisfy water demands along the CHFC while the C-BT facilities recovered from the September 2013 flood along the Front Range. Deliveries of water from Carter Reservoir were expected to total 86,100 AF; 77,700 AF of that C-BT water; and 8,400 AF from the Windy Gap Project. The boat ramps were expected to stay operational by the spring of 2014, based on those projections.

After the unexpected localized inflow caused by the flood of September 2013, Horsetooth Reservoir began WY 2014 with 94,523 AF of water in storage, significantly higher than normal. According to the AOP 2014, inflow to Horsetooth Reservoir was expected to total 127,400 AF by the end of September 2014, while the reservoir content was expected to rise from 94,523 AF to over 150,000 AF by June 2014. Deliveries of water were anticipated to total 100,900 AF for the entire WY 2014, with 94,700 AF coming from the C-BT Project, and 6,200 AF from the Windy Gap Project. The boat ramps were also expected to stay in the water during the entire WY, based on the AOP 2014 projections.

Three versions of the Annual Operating Plan were developed in October 2013; the Maximum-Reasonable Plan, Most-Probable Plan, and Minimum-Reasonable Plan. Only the Most-Probable Plan was considered in this report.

Weather Conditions and their Impact on C-BT Operations

Snowfall during the fall and winter seasons of WY 2014 was slightly below average in northern Colorado. The snowpack remained below average until the middle of January. Weather did not have a significant effect on C-BT operations during the fall and winter seasons.

The snowpack over the northern mountains of Colorado continued to increase during February and March, as a series of weather systems continued to move into the region. By late March the snowpack was near 140 percent of average at most locations in the northern mountains. Table 1 provides a view of the snowpack condition on April 1 at some of the watersheds within the C-BT system. Based on the snowpack condition, the runoff forecast for April 1 was also above average for most locations within the C-BT region. Table 2 provides the runoff forecasts for several C-BT facilities.

Table 1. Snow-Water Content for April 1, 2014

Watershed	Snow-Water Content		
	2014 (In.)	Avg. (In.)	% of Avg.
Green Mtn. Res	20.3	14.2	143
Willow C	13.7	9.3	147
Lake. Granby	16.1	11.0	146
Lake. Estes	14.6	9.8	149

Table 2. Runoff Forecast for Several Locations within the C-BT Area

Forecast of April-July Volume (KAF)						
	Chance of Exceeding					
Forecast Point	**95% Reason-able Min 1/**	**75%**	**50% Most Probable**	**25%**	**5% Reason-able Max 1/**	**Most Probable % Avg**
Green Mtn. Res	336	379	410	441	484	150
Willow Crk. Res	48	62	72	82	96	150
Lake Granby	226	267	295	323	364	150
Big Thompson River Above Lake Estes	64	79	90	101	116	129
Big Thompson R. at Canyon Mouth	69	97	116	135	163	125

1/ The probability is estimated to be 9 chances in 10 that the actual volume will fall between the reasonable minimum and reasonable maximum.

The CROS for WY 2014 was cancelled early in the spring because of the unusually high runoff projections. The CROS is an important component of the C-BT operations. CROS can be described as an initiative supported by reservoir operators over the west slope, in an effort to augment Colorado River flows at the 15-Mile reach near Grand Junction, Colorado. The goal of

the operation is to pass inflow during the peak of the runoff for the Colorado River to benefit endangered species of fish along that section of the river. CROS is voluntary and is planned in a way that it does not affect water supply, or hinder filling reservoirs. During years of extremely high runoff, CROS is often cancelled to prevent any potential flooding from occurring in vulnerable areas.

By April 2014, the snowpack stopped rising. Snowstorms continued, but they lacked the intensity of the winter storms. Temperatures also began to rise, allowing the runoff season to begin at some locations. The late spring storms and the cooler temperatures at high elevations extended the peak of the snow season at many locations during 2014.

The runoff season began in the middle of April, fed mainly by the low elevation snowpack. The Big Thompson River experienced a surge in runoff as early as April 10, 2014. The Big Thompson River produced 4,700 AF more than projected for the period April through July. The remaining watersheds in the C-BT also experienced high runoff for that period.

NCWCD declared a quota of 60 percent in April 2014 and that quota was held for the remainder of the WY. The quota assumed for the AOP 2014 had been 70 percent. The 10 percent reduction in the quota represented 31,000 AF decrease in water diversions from the west slope. Therefore, adjustments to water diversions from the west slope had to be incorporated into the May version of the Annual Operating Plan for the C-BT.

The Grand Lake Water Clarity Initiative planned for WY 2014 was announced in June and was included in the June version of the C-BT Annual Operating Plan. The plan for WY 2014 resulted in a no-pumping operation for the Farr Pumping Plant which ended on September 2, 2014. The new plan incorporated minimum diversions through the Adams Tunnel for August 2014.

The wet pattern experienced during the spring over the east slope and the eastern plains affected water demands significantly during the summer months. The wet weather of the spring months was followed by an active monsoonal season. The weather remained relatively wet during the summer, while the temperatures remained relatively mild. Demands for C-BT water were low the entire spring and summer seasons, and even into the fall. The flows in the Big Thompson River were adequate to satisfy the water demands most of the year, limiting the demands for C-BT water. The NCWCD quota was kept at 60 percent for the remaining of the WY.

The skim operation during WY 2014 was limited by the unavailability of the Dille Tunnel diversion structure most of the year. Despite the loss of the Dille diversions, the skim operation was conducted from May through September using water diverted via Olympus Tunnel. The Olympus Tunnel was also used to capture a substantial volume of east slope priority water. For the entire WY, the Olympus Tunnel captured 27,884 AF of priority water, from which 11,720 AF was pumped to Carter Reservoir, while 16,163 AF was moved to Horsetooth Reservoir. The Dille Tunnel was used temporarily while the Colorado Department of

Transportation was repairing the stretch of Highway 34 across the Narrows near the mouth of the Big Thompson River Canyon. During that operation the Dille Tunnel diversion structured captured 1,745 AF of water which was delivered to Horsetooth Reservoir.

The Big Thompson Powerplant did not begin to generate power until late June, 2014. The plant was damaged by the flood of September, 2013, and repairs were not completed until June, 2014. It took a significant effort to bring the powerplant back into service. Once the repairs were completed, the powerplant began to generate power. Power generation continued, from late June until the middle of August.

During the Grand Lake Water Clarity Initiative, water from Carter Reservoir was used to supply the C-BT allotees along the Big Thompson River and the CHFC. Flatiron Unit #3 was operated intermittently as a generator from the middle of August until early September 2014. Almost 1,936 AF of water from Carter Reservoir were used during the Grand Lake Water Clarity Initiative of 2014 to satisfy demands for C-BT water over the east slope. In addition, another 4,000 AF of water were used on October, 2013, immediately after the September flood, to satisfy the water demands for C-BT water. The AOP 2014 did not account for the Carter Reservoir water used during the Grand Lake Water Clarity Initiative of 2014. It did, however, account for 5,900 AF of water to be used in October, 2013, 1,900 AF more than it was actually used.

Impact of Maintenance and Other Outages on C-BT Operations

The fall maintenance season during WY 2014 turned into a flood recovery effort, which had a significant effect on general operations, water diversions, and power generation. The September 2013 flood caused significant damage at some facilities. Maintenance, cleaning and other repair projects were taking place at multiple facilities within the C-BT. There was significant sediment deposition at many locations. Lake Estes received large volumes of sediment. The Little Hells Canyon diversion structure and the Pole Hill Powerplant afterbay were also impacted. Some sediment traveled down into Pinewood and Flatiron reservoirs. Besides the sediment deposition, the Dille Tunnel diversion dam and the Big Thompson Powerplant were damaged by the intense flood in the Big Thompson River.

Water diversions from the west slope were suspended during the flood, and did not resume until late November, 2013. Lake Estes was drained in October to allow a large dredging operation to take place. The low level of the reservoir also allowed for inspections and other work to take place at the Olympus Dam and surrounding area. The reservoir level remained low until early December 2013.

During the period September through December, 2013, there was a lot of cleaning and repair work taking place at many facilities along the C-BT project. Aside from all the work taking place around Lake Estes, there was also a significant level of effort taking place at other facilities

such as Pole Hill Powerplant afterbay and the Little Hells Canyon diversion structure, in order to make them available to resume operations by winter.

While all this work was taking place, deliveries of C-BT water continued. With many diversion structures along the Big Thompson River damaged during the flood, and with the river continuing to carry large volumes of sediment, some allotees turned to the C-BT for their water supply. Carter Lake became the source of water for those allotees. Flatiron Powerplant Unit #3 began generating power every few days to supply water for the Charles Hansen Feeder Canal.

One of the biggest issues during and immediately after the September flood was the suspended particles in the water, which continued cause problems for some powerplants turbines. The long period of recovery allowed sufficient time for suspended sediment in the water to settle.

Lake Estes remained drained until December 2, 2013. On December 2, 2013 the reservoir level began to rise slowly. Flows through the Adams Tunnel were initially low, to allow Lake Estes to rise slowly while protecting the Estes Powerplant turbines and the coffer dam in front of the plant. The slow pace also allowed the completion of the annual maintenance for Mary's and Pole Hill powerplants. The reservoir reached its operational pool at elevation 7469.50 feet on December 10, 2013.

The annual maintenance for Pole Hill and Mary's powerplants was completed by the middle of December, as planned. But, even after the maintenance season ended, the flood recovery effort continued. Flatiron Powerplant personnel spent many man-hours working to clean up and protect the Dille Tunnel diversion dam before the runoff began. Their effort paid off later in the spring, when the Colorado Department of Transportation (CDOT) asked ECAO to divert river water, in order to allow the completion of repairs of Highway 34 at the Narrows section. The Dille Tunnel diversions from the Big Thompson River in April and May made the completion of the highway repair work possible. CDOT and their contractors contributed to the recovery effort at the Dille Tunnel diversion dam by installing a temporary bridge and dredging the pool upstream from the dam.

ECAO also brought in a group of skilled machine operators from the Provo Area Office in Utah to help with the dredging upstream and below of the Little Hells Canyon Dam. The Provo group also worked to repair the access road to the Little Hells Canyon diversion dam, and completed the dredging of the Pole Hill Powerplant afterbay. A big part of the Provo crew effort was devoted to the recovery work at the Big Thompson Powerplant. The Big Thompson Powerplant lost its afterbay during the flood. The Provo crew was able to put together a new afterbay, and to dredge passed the afterbay and into the river channel. Their efforts allowed the Pole Hill Powerplant to become available by November 2013, and the Big Thompson Powerpant to generate power by the summer of 2014.

One of the consequences of the September, 2013 flood was the abrupt cancellation of some of the scheduled maintenance work. The first maintenance work to be cancelled was the annual

maintenance for the Flatiron Powerplant Unit #3. That unit was due for maintenance in October 2013, but with the Olympus Tunnel shutdown and Pole Hill Powerplant peripheral facilities being repaired, the only source of C-BT water for many allottees became Carter Reservoir. Flatiron Powerplant Unit #3 was needed to deliver Carter Reservoir water for the Charles Hansen Feeder Canal, and eventually C-BT allottees. As pumping to Carter Reservoir resumed on December 23, 2013, its annual maintenance had to be re-scheduled for the summer months. The pumping operation continued, uninterrupted, until May 7, 2014. There were two more pumping sessions, one in June and another in early August, before the annual maintenance finally took place.

Other work which had to be re-scheduled was the annual maintenance work at the Charles Hansen Feeder Canal 930 Section (CHFC 930 Section). Normally scheduled for the month of April, this work was cancelled before the spring of WY 2014 even arrived. The need to move water to Horsetooth Reservoir, and the unavailability of the Dille Tunnel were the main reasons for the cancellation. There was also concern about a possible spill at Granby Reservoir due to the high snowpack across the northern mountains in Colorado. The cancellation of the annual maintenance at the CHFC 930 Section allowed the Adams Tunnel to continue moving over 500 cfs during most of the month of April, further lowering the pool at Granby Reservoir in preparation for the runoff season.

Once water began to flow through the C-BT system, the flow of water into Horsetooth Reservoir was maintained during most of the year. Water flows were relatively higher during the spring months. Eventually, the flow through the Charles Hansen Feeder Canal 550 section was interrupted to allow its annual maintenance to take place in late September 2014.

Impact of the Grand Lake Water Clarity Initiative on C-BT Operations

The Grand Lake Water Clarity Initiative had a significant effect on C-BT operations, including not only on water diversions, but also on power generation.

Several factors contributed to successful C-BT operations during the Grand Lake Water Clarity Initiative. First, the water diversions from the west slope began relatively early in the water year, and continued almost uninterrupted until late May. The long water diversion season allowed reservoir storage at Carter and Horsetooth to be sufficient to satisfy demands for C-BT water, despite the low flows through the Adams Tunnel during June through August 2013. Also, the 60 percent quota decreed by NCWCD in the spring was not increased during the summer. This kept demands for C-BT water relatively low during the peak demand period. The wet spring and the relatively high Big Thompson River flows helped to keep demands relatively low during the spring and summer months.

Carter Reservoir supplied 1,992 AF of the C-BT water used to satisfy demands along the CHFC and the Big Thompson River during the Grand Lake Water Clarity Initiative. Despite the low diversion flows from the west slope during August, the reservoir levels at Carter and Horsetooth reservoirs remained high for the season. Recreation at Carter and Horsetooth reservoirs was very successful during WY 2014. The boat ramps remained in the water the entire summer and into the fall months.

Drought Impact on C-BT Operations

The drought conditions that affected northern Colorado a couple of years ago ended after the September, 2013 flood. The combined storage content for the C-BT at the end of WY 2014 was the highest on record.

Flooding Impact on C-BT Operations

The C-BT project did not experience any flooding conditions during WY 2014.

WY 2014 OPERATIONS BY FACILITY

Green Mountain Reservoir

Fall, Winter and Spring of WY 2014: Similar to other sections of the C-BT, the Green Mountain Reservoir contributing watershed experienced average snowfall, with the snowpack at 100 percent of average during the first 4 months of WY 2014. In February, the snowpack began to increase until early June. Figure 1 shows the basin snow-water equivalent for WY 2013 in comparison to the 30-year average.

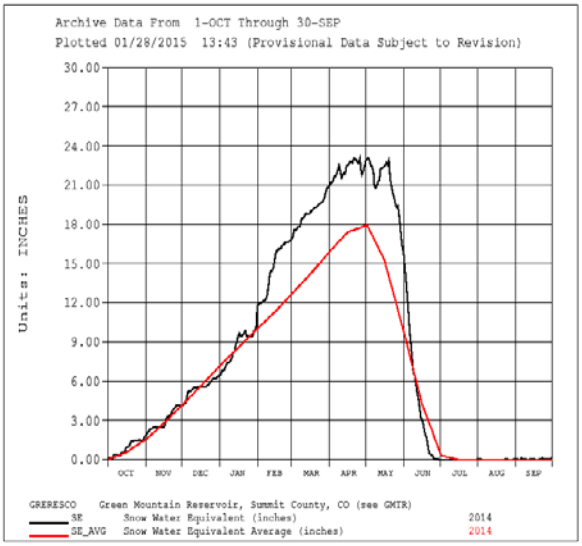


Figure 1: WY 2014 and 30-year average snow-water equivalent for the Green Mountain Reservoir drainage area.

October through May: The maximum drawdown rate limitations, initially put in place in 2003 to alleviate landslide concerns, were continued in 2014. These drawdown rate limitations were to be initiated when the reservoir's water surface elevation dropped below 7880.0 feet. The 2014 available supply and demands were such that the water surface elevation remained above 7880.0 feet during the entire irrigation season. Therefore, the drawdown rate limitations were never triggered. Figure 2 illustrates the storage content for the reservoir during WY 2014 compared to the 30-year average.

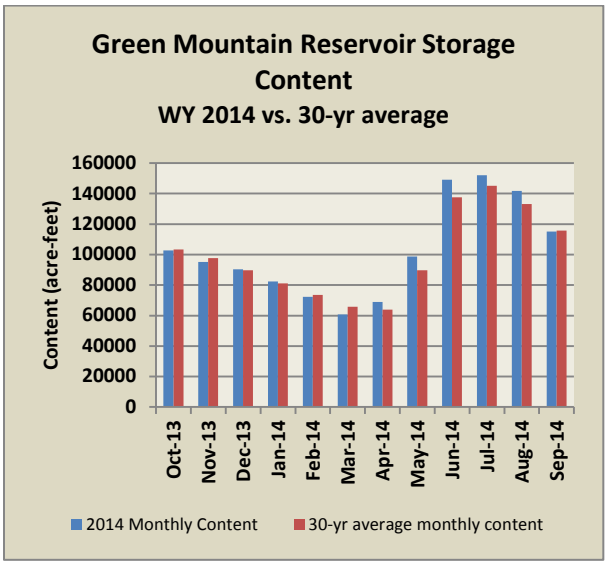


Figure 2: Comparison between the Green Mountain Reservoir content during WY 2014 and its 30-year average content.

October through May: The relatively wet conditions of WY 2013, allowed the basin's reservoirs to recover from the very dry conditions of WY 2012. The 2013-2014 carryover storage in the basin's reservoirs was about 93 percent of average, much improved from the 66percent of average the year before. With the relatively good carryover storage conditions and the very high May 1 streamflow projections the reservoir operators projected that all of the basin's reservoirs would have little problem filling. However, due to the predictions of very high peak stream flows in the Grand Valley and the resultant potential for flooding, it was decided that the CROS program would not be conducted.

April: On April 23, 2014, the Division 5 Engineer's Office issued a letter notifying the Parties to Water Court Case No. 13CW3077 that Green Mountain Reservoir would be administered pursuant to the Green Mountain Reservoir Administrative Protocol (Protocol) for the 2014 irrigation year (Attachment B). Pursuant to the Protocol, Green Mountain Reservoir achieved a "paper fill" on June 12, 2014.

May 15: The Start-of Fill for Green Mountain for WY 2014 was declared on May 15, 2014 with the reservoir holding 78,412 acre-feet in storage, well above its historic 65,000 acre-foot start of fill target.

Late May: Due to the predictions of very high peak streamflows in the Grand Valley and the resultant potential for flooding, it was decided that Coordinated Reservoir Operations would not be conducted in WY 2015.

June 12: Green Mountain Reservoir achieved a "paper fill" on June 12, 2014. By that date, Denver Water and Colorado Springs Utilities (Cities) had depleted a total of 25,767 AF against the Green Mountain Reservoir First Fill Storage Right. A provision of the Protocol allows Green Mountain Reservoir to continue storing its inflow under a 1955 priority date after "paper filling" to reduce the amount of water owed by the Cities. Under this provision, Green Mountain Reservoir stored sufficient water between June 12, 2014 through July 4, 2014; to fully eliminate the amount owed by the Cities. Under the terms of the Protocol, the end of fill was July 4, 2014.

June 25: The HUP Managing Entities held their initial meeting on June 25, 2014, to consider conditions and plan for the upcoming season's operations. A total of 16 meetings and/or conference calls were held between June 25, 2014 through October 29, 2014 to manage releases from Green Mountain, Ruedi, Granby, Wolford Mountain, and Williams Fork Reservoirs, coordinate irrigation diversions in the Grand Valley, and attempt to maintain the mean monthly target flows in the 15-Mile Reach.

June 25: At the June 25, 2014 meeting, the U.S. Fish and Wildlife Service initially set the mean monthly target flow for the 15 Mile Reach at the Wet Year Target of 1,630 cfs based upon the above average runoff and current water supply conditions. Due to continued wet conditions throughout the summer and the availability of augmentation water, the U.S. Fish and Wildlife Service was able to maintain the 1,630 cfs flow target throughout the entire summer and early fall season.

July 4: Green Mountain Reservoir achieved a physical fill on this day. July 4, 2014 was declared the End-of-Fill official date. By continuing to store under its refill rights, Green Mountain Reservoir was able to reach a maximum physical content for the year on July 25, with a total of 152,285 acre-feet in storage. Because the reservoir achieved a "paper fill", water was available to fully satisfy each of the following: the 52,000 AF CBT Project replacement pool; the 5,000 AF

Silt Project reservation; the 66,000 AF HUP allocation; and the 20,000 AF set aside for contracts.

July 4: While the interim policy requires that upstream depletions by Green Mountain Reservoir beneficiaries junior to Green Mountain Reservoir be charged against the "paper fill" of Green Mountain Reservoir, those depletions were not charged against this year's HUP allocation. Therefore, the entire 66,000 AF HUP allocation remained available when the reservoir achieved its "paper fill" on June 7, 2014.

July 4: While the Protocol requires that upstream depletions by Green Mountain Reservoir beneficiaries junior to Green Mountain Reservoir be charged against the "paper fill" of Green Mountain Reservoir, those depletions were not charged against this year's HUP allocation. Therefore, the entire 66,000 AF HUP allocation remained available through the July 4, 2014 end- of-fill date.

April through September: As a result of this year's high spring runoff, free river conditions prevailed between April 7, 2014 and August 12, 2014. Between August 13, 2014 and September 30, the controlling right on the main stem of the Colorado River was the Shoshone Powerplant junior water right call. Colorado River tributary inflow below the Shoshone Powerplant, combined with water being drawn down from the upper basin by the Shoshone Powerplant water right call was sufficient to make a Grand Valley water right call unnecessary during the entire WY2014. With wetter conditions in October and a Shoshone Powerplant maintenance outage, free river conditions prevailed between October 1 and the end of the irrigation season.

WY 2014: The maximum drawdown rate limitations initially put in place in 2003 due to landslide concerns were continued in 2014. These drawdown rate limitations were to be initiated when the reservoir's water surface elevation dropped below 7880.0 feet. With the reservoir achieving a physical fill in 2014, the water surface elevation remained above 7880.0 feet during the entire irrigation season, and therefore, the drawdown rate limitations were never triggered.

Figure 3: Green Mountain Reservoir and Dam.

August 13: HUP surplus releases began on August 13, 2014 and continued through October 30, 2014 when they were terminated for the year. During this period, HUP surplus releases varied between 69 cfs and 517 cfs, averaging about 380 cfs, HUP surplus releases totaled 59,594 AF in 2014.

Willow Creek Reservoir

February and March: After an average fall and winter snow accumulation, the snowpack continued to rise steadily, creating concerns about a possible repeat of the snowpack conditions of WY 2011.

April 7: Pumping from Willow Creek Reservoir to Granby Reservoir began. Pumping was initially intermittent.

April 9: Runoff began at the Willow Creek watershed.

May 5: Pumping from Willow Creek Reservoir to Granby Reservoir reached a flow of approximately 450 cfs. The flow remained at that level until June 2, 2014.

Middle of May: There were concerns about a possible spill at Granby Reservoir. Discussions about curtailing the pumping from Willow Creek to Granby were beginning.

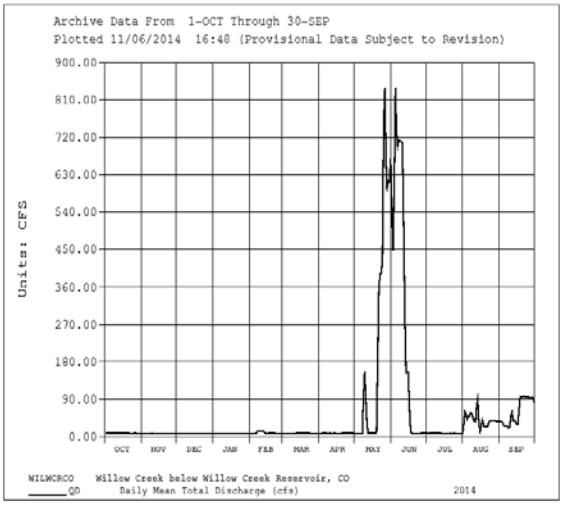


Figure 4: Releases from Willow Creek Reservoir to Willow Creek during WY 2014.

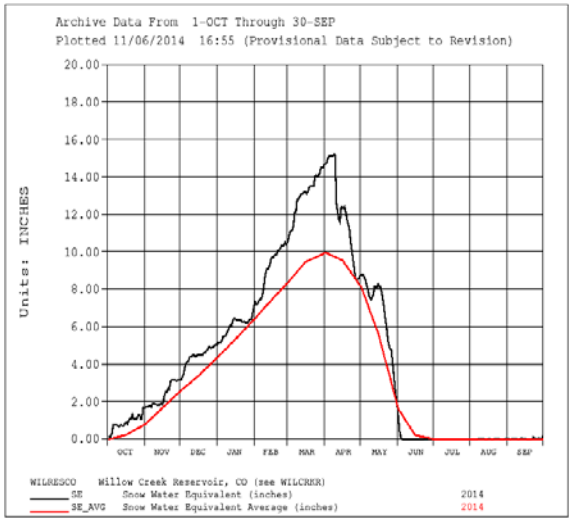


Figure 5: WY 2014 and 30-year average snow-water equivalent for the Willow Creek Reservoir drainage area.

May 25: The peak of the runoff season occurred this day, when the inflow to Willow Creek reached 1,317 cfs.

May through June: By the middle of May, high releases through the outlet works had begun. The high releases did not cause any issues downstream.

June 3: Pumping to Granby Reservoir was suspended, while releases through the outlet works were increased. Of the total releases, 450 cfs was considered a Granby spill.

June 16: Releases from Willow Creek Reservoir to Willow Creek were stopped, and pumping to Granby Reservoir resumed.

Middle of August: Willow Creek Canal pumps maintenance work began. Inflow to Willow Creek was bypassed from that point on.

Granby Reservoir

December through April: The reservoir level was dropped 18 feet, as diversions through the Adams Tunnel remained high. By the middle of April, the runoff had begun, and the reservoir level stabilized.

Middle of May: Once Carter and Horsetooth reservoirs approached their full capacities by late May, the diversions through the Adams Tunnel were discontinued. East slope priority water was used to completely fill the remaining pool at Horsetooth.

May through June: The water surface level at Granby Reservoir continued to rise at an alarming pace through May and June.

July 17: Releases from Granby Reservoir were increased to almost 500 cfs. Higher than normal releases continued for six days. The release was considered a spill.

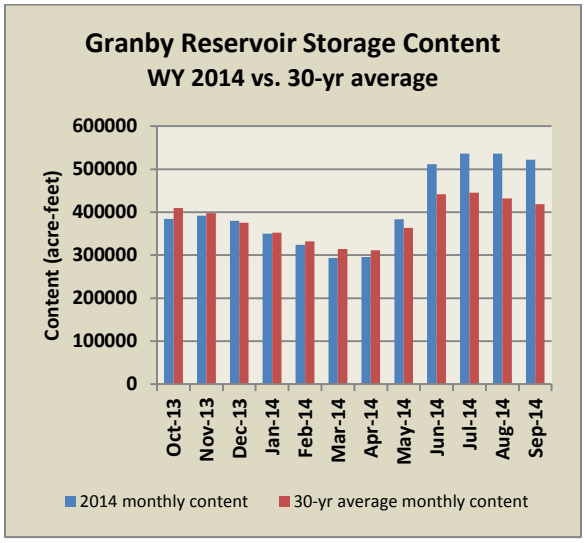


Figure 6: Granby Reservoir storage content during WY 2014 versus the 30-year average.

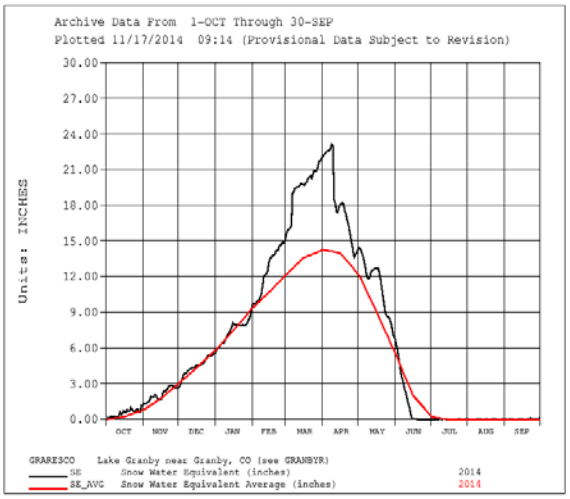


Figure 7: WY 2014 versus 30-year average snow-water equivalent for the Granby Reservoir drainage area.

July 30: High releases resumed, as the reservoir level reached elevation 8279.50 feet.

August 11: The Grand Lake Water Clarity Initiative began on August 11, 2014 and continued until September 2, 2014. The Farr Pumping Plant units remained offline during that period.

July through early September: The water surface level at Granby remained high, just below the 8279.50 feet full capacity elevation. Inflow remained higher than normal during that time.

September 4: Pumping to Carter resumed for the last time in WY 2014, allowing diversions from the west slope to resume. The diversions lowered the reservoir level at Granby by over two feet by late September.

September 30: Water surface level at Granby Reservoir was one of the highest ever recorded for September 30, 2014.

Lake Estes

October 1: As a result of the September 2013 flood, the Lake Estes water surface was lowered down to the spillway crest level. That allowed the City of Estes Park to dredge sediment from the reservoir bottom to be used as filling material as part of the recovery effort.

December 2: Once the dredging operation ended, water began to flow into Lake Estes once again, and its water surface began to rise.

December 11: The level at Lake Estes reached its normal operational pool.

December 24: The Adams Tunnel flow reached its full capacity. Diversions through the Adams Tunnel continued, uninterrupted, until May 23, 2014.

February through March: Snowpack continued to grow significantly, creating concerns among local residents and the general public, as the area continued to recover from the September 2013 flood.

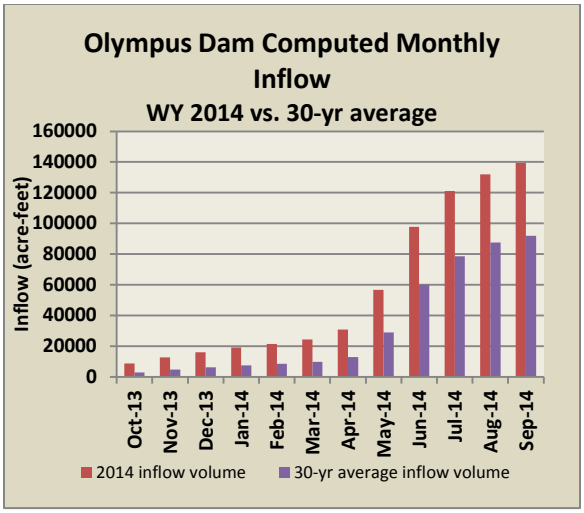


Figure 8: Computed 24-hour average native inflow for Lake Estes during WY 2014 versus its 30-year average.

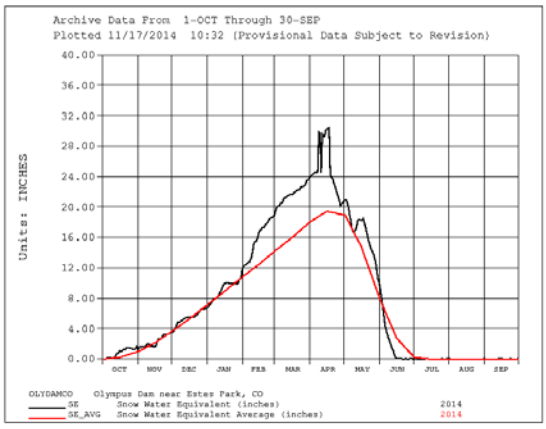


Figure 9: WY 2014 and 30-year average snow-water for the Olympus Dam drainage area.

Middle of April: Inflow to Lake Estes remained high for most of the winter. But by April 10, the runoff began.

May 5: As the runoff continued to rise, and with the Olympus Tunnel moving water at maximum capacity, the releases from Olympus Dam to the Big Thompson River had to be increased to match inflow.

May 23: The Adams Tunnel diversions had ended, and the Olympus Tunnel was moving solely skim and priority water.

May 26: Estes Powerplant Unit #2 headcover repair was completed and the unit became available once again.

May 31: The peak of the runoff occurred, reaching a daily average flow of 1,257 cfs. The average 24-hour release from Olympus Dam to the Big Thompson River that day was 769 cfs, the highest for WY 2014. The high releases from Olympus Dam in late May and June were not considered flooding operations, and did not cause any known issues along the Big Thompson River.

Foothill's Power Arm

October 1: The Olympus Tunnel began WY 2014 under clearance, as a consequence of the September 2013 flood. The tunnel remained shutdown until early November.

October 1: Pinewood Reservoir began the year with a water surface elevation of 6557.0 feet. Water from the reservoir was been used to continue deliveries of C-BT water through the Charles Hansen Feeder Canal. The reservoir level began to rise slowly in early November, when the Olympus Tunnel flows resumed.

October 1: The Flatiron Powerplant units #1 and #2 were available most of the WY2014, except during their annual maintenance periods in the spring. The bifurcation at Flatiron Powerplant was never used during WY 2014.

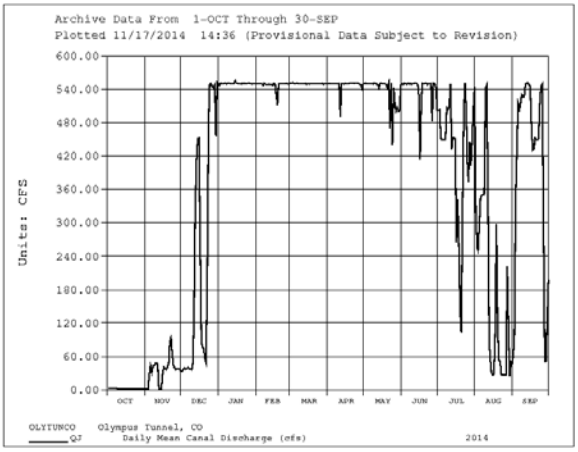


Figure 10: Olympus Tunnel 24-hour average flow during WY 2014.

Middle of December: Pole Hill Powerplant resumed power generation once water from the Olympus Tunnel became available once again. The plant continued to generated power, uninterrupted, until the Grand Lake Water Clarity Initiative began in August 2014.

April: The annual maintenance of the Charles Hansen Feeder Canal 930 Section was cancelled for the spring of WY2014 because the Dille Tunnel was not available to supply water for the Charles Hansen Feeder Canal 550 Section. The canal was also needed to continue moving water to Horsetooth Reservoir, in preparation for what was expected to be a high runoff year for Granby Reservoir and the Front Range.

Figure 11: The Dille Tunnel temporary diversion operation during April 2014. The bridge was a temporary installation to allow the operation to take place. The diversion operation allowed the Colorado Department of Transportation to complte repairs at Highway 34 along the Big Thompson River Canyon narrows section.

Figure 12: Repairs upstream of the Big Thompson Powerplant during May 2014. The Charles Hansen Feeder Canal Siphon over Highway 34 can be seen in the distance. The footings for the siphon supports were also repaired and reinforced earlier in the year.

July 1: The Big Thompson Powerplant began power generation, for the first time after the September 2013 flood. The small plant was impacted by the tremendous flows at the mouth of the Big Thompson River Canyon. Its afterbay was washed away and had to be rebuilt. The plant continued generating power until August 8.

September 25: The annual maintenance for the Chrales Hansen Feeder Canal 550 Section began this day and continued into October 2014.

Carter and Horsetooth Reservoirs

October 1: Carter Reservoir began WY 2014 with 49,912 AF of water in storage. Its 30-year average is 55,350 AF.

October 1: Horsetooth Reservoir began WY 2014 with 94,523 AF of water in storage. Its 30-year average is 82,620 AF.

October: At the beginning of WY 2014, while the flood recovery effort was taking place, there was no water flowing through the Adams and Olympus tunnels. The most suitable source of C-BT water to satisfy demands was Carter Reservoir. Therefore, Flatiron Powerplant Unit #3 was used repeatedly during October as a generator to continue deliveries of C-BT water through the Charles Hansen Feeder Canal. A portion of that water ended up at Horsetooth.

October through early December: Carter Lake delivered over 13,500 AF of water. Meanwhile, Horsetooth Reservoir delivered 4,700 AF of water during the same period. These deliveries helped mitigate the impact of the flood of September, 2013.

December 13: The flow through the Charles Hansen Feeder Canal was increased to begin filling Horsetooth Reservoir.

December 23: Pumping to Carter Reservoir began. Pumping continued, uninterrupted, until May 7.

May 7: Carter Reservoir reached its full capacity, and the pump was turned off.

Figure 13: A full Horsetooth Reservoir in June 2014. The high level cause some shore erosion and affected some of the recreational facilities. Despite those, recreation was very successful during WY 2014 at Carter and Horsetooth reservoirs.

June 12: In order to reduce any spilling of C-BT water at Granby Reservoir, pumping to Carter Reservoir resumed. Pumping continued until June 28.

June 25: Horsetooth Reservoir reached its highest water surface level of the year. The reservoir was considered full from early June through August.

July: Deliveries via the Charles Hansen Supply Canal out of Horsetooth Reservoir began as early as April 2014. But the bulk of the deliveries were made between the middle of July and the Middle of September. For Carter Reservoir, deliveries of water via the Saint Vrain Canal began earlier in the year that for Horsetooth Reservoir, and they were more evenly distributed.

Throughout WY 2014: With both reservoirs full for the majority of the year, recreation was very successful. The boat ramps were in the water the entire year.

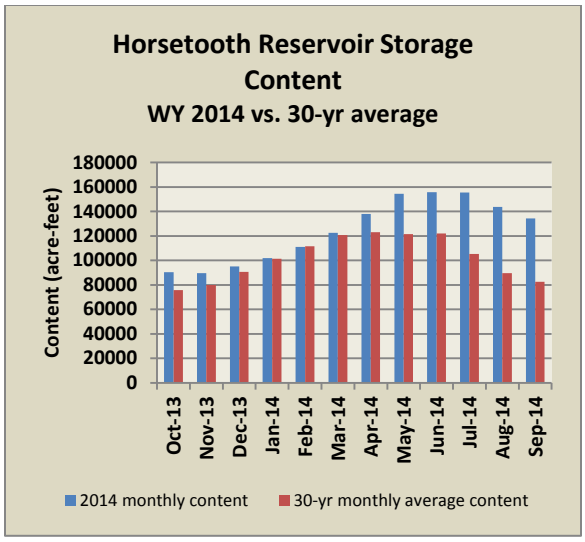


Figure 14: Horsetooth Reservoir storage content during WY 2014 versus its 30-year average.

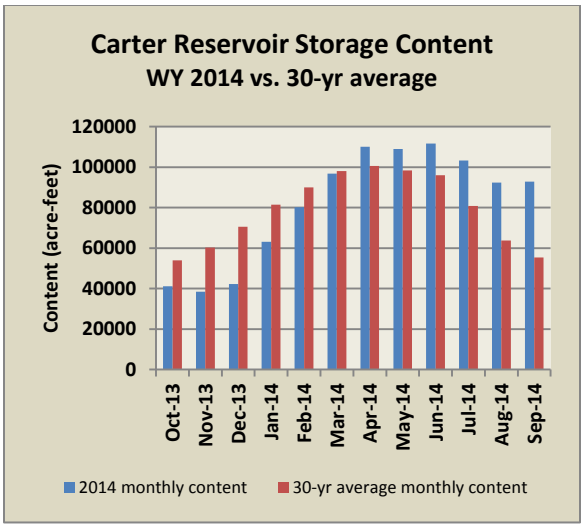


Figure 15: Carter Reservoir storage content during WY 2014 versus its 30-year average.

Throughout WY 2014: Carter Reservoir delivered 50,432 AF of C-BT water and 7,396 AF of Windy Gap water, approximately. Meanwhile, Horsetooth Reservoir delivered 55,809 AF of C-BT water and 5,091 AF of Windy Gap water.

C-BT PLANNING AND CONTROL

The C-BT is operated for the purpose for which it was authorized and constructed; to provide supplemental municipal and industrial water supply, irrigation water supply and hydroelectric power production.

The integrated operation of the C-BT is planned and coordinated by the Water Resources Group at ECAO in Loveland, Colorado. Staff at this office collects and analyzes information daily and makes the decisions necessary for successful operation of the C-BT. This continuous water management function involves coordination between the Division of Water Resources of the state of Colorado, NCWCD, Upper Colorado and Great Plains regions of the Bureau of Reclamation, the Western Area Power Administration (Department of Energy), other Bureau of Reclamation groups, and many other local, state, and Federal agencies.

Experience has proven that proper use of the available water resource in a multi-purpose project such as the C-BT can be achieved only through careful budgeting and management of the anticipated water supply. One product of this budgeting and management process is an AOP.

The C-BT water operations are routinely planned on a 12 month basis. The first AOP of the new water year is prepared in early October and it covers the October 1 to September 30 period. AOPs are prepared for reasonable-maximum, most-probable and reasonable-minimum runoff conditions of water supply and associated requirements. The C-BT is operated to optimize the most-probable water supply without jeopardizing the operational position, should either the reasonable-maximum or the reasonable-minimum water supply conditions occur. The plan is reviewed and revised monthly, or as needed during the year, as new information becomes available or changing conditions occur. Computer programs and models are used by ECAO to develop the AOP and water supply forecasts. Tables 5A, 5B and 5C include the October, 2014 three versions of the AOP. Exhibits 3 through 9 also provide a view of the planned WY 2015 C-BT operations.

IRRIGATION REQUIREMENTS

The amount of water that is made available to the C-BT for irrigation will be determined by NCWCD. This determination will be subject to change by agreement throughout the remainder of the irrigation season. Changes may occur as a result of substantial changes in the prevailing climatic, demand or operational conditions. Irrigation requirements for the three inflow conditions were estimated by analyzing actual use under a variety of actual runoff conditions.

Estimated supplemental irrigation deliveries from Green Mountain Reservoir to irrigators in the Colorado River Basin are included in the release from Green Mountain Reservoir according to the "Operating Criteria for Green Mountain Reservoir."

MINIMUM REQUIRED RESERVOIR RELEASES

January 19, 1961, the Secretary of the Interior established specific guidelines for water releases out of Lake Granby to satisfy fish habitat requirements. A release from Lake Granby of 20 cfs is required from October through April of each year. During the remaining months of the year, the control point is almost 3 miles downstream from the dam at the YMCA gauging station.

A minimum flow requirement of 75 cfs, 40 cfs during August, and 20 cfs during September is maintained at the YMCA gauge downstream of Lake Granby. The flow during the May through September period can be progressively reduced if the inflow during the WY to Shadow Mountain Lake, Grand Lake, and Lake Granby (less the decreed rights in the reach of the Colorado River between Granby Dam and the mouth of the Fraser River) and the water capable of being pumped from Willow Creek Reservoir during that year is forecasted to be 230,000 AF or less.

According to the *"Principles to Govern the Release of Water at Granby Dam to Provide Fishery Flows immediately Downstream in the Colorado River"* signed by the Secretary of the Interior and Commissioner of the Bureau of Reclamation in 1961, the following reduction of fishery flows below Lake Granby will apply on the basis of a forecast to be made by the Bureau of Reclamation during the last week in April, using information from all available sources.

Forecast Inflow	Percentage Reduction
in AF	in Minimum Release
220,000 - 230,000	15
210,000 - 220,000	20
195,000 - 210,000	25
Less than 195,000	30

Adjustments will be made in the reductions, when appropriate, based on revised forecasts and consideration of actual flows during May - July. A copy of the document is included in the Standard Operating Procedures (SOP) for Granby Dams and Reservoir, Appendix A, Exhibit 4.
Also according to the SOP, Willow Creek below Willow Creek Reservoir is not considered a fishery resource since an irrigation ditch a short distance below the dam typically uses the entire flow in the late summer months. In the Secretarial determination minimum instream flow requirements for Willow Creek were not provided. However, a release of 7 cfs or inflow (whichever is the lesser) from Willow Creek Reservoir is required between October 1 through April 30 to augment fish habitat flows in the Colorado River.

In accordance with the SOP for Shadow Mountain Reservoir, Chapter 4, Section D, minimum releases from Shadow Mountain Lake of 35 cfs during September - October, 45 cfs during November and December, 20 cfs from January through May, 50 cfs in June - July, and 40 cfs in August or inflow (whichever is the lesser) must be maintained to protect fish and wildlife in the Colorado River above Lake Granby.

The minimum release required out of Green Mountain Reservoir is determined by senior adjudicated water rights downstream from the reservoir. Inflow to Green Mountain Reservoir is

released, as required, to meet these downstream rights. Releases are maintained at all times to be adequate for the preservation of fish habitat.

The State of Colorado Department of Natural Resources, Parks and Wildlife Division, and the United States Fish and Wildlife Service have recommended the following minimum release schedule for Lake Estes. This schedule meets the flow requirements of native fish along the Big Thompson River.

Minimum Releases (cfs)	Period
25	November 1 - April 15
50	April 16 - April 30
100	May 1 - May 15
125	May 16 - August 15
100	August 16 - August 31
75	September 1 - September 15
50	September 16 - October 31

Diversion of flows from the Big Thompson River at Olympus Dam for power production is generally restricted to the May 15 through September 15 period, since runoff during the remaining period of the year usually is much less than the recommended minimum flows. Releases in excess of inflows are not required.

GREEN MOUNTAIN RESERVOIR OPERATIONS

Paragraph 6 of the October 5, 1955 Stipulation in the decree for the Consolidated Cases Nos. 2782, 5016, and 5017 in the United States District Court for the District of Colorado (Blue River Decree), calls for periodic plans for the operation of Green Mountain Reservoir to be developed. This plan addresses this requirement.

Provisions guiding the operations of Green Mountain Reservoir are contained in the following documents. Operations will be consistent with the applicable provisions in the following documents:

Manner of Operation of Project Facilities and Auxiliary Features, Senate Document No. 80, 75th Congress, 1st Session

Consolidated Cases Nos. 2782, 5016, and 5017
October 12, 1955, Stipulation and Decree
April 16, 1964, Stipulation and Decree

Operating Policy for Green Mountain Reservoir, Colorado-Big Thompson Project, published in the Federal Register, Vol. 48, No. 247, December 22, 1983,

September 4, 1996, Stipulation and Agreement in Colorado Water Div. 5, Case No. 91CW247 (Orchard Mesa Check Case), and attached HUP Operating Criteria.

The General Operations Guided By These Provisions Are Given Below:

1. Winter Operation (November-March)
   a. Bypass inflow to supply downstream vested senior rights.
   b. Make releases to replace water diverted or stored out of priority by the C-BT collection system, as required.
   c. Make releases for west slope irrigation and domestic uses per Green Mountain Operating Policy and the HUP Operating Criteria.
   d. Make releases for water service contracts pursuant to the Operating Policy.
   e. Maximize power generation, while maintaining:
      i. Adequate storage to meet the anticipated needs under the guiding documents.
      ii. A minimum power head consistent with the integrated system power operations.

2. Operation during Snowmelt Period (April-July)
   a. Bypass inflow to supply downstream vested senior rights.
   b. Make releases to replace water diverted or stored out of priority by the C-BT collection system, as required.
   c. Make releases for west slope irrigation and domestic uses per Green Mountain Operating Policy and the HUP Operating Criteria.
   d. Make releases for water service contracts pursuant to the Operating Policy.
   e. Participate in the Coordinated Reservoir Operations effort to enhance peak flows for the Colorado River Endangered Fishes. Reduce releases from traditional levels before and after the peak flow period on the Colorado River in the Grand Junction area. During peak flow period, release the lesser of inflows or turbine capacity for approximately a 10-day period.

f. Fill without spilling to maximize power generation by using the storage and power rights concurrently.

g. On or before June 30 each year, meet with Managing Entities established under the settlement of the Orchard Mesa Check Case to assess availability of surplus water in the Historic Users Pool (HUP).

h. Confer with Managing Entities on a regular basis through the irrigation season to assess availability of surplus water in the Historic Users Pool (HUP).

i. If a surplus condition is declared, make releases up to the amount of surplus, under agreements, to:

i. the Grand Valley Powerplant up to its need or capacity; then to

ii. the Grand Valley under the Municipal Recreation contract in excess of that needed by the powerplant

j. Maximize power operation consistent with 1.e.

k. Make releases as outlined in the above referenced documents.[1]

3. Operation After Snowmelt Period (August-October)

a. Bypass inflow to supply downstream vested senior rights.

b. Make releases to replace water diverted or stored out of priority by the C-BT collection system, as required.

c. Make releases for west slope irrigation and domestic uses per Green Mountain Operating Policy and the HUP Operating Criteria.

d. Make releases for water service contracts pursuant to the Operating Policy.

e. Confer with Managing Entities on a regular basis through the irrigation season to assess availability of surplus water in the Historic Users Pool (HUP).

f. If a surplus condition is declared, make releases up to the amount of surplus, under agreements, to:

i. the Grand Valley Powerplant up to its need or capacity; then to

ii. the Grand Valley under the Municipal Recreation contract in excess of that needed by the powerplant

g. Maximize power operation consistent with 1.e.

h. Make releases as outlined in the above referenced documents.[2]

1 By the use of these criteria for current operating purposes, the United States does not intend to imply any definition of rights and obligations. The order in which these criteria are listed does not reflect any intended priority.

2 By the use of these provisions for current operating purposes, the United States does not intend to imply any definition of rights and obligations. The order in which these criteria are listed does not reflect any intended priority.

GREEN MOUNTAIN HISTORIC USERS POOL AND THE ORCHARD MESA CHECK CASE SETTLEMENT

Background and Authority

The Orchard Mesa Check (Check) is a structure below the common afterbay of the Orchard Mesa Irrigation District (OMID) Pumping Plant and the federal Grand Valley Powerplant in the Grand Valley of Colorado. The purpose of the Check is to raise the water level in the common afterbay, allowing water to flow through the bypass channel to support hydropower operations and return to the Colorado River upstream of the Grand Valley Irrigation Company (GVIC) diversion dam.

Operation of the Check was determined to constitute an 'exchange' of water whereby water destined for the senior GVIC irrigation water rights is borrowed for pumping and hydroelectric power generation purposes and returned to GVIC for irrigation use. Operation of the Check influences the operation of the following: Grand Valley irrigation systems; Grand Valley Powerplant; Green Mountain Reservoir releases; and the 15-Mile Reach of the Colorado River. The 15-Mile Reach is that section of the Colorado River from the GVIC diversion dam to the confluence of the Gunnison River and has been designated critical habitat by the Upper Colorado River Endangered Fish Recovery Program.

The Check has been operated on an informal basis without a decreed right since approximately 1926 to manage flows in the Colorado River for the benefit of the United States, Grand Valley Water Users Association (GVWUA), and OMID. In the late 1980's, a hydropower development was proposed in a reach of the Colorado River between the Grand Valley Diversion Dam, the point where the exchange water is diverted, and the GVIC diversion dam where the exchange water is returned. The OMID was concerned that a water right awarded for this development could interfere with the exchange of water. In response the OMID filed an application in State Water Court on December 30, 1991, for approval of an exchange of water. This case (Water Division 5, Case No. 91CW247) was informally known as the Orchard Mesa Check Case. Resolution of the case resulted in a negotiated Stipulation and Agreement entered into the District Court, Water Division No. 5, State of Colorado, on September 4, 1996.

Overview of the Stipulated Settlement

The settlement contains two major components: the Stipulation and Agreement and the Green Mountain Reservoir Historic Users Pool Operating Criteria (Operating Criteria). The Operating Criteria further defines operation of the Green Mountain Reservoir Historic Users Pool (HUP) consistent with Senate Document 80 and the 1984 Operating Policy. The parts of the Stipulation and Agreement pertinent to the operation of the HUP are summarized below.

As part of the Stipulation and Agreement the OMID and GVIC agree not to exercise their irrigation rights against any upstream HUP beneficiary provided that the Check is physically operable; there is at least 66,000 AF of water in storage in the Green Mountain Reservoir HUP, or approved substitute storage reservoir, when Green Mountain Reservoir storage rights cease to be in priority; and the water rights for the Shoshone Powerplant continue to be exercised in a manner consistent with their historical operation. (Section 3.b. of the Stipulation and Agreement).

The Stipulation and Agreement also provides that Reclamation will declare surplus water which is in excess of the needs of HUP beneficiaries for a given WY. Water declared surplus might be delivered through agreements for beneficial uses in western Colorado. This is to be done in accordance with the provisions of the HUP Operating Criteria, which are summarized below.

Management of the Historic User's Pool (HUP) Under the Operating Criteria

The management of the HUP is accomplished through the process defined in Sections 3.d and 3.e of the Operating Criteria. This process requires the development of this Annual HUP Operating Plan on or before June 30 of each year.

The Annual HUP Operating Plan is developed by the Bureau of Reclamation in consultation with the Grand Valley Water Users Association, the Orchard Mesa Irrigation District, the Grand Valley Irrigation Company, the Division 5 Engineer, the Colorado Water Conservation Board, and Fish and Wildlife Service (Managing Entities). The Managing Entities agree to make a good faith effort to develop an Annual HUP Operating Plan that is unanimously supported. However, the Bureau of Reclamation reserves the right to establish a release schedule should unanimous consent proves unattainable.

