



# LOVELAND UTILITIES COMMISSION REGULAR MEETING

**February 20, 2013 - 4:00 p.m.**  
*Service Center Board Room*  
*200 North Wilson Avenue*



## **AGENDA**

**4:00 pm - CALL TO ORDER**

**4:05 pm - APPROVAL OF MINUTES - 1/16/2013**

### **CITIZENS REPORTS**

**4:10 pm - CONSENT AGENDA**

1. 2013 Renewal for Services Contract for Liquid Waste Management for Hauling & Land Application of Biosolids – Michael McCrary

**4:15 pm - REGULAR AGENDA**

2. CBT Market Price Consideration – Scott Dickmeyer
3. Change of Installation of Services – Brieana Reed-Harmel
4. Draft Updated Water Conservation Plan – Lindsey Bashline & Tracy Bouvette

**5:15 pm - STAFF REPORT**

5. Oil & Gas Aquifers as Potential Raw Water Supply – Larry Howard
6. Financial Report Update – Jim Lees

**5:45 pm - 7. COMMISSION / COUNCIL REPORTS**

- Colorado Water Congress –January 31, 2013-February 1, 2013
- City Council Meeting on Water Financing – February 19, 2013

**8. DIRECTOR'S REPORT – Steve Adams**

### **INFORMATION ITEMS**

9. Status of Forest / Watershed Health Efforts – Greg Dewey
10. Electric Legislative Update – Kim O'Field
11. Water Legislative Update – Greg Dewey
12. Water Supply Update – Larry Howard
13. CBT Quota Setting Meeting Discussion – Larry Howard

### **ADJOURN**

*The City of Loveland is committed to providing an equal opportunity for citizens and does not discriminate on the basis of disability, race, color, national origin, religion, sexual orientation or gender.*

*The City will make reasonable accommodations for citizens in accordance with the Americans with Disabilities Act. For more information, please contact the City's ADA Coordinator at [bettie.greenberg@cityofloveland.org](mailto:bettie.greenberg@cityofloveland.org) or 970-962-3319.*



**Commission Members Present:**

C.J. McKinney, Dan Herlihey, Darell Zimbelman, David Schneider (Chair), Gary Hausman, Gene Packer (Vice Chair), John Rust Jr., Randy Williams

**Council Liaison:** Daryl Klassen

**City Staff Members:**

Alan Krcmarik, Bob Miller, Brieana Reed-Harmel, Chris Matkins, Darcy Hodge, Garth Silvernale, Greg Dewey, Gretchen Stanford, Jim Lees, John Duval, Kim O'Field, Lindsey Bashline, Lindsey Bashline, Michael McCrary, Michelle Stalker, Roger Berg, Steve Adams, Scott Dickmeyer, Sharon Citino, Tom Greene

**Guest Attendance:** Al Paquet (Ch2MHill)

**CALL TO ORDER:** Dave Schneider called the meeting to order at 4:05 pm.

**APPROVAL OF MINUTES:** Dave asked for a motion to approve the minutes of the November 14, 2012 meeting.

**Comments:** Dan Herlihey suggested in reference to John Chilson's citizen report, we should specify that we will utilize information from the available oil and gas drilling logs, rather than other area logs such as water logs.

**Motion:** Dan Herlihey made the motion to approve the revised minutes of the November 14, 2012 meeting.

**Second:** John Rust Jr. seconded the motion. The revised minutes were approved unanimously.

**CITIZEN REPORTS:** None

**CONSENT AGENDA**

**Item 1: 2012 4th Quarter Goals and Milestones Report – Steve Adams** This is a quarterly review of our progress on our 2012 utility goals and milestones report.

**Recommendation:** Discuss the presented information and approve the 4th Quarter 2012 LUC status report.

**Item 2: NCWCD Regional Water Treatment Plant Pre-Feasibility Study Intergovernmental Agreement – Greg Dewey** Agreement with the Northern Colorado Water Conservancy District for Participation in the 2012-2013 Regional Transmission and Treatment Study

**Recommendation:** Adopt a motion recommending that the City Council adopt a resolution approving the Agreement with the Northern Colorado Water Conservancy District for Participation in the 2012-2013 Regional Transmission and Treatment Study.

**Item 3: Liquid Waste Management Change Order for Hauling & Land Application of Biosolids – Michael McCrary** The cost of biosolids hauling and land application in 2012 exceeded the amount projected and budgeted. The contract with Liquid Waste Management, Inc. (LWM) has a not-to-exceed total of the budgeted amount of \$480,000. The percent and dollar amount of this change order require Loveland Utilities Commission approval. This administrative action is to increase the not-to-exceed price of this contract by \$115,000 to a total of \$595,000. This increase is due to an increase in hauling charges per gallon and an unexpected increase in the number of gallons hauled.

**Recommendation:** Adopt a motion approving a change order to the agreement with Liquid Waste Management for hauling and land application of biosolids for the Wastewater Treatment Plant to increase the contract amount by \$115,000 to a not-to-exceed contract price of \$595,000 and authorizing the City Manager to execute the change order.

**Item 4: Intergovernmental Agreement Between the City of Loveland and Larimer County for the LCCC Water & Energy Program Efficiency Audits and Training – Lindsey Bashline**

Resolution approving an Intergovernmental Agreement (IGA) between the City of Loveland and Larimer County for the Larimer County Conservation Corps, Water and Energy Program Efficiency Audits and Training.

**Recommendation:** Adopt a motion recommending that the City Council adopt the resolution approving the IGA with Larimer County for the Larimer County Conservation Corps, Water and Energy Program Efficiency Audits and Training.

**Item 5: Conversion of 282 C-BT units from a Temporary Use Permit to a permanent Section 131 Contract - Greg Dewey** Conversion of 282 C-BT Units from a Temporary Use Permit to a Permanent Section 131 Contract.

**Recommendation:** Recommend that City Council adopt the attached resolution authorizing the Director of the Department of Water and Power to sign the application for the Section 131 Contract.

**Motion:** Gary Hausman made the motion to accept consent agenda items as written

**Second:** Darell Zimbelman seconded the motion. The motion was approved unanimously.

## REGULAR AGENDA

**Item 6: Water Utility Financing Update – Jim Lees & Chris Matkins** Staff went to LUC six times and City Council three times in 2012 for input on the Water and Wastewater cost-of-service rate study. Funding the needs of the Water Utility has been the primary focus of these Study Sessions. After taking Council input into account, Staff is back with specific actions to carry out the consensus direction from Council for LUC consideration and recommendation.

At the November 27, 2012 City Council Study Session, the City Council gave consensus direction to meet the financing needs of the Water Utility through four specific instructions:

1. Pursue an external loan of \$10 million, with a 20 year length
2. Pursue an internal loan of \$6 million, with an 8 year length
3. Have the General Fund contribute \$750,000 per year for 8 years to pay for the principal portion of the internal loan, and have the Water Utility pay for the interest portion of the internal loan
4. Consensus support for the following series of rate increases to provide adequate cash flow to fund the Water Utility:  
2014: 13%  
2015-20119: 9% per year  
2020-2022: 8% per year

**Comments:**

Discussion ensued about how the Water Utility would be affected if it were to lose its enterprise fund status for a year. The Water Utility would not be able to enter into multi-year debt without passing an election. In cases of an emergency or disaster, the Water Utility could initially do a short term loan and then once the enterprise fund status was reinstated it could do a longer term loan. There would be a slim chance that Water Utility would be negatively affected if it needed funding for the Windy Gap project; however, funding for this project would probably not occur during 2014 when the Water Utility would potentially lose the enterprise fund status. The Water Utility would maintain the ability to set fees and charges, and it would not be penalized on future loan applications for having lost the enterprise

status for a year, but the change in fund status could trigger a more in-depth review prior to receiving financing.

Board and staff members discussed that if the \$6 million internal loan portion were to come from the Power Utility rather than the General Fund that the Power Utility would be able to maintain the enterprise fund status. Based on the loan repayment schedule, the Power Utility would still be able to complete all the projects included in their 10-year capital improvement plan. The Utilities have borrowed between themselves in the past, so this type of loan would not set a new precedence.

Discussion ensued over how LUC and City Council have differed in their views over the best way for the City to finance the Water Utility's needs and how much Council is willing to fund. City Council is looking to fund \$16 million of what was asked for, which includes the highest rate increases for a period of time ever requested by the Water Utility. They discussed the ramifications upon the Water Utility today due to not having raised water rates over the past ten years.

**Recommendation:**

- 1) Make a recommendation to City Council that they direct Staff to seek out the most advantageous external financing package
- 2) Make a recommendation to City Council that the source of funds for the internal loan be the Power Utility
- 3) Make a recommendation to City Council to adopt a resolution that:
  - a) Supports an annual transfer of \$750,000 from the General Fund to the Water Utility Fund to be used to pay the principal portion of the internal loan; and
  - b) Supports this series of rate increases:
    - 2014: 13%
    - 2015-2019: 9% per year
    - 2020-2022: 8% per year

**Motion:** Dan Herlihey made the motion.

**Second:** Gary Hausman seconded the motion. The motion was approved by all LUC board members present except David Schneider.

**Item 7: 2011 Comprehensive Master Plan Status Update – Steve Adams** In November 2012, Water and Power staff received a request from the City's Development Services Department to update the progress and status as of the end of 2012 on the Phase Two category "C" objectives and goals in the 2011 Comprehensive Master Plan for the Water, Power and Wastewater Utilities.

**Comments:** Board members asked that an update on the automatic meter reading pilot at the Medical Center of the Rockies be included on page 88. Also there was an inquiry as to whether we wanted to change the progress status on page 87 in regards to our talks with Johnstown to "In-progress". Staff responded that because we do not expect to be making any progress within the next four years that for now we consider this goal to be complete.

**Recommendation:** Discuss progress made on the objectives and goals and our plans and time frames in working on and completing the unfinished goals and objectives. Approve the status updates be approved and submitted to City Council.

**Motion:** Dan Herlihey made the motion with the addition of the automatic meter reading pilot project update.

**Second:** John Rust Jr. seconded the motion. The motion was approved unanimously.

**Item 8: LUC 2012 Accomplishments and 2013 Goals – Steve Adams** This item is to set new 2013 goals and review and update a staff compilation of the Utilities' 2012 accomplishments.

**Comments:** Staff and board commented that we should include the payment of \$100,000 to the City of Greeley for the fire mitigation as a 2012 Accomplishment. They also recommended that due to the audience of who will receive this information that we should spell out the acronyms. Board members recommended including photos and video clips where appropriate in our short presentation at the Boards and Commissions Summit.

**Recommendation:** That the LUC approve the list of 2012 accomplishments and 2013 goals determined through discussion at this LUC meeting.

**Motion:** Dan Herlihey made the motion with the addition of the \$100,000 assistance to City of Greeley for fire mitigation.

**Second:** Gary Hausman seconded the motion. The motion was approved unanimously.

## STAFF REPORTS

**Item 9: Marketing Update – Lindsey Bashline** As a Loveland Utilities Commission goal, staff was asked to expand communications, public outreach and marketing for utility programs, challenges, infrastructure concerns, rates and supply. This item presents a few of these recent communication improvements.

**Comments:** Many citizens have a high level of concern due to the receipt of letters from private companies that communicate an urgency for homeowners to insure their water lines. Board members requested that we include on our website information to education our citizens about which portions of the water, waste water, and power servicers are their responsibility and to educate about the average risk associated with these utility services. Board members liked the new videos included on the website. Dave Schneider mentioned that in addition to the video addressing the installation and use of back flow preventers on water hoses, we should also educate that these should be removed prior to when it freezes.

Staff Report only. No action required.

**Item 10: Drive Electric Northern Colorado – Brieana Reed-Harmel** This item will include an introduction and background to the Drive Electric Northern Colorado program in which the City of Loveland is participating.

**Comments:** Board members inquired as to the locations of where we will have charging stations and staff responded that they hope to have rapid charging stations near I-25 such as at Centerra. Board members also made inquiries as to the cost analysis of the programs, whether there are set standards for the charging stations and the affects upon businesses (construction costs and grants available, permitting, parking space allocated), dealing with accidents and vandalism, and the affects upon the electrical system. Staff responded with what standards and safety features are already in place and that at this point we are in the preliminary stages and will be looking to answer and plan for these types of questions. The adoption for all-electric vehicles is higher than for hybrids. This industry is in its infancy and will continue to grow.

Staff Report only. No action required.

**Item 11: November 2012 Financial Report Update – Jim Lees** This item summarizes the monthly and year-to-date financials for November.

Staff Report only. No action required.

## COMMISSION/COUNCIL REPORTS

### Item 12: Commission/Council Reports

- CFAC: Water Utility Financing Alternatives Meeting – November 14, 2012
- City Council Study Session: Water Utility Financing Alternatives – November 27, 2012
- CSU Engines Lab Tour – January 16, 2013

Board members appreciated the opportunity to go on this tour and learn how it works. They could see that this could be where the future is heading. Board members commented that the presentation at Net Zero symposium addressing the CSU Engine Labs was a great presentation. Board members expressed interest to follow up on how the CSU Engines Lab grows and what new things they will develop.

Dan Herlihey commented on the favorable news of the Windy Gap project that on December 4, 2012, the Grand County Board of County Commissioners voted to approve a permit and several related agreements that not only move the Windy Gap Firming Project forward, but mark a positive new step in the relationship between the West and East slopes of Colorado.

### Council Report: Daryle Klassen

#### ***Nov 20, 2012 Meeting:***

- City Council approved the second reading of Ordinance #5725 regarding water rights for service outside the city limits.

#### ***Nov 27, 2012 Study Session:***

- City Staff made a presentation regarding Water Utility Financing Scenarios for Infrastructure Needs update. City Council directed staff to return with solid details using the rate structure presented in Option B, which includes a \$10M bond for a 20 year external loan and a determination of whether a fixed rate for an internally borrowed \$6M loan could be used. A Option D was also presented, which includes a \$10M bond for a 20 year external loan and a 8-year \$6M internally borrowed loan.

#### ***Dec 4, 2012 Meeting:***

- N/A

#### ***Dec 11, 2012 Study Session:***

- N/A

#### ***Dec 18, 2012 Meeting:***

- Motion to approve Resolution #R-882012 approving an IGA between the City of Loveland and Platte River Power Authority for Demand Side Management Program funding was approved.

#### ***Jan 8, 2013 Study Session:***

- N/A

#### ***Jan 15, 2013 Meeting:***

- City Council heard a motion to approve Resolution #R-2-2013 to adopt a Three Mile Plan for the City of Loveland, consisting of plans covering infrastructure and utility services within the area extending three miles beyond current City limits.

**Comments:** Klassen gave an update a short update that Cumberland and Western has invested a couple million dollars into the project. Rather than filling the space with several smaller entities, they are holding out for larger tenants. Cumberland and Western said the process will be slow and methodical. Klassen said they have heard that Cumberland and Western are dealing with some large tenants, no names however.

## DIRECTOR'S REPORT

### Item 13: Director's Report – Steve Adams

**Comments:**

- Steve Adams will distribute information from PRPA, including their budget electronically to the LUC. Jackie Sargent will attend a future LUC meeting.
- Board members are interested to learn how successful the hydro turbine at Carter Lake is performing. Darell Zimbelman responded that he knew it was working well, but does not know the amount of power it is producing.
- The LUC Chair and Vice Chair, Dave Schneider and Gene Packer, will attend this year's Boards and Commissions Summit.
- Once we receive the agenda for the City Council Advance, Steve Adams will forward the agenda to the LUC.

## INFORMATION ITEMS

### Item 14: Water Supply Update – Greg Dewey Projection for water supply in 2013.

Information report only. No action required.

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**ADJOURN** The meeting was adjourned at 7:05 pm. The next LUC Meeting will be February 20, 2013 at 4:00 pm.

Respectfully submitted,

Michelle Stalker  
Recording Secretary  
Loveland Utilities Commission



**CITY OF LOVELAND**  
WATER & POWER DEPARTMENT  
200 North Wilson • Loveland, Colorado 80537  
(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

**AGENDA ITEM:** 1  
**MEETING DATE:** 2/20/2013  
**SUBMITTED BY:** Michael McCrary, Wastewater Treatment Plant Manager *MS for MM*

**TITLE:** 2013 Renewal for Service Contract for Liquid Waste Management for Hauling and Land Application of Biosolids

**DESCRIPTION:**

The not-to-exceed total in the LWM biosolids hauling contract for 2013 is \$536,000. This exceeds \$500,000 for the first time. Because this contract exceeds \$500,000 LUC approval is needed to execute this contract. This administrative action is to provide this approval.

**SUMMARY:**

The unit cost for hauling biosolids increased 13.7% in 2012 to \$0.0316/Gallon. A further, though more modest, increase in unit cost was negotiated for 2013. After a 1.78% increase, the unit cost for 2013 is \$0.0322/Gallon.

\$536,000 was budgeted for biosolids disposal in 2013 in the desire to capture the increase in unit volume cost. This is the amount we are using as the not-to exceed amount in the 2013 Biosolids Disposal contract with Liquid Waste Management.

**RECOMMENDATION:**

Adopt a motion approving the 2013 Contract for Liquid Waste Management for Hauling and Land Application of Biosolids with a not-to-exceed contract price of \$536,000 and authorizing the City Manager to execute the renewal for service contract.

**REVIEWED BY DIRECTOR:** *MS for SA*





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**AGENDA ITEM:**

**2**

**MEETING DATE:**

2/20/2013

**SUBMITTED BY:**

Scott Dickmeyer, Staff Engineer

*Levi P. Hickey, Jr.*

**TITLE:**

CBT Market Price Consideration

**DESCRIPTION:**

The City's cash-in-lieu fee is based primarily on the market price of one Colorado-Big Thompson Project (C-BT) unit as recognized by resolution of the Loveland Utilities Commission (LUC). On April 19, 2006 the LUC discussed with staff the process in which the LUC members desire to keep abreast of the changes to the market price of Colorado-Big Thompson Project units. Because of the trend in prices increasing for all transactions, staff recommends changing the City's currently recognized C-BT market price to \$10,667.

**SUMMARY:**

The City's cash-in-lieu fee is based primarily on the market price of one Colorado-Big Thompson Project (C-BT) unit as recognized by resolution of the Loveland Utilities Commission (LUC). The cash-in-lieu fee equals market price of one C-BT unit divided by the yield of one C-BT unit, multiplied by 1.05 ( $\$10,667 / 1.0 * 1.05 = \$11,200$ ). Staff is bringing forth this item to assist the LUC in recognizing the current market price, and recommends a change to the City's currently recognized price of \$8,190 to \$10,667 per C-BT unit. Making this change would result in an increase in the cash-in-lieu price from \$8,600 to \$11,200.

On April 19, 2006 the LUC discussed with staff the process in which the LUC members desire to keep abreast of the changes to the market price of Colorado-Big Thompson Project units. The LUC direction was as follows:

- Using sales as reported in the Water Strategist trade publication, any change of 5% in the C-BT sales price, up or down, over a running six-month period from the City's currently recognized price should trigger consideration of a price change by the LUC. Please note the Water Strategist is no longer published, but Stratecon, Inc sends out a monthly CBT Transactions Report. These reports were used in this analysis.
- Because use of cash-in-lieu payments in the current raw water policies is included as a convenience for small transactions of 4 acre-feet or less, more weight should be given to the smaller blocks of C-BT unit sales.
- Rapid trends in price for significant numbers of units over shorter periods of time should be pointed out to the LUC for evaluation and possible changes as needed.

Although every transfer of units from one party to another is published, some of the transfers are to meet development requirements and do not list a price. Only the transactions which list the selling price are taken into consideration.

The transactions were broken out into the following four categories: (1) 5 units or less, (2) 10 units or less, (3) 20 units or less, (4) all reported transactions regardless of number of units. The sale prices were used to determine the weighted average per unit in each of the above four categories. The weighted average values for a particular month and the previous five months were used to determine the six-month running weighted average. The most recent data is from December, 2012 and the attached table and graphs show data back to June 2012.

Focusing on the transactions with smaller blocks of units, the six-month running weighted averages for transactions of five units or less and ten units or less increased from the City's currently recognized C-BT market price by 16.9% and 15%, respectively. The same six-month running weighted averages for transactions of 20 units or less increased from the City's currently recognized C-BT market price by 12.6%. The six month running average for all transactions increased from the currently recognized C-BT market price by 14.2%.

Due to the trend in prices increasing for all transactions, staff recommends changing the City's currently recognized C-BT market price to \$10,667. A calculation sheet similar to the one described above is attached for the proposed recognized market price of \$10,667.

Staff will continue to monitor the market and provide updated information in the future.

**RECOMMENDATION:**

Adopt the attached Resolution R-1-2013U increasing the City's currently recognized price for C-BT water from \$8,190/unit to \$10,667/unit.

**REVIEWED BY DIRECTOR:** *MS for SA*

**ATTACHMENTS:**

- 1 - Resolution
- 2a – CBT Market Price Table
- 2b – CBT Weighted Moving Average Graph
- 2c – CBT Weighted Average Graph

# Attachment 1

## LOVELAND UTILITIES COMMISSION

### RESOLUTION #R-1-2013U

#### RESOLUTION RECOGNIZING THE MARKET PRICE OF ONE COLORADO-BIG THOMPSON PROJECT UNIT AS AUTHORIZED BY LOVELAND MUNICIPAL CODE SECTION 19.04.040

**WHEREAS**, Section 19.04.040 of the Loveland Municipal Code authorizes the Loveland Utilities Commission to recognize the market price of one Colorado-Big Thompson Project (“C-BT”) unit by resolution; and

**WHEREAS**, the Loveland Utilities Commission has reviewed relevant C-BT market data; and

**WHEREAS**, following said review, the Loveland Utilities Commission is of the opinion that the market price of one C-BT unit is \$10,667.

#### **NOW, THEREFORE, BE IT RESOLVED BY THE LOVELAND UTILITIES COMMISSION OF THE CITY OF LOVELAND, COLORADO:**

**Section 1.** That the Loveland Utilities Commission hereby recognizes that the market price of one C-BT unit is \$10,667.

**Section 2.** That Resolution #R-1-2012U of the Loveland Utilities Commission is hereby repealed and superseded in all respects by this Resolution.

**Section 3.** That this Resolution shall be effective as of the date of its adoption.

ADOPTED this 20<sup>th</sup> day of February, 2013.

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Chairman, Loveland Utilities Commission

ATTEST:

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Secretary, Loveland Utilities Commission

APPROVED AS TO FORM:

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Assistant City Attorney



## Recognition of C-BT Market Price

Current C-BT Market Price = \$8190

# Attachment 2a

### 10 units or less

Month	Number of Units	Average price/Unit	Weighted Average of 6 months	% difference of weighted average and market price of \$8190
Jun-12	0	\$ -	\$ 8,233	0.5%
Jul-12	31	\$ 8,968	\$ 8,720	6.5%
Aug-12	6	\$ 9,000	\$ 8,770	7.1%
Sep-12	9	\$ 10,017	\$ 8,966	9.5%
Oct-12	0	\$ -	\$ 9,022	10.2%
Nov-12	0	\$ -	\$ 9,177	12.1%
Dec-12	9	\$ 10,667	\$ 9,421	15.0%

### 20 units or less

Month	Number of Units	Average price/Unit	Weighted Average of 6 months	% difference of weighted average and market price of \$8190
Jun-12	20	\$ 8,500	\$ 8,381	2.3%
Jul-12	43	\$ 8,837	\$ 8,570	4.6%
Aug-12	6	\$ 9,000	\$ 8,596	5.0%
Sep-12	20	\$ 9,458	\$ 8,736	6.7%
Oct-12	0	\$ -	\$ 8,869	8.3%
Nov-12	0	\$ -	\$ 8,912	8.8%
Dec-12	9	\$ 10,667	\$ 9,220	12.6%

### 5 units or less

Month	Number of Units	Average price/Unit	Weighted Average of 6 months	% difference of weighted average and market price of \$8190
Jun-12	0	\$ -	\$ 8,684	6.0%
Jul-12	11	\$ 8,636	\$ 8,662	5.8%
Aug-12	6	\$ 9,000	\$ 8,789	7.3%
Sep-12	9	\$ 10,017	\$ 9,208	12.4%
Oct-12	0	\$ -	\$ 9,198	12.3%
Nov-12	0	\$ -	\$ 9,198	12.3%
Dec-12	9	\$ 10,667	\$ 9,576	16.9%

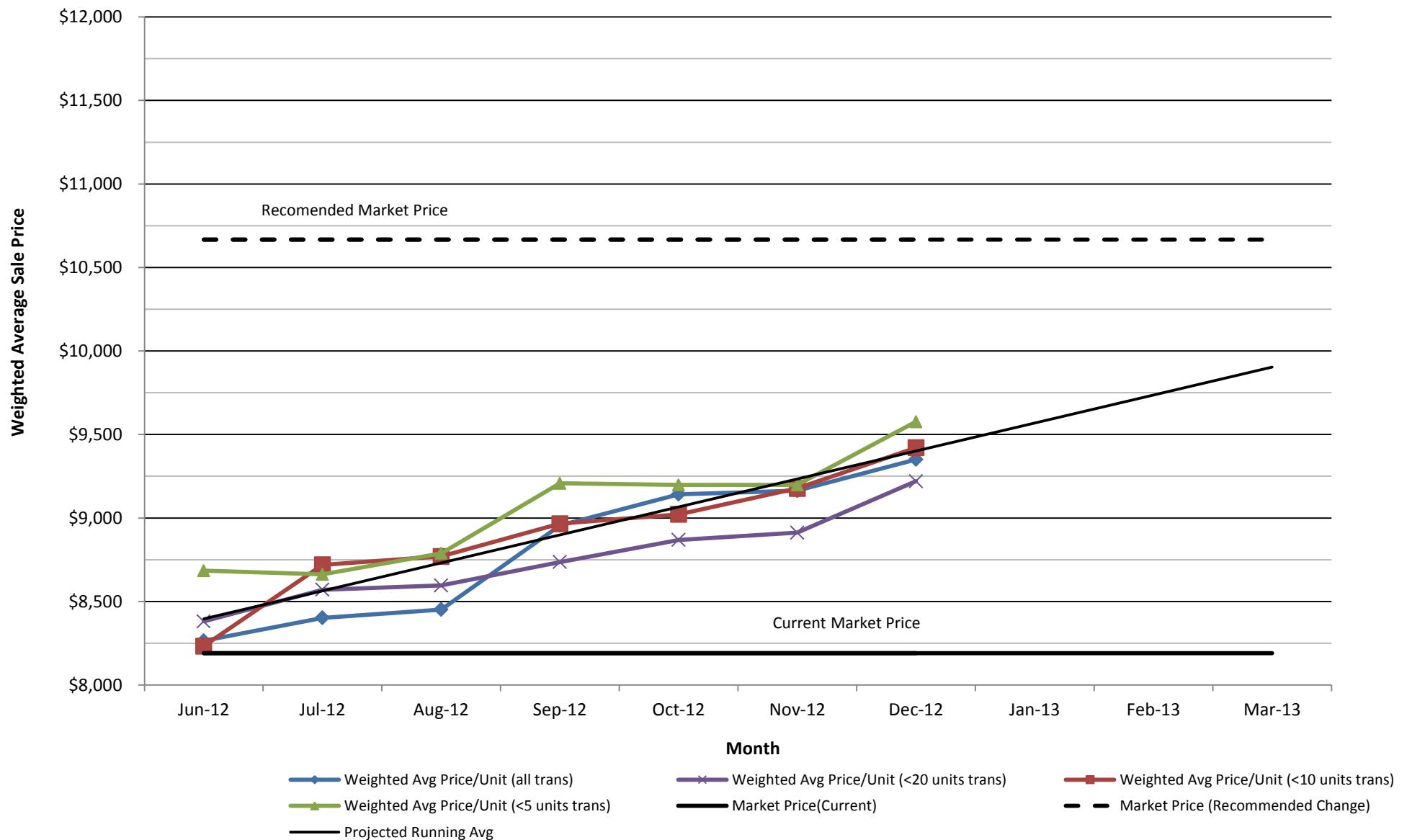
### All units

Month	Number of Units	Average price/Unit	Weighted Average of 6 months	% difference of weighted average and market price of \$8190
Jun-12	95	\$ 8,500	\$ 8,265	0.9%
Jul-12	133	\$ 8,797	\$ 8,402	2.6%
Aug-12	36	\$ 9,417	\$ 8,452	3.2%
Sep-12	231	\$ 9,607	\$ 8,956	9.4%
Oct-12	0	\$ -	\$ 9,142	11.6%
Nov-12	0	\$ -	\$ 9,163	11.9%
Dec-12	9	\$ 10,667	\$ 9,350	14.2%



# Attachment 2b

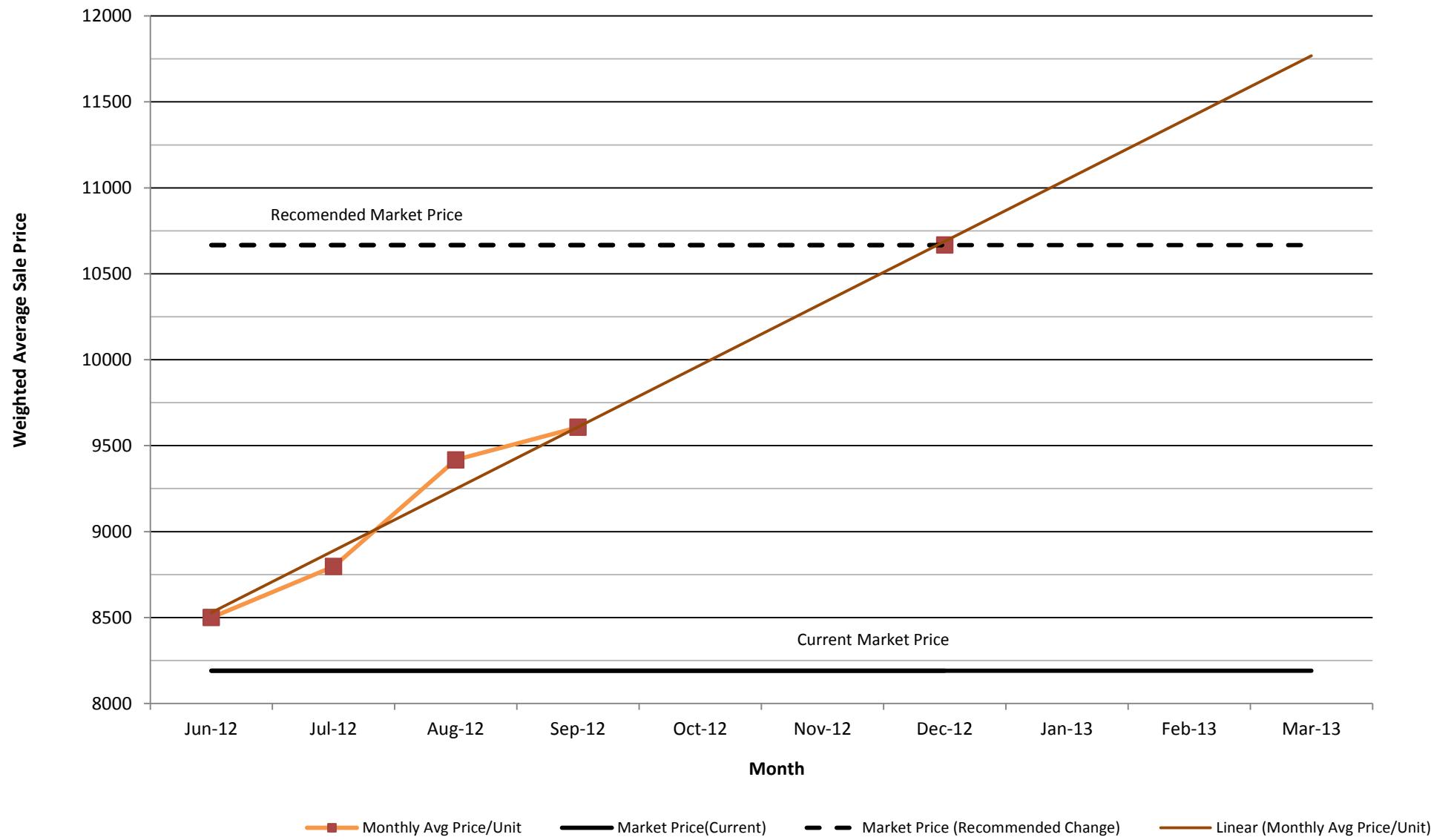
## 6-Month Weighted Moving Average Sale Price of C-BT Units



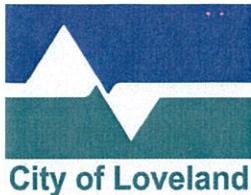


# Attachment 2c

## Weighted Average Sale Price of C-BT Units







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WATER & POWER DEPARTMENT

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**AGENDA ITEM:** **3**

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Brieana Reed-Harmel, Senior Electrical Engineer 

**TITLE:** Change of Installation of Services

**DESCRIPTION:**

The power division has been piloting a change to the way that residential service installations are installed

**SUMMARY:**

The Power Division is in the process of updating the Requirements for Electric Services (RES) book. One of the proposed changes is how residential services are installed. Since this is a significant change to our current practices, the decision was made to pilot this new procedure and then present this before both the Construction Advisory Board and the LUC prior to incorporating the changes into the RES book.

The current practice is to have the city electrical contractor install the substructure in a new development. This includes all conduit, vaults, pads and handholes. City linecrew come in afterwards to install and connect the electric cable. When a developer is ready to begin construction, the developer/contractor will install the meter canister and riser on the side of the house and tell the utility that they are ready for installation of the service conductor. The Power Division schedules a crew to trench from the handhole or transformer to the meter and install Cable-in-Conduit. This is typically a three-man crew and can take several weeks to schedule during peak construction season.

The proposed change to the installation procedure would have the city electrical contractor install a conduit stub-out from the handhole at the same time that they are installing the substructure. This allows the developer/contractor to access the conduit from the handhole without exposure to live electrical wires. The developer/contractor is responsible for trenching and installing conduit from the stub-out to the meter at the side of the house. The linecrew is then scheduled to pull the cable into the conduit. This would typically be a two man crew and can be scheduled faster due to easier installation and no need for specialized equipment for trenching.

This proposed procedure change has several advantages:

- Saves the customer/developer money
  - Rather than paying linemen, trained in electrical work, to dig a trench for the service installation, an excavator or similarly qualified persons can install the conduit. Excavators are more cost effective for this type of work and tend to do a better and more consistent job.
- Saves the customer/developer time
  - The customer/developer can schedule the excavator to trench the conduit when other similar services are being installed.
  - Linecrew will be able to respond to service requests sooner because special equipment does not need to be reserved and a two-man crew can perform the work.

The proposed change has been presented to the Construction Advisory Board. They have approved the change barring any negative comments from a survey of Developers and Contractors involved in the pilot program.

**RECOMMENDATION:**

Staff recommends that this new installation procedure be incorporated into the Requirements for Electric Services book.

**REVIEWED BY DIRECTOR:** *WS for SA*

**ATTACHMENTS:**

Service Installation Pilot Project Presentation  
Guideline for Service Installations Pilot Program

# Service Installation Pilot Project

Briana Reed-Harmel, Water & Power Department

Loveland Utilities Commission

February 20, 2013

## Background

The City is in process of piloting a new design standard for underground residential services in subdivisions

Reduce installation costs

Reduce installation time

Make service installations more efficient

## Current Practice

City Contractor installs electrical substructure



Customer installs meter canister and riser



Customer calls utility and waits for availability for installation



Linemen trench and install Cable in Conduit (CIC)

- A minimum crew of 3 at a average time of 3 hours

## Proposed Changes

City Contractor installs electrical substructure

- Installs a stub from the secondary handhole



Customer installs meter canister and riser

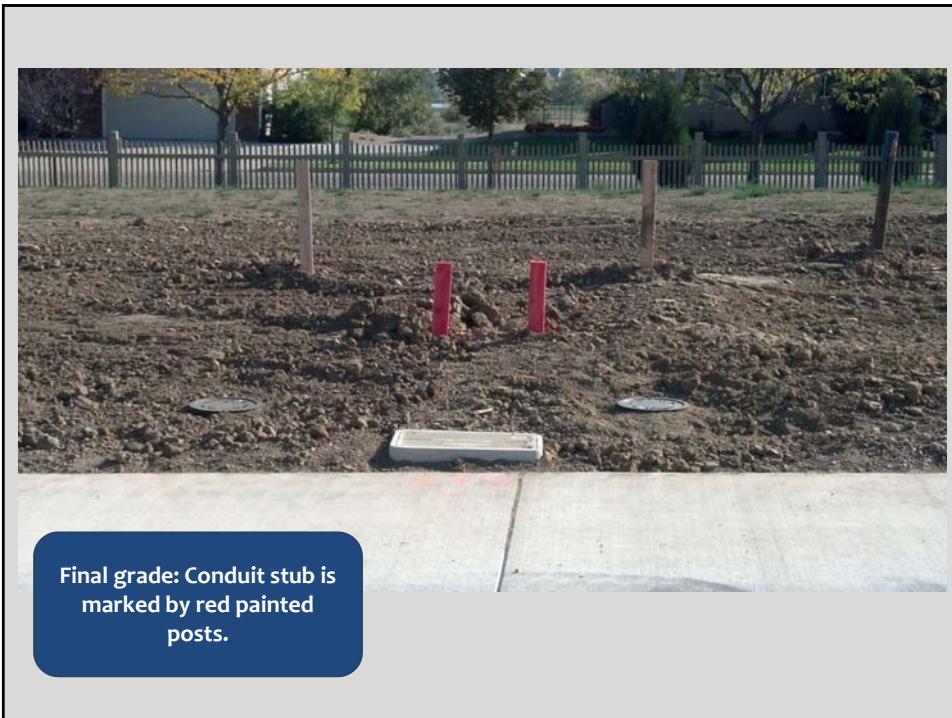
- Customer also installs conduit from the riser to the stub at secondary handhole



Linemen install secondary cable in conduit and connect service

- A crew of 2 at a average time of less than 1 hour





## Benefits

- \* Timing
  - \* Coordination and timing of conduit installation is under the control of the developer/contractor
  - \* Service installation by electric crews takes less time and can be done with minimal disruption to landscape and other construction
- \* Cost reduction
  - \* Trenching and empty conduit can be installed by any qualified person (not just electric crews), saving labor costs
  - \* Electric crews only need to visit the premise once to connect services, saving labor costs
- \* Consistency
  - \* In line with standard industry practice
  - \* Consistent with Longmont, Poudre Valley REA and Xcel policy

# Costs

## Current Service Installations Cost (average)

* Material:	\$94
* Labor & Vehicle:	\$642
* Total:	\$736

## Proposed Service Installation Costs

- \* Estimated installation cost for utility
  - \* Material: \$80
  - \* Labor & Vehicle: \$200
  - \* Total: \$280
- \* Estimated installation cost for contractor
  - \* Material: \$100
  - \* Labor & Vehicle: \$120
  - \* Total: \$220

Estimated Net savings  
to the customer:  
\$236

# Feedback and Questions?

Thank You!





### **Guideline for Service Installations Pilot Program**

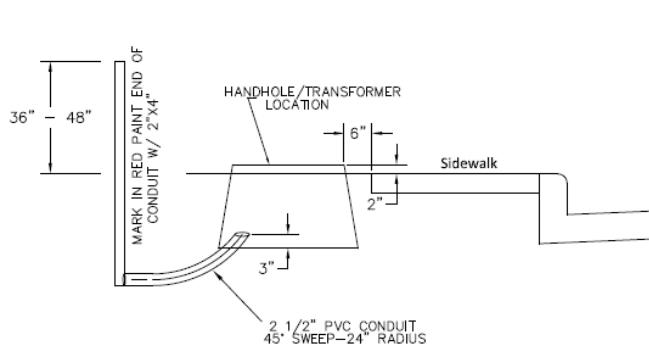
**Purpose:** This guideline shall outline the expectations and requirements for new service installations in subdivisions until the new version of the Requirements for Electric Service has been published.