The Annual HUP Operating Plan is based upon actual HUP storage conditions, projected runoff forecasts, operational and climatological conditions, projected irrigation demands, and 15-Mile Reach flow needs. It is expressly recognized that, in some years, release of the entire HUP by the end of the irrigation season will not be necessary or possible.

On or before June 30 of each year the Bureau of Reclamation assembles initial information on storage in the HUP and comparative runoff years. Based upon the information assembled a meeting is held with the other Managing Entities. During this meeting a review of the forecasts is analyzed and initial determinations are made of the level of "checking" required to preserve water in the HUP, and of water surplus available for HUP beneficiaries.

The HUP operations are reviewed and modified by the Managing Entities as necessary to respond to changing conditions. Subsequent meetings or conference calls are held as needed to reconsider prevailing conditions including HUP storage conditions, runoff forecasts, climatological conditions, irrigation demands, 15-Mile Reach flow needs, and other operational conditions. The Managing Entities adjust the checking as warranted by the examination of prevailing conditions, and determine the water surplus and release schedule for HUP beneficiaries. During periods of below average river flows the Managing Entities may meet as frequently as every week.

This mechanism provides a way to integrate management of releases from the HUP with operation of the Check to accomplish the purposes of the Operating Criteria. The mechanism is also used to integrate releases from the HUP with releases for the endangered fish from other reservoirs including Ruedi and Wolford Mountain.

OPERATION SKIM

Big Thompson River water in excess of the minimum instream flow requirements is diverted at Olympus Dam into the Southern Power Arm of the Foothills System to be used for power generation. This operation is known as "Operation Skim". The amount diverted depends on the flow at the Big Thompson River and the tributaries above Lake Estes, C-BT water imported through the Adams Tunnel, and the capacity of the Foothills System.

The water taken from the Big Thompson River can be used for power generation immediately. It can also be held in storage and replaced to the river with water from other facilities, depending on the power requirements. In general, water taken from the Big Thompson River at a variable rate, on a given date, is returned to the river at a flat rate, on the following day. This operation provides incidental benefits to the tourist and fishing industries along the Big Thompson Canyon by attenuating high flows, and by maintaining a steady stream during the runoff season.

Operation Skim and storage of surplus water from the Big Thompson River in C-BT reservoirs are managed according to the AOP and as prescribed by the ECAO Water Resources staff.

A total of 38,894 AF of Big Thompson River water was skimmed through the Olympus Tunnel, producing an estimated 66,400 megawatts of power at Pole Hill, Flatiron and the Big Thompson powerplants. The Dille Tunnel was not available to divert water during WY 2014 due to the damage caused by the September 2013 flood.

FLOOD BENEFITS

Precipitation in Colorado was above average during the winter and spring seasons of WY 2014. The pattern of wet weather continued into the summer and early fall periods. After the snowy months of February through April, the weather remained wet. The monsoon season during WY 2014 began in early July and lasted until September. The runoff season lasted from April through September. It was a higher-than-normal runoff season.

Despite the higher than average precipitation over the mountains of Northern Colorado during WY 2014, there were no flooding operations at any of the C-BT facilities. There were high releases out of Shadow Mountain, Willow Creek and Granby reservoirs due to the high inflows, but there were no flooding situations triggered by these conditions. Precipitation, although high for the entire water year, was generally moderate in intensity.

Despite those facts, there were flood-protection benefits associated to C-BT operations during WY 2014. Based on the data collected from the Colorado River Basin, and according to figures provided by the U.S. Army Corps of Engineers, Sacramento District, the C-BT reservoirs over the west slope prevented a total of $89,100 in potential flood damages. While the C-BT reservoirs are not authorized for flood control, prevented flood damages are calculated for the cluster of reservoirs in the upper Colorado River reaches, which include Granby, Willow Creek, Shadow Mountain and Grand Lake, as well as for Green Mountain Reservoir in the Blue River. The operations at these reservoirs contribute ancillary benefits to conditions at Dotsero, Colorado, a location where economic studies have enabled calculation of such benefits. During WY 2014, Green Mountain Reservoir prevented a total of $12,100 in potential flood damages downstream, while Granby, Willow Creek, Shadow Mountain and Grand Lake prevented a total of $77,000. Since construction, the C-BT has prevented flood damages totaling $599,400.

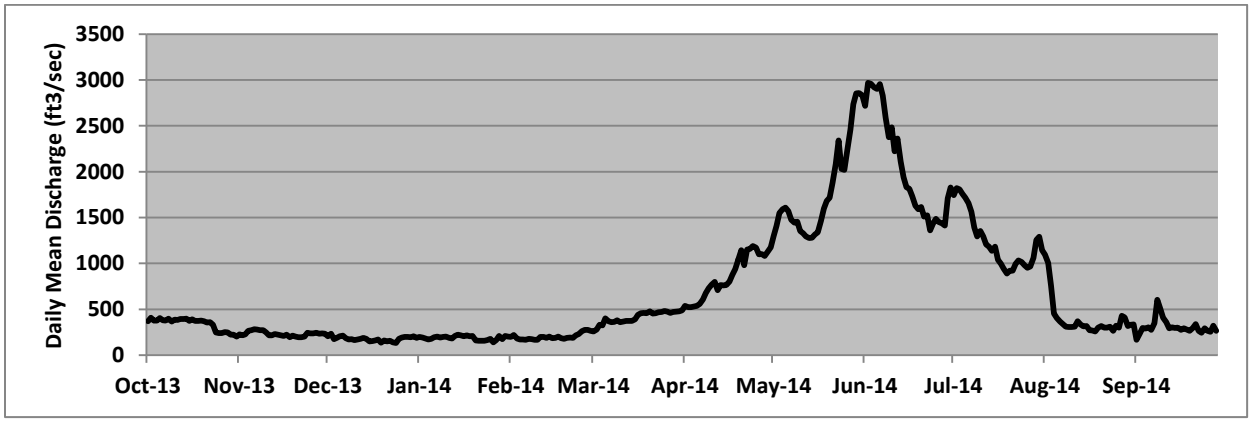
APPENDIX A – DAILY RECORDS

Appendix A (Table 1 of 38)
Green Mountain Reservoir, CO

Location. --Lat 39°52'42", long 106°19'42", Summit County, Hydrologic Unit 14010002, on Green Mountain Dam, 13 miles southeast of Kremmling, Colorado, on the Blue River.
Gage. –Water level recorder with satellite telemetry. Elevation of gage is 7960 from topographic map.
Remarks.-- Inflow computed daily based on change in content from midnight to midnight, and on the 24-hour average releases from Green Mountain Reservoir. Recorders were operated from 01-Oct-2013 to 30-Sep-2014. Records are complete and fair, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Inflow, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	358	225	238	206	209	275	478	1130	2856	1711	1292	331
2	372	202	235	189	201	264	490	1174	2832	1829	1142	334
3	371	227	206	197	198	260	538	1298	2716	1745	1096	169
4	407	218	233	193	218	279	522	1410	2967	1820	1005	233
5	378	227	173	180	182	330	522	1548	2958	1809	753	295
6	378	266	187	170	171	325	532	1590	2918	1758	454	289
7	404	271	206	178	171	402	538	1609	2902	1718	404	303
8	382	282	211	194	166	370	557	1570	2955	1658	365	277
9	376	280	186	203	179	361	608	1477	2829	1564	340	348
10	398	271	171	193	176	363	677	1444	2587	1390	311	604
11	368	271	176	198	167	381	728	1455	2376	1295	307	508
12	386	249	163	203	169	358	766	1354	2482	1354	307	408
13	383	217	171	189	199	366	800	1329	2221	1294	310	361
14	395	215	179	182	200	372	709	1293	2360	1207	370	292
15	395	231	188	210	187	372	763	1276	2111	1184	336	303
16	398	223	179	223	202	374	760	1281	1939	1136	315	296
17	374	217	148	217	183	390	764	1315	1831	1182	316	300
18	390	210	152	205	190	440	803	1341	1813	1038	273	276
19	372	224	161	216	203	455	877	1466	1735	999	270	294
20	373	196	170	206	185	461	938	1599	1630	941	259	280
21	377	213	135	208	177	458	1037	1682	1591	890	301	264
22	370	203	159	160	189	477	1144	1715	1616	922	318	298
23	357	195	151	159	191	452	981	1877	1512	921	300	339
24	359	195	157	157	187	457	1150	2082	1524	994	301	265
25	333	204	139	157	216	468	1158	2340	1360	1032	311	245
26	248	244	133	164	229	472	1191	2032	1432	1015	265	294
27	239	236	178	179	262	480	1172	2019	1486	982	321	264
28	240	237	191	139	275	476	1097	2253	1453	951	301	256
	251	245	199	165		461	1102	2459	1438	965	430	321
30	247	234	199	209		472	1083	2735	1414	1059	412	266
31	225		194	175		476		2853		1255	316	
Min	225	195	133	139	166	260	478	1130	1360	890	259	169
Max	407	282	238	223	275	480	1191	2853	2967	1829	1292	604
Mean	352	231	180	188	196	398	816	1678	2128	1278	445	310
ac-ft	21586	13716	11023	11536	10857	24448	48484	102971	126415	78442	27325	18440

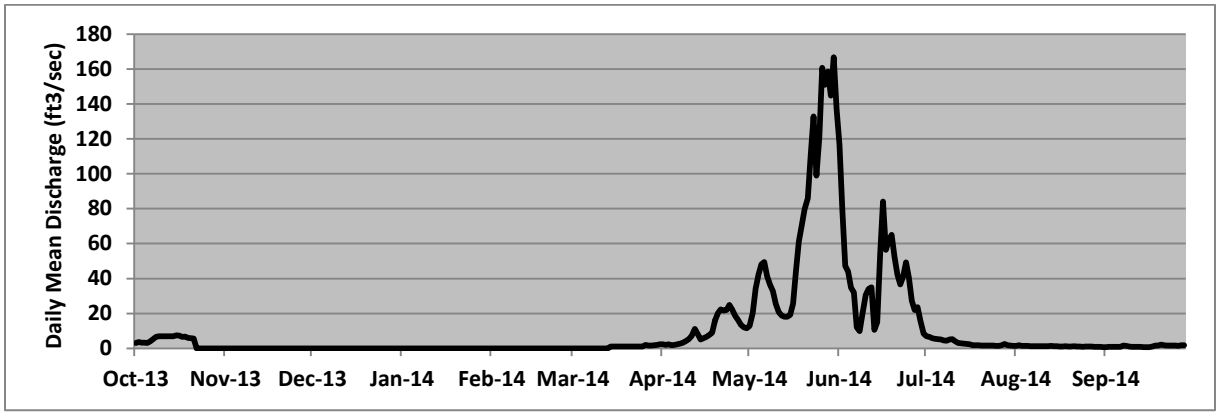


Appendix A (Table 2 of 38)
Elliot Creek Canal near Green Mountain Reservoir, CO

Location. --Lat 39°52'25", long 106°19'49", Summit County, Hydrologic Unit 14010002 , on left bank at concrete flume structure, and 1.1 mi west of Heeney.
Gage.--Water-stage recorder with satellite telemetry. Elevation of gage is 8050 ft from topographic map.
Remarks.—This is a diversion from Elliot Creek in the Blue River Basin to Green Mountain Reservoir. Recorder was operated in the early fall, and from28-Mar-2014 through 30-Sep-2014. Records are incomplete and only reliable while recorder is operated. This record contains operational data which could be subject to future revisions and changes. Official data is published by the United States Geological Survey.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	3	0	0	0	0	0	2	12	167	16	2	1
2	3	0	0	0	0	0	2	11	137	8	1	1
3	3	0	0	0	0	0	2	13	117	7	1	1
4	4	0	0	0	0	0	2	20	79	7	2	1
5	3	0	0	0	0	0	2	34	47	6	2	1
6	3	0	0	0	0	0	2	42	44	5	1	1
7	3	0	0	0	0	0	2	48	35	5	1	1
8	4	0	0	0	0	0	2	49	32	5	1	1
9	5	0	0	0	0	0	3	41	12	5	1	2
10	7	0	0	0	0	0	3	36	10	4	1	1
11	7	0	0	0	0	0	4	33	20	5	1	1
12	7	0	0	0	0	0	5	25	31	5	1	1
13	7	0	0	0	0	0	7	21	34	4	1	1
14	7	0	0	0	0	0	11	19	35	3	1	1
15	7	0	0	0	0	0	8	18	11	3	1	1
16	7	0	0	0	0	1	5	18	15	3	1	1
17	7	0	0	0	0	1	6	19	54	3	1	1
18	7	0	0	0	0	1	7	26	84	2	1	1
19	7	0	0	0	0	1	8	44	56	2	1	1
20	7	0	0	0	0	1	9	61	62	2	1	2
21	6	0	0	0	0	1	16	70	65	2	1	2
22	6	0	0	0	0	1	20	80	52	2	1	2
23	6	0	0	0	0	1	22	86	42	2	1	2
24	0	0	0	0	0	1	22	110	37	2	1	2
25	0	0	0	0	0	1	22	133	41	2	1	2
26	0	0	0	0	0	1	25	99	49	2	1	2
27	0	0	0	0	0	1	22	121	40	2	1	2
28	0	0	0	0	0	2	19	161	27	1	1	1
29	0	0	0	0		2	16	151	22	2	1	2
30	0	0	0	0		2	13	159	24	2	1	2
31	0		0	0		2		145		2	1	
Min	0	0	0	0	0	0	2	11	10	1	1	1
Max	7	0	0	0	0	2	25	161	167	16	2	2
Mean	4	0	0	0	0	1	10	61	49	4	1	1
ac-ft	248	0	0	0	0	38	575	3774	2931	234	74	71

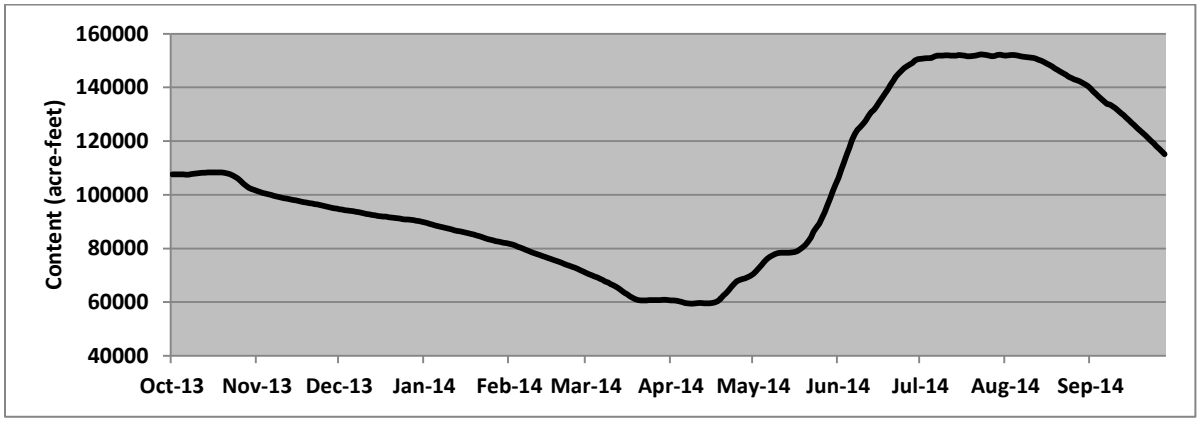


Appendix A (Table 3 of 38)
Green Mountain Reservoir, CO

Location. --Lat 39°52'42", long 106°19'42", Summit County, Hydrologic Unit 14010002, on Green Mountain Dam, 13 miles southeast of Kremmling, Colorado, on the Blue River..
Gage. –Water level recorder with satellite telemetry. Elevation of gage is 7960 from topographic map.
Remarks.--Reservoir is formed by an earth-fill dam. Construction completed in 1943. Impoundment began on 16-Nov-1942. Green Mountain Reservoir provides storage used for replacement water of the Colorado-Big Thompson Project diversions. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Maximum capacity is 153,639 acre-feet at elevation 7950.00 ft, with 146,779 acre-feet of active capacity. Records are complete and fair, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	107374	102175	95014	90201	82139	71887	60844	69318	101330	150036	152180	141135
2	107656	101791	94819	89970	81936	71396	60757	69811	103927	150518	151989	140554
3	107656	101456	94609	89724	81706	70905	60692	70539	106311	150602	151841	139533
4	107656	101094	94489	89463	81476	70454	60595	71494	109183	150811	151947	138480
5	107606	100731	94294	89176	81125	70042	60476	72657	111996	150937	152095	137548
6	107557	100447	94129	88876	80723	69569	60241	73859	114757	150937	152053	136603
7	107557	100179	93994	88575	80322	69198	59995	75100	117501	151042	151926	135659
8	107507	99927	93874	88303	79907	68720	59717	76163	120360	151482	151714	134683
9	107540	99677	93695	88060	79522	68220	59514	76848	122643	151820	151545	133865
10	107723	99413	93488	87804	79126	67724	59440	77406	124155	151820	151377	133554
11	107856	99148	93295	87564	78690	67263	59461	77981	125232	151820	151272	133012
12	108022	98899	93073	87323	78281	66762	59557	78255	126483	151989	151147	132299
13	108106	98697	92865	87054	77929	66274	59717	78373	127646	152010	151000	131508
14	108190	98494	92673	86785	77589	65685	59632	78412	129425	151905	150728	130552
15	108257	98308	92495	86559	77224	65008	59621	78412	130762	151820	150329	129635
16	108308	98108	92332	86363	76874	64260	59600	78412	131720	151862	149889	128706
17	108308	97908	92171	86153	76499	63506	59589	78491	132974	152095	149428	127778
18	108325	97693	92039	85915	76138	62848	59664	78637	134702	152010	148909	126821
19	108325	97509	91922	85692	75802	62218	59899	79020	136288	151841	148389	125864
20	108325	97278	91819	85454	75419	61603	60380	79680	137647	151672	147766	124897
21	108325	97109	91658	85216	75024	61082	61288	80469	139154	151630	147125	123895
22	108190	96940	91541	84883	74654	60812	62438	81354	140895	151736	146528	122974
23	107988	96756	91409	84551	74287	60660	63260	82532	142447	151841	145891	122146
24	107723	96574	91278	84220	73897	60649	64418	84137	144030	152095	145253	121143
25	107291	96377	91117	83888	73544	60682	65593	86251	145131	152285	144642	120124
26	106676	96149	90941	83572	73155	60703	66785	87776	146220	152264	144009	119168
27	106016	95921	90853	83312	72769	60736	67747	89291	147228	152074	143520	118161
28	105098	95694	90795	82997	72358	60768	68231	91234	147912	151841	143013	117144
29	104170	95481	90723	82737		60779	68588	93503	148556	151672	142669	116221
30	103312	95239	90578	82559		60812	68899	96058	149158	151757	142265	115180
31	102638		90375	82314		60844		98697		152032	141679	
Min	102638	95239	90375	82314	72358	60649	59440	69318	101330	150036	141679	115180
Max	108325	102175	95014	90201	82139	71887	68899	98697	149158	152285	152180	141135
EOM	102638	95239	90375	82314	72358	60844	68899	68899	149158	152032	141679	115180

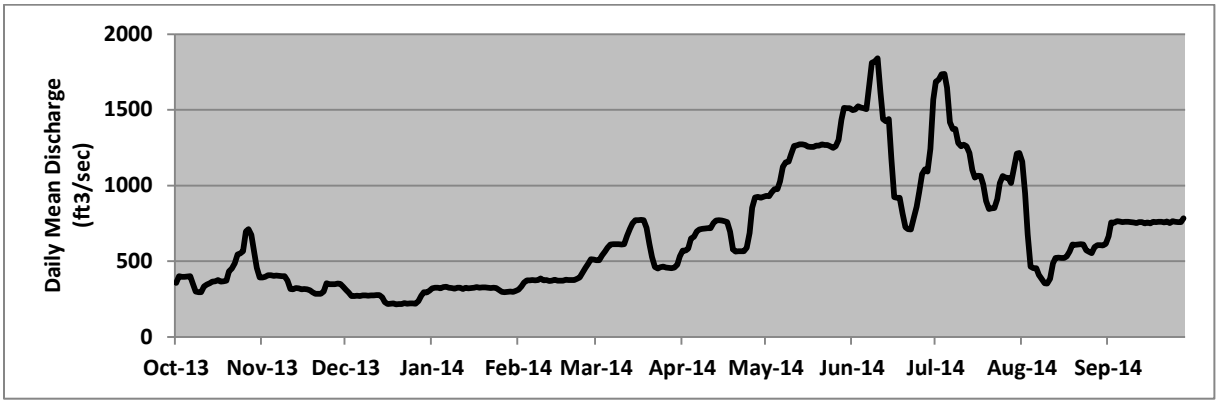


Appendix A (Table 4 of 38)
Blue River below Green Mountain Reservoir, CO

Location.--Lat 39°52'49", long 106°20'00", Summit County, Hydrologic Unit 14010002, on left bank 0.3 miles upstream from Elliot Creek, 0.3 miles downstream from Green Mountain Reservoir and 13 miles southeast of Kremmling.
Gage.-- Water-stage recorder with satellite telemetry. Datum of gage is 7682.66 feet (levels by U.S. Bureau of Reclamation).
Remarks.--Drainage area is 599 mi^2 including 15.3 mi^2 of Elliot Creek above the diversion for Elliot Creek feeder canal. Flow regulated by Green Mountain Reservoir since 1942. Diversions for irrigation of 5,000 acres upstream from station. Transmountain diversions upstream from station. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes. Official record is published by the United States Geological Survey.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	190	456	351	294	298	513	478	918	1512	1244	1211	605
2	219	392	332	306	303	511	534	925	1512	1568	1215	614
3	358	393	311	321	314	507	571	931	1497	1686	1157	666
4	401	398	293	324	334	506	571	929	1504	1700	946	757
5	397	408	270	325	359	538	582	954	1523	1736	678	755
6	397	407	270	322	374	564	650	976	1514	1737	466	765
7	398	404	273	329	373	589	662	976	1510	1647	455	762
8	401	406	271	331	375	612	697	1026	1504	1418	455	759
9	353	403	275	326	373	613	711	1124	1665	1375	409	760
10	299	402	274	322	375	613	715	1155	1812	1373	383	761
11	295	402	272	319	387	613	717	1158	1819	1281	354	760
12	296	372	275	324	375	611	718	1208	1841	1260	352	756
13	334	317	275	325	377	612	719	1262	1615	1271	384	753
14	347	314	276	317	371	669	752	1266	1439	1260	487	758
15	355	322	278	325	372	714	769	1272	1424	1215	523	758
16	366	321	261	322	379	751	771	1272	1439	1102	524	750
17	368	315	230	323	372	770	769	1268	1178	1053	522	758
18	375	316	218	325	372	771	766	1258	923	1066	523	751
19	366	314	220	329	373	773	759	1255	920	1064	532	760
20	367	309	222	325	378	771	696	1256	920	1007	564	758
21	371	296	216	328	376	720	579	1264	816	897	611	760
22	432	285	218	327	376	614	564	1265	725	845	608	762
23	452	285	218	326	376	528	566	1271	713	849	612	756
24	487	285	223	324	384	463	566	1268	709	852	612	764
25	545	300	220	325	394	451	566	1268	787	912	612	753
26	551	356	222	324	426	461	590	1260	860	1016	573	765
27	566	349	222	310	457	464	687	1250	957	1064	561	761
28	697	349	220	297	483	460	853	1260	1075	1053	553	759
29	713	349	236	296		455	922	1301	1106	1051	593	759
30	674	354	272	298		455	926	1435	1093	1017	607	784
31	559		296	299		459		1514		1114	606	
Min	190	285	216	294	298	451	478	918	709	845	352	605
Max	713	456	351	331	483	773	926	1514	1841	1737	1215	784
Mean	417	353	258	319	375	586	681	1185	1264	1217	603	746
ac-ft	25600	20947	15863	19583	20796	35942	40442	72752	75071	74709	37003	44332

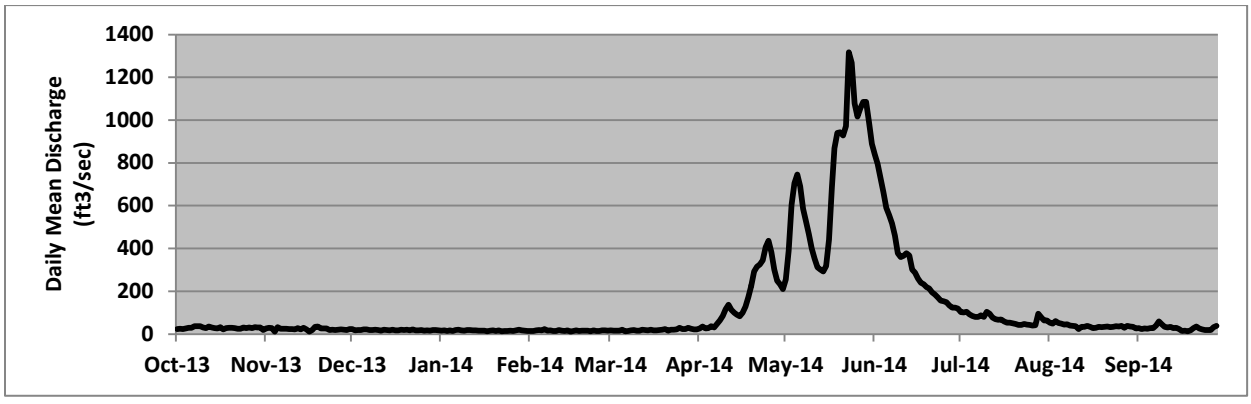


Appendix A (Table 5 of 38)
Willow Creek Reservoir, CO

Location. –- Lat 40°08'52", long 105°56'28", Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, 4 miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.
Gage.— Water level recorder with satellite telemetry. Elevation of gage is 8130 from topographic map.
Remarks.—Inflow computed daily using change in content from midnight to midnight, plus the 24-hour average releases through the Willow Creek Pump Canal and the reservoir outlet works. Recorders were operated from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Inflow, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	24	30	19	19	16	18	22	233	992	123	63	34
2	22	18	24	18	14	16	21	210	889	119	64	26
3	24	26	23	16	14	17	26	255	839	102	53	28
4	25	29	17	17	15	15	34	390	796	100	48	24
5	23	28	18	14	17	15	26	603	729	104	60	26
6	26	12	19	17	18	15	27	706	663	92	51	25
7	29	32	22	14	17	20	37	745	590	85	48	27
8	29	25	22	19	23	13	30	690	556	81	44	28
9	37	24	18	20	16	14	47	585	517	81	46	40
10	36	25	19	18	17	17	64	528	461	88	39	60
11	37	24	19	16	14	19	85	468	378	80	38	45
12	31	23	19	18	15	15	116	400	359	104	37	34
13	28	21	16	18	19	16	136	353	366	95	23	31
14	35	27	19	16	16	20	113	312	378	78	34	34
15	30	22	18	17	15	18	100	301	368	70	34	28
16	28	29	17	15	18	17	91	292	302	66	38	30
17	27	21	20	16	11	21	83	319	286	68	34	24
18	32	11	17	16	14	17	99	441	259	60	27	15
19	22	19	17	13	17	17	127	685	240	53	29	16
20	28	34	19	16	15	18	173	869	233	53	33	13
21	29	35	19	17	15	20	226	941	220	50	33	17
22	28	26	19	15	15	24	292	944	213	47	33	27
23	27	27	17	17	16	16	315	928	196	43	35	35
24	25	26	21	12	13	20	325	972	184	43	32	27
25	25	19	18	15	17	21	345	1318	171	46	34	21
26	31	20	17	14	14	22	407	1268	157	45	36	18
27	27	18	18	16	15	29	436	1078	153	43	36	18
28	30	21	16	15	18	23	382	1016	148	40	38	19
29	28	21	18	17		23	302	1055	133	41	29	32
30	33	20	16	20		29	249	1086	124	96	39	39
31	30		19	17		24		1085		79	36	
Min	22	11	16	12	11	13	21	210	124	40	23	13
Max	37	35	24	20	23	29	436	1318	992	123	64	60
Mean	28	24	19	16	16	19	158	680	397	73	40	28
ac-ft	1749	1413	1156	1005	880	1163	9380	41731	23561	4499	2426	1667

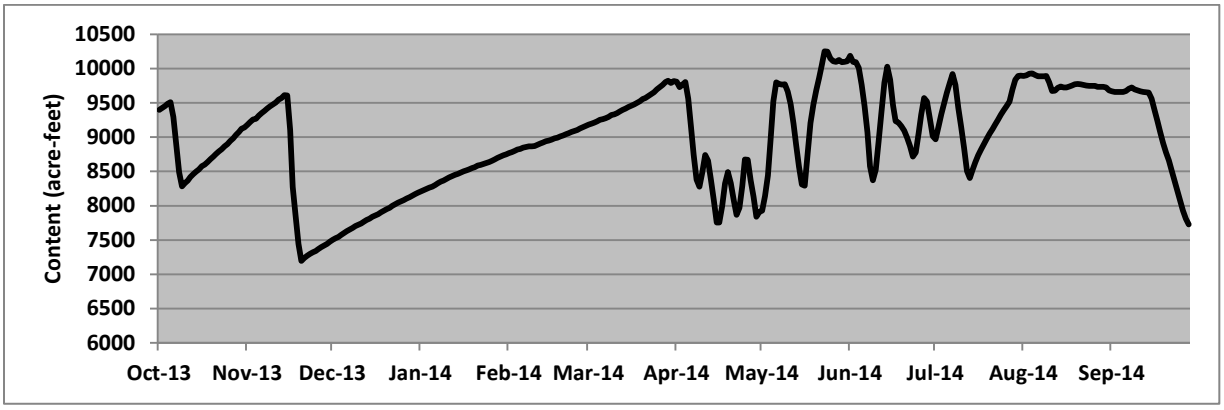


Appendix A (Table 6 of 38)
Willow Creek Reservoir, CO

Location. –-Lat 40° 08’52”, long 105° 56’28”, Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, 4 miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.
Gage.— Water level recorder with satellite telemetry. Elevation of gage is 8130 from topographic map.
Remarks.—Reservoir is formed by an earth-fill dam. Construction completed in 1953. Impoundment began on April 2, 1953. Willow Creek Reservoir stores water from Willow Creek for diversion to Granby Reservoir via the Willow Creek Canal. Maximum capacity is 10,600 acre-feet at elevation 8,130.00 ft, with 9,100 acre-feet of active capacity between elevations 8077.00 and 8130.00 feet. Recorder was operated from 01-Oct 2013 to 30-Sep-2014. Record is complete and fair, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	9345	9120	7444	8169	8736	9147	9789	7837	10099	9272	9894	9726
2	9369	9141	7474	8190	8751	9162	9817	7911	10105	9017	9896	9684
3	9396	9179	7505	8209	8766	9181	9809	7928	10186	8970	9891	9668
4	9427	9221	7525	8229	8782	9197	9729	8145	10099	9149	9902	9659
5	9454	9259	7547	8244	8800	9213	9766	8442	10091	9337	9925	9659
6	9485	9267	7572	8263	8817	9229	9803	8942	10009	9498	9928	9659
7	9512	9315	7601	8278	8827	9253	9559	9523	9763	9645	9905	9659
8	9296	9350	7630	8302	8848	9264	9134	9800	9454	9783	9885	9673
9	8892	9383	7652	8328	8856	9278	8741	9775	9070	9922	9885	9704
10	8489	9416	7677	8351	8864	9296	8380	9766	8579	9760	9888	9724
11	8285	9449	7703	8368	8866	9321	8278	9772	8370	9427	9894	9696
12	8328	9479	7725	8390	8872	9334	8489	9662	8524	9144	9800	9684
13	8368	9506	7743	8413	8890	9350	8741	9482	8939	8843	9673	9668
14	8420	9545	7768	8432	8908	9375	8656	9197	9375	8507	9676	9659
15	8461	9572	7791	8452	8921	9396	8375	8892	9795	8403	9721	9654
16	8497	9614	7812	8467	8942	9416	8076	8572	10026	8517	9738	9651
17	8532	9606	7837	8484	8950	9441	7757	8311	9834	8634	9724	9561
18	8577	9104	7858	8502	8963	9460	7757	8292	9462	8733	9726	9399
19	8602	8275	7879	8514	8981	9479	7995	8756	9234	8817	9738	9237
20	8639	7856	7904	8532	8994	9501	8323	9207	9210	8900	9754	9073
21	8677	7444	7928	8549	9009	9526	8489	9471	9160	8978	9772	8913
22	8718	7198	7951	8564	9025	9556	8328	9684	9096	9051	9775	8779
23	8756	7237	7972	8584	9043	9572	8088	9862	8994	9118	9772	8661
24	8789	7273	8000	8594	9056	9598	7870	10040	8869	9181	9760	8524
25	8822	7297	8022	8609	9075	9626	7972	10251	8718	9253	9752	8378
26	8864	7322	8043	8622	9088	9656	8292	10245	8776	9326	9749	8227
27	8900	7341	8064	8639	9104	9698	8674	10149	9059	9394	9746	8076
28	8944	7368	8083	8654	9126	9729	8669	10108	9329	9454	9746	7928
29	8983	7395	8105	8674		9760	8373	10099	9572	9517	9732	7812
30	9033	7419	8123	8700		9803	8133	10125	9520	9693	9735	7727
31	9075		8147	8718		9823		10091		9834	9735	
Min	8285	7198	7444	8169	8736	9147	7757	7837	8370	8403	9673	7727
Max	9512	9614	8147	8718	9126	9823	9817	10251	10186	9922	9928	9726
EOM	9075	7419	8147	8718	9126	9823	8133	8133	9520	9834	9735	7727

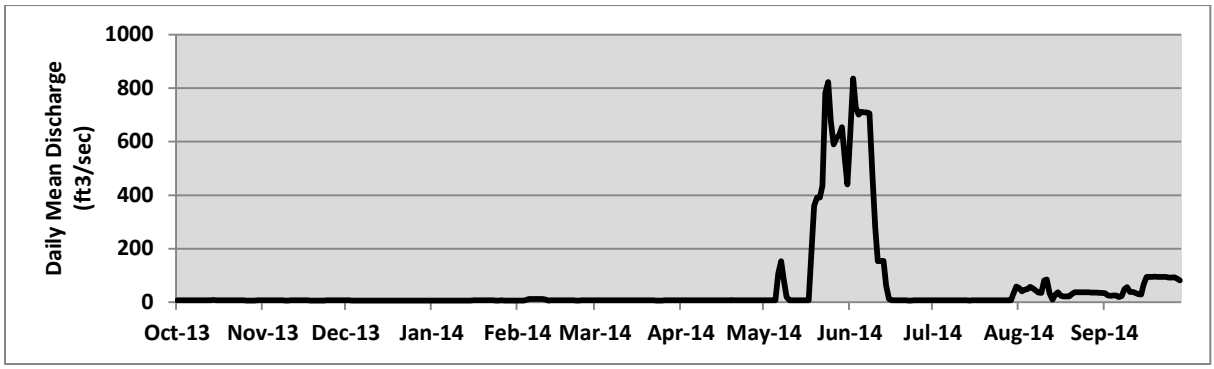


Appendix A (Table 7 of 38)
Willow Creek below Willow Creek Reservoir, CO

Location.--Lat 40°08'50", long 105°56'16", Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, 4 miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.
Gage.--Water-stage recorder with satellite telemetry. Elevation of gage is 8040 feet from topographic map.
Remarks.-- Drainage area is 127 square miles. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable. The official record is published by the Division of Water Resources, State of Colorado. This record contains operational data which could be subject to future revisions and changes.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	8	7	7	7	7	7	7	7	534	7	32	36
2	8	7	7	7	7	7	7	7	440	7	59	35
3	8	7	7	7	7	7	7	7	630	8	54	34
4	8	7	7	7	7	7	7	7	836	7	41	26
5	8	7	7	7	7	7	7	7	730	7	48	25
6	8	7	7	7	9	7	7	7	701	7	50	25
7	8	7	7	7	12	7	7	7	712	7	58	25
8	8	7	7	7	12	7	7	108	710	8	52	19
9	8	7	7	7	12	7	7	153	709	8	44	24
10	8	7	7	7	12	7	7	85	705	8	36	49
11	8	7	7	7	12	7	7	20	480	7	35	56
12	8	7	7	7	12	7	7	8	279	7	81	38
13	8	7	7	7	10	7	7	7	154	7	85	39
14	8	7	7	7	7	7	7	7	154	7	33	35
15	8	7	7	7	7	7	7	7	154	7	10	30
16	8	7	7	7	7	7	7	7	62	7	28	29
17	8	7	7	7	7	7	7	7	12	7	37	68
18	8	7	7	7	7	7	7	7	7	7	24	95
19	8	7	7	7	7	7	7	7	7	7	22	95
20	8	7	7	7	7	7	7	196	7	7	22	95
21	8	7	7	7	7	7	7	360	7	7	22	96
22	7	7	7	7	7	7	7	391	7	7	30	95
23	7	7	7	7	7	8	7	391	7	7	37	95
24	7	7	7	7	7	7	7	436	7	8	37	94
25	8	7	7	7	7	7	7	782	7	7	37	94
26	8	7	7	7	7	7	7	823	7	7	37	93
27	8	7	7	7	7	7	7	678	7	7	37	93
28	7	7	7	7	7	7	7	590	7	7	37	93
29	7	7	7	7		7	7	613	7	7	37	89
30	7	7	7	7		7	7	623	8	7	36	82
31	7		7	7		7		654		7	36	
Min	7	7	7	7	7	7	7	7	7	7	10	19
Max	8	7	7	7	12	8	7	823	836	8	85	96
Mean	8	7	7	7	8	7	7	226	270	7	40	60
ac-ft	474	418	417	422	463	442	436	13882	16031	448	2446	3564

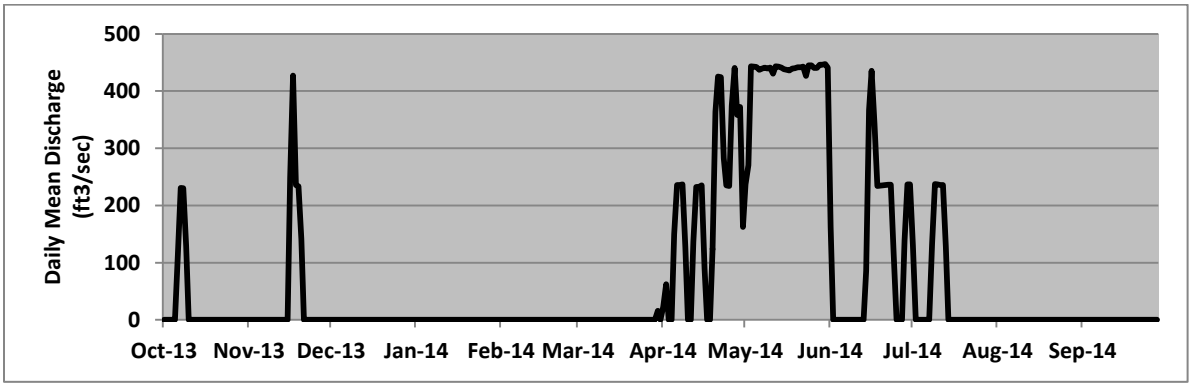


Appendix A (Table 8 of 38)
Willow Creek Pump Canal, CO

Location. –-Lat 40°08’39”, long 105°54’10”, Grand County, Hydrologic Unit 14010001, at Willow Creek Pump Canal, 4 miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.
Gage.— Water-stage recorder with satellite telemetry at 15 foot Parshall Flume. Elevation of gage is 8300 feet from topographic map.
Remarks.—Canal is used to divert water from Willow Creek Reservoir to Granby Reservoir. Diversions are seasonal, mainly during late spring and early summer. Construction completed in 1953. Length of the canal is 3.4 miles. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	16	372	447	237	0	0
2	0	0	0	0	0	0	0	163	441	237	0	0
3	0	0	0	0	0	0	23	237	162	131	0	0
4	0	0	0	0	0	0	62	271	0	0	0	0
5	0	0	0	0	0	0	0	443	0	0	0	0
6	0	0	0	0	0	0	0	443	0	0	0	0
7	0	0	0	0	0	0	150	442	0	0	0	0
8	113	0	0	0	0	0	235	437	0	0	0	0
9	231	0	0	0	0	0	236	439	0	0	0	0
10	230	0	0	0	0	0	237	441	0	133	0	0
11	129	0	0	0	0	0	126	440	0	237	0	0
12	0	0	0	0	0	0	0	441	0	237	0	0
13	0	0	0	0	0	0	0	430	0	236	0	0
14	0	0	0	0	0	0	137	443	0	236	0	0
15	0	0	0	0	0	0	232	443	0	128	0	0
16	0	0	0	0	0	0	233	441	86	0	0	0
17	0	0	0	0	0	0	235	438	366	0	0	0
18	0	249	0	0	0	0	90	437	435	0	0	0
19	0	427	0	0	0	0	0	436	343	0	0	0
20	0	236	0	0	0	0	0	439	234	0	0	0
21	0	234	0	0	0	0	124	440	235	0	0	0
22	0	141	0	0	0	0	364	441	235	0	0	0
23	0	0	0	0	0	0	426	442	236	0	0	0
24	0	0	0	0	0	0	425	443	237	0	0	0
25	0	0	0	0	0	0	283	427	236	0	0	0
26	0	0	0	0	0	0	235	445	115	0	0	0
27	0	0	0	0	0	0	234	445	0	0	0	0
28	0	0	0	0	0	0	374	441	0	0	0	0
29	0	0	0	0		0	441	440	0	0	0	0
30	0	0	0	0		0	359	446	139	0	0	0
31	0		0	0		0		446		0	0	
Min	0	0	0	0	0	0	0	163	0	0	0	0
Max	231	427	0	0	0	0	441	446	447	237	0	0
Mean	23	43	0	0	0	0	176	417	132	58	0	0
ac-ft	1391	2548	0	0	0	0	10445	25606	7819	3587	0	0

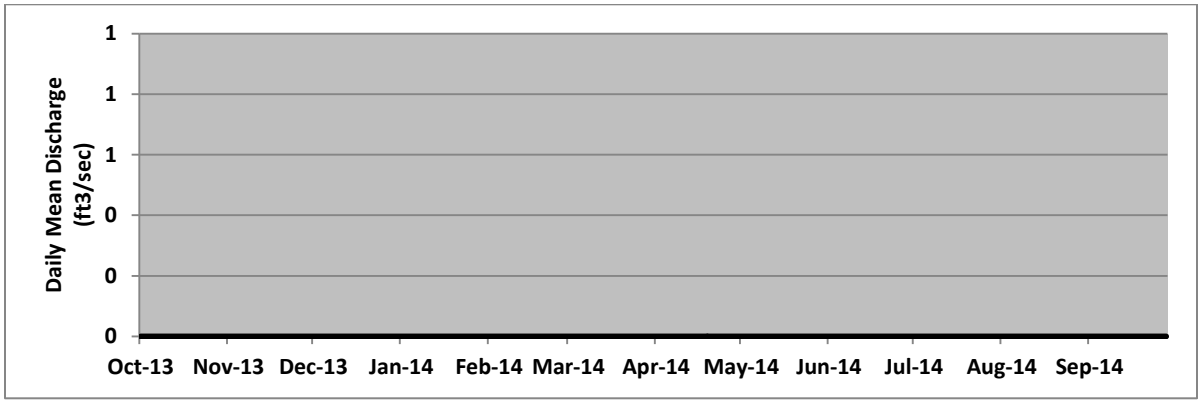


Appendix A (Table 9 of 38)
Windy Gap Pumping Plant, CO

Location. --Lat 40°06'24", long 105°58'48", Grand County, Hydrologic Unit 14010001, 5.5 miles northeast of Granby, Colorado, on the Colorado River.
Gage.-- Reading taken directly from the pumps. Elevation of the pumping plant is 7823 from topographic map.
Remarks.— Water is pumped from Windy Gap Reservoir to Granby Reservoir. Water is stored at Granby Reservoir before delivery through Adams Tunnel. Data was provided by Farr Pumping Plant operators each morning. Data was collected from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Windy Gap Pump Discharge, Cubic Feet per Second, Daily Mean Values

1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0		0	0	0	0	0	0	0
30	0	0	0	0		0	0	0	0	0	0	0
31	0		0	0		0		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	0	0	0	0	0	0
Mean	0	0	0	0	0	0	0	0	0	0	0	0
ac-ft	0	0	0	0	0	0	0	0	0	0	0	0

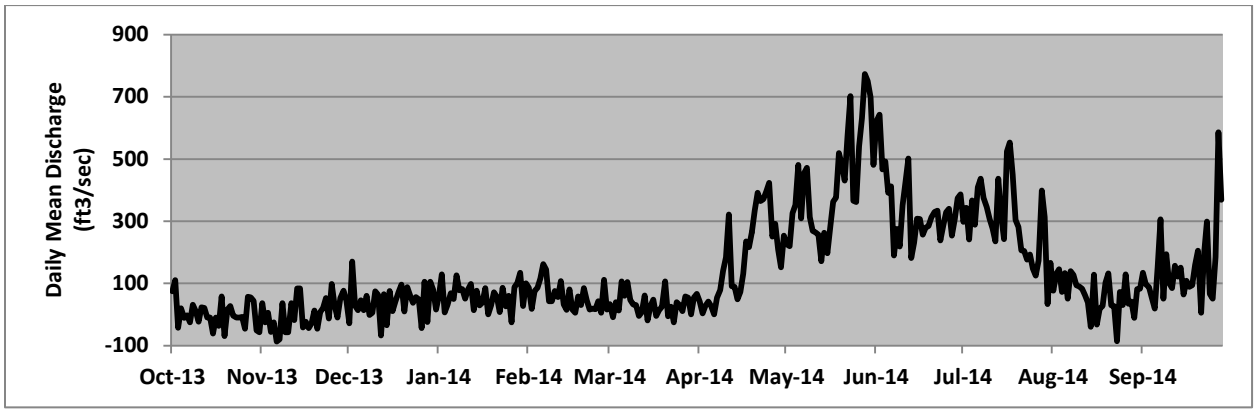


Appendix A (Table 10 of 38)
Granby Reservoir, CO

Location. --Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, Colorado, on the Colorado River.
Gage.-- Water level recorder with satellite telemetry. Elevation of gage is 8300 from topographic map.
Remarks.-- Inflow computed daily based on change in content from midnight to midnight, and on the average daily releases through the reservoir outlet works. Recorders were operated from 01-Oct-2013 to 30-Sep-2014. Records are complete, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Inflow, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	7	-51	76	80	28	112	55	151	698	374	33	82
2	53	-57	44	16	101	16	67	254	481	386	166	83
3	75	37	-28	61	86	34	42	226	621	297	76	135
4	110	-25	170	129	18	-8	4	219	643	343	130	97
5	-43	6	29	6	76	40	28	326	467	242	146	88
6	20	-56	14	31	86	13	42	352	492	367	72	53
7	-11	-25	45	68	116	107	26	481	391	289	133	19
8	-2	-87	14	50	162	60	0	309	412	409	51	152
9	-25	-80	60	126	145	104	54	454	190	436	140	307
10	31	37	-2	78	43	47	79	472	276	375	127	51
11	11	-57	6	82	43	33	140	314	219	346	94	194
12	-23	-57	74	51	76	30	184	269	351	307	90	101
13	23	36	64	81	57	-5	321	264	426	277	83	85
14	21	-18	-67	98	107	7	92	257	502	235	63	157
15	-10	84	65	14	32	61	89	171	181	437	39	122
16	-10	84	-34	77	15	-19	49	263	231	317	-39	151
17	-61	-42	76	29	81	28	72	197	308	242	128	65
18	-10	-23	11	39	16	47	131	281	307	524	-32	109
19	-37	-43	42	85	5	-4	236	362	256	553	19	89
20	58	-29	73	1	58	14	216	376	279	450	27	95
21	-70	13	96	29	30	25	265	519	285	304	102	159
22	16	-46	10	72	85	106	335	482	313	281	132	206
23	27	8	89	57	45	-6	391	431	330	207	29	5
24	-4	21	61	8	16	26	365	575	334	204	27	194
25	-10	53	38	86	19	-25	371	702	238	176	-86	299
26	-10	-13	56	27	17	40	395	366	285	193	72	67
27	-8	99	49	60	42	30	423	362	329	148	31	51
28	-46	29	-44	-25	6	11	251	541	340	125	130	185
29	57	-10	105	88		58	292	631	253	173	35	586
30	55	53	-24	101		54	210	773	306	398	41	369
31	44		106	134		0		750		313	-10	
Min	-70	-87	-67	-25	5	-25	0	151	181	125	-86	5
Max	110	99	170	134	162	112	423	773	698	553	166	586
Mean	7	-5	41	59	58	33	174	391	358	314	66	145
ac-ft	452	-311	2518	3637	3190	2056	10348	24019	21272	19269	4059	8623

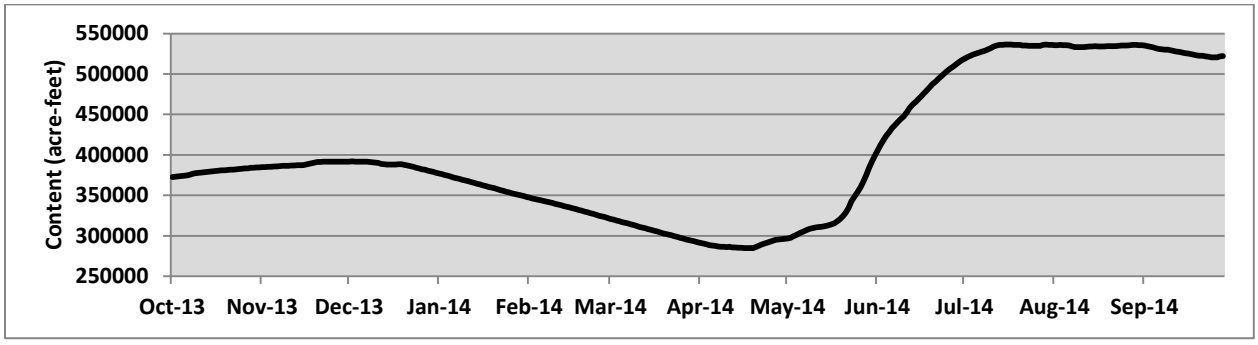


Appendix A (Table 11 of 38)
Granby Reservoir, CO

Location. --Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, Colorado, on the Colorado River.
Gage.-- Water level recorder with satellite telemetry. Elevation of gage is 8300 from topographic map.
Remarks.--Reservoir is formed by an earth-fill dam and four earth-fill dikes. Construction completed in 1950. Impoundment began on 14-Sep-1949. Granby Reservoir provides west-slope storage for the Colorado-Big Thompson Project. Maximum capacity is 539,800 acre-feet at elevation 8,280.00, with 463,300 acre-feet of active capacity between elevations 8186.90 and 8280.00 feet. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Records are complete, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	371553	384423	391769	378785	349151	323017	292977	296007	391769	514700	536133	535628
2	372099	384546	391646	377746	348273	321940	292118	296280	398690	517118	535917	535628
3	372463	384852	391460	376833	347335	320922	291309	296822	405286	519110	535700	535267
4	373066	385036	391831	376042	346280	319853	290446	297585	412126	520969	535700	534326
5	373368	385281	391646	375071	345347	318893	289538	299435	418247	522681	535917	533676
6	373794	385404	391522	374038	344587	317879	288572	301128	423582	524257	535773	532665
7	374159	385588	391646	373066	343709	317040	287929	302830	428113	525402	535484	531658
8	374765	385835	391522	372039	343013	316084	287395	304588	432994	526550	535049	530791
9	375557	386083	391460	371191	342374	315186	286970	306295	436859	527627	534110	530289
10	376588	386392	391090	370222	341443	314183	286597	307787	440545	528921	533313	530144
11	377442	386515	391028	369260	340454	313177	286275	308895	444113	530289	533240	530144
12	377869	386637	390471	368294	339470	312171	285956	309725	447966	532090	533240	529351
13	378299	386945	389850	367389	338658	311117	286222	310448	452572	533893	533313	528563
14	378725	387007	388921	366491	337788	310116	285796	311117	458015	535049	533530	527844
15	379089	387194	388304	365468	336809	309226	285583	311340	461869	535917	533893	527125
16	379454	387380	387935	364508	335768	308176	285263	312116	465262	536205	534182	526406
17	379884	387380	387935	363493	334901	307179	285049	313010	468668	536565	534326	525545
18	380313	387996	387996	362534	333926	306240	284731	314072	472294	536421	534182	525402
19	380495	388921	388119	361577	332890	305192	284625	315468	476210	536277	534182	524545
20	380801	389665	388304	360506	331969	304201	284628	317767	479938	536205	534182	523754
21	381047	390471	388304	359491	330940	303214	284943	320583	483748	536133	534326	523112
22	381416	391090	387627	358598	329966	302389	286115	324038	487646	535917	534541	522681
23	381660	391398	387007	357650	329048	301457	287555	328366	490710	535267	534613	522465
24	381843	391460	386083	356580	328023	300475	289108	334156	493924	535049	534613	521824
25	382209	391584	385220	355632	326996	299435	290393	342432	497354	534830	534758	521397
26	382576	391460	384299	354570	325969	298561	291631	348273	500791	534976	535049	520610
27	382947	391584	383316	353624	324947	297585	292923	353448	503885	534976	535121	520467
28	383194	391460	382209	352621	323924	296551	293789	359491	506704	534758	535267	520610
29	383500	391460	381599	351739		295681	294980	366790	509315	534976	535484	521611
30	383929	391584	380495	350855		294818	295627	374704	512003	536133	535989	522180
31	384299		379638	350151		293843		383561		536421	535917	
Min	371553	384423	379638	350151	323924	293843	284625	296007	391769	514700	533240	520467
Max	384299	391584	391831	378785	349151	323017	295627	383561	512003	536565	536133	535628
EOM	384299	391584	379638	350151	323924	293843	295627	295627	512003	536421	535917	522180

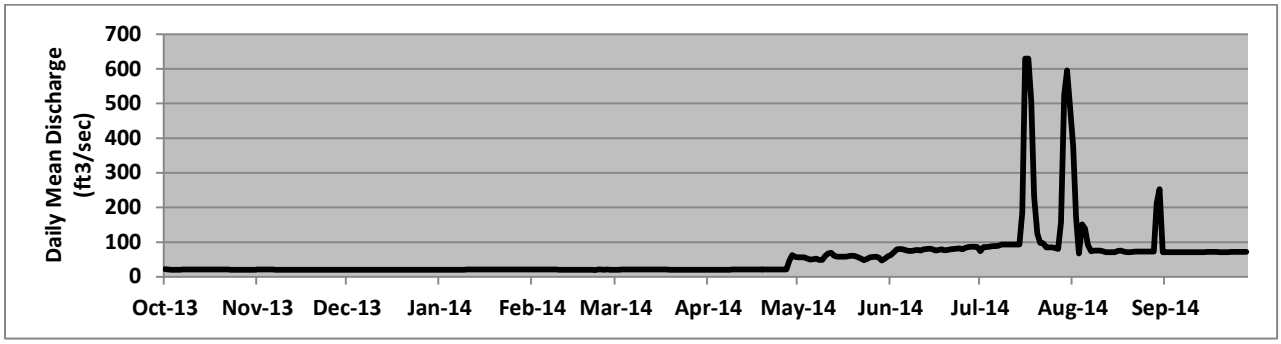


Appendix A (Table 12 of 38)
Granby Reservoir, CO

Location. --Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, Colorado, on the Colorado River.
Gage.-- Water level recorder with satellite telemetry. Elevation of gage is 8300 feet, from topographic map.
Remarks.--Reservoir is formed by an earth-fill dam and four earth-fill dikes. Construction completed in 1950. Impoundment began on 14-Sep-1949. Granby Reservoir provides west-slope storage for the Colorado-Big Thompson Project. Data was provided by personnel from the Northern Colorado Water Conservancy District. Releases were made through the outlet works valve. The stream gage directly below the dam is used to measure flows during winter. A USGS station further downstream is used to measure flows between spring and fall. Data was recorded from 01-Oct-2013 to 30-Sep-2014. Records are complete and fair. This record contains operational data which could be subject to future revisions and changes.