**Background:** The City is in process of piloting a new design standard for Underground Residential Services in subdivisions. The goal of this change is to reduce costs and time constraints to the property owner/developer and make service installations more efficient.

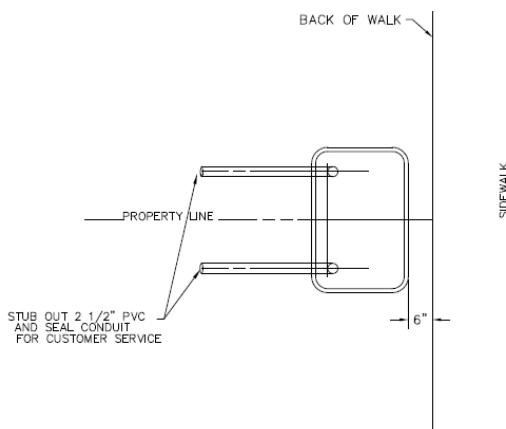
**Procedure:** The Developer, Builder or Assignee of the property is responsible for installing the underground service conduit from the conduit stub adjacent to the handhole (junction box) or transformer pad to the permanent meter location. The conduit stubs are marked by a red colored stake. (see Figure 1 and Figure 2). The installation must comply with National Electric Code and with the City of Loveland's Standards and must be inspected by the City's Power Inspector.

- Developer, Builder or Assignee must meet with the Field Engineer prior to any installation to discuss meter location, service conduit path and the Requirements for Electric Services.
- Developer, Builder or Assignee is responsible for obtaining all utility locates prior to excavation.
- At no time is the Developer, Builder or Assignee allowed to open or enter the City's handhole (junction box) or any other City owned electrical equipment. Contact the City if access is needed.
- The trench bottom must be smooth, continuous and free of any large rocks or other sharp objects.
- The top of the conduit shall be a minimum of 24" deep below final grade. The depth shall not exceed 40".
- The trench must remain open until the conduit is inspected.
- The conduit size shall be 2 ½" PVC SCH 40 conduit. Sweeps must be a minimum 24" radius
- The Developer, Builder or Assignee shall keep conduit free of dirt and debris during installation.
- All conduit (sweeps and straight sections) shall be fully seated within the bell ends and glued to prevent infiltration of water into electrical equipment.
- The path between the conduit stub and the meter shall be as straight as possible. The number of conduit bends shall not exceed a maximum of 270 degrees of bends (including the riser sweep).
- A slip meter riser is required below the meter. The thread size shall be 2 ½" to match the meter canister opening. The inside diameter of the slip riser shall be large enough to fit over the 2 ½" conduit. The 2 ½" conduit shall extend the complete length into the slip meter riser and be fully seated.
- Red electric warning tape shall be installed 12" below final grade directly above the conduit.
- Backfill within 4" of the conduit, on all sides, shall be free of any materials that may damage the conduit system.
- Care shall be taken during installation and during backfill around the conduit to ensure that the conduit is undamaged, crushed or deformed. There shall be no internal burrs or sharp edges that will obstruct the cable installation.

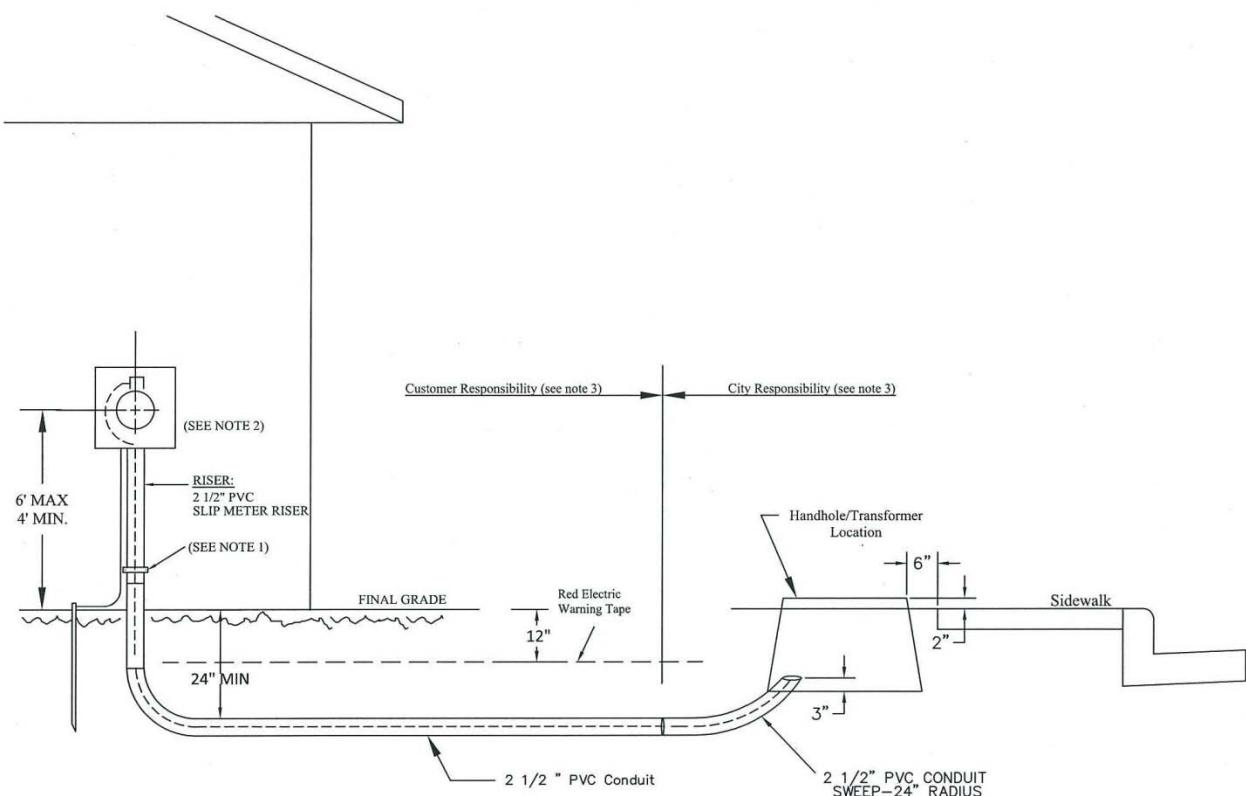
**Figure 1 –Stub location Side View**



**Figure 2 –Stub Location Top View**



**Figure 3 – Residential Service**



**Service Connection:** Once the conduit has been inspected and approved, the City Line Crews will be scheduled to install the service conductor. The City Line Crew will blow a line into the conduit and will proof the conduit prior to installation. If conduit is found to have damage or obstructions that prevent the cable from being installed, the Developer, Builder or Assignee is responsible for all repair costs and any additional labor cost incurred by the City to return to the job site. After the City Line Crews have installed the conductor and made the electrical connection the City will assume responsibility for the service and all related equipment from the handhole or transformer to the meter as per the Requirements for Electric Services book.



**CITY OF LOVELAND**  
WATER & POWER DEPARTMENT

200 North Wilson • Loveland, Colorado 80537

(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

**AGENDA ITEM:** 4

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Lindsey Bashline, Customer Relations Specialist

*MS for LB*

**TITLE:** Draft Updated Water Conservation Plan

**DESCRIPTION:**

The purpose of this item is to provide LUC with an overview of the Draft Water Conservation Plan. To comply with the State's Water Conservation Act of 2004, staff has updated the 1996 Loveland Water Conservation Plan.

**SUMMARY:**

According to Colorado's Water Conservation Act of 2004, all covered entities – retail water providers who sell 2,000 acre feet or more of water annually – must have a water efficiency plan on file with the state that has been approved by the Colorado Water Conservation Board (CWCB). This requirement prompted an update of the city's water conservation plan.

In 2012, Loveland Water and Power received a grant from Recharge Colorado and Symbiotic Engineering, securing assistance from a consultant, Great Western Institute, to perform the modeling necessary to forecast savings from various water conservation measures, a comparison of plans with other Colorado communities and assistance in drafting the plan.

The Water Conservation Plan includes:

- A profile of the existing water system
- Profile of water demands and historical demand
- Integrated planning and Water efficiency benefits and goals
- Selection of water efficiency activities
- Implementation and monitoring plans

Loveland's water conservation plan focuses on assisting future water use efficiency within the utility's service area by:

- Managing City water use both indoor and outdoor;
- Identifying and implementing measures and programs that are expected to reduce summertime peak day water demand; and
- Assisting customers that wish to improve their water use efficiency.

Specific goals that the City looks to achieve include:

- Reducing summertime peak daily demands in the future by about 1 mgd (or about 3 acre-feet (AF) per day) during above average demand periods by 2016;

- Reducing non-revenue water from current levels to 10-11% of total treated water by 2020 (which is a reduction in real and apparent water loss of about 575 acre-feet);
- Developing water rates that accurately reflect the cost of service for providing reliable, secure and sustainable water supplies, including infrastructure management and maintenance, and the impact of changing customer water use behavior patterns in the future;
- Supporting the City's "Sustainability Plan" in part by reducing City water use (indoor and outdoor) by another 5% by 2020; and
- Developing technical assistance programs that will support improved water use efficiency by the City's large commercial and irrigation only users.

The draft Plan will be available for a 60-day public comment period beginning February 21, 2013 through April 21, 2013. During the public comment period staff will also present to the Construction Advisory Board (CAB). Revisions reflecting comments received from LUC and the public will be made, with the Plan returning to LUC in April for approval, followed by City Council May 14, 2013.

Pending approval from LUC and City Council, the Plan is scheduled to be sent to the CWCB in May, 2013. The objective is final adoption by the CWCB of a plan that establishes water conservation in the city's framework.

**RECOMMENDATION:**

Information item only. No action required.

**REVIEWED BY DIRECTOR:** *MS for SH*

**ATTACHMENTS:**

City of Loveland- Draft Updated Water Conservation Plan



# City of Loveland

## Updated Water Conservation Plan

FINAL DRAFT  
February 2013



Prepared by: GREAT WESTERN INSTITUTE  
Littleton, CO  
through a generous grant from the Governors Energy Office (GEO) through Symbiotic Engineering, LLC. Boulder, CO

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## Foreword

Loveland Water and Power has a long history of promoting the responsible use of water in the community, since water is a precious resource in this semi-arid region of the Western United States. The City has long utilized multiple tools to ensure that its citizens and customers are provided with safe and sufficient water supplies now and for future generations. To this point, the City and its citizens have long shared an enlightened relationship, whereby the City's customers understand and value the importance of a reliable and sustainable water supply, and together the utility and the local citizenry work to manage this precious resource responsibly and with mindfulness.

The City of Loveland's Water Utility has been delivering drinking water to customers in and near Loveland since 1887. Today, the Water Utility is part of the Department of Water and Power and serves water to a population of over 65,000 with a service territory of an estimated 30.8 square miles. Since 1990, the City has seen an increase of nearly 35% in the population served by the utility, which is consistent with the population boom experienced by much of the north Front Range. However, the City and its customers have been able to work together to limit water restriction practices that many other Front Range communities needed to implement during the 2002 and 2003 drought when water supplies became short. Since the drought, the City has been able to limit water demand increases through messaging with its engaged citizenry.

As with other Colorado Front Range communities, the City expects to realize growth and increased water demands over the coming decade. Although the City maintains a diversified water rights portfolio that will meet the needs of the growing community, the current infrastructure has limits that will require expansion and improvement to meet the predicted increases in peak day demands and average annual water delivery and wastewater treatment. In addition, the City is responsible to its customers to provide water supplies, both treated water and raw water, reliably and cost effectively. Therefore, the City has a number of reasons to guide and support customer water use efficiency during the coming years.

The City's water conservation planning effort, which is documented in this report, focuses on assisting future water use efficiency within the utility's service area by:

- Managing City water use both indoor and outdoor;
- Identifying and implementing measures and programs that are expected to reduce summertime peak day water demand; and
- Assisting customers that wish to improve their water use efficiency.

Overall, the City recognizes that it is a combination of its actions and the actions and behaviors of its customers that will determine whether or not the water conservation measures and programs presented in this Plan are successful. Therefore, the City is committed to implementing those efforts that will support the long-term sustainability and efficacy of the utility to provide affordable, reliable water to its customers in a manner that the City's citizenry justifiably depends upon. The City has

prepared this Water Conservation Plan in adherence to the prevailing state statutory requirements according to Colorado's Water Conservation Act of 2004 (HB 1365).

## Section 1

### Overview of the City's Water System

The City of Loveland was incorporated in the 1880s, and has been acquiring and administering water rights ever since. The City began acquiring water rights to use water in the Big Thompson River. Some water rights were purchased outright or filed on the river by the City, while others were dedicated to the City. Early transfers of the No. 1 priority on the Big Thompson River and domestic rights diverted at the Loveland pipeline form the base of the City's water rights. Early plats of the City's annexation show dedication of water rights which were appurtenant to the land becoming part of the City. In 1960, the City began formally requiring dedication of water rights prior to development. The City has historically accepted native ditch shares/inches, Colorado-Big Thompson Project water and cash-in-lieu of water rights to satisfy raw water requirements for development. The city owns about 12,000 units of the CBT Project. The City was also one of the original "Six Cities" to invest in the Windy Gap Project. None of Loveland's water supply comes from groundwater. Its sources are renewed each year with snow melt and rain.

Currently, the City has a firm yield<sup>1</sup> of approximately 24,590 acre feet (AF) per year, with another 2,800 AF expected as part of the Windy Gap Firming project. In current years, the greatest annual demand for a combination of potable and non-potable<sup>2</sup> water by the community served by the City's water utility was about 14,300 AF in 2006. Table 1 summarizes the water demand and approximate population served in recent years within the City's service area (which is shown in Figure 1).

**Table 1 – Summary of Population Served and Treated Water Demand - 2005 to 2011**

Year	Approximate Population Served <sup>3</sup>	Treated Water Demand (AF)
2005	60,157	12,040
2006	61,098	14,309
2007	63,025	13,636
2008	64,690	13,652
2009	66,132	11,773
2010	66,572	12,752
2011	67,455	13,284

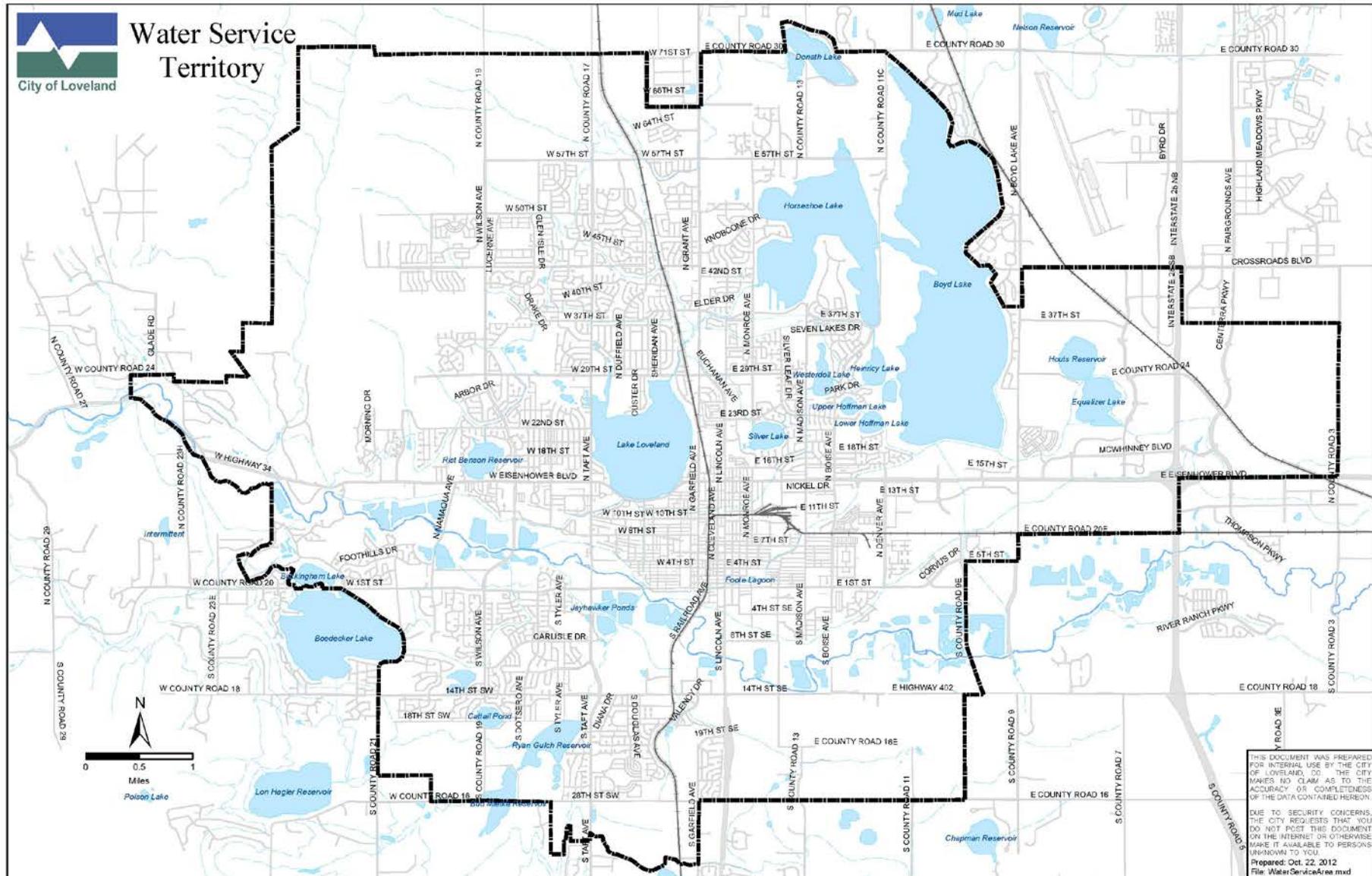
Note that the City's population has increased each year since 2005; however water demand peaked in 2006, and has maintained a slight downward trend since. Figure 2 further illustrates this observation.

<sup>1</sup> Firm yield is based on the yield of the City's water rights portfolio in conditions equivalent to a 100-year drought.

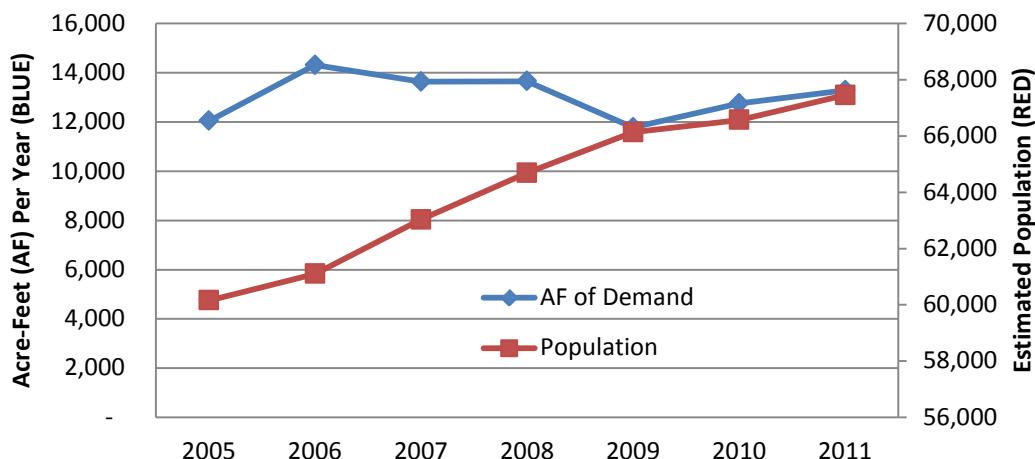
<sup>2</sup> Currently, the City only has water demand that is for treated water. In the future, raw water use may be used to irrigate municipal facilities and other large areas of turf, as deemed appropriate.

<sup>3</sup> From the "Annual Data and Assumptions Report – January 1, 2011 by City of Loveland Community and Strategic Planning.

Figure 1 - City of Loveland Water Service Area



**Figure 2 - Population Served and Total Treated Water Demand  
2005 to 2011**



The City currently provides water to approximately 24,650 connections or accounts for commercial and residential customers, including connections for customers both inside and outside of the City limits. Table 2 presents a summary of the type and number of water customers currently in water service.

**Table 2 – Summary of City Water Customers<sup>4</sup> – August 2011**

Customer Type	Number of Connections	% of Total Connections
<b><i>Residential</i></b>		
<b><i>Inside City Limits</i></b>		<b>89.9%</b>
Single Family	20,911	
Multi-Family	1,245	
<b><i>Outside City Limits</i></b>		<b>3.7%</b>
Single Family	866	
Multi-Family	40	
Special Base	14	
<b><i>Irrigation Only</i></b>		<b>1.4%</b>
Inside City Limits	346	
Outside City Limits	5	
<b><i>Commercial</i></b>		<b>4.7%</b>
Inside City Limits	1,069	
Outside City Limits	86	
<b><i>City Uses (Inside City Limits)</i></b>	71	<b>0.3%</b>
<b>Total</b>	<b>24,653</b>	<b>100%</b>

<sup>4</sup> The City also has water use tracked related to hydrant use (for construction), construction water use, and through an interconnect with the Little Thompson Water District. These customers are tracked separately from those summarized in Table 2.

Table 3 provides a summary of billed water demand for each of the City's customer categories for the period from 2005 to 2011. An explanation of the customer categories used in this table is provided below.

**Residential** – These two categories (Inside and Outside City Limits) include combined single family and multifamily uses, as well as irrigation only demand, since the City did not differentiate these uses until 2008. After 2008, the City maintained different customer categories for single family and multifamily uses, as well as irrigation only taps for residential customers.

**Commercial** – These two categories (Inside and Outside City Limits) include all commercial uses, including special base customers.

**City Uses** – This category include all City facilities (excluding City Enterprise Funds, e.g. Water, Power, Golf. These are treated as businesses and are billed at the Commercial rate.) that are currently metered – both for indoor and outdoor use. Note that a small number of City facilities are currently unmetered, and that this water use is currently tracked as non-revenue water.

**Other Uses** – This customer category tracks the water use related to industrial water use and water transferred to (and from) the Little Thompson Water District as wholesale water. Note that the City has not had customers tracked within the industrial customer category since 2007 when the water rate structure provided incentives for these customers to change to the commercial customer category. Therefore, post-2007 "Other Water Use" only includes wholesale transfers to (and from) Little Thompson Water District<sup>5</sup>.

**Ranch** – The City maintains a stand pipe at its Utility Maintenance Facility that can be used by any customer via pre-paid credit cards at a rate of \$1.00 per 300 gallons. Water obtained from the stand-pipe has been used for watering livestock, dust suppression, and other local uses. All water delivered through the stand pipe is metered and billed.

**Hydrant** – The City also maintains a hydrant water use system, which is also a "pay as you go" program typically used to support construction contractors. The permit to use hydrants for construction water includes meter rental and a security deposit on the meter, as well as billed water use at the rate of \$1.00 per 300 gallons. Most water delivered through this program is metered and billed<sup>6</sup>.

**Non-Revenue Water** – This category of water use tracks the difference between treated water produced by the City and total water sold. The difference between these two

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<sup>5</sup> This is the net amount of water purchased wholesale from Little Thompson Water District. Whichever entity received a net of positive water into their service area has to transfer Colorado Big Thompson shares to these uses, as well as pay the treated water charge.

<sup>6</sup> The actual amount of hydrant water being delivered by the City could be characterized by a system wide water audit.

**Table 3 – Summary of Billed Water By Customer Category**

Year	Billed Water (1000s Gallons)								Total	Total	Total	
	Residential	Outside City	Commercial	Outside City	City Use	Other Uses	Hydrant	Ranch				
	Inside City	Inside City	Inside City	Outside City	City Use	Hydrant	Ranch			(1000 gallons)	Acre-Feet	
2005	2,623,544	133,597	466,292	21,020	53,628	93,248	4,610	97,001	3,492,940	430,360	3,923,300	12,040
2006	3,186,549	150,123	517,424	22,288	68,868	101,227	5,102	123,473	4,175,054	487,646	4,662,700	14,309
2007	2,989,778	139,242	515,274	20,981	68,262	54,810	3,683	53,921	3,845,950	597,250	4,443,200	13,636
2008	2,967,702	140,831	590,295	18,266	69,194	5	4,033	78,957	3,869,283	579,317	4,448,600	13,652
2009	2,516,008	120,300	510,429	14,786	56,127	0	3,166	41,004	3,261,820	574,580	3,836,400	11,773
2010	2,816,305	133,651	538,454	16,429	68,156	1,295	3,707	32,669	3,610,666	544,734	4,155,400	12,752
2011	2,875,155	134,224	572,683	16,680	71,316	1,221	3,584	27,905	3,702,767	625,956	4,328,723	13,284

accountings of water is considered as non-revenue water based on standards set forth by the American Water Works Association<sup>7</sup>. Non-revenue water includes real and apparent losses. Real losses are water that is lost due to leaks; whereas apparent losses are due to unauthorized uses, metering inaccuracies, and unmetered uses and/or metered and unbilled uses. Non-revenue water is further described below.

### **Water Supply Limitations**

As previously indicated, the City has a robust water rights portfolio that has been developed over the past 130 plus years. The firm yield that exists as a result of the City's diligence is adequate to provide for current demands even within the 100 year drought.

Between 1986 and 1988 the City initiated work on a two-phase drought study using the services of the engineering firm of Camp, Dresser & McKee, Inc. Phase I of the study contained a recommendation that the City prepare to meet its full demands during a drought event with an average recurrence of 1-in-100 years, which translates into a 1% chance that in any year the City could not meet demands without curtailment. Council accepted Phase I the report, including the recommendation, on October 7, 1986, and the 1-in-100 year level of drought protection remains the goal for the City's raw water supply planning.

This planning policy requires developing sufficient supplies to meet the City's full water demand during the 1-in-100 year drought without water use restrictions. The LUC and City Council reaffirmed this policy as part of the approval process for the original Raw Water Master Plan in 2005 and the update in 2012.

However, the City's infrastructure currently limits the amount of treated water that can be delivered for potable use to the City's customers at 30 million gallons a day (mgd). Although the treatment capacity is adequate to meet average daily demands, summer peak day demands have exceeded 27 mgd in the past three years<sup>8</sup>, and are expected to increase as population grows and summertime demands increase.

The City has plans to expand the treatment plant capacity by 8 mgd over the current planning horizon. The timing and cost of the water treatment plant expansion will be discussed in later sections of this Plan.

Noteworthy is that the City maintains an interconnect with the Little Thompson Water District, which allows treated water to pass between the service area of the two entities on an as-needed basis. This interconnect may support peak daily water demands in excess of the City's current treatment capacity, if needed, until the treatment plant expansion can be constructed.

The City's wastewater treatment plant capacity may also limit current treated water deliveries, since indoor water use requires wastewater treatment to capture grey and black water for cleansing before it is returned to local receiving waters.

### **Water Reuse in the City**

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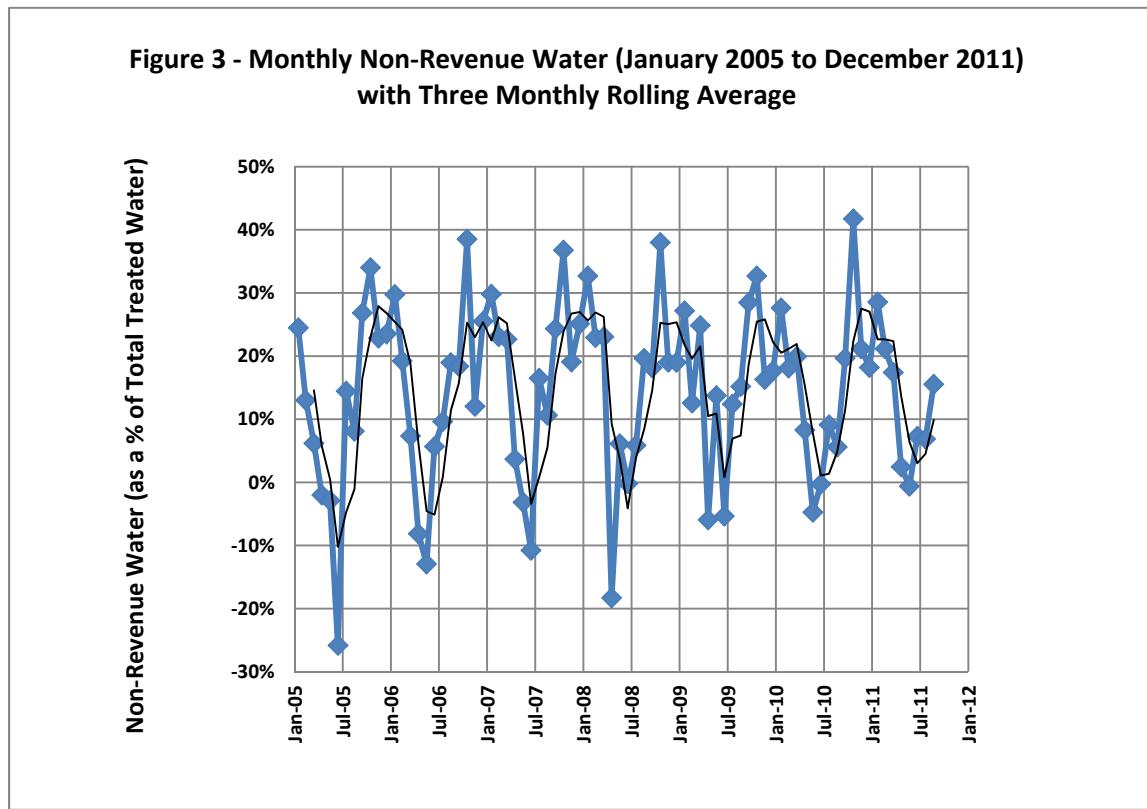
<sup>7</sup> AWWA Manual M-36 defines standard practices for water loss control and management for water utilities.

<sup>8</sup> Water use data for this report covers monthly and daily use from 2005 to 2011.

The City has limited opportunities for reusing treated wastewater since a substantial portion of the City's water portfolio is direct diversions from east slope supplies or Colorado Big Thompson water, which cannot be reused. A portion of the City's water portfolio does include some reusable supply from its reservoirs and some Windy Gap allocations. However, reusing these water sources reduces overall firm yield, so the City does not practice reuse in its normal operations.

### Non-Revenue Water

Based on those data presented in Table 3, the City has an average non-revenue water of about 14%<sup>9</sup>, dating back to 2008 when it recategorized its customers into those categories that it currently uses. Non-revenue water changes monthly and appears to vary seasonally, as depicted in Figure 3. The reason for this seasonality is unclear; however, it appears that in late-spring/early-summer each year non-revenue water is calculated to be negative. This trend has been reduced each year since 2005, as evidenced by the 3-month rolling average which is positive in 2009, 2010 and 2011.



*Note: The definitions of non-revenue water are as defined in the AWWA Publication M36.*

Non-revenue water, which can be segregated into accounts" as depicted in Figure 4, is expected to consist of the following components for the City.

<sup>9</sup> Non-revenue water has ranged from 13 to 14.9% annually since 2008.

**Unbilled Authorized Consumption** – associated with unmetered, authorized water uses such as may be occurring in a small number of City parks; and metered, but unbilled water uses such as may be occurring at the water and/or wastewater treatment plants, or with some unactive water accounts that may be using water (not as water theft but through billing program and/or accounting glitches, for example).

**Apparent water loss** – associated with inaccurate and malfunctioning meters and with unauthorized water uses (i.e., water theft).

**Real water loss** – associated with detected and repaired and undetected transmission line, distribution system, and service line leaks on the supply side of customer meters. Leaks on the demand side of customer meters are not included in the accounting of non-revenue water.

**Figure 4 – Overview of Treated Water Accounts As Defined by AWWA M-36**

System Input Volume	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
			Billed Un-metered Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	
			Unbilled Un-metered Consumption	
	Water Losses	Apparent Losses (Commercial Losses)	Unauthorized Consumption	Non Revenue Water (NRW)
			Customer Meter Inaccuracies and Data Handling Errors	
		Real Losses (Physical Losses)	Leakage in Transmission and Distribution Mains	
			Storage Leaks and Overflows from Water Storage Tanks	
			Service Connections Leaks up to the Meter	

It is likely that a portion of the City's current 14% non-revenue water includes untracked authorized uses within City facilities and at City parks such as at the fire training grounds - albeit a small amount, this may be a significant (i.e., measurable) use. The City may also have a small number of inaccurate water meters installed on customer taps, or minor billing and/or accounting glitches that are included in the 14% of non-revenue water. Future water conservation programs that the City will be considering will include a formal audit of the City's meter testing, and accounting systems, and a review of all water use at City facilities. The City has already begun this audit process.

### **Meter Testing and Replacement Policies and Procedures**

In July 1979, the Loveland City Council approved an ordinance requiring water meters for all new construction and for existing homes when ownership changed hands. Before that time, the City only required meters for commercial accounts within the City and for all accounts served outside the City limits. Less than a year later, June 1980, the council passed another ordinance requiring meters for all water customers.

By 1981, the City was the first municipality in the state to be completely metered, and at a cost of over \$3 million. The average annual water usage declined by 20 percent. Before metering, the water treatment plant's maximum day demand was 22 million gallons per day. After metering, the maximum day demand was 16.7 million gallons per day (City of Loveland, 1989). On a per capita basis, these reductions remain reflective of today's uses.

Since being fully metered in 1981, the City has maintained an aggressive meter testing and replacement program. This program involves annual testing of most meters that are 1 ½ inch or greater in service in the City (see Table 4 for an inventory of meter types and sizes currently maintained by the City). The City tested 420, meters last year, 400 meters in 2011 and 516 in 2010. Meters that go through this program are tested for accuracy and either replaced or repaired to restore meter accuracy and maintain the accuracy of City water billings.

**Table 4 – Current Inventory of Meters Maintained by the City (February 2013)**

Meter Size (inches)	Count
0.75	23,616
1	729
1.25	1
1.5	375
2	274
3	56
4	27
6	7
8	1

Meters that are less than 1 ½ inch are tested and/or replaced on an as needed basis based on bringing into service new customers, observed meter damage, or observed losses in meter accuracy detected by meter readers and/or utility billing services.

A limited number of new meters installed for large water use customers have included automated meter reading (AMR) technology to allow for remote data collection (e.g., drive by) of water use. Expansion of the AMR program may be considered by the City as part of the Water Conservation Plan implementation. All of the meters in the City are currently read manually by meter readers on a monthly basis. Expansion

of the AMR program may help reduce the City's lost time injuries incurred by its meter reading work force, due to slips, trips, falls and dog and insect bites (for example).

## Water Rates and Billings

The City maintains a comprehensive water use billing program that provides for different rates for each of its different customer categories. The rates include a base fee and a water use fee. Overall, the City maintains a water rate structure that is designed to create revenue to cover both its fixed and variable expenses – with the base fee covering the fixed expenses and the use fee covering the variable expenses. In this way, the City has more predictable revenue generation based on actual operating costs.

In 1887, the Water Utility established a flat annual billing rate, based on the type of dwelling and the number of fixtures. Customers paid the yearly fee in advance. Until 1968, water rates were based on a flat fee determined by fixture counts. Keeping track of the number of bathrooms and toilet fixtures in homes as the City grew became increasingly difficult, and in July 1968, the City developed a flat rate charge per family based upon average water usage. Since the installation of meters in 1981, the monthly billing has reflected actual water use, and uses a uniform rate for residential customers.

In 1989 City Council approved a series of rate increases that specified water rates from 1990 to 1997. A portion of the revenues from these rate increases allowed Loveland to purchase additional CBT units, cash fund the Green Ridge Glade Reservoir expansion, and set aside money to pay off the City's obligation in the original Windy Gap Project. In 2001, once the specific needs for the rate increases were met, the City lowered rates by 33 percent. Rates are set periodically using a cost of service methodology, meaning that the rates are designed to reflect as closely as possible the real cost of providing water service to customers.

The City bills its customers for water monthly, except for those water users that utilize "ranch" and "hydrant" water sources. These two water services are provided on an as-needed "pay as you go" basis using pre-paid credit cards and use fees. Details of all the City's water rates are provided in Appendix A.

The City maintains a couple of noteworthy incentive programs within its rate structure to support water use efficiency. The first is the City's excess water use surcharge that it accesses to commercial accounts that exceed a specific individual base amount of annual water use. This fee is accessed to aid in recovering the cost of replacement water for those large water users.

The second is the City's impact fee credit for irrigation only taps that take advantage of native plantings and other outdoor water use efficiency practices to reduce the tap size required to serve the property, as well as the water right dedication or raw water requirement. The City has been piloting the efficacy of native plantings to reduce expected irrigation water requirements in various settings such as at the Medical Center of the Rockies<sup>10</sup>.

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<sup>10</sup> The pilot program has involved the installation of multiple hydrozones to evaluate Xeric landscape in various settings including boundary landscapes, parking lot islands, heliport landing area, etc.

The City conducts water rate studies to correctly and fairly price its water and services, on a three to five year cycle. A water rate study was just finished in 2012, with another planned for 2015. Additional water rates evaluations, post-2015, will be considered for inclusion in the implementation of this Plan.

### **Leak Detection and Repair**

The City has maintained a proactive leak detection program for many years. Currently, the City has implemented an acoustic emissions program that detects distribution system leaks between adjacent valves. In 2011, the City had a goal of testing 50 miles of pipe; however, the number of leaks that surfaced during this time diverted staff from finding leaks to fixing leaks. Nonetheless, the technology detected 6 leaks in 2011 that had not surfaced, saving an estimated 310,000 gallons per day (gpd) in water losses (and another 2 leaks in 2012 saving an additional 130,000 gpd).

Despite the City efforts, the number of leaks being detected and fixed by the City in recent years (and the related water loss) has been increasing, as illustrated in Table 5. Based on these data, the repairs conducted by the City have reduced water loss by approximately 42 million gallons in the past 4 years. This represents about 1% of the City's total treated water demand or about 7% of the City's non-revenue water in 2011 (not including the found leaks listed above).

**Table 5- Summary of Leaks Detected and Repaired by the City**

	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
<b>Number of Leaks</b>	<b>73</b>	<b>62</b>	<b>61</b>	<b>62</b>	<b>100</b>	<b>76</b>
<b>Estimated Losses (millions of gallons)</b>	<b>n/a</b>	<b>6.2</b>	<b>3.1</b>	<b>8.9</b>	<b>23.9</b>	<b>27.8</b>

## Section 2

### Past Water Use Trends and Ongoing Conservation Programs

As previously indicated, the City's total water demand has not increased in relation to the City's population, as illustrated in Figure 2. Figure 5 presents the change in per connection water use observed over the past 7 years. Figure 5 also presents the observed evapotranspiration for the years 2008 through 2011<sup>11</sup>. As can be seen in Figure 5, total water demand per connection correlates well to annual ET – meaning that total demand is substantially influenced by outdoor irrigation needs of the community based on prevailing weather conditions (i.e., precipitation, wind and temperature).

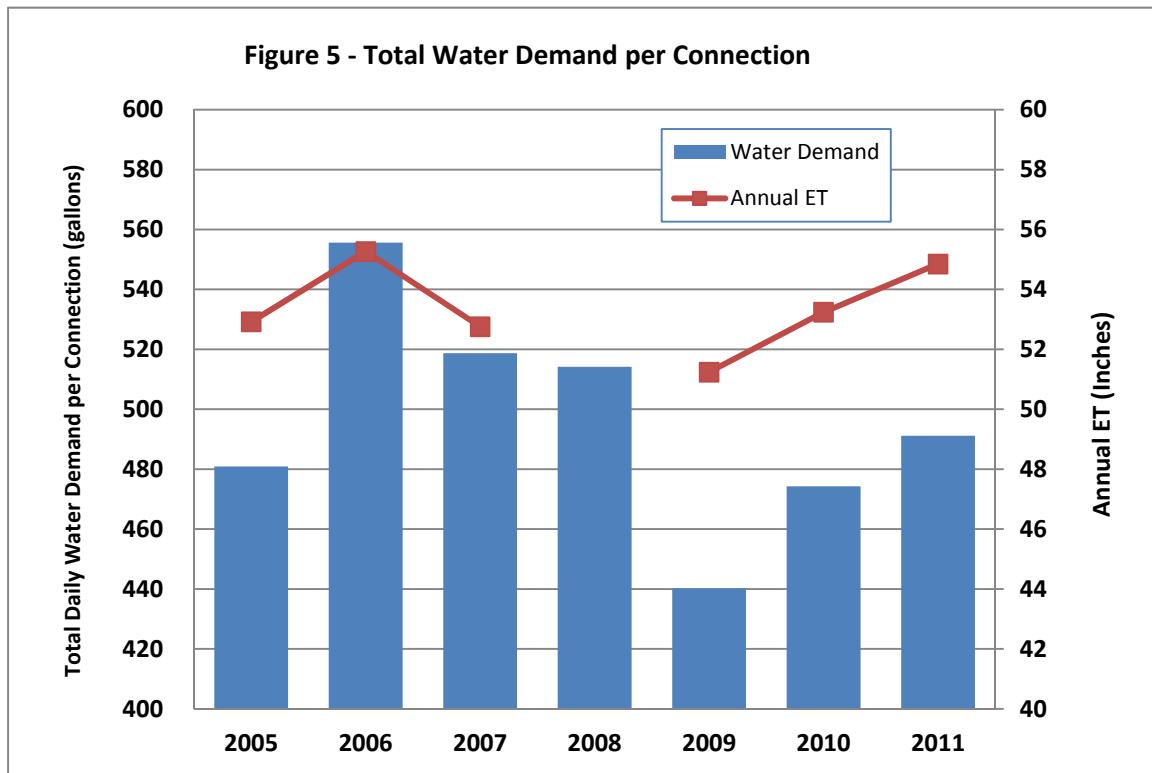
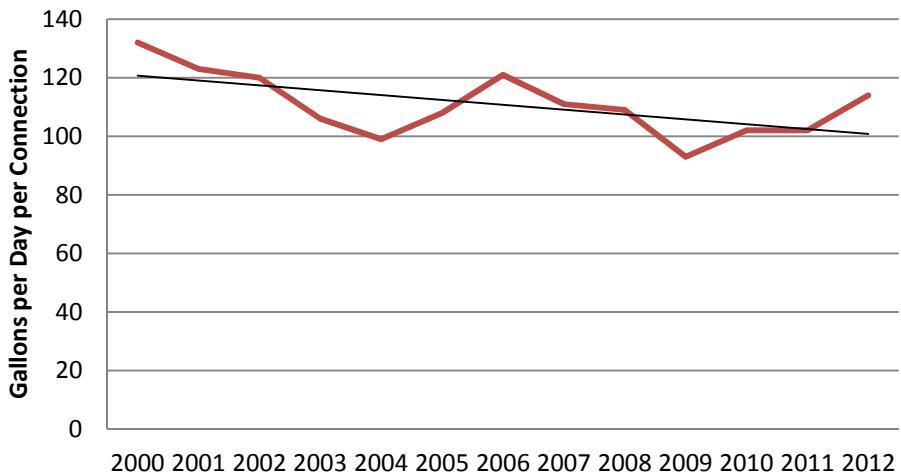


Figure 6 demonstrates the observed water use of a residential single family over the last twelve years. While use varies slightly from year to year, overall gallons per capita day demonstrates a downward trend.

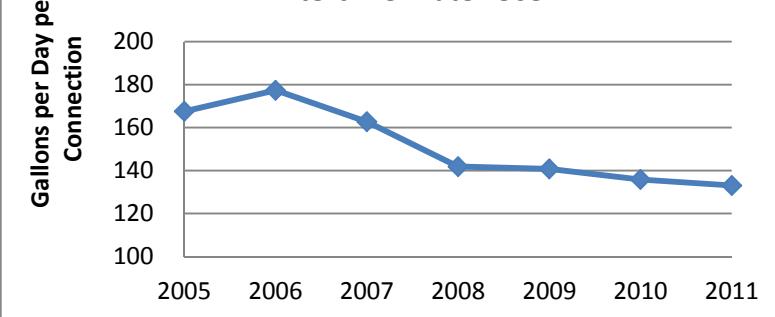
<sup>11</sup> ET for Alfalfa is based on weather data maintained by Northern Water for the Loveland station at <http://www.northernwater.org/WaterConservation/WeatherandETData.aspx>.

**Figure 6 - Residential Single Family Water Use**



This downward trend can further be demonstrated in indoor water use within the City, which is illustrated in Figure 7. Figure 7 presents the daily water use by single family residential connection for the winter months only. This figure indicates that since 2006, average daily water use in the winter has dropped. Noteworthy is that starting in 2008, the residential water use category was revised, segregating single family from multifamily accounts. For this reason, the observed drop from 2007 to 2008 shown in Figure 7 may not be a result of true indoor water savings. However, since 2008, average daily indoor water use for single family residential customers has dropped by 6%.

**Figure 7 - Residential Single Family Wintertime Water Use**



The 6% drop in residential wintertime per connection use correlates well to expected passive savings that were reported by the CWC (2010). Specifically, passive savings are those water demand reductions that have occurred, and will continue to occur, as a result of new technology in appliances and fixtures improving customer water use efficiency independent of local water conservation programs conducted by water providers. Residential customer toilets, dishwashers, and clothes washing machines have become substantially more water efficient, and as customers replace aging and broken appliances and fixtures, passive savings have, and will continue to occur organically within the water utility's service area. To this

end, the City has and is expected to continue to see average indoor residential demand decrease into the future as more customers replace and upgrade toilets, dishwashers and clothes washing machines.

### **Ongoing Water Conservation Programs**

In light of this trend in indoor water demand reductions, the City supports and promotes local water conservation using the following programs – which are generally focused on reducing outdoor irrigation requirements for its customers.

- **Educational programs** – the City's educational programs include producing and distributing flyers and informational materials, maintaining an informational website, public events, and maintaining two demonstration Xeriscape gardens: one at the downtown Civic Center and another at the City Service Center.
- **Outdoor residential irrigation audits** (AKA, Slow the Flow) – the City supports the Center for Resource Conservation (CRC) Slow the Flow audits at 70 to 75 individual residents each year.
- **Commercial customer energy audits** (through the Energy-Water Efficiency Express) – the City provides financial support to this program. As a result, Efficiency Express installs low flow faucet aerators and pre-rinse spray nozzles in conjunction with energy audits that it conducts.
- **Garden-in-a-Box** residential Xeriscape program – The City provides between 125 and 150 discounted Garden-in-a-Box kits to local residential customers through this CRC program.
- **Hydrozoning** (and water credits) – As previously indicated, the City supports an impact fee reduction for new customers (and water rights development credits for existing customers) that utilize water efficient landscaping to reduce long-term water demand for a specific tap within the City's service area. The reduction in water demand allows for a discount to be provided with respect to the expected cost of replacement water for new construction, and a credit to be provided to existing construction. This is a new program that is currently being piloted in cooperation with the Medical Center of the Rockies.
- **Larimer County Conservation Corps, Energy and Water Program and the Home Energy Audit Program** – The City supports and offers these energy and water programs, which provides home assessments and audits to residents. These assessments and audits include replacing faucet aerators and showerheads, installing toilet dams and providing dye tablets to test for leaking toilets. These programs reach about 400 homes each year.

As another example, the City also has water waste ordinance as follows:

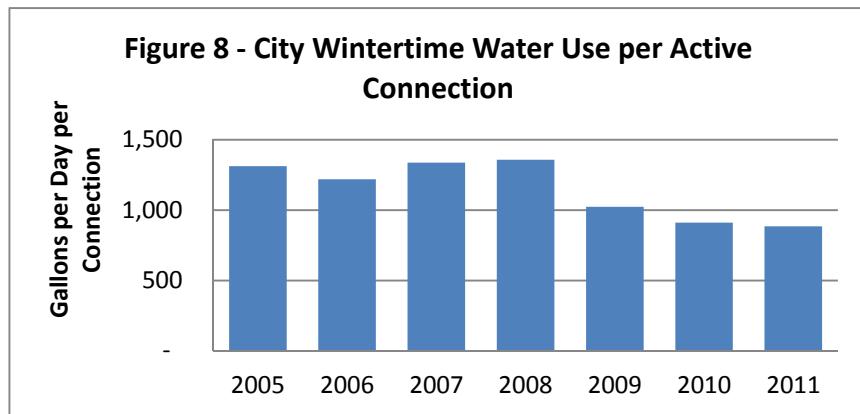
#### **City of Loveland Municipal Code 13.04.170 Wasting water.**

Consumers shall prevent unnecessary waste of water and keep all water outlets closed when not in actual use. Hydrants, urinals, water closets, and other fixtures, must be kept in repair so that they will not cause unnecessary waste of water. The supplying of water may be discontinued for any violation of this section. (Ord. 997 § 6, 1968; prior code § 13.13).

In practice, the City utilizes this ordinance to support water waste complaints filed by local customers. The City dispatches staff to investigate the complaint, and most often it is against a home owner who was unaware of their water waste issue. Once the home owner has been made aware, the problem is fixed and no additional complaint is lodged. Typically, about 3 complaints are filed a year with the utility.

### **City Water Use**

The City uses water at about 70 to 80 different parks and facilities during the course of the year; with about 25 of the connections used year round. Indoor water use has been managed effectively by the City. This is evidenced by the consistently lower wintertime water use in City facilities, as illustrated in Figure 8.



### **Irrigation Plan for the Parks**

Irrigation water use in the parks operated by the City includes both raw and treated water applications<sup>12</sup>. The majority of the irrigation water is raw water and is applied through a centralized irrigation controller system that monitors real time ET and rainfall updates, to support human judgment in the management of individual hydrozones which can be remotely operated using SCADA. Only a very small number of park facilities are without centralized irrigation controllers<sup>13</sup>.

In 2008, the City of Loveland Parks and Recreation Department developed a detailed Irrigation Conservation Plan for most of the properties that the City irrigates. The plan (see Appendix B) provides details on each park and public space, including size, and average annual irrigation volumes. The plan also presents a four tiered irrigation program that may be implemented in case of drought and water shortages.

Integral to the City's Irrigation Plan is the understanding that application of irrigation water to the City's properties is not a one-size-fits-all program. As the Irrigation Plan states:

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<sup>12</sup> There are 17 parks and 18 public grounds on treated water. 9 parks, 1 public ground and 3 golf courses on raw water. The large parks (LSP, Fairgrounds/Barnes, North Lake, Centennial, Kroh) are all raw water.

<sup>13</sup> Everything but 2 detention ponds (total of 2.3 acres) and 2 small planter beds in the Old Town are on central irrigation control.

Several factors need to be applied when calculating actual turf watering requirements: types of grasses being irrigated (Blue Grass, Buffalo Grass, Turf Type Fescue, etc.); site conditions (shady, sunny, hillside, low area, soil type, soil compaction, etc.); site impacts (low use, high use, sports turf, green belts, etc.); safety concerns regarding recreation activities (hard playing surfaces, large cracks in the soil, bare ground, etc.); current weather conditions (evapotranspiration rates, temperatures, soil moisture levels, wind, sunshine, weekly rain totals); aesthetics (public buildings, sculpture parks, planned public events, etc.).

Overall, the irrigation water used by the Parks Department is efficiently managed at all times leveraging the benefits of centralized controllers with human judgment, as conditions warrant, since Parks staff can remotely operate the irrigation systems at 98% of the park and public spaces for which the City is responsible. Noteworthy is that based on the four tiered irrigation program, Park irrigation has been used effectively by the City in the past as a drought buffer.

### **Data Collection and Assessment of Programs**

The City does not currently conduct an assessment of the effectiveness of its water conservation programs per se<sup>14</sup>. The City does track total treated water production and water billings on a monthly basis, and uses this information to track non-revenue water. However, no formal data tracking program is in place to support an assessment of individual water conservation programs. The City will identify future data tracking and reporting programs that will be implemented as part of this Plan to support the assessment of individual water conservation programs, as well as maintain compliance with new state regulations (i.e., HB 11-1051).

Given that the City maintains customer categories that differentiate residential single family from multi-family water use, from commercial use, from City use, it will be fairly straightforward for the City to conduct assessments and evaluations of specific water conservation programs – especially those that focus on specific types of customers and water use.

### **Past Water Savings from Water Conservation**

Based on the available data, it is difficult to identify specific water demand reductions that have occurred as a result of the City's programs with the exception of the City's indoor water use reductions observed between 2008 and 2011 (which is an approximate 30% reduction from 2005 and 2006 to 2011, accounting for about 8 AF annually or about 0.06% of total annual treated water demand)<sup>15</sup>.

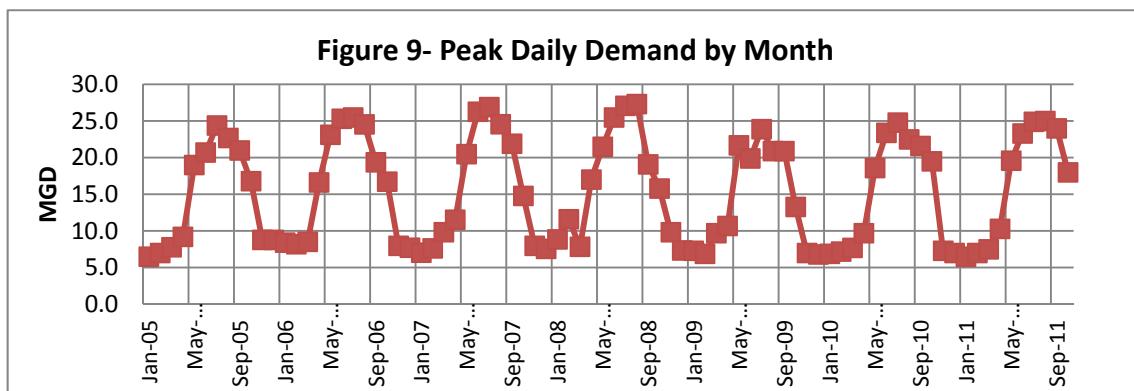
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<sup>14</sup> Some tracking of water efficiency improvements is conducted as part of programs that the City supports such as the Efficiency Express, the Home Energy Audit Program and the Larimer County Conservation Corps assessment and audit programs.

<sup>15</sup> Outdoor irrigation conservation efforts conducted by the City were implemented in the early part of the last decade, such that water demand reductions associated with these programs likely occurred prior to the time when data used in this Plan were collected. However, since 2009, the ratio of peak day demand to total demand and to observed ET have both been reduced, perhaps indicating that some improved efficiencies have occurred with regard to summer time peak day usage.

Other City water conservation programs appear to be overshadowed by the effects of “passive savings” that are occurring organically as residential customers repair and upgrade their water using appliances and fixtures.

It does appear, based on current trends in water use, that the City’s customers, including residential and commercial customers, are reducing their average water use on an annual basis. However, peak daily demand, which occurs during the heat of the summer, appears to be on the rise since 2009 (see Figure 9). This trend tracks with observed ET during this period of time (see Figure 5). Given that in the future the City will have a larger service population and the potential for variable weather conditions (which influence peak demand), future water conservation programs that the City implements will likely need to address peak daily summertime uses.



## Section 3

### Forecast of Future Water Demands

Forecasting water use (or water demand) is a critical part of water conservation planning since water conservation may be used to offset increases in future water demand – identified as increasing water use within specific customer categories – and/or postpone infrastructure improvements that are needed to support growing demands.

Forecasts can range from simple projections based on anticipated growth in the population to complex models using several variables to explain variations in water use. Forecasts can be made for a water system as a whole; however, forecasts are considered more accurate and valuable to water conservation planning when they are based on expected trends for each category of customers, since residential growth may not mirror commercial or institutional growth. For this reason, the demand forecasting developed for Loveland evaluated expected growth of peak daily, monthly and annual water demand for each of the City's customer types – single family residential, multi-family and commercial groups for both inside and outside of the City Limits plus City uses and pre-paid uses (i.e., Ranch and hydrants), and the annual figures compare reasonably with projections in the City's Raw Water Master Plan.

The potential effects of future water conservation programs that the City chooses to implement have not been included in the demand forecast prepared during this step. Demand forecasting at this point in the planning process only incorporate trends in future customer water demand based on a continuation of the current and ongoing water conservation efforts and “passive conservation” as older fixtures and appliances wear out and are replaced with models that meet current efficiency standards. A revision to the demand forecast based on implementing the conservation measures selected by the City is made later during the planning process, and is presented in Section 8.

### Forecasting Method

To begin with, the forecasting methods that were developed for this planning effort focused on predicting future treated water demand based on the continuation of ongoing trends in water use and expected population growth in the City's service area.<sup>16</sup> The forecasting methods were used to estimate average conditions water demand, as well as above average water demand in future years<sup>17</sup>. A presentation of the forecast model assumptions and results are provided in Appendix C.

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<sup>16</sup> Data for forecasting was based on average monthly per connection water use for the period 2005 through 2011; during which time recent trends in municipal water use were established. Characterizing variability in City water demands was performed using either this entire database, or some subset as is described in the assumptions listed in Appendix C.

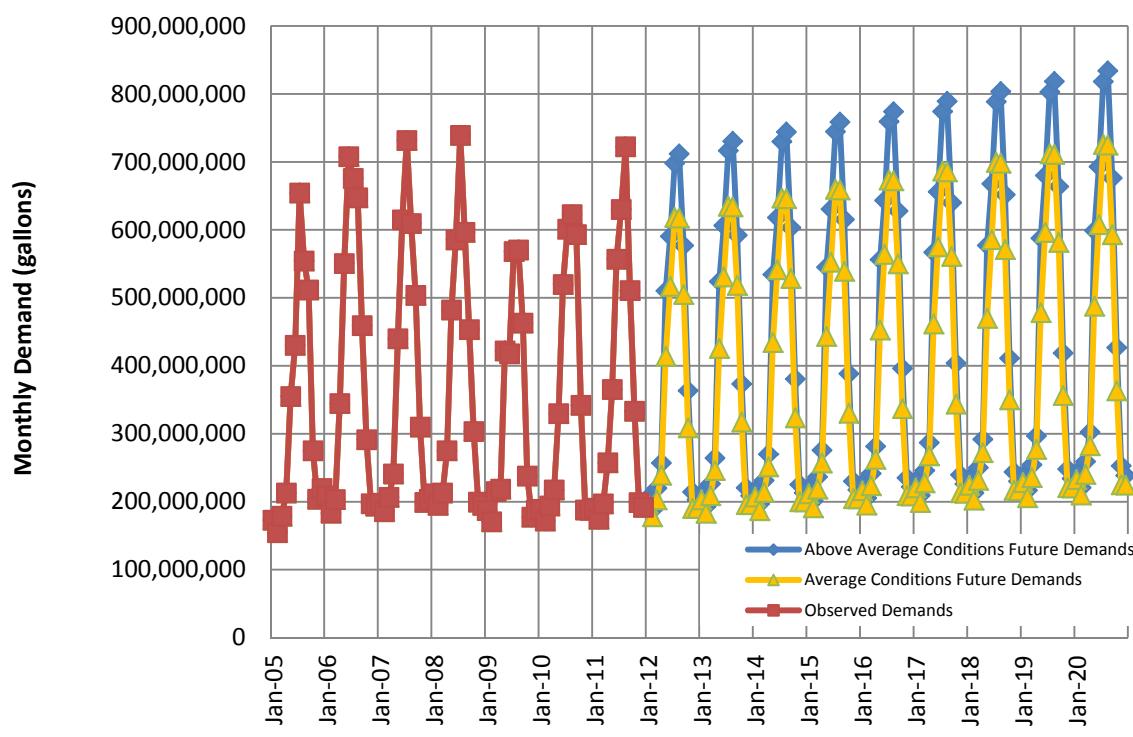
<sup>17</sup> Variability of future water demand was developed assuming that the water demand over the past record is normally distributed and that natural variability of weather and customer water use behaviors will continue through the planning period in a manner consistent with those observed since 2005. The available data was determined to be adequate for predicting variability in future demand over the coming 8 years, but not adequate to estimate extreme variations due to drought or wet weather with more than a 8 year return period.

The specific forecast model results of interest to this Plan and related analyses include future annual treated water demands and future peak day demands, both of which are based on estimated future monthly treated water demands. Therefore, the results for each of these three future demands are presented below.

### Monthly Treated Water Demand

Monthly water demand is the basis of all other estimated future water demands. Appendix C presents how future monthly water demands were developed and how these demands were used to estimate future annual and peak daily demands. Figure 10 presents the results of the predicted monthly treated water demands throughout the planning period for both average and above average conditions<sup>18</sup>.

**Figure 10 - Past and Estimated Future Monthly Treated Water Demands**



As this figure illustrates, future monthly demand is not expected to peak as sharply as has been observed in the past four years (from 2007 to 2011), based on average conditions. However, peak monthly treated

<sup>18</sup> The reduction of treated water demands related to expected passive savings are not included in the monthly treated water demands; since they are calculated on an annual basis. Therefore, passive savings are integrated into reported annual treated water demands. Monthly water demands are presented only to illustrate the seasonal nature of monthly demands and the relative differences between average and above average conditions.

water demand for above average conditions (i.e., one standard deviation above average conditions), which are about 12% higher than average conditions<sup>19</sup>. The peak treated water demand difference between average and above average conditions is about 110 million gallons in August 2020.

### Annual Water Demand

Annual water demand projections were developed by summing the monthly water demands for each calendar year and subtracting the estimated annual impact of passive savings<sup>20</sup>. Figure 11 presents the annual treated water demands in the past and as estimated through the planning period as a result of those analyses presented in Appendix C.

**Figure 11 - Past and Predicted Total Treated Water Annual Demands with Passive Savings**

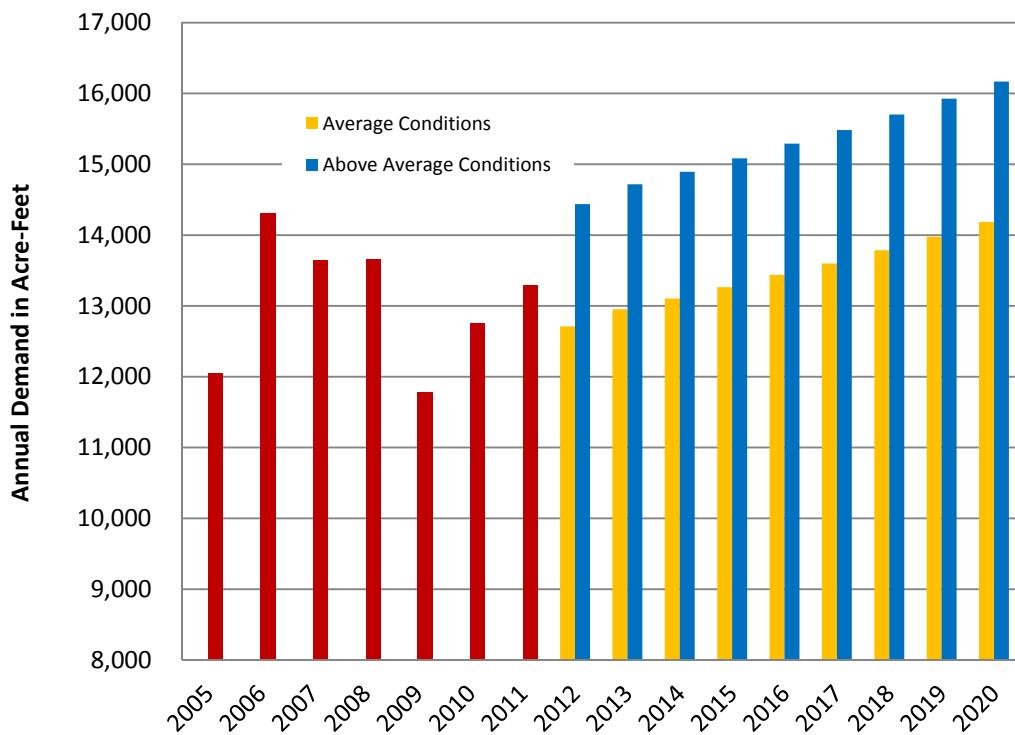


Figure 11 illustrates the relative impact of demand variability on estimated future treated water demands. Above average annual treated water demands vary over the planning period from about 14,440 to 16,170 acre-feet (AF), whereas average annual treated water demands vary from about 12,710 to 14,185 AF. These values compare reasonably with the city's Raw Water Master Plan when adjusted for the impact of

<sup>19</sup> Above average treated water demands vary from about 4 (January) to 23% (August) of monthly average treated water demands; averaging about 12% higher over the course of a year.

<sup>20</sup> Passive saving water demand reductions are estimated to be about one quarter billion gallons of treated water per year in 2020.

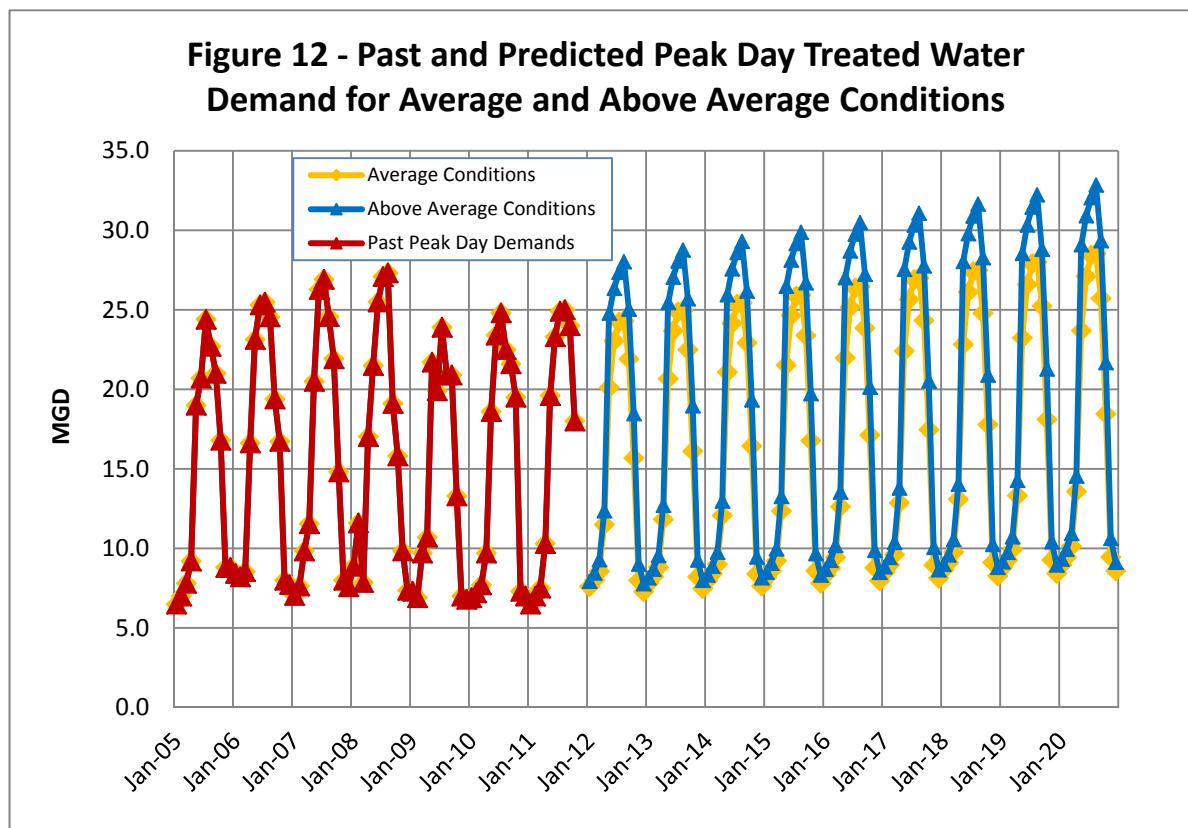
projected passive savings. This difference illustrates the challenge of planning for average conditions (i.e., those that occur only 5 out of 10 years), versus planning for conditions that occur 8 out of 10 years; given that demands may reasonably vary over average conditions by as much as 2,000 AF by the end of the planning horizon (2020).

For the City of Loveland, this variability is not significant given the current water portfolio used to provide the City with potable water supply. It may be that at some time in the future, the estimated demand variability may impact the City's ability to provide potable water on an annual basis, but it is not expected to be rate limiting over the current planning horizon.

### Peak Daily Forecasts

The City's current peak day treatment capacity is approximately 30 MGD; whereas peak daily demands in the summer of 2008 topped 27 MGD. Peak day treatment capacity is therefore an issue for the City.

Peak day demands were estimated for each month in the planning period based on the average peaking factors presented in Appendix C. Figure 12 presents the results of the forecast modeling used to estimate peak day treated water demands for the period 2012 through 2020 (compared against past peak day demands).



Based on the analyses presented in Figure 12, average conditions peak day treated water demands are not expected to exceed 30 MGD during the planning period (the highest annual peak day demand in 2020 is

estimated to be about 28.5 MGD); whereas for above average conditions, the highest annual peak day demand exceeds 30 MGD in 2016 (30.5 MGD). Although the City has the ability to utilize an interconnect with Little Thompson Water District to meet peak day demands above 30 MGD, future peak day water demands in the summer will require that additional water treatment capacity is developed by the City, unless water conservation programs can be developed and implemented that “shave” peak day demands, effectively postponing (or eliminating) the need for the treatment plant capacity expansion.

## Section 4

### Capital Improvement Projects

The City maintains a detailed 5-year capital plan that identifies design, consulting and construction costs associated with ongoing and upcoming water related projects, including:

- Transmission and distribution projects (focusing on replacing steel and cast iron pipe with plastic in critical areas)
- Water treatment plant
- Water resources
- Upgrades and extensions (AKA – oversizing and extensions)
- Miscellaneous operations and maintenance (O&M) budgets

The projects that the Water Utility are currently tracking include water line replacements, water storage tank construction, meter upgrades and replacements, treatment plant upgrades and improvements, water resources projects, vehicle purchases, and various O&M projects. A specific breakdown of the City's 5-year detailed capital project list is provided in Table 6.

**Table 6 – Summary of City's 5-Year (2013-2017) Detailed Capital Plan for Water Projects<sup>21</sup>**

	<b>5-Year Total</b>
<b>Transmission and Distribution</b>	
Water Line Replacements	11,280,620
Water Storage Tanks	240,140
Meter Replacements	440,930
<b>Water Treatment Plant (general)</b>	11,779,700
<b>Water Resources</b>	
<b>SIF Projects</b>	
Water Lines	860,130
Water Storage	240,140
Water Treatment	6,136,460
<b>General Plant</b>	471,200
<b>O&amp;M Projects</b>	3,907,780
<b>5-Year Total</b>	<b>61,321,470</b>

Capital projects that are considered as a part of the City's water conservation programs include water line replacements and upgrades (which are expected to help reduce water losses); and meter replacements (which are expected to help reduce apparent water losses). The costs of these programs will be included in the overall water conservation program costs provided later in this Plan.

<sup>21</sup> From the 2013 CIP for the Water Utility

## Section 5

### Goals for Water Conservation

The City has a number of goals for its water conservation programs. Perhaps the most important relates to the City maintaining a connection with the community that it serves; such that it can promote the importance and value of water use efficiency in maintaining a reliable, secure and sustainable water supply now and into the future. To do this, the City will rely on a number of integrated programs, each of which is described in the following section. The City understands that it is the true integration of water conservation and water resources management, in a conscientious, deliberate and transparent manner that will allow for the City and its customers to work together to reach the overall goals stated below.

Specific goals that the City looks to achieve include:

- Reducing summertime peak daily demands in the future by about 1 mgd (or about 3 acre-feet (AF) per day) during above average demand periods by 2016;
- Reducing non-revenue water from current levels to 10-11% of total treated water by 2020 (which is a reduction in real and apparent water loss of about 575 acre-feet<sup>22</sup>);
- Developing water rates that accurately reflect the cost of service for providing reliable, secure and sustainable water supplies, including infrastructure management and maintenance, and the impact of changing customer water use behavior patterns in the future;
- Supporting the City's "Sustainability Plan" in part by reducing City water use (indoor and outdoor) by another 5% by 2020; and
- Developing technical assistance programs that will support improved water use efficiency by the City's large commercial and irrigation only users.

Through the implementation of the Plan, and beyond, the City will strive to reduce per connection water use by about 5% between 2012 and 2020, for an estimated demand reduction of about 790 AF<sup>23,24</sup>.

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<sup>22</sup> For the purposes of actual demand reductions and predicted impacts on future revenue, that real and apparent losses constitute 80% and 20% of the observed non-revenue water loss, respectively.

<sup>23</sup> Passive savings are estimated to be about 780 acre feet (AF) between 2012 and 2020; such that the City conservation goal of 790 AF is in addition to the estimated passive savings.

<sup>24</sup> The City's goal of 790 AF was developed based on an average per connection daily use from 2008 to 2011 of 480 gallons; decreasing to about 456 gallons per day per connection in 2020 (for an estimated 29,000 connections serving a population of about 80,000).

## Section 6

### Identification and Evaluation of Candidate Measures and Programs

As indicated in the previous section, the City has identified that water conservation efforts can best support the needs of the water utility through:

- Reducing summer time peak demand;
- Reducing current system wide water loss; and
- Supporting improved water use efficiency for the City's commercial and large irrigation customers

Therefore, the City will identify, evaluate and ultimately select water conservation measures and programs that support these goals.

The State has regulations (CRS 37-60-126 – see Appendix C) which require that covered entities that develop water conservation plans for review and approval by the CWCB consider a broad range of potential measures and programs for the plan to be complete. Table 7 presents each of the categories of water conservation measures and programs that the City considered, aligned with the regulation, as it developed its “short list” of measures and programs for detailed evaluation.

A few key points related to this analysis are noteworthy.

- Based on the CWCB SWSI Levels Analysis (June 2010), the City has decided not to actively support the retrofits and related incentives (e.g., rebates) for indoor water using fixtures and appliances, since home and business owners will be naturally replacing and upgrading toilets, faucet aerators, clothes washers and dishwashers naturally, with newer, high efficiency models in the future. This market driven process does not benefit from the City spending additional resources to accelerate the impact of these passive savings.
- The City does not currently provide water to any large commercial or industrial customer that would benefit from improved process water retrofits and upgrades. Hospitals and large laundry services, car washes, and greenhouses may benefit from improved water use efficiency upgrades; however, the City will focus its commercial programs with a higher rate of return on investment (e.g., faucet aerator retrofits, shower head replacement programs). In future years, the City may decide to evaluate process water efficiency improvements, but they are not included in this version of the City's Water Conservation Plan.
- The City has not agreed philosophically or politically with the use of inclining rate block structures for residential customers that are not based on the cost of service. For this reason, the City maintains a flat residential water rate, which is raised periodically as fixed and variable costs increase. The City does have a surcharge for commercial customers that exceed a specified quantity of water use in a year; which is associated with the cost of replacement water.

**Table 7 – Summary of Measures and Programs that Must Be Considered During Plan Development**

CRS 37-60-126 Category of Measures and Programs*	Current Efforts	Future Evaluations Proposed by the City
<b>Water-efficient fixtures</b> and appliances, including toilets, urinals, clothes washers, showerheads, and faucet aerators	The City currently provides replacement of showerheads and aerators through energy and water assessments and audit programs. The City does not currently have programs to support customer replacement and/or upgrade of appliances.	These types of programs will only be considered for large commercial customers, since residential customers will be replacing toilets, faucet aerators, clothes washers and dishwashers with more water efficient models organically (based on CWCB, 2010).
<b>Low water use landscapes</b> , drought-resistant vegetation, removal of phreatophytes, and efficient irrigation	The City does not currently have specific programs to support customer replacement of landscape materials; however the City supports Garden-in-a-Box (which provides water efficiency landscape materials to interested homeowners); has been installing water efficiency landscapes in selected City parks and facilities; and maintains a tap fee structure that allows for reduced impact fees for customers that can demonstrate the appropriate use of water efficient landscape materials.	The City will continue its current programs
<b>Water-efficient industrial and commercial water-using processes</b>	The City does not currently have a program for industrial or commercial water customers – associated with process water use.	The City's customer base does not justify development of a process water focused water conservation program.
<b>Water reuse systems</b>	The City has limited opportunities for reusing treated wastewater since a substantial portion of the City's water portfolio is direct diversions from east slope supplies or Colorado Big Thompson water, which cannot be reused. A portion of the City's water portfolio does include some reusable supply from its reservoirs and some Windy Gap allocations. However, reusing these water sources reduces overall firm yield, so the City does not practice reuse in its normal operations.	The City may obtain some water rights that would allow reuse through the Windy Gap firming project; however, until such that that project occurs, reuse opportunities do not exist for the City.

**Table 7 – Summary of Measures and Programs that Must Be Considered During Plan Development (continued)**

<b>Distribution system leak identification and repair</b>	The City currently has a water loss control program including leak detection and repair projects, meter testing and replacement, and water loss tracking; however these programs can be improved	The City will evaluate measures and programs to improve its current supply-side water loss management efforts. In addition, the City will evaluate strengthen its overall messaging regarding water use efficiency, water management, and the importance of maintaining and upgrading water infrastructure to support customer needs with respect to reliable, secure and sustainable water supply.
<b>Dissemination of information</b> regarding water use efficiency measures, including by public education, customer water use audits, and water-saving demonstrations	The City maintains a strong relationship with the community that it serves through messaging, educational efforts, and its “lead by example” mentality. The City also supports customer water use audits employing outdoor irrigation audits for residential customers (AKA, Slow the Flow); indoor audits and retrofits for low-income residences; and combined energy/water audits for selected commercial customers.	The City will evaluate the efficacy of each of these programs with respect to measurable results and maintain those that can be shown to have positive impacts on managing customer water demand.
<b>Water rate structures and billing</b> systems designed to encourage water use efficiency in a fiscally responsible manner.	The City has a flat residential block rate that is based on the cost of service which in turn is based on fixed and variable costs; including a reserve for infrastructure replacement and management. Commercial water rates are also a flat rate with a water use surcharge included for high annual water use. Irrigation only water rates are inclining block rate based on a water budget for established landscapes.	The City performs a rate study every 3-5 years to keep its rates in balance with costs; which included a 4% rate increase in 2011. The City will maintain a flat block rate which reflects the cost of service to its customers; while utilizing other methods to manage future water demands. Part of the City’s efforts will include utilizing a reduction in tap fees for irrigation only customers that can demonstrate reduced water use via native plant materials and efficient hydrozones.
<b>Regulatory measures</b> designed to encourage water conservation	The City maintains a water waste ordinance.	The City will evaluate methods to broaden its water waste ordinance.
<b>Incentives</b> to implement water conservation techniques, including rebates to customers to encourage the installation of water conservation measures	The City has not used rebates in the past to encourage water use efficiency.	These types of programs for indoor uses will only be considered for large commercial customers, since residential customers will be replacing toilets, faucet aerators, clothes washers and dishwashers with more water efficient models organically (based on CWC, 2010). Outdoor water use efficiency incentives and rebates will be evaluated by the City.