Discharge, Cubic Feet per Second, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	34	20	20	20	21	20	20	63	53	87	595	253
2	21	20	20	20	21	20	20	57	59	86	493	71
3	22	21	20	20	21	20	20	56	63	74	378	71
4	21	21	20	20	21	20	20	56	71	86	173	71
5	20	21	20	20	21	21	20	56	79	86	67	71
6	20	21	20	20	21	21	20	53	80	87	151	71
7	20	21	20	20	21	21	20	50	79	89	139	71
8	20	21	20	20	21	21	20	51	77	89	92	71
9	21	20	20	20	21	21	20	53	75	90	74	71
10	21	20	20	20	21	21	20	49	75	93	76	71
11	21	20	20	20	21	21	21	49	77	93	76	71
12	21	20	20	21	20	21	21	60	78	93	76	71
13	21	20	20	21	20	21	21	67	76	93	74	71
14	21	20	20	21	20	21	21	69	79	93	71	71
15	21	20	20	21	20	21	21	61	80	93	71	71
16	21	20	20	21	20	21	21	58	81	93	71	71
17	21	20	20	21	20	21	21	58	79	186	71	72
18	21	20	20	21	20	21	21	58	76	630	75	72
19	21	20	20	21	20	21	21	58	78	630	76	72
20	21	20	20	21	20	21	21	60	79	508	73	72
21	21	20	20	21	20	20	21	61	77	232	71	71
22	21	20	20	21	20	20	21	60	78	125	71	71
23	21	20	20	21	20	20	21	56	79	98	72	71
24	21	20	20	21	19	20	21	53	80	97	73	71
25	20	20	20	21	21	20	21	48	81	85	73	72
26	20	20	20	21	21	20	21	52	82	85	73	72
27	20	20	20	21	20	20	21	56	79	85	73	72
28	20	20	20	21	21	20	21	57	84	83	73	72
29	20	20	20	21		20	21	58	86	80	73	72
30	20	20	20	21		20	46	55	87	157	73	72
31	20		20	21		20		47		524	212	
Min	20	20	20	20	19	20	20	47	53	74	67	71
Max	34	21	20	21	21	21	46	69	87	630	595	253
Mean	21	20	20	21	20	21	22	56	77	162	126	77
ac-ft	1295	1200	1228	1267	1135	1259	1277	3455	4568	9959	7740	4598

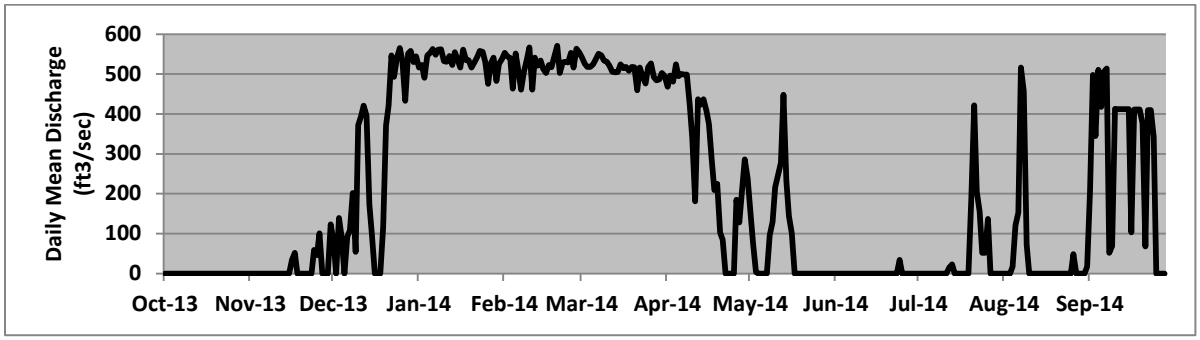


Appendix A (Table 13 of 38)
Farr Pumping Plant, Granby Reservoir, CO

Location. --Lat 40°11'30", long 105°52'52", Grand County, Hydrologic Unit 14010001, at Farr Pumping Plant on the north end of Granby Reservoir, 8 miles northeast of Granby, Colorado, on the Colorado River.
Gage.-- Reading taken directly from the pumps, based on conduit pressure and Granby Reservoir's elevation. Elevation of the pumping plant is 8320 from topographic map.
Remarks.-- Water is pumped from Granby to the Granby Pump Canal which discharges into Shadow Mountain Reservoir. The operation keeps Shadow Mountain Reservoir/Grand Lake at a steady water surface level when transmountain diversions via Adams Tunnel are taking place. Data was provided by Farr Pumping Plant operators, Northern Colorado Water Conservancy District, each morning. Data was collected from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	530	526	564	503	286	0	0	0	0
2	0	0	123	544	537	554	495	239	0	0	0	17
3	0	0	82	516	553	542	468	151	0	0	0	208
4	0	0	0	523	544	526	496	75	0	0	0	498
5	0	0	139	491	540	518	481	4	0	0	0	345
6	0	0	93	547	463	518	524	0	0	0	17	511
7	0	0	0	553	552	524	495	0	0	0	121	418
8	0	0	93	563	507	536	500	0	0	0	153	505
9	0	0	108	548	461	551	499	0	0	0	516	514
10	0	0	202	561	506	547	499	96	0	0	456	52
11	0	0	54	562	536	534	423	130	0	0	72	69
12	0	0	372	532	567	531	339	216	0	0	0	413
13	0	0	394	531	461	521	181	247	0	0	0	412
14	0	0	421	545	541	506	437	278	0	15	0	412
15	0	0	396	523	521	504	423	448	0	23	0	412
16	0	0	172	555	534	505	437	232	0	0	0	412
17	0	0	96	535	513	524	409	144	0	0	0	412
18	0	34	0	516	503	515	375	101	0	0	0	103
19	0	52	0	561	523	518	283	0	0	0	0	411
20	0	0	0	535	517	508	209	0	0	0	0	411
21	0	0	116	535	544	518	224	0	0	0	0	411
22	0	0	371	516	571	517	102	0	0	189	0	377
23	0	0	421	529	503	459	85	0	0	422	0	68
24	0	0	547	541	529	516	0	0	0	206	0	410
25	0	0	493	558	531	494	0	0	0	155	0	410
26	0	59	540	556	529	476	0	0	34	52	0	342
27	0	46	565	531	553	517	0	0	0	52	0	0
28	0	101	534	475	516	527	185	0	0	137	49	0
29	0	0	433	526		492	128	0	0	0	0	0
30	0	0	552	541		484	213	0	0	0	0	0
31	0		558	483		487		0		0	0	
Min	0	0	0	475	461	459	0	0	0	0	0	0
Max	0	101	565	563	571	564	524	448	34	422	516	514
Mean	0	10	254	534	524	517	314	85	1	40	45	285
ac-ft	0	578	15593	32793	29068	31745	18638	5241	67	2477	2740	16935

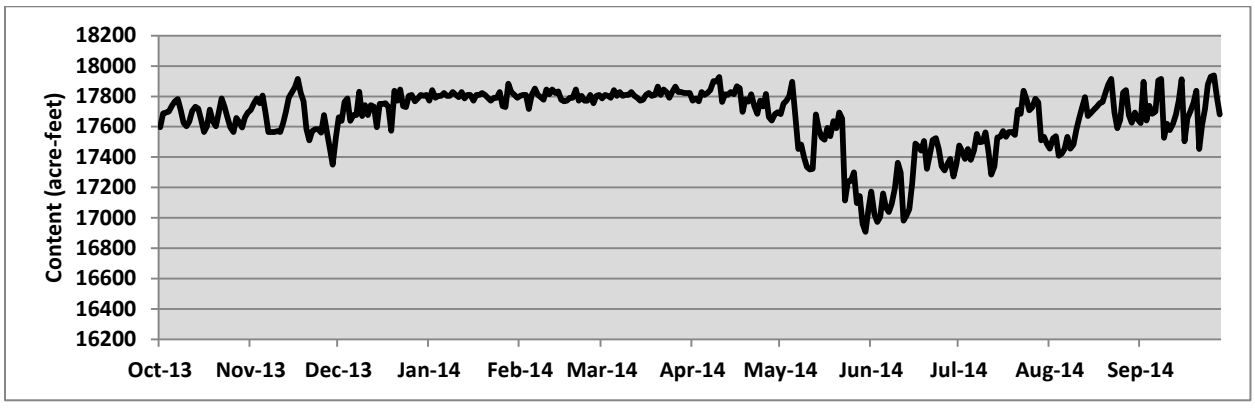


Appendix A (Table 14 of 38)
Shadow Mountain/Grand Lake, CO

Location. --Lat 40°12'26", long 105°50'28", Grand County, Hydrologic Unit 14010001, on the Colorado River at the Shadow Mountain outlet works structure, 10 miles northeast of Granby, Colorado.
Gage.--Water-stage recorder with satellite telemetry. Elevation of gage is 8375 feet from topographic map.
Remarks.—Shadow Mountain/Grand Lake was constructed between 1944 and 1946. Impoundment began in 1946. Active capacity between elevations 8,366 and 8,367 is 1,800 acre-feet. Grand Lake is used as forebay storage for Adams Tunnel. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Some data were provided by Farr Pumping Plant personnel during down time. Records are complete and fair. This record contains operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	17571	17663	17350	17804	17809	17804	17822	17682	16908	17272	17534	17695
2	17529	17695	17529	17809	17791	17809	17822	17696	17051	17352	17487	17648
3	17597	17710	17663	17772	17804	17786	17772	17682	17173	17476	17456	17624
4	17686	17755	17640	17841	17809	17809	17786	17753	17024	17439	17524	17895
5	17695	17786	17763	17791	17809	17804	17767	17771	16973	17389	17537	17641
6	17700	17755	17787	17804	17717	17791	17827	17803	17006	17453	17409	17738
7	17737	17805	17640	17804	17809	17841	17809	17895	17161	17382	17422	17685
8	17768	17695	17676	17822	17851	17804	17822	17666	17067	17442	17454	17701
9	17781	17566	17676	17804	17809	17827	17841	17454	17039	17553	17533	17905
10	17710	17566	17832	17804	17796	17804	17901	17483	17094	17498	17457	17915
11	17626	17566	17671	17827	17777	17809	17898	17399	17196	17503	17482	17527
12	17603	17571	17743	17809	17846	17809	17927	17336	17364	17563	17579	17619
13	17634	17566	17677	17796	17814	17827	17764	17318	17298	17442	17658	17577
14	17705	17621	17743	17827	17846	17804	17814	17323	16982	17285	17726	17619
15	17732	17700	17732	17786	17822	17791	17809	17680	17015	17340	17795	17679
16	17718	17794	17598	17809	17833	17772	17827	17585	17057	17529	17671	17771
17	17645	17823	17750	17809	17777	17777	17814	17530	17229	17534	17690	17913
18	17566	17860	17750	17772	17767	17809	17866	17514	17488	17571	17713	17504
19	17603	17915	17755	17809	17772	17822	17853	17593	17470	17534	17731	17656
20	17713	17823	17731	17809	17791	17804	17698	17537	17443	17566	17755	17701
21	17639	17768	17574	17822	17791	17809	17779	17637	17507	17566	17763	17756
22	17603	17584	17837	17809	17846	17864	17766	17589	17323	17546	17823	17837
23	17695	17511	17772	17791	17772	17809	17813	17694	17416	17711	17879	17454
24	17786	17571	17846	17772	17804	17846	17735	17653	17512	17684	17915	17614
25	17732	17584	17736	17791	17772	17827	17684	17114	17525	17837	17695	17716
26	17663	17584	17730	17791	17772	17791	17771	17241	17454	17782	17589	17879
27	17598	17561	17804	17827	17809	17827	17735	17242	17339	17708	17645	17929
28	17566	17676	17809	17736	17754	17864	17816	17300	17313	17726	17823	17939
29	17658	17566	17767	17730		17827	17664	17098	17354	17784	17842	17797
30	17632	17461	17786	17883		17827	17641	17143	17389	17760	17676	17681
31	17594		17809	17827		17822		16960		17511	17626	
Min	17529	17461	17350	17730	17717	17772	17641	16960	16908	17272	17409	17454
Max	17786	17915	17846	17883	17851	17864	17927	17895	17525	17837	17915	17939
EOM	17594	17461	17809	17827	17754	17822	17641	17641	17389	17511	17626	17681

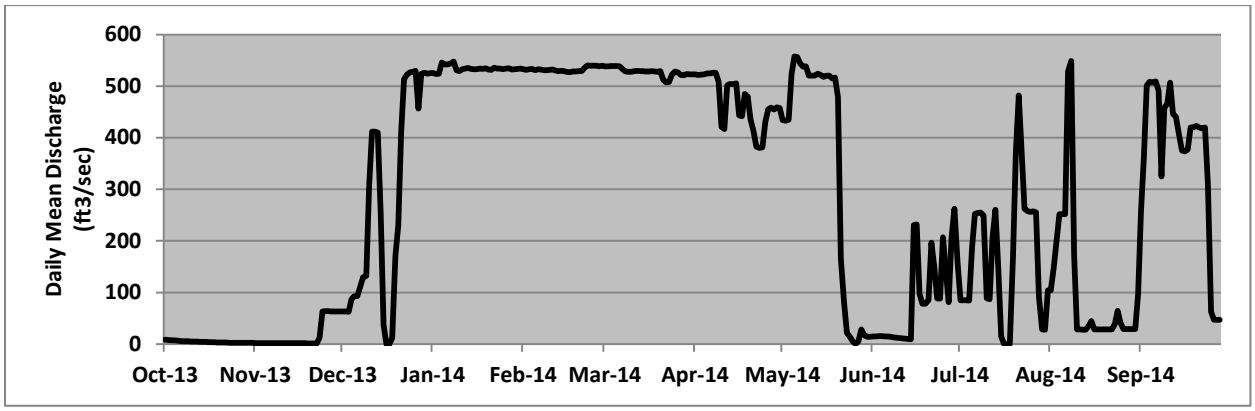


Appendix A (Table 15 of 38)
Alva B. Adams Tunnel at East Portal, near Estes Park, CO

Location. --Lat 40°19'40", long 105°34'39", Larimer County, Hydrologic Unit 10190006, 4.5 miles southwest of Estes Park, Colorado.
Gage.-- Water-stage recorder with satellite telemetry at 15 foot Parshall flume. Elevation of gage is 8250 from topographic map.
Remarks.-- Constructed between 1940 and 1947. Tunnel is 13.1 miles long, and extends between Grand Lake and Estes Park. Its maximum capacity is 550 cubic feet per second. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes. Official record published by the Colorado Division of Water Resources.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	9	2	63	524	533	539	523	459	14	263	28	29
2	9	2	63	525	534	539	523	458	14	156	104	97
3	9	2	63	525	533	539	523	434	15	85	104	257
4	8	2	63	524	532	539	522	433	15	85	146	362
5	7	2	63	524	533	539	523	434	15	85	199	501
6	7	2	88	546	533	539	523	523	15	84	252	509
7	7	2	93	542	531	539	525	558	15	186	252	507
8	6	2	93	542	533	539	525	557	15	253	252	509
9	6	2	111	544	532	533	526	544	14	254	529	491
10	5	2	130	547	531	529	526	538	13	255	549	325
11	5	1	132	531	531	528	509	539	13	249	172	458
12	5	1	308	529	532	528	421	521	12	89	28	466
13	5	1	412	533	532	529	417	520	11	86	28	507
14	5	1	412	534	530	529	502	520	10	207	28	446
15	4	1	410	535	529	529	505	524	10	260	28	441
16	4	1	255	533	529	529	504	522	9	147	34	409
17	4	1	37	532	529	529	506	518	231	15	45	375
18	4	1	0	533	527	528	444	520	232	0	28	373
19	3	2	0	534	527	529	441	520	96	0	28	377
20	3	1	12	533	528	529	485	515	78	0	28	420
21	3	1	171	535	528	528	479	516	78	169	28	421
22	3	1	230	532	529	529	435	479	85	373	28	423
23	3	1	411	532	529	512	413	166	197	482	28	420
24	3	1	513	536	535	508	382	81	150	373	28	418
25	2	12	522	534	540	508	380	22	89	263	38	420
26	2	63	527	534	539	522	381	14	88	258	64	311
27	2	64	528	533	540	528	431	5	207	256	41	63
28	2	64	530	534	540	527	455	0	143	257	29	47
29	2	63	457	535		521	459	5	81	255	29	47
30	2	63	524	532		521	455	28	207	91	29	47
31	2		526	533		523		17		28	29	
Min	2	1	0	524	527	508	380	0	9	0	28	29
Max	9	64	530	547	540	539	526	558	232	482	549	509
Mean	5	12	250	534	532	529	475	371	72	180	104	349
ac-ft	286	727	15332	32751	29505	32443	28197	22754	4297	11020	6409	20741

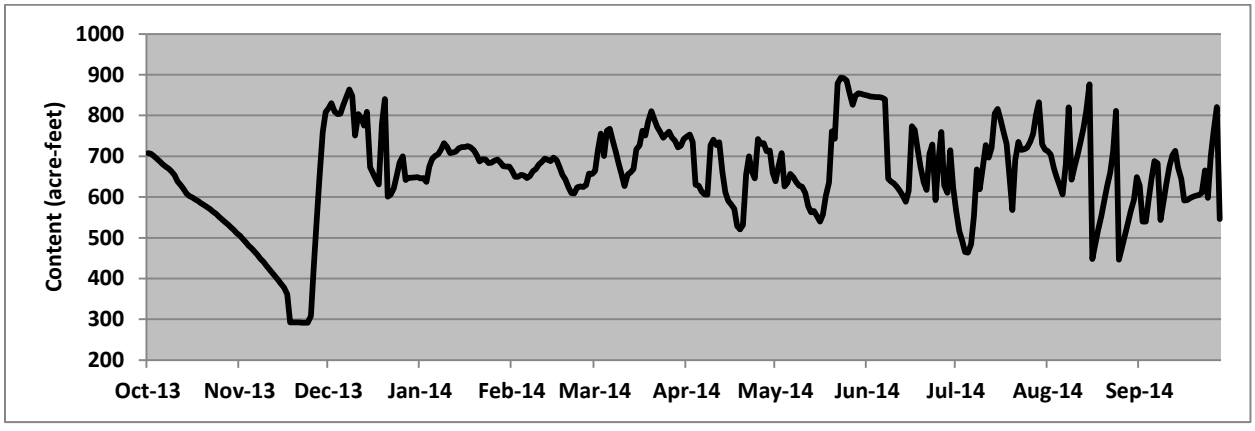


Appendix A (Table16 of 38)
Marys Lake, CO

Location. --Lat 40°22'40", long 105°31'50", Larimer County, Hydrologic Unit 10190006, 2 miles southwest of Estes Park, Colorado.
Gage.-- Water-level recorder with satellite telemetry. Elevation of gage is 8060 feet from topographic map.
Remarks.-- Constructed between 1947 and 1949. Impoundment began in August, 1950. Active capacity between elevations 8,025 and 8,040 is 500 acre-feet. Used as a forebay storage for Estes Powerplant. The only measurable inflow into the reservoir comes from Adams Tunnel. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Record is complete and reliable. The gage does not record water surface levels below elevation 8,022.62 feet, content of 322 acre-feet. These are operational data which could be subject to further revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	713	519	759	648	675	657	726	714	853	715	730	593
2	709	512	808	649	675	657	742	660	851	624	717	649
3	708	506	818	646	664	663	749	639	849	568	712	628
4	706	498	830	647	650	716	753	675	847	517	704	539
5	700	490	810	637	650	756	736	708	846	493	670	540
6	694	481	803	675	654	701	630	626	845	465	647	594
7	688	474	804	694	653	762	628	635	845	463	628	645
8	680	466	825	701	646	768	614	657	843	484	606	688
9	675	458	846	705	651	739	606	648	840	554	680	683
10	669	449	864	717	664	710	606	636	645	668	820	544
11	662	441	848	732	669	681	727	628	638	619	642	587
12	653	431	751	724	680	655	740	625	633	675	673	632
13	639	423	804	708	686	627	727	610	625	727	704	676
14	630	414	795	709	694	655	735	578	614	696	736	703
15	620	405	775	711	691	660	661	563	603	720	768	713
16	609	396	809	720	688	669	612	566	588	805	812	671
17	602	387	673	723	697	717	591	553	615	816	877	644
18	599	378	658	723	690	726	582	540	774	790	448	592
19	594	362	643	725	673	762	571	557	764	761	484	592
20	590	293	631	722	654	751	529	603	717	731	519	597
21	585	292	780	715	643	786	521	636	674	651	553	601
22	580	292	840	703	624	810	531	761	637	568	590	604
23	575	292	601	687	610	791	655	743	617	690	626	605
24	570	292	606	693	609	772	700	879	706	736	661	610
25	564	292	622	692	624	760	663	893	729	715	713	665
26	559	291	652	683	626	746	646	891	592	717	812	598
27	552	308	684	684	625	754	742	886	689	721	447	700
28	546	430	700	689	630	760	730	856	760	736	478	761
29	539	542	642	692		746	732	826	629	756	507	821
30	533	650	647	685		738	712	849	610	802	536	546
31	526		647	675		722		855		832	566	
Min	526	291	601	637	609	627	521	540	588	463	447	539
Max	713	650	864	732	697	810	753	893	853	832	877	821
EOM	526	650	647	675	630	722	712	712	610	832	566	546

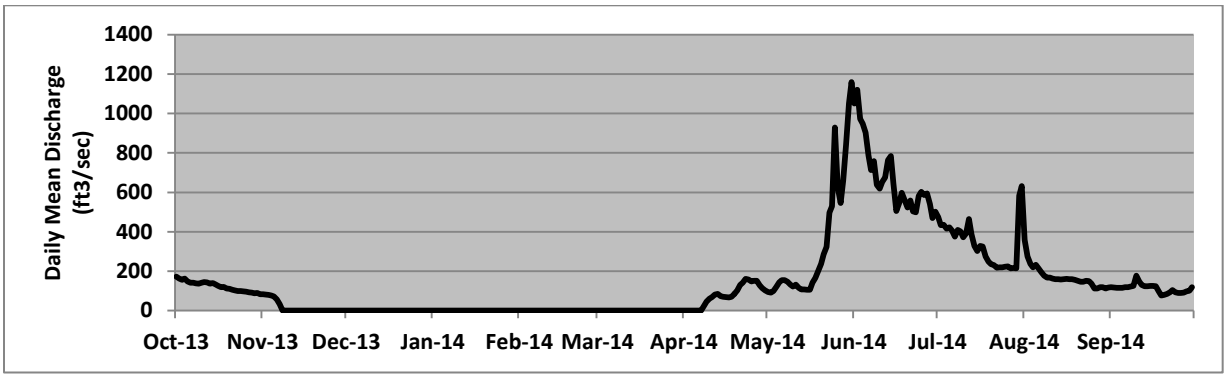


Appendix A (Table 17 of 38)
Big Thompson River above Lake Estes, CO

Location. --Lat 40°22'42", long 105°30'48", Larimer County, Hydrologic Unit 10190006, 600 feet downstream from bridge on state highways 7 and 36 in Estes Park, Colorado, downstream from Black Canyon Creek, and 0.3 miles northwest of Estes Powerplant.
Gage.-- Water-stage recorder with satellite telemetry. 15 foot Parshall flume with overflow weirs and supplemental outside gage. Datum of gage at 7492.5 feet.
Remarks.— Drainage area is 137 mi^2. Station consists of data collection platform as primary record with graphic chart recorder as backup. Recorder was operated from 01-Oct-2013 until 07-Nov-13, before it was winterized. The station was put back into service from 8-Apr-2014 to 30-Sep-2014. Values for the off-season are marked as zero, but winter month flows normally fluctuate between 10 and 30 cfs. This record contains operational data which could be subject to future revisions and changes. The official record for this station is published by the Colorado Division of Water Resources.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	172	83	0	0	0	0	0	94	1050	475	359	118
2	163	82	0	0	0	0	0	91	1120	433	275	117
3	156	80	0	0	0	0	0	100	972	436	238	116
4	162	77	0	0	0	0	0	120	949	416	220	116
5	148	72	0	0	0	0	0	143	903	423	233	116
6	142	58	0	0	0	0	0	155	787	406	213	118
7	142	33	0	0	0	0	0	155	713	375	195	118
8	138	0	0	0	0	0	21	147	758	409	178	122
9	137	0	0	0	0	0	47	132	638	402	167	125
10	141	0	0	0	0	0	61	122	619	372	167	177
11	144	0	0	0	0	0	69	132	653	392	163	148
12	143	0	0	0	0	0	81	116	675	464	159	130
13	136	0	0	0	0	0	85	108	763	386	159	124
14	140	0	0	0	0	0	73	107	785	328	158	123
15	133	0	0	0	0	0	70	106	643	302	159	125
16	125	0	0	0	0	0	69	105	505	328	161	125
17	119	0	0	0	0	0	66	141	546	325	160	123
18	120	0	0	0	0	0	70	166	598	274	160	98
19	112	0	0	0	0	0	85	202	561	249	156	76
20	111	0	0	0	0	0	102	237	523	236	151	79
21	106	0	0	0	0	0	130	286	558	230	147	84
22	103	0	0	0	0	0	141	323	503	218	147	93
23	100	0	0	0	0	0	161	497	499	219	151	104
24	99	0	0	0	0	0	157	529	582	219	150	93
25	97	0	0	0	0	0	148	928	602	223	136	90
26	96	0	0	0	0	0	151	626	587	224	113	89
27	93	0	0	0	0	0	151	545	594	215	112	92
28	91	0	0	0	0	0	129	660	541	216	118	97
29	88	0	0	0		0	114	843	470	215	119	101
30	89	0	0	0		0	103	1050	502	583	113	118
31	83		0	0		0		1160		632	117	
Min	83	0	0	0	0	0	0	91	470	215	112	76
Max	172	83	0	0	0	0	161	1160	1120	632	359	177
Mean	124	16	0	0	0	0	76	327	673	343	169	112
ac-ft	7581	961	0	0	0	0	4520	20049	39994	21038	10403	6643

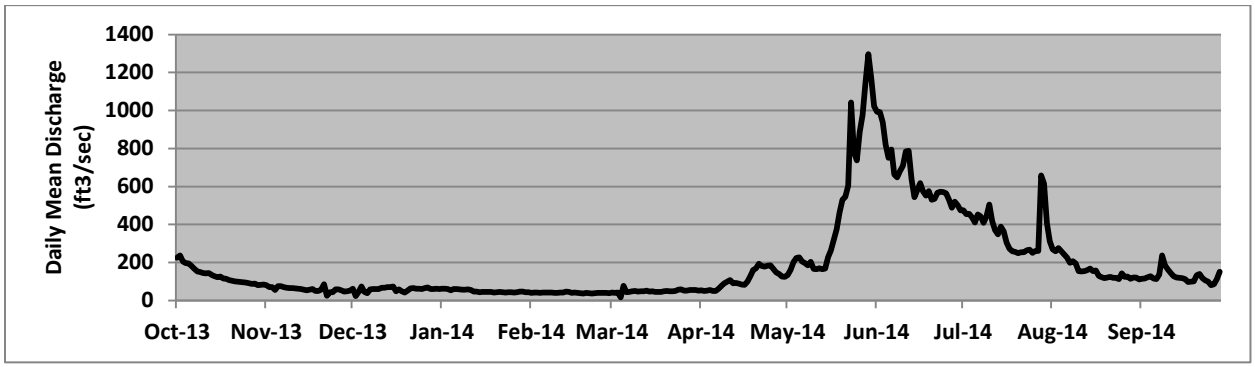


Appendix A (Table 18 of 38)
Olympus Dam, CO

Location. --Lat 40°22'31", long 105°29'15", Larimer County, Hydrologic Unit 10190006, 1.5 miles east of Estes Park, Colorado, on the Big Thompson River.
Gage.—Water-stage recorders with satellite telemetry. Inflow computed daily based on the change in content from midnight to midnight at Marys Lake and Lake Estes, daily average releases from Olympus Dam, and daily average discharge at Olympus Tunnel and Adams Tunnel.
Remarks.— Olympus dam was constructed between 1947 and 1949. Impoundment began on November 1948. Total capacity at maximum water surface elevation of 7475.0 feet is 3,070 acre-feet. Inflow is computed based on change-in-storage, flow through the Adams Tunnel and outflow. Records are complete and reliable, except for a few some questionable values during November and December, 2013, when the reservoir was drain. Record has not been revised. This record contains operational data which could be subject to future revisions and changes.

Inflow, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	249	82	48	62	43	40	55	126	1170	501	407	122
2	234	83	51	60	44	39	52	124	1022	475	311	111
3	226	80	62	62	41	42	54	134	993	474	270	115
4	237	71	23	63	43	41	51	162	992	455	259	116
5	206	71	46	61	41	42	51	203	937	457	276	122
6	196	55	73	53	40	17	56	224	820	437	259	128
7	195	76	45	61	41	77	51	227	750	411	242	116
8	182	76	39	60	42	44	50	205	795	453	226	112
9	166	71	58	59	42	46	62	197	664	442	198	136
10	153	68	61	57	42	49	78	185	649	409	208	237
11	150	65	60	58	41	51	91	204	682	442	196	185
12	145	66	61	58	40	47	99	166	709	505	156	164
13	143	63	68	55	41	49	108	166	785	417	153	145
14	144	63	67	47	42	49	91	169	788	371	154	128
15	135	61	71	47	46	51	92	166	638	348	161	121
16	127	57	70	44	45	47	88	169	544	388	168	120
17	122	55	74	45	40	50	84	226	581	364	155	117
18	127	56	49	45	42	45	83	265	617	305	158	113
19	116	61	58	45	40	45	100	319	575	272	130	97
20	115	51	48	45	38	45	128	375	553	260	122	99
21	107	50	41	43	36	48	160	464	576	256	117	101
22	105	57	52	44	40	50	170	530	531	249	121	134
23	101	85	63	45	39	49	193	545	536	255	125	140
24	100	25	65	44	37	49	182	605	567	254	119	118
25	97	43	61	42	39	50	179	1042	573	264	119	106
26	96	43	62	44	40	58	183	782	571	268	113	100
27	93	58	61	44	40	59	186	738	564	251	143	81
28	91	58	65	41	40	53	166	888	530	260	124	86
29	87	54	68	43		53	148	977	489	261	126	113
30	89	48	61	48		56	139	1147	520	659	114	151
31	81		60	46		56		1297		615	122	
Min	81	25	23	41	36	17	50	124	489	249	113	81
Max	249	85	74	63	46	77	193	1297	1170	659	407	237
Mean	143	62	58	51	41	48	108	420	691	380	179	124
ac-ft	8748	3670	3551	3110	2270	2965	6399	25796	41031	23321	10987	7389

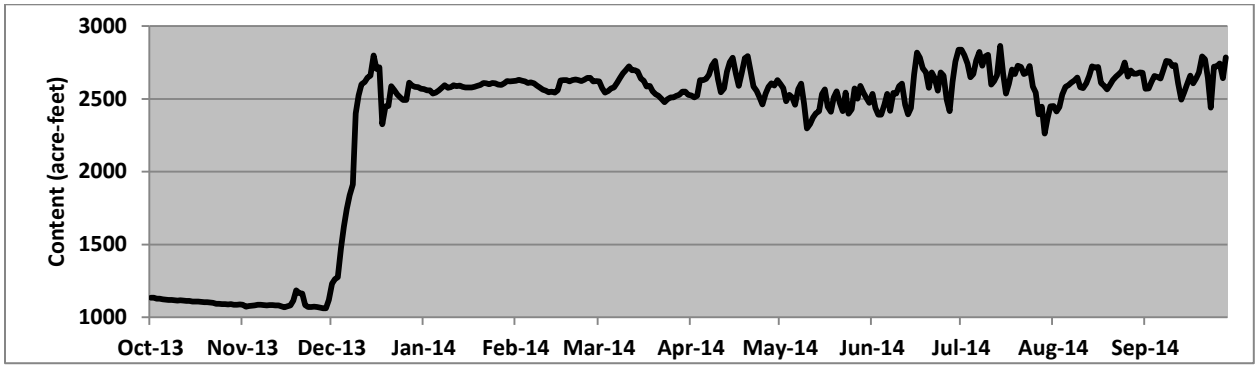


Appendix A (Table 19 of 38)
Olympus Dam, CO

Location. --Lat 40°22'31", long 105°29'19", Larimer County, Hydrologic Unit 10190006, 1.5 miles east of Estes Park, Colorado, on the Big Thompson River.
Gage.-- Water-level recorder with satellite telemetry. Elevation of gage is 7490 feet from topographic map.
Remarks.-- Constructed between 1947 and 1949. Impoundment began in November, 1948. Active capacity between elevations 7,450.25 and 7,474.00 is 2,476 acre-feet. Used as afterbay storage for Estes Powerplant and forebay for Olympus Tunnel. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1139	1087	1062	2580	2620	2620	2549	2592	2506	2757	2367	2681
2	1133	1090	1119	2569	2621	2621	2529	2628	2473	2838	2448	2679
3	1135	1086	1231	2567	2625	2620	2522	2603	2534	2838	2450	2569
4	1134	1074	1262	2559	2631	2574	2509	2574	2439	2799	2413	2572
5	1129	1077	1275	2558	2625	2542	2521	2483	2391	2740	2443	2618
6	1129	1080	1475	2536	2620	2554	2628	2527	2391	2648	2530	2657
7	1125	1082	1623	2544	2609	2571	2628	2509	2459	2670	2582	2650
8	1121	1086	1742	2558	2614	2579	2637	2459	2534	2762	2594	2640
9	1119	1086	1838	2577	2608	2611	2665	2567	2418	2822	2611	2699
10	1119	1084	1913	2594	2591	2643	2728	2604	2541	2728	2626	2761
11	1118	1083	2400	2577	2579	2676	2761	2468	2537	2791	2647	2757
12	1116	1084	2522	2580	2563	2696	2635	2298	2587	2803	2580	2725
13	1117	1084	2599	2594	2556	2723	2546	2328	2604	2597	2574	2732
14	1116	1083	2616	2587	2546	2698	2572	2371	2459	2623	2606	2606
15	1113	1082	2647	2592	2549	2698	2686	2400	2394	2662	2657	2494
16	1112	1075	2660	2582	2544	2688	2752	2416	2439	2864	2723	2546
17	1110	1068	2797	2579	2559	2640	2782	2532	2669	2674	2715	2599
18	1109	1075	2706	2579	2626	2625	2672	2566	2817	2536	2718	2659
19	1110	1083	2716	2579	2628	2584	2589	2447	2782	2603	2609	2606
20	1106	1114	2327	2582	2628	2589	2676	2411	2710	2701	2591	2640
21	1104	1186	2448	2589	2620	2553	2778	2511	2681	2670	2566	2681
22	1103	1165	2450	2596	2630	2532	2794	2553	2575	2727	2596	2791
23	1102	1164	2587	2609	2633	2521	2689	2470	2681	2718	2630	2771
24	1101	1084	2559	2606	2630	2499	2585	2415	2645	2670	2654	2643
25	1093	1070	2530	2601	2623	2476	2554	2544	2556	2679	2670	2440
26	1093	1070	2509	2609	2631	2497	2511	2397	2682	2725	2689	2721
27	1092	1074	2492	2606	2643	2509	2462	2429	2659	2584	2749	2723
28	1092	1070	2492	2597	2643	2511	2536	2572	2492	2542	2652	2742
29	1090	1066	2611	2596		2521	2582	2501	2416	2394	2694	2642
30	1091	1062	2591	2608		2529	2608	2589	2616	2447	2672	2784
31	1087		2582	2621		2549		2541		2262	2672	
Min	1087	1062	1062	2536	2544	2476	2462	2298	2391	2262	2367	2440
Max	1139	1186	2797	2621	2643	2723	2794	2628	2817	2864	2749	2791
EOM	1087	1062	2582	2621	2643	2549	2608	2608	2616	2262	2672	2784

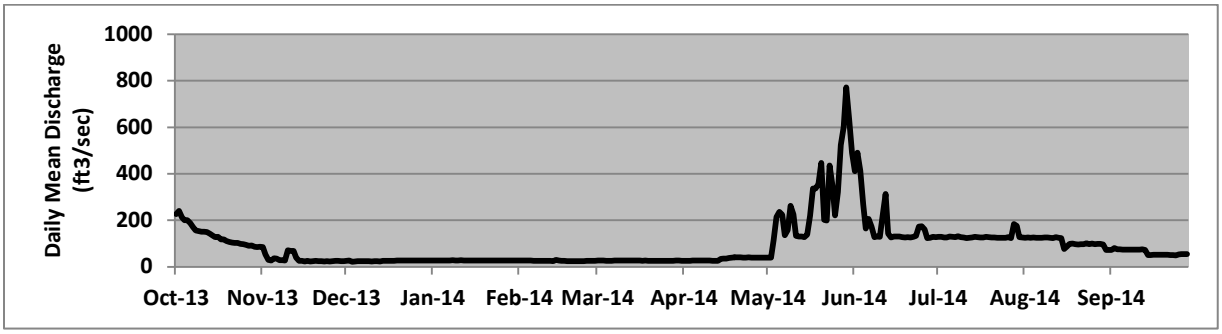


Appendix A (Table 20 of 38)
Big Thompson River below Olympus Dam, CO

Location. --Lat 40°22'35", long 105°29'06", Larimer County, Hydrologic Unit 10190006, 620 feet downstream from Olympus Dam and 100 feet upstream of Dry Gulch, 2.0 miles east in Estes Park.
Gage.-- Water-stage recorder with satellite telemetry. 15 foot Parshall flume with overflow weirs in a concrete shelter with a supplemental outside gage. Datum of gage at 7422.50 feet.
Remarks.— Drainage area is 155 mi^2. Area at site used between 29-Jan-1934 and 21-Mar-1951 was 162 mi^2. Station consists of data collection platform and digital recorder as primary record. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Record is complete. Flow calculations during peak runoff could lose accuracy as the water begins to flow over the outside boards. This record contains operational data which could be subject to future revisions and changes. The official record for this station is published by the Colorado Division of Water Resources.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	283	85	24	27	27	26	27	40	637	129	128	72
2	240	86	25	28	27	26	26	40	490	128	126	72
3	226	85	26	27	27	27	26	40	411	130	125	73
4	240	53	27	27	27	27	26	39	491	128	126	80
5	213	30	22	28	28	27	26	114	412	127	125	75
6	200	28	23	27	27	26	27	214	269	127	126	75
7	201	37	25	28	27	26	27	237	165	130	124	74
8	188	36	24	28	26	26	27	224	206	130	125	75
9	171	29	24	28	26	27	27	136	173	127	125	74
10	157	28	25	28	26	27	27	157	128	131	126	73
11	154	27	24	28	26	27	27	263	130	127	126	73
12	151	72	24	28	26	27	27	225	128	127	125	74
13	151	69	24	28	25	28	26	133	223	124	123	74
14	150	69	24	28	25	27	26	130	313	124	128	75
15	142	39	24	27	25	28	26	130	142	126	125	72
16	134	26	25	28	29	28	33	128	126	129	124	50
17	127	26	26	27	27	27	36	139	130	127	77	51
18	129	23	26	27	25	27	36	220	130	126	88	51
19	118	26	26	28	25	26	38	337	130	126	99	51
20	118	23	25	27	25	27	40	337	128	128	99	52
21	111	24	27	27	25	26	40	355	127	128	98	51
22	108	25	27	27	24	26	41	447	127	127	96	52
23	105	24	28	28	24	26	40	201	127	126	97	52
24	102	24	28	28	24	26	39	199	128	124	98	51
25	103	24	27	27	24	26	40	436	133	124	102	50
26	99	24	27	27	24	26	40	349	173	125	98	49
27	97	23	27	28	25	26	40	221	174	125	100	53
28	94	25	27	28	26	26	40	322	160	127	98	54
29	91	26	27	27		26	39	523	123	124	98	54
30	91	25	27	27		26	39	600	125	184	98	54
31	86		27	27		27		772		175	95	
Min	86	23	22	27	24	26	26	39	123	124	77	49
Max	283	86	28	28	29	28	41	772	637	184	128	80
Mean	148	38	26	28	26	27	33	249	212	130	111	63
ac-ft	9067	2259	1570	1689	1436	1632	1942	15254	12594	7999	6827	3738

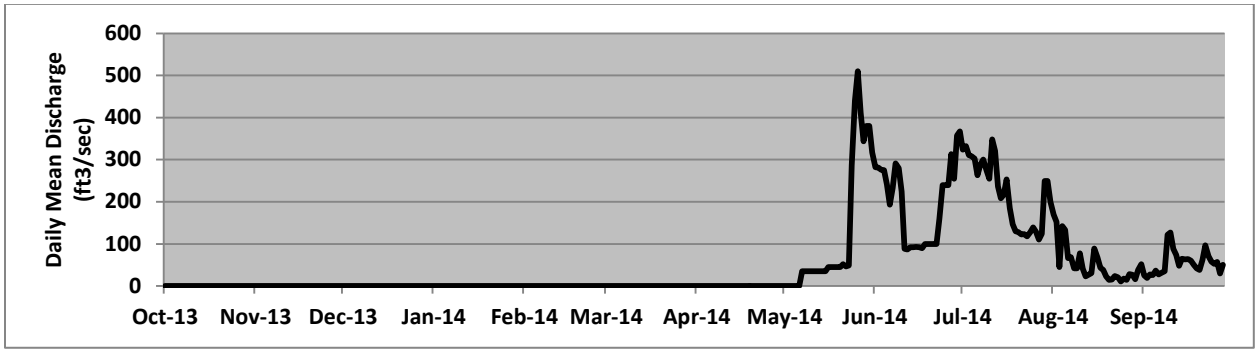


Appendix A (Table 21 of 38)
Olympus Tunnel near Estes Park, CO

Location. --Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, Colorado.
Gage.-- Water-stage recorder and satellite telemetry. Elevation of gage is 7460 from topographic map.
Remarks.— Constructed between 1949 and 1952. The tunnel is 7.2 miles long, between Estes Park and the Pole Hill Canal. Its diameter is 9.75 feet and maximum capacity is 550 cubic feet per second. The hydropower diversion operation, also known as the skim operation, diverts water from the Big Thompson River through Olympus Tunnel for power generation at three power plants down the foothills, before returning it to the Big Thompson River near the canyon mouth. The skim daily value is determined based on the data from the stream gages in the system. Period of record includes from 01-Oct-2013 through 30-Sep-2014. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Hydropower Diversion (Skim), Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	380	358	250	38
2	0	0	0	0	0	0	0	0	317	368	200	52
3	0	0	0	0	0	0	0	0	282	324	170	25
4	0	0	0	0	0	0	0	0	281	332	152	19
5	0	0	0	0	0	0	0	0	276	311	45	28
6	0	0	0	0	0	0	0	0	275	308	142	26
7	0	0	0	0	0	0	0	0	241	303	133	37
8	0	0	0	0	0	0	0	0	193	263	66	28
9	0	0	0	0	0	0	0	35	233	289	69	31
10	0	0	0	0	0	0	0	35	291	301	42	36
11	0	0	0	0	0	0	0	35	280	276	42	122
12	0	0	0	0	0	0	0	35	224	255	77	127
13	0	0	0	0	0	0	0	35	88	349	41	88
14	0	0	0	0	0	0	0	35	87	321	23	74
15	0	0	0	0	0	0	0	35	92	237	27	48
16	0	0	0	0	0	0	0	35	93	209	30	65
17	0	0	0	0	0	0	0	35	93	217	89	63
18	0	0	0	0	0	0	0	45	92	253	68	64
19	0	0	0	0	0	0	0	45	90	185	44	60
20	0	0	0	0	0	0	0	45	100	147	38	50
21	0	0	0	0	0	0	0	45	100	130	23	42
22	0	0	0	0	0	0	0	45	100	128	15	38
23	0	0	0	0	0	0	0	52	100	123	15	62
24	0	0	0	0	0	0	0	47	100	124	23	97
25	0	0	0	0	0	0	0	49	160	118	21	71
26	0	0	0	0	0	0	0	287	240	128	11	58
27	0	0	0	0	0	0	0	440	240	139	17	53
28	0	0	0	0	0	0	0	510	240	129	15	57
29	0	0	0	0		0	0	411	313	110	28	30
30	0	0	0	0		0	0	344	255	124	27	50
31	0		0	0		0		380		250	16	
Min	0	0	0	0	0	0	0	0	87	110	11	19
Max	0	0	0	0	0	0	0	510	380	368	250	127
Mean	0	0	0	0	0	0	0	99	195	229	63	55
ac-ft	0	0	0	0	0	0	0	6057	11584	14062	3881	3241

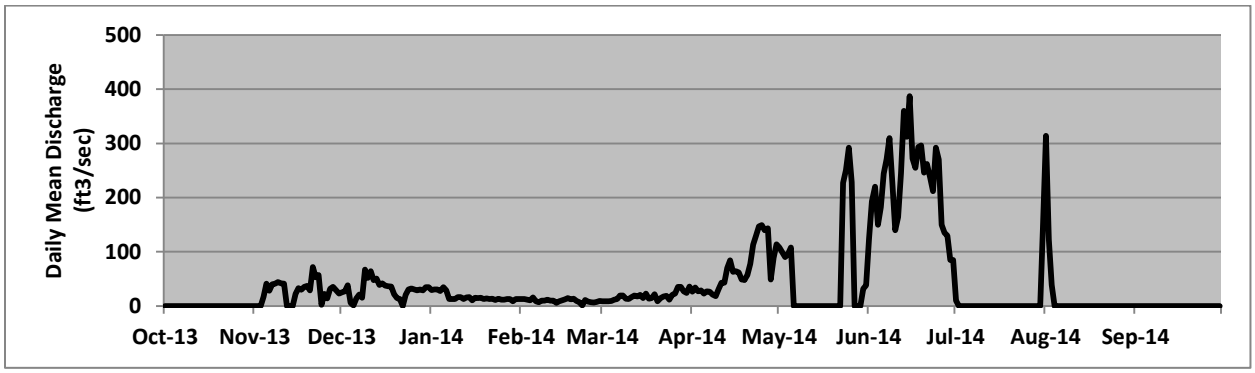


Appendix A (Table 22 of 38)
Olympus Tunnel, CO

Location. --Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, Colorado.
Gage.-- Water-stage recorder and satellite telemetry. Elevation of gage is 7460 from topographic map.
Remarks.— Constructed between 1949 and 1952. The tunnel is 7.2 miles long, between Estes Park and the Pole Hill Canal. Its diameter is 9.75 feet and maximum capacity is 550 cubic feet per second. The right to divert native run-off is determined by the Colorado Division of Water Resources. Period of record from 01-Oct-2013 through 30-Sep-2014. Record is complete and reliable.