\* In developing a water conservation plan, state regulation requires that each covered entity shall, at a minimum, consider these categories of measures and programs.

- The City has an incentive program to reward landscape irrigation efficiency through either a refund of a new tap impact fee and/or a credit for water rights provided during development. This program is relatively new, and is in the pilot phase, but will continue to be offered as the Water Conservation Plan is implemented.
- The City has seen a consistent reduction in its own water use, both indoors and outdoors. Indoor water demand reduction has been associated with the installation of upgraded fixtures and more efficient water use practices. Outdoor water use efficiency has been improved with the installation and use of centralized irrigation controllers that manage each zone of each park individually. These improvements are examples of how the City “leads by example.”
- In addition, the City Parks Department has developed an in depth Drought Management Plan detailing water use reductions in each park during times of water supply shortage.
- The City has a water waste ordinance that has been used in the past to respond to citizen complaints; however, the City has not allocated resources to conduct more hands-on efforts to identify and correct wasteful watering practices (e.g., driving inspections for over watering, time of day watering violations, etc.). The City may wish to consider allocating resources to conduct “on the street” assessments to help control summer peak demand in the future. In addition, the City may want to consider adding language to its current ordinance that would designate time of day watering restrictions and/or overspray requirements.

Based on the City’s past efforts, current policies, and future infrastructure limitations, it proposed to evaluate the efficacy of implementing the following suite of water conservation measures and programs.

To reduce summer time peak day demands, the City will evaluate the following:

- Continue management of the City’s parks utilizing the central controllers and drought management plan;
- Expand the City’s water waste ordinance to detail actions that the City may take to identify and potentially penalize water waste repeat offenders;
- Continue to support residential outdoor irrigation audits (Slow the Flow) and residential Xeriscape planting (Garden-in-a-Box) programs;
- Develop and broadcast a new community water use messaging to stress the need for summertime use reductions (e.g., initiate voluntary watering restrictions), infrastructure management and maintenance, and general water use efficiency; and
- Initiate large commercial and irrigation only audit programs to improve outdoor irrigation efficiency.

To improve water loss management and water rate structures:

- Conduct a system-wide water audit using the American Water Works Association (AWWA) M-36 methodology;

- Implement recommendations from the system-wide water audit related to metering, data collection and management, and leak detection;
- Perform annual system-wide water audits as a means to track water loss patterns and verify that improvements are in-fact reducing real and apparent water losses; and
- Continue to perform water rate studies to evaluate and set water rates based on the cost of service for water supply to each customer. The water rate studies may also evaluate issues such as excess water use surcharges, commercial and industrial customer billing options, and creating more commercial customer categories.

Other relevant programs:

- Continue K-12 education by supporting the Loveland water fair;
- Continue to support the Energy and Water Efficiency Express such that water efficient faucet aerators and showerheads can be installed as energy audits are conducted; and
- Continue to support and offer the Larimer County Conservation Corps, Energy and Water Program and the Home Energy Audit Program for residential customers.

A detailed evaluation of each of these potential measures and programs are provided below.

### **Summertime Water Demand Management**

**Parks irrigation watering management** – The City will continue its programs to manage the use of irrigation water on its parks, which has been a success story leveraging both human judgment and centralized controllers to efficiently apply irrigation water as conditions, and the City's irrigation conservation plan dictate. However, the parks will be evaluated for turf replacement with native plant materials, depending on the park use, location and character. In addition, minor improvements will be evaluated to further improve the current efficiency of the park irrigation efforts (MP rotors to replace older spray rotors, improving some hydrozones to support new native plantings, etc.).

Irrigation in the City main parks covers nearly 275 acres with about 26 AF per week during peak summertime use. The MP rotors will not only reduce total irrigation water demand for the City, but it will lower peak day demand by about 0.6 mgd.

**Costs** - \$70,000 (for materials, no labor) for replacing all existing rotors with MP rotors over the next five years.

**Estimated Savings** – 70 to 80 AF (based on a 15% improvement in irrigation application efficiency)

**Expanded Water Waste Ordinance** - The City's water waste ordinance provides general guidelines for unacceptable water waste by its customers, and allows for the City to shut off service for offenders. The City will consider developing two key amendments to this section of the municipal code:

- i) Time of day watering restrictions that discourage outdoor irrigation between 10 am and 6 pm from May 1<sup>st</sup> to September 15<sup>th</sup>.
- ii) The ability of the City to fine observed water wasters for violations (see Appendix D for an example from the CWW BP Manual).

On the heels of these amendments, the City will consider methods to identify and if necessary, penalize repeat water wasters as a means of broadcasting a low tolerance for inappropriate irrigation practices.

**Cost** - \$1,500 for Ordinance Revision

**Estimated savings** – savings are included as a part of the messaging campaign described below.

**Slow the Flow and Garden-in-a-Box** – The City will determine whether or not to continue its support of two popular programs. Both are provided by the Center for ReSource Conservation (a non-profit operating out of Boulder). Costs carried by the City will include providing for up to 100 residential audits; and up to 75 Garden-in-a-Box native planting kits. Combined, these programs will continue the City's engagement and support of its residential customers, and in the future be linked to the City's overall efforts to reduce summertime peak water demand.

**Cost** - \$17,200 (for 80 Garden-in-a-Box Kits (City pays \$50 per kit); and 120 Slow the Flow residential irrigation audits (City pays about \$110 per audit))

**Estimated savings** – 2.5 % of outdoor irrigation water use per connection in the program (5.4 AF<sup>25</sup>)

**Smart Water Use Messaging** - The City will consider developing water messaging campaign that will include a tag line, logo, and related materials to help announce and publicize the implementation of the new water conservation programs; to educate and engage its customer base about the need to reduce summertime peak demand; and to ask for support of the new water waste ordinance, new water rates, overall infrastructure management and water loss control, and voluntary watering restrictions. The logo and messaging may also be incorporated into the stenciling on the City's service vehicles; water billings; educational programs; the City website; and printed information provided during customer water audits.

The City will connect the messaging effort to customer surveys that are conducted by the utility on to test messaging, identify customer hot buttons and key water topics, and evaluate public opinion regarding various water conservation strategies and programs.

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<sup>25</sup> Based on residential summertime usage in 2007 and 875 total customers participating in the programs over 5 years.

**Cost** - \$20,000 to \$25,000 Message development and initial launch (printing, web update, etc.)

**Estimated savings** - dependent on the breath of the City's efforts to publicize and engage the community. Expect a reduction of about 0.75 to 1.5% of community water demand reduction due to combination of the messaging campaign with other City water conservation efforts including the water waste ordinance, the improved City facility water use, reduced distribution system water loss, and increased water rates. The messaging campaign will focus on creating synergies linking City actions with customer water use behaviors (e.g., lead by example), (75 to 100 AF<sup>26</sup>).

**Commercial Water Audits and Retrofits** – The City will consider initiating a program to provide free water audits to its largest water customers coupled with retrofits for showerheads, faucet aerators and pre rinse spray nozzles, depending on the nature of the business. The largest water users in the City have been identified to include schools, manufacturing facilities, churches, business offices, nursing homes and elderly care, and City facilities. Of these, the City will focus its audits and retrofits on those with large outdoor irrigation uses coupled with indoor uses that may be receptive to the proposed retrofits<sup>27</sup>.

The proposed audit program that the City would implement would involve obtaining grant funding to support data collection and analysis efforts, water use modeling and retrofits to improve the water use efficiency at each location listed in Table 8. The proposed audit program would be similar to programs conducted in other parts of the State supported by CWCB water efficiency grant funding. To this point, the costs of the first year or two of commercial facility audits and the estimated water savings are in line with those reported by past CWCB grant recipients. Note that although the water savings predicted from the audits includes both indoor and outdoor water use reductions; the audits will be focused on those organizations that may reduce summer time irrigation use, thereby supporting the City's goal to reduce peak summertime demands.

**Costs** - \$ 36,000 – \$45,000 for audits and retrofit fixtures (depending on how many of each retrofit type is installed - faucet aerators, pre-rinse spray nozzles and showerheads). This estimated cost includes \$12,000 to 15,000 for one nursing home facility customer.

**Estimated savings** – 8 AF and 20,600 gpd during peak demand (see Table 8).

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<sup>26</sup> This water demand reduction is based on the positive results of the City's past efforts to reduce customer water use demand solely through messaging and public relationship programs.

<sup>27</sup> The retrofits being proposed are low cost and energy efficient, which therefore make them cost effective as compared to upgrades or improvements to kitchen and laundry equipment, air cooling equipment, and/or other commercial wash uses.

**Table 8 – Summary of Potential Commercial Facility Audits**

	Average Annual Water Use (gallons)		Potential Savings	
	Indoor	Outdoor	AF (annual <sup>c</sup> )	GPD (during peak)
Manufacturing Facility	2,355,000	1,970,000	1.5	3,500
Nursing Home and Elderly Care (one local customer)	9,375,000	3,172,000 <sup>a</sup>	4.1	8,600
Church and Publishing Facility	988,000	2,931,000	1.2	3,900
Manufacturing Facility	303,000	584,000	0.3	1,000
Office Building	232,000	369,000 <sup>b</sup>	0.2	600
Office Building	297,000	1,570,000	0.7	2,300
Office Building	135,000	537,000	0.2	700
			8.2	20,600

<sup>a</sup> uses last 4 years of water use for outdoor estimate

<sup>b</sup> high water use in 2010 not included in estimate of potential savings

<sup>c</sup> including savings from both indoor retrofits and outdoor efficiency improvements

## Water Loss Management

**System Wide Water Audit and Recommendations** – The City will consider conducting a system wide water audit using the methodology specified in the AWWA M-36 Water Loss Control Manual. Specific tasks that the City should consider paying special attention to relate to tracking and quantifying, where possible, metered, unbilled and unmetered, unbilled water uses; as well as looking at meter reading accuracy for large taps. In addition, the City should evaluate the accuracy of its current billing system to track all billable water accounts including those that are transferred from one customer to another. Seasonal variations in non-revenue water should also be evaluated and characterized. The audit should be provided by a third party working closely with all utility departments that handle and manage water use accounting and billing.

Recommendations from the audit may include, but not be limited to such tasks and actions as:

- Install system pressure controllers to reduce system pressure and thereby reduce supply side leaks.
- Install meters on unmetered uses.
- Calibrate and repair/replace large meters including totalizing meters on treatment plant effluent, commercial and irrigation only customers, etc.
- Accelerate the installation of AMR and AMI technologies to assist the City in identify and tracking supply side and demand side leaks, improving data handling and billing accuracy, and reducing City loss time injuries.

- Add system metering redundancy for measuring treatment plant throughput, distribution system subareas or management areas, and other key locations of potential apparent water loss.

**Costs** – for the audit \$25,000 to \$40,000 (depending chiefly on the extent to which meter testing is incorporated into the scope); with costs to implement audit recommendations variable based on findings during the audit.

**Estimated savings** – It is possible that the City will be able to reduce its current average water loss by about 3 percent (i.e., from about 13.5% of total demand to about 10.5% by 2020) as a result of the audit – which includes better understanding the City's real and apparent losses. This reduction corresponds to a reduction of non-revenue water by about 575 AF on average<sup>28</sup>. Noteworthy is that these savings will result from a combination of the audit and the implementation of key audit recommendations.

**Water Rate Study and Implementation** – The City has a policy of conducting water rate studies once every three to five years to maintain appropriate customer water rates based on the cost of service. The City has just completed a water rate study in 2012 to assess current and projected future costs, and to fine tune current policies regarding:

- Excess water use surcharge for commercial customers,
- Commercial and industrial customer billing options, and
- Creating more commercial customer categories.

A water rate study can also examine the impacts of alternative tap fee incentives for new and existing customers that install water efficient landscapes and appropriately designed irrigation systems for those landscapes.

The water rate study is important to the water conservation planning effort for three reasons. First, the water rates will need to be developed in a manner consistent with the projected future demands – based on the impacts of both passive and active savings and expected peak day demand reductions. Second, the development of new and/or expanded water rate categories (e.g., for different customer classes, to account for seasonal variability in fixed and/or variable costs, etc.) should support water use tracking as new water conservation measures and programs are implemented. This will help to ensure that water demand reductions can be attributed to active programs conducted and funded by the City.

Third, the water rates should include the costs of the water conservation measures and programs selected for implementation, such that the true cost of services can be included in the base and rate fee structure. In addition, the City should ensure that costs for emergencies,

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<sup>28</sup> Real and apparent losses constitute non-revenue water. Based on the assumption in footnote 25, the real and apparent losses contribute 460 and 115 AF, respectively. The real loss reduction represents a reduction in demand; whereas the apparent loss reduction represents an increase in water sales revenue.

capital projects, leak detection and prevention, improved metering and data management, and overall system wide loss control are included in water rates and fees. Finally, the City will evaluate options and efficacy of including additional tiers of water rates in its pricing for residential and commercial customers.

Savings from the City setting new water rates is not expected to be significant<sup>29</sup>; however the City should plan to integrate the water rate fee changes with its messaging on wise water use and water conservation to help educate and engage its customer base regarding the justification for increased water rates, and to manage customer expectations regarding further water rate increases.

**Cost** – \$25,000 for a water rate study assuming the City has the engineering data need to assess meter reading accuracy and effectiveness, and characterize overall system wide water loss (which indicates that the system wide water audit should be completed prior to the next water rate study).

**Savings** – For a 5% water rate increase (\$0.09), a water demand reduction of between 70 and 210 AF in 2012 (and 80 and 240 AF in 2020<sup>30</sup>) could be expected under average conditions, especially if the City introduces the new smart water use messaging along with the increased water rates; however, due to the relatively low cost of water in the City, it is anticipated that actual water savings related to water rate increases will tend to be at the middle to low end of the literature-based savings estimates<sup>31</sup>.

### Other Programs

**K-12 Education** – The City will continue its efforts to support local K-12 educational efforts including participation in the Loveland water fair, classroom presentations on responsible water use and management, and other adhoc water related events. The City's presence at these events helps to engage the community and instill a general sense of water awareness in its attendees. There is no specific attempt to quantify potential water savings that are attributed to these expenditures; however the City believes that the support of local K-12 education is a basic responsibility of the utility that will continue to be funded.

**Cost** – The City has \$5,000 in the water utility budget for educational support, in addition to the other programs outlined in this plan.

**Larimer County Conservation Corps, Energy and Water Program and the Home Energy Audit Program** – The City has provided funding for these programs in the past to support the audits

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<sup>29</sup> Water rate increases at the City may reduce overall water use by between 0.1 to 0.7% per 1% increase in water rate based on Stevens, et.al.(1992), at an average of about 0.33% (Olmstead, et. al., 2006).

<sup>30</sup> Increased demand reductions are estimated for 2020 based on increased water demand from a combination of growth and reduced apparent losses, both of which increase water deliveries to customers.

<sup>31</sup> A 5% rate increase would increase an average water bill for a single family residential customer by about \$0.45 for wintertime use and by about \$4.00 for summertime use (assuming 5,000 per month and 40,000 per month, respectively).

and retrofits of residential housing with water and energy efficient fixtures including faucet aerators, showerheads, toilet dams and dye tablets (for toilet leak detection). Although this program has not provided explicit reporting back to the City regarding measured water savings, the staff visit, audit and retrofit 200 homes each year. It is estimated that the showerheads and faucet aerators reduce the typical indoor single-family water use by about 10% (or about 135 gallons per connection per day for each of 200 homes).

**Costs** - \$8,000 for 50 faucet aerators and showerheads to support residential retrofits (for quality 0.5 gpm faucet aerators and 1.5 gpm showerheads cost about \$40 a set wholesale – without quality retrofits, the home owner is more likely to remove the retrofit and install less efficient models after the audit is completed) .

**Savings** – 0.03 AF (for each year the program is conducted)<sup>32</sup>.

**Efficiency Express through Platte River Power Authority** – Loveland Water and Power has joined with the Platte River Power Authority to fund energy and water audits for qualifying commercial and industrial buildings to support building energy tune-ups and efficiency upgrade assistance. Although the program components are focused on energy efficiencies, some water use efficiencies are possible (with respect to ice making and other food service equipment). For example, the audit team will provide educational support to facility managers regarding rebate opportunities and technical support. Since the City is not supporting rebates, the potential water savings that could occur as a result of this program relate to City retrofits of faucet aerators and showerheads. The City could potentially link the commercial water audit program to the Efficiency Express Program to support finding interested and qualifying commercial water customers.

Given that the actual water savings related to this program will likely occur as the result of fixtures that are replaced by the City as part of its commercial water audit and retrofit program, the savings for this program are imbedded in that program.

**Costs** - \$2,500 for 10 facilities in conjunction with the Brendle Group's scheduled facility assessment.

**Savings** – no savings were estimated for this program since the nature of the water savings can vary substantially from year to year, and the overall expected water savings are expected to be small.

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<sup>32</sup> Based on reduction from 2.5 gpm to 1.5 gpm in the shower for an 8 minute shower per person per day; and from 2.2 gpm to 0.5 gpm for 2.3 minutes of bathroom sink use per person per day; for an average of 2.5 persons per audited household.

## Section 7

### Summary of Candidate Measures and Programs

Table 9 presents a summary of the water conservation measures and programs evaluated and selected by the City for implementation during the period 2013 to 2017. Details of the proposed budget are provided in Section 9.

**Table 9 - Summary of Selected Water Conservation Programs for Implementation**

Measure/Program	Estimated Annual Cost	Estimated One Time Cost Over Planning Period	Estimated Savings <sup>33</sup> (AF)	Comment
<b>Summertime Demand Management</b>				
<b>Park Irrigation Improvements</b>		\$70,000	70	Includes both landscape efficiency and conversions from spray rotors to MP rotors
<b>Expanded Water Waste Ordinance</b>		\$1,500	Included in savings estimate for Smart Water Use Messaging	Includes increasing nature of ordinance to allow for penalties to water wasters
<b>Slow the Flow/Garden-in-a-Box</b>	\$17,200		5	Helps to develop good will and support the City's messaging
<b>Wise Water Use Messaging</b>	\$8,000	\$25,000	92	must be performed in close coordination with other measures and programs identified for implementation to achieve savings
<b>Commercial Water Audits</b>		\$30,000	8	partnership for management of City's biggest customers
<b>System Wide Water Audit and Recommendations</b>	\$15,000	\$40,000	294	mid-term commitment to future reduction of non-revenue water
<b>Water Rate Study and Implementation</b>		\$25,000	147	part of City's typical management program
<b>K-12 Education</b>	\$5,000		n/a	It is the right thing to do for the City
<b>Water and Energy Assessments and Audits</b>	\$8,000		<1	Supports low income families
<b>Efficiency Express</b>	\$2,500		n/a	Included in Commercial Water Audits
	<b>\$55,700<sup>a</sup></b>	<b>\$191,500<sup>b</sup></b>	<b>~620</b>	

<sup>a</sup> includes \$40,000 for financial software and public relations expenses

<sup>b</sup> includes \$70,000 from parks; \$25,000 from public relations; and \$25,000 from finance and administration.

<sup>33</sup> Estimated as average annual water demand reduction after five years of program implementation

Note that one of the City's implementation goals for this Plan is to reduce summertime peak day demand by about 1 mgd by 2016. The projected savings of 620 AF by 2020 represents about 0.6 mgd, which on first blush appears to be short of the goal. However, the 1 mgd peak demand reduction goal only relates to a water supply condition that occurs during a few weeks in the summer, rather than over the entire year. Therefore, the total annual demand reduction related to summertime peaking is in the range of only 125 to 170 AF (which corresponds to a 6 to 8 week period). The summertime peak demand reductions related to irrigation improvements in the parks and at commercial facilities, as well as for residential customers, are focused on the current June through August peak day demands. These programs, if implemented by the City and its customers, could trim peak day water use by 1.5 to 2 mgd.

## Section 8

### Integration of Proposed Water Conservation Program with Water Demand and Sales

The impact of the proposed water conservation program will be apparent with regard to both total water demand and water sales in the City. The design of the water conservation program focuses on reducing both real and apparent water loss, summertime peak demand, and overall customer water use efficiency, helping to postpone capital improvement projects (i.e., the expansion of the water treatment plant) and reducing long-term water supply development requirements. However, water conservation and demand reduction cannot be counted on alone to reduce long-term water needs for the City. The City will need to continue its practices related to the integration of storage and efficient water use to meet the needs of its customers – since the nature of a future water supply that is reliable, secure and sustainable will change in response to a growing service population, evolving commercial and business uses, and changing climatic conditions.

It is also vital to note that overall water demand reductions are estimates based on experience, literature assessments and expected trends in the City's municipal and industrial water use. Actual water savings may vary widely dependent on customer behaviors, weather conditions, City messaging efforts, and any number of other external factors. However, with the City's investment in water conservation, individual customer water use will trend downward as more responsible water use is condoned and supported. For the City to manage its practices and understand the impact of its expenditures, it is vital that a robust water use monitoring program be established to track individual and sector water use on a daily, monthly, quarterly and annual basis as plan implementation occurs. Therefore, the City will need to commit staff resources to managing the implementation phase of the water conservation program such that mid-course corrections can be identified and executed, allowing the City to best leverage its resources to achieve meaningful water conservation.

Table 10 presents the estimated decreases in future water demand associated with the proposed water conservation measures and programs presented in the previous section. The table presents demand reductions for both average conditions and above average (i.e., one standard deviation above average demands) conditions. Above average conditions savings are greater due to the impact of improved water loss management, and the associated reduction of real losses associated to delivering future water to the City's customers, since real losses are accounted for as a percentage of water deliveries.

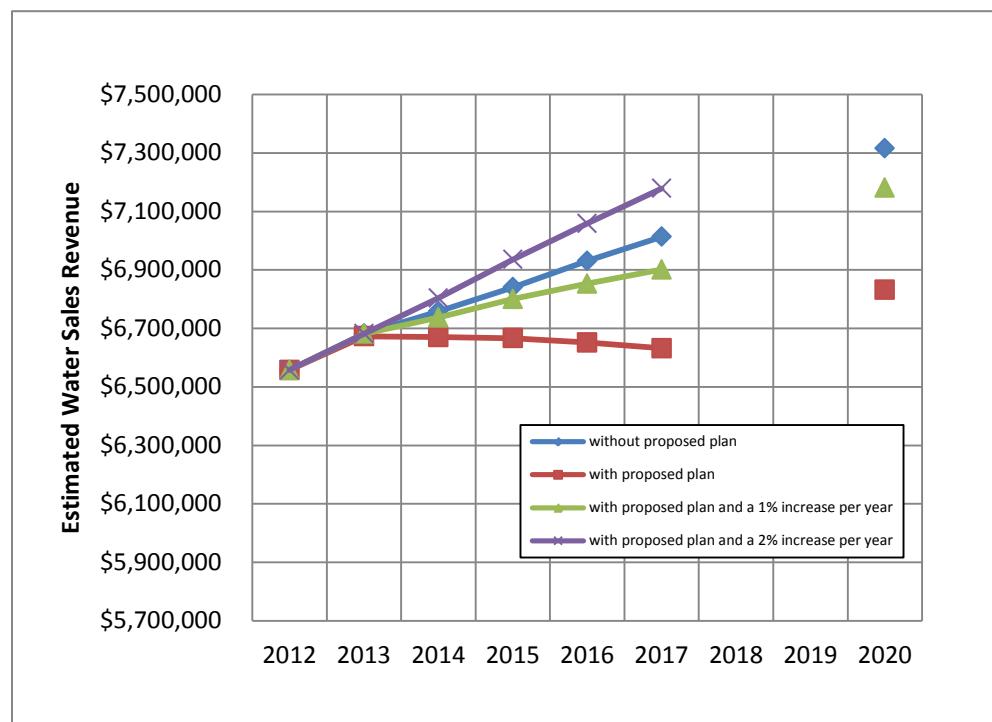
Figure 13 presents the predicted impact of improved water use efficiency on City water sales revenues. The base case of water sales revenues is calculated maintaining water rates at the current rate of \$1.83 per thousand gallons. Two alternative water rate scenarios are presented for comparison purposes – one with an annual 1% increase in rates and one with an annual 2% increase in rates. Based on the results of this analysis, it was estimated that a water rate increase of about 1.4% per year would offset the lost water sales revenue related to the implementation of the proposed water conservation program.

**Table 10 - Impact of Proposed Water Conservation Program on Average and Above Average Future Annual Water Supply Demands**

	Average Conditions (AF)			Above Average Conditions <sup>a</sup> (AF)		
	Without Proposed Plan	With Proposed Plan	Savings	Without Proposed Plan	With Proposed Plan	Savings
2012	12,712	12,712	0	14,436	14,436	0
2013	12,954	12,939	15	14,717	14,702	15
2014	13,103	12,959	144	14,894	14,730	164
2015	13,324	13,042	282	15,084	14,766	318
2016	13,439	12,988	451	15,292	14,784	508
2017	13,599	12,983	616	15,484	14,791	693
2020	14,185	13,395	790	16,168	15,193	975

<sup>a</sup> above average conditions are described in Appendix C.

**Figure 13 – Water Sales Revenue Impacts Related to Proposed Water Conservation Program**



Note that adjustments to water rates in the future will need to incorporate more factors than simply changes to future water demand associated with water conservation impacts. For example, the predicted impact of passive water conservation savings is in the range of 780 AF by 2020. Water rates will need to be adjusted in accordance with expected passive water savings to maintain current levels of water sales revenue independent of the impacts of the proposed water conservation program. Other factors such as changes in debt service, the need for cash reserves, costs of labor, energy and materials, and the scope of capital improvements will all affect future water rates as well.

The overall water demand reduction of 790 AF projected for the City by 2020 has a replacement value of about \$15.8 million (based on the cost of storage, transmission, treatment and distribution).

## Section 9

### Implementation

The City has identified those measures and programs that it chooses to implement to reduce future customer water demand; however the specific staging and order of measure and program implementation is clarified in this implementation plan. Clearly the City will earnestly pursue meaningful water conservation in compliance with the elements of this Plan and the direction of City Council. Future capital funding and annual budgets will be developed in accordance with the funding requirements laid out in the preceding chapters. However, future appropriations of City funding for the various measures and programs contained herein cannot be guaranteed given that the nature of future City priorities may change due to acts of God, public health issues, or other unforeseeable issues.

To this point, the implementation plan for water use efficiency by the City needs to maintain flexibility to adapt to the changing needs and requirements of not only the City's resources, but the water use efficiency program as well. For as portions of the water use efficiency program are implemented, new data and information will be acquired which may dictate or influence future water use efficiency programs needs not predicted at the time of this planning effort. Therefore, this Plan will be implemented in an adaptive management approach, incorporating changing conditions and influences into the year to year, and month to month, water use efficiency activities planned and executed by the City. This City will also perform surveys on various customer classes to gain a better understanding of the customers' current perception of water, water use and interest in various water measures and programs. Results from these surveys will aid the City in planning.

Given this framework and understanding of how water use efficiency will be best implemented in the City, the Plan is best served through the identification of the staging, or sequencing, of the various selected water use efficiency measures and programs; and a listing of those measures and programs that are of the highest priority to the City as of this writing. In this way, the first set of measures and programs that the City plans to implement can be identified (i.e., those measures and programs that will be implemented in the next 1 to 2 years). As new information becomes available over the next 1 to 2 years, the City will revise and update its water efficiency methods to best address the circumstances at that time (with regard to data collected, current fiscal resources, changing customer needs, etc.).

#### Sequencing

Although the City understands and supports the implementation of meaningful water conservation, its resources are not unlimited; therefore, it has chosen to sequence the implementation of its selected water use efficiency measures and programs in accordance with its current needs, expectations for future fund allocations, and perhaps most importantly due to the logical connection and interaction between specific measures and programs. For example, a system-wide audit of the City's water treatment, distribution and billing systems will be used to inform decisions to implement new meter testing, repair, and/or installation activities.

Table 11 presents a summary of the estimated annual costs for selected water use efficiency measures and programs as understood at this time. The costs have been developed based on the following assumptions:

- Individual water customers of the City's will be interested and participate in the various measures and programs, especially the residential and commercial programs;
- The system-wide audit will help to identify areas for City improvement regarding measuring and reducing non-revenue water uses; and
- The City will coordinate the budgeting of its Capital Improvement Projects with the annual water conservation budget.

**Table 11 – Proposed Water Conservation Program Implementation Budget 2013- 2017**

	2013 <sup>a</sup>	2014	2015	2016	2017
Park Irrigation Retrofits	\$ 14,000	\$ 14,000	\$ 14,000	\$ 14,000	\$ 14,000
Water Waste Ordinance	\$ 1,500				
Slow the Flow	\$ 13,200	\$ 13,200	\$ 13,200	\$ 13,200	\$ 13,200
Garden-in-a-Box	\$ 4,000	\$ 4,000	\$ 4,000	\$ 4,000	\$ 4,000
Wise Water Use Messaging	\$ 25,000	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000
Commercial Water Audits			\$ 15,000	\$ 15,000	
System Wide Water Audits	\$ 40,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
Water Rate Study		\$ 25,000			\$ 25,000
K-12 Education	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
Larimer County Conservation Corps, Energy and Water Program and the Home Energy Audit Program	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000
Efficiency Express	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500
<b>Total</b>	<b>\$ 114,200</b>	<b>\$ 94,700</b>	<b>\$ 84,700</b>	<b>\$ 84,700</b>	<b>\$ 94,700</b>

<sup>a</sup> at this time, 2013 programs are funded by budgeting annually, no rate increase has been dedicated to support programs.

### Priorities

For the City, the implementation of water conservation to support future demand reduction begins with the management of current non-revenue water (which aligns with one of the State-defined foundational water use efficiency elements). Non-revenue water includes both apparent losses that effect City billings and revenue; as well as real losses, which effect City operational costs. The City is focused on reducing the current level of non-revenue water, estimated to be about 13.5% of total treated water to about 10.5% in the next 9 years. To achieve this goal, the City will need to:

- Plan for and conduct a system-wide water audit to better characterize current non-revenue water and identify areas for utility improvements (e.g., revising the customer

billing categories, identifying unmetered uses, developing cost estimates for making various proposed improvements to current water accounting practices);

- Improve meter reading accuracy on existing accounts;
- Identify and measure unmetered water uses; and
- Continue testing and repair of water distribution lines to manage leaks and other real losses between the treatment works and customer meters.

The City also wants to develop and launch a water value messaging campaign to inform and engage its customers regarding the value and importance of a water system that is reliable, secure and sustainable. The messaging effort will focus on developing talking points, themes, and outreach efforts that help water customers to understand the nature of water supply and development in the City; the importance and value of maintained water supply infrastructure; and the need for water use efficiency by all. The City will use the proposed water conservation measures related to water loss control, improved water use efficiency at City facilities, better defined water waste management via ordinance, and various customer support programs (commercial audits, Slow the Flow and Garden-in-a-Box, etc.) to lead by example. The City will also develop and execute a customer survey to initiate the messaging campaign, gathering information regarding customer perceptions and values regarding water and water supply.

These two areas are therefore funded in 2013 to initiate the City's water conservation program.

Pricing of the City's water – both respect to the generation of revenue to cover actual fixed and variable costs; and to promote water use efficiency by its customers – is another high priority set of activities. To this end, the City will continue with its planned water rate increases and will conduct a complete evaluation of its water rates in 2014, including an assessment of rate structures and options for using inclining block rates. Table 12 demonstrates current proposed rate increases through 2012:

Table 12: Proposed Rate Increases Through 2022 <sup>a</sup>	
2014	13%
2015-2019	9%
2020-2022	8%

<sup>a</sup> proposed rate increase have not been approved by Loveland City Council

The next highest priority for the City will be to conduct those measures and programs that improve the water use efficiency of the City's facilities including those measures and programs that will improve water use efficiency for both indoor and outdoor uses.

Other water use efficiency measures and programs that will support a better understanding of specific customer uses and improve their water use efficiencies, while considered important to the management of future water demand are considered less important than those measures and programs controlled entirely by the City. Future implementation of customer water conservation programs will be conducted dependent on available funding and overall customer water use trends.

### **Public Input**

The summary of public input will be provided after the comment period has closed. Public comment is expected to open on February 21, 2013. The public comment period will be announced through the City's webpage and notice in the local newspaper. Copies of the Final Draft plan will be made available at City Hall, City Public Library and the Water Utility Offices. Appendix D contains copies of the public notices used by the City to advertise the public comment period.

Public comment will continue for 60 days during which time City Council and the Water Utility Department will collect public comments, which will be used to inform the Final Plan. The Plan will be finalized after the public comment period has been completed and the guidance is provided by City Council. The Final Plan should be prepared and ready for CWCB review by May 2013.

## Section 10

# Monitoring and Evaluation of Measures and Programs

It is important to identify an approach to monitoring as many of the measures and programs as possible so the value of each program can be evaluated as it is implemented. In this way, adaptive management of the Plan components can be performed, and resources from the City allocated.

Generally, the City has selected water use efficiency measures and programs that can be tracked.<sup>34</sup> However, some measures and programs such as customer education and the effect of increasing water rates cannot be measured directly. For these measures and programs, overall customer water use metrics such as per capita residential water use and total per capita water use will be tracked. Other measures and programs, such as the audits conducted on large commercial water users and Slow the Flow can be monitored on an individual basis.

Monitoring efforts and metrics that the City proposes are summarized in Table 13.

**Table 13 - Summary of Monitoring Methods for Estimating Water Savings**

Use Efficiency Measure/Program	Real Water Losses	Apparent Water Loss Reductions	Quantity of Audits/Packages Used	Individual Water Use	Per Capita Water Use	Peak Monthly Demand
System-Wide Audit	X	X			X	
Messaging Campaign					X	X
Water Rate Increase					X	X
Residential Programs			X	X	X	X
Commercial Audits	X	X		X	X	X
Efficiency Express			X	X		
Water and Energy Assessments and Audits			X	X		

### Plan Updates and Revisions

On an annual basis the City will monitor the metrics proposed in Table 13. The results will be reported to the Water Commission and City Council on a semi-annual and annual basis. The annual reports will help prepare the City for updating the Water Efficiency Plan every five to seven years, as required by the CWCB. It is the City's intent to update this Plan at the end of 2016.

<sup>34</sup> The City may have to implement some changes to its current protocols to track targeted customer water use, such as the City's water use and raw water uses, to complement the City's active water conservation efforts.

## **Appendix A**

### **City of Loveland Current Water Rates**

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February, 2013

# CITY OF LOVELAND, COLORADO



Water and Power Department  
Schedule of Rates, Charges and Fees

*Effective 1/1/13*

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*City of Loveland, Colorado  
Water and Power Department  
2013 Schedule of Rates, Charges and Fees  
SUMMARY*

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## **SUMMARY**

### ***Electric Rates***

Annexation Surcharge	5%	
Renewable Energy Premium per 100 kilowatt-hour (kWh)	\$2.70	
	<u>Jan.-June, Oct.-Dec.</u>	<u>July-Sept.</u>
Residential (Schedule R)		
Base Charge per Month	\$8.91	\$8.91
Energy Charge per kWh	\$0.06600	\$0.07220
PILT per kWh	\$0.00593	\$0.00633
Residential Demand (Schedule RD)		
Base Charge per Month	\$18.00	\$18.00
Energy Charge per kWh	\$0.02800	\$0.02800
PILT per kWh	\$0.00466	\$0.00497
Demand Charge per kW	\$8.21	\$8.75
Small General Service (Schedule SG)		
Base Charge per Month	\$14.20	\$14.20
Energy Charge per kWh	\$0.06640	\$0.07100
PILT per kWh	\$0.00554	\$0.00586
Plant Investment Fee per kWh	\$0.00514	\$0.00514
Large General Service (Schedule LG)		
Base Charge per Month	\$65.00	\$65.00
Energy Charge per kWh	\$0.03350	\$0.03490
PILT per kWh	\$0.00466	\$0.00499
Plant Investment Fee per kWh	\$0.00514	\$0.00514
Demand Charge per kW	\$10.49	\$11.51
Primary Service with Customer Owned Transformer (Schedule PT)		
Base Charge per Month	\$81.00	\$81.00
Energy Charge per kWh	\$0.03276	\$0.03413
PILT per kWh	\$0.00384	\$0.00412
Plant Investment Fee per kWh	\$0.00499	\$0.00499
Demand Charge per kW	\$9.49	\$10.51

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*City of Loveland, Colorado*  
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***Electric Rates Cont'd***

Transmission Voltage by Contract (Schedule TS)

Area Lighting (Schedule AL)	<u>Jan.-Dec.</u>
Rate per watt of bulb	\$0.04717
PILT per watt of bulb	\$0.00353
Flat Rates (Schedule FR)	<u>Jan.-Dec.</u>
Signal Amplifiers	\$27.80
PILT	\$2.08
Automatic Sprinkler Controls	\$4.13
PILT	\$0.31
Bus Shelters	\$17.09
PILT	\$1.28

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*City of Loveland, Colorado  
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## ***Wastewater Rates***

<u>Monthly Flat Rate</u>	<u>Inside City</u>	<u>Outside City</u>
Single-family residential	\$18.81	\$28.22
Multi-family residential per unit	\$11.22	\$16.83
Non-residential property (Commercial or Industrial)	\$125.87	\$188.81
<u>Metered Water Service</u>		
Monthly base charge – single-family residential	\$8.22	\$12.33
Monthly base charge – multi-family residential	\$3.43	\$5.15
Monthly base charge – commercial	\$8.00	\$12.00
Volume charge per 1,000 gallons – single-family residential	\$2.59	\$3.89
Volume charge per 1,000 gallons – multi-family residential	\$2.59	\$3.89
Volume charge per 1,000 gallons – commercial	\$3.21	\$4.82
<u>High Strength Surcharge</u>		
BOD charge per pound when discharge is greater than 276 mg/l	\$0.44	\$0.66
TSS charge per pound when discharge is greater than 207 mg/l	\$0.26	\$0.39

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*City of Loveland, Colorado*  
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## **Water Rates**

### Metered Rates

The monthly service charge shall be the sum of the base charge and the use fee per 1,000 gallons as set forth below:

#### Single-Family Residential Base Charge

<u>Tap Size (in inches)</u>	<u>Inside City</u>	<u>Outside City</u>
0.75	\$10.07	\$15.11
1.00	\$12.97	\$19.46
1.50	\$15.86	\$23.79
2.00	\$23.84	\$35.76
3.00	\$82.53	\$123.80
4.00	\$104.27	\$156.41
6.00	\$155.00	\$232.50

#### Multi-Family Residential Base Charge

<u>Tap size (in inches)</u>	<u>Inside City</u>	<u>Outside City</u>
0.75	\$14.83	\$22.25
1.00	\$17.73	\$26.60
1.25	\$19.18	N/A
1.50	\$20.62	\$30.93
2.00	\$28.59	\$42.89
3.00	\$87.24	\$130.86
4.00	\$108.96	\$163.44
6.00	\$159.64	\$239.46

#### Commercial Base Charge

<u>Tap size (in inches)</u>	<u>Inside City</u>	<u>Outside City</u>
0.75	\$10.07	\$15.11
1.00	\$12.97	\$19.46
1.50	\$15.86	\$23.79
2.00	\$23.84	\$35.76
3.00	\$82.53	\$123.80
4.00	\$104.27	\$156.41
6.00	\$155.00	\$232.50

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## **Water Rates Cont'd**

## Irrigation Base Charge

<u>Tap size (in inches)</u>	<u>Inside City</u>	<u>Outside City</u>
0.75	\$10.07	\$15.11
1.00	\$12.97	\$19.46
1.50	\$15.86	\$23.79
2.00	\$23.84	\$35.76
3.00	\$82.53	\$123.80
4.00	\$104.27	\$156.41
6.00	\$155.00	\$232.50

Charges for larger taps will be set by City Council.

Use Fee per 1,000 gallons	<u>Inside City</u>	<u>Outside City</u>
Single-Family Residential	\$1.75	\$2.63
Multi-Family Residential	\$1.61	\$2.42
Commercial	\$1.76	\$2.64
Irrigation	\$2.15	\$3.23

Hidden Valley Monthly Base Charge for 0.75 inch tap \$160.70

Excess Water Use – Surcharge per 1,000 gallons \$0.75

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*City of Loveland, Colorado  
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**Water Rates Cont'd**

Fire Hydrant Charge per month	
Residential	\$2.50
Commercial	\$6.20
Fire Protection Tap Service Fee per month	\$1.80
Tank and Hydrant Rate per 300 gallons	\$1.00

**Plant Investment Fees - Electric**

Residential Service	
Residential over 150 amp service	\$1,630.00
Residential 150 amp service or less	\$1,270.00
Non-Residential per kWh	
Small General Service	\$0.00514
Large General Service	\$0.00514
Primary Service w/customer equipment	\$0.00499

**System Impact Fees – Wastewater**

	<u>Inside City</u>	<u>Outside City</u>
Detached one-family dwelling	\$2,510.00	\$3,770.00
Attached one-family dwelling, per unit	\$2,240.00	\$3,360.00
Two-family dwelling, per unit	\$2,240.00	\$3,360.00
Multifamily dwelling containing 3-8 dwelling units, per unit	\$2,240.00	\$3,360.00
Multifamily dwelling containing 9 or more dwelling units, per unit	\$1,620.00	\$2,430.00
Nonresidential		
<u>Tap size (in inches)</u>	<u>Inside City</u>	<u>Outside City</u>
0.75	\$5,450.00	\$8,180.00
1.00	\$17,820.00	\$26,730.00
1.50	\$31,360.00	\$47,040.00

Nonresidential taps above 1.5-inch pays the capital recovery surcharge

**Capital Recovery Surcharge – Wastewater**

Inside City per 1,000 gallons of sewer billed	\$0.745
Outside City per 1,000 gallons of sewer billed	\$1.118

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***System Impact Fees – Water***

	<u>Inside City</u>	<u>Outside City</u>
Detached one-family dwelling	\$4,670.00	\$7,010.00
Attached one-family dwelling, per unit	\$2,810.00	\$4,220.00
Two-family dwelling, per unit	\$2,810.00	\$4,220.00
Multifamily dwelling containing 3-8 dwelling units, per unit	\$2,810.00	\$4,220.00
Multifamily dwelling containing 9 or more dwelling units, per unit	\$2,010.00	\$3,020.00

Nonresidential

<u>Tap size (in inches)</u>	<u>Inside City</u>	<u>Outside City</u>
0.75	\$5,480.00	\$8,220.00
1.00	\$17,350.00	\$26,030.00
1.50	\$31,890.00	\$47,840.00

Irrigation

<u>Tap size (in inches)</u>	<u>Inside City</u>	<u>Outside City</u>
0.75	\$11,930.00	\$17,900.00
1.00	\$32,760.00	\$49,140.00
1.50	\$84,120.00	\$126,180.00
2.00	\$105,940.00	\$158,910.00
3.00	\$271,720.00	\$407,580.00

Tap sizes larger than 3-inch shall be established by City Council. The impact fee for taps larger than 1.5 inch applies only to irrigation meters. Nonresidential taps above 1.5 inch pay the capital recovery surcharge.

***Hidden Valley Water Tap Activation Fee:***

This fee applies to all water taps applied for on or after January 1, 2010 to serve lots authorized pursuant to Resolutions #R-35-2004 and #R-83-2005. Payment of this fee shall be due upon application for the water tap. The fee shall be calculated as follows: A x B x C = fee.

A = Number of months from July 1, 2005 to the activation fee due date

B = \$67.00 per month

C = *Engineering News Record 20 Cities Construction Cost Index* (used to inflate the construction costs to current dollars)

***Capital Recovery Surcharge - Water***

Inside City per 1,000 gallons of water	\$0.721
Outside City per 1,000 gallons of water	\$1.082

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***Fire Tap Plant Investment Fee***

Fire Tap Plant Investment Fee (outside City only)	\$553.00
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***Raw Water Development Fee***

Detached One-Family Dwelling	\$1,000.00
Attached One-Family Dwelling, per unit	\$1,000.00
Multifamily dwelling containing 2-24 dwelling units, per unit	\$626.00
Multifamily dwelling containing 25 or more dwelling units, per unit	\$123.00
Nonresidential	
<u>Tap size (in inches)</u>	
0.75	\$1,000.00
1.00	\$1,700.00
1.50	\$3,300.00
2.00	\$5,300.00
3.00	\$10,000.00

Tap sizes larger than 3-inch shall be established by City Council. The impact fee for taps larger than 1.5 inch applies only to irrigation meters. Commercial taps above 1.5 inch pay the capital recovery surcharge.

***Raw Water Capital Recovery Surcharge Per 1,000 Gallons***

Raw Water Capital Recovery Surcharge Per 1,000 Gallons	\$0.15
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***Electric Fees***

Service Turn-On at the meter	\$35.00
Service Turn-On at the meter – After Hours	\$65.00
Service Turn-Off at the meter resulting from an unauthorized Service Turn-On	\$30.00
Disconnect/Reconnect Services	\$155.00
Disconnect/Reconnect Services with Engineering	\$255.00
Permanent Service Connect (No Disconnect Needed)	\$155.00
Permanent Disconnect of Service	\$155.00

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*City of Loveland, Colorado  
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***Electric FeesCont'd***

Charges When Access Denied

Appointment or Special Trip to Read the Meter	\$15.00
Appointment or Special Trip to Read the Meter After Hours	\$25.00
Appointment or Special Trip to Change the Meter	\$55.00
Appointment or Special Trip to Change Meter After Hours or Weekends	\$70.00
Service is disconnected at the junction box or the overhead pole	\$155.00
When access to the pole is denied, actual costs will be billed	

Residential Service Installations

Typical Underground with 1/0 CIC	\$590.00
Typical Underground with 4/0 CIC	\$800.00
Typical Overhead	\$310.00

Multiplex 3-6 Units	\$700.00
Multiplex 7 or More Units (deposit, to be billed on actuals)	\$855.00

Field Engineering Deposits

Residential and duplex single phase installations, 1-2 lots	\$800.00
Single commercial buildings, transformer upgrades, raising, lowering, or removing existing power	\$1,200.00
Residential subdivision of 3-25 lots, commercial subdivision of 2-10 lots, raising, lowering, or removing existing power	\$1,600.00
Residential subdivision of more than 25 lots, commercial subdivision of more than 10 lots, malls, shopping centers, hospitals	\$3,000.00

Other Deposits – See Section Fees – Electric “Other Deposits”

Temporary Residential Connections	\$170.00
Termination and energizing electric services to small devices	\$285.00

Installation of Area Light	\$325.00
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*City of Loveland, Colorado*  
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**SUMMARY**

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### **Wastewater Fees**

Pretreatment Inspection Fee	\$70.00
Pretreatment Significant Industrial User (SIU) Laboratory Analysis	<u>\$60.00</u>
Pretreatment SIU Public Notification of Violation	\$82.00
Tapping Fees 4 inch or 6 inch Tap	\$215.00
4 inch Saddle and Stainless Strap	\$60.00
6 inch Saddle and Stainless Strap	\$80.00

### **Water Fees**

#### Construction Water Fee

##### Tap size (in inches)

0.75	\$34.00
1.00	\$56.00
1.50	\$113.00
2.00	\$180.00
3.00	\$336.00
4.00	\$559.00

Above 4.00 inch tap will be negotiated with the Water and Power Department

Water Turn-on Fee – Regular Hours	\$35.00
Water Turn-on Fee – After Regular Hours	\$60.00
Water Turn-off Fee for Unauthorized Service Turn-on	\$30.00
Water Meter Appointment Fee – Regular Hours	\$20.00
Water Meter Appointment Fee – After Regular Hours	\$30.00
Raw Water Cash-in-lieu Fee per Acre-Foot (City Code Sec.19.04.040)	Set by Loveland Utilities Commission
Native Raw Water Storage Fee per Acre-Foot	
Barnes Ditch	\$5,750.00
Big Thompson Ditch & Manufacturing Co.	\$3,530.00
Buckingham Irrigation Co. (Geo. Rist Ditch)	\$7,400.00
Chubbuck Ditch	\$7,400.00
Louden Irrigating Canal and Reservoir Co.	\$6,850.00
South Side Ditch Company	\$6,770.00

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*City of Loveland, Colorado  
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**Water Fees Cont'd**

Construction Hydrant Meter Deposit	\$1,000.00
Hydrant Meter Rental	
Daily Rental	\$5.00
Install Fee	\$25.00
Remove Fee	\$25.00
Moving Meter Fee	\$25.00
Water Use	\$1.00/300 gallons
Meter Fees	
0.75 inch Meter and Readout	\$180.00
1.00 inch Meter and Readout	\$255.00
Install Meter and Inspection	
Meter inspect	\$45.00
Meter install	\$75.00
Water Tapping Fee	
0.75 inch	\$285.00
1.00 inch	\$285.00
1.50 inch	\$325.00
2.00 inch	\$340.00
Above 2.00 inch	\$355.00

**Miscellaneous Fees**

Late Payment Penalty	\$12.00
Field Collection Fee	\$18.00
New Account Fee	\$11.00
Reactivation Fee	\$10.00
New Account Meter Reading Fee	\$10.00
Interfering or Tampering with a Meter – electric or water	\$50.00
Return Check (Insufficient Funds) Charge	\$25.00
Filing Fee for Unpaid Bills	\$35.00

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*City of Loveland, Colorado  
Water and Power Department  
2013 Schedule of Rates, Charges and Fees  
RATES - ELECTRIC*

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## **I. Rates - Electric**

### ***Resale of Electric Current Prohibited***

It is unlawful for any consumer who purchases electric service from the City to sell such service to others.

### ***Surcharge***

There is imposed a surcharge in the amount of five percent of base charges plus charges for energy, demand, payment-in-lieu-of-taxes (PILT) for the sale of electric power to services that come into existence in all areas annexed to the City after January 31, 1987, which areas were formerly a part of an exclusive service territory granted to a cooperative electric association by the Public Utilities Commission. Such surcharge shall expire ten years after the effective date of annexation of each such area.

### ***Renewable Energy Premium***

#### **Availability**

The renewable energy premium is available as an option to all residential, commercial, and industrial customers served under Schedules R, RD, SG, LG, PS, and PT. The renewable energy premium is not available to Transmission Voltage Service, Area Light or Flat Rate customers served under Schedules TS, AL or FE.

#### **Monthly Rate**

Premium per each 100 kWh increment of energy .....\$2.70  
This charge is in addition to all other regular charges the customer incurs for electric service.

#### **Monthly Minimum**

The minimum bill shall be \$2.70 for each 100 kWh increment requested by the customer in the service agreement, plus the minimum bill as identified in the principal rate schedule for the customer.

#### **Conditions**

Service Restrictions – The supply of renewable energy is limited to the resources made available to the department by its power supplier, Platte River Power Authority (PRPA), and is therefore subject to all terms and conditions identified in PRPA's tariff for Renewable Energy Service.

#### **Service Agreement**

The renewable energy premium is an optional charge and requires the customer to sign a service agreement with Loveland Water and Power.

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**Service Agreement Period**

The renewable energy premium for all eligible rate schedules shall be available for a minimum initial period of 12 consecutive months and then continuing month to month thereafter until terminated. After the minimum period, the obligation to purchase or provide renewable energy may be terminated upon 30 days notice by either party. Termination of the principal service shall also terminate the agreement unless the customer chooses to advance the agreement to the new service address.

**Service Agreement Amount**

Customer may request renewable energy in 100 kWh increments. The billable monthly renewable energy premium will be the number of 100 kWh increments requested by the customer in the service agreement. The actual kilowatt-hours used by the customer in any given month may be more or less than the average.

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## ***Self-Generation Rate***

### **Availability**

The Self-Generation Rate is available as an option to all electric service customers who own, operate and maintain their own generation equipment.

### **Monthly Rate – System Size 1-50 kW**

	<u>Jan. – June, Oct. – Dec.</u>	<u>July – Sept.</u>
<b>Residential</b>		
Base charge	\$8.91	\$8.91
Energy charge per kWh	\$0.06600	\$0.07220
Buyback charge per kWh	\$0.03798	\$0.04071
Monthly minimum bill	\$8.91	\$8.91
System size range limitation	1-50 kW	1-50 kW
PILT per kWh	\$0.00593	\$0.00633
<b>Small General</b>		
Base charge	\$14.20	\$14.20
Energy charge per kWh	\$0.06640	\$0.07100
Buyback charge per kWh	\$0.03798	\$0.04071
Monthly minimum bill	\$14.20	\$14.20
System size range limitation	1-50 kW	1-50 kW
PILT per kWh	\$0.00554	\$0.00586
Plant Investment Fee per kWh	\$0.00514	\$0.00514
<b>Large General</b>		
Base charge	\$65.00	\$65.00
Energy charge per kWh	\$0.03350	\$0.03490
Demand per kW	\$10.49	\$11.51
Buyback charge per kWh	\$0.03798	\$0.04071
Monthly minimum bill	\$65.00	\$65.00
System size range limitation	1-50 kW	1-50 kW
PILT per kWh	\$0.00466	\$0.00500
Plant Investment Fee per kWh	\$0.00514	\$0.00514

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### ***Self-Generation Rate Cont'd***

#### **Conditions**

The city will net meter all energy consumed by the customer and produced by the customer's generation system. Net metering shall be, for billing purposes, the net consumption as measured at the service meter on a monthly basis. Consumption will be measured monthly and in the event net metering is negative in a given month, such that the customer's generation system production is greater than the customer's consumption, there will not be a monthly cash credit for such production. All such excess energy, expressed in kilowatt-hours, shall be carried forward from month to month and credited against the customer's energy consumption, expressed in kilowatt-hours, in subsequent months. In the event that a negative net consumption balance remains after twelve consecutive months following the effective date of customer's commencing on the Self Generation Rate, or any annual anniversary thereafter, the City will pay the customer for such negative balances at the Self Generation Buyback Charge Rate.

Monthly Rate – System Size 51 – 400 kW

<b>Large General Service</b>	<b>Jan. – Jun. Oct. – Dec.</b>	<b>July – Sept.</b>
Base Energy	\$65.00	\$65.00
Energy Charge per kWh	\$0.03350	\$0.03490
PILT per kWh	\$0.00466	\$0.00500
Plant Investment Fee per kWh	\$0.00514	\$0.00514
Demand per kW	\$10.49	\$11.51
Buyback charge per kWh	\$0.05290	\$0.06220
Monthly Minimum Bill	\$65.00	\$65.00
System Size Range Limitation	51-400 kW	51-400 kW

The Self-Generating customer must be in compliance with the technical specifications and requirements contained in the Standard for Interconnecting Distributed Resources with the City of Loveland Electric Power System as found in the City's Municipal Code, Section 13.12.240 and must enter into a contract with the City.

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## **Residential Service Schedule R**

### **Availability**

Residential Service is available for single-family dwelling units and individually metered multi-family dwelling units at any location within the area served by Loveland Water and Power. Single-family dwelling units and individually metered multi-family dwelling units shall mean those buildings or units used solely as residences and not used in part for any other purpose. This rate is applicable to existing and new residential customers. Service will be delivered through a single meter per dwelling unit, at one point of delivery.

### **Monthly Rate**

The rate for Residential Service shall consist of the sum of the base charge, energy charge, and PILT in accordance with the following table:

### **Monthly Rate**

The rate for Residential Service shall consist of the sum of the base charge, energy charge, and PILT in accordance with the following table:

	Jan. – June, <u>Oct. – Dec.</u>	<u>July – Sept.</u>
Base charge	\$8.91	\$8.91
Energy charge per kWh	\$0.06600	\$0.07220
PILT charge per kWh	\$0.00593	\$0.00633
Monthly minimum bill	\$8.91	\$8.91

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## **Residential Demand Service Schedule RD**

### **Availability**

Residential Demand Service is available for single-family dwelling units and individually metered multi-family dwelling units at any location within the area served by Loveland Water and Power. Single-family dwelling units and individually metered multi-family units shall mean those buildings or dwelling units used solely as residences and not used in part for any other purpose. Existing accounts may elect service under this schedule by making application to Loveland Water and Power. Service will be delivered through a single meter per dwelling unit, at one point of delivery.

### **Monthly Rate**

The rate for Residential Demand Service shall consist of the sum of the base charge, energy charge, demand charge and PILT in accordance with the following table:

	Jan. – June, <u>Oct. – Dec.</u>	<u>July – Sept.</u>
Base charge	\$18.00	\$18.00
Energy charge per kWh	\$0.02800	\$0.02800
PILT charge per kWh	\$0.00466	\$0.00497
Demand charge per kW	\$8.21	\$8.75
Monthly minimum bill	\$18.00	\$18.00

### **Billing Demand**

The demand shall be the highest rate of use in kilowatts during any 15 minute interval of the billing period.

### **Power Factor Charge**

Power factor charge of one hundred percent of the power factor charge incurred by the City on account of and attributable to service to the customer may be billed to the customer.

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## ***Small General Service Schedule SG***

### **Availability**

Small General Service is required for all non-residential customers with less than or equal to 50 kW demand per month in ten months of a consecutive 12-month period. This also includes temporary power for non-permanent non-residential customers (for example: firework stands and holiday lights).

### **Monthly Rate**

The rate for Small General Service shall consist of the sum of the base charge, energy charge and PILT in accordance with the following table:

	Jan. – June, <u>Oct. – Dec.</u>	<u>July – Sept.</u>
Base charge	\$14.20	\$14.20
Energy charge per kWh	\$0.06640	\$0.07100
PILT charge per kWh	\$0.00554	\$0.00586
Plant Investment Fee per kWh	\$0.00514	\$0.00514
Monthly minimum bill	\$14.20	\$14.20

### **Conditions**

- A. Whenever metered demand exceeds 50 kW in any three months out of a consecutive 12-month period, Loveland Water and Power will notify the customer and further service provided to such customer shall be furnished at the Large General Service Rate. The department may install such meters as it deems necessary in order to determine the metered demand.
- B. For single-phase, three-wire service, the customer's equipment shall be connected so that the current carried by the neutral conductor shall be not greater than 15 percent of the maximum current in either of the two conductors. For three-phase wye or delta service, the customer's equipment shall be connected so that the current carried by any one-phase conductor shall be no greater than 115 percent of the current in either of the two-phase conductors.

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## **Large General Service Schedule LG**

### **Availability**

Large General Service is required for all non-residential customers exceeding 50 kW demand in any three months out of a consecutive 12-month period.

### **Continuation for Certain Customers**

Customers on the Large General Service rate on January 31, 1999, with less than three months of 50 kW demand in a consecutive 12-month period will be grandfathered into the LG rate.

### **Monthly Rate**

The rate for Large General Service shall consist of the sum of the base charge, energy charge, demand charge and PILT in according with the following table:

	<u>Jan. – June,</u>	<u>Oct. – Dec.</u>	<u>July – Sept.</u>
Base charge	\$65.00	\$65.00	
Energy charge per kWh	\$0.03350	\$0.03490	
PILT charge per kWh	\$0.00466	\$0.00499	
Demand charge per kW	\$10.49	\$11.51	
Plant Investment Fee per kWh	\$0.00514	\$0.00514	
Monthly minimum bill	\$65.00	\$65.00	

### **Billing Demand**

The demand shall be the highest rate of use in kilowatts during any 15-minute interval of the billing period.

### **Power Factor Charge**

Power factor charge of one hundred percent of the power factor charge incurred by the City on account of and attributable to service to the customer may be billed to the customer.

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## **Primary Service with Transformer Schedule PT**

### **Availability**

Primary Service is available to all non-residential customers exceeding 50 kW demand in any three months within a 12-month period where service is delivered and metered at the available primary voltage and all serving facilities on the customer's side of the metering point are owned, operated and maintained by the customer.

### **Monthly Rate**

The rate for Primary Service where the customer owns the transformers shall consist of the sum of the base charge, energy charge, demand charge and PILT in accordance with the following table:

	<u>Jan. – June,</u>	<u>Oct. – Dec.</u>	<u>July – Sept.</u>
Base charge	\$81.00	\$81.00	\$81.00
Energy charge per kWh	\$0.03276	\$0.03413	\$0.03413
PILT charge per kWh	\$0.00384	\$0.00412	\$0.00412
Demand charge per kW	\$9.49	\$10.51	\$10.51
Plant Investment Fee per kWh	\$0.00499	\$0.00499	\$0.00499
Monthly minimum bill	\$81.00	\$81.00	\$81.00

### **Billing Demand**

The demand shall be the highest rate of use in kilowatts during any 15-minute interval of the billing period.

### **Power Factor Charge**

A power factor charge of one hundred percent of the power factor charge incurred by the City on account of and attributable to service to the customer may be billed to the customer.

### **Conditions**

Transformer ownership and maintenance is the responsibility of the customer receiving service under this rate schedule. The customer requesting this rate schedule is solely responsible for all costs associated with the installation and maintenance of the primary metering equipment and facilities. See the Water and Power Department's *Contractor Construction Standards* for equipment specifications.

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## **Transmission Voltage Service**

### **Schedule TS**

#### **Eligibility Requirements**

Transmission Voltage Service is available to any customer: (i) whose load is of sufficient magnitude or of an unusual nature such that it cannot be served from the distribution system; and (ii) whose premises are adjacent to transmission lines that are, or by contract can become, lines that supply wholesale power to the city's system; and (iii) who meets the criteria for large user service as set forth in Platte River Power Authority's Tariff 9, or applicable successor tariff.

#### **Character of Service**

The power furnished under Schedule TS shall be three phase alternating current and approximately 60 hertz, and delivered at approximately 115kV, or at other voltages subject to conditions as agreed upon, metered at each delivery point.

#### **Charges for Service**

The charges for service under Schedule TS shall be determined based on the unique load characteristics and service requirements of the customer. The rate for service delivered under Schedule TS shall at a minimum be sufficient to recover the city's cost of service, including, without limitation, wholesale rates and the city's projected operating and maintenance costs. In addition, the customer shall be responsible for all wholesale charges and fees incurred by the city in providing service under Schedule TS to the customer, including, without limitation, power factor charges.

#### **Conditions of Service**

In order to receive service under Schedule TS, the customer must meet the eligibility requirements set forth above and enter into an electric service agreement with the city. All such agreements must meet the requirements of this Schedule TS, protect the integrity of the City's electric system, protect against interference with other city electric customers, and shall address, at a minimum, the following material terms:

- term of the agreement, including initial date of service;
- charges for service, including rate adjustments;
- metering, including configuration, ownership, and maintenance;
- infrastructure, including ownership and maintenance;
- load factor, including any penalties for failure to comply;
- nature and frequency of interruptions (if service is provided on an interruptible basis), including any penalties for failure to comply;
- any other terms and conditions required to be addressed pursuant to Platte River Power Authority's Tariff 9, or applicable successor tariff.

In addition, the agreement must include a waiver of all liability for the city and Platte River Power Authority for actual and consequential damages resulting from interruptions in accordance with the agreement.

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The city manager shall be authorized to negotiate all such agreements, in consultation with Platte River Power Authority, and to execute such agreements on behalf of the city.

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## ***Area Lighting Schedule AL***

### **Availability**

Area lights will be furnished to customers who request this service for the purpose of lighting private property or alleys or other areas where City street lighting would normally not be installed. Decisions for location of the lights shall be in the discretion of the City. Applications for area lights should be made at the City of Loveland Water and Power Department.

### **Monthly Rate (Jan.-Dec.)**

The rate per watt for area lights shall be.....\$0.04717

The PILT charge per watt for area lights shall be.....\$0.00353

### **Conditions**

All area lights shall be high pressure sodium vapor units.

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## **Flat Rate Service Schedule FE**

### **Availability**

Small devices attached to the City's electric distribution system for the purpose of amplifying cable TV and telephone signals or operating automatic sprinkler controls in remote locations after June 1, 1992, will not require metering and will be billed on a flat monthly rate. Accounts existing prior to June 1, 1992, shall continue to be metered and billed at their present rate unless the customer requests conversion to the flat rate set forth in this schedule.

### **Monthly Rates (Jan.-Dec.)**

Signal amplifiers .....	\$27.80
Signal amplifiers PILT charge .....	\$2.08
Automatic sprinkler controls.....	\$4.13
Automatic sprinkler controls PILT charge .....	\$0.31
Bus shelters .....	\$17.09
Bus shelters PILT charge .....	\$1.28

### **Conditions**

- A. Signal amplifiers can be no greater than 5 amps per device.
- B. Automatic sprinkler controls can be no greater than 1.0 amp per device.
- C. The department may randomly install meters as it deems necessary in order to monitor the actual consumption.
- D. A customer with multiple device locations existing prior to June 1, 1992, requesting a conversion of said devices to the Flat Rate Schedule, must convert all devices existing prior to June 1, 1992, to the Flat Rate Schedule.

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## **II. Fees - Electric**

### ***Applications for Electric Service***

Every person desiring a supply of electric current from the City, or an upgrade or other change in existing service, shall make application therefore to the City upon forms furnished for that purpose.

#### ***Plant Investment Fee***

Plant Investment Fees provide for the additional electric transmission, substation and distribution facilities made necessary by the extension of electric service to new connections. The Plant Investment Fee provided herein shall be, in addition to, all of the rates and charges made in connection with the furnishing by the City of electric service, and shall be payable as provided for in this section.

**A. Schedule R – Residential Service and Schedule RD – Residential Demand Service.** At the time application is made for any dwelling unit to be built within the corporate boundaries of the City, or at the time of application for electric service for any dwelling unit to be built outside the corporate boundaries of the City, there shall be paid to the City a Plant Investment Fee in the amount of \$1,630.00 for each electric meter to be installed in connection with the dwelling unit with a service size of greater than 150 amps and \$1,270.00 for each electric meter to be installed in connection with the dwelling unit with a service size of 150 amps or less. (Each dwelling unit within a structure containing more than one dwelling unit shall be separately metered). No energization of a permanent connection to any dwelling unit served by the City shall occur unless and until the Plant Investment Fee is paid.

For the purpose of this section, “dwelling unit” means one or more rooms and a kitchen area designed for or occupied as a unit for living and cooking purposes, which is located within a single family, multiple family or mobile home, but excluding congregate care facilities, as those terms are defined in Municipal Code Chapter 18.04. A congregate care facility may receive service under Schedules R, RD, SG, LG, or PT.

Upon application, the Water and Power Department may allow a single meter to serve a multiple family dwelling if such multiple family dwelling is a federally assisted and federally supervised project and the project sponsor is required by the federal agency having jurisdiction thereof to include the provision of electric service within the rent structure for the project. Such project may receive service under Schedules R, RD, SG, LG, or PT. If any such projects should cease to be federally supervised, then the project shall revert to the requirement of individual metering, the Plant Investment Fee for residential service shall be paid and a credit shall be applied against such Plant Investment Fee in the amount of the Plant Investment Fees paid while receiving service under another class.

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### ***Plant Investment Fee (cont'd)***

- B. Schedule SG** – Small General Service. The Plant Investment Fee for accounts receiving small general service shall be collected in each billing period. The amount of the Plant Investment Fee to be billed in each period shall be equal to \$0.00514 per kWh used by the account during the billing period.
- In establishing the Plant Investment Fees in 1979, customers served prior to May 1, 1979, are exempt from the Plant Investment Fee at the existing location only. Customers who have paid the five-year Plant Investment Fee for a particular location are exempt from the fee at the location covered.
- C. Schedule LG** – Large General Service. The amount of Plant Investment Fee to be billed in each billing period shall be equal to \$0.00514 per kWh used by the account during the billing period.
- D. Schedule PT** – Primary Service with Transformer. The amount of Plant Investment Fee to be billed in each billing period shall be equal to \$0.00499 per kWh used by the account during the billing period.
- E. Discontinuance of Service.** In addition to all of the remedies available to the City, electric service may be discontinued for failure to pay the Plant Investment Fee provided for in this section, and such discontinuance shall be in accordance with the notice procedures set forth in Municipal Code Section 13.02.070.

### ***Service Turn-On Fee at the Meter***

During regularly scheduled work hours, there is imposed a fee in the amount of \$35.00 for each service turn-on where power is energized at the meter.

After regularly scheduled work hours, there is imposed a fee in the amount of \$65.00 for each service turn on where the power is energized at the meter.

After hours fees apply to all requests received after 4 p.m. Monday through Friday, anytime Saturday or Sunday, and all holidays observed by the City of Loveland.

### ***Disconnect and Reconnect Services***

Water and Power will perform a typical service disconnect/reconnect where power is energized or de-energized on the line side of the meter, on a flat fee basis.

There is imposed a fee in the amount of \$155.00 for each typical service disconnect/reconnect and \$255.00 for each typical service disconnect/reconnect with engineering.

A typical service disconnect/reconnect is defined as one where there is no increase in wire size or length.

All other service disconnect/reconnects will be billed at Water and Power's actual cost.

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### ***Permanent Disconnect and Removal of Service***

Where a request for permanent disconnection and removal of single-phase service has been requested, there is imposed a flat fee of \$155.00.

Where a request for permanent termination of three-phase service has been requested, charges will be billed at Water and Power's actual cost.

### ***Charges When Access Denied***

There is imposed a charge as set forth in this section, that shall be due and payable when billed, to cover the additional costs and expenses incurred by the City whenever clear access to the meter location is denied. Clear access shall be deemed to be denied whenever, because of locked gates, animals confined in the same space as the meter location, or for any other reason, and after making a reasonable attempt to locate a person upon the premises to gain access, an authorized representative of the City is unable to read the meter, change the meter, or perform such other function as such representative is lawfully authorized to perform. The amount of such charge shall be as follows:

- A. When clear access is denied for two successive meter readings, and an appointment is made with the consumer or a special trip is made for reading the meter, a charge of \$15.00 is imposed for such appointment or special trip occurring during regular business hours, and \$25.00 for such appointment occurring during off-duty hours and weekends.
- B. When clear access is denied and a special trip is made to change a meter on the department's regular maintenance program, a \$55.00 charge is imposed.
- C. When clear access is denied for the purpose of disconnecting service, and service is disconnected at the junction box or overhead pole, a charge of \$155.00 is imposed.
- D. When clear access is denied for the purpose of disconnecting service at the junction box or overhead pole, the actual costs will be billed.

### ***Residential Service Installations and Upgrades for Single Family and Duplex Dwellings***

A. A typical new residential service installation will be performed by the Water and Power Department on a flat fee basis. A typical new underground service is defined as having a trench length of 100 feet or less; trenching to be performed in normal soil conditions.

1. For a service using 1/0 triplex CIC with a panel size of 150 amps or less, the fee is \$590.00 and the Plant Investment Fee, as described in the Resolution Schedule of Rates, Charges and Fees as adopted by City Council, shall also be collected.
2. For a service using 4/0 triplex CIC with a panel size of 200 amps, the fee is \$800.00 and the Plant Investment Fee, as described in the Resolution Schedule of Rates, Charges and Fees as adopted by City Council, shall also be collected.

A typical new overhead service is defined as a service length of 80 feet or less, does not require setting a pole or transformer, is #2 triplex with a panel size of 150 amps or less, or 1/0 triplex with panel size of 200 amps. The fee for such service is \$310.00.

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## ***Residential Service Installations and Upgrades for Single Family and Duplex Dwellings (cont'd)***

A service not meeting the above criteria shall be billed at the Water and Power Department's actual cost of installation.

Within the city limits of the City of Loveland, the fees shall be collected by the department issuing the building permit for the residence. If outside the city limits, the fee will be collected by the Water and Power Department before work can proceed.

B. Residential service upgrades resulting in services larger than 150 amps and no larger than 200 amps shall require a deposit of \$300.00 for overhead, and \$800.00 for underground. This deposit will be applied to the actual costs billed by the Water and Power Department upon completion of work performed.

## ***Residential Service Installations and Upgrades for Multiplex Service Installations***

- A. For purposes of this Resolution, a "multiplex" is defined as a structure containing not less than three and not more than six dwellings.
- B. A "typical" multiplex electric service installation will be provided by and installed by the contractor per National Electric Code. It will be energized by the Water and Power Department on a flat fee basis.

A 3-6 unit multiplex service installation will be provided by the contractor in which an electrical secondary source is already in existence. The fee for installation of an electric service in a 3-6 unit multiplex project is \$700.00 for the project and the Plant Investment Fee, as described in the current Schedule of Rates, Charges and Fees as adopted by the City Council, shall also be collected for each unit.

A 7 unit or more multiplex service termination and meter set service installation requires a deposit of \$855.00 to be made at the Water and Power Department. The contractor is to provide and install all materials. This deposit will be applied to the actual costs billed by the Water and Power Department upon completion of work performed.

Multiplexes requiring an underground service in an overhead service area will have an underground service provided by and installed by the contractor per National Electric Code. They will be billed the actual costs incurred by the Water and Power Department.

If there is no existing source for electric service and an extension of secondary power is necessary, the customer shall pay the actual costs incurred by the Water and Power Department to extend the secondary power source.

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Requests for overhead multiplex service installations will be evaluated for feasibility by the Water and Power Department. If overhead service is deemed appropriate, it will be installed and billed at the actual cost incurred by the Water and Power Department.

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### ***Residential Service Installations and Upgrades for Multiplex Service Installations (cont'd)***

All services to multiplexes will be installed as described in the National Electric Code pertaining to commercial services. NOTE: Duplexes will be billed as outlined in the “Residential Service Installations and Upgrades for Single and Duplex Dwellings” section in the current Schedule of Rates and Charges – Electric.

**C. Buildings with greater than six dwelling units:**

Any complex containing more than six dwelling units shall pay the actual costs incurred by the Water and Power Department to have a contractor-installed service energized.

### ***Field Engineering Deposits***

A customer requesting a new or modified electric service, relocation of facilities, or other work requiring engineering and construction, must make a deposit with the department. If the project is cancelled, the deposit will be applied to the actual charges incurred, any resulting credit or debit will be refunded or billed to the customer. Upon completion of engineering, the customer will deposit with the department the total deposit required.

#### **ENGINEERING DEPOSITS**

A.	Residential and duplex single phase installations, 1-2 lots.....	\$800.00
B.	Single commercial buildings, transformer upgrades, raising, lowering, or removing existing power.....	\$1,200.00
C.	Residential subdivision of 3-25 lots, commercial subdivision of 2-10 lots, raising, lowering, or removing existing power.....	\$1,600.00
D.	Residential subdivision of more than 25 lots, commercial subdivision of more than 10 lots, malls, shopping centers, hospitals .....	\$3,000.00

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### ***Other Deposits***

The following jobs are standard in nature, and specific deposits have been established for them. In all cases actual costs will be tracked and any resulting credit or debit will be refunded or billed to the customer.

A. Install and terminate secondary riser up to 100 feet (no transformer required)	
Residential to 200 amps .....	\$1,155.00
Commercial (cable supplied and installed by customer) .....	\$805.00
B. Open transformer to pull in secondary and terminate cable up to 130' .....	\$565.00
C. Single phase padmount transformer upgrade (no other customers)	
Upgrade one transformer size .....	\$1,965.00
Upgrade two transformer sizes .....	\$2,510.00
Upgrade three transformer sizes .....	\$3,055.00
D. Single phase padmount transformer upgrade (other customers)	
Upgrade one transformer size .....	\$2,525.00
Upgrade two transformer sizes .....	\$3,070.00
Upgrade three transformer sizes .....	\$3,335.00
E. Single phase overhead transformer upgrade (no other customers)	
Upgrade one transformer size .....	\$1,665.00
Upgrade two transformer sizes .....	\$2,175.00
F. Single phase overhead transformer upgrade (other customers)	
Upgrade one transformer size .....	\$2,225.00
Upgrade two transformer sizes .....	\$2,735.00

Note: Work tickets (not work orders) will be opened for these jobs and the actual costs will be billed. The cutoff for work tickets is \$1,000.00 except for transformer upgrades.

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### ***Temporary Extensions***

The following requirements apply to all temporary extensions/connections necessary to serve customers such as transient shows, carnivals, fairs, circuses, concessions, residential construction work, or others of a temporary nature, excluding commercial development construction as defined in the *Contractor Construction Standards*.

- A. The customer shall pay a flat rate of \$170.00 for the cost of installation and removal of the temporary extension as defined in the *Contractor Construction Standards*, under “Temporary Construction Service”. Customers with extensions not meeting these standards will be billed for the actual costs.
- B. The customer shall pay for electric consumption monthly under the applicable rate.
- C. No temporary service shall continue beyond the time of building occupancy, or eighteen months from connection of such temporary service, whichever occurs sooner, without the consent of the City.
- D. The City may refuse to connect additional customers to temporary extensions until the temporary extensions have become permanent.

### ***Area Lighting***

A 100-watt high pressure sodium vapor fixture will be furnished and installed by the City at a fixed one time charge. Any fixture other than a 100-watt fixture, poles, secondary conductor and other apparatus, if required, will be provided at an additional charge based on actual costs incurred by the Water and Power Department. Decisions for location of the lights shall be at the discretion of the City.

Applications for area lights should be made at the City of Loveland Water and Power Department. The fee for the installation of a 100-watt high pressure sodium vapor fixture is \$325.00.

### ***Energizing of Electric Service to Small Devices Qualifying for Flat Rate Service***

There will be a flat fee for the energizing of electric service to small devices attached to the City's electric distribution system for the purpose of amplifying cable TV and telephone signals or operating automatic sprinkler controls in remote locations. A fee of \$285.00 shall be charged to the customer for the actual installation of the service. No outlets will be permitted, nor shall there be lighting of any kind connected to this type of service. If there is no existing source and an extension of secondary power is necessary, the customer will pay for actual costs to energize the device

### ***Pole Attachment Fee***

Each attachment by a non-City utility to a City of Loveland power pole will be charged \$21.64 per year.

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### **III.Fees - Miscellaneous**

#### **After Hours**

After hours fees apply to all requests received after 4:00 p.m. Monday through Friday, anytime Saturday or Sunday, and all holidays observed by the City of Loveland.

#### **Fire Hydrant and Fire Protection Tap**

A charge of \$2.50 per residence and \$6.20 per business per month shall be paid by water users outside the city who are located within one thousand feet of a fire hydrant, measured along roads or streets, and \$6.20 per month per tap for each fire protection tap serving premises outside the city. If fire protection tap service is the only city utility service received by the premises, an administrative fee of \$1.80 per month shall also be paid.

#### **Hydrant Meter Guidelines**

General: Fire hydrants are installed for the main purpose of fire protection. Whenever a hydrant meter is placed on a hydrant, that hydrant is, for all practical purposes, out of service and the chances of causing damage to that hydrant are increased. For these reasons and the potential for problems involved with providing hydrant meters on a rental basis, it has become necessary to establish more clearly defined guidelines for the use of hydrant meters.

Intent: The use of fire hydrant meters is intended for only those situations when a large volume of water is needed in a short period of time. These meters shall not be used as a temporary substitute for a permanent water service connection or a permanent irrigation tap. Examples of acceptable and unacceptable uses are as follows:

Acceptable:

- Providing water for increasing moisture during earthmoving.
- Filling swimming pools.
- Filling tanks on water truck (No chemicals allowed in tank).