Priority Diversion Flow, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	25	30	13	9	26	108	123	10	314	0
2	0	0	27	31	13	9	34	99	193	0	123	0
3	0	0	38	31	12	9	27	90	220	0	39	0
4	0	17	6	28	11	10	29	96	150	0	0	0
5	0	41	1	35	16	12	23	108	182	0	0	0
6	0	28	14	29	9	13	27	0	244	0	0	0
7	0	40	21	13	7	20	27	0	271	0	0	0
8	0	41	15	13	10	20	21	0	310	0	0	0
9	0	44	67	13	10	14	18	0	227	0	0	0
10	0	42	52	17	12	13	31	0	140	0	0	0
11	0	41	64	17	10	17	43	0	164	0	0	0
12	0	0	48	13	10	20	43	0	245	0	0	0
13	0	0	51	16	6	18	70	0	360	0	0	0
14	0	0	39	17	9	21	84	0	312	0	0	0
15	0	22	42	11	11	15	63	0	387	0	0	0
16	0	33	38	15	12	23	64	0	272	0	0	0
17	0	30	37	15	15	14	62	0	255	0	0	0
18	0	35	36	15	12	15	49	0	293	0	0	0
19	0	37	22	13	14	22	48	0	296	0	0	0
20	0	29	15	14	10	9	57	0	246	0	0	0
21	0	72	13	13	7	15	78	0	262	0	0	0
22	0	53	0	14	1	18	113	0	237	0	0	0
23	0	57	21	11	11	19	130	227	212	0	0	0
24	0	3	31	14	8	12	147	251	292	0	0	0
25	0	22	33	12	7	21	149	292	270	0	0	0
26	0	14	31	12	7	23	140	228	150	0	0	0
27	0	32	29	13	8	35	143	0	135	0	0	0
28	0	35	31	13	10	35	49	0	130	0	0	0
29	0	29	29	9		27	89	0	85	0	0	0
30	0	23	35	13		24	114	32	85	0	0	0
31	0		35	13		36		38		153	0	
Min	0	0	0	9	1	9	18	0	85	0	0	0
Max	0	72	67	35	16	36	149	292	387	153	314	0
Mean	0	27	30	17	10	18	67	51	225	5	15	0
ac-ft	0	1623	1858	1017	547	1105	3957	3107	13361	322	941	0

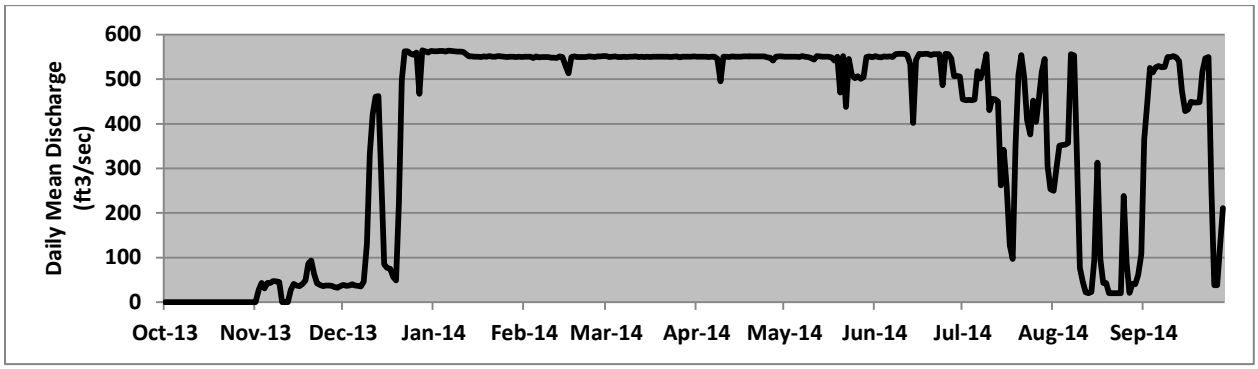


Appendix A (Table 23 of 38)
Olympus Tunnel, CO

Location. --Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, Colorado, on the Big Thompson River.
Gage.-- Water-stage recorder with satellite telemetry. Elevation of gage is 7460 from topographic map.
Remarks.— Constructed between 1949 and 1952. The tunnel is 7.2 miles long, between Estes Park and the Pole Hill Canal. Its diameter is 9.75 feet and maximum capacity is 550 cubic feet per second. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes. Official record is published by the Colorado Division of Water Resources.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	32	559	550	551	550	551	551	507	306	61
2	0	0	36	563	550	551	551	551	549	506	254	108
3	0	0	39	562	551	552	550	550	552	455	250	365
4	0	28	37	563	550	550	550	550	550	453	302	441
5	0	43	38	563	550	550	550	550	549	454	351	525
6	0	31	40	563	547	551	551	550	551	453	352	515
7	0	43	38	562	551	550	550	550	550	454	353	527
8	0	43	37	564	549	550	551	550	551	518	357	530
9	0	47	36	563	549	550	550	552	550	502	556	526
10	0	47	46	562	549	549	546	550	556	521	553	528
11	0	45	131	562	549	550	495	550	557	556	321	550
12	0	0	332	562	548	551	550	547	557	431	77	550
13	0	0	421	561	548	551	550	544	557	456	46	552
14	0	0	461	556	548	549	550	552	553	455	22	549
15	0	28	462	551	551	550	551	551	533	450	21	540
16	0	41	276	551	549	550	550	551	402	262	23	474
17	0	38	85	550	529	550	550	550	543	342	94	429
18	0	36	77	550	513	550	550	550	557	262	313	432
19	0	41	75	550	550	550	551	549	556	127	96	449
20	0	49	57	551	551	550	551	542	556	97	43	448
21	0	87	49	550	550	550	551	551	557	353	43	448
22	0	94	223	551	550	550	551	470	554	509	20	448
23	0	63	498	550	550	550	551	552	556	554	20	517
24	0	43	562	551	550	551	551	438	556	504	20	546
25	0	39	563	552	551	550	551	545	556	408	20	550
26	0	36	557	551	550	550	551	510	487	376	20	254
27	0	38	554	550	550	551	549	502	557	452	238	38
28	0	38	560	550	551	549	548	507	556	404	89	38
29	0	37	467	550		550	541	501	547	457	21	126
30	0	34	565	551		550	550	505	507	517	41	211
31	0		563	550		550		550		545	41	
Min	0	0	32	550	513	549	495	438	402	97	20	38
Max	0	94	565	564	551	552	551	552	557	556	556	552
Mean	0	36	255	556	548	550	548	536	544	430	170	409
ac-ft	10	2116	15672	34104	30363	33778	32556	32905	32294	26410	10425	24301

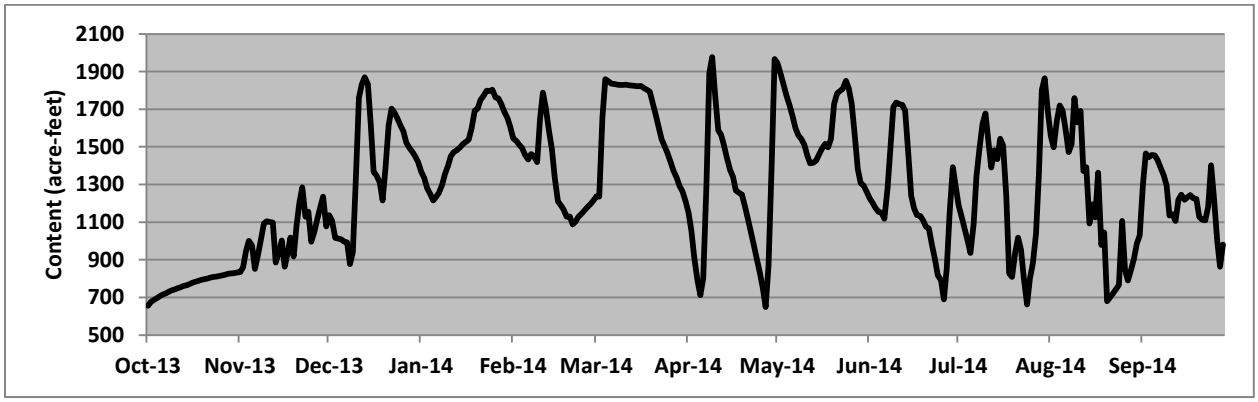


Appendix A (Table 24 of 38)
Pinewood Reservoir near Loveland, Colorado , CO

Location. --Lat 40°22', long 105°17.9', Larimer County, Hydrologic Unit 10190006, 10 miles southwest of Loveland, Colorado.
Gage.-- Water-level recorder with satellite telemetry. Elevation of gage is 6,600 feet from topographic map.
Remarks.-- Constructed between 1951 and 1952. Impoundment began in January 4, 1954. Active capacity between elevations 6,550.00 and 6.580.00 is 1,570 acre-feet. Used as the forebay storage for Flatiron Powerplant. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Record is complete and reliable. The gage is capable of measuring the water surface elevation down to 6555.70 feet, a content of 604 acre-feet. This record contains operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	848	830	1235	1450	1653	1196	1264	1413	1295	1392	1864	985
2	651	832	1078	1419	1606	1215	1209	1967	1260	1290	1686	1031
3	655	834	1137	1367	1545	1237	1151	1944	1227	1189	1559	1298
4	675	861	1108	1337	1531	1236	1054	1887	1204	1125	1497	1465
5	686	945	1017	1281	1511	1657	912	1830	1177	1064	1638	1445
6	697	1001	1013	1249	1494	1860	790	1774	1154	1003	1721	1457
7	706	975	1010	1214	1458	1849	713	1725	1151	937	1694	1454
8	715	851	998	1235	1433	1836	802	1664	1119	1090	1595	1429
9	722	921	993	1256	1461	1833	1296	1602	1279	1347	1472	1390
10	730	1009	877	1298	1450	1830	1892	1562	1494	1487	1514	1350
11	737	1093	940	1357	1420	1829	1977	1544	1713	1625	1760	1295
12	743	1105	1357	1397	1649	1829	1779	1512	1736	1677	1630	1134
13	749	1101	1762	1450	1788	1830	1587	1454	1727	1532	1692	1142
14	755	1097	1832	1473	1706	1828	1564	1413	1724	1390	1371	1107
15	760	886	1870	1483	1584	1826	1506	1416	1692	1483	1392	1221
16	765	934	1834	1497	1488	1824	1442	1428	1460	1435	1093	1245
17	771	1003	1620	1514	1336	1823	1376	1460	1238	1544	1195	1218
18	778	864	1367	1526	1209	1825	1342	1491	1173	1508	1125	1232
19	783	933	1347	1537	1190	1813	1268	1516	1137	1239	1364	1244
20	788	1018	1312	1597	1165	1803	1256	1498	1133	828	980	1227
21	793	917	1216	1693	1129	1794	1246	1542	1109	809	1045	1223
22	797	1079	1387	1704	1131	1733	1187	1729	1076	940	679	1129
23	801	1203	1617	1749	1087	1668	1122	1783	1067	1018	701	1113
24	805	1284	1702	1774	1104	1603	1047	1797	978	953	722	1110
25	808	1128	1682	1798	1128	1540	979	1808	904	801	744	1182
26	811	1155	1652	1797	1146	1502	907	1851	817	663	767	1402
27	815	995	1614	1803	1162	1464	832	1811	792	802	1107	1230
28	818	1051	1583	1763	1180	1419	751	1729	690	880	848	1005
29	821	1117	1523	1758		1374	649	1552	855	1040	790	864
30	825	1177	1494	1728		1335	867	1381	1148	1357	848	980
31	827		1473	1688		1293		1307		1801	905	
Min	651	830	877	1214	1087	1196	649	1307	690	663	679	864
Max	848	1284	1870	1803	1788	1860	1977	1967	1736	1801	1864	1465
EOM	827	1177	1473	1688	1180	1293	867	867	1148	1801	905	980

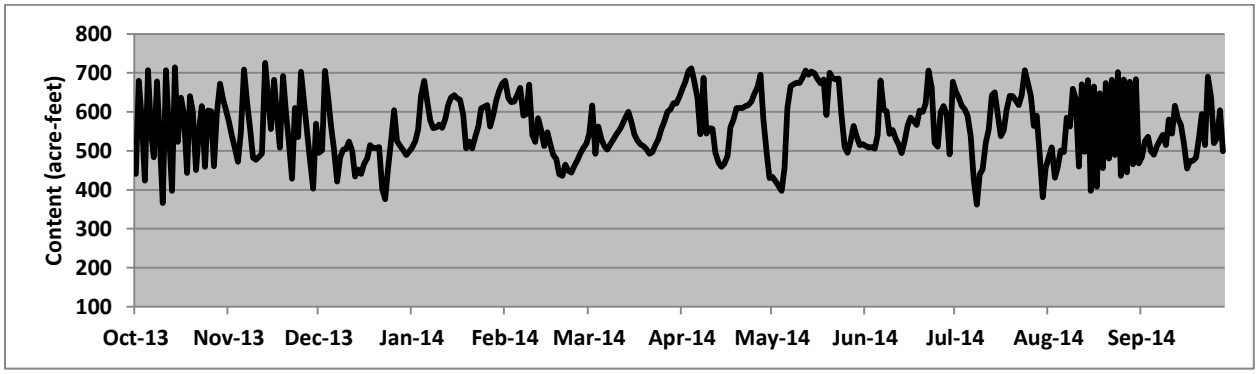


Appendix A (Table 25 of 38)
Flatiron Reservoir, CO

Location. --Lat 40°22.1', long 105°13.3', Larimer County, Hydrologic Unit 10190006, 8 miles southwest of Loveland, Colorado.
Gage.-- Water-level recorder with satellite telemetry. Elevation of gage is 5,600 feet from topographic map.
Remarks.-- Constructed between 1951 and 1953. Impoundment began in January, 1954. Active capacity between elevations 5,462.00 and 5.472.80 is 436 acre-feet. Used as the afterbay storage for Flatiron Powerplant. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	537	634	403	490	653	506	622	496	515	491	380	684
2	583	604	570	498	672	518	639	430	517	677	456	468
3	441	574	495	508	679	545	659	434	513	652	484	484
4	680	538	501	524	635	617	677	422	508	637	509	525
5	576	505	706	555	625	493	705	410	510	615	431	536
6	424	472	636	641	627	563	712	398	506	606	459	499
7	707	547	562	680	644	529	678	456	540	590	501	490
8	553	708	504	630	662	512	635	610	680	537	496	512
9	484	629	421	578	590	503	542	666	605	429	585	527
10	678	556	482	558	594	517	688	671	602	362	563	541
11	523	482	503	560	670	529	544	675	544	440	659	515
12	366	477	504	567	540	542	558	674	553	453	633	580
13	707	485	524	559	523	553	556	687	532	522	460	544
14	552	494	500	582	584	567	495	706	516	554	671	615
15	397	726	434	618	550	585	469	695	494	643	498	584
16	714	641	453	637	512	600	459	703	524	651	681	565
17	523	555	441	643	548	575	467	698	566	595	398	519
18	636	682	467	634	517	542	486	685	586	538	665	455
19	595	590	481	631	490	527	561	673	576	552	408	474
20	444	508	514	592	479	516	579	683	567	605	648	474
21	640	692	508	506	440	512	609	592	604	641	455	482
22	601	599	507	524	436	504	610	700	600	641	674	532
23	450	515	510	507	464	492	610	688	622	629	480	595
24	550	429	401	534	449	496	614	683	706	617	682	515
25	615	610	376	562	444	514	618	686	662	643	489	691
26	459	536	455	609	461	530	628	591	520	707	702	637
27	604	703	530	613	474	555	647	510	510	676	436	520
28	602	622	604	618	493	576	664	495	600	641	683	532
29	460	548	525	562		600	695	523	614	564	445	605
30	596	478	512	592		606	580	564	591	590	677	499
31	673		502	629		623		538		485	465	
Min	366	429	376	490	436	492	459	398	494	362	380	455
Max	714	726	706	680	679	623	712	706	706	707	702	691
EOM	673	478	502	629	493	623	580	580	591	485	465	499

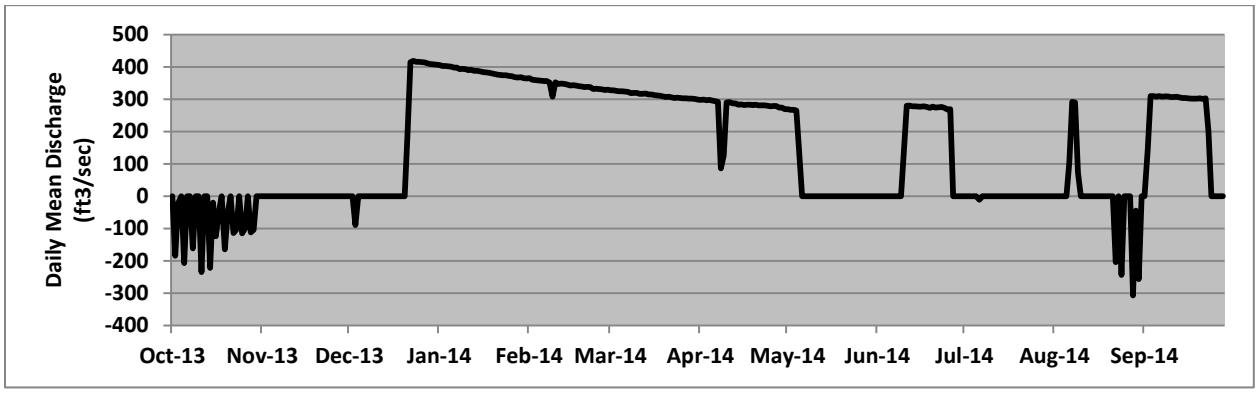


Appendix A (Table 26 of 38)
Flatiron Powerplant Unit #3 Pump, CO

Location. --Lat 40°21'53", long 105°14'09", Larimer County, Hydrologic Unit 10190006, 9 miles west of Loveland, Colorado
Gage.-- There is a flow meter in place.
Remarks.-- Constructed between 1951 and 1953. The Powerplant consists of three generating units. Unit #3 can be used to pump water from Flatiron Reservoir to Carter Lake, or to generate power. For the purpose of this table, any negative values indicate power generation. The maximum capacity of the pump is approximately 480 cubic feet per second, but the efficiency varies according to the water surface levels at Carter Lake and Flatiron Reservoir. Discharges are measured using a flow meter inside the pressure conduit. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	408	365	329	301	274	0	0	0	-257
2	0	0	0	407	364	329	299	269	0	0	0	0
3	0	0	0	405	365	327	298	269	0	0	0	0
4	-184	0	0	402	360	328	299	267	0	0	0	143
5	-22	0	-89	403	359	326	297	267	0	0	0	310
6	0	0	0	402	359	325	298	265	0	0	0	310
7	-207	0	0	400	358	324	296	133	0	0	0	308
8	0	0	0	397	357	323	294	0	0	-11	104	309
9	0	0	0	398	356	323	292	0	0	0	292	308
10	-161	0	0	393	352	319	86	0	0	0	290	309
11	0	0	0	394	307	320	126	0	0	0	73	309
12	0	0	0	393	352	319	290	0	139	0	0	307
13	-234	0	0	390	348	317	291	0	280	0	0	307
14	0	0	0	390	348	316	287	0	280	0	0	308
15	0	0	0	388	348	317	287	0	278	0	0	306
16	-222	0	0	388	345	315	283	0	278	0	0	304
17	-20	0	0	385	343	314	284	0	277	0	0	304
18	-124	0	0	384	344	312	282	0	277	0	0	302
19	-51	0	0	383	343	312	283	0	278	0	0	302
20	0	0	0	382	340	311	283	0	276	0	0	302
21	-164	0	0	380	339	309	282	0	273	0	0	302
22	-51	0	0	378	337	307	283	0	277	0	0	303
23	0	0	196	376	338	308	281	0	274	0	0	301
24	-114	0	414	375	337	306	281	0	275	0	-204	303
25	-103	0	419	374	332	303	281	0	276	0	0	198
26	0	0	416	374	332	304	280	0	273	0	-243	0
27	-114	0	416	372	332	304	278	0	268	0	0	0
28	-100	0	415	371	331	303	279	0	269	0	0	0
29	0	0	413	368		303	279	0	0	0	0	0
30	-112	0	410	367		302	274	0	0	0	-307	0
31	-104		409	368		301		0		0	-44	
Min	-234	0	-89	367	307	301	86	0	0	-11	-307	-257
Max	0	0	419	408	365	329	301	274	280	0	292	310
Mean	-67	0	110	387	346	315	275	56	152	0	-1	207
ac-ft	-4132	0	6769	23749	19187	19315	16345	3456	9006	-22	-79	12270

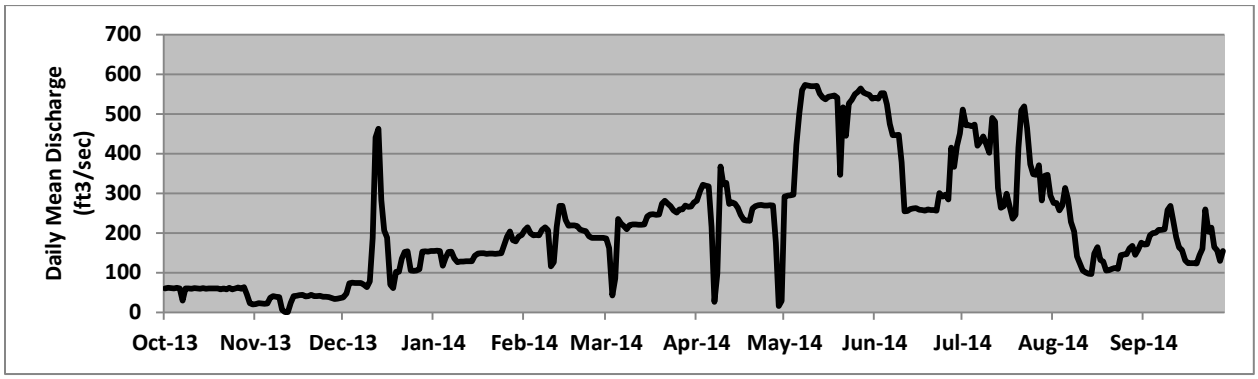


Appendix A (Table 27 of 38)
Charles Hansen Feeder Canal 930 Section, CO

Location. --Lat 40°22'26", long 105°13'52", Larimer County, Hydrologic Unit 10190006, 8 miles southwest of Loveland, Colorado.
Gage.-- Water-stage recorder with satellite telemetry. Elevation of gage is 5470 feet from topographic map.
Remarks.-- Constructed between 1949 and 1953. The canal is 3.8 miles long and has a maximum capacity of 930 cubic feet per second. The canal is used to move Colorado-Big Thompson Project water and diverted native water to the Big Thompson River and/or Horsetooth Reservoir. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Data from this station has been question in the past for its low accuracy, due to algae growth issues. The record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Flow, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	60	23	34	153	191	188	267	16	548	420	346	158
2	61	20	36	155	195	188	277	29	539	451	294	175
3	60	20	37	155	207	186	281	291	541	511	276	171
4	62	23	47	155	214	162	305	294	539	471	276	171
5	61	22	73	155	200	42	321	295	552	472	257	194
6	60	21	75	118	194	85	319	297	552	469	269	200
7	62	23	74	138	195	235	318	421	524	473	313	200
8	61	37	74	152	194	224	215	500	475	420	285	208
9	30	41	74	153	208	218	26	560	446	431	228	207
10	60	39	70	136	214	210	97	573	447	444	204	210
11	60	39	63	127	207	220	368	572	447	422	141	258
12	59	6	78	128	116	221	323	570	378	402	123	268
13	61	0	187	128	127	222	326	569	255	490	105	230
14	60	0	441	129	215	220	273	571	256	480	101	189
15	59	24	463	129	268	220	277	552	260	313	98	163
16	61	41	283	129	268	222	274	542	262	264	96	157
17	59	42	206	143	233	241	264	537	263	268	148	131
18	60	43	188	148	219	247	245	544	259	299	164	124
19	60	44	70	149	219	247	233	545	258	265	132	123
20	60	40	61	149	219	246	231	547	256	236	128	124
21	60	41	102	147	218	246	231	541	259	246	105	123
22	58	44	102	148	209	274	262	347	258	415	106	144
23	60	41	135	148	206	281	268	516	258	509	110	160
24	58	41	152	147	205	274	270	445	256	519	112	259
25	62	41	153	148	192	267	271	526	301	464	110	203
26	58	39	105	149	187	257	269	536	291	373	144	213
27	60	39	104	170	188	252	269	549	296	348	146	164
28	63	39	105	191	188	259	270	556	285	347	147	156
29	60	36	109	204		259	269	564	415	371	161	130
30	63	34	153	182		269	174	553	366	282	167	154
31	45		154	179		266		551		344	145	
Min	30	0	34	118	116	42	26	16	255	236	96	123
Max	63	44	463	204	268	281	368	573	552	519	346	268
Mean	59	31	129	150	203	224	260	468	368	394	175	179
ac-ft	3611	1867	7935	9184	11274	13758	15429	28727	21860	24191	10762	10632

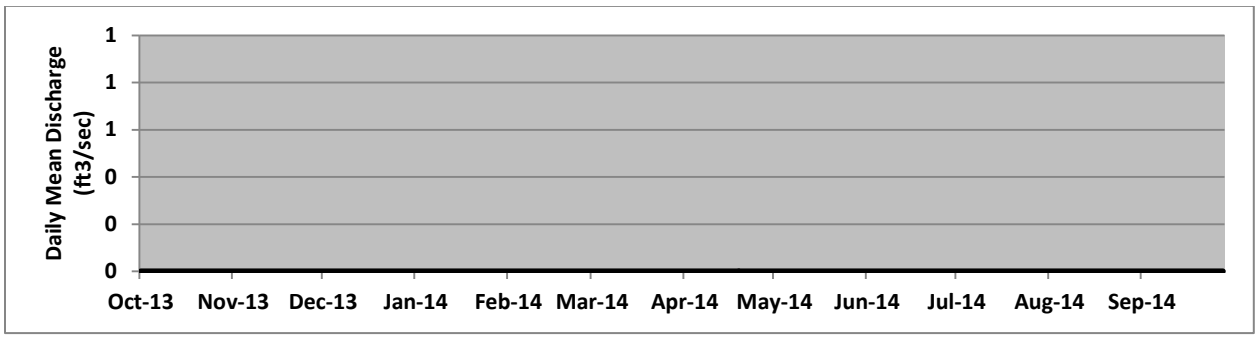


Appendix A (Table 28 of 38)
Dille Tunnel near Drake, CO

Location. --Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, Colorado, on the Big Thompson River.
Gage.-- Water-stage recorder with satellite telemetry at Parshall Flume. Elevation of gage is 5520 feet from topographic map.
Remarks.-- Constructed in 1950. Maximum capacity is 600 cubic feet per second. Dille Tunnel diverts water from the Big Thompson River for power generation and water supply. The hydropower diversion operation, also known as the skim operation, diverts water from the Big Thompson River through Dille Tunnel for power generation at the Big Thompson Power Plant, where the diverted water is returned to the river. The skim daily value is determined based on the data from the gage. The skim operation for the Dille Tunnel during water year 2014 was cancelled due to the damages caused by the flood of September 2013. Recorder was not operated during water year 2014.

Hydropower Diversion Flow (Skim), Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0		0	0	0	0	0	0	0
30	0	0	0	0		0	0	0	0	0	0	0
31	0		0	0		0		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	0	0	0	0	0	0
Mean	0	0	0	0	0	0	0	0	0	0	0	0
ac-ft	0	0	0	0	0	0	0	0	0	0	0	0

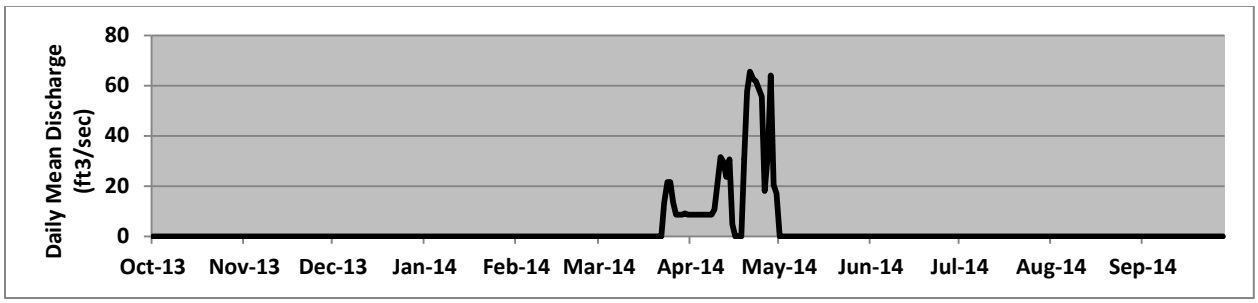


Appendix A (Table 29 of 38)
Dille Tunnel near Drake, CO

Location. --Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, Colorado, on the Big Thompson River.
Gage.-- None.
Remarks.-- Constructed in 1950. Maximum capacity is 600 cubic feet per second. Dille Tunnel diverts water from the Big Thompson River for power generation and water supply. The right to divert native run-off is determined by the State of Colorado. The recorder was not operated during water year 2014 because it was damaged during the flood of September, 2013. The numbers presented in this table are based on mass balance computations. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Priority Diversion Flow, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	9	20	0	0	0	0
2	0	0	0	0	0	0	9	17	0	0	0	0
3	0	0	0	0	0	0	9	0	0	0	0	0
4	0	0	0	0	0	0	9	0	0	0	0	0
5	0	0	0	0	0	0	9	0	0	0	0	0
6	0	0	0	0	0	0	9	0	0	0	0	0
7	0	0	0	0	0	0	9	0	0	0	0	0
8	0	0	0	0	0	0	9	0	0	0	0	0
9	0	0	0	0	0	0	9	0	0	0	0	0
10	0	0	0	0	0	0	9	0	0	0	0	0
11	0	0	0	0	0	0	11	0	0	0	0	0
12	0	0	0	0	0	0	22	0	0	0	0	0
13	0	0	0	0	0	0	32	0	0	0	0	0
14	0	0	0	0	0	0	30	0	0	0	0	0
15	0	0	0	0	0	0	24	0	0	0	0	0
16	0	0	0	0	0	0	31	0	0	0	0	0
17	0	0	0	0	0	0	5	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	31	0	0	0	0	0
22	0	0	0	0	0	0	58	0	0	0	0	0
23	0	0	0	0	0	0	66	0	0	0	0	0
24	0	0	0	0	0	0	63	0	0	0	0	0
25	0	0	0	0	0	14	62	0	0	0	0	0
26	0	0	0	0	0	22	59	0	0	0	0	0
27	0	0	0	0	0	22	56	0	0	0	0	0
28	0	0	0	0	0	14	18	0	0	0	0	0
29	0	0	0	0		9	33	0	0	0	0	0
30	0	0	0	0		9	64	0	0	0	0	0
31	0		0	0		9		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	22	66	20	0	0	0	0
Mean	0	0	0	0	0	3	25	1	0	0	0	0
ac-ft	0	0	0	0	0	190	1478	74	0	0	0	0

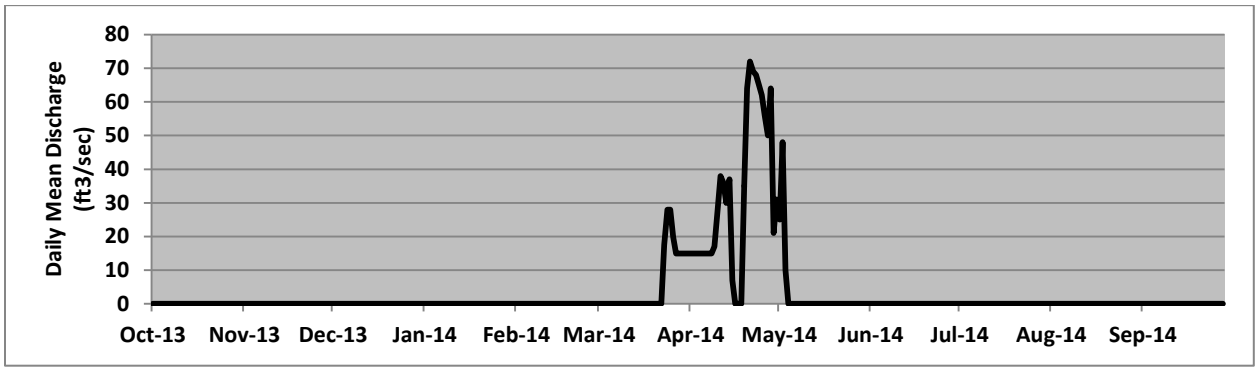


Appendix A (30 of 38)
Dille Tunnel near Drake, CO

Location. --Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, Colorado, on the Big Thompson River.
Gage.-- Water-stage recorder with satellite telemetry at Parshall Flume. Elevation of gage is 5520 feet from topographic map.
Remarks.— Constructed in 1950. Maximum capacity is 600 cubic feet per second. Dille Tunnel diverts water from the Big Thompson River for power generation and water supply. Recorder was not operated during water year 2014 because it was damaged during the flood of September, 2013. The numbers presented in this table are based on mass balance computations. Record is complete and reliable, although data has not been revised. This record contains operational data which could be subject to future revisions and changes. The official record is published by the Colorado Division of Water Resources.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	15	21	0	0	0	0
2	0	0	0	0	0	0	15	31	0	0	0	0
3	0	0	0	0	0	0	15	25	0	0	0	0
4	0	0	0	0	0	0	15	48	0	0	0	0
5	0	0	0	0	0	0	15	10	0	0	0	0
6	0	0	0	0	0	0	15	0	0	0	0	0
7	0	0	0	0	0	0	15	0	0	0	0	0
8	0	0	0	0	0	0	15	0	0	0	0	0
9	0	0	0	0	0	0	15	0	0	0	0	0
10	0	0	0	0	0	0	15	0	0	0	0	0
11	0	0	0	0	0	0	17	0	0	0	0	0
12	0	0	0	0	0	0	28	0	0	0	0	0
13	0	0	0	0	0	0	38	0	0	0	0	0
14	0	0	0	0	0	0	36	0	0	0	0	0
15	0	0	0	0	0	0	30	0	0	0	0	0
16	0	0	0	0	0	0	37	0	0	0	0	0
17	0	0	0	0	0	0	7	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	35	0	0	0	0	0
22	0	0	0	0	0	0	64	0	0	0	0	0
23	0	0	0	0	0	0	72	0	0	0	0	0
24	0	0	0	0	0	0	69	0	0	0	0	0
25	0	0	0	0	0	18	68	0	0	0	0	0
26	0	0	0	0	0	28	65	0	0	0	0	0
27	0	0	0	0	0	28	62	0	0	0	0	0
28	0	0	0	0	0	20	56	0	0	0	0	0
29	0	0	0	0		15	50	0	0	0	0	0
30	0	0	0	0		15	64	0	0	0	0	0
31	0		0	0		15		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	28	72	48	0	0	0	0
Mean	0	0	0	0	0	4	32	4	0	0	0	0
ac-ft	0	0	0	0	0	274	1877	267	0	0	0	0

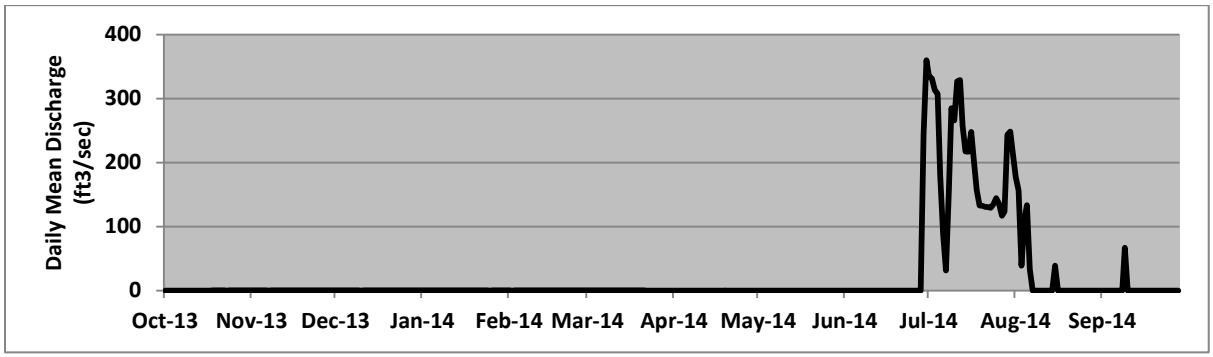


Appendix A (Table 31 of 38)
Big Thompson Power Plant, CO

Location. --Lat 40°25'16", long 105°13'26", Larimer County, Hydrologic Unit 10190006, 9 miles west of Loveland, Colorado, on the Big Thompson River.
Gage.-- Flow meter with satellite telemetry. Elevation of gage is 5280 feet from topographic map.
Remarks.-- Initial operation in 1959. Maximum capacity is 400 cubic feet per second. Power plant returns hydropower diversions to the Big Thompson River downstream of the Big Thompson River canyon mouth. The plant is also used to deliver Colorado-Big Thompson project and Windy Gap Project water to the Big Thompson River. The plant is winterized from November through April each year. This record contains data recorded between 01-Oct-2013 and 30-Sep-2014. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	0	243	249	0
2	0	0	0	0	0	0	0	0	0	360	210	0
3	0	0	0	0	0	0	0	0	0	335	177	0
4	0	0	0	0	0	0	0	0	0	331	156	0
5	0	0	0	0	0	0	0	0	0	313	39	0
6	0	0	0	0	0	0	0	0	0	307	110	0
7	0	0	0	0	0	0	0	0	0	180	134	0
8	0	0	0	0	0	0	0	0	0	89	33	0
9	0	0	0	0	0	0	0	0	0	31	0	0
10	0	0	0	0	0	0	0	0	0	155	0	0
11	0	0	0	0	0	0	0	0	0	285	0	67
12	0	0	0	0	0	0	0	0	0	266	0	0
13	0	0	0	0	0	0	0	0	0	327	0	0
14	0	0	0	0	0	0	0	0	0	329	0	0
15	0	0	0	0	0	0	0	0	0	258	0	0
16	0	0	0	0	0	0	0	0	0	217	0	0
17	0	0	0	0	0	0	0	0	0	217	39	0
18	0	0	0	0	0	0	0	0	0	248	0	0
19	0	0	0	0	0	0	0	0	0	204	0	0
20	0	0	0	0	0	0	0	0	0	157	0	0
21	0	0	0	0	0	0	0	0	0	133	0	0
22	0	0	0	0	0	0	0	0	0	132	0	0
23	0	0	0	0	0	0	0	0	0	131	0	0
24	0	0	0	0	0	0	0	0	0	130	0	0
25	0	0	0	0	0	0	0	0	0	129	0	0
26	0	0	0	0	0	0	0	0	0	135	0	0
27	0	0	0	0	0	0	0	0	0	145	0	0
28	0	0	0	0	0	0	0	0	0	135	0	0
29	0	0	0	0		0	0	0	0	117	0	0
30	0	0	0	0		0	0	0	0	123	0	0
31	0		0	0		0		0		243	0	
Min	0	0	0	0	0	0	0	0	0	31	0	0
Max	0	0	0	0	0	0	0	0	0	360	249	67
Mean	0	0	0	0	0	0	0	0	0	207	37	2
ac-ft	8	21	19	24	22	17	0	0	0	12685	2272	133



Appendix A (Table 32 of 38)
Charles Hansen Feeder Canal Wasteway, CO

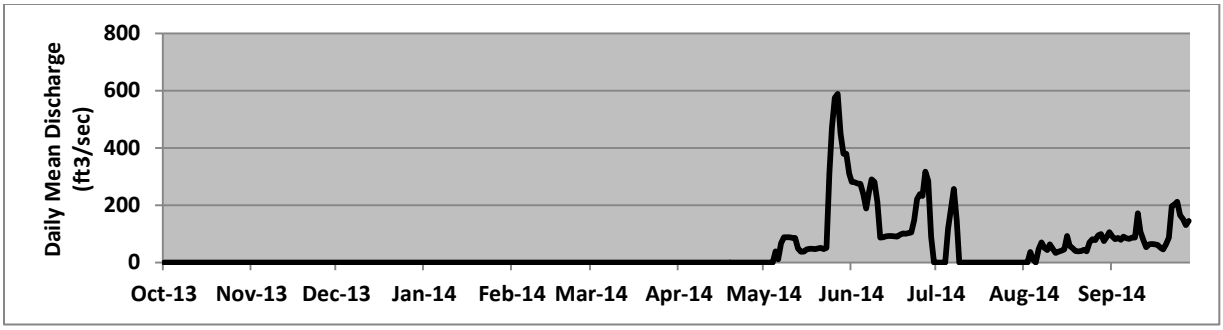
Location. --Lat 40°25'13", long 105°13'28", Larimer County, Hydrologic Unit 10190006, 9 miles west of Loveland, Colorado, on the Big Thompson River.

Gage.-- Water-stage recorder with satellite telemetry at 15 foot Parshall Flume. Elevation of gage is 5465 feet from Designer's Operating Criteria.

Remarks.-- Constructed between 1949 and 1953. Maximum capacity is 400 cubic feet per second. The structure is used to return diverted water and to deliver Colorado-Big Thompson Project and Windy Gap Project water to the Big Thompson River. The facility is winterized between November and April. Recorder was operated in October and November, 2013, and between March and 30-Sep-2013. Record is complete and reliable. These data are provisional operations data and are subject to further revision and change. The official record is published by the Colorado Division of Water Resources.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	380	91	0	88
2	0	0	0	0	0	0	0	0	311	0	0	106
3	0	0	0	0	0	0	0	0	282	0	0	92
4	0	0	0	0	0	0	0	0	281	0	0	82
5	0	0	0	0	0	0	0	0	276	0	38	86
6	0	0	0	0	0	0	0	0	275	0	11	80
7	0	0	0	0	0	0	0	40	240	119	0	91
8	0	0	0	0	0	0	0	12	190	188	48	86
9	0	0	0	0	0	0	0	68	242	257	70	83
10	0	0	0	0	0	0	0	88	291	148	51	87
11	0	0	0	0	0	0	0	88	281	0	44	88
12	0	0	0	0	0	0	0	88	212	0	64	173
13	0	0	0	0	0	0	0	87	88	0	48	109
14	0	0	0	0	0	0	0	86	88	0	34	79
15	0	0	0	0	0	0	0	50	92	0	38	54
16	0	0	0	0	0	0	0	39	93	0	42	63
17	0	0	0	0	0	0	0	39	94	0	46	65
18	0	0	0	0	0	0	0	46	92	0	93	64
19	0	0	0	0	0	0	0	48	91	0	58	62
20	0	0	0	0	0	0	0	48	98	0	50	53
21	0	0	0	0	0	0	0	47	102	0	40	47
22	0	0	0	0	0	0	0	49	101	0	40	64
23	0	0	0	0	0	0	0	52	103	0	40	88
24	0	0	0	0	0	0	0	47	105	0	46	197
25	0	0	0	0	0	0	0	52	148	0	40	203
26	0	0	0	0	0	0	0	310	222	0	71	213
27	0	0	0	0	0	0	0	471	239	0	82	166
28	0	0	0	0	0	0	0	575	233	0	79	152
29	0	0	0	0		0	0	589	317	0	95	131
30	0	0	0	0		0	0	450	285	0	99	146
31	0		0	0		0		380		0	75	
Min	0	0	0	0	0	0	0	0	88	0	0	47
Max	0	0	0	0	0	0	0	589	380	257	99	213
Mean	0	0	0	0	0	0	0	124	195	26	47	103
ac-ft	0	0	0	0	0	0	0	7621	11583	1588	2860	6134

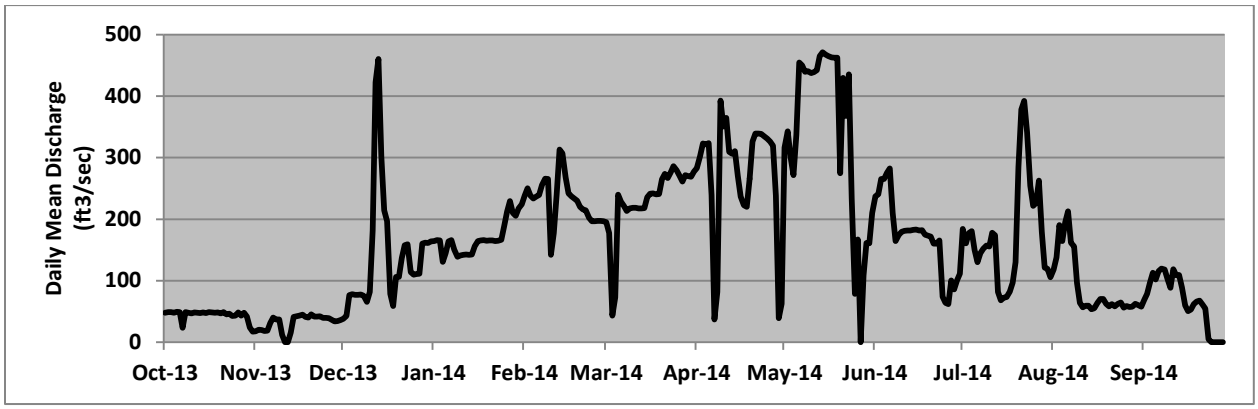


Appendix A (Table 33 of 38)
Charles Hansen Feeder Canal 550 Section, CO

Location. --Lat 40°25'25", long 105°13'34", Larimer County, Hydrologic Unit 10190006, 9 miles west of Loveland, Colorado.
Gage.-- Water-stage recorder with satellite telemetry. Elevation of gage is 5460 feet from topographic map.
Remarks.-- Constructed between 1949 and 1953. The canal is 9.4 miles long and has a maximum capacity of 550 cubic feet per second. The canal is used to move Colorado-Big Thompson Project water and Big Thompson River priority water to Horsetooth Reservoir. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	52	24	35	162	218	197	269	39	161	101	119	61
2	49	18	36	164	224	197	277	62	210	111	106	58
3	48	18	38	165	238	195	283	316	237	184	118	69
4	49	20	43	166	250	178	302	343	240	161	138	79
5	49	20	77	165	238	43	323	301	266	178	191	97
6	48	18	78	131	233	73	322	271	266	181	165	113
7	50	19	77	145	237	240	324	337	275	150	195	102
8	49	31	77	164	239	229	240	455	282	130	213	116
9	23	40	78	166	256	222	37	450	210	145	162	120
10	49	37	75	150	266	213	82	440	165	152	155	118
11	48	37	66	139	265	218	393	441	174	157	96	102
12	47	12	82	141	142	219	351	437	180	155	64	89
13	48	0	182	142	177	218	365	439	181	178	57	119
14	48	0	423	142	240	218	310	442	181	174	60	109
15	47	16	460	142	313	218	307	465	182	82	59	109
16	49	41	303	143	307	218	310	471	183	68	54	89
17	47	42	215	156	268	236	271	468	183	72	56	60
18	49	43	197	164	242	242	237	465	182	73	64	51
19	49	45	79	165	237	242	222	463	182	83	70	53
20	48	41	59	166	234	240	220	462	175	97	70	62
21	49	40	106	165	230	241	266	462	173	130	63	66
22	47	46	106	165	220	265	326	275	172	285	58	68
23	49	42	137	165	216	274	339	430	161	378	62	61
24	45	42	158	165	214	267	339	368	161	392	59	55
25	46	42	159	165	202	276	339	435	166	341	63	5
26	43	40	114	167	197	286	334	233	74	255	64	0
27	43	40	110	189	197	279	331	79	64	222	57	0
28	49	39	111	213	197	271	326	167	62	227	59	0
29	44	37	111	229		261	320	0	100	263	58	0
30	48	34	160	210		272	238	109	86	180	58	0
31	42		162	205		270		161		121	63	
Min	23	0	35	131	142	43	37	0	62	68	54	0
Max	52	46	460	229	313	286	393	471	282	392	213	120
Mean	47	31	133	165	232	226	287	332	178	175	93	68
ac-ft	2874	1830	8144	10132	12868	13890	17027	20366	10561	10740	5689	4019

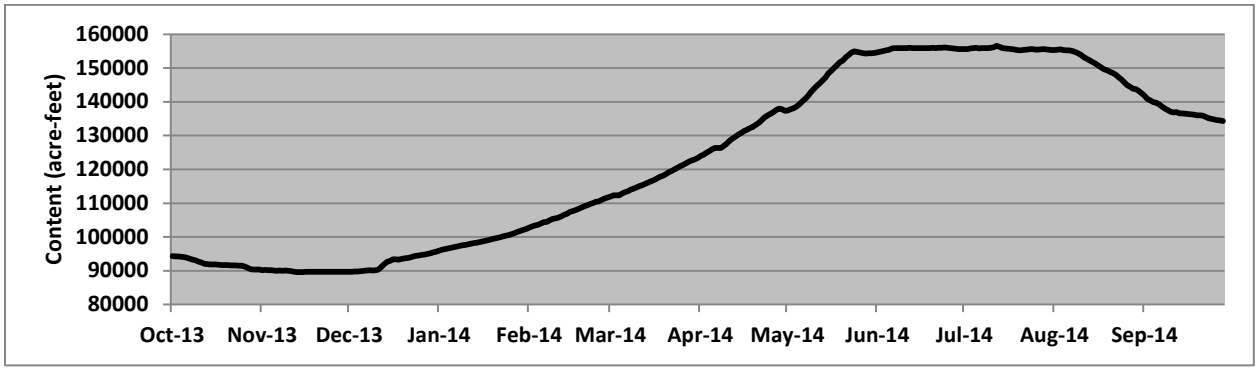


Appendix A (34 of 38)
Horsetooth Reservoir near Fort Collins, CO

Location. –-Lat 40°36'00", long 105°10'05" , Larimer County, Hydrologic Unit 10190007, at Horsetooth Dam outlet works, 4.8 miles west of Fort Collins, Colorado.
Gage.— Water level recorder with satellite telemetry. Elevation of gage is 5300 from topographic map.
Remarks.—Reservoir is formed by four earth-fill dams. Construction completed in 1949. Impoundment began in 1951. Horsetooth Reservoir is one of two terminal reservoirs for Colorado-Big Thompson Project diversions. Transmountain diversions are stored at Horsetooth Reservoir before final delivery. Maximum capacity is 156,735 acre-feet at elevation 5430.00 ft, with 142,038 acre-feet of active storage. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	94427	90342	89730	95479	102122	111373	122938	137807	154378	155616	155412	143241
2	94364	90327	89730	95699	102431	111696	123404	137352	154480	155575	155351	142542
3	94380	90204	89670	95951	102773	111917	123959	137428	154641	155656	155371	141750
4	94271	90250	89715	96188	103101	112293	124355	137788	154824	155656	155392	140845
5	94224	90174	89776	96410	103411	112327	124931	138092	155047	155798	155494	140327
6	94146	90159	89791	96631	103640	112310	125437	138606	155249	155900	155310	139886
7	94083	90067	89883	96789	103969	112857	125961	139236	155432	155961	155229	139675
8	93849	89975	89975	96964	104347	113234	126360	140058	155758	155839	155189	139198
9	93569	90036	90036	97201	104462	113595	126360	140884	155920	155859	155047	138606
10	93304	90021	90128	97344	104973	114024	126324	141712	155859	155879	154803	137997
11	93070	90036	90036	97551	105370	114317	126959	142833	155859	155879	154419	137504
12	92714	90021	90143	97662	105536	114662	127614	143765	155900	156002	153894	137087
13	92435	89883	90357	97854	105734	115094	128417	144601	155940	156165	153288	136878
14	92095	89670	91124	97997	106099	115406	129058	145461	155961	156551	152785	136935
15	91956	89609	91987	98253	106530	115787	129645	146284	155940	156286	152302	136576
16	91894	89563	92590	98332	106880	116151	130306	147210	155920	155920	151861	136594
17	91863	89609	92961	98492	107363	116500	130842	148414	155920	155798	151340	136500
18	91863	89670	93351	98684	107714	116882	131322	149148	155920	155717	150761	136387
19	91786	89670	93413	98908	107999	117319	131729	150023	155920	155636	150241	136292
20	91724	89685	93304	99116	108350	117826	132173	150861	155900	155555	149664	136160
21	91662	89700	93522	99341	108720	118141	132638	151721	155859	155371	149386	136028
22	91647	89700	93647	99533	109156	118596	133178	152182	156002	155249	148890	135990
23	91616	89654	93756	99710	109410	119107	133775	153167	155900	155310	148553	135896
24	91585	89685	94005	99952	109814	119564	134487	153793	156022	155453	148019	135576
25	91554	89654	94286	100209	110051	120041	135331	154540	156002	155473	147288	135181
26	91524	89654	94427	100387	110405	120483	135915	154905	156063	155575	146579	134955
27	91477	89685	94537	100549	110575	120909	136387	154803	156002	155534	145774	134749
28	91216	89654	94725	100871	110964	121334	136897	154581	155859	155392	144953	134618
29	90816	89700	94772	101147		121850	137504	154399	155778	155494	144426	134487
30	90449	89715	95039	101569		122260	137959	154317	155676	155616	143882	134262
31	90357		95195	101845		122635		154378		155534	143745	
Min	90357	89563	89670	95479	102122	111373	122938	137352	154378	155249	143745	134262
Max	94427	90342	95195	101845	110964	122635	137959	154905	156063	156551	155494	143241
EOM	90357	89715	95195	101845	110964	122635	137959	137959	155676	155534	143745	134262

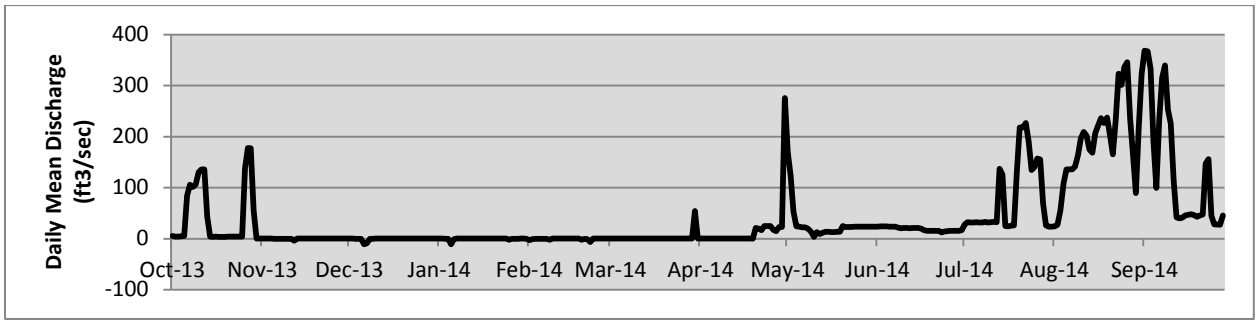


Appendix A (35 of 38)
Charles Hansen Supply Canal below Horsetooth Reservoir, CO

Location. --Lat 40°36'01", long 105°10'18", Larimer County, Hydrologic Unit 10190007, 4 miles west of Fort Collins, Colorado.
Gage.-- Two flow meters with satellite telemetry measure the flow for each conduits leading toward the hollow jet valves.
Remarks.-- Constructed between 1950 and 1952. The canal is 5.1 miles long and has a maximum capacity of 1500 cubic feet per second. The canal is used to deliver Colorado-Big Thompson Project and Windy Gap Project water stored at Horsetooth Reservoir. Recorder was operated from 01-Oct-2013 to 30-Sep-2014 by the Northern Colorado Water Conservancy District and the Colorado Division of Water Resources. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Discharge, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	6	0	0	0	0	0	55	23	24	16	24	218
2	6	0	0	0	0	0	0	275	24	17	24	323
3	6	0	0	0	-3	0	0	171	24	28	24	368
4	4	0	0	0	-1	0	0	124	24	33	27	367
5	4	0	0	0	0	0	0	53	24	32	55	333
6	5	0	0	0	0	0	0	25	24	32	108	190
7	5	0	0	-11	0	0	0	24	24	32	136	100
8	84	0	-11	-1	0	0	0	22	24	32	136	233
9	106	0	-9	0	0	0	0	22	24	32	136	315
10	101	0	0	0	-2	0	0	20	22	33	141	340
11	106	0	0	0	0	0	0	14	21	32	163	254
12	130	0	0	0	0	0	0	3	21	32	197	225
13	136	0	0	0	0	0	0	13	21	33	209	115
14	136	-4	0	0	0	0	0	9	21	32	202	42
15	43	0	0	0	0	0	0	12	21	137	175	40
16	4	0	0	0	0	0	0	13	21	126	169	41
17	4	0	0	0	0	0	0	13	21	25	206	46
18	4	0	0	0	0	0	0	13	20	24	222	47
19	4	0	0	0	0	0	0	13	17	25	236	48
20	4	0	0	0	0	0	0	13	16	26	227	46
21	4	0	0	0	-2	0	0	13	16	131	237	43
22	4	0	0	0	0	0	21	25	16	218	203	45
23	4	0	0	0	-1	0	20	23	15	218	165	48
24	4	0	0	0	-7	0	17	23	15	227	233	147
25	4	0	0	0	0	0	25	23	12	190	324	156
26	4	0	0	0	0	0	25	23	14	134	301	45
27	4	0	0	-2	0	0	25	24	15	140	336	28
28	138	0	0	0	0	0	17	24	15	157	346	28
29	178	0	0	0		0	15	24	15	155	236	28
30	177	0	0	0		0	23	24	16	70	165	45
31	56		0	0		0		24		26	90	
Min	4	-4	-11	-11	-7	0	0	3	12	16	24	28
Max	178	0	0	0	0	0	55	275	24	227	346	368
Mean	48	0	0	0	0	0	8	36	20	79	176	143
ac-ft	2921	4	-29	-17	-22	17	493	2227	1159	4844	10792	8521