Unacceptable

- Masonry work
- Car washes
- Irrigation
- Water for concrete saws
- Washing streets or parking lots

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### **Hydrant Meter Guidelines (cont'd)**

Guidelines & Procedures: The following guidelines shall be used for regulating the use of fire hydrant meters:

1. Requests for hydrant meters must be received a minimum of 48 hours prior to the time needed. All requests should be made by contacting the Water and Power Department at 970-962-3701. The applicant must sign the Hydrant Meter Request Form at the Water and Power Department, 200 N. Wilson Avenue, and post a deposit of \$1,000.00 (money order or cashier's check) before the meter will be set. The deposit shall be held until all costs associated with the hydrant rental are paid in full and may be used to offset any such costs not paid within 30 days of issuance of the final invoice.
2. Each request will be reviewed to determine if the proposed use meets the intent of these guidelines. The use of the water from a hydrant meter for other than the stated purposes or misrepresentation of that use will result in the loss of the convenience of obtaining water in this manner.
3. The City will determine on a case-by-case basis whether or not a particular hydrant is acceptable for the installation of a meter. Not all hydrants are available for use with a meter. If the requested hydrant is not available, alternate hydrants will be suggested.
4. Water Utility personnel will install the meter, secure it to the hydrant, and operate the hydrant. Customer shall control flow of water with valve provided on meter assembly. Customer is responsible for securing this valve to prevent the unauthorized use of water by others. Removal of the handle or hand wheel from the control valve is not an acceptable method of securing the valve. ONLY trained City employees will be authorized to operate fire hydrants.
5. During the winter months, hydrant meters will be issued only on a day-to-day basis when outside temperatures are above freezing and are expected to remain above freezing for most of the day. Meters will be installed as soon after 8:00 a.m. as practical, and will be picked up at approximately 3:00 p.m. or earlier if outside temperatures drop below freezing, or if requested.
6. Meters will be issued with a male 2½" National Standard thread connection. No hoses or adapters will be provided.
7. Customer is responsible for all rental fees and other charges. A copy of the current fees is attached. These fees will include charges for all water use.
8. Customer is responsible for any and all damage to the meter and/or fire hydrant while meter is installed. If damage occurs, an invoice will be issued to cover all repair or replacement costs, and customer shall promptly pay the invoiced amount.
9. Number of hydrant meters is limited; therefore the meters are available on a first-come/first-served basis. A separate request form must be submitted for each location and/or time period requested.
10. In accordance with the City Code, it is unlawful to waste water. Every effort should be made to conserve this valuable resource. Wasteful uses will not be allowed.
11. Failure to comply with these guidelines, or illegally obtaining water from, or in any way tampering with a fire hydrant, is in violation of the City Code, and upon conviction is punishable by a fine or imprisonment.

Alternate Source of Water: For building construction projects, water is also available through permanent water taps at a construction billing rate. This source of water is handled by the Building Division, 500 E. 3<sup>rd</sup> Street, 962-2504, and typically issued along with a building permit.

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### **Summary of Hydrant Meter Fees and Charges**

Installation of meter	\$25.00*
Moving meter	\$25.00*
Removal of meter	\$25.00*
Meter rental	\$5.00/day
Water used	\$1.00/300 gallons

\*After hour services (normal hours are Monday through Friday, 7:30 a.m. to 4:00 p.m.) will be charged for overtime labor rates in addition to the \$25.00 charge

**New Account or Reactivation Fee and New Account Meter Reading Fee.** Connection fees in the following amounts are hereby imposed, to be collected with the first utility bill rendered after utility service has been established or a customer account or utility service is reactivated following voluntary or involuntary termination:

Activation or establishment of a customer account for a service address .....	\$11.00
Meter reading charge for service address if read by Utility Billing Division.....	\$10.00
Reactivation of a customer account for a service address .....	\$10.00
Interfering or Tampering with a Meter .....	\$50.00

**Automated Load Profile Metering Program (ALPS). No new ALPS customers will be accepted after 2009.** Commercial and industrial customers will be given the option of utilizing specialized metering equipment that will allow them to monitor their utility consumption on a daily basis through a web-based program. The fees to participate in this program are according to the following schedule:

#### **Monthly Fee Per Meter**

First 9 meters	\$67.50
Meters 10 through 19	\$54.00
Meters 20 and up	\$50.00

Customers that will be enrolling to use this service will need to provide their own telephone line, preferably a line dedicated solely for this purpose. The cost of the telephone line will be borne by the customer. If a customer signs up for the program, and then decides to leave the program in less than one year, the customer will be subject to a \$200 exit fee per meter.

## **Appendix B**

### **City of Loveland Irrigation Plan**

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February, 2013

## **IRRIGATION CONSERVATION PLAN:**

The purpose of this plan is for the conservation of irrigation water during a supply shortage. It includes both domestic and raw water irrigation systems stemming from Parks to Public Grounds. A multi-level approach was used to determine the extent of conservation needed based on water availability, budget considerations, local mandates, and emergency situations.

## **IRRIGATION SYSTEM WATER REQUIREMENTS:**

1. Under normal operating conditions the Parks and Public Grounds irrigation systems are capable of applying 1.50" (inches) of water per week on average. This translates into about 40,712 gallons per acre during peak demand periods. Several factors need to be applied when calculating actual turf watering requirements: types of grasses being irrigated (Blue Grass, Buffalo Grass, Turf Type Fescue, etc.); site conditions (shady, sunny, hillside, low area, soil type, soil compaction, etc.); site impacts (low use, high use, sports turf, green belts, etc.); safety concerns regarding recreation activities (hard playing surfaces, large cracks in the soil, bare ground, etc.); current weather conditions (evapotransporation rates, temperatures, soil moisture levels, wind, sunshine, weekly rain totals); aesthetics (public buildings, sculpture parks, planned public events, etc.).
2. It would be impractical to develop a conservation plan that could take every possible environmental and site use consideration into account. The watering requirements under this plan will take an average for each area of consideration and place the highest priority on recreational safety, long-term turf damage and tree loss followed by aesthetics and special event considerations.
3. System designs and limitations will also play a key role in the ability to adjust programming and watering schedules. Several park sites lack the capacity to water the entire area in just one night. In these situations, half of the irrigation controllers will run one night and the other half of the controllers run the second night. This creates an odd/even watering schedule to accommodate at least several applications of water per week. In the event of a local mandate by the City Council to limit the watering days to specific days of the week rather than odd or even, we could lose 50% or more of our irrigation watering window. Example: a normal four-day schedule reduced to two days with the same watering window would equal a 50% reduction, on the other hand, a odd/even system reduced to two days per week would result in each controller operating only one time per week or a 75% reduction. This would exceed mandated target amounts and result in increased losses to landscape.

## **SITE PRIORITIES:**

Before a conservation plan can be implemented all sites need to be first ranked according to an individual priority within the entire system. This will allow for other considerations such as budgets, special events, raw water availability, and recreational programming needs. Sites that have high levels of recreational activities and community parks/public grounds are given top priority. Within each of these sites there is often an area of lesser priority that will be given a lower ranking in the site-specific conservation plan.

## DETERMINING THE NEED FOR CONSERVATION:

The need to implement a water conservation plan may be driven by either internal or external factors. These factors may include community water shortages caused by a drought, disruption of the supply lines due to mechanical failures, water diversions to other communities experiencing shortages, or budget shortfalls. The severity and duration of such events will be a key factor as to the level of conservation that will be required. For the purposes of this plan, a four-tier approach will be used to conserve water to varying degrees. This will allow for a general systematic approach to conservation based on current conditions and restrictions. The intent of this plan is to provide a sound basis for conservation and to allow for changing variables.

## FOUR TIER APPROACH:

A four-tier approach was used to determine a target level of required water savings and an action plan to achieve these targets for each individual site. The action plan for each site is based on the primary areas of use, function, and priority ranking.

**Table 1 - Drought Stages and Impacts**

Drought Stage	Reduction Goal	Response Options	Anticipated User Impacts	Anticipated Landscape Impacts
Stage I <b>Moderate</b>	10%	Reduce irrigation programs by 10%	N/A	No noticeable loss short term.
Stage II <b>Serious</b>	25%	Cut the equivalent of one watering day from the normal watering schedule.	1 <sup>st</sup> year -aesthetic impact. Two or more years increased risk of sports injury and poor aesthetics.	1 <sup>st</sup> year 5% turf loss. 2 <sup>nd</sup> year 15% turf loss. 3 plus years > 15% turf loss and increased tree mortality in younger trees.
Stage III <b>Severe</b>	50%	Cut the equivalent of two days from the normal watering schedule	1 <sup>st</sup> year- fields will show a significant increase in wear. 2 <sup>nd</sup> year plus- fields may become a safety issue and might need to be closed or have restricted use	1 <sup>st</sup> year-10% turf loss. 2 <sup>nd</sup> year 30% turf loss. 3 plus years > 50% turf loss and increased tree mortality including established trees
Stage IV <b>Extreme</b>	75%	Cut the equivalent of three days from the normal watering schedule.	1 <sup>st</sup> year- fields may become a safety issue and might need to be closed or have restricted use. 2 <sup>nd</sup> year- Fields will be closed to all users.	1 <sup>st</sup> year-50% turf loss. 2 <sup>nd</sup> year plus >50% turf loss. And high tree mortality including established trees

## **TIER I - MODERATE**

Use Reduction Target - 10 percent

This tier is intended for a seasonal drought or a possible minor disruption in water distribution system. A 10 percent reduction in the micro managed irrigation watering window will accomplish this goal. No noticeable loss of turf or landscape would be anticipated as a result of this short term reduction

## **TIER II - SERIOUS**

Use Reduction Target - 25 percent

This tier is intended for a multiple year drought with imposed community watering restrictions with a target reduction rate of 25 percent. A 25 percent reduction in the micro managed watering window for sites requiring an odd/even programming schedule or the equivalent elimination of one watering day at all other locations with a normal program of four days per week will accomplish this goal. Some minor turf loss would be anticipated as a result of this reduction in the first two years. Continued reductions for more than two years at this level may result in an overall turf loss in excess of fifteen percent and a twenty percent increase in tree mortality rates. The most noticeable effects will be in high use areas

## **TIER III - SERVE**

Use Reduction Target - 50 percent

This tier is intended for a multiple year drought with imposed community watering restrictions with a target reduction rate of 50 percent. For sites requiring an odd/even programming schedule a change would be made to switch these sites to specific days of the week. Odd controllers would run Sunday and Wednesday; even controllers would run Monday and Thursday. Both types of controllers would run at 80 percent of normal to achieve a 50 percent reduction. The equivalent elimination of two watering days at all other locations normally programmed for four days per week will achieve a 50 percent reduction at those locations. At community parks and public grounds additional controller modifications may include reducing watering times on low use areas within a site and adding that savings to an extra run on a third day for high use areas at the same location. A ten to thirty percent overall turf loss would be anticipated as a result of this reduction in the first two years. Continued reductions for more than two years at this level may result in an overall turf loss in excess of fifty percent and an increase in tree mortality rates above twenty percent. The most noticeable effects will be in high use areas and recently planted landscape.

## **TIER IV - EXTREME**

Use Reduction Target - 75 percent

This tier is intended for a long term multiple year drought with imposed community watering restrictions with a target reduction rate of 75 percent. For sites requiring an odd/even programming schedule a change would be made to switch these sites to specific days of the week. Odd controllers would run Sunday and Wednesday; even controllers would run Monday and Thursday. Both types of controllers would run at 50 percent of normal and very low use areas would be turned off as needed to achieve a 75 percent reduction. The equivalent elimination of two watering days at all other locations normally programmed for four days per week and reducing these controllers to fifty percent of normal will achieve a 75 percent reduction at these locations. At community parks and public grounds additional controller modifications may include reducing watering times on low use areas within a site and adding that savings to increased percents on high use areas at the same location. A fifty percent or more overall turf loss would be anticipated as a result of this reduction in the first two years. Continued reductions for more than two years at this level may result in a complete turf loss and an increase in tree mortality rates above fifty percent including well established trees. The effects will be noticeable at all locations.

## **POTABLE WATER CONSERVATION - IRRIGATION:**

This plan is broken down to specific sites that have a potable irrigation water source. These sites are listed on a priority basis. The first few sites on the list have the highest priority for irrigation and would be impacted last by any mandatory watering reductions if such mandates allow for selection. The sites listed further down the list are of lower priority for irrigation and would be subject to the initial water conservation. The second part of this plan has each site listed alphabetically. They have been divided into two sections, Parks and Public Grounds. Each site has a four-tier approach to water conservation with recommended irrigation programming schedules, zone deletions, and special considerations. The calculations show the amount of water that could potentially be saved when compared to normal operating practices. Each site is followed by a brief summary that explains the possible impacts, such as the long-term effects and recreational/aesthetic implications.

### **Site Priority Ranking**

#### **Parks:**

1. Loch Lon
2. Osborn/Winona
3. Dwayne Webster
4. South Shore Parkway
5. Woodmere
6. Eagleview
7. Seven Lakes
8. Sherri-Mar
9. Edmondson
10. Silver Glen
11. Derby Hill
12. Namaqua
13. Junior Achievement
14. Estrella
15. Westside
16. Kirkview
17. Loch Mount

#### **Public Grounds:**

1. McWhinney Hahn Visitor Center
2. Police and Courts
3. Glen Arbor
4. Service Center
5. Fire Station #1
6. Fire Station #2
7. Fire Station #3
8. Fire Station #4
9. Fire Station #5
10. Fire Station #6
11. South West 14<sup>th</sup>
12. Xeriscape Garden
13. Park Maintenance Shop
14. Iron Shirt
15. Museum
16. Fire Training Center
17. Detention Pond Tyler
18. Detention Pond Dotsero

Note: Sites on the top of this list have the highest priority for continued irrigation and the sites on the bottom of this list have the lowest priority.

## **RAW WATER CONSERVATION - IRRIGATION:**

This plan is broken down to specific sites that have a raw water irrigation source. These sites are listed on a priority basis. The first few sites on the list have the highest priority for irrigation and would be impacted last by any mandatory (political/budgetary) watering reductions if such mandates allow for selection. Most of these sites are independent of each other and rely on separate raw water sources. Conservation methods will normally be based on water availability from specific sources rather than by a site priority. When feasible the sites listed further down the list are of lower priority for irrigation and would be subject to the initial water conservation. The second part of this plan has each site listed alphabetically. They have been divided into two sections, Parks and Public Grounds. Each site has a four-tier approach to water conservation with recommended irrigation programming schedules, zone deletions, and special considerations. The calculations show the amount of water that could potentially be saved when compared to normal operating practices. Each site is followed by a brief summary that explains the possible impacts, such as the long-term effects and recreational/aesthetic implications.

### **Site Priority Ranking**

#### **Parks:**

1. Loveland Sports Park
2. Fairgrounds/Barnes
3. North Lake
4. Centennial
5. Kroh
6. Benson
7. Sunnyside
8. McKee
9. Silver Lake

#### **Public Grounds:**

1. Civic Center

Note: Sites on the top of this list have the highest priority for continued irrigation if water sources allow and the sites on the bottom of this list have the lowest priority.

**Park/Public Ground: Kroh Park**

**Brief Site Description:**

This is a 37.3 acre community park used primarily for soccer. This facility is irrigated with raw water from the Louden Ditch Company with supplemental domestic water in the off-season. The holding pond that is located in the center of the park and has about a 12-acre foot capacity. During the peak of the irrigation season this site requires about 3.5 to 4.0 acre-feet of water per week. A total loss of irrigation would result in excessive turf damage and unsafe playing conditions on the soccer fields.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Sunday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact soccer fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Sunday, Wednesday, and Friday on the athletic field zones.
- ◆ Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include soccer/ball fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Tuesday and Thursday

**Tier#4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- ◆ Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer/ball fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.
- ◆ Turn off all half head zones in non-recreational areas.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

**Park/Public Ground: North Lake Park**

**Brief Site Description:**

This is a 60.2-acre community park used primarily for recreation, swimming, picnics, community events, stage productions, and high school athletics. This facility is irrigated with raw water from the Louden Ditch Company. The holding pond that is located near the amphitheater has a 18-acre foot capacity. During the peak of the irrigation season this site requires about 4.5 to 5.0 acre-feet of water per week. A total loss of irrigation would result in excessive turf damage around shelters, the swim beach, recreation areas, event locations and would contribute to unsafe playing conditions on the soccer and baseball fields. Special Note: The School District shares this raw water source with North Lake Park and Benson Park. Any conservation methods would need to be done jointly with the School District in order to achieve the desired results. Please refer to the Benson Park conservation plan for further details relating to that facility.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

**Tier #2 Conservation:**

- ◆ Reduce the watering percent on the odd/even controllers by 25%, based on current weather and site considerations, but no more than 75% of normal. Watering days will continue to be odd/even.
- ◆ Turn off all buffalo grass zones

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days on lower use areas (controllers Ab, B, E, F, G, H, and L) from the normal odd/even cycle and water up to 50% of normal based on current weather and site considerations. Watering days on low use areas will be Sunday, Tuesday, and Friday. On high use areas including athletic fields and shelter areas change the odd/even schedule to four days per week (controllers A, D, I, J, K, and M) and water up to 70% of normal based on current weather and site considerations. Watering days on high use areas will be Saturday, Monday, Wednesday, and Thursday.

- ◆ Turn off all buffalo grass zones
- ◆ Turn off all half-head irrigation zones in non-recreational/low use areas and add savings to high use areas as needed.

#### **Tier#4 Conservation:**

- ◆ Reduce the watering schedule to two days on lower use areas (controllers Ab, B, E, F, G, H, and L) from the normal odd/even cycle and water up to 50% of normal based on current weather and site considerations. Watering days on low use areas will be Sunday and Friday. On high use areas including athletic fields and shelter areas change the odd/even schedule to two days per week (controllers A, D, I, J, K, and M) and water up to 60% of normal based on current weather and site considerations. Watering days on high use areas will be Monday and Thursday.
- ◆ Turn off all half-head irrigation zones in non-recreational/ low use areas and add savings to high use areas as needed.
- ◆ Turn off all buffalo grass zones
- ◆ Turn off parking island near the swim beech lot
- ◆ Turn off irrigation on flat area north and east of the tennis courts

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in athletic and shelter areas. Tier three may require the closure of some or all athletic fields after one year and potentially the cancellation of special events or shelter reservations. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in athletic and shelter areas. Tier four would require the immediate closure of all athletic fields, and the cancellation of shelter reservations and special events.

**Park/Public Ground: Centennial Park**

**Brief Site Description:**

This is a 35-acre community park used primarily for picnics, and baseball. This facility is irrigated with raw water from the Big Thompson Ditch Company. The holding pond that is located on the south side of First Street has a 30-acre foot capacity. During the peak of the irrigation season this site requires about 1.75 to 2.0 acre feet of water per week. A total loss of irrigation would result in excessive turf damage in the ball fields and around the playground. This would contribute to unsafe playing conditions on the baseball fields.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact ball fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.
- ◆ Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include all ball fields. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Tuesday and Thursday

**Tier#4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones that impact ball fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- ◆ Turn off all half head zones in non-recreational areas.
- ◆ Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include ball fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

## **Park/Public Ground: Barnes Park**

### **Brief Site Description:**

This is a 24-acre community park used primarily for baseball. This facility is irrigated with raw water from the Farmers Ditch Company. The holding pond that is located in the southeast corner of the park has a 1-acre foot capacity. This holding pond also receives some of its water through ground water infiltration in wet years and can lose water due to groundwater outflow in dry years. During the peak of the irrigation season this site requires about 1.5 to 2.0 acre feet of water per week depending on ground water levels at the holding pond. A total loss of irrigation would result in excessive turf damage in the ball fields and around the playground. This would contribute to unsafe playing conditions on the baseball fields.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact ball fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.
- ◆ Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include all ball fields. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all non-recreational area half head zones. Recreational areas include ball fields only.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones that impact ball fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in non-recreational areas.
- ◆ Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include ball fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

**Park/Public Ground: Loch Lon Park**

**Brief Site Description:**

This is a 10.7 acre neighborhood park used for general recreation and soccer. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 410,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage in the soccer fields and around the playground. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact soccer fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.
- ◆ Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include all soccer fields. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all non-recreational area half head zones. Recreational areas include soccer fields only.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in non-recreational areas.
- ◆ Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

**Park/Public Ground: Osborn Park/Pool**

**Brief Site Description:**

This is a 13 acre neighborhood park and community pool complex used for soccer, softball and swimming. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 326,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage in the soccer fields and around the pool area. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact the soccer field and zones inside the pool area when the pool is open. Set the water budget on field zones at 75% and pool zones to 60% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.
- ◆ Turn off two days on all non-athletic field area irrigation zones including the pool area during the months the pool is not open from the normal four day schedule. Athletic areas include all soccer fields. Reduce the percent on these zones to 65% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all non-recreational area half head zones unless the zone is sole source for a specific area. Recreational areas include soccer field and zones inside the pool fence only.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on the soccer field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in non-recreational areas.
- ◆ Turn off three days on all non-athletic field area irrigation zones including the pool area from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas including the pool.

## **Park/Public Ground: Seven Lakes Park**

### **Brief Site Description:**

This is a 10.2 acre neighborhood park used for soccer and picnics. This facility is irrigated with raw water from the Seven Lakes Reservoir Company. This water reservoir is used jointly by the Upper and Lower Hoffman Lake property owners, McKee Hospital and McKee/Seven Lakes Parks. Refer to the McKee Park conservation plan for further information. In the case of a raw water shortage McKee hospital will convert to a private domestic watering source. During the peak of the irrigation season this site requires about 1.25 acre-feet of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer fields and around the playground. This would contribute to unsafe playing conditions.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact the soccer field. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.
- ◆ Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include the soccer field only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all non-recreational area half head zones unless a zone is sole source for a specific area. Recreational areas include soccer fields only.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones that impact the soccer field. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in non-recreational areas.
- ◆ Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include the soccer field only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

## **Park/Public Ground: Dwayne Webster Park**

### **Brief Site Description:**

This is a 5.4 acre neighborhood park used for picnics and family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 430,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage in around the playground and shelter areas. This would contribute to unsafe playing conditions.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

#### **Tier #2 Conservation:**

- ◆ Reduce the watering percent on the odd/even controllers by 25%, based on current weather and site considerations, but no more than 75% of normal. Watering days will continue to be odd/even.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule from the normal odd/even schedule to a three day schedule. Implement the emergency micro management watering schedule to accommodate all zones watering in a single night. This will automatically cut 25% off the normal run times per zone on average. Set the water budget on this reduced schedule to 100% or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.
- ◆ Turn off all non-recreational area half head zones unless a zone is sole source for a specific area. Recreational areas include shelter areas only.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule from the normal odd/even schedule to a two day schedule. Implement the emergency micro management watering schedule to accommodate all zones watering in a single night. This will automatically cut 25% off the normal run times per zone on average. Set the water budget on this reduced schedule to 75% or less based on current weather and site considerations. Watering days will be Monday and Friday.
- ◆ Turn off all non-recreational area half head zones unless a zone is sole source for a specific area. Recreational areas include shelter areas only.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

## **Park/Public Ground: South Shore Scenic Way**

### **Brief Site Description:**

This is a 5.3 acre scenic walkway along Lake Loveland. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 138,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the parking lots and poor aesthetics along highway 34.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on all zones. Set the water budget to 67% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget to 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased wear in high use areas near the parking lots. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would require a consideration to be made regarding the potential impacts of the Fourth of July celebration.

## **Park/Public Ground: Benson Park**

### **Brief Site Description:**

This is a 13.5 acre sculpture park. This facility is irrigated with raw water from the Louden Ditch Company. The pumping station is located on the holding pond in North Lake Park. This holding pond is used jointly by the RJ2 School District for Loveland High School and by North Lake/Benson Parks. During the peak of the irrigation season this site requires about 1.25 acre-feet of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics quality of the park and possible turf damage during major events. Please refer to the North Lake Park conservation plan for further details.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

#### **Tier #2 Conservation:**

- ◆ Reduce the watering percent on the odd/even controllers by 25%, based on current weather and site considerations, but no more than 75% of normal. Watering days will continue to be odd/even.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days on lower use areas (controllers C and D) from the normal odd/even cycle and water up to 50% of normal based on current weather and site considerations. Watering days on low use areas will be Sunday, Tuesday, and Friday. On high use areas including the sculpture show section and the pavilion area change the odd/even schedule to four days per week (controllers A, B, and E) and water up to 60% of normal based on current weather and site considerations. Watering days on high use areas will be Saturday, Monday, Wednesday, and Thursday.
- ◆ Turn off all half-head irrigation zones in low use areas to provide water savings needed for the high use areas.

#### **Tier#4 Conservation:**

- ◆ Reduce the watering schedule to two days on lower use areas (controllers C and D) from the normal odd/even cycle and water up to 50% of normal based on current weather and site considerations. Watering days on low use areas will be Tuesday and Friday. On high use areas including the sculpture show area and pavilion change the odd/even schedule to two days per week (controllers A, B, and E) and water up to 60% of normal based on current weather and site considerations. Watering days on high use areas will be Monday and Thursday.
- ◆ Turn off all half-head irrigation zones in low use areas (all areas north of the pavilion and all zones along the ponds) this will provide savings for the high use areas as needed.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased turf loss near high traffic areas. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential turf failures in the sculpture show areas. Tier three may require the potential cancellation of special events such as the sculpture show. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would require the immediate cancellation of the sculpture show and other special events.

**Park/Public Ground: Sunnyside Park**

**Brief Site Description:**

This is a 3.6 acre neighborhood park used for general recreation and soccer. This facility is irrigated with well water. During the peak of the irrigation season this site requires about 125,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage in the soccer fields. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact the soccer field. Set the water budget on field zones at 60% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the soccer field zones.
- ◆ Turn off two days on all non-soccer field area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all non-recreational area half head zones that are not sole source for a specific area. Recreational areas include soccer fields only.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in non-recreational areas.
- ◆ Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of the soccer field area after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

**Park/Public Ground: Junior Achievement Park**

**Brief Site Description:**

This is a 1.5 acre neighborhood park used for general recreation and skate boarding. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 60,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage in the soccer/ball fields. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact the athletic field area. Set the water budget on field zones at 60% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the field zones.
- ◆ Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all non-recreational area half head zones that are not sole source for a specific area. Recreational areas include flat open area on the south side only.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones that impact athletic field. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in non-recreational areas.
- ◆ Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 65% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of the athletic field area after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

**Park/Public Ground: Woodmere Park**

**Brief Site Description:**

This is a 4.0 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 140,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage in the soccer/ball field. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact the ball field and playground area. Set the water budget on field zones at 70% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the field zones.
- ◆ Turn off two days on all low use area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all half head zones not affecting the playground or ball field and are not sole source for a specific area.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the athletic field and playground area. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in low use areas.
- ◆ Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the west end between the fence and the sidewalk and the entrance to the park from the south. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Eagleview Park**

**Brief Site Description:**

This is a **12.0** acre neighborhood park (**8.0 irrigated**) used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 280,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage in the soccer/ball field. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact the ball field and playground area. Set the water budget on field zones at 70% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the field zones.
- ◆ Turn off two days on all low use area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all half head zones not affecting the playground or ball field and are not sole source for a specific area.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the athletic field and playground area. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in low use areas.
- ◆ Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the west end between the soccer field and Lincoln Ave, the area adjacent to the west fence line just north of the church parking and the sledding hill. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Sherri-Mar Park**

**Brief Site Description:**

This is a 2.7 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 110,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage in the soccer/playing areas. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on zones that impact the playing field and playground area. Set the water budget on field zones at 60% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the field zones.
- ◆ Turn off two days on all low use area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday
- ◆ Turn off all half head zones not affecting the playground or playing field and are not sole source for a specific area.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field and playground area. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones that are not sole source for a specific area.
- ◆ Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the north third of the park. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Edmondson Park**

**Brief Site Description:**

This is a 2.61 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 106,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field and playground area. Set the water budget on the field and playground zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones that are not sole source for a specific area.
- ◆ Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the area east of the tennis court. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

## **Park/Public Ground: Silver Glen Park**

### **Brief Site Description:**

This is a 3.88 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 157,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field and playground area. Set the water budget on the field and playground zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones that are not sole source for a specific area.
- ◆ Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the area east of the area between the playground sidewalk and the west fence. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Derby Hill Park**

**Brief Site Description:**

This is a 3.45 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 120,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to no more than 75% of the normal odd/even based on current weather and site considerations. Watering days will continue to be odd/even.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to two days by implementing the revised conservation micro schedule to replace the normal odd/even day cycle on all zones. Set the water budget on all zones on this revised micro schedule to 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days by implementing the revised conservation micro schedule to replace the normal odd/even day cycle on all zones. Set the water budget on all zones on this revised micro schedule to 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones that are not sole source for a specific area.
- ◆ Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the area south east of the playground and the entrance area off Eugene. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

## **Park/Public Ground: Namaqua Park**

### **Brief Site Description:**

This is a 4.0 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 125,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field, shelter, and playground area. Set the water budget on the field, shelter and playground zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones that are not sole source for a specific area.
- ◆ Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the eastern third of the park. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

## **Park/Public Ground: McKee Park**

### **Brief Site Description:**

This is a 3.8 acre neighborhood park used for general family recreation and picnics. This facility is irrigated with raw water from the Seven Lakes Reservoir Company. This is a shared reservoir with the Upper and Lower Hoffman Lake property owners and McKee Hospital. Refer to the Seven Lakes Park conservation plan for further details. During the peak of the irrigation season this site requires about 0.50 acre-feet of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer/ ball fields and around the playground. This would contribute to unsafe playing conditions.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to no more than 75% of the normal odd/even based on current weather and site considerations. Watering days will continue to be odd/even.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule to two days by implementing the revised conservation micro schedule to replace the normal odd/even day cycle on all zones. Set the water budget on all zones on this revised micro schedule to 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days by implementing the revised conservation micro schedule to replace the normal odd/even day cycle on all zones. Set the water budget on all zones on this revised micro schedule to 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones that are not sole source for a specific area or around the playground.

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

## **Park/Public Ground: Estrella Park**

### **Brief Site Description:**

This is a 1.3 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 53,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field, shelter, and playground area. Set the water budget on the field, shelter and playground zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones that are not sole source for a specific area or the playground.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Westside Park**

**Brief Site Description:**

This is a 1.4 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 57,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Kirkview Park**

**Brief Site Description:**

This is a 1.6 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 66,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Silver Lake Park**

**Brief Site Description:**

This is a 5.0 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 204,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Loch Mount Park**

**Brief Site Description:**

This is a 0.9 acre neighborhood park used for general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 37,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Civic Center**

**Brief Site Description:**

This is a 7.66 acre public ground facility that is the site of the City of Loveland municipal building, library and recreation/senior center. This facility is irrigated with well water. During the peak of the irrigation season this site requires about 275,000 gallons of water per week plus varying amounts of water to refill the Foote Lagoon depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle on all zones. Set the water budget at 67% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier #4 Conservation:**

- ◆ Reduce the watering schedule to two days from the normal four-day cycle on zones in all areas. Set the water budget at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.
- ◆ Turn off all half head zones in low use areas that are not sole source for a specific site.
- ◆ Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the area between the Senior Housing and the Chilson Center, the area west of the Library, and the areas south of the south parking lot. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf and could impact special events.

**Park/Public Ground: McWhinney Hahn Visitor Center**

**Brief Site Description:**

This is a 4.2 acre public ground facility that is the site of the City of Loveland Chamber of Commerce and Visitor Center. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 175,000 gallons of water per week plus varying amounts of water to refill the sculpture pond depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Police and Courts Center**

**Brief Site Description:**

This is a 2.1 acre (irrigated) public ground facility that is the site of the City of Loveland Justice Center and Police Department. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 72,500 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

**Park/Public Ground: Glen Arbor Parkway**

**Brief Site Description:**

This is a 1.85 acre public ground facility that is primarily a green belt along highway 287. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 70,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

## **Park/Public Ground: Service Center**

### **Brief Site Description:**

This is a 4.52 acre public ground maintenance facility for public works, water and power, traffic, vehicle maintenance and school district busses. This facility is irrigated with domestic water from two separate taps. One of these water taps also supplies potable water to the warehouse. During the peak of the irrigation season this site requires about 185,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 55% of normal or less based on current weather and site considerations. Turn off all zones south of the administration building in the flat area (golf course). Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

**Park/Public Ground: Fire Station #1**

**Brief Site Description:**

This is a 0.2 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 6,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

## **Park/Public Ground: Fire Station #2**

### **Brief Site Description:**

This is a 0.60 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 24,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

## **Park/Public Ground: Fire Station #3**

### **Brief Site Description:**

This is a 0.67 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 25,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

## **Park/Public Ground: Fire Station #4**

### **Brief Site Description:**

This is a 0.65 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 25,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

## **Park/Public Ground: Fire Station #5**

### **Brief Site Description:**

This is a 0.75 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 30,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

## **Park/Public Ground: Fire Station #6**

### **Brief Site Description:**

This is a 1.0 acre (irrigated) fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 35,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

#### **Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

#### **Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

**Park/Public Ground: S.W. 14<sup>th</sup>**

**Brief Site Description:**

This is a 1.06 acre highway median with buffalo grass and junipers. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 30,000 gallons of water per week depending on evapotranspiration rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

**Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

**Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

**Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

## **Park/Public Ground: Xeriscape Garden**

### **Brief Site Description:**

This is a 0.75 acre xeriscape demonstration garden with turf and shrub plots. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 18,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

#### **Tier #2 Conservation:**

- ◆ Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.
- ◆ Reduce the watering schedule on normal three day zones to 75% or less based on current weather and site conditions. Watering days will be set as normal

#### **Tier#3 Conservation:**

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- ◆ Reduce the watering schedule to two days on normal three day zones and reduce the run time to 75% of normal or less based on current weather and site conditions. Watering days will be Monday and Thursday

#### **Tier #4 Conservation:**

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- ◆ Reduce the watering schedule to one day on normal three day zones and set the run time to 100% of normal or less based on current weather and site conditions. Watering days will be Monday and Thursday

#### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

## **Park/Public Ground: Park Maintenance Shop**

### **Brief Site Description:**

This is a 0.5 acre (landscaped area only) maintenance facility. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 20,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 80% of the maximum settings as determined by the micro management plan and weather conditions.

#### **Tier #2 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 60% of the maximum settings as determined by the micro management plan and weather conditions.
- ◆ Turn off all drip irrigation.

#### **Tier#3 Conservation:**

- ◆ Turn off all drip irrigation zones.
- ◆ Reduce the water budget/ times on all remaining irrigation zones to a range between zero and 45% of the maximum settings as determined by the micro management plan and weather conditions.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 20%. Water conservation methods in tier two would reduce the watering requirements by about 40%. Tier three would reduce the watering requirements by about 60%.

## **Park/Public Ground: Iron Shirt**

### **Brief Site Description:**

This is a 0.2 acre highway median. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 4,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 75% of the maximum settings as determined by the micro management plan and weather conditions.

#### **Tier #2 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 60% of the maximum settings as determined by the micro management plan and weather conditions.
- ◆ Turn off all drip irrigation.

#### **Tier#3 Conservation:**

- ◆ Turn off all drip irrigation zones.
- ◆ Reduce the water budget/ times on all remaining irrigation zones to a range between zero and 40% of the maximum settings as determined by the micro management plan and weather conditions.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 25%. Water conservation methods in tier two would reduce the watering requirements by about 40%. Tier three would reduce the watering requirements by about 60%.

## **Park/Public Ground: Museum**

### **Brief Site Description:**

This is a 0.03 acre facility with shrub beds only. This site is irrigated with domestic water from the museum building water supply. During the peak of the irrigation season this site requires about 750 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 75% of the maximum settings as determined by the micro management plan and weather conditions.

#### **Tier #2 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 50% of the maximum settings as determined by the micro management plan and weather conditions.

#### **Tier#3 Conservation:**

- ◆ Reduce the water budget/ times on all remaining irrigation zones to a range between zero and 40% of the maximum settings as determined by the micro management plan and weather conditions.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 25%. Water conservation methods in tier two would reduce the watering requirements by about 50%. Tier three would reduce the watering requirements by about 60%.

## **Park/Public Ground: Fire Training Center**

### **Brief Site Description:**

This is a 0.3 acre facility with one turf area. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 12,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

### **Conservation Methods:**

#### **Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 75% of the maximum settings as determined by the micro management plan and weather conditions.

#### **Tier #2 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 50% of the maximum settings as determined by the micro management plan and weather conditions.

#### **Tier#3 Conservation:**

- ◆ Reduce the water budget/ times on all remaining irrigation zones to a range between zero and 40% of the maximum settings as determined by the micro management plan and weather conditions.

### **Summary:**

Conservation methods in tier one would reduce the watering requirements by about 25%. Water conservation methods in tier two would reduce the watering requirements by about 50%. Tier three would reduce the watering requirements by about 60%.

**Park/Public Ground: Detention Pond at 1<sup>st</sup> and Tyler**

**Brief Site Description:**

This is a 1.28 acre storm water detention facility. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 46,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 75% of the maximum settings as determined by the micro management plan and weather conditions.

**Tier #2 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 50% of the maximum settings as determined by the micro management plan and weather conditions.

**Tier#3 Conservation:**

- ◆ Reduce the water budget/ times on all remaining irrigation zones to a range between zero and 40% of the maximum settings as determined by the micro management plan and weather conditions.

**Summary:**

Conservation methods in tier one would reduce the watering requirements by about 25%. Water conservation methods in tier two would reduce the watering requirements by about 50%. Tier three would reduce the watering requirements by about 60%.

**Park/Public Ground: Detention Pond at 1<sup>st</sup> and Dotsero**

**Brief Site Description:**

This is a 1.04 acre storm water detention facility. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 32,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

**Conservation Methods:**

**Tier #1 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 75% of the maximum settings as determined by the micro management plan and weather conditions.

**Tier #2 Conservation:**

- ◆ Reduce the water budget/ times on all irrigation zones to a range between zero and 50% of the maximum settings as determined by the micro management plan and weather conditions.

**Tier#3 Conservation:**

- ◆ Reduce the water budget/ times on all remaining irrigation zones to a range between zero and 40% of the maximum settings as determined by the micro management plan and weather conditions.

**Summary:**

Conservation methods in tier one would reduce the watering requirements by about 25%. Water conservation methods in tier two would reduce the watering requirements by about 50%. Tier three would reduce the watering requirements by about 60%.

## **Appendix C**

### **Forecasting Future Water Demands**

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February, 2013

## Appendix C

# Forecasting Future Water Demands

This appendix presents the water demand forecasting used to estimate future water demand in the City assuming current trends in water use continued over the coming 8 years – including the effects on past and ongoing water conservation programs, and excluding the effects of new water conservation efforts that will be identified and implemented as a result of this Plan. The forecasting presented herein also characterized the impact of passive savings which are expected to occur over the planning period (i.e., from 2012 to 2020) as a result of customers replacing toilets, dishwashers and clothes washers with more water efficient models independent of any programs that the City implements.

Forecasting was initiated by segregating past monthly water demands for each major customer category:

- Residential – both for inside and outside the City limits – with separate categories for
  - single family,
  - multi-family, and
  - irrigation only accounts.
- Commercial – both for inside and outside the City Limits
- City facility water use including indoor and outdoor uses
- Wholesale water sales
- Other water sales (which relate specifically to pre-paid water sales at City hydrants and the City's stand pipe (AKA – Ranch water))

Forecasting was developed for each customer category individually to develop predictions of monthly and annual water demand for the planning period. The results of the individual predictions by customer category were summed to estimate total water delivery (i.e., billed water). Total treated water demand was calculated by estimating average monthly non-revenue water (based on the period 2005 to 2011) as a percentage of total treated water. Total treated water was finally estimated by dividing total billed water by one less the percentage of non-revenue for each month.