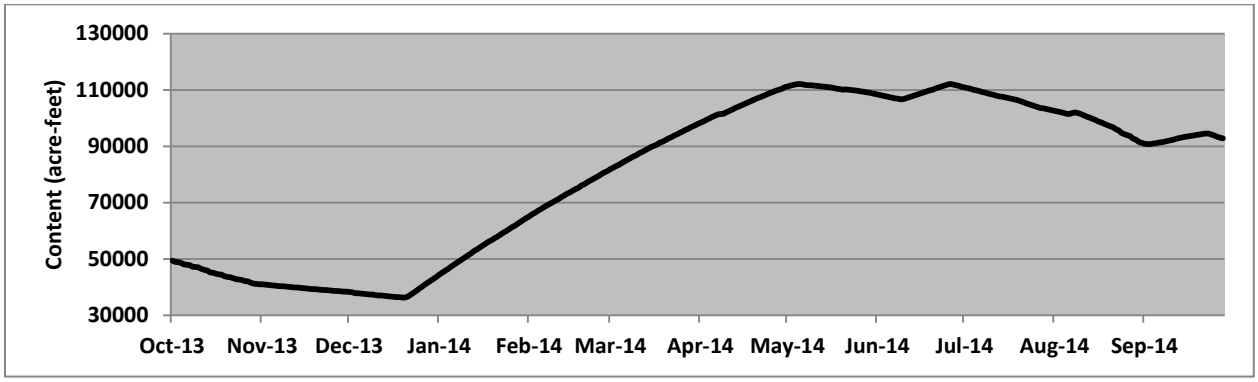


Appendix A (36 of 38)
Carter Lake near Berthoud, Colorado, CO

Location. --Lat 40°19' 28" , long 105°12' 41" , Larimer County, Hydrologic Unit 10190006, on Dam #1, 7 miles northwest of Berthoud, Colorado, and 10 miles west of Loveland, Colorado.
Gage.--Water level recorder with satellite telemetry. Elevation of gage is 5770 from topographic map.
Remarks.--Reservoir is formed by three earth-fill dams. Construction completed in 1952. Carter Lake is one of two terminal reservoirs for Colorado-Big Thompson Project water diversions. Transmountain water diversions are stored at Carter Lake before final delivery. Maximum capacity is 112,200 acre-feet at elevation 5759.00 ft, with 108,900 acre-feet of active capacity. Recorder was operated from 01-Oct-2013 to 30-Sep-2014. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Storage, Acre-Feet, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	49747	41111	38386	42925	63833	80746	97368	110449	108839	111418	103032	91545
2	49610	41023	38338	43571	64467	81261	97913	110927	108612	111144	102823	91205
3	49438	40935	38190	44411	65084	81868	98383	111224	108398	110893	102612	90822
4	48959	40823	38128	45091	65807	82435	98843	111509	108149	110642	102367	90726
5	48762	40711	37824	45782	66458	82973	99369	111783	107889	110403	102091	90779
6	48633	40607	37770	46468	67091	83531	99863	112057	107675	110120	101836	90928
7	48072	40519	37646	47209	67696	84132	100357	112125	107450	109846	101527	91109
8	47886	40431	37545	47920	68372	84704	100919	111954	107225	109586	101427	91290
9	47750	40327	37475	48608	68895	85286	101338	111806	107045	109279	101726	91482
10	47277	40264	37344	49318	69546	85829	101394	111646	106842	108997	101991	91663
11	47116	40152	37282	49954	70100	86382	101582	111680	106618	108736	101759	91876
12	46998	40057	37158	50687	70656	86916	102102	111554	106741	108477	101405	92101
13	46376	39977	37050	51338	71234	87525	102612	111429	107090	108228	101008	92357
14	46100	39890	36981	52009	71882	88081	103066	111315	107427	107946	100567	92668
15	45824	39803	36919	52754	72503	88556	103566	111190	107754	107675	100160	92925
16	45174	39668	36773	53405	73106	89136	104033	111053	108149	107518	99753	93149
17	45083	39581	36665	54024	73621	89676	104513	110927	108499	107338	99347	93354
18	44668	39510	36581	54699	74238	90174	104938	110813	108827	107124	98875	93504
19	44453	39408	36443	55448	74796	90684	105419	110631	109178	106921	98459	93719
20	44329	39313	36382	56048	75346	91269	105877	110437	109518	106640	98011	93870
21	43859	39226	36298	56642	76037	91684	106303	110313	109801	106382	97618	94063
22	43637	39178	36198	57337	76560	92229	106752	110120	110097	106091	97150	94204
23	43498	39076	36497	57963	77196	92775	107191	110176	110506	105743	96790	94408
24	43137	38958	37173	58592	77833	93268	107619	110120	110825	105351	96052	94559
25	42802	38903	37918	59261	78330	93794	108048	109949	111167	105004	95608	94537
26	42713	38793	38628	59877	78930	94290	108488	109835	111589	104625	94732	94160
27	42403	38707	39368	60541	79510	94818	108895	109699	111875	104246	94311	93805
28	42079	38613	40097	61191	80143	95304	109268	109529	112137	103911	93934	93407
29	41949	38558	40839	61806		95813	109733	109348	111897	103600	93579	93075
30	41594	38448	41521	62498		96345	110108	109166	111680	103466	92689	92786
31	41200		42225	63174		96878		109008		103244	92304	
Min	41200	38448	36198	42925	63833	80746	97368	109008	106618	103244	92304	90726
Max	49747	41111	42225	63174	80143	96878	110108	112125	112137	111418	103032	94559
EOM	41200	38448	42225	63174	80143	96878	110108	110108	111680	103244	92304	92786

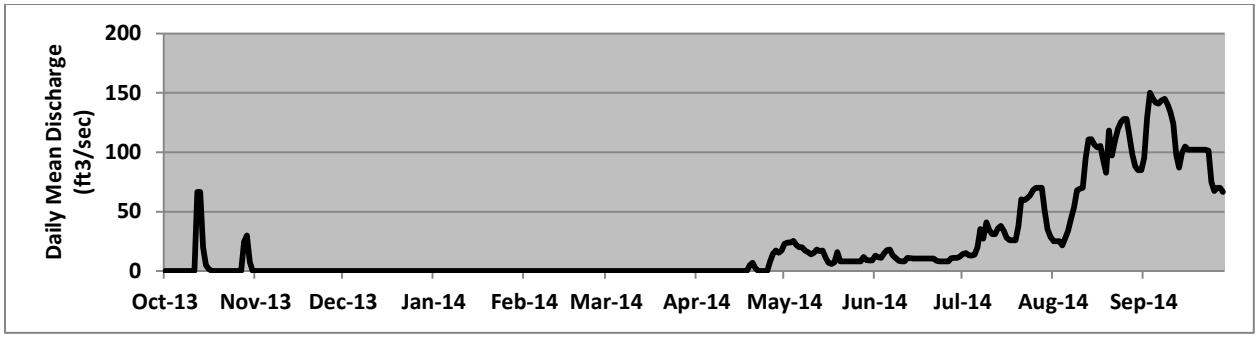


Appendix A (37 of 38)
Saint Vrain Canal below Carter Reservoir, CO

Location. --Lat 40°19'27", long 105°12'35", Larimer County, Hydrologic Unit 10190006, downstream from Carter Reservoir Dam #1, 7 miles northwest of Berthoud, Colorado, and 10 miles west of Loveland, Colorado.
Gage.-- Water-stage recorder with telephone telemetry. Data provided by the Northern Colorado Water Conservancy District. Elevation of gage is 5,590 feet from topographic map.
Remarks.-- Constructed between 1952 and 1954. The canal is 9.8 miles long and has a maximum capacity of 625 cubic feet per second. The canal is used to deliver Colorado-Big Thompson Project and Windy Gap Project water as well as diverted native water from conveyance contract holders. Record was provided by the Northern Colorado Water Conservancy District for the period 01-Oct-2013 to 30-Sep-2014. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Flow, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	8	0	0	0	0	0	15	9	11	35	85
2	0	0	0	0	0	0	0	17	9	12	29	85
3	0	0	0	0	0	0	0	23	13	14	25	95
4	0	0	0	0	0	0	0	24	12	15	25	129
5	0	0	0	0	0	0	0	24	11	13	25	150
6	0	0	0	0	0	0	0	25	15	13	22	145
7	0	0	0	0	0	0	0	22	18	14	28	142
8	0	0	0	0	0	0	0	20	18	20	34	141
9	0	0	0	0	0	0	0	20	13	35	44	144
10	0	0	0	0	0	0	0	17	11	27	54	145
11	0	0	0	0	0	0	0	16	9	41	68	140
12	0	0	0	0	0	0	0	14	8	35	69	134
13	0	0	0	0	0	0	0	15	8	31	70	124
14	67	0	0	0	0	0	0	18	11	31	95	98
15	67	0	0	0	0	0	0	17	11	36	111	87
16	20	0	0	0	0	0	0	17	11	38	111	100
17	5	0	0	0	0	0	0	12	11	34	106	105
18	2	0	0	0	0	0	0	7	11	28	104	102
19	0	0	0	0	0	0	0	6	11	26	105	102
20	0	0	0	0	0	0	0	7	11	26	93	102
21	0	0	0	0	0	0	5	16	11	26	83	102
22	0	0	0	0	0	0	7	8	11	38	118	102
23	0	0	0	0	0	0	2	8	11	61	97	102
24	0	0	0	0	0	0	0	8	9	60	109	102
25	0	0	0	0	0	0	0	8	8	61	120	101
26	0	0	0	0	0	0	0	8	8	64	125	75
27	0	0	0	0	0	0	0	8	8	68	128	67
28	0	0	0	0	0	0	8	8	8	70	128	70
29	0	0	0	0		0	15	8	11	70	113	70
30	25	0	0	0		0	17	12	11	70	98	67
31	30		0	0		0		9		51	88	
Min	0	0	0	0	0	0	0	6	8	11	22	67
Max	67	8	0	0	0	0	17	25	18	70	128	150
Mean	7	0	0	0	0	0	2	14	11	37	79	107
ac-ft	425	15	0	0	0	0	107	869	636	2256	4871	6360

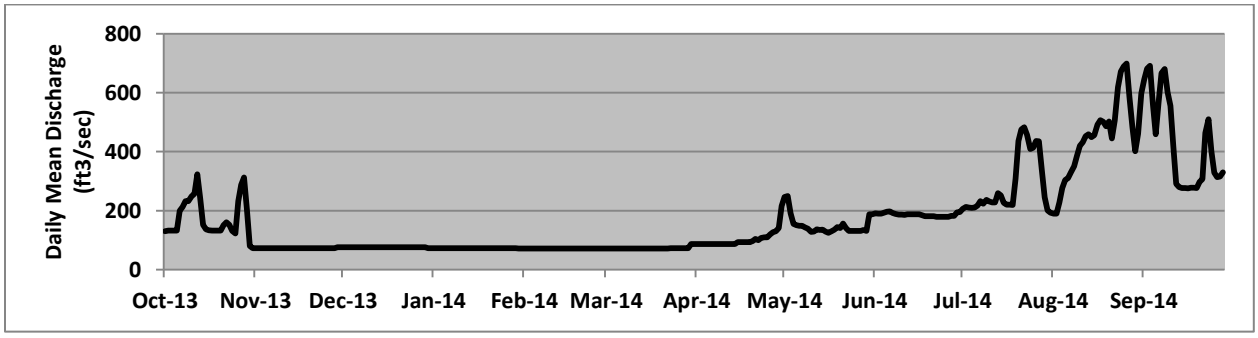


Appendix A (38 of 38)
Colorado-Big Thompson Project, CO

Location. -- Larimer , Grand, Summit, Boulder, Weld counties in Colorado, hydrologic units 14010001, 14010002 and 10190006, 10190007**,** on the Colorado River, Big Thompson River and Cache La Poudre River basins.
Remarks.— This table presents a summation of all the daily deliveries of Colorado-Big Thompson Project and Windy Gap Project water through the Saint Vrain Canal, the Charles Hansen Supply Canal, the Dixon Canal ,the Charles Hansen Feeder Canal and small deliveries upstream from Flatiron Reservoir. These values include metered water. The Colorado-Big Thompson Project is a transmountain water diversion system. The water diverted is used for agricultural, municipal and industrial purposes, to generate hydroelectric power and to provide recreation for the public. This record contains operational data which could be subject to future revisions and changes. Period of record is between 01-Oct-2013 and 30-Sep-2014. Data was provided by the Northern Colorado Water Conservancy District. Record is complete and reliable.

Total Daily Water Deliveries, Cubic Feet per Second, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	127	81	76	73	72	72	87	141	188	194	201	461
2	127	73	76	73	72	72	87	216	188	196	193	598
3	131	73	76	73	72	72	87	247	191	207	190	645
4	132	73	76	73	72	72	87	249	190	213	191	682
5	132	73	76	73	72	72	87	191	190	211	228	691
6	132	73	76	73	72	72	87	155	193	210	277	563
7	132	73	76	73	72	72	87	151	197	210	303	459
8	200	73	76	73	72	72	87	149	198	217	310	567
9	213	73	76	73	72	72	87	149	193	232	330	666
10	232	73	76	73	72	72	87	143	189	224	350	680
11	232	73	76	73	72	72	87	139	187	237	386	603
12	249	73	76	73	72	72	87	128	187	231	420	556
13	257	73	76	73	72	72	87	129	186	228	431	419
14	324	73	76	73	72	72	87	136	188	228	453	291
15	242	73	76	73	72	72	87	135	188	259	459	281
16	152	73	76	73	72	72	87	135	188	252	449	276
17	137	73	76	73	72	72	93	130	188	227	456	276
18	134	73	76	73	72	72	93	125	188	221	492	276
19	132	73	76	73	72	72	93	131	184	220	507	278
20	132	73	76	73	72	72	93	135	182	219	501	278
21	132	73	76	73	72	72	94	144	182	308	486	277
22	132	73	76	73	72	72	97	142	182	436	503	297
23	151	73	76	73	72	72	104	156	182	476	445	307
24	160	73	76	73	72	72	100	141	180	483	506	463
25	152	73	76	73	72	73	108	131	179	457	618	510
26	131	73	76	73	72	73	110	131	179	409	671	402
27	122	73	76	73	72	73	110	131	179	414	689	329
28	233	73	76	73	72	73	120	131	179	436	699	314
29	288	73	76	73		73	127	131	182	435	583	315
30	312	73	76	73		73	130	135	182	338	485	330
31	204		76	73		73		132		245	401	
Min	122	73	76	73	72	72	87	125	179	194	190	276
Max	324	81	76	73	72	73	130	249	198	483	699	691
Mean	180	73	76	73	72	72	95	149	186	286	426	436
ac-ft	11029	4365	4658	4491	3974	4447	5666	9144	11057	17566	26165	25918



APPENDIX B – OPERATIONS DATA

TABLE 1

WESTERN DIVISION – PICK-SLOAN MISSOURI BASIN PROGRAM

PERTINENT RESERVOIR DATA

(Data in AF)

Reservoir	Dead Storage 1/	Active Storage 2/	Total Storage	Normal Minimum Storage	Limitation on normal minimum storage
Green Mountain	6,860	146,779	153,639	47,684	Minimum elevation for rated power output
Willow Creek	1,486	9,779	10,553	6,675	Elevation of pump canal head-works
Lake Granby	74,190	465,568	539,758	74,190	Lowest outlet elevation
Shadow Mountain	506	16,848	17,354	16,026	Minimum permissible Grand Lake elevation; 8,366 ft.
Grand Lake	3/	511	1,015	504	Legislation limits fluctuation
Marys Lake	42	885	927	308	Minimum elevation for power generation
Lake Estes	409	2,659	3,068	740	Minimum elevation to release 550 cfs
Pinewood Lake	416	1,765	2,181	613	Minimum elevation for power generation
Flatiron	125	635	760	324	Minimum elevation to release 550 cfs
Carter Lake	3,306	108,924	112,230	306	Lowest outlet elevation
Horsetooth	7,003	149,732	156,735	17,600	Elevation on highest delivery works
Total	94,343	903,373	998,220	167,970	

1/ Storage capacity below elevation of lowest outlet
2/ Total storage minus dead storage
3/ Not determined

TABLE 2

COLORADO-BIG THOMPSON PROJECT
MONTHLY SUMMARY
WATER YEAR 2014 **OF BLUE RIVER OPERATIONS** **(ACRE-FEET)**

	INI	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
UNDEPLETED RUNOFF ABOVE GREEN MTN. RESERVOIR		20,500	12,700	10,100	9,800	8,400	10,000	32,700	102,000	179,800	79,800	35,800	25,100
UNDEPLETED RUNOFF ABOVE DILLON RES.		12,700	7,600	6,000	6,200	5,000	5,900	18,400	62,800	117,500	46,000	20,400	13,100
PERCENT OF TOTAL UN-DEPLETED RUNOFF ORI-GINATING ABOVE DILLON		0.620	0.598	0.594	0.633	0.595	0.590	0.563	0.616	0.654	0.576	0.570	0.522
DEPLETIONS BY 1929 COLORADO SPRINGS RIGHT		0	0	0	0	0	0	24	250	850	328	159	127
DEPLETIONS BY 1948 COLORADO SPRINGS RIGHT		79	-786	-52	0	0	0	76	1665	3,714	1427	1178	257
INFLOW TO DILLON		12,600	8,400	6,000	6,100	5,000	5,900	18,200	60,800	112,900	44,200	19,100	12,700
DILLON STORAGE (1000 AF)	245.9	243.5	242.3	241.5	239.7	237.2	222.6	206.4	203.0	251.1	245.9	251.9	247.2
ROBERTS TUNNEL DIVERSIONS		000	000	000	000	000	000	000	000	000	3,700	000	10,000
DILLON OUTFLOW TO THE RIVER		13,800	8,600	6,900	7,900	7,500	20,400	34,500	63,800	64,000	44,800	12,000	6,400
TOTAL DEPLETIONS BY DENVER		-1,200	-200	-900	-1,700	-2,500	-14,400	-16,100	-3,000	48,600	-550	7,000	6,300
RUNOFF ORIGINATING BETWEEN DILLON AND GREEN MTN RESERVOIR		7,900	5,200	4,200	3,800	3,500	4,300	14,600	40,100	63,800	34,500	15,600	12,200
ACTUAL INFLOW TO GREEN MTN RESERVOIR		21,600	13,700	11,000	11,600	10,900	24,500	48,700	103,100	126,700	78,600	27,400	18,400
GREEN MTN RESERVOIR STORAGE (1000 AF)	107.1	102.6	95.2	90.4	82.3	72.4	60.8	68.9	98.6	149.1	152.0	141.7	115.2
TOTAL GREEN MTN OUTFLOW		25,600	21,000	15,900	19,600	20,800	36,000	40,500	72,800	75,200	74,800	37,100	44,400

PICK-SLOAN MISSOURI BASIN PROGRAM
WESTERN DIVISION WATER AND POWER SYSTEM
COLORADO-BIG THOMPSON PROJECT

2014 ACTUAL OPERATIONS

	WATER IN 1000 ACRE-FEET				* * *	* * *	* * *	* * *	* * *	ENERGY IN GWH			
	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
GREEN MOUNTAIN RESERVOIR													
Depleted Watershed Inflow	496.2	21.6	13.7	11.0	11 .6	10.9	24.5	48.7	103.1	126.7	78.6	27.4	18.4
Turbine Release	477.1	24.7	21.0	15.9	19.6	20.8	36.0	40.5	72.8	72.4	72.3	37.0	44.1
Bypass	1.2	0.9	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.08	0.2
Spill	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	2.5	0.0	0.0
End of Month Content	107.1	102.6	95.2	90.4	82.3	72.4	60.8	68.9	98.6	149.1	152.0	141.7	115.2
Kwh/AF		218.6	219.0	182.4	178.6	111.6	177.8	175.3	186.8	208.6	215.8	216.2	192.7
Generation	94.4	5.4	4.6	2.9	3.5	3.7	6.4	7.1	13.6	15.1	15.6	8.0	8.5
WILLOW CREEK RESERVOIR													
Inflow	90.8	1.7	1.4	1.2	1.0	0.9	1.2	9.4	41.7	23.7	4.5	2.4	1.7
Release to River	39.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	13.8	16.1	0.4	2.5	3.6
Pumped to Granby	51.5	1.4	2.6	0.0	0.0	0.0	0.0	10.5	25.6	7.8	3.6	0.0	0.0
End of Month Content	9.3	9.1	7.4	8.2	8.7	9.1	9.8	8.1	10.1	9.5	9.8	9.7	7.7
Pump Energy	10.8	0.3	0.5	0.0	0.0	0.0	0.0	2.2	5.5	1.6	0.7	0.0	0.0
GRANBY - SHADOW MOUNTAIN - GRAND LAKE													
Natural Watershed Inflow	366.5	15.4	7.1	5.3	4.9	4.7	4.3	22.1	89.9	134.5	46.9	16.9	14.5
Total Inflow into Granby	366.4	16.4	9.7	5.2	4.9	4.3	3.4	22.9	98.3	137.4	41.1	12.6	10.2
Granby Fish Release	37.8	1.3	1.2	1.2	1.3	1.1	1.3	1.3	3.5	4.6	9.1	7.3	4.6
Granby Seepage	4.9	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.5	0.8	0.7	0.6
Granby Spill	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.5	0.0
Adams Tunnel	203.7	0.02	0.7	15.4	32.8	29.6	32.5	28.2	22.6	3.7	11.0	6.4	20.8
Granby End of Month content	371.0	384.3	391.6	379.6	350.1	323.9	293.8	295.7	383.2	512.0	536.4	536.1	522.2
SM-GL End of Month Content	17.6	17.6	17.5	17.8	17.8	17.8	17.8	17.6	16.9	17.4	17.5	17.6	17.7
Pumped from Granby	156.0	00.0	0.6	15.6	32.8	29.1	31.8	18.7	5.2	0.07	2.5	2.7	17.0
Granby Pump Kwh/AF		000.0	166.7	153.8	158.5	164.9	173.0	176.5	173.1	000.0	120.0	148.1	135.3
Granby Pump Energy	25.2	0.0	0.1	2.4	5.2	4.8	5.5	3.3	0.9	0.0	0.3	0.4	2.3

PICK-SLOAN MISSOURI BASIN PROGRAM
WESTERN DIVISION WATER AND POWER SYSTEM
COLORADO-BIG THOMPSON PROJECT

2014 ACTUAL OPERATIONS

WATER IN 1000 ACRE-FEET * * * * * * * * * * * * ENERGY IN GWH

	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MARYS LAKE – ESTES – FLATIRON													
Adams Tunnel Water	203.7	0.02	0.7	15.4	32.8	29.6	32.5	28.2	22.6	3.7	11.0	6.4	20.8
Marys Lake Generation	35.4	0.0	0.0	2.4	6.0	5.5	6.0	5.2	4.1	0.4	1.6	0.7	3.6
Estes Generation	92.8	0.0	0.0	6.6	15.2	13.7	15.3	12.9	10.3	1.7	4.7	2.9	9.5
Divertible Big-Thompson	92.5	5.4	2.3	1.9	1.6	0.9	1.4	4.1	18.4	32.9	15.5	4.4	3.7
Diverted Big-Thompson Water	38.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	11.6	14.1	3.9	3.2
Olympus Tunnel	275.3	0.0	2.1	15.7	34.2	30.4	33.8	32.6	33.0	32.1	26.4	10.7	24.3
Pole Hill Generation	189.1	0.0	0.0	9.0	24.3	21.6	24.4	23.5	23.8	22.3	17.8	5.9	16.6
Flatiron 1 & 2 Generation	242.7	0.2	1.3	13.3	28.6	26.7	31.2	30.0	30.4	29.3	21.5	9.5	20.7
Flatiron 3 Turbine Release	6.4	4.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.5
Flatiron 3 Kwh/AF Gen.		170.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	187.5	200.0
Flatiron 3 Generation	1.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
Flatiron 3 Pumping	112.6	0.04	0.0	7.0	23.8	19.2	19.4	16.4	3.5	9.0	0.0	1.5	12.8
Flatiron 3 Kwh/AF Pump		0.0	0.0	271.4	289.9	312.5	335.1	353.7	371.4	366.7	0.0	333.3	343.8
Flatiron 3 Pump Energy	36.6	0.0	0.0	1.9	6.9	6.0	6.5	5.8	1.3	3.3	0.0	0.5	4.4
CARTER LAKE													
Pumped from Flatiron	112.6	0.04	0.0	7.0	23.8	19.2	19.4	16.4	3.5	9.0	00.0	1.5	12.8
Release to Flatiron	6.4	4.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.5
Irrigation Delivery	50.8	4.0	1.6	1.5	1.9	1.6	1.9	2.5	3.7	4.3	7.1	9.6	11.1
Evaporation & Seepage	2.3	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.4	0.4	0.2
End of Month Content	49.9	41.2	38.4	42.2	63.2	80.1	96.8	110.0	109.0	111.7	103.2	92.3	92.7
BIG THOMPSON POWERPLANT													
Diverted Dille Tunnel Water	2.5	0.0	0.0	0.0	0.0	0.0	0.3	1.9	0.3	0.0	0.0	0.0	0.0
Irrigation Delivery	20.4	3.7	0.2	0.4	0.4	0.4	0.4	0.4	1.1	3.8	1.8	3.1	4.7
Turbine Release	15.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.7	2.3	0.1
Generation	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.3	0.0
HORSETOOTH RESERVOIR													
Hansen Feeder Canal Inflow	104.4	1.2	1.7	7.7	9.7	12.5	13.5	16.7	19.0	6.9	9.2	3.8	2.5
Irrigation Delivery	57.2	4.3	1.4	1.7	1.9	1.7	2.0	2.5	4.6	4.4	8.6	13.9	10.2
Evaporation	4.0	0.2	0.1	0.0	0.0	0.0	0.1	0.5	0.5	0.8	0.7	0.7	0.4
End of Month Content	94.5	90.4	89.7	95.2	101.8	111.1	122.7	137.9	154.3	155.7	155.5	143.7	134.3
TOTAL CBT DELIVERY *	128.4	12.0	3.2	3.6	4.2	3.7	4.3	5.4	9.4	12.5	17.5	26.6	26.0

* May include Windy Gap
and/or carriage contract water.

PICK-SLOAN MISSOURI BASIN PROGRAM
WESTERN DIVISION WATER AND POWER SYSTEM
COLORADO-BIG THOMPSON PROJECT

2014 ACTUAL OPERATIONS

WATER IN 1000 ACRE-FEET * * * * * * * * * * * * ENERGY IN GWH

	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BASE GENERATION													
Green Mountain	94.4	5.4	4.6	2.9	3.5	3.7	6.4	7.1	13.6	15.1	15.6	8.0	8.5
Flatiron 3	1.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
Big Thompson	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.3	0.0
TOTAL	97.5	6.1	4.6	2.9	3.5	3.7	6.4	7.1	13.6	15.1	17.3	8.6	8.6
LOAD FOLLOWING GENERATION													
Marys Lake	35.4	0.0	0.0	2.4	6.0	5.5	6.0	5.2	4.1	0.4	1.6	0.7	3.6
Estes	92.8	0.0	0.0	6.6	15.2	13.7	15.3	12.9	10.3	1.7	4.7	2.9	9.5
Pole Hill	189.1	0.0	0.0	9.0	24.3	21.6	24.4	23.5	23.8	22.3	17.8	5.9	16.6
Flatiron 1 & 2	242.7	0.2	1.3	13.3	28.6	26.7	31.2	30.0	30.4	29.3	21.5	9.5	20.7
TOTAL	560.2	0.2	1.3	31.3	74.1	67.5	76.9	71.6	68.6	53.7	45.6	19.0	50.4
PUMP ENERGY													
Willow Creek	10.8	0.3	0.5	0.0	0.0	0.0	0.0	2.2	5.5	1.6	0.7	0.0	0.0
Granby	25.2	0.0	0.1	2.4	5.2	4.8	5.5	3.3	0.9	0.0	0.3	0.4	2.3
Flatiron 3	36.6	0.0	0.0	1.9	6.9	6.0	6.5	5.8	1.3	3.3	0.0	0.5	4.4
TOTAL	72.6	0.3	0.6	4.3	12.1	10.8	12.0	11.3	7.7	4.9	1.0	0.9	6.7
TOTAL GENERATION	657.7	6.3	5.9	34.2	77.6	71.2	83.3	78.7	82.2	68.8	62.9	27.6	59.0
TOTAL GENERATION MINUS PUMP	585.1	6.0	5.3	29.9	65.5	60.4	71.3	67.4	74.5	63.9	61.9	26.7	52.3

TABLE 4

COLORADO-BIG THOMPSON PROJECT
FLOOD DAMAGE PREVENTED IN WATER YEAR 2014

	Cumulative Total Prior to WY 2014	WY 2014	Cumulative Total Current
Granby, Willow Creek, Shadow Mountain and Grand Lake	$357,700	$77,000	$434,700
Green Mountain	$152,600	$12,100	$164,700
Total	$510,300	$89,100	$599,400

CBTAOP V2.06 Run: 06-Oct-2014 12:58
Most Probable Plan (60% Quota Oct; 70% Quota Nov-Sep)

COLORADO-BIG THOMPSON MONTHLY OPERATIONS
2015 PROJECT OPERATING PLAN FOR MOST PROBABLE WATER SUPPLY CONDITION

HYDROLOGY OPERATIONS

Green Mtn Reservoir		Initial Cont		115.2 kaf		Maximum Cont		154.6 kaf		Minimum Cont		8.0 kaf		
				Elev	7930.10 ft			Elev	7950.38 ft			Elev	7804.68 ft	
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Dillon Inflow	kaf	6.4	4.9	4.1	4.0	3.5	4.4	11.4	47.3	69.3	33.8	14.6	8.8	212.5
Dillon-Grn Mtn Gain	kaf	6.7	4.8	3.9	3.7	3.2	4.2	10.7	32.3	45.6	24.2	12.7	9.2	161.2
Undepleted Inflow	kaf	13.1	9.7	8.0	7.7	6.7	8.6	22.1	79.6	114.9	58.0	27.3	18.0	373.7
Depletion	kaf	1.0	-0.1	-1.0	0.0	0.0	0.0	0.0	20.0	55.0	8.9	5.0	6.1	94.9
Depleted Inflow	kaf	12.1	9.8	9.0	7.7	6.7	8.6	22.1	59.6	59.9	49.1	22.3	11.9	278.8
Turbine Release	kaf	38.9	12.7	13.0	11.7	10.7	12.4	15.8	19.1	29.0	48.3	46.7	43.4	301.7
Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	38.9	12.7	13.0	11.7	10.7	12.4	15.8	19.1	29.0	48.3	46.7	43.4	301.7
Min Release	cfs	60	60	60	60	60	60	100	100	60	60	60	60	
Total River Release	cfs	633	213	211	190	193	202	266	311	487	786	760	729	
Evaporation	kaf	0.4	0.1	0.0	0.0	0.0	0.2	0.3	0.5	0.9	0.8	0.6	0.5	4.3
End-Month Targets	kaf	88.0	85.0	81.0	77.0	73.0	69.0	75.0	115.0	145.0	145.0	120.0	88.0	
End-Month Content	kaf	88.0	85.0	81.0	77.0	73.0	69.0	75.0	115.0	145.0	145.0	120.0	88.0	
End-Month Elevation	ft	7912.92	7910.79	7907.86	7904.83	7901.68	7898.40	7903.27	7929.98	7945.78	7945.78	7932.79	7912.92	

Willow Crk Reservoir		Initial Cont		7.7 kaf		Maximum Cont		10.1 kaf		Minimum Cont		7.2 kaf		
				Elev	8119.18 ft			Elev	8128.48 ft			Elev	8116.90 ft	
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native Inflow	kaf	1.0	0.8	0.9	0.8	0.7	1.0	3.9	22.1	17.7	4.4	1.7	1.3	56.3
Min Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.5	2.6	0.5	0.5	0.4	8.3
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6	15.0	3.8	0.0	0.0	36.4
Total River Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	0.4	19.1	17.6	4.3	0.5	0.4	44.7
Pumped to Granby	kaf	0.8	0.7	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0	1.5	1.5	9.7
Evaporation	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
End-Month Targets	kaf		7.2					7.2	9.0	10.0	9.0		9.0	
End-Month Content	kaf	7.5	7.2	7.7	8.1	8.4	9.0	7.2	10.1	10.1	10.1	9.7	9.0	
End-Month Elevation	ft	8118.29	8116.90	8119.18	8120.90	8122.14	8124.50	8116.90	8128.48	8128.48	8128.48	8127.09	8124.50	

Lake Granby		Initial Cont	522.2 kaf		Maximum Cont	538.0 kaf		Minimum Cont	76.5 kaf				
		Elev	8277.56 ft		Elev	8279.76 ft		Elev	8186.91 ft				
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native inflow	kaf	4.9	3.2	2.3	1.9	1.6	2.4	5.3	22.7	37.0	12.6	4.8	2.3	101.0
Rels frm Shadow Mtn	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	9.2	29.3	3.1	2.5	2.1	58.6
Pump frm Windy Gap	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pump frm Willow Crk	kaf	0.8	0.7	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0	1.5	1.5	9.7
Total Inflow	kaf	7.9	6.6	5.1	3.1	2.7	3.6	11.7	31.9	66.3	15.7	8.8	5.9	169.3
Min River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	3.5	4.5	5.0	5.0	4.5	30.8
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	33.3
Total River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	3.5	37.8	5.0	5.0	4.5	64.1
Pumped to Shadow Mtn	kaf	4.2	3.0	9.4	25.0	15.7	6.2	5.7	0.0	0.0	18.6	4.8	9.7	102.3
Evaporation	kaf	1.6	0.7	0.2	0.0	0.0	1.0	1.6	2.5	3.2	2.9	2.3	2.0	18.0
Seepage loss	kaf	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	5.1
End-Month Content	kaf	522.7	524.0	517.9	494.4	480.0	474.8	477.6	503.1	527.9	516.6	512.8	502.0	
End-Month Elevation	ft	8277.63	8277.81	8276.96	8273.63	8271.56	8270.81	8271.21	8274.87	8278.36	8276.78	8276.24	8274.71	

Shadow Mtn		Initial Cont	17.7 kaf		Maximum Cont	18.4 kaf		Minimum Cont	16.6 kaf				
		Elev	8366.62 ft		Elev	8367.00 ft		Elev	8366.02 ft				
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native inflow	kaf	7.3	4.9	3.4	2.9	2.3	3.5	7.9	34.0	55.6	19.0	7.2	3.5	151.5
Pumped from Granby	kaf	4.2	3.0	9.4	25.0	15.7	6.2	5.7	0.0	0.0	18.6	4.8	9.7	102.3
Total Inflow	kaf	11.5	7.9	12.8	27.9	18.0	9.7	13.6	34.0	55.6	37.6	12.0	13.2	253.8
Min River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	1.2	3.0	3.1	2.5	2.1	24.3
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	26.3	0.0	0.0	0.0	34.3
Total River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	9.2	29.3	3.1	2.5	2.1	58.6
Adams Tunnel Flow	kaf	8.9	5.0	9.9	26.7	16.9	8.2	12.0	24.1	25.5	33.8	8.9	10.6	190.5
Evaporation	kaf	0.4	0.2	0.1	0.0	0.0	0.3	0.4	0.7	0.8	0.7	0.6	0.5	4.7
End-Month Content	kaf	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	
End-Month Elevation	ft	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	

Adams Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Tunnel Capacity	kaf	33.8	6.5	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	371.7
Actual delivery	kaf	8.9	5.0	9.9	26.7	16.9	8.2	12.0	24.1	25.5	33.8	8.9	10.6	190.5
% max delivery	%	26	77	29	79	55	24	37	71	78	100	26	32	

Big T @ Lake Estes	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Big Thompson inflow	kaf	2.2	1.4	1.3	1.2	1.0	1.2	3.3	13.4	30.2	20.2	7.8	4.4	87.6
Min river release	kaf	3.1	1.5	1.5	1.5	1.4	1.5	2.2	6.9	7.4	7.7	6.9	3.7	45.3
Act river release	kaf	2.2	1.4	1.3	1.2	1.0	1.2	2.2	6.9	22.8	20.1	6.9	3.7	70.9
Max div available	kaf	0.0	0.0	0.0	0.0	0.0	0.0	1.1	6.5	22.8	12.5	0.9	0.7	44.5
Priority water div	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skim water diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	1.1	6.5	7.4	0.1	0.9	0.7	16.7
% max diverted	%							100	100	32	1	100	100	

Irrigation demand	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.9
Irrigation delivery	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.9
Total river release	kaf	2.2	1.4	1.4	1.2	1.1	1.3	2.3	7.0	23.0	20.2	7.0	3.7	71.8

Olympus Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Tunnel Capacity	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Actual delivery	kaf	8.9	5.0	9.8	26.7	16.8	8.1	13.0	30.5	32.7	33.8	9.7	11.3	206.3
% max delivery	%	26	15	29	79	55	24	40	90	100	100	29	35	
Seepage and Evap	kaf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
Inflow to Flatiron	kaf	8.7	4.8	9.6	26.5	16.6	7.9	12.8	30.3	32.5	33.6	9.5	11.1	203.9

Carter Lake		Initial Cont Elev	92.7 kaf 5741.37 ft			Maximum Cont Elev	112.2 kaf 5758.98 ft			Minimum Cont Elev	6.0 kaf 5626.80 ft		
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Pump from Flatiron	kaf	0.0	0.0	3.0	18.2	9.2	0.0	5.4	9.2	13.7	15.5	0.0	0.2	74.4
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Evaporation loss	kaf	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.2	2.3
Seepage loss	kaf	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	1.9
End-Month Targets	kaf	84.8	77.2	82.4	98.3	105.3	102.8	104.7	107.0	111.1	109.9	88.1	73.9	
End-Month Content	kaf	84.9	82.1	82.4	98.3	105.3	102.8	104.7	107.0	111.1	109.6	87.8	73.9	
End-Month Elevation	ft	5733.98	5731.27	5731.57	5746.54	5752.87	5750.63	5752.34	5754.39	5758.01	5756.69	5736.75	5723.18	
Irrigation demand	kaf	7.2	1.6	1.5	1.6	1.4	1.7	3.0	6.1	7.7	15.2	19.5	11.8	78.3
Metered delivery	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windy Gap demand	kaf	0.3	0.9	1.0	0.5	0.6	0.5	0.1	0.4	1.4	1.2	1.8	2.0	10.7
Total demand	kaf	7.5	2.5	2.5	2.1	2.0	2.2	3.1	6.5	9.1	16.4	21.3	13.8	89.0
Total delivery	kaf	7.5	2.5	2.5	2.1	2.0	2.2	3.1	6.5	9.1	16.4	21.3	13.8	89.0
% required delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 930	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Minimum flow	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum flow	kaf	57.2	55.3	57.2	57.2	51.6	57.2	27.7	57.2	55.3	57.2	57.2	55.3	645.6
Actual flow	kaf	8.7	4.8	6.6	8.3	7.4	7.9	7.4	21.1	18.8	18.1	9.5	10.9	129.5

Dille Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Big T @ Canyon Mouth	kaf	3.2	2.2	1.8	1.7	1.4	2.0	4.8	18.6	36.8	24.1	10.2	5.8	112.6
Less Estes skim	kaf	0.0	0.0	0.0	0.0	0.0	0.0	1.1	6.5	7.4	0.1	0.9	0.7	16.7
Big T irr (Estes)	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.9
Handy Ditch release	kaf	1.2	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.8	2.9	1.7	11.2
Water available	kaf	2.0	2.2	1.9	1.7	1.5	2.1	2.6	11.0	28.4	22.3	6.5	3.4	85.6
Water diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% diverted	%													

Trifurcation Works	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Rels from Flatiron	kaf	8.7	4.8	6.6	8.3	7.4	7.9	7.4	21.1	18.8	18.1	9.5	10.9	129.5
Rels to 550 Canal	kaf	5.0	4.8	6.6	8.3	7.4	7.9	6.2	13.9	10.3	15.8	2.4	2.1	90.7
Big T irrigation	kaf	3.7	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.1	2.2	6.2	8.1	22.1
Dille Tunnel	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tot rels to river	kaf	3.7	0.0	0.0	0.0	0.0	0.0	1.2	7.2	8.5	2.3	7.1	8.8	38.8
Irrigation demand	kaf	3.7	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.1	2.2	6.2	8.1	22.1
Big T irr (Estes)	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.9
Windy Gap demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total requirement	kaf	3.7	0.0	0.1	0.0	0.1	0.1	0.2	0.8	1.3	2.3	6.3	8.1	23.0
Total delivery	kaf	3.7	0.0	0.1	0.0	0.1	0.1	0.2	0.8	1.3	2.3	6.3	8.1	23.0
% required delivery	%	100	0	100	0	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 550	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow from Flatiron	kaf	5.0	4.8	6.6	8.3	7.4	7.9	6.2	13.9	10.3	15.8	2.4	2.1	90.7
Maximum flow	kaf	16.9	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	27.2	375.5
Seepage loss	kaf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
Irrigation demand	kaf	1.8	0.3	0.1	0.1	0.1	0.2	0.2	0.6	0.5	1.0	1.4	1.3	7.6
Irrigation delivery	kaf	1.8	0.3	0.1	0.1	0.1	0.2	0.2	0.6	0.5	1.0	1.4	1.3	7.6
Minimum flow	kaf	0.6	0.6	6.1	6.1	5.6	6.1	2.4	0.0	0.0	0.0	0.6	0.6	28.7
Rels to Horsetooth	kaf	3.0	4.3	6.3	8.0	7.1	7.5	5.8	13.1	9.6	14.6	0.8	0.6	80.7

Horsetooth Reservoir		Initial Cont Elev	134.3 kaf 5418.53 ft		Maximum Cont Elev	156.5 kaf 5429.88 ft		Minimum Cont Elev	13.0 kaf 5316.81 ft			
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow	kaf	3.0	4.3	6.3	8.0	7.1	7.5	5.8	13.1	9.6	14.6	0.8	0.6	80.7
Priority water div	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total irr delivery	kaf	12.7	1.5	1.6	1.8	1.5	1.9	2.4	7.4	8.8	18.8	24.1	12.0	94.5
Evaporation loss	kaf	0.3	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.6	0.7	0.6	0.4	3.8
Seepage loss	kaf	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	2.1
End-Month Targets	kaf	124.1	126.6	131.0	136.8	142.1	147.5	150.4	155.6	155.6	150.7	126.5	114.4	
End-Month Content	kaf	124.1	126.6	131.0	136.8	142.1	147.5	150.4	155.6	155.6	150.5	126.5	114.6	
End-Month Elevation	ft	5412.97	5414.35	5416.76	5419.86	5422.63	5425.40	5426.86	5429.44	5429.44	5426.91	5414.30	5407.57	
Irrigation demand	kaf	10.9	0.1	0.0	0.0	0.0	0.0	0.3	4.2	4.7	13.4	18.3	7.8	59.7
Metered delivery	kaf	1.6	1.0	1.2	1.2	1.2	1.3	1.8	2.7	3.6	4.4	3.9	3.0	26.9
Windy Gap demand	kaf	0.2	0.4	0.4	0.6	0.3	0.6	0.3	0.5	0.5	1.0	1.9	1.2	7.9
Total demand	kaf	12.7	1.5	1.6	1.8	1.5	1.9	2.4	7.4	8.8	18.8	24.1	12.0	94.5
Total irr delivery	kaf	12.7	1.5	1.6	1.8	1.5	1.9	2.4	7.4	8.8	18.8	24.1	12.0	94.5
% required delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total CBT Delivery	kaf	25.2	3.0	2.9	2.9	2.8	3.3	5.5	14.4	17.8	36.3	49.4	32.0	195.5

Windy Gap Ownership 2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Accrual	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total release	kaf	0.5	1.3	1.4	1.1	0.9	1.1	0.4	0.9	1.9	2.2	3.7	3.2	18.6
Spill	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
End-month Ownership	kaf	-0.5	-1.8	-3.2	-4.3	-5.2	-6.3	-6.7	-7.6	-9.5	-11.7	-15.4	-18.6	

PUMPING AND GENERATION OPERATIONS

Green Mtn Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Generation	gwh	18.600	18.000	18.600	18.600	8.400	9.300	13.500	18.600	18.000	18.600	18.600	18.000	196.800
Generation	gwh	7.273	2.254	2.274	2.013	1.810	2.061	2.638	3.495	5.858	10.064	9.483	8.177	57.400
% Max Generation	%	39	13	12	11	22	22	20	19	33	54	51	45	
Ave kwh/af		187	177	175	172	169	166	167	183	202	208	203	188	

Willow Crk Pumping	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	27.7	26.8	0.0	0.0	0.0	0.0	26.8	0.0	0.0	0.0	27.7	26.8	135.8
Actual pumping	kaf	0.8	0.7	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0	1.5	1.5	9.7
Pump energy	gwh	0.170	0.149	0.000	0.000	0.000	0.000	1.108	0.000	0.000	0.000	0.320	0.320	2.067
% max pumping	%	3	3					19				5	6	
Average kwh/af		213	213					213				213	213	

Lake Granby Pumping	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	36.9	35.7	36.9	36.9	33.3	36.9	35.7	36.9	35.7	36.9	36.9	35.7	434.4
Actual pumping	kaf	4.2	3.0	9.4	25.0	15.7	6.2	5.7	0.0	0.0	18.6	4.8	9.7	102.3
Pump energy	gwh	0.592	0.423	1.325	3.525	2.229	0.887	0.815	0.000	0.000	2.623	0.677	1.368	14.464
% max pumping	%	11	8	25	68	47	17	16			50	13	27	
Average kwh/af		141	141	141	141	142	143	143			141	141	141	

Marys Lake Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel Flow	kaf	8.9	5.0	9.9	26.7	16.9	8.2	12.0	24.1	25.5	33.8	8.9	10.6	
Max generation	gwh	6.060	0.000	2.980	6.060	5.400	6.060	5.840	6.060	5.840	6.060	6.060	5.840	62.260
Generation	gwh	1.480	0.000	1.680	4.740	2.980	1.340	2.100	4.320	4.550	6.060	1.480	1.820	32.550
% Max Generation	%	24		56	78	55	22	36	71	78	100	24	31	
Ave kwh/af		166		170	178	176	163	175	179	178	179	166	172	

Lake Estes Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel Flow	kaf	8.9	5.0	9.9	26.7	16.9	8.2	12.0	24.1	25.5	33.8	8.9	10.6	
Max generation	gwh	14.920	14.450	14.920	14.920	13.450	14.920	14.450	14.920	14.450	14.920	14.920	14.450	175.690
Generation	gwh	3.850	2.100	4.350	11.780	7.760	3.500	5.600	10.640	11.250	14.920	3.850	4.700	84.300
% Max Generation	%	26	15	29	79	58	23	39	71	78	100	26	33	
Ave kwh/af		433	420	439	441	459	427	467	441	441	441	433	443	

Pole Hill Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Olympus Tunnel flow	kaf	8.9	5.0	9.8	26.7	16.8	8.1	13.0	30.5	32.7	33.8	9.7	11.3	206.3
Max generation	gwh	25.260	0.000	12.910	25.260	22.800	25.260	24.460	25.260	24.460	25.260	25.260	24.460	260.650
Generation	gwh	5.890	3.180	6.520	19.800	12.640	5.340	9.660	22.640	24.300	25.120	6.450	8.380	149.920
% Max Generation	%	23		51	78	55	21	39	90	99	99	26	34	
Ave kwh/af		662		665	742	752	659	743	742	743	743	665	742	

Flatiron 1&2 Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow to Flatiron	kaf	8.7	4.8	9.6	26.5	16.6	7.9	12.8	30.3	32.5	33.6	9.5	11.1	203.9
Max generation	gwh	29.040	28.130	29.040	29.040	26.250	29.040	28.130	29.040	28.130	29.040	29.040	28.130	342.050
Generation	gwh	7.160	3.740	7.940	23.300	14.800	6.520	11.420	26.070	27.950	28.880	7.850	9.890	175.520
% Max Generation	%	25	13	27	80	56	22	41	90	99	99	27	35	
Ave kwh/af		823	779	827	879	892	825	892	860	860	860	826	891	

Flatiron 3 Pump/Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	18.3	18.4	19.2	18.2	15.1	16.5	16.0	16.3	15.4	15.8	0.0	16.8	186.0
Pump from Flatiron	kaf	0.0	0.0	3.0	18.2	9.2	0.0	5.4	9.2	13.7	15.5	0.0	0.2	74.4
Pump energy	gwh	0.000	0.000	0.993	6.334	3.441	0.000	2.047	3.533	5.370	6.123	0.000	0.066	27.907
% max pumping	%			16	100	61		34	56	89	98		1	
Average kwh/af				331	348	374		379	384	392	395		328	
Max turbine rels	kaf	25.3	24.2	24.9	25.4	23.7	26.4	25.5	26.5	25.8	26.8	0.0	21.6	276.1
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Actual generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
% max generation	%													
Average kwh/af														

Big Thompson Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Total release	kaf	3.7	0.0	0.0	0.0	0.0	0.0	1.2	7.2	8.5	2.3	7.1	8.8	38.8
Turbine release	kaf	3.7	0.0	0.0	0.0	0.0	0.0	1.2	7.2	8.5	2.3	7.1	8.8	38.8
Wasteway release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max generation	gwh	3.940	0.000	0.000	0.000	0.000	0.000	3.800	3.940	3.800	3.940	3.940	3.800	27.160
Generation	gwh	0.340	0.000	0.000	0.000	0.000	0.000	0.103	0.840	1.000	0.197	0.820	1.060	4.360
% Max Generation	%	9						3	21	26	5	21	28	
Ave kwh/af		92						86	117	118	86	115	120	

PROJECT GENERATION AND PUMPING SUMMARY

Project Generation	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Base Generation:														
Big Thompson	gwh	0.340	0.000	0.000	0.000	0.000	0.000	0.103	0.840	1.000	0.197	0.820	1.060	4.360
Green Mtn	gwh	7.273	2.254	2.274	2.013	1.810	2.061	2.638	3.495	5.858	10.064	9.483	8.177	57.400
Flatiron 3	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	gwh	7.613	2.254	2.274	2.013	1.810	2.061	2.741	4.335	6.858	10.261	10.303	9.237	61.760

Load Following Generation:														
Marys Lake	gwh	1.480	0.000	1.680	4.740	2.980	1.340	2.100	4.320	4.550	6.060	1.480	1.820	32.550
Lake Estes	gwh	3.850	2.100	4.350	11.780	7.760	3.500	5.600	10.640	11.250	14.920	3.850	4.700	84.300
Pole Hill	gwh	5.890	3.180	6.520	19.800	12.640	5.340	9.660	22.640	24.300	25.120	6.450	8.380	149.920
Flatiron 1,2	gwh	7.160	3.740	7.940	23.300	14.800	6.520	11.420	26.070	27.950	28.880	7.850	9.890	175.520
Total	gwh	18.380	9.020	20.490	59.620	38.180	16.700	28.780	63.670	68.050	74.980	19.630	24.790	442.290
Total generation	gwh	25.993	11.274	22.764	61.633	39.990	18.761	31.521	68.005	74.908	85.241	29.933	34.027	504.050
Total max generation	gwh	97.820	60.580	78.450	93.880	76.300	84.580	90.180	97.820	94.680	97.820	97.820	94.680	1064.610