Three separate estimates of monthly total treated water demands were developed to support water conservation planning. The three separate estimates include:

- Estimates for average conditions based on current trends.
- Estimates for above average conditions (i.e., one standard deviation above average) based on current trends.
- Adjusted estimates for average and above average conditions including the impacts of passive water savings.

Average conditions (i.e., demands which will occur no more than 5 out of every 10 years) and above average conditions (i.e., demand which will occur no more than 8 out of 10 years) were forecasted to provide insight into the variability of future demands and the relative impact of proposed water conservation programs on variable future water use.

## Assumptions

Specific assumptions used to estimate average future water demands without passive savings (passive savings were added into the forecasted demands under a separate step) are as follows:

- Residential water use inside the City limits will increase at a rate equivalent to the City's predicted growth of housing units (see Table C-1). The housing unit growth rate was used to adjust single family, multi-family and irrigation only water use based on average monthly water use observed over the last 4 years (i.e., 2008 through 2011<sup>1</sup>) for each year from 2012 to 2020, compounded annually.
- Residential water use outside the City limits will not increase over the planning period, since the City does not currently plan to increase its service area. Therefore, future monthly water demand for each residential customer category outside the City limits (including single family, multi-family and special based use) was maintained at a demand equal to the average monthly water use observed over the last 4 years (i.e., 2008 through 2011<sup>2</sup>).
- Commercial water use, both inside and outside the City limits will increase at a rate equivalent to the City's predicted growth of housing units. The housing unit growth rate was used to adjust commercial water use for customers inside and outside the City limits, as well as commercial special base accounts, based on average monthly water use observed over the last 4 years (i.e., 2008 through 2011<sup>3</sup>) for each year from 2012 to 2020, compounded annually.
- City water use, at its various facilities and parks, will be maintained at current demands, based on average monthly demand for the period 2009 through 2011, since City indoor

Table C-1		
Year	Population	Housing Units
2010	66,572	27,773
2011	67,455	28,120
2012	68,495	28,300
2013	69,690	29,037
2014	70,991	29,579
2015	72,403	30,167
2016	73,926	30,803
2017	75,449	31,437
2018	76,975	32,073
2019	78,502	32,709
2020	80,086	33,369

<sup>1</sup> 2008 through 2011 were included in the analysis since it was only during this period that these customer categories were tracked by the City. Prior to 2008, the City lumped these accounts into one customer category.

<sup>2</sup> 2008 through 2011 were included in the analysis since it was only during this period that these customer categories were tracked by the City. Prior to 2008, the City lumped these accounts into one customer category.

<sup>3</sup> 2008 through 2011 were included in the analysis since it was only during this period that these customer categories were tracked by the City. Prior to 2008, the City lumped these accounts into one customer category.

water use dropped substantially during this period of time, and the City is not currently planning on expanding its facilities over the planning period.

- Wholesale water use, which represents that interconnection between Little Thompson Water District and the City, is not expected to change over the planning period. Monthly averages for the years 2010 and 2011 were used to estimate future water demand for this account given that prior to 2010 water use tracked by this account was negligible.
- Pre-paid water sold through fire hydrants across the City is not expected to change over the planning period. Monthly averages for the years 2010 and 2011 were used to estimate future water demand for this account given that prior to 2010 water use tracked by this account was negligible.
- Per-paid water sold through the City's stand pipe (i.e., Ranch water), will increase in accordance with future population growth. Analyses presented in Appendix C indicate that both a linear and logarithmic relationship exists between Ranch water use and a three-year rolling average<sup>4</sup> of population growth (which accounts for construction of infrastructure and residences/businesses over time). The logarithmic relationship between population growth and expected water use presented in Figure C-1 was used to estimate future monthly water demands for the planning period based on average monthly demands for the period 2005 to 2011.

Total water billings were estimated by summing the predicted monthly water use for each of these categories of customer water use. Non-revenue was added to total billed water to calculate total treated water demand throughout the planning period.

Note that past average monthly water use was not normalized to "per connection use" for the purposes of this analysis, given the expected combined influence of population growth and passive savings over the period 2008 to 2011. Growth in the City was estimated to be about 7% during this period; and passive saving reductions estimated from observed indoor residential water use over this same period of time were also about 7%. Therefore, these two factors were assumed to offset one another. The total treated water delivery in the City is presented in Figure C-2 to illustrate this point since there has not been a demand increase since 2008.

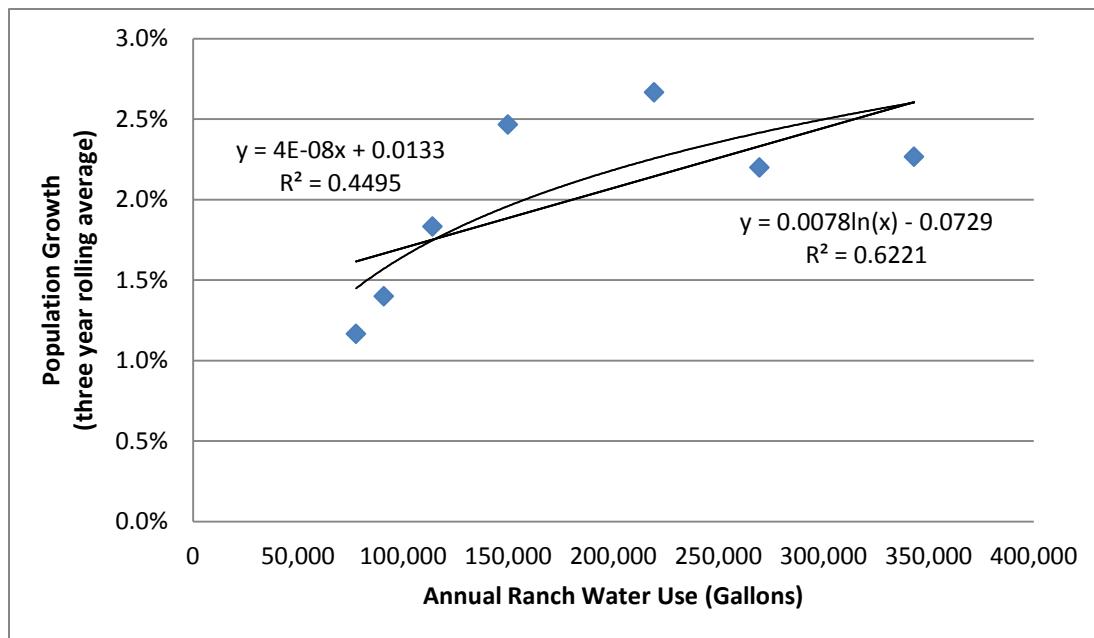
## Above Average Conditions

To understand the potential variability on the City's future water demands, a statistical analysis was performed using the last four years of monthly water use data. For purposes of this analysis, it is assumed that the variability in water use relates to the natural variability of weather and behavioral impacts on water use in the City.

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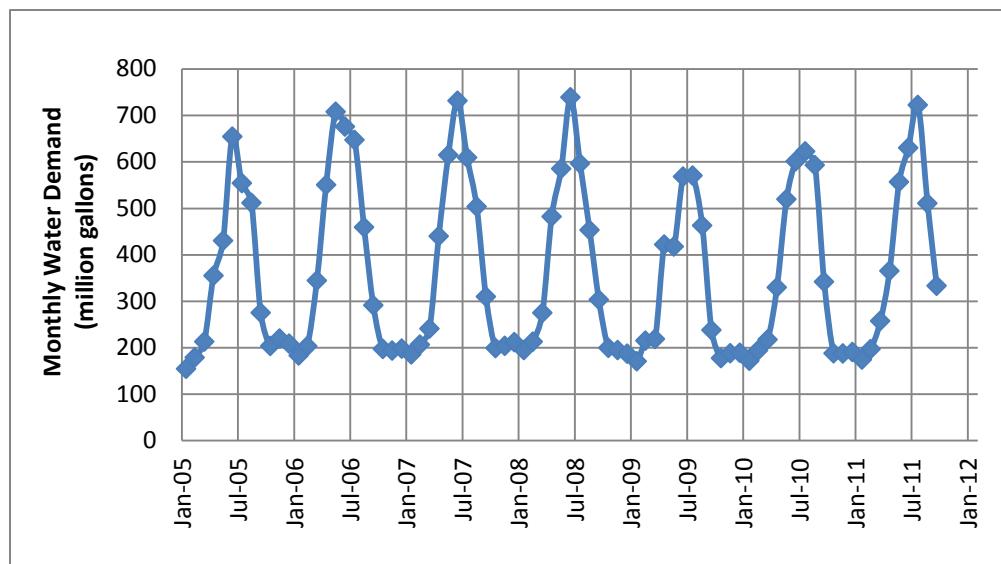
<sup>4</sup> A three-year rolling average was used to smooth the natural variation in the data, and allow for incorporating the multi-year impact of growth on the community (given that building a subdivision typically requires more than one year of construction to allow for building water, sewer and storm sewer systems, as well as individual residences).

**Figure C-1 – Correlation of Ranch Water Use to Percent Growth<sup>5</sup>**



The importance of developing an above average water demand is as follows: there is a 16% probability that total water demand will be greater than above average conditions (based on estimating water demands one standard deviation greater than average conditions); whereas there is a 50% probability that total water demand will be greater than average conditions. Therefore, above average conditions allows for planning to meet estimated water demands for 8 out of 10 years, as opposed to 5 out of ten years (which is what average conditions represent).

**Figure C-2 Total Treated Water Delivery**



<sup>5</sup> This figure illustrates a better correlation of Ranch Water use to percent growth using a logarithmic function ( $R \sim 0.62$ ) versus a linear approximation ( $R \sim 0.45$ ).

## Passive Savings

To incorporate impacts of “passive savings,” per capita residential water use (for treated water only) was estimated to decrease over the planning period by between 7.3 to 10.1 gallons per person per day (gpcd) in conjunction with those water demand reductions that are expected to occur as residential customers replace outmoded and broken toilets, dishwashers and clothes washers with new, high efficiency models without the influence of the City’s water conservation efforts. Passive conservation only impacted future demands for single family and multi-family residential demands. Passive savings were developed based on recent analyses conducted by the CWCB (Great Western Institute, 2010).<sup>6</sup> For purposes of this plan, the total passive savings demand reductions of 8.7 gpcd (the average of the high and the low estimates) were applied to the annual residential uses for both inside and outside of the City limits, resulting in a reduced annual demand of about 254 million gallons in 2020, or about 700,000 gallons of treated water a day.

## Peak Day Water Demands

Peak daily water demands are of concern to any City that operates a water treatment plant. Loveland is no different. Past peak daily demands in the summer have approached the capacity of the treatment facility. To evaluate future peak daily demands, peaking factors were developed for each month of the year based on the ratio of highest peak daily demand in the month to total monthly demand – as an average over the period from January 2000 through October 2011.

<b>Table C-2</b> <b>Peaking Factors</b>	
<b>(MGD/Million Gals)</b>	
Jan	3.85%
Feb	4.50%
Mar	4.22%
Apr	4.81%
May	4.86%
Jun	4.46%
Jul	3.92%
Aug	3.94%
Sep	4.34%
Oct	5.08%
Nov	4.20%
Dec	3.82%

The resulting peaking factors are provided in Table C-2. These peaking factors were multiplied by the average and above average monthly total treated water demands developed through the forecasting effort, to estimate future peak day demands for each month between January 2012 and December 2020.

## List of Other Assumptions

In addition to those assumptions presented above, the following assumptions were used to develop the forecasted water demands.

- No substantial changes to current residential water use practices have been included to represent existing or future single and multi-family water use such as:

<sup>6</sup> Passive savings calculations were developed by estimating the reduction to per capita water use for those populations that existed or will exist at key dates during the development of high-efficiency products for consumer use (i.e., 1996 for low-flow toilets (1.6 gallons per flush (gpf)); 2005 for high-efficiency clothes washers and dishwashers; and 2015 for high-efficiency toilets (0.9 to 1.28 gpf)).

- Residential outdoor watering will not occur using grey-water or non-potable water systems; and
- Indoor water use will occur for the same basic configuration of bathroom, laundry and kitchen uses as exist today (noting that passive savings account for the use of new, more efficiency appliances and fixtures without changing the way that the appliance and fixtures are used).
- The City will maintain the current level of non-revenue water and water treatment plant efficiencies into the future.
- No large industrial, commercial and/or manufacturing facilities will be constructed within the City's service area over the next eight years requiring substantial new water supply.
- No substantial change from past measured conditions in current weather and precipitation patterns will occur over the planning period.

## Results

The tables that are contained in this appendix provide the results of the forecasting, as described above. These tables are as follows:

- **Table C-3** – Presentation of monthly water use data including past water use and forecasted monthly water use for average conditions.
- **Table C-4** – Presentation of monthly water use data including past water use and forecasted monthly water use for above average conditions.
- **Table C-5** – Presentation of Passive Savings estimates in the form of per capita water use adjusts to future estimated water demands
- **Table C-6** – Summary of past and predicted annual water use for average and above average conditions without passive savings
- **Table C-7** – Summary of past and predicted annual water use for average and above average conditions with passive savings

A graphic presentation of the results of the forecasting is provided in the main body of the text.

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside Residential	Inside Multi-Family	Inside Irrigation	Inside Residential Total SF+ MF	Outside Residential	Outside Multi-Family	Outside Irrigation	Outside Res - Special Base	Outside Residential Total SF+ MF
Jan-05	109,547,839	-	-	109,547,839	8,390,000	-	-	-	8,390,000
Feb-05	91,946,900	-	-	91,946,900	6,731,000	-	-	-	6,731,000
Mar-05	95,470,039	-	-	95,470,039	7,029,100	-	-	-	7,029,100
Apr-05	121,536,723	-	-	121,536,723	7,677,600	-	-	-	7,677,600
May-05	160,891,579	-	-	160,891,579	9,462,300	-	-	-	9,462,300
Jun-05	279,120,014	-	-	279,120,014	13,130,000	-	-	-	13,130,000
Jul-05	424,146,200	-	-	424,146,200	18,922,000	-	-	-	18,922,000
Aug-05	425,802,200	-	-	425,802,200	18,743,000	-	-	-	18,743,000
Sep-05	394,132,748	-	-	394,132,748	17,333,000	-	-	-	17,333,000
Oct-05	279,788,600	-	-	279,788,600	11,851,800	-	-	-	11,851,800
Nov-05	128,564,600	-	-	128,564,600	6,710,200	-	-	-	6,710,200
Dec-05	112,596,900	-	-	112,596,900	7,637,100	-	-	-	7,637,100
Jan-06	117,025,547	-	-	117,025,547	8,404,900	-	-	-	8,404,900
Feb-06	103,678,953	-	-	103,678,953	7,021,000	-	-	-	7,021,000
Mar-06	102,035,487	-	-	102,035,487	7,009,000	-	-	-	7,009,000
Apr-06	138,511,159	-	-	138,511,159	8,567,000	-	-	-	8,567,000
May-06	293,578,622	-	-	293,578,622	13,179,800	-	-	-	13,179,800
Jun-06	496,795,889	-	-	496,795,889	21,564,200	-	-	-	21,564,200
Jul-06	525,171,479	-	-	525,171,479	23,378,000	-	-	-	23,378,000
Aug-06	477,540,475	-	-	477,540,475	19,200,600	-	-	-	19,200,600
Sep-06	404,186,500	-	-	404,186,500	16,057,400	-	-	-	16,057,400
Oct-06	279,511,911	-	-	279,511,911	11,850,000	-	-	-	11,850,000
Nov-06	123,457,000	-	-	123,457,000	6,932,914	-	-	-	6,932,914
Dec-06	125,055,758	-	-	125,055,758	6,958,428	-	-	-	6,958,428
Jan-07	103,665,559	-	-	103,665,559	7,801,189	-	-	-	7,801,189
Feb-07	100,225,253	-	-	100,225,253	6,533,383	-	-	-	6,533,383
Mar-07	99,508,230	-	-	99,508,230	6,596,000	-	-	-	6,596,000
Apr-07	115,275,789	-	-	115,275,789	7,256,000	-	-	-	7,272,000
May-07	178,867,000	-	-	178,867,000	9,201,800	-	-	-	9,259,800
Jun-07	363,240,631	-	-	363,240,631	15,624,200	-	-	-	15,683,200
Jul-07	550,764,689	-	-	550,764,689	22,827,000	-	-	-	22,998,000
Aug-07	493,982,153	-	-	493,982,153	18,844,000	-	-	-	19,067,000
Sep-07	432,263,247	-	-	432,263,247	16,830,000	-	-	-	443,000
Oct-07	293,196,700	-	-	293,196,700	11,589,000	-	-	-	261,000
Nov-07	142,514,904	-	-	142,514,904	7,512,000	-	-	-	118,000
Dec-07	116,274,289	-	-	116,274,289	7,198,000	-	-	-	7,299,000
Jan-08	90,773,689	-	-	90,773,689	11,3,521,089	6,864,000	244,000	1,000	19,000
Feb-08	80,380,636	-	-	80,380,636	35,000	10,1,703,636	6,330,000	230,000	12,000
Mar-08	83,119,897	-	-	83,119,897	49,000	10,4,233,897	6,354,000	231,000	58,000
Apr-08	91,141,367	-	-	91,141,367	1,638,000	11,4,142,567	7,106,700	244,000	118,000
May-08	194,438,100	-	-	194,438,100	28,272,300	31,814,000	25,4,524,400	10,956,300	355,000
Jun-08	245,541,100	-	-	245,541,100	34,400,000	74,413,000	35,4,354,100	13,763,000	444,000
Jul-08	335,981,000	-	-	335,981,000	39,914,000	98,411,500	47,2,306,500	18,422,000	530,000
Aug-08	373,924,800	-	-	373,924,800	49,564,000	131,131,000	55,225,800	20,187,000	662,000
Sep-08	242,903,000	-	-	242,903,000	38,169,000	37,0,215,485	37,0,215,485	40,700	860,000
Oct-08	186,940,500	-	-	186,940,500	32,226,000	61,0,232,827	28,0,190,327	10,033,000	311,000
Nov-08	100,178,000	-	-	100,178,000	22,921,000	11,371,809	13,4,470,809	6,895,000	220,000
Dec-08	98,803,000	-	-	98,803,000	21,571,000	4,39,343	11,2,813,343	7,074,000	239,000
Jan-09	91,414,696	-	-	91,414,696	22,682,000	(38,000)	11,4,058,696	7,097,000	234,000
Feb-09	79,107,256	-	-	79,107,256	20,625,000	1,000	9,9,733,256	6,145,000	198,000
Mar-09	87,262,000	-	-	87,262,000	20,671,000	77,505	10,8,010,505	7,074,000	206,000
Apr-09	98,029,000	-	-	98,029,000	22,648,440	1,149,554	12,1,826,994	7,138,000	246,000
May-09	134,661,000	-	-	134,661,000	25,045,000	98,411,500	47,2,306,500	18,422,000	530,000
Jun-09	196,335,000	-	-	196,335,000	31,328,000	57,576,486	28,5,239,486	11,347,000	556,000
Jul-09	241,904,000	-	-	241,904,000	40,609,000	34,143,485	37,0,215,485	820,000	117,000
Aug-09	256,740,000	-	-	256,740,000	38,203,000	94,380,799	39,1,729,799	14,110,000	975,000
Sep-09	257,340,000	-	-	257,340,000	88,816,521	38,4,359,521	13,868,000	443,000	988,000
									86,000

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside Residential	Inside Multi-Family	Inside Irrigation	Inside Residential Total SF+ MF	Outside Residential	Outside Multi-Family	Outside Irrigation	Outside Res - Special Base	Outside Residential Total SF+ MF
Oct-09	165,580,000	32,517,000	57,633,397	255,730,397	9,455,000	327,000	486,000	36,000	10,304,000
Nov-09	94,864,000	21,626,000	8,039,374	114,559,374	6,412,000	181,000	4,000	9,000	6,606,000
Dec-09	87,938,000	22,192,000	93,420	110,223,420	7,190,000	203,000	4,000	16,000	7,413,000
Jan-10	85,919,000	24,246,207	1,000	114,156,207	6,886,000	197,000	3,000	19,000	7,105,000
Feb-10	79,070,000	20,040,415	1,000	99,111,415	5,748,000	848,000	3,000	58,000	6,657,000
Mar-10	79,763,000	20,994,000	1,000	100,748,000	5,812,000	981,000	2,000	20,000	6,815,000
Apr-10	91,306,741	21,893,000	1,972,756	115,170,497	6,476,000	931,000	9,000	27,000	7,443,000
May-10	111,989,000	23,348,066	14,585,668	149,922,734	6,948,000	1,018,000	7,000	61,000	8,034,000
Jun-10	197,113,000	30,122,000	46,840,249	27,387,5249	10,789,000	1,496,500	583,000	110,000	12,978,500
Jul-10	291,034,000	40,181,000	91,094,682	42,309,682	14,434,000	1,498,500	603,000	118,000	16,651,500
Aug-10	296,154,456	42,380,000	102,858,870	43,539,326	18,398,708	2,171,000	730,000	135,000	18,224,708
Sep-10	322,030,059	44,587,906	109,023,407	47,564,1072	15,991,000	2,759,000	917,000	87,000	19,064,000
Oct-10	242,319,538	40,218,092	92,436,758	37,497,4388	12,435,000	1,749,000	1,076,000	252,000	15,512,000
Nov-10	106,406,559	23,847,000	15,873,137	146,126,696	6,543,000	976,000	30,000	3,000	7,552,000
Dec-10	86,848,200	21,987,800	40,123	108,875,823	6,565,000	951,000	6,000	92,000	7,614,000
Jan-11	88,431,400	23,179,806	2,000	111,613,206	6,290,000	1,121,000	3,000	40,000	7,454,000
Feb-11	76,327,935	21,297,082	-	97,625,117	5,935,000	1,147,000	2,000	81,000	7,145,000
Mar-11	77,560,044	21,859,143	3,700	99,112,887	4,387,851	2,315,000	3,000	34,000	6,739,851
Apr-11	98,181,392	22,716,368	34,15,776	124,313,436	5,373,123	2,458,000	7,000	45,000	7,883,123
May-11	143,207,466	27,611,392	29,770,595	20,591,953	6,672,553	2,517,000	81,000	98,000	9,368,553
Jun-11	198,577,986	34,673,193	54,373,825	28,813,048	8,976,000	3,418,000	405,000	131,000	12,930,000
Jul-11	284,351,642	43,333,408	84,674,358	41,235,408	12,417,000	3,821,000	577,000	154,000	16,969,255
Aug-11	310,674,227	47,285,797	105,545,888	46,3485,922	13,663,000	4,540,000	781,000	173,000	19,147,000
Sep-11	324,823,276	48,787,117	112,668,890	48,280,583	12,825,221	4,829,000	778,000	171,000	18,603,221
Oct-11	217,096,887	39,565,886	39,986,138	33,476,0681	9,033,270	3,580,000	564,000	115,000	13,292,270
Nov-11	101,741,384	24,849,245	16,782,581	14,373,210	4,887,958	2,144,000	17,000	21,000	7,069,588
Dec-11	88,035,195	24,819,734	158,510	113,013,379	4,822,665	2,760,436	11,000	28,000	7,622,121
Jan-12	90,672,989	23,329,747	14,587	114,017,323	6,784,250	449,000	2,250	24,250	7,259,750
Feb-12	79,193,785	20,937,525	9,306	10,140,616	6,034,500	605,750	3,250	41,250	6,684,750
Mar-12	82,412,763	21,198,719	32,998	10,644,480	5,906,963	933,250	41,500	23,000	6,904,713
Apr-12	95,532,613	23,565,818	1,387,123	11,975,554	6,523,016	969,750	40,000	30,250	7,563,456
May-12	146,950,335	26,226,233	24,325,025	19,750,583	8,403,713	1,030,250	203,500	85,000	9,722,463
Jun-12	20,899,625	32,826,583	58,600,395	30,232,603	11,218,750	1,409,875	675,250	140,000	13,443,875
Jul-12	29,047,566	39,729,055	87,013,326	41,6789,947	14,658,320	1,534,375	917,000	154,000	17,263,695
Aug-12	30,720,611	45,282,427	109,282,426	46,227,464	15,784,677	1,940,500	989,000	144,000	18,882,177
Sep-12	288,194,728	42,691,376	10,512,806	43,1,689,910	14,360,186	605,750	3,250	41,250	17,312,230
Oct-12	2,04,202,129	36,348,485	72,731,818	31,3,282,432	10,231,568	1,491,750	765,000	105,500	12,634,058
Nov-12	98,887,271	23,450,676	13,112,431	13,15,450,377	6,184,397	880,250	25,500	20,250	7,110,397
Dec-12	88,936,520	22,778,414	183,946	20,283,4136	8,403,713	1,038,359	5,500	37,000	7,493,780
Jan-13	93,121,160	23,959,650	14,981	11,095,791	11,218,750	449,000	6,784,875	140,000	13,443,875
Feb-13	81,232,018	21,502,739	9,557	10,284,413	6,034,500	605,750	3,250	41,250	6,684,750
Mar-13	84,637,907	21,771,085	33,889	10,6,442,881	5,906,963	933,250	41,500	23,000	6,904,713
Apr-13	97,803,893	22,960,452	2,040,775	12,2,805,121	6,523,456	969,750	40,000	30,250	7,563,456
May-13	150,917,294	26,934,342	24,981,801	32,1,741,058	10,231,568	1,491,750	203,500	85,000	9,722,463
Jun-13	26,593,915	33,712,901	60,182,606	31,0489,421	11,218,750	1,184,397	675,250	20,250	7,110,397
Feb-14	91,337,806	23,393,431	188,913	42,803,413	6,412,921	1,534,375	917,000	154,000	17,263,695
Mar-14	94,890,462	24,414,883	15,265	119,320,611	6,784,250	449,000	2,250	24,250	7,259,750
Apr-14	296,784,086	43,844,043	103,226,651	44,3,354,781	14,360,555	1,982,925	863,250	105,500	17,312,230
May-14	209,715,287	37,329,894	74,695,577	32,1,741,058	10,231,568	1,491,750	765,000	145,750	12,634,068
Jun-14	101,557,227	24,083,844	13,466,466	13,170,975,38	6,184,397	675,250	41,500	23,000	6,904,713
Feb-14	91,337,806	23,393,431	188,913	42,803,413	6,412,921	1,038,359	5,500	37,000	7,493,780
Mar-14	94,890,462	24,414,883	15,265	119,320,611	6,784,250	449,000	2,250	24,250	7,259,750
Apr-14	82,877,326	21,911,392	9,738	10,4,798,457	6,034,500	605,750	3,250	41,250	6,684,750
May-14	86,246,027	22,184,736	34,533	10,8,465,296	5,906,963	933,250	41,500	23,000	6,904,713
Jun-14	99,662,167	23,396,701	10,075,550	12,158,418	6,523,456	969,750	40,000	20,250	7,563,456
May-14	153,785,436	27,446,094	25,456,455	20,6,687,935	8,403,713	1,038,359	203,500	85,000	9,722,463
Jun-14	20,709,199	34,333,446	61,326,076	316,388,720	11,218,750	1,409,875	675,250	140,000	13,443,875

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside Residential	Inside Multi-Family	Inside Irrigation	Inside Residential Total SF+ MF	Outside Residential	Outside Multi-Family	Outside Irrigation	Outside Res - Special Base	Outside Residential Total SF+ MF
Jul-14	303,538,549	41,576,972	91,060,577	436,176,098	14,658,220	1,534,375	917,000	154,000	17,263,695
Aug-14	320,126,646	47,327,951	114,365,479	485,820,076	15,784,677	1,910,000	989,000	144,000	18,938,177
Sep-14	301,913,484	44,677,080	105,187,958	451,778,522	14,360,555	1,982,925	863,250	105,500	17,312,230
Oct-14	213,700,183	38,039,162	76,114,793	327,854,138	10,231,568	1,491,750	765,000	145,750	12,634,068
Nov-14	103,486,814	24,541,437	13,722,329	141,750,581	6,184,397	880,250	25,500	20,250	7,110,397
Dec-14	93,073,225	23,837,906	192,502	117,103,633	6,412,921	1,038,359	5,500	37,000	7,493,780
Jan-15	96,788,271	24,903,181	15,571	121,707,023	6,784,250	449,000	2,250	24,250	7,259,750
Feb-15	84,534,873	22,349,620	9,933	106,894,426	6,034,500	605,750	3,250	41,250	6,684,750
Mar-15	87,970,948	22,628,430	35,224	110,634,602	5,906,063	933,250	41,500	23,000	6,904,713
Apr-15	101,655,411	23,884,635	2,121,141	12,764,1,186	6,523,456	969,750	40,000	30,250	7,563,456
May-15	156,861,144	27,995,016	25,965,584	21,821,744	8,403,713	1,030,250	203,500	85,000	9,722,463
Jun-15	25,123,383	35,040,515	62,552,597	32,271,6495	11,218,750	1,409,875	675,250	140,000	13,403,875
Jul-15	309,609,320	42,408,512	92,881,788	44,899,620	14,658,220	1,534,375	917,000	154,000	17,263,695
Aug-15	330,609,179	48,274,510	116,652,789	49,536,478	15,784,677	1,940,500	989,000	144,000	18,838,177
Sep-15	307,951,753	45,570,622	107,291,717	46,814,092	14,360,555	1,982,925	863,250	105,500	17,312,230
Oct-15	217,974,186	76,399,945	7,637,089	34,411,220	10,231,568	1,491,750	765,000	145,750	12,634,068
Nov-15	105,556,551	25,032,666	13,996,776	14,585,582	6,184,397	880,250	25,500	20,250	7,110,397
Dec-15	94,934,689	24,314,664	196,352	119,445,705	6,412,921	1,038,359	5,500	37,000	7,493,780
Jan-16	98,820,825	25,426,148	15,898	124,262,871	6,784,250	449,000	2,250	24,250	7,259,750
Feb-16	86,310,105	22,818,962	10,142	109,139,209	6,034,500	605,750	3,250	41,250	6,684,750
Mar-16	89,818,338	23,103,627	35,963	11,295,798	5,906,963	933,250	41,500	23,000	6,904,713
Apr-16	103,790,174	24,365,792	2,165,685	130,321,651	6,523,456	969,750	40,000	30,250	7,563,456
May-16	160,155,229	28,582,911	26,510,861	215,249,001	8,403,713	1,030,250	203,500	85,000	9,722,463
Jun-16	229,850,974	35,776,366	63,866,202	329,493,541	11,218,750	1,409,875	675,250	140,000	13,443,875
Jul-16	316,111,116	43,289,090	94,832,306	454,242,512	14,658,220	1,534,375	917,000	154,000	17,263,695
Aug-16	337,551,971	49,288,275	119,102,497	50,592,744	15,784,677	1,940,500	989,000	144,000	18,838,177
Sep-16	314,148,740	46,527,605	109,544,843	47,049,188	14,360,555	1,982,925	863,250	105,500	17,312,230
Oct-16	222,551,644	39,614,744	79,267,468	341,433,856	10,231,568	1,491,750	765,000	145,750	12,634,068
Nov-16	107,773,238	25,557,944	14,290,708	147,621,890	6,184,397	880,250	25,500	20,250	7,110,397
Dec-16	96,228,318	24,825,272	20,076,589	121,954,065	6,412,921	1,038,359	5,500	37,000	7,493,780
Jan-17	100,595,062	25,960,097	16,232	126,872,391	6,784,250	449,000	2,250	24,250	7,259,750
Feb-17	88,122,617	23,298,160	10,355	111,431,132	6,034,500	605,750	3,250	41,250	6,684,750
Mar-17	91,704,523	23,588,803	36,718	115,330,045	5,906,963	933,250	41,500	23,000	6,904,713
Apr-17	105,969,768	24,877,473	2,211,165	13,058,406	6,523,456	969,750	40,000	30,250	7,563,456
May-17	163,118,488	29,183,153	21,067,589	21,769,230	8,403,713	1,030,250	203,500	85,000	9,722,463
Jun-17	234,677,844	36,527,669	65,207,392	33,641,905	11,218,750	1,409,875	675,250	140,000	13,443,875
Jul-17	322,749,449	44,208,371	96,823,784	46,378,1605	14,658,220	1,534,375	917,000	154,000	17,263,695
Aug-17	344,640,563	50,323,29	121,603,650	516,567,541	15,784,677	1,940,500	989,000	144,000	18,838,177
Sep-17	321,021,534	47,504,685	111,845,285	48,037,503	14,360,555	1,982,925	863,250	105,500	17,312,230
Oct-17	227,225,229	40,446,653	80,932,085	34,603,967	10,231,568	1,491,750	765,000	145,750	12,634,068
Nov-17	110,036,476	26,094,6161	14,082,183	15,072,1950	6,184,397	880,250	25,500	37,000	7,110,397
Dec-17	98,963,812	25,346,603	204,685	124,515,101	6,412,921	1,038,359	5,500	30,250	7,493,780
Jan-18	102,913,984	26,479,799	16,556	129,409,839	6,784,250	449,000	2,250	24,250	6,684,750
Feb-18	88,885,069	23,764,124	10,562	113,659,755	6,034,500	605,750	3,250	41,250	6,904,713
Mar-18	93,538,614	24,060,579	37,453	117,636,646	5,906,963	933,250	41,500	23,000	7,563,456
Apr-18	108,089,163	25,375,023	2,255,388	14,082,190	15,784,677	1,940,500	989,000	105,500	17,312,230
May-18	166,788,858	29,766,816	27,608,941	224,164,615	8,403,713	1,030,250	203,500	85,000	9,722,463
Jun-18	239,371,401	37,238,223	66,511,540	34,314,164	11,218,750	1,409,875	675,250	140,000	13,443,875
Jul-18	329,204,438	45,092,539	98,760,260	47,307,237	14,658,220	1,534,375	917,000	154,000	17,263,695
Aug-18	321,533,374	51,329,795	124,035,723	52,888,892	15,784,677	1,940,500	989,000	144,000	18,838,177
Sep-18	327,441,964	48,454,778	114,082,190	14,082,190	14,360,555	1,982,925	863,250	105,500	17,312,230
Oct-18	231,769,733	41,255,87	82,550,726	35,576,046	10,231,568	1,491,750	765,000	145,750	12,634,068
Nov-18	112,237,206	26,616,554	14,882,629	15,376,389	6,184,397	880,250	25,500	20,250	7,110,397
Dec-18	100,943,088	25,835,335	20,779	127,005,403	6,412,921	1,038,359	5,500	37,000	6,684,750
Jan-19	104,972,263	27,008,885	16,887	131,998,036	6,784,250	449,000	2,250	24,250	7,493,780
Feb-19	91,682,771	24,239,406	10,773	115,992,950	6,034,500	605,750	3,250	41,250	6,684,750
Mar-19	95,409,386	24,541,791	38,202	119,989,379	5,906,963	933,250	41,500	23,000	6,904,713

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside Residential	Inside Multi-Family	Inside Irrigation	Inside Residential Total SF+ MF	Outside Residential	Outside Multi-Family	Outside Irrigation	Outside Res - Special Base	Outside Residential Total SF+ MF
Apr-19	10,250,947	25,882,523	2,300,496	138,433,966	6,523,456	969,750	40,000	30,250	7,563,456
May-19	10,124,635	30,362,152	28,161,120	228,607,907	8,403,713	1,030,250	203,500	95,000	9,722,463
Jun-19	244,158,829	38,003,387	67,841,770	350,003,987	11,218,750	1,409,875	675,250	140,000	13,443,875
Jul-19	35,788,527	45,994,389	10,073,545	84,251,831	14,658,320	1,534,375	917,000	154,000	17,263,695
Aug-19	358,964,042	52,356,391	126,516,437	537,436,870	15,784,677	1,940,500	989,000	144,000	18,858,177
Sep-19	33,990,804	49,423,874	116,363,834	49,778,512	14,360,555	1,983,925	863,250	105,500	17,312,230
Oct-19	236,405,128	42,080,698	84,201,741	362,687,567	10,231,568	1,491,750	765,000	145,750	12,634,058
Nov-19	114,481,950	27,148,885	15,180,282	156,811,116	6,184,397	880,250	25,500	20,250	7,110,397
Dec-19	102,961,950	26,370,606	212,955	129,545,511	6,412,321	1,038,359	5,500	37,000	7,493,780
Jan-20	107,071,709	27,549,063	17,225	134,637,936	6,784,750	449,000	2,250	24,250	7,259,750
Feb-20	93,516,426	24,724,194	10,988	118,251,609	6,034,500	605,750	3,250	41,250	6,684,750
Mar-20	97,317,573	25,032,627	38,966	122,389,166	5,906,963	933,250	41,500	23,000	6,904,713
Apr-20	112,455,965	26,400,174	2,346,506	141,202,645	6,523,456	969,750	40,000	30,250	7,563,456
May-20	173,527,128	30,969,395	28,724,342	233,220,865	8,403,713	1,030,250	203,500	85,000	9,722,463
Jun-20	249,042,006	38,763,455	69,198,606	357,004,067	11,218,750	1,409,875	675,250	140,000	13,443,875
Jul-20	342,504,297	46,914,277	102,750,174	49,2,168,749	14,658,320	1,534,375	917,000	154,000	17,263,695
Aug-20	365,735,322	53,403,519	129,046,766	54,8,185,607	15,784,677	1,940,500	899,000	144,000	18,858,177
Sep-20	340,670,620	50,412,351	118,691,111	50,9,774,082	14,360,555	1,982,925	863,250	105,500	17,312,230
Oct-20	241,133,331	42,922,312	85,885,776	36,9,941,319	10,231,568	1,491,750	765,000	145,750	12,634,058
Nov-20	16,771,189	27,691,863	15,483,887	159,947,339	6,184,397	880,250	25,500	20,250	7,110,397
Dec-20	105,021,189	26,898,018	217,214	132,136,421	6,412,921	1,038,359	5,500	37,000	7,493,780