Project Pump Energy 2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Granby	gwh	0.592	0.423	1.325	3.525	2.229	0.887	0.815	0.000	0.000	2.623	0.677	1.368	14.464
Willow Creek	gwh	0.170	0.149	0.000	0.000	0.000	0.000	1.108	0.000	0.000	0.000	0.320	0.320	2.067
Flatiron 3	gwh	0.000	0.000	0.993	6.334	3.441	0.000	2.047	3.533	5.370	6.123	0.000	0.066	27.907
Total pump energy	gwh	0.762	0.572	2.318	9.859	5.670	0.887	3.970	3.533	5.370	8.746	0.997	1.754	44.438
Total net generation	gwh	25.231	10.702	20.446	51.774	34.320	17.874	27.551	64.472	69.538	76.495	28.936	32.273	459.612

Release Flexibility 2014			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel	Min	kaf	8.9	5.0	9.9	26.7	16.9	8.2	12.0	24.1	25.5	33.8	8.9	10.6	
Adams Tunnel	Max	kaf	8.9	5.0	9.9	26.7	16.9	8.2	12.0	24.1	25.5	33.8	8.9	10.6	
Marys Lake	Min	gwh	1.480	0.000	1.680	4.740	2.980	1.340	2.100	4.320	4.550	6.060	1.480	1.820	
Marys Lake	Max	gwh	1.480	0.000	1.680	4.740	2.980	1.340	2.100	4.320	4.550	6.060	1.480	1.820	
Lake Estes	Min	gwh	3.850	2.100	4.350	11.780	7.760	3.500	5.600	10.640	11.250	14.920	3.850	4.700	
Lake Estes	Max	gwh	3.850	2.100	4.350	11.780	7.760	3.500	5.600	10.640	11.250	14.920	3.850	4.700	
Olympus Tunnel	Min	kaf	8.9	5.0	9.8	26.7	16.8	8.1	13.0	30.5	32.7	33.8	9.7	11.3	
Olympus Tunnel	Max	kaf	8.9	5.0	9.8	26.7	16.8	8.1	13.0	30.5	32.7	33.8	9.7	11.3	
Pole Hill	Min	gwh	6.030	0.000	6.660	19.960	12.820	5.470	9.800	22.800	24.460	25.260	6.590	8.540	
Pole Hill	Max	gwh	6.030	0.000	6.660	19.960	12.820	5.470	9.800	22.800	24.460	25.260	6.590	8.540	
Flatiron 1&2	Min	gwh	7.160	3.740	7.940	23.300	14.800	6.520	11.420	26.070	27.950	28.880	7.850	9.890	
Flatiron 1&2	Max	gwh	7.160	3.740	7.940	23.300	14.800	6.520	11.420	26.070	27.950	28.880	7.850	9.890	
Load following	Min	gwh	18.520	5.840	20.630	59.780	38.360	16.830	28.920	63.830	68.210	75.120	19.770	24.950	
Load following	Max	gwh	18.520	5.840	20.630	59.780	38.360	16.830	28.920	63.830	68.210	75.120	19.770	24.950	
Total project	Min	gwh	26.133	8.094	22.904	61.793	40.170	18.891	31.661	68.165	75.068	85.381	30.073	34.187	
Total project	Max	gwh	26.133	8.094	22.904	61.793	40.170	18.891	31.661	68.165	75.068	85.381	30.073	34.187	

GENERATION CAPACITY AND DURATION

Project Generation	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Base Generation:														
Green Mtn	mw	9.8	3.1	3.1	2.7	2.7	2.8	3.7	4.7	8.1	13.5	12.7	11.4	
Flatiron 3	mw													
Big Thompson	mw	0.5						0.1	1.1	1.4	0.3	1.1	1.5	
Total base load	mw	10.3	3.1	3.1	2.7	2.7	2.8	3.8	5.8	9.5	13.8	13.8	12.9	
Load Following Generation:														
Marys Lake														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.0	0.0	
Duration	hr/d	9.2	14.0	11.7	3.8	10.9	10.6	11.4	5.7	4.7	12.0	9.2	11.4	
Max Capacity	mw	3.5	2.7	4.9	8.1	8.1	3.5	5.8	8.1	8.1	8.1	3.5	5.0	
Duration	hr/d	13.8	10.0	11.3	19.2	12.1	12.4	11.6	17.3	18.4	12.0	13.8	11.6	
Lake Estes														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Duration	hr/d	12.0	14.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.0	12.0	12.0	
Max Capacity	mw	11.1	7.0	12.6	33.2	20.8	10.2	15.0	30.1	31.7	45.0	11.1	13.5	
Duration	hr/d	12.0	10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	10.0	12.0	12.0	
Pole Hill														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	34.0	0.0	0.0	
Duration	hr/d	12.0	14.0	12.0	4.4	11.6	12.0	12.0	1.8	12.0	12.0	12.0	12.0	
Max Capacity	mw	16.8	11.0	19.4	34.0	33.8	15.2	27.0	34.0	34.0	34.0	19.1	22.9	
Duration	hr/d	12.0	10.0	12.0	19.6	12.4	12.0	12.0	22.4	12.0	12.0	12.0	12.0	
Flatiron 1&2														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Duration	hr/d	12.0	14.4	12.0	12.0	11.5	12.0	12.0	11.5	9.6	8.8	12.0	12.0	
Max Capacity	mw	21.1	13.0	23.2	65.5	42.2	18.7	31.6	79.2	85.0	86.0	23.0	27.3	
Duration	hr/d	12.0	9.6	12.0	12.0	12.5	12.0	12.0	11.4	10.1	10.0	12.0	12.0	
Total Load Following														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	42.1	0.0	0.0	
Max Capacity	mw	52.5	33.7	60.1	140.8	104.9	47.6	79.4	151.4	158.8	173.1	56.7	68.7	
Total Project Capacity														
Min Capacity	mw	10.3	3.1	3.1	2.7	2.7	2.8	3.8	5.8	43.5	55.9	13.8	12.9	
Max Capacity	mw	62.8	36.8	63.2	143.5	107.6	50.4	83.2	157.2	168.3	186.9	70.5	81.6	

CBTAOP V2.06 Run: 24-Nov-2014 11:38
Minimum Reasonable Plan (70% Quota Oct; 80% Quota Nov-Sep)

COLORADO-BIG THOMPSON MONTHLY OPERATIONS
2015 PROJECT OPERATING PLAN FOR REASONABLE-MINIMUM WATER SUPPLY CONDITION

HYDROLOGY OPERATIONS

Green Mtn Reservoir		Initial Cont Elev	115.2 kaf 7930.10 ft			Maximum Cont Elev	154.6 kaf 7950.38 ft			Minimum Cont Elev	8.0 kaf 7804.68 ft		
2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Dillon Inflow	kaf	6.4	4.9	4.1	4.0	3.5	4.4	6.8	24.6	33.5	18.2	10.0	5.7	126.1
Dillon-Grn Mtn Gain	kaf	6.7	4.8	3.9	3.7	3.2	4.2	7.2	18.6	24.0	14.8	9.9	5.9	106.9
Undepleted Inflow	kaf	13.1	9.7	8.0	7.7	6.7	8.6	14.0	43.2	57.5	33.0	19.9	11.6	233.0
Depletion	kaf	1.0	-1.0	-1.0	0.0	0.0	0.0	0.0	20.0	30.0	10.0	5.0	2.7	66.7
Depleted Inflow	kaf	12.1	10.7	9.0	7.7	6.7	8.6	14.0	23.2	27.5	23.0	14.9	8.9	166.3
Turbine Release	kaf	38.9	13.6	13.0	11.7	10.7	11.4	6.0	6.1	3.6	27.7	28.5	27.5	198.7
Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	38.9	13.6	13.0	11.7	10.7	11.4	6.0	6.1	3.6	27.7	28.5	27.5	198.7
Min Release	cfs	60	60	60	60	60	60	100	100	60	450	60	60	
Total River Release	cfs	633	229	211	190	193	185	101	99	61	450	464	462	
Evaporation	kaf	0.4	0.1	0.0	0.0	0.0	0.2	0.3	0.5	0.7	0.7	0.5	0.4	3.8
End-Month Targets	kaf	88.0	85.0	81.0	77.0	73.0	70.0	80.0	115.0	145.0	145.0	98.0	79.0	
End-Month Content	kaf	88.0	85.0	81.0	77.0	73.0	70.0	77.7	94.3	117.5	112.1	98.0	79.0	
End-Month Elevation	ft	7912.92	7910.79	7907.86	7904.83	7901.68	7899.24	7905.36	7917.23	7931.40	7928.31	7919.66	7906.36	

Willow Crk Reservoir		Initial Cont Elev	7.7 kaf 8119.18 ft			Maximum Cont Elev	10.1 kaf 8128.48 ft			Minimum Cont Elev	7.2 kaf 8116.90 ft		
2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native Inflow	kaf	1.0	0.8	0.9	0.8	0.7	1.0	3.8	12.7	6.3	2.1	1.1	0.7	31.9
Min Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.5	2.6	0.5	0.5	0.4	8.3
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.5	2.6	0.5	0.5	0.4	8.3
Pumped to Granby	kaf	0.8	0.7	0.0	0.0	0.0	0.0	5.1	9.3	2.6	2.5	0.4	0.3	21.7
Evaporation	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
End-Month Targets	kaf		7.2					7.2	9.0	10.0	9.0		9.0	
End-Month Content	kaf	7.5	7.2	7.7	8.1	8.4	9.0	7.2	9.0	10.0	9.0	9.1	9.0	
End-Month Elevation	ft	8118.29	8116.90	8119.18	8120.90	8122.14	8124.50	8116.90	8124.50	8128.14	8124.50	8124.88	8124.50	

Lake Granby		Initial Cont	522.2 kaf		Maximum Cont	536.5 kaf		Minimum Cont	76.5 kaf				
		Elev	8277.56 ft		Elev	8279.55 ft		Elev	8186.91 ft				
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native inflow	kaf	4.9	3.2	2.3	1.9	1.6	2.4	4.9	17.3	21.8	7.0	2.5	1.6	71.4
Rels frm Shadow Mtn	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	3.1	11.7	3.1	2.5	2.1	34.9
Pump frm Windy Gap	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pump frm Willow Crk	kaf	0.8	0.7	0.0	0.0	0.0	0.0	5.1	9.3	2.6	2.5	0.4	0.3	21.7
Total Inflow	kaf	7.9	6.6	5.1	3.1	2.7	3.6	11.2	29.7	36.1	12.6	5.4	4.0	128.0
Min River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	3.5	4.5	5.0	5.0	4.5	30.8
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	3.5	4.5	5.0	5.0	4.5	30.8
Pumped to Shadow Mtn	kaf	4.2	3.3	10.2	25.3	16.4	6.3	10.2	0.0	0.0	1.4	13.3	16.2	106.8
Evaporation	kaf	1.6	0.7	0.2	0.0	0.0	1.0	1.6	2.5	3.2	2.9	2.3	2.0	18.0
Seepage loss	kaf	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.4	5.0
End-Month Content	kaf	522.7	523.7	516.8	493.0	477.9	472.6	470.4	493.7	521.6	524.4	508.7	489.6	
End-Month Elevation	ft	8277.63	8277.77	8276.81	8273.43	8271.26	8270.48	8270.16	8273.53	8277.48	8277.87	8275.66	8272.94	

Shadow Mtn		Initial Cont	17.7 kaf		Maximum Cont	18.4 kaf		Minimum Cont	16.6 kaf				
		Elev	8366.62 ft		Elev	8367.00 ft		Elev	8366.02 ft				
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native inflow	kaf	7.3	4.9	3.4	2.9	2.3	3.5	7.4	26.0	32.6	10.6	3.7	2.5	107.1
Pumped from Granby	kaf	4.2	3.3	10.2	25.3	16.4	6.3	10.2	0.0	0.0	1.4	13.3	16.2	106.8
Total Inflow	kaf	11.5	8.2	13.6	28.2	18.7	9.8	17.6	26.0	32.6	12.0	17.0	18.7	213.9
Min River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	1.2	3.0	3.1	2.5	2.1	24.3
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	8.7	0.0	0.0	0.0	10.6
Total River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	3.1	11.7	3.1	2.5	2.1	34.9
Adams Tunnel Flow	kaf	8.9	5.3	10.7	27.0	17.6	8.3	16.0	22.2	20.1	8.2	13.9	16.1	174.3
Evaporation	kaf	0.4	0.2	0.1	0.0	0.0	0.3	0.4	0.7	0.8	0.7	0.6	0.5	4.7
End-Month Content	kaf	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	
End-Month Elevation	ft	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	

Adams Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Tunnel Capacity	kaf	33.8	6.5	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	371.7
Actual delivery	kaf	8.9	5.3	10.7	27.0	17.6	8.3	16.0	22.2	20.1	8.2	13.9	16.1	174.3
% max delivery	%	26	82	32	80	58	25	49	66	61	24	41	49	

Big T @ Lake Estes	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Big Thompson inflow	kaf	2.2	1.4	1.3	1.2	1.0	1.2	1.9	10.9	19.6	12.5	5.8	2.8	61.8
Min river release	kaf	3.1	1.5	1.5	1.5	1.4	1.5	2.2	6.9	7.4	7.7	6.9	3.7	45.3
Act river release	kaf	2.2	1.4	1.3	1.2	1.0	1.2	1.9	6.9	7.4	7.7	5.8	2.8	40.8
Max div available	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	12.2	4.8	0.0	0.0	21.0
Priority water div	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skim water diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	12.2	4.8	0.0	0.0	21.0
% max diverted	%								100	100	100			

Irrigation demand	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.9
Irrigation delivery	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.9
Total river release	kaf	2.2	1.4	1.4	1.2	1.1	1.3	2.0	7.0	7.6	7.8	5.9	2.8	41.7

Olympus Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Tunnel Capacity	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Actual delivery	kaf	8.9	5.3	10.6	27.0	17.5	8.2	15.9	26.1	32.1	12.9	13.8	16.1	194.4
% max delivery	%	26	16	31	80	57	24	49	77	98	38	41	49	
Seepage and Evap	kaf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
Inflow to Flatiron	kaf	8.7	5.1	10.4	26.8	17.3	8.0	15.7	25.9	31.9	12.7	13.6	15.9	192.0

Carter Lake		Initial Cont Elev	92.7 kaf 5741.37 ft			Maximum Cont Elev	112.2 kaf 5758.98 ft			Minimum Cont Elev	6.0 kaf 5626.80 ft		
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Pump from Flatiron	kaf	0.0	0.0	3.6	18.2	9.8	0.0	9.1	11.8	7.0	0.0	0.0	0.0	59.5
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Evaporation loss	kaf	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.3	0.2	2.2
Seepage loss	kaf	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	1.9
End-Month Targets	kaf	84.8	77.2	82.4	98.3	105.5	102.8	108.0	112.0	108.3	88.0	60.0	49.0	
End-Month Content	kaf	84.9	81.8	82.4	98.1	105.5	102.8	108.0	112.0	108.3	89.2	64.8	49.0	
End-Month Elevation	ft	5733.98	5730.98	5731.57	5746.36	5753.05	5750.63	5755.28	5758.80	5755.54	5738.08	5713.81	5696.30	
Irrigation demand	kaf	7.2	1.9	1.8	1.8	1.6	1.9	3.4	7.0	8.8	17.3	22.2	13.5	88.4
Metered delivery	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windy Gap demand	kaf	0.3	0.9	1.0	0.5	0.6	0.5	0.1	0.4	1.4	1.2	1.8	2.0	10.7
Total demand	kaf	7.5	2.8	2.8	2.3	2.2	2.4	3.5	7.4	10.2	18.5	24.0	15.5	99.1
Total delivery	kaf	7.5	2.8	2.8	2.3	2.2	2.4	3.5	7.4	10.2	18.5	24.0	15.5	99.1
% required delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 930	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Minimum flow	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum flow	kaf	57.2	55.3	57.2	57.2	51.6	57.2	27.7	57.2	55.3	57.2	57.2	55.3	645.6
Actual flow	kaf	8.7	5.1	6.8	8.6	7.5	8.0	6.6	14.1	24.9	12.7	13.6	15.9	132.5

Dille Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Big T @ Canyon Mouth	kaf	3.2	2.2	1.8	1.7	1.4	2.0	2.9	14.0	23.0	15.1	7.2	3.9	78.4
Less Estes skim	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	12.2	4.8	0.0	0.0	21.0
Big T irr (Estes)	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.9
Handy Ditch release	kaf	1.2	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.8	2.9	1.7	11.2
Water available	kaf	2.0	2.2	1.9	1.7	1.5	2.1	1.8	8.9	9.8	8.6	4.4	2.2	47.1
Water diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% diverted	%													

Trifurcation Works	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Rels from Flatiron	kaf	8.7	5.1	6.8	8.6	7.5	8.0	6.6	14.1	24.9	12.7	13.6	15.9	132.5
Rels to 550 Canal	kaf	5.0	5.1	6.8	8.6	7.5	8.0	6.5	9.3	11.5	5.4	6.6	6.6	86.9
Big T irrigation	kaf	3.7	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.2	2.5	7.0	9.3	24.6
Dille Tunnel	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tot rels to river	kaf	3.7	0.0	0.0	0.0	0.0	0.0	0.1	4.8	13.4	7.3	7.0	9.3	45.6
Irrigation demand	kaf	3.7	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.2	2.5	7.0	9.3	24.6
Big T irr (Estes)	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.9
Windy Gap demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total requirement	kaf	3.7	0.0	0.1	0.0	0.1	0.1	0.2	0.9	1.4	2.6	7.1	9.3	25.5
Total delivery	kaf	3.7	0.0	0.1	0.0	0.1	0.1	0.2	0.9	1.4	2.6	7.1	9.3	25.5
% required delivery	%	100	0	100	0	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 550	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow from Flatiron	kaf	5.0	5.1	6.8	8.6	7.5	8.0	6.5	9.3	11.5	5.4	6.6	6.6	86.9
Maximum flow	kaf	16.9	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	27.2	375.5
Seepage loss	kaf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
Irrigation demand	kaf	1.8	0.4	0.1	0.2	0.1	0.2	0.3	0.6	0.5	1.1	1.6	1.4	8.3
Irrigation delivery	kaf	1.8	0.4	0.1	0.2	0.1	0.2	0.3	0.6	0.5	1.1	1.6	1.4	8.3
Minimum flow	kaf	0.6	0.6	6.1	6.1	5.6	6.1	2.4	0.0	0.0	0.0	0.6	0.6	28.7
Rels to Horsetooth	kaf	3.0	4.5	6.5	8.2	7.2	7.6	6.0	8.5	10.8	4.1	4.8	5.0	76.2

Horsetooth Reservoir		Initial Cont Elev	134.3 kaf 5418.53 ft			Maximum Cont Elev	156.5 kaf 5429.88 ft			Minimum Cont Elev	13.0 kaf 5316.81 ft		
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow	kaf	3.0	4.5	6.5	8.2	7.2	7.6	6.0	8.5	10.8	4.1	4.8	5.0	76.2
Priority water div	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total irr delivery	kaf	12.7	1.7	1.8	2.0	1.6	2.0	2.6	8.4	10.0	21.3	27.1	13.5	104.7
Evaporation loss	kaf	0.3	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.6	0.6	0.6	0.4	3.7
Seepage loss	kaf	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	2.1
End-Month Targets	kaf	124.1	126.6	131.0	136.8	142.1	147.5	150.4	150.0	150.0	132.0	109.0	100.0	
End-Month Content	kaf	124.1	126.6	131.0	136.8	142.1	147.5	150.4	150.0	150.0	132.0	109.0	100.0	
End-Month Elevation	ft	5412.97	5414.35	5416.76	5419.86	5422.63	5425.40	5426.86	5426.66	5426.66	5417.30	5404.29	5398.82	
Irrigation demand	kaf	10.9	0.1	0.0	0.0	0.0	0.0	0.3	4.8	5.4	15.3	20.8	8.9	66.5
Metered delivery	kaf	1.6	1.2	1.4	1.4	1.3	1.4	2.0	3.1	4.1	5.0	4.4	3.4	30.3
Windy Gap demand	kaf	0.2	0.4	0.4	0.6	0.3	0.6	0.3	0.5	0.5	1.0	1.9	1.2	7.9
Total demand	kaf	12.7	1.7	1.8	2.0	1.6	2.0	2.6	8.4	10.0	21.3	27.1	13.5	104.7
Total irr delivery	kaf	12.7	1.7	1.8	2.0	1.6	2.0	2.6	8.4	10.0	21.3	27.1	13.5	104.7
% required delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total CBT Delivery	kaf	25.2	3.6	3.4	3.4	3.1	3.6	6.2	16.4	20.2	41.3	56.1	36.5	219.0

Windy Gap Ownership 2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Accrual	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total release	kaf	0.5	1.3	1.4	1.1	0.9	1.1	0.4	0.9	1.9	2.2	3.7	3.2	18.6
Spill	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
End-month Ownership	kaf	-0.5	-1.8	-3.2	-4.3	-5.2	-6.3	-6.7	-7.6	-9.5	-11.7	-15.4	-18.6	

PUMPING AND GENERATION OPERATIONS

Green Mtn Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Generation	gwh	18.600	18.000	18.600	18.600	8.400	9.300	13.500	18.600	18.000	18.600	18.600	18.000	196.800
Generation	gwh	7.273	2.413	2.274	2.013	1.810	1.899	1.010	1.080	0.682	5.385	5.387	4.920	36.146
% Max Generation	%	39	13	12	11	22	20	7	6	4	29	29	27	
Ave kwh/af		187	177	175	172	169	167	168	177	189	194	189	179	

Willow Crk Pumping	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	27.7	26.8	0.0	0.0	0.0	0.0	26.8	27.7	26.8	27.7	27.7	26.8	218.0
Actual pumping	kaf	0.8	0.7	0.0	0.0	0.0	0.0	5.1	9.3	2.6	2.5	0.4	0.3	21.7
Pump energy	gwh	0.170	0.149	0.000	0.000	0.000	0.000	1.086	1.981	0.554	0.533	0.085	0.064	4.622
% max pumping	%	3	3					19	34	10	9	1	1	
Average kwh/af		213	213					213	213	213	213	213	213	

Lake Granby Pumping	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	36.9	35.7	36.9	36.9	33.3	36.9	35.7	36.9	35.7	36.9	36.9	35.7	434.4
Actual pumping	kaf	4.2	3.3	10.2	25.3	16.4	6.3	10.2	0.0	0.0	1.4	13.3	16.2	106.8
Pump energy	gwh	0.592	0.465	1.438	3.593	2.329	0.901	1.459	0.000	0.000	0.197	1.875	2.300	15.149
% max pumping	%	11	9	28	69	49	17	29			4	36	45	
Average kwh/af		141	141	141	142	142	143	143			141	141	142	

Marys Lake Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel Flow	kaf	8.9	5.3	10.7	27.0	17.6	8.3	16.0	22.2	20.1	8.2	13.9	16.1	
Max generation	gwh	6.060	0.000	2.980	6.060	5.400	6.060	5.840	6.060	5.840	6.060	6.060	5.840	62.260
Generation	gwh	1.480	0.000	1.840	4.800	3.120	1.360	2.800	3.940	3.610	1.340	2.480	2.820	29.590
% Max Generation	%	24		62	79	58	22	48	65	62	22	41	48	
Ave kwh/af		166		172	178	177	164	175	177	180	163	178	175	

Lake Estes Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel Flow	kaf	8.9	5.3	10.7	27.0	17.6	8.3	16.0	22.2	20.1	8.2	13.9	16.1	
Max generation	gwh	14.920	14.450	14.920	14.920	13.450	14.920	14.450	14.920	14.450	14.920	14.920	14.450	175.690
Generation	gwh	3.850	2.220	4.750	11.900	8.040	3.550	7.400	9.780	8.940	3.500	6.450	7.440	77.820
% Max Generation	%	26	15	32	80	60	24	51	66	62	23	43	51	
Ave kwh/af		433	419	444	441	457	428	463	441	445	427	464	462	

Pole Hill Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Olympus Tunnel flow	kaf	8.9	5.3	10.6	27.0	17.5	8.2	15.9	26.1	32.1	12.9	13.8	16.1	194.4
Max generation	gwh	25.260	0.000	12.910	25.260	22.800	25.260	24.460	25.260	24.460	25.260	25.260	24.460	260.650
Generation	gwh	5.890	3.370	7.400	20.040	13.240	5.400	11.860	19.330	23.830	9.590	10.280	12.020	142.250
% Max Generation	%	23		57	79	58	21	48	77	97	38	41	49	
Ave kwh/af		662		698	742	757	659	746	741	742	743	745	747	

Flatiron 1&2 Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow to Flatiron	kaf	8.7	5.1	10.4	26.8	17.3	8.0	15.7	25.9	31.9	12.7	13.6	15.9	192.0
Max generation	gwh	29.040	28.130	29.040	29.040	26.250	29.040	28.130	29.040	28.130	29.040	29.040	28.130	342.050
Generation	gwh	7.160	3.980	8.900	23.480	15.470	6.600	13.960	22.940	27.420	11.330	12.140	14.120	167.500
% Max Generation	%	25	14	31	81	59	23	50	79	97	39	42	50	
Ave kwh/af		823	780	856	876	894	825	889	886	860	892	893	888	

Flatiron 3 Pump/Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	18.3	18.4	19.2	18.2	15.1	16.5	15.8	15.8	15.3	17.1	0.0	19.7	189.4
Pump from Flatiron	kaf	0.0	0.0	3.6	18.2	9.8	0.0	9.1	11.8	7.0	0.0	0.0	0.0	59.5
Pump energy	gwh	0.000	0.000	1.188	6.334	3.665	0.000	3.485	4.649	2.758	0.000	0.000	0.000	22.079
% max pumping	%			19	100	65		58	75	46				
Average kwh/af				330	348	374		383	394	394				
Max turbine rels	kaf	25.3	24.2	24.9	25.4	23.7	26.4	25.6	26.7	25.9	26.0	0.0	20.1	274.2
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Actual generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
% max generation	%													
Average kwh/af														

Big Thompson Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Total release	kaf	3.7	0.0	0.0	0.0	0.0	0.0	0.1	4.8	13.4	7.3	7.0	9.3	45.6
Turbine release	kaf	3.7	0.0	0.0	0.0	0.0	0.0	0.1	4.8	13.4	7.3	7.0	9.3	45.6
Wasteway release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max generation	gwh	3.940	0.000	0.000	0.000	0.000	0.000	3.800	3.940	3.800	3.940	3.940	3.800	27.160
Generation	gwh	0.340	0.000	0.000	0.000	0.000	0.000	0.009	0.500	1.980	0.860	0.800	1.160	5.649
% Max Generation	%	9							13	52	22	20	31	
Ave kwh/af		92						90	104	148	118	114	125	

PROJECT GENERATION AND PUMPING SUMMARY

Project Generation	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Base Generation:														
Big Thompson	gwh	0.340	0.000	0.000	0.000	0.000	0.000	0.009	0.500	1.980	0.860	0.800	1.160	5.649
Green Mtn	gwh	7.273	2.413	2.274	2.013	1.810	1.899	1.010	1.080	0.682	5.385	5.387	4.920	36.146
Flatiron 3	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	gwh	7.613	2.413	2.274	2.013	1.810	1.899	1.019	1.580	2.662	6.245	6.187	6.080	41.795

Load Following Generation:														
Marys Lake	gwh	1.480	0.000	1.840	4.800	3.120	1.360	2.800	3.940	3.610	1.340	2.480	2.820	29.590
Lake Estes	gwh	3.850	2.220	4.750	11.900	8.040	3.550	7.400	9.780	8.940	3.500	6.450	7.440	77.820
Pole Hill	gwh	5.890	3.370	7.400	20.040	13.240	5.400	11.860	19.330	23.830	9.590	10.280	12.020	142.250
Flatiron 1,2	gwh	7.160	3.980	8.900	23.480	15.470	6.600	13.960	22.940	27.420	11.330	12.140	14.120	167.500
Total	gwh	18.380	9.570	22.890	60.220	39.870	16.910	36.020	55.990	63.800	25.760	31.350	36.400	417.160
Total generation	gwh	25.993	11.983	25.164	62.233	41.680	18.809	37.039	57.570	66.462	32.005	37.537	42.480	458.955
Total max generation	gwh	97.820	60.580	78.450	93.880	76.300	84.580	90.180	97.820	94.680	97.820	97.820	94.680	1064.610

Project Pump Energy 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Granby gwh	0.592	0.465	1.438	3.593	2.329	0.901	1.459	0.000	0.000	0.197	1.875	2.300	15.149
Willow Creek gwh	0.170	0.149	0.000	0.000	0.000	0.000	1.086	1.981	0.554	0.533	0.085	0.064	4.622
Flatiron 3 gwh	0.000	0.000	1.188	6.334	3.665	0.000	3.485	4.649	2.758	0.000	0.000	0.000	22.079
Total pump energy gwh	0.762	0.614	2.626	9.927	5.994	0.901	6.030	6.630	3.312	0.730	1.960	2.364	41.850
Total net generation gwh	25.231	11.369	22.538	52.306	35.686	17.908	31.009	50.940	63.150	31.275	35.577	40.116	417.105

Release Flexibility 2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel	Min kaf	8.9	5.3	10.7	27.0	17.6	8.3	16.0	22.2	20.1	8.2	13.9	16.1	
Adams Tunnel	Max kaf	8.9	5.3	10.7	27.0	17.6	8.3	16.0	22.2	20.1	8.2	13.9	16.1	
Marys Lake	Min gwh	1.480	0.000	1.840	4.800	3.120	1.360	2.800	3.940	3.610	1.340	2.480	2.820	
Marys Lake	Max gwh	1.480	0.000	1.840	4.800	3.120	1.360	2.800	3.940	3.610	1.340	2.480	2.820	
Lake Estes	Min gwh	3.850	2.220	4.750	11.900	8.040	3.550	7.400	9.780	8.940	3.500	6.450	7.440	
Lake Estes	Max gwh	3.850	2.220	4.750	11.900	8.040	3.550	7.400	9.780	8.940	3.500	6.450	7.440	
Olympus Tunnel	Min kaf	8.9	5.3	10.6	27.0	17.5	8.2	15.9	26.1	32.1	12.9	13.8	16.1	
Olympus Tunnel	Max kaf	8.9	5.3	10.6	27.0	17.5	8.2	15.9	26.1	32.1	12.9	13.8	16.1	
Pole Hill	Min gwh	6.030	0.000	7.700	20.200	13.400	5.540	12.020	19.480	23.980	9.730	10.440	12.190	
Pole Hill	Max gwh	6.030	0.000	7.700	20.200	13.400	5.540	12.020	19.480	23.980	9.730	10.440	12.190	
Flatiron 1&2	Min gwh	7.160	3.980	8.900	23.480	15.470	6.600	13.960	22.940	27.420	11.330	12.140	14.120	
Flatiron 1&2	Max gwh	7.160	3.980	8.900	23.480	15.470	6.600	13.960	22.940	27.420	11.330	12.140	14.120	
Load following	Min gwh	18.520	6.200	23.190	60.380	40.030	17.050	36.180	56.140	63.950	25.900	31.510	36.570	
Load following	Max gwh	18.520	6.200	23.190	60.380	40.030	17.050	36.180	56.140	63.950	25.900	31.510	36.570	
Total project	Min gwh	26.133	8.613	25.464	62.393	41.840	18.949	37.199	57.720	66.612	32.145	37.697	42.650	
Total project	Max gwh	26.133	8.613	25.464	62.393	41.840	18.949	37.199	57.720	66.612	32.145	37.697	42.650	

GENERATION CAPACITY AND DURATION

Project Generation 2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Base Generation:														
Green Mtn	mw	9.8	3.4	3.1	2.7	2.7	2.6	1.4	1.5	0.9	7.2	7.2	6.8	
Flatiron 3	mw													
Big Thompson	mw	0.5							0.7	2.8	1.2	1.1	1.6	
Total base load	mw	10.3	3.4	3.1	2.7	2.7	2.6	1.4	2.2	3.7	8.4	8.3	8.4	
Load Following Generation:														
Marys Lake														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Duration	hr/d	9.2	13.4	11.3	3.6	10.5	10.4	11.0	6.9	8.6	10.6	10.9	11.0	
Max Capacity	mw	3.5	2.7	5.0	8.1	8.1	3.5	7.7	8.1	8.1	3.5	6.5	7.7	
Duration	hr/d	13.8	10.6	11.7	19.4	12.5	12.6	12.0	16.1	14.4	12.4	12.1	12.0	
Lake Estes														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Duration	hr/d	12.0	13.4	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Max Capacity	mw	11.1	7.0	13.6	33.6	21.6	10.4	19.5	28.3	24.4	10.2	16.6	19.6	
Duration	hr/d	12.0	10.6	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Pole Hill														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	0.0	0.0	0.0	
Duration	hr/d	12.0	13.4	12.0	4.2	11.2	12.0	12.0	4.8	12.0	12.0	12.0	12.0	
Max Capacity	mw	16.8	11.0	21.2	34.0	34.0	15.4	32.9	34.0	34.0	26.8	29.4	33.1	
Duration	hr/d	12.0	10.6	12.0	19.8	12.9	12.0	12.0	19.2	12.0	12.0	12.0	12.1	
Flatiron 1&2														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Duration	hr/d	12.0	13.8	12.0	12.0	11.4	12.0	12.0	12.0	10.0	12.0	12.0	12.0	
Max Capacity	mw	21.1	13.0	25.2	66.4	43.3	19.0	39.8	63.8	83.8	31.4	33.8	40.6	
Duration	hr/d	12.0	10.2	12.0	12.0	12.6	12.0	12.0	12.0	10.2	12.0	12.0	12.0	
Total Load Following														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	0.0	0.0	0.0	
Max Capacity	mw	52.5	33.7	65.0	142.1	107.0	48.3	99.9	134.2	150.3	71.9	86.3	101.0	
Total Project Capacity														
Min Capacity	mw	10.3	3.4	3.1	2.7	2.7	2.6	1.4	2.2	37.7	8.4	8.3	8.4	
Max Capacity	mw	62.8	37.1	68.1	144.8	109.7	50.9	101.3	136.4	154.0	80.3	94.6	109.4	

CBTAOP V2.06 Run: 24-Nov-2014 09:28
Maximum Reasonable Plan (70% Quota Oct; 60% Quota Nov-Sep)

COLORADO-BIG THOMPSON MONTHLY OPERATIONS

HYDROLOGY OPERATIONS

Green Mtn Reservoir		Initial Cont Elev	115.2 kaf 7930.10 ft		Maximum Cont Elev	154.6 kaf 7950.38 ft		Minimum Cont Elev	8.0 kaf 7804.68 ft				
2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Dillon Inflow	kaf	6.4	4.9	4.1	4.0	3.5	4.4	7.7	41.0	110.4	73.2	28.9	10.3	298.8
Dillon-Grn Mtn Gain	kaf	6.7	4.8	3.9	3.7	3.2	4.2	8.3	28.6	70.4	48.0	21.2	10.0	213.0
Undepleted Inflow	kaf	13.1	9.7	8.0	7.7	6.7	8.6	16.0	69.6	180.8	121.2	50.1	20.3	511.8
Depletion	kaf	1.0	-1.0	-1.0	0.0	0.0	0.0	0.0	20.0	20.0	5.0	5.0	4.0	53.0
Depleted Inflow	kaf	12.1	10.7	9.0	7.7	6.7	8.6	16.0	49.6	160.8	116.2	45.1	16.3	458.8
Turbine Release	kaf	38.9	13.6	13.0	11.7	13.7	18.4	15.8	34.2	95.2	89.7	69.5	40.8	454.5
Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	10.7	0.0	0.0	15.6
Total River Release	kaf	38.9	13.6	13.0	11.7	13.7	18.4	15.8	34.2	100.1	100.4	69.5	40.8	470.1
Min Release	cfs	60	60	60	60	60	60	100	100	60	60	60	60	
Total River Release	cfs	633	229	211	190	247	299	266	556	1682	1633	1130	686	
Evaporation	kaf	0.4	0.1	0.0	0.0	0.0	0.2	0.2	0.4	0.7	0.8	0.6	0.5	3.9
End-Month Targets	kaf	88.0	85.0	81.0	77.0	70.0	60.0	60.0	75.0	135.0	150.0	125.0	100.0	
End-Month Content	kaf	88.0	85.0	81.0	77.0	70.0	60.0	60.0	75.0	135.0	150.0	125.0	100.0	
End-Month Elevation	ft	7912.92	7910.79	7907.86	7904.83	7899.24	7890.45	7890.45	7903.27	7940.78	7948.20	7935.52	7920.95	

Willow Crk Reservoir		Initial Cont Elev	7.7 kaf 8119.18 ft		Maximum Cont Elev	10.1 kaf 8128.48 ft		Minimum Cont Elev	7.2 kaf 8116.90 ft				
2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native Inflow	kaf	1.0	0.8	0.9	0.8	0.7	1.0	5.9	30.2	31.8	7.1	3.0	1.5	84.7
Min Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.5	2.6	0.5	0.5	0.4	8.3
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	4.3	28.6	29.1	6.5	2.4	0.0	70.9
Total River Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	4.7	30.1	31.7	7.0	2.9	0.4	79.2
Pumped to Granby	kaf	0.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.6
Evaporation	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
End-Month Targets	kaf		7.2					7.2	9.0	10.0	9.0		9.0	
End-Month Content	kaf	7.5	7.2	7.7	8.1	8.4	9.0	10.1	10.1	10.1	10.1	10.1	9.0	
End-Month Elevation	ft	8118.29	8116.90	8119.18	8120.90	8122.14	8124.50	8128.48	8128.48	8128.48	8128.48	8128.48	8124.50	

Lake Granby		Initial Cont		522.2 kaf		Maximum Cont		536.5 kaf		Minimum Cont		76.5 kaf		
				Elev	8277.56 ft			Elev	8279.55 ft			Elev	8186.91 ft	
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native inflow	kaf	4.9	3.2	2.3	1.9	1.6	2.4	6.7	24.0	54.6	24.1	8.6	3.4	137.7
Rels frm Shadow Mtn	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	18.8	65.8	6.6	2.5	2.1	108.2
Pump frm Windy Gap	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pump frm Willow Crk	kaf	0.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.6
Total Inflow	kaf	7.9	6.6	5.1	3.1	2.7	3.6	7.9	42.8	120.4	30.7	11.1	7.6	249.5
Min River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	3.5	4.5	5.0	5.0	4.5	30.8
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.5	12.2	0.0	0.0	106.7
Total River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	3.5	99.0	17.2	5.0	4.5	137.5
Pumped to Shadow Mtn	kaf	1.6	2.9	7.8	24.6	15.3	5.9	2.5	0.0	0.0	0.0	10.4	10.1	81.1
Evaporation	kaf	1.6	0.7	0.2	0.0	0.0	1.0	1.6	2.5	3.2	2.9	2.3	2.1	18.1
Seepage loss	kaf	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	5.1
End-Month Content	kaf	525.3	526.7	522.2	499.1	485.1	480.2	482.4	518.8	536.5	536.5	529.4	519.8	
End-Month Elevation	ft	8278.00	8278.19	8277.56	8274.30	8272.29	8271.59	8271.91	8277.09	8279.55	8279.55	8278.57	8277.23	

Shadow Mtn		Initial Cont		17.7 kaf		Maximum Cont		18.4 kaf		Minimum Cont		16.6 kaf		
				Elev	8366.62 ft			Elev	8367.00 ft			Elev	8366.02 ft	
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Native inflow	kaf	7.3	4.9	3.4	2.9	2.3	3.5	10.1	36.1	81.8	36.2	12.8	5.1	206.4
Pumped from Granby	kaf	1.6	2.9	7.8	24.6	15.3	5.9	2.5	0.0	0.0	0.0	10.4	10.1	81.1
Total Inflow	kaf	8.9	7.8	11.2	27.5	17.6	9.4	12.6	36.1	81.8	36.2	23.2	15.2	287.5
Min River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	1.2	3.0	3.1	2.5	2.1	24.3
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6	62.8	3.5	0.0	0.0	83.9
Total River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	18.8	65.8	6.6	2.5	2.1	108.2
Adams Tunnel Flow	kaf	6.3	4.9	8.3	26.3	16.5	7.9	11.0	16.6	15.2	28.9	20.1	12.6	174.6
Evaporation	kaf	0.4	0.2	0.1	0.0	0.0	0.3	0.4	0.7	0.8	0.7	0.6	0.5	4.7
End-Month Content	kaf	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	
End-Month Elevation	ft	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	

Adams Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Tunnel Capacity	kaf	33.8	6.5	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	371.7
Actual delivery	kaf	6.3	4.9	8.3	26.3	16.5	7.9	11.0	16.6	15.2	28.9	20.1	12.6	174.6
% max delivery	%	19	75	25	78	54	23	34	49	46	86	59	39	

Big T @ Lake Estes	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Big Thompson inflow	kaf	2.2	1.4	1.3	1.2	1.0	1.2	2.9	17.6	50.5	26.0	13.6	6.0	124.9
Min river release	kaf	3.1	1.5	1.5	1.5	1.4	1.5	2.2	6.9	7.4	7.7	6.9	3.7	45.3
Act river release	kaf	2.2	1.4	1.3	1.2	1.0	1.2	2.2	6.9	32.9	21.0	6.9	3.7	81.9
Max div available	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.7	10.7	43.1	18.3	6.7	2.3	81.8
Priority water div	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	10.0	5.0	0.0	0.0	20.0
Skim water diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.7	7.6	0.0	6.7	2.3	23.0
% max diverted	%							100	100	23		100	100	

Irrigation demand	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.8
Irrigation delivery	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.8
Total river release	kaf	2.2	1.4	1.4	1.2	1.1	1.3	2.3	7.0	33.0	21.1	7.0	3.7	82.7

Olympus Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Tunnel Capacity	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Actual delivery	kaf	6.3	4.9	8.2	26.3	16.4	7.8	11.6	27.2	32.7	33.8	26.7	14.9	216.8
% max delivery	%	19	15	24	78	54	23	35	80	100	100	79	46	
Seepage and Evap	kaf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
Inflow to Flatiron	kaf	6.1	4.7	8.0	26.1	16.2	7.6	11.4	27.0	32.5	33.6	26.5	14.7	214.4

Carter Lake		Initial Cont Elev	92.7 kaf 5741.37 ft				Maximum Cont Elev	112.2 kaf 5758.98 ft				Minimum Cont Elev	6.0 kaf 5626.80 ft	
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Pump from Flatiron	kaf	0.0	0.0	1.6	18.0	9.0	0.0	4.7	13.5	8.5	14.5	7.1	0.0	76.9
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Evaporation loss	kaf	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.2	2.3
Seepage loss	kaf	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	2.0
End-Month Targets	kaf	84.8	77.2	82.4	98.3	105.3	102.8	104.7	112.2	112.2	112.2	100.0	73.9	
End-Month Content	kaf	85.9	83.3	82.4	98.3	105.3	103.1	104.7	112.2	112.2	111.9	100.0	87.5	
End-Month Elevation	ft	5734.94	5732.44	5731.57	5746.54	5752.87	5750.90	5752.34	5758.98	5758.98	5758.71	5748.10	5736.47	
Irrigation demand	kaf	6.2	1.4	1.3	1.4	1.2	1.4	2.6	5.2	6.6	13.0	16.7	10.1	67.1
Metered delivery	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windy Gap demand	kaf	0.3	0.9	1.0	0.5	0.6	0.5	0.1	0.4	1.4	1.2	1.8	2.0	10.7
Total demand	kaf	6.5	2.3	2.3	1.9	1.8	1.9	2.7	5.6	8.0	14.2	18.5	12.1	77.8
Total delivery	kaf	6.5	2.3	2.3	1.9	1.8	1.9	2.7	5.6	8.0	14.2	18.5	12.1	77.8
% required delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 930	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Minimum flow	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum flow	kaf	57.2	55.3	57.2	57.2	51.6	57.2	27.7	57.2	55.3	57.2	57.2	55.3	645.6
Actual flow	kaf	6.1	4.7	6.4	8.1	7.2	7.6	6.7	13.5	24.0	19.1	19.4	14.7	137.5

Dille Tunnel	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Big T @ Canyon Mouth	kaf	3.2	2.2	1.8	1.7	1.4	2.0	6.9	29.2	61.5	37.7	20.1	7.6	175.3
Less Estes skim	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.7	7.6	0.0	6.7	2.3	23.0
Big T irr (Estes)	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.8
Handy Ditch release	kaf	1.2	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.8	2.9	1.7	11.2
Water available	kaf	2.0	2.2	1.9	1.7	1.5	2.1	5.1	22.4	52.8	36.0	10.6	3.6	141.9
Water diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% diverted	%													

Trifurcation Works	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Rels from Flatiron	kaf	6.1	4.7	6.4	8.1	7.2	7.6	6.7	13.5	24.0	19.1	19.4	14.7	137.5
Rels to 550 Canal	kaf	2.9	4.7	6.4	8.1	7.2	7.6	5.9	7.2	15.5	17.2	7.4	5.4	95.5
Big T irrigation	kaf	3.2	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.9	1.9	5.3	7.0	19.0
Dille Tunnel	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tot rels to river	kaf	3.2	0.0	0.0	0.0	0.0	0.0	0.8	6.3	8.5	1.9	12.0	9.3	42.0
Irrigation demand	kaf	3.2	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.9	1.9	5.3	7.0	19.0
Big T irr (Estes)	kaf	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.8
Windy Gap demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total requirement	kaf	3.2	0.0	0.1	0.0	0.1	0.1	0.2	0.7	1.0	2.0	5.4	7.0	19.8
Total delivery	kaf	3.2	0.0	0.1	0.0	0.1	0.1	0.2	0.7	1.0	2.0	5.4	7.0	19.8
% required delivery	%	100	0	100	0	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 550	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow from Flatiron	kaf	2.9	4.7	6.4	8.1	7.2	7.6	5.9	7.2	15.5	17.2	7.4	5.4	95.5
Maximum flow	kaf	16.9	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	27.2	375.5
Seepage loss	kaf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
Irrigation demand	kaf	1.5	0.3	0.1	0.1	0.1	0.1	0.2	0.5	0.4	0.8	1.2	1.1	6.4
Irrigation delivery	kaf	1.5	0.3	0.1	0.1	0.1	0.1	0.2	0.5	0.4	0.8	1.2	1.1	6.4
Minimum flow	kaf	0.6	0.6	6.1	6.1	5.6	6.1	2.4	0.0	0.0	0.0	0.6	0.6	28.7
Rels to Horsetooth	kaf	1.2	4.2	6.1	7.8	6.9	7.3	5.5	6.5	14.9	16.2	6.0	4.1	86.7

Horsetooth Reservoir		Initial Cont Elev	134.3 kaf 5418.53 ft			Maximum Cont Elev	156.5 kaf 5429.88 ft			Minimum Cont Elev	13.0 kaf 5316.81 ft		
	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow	kaf	1.2	4.2	6.1	7.8	6.9	7.3	5.5	1.5	4.9	11.2	6.0	4.1	66.7
Priority water div	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	10.0	5.0	0.0	0.0	20.0
Total irr delivery	kaf	10.9	1.4	1.4	1.6	1.3	1.7	2.1	6.4	7.6	16.3	20.8	10.5	82.0
Evaporation loss	kaf	0.3	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.6	0.7	0.6	0.4	3.8
Seepage loss	kaf	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	2.2
End-Month Targets	kaf	124.1	126.6	131.0	136.8	142.1	147.5	150.4	145.0	146.5	150.7	140.0	133.0	
End-Month Content	kaf	124.1	126.6	131.0	136.8	142.1	147.5	150.4	150.0	156.5	155.5	140.0	133.0	
End-Month Elevation	ft	5412.97	5414.35	5416.76	5419.86	5422.63	5425.40	5426.86	5426.66	5429.88	5429.39	5421.54	5417.83	
Irrigation demand	kaf	9.4	0.1	0.0	0.0	0.0	0.0	0.3	3.6	4.0	11.5	15.6	6.7	51.2
Metered delivery	kaf	1.3	0.9	1.0	1.0	1.0	1.1	1.5	2.3	3.1	3.8	3.3	2.6	22.9
Windy Gap demand	kaf	0.2	0.4	0.4	0.6	0.3	0.6	0.3	0.5	0.5	1.0	1.9	1.2	7.9
Total demand	kaf	10.9	1.4	1.4	1.6	1.3	1.7	2.1	6.4	7.6	16.3	20.8	10.5	82.0
Total irr delivery	kaf	10.9	1.4	1.4	1.6	1.3	1.7	2.1	6.4	7.6	16.3	20.8	10.5	82.0
% required delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total CBT Delivery	kaf	21.6	2.7	2.5	2.5	2.4	2.7	4.8	12.3	15.1	31.1	42.2	27.5	167.4

Windy Gap Ownership 2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Accrual	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total release	kaf	0.5	1.3	1.4	1.1	0.9	1.1	0.4	0.9	1.9	2.2	3.7	3.2	18.6
Spill	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
End-month Ownership	kaf	-0.5	-1.8	-3.2	-4.3	-5.2	-6.3	-6.7	-7.6	-9.5	-11.7	-15.4	-18.6	

PUMPING AND GENERATION OPERATIONS

Green Mtn Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Max Generation	gwh	18.600	18.000	18.600	18.600	8.400	9.171	12.847	18.600	18.000	18.600	18.600	18.000	196.018
Generation	gwh	7.273	2.413	2.274	2.013	2.302	2.978	2.500	5.598	18.000	18.600	14.260	7.885	86.096
% Max Generation	%	39	13	12	11	27	32	19	30	100	100	77	44	
Ave kwh/af		187	177	175	172	168	162	158	164	189	207	205	193	

Willow Crk Pumping	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	27.7	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.8	81.3
Actual pumping	kaf	0.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.6
Pump energy	gwh	0.170	0.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.447	0.766
% max pumping	%	3	3										8	
Average kwh/af		213	213										213	

Lake Granby Pumping	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	36.9	35.7	36.9	36.9	33.3	36.9	35.7	36.9	35.7	36.9	36.9	35.7	434.4
Actual pumping	kaf	1.6	2.9	7.8	24.6	15.3	5.9	2.5	0.0	0.0	0.0	10.4	10.1	81.1
Pump energy	gwh	0.226	0.406	1.100	3.469	2.173	0.844	0.358	0.000	0.000	0.000	1.466	1.424	11.466
% max pumping	%	4	8	21	67	46	16	7				28	28	
Average kwh/af		141	140	141	141	142	143	143				141	141	

Marys Lake Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel Flow	kaf	6.3	4.9	8.3	26.3	16.5	7.9	11.0	16.6	15.2	28.9	20.1	12.6	
Max generation	gwh	6.060	0.000	2.980	6.060	5.400	6.060	5.840	6.060	5.840	6.060	6.060	5.840	62.260
Generation	gwh	1.030	0.000	1.360	4.660	2.900	1.280	1.900	2.920	2.640	5.180	3.610	2.220	29.700
% Max Generation	%	17		46	77	54	21	33	48	45	85	60	38	
Ave kwh/af		163		164	177	176	162	173	176	174	179	180	176	

Lake Estes Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel Flow	kaf	6.3	4.9	8.3	26.3	16.5	7.9	11.0	16.6	15.2	28.9	20.1	12.6	
Max generation	gwh	14.920	14.450	14.920	14.920	13.450	14.920	14.450	14.920	14.450	14.920	14.920	14.450	175.690
Generation	gwh	2.620	2.060	3.550	11.620	7.600	3.350	4.900	7.640	7.080	12.750	8.940	5.840	77.950
% Max Generation	%	18	14	24	78	57	22	34	51	49	85	60	40	
Ave kwh/af		416	420	428	442	461	424	445	460	466	441	445	463	

Pole Hill Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Olympus Tunnel flow	kaf	6.3	4.9	8.2	26.3	16.4	7.8	11.6	27.2	32.7	33.8	26.7	14.9	216.8
Max generation	gwh	25.260	0.000	12.910	25.260	22.800	25.260	24.460	25.260	24.460	25.260	25.260	24.460	260.650
Generation	gwh	4.080	3.120	5.400	19.480	12.280	5.160	8.620	20.200	24.300	25.120	19.800	11.090	158.650
% Max Generation	%	16		42	77	54	20	35	80	99	99	78	45	
Ave kwh/af		648		659	741	749	662	743	743	743	743	742	744	

Flatiron 1&2 Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Inflow to Flatiron	kaf	6.1	4.7	8.0	26.1	16.2	7.6	11.4	27.0	32.5	33.6	26.5	14.7	214.4
Max generation	gwh	29.040	28.130	29.040	29.040	26.250	29.040	28.130	29.040	28.130	29.040	29.040	28.130	342.050
Generation	gwh	4.810	3.660	6.600	23.060	14.400	6.280	10.160	23.600	27.950	28.880	23.300	13.130	185.830
% Max Generation	%	17	13	23	79	55	22	36	81	99	99	80	47	
Ave kwh/af		789	779	825	884	889	826	891	874	860	860	879	893	

Flatiron 3 Pump/Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Maximum pumping	kaf	18.3	18.3	19.1	18.2	15.1	16.5	16.0	16.0	15.1	15.6	16.2	15.5	199.9
Pump from Flatiron	kaf	0.0	0.0	1.6	18.0	9.0	0.0	4.7	13.5	8.5	14.5	7.1	0.0	76.9
Pump energy	gwh	0.000	0.000	0.531	6.264	3.366	0.000	1.781	5.265	3.400	5.786	2.726	0.000	29.119
% max pumping	%			8	99	60		29	84	56	93	44		
Average kwh/af				332	348	374		379	390	400	399	384		
Max turbine rels	kaf	25.4	24.3	25.0	25.4	23.7	26.4	25.5	26.7	26.2	27.1	26.5	22.3	304.5
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Actual generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
% max generation	%													
Average kwh/af														

Big Thompson Gen	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Total release	kaf	3.2	0.0	0.0	0.0	0.0	0.0	0.8	6.3	8.5	1.9	12.0	9.3	42.0
Turbine release	kaf	3.2	0.0	0.0	0.0	0.0	0.0	0.8	6.3	8.5	1.9	12.0	9.3	42.0
Wasteway release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max generation	gwh	3.940	0.000	0.000	0.000	0.000	0.000	3.800	3.940	3.800	3.940	3.940	3.800	27.160
Generation	gwh	0.274	0.000	0.000	0.000	0.000	0.000	0.069	0.660	1.000	0.163	1.700	1.160	5.026
% Max Generation	%	7						2	17	26	4	43	31	
Ave kwh/af		86						86	105	118	86	142	125	

PROJECT GENERATION AND PUMPING SUMMARY

Project Generation	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Base Generation:														
Big Thompson	gwh	0.274	0.000	0.000	0.000	0.000	0.000	0.069	0.660	1.000	0.163	1.700	1.160	5.026
Green Mtn	gwh	7.273	2.413	2.274	2.013	2.302	2.978	2.500	5.598	18.000	18.600	14.260	7.885	86.096
Flatiron 3	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	gwh	7.547	2.413	2.274	2.013	2.302	2.978	2.569	6.258	19.000	18.763	15.960	9.045	91.122

Load Following Generation:														
Marys Lake	gwh	1.030	0.000	1.360	4.660	2.900	1.280	1.900	2.920	2.640	5.180	3.610	2.220	29.700
Lake Estes	gwh	2.620	2.060	3.550	11.620	7.600	3.350	4.900	7.640	7.080	12.750	8.940	5.840	77.950
Pole Hill	gwh	4.080	3.120	5.400	19.480	12.280	5.160	8.620	20.200	24.300	25.120	19.800	11.090	158.650
Flatiron 1,2	gwh	4.810	3.660	6.600	23.060	14.400	6.280	10.160	23.600	27.950	28.880	23.300	13.130	185.830
Total	gwh	12.540	8.840	16.910	58.820	37.180	16.070	25.580	54.360	61.970	71.930	55.650	32.280	452.130
Total generation	gwh	20.087	11.253	19.184	60.833	39.482	19.048	28.149	60.618	80.970	90.693	71.610	41.325	543.252
Total max generation	gwh	97.820	60.580	78.450	93.880	76.300	84.451	89.527	97.820	94.680	97.820	97.820	94.680	1063.828

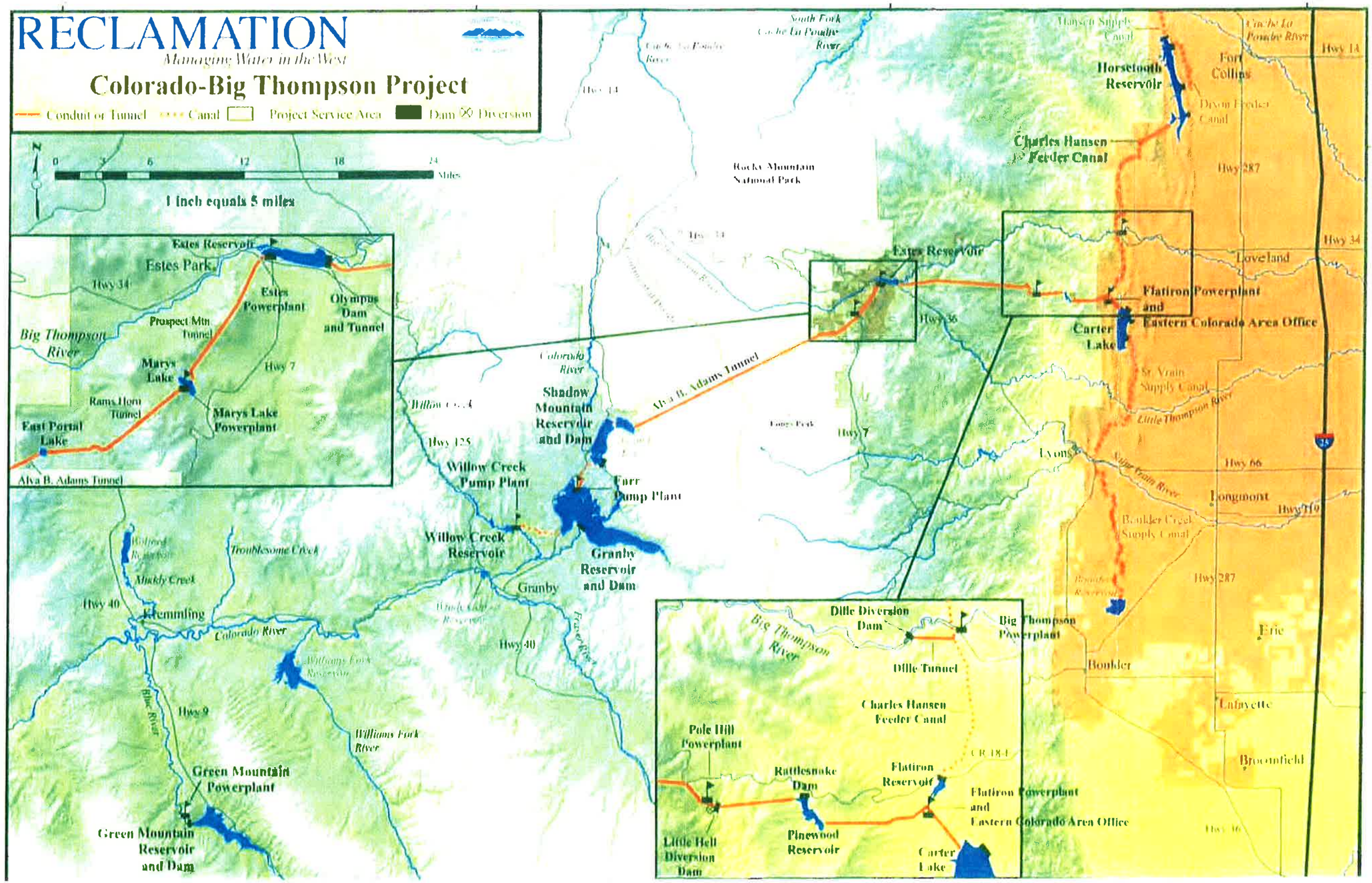
Project Pump Energy 2014		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Granby	gwh	0.226	0.406	1.100	3.469	2.173	0.844	0.358	0.000	0.000	0.000	1.466	1.424	11.466
Willow Creek	gwh	0.170	0.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.447	0.766
Flatiron 3	gwh	0.000	0.000	0.531	6.264	3.366	0.000	1.781	5.265	3.400	5.786	2.726	0.000	29.119
Total pump energy	gwh	0.396	0.555	1.631	9.733	5.539	0.844	2.139	5.265	3.400	5.786	4.192	1.871	41.351
Total net generation	gwh	19.691	10.698	17.553	51.100	33.943	18.204	26.010	55.353	77.570	84.907	67.418	39.454	501.901

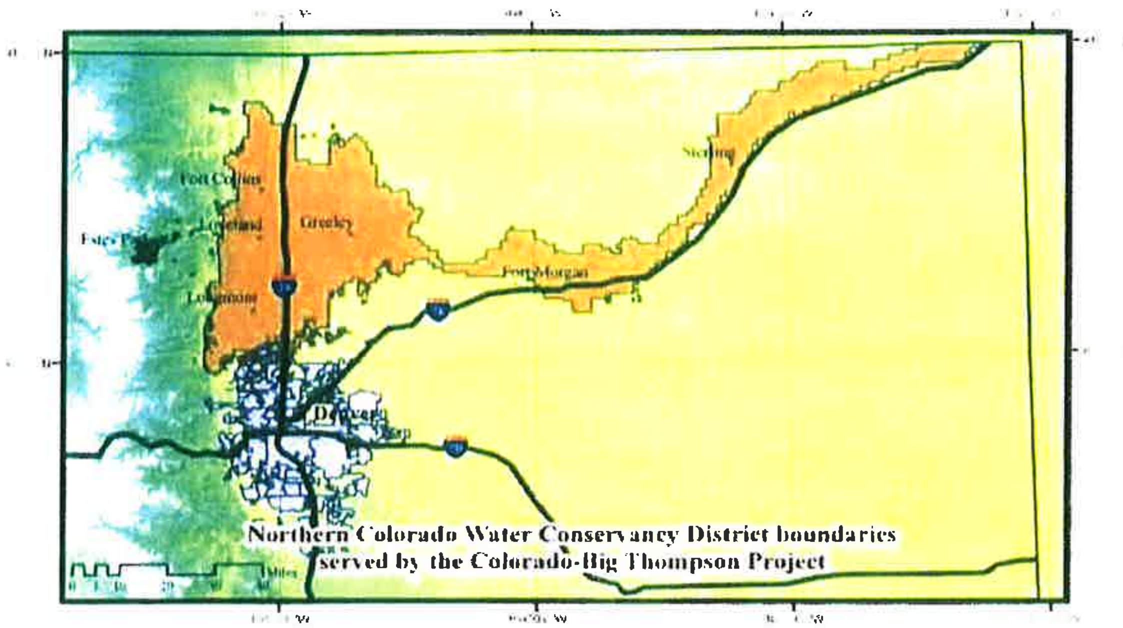
Release Flexibility 2014			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Adams Tunnel	Min	kaf	6.3	4.9	8.3	26.3	16.5	7.9	11.0	16.6	15.2	28.9	20.1	12.6	
Adams Tunnel	Max	kaf	6.3	4.9	8.3	26.3	16.5	7.9	11.0	16.6	15.2	28.9	20.1	12.6	
Marys Lake	Min	gwh	1.030	0.000	1.360	4.660	2.900	1.280	1.900	2.920	2.640	5.180	3.610	2.220	
Marys Lake	Max	gwh	1.030	0.000	1.360	4.660	2.900	1.280	1.900	2.920	2.640	5.180	3.610	2.220	
Lake Estes	Min	gwh	2.620	2.060	3.550	11.620	7.600	3.350	4.900	7.640	7.080	12.750	8.940	5.840	
Lake Estes	Max	gwh	2.620	2.060	3.550	11.620	7.600	3.350	4.900	7.640	7.080	12.750	8.940	5.840	
Olympus Tunnel	Min	kaf	6.3	4.9	8.2	26.3	16.4	7.8	11.6	27.2	32.7	33.8	26.7	14.9	
Olympus Tunnel	Max	kaf	6.3	4.9	8.2	26.3	16.4	7.8	11.6	27.2	32.7	33.8	26.7	14.9	
Pole Hill	Min	gwh	4.240	0.000	5.540	19.640	12.460	5.280	8.780	20.340	24.460	25.260	19.960	11.230	
Pole Hill	Max	gwh	4.240	0.000	5.540	19.640	12.460	5.280	8.780	20.340	24.460	25.260	19.960	11.230	
Flatiron 1&2	Min	gwh	4.810	3.660	6.600	23.060	14.400	6.280	10.160	23.600	27.950	28.880	23.300	13.130	
Flatiron 1&2	Max	gwh	4.810	3.660	6.600	23.060	14.400	6.280	10.160	23.600	27.950	28.880	23.300	13.130	
Load following	Min	gwh	12.700	5.720	17.050	58.980	37.360	16.190	25.740	54.500	62.130	72.070	55.810	32.420	
Load following	Max	gwh	12.700	5.720	17.050	58.980	37.360	16.190	25.740	54.500	62.130	72.070	55.810	32.420	
Total project	Min	gwh	20.247	8.133	19.324	60.993	39.662	19.168	28.309	60.758	81.130	90.833	71.770	41.465	
Total project	Max	gwh	20.247	8.133	19.324	60.993	39.662	19.168	28.309	60.758	81.130	90.833	71.770	41.465	

GENERATION CAPACITY AND DURATION

Project Generation	2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Base Generation:														
Green Mtn	mw	9.8	3.4	3.1	2.7	3.4	4.0	3.5	7.5	25.0	25.0	19.2	11.0	
Flatiron 3	mw													
Big Thompson	mw	0.4						0.1	0.9	1.4	0.2	2.3	1.6	
Total base load	mw	10.2	3.4	3.1	2.7	3.4	4.0	3.6	8.4	26.4	25.2	21.5	12.6	
Load Following Generation:														
Marys Lake														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Duration	hr/d	11.4	14.2	10.4	4.1	11.0	10.9	11.0	10.9	10.9	2.2	8.6	10.8	
Max Capacity	mw	2.7	2.7	3.5	8.1	7.9	3.4	5.0	7.9	7.2	8.1	8.1	5.8	
Duration	hr/d	12.6	9.8	12.6	18.9	12.1	12.2	12.0	12.1	12.1	20.8	14.4	12.2	
Lake Estes														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Duration	hr/d	12.0	14.2	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Max Capacity	mw	7.5	7.0	10.4	32.8	20.2	9.9	14.0	20.3	18.3	36.1	24.4	15.2	
Duration	hr/d	12.0	9.8	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Pole Hill														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	34.0	0.0	0.0	
Duration	hr/d	12.0	14.2	12.0	4.7	11.8	12.0	12.0	4.1	12.0	12.0	4.4	12.0	
Max Capacity	mw	11.3	11.0	15.4	34.0	33.4	14.4	23.8	34.0	34.0	34.0	34.0	31.8	
Duration	hr/d	12.0	9.8	12.0	19.3	12.2	12.0	12.0	19.9	12.0	12.0	19.6	12.0	
Flatiron 1&2														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Duration	hr/d	12.0	14.6	12.0	12.0	11.8	12.0	12.0	12.0	9.6	8.8	12.0	12.0	
Max Capacity	mw	13.3	13.0	19.0	64.3	41.4	17.8	28.2	67.0	85.0	86.0	65.5	36.4	
Duration	hr/d	12.0	9.4	12.0	12.0	12.2	12.0	12.0	12.0	10.1	10.0	12.0	12.0	
Total Load Following														
Min Capacity	mw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	34.0	0.0	0.0	
Max Capacity	mw	34.8	33.7	48.3	139.2	102.9	45.5	71.0	129.2	144.5	164.2	132.0	89.2	
Total Project Capacity														
Min Capacity	mw	10.2	3.4	3.1	2.7	3.4	4.0	3.6	8.4	60.4	59.2	21.5	12.6	
Max Capacity	mw	45.0	37.1	51.4	141.9	106.3	49.5	74.6	137.6	170.9	189.4	153.5	101.8	

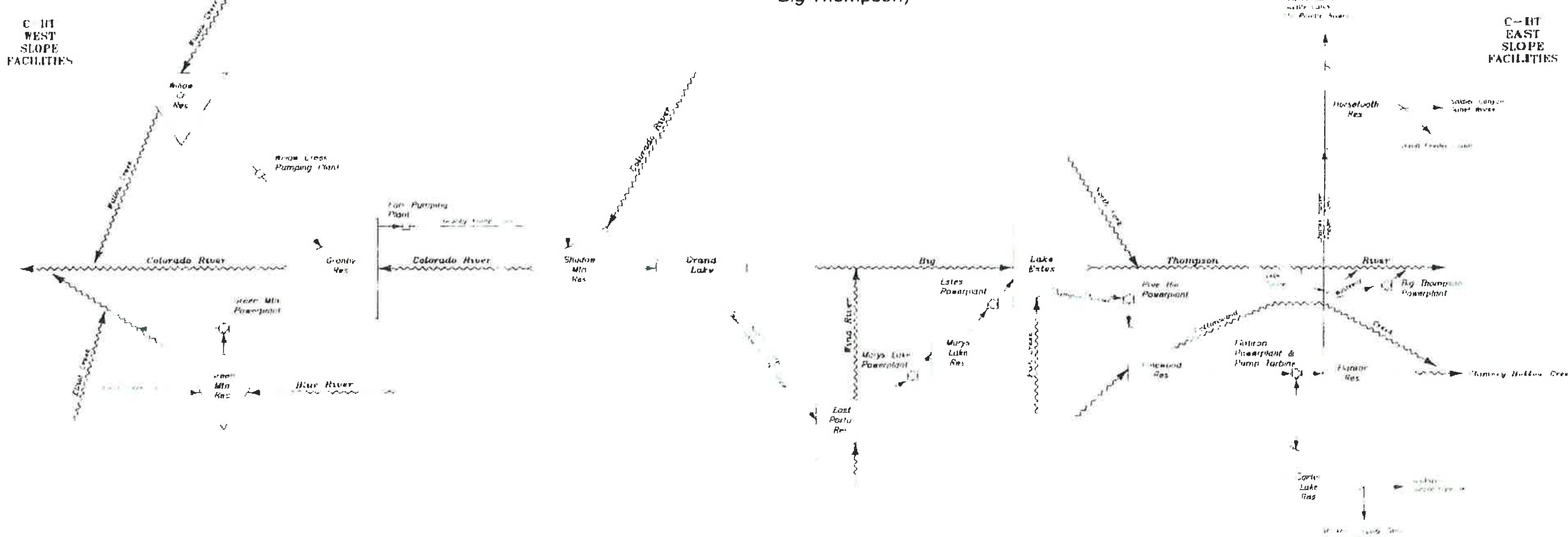
APPENDIX C - EXHIBITS

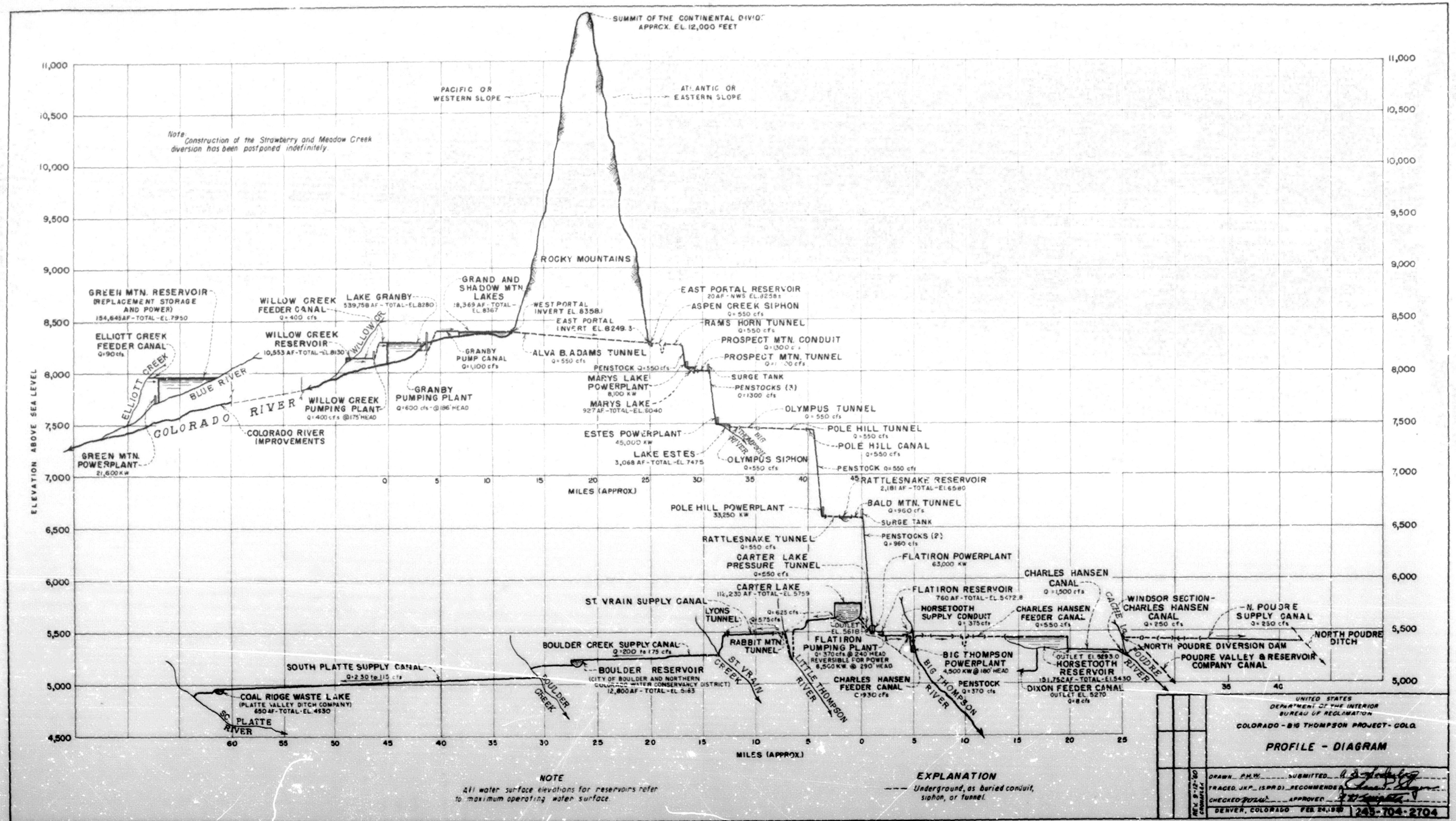

RECLAMATION
Managing Water in the West
Colorado-Big Thompson Project
Conduit or Tunnel
Canal
Project Service Area
Dam
Diversion
1 inch equals 5 miles
Miles
Estes Reservoir
Estes Park
Hwy 34
Estes Powerplant
Olympus Dam and Tunnel
Prospect Mtn Tunnel
Big Thompson River
Marys Lake
Hwy 7
Rams Horn Tunnel
Marys Lake Powerplant
East Portal Lake
Alva B. Adams Tunnel
Rocky Mountain National Park
Alva B. Adams Tunnel
Shadow Mountain Reservoir and Dam
Willow Creek Pump Plant
Hwy 125
Farr Pump Plant
Willow Creek Reservoir
Granby Reservoir and Dam
Granby
Hwy 40
Fraser River
Troublesome Creek
Muddy Creek
Kremmling
Colorado River
Williams Fork Reservoir
Blue River
Hwy 9
Williams Fork River
Green Mountain Powerplant
Green Mountain Reservoir and Dam
Hwy 36
Horsetooth Reservoir
Fort Collins
Hwy 14
Charles Hansen Feeder Canal
Hwy 287
Loveland
Hwy 34
Flatiron Powerplant and Eastern Colorado Area Office
Carter Lake
St. Vrain Supply Canal
Little Thompson River
Lyons
Hwy 66
Longmont
Hwy 119
Boulder Creek Supply Canal
Erie
Boulder
Lafayette
Broomfield
Dille Diversion Dam
Big Thompson Powerplant
Dille Tunnel
Charles Hansen Feeder Canal
Pole Hill Powerplant
Rattlesnake Dam
Flatiron Reservoir
CR 18-E
Flatiron Powerplant and Eastern Colorado Area Office
Little Bell Diversion Dam
Pinewood Reservoir
Carter Lake



Colorado-Big Thompson Facts

- A trans-mountain, trans-basin water diversion, storage, and delivery project
- Signed into law by President Roosevelt in 1937
- Construction period 1938-1952
- Ten major reservoirs (Green Mountain, Willow Creek, Granby, Shadow Mountain, Marys Lake, Estes, Pinewood, Carter, Flatiron and Horsetooth)
- Twenty major dams and dikes
- Twenty-two tunnels, canals and other conduits covering about 130 miles
- Six hydroelectric powerplants (Green Mountain, Marys, Estes, Pole Hill, Flatiron, Big Thompson)
- Water right allows for diversion of up to 310,000 acre-feet of water a year
- Average annual diversion over life of project is 260,000 acre-feet
- Water falls over 2000 feet from Continental Divide to Colorado's eastern Plains, providing for hydroelectric power generation.
- Together, all six powerplants generate approximately 759 million kilo-Watt hours of electricity a year—enough to power 58,300 American homes for a year
- The C-BT provides water to 29 cities and towns, including 620,000 irrigated acres and a population of 725,000 people





SUMMIT OF THE CONTINENTAL DIVIDE APPROX. EL. 12,000 FEET
PACIFIC OR WESTERN SLOPE
ATLANTIC OR EASTERN SLOPE
Note: Construction of the Strawberry and Meadow Creek diversion has been postponed indefinitely.
ROCKY MOUNTAINS
GREEN MTN. RESERVOIR (REPLACEMENT STORAGE AND POWER) 154,645 AF-TOTAL-EL. 7950
ELLIOTT CREEK FEEDER CANAL Q=90 cfs
ELLIOTT CREEK
BLUE RIVER
COLORADO RIVER
GREEN MTN. POWERPLANT 21,600 KW
WILLOW CREEK FEEDER CANAL Q=400 cfs
WILLOW CREEK RESERVOIR 10,553 AF-TOTAL-EL. 8130
WILLOW CR.
LAKE GRANBY 539,758 AF-TOTAL-EL. 8280
WILLOW CREEK PUMPING PLANT Q=400 cfs @175' HEAD
COLORADO RIVER IMPROVEMENTS
GRANBY PUMPING PLANT Q=600 cfs-@186' HEAD
GRAND AND SHADOW MTN. LAKES 18,369 AF-TOTAL-EL. 8367
GRANBY PUMP CANAL Q=1,100 cfs
WEST PORTAL INVERT EL. 8358.1
EAST PORTAL INVERT EL. 8249.3
ALVA B. ADAMS TUNNEL Q=550 cfs
EAST PORTAL RESERVOIR 20 AF-NWS EL. 8258±
ASPEN CREEK SIPHON Q=550 cfs
RAMS HORN TUNNEL Q=550 cfs
PROSPECT MTN. CONDUIT Q=1300 cfs
PROSPECT MTN. TUNNEL Q=1300 cfs
PENSTOCK Q=550 cfs
MARYS LAKE POWERPLANT 8,100 KW
MARYS LAKE 927 AF-TOTAL-EL. 6040
SURGE TANK
PENSTOCKS (3) Q=1300 cfs
OLYMPUS TUNNEL Q=550 cfs
POLE HILL TUNNEL Q=550 cfs
POLE HILL CANAL Q=550 cfs
ESTES POWERPLANT 45,000 KW
LAKE ESTES 3,068 AF-TOTAL-EL. 7475
BIG THOMPSON RIVER
OLYMPUS SIPHON Q=550 cfs
PENSTOCK Q=550 cfs
RATTLESNAKE RESERVOIR 2,181 AF-TOTAL-EL. 6580
BALD MTN. TUNNEL Q=960 cfs
POLE HILL POWERPLANT 33,250 KW
SURGE TANK
PENSTOCKS (2) Q=960 cfs
RATTLESNAKE TUNNEL Q=550 cfs
CARTER LAKE PRESSURE TUNNEL Q=550 cfs
FLATIRON POWERPLANT 63,000 KW
CARTER LAKE 112,230 AF-TOTAL-EL. 5759
FLATIRON RESERVOIR 760 AF-TOTAL-EL. 5472.8
CHARLES HANSEN CANAL Q=1,500 cfs
ST. VRAIN SUPPLY CANAL
LYONS TUNNEL Q=625 cfs
Q=575 cfs
OUTLET EL. 5618
HORSETOOTH SUPPLY CONDUIT Q=375 cfs
CHARLES HANSEN FEEDER CANAL Q=550 cfs
WINDSOR SECTION-CHARLES HANSEN CANAL Q=250 cfs
N. POUDRE SUPPLY CANAL Q=250 cfs
NORTH POUDRE DITCH
NORTH POUDRE DIVERSION DAM
POUDRE VALLEY & RESERVOIR COMPANY CANAL
CACHE LA POUDRE RIVER
BOULDER CREEK SUPPLY CANAL Q=200 to 175 cfs
RABBIT MTN. TUNNEL
FLATIRON PUMPING PLANT Q=370 cfs @ 240' HEAD REVERSIBLE FOR POWER 6,500 KW @ 290' HEAD
BIG THOMPSON POWERPLANT 4,500 KW @ 180' HEAD
OUTLET EL. 5293.0
HORSETOOTH RESERVOIR 151,752 AF-TOTAL-EL. 5430
DIXON FEEDER CANAL OUTLET EL. 5270 Q=8 cfs
SOUTH PLATTE SUPPLY CANAL Q=230 to 115 cfs
BOULDER RESERVOIR (CITY OF BOULDER AND NORTHERN COLORADO WATER CONSERVANCY DISTRICT) 12,800 AF-TOTAL-EL. 5163
ST. VRAIN CREEK
LITTLE THOMPSON RIVER
BIG THOMPSON RIVER
CHARLES HANSEN FEEDER CANAL Q=930 cfs
PENSTOCK Q=370 cfs
BOULDER CREEK
COAL RIDGE WASTE LAKE (PLATTE VALLEY DITCH COMPANY) 650 AF-TOTAL-EL. 4930
SO. PLATTE RIVER
ELEVATION ABOVE SEA LEVEL
MILES (APPROX.)
NOTE
All water surface elevations for reservoirs refer to maximum operating water surface.
EXPLANATION
Underground, as buried conduit, siphon, or tunnel.
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
COLORADO-BIG THOMPSON PROJECT-COLO.
PROFILE - DIAGRAM
DRAWN P.H.W. SUBMITTED
TRACED J.K.P. (S.P.R.D.) RECOMMENDED
CHECKED APPROVED
DENVER, COLORADO FEB. 24, 1950
245-704-2704
REV. 9-12-60 CROMAFLEX

Exhibit 3

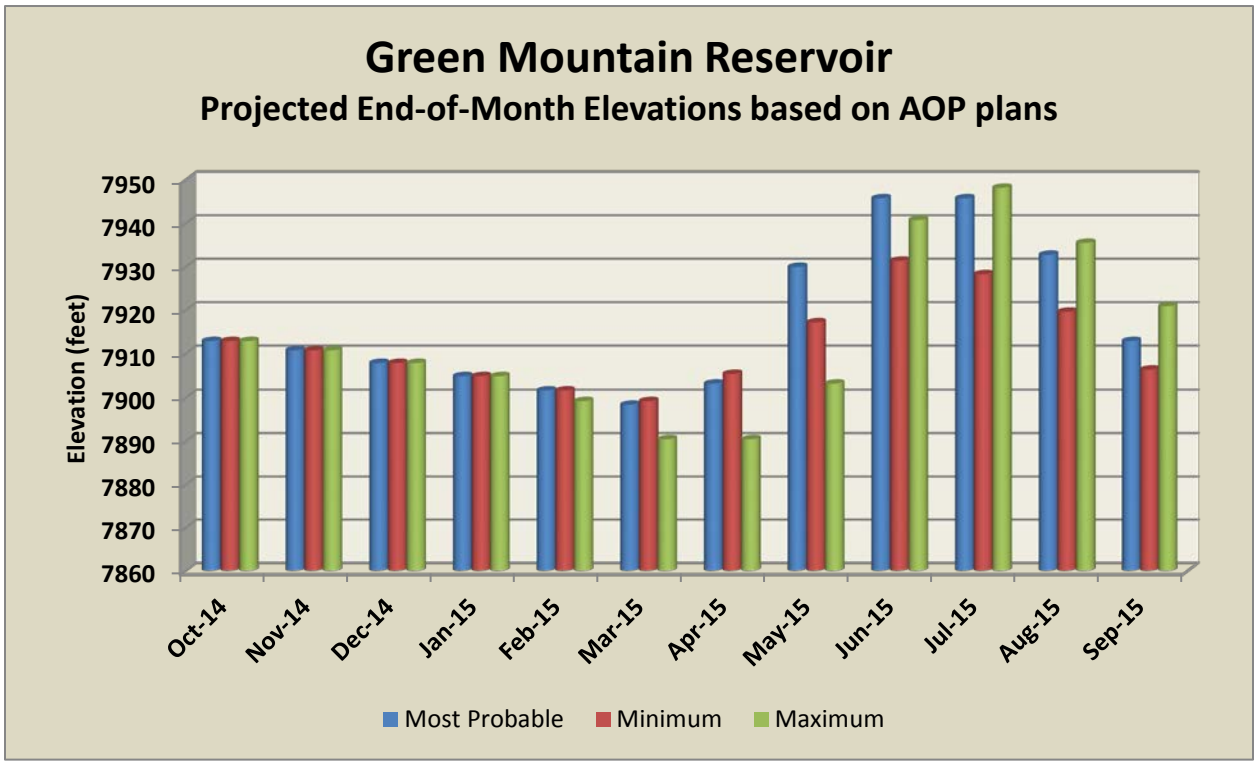

Green Mountain Reservoir
Projected End-of-Month Elevations based on AOP plans
Elevation (feet)
7950
7940
7930
7920
7910
7900
7890
7880
7870
7860
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Most Probable
Minimum
Maximum

Exhibit 4

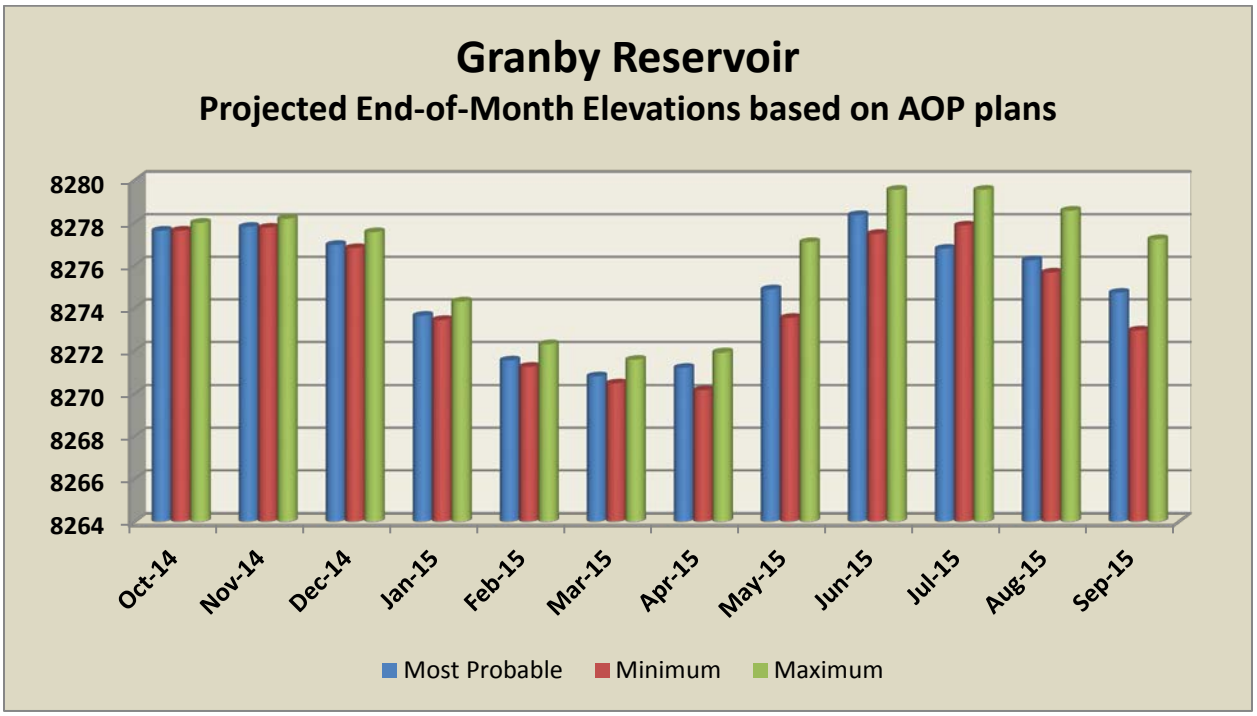

Granby Reservoir
Projected End-of-Month Elevations based on AOP plans
8280
8278
8276
8274
8272
8270
8268
8266
8264
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Most Probable
Minimum
Maximum

Exhibit 5

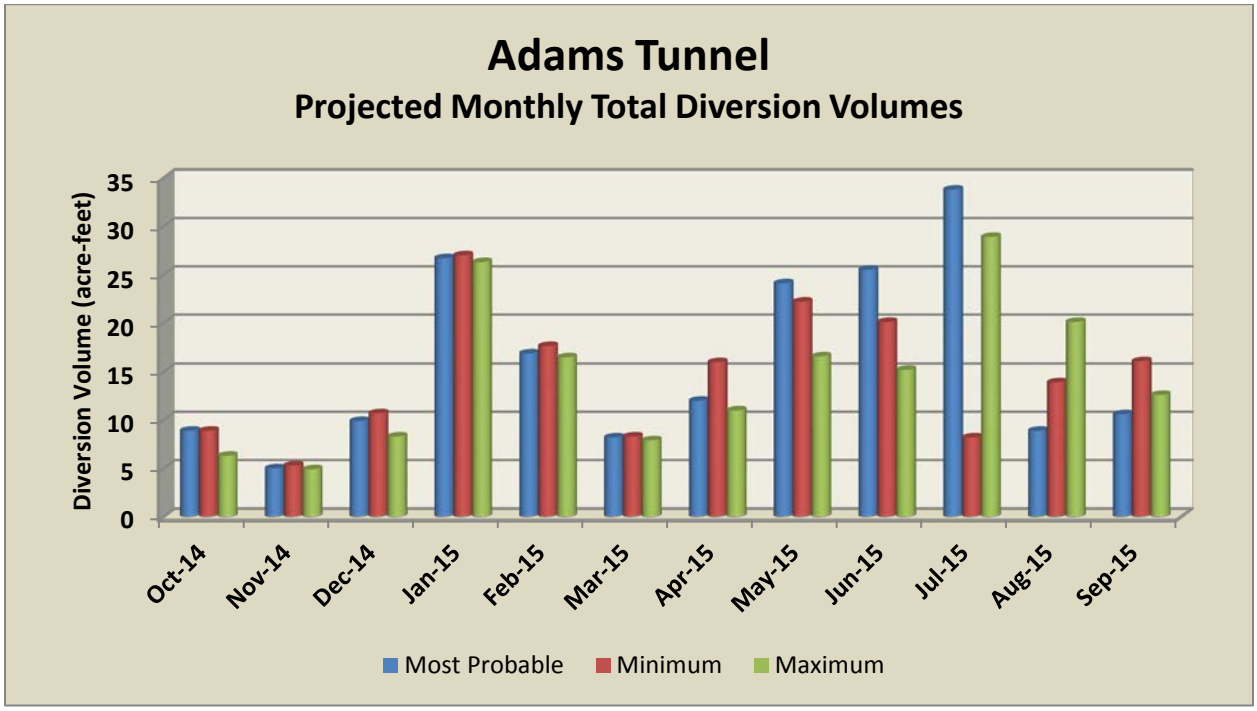

Adams Tunnel
Projected Monthly Total Diversion Volumes
Diversion Volume (acre-feet)
35
30
25
20
15
10
5
0
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Most Probable
Minimum
Maximum

Exhibit 6

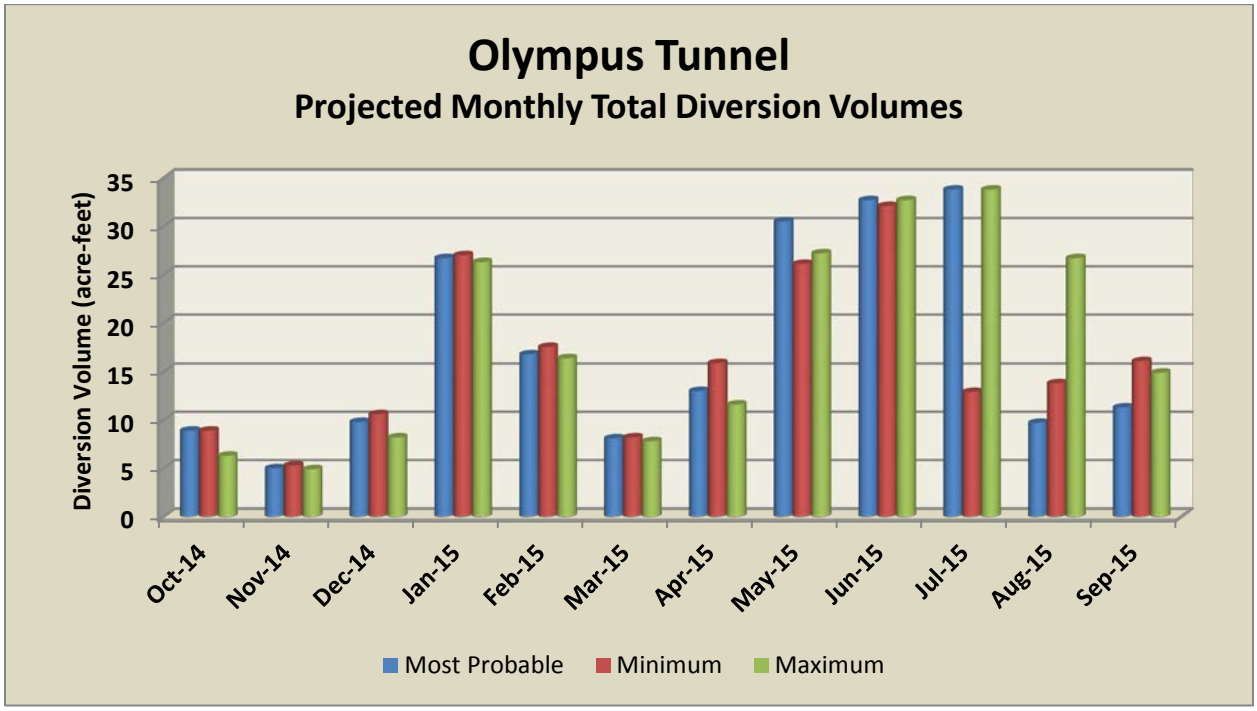

Olympus Tunnel
Projected Monthly Total Diversion Volumes
Diversion Volume (acre-feet)
35
30
25
20
15
10
5
0
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Most Probable
Minimum
Maximum

Exhibit 7

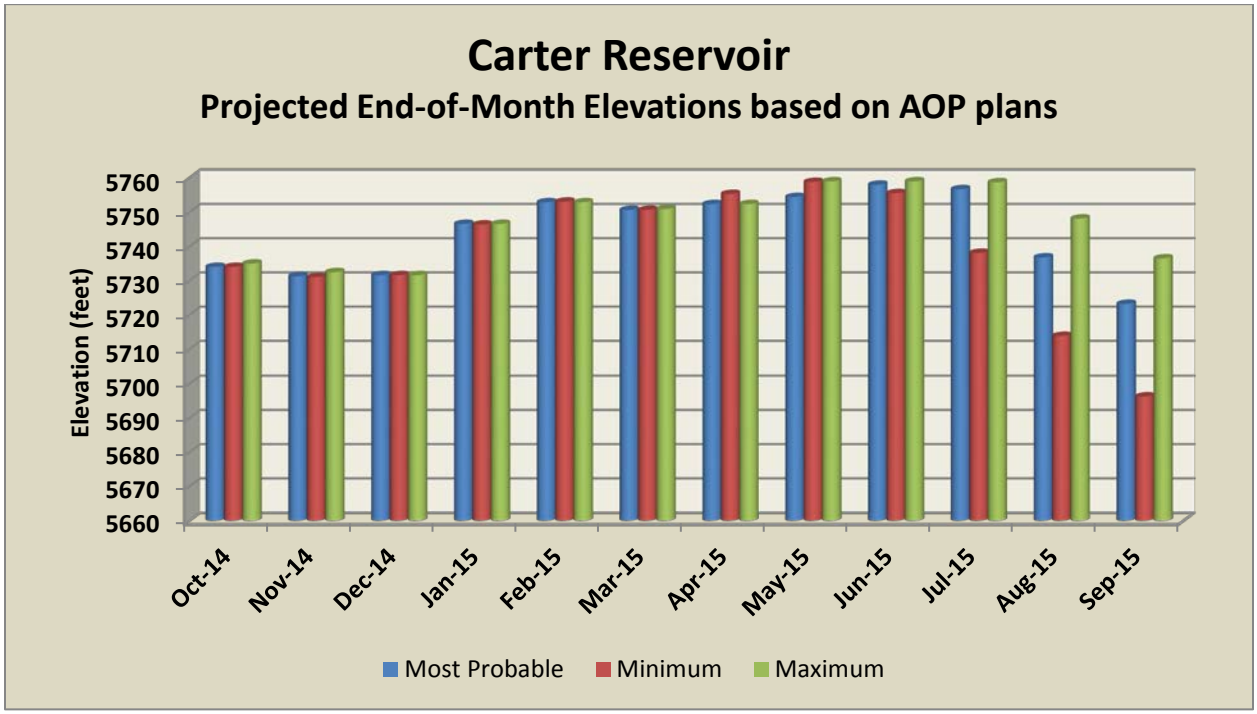

Carter Reservoir
Projected End-of-Month Elevations based on AOP plans
Elevation (feet)
5760
5750
5740
5730
5720
5710
5700
5690
5680
5670
5660
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Most Probable
Minimum
Maximum

Exhibit 8

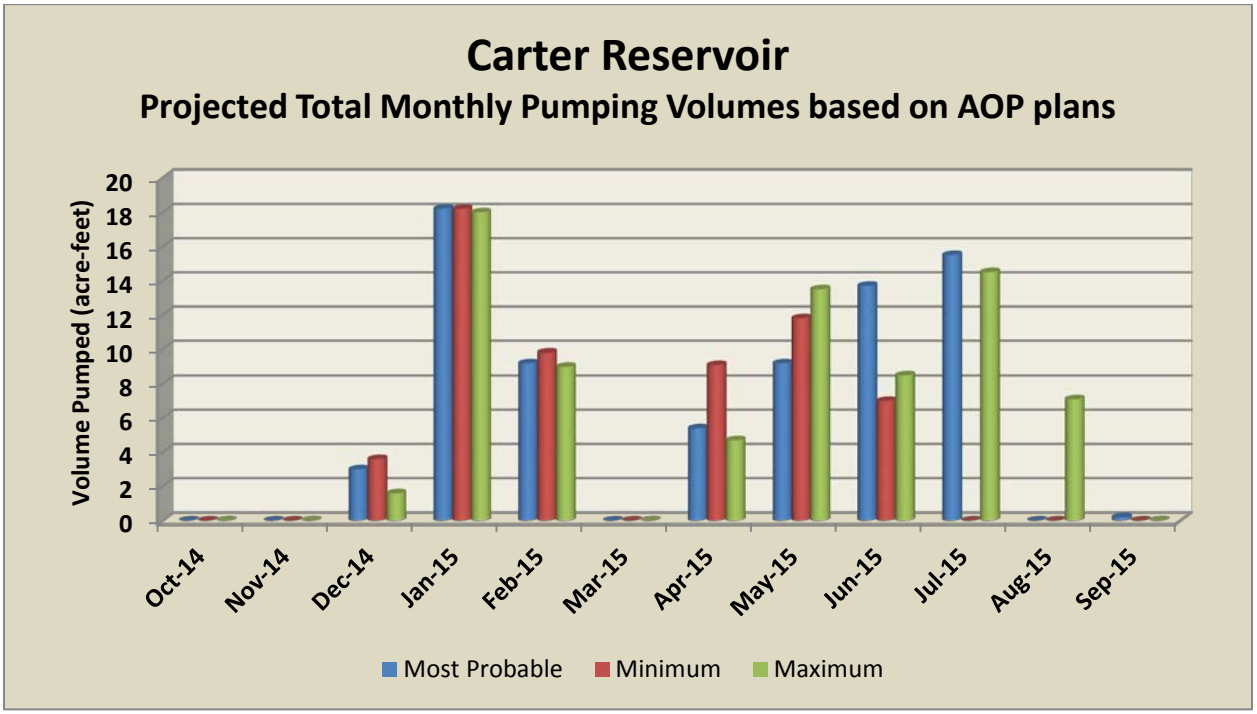

Carter Reservoir
Projected Total Monthly Pumping Volumes based on AOP plans
Volume Pumped (acre-feet)
0
2
4
6
8
10
12
14
16
18
20
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Most Probable
Minimum
Maximum

Exhibit 9

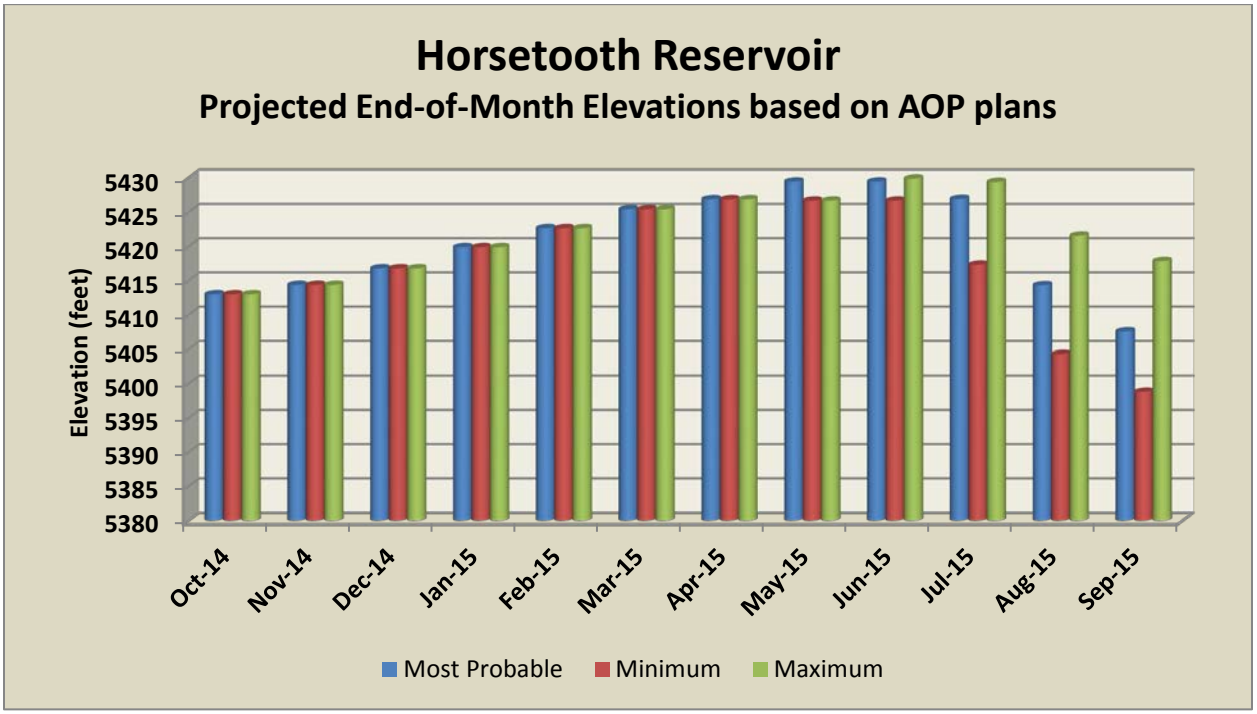
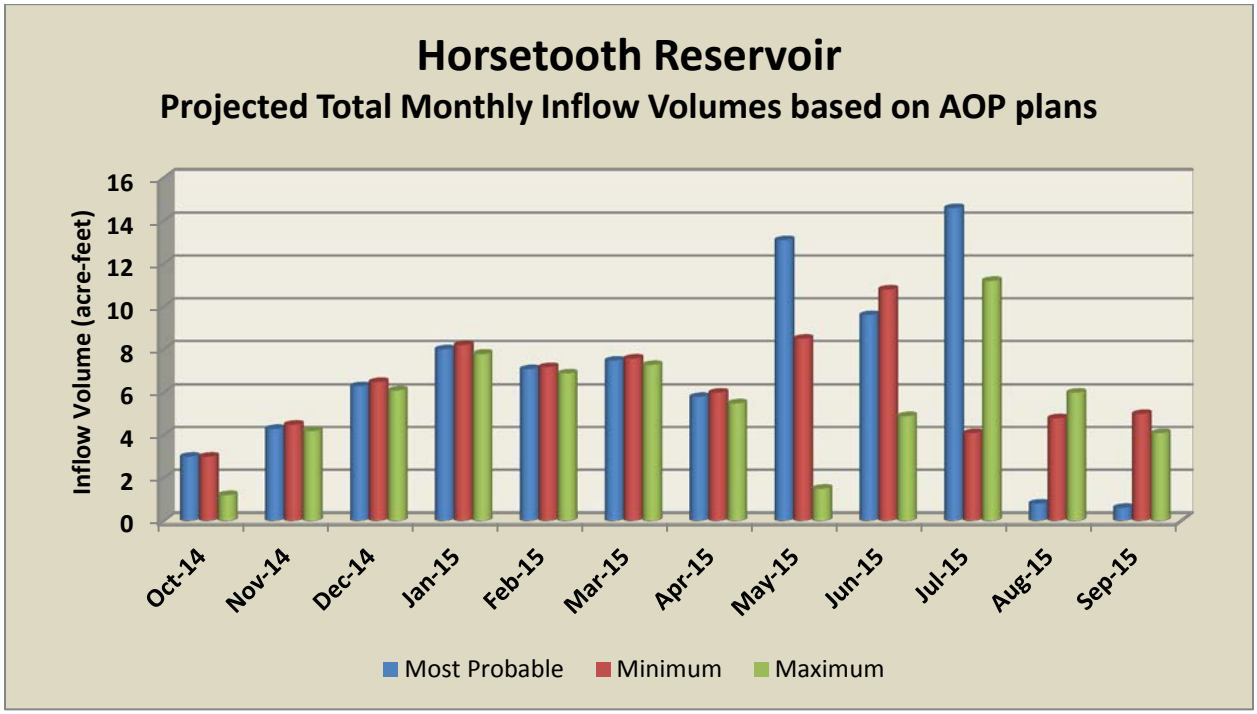

Horsetooth Reservoir
Projected End-of-Month Elevations based on AOP plans
Elevation (feet)
5430
5425
5420
5415
5410
5405
5400
5395
5390
5385
5380
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Most Probable
Minimum
Maximum

Exhibit 10


Horsetooth Reservoir
Projected Total Monthly Inflow Volumes based on AOP plans
Inflow Volume (acre-feet)
16
14
12
10
8
6
4
2
0
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Most Probable
Minimum
Maximum

* * * * * * * * *

This is the 63rd annual report for the Pick-Sloan Missouri Basin Program Western Division System (System) power operations. For the purpose of this report, the System also includes the Yellowtail Powerplant Units 1 & 2 and the generating facilities of the Fryingpan-Arkansas Project. The purpose of the report is to inform interested parties of the generation and pump energy requirements of the hydropower system. The report consists of two parts: One part describes the actual generation and pumping operations for WY 2014 and the other part presents the plan of generation and pumping operations for WY 2015.

An update on the System generation and pumping operations is included in the "Water Supply and Utilization" report, which is issued monthly.

WESTERN DIVISION SYSTEM POWER OPERATIONS
GENERATION AND PUMP ENERGY

TABLE OF CONTENTS

WY 2013 - GENERATION AND PUMP ENERGY SUMMARY 1

WY 2014 - GENERATION AND PUMP ENERGY FORECAST.....2

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1 Western Division System: Gross Generation - WY 2014
2 Western Division System: Pump Energy - WY 2014
3 Western Division System: WY 2014 Actual System Generation and Pump Energy
4a Western Division System: WY 2015 Most Probable Water Supply Plan for Generation and Pump Energy
4b Western Division System: WY 2015 Reasonable-Minimum Water Supply Plan for Generation and Pump Energy
4c Western Division System: WY 2015 Reasonable-Maximum Water Supply Plan for Generation and Pump Energy
5 Recommended Monthly Outages for Regular Maintenance of C-BT Facilities (Conveyance Facilities and Reservoirs)
6 Powerplant Data: Western Division System
7 Pumping Plant Data: Western Division System

APPENDIX B - EXHIBITS

1 Western Division Water Resource Map
2 Western Division System: 2014 Generation versus Load
3A Western Division System: 2015 Projected Generation Most Probable Inflow Condition
3B Western Division System: 2015 Projected Generation Reasonable-Minimum Inflow Condition
3C Western Division System: 2015 Projected Generation Reasonable-Maximum Inflow Condition

WESTERN DIVISION POWER SYSTEM
WATER YEAR 2014 – GENERATION AND PUMP ENERGY SUMMARY

WY 2014 was a productive year for power plants in the Colorado-Big Thompson (C-BT) and the Fryingpan-Arkansas (FryArk) projects. C-BT powerplants produced an accumulated gross generation total of 657.62 gigawatt-hours (GWh) of electricity representing 110 percent of its 30-year average. Meanwhile, the gross generation produced by the entire Western Division Power System's (System) was 2,058.1 GWh or 78 percent of the 30-year average. Gross generation includes one-half of the Yellowtail generation. Total generation is the gross generation less the energy used for pumping at Farr Plant, Willow Creek Pump, Flatiron Unit 3 and the two Mount Elbert units. The System total generation was 1,912.8 GWh. The average for a water year is 2,400.7 GWh. The total System load includes firm energy deliveries, C-BT use-energy, support-energy, plant station service, and an estimate of transmission-system losses.

The Western Division Power System boundaries are illustrated in Exhibit 1. Table 1 in this section includes the total generation for every powerplant in the system. Table 3 shows monthly generation and pumping energy, by plant, as well as monthly System loads for the WY. The total energy that was required to operate the pumps in the System is included in Table 2. Some of the numbers included in this section were provided by Western Area Power Administration (WAPA).

Inflow for all the C-BT reservoirs during WY 2014 was above average. The period of February through April was particularly wet. The C-BT snowpack in general was above average the entire fall, winter and spring seasons. Diversions through the Adams Tunnel were high during most of the winter and spring. But with a quota of 60 percent declared by the Northern Colorado Water Conservancy District, the diversions of water from the west were relaxed in the late spring, which allowed for a strong skim operation from May - July. The Olympus Tunnel was able to skim 38,894 AF of water for power generation during WY 2014, producing an estimated 64,000 MW of electricity.

Pumping from the Willow Creek Canal during WY 2014 required 10.8 GWh, while Farr Plant and Flatiron Powerplant required 25.2 and 36.6 GWh, respectively. The three plants pumping operations were above-average in WY2013. Their power requirements were 115 percent of the 30-year average.

According to the numbers provided by WAPA's office in Loveland, sales of electric power totaled 2,676,488 mega-watt hours (MWh) during WY 2014, with a revenue of $99,459,031. Energy deficits were covered by a combination of scheduled interchange energy, use of the Mount Elbert pumped storage plant, and power purchases. The power purchases totaled 549,274 MWh during WY 2014 for which WAPA paid a total of $21,290,261.

WESTERN DIVISION POWER SYSTEM
WATER YEAR 2014 – GENERATION AND PUMP ENERGY FORECAST

Under the most-probable runoff condition plan developed on October, 2014, the gross generation for the C-BT powerplants is projected to be 504.0 GWh during WY2014, while pump energy requirements from the C-BT Power System are expected to reach 44.4 GWh. The total generation for the entire Western Division Power System (System) is expected to be 2,011.2 GWh, with a total load of 2,162.5 GWh, leaving a shortfall of 151.3 GWh. The System generation includes one-half of the total Yellowtail Powerplant generation and the Mount Elbert Powerplant generation resulting from Fryingpan-Arkansas Project water deliveries. The total load includes energy deliveries under firm contracts, seasonal support energy deliveries, energy dedicated for C-BT use, estimates of station service energy, and estimates of transmission system losses.

Under the reasonable-minimum runoff conditions plan from October, 2014, the Gross generation for the C-BT powerplants is projected to be 459.0 GWh in WY 2015 while the total System generation is projected to be 1,741.4 GWh during WY 2015, 269.8 GWh less than the total generation projected under most probable runoff conditions. Under this plan, pump energy requirements for the C-BT would total 41.9 GWh. The total System load is expected to be 2,162.5 GWh over the entire WY, leaving a total generation shortfall of 421.1 GWh. Under the reasonable-minimum runoff conditions, total generation shortfalls are expected for almost every month except for May, June and August.

If reasonable-maximum runoff conditions occur during WY 2015, the C-BT powerplants should produce 543.3 GWh of power generation while the System total generation should reach 2,375.6 GWh, 364.4 GWh more than the generation projected under most-probable runoff conditions. Under the reasonable-maximum conditions the total C-BT pump energy requirements would be 41.4 GWh. The total System load is expected to be 2,162.5 GWh over the entire WY, leaving a total generation surplus of 213.1 GWh.

Tables 4A through 4C summarize the projected monthly System generation, pump energy, and loads for the three forecasted runoff conditions for WY 2015. Exhibits 3A through 3C graphically display the gross generation less pumping for the C-BT contributing to the System for the most probable, reasonable-minimum, and reasonable-maximum inflow conditions. Tables 5A and 5B lists the scheduled maintenance for the various facilities in the C-BT. Tables 6 and 7 summarize the capacity data for the powerplants and pumping plants within the System, including the Yellowtail and Mount Elbert Units.

Table 1

WESTERN DIVISION SYSTEM
GENERATION FOR WY 2014

Powerplant	Accum. Gross Generation 1/		
	WY 2014 (GWH)	Avg 2/ (GWH)	% of Avg
Green Mtn.	94.4	51.9	181
Marys Lake	35.4	37.3	95
Estes	92.8	100.3	104
Pole Hill	189.1	172.3	93
Flatiron 1&2	242.7	226.7	107
Big Thompson	2	10.9	18
Seminoe	122	132.5	92
Kortes	132.4	140.3	94
Fremont C.	140.3	239.6	59
Alcova	76.2	118.1	65
Glendo	83.4	80.3	104
Guernsey	16.5	19.4	85
Boysen	58.6	69.3	85
Heart Mtn.	17.4	15.7 3/	111
Buffalo Bill	94.8	68.3 3/	139
Shoshone	20.2	20.3 3/	100
Spirit Mtn.	15.2	14.7 3/	103
Mt. Elbert	40.8	169.0 4/	24
Yellowtail	510	959.0 5/	53
Total	1984.2	2645.9	75

1/ Oct-Sep
2/ 1976-2005 average
3/ 1995-2012 average
4/ 1990-1999 average
5/ 1971-1990 average; In general 1/2 of Yellowtail energy is dedicated to the Western Division System through marketing arrangement. The other 1/2 is marketed in Eastern Division System.

Table 2

PUMP ENERGY USED DURING WY2014

Pumping Plant	Oct-September Pump Energy		
	WY2013 (GWH)	Avg 1/ (GWH)	% of Avg
Willow Crk	10.8	5.7	190
Farr	25.2	30.6	82
Flatiron 3	36.6	26.8	137
Mt. Elbert	290.1	182.1 2/	159
Total	362.7	245.2	148

1/ 1976-2005 average

2/ 1990-1999 average

Table 3

PICK-SLOAN MISSOURI BASIN PROGRAM WESTERN DIVISION POWER SYSTEM
WATER YEAR 2014 OPERATIONS
GROSS GENERATION LESS PUMPING IN GIGAWATT-HOURS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Mt. Elbert *	0.5	5.4	0.2	0.0	0.0	4.9	7.3	6.7	8.0	4.4	3.4	0.0	40.8
Green Mtn.	5.4	4.6	2.9	3.5	3.7	6.4	7.1	13.6	15.1	15.6	8.0	8.5	94.4
Willow Cr. pump	0.3	0.5	0.0	0.0	0.0	0.0	2.2	5.5	1.6	0.7	0.0	0.0	10.8
Farr pump	0.0	0.1	2.4	5.2	4.8	5.5	3.3	0.9	0.0	0.3	0.4	2.3	25.2
Marys Lake	0.0	0.0	2.4	6.0	5.5	6.0	5.2	4.1	0.4	1.6	0.7	3.6	35.4
Estes	0.0	0.0	6.6	15.2	13.7	15.3	12.9	10.3	1.7	4.7	2.9	9.5	92.8
Pole Hill	0.0	0.0	9.0	24.3	21.6	24.4	23.5	23.8	22.3	17.8	5.9	16.6	189.1
Flatiron 1&2	0.2	1.3	13.3	28.6	26.7	31.2	30.0	30.4	29.3	21.5	9.5	20.7	242.7
Flatiron 3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	1.2
Flatiron 3 pump	0.0	0.0	1.9	6.9	6.0	6.5	5.8	1.3	3.3	0.0	0.5	4.4	36.6
Big Thompson	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.3	0.0	2.0
Seminoe	4.6	3.8	4.1	4.0	3.5	3.7	12.3	16.5	25.8	21.5	15.5	6.7	122.0
Kortes	6.0	5.2	5.5	5.5	4.9	4.8	15.9	19.9	22.6	16.8	17.5	7.8	132.4
Fremont Canyon	0.4	7.0	4.6	6.4	6.4	14.2	14.4	7.5	23.1	41.5	5.1	9.7	140.3
Alcova	3.2	3.1	3.2	3.2	2.9	5.6	2.9	3.0	9.9	24.4	12.0	2.8	76.2
Glendo	0.0	0.0	0.0	0.0	0.0	0.0	3.9	15.9	13.6	23.4	20.4	6.2	83.4
Guernsey	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.3	2.9	1.5	4.1	3.8	16.5
Pilot Butte **	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Boysen	0.0	0.0	0.0	0.0	0.0	2.4	8.8	10.6	11.1	9.9	8.6	7.2	58.6
Shoshone	1.7	1.7	1.8	1.7	1.3	1.4	1.7	1.6	1.7	1.9	2.0	1.7	20.2
Buffalo Bill	3.3	4.9	2.0	2.7	2.9	4.6	13.1	13.0	13.4	12.9	9.2	12.8	94.8
Spirit Mtn.	0.7	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.8	3.4	3.4	2.9	15.2
Diamond Cr. pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heart Mtn.	1.0	0.0	0.0	0.0	0.0	0.0	0.2	3.4	3.1	3.1	3.3	3.3	17.4
Yellowtail/2	17.8	20.8	27.0	27.9	23.8	53.8	75.9	79.1	51.5	54.1	31.8	46.7	510.0
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Fry-Ark	0.5	5.4	0.2	0.0	0.0	4.9	7.3	6.7	8.0	4.4	3.4	0.0	40.8
CBT	6.0	5.3	29.9	65.5	60.4	71.3	67.4	74.5	63.9	61.9	26.7	52.3	585.0
North Platte	14.2	19.1	17.4	19.1	17.7	28.3	50.3	66.1	97.9	129.1	74.7	37.0	570.9
Bighorn	24.5	27.4	30.8	32.3	28.0	62.2	99.7	109.8	83.6	85.2	58.3	74.6	716.2
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TOTAL GEN	45.1	57.2	78.2	116.9	106.1	166.7	224.7	257.1	253.4	280.6	162.9	163.9	1912.8
TOTAL LOAD	162.5	162.3	177.2	172.6	137.1	149.2	176.3	184.8	211.2	262.2	211.2	156.8	2163.4
SURPLUS/DEFICIT	-117.4	-105.1	-99.0	-55.7	-31.0	17.5	48.4	72.3	42.2	18.4	-48.3	7.1	-250.6

Table 4A

PICK-SLOAN MISSOURI BASIN PROGRAM WESTERN DIVISION POWER SYSTEM
WATER YEAR 2015 FORECASTED OPERATIONS
MOST PROBABLE WATER SUPPLY CONDITION
GROSS GENERATION AND PUMPING IN GIGAWATT-HOURS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Mt. Elbert *	1.3	2.4	2.4	2.5	3.1	2.5	3.5	3.9	4.7	4.4	2.0	1.0	33.7
Green Mtn.	7.3	2.3	2.3	2.0	1.8	2.1	2.6	3.5	5.9	10.1	9.5	8.2	57.4
Willow Cr. pump	0.2	0.1	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.3	0.3	2.1
Farr pump	0.6	0.4	1.3	3.5	2.2	0.9	0.8	0.0	0.0	2.6	0.7	1.4	14.5
Marys Lake	1.5	0.0	1.7	4.7	3.0	1.3	2.1	4.3	4.6	6.1	1.5	1.8	32.5
Estes	3.9	2.1	4.4	11.8	7.8	3.5	5.6	10.6	11.3	14.9	3.9	4.7	84.3
Pole Hill	5.9	3.2	6.5	19.8	12.6	5.3	9.7	22.6	24.3	25.1	6.5	8.4	149.9
Flatiron 1&2	7.2	3.7	7.9	23.3	14.8	6.5	11.4	26.1	28.0	28.9	7.9	9.9	175.5
Flatiron 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 pump	0.0	0.0	1.0	6.3	3.4	0.0	2.0	3.5	5.4	6.1	0.0	0.1	27.9
Big Thompson	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.0	0.2	0.8	1.1	4.3
Seminoe	5.5	5.3	5.5	5.4	4.9	5.4	13.0	26.4	26.3	27.5	26.9	10.2	162.4
Kortes	5.6	5.4	5.6	5.6	5.0	5.6	13.3	26.4	25.6	26.4	26.4	10.2	161.3
Fremont Canyon	0.1	6.2	6.4	6.4	5.7	12.3	29.9	40.2	43.8	43.5	40.2	17.8	252.4
Alcova	4.0	3.6	3.8	3.8	3.4	6.7	12.4	19.8	21.0	20.4	18.5	10.2	127.6
Glendo	0.0	0.0	0.0	0.0	0.0	0.0	2.6	17.1	19.2	24.3	19.0	6.2	88.3
Guernsey	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.8	3.7	3.8	3.8	3.4	20.6
Pilot Butte**	0.4	0.0	0.0	0.0	0.0	0.0	0.6	1.2	1.2	1.2	1.2	1.2	7.0
Boysen	4.5	4.7	4.8	4.8	4.3	4.7	6.2	11.1	11.5	11.6	9.8	6.9	85.0
Shoshone	1.1	2.2	2.2	2.2	0.2	1.1	1.1	2.1	2.2	2.2	2.2	1.1	20.0
Buffalo Bill	13.0	0.2	0.0	0.0	0.0	4.2	5.2	13.4	13.0	13.4	12.7	12.7	87.8
Spirit Mtn.	1.6	0.0	0.0	0.0	0.0	0.0	1.6	2.6	2.8	3.2	3.3	3.0	18.2
Diamond Cr. pu	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heart Mtn.	1.9	0.0	0.0	0.0	0.0	0.0	2.2	4.5	4.3	4.5	4.5	3.1	24.8
Yellowtail/2	40.0	32.4	33.3	32.9	29.0	32.4	31.1	58.3	48.8	43.0	42.0	39.5	462.7
Fry-Ark	1.3	2.4	2.4	2.5	3.1	2.5	3.5	3.9	4.7	4.4	2.0	1.0	33.7
CBT	25.3	10.7	20.4	51.7	34.3	17.9	27.6	64.4	69.6	76.5	29.0	32.2	459.5
North Platte	15.1	20.5	21.2	21.2	19.1	30.1	73.3	133.7	139.6	146.0	134.8	58.0	812.5
Bighorn	62.6	39.6	40.4	39.9	33.5	42.5	47.9	93.2	83.8	79.1	75.7	67.5	705.5
TOTAL GEN	104.2	73.2	84.4	115.3	90.0	92.9	152.4	295.2	297.7	305.9	241.4	158.7	2011.2
TOTAL LOAD	162.4	162.2	177.1	172.6	137.0	149.3	176.4	184.7	211.0	262.0	211.2	156.6	2162.5
SURPLUS/DEF	-58.2	-89.0	-92.7	-57.3	-47.0	-56.4	-24.0	110.5	86.7	43.9	30.2	2.1	-151.3

* PROJECTED VALUES ARE HISTORIC AVERAGE FLOW THROUGH ENERGY

** PROJECTED VALUES ARE MARKETED ENERGY

Table 4B

PICK-SLOAN MISSOURI BASIN PROGRAM WESTERN DIVISION POWER SYSTEM
WATER YEAR 2015 FORECASTED OPERATIONS
REASONABLE MINIMUM WATER SUPPLY CONDITION
GROSS GENERATION AND PUMPING IN GIGAWATT-HOURS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Mt. Elbert *	1.3	2.4	2.4	2.5	3.1	2.5	3.5	3.9	4.7	4.4	2.0	1.0	33.7
Green Mtn.	7.3	2.4	2.3	2.0	1.8	1.9	1.0	1.1	0.7	5.4	5.4	4.9	36.1
Willow Cr. pump	0.2	0.1	0.0	0.0	0.0	0.0	1.1	2.0	0.6	0.5	0.1	0.1	4.6
Farr pump	0.6	0.5	1.4	3.6	2.3	0.9	1.5	0.0	0.0	0.2	1.9	2.3	15.1
Marys Lake	1.5	0.0	1.8	4.8	3.1	1.4	2.8	3.9	3.6	1.3	2.5	2.8	29.6
Estes	3.9	2.2	4.8	11.9	8.0	3.6	7.4	9.8	8.9	3.5	6.5	7.4	77.8
Pole Hill	5.9	3.4	7.4	20.0	13.2	5.4	11.9	19.3	23.8	9.6	10.3	12.0	142.3
Flatiron 1&2	7.2	4.0	8.9	23.5	15.5	6.6	14.0	22.9	27.4	11.3	12.1	14.1	167.5
Flatiron 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 pump	0.0	0.0	1.2	6.3	3.7	0.0	3.5	4.6	2.8	0.0	0.0	0.0	22.1
Big Thompson	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.0	0.9	0.8	1.2	5.6
Seminoe	5.5	5.3	5.4	5.4	4.9	5.4	8.4	16.4	16.0	16.4	15.9	15.7	120.8
Kortes	5.6	5.4	5.6	5.6	5.1	5.6	8.7	16.9	16.4	16.9	16.9	17.4	126.2
Fremont Canyon	0.1	6.1	6.3	6.3	5.7	11.4	35.9	39.2	42.6	42.8	41.3	15.7	253.5
Alcova	4.0	3.6	3.8	3.8	3.4	6.3	15.6	19.8	23.3	24.1	24.1	11.3	143.1
Glendo	0.0	0.0	0.0	0.0	0.0	0.0	3.4	14.0	18.8	22.7	17.4	6.3	82.6
Guernsey	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.8	3.7	3.8	3.8	3.4	20.5
Pilot Butte **	1.2	0.5	0.0	0.0	0.0	0.0	0.8	1.9	4.0	3.8	3.7	1.7	17.6
Boysen	4.5	4.7	4.8	4.8	4.2	4.7	3.5	5.3	6.0	5.9	5.1	3.6	57.0
Shoshone	1.6	2.2	2.2	2.2	0.2	1.1	1.1	1.1	1.1	1.2	1.2	1.1	16.3
Buffalo Bill	13.4	0.2	0.0	0.0	0.0	4.2	4.0	13.3	12.8	13.1	11.9	10.9	83.7
Spirit Mtn.	1.2	0.0	0.0	0.0	0.0	0.0	1.1	2.9	3.0	3.1	3.0	2.9	17.2
Diamond Cr. pu	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heart Mtn.	0.9	0.0	0.0	0.0	0.0	0.0	0.9	1.5	1.7	3.1	2.5	0.3	10.8
Yellowtail/2	37.2	31.9	32.7	32.3	28.3	27.4	20.5	23.5	27.0	28.2	27.2	25.1	341.2
Fry-Ark	1.3	2.4	2.4	2.5	3.1	2.5	3.5	3.9	4.7	4.4	2.0	1.0	33.7
CBT	25.2	11.4	22.5	52.3	35.7	17.9	31.0	50.9	63.2	31.3	35.6	40.1	417.1
North Platte	15.1	20.5	21.2	21.1	19.1	28.7	74.0	110.2	120.8	126.8	119.5	69.8	746.6
Bighorn	59.9	39.5	39.8	39.3	32.8	37.3	31.8	49.5	55.7	58.3	54.6	45.5	543.9
TOTAL GEN	101.5	73.8	85.9	115.2	90.6	86.4	140.4	214.6	244.3	220.8	211.6	156.4	1741.4
TOTAL LOAD	162.4	162.2	177.1	172.6	137.0	149.3	176.4	184.7	211.0	262.0	211.2	156.6	2162.5
SURPLUS/DEF	-60.9	-88.4	-91.2	-57.4	-46.4	-62.9	-36.1	29.9	33.3	-41.2	0.4	-0.2	-421.1

* PROJECTED VALUES ARE HISTORIC AVERAGE FLOW THROUGH ENERGY
** PROJECTED VALUES ARE MARKETED ENERGY

Table 4C

PICK-SLOAN MISSOURI BASIN PROGRAM WESTERN DIVISION POWER SYSTEM
WATER YEAR 2015 FORECASTED OPERATIONS
REASONABLE MAXIMUM WATER SUPPLY CONDITION
GROSS GENERATION AND PUMPING IN GIGAWATT-HOURS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Mt. Elbert *	1.3	2.4	2.4	2.5	3.0	2.5	3.5	3.9	4.7	4.4	2.0	1.0	33.6
Green Mtn.	7.3	2.4	2.3	2.0	2.3	3.0	2.5	5.6	18.0	18.6	14.3	7.9	86.1
Willow Cr. pum	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8
Farr pump	0.2	0.4	1.1	3.5	2.2	0.8	0.4	0.0	0.0	0.0	1.5	1.4	11.5
Marys Lake	1.0	0.0	1.4	4.7	2.9	1.3	1.9	2.9	2.6	5.2	3.6	2.2	29.7
Estes	2.6	2.1	3.6	11.6	7.6	3.4	4.9	7.6	7.1	12.8	8.9	5.8	78.0
Pole Hill	4.1	3.1	5.4	19.5	12.3	5.2	8.6	20.2	24.3	25.1	19.8	11.1	158.7
Flatiron 1&2	4.8	3.7	6.6	23.1	14.4	6.3	10.2	23.6	28.0	28.9	23.3	13.1	185.8
Flatiron 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 pump	0.0	0.0	0.5	6.3	3.4	0.0	1.8	5.3	3.4	5.8	2.7	0.0	29.1
Big Thompson	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.0	0.2	1.7	1.2	5.0
Seminoe	5.5	5.3	5.5	5.5	4.9	27.6	29.7	31.7	32.2	32.5	15.8	15.1	211.2
Kortes	5.6	5.4	5.6	5.6	5.0	27.6	26.7	27.6	26.7	27.6	15.2	14.7	193.4
Fremont Canyo	0.1	6.2	6.4	6.4	5.8	15.9	33.7	31.0	45.8	47.3	47.3	18.3	264.0
Alcova	4.0	3.6	3.8	3.8	3.4	8.4	13.9	14.6	26.7	27.6	27.6	15.8	152.9
Glendo	0.0	0.0	0.0	0.0	0.0	0.5	4.9	21.4	26.9	24.0	19.8	9.9	107.4
Guernsey	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.8	3.7	3.8	3.8	3.4	22.1
Pilot Butte**	1.6	0.0	0.0	0.0	0.0	0.0	0.7	1.5	3.5	4.1	3.0	1.7	16.1
Boysen	4.6	4.8	4.9	4.9	4.4	8.9	11.1	10.7	11.4	11.9	11.9	7.6	97.0
Shoshone	1.2	2.2	2.2	2.2	0.2	1.1	1.8	2.2	2.2	2.2	2.2	1.1	21.0
Buffalo Bill	13.4	0.2	0.0	0.0	0.0	4.2	13.0	13.4	13.0	13.4	13.4	12.7	96.6
Spirit Mtn.	1.7	0.0	0.0	0.0	0.0	0.0	1.5	2.6	2.8	3.2	3.2	3.0	18.0
Diamond Cr. pu	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heart Mtn.	2.2	0.0	0.0	0.0	0.0	0.0	2.2	4.5	4.3	4.5	4.5	3.6	25.7
Yellowtail/2	42.9	33.0	34.0	33.6	29.7	47.6	70.9	75.3	72.9	75.3	53.3	46.1	614.6
Fry-Ark	1.3	2.4	2.4	2.5	3.0	2.5	3.5	3.9	4.7	4.4	2.0	1.0	33.6
CBT	19.7	10.7	17.6	51.1	33.9	18.2	26.0	55.4	77.6	84.9	67.4	39.5	501.9
North Platte	15.1	20.5	21.2	21.2	19.1	80.0	112.6	130.1	161.9	162.9	129.5	77.1	951.1
Bighorn	67.6	40.2	41.1	40.7	34.3	61.8	101.2	110.2	110.0	114.6	91.5	75.8	889.0
TOTAL GEN	103.7	73.8	82.2	115.5	90.3	162.5	243.3	299.5	354.2	366.8	290.4	193.4	2375.6
TOTAL LOAD	162.4	162.2	177.1	172.6	137.0	149.3	176.4	184.7	211.0	262.0	211.2	156.6	2162.5
SURPLUS/DEF	-58.7	-88.4	-94.9	-57.1	-46.7	13.2	66.9	114.8	143.2	104.8	79.2	36.8	213.1

* PROJECTED VALUES ARE HISTORIC AVERAGE FLOW THROUGH ENERGY

** PROJECTED VALUES ARE MARKETED ENERGY

Table 5

COLORADO-BIG THOMPSON AND FRYINGPAN-ARKANSAS PROJECTS

ESTIMATED MAINTENANCE SCHEDULE FOR WATER YEAR 2015

Facility	Description of Work	Begin Date	End Date	Generation Affected	Water Ops Affected
Estes Unit 1	Headcover Repair	09-Oct-14	31-May-15	Y	N
Estes Unit 1	Annual Maintenance	09-Oct-14	31-May-15	Y	N
Flatiron SWYD KW2A	Annual Transformer Maintenance	9-Mar-15	12-Mar-15	Y	N
Flatiron Unit 3	Annual Maintenance	14-Sep-15	23-Oct-15	Y	Y
Flatiron Unit 2	Annual Maintenance	23-Feb-15	3-Apr-15	Y	N
Flatiron SWYD KW1A	Annual Transformer Maintenance	4-May-15	7-May-15	Y	N
Flatiron Unit 1	Annual Maintenance	20-Apr-15	29-May-15	Y	N
Big T Powerplant	Annual Maintenance	5-Jan-15	6-Feb-15	N	N
Big T Powerplant SWYD KW1A	Annual Transformer Maintenance	19-Jan-15	22-Jan-15	N	N
Hansen Canal 930 Section	Annual Maintenance of Canal	2-Apr-15	17-Apr-15	Y	Y
Hansen Canal 550 Section	Annual Maintenance of Canal	25-Sep-15	9-Oct-15	Y	Y
Green Mountain Unit 1	GM Unit 1 Annual Maintenance	5-Jan-15	13-Feb-15	N	N
Green Mountain Unit 2	GM Unit 2 Annual Maintenance	1-Sep-15	10-Oct-15	N	N
Green Mountain Unit 1	KZ1A Annual Transformer Maintenance	26-Jan-15	30-Jan-15	N	N
Green Mountain Unit 2	KZ2A Annual Transformer Maintenance	23-Mar-15	27-Mar-15	N	N
Mt Elbert Unit 1	Sump Inspection and Assessment	13-Jan-15	14-Jan-15	Y	N
Mt Elbert Unit 2	Sump Inspection and Assessment	13-Jan-15	14-Jan-15	Y	N
Mt Elbert Unit 1	Annual Maintenance	8-Sep-15	30-Oct-15	Y	N
Mt Elbert Unit 2	Annual Maintenance	26-Jan-15	20-mar-15	Y	N
Willow Creek Pump 1	Power Lead Repair Work	17-Sep-14	16-Mar-15	N	N
Willow Creek Pump 2	Power Lead and Rotor Repair Work	17-Sep-14	16-Mar-15	N	N
Pole Hill Powerplant	Annual Maintenance	2-Nov-15	11-Dec-15	N	N
Pole Hill SWYD K1A	Annual Transformer Maintenance	16-Nov-15	19-Nov-15	N	N
Dille Diversion Dam	Tentative Flood Recovery and Repair	2-Jun-15	30-Apr-17	Y	Y
	Other outages could take place between 02-Nov-15 and 11-Dec-15, during the C-BT maintenance season			N	N

TABLE 6

WESTERN DIVISION - PICK-SLOAN MISSOURI BASIN PROGRAM

POWERPLANT DATA

Facility	No. Units	Capacity Each Unit (kWh)	Total Installed Capacity (kWh)	Normal Operating Head (ft)	Output at Rated Head (ft^3/s)
Green Mountain	2	13,000	26,000	192-262	1,660
Marys Lake	1	8,100	8,100	202-217	550
Estes	3	16,500	49,500	551-571	1,300
Pole Hill	1	33,250	33,250	830-838	550
Flatiron units #1 & #2	2	43,000	86,000	1,096 - 1,118	1,070
(Flatiron 1/)	1	8,500	8,500	158-287	440
Big Thompson	1	5,300	5,300	183- 184	350
Seminoe	3	15,000	45,000	97-227	2,850
Kortes	3	12,000	36,000	192-204	2,700
Fremont Canyon	2	33,000	66,000	247-363	2,200
Alcova	2	18,000	36,000	153-165	2,200
Glendo	2	19,000	38,000	73-156	2,800
Guernsey	2	2,400	4,800	89-91	820
Pilot Butte2/	2	800	1,600	-- --	---
Boysen	2	7,500	15,000	72-112	2,415
Shoshone3/	1	3,000	3,000	-- --	---
Buffalo Bill3/	3	6,000	18,000	-- --	---
Heart Mountain	1	5,000	5,000	265-275	355
Mt. Elbert	2	103,000	206,000	447-477	6,400
Yellowtail	4	72,000	288,000	327-440	8,500
TOTAL	34	--------	979,050	----------	-------

TABLE 7

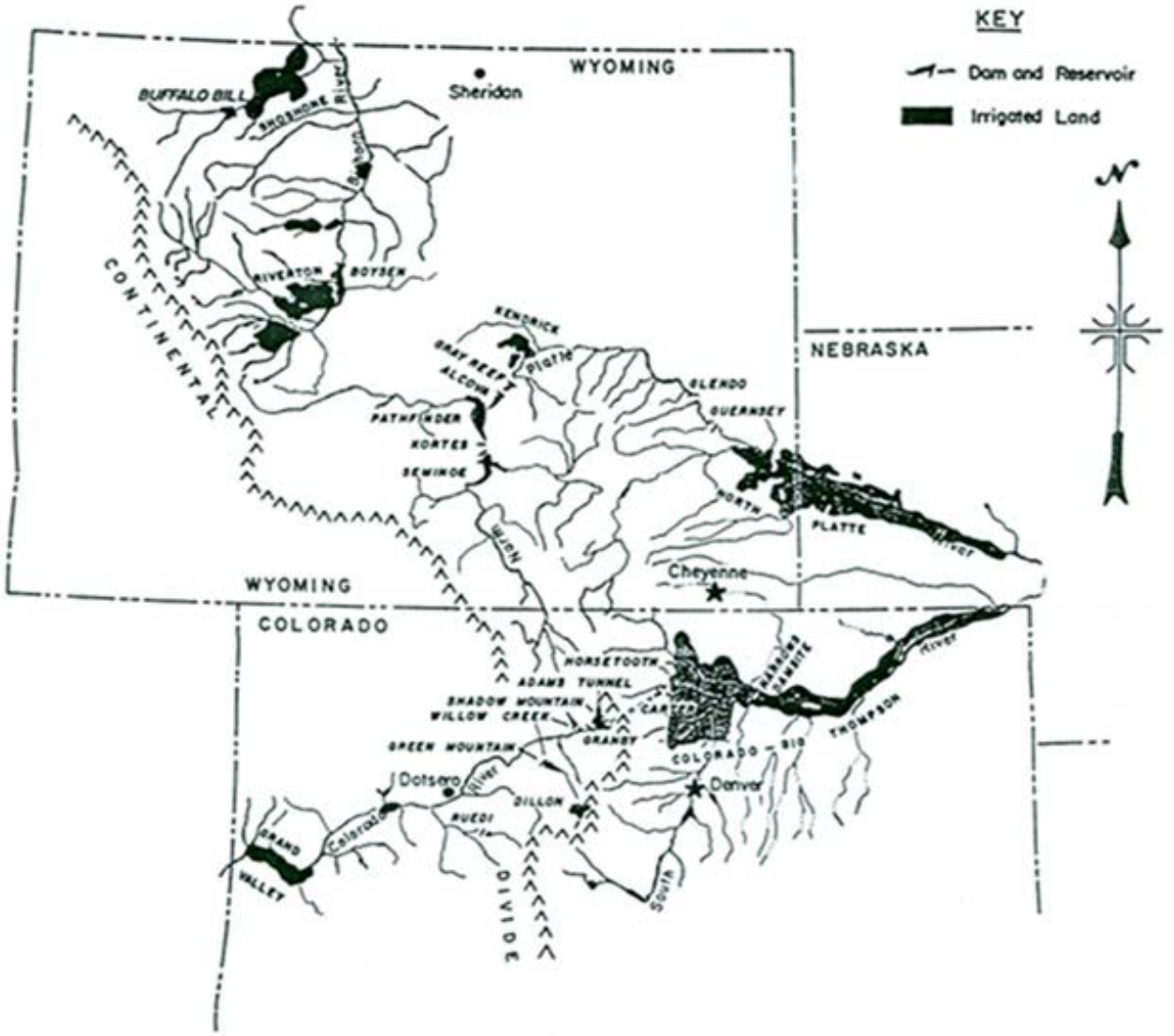
WESTERN DIVISION - PICK-SLOAN MISSOURI BASIN PROGRAM

PUMPING PLANT DATA

	Pumping Units			Plant Rating	
Facilities	No	Capacity (ft^3/s)	Normal Operating Head (ft)	Installed (Hp)	Kwh to Pump 1-Acre-ft at Maximum Head
Granby	3	600	92-186	18,000	227
Willow Creek	2	400	167-169	18,000	227
Flatiron	11/	440	173-287	13,000	391
Mt. Elbert	2	5,690	447-477	340,000	620

APPENDIX B - EXHIBITS

Exhibit 1



PICK-SLOAN MISSOURI BASIN PROJECT

WESTERN DIVISION

WATER RESOURCE MAP

50 0 50 100

SCALE OF MILES

MAP NO. X-700-121

JUNE 1, 1976

Exhibit 2

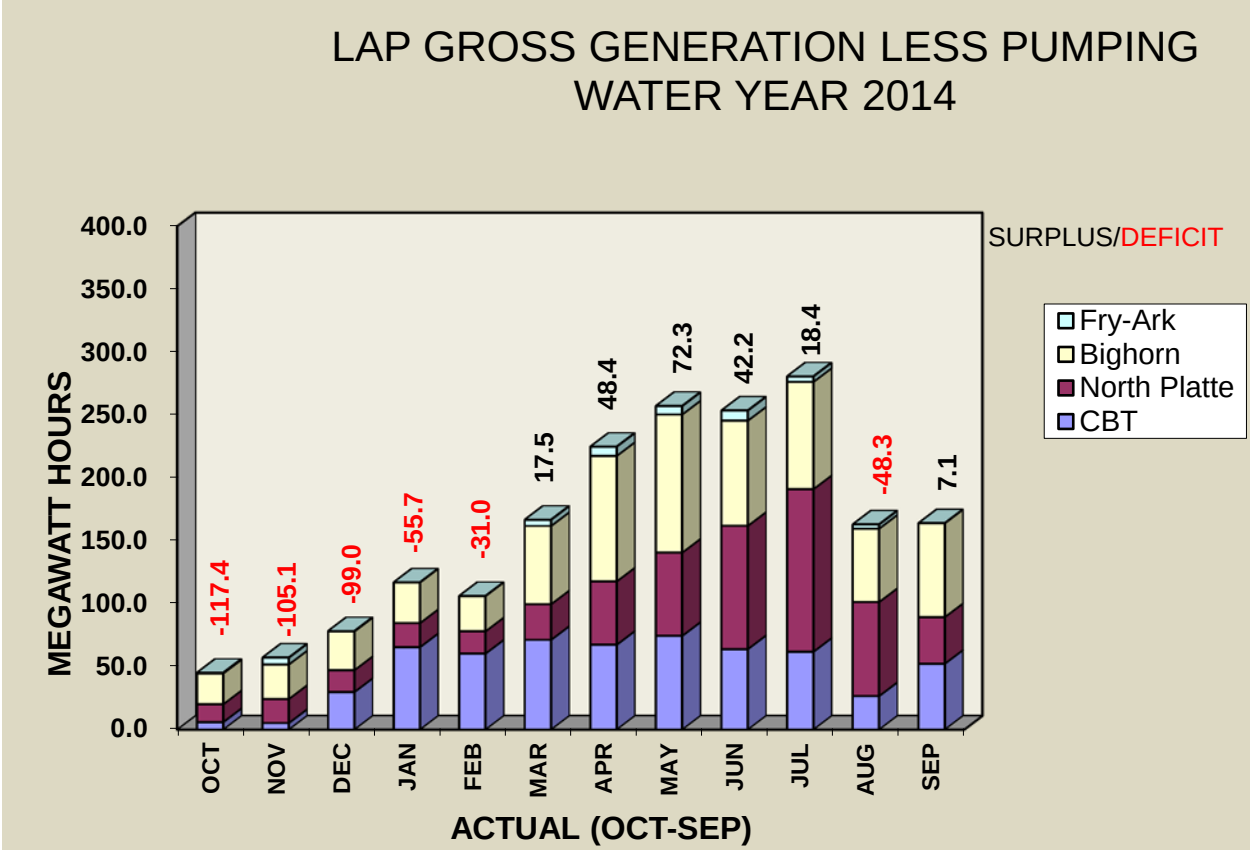

LAP GROSS GENERATION LESS PUMPING
WATER YEAR 2014
MEGAWATT HOURS
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
SURPLUS/DEFICIT
Fry-Ark
Bighorn
North Platte
CBT
-117.4
-105.1
-99.0
-55.7
-31.0
17.5
48.4
72.3
42.2
18.4
-48.3
7.1
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
ACTUAL (OCT-SEP)

Exhibit 3A

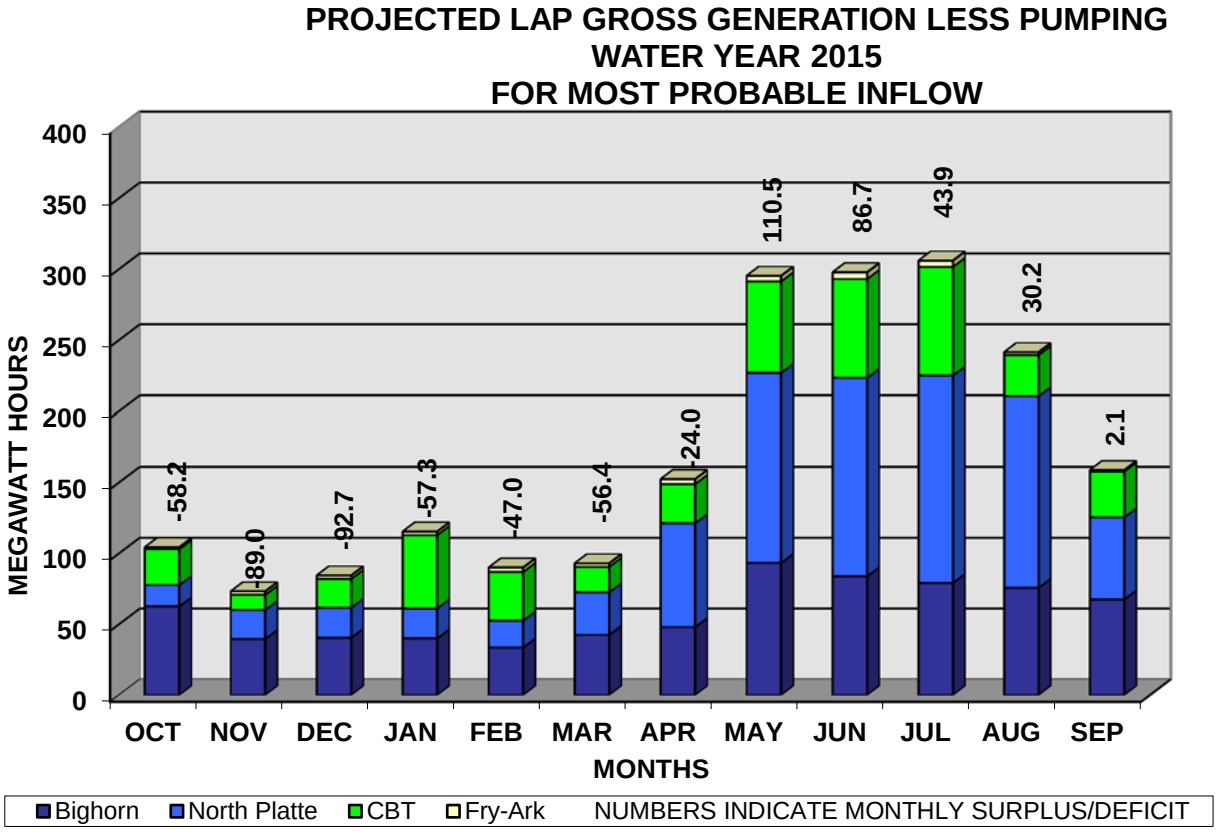

PROJECTED LAP GROSS GENERATION LESS PUMPING
WATER YEAR 2015
FOR MOST PROBABLE INFLOW
MEGAWATT HOURS
400
350
300
250
200
150
100
50
0
-58.2
-89.0
-92.7
-57.3
-47.0
-56.4
-24.0
110.5
86.7
43.9
30.2
2.1
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
MONTHS
Bighorn
North Platte
CBT
Fry-Ark
NUMBERS INDICATE MONTHLY SURPLUS/DEFICIT

Exhibit 3B

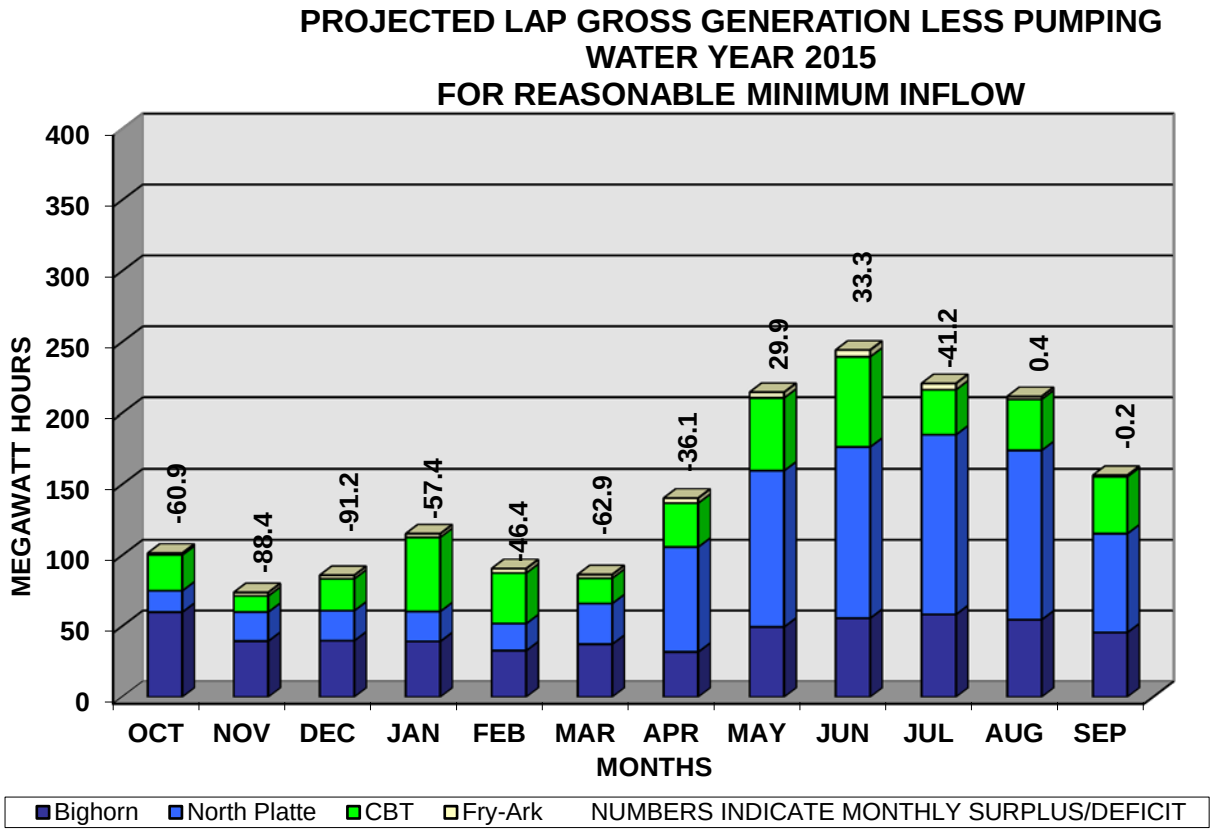
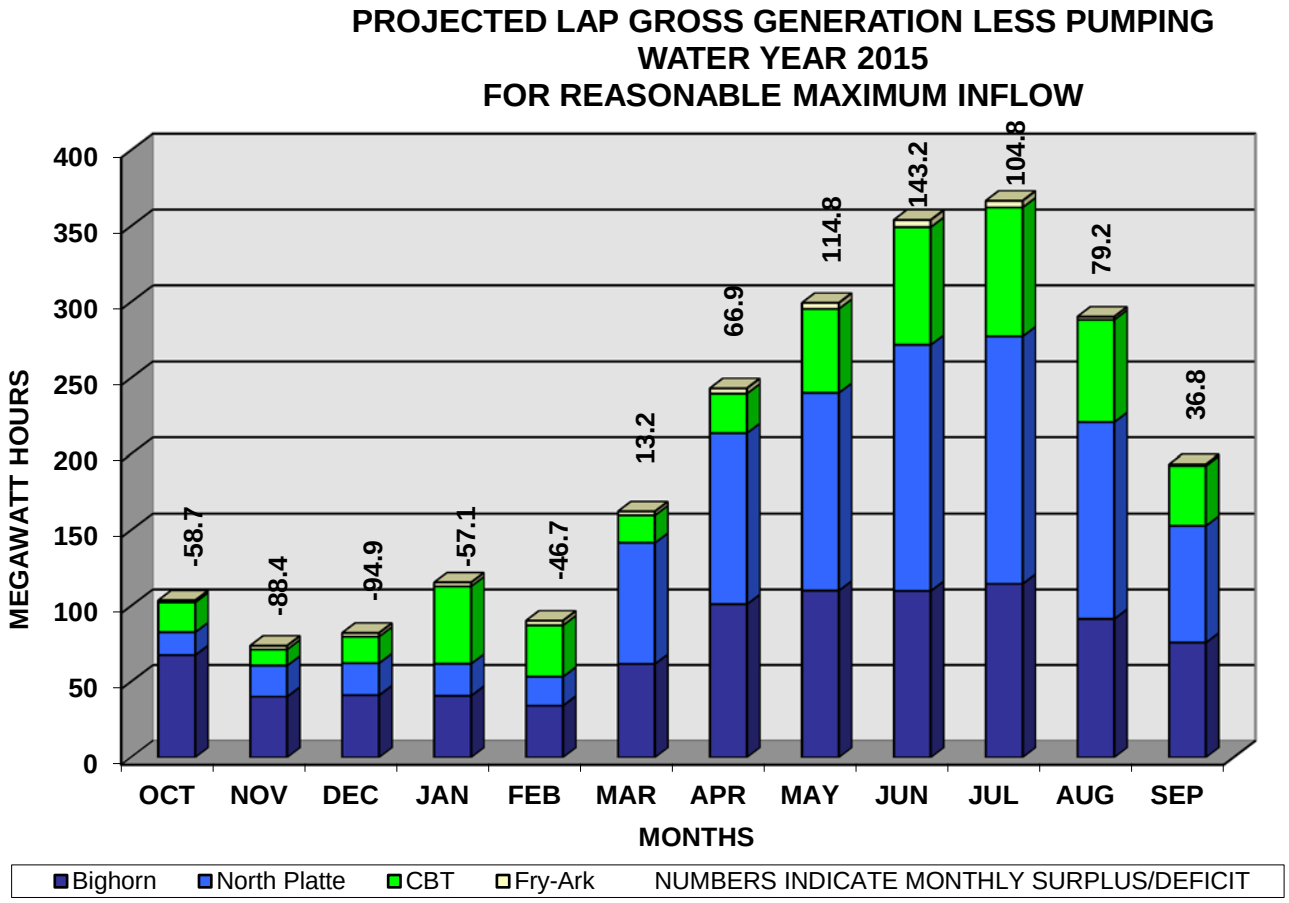

PROJECTED LAP GROSS GENERATION LESS PUMPING
WATER YEAR 2015
FOR REASONABLE MINIMUM INFLOW
MEGAWATT HOURS
400
350
300
250
200
150
100
50
0
-60.9
-88.4
-91.2
-57.4
-46.4
-62.9
-36.1
29.9
33.3
-41.2
0.4
-0.2
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
MONTHS
Bighorn
North Platte
CBT
Fry-Ark
NUMBERS INDICATE MONTHLY SURPLUS/DEFICIT

Exhibit 3C


PROJECTED LAP GROSS GENERATION LESS PUMPING
WATER YEAR 2015
FOR REASONABLE MAXIMUM INFLOW
MEGAWATT HOURS
400
350
300
250
200
150
100
50
0
-58.7
-88.4
-94.9
-57.1
-46.7
13.2
66.9
114.8
143.2
104.8
79.2
36.8
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
MONTHS
Bighorn
North Platte
CBT
Fry-Ark
NUMBERS INDICATE MONTHLY SURPLUS/DEFICIT