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside Commercial	Outside Commercial	Outside Com - Special Base	Outside Com Total	Total Commercial	Inside - City	Outside - City	City Usas	Industrial
Jan-05	23,395,000	1,428,340	-	1,428,340	24,824,040	860,000	-	860,000	3,921,000
Feb-05	20,140,000	1,267,960	-	1,267,960	21,408,360	970,000	-	970,000	3,569,000
Mar-05	20,826,000	1,288,110	-	1,288,110	22,034,710	729,000	-	729,000	3,624,000
Apr-05	22,565,800	1,247,040	-	1,247,040	23,808,840	960,000	-	960,000	4,156,000
May-05	28,669,400	1,367,240	-	1,367,240	30,036,840	1,993,800	-	1,993,800	4,649,000
Jun-05	45,763,111	2,041,240	-	2,041,240	47,804,351	6,301,000	-	6,301,000	4,767,000
Jul-05	62,382,689	2,544,070	-	2,544,070	65,230,159	11,982,000	-	11,982,000	4,983,000
Aug-05	71,919,000	2,607,370	-	2,607,370	74,527,170	13,023,000	-	13,023,000	6,783,000
Sep-05	63,051,800	2,722,200	-	2,722,200	65,774,000	9,689,000	-	9,689,000	5,039,000
Oct-05	54,501,022	2,053,160	-	2,053,160	56,554,182	5,632,000	-	5,632,000	5,468,000
Nov-05	26,671,700	995,579	-	995,579	27,672,579	969,000	-	969,000	3,816,000
Dec-05	26,998,000	1,538,120	-	1,538,120	27,636,720	588,000	-	588,000	3,977,000
Jan-06	22,410,000	1,287,070	-	1,287,070	23,697,670	739,000	-	739,000	4,044,000
Feb-06	21,364,400	1,154,330	-	1,154,330	22,518,730	615,000	-	615,000	2,872,000
Mar-06	22,057,400	1,197,530	-	1,197,530	23,254,930	802,000	-	802,000	3,244,000
Apr-06	24,235,000	1,307,580	-	1,307,580	25,543,580	1,042,000	-	1,042,000	3,558,000
May-06	41,726,310	1,797,860	-	1,797,860	43,524,170	4,026,000	-	4,026,000	4,705,000
Jun-06	62,753,890	2,553,730	-	2,553,730	65,307,620	11,930,000	-	11,930,000	4,636,000
Jul-06	77,074,800	2,720,570	-	2,720,570	79,795,370	15,210,000	-	15,210,000	6,684,000
Aug-06	69,554,800	3,326,800	-	3,326,800	72,881,600	14,329,000	-	14,329,000	6,764,900
Sep-06	66,675,000	2,673,210	-	2,673,210	69,349,110	12,624,000	-	12,624,000	5,296,000
Oct-06	54,335,000	1,967,490	-	1,967,490	56,302,490	5,056,000	-	5,054,000	5,048,000
Nov-06	29,062,000	1,313,140	-	1,313,140	30,375,840	913,000	-	913,000	3,982,000
Dec-06	26,172,152	989,063	-	989,063	27,161,215	694,029	-	694,029	4,320,000
Jan-07	23,822,302	1,128,697	-	1,128,697	24,753,999	702,971	-	702,971	3,564,500
Feb-07	23,183,381	1,451,000	-	1,451,000	24,634,881	936,000	-	936,000	3,123,500
Mar-07	23,530,900	1,724,000	-	1,724,000	25,254,900	814,000	-	814,000	4,048,000
Apr-07	26,258,000	1,129,000	-	1,129,000	27,387,200	1,233,000	-	1,233,000	4,737,000
May-07	32,112,000	1,261,330	-	1,261,330	33,373,730	2,136,000	-	2,136,000	4,320,000
Jun-07	54,922,600	2,012,670	-	2,012,670	56,936,270	10,475,000	-	10,475,000	4,605,000
Jul-07	79,127,000	2,934,720	-	2,934,720	82,061,720	15,282,000	-	15,282,000	5,507,000
Aug-07	71,765,200	2,536,280	-	2,536,280	74,305,480	14,333,000	-	14,333,000	5,981,000
Sep-07	69,579,511	2,215,620	-	2,215,620	71,795,131	11,956,000	-	11,956,000	5,433,000
Oct-07	53,442,809	2,082,380	-	2,082,380	55,525,289	8,122,000	-	8,122,000	4,834,000
Nov-07	31,444,400	1,408,000	-	1,408,000	32,881,400	1,489,000	-	1,489,000	4,233,000
Dec-07	26,277,800	1,097,000	-	1,097,000	27,374,800	781,000	-	781,000	4,295,000
Jan-08	28,092,400	1,168,610	-	1,168,610	29,261,010	673,000	-	673,000	-
Feb-08	28,821,000	1,002,390	-	1,002,390	29,523,390	698,000	-	698,000	-
Mar-08	29,168,800	994,000	-	994,000	30,162,800	870,000	-	870,000	-
Apr-08	30,038,848	1,034,860	-	1,034,860	31,073,708	1,214,000	-	1,214,000	-
May-08	44,120,500	1,443,140	-	1,443,140	45,863,640	4,640,000	-	4,640,000	-
Jun-08	65,375,000	1,849,000	-	1,849,000	67,228,000	9,119,000	-	9,119,000	-
Jul-08	70,381,400	2,214,000	-	2,214,000	73,195,400	13,867,000	-	13,867,000	-
Aug-08	91,172,600	2,521,000	-	2,521,000	93,693,600	940,000	-	940,000	-
Sep-08	72,669,000	2,367,000	-	2,367,000	75,036,000	10,177,000	-	10,177,000	-
Oct-08	61,045,000	1,502,000	-	1,502,000	62,162,072	682,000	-	682,000	-
Nov-08	38,419,475	1,137,000	-	1,137,000	39,547,475	2,063,000	-	2,063,000	-
Dec-08	30,395,433	1,033,000	-	1,033,000	31,428,643	976,000	-	976,000	-
Jan-09	29,544,816	1,016,000	-	1,016,000	30,560,816	-	-	-	-
Feb-09	25,419,725	846,000	-	846,000	26,265,725	973,000	-	973,000	-
Mar-09	26,154,072	1,008,000	-	1,008,000	27,162,072	682,000	-	682,000	-
Apr-09	26,956,000	1,004,000	-	1,004,000	27,962,000	1,079,110	-	1,079,110	-
May-09	34,835,665	1,222,000	-	1,222,000	36,057,965	2,852,000	-	2,852,000	-
Jun-09	55,948,018	1,561,000	-	1,561,000	57,509,018	5,757,000	-	5,757,000	-
Jul-09	57,512,224	1,669,000	-	1,669,000	59,181,324	12,163,000	-	12,163,000	-
Aug-09	73,564,946	1,676,000	-	1,676,000	75,249,946	13,419,000	-	13,419,000	-
Sep-09	68,558,627	1,597,000	-	1,597,000	70,156,627	10,164,000	-	10,164,000	-

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside Commercial	Outside Commercial	Outside Com - Special Base	Outside Com Total	Total Commercial	Inside - City	Outside - City	City Usas	Industrial
Oct-09	53,383,518	1,206,000	38,000	1,244,000	54,632,518	6,295,000	-	6,295,000	-
Nov-09	31,355,956	893,000	-	32,246,956	-	1,279,000	-	1,279,000	-
Dec-09	27,189,282	1,050,000	-	1,050,000	28,239,282	524,000	-	524,000	-
Jan-10	28,833,665	977,000	-	977,000	29,810,055	837,000	-	837,000	-
Feb-10	25,874,413	952,000	-	952,000	26,926,413	513,000	-	513,000	-
Mar-10	26,591,375	972,000	-	972,000	27,563,375	820,000	-	820,000	-
Apr-10	28,135,184	1,108,000	8,000	1,108,000	29,241,184	765,000	-	765,000	-
May-10	32,745,064	1,268,000	46,000	1,314,000	34,057,064	4,986,000	-	4,986,000	-
Jun-10	45,771,921	1,741,000	95,000	1,836,000	47,607,921	7,575,000	-	7,575,000	-
Jul-10	64,731,690	1,692,000	84,000	1,777,000	66,507,690	12,388,000	-	12,388,000	-
Aug-10	75,019,013	1,598,000	99,000	1,697,000	76,716,013	12,450,143	-	12,450,143	-
Sep-10	73,554,892	1,996,000	96,000	2,092,000	75,646,892	15,011,000	-	15,011,000	-
Oct-10	69,484,929	1,563,260	70,000	1,633,260	71,122,189	10,946,024	-	10,946,024	-
Nov-10	38,357,819	1,098,000	-	1,098,000	40,055,819	1,334,000	-	1,334,000	-
Dec-10	28,854,267	974,000	-	974,000	29,628,267	527,000	-	527,000	-
Jan-11	28,616,674	922,000	-	922,000	29,538,074	676,405	-	676,405	-
Feb-11	26,258,447	943,000	-	943,000	27,201,447	684,222	-	684,222	-
Mar-11	26,333,929	<b>2,591,000</b>	-	2,591,000	28,928,929	706,000	-	706,000	-
Apr-11	27,396,680	905,106	9,000	914,106	28,210,796	789,268	-	789,268	-
May-11	37,715,153	1,185,000	21,000	1,206,000	38,921,753	1,663,300	-	1,663,300	-
Jun-11	53,502,633	1,366,000	62,000	1,418,000	54,920,633	7,482,579	-	7,482,579	-
Jul-11	61,728,653	1,714,000	97,000	1,811,000	69,096,653	13,355,000	-	13,355,000	-
Aug-11	82,416,828	1,823,000	88,000	1,911,000	84,329,628	16,657,000	-	16,657,000	-
Sep-11	83,086,966	1,769,642	93,000	1,862,642	84,949,608	16,346,000	-	16,346,000	-
Oct-11	71,814,787	1,350,000	72,000	1,422,000	73,236,787	10,905,000	-	10,905,000	-
Nov-11	38,270,720	870,000	-	870,000	39,270,720	1,610,000	-	1,610,000	-
Dec-11	30,076,664	809,000	-	809,000	30,887,664	660,000	-	660,000	-
Jan-12	28,944,218	1,027,028	-	1,027,028	29,971,246	817,802	-	817,802	-
Feb-12	26,702,657	941,463	-	941,463	27,644,119	723,401	-	723,401	-
Mar-12	27,225,422	1,399,598	-	1,399,598	28,625,020	736,000	-	736,000	-
Apr-12	28,225,318	1,017,597	4,276	1,021,333	29,275,651	961,845	-	961,845	-
May-12	37,633,338	1,287,212	16,831	1,304,063	38,957,456	3,535,325	-	3,535,325	-
Jun-12	55,481,295	1,636,511	39,486	1,675,996	57,157,291	7,484,395	-	7,484,395	-
Jul-12	65,518,533	1,833,184	45,522	1,878,705	67,397,238	12,988,250	-	12,988,250	-
Aug-12	81,027,050	1,915,927	47,031	1,962,958	82,990,017	14,889,036	-	14,889,036	-
Sep-12	74,914,427	1,944,005	47,534	1,991,538	76,905,955	12,924,500	-	12,924,500	-
Oct-12	64,317,914	1,413,747	45,270	1,459,017	65,776,931	8,903,256	-	8,903,256	-
Nov-12	36,968,732	1,005,497	-	1,005,497	37,974,229	1,407,667	-	1,407,667	-
Dec-12	29,253,941	972,299	-	972,299	30,226,240	570,333	-	570,333	-
Jan-13	29,725,712	1,054,758	-	1,054,758	30,780,470	817,802	-	817,802	-
Feb-13	27,423,628	96,582	47,534	96,582	28,390,510	723,401	-	723,401	-
Mar-13	27,960,509	1,437,387	-	1,437,387	29,397,895	736,000	-	736,000	-
Apr-13	29,038,752	1,044,518	4,391	1,048,909	30,087,661	961,845	-	961,845	-
May-13	38,670,035	1,321,967	17,305	1,339,272	40,009,307	3,535,325	-	3,535,325	-
Jun-13	56,979,290	1,680,696	40,552	1,721,248	58,700,538	7,484,395	-	7,484,395	-
Feb-13	67,287,534	1,882,579	46,751	1,929,430	69,216,964	12,988,250	-	12,988,250	-
Mar-13	83,214,790	1,967,657	48,300	2,015,957	85,230,747	14,889,036	-	14,889,036	-
Apr-13	76,937,117	1,996,493	48,817	2,045,310	78,982,427	12,924,500	-	12,924,500	-
May-13	66,054,498	1,451,918	46,492	1,498,410	67,552,908	8,903,256	-	8,903,256	-
Jun-13	37,966,888	1,032,645	-	1,032,645	38,999,533	1,407,667	-	1,407,667	-
Feb-13	30,043,797	998,551	-	998,551	31,042,348	570,333	-	570,333	-
Mar-13	30,290,501	1,074,798	-	1,074,798	31,365,299	817,802	-	817,802	-
Apr-13	27,944,677	985,253	-	985,253	28,929,930	723,401	-	723,401	-
May-14	28,491,758	1,464,697	-	1,464,697	29,956,455	736,000	-	736,000	-
Jun-14	39,590,488	1,064,364	4,474	1,068,838	30,659,326	961,845	-	961,845	-
Feb-14	39,404,766	1,347,384	17,634	1,364,719	40,769,484	3,535,325	-	3,535,325	-
Mar-14	58,061,897	1,712,630	41,322	1,753,952	59,815,848	7,484,395	-	7,484,395	-

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside Commercial	Outside Commercial	Outside Com - Special Base	Outside Com Total	Total Commercial	Inside - City	Outside - City	City Usas	Industrial
Jul-14	68,565,997	1,918,450	47,639	1,966,089	70,532,086	12,988,250	12,988,250	12,988,250	
Aug-14	84,795,871	2,054,261	49,218	86,950,121	14,889,036	14,889,036	14,889,036	14,889,036	
Sep-14	78,398,922	2,034,426	49,744	2,084,171	80,483,093	12,924,500	12,924,500	12,924,500	
Oct-14	67,309,534	1,479,504	47,376	1,526,880	68,836,414	8,903,256	8,903,256	8,903,256	
Nov-14	38,668,259	1,052,266	-	1,052,266	39,740,524	1,407,667	1,407,667	1,407,667	
Dec-14	30,614,629	1,017,524	-	1,017,524	31,632,153	570,333	570,333	570,333	
Jan-15	30,896,311	1,096,294	-	1,096,294	31,992,605	817,802	817,802	817,802	
Feb-15	28,503,571	1,004,958	-	1,004,958	29,508,529	723,401	723,401	723,401	
Mar-15	29,061,593	1,493,991	-	1,493,991	30,555,584	736,000	736,000	736,000	
Apr-15	30,182,298	1,085,551	4,564	1,090,215	31,272,513	961,845	961,845	961,845	
May-15	40,192,861	1,374,026	17,987	1,392,013	41,584,874	3,535,325	3,535,325	3,535,325	
Jun-15	59,223,315	1,746,382	42,149	1,789,031	61,012,165	7,484,395	7,484,395	7,484,395	
Jul-15	69,937,317	1,956,819	48,592	2,005,411	71,942,728	12,988,250	12,988,250	12,988,250	
Aug-15	86,491,789	2,045,143	50,202	2,095,346	88,587,134	14,889,036	14,889,036	14,889,036	
Sep-15	79,966,900	2,075,115	50,739	2,125,854	82,092,754	12,924,500	12,924,500	12,924,500	
Oct-15	68,655,724	1,509,095	48,323	1,557,418	70,213,142	8,903,256	8,903,256	8,903,256	
Nov-15	39,462,024	1,073,311	-	1,073,311	40,535,335	1,407,667	1,407,667	1,407,667	
Dec-15	31,226,922	1,037,374	-	1,037,374	32,254,796	570,333	570,333	570,333	
Jan-16	31,545,133	1,119,316	-	1,119,316	32,664,449	817,802	817,802	817,802	
Feb-16	29,102,146	1,026,062	-	1,026,062	30,128,208	723,401	723,401	723,401	
Mar-16	29,671,887	1,525,365	-	1,525,365	31,197,252	736,000	736,000	736,000	
Apr-16	30,816,126	1,108,450	4,660	1,113,109	31,929,235	961,845	961,845	961,845	
May-16	41,036,911	1,402,381	18,365	1,421,245	42,458,156	3,535,325	3,535,325	3,535,325	
Jun-16	60,466,821	1,783,567	43,034	1,826,600	62,293,421	7,484,395	7,484,395	7,484,395	
Jul-16	71,406,000	1,997,913	49,612	2,047,525	73,453,525	12,988,250	12,988,250	12,988,250	
Aug-16	88,308,191	2,088,091	51,257	2,139,348	90,447,644	14,889,036	14,889,036	14,889,036	
Sep-16	81,646,692	2,118,692	51,805	2,170,497	83,816,702	12,924,500	12,924,500	12,924,500	
Oct-16	70,097,494	1,540,786	49,338	1,590,124	71,687,618	8,903,256	8,903,256	8,903,256	
Nov-16	40,290,726	1,095,351	-	1,095,351	41,386,577	1,407,667	1,407,667	1,407,667	
Dec-16	31,882,687	1,059,669	-	1,059,669	32,942,357	570,333	570,333	570,333	
Jan-17	32,207,581	1,142,322	-	1,142,322	33,359,043	817,802	817,802	817,802	
Feb-17	29,713,291	1,047,609	-	1,047,609	30,760,900	723,401	723,401	723,401	
Mar-17	30,294,997	1,557,397	-	1,557,397	31,832,394	736,000	736,000	736,000	
Apr-17	31,463,265	1,131,727	4,758	1,136,485	32,589,749	961,845	961,845	961,845	
May-17	41,888,686	1,432,341	18,750	1,451,091	43,349,778	3,535,325	3,535,325	3,535,325	
Jun-17	61,736,624	1,821,192	43,937	1,864,937	63,601,583	7,484,395	7,484,395	7,484,395	
Jul-17	72,905,526	2,039,869	50,654	2,059,523	74,996,049	12,988,250	12,988,250	12,988,250	
Aug-17	90,162,587	2,131,941	52,333	2,184,274	92,346,861	14,889,036	14,889,036	14,889,036	
Sep-17	83,360,775	2,163,185	52,893	2,216,078	85,576,833	12,924,500	12,924,500	12,924,500	
Oct-17	71,569,542	1,573,142	50,374	1,623,516	73,193,058	8,903,256	8,903,256	8,903,256	
Nov-17	41,136,832	1,118,863	-	1,118,863	42,260,695	1,407,667	1,407,667	1,407,667	
Dec-17	32,552,224	1,081,922	-	1,081,922	33,634,146	570,333	570,333	570,333	
Jan-18	32,851,733	1,165,518	-	1,165,518	34,017,411	817,802	817,802	817,802	
Feb-18	30,307,557	1,068,561	-	1,068,561	31,376,118	723,401	723,401	723,401	
Mar-18	30,900,897	1,588,545	-	1,588,545	32,489,442	736,000	736,000	736,000	
Apr-18	32,092,530	1,154,362	4,853	1,159,214	33,251,744	961,845	961,845	961,845	
May-18	42,736,660	1,460,988	19,125	1,480,113	44,216,773	3,535,325	3,535,325	3,535,325	
Jun-18	62,971,356	1,857,442	44,816	1,902,258	64,873,614	7,484,395	7,484,395	7,484,395	
Jul-18	74,363,637	2,080,666	51,667	2,132,333	76,495,970	12,988,250	12,988,250	12,988,250	
Aug-18	91,965,838	2,174,580	53,380	2,227,960	94,193,798	14,889,036	14,889,036	14,889,036	
Sep-18	85,027,991	2,206,449	53,951	2,260,399	87,288,390	12,924,500	12,924,500	12,924,500	
Oct-18	73,000,933	1,604,505	51,382	1,655,986	74,656,919	8,903,256	8,903,256	8,903,256	
Nov-18	41,959,568	1,141,241	-	1,141,241	43,100,809	1,407,667	1,407,667	1,407,667	
Dec-18	33,203,268	1,103,561	-	1,103,561	34,306,829	570,333	570,333	570,333	
Jan-19	33,508,767	1,188,992	-	1,188,992	34,697,759	817,802	817,802	817,802	
Feb-19	32,913,708	1,089,933	-	1,089,933	32,003,641	723,401	723,401	723,401	
Mar-19	31,518,914	1,620,316	-	1,620,316	33,139,231	736,000	736,000	736,000	

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside Commercial	Outside Commercial	Outside Com - Special Base	Outside Com Total	Total Commercial	Inside - City	Outside - City	City Issues	Industrial
Apr-19	32,734,380	1,177,449	4,950	1,182,399	33,916,779	961,845			961,845
May-19	43,591,393	1,490,208	19,508	1,509,719	45,101,109	3,535,325			3,535,325
Jun-19	64,230,783	1,894,591	45,712	1,940,303	66,171,087	7,484,395			7,484,395
Jul-19	75,850,910	2,122,279	52,700	2,174,980	78,025,890	12,988,250			12,988,250
Aug-19	93,805,155	2,218,072	54,447	2,272,519	96,077,674	14,889,036			14,889,036
Sep-19	86,728,551	2,250,578	55,030	2,305,607	89,034,158	12,924,500			12,924,500
Oct-19	74,460,951	1,636,597	52,409	1,689,106	76,150,057	8,903,256			8,903,256
Nov-19	42,798,759	1,164,065	-	1,164,065	43,962,825	1,407,667			1,407,667
Dec-19	33,867,334	1,125,532	-	1,125,632	34,992,966	570,333			570,333
Jan-20	34,178,943	1,212,772	-	1,212,772	35,391,714				817,802
Feb-20	31,531,982	1,111,731	-	1,111,731	32,643,713				723,401
Mar-20	32,149,293	1,652,723	-	1,652,723	33,802,015				736,000
Apr-20	33,389,058	1,200,998	5,049	1,206,047	34,595,115				961,845
May-20	44,463,221	1,520,012	19,898	1,539,910	46,003,131				3,535,325
Jun-20	65,515,399	1,932,483	46,627	1,979,109	67,494,508				7,484,395
Jul-20	77,367,928	2,164,725	53,754	2,218,479	79,586,407				12,988,250
Aug-20	95,681,258	2,262,433	55,536	2,317,959	97,999,228				14,889,036
Sep-20	88,463,122	2,295,389	56,130	2,351,719	90,814,841				12,924,500
Oct-20	75,950,170	1,669,331	53,457	1,772,888	77,673,059				8,903,256
Nov-20	43,654,735	1,187,347	-	1,187,347	44,842,081				1,407,667
Dec-20	34,544,680	1,148,145	-	1,148,145	35,692,825				570,333

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside - Wholesale	Outside - Wholesale	Total Other	Hydrant	Ranch	Total Consumption	% Non-Revenue	Treated Water Demand
Jan-05	1,384,500	-	5,305,500	1,069,100	4,377,700	154,374,179	10.7%	172,900,000
Feb-05	1,478,000	-	4,987,000	-	4,536,200	130,579,460	15.9%	154,500,000
Mar-05	1,480,000	-	5,104,000	-	4,026,700	134,393,549	24.8%	178,800,000
Apr-05	1,610,100	-	5,766,100	207,000	7,768,900	167,725,163	21.3%	213,000,000
May-05	1,743,900	-	6,392,900	428,000	8,017,000	217,222,419	38.8%	355,000,000
Jun-05	3,547,500	-	8,314,500	362,000	10,162,300	365,194,165	15.1%	430,300,000
Jul-05	4,093,500	-	8,986,500	555,000	11,601,800	541,414,659	17.3%	654,400,000
Aug-05	7,256,407	-	14,033,407	463,000	13,149,200	559,740,977	-1.0%	554,200,000
Sep-05	6,325,000	-	11,364,000	453,000	10,567,200	509,232,948	0.5%	511,700,000
Oct-05	5,655,000	-	11,113,000	434,000	8,990,400	374,363,982	-36.0%	275,200,000
Nov-05	2,865,000	-	6,741,000	303,300	10,668,300	181,588,797	-10.9%	203,700,000
Dec-05	1,163,000	-	5,140,000	335,700	3,174,832	157,109,252	28.5%	219,600,000
Jan-06	1,281,400	-	5,325,400	332,000	12,375,350	167,899,867	19.5%	208,700,000
Feb-06	1,593,600	-	4,965,600	330,000	7,982,600	146,611,883	20.0%	183,200,000
Mar-06	1,603,000	-	4,847,700	323,000	9,656,090	147,967,507	27.2%	203,200,000
Apr-06	2,162,000	-	5,720,000	384,000	8,455,200	188,222,939	45.0%	344,500,000
May-06	3,374,000	-	7,973,000	502,000	9,015,700	372,478,292	32.3%	550,500,000
Jun-06	7,030,000	-	12,139,000	625,000	13,238,400	621,600,109	12.2%	707,900,000
Jul-06	7,842,000	-	14,526,000	579,000	8,827,300	667,698,149	1.2%	675,900,000
Aug-06	6,605,000	-	13,869,900	621,000	12,736,595	610,679,170	5.7%	647,300,000
Sep-06	6,262,000	-	11,558,500	468,000	10,255,300	524,468,510	-14.2%	459,300,000
Oct-06	4,115,000	-	9,523,000	373,000	12,306,530	374,920,931	-28.7%	291,300,000
Nov-06	2,369,000	-	6,351,000	299,000	10,742,100	179,070,854	9.2%	197,200,000
Dec-06	1,108,700	-	5,128,700	266,000	7,871,800	173,435,930	10.5%	193,700,000
Jan-07	-	-	3,564,500	230,000	3,512,600	144,246,818	27.1%	197,900,000
Feb-07	-	-	3,123,500	206,000	3,200,100	138,909,117	25.1%	185,500,000
Mar-07	-	-	4,048,000	299,000	6,089,900	142,653,030	31.0%	206,600,000
Apr-07	-	-	4,737,000	275,000	3,618,000	159,797,989	33.7%	241,000,000
May-07	-	-	4,487,000	297,000	3,671,400	232,091,930	47.3%	440,000,000
Jun-07	-	-	4,605,000	339,000	2,668,484	453,947,585	26.2%	614,700,000
Jul-07	-	-	5,507,000	709,000	3,477,700	680,800,109	6.9%	731,600,000
Aug-07	1,838	-	5,952,838	334,000	2,911,657	610,886,128	-0.3%	609,300,000
Sep-07	-	-	5,433,000	282,000	5,561,700	544,506,078	-8.1%	503,700,000
Oct-07	-	-	4,834,000	277,000	7,319,834	381,124,823	-23.0%	309,900,000
Nov-07	-	-	4,233,000	192,000	6,986,000	195,910,304	1.6%	199,100,000
Dec-07	-	-	4,285,000	193,000	4,989,300	161,076,389	21.0%	203,900,000
Jan-08	-	-	-	227,000	1,880,000	152,700,099	22.7%	211,900,000
Feb-08	-	-	-	251,000	3,873,400	142,622,426	26.8%	194,800,000
Mar-08	-	-	-	308,000	7,881,930	150,130,597	29.5%	212,900,000
Apr-08	-	-	-	285,000	9,582,200	163,799,175	40.4%	275,000,000
May-08	-	-	-	343,000	7,886,300	325,262,640	32.5%	482,200,000
Jun-08	-	-	-	450,000	6,113,100	452,723,200	22.7%	585,300,000
Jul-08	-	-	-	451,000	5,792,200	586,459,100	20.7%	739,100,000
Aug-08	-	-	-	354,000	6,936,800	695,740,200	-16.7%	596,400,000
Sep-08	5,078	-	5,078	406,000	7,112,500	479,148,763	5.7%	453,300,000
Oct-08	-	-	-	329,000	8,669,000	371,050,327	-22.3%	303,300,000
Nov-08	-	-	-	334,000	4,418,600	188,047,884	5.8%	199,600,000
Dec-08	-	-	-	295,000	8,759,300	161,598,286	17.0%	194,800,000
Jan-09	-	-	-	277,000	4,552,700	157,741,212	15.6%	187,000,000
Feb-09	-	-	-	295,000	2,568,300	136,199,281	20.2%	170,700,000
Mar-09	-	-	-	361,000	5,615,800	149,231,377	30.6%	215,100,000
Apr-09	-	-	-	203,000	3,143,100	161,640,204	26.1%	218,700,000
May-09	-	-	-	228,000	2,748,300	231,635,783	45.1%	422,000,000
Jun-09	-	-	-	319,000	2,776,578	364,009,082	12.9%	417,700,000
Jul-09	179	-	-	179	268,000	3,548,147	22.6%	568,300,000
Aug-09	-	-	-	311,000	1,555,051	497,796,796	12.7%	570,500,000
Sep-09	-	-	-	262,000	3,482,027	483,809,175	-4.5%	463,000,000

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside - Wholesale	Outside - Wholesale	Total Other	Hydrant	Ranch	Total Consumption	% Non-Revenue	% Treated Water Demand
Oct-09	-	-	-	233,000	3,881,639	331,086,554	-33.2%	237,900,000
Nov-09	-	-	-	239,000	5,155,060	160,125,390	9.8%	177,500,000
Dec-09	-	-	-	170,000	1,986,800	148,556,502	21.0%	188,000,000
Jan-10	-	-	-	188,000	2,680,880	154,777,132	18.1%	189,000,000
Feb-10	-	6,830	202,000	3,377,500	136,794,158	20.3%	171,700,000	
Mar-10	-	-	289,000	4,355,250	140,560,625	27.5%	193,900,000	
Apr-10	-	-	253,000	2,314,500	155,187,181	28.6%	217,400,000	
May-10	-	-	-	227,000	2,156,800	199,382,698	39.5%	329,700,000
Jun-10	47,000	28,000	75,000	422,000	2,754,500	345,332,170	33.5%	519,600,000
Jul-10	214,000	-	214,000	379,000	2,555,465	521,005,337	13.3%	601,200,000
Aug-10	377,000	1,000	378,000	375,000	2,683,100	546,280,290	12.2%	622,500,000
Sep-10	319,000	40,000	359,000	363,000	1,476,600	587,561,564	0.9%	593,100,000
Oct-10	246,000	-	246,000	322,000	3,338,100	476,460,701	-39.4%	341,900,000
Nov-10	14,000	-	14,000	305,000	3,764,200	199,181,715	-6.0%	187,900,000
Dec-10	1,000	1,000	2,000	322,000	1,173,000	148,142,090	21.0%	187,500,000
Jan-11	1,000	(1,000)	-	362,000	3,704,300	153,347,985	19.3%	190,600,000
Feb-11	1,000	-	1,000	233,000	3,205,300	136,155,066	21.9%	174,400,000
Mar-11	-	-	-	273,000	1,705,845	137,466,512	30.2%	196,900,000
Apr-11	1,000	-	1,000	235,000	1,191,700	162,624,313	36.8%	257,500,000
May-11	10,000	-	10,000	316,000	301,200	251,172,759	31.2%	365,300,000
Jun-11	10,000	-	10,000	310,000	3,221,500	367,499,726	34.0%	556,800,000
Jul-11	224,000	15,675	239,675	343,000	3,634,000	516,176,991	18.1%	630,200,000
Aug-11	267,000	29,000	296,000	495,000	2,514,300	586,924,850	18.8%	722,500,000
Sep-11	447,000	-	447,000	298,000	3,250,300	610,174,712	-19.5%	510,800,000
Oct-11	200,000	125	200,125	326,000	2,234,700	434,606,563	-30.4%	333,200,000
Nov-11	13,000	-	13,000	198,000	1,847,200	193,251,718	2.8%	198,805,395
Dec-11	3,000	-	3,000	195,000	984,714	153,365,878	20.0%	191,717,971
Jan-12	-	-	275,000	1,995,953	154,334,074	21.7%	197,028,234	
Feb-12	-	3,915	217,500	1,737,004	137,151,305	22.9%	177,826,457	
Mar-12	-	-	281,000	2,363,820	142,561,033	29.8%	202,934,286	
Apr-12	500	244,000	2,172,200	159,815,425	542,081,277	33.1%	239,017,485	
May-12	5,000	271,500	2,035,969	252,029,307	381,1%	414,080,611		
Jun-12	42,500	366,000	2,467,583	383,288,247	25.8%	516,830,018		
Jul-12	-	226,838	361,000	2,379,947	517,401,915	16.3%	618,319,433	
Aug-12	-	337,000	465,000	2,557,424	584,324,118	5.4%	617,464,248	
Sep-12	-	403,000	330,500	2,056,171	542,081,277	-7.4%	504,901,399	
Oct-12	-	223,063	324,000	2,819,600	403,963,350	-30.9%	308,707,252	
Nov-12	-	13,500	251,500	2,621,787	184,829,457	2.8%	190,141,095	
Dec-12	-	2,500	258,500	1,740,999	152,191,233	20.0%	190,245,583	
Jan-13	-	-	275,000	2,575,459	158,084,272	21.7%	202,736,072	
Feb-13	3,915	217,500	2,244,700	141,109,189	22.9%	182,960,194		
Mar-13	-	-	281,000	3,062,478	146,824,967	29.8%	209,000,956	
Apr-13	500	244,000	2,807,381	164,469,962	556,546,119	-7.4%	518,374,137	
May-13	5,000	271,500	2,631,048	415,022,073	-30.9%	317,158,386		
Jun-13	-	42,500	366,000	3,188,815	393,715,544	2.8%	425,547,787	
Jul-13	-	226,838	361,000	3,066,103	531,169,125	16.3%	530,890,298	
Aug-13	-	337,000	465,000	3,304,916	599,846,481	5.4%	633,866,966	
Sep-13	-	403,000	330,500	3,238,682	-	-	-	
Oct-13	-	223,063	324,000	3,643,721	-	-	-	
Nov-13	-	13,500	251,500	3,388,090	-	-	-	
Dec-13	-	2,500	258,500	2,249,863	156,537,475	20.0%	195,682,887	
Jan-14	-	-	275,000	3,188,986	162,227,448	21.7%	207,106,239	
Feb-14	-	3,915	217,500	2,779,433	144,137,386	22.9%	186,886,511	
Mar-14	-	-	281,000	3,792,023	150,135,487	29.8%	213,716,449	
Apr-14	500	244,000	3,476,156	168,043,700	33.1%	251,323,367		
May-14	5,000	271,500	3,257,817	264,249,574	39.1%	434,156,339		
Jun-14	-	42,500	366,000	3,948,456	401,489,794	25.8%	541,371,181	

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**  
**City of Loveland**

Date	Inside - Wholesale	Outside - Wholesale	Total Other	Hydrant	Ranch	Total Consumption	% Non-Revenue	%	Treated Water Demand
Jul-14			226,838	361,000	3,800,226	541,348,192	16.3%	646,936,552	
Aug-14			337,000	409,214	611,311,634	511,952,269	5.7%	645,982,269	
Sep-14			403,000	4,010,202	567,242,046	7.4%	528,336,459		
Oct-14			223,063	4,511,730	423,286,567	30.9%	323,474,058		
Nov-14			13,500	251,500	4,195,202	194,469,371	2.8%	200,058,041	
Dec-14			2,500	258,500	2,783,826	159,846,726	20.0%	199,811,480	
Jan-15			275,000	3,785,476	165,835,656	21.7%	211,712,526		
Feb-15			3,915	217,500	3,297,574	147,330,095	22.9%	191,026,133	
Mar-15			-	281,000	4,498,931	153,610,829	29.8%	218,663,567	
Apr-15			500	244,000	4,124,180	171,807,680	33.1%	256,957,916	
May-15			5,000	271,500	3,865,139	269,066,045	39.1%	443,287,543	
Jun-15			42,500	366,000	4,684,526	409,749,556	25.8%	552,511,272	
Jul-15			226,838	361,000	4,058,663	552,190,793	16.3%	659,897,766	
Aug-15			337,000	465,000	4,855,084	623,527,908	5.4%	658,891,493	
Sep-15			403,000	330,500	4,757,783	578,634,859	7.4%	538,941,870	
Oct-15			223,063	324,000	5,358,805	432,061,554	-30.9%	330,175,793	
Nov-15			13,500	251,500	4,977,271	198,881,262	2.8%	204,596,721	
Dec-15			2,500	258,500	3,305,160	163,340,775	20.0%	204,187,283	
Jan-16			-	275,000	4,120,072	169,400,944	21.7%	216,264,220	
Feb-16			3,915	217,500	3,591,814	150,488,796	22.9%	195,121,661	
Mar-16			-	281,000	4,900,365	156,977,258	29.8%	223,455,647	
Apr-16			500	244,000	4,492,177	175,512,864	33.1%	262,494,332	
May-16			5,000	271,500	4,210,021	275,451,467	39.1%	452,562,891	
Jun-16			42,500	366,000	5,105,522	418,226,253	25.8%	563,940,903	
Jul-16			226,838	361,000	4,910,966	563,446,786	16.3%	673,348,202	
Aug-16			337,000	465,000	5,288,298	636,227,718	5.4%	672,311,577	
Sep-16			403,000	330,500	5,182,315	590,460,435	-7.4%	549,962,362	
Oct-16			223,063	324,000	5,830,431	441,036,291	-30.9%	337,038,252	
Nov-16			13,500	251,500	5,421,388	203,212,918	2.8%	209,052,861	
Dec-16			2,500	258,500	3,600,076	166,821,611	20.0%	208,538,569	
Jan-17			-	275,000	4,120,072	172,966,417	21.7%	220,471,357	
Feb-17			3,915	217,500	3,591,814	153,413,412	22.9%	198,913,676	
Mar-17			-	281,000	4,900,365	160,004,517	29.8%	227,764,921	
Apr-17			500	244,000	4,492,177	178,920,132	33.1%	267,590,190	
May-17			5,000	271,500	4,210,021	280,863,317	33.1%	461,454,485	
Jun-17			42,500	366,000	5,105,522	426,453,779	25.8%	575,034,889	
Jul-17			226,838	361,000	4,910,966	574,528,403	16.3%	686,588,251	
Aug-17			337,000	465,000	5,283,298	648,751,913	5.4%	685,546,085	
Sep-17			403,000	330,500	5,182,315	602,100,901	-7.4%	560,804,440	
Oct-17			223,063	324,000	5,830,431	449,711,842	-30.9%	343,668,075	
Nov-17			13,500	251,500	5,421,388	207,182,096	2.8%	213,136,105	
Dec-17			2,500	258,500	3,600,076	170,074,436	20.0%	212,604,826	
Jan-18			-	275,000	3,946,668	175,728,469	21.7%	224,342,199	
Feb-18			3,915	217,500	3,441,551	156,106,990	22.9%	202,406,132	
Mar-18			-	281,000	4,693,360	162,473,160	29.8%	231,663,354	
Apr-18			500	244,000	4,304,248	182,045,366	33.1%	272,264,142	
May-18			5,000	271,500	4,033,896	285,949,572	39.1%	469,811,130	
Jun-18			42,500	366,000	4,883,059	434,240,606	25.8%	585,537,730	
Jul-18			226,838	361,000	4,705,517	585,098,507	16.3%	689,220,019	
Aug-18			337,000	465,000	5,067,063	660,708,966	5.4%	698,181,286	
Sep-18			403,000	330,500	4,965,514	613,203,067	-7.4%	571,145,139	
Oct-18			223,063	324,000	5,585,516	457,903,867	-30.9%	349,928,390	
Nov-18			13,500	251,500	5,195,585	210,814,846	2.8%	216,873,553	
Dec-18			2,500	258,500	3,443,467	173,086,813	20.0%	216,370,505	
Jan-19			-	275,000	3,783,476	178,381,823	21.7%	228,304,068	
Feb-19			3,915	217,500	3,297,574	158,863,731	22.9%	205,980,483	
Mar-19			-	281,000	4,498,931	165,549,253	29.8%	235,657,800	

**Table C-3 - Monthly Water Demands Past and Future for Average Conditions**

**City of Loveland**

Date	Inside - Wholesale	Outside - Wholesale	Total Other	Hydrant	Ranch	Total Consumption	% Non-Revenue	%	Treated Water Demand
Apr-19			500	244,000	4,124,180	185,244,725		33.1%	277,041,154
May-19			5,000	271,500	3,865,139	291,148,442		39.1%	478,352,901
Jun-19			42,500	366,000	4,684,526	442,196,369		25.8%	596,261,367
Jul-19			226,838	361,000	4,508,663	595,892,716		16.3%	712,119,603
Aug-19			337,000	465,000	4,855,084	672,918,840		5.4%	711,083,648
Sep-19			403,000	330,500	4,757,783	624,540,683		7.4%	581,705,138
Oct-19			223,063	324,000	5,355,805	466,274,816		-30.9%	356,325,137
Nov-19			13,500	251,500	4,977,271	214,534,276		2.8%	220,699,572
Dec-19			2,500	258,500	3,305,160	176,168,750		20.0%	220,223,140
Jan-20			-	275,000	3,948,668	182,330,930		21.7%	232,771,173
Feb-20			3,915	217,500	3,441,551	161,966,439		22.9%	210,003,411
Mar-20			-	281,000	4,695,360	168,808,254		29.8%	240,295,958
Apr-20			500	244,000	4,304,248	188,871,807		33.1%	282,471,762
May-20			5,000	271,500	4,033,896	296,792,180		39.1%	487,625,383
Jun-20			42,500	366,000	4,880,059	450,724,403		25.8%	607,761,661
Jul-20			226,838	361,000	4,705,517	607,300,456		16.3%	725,752,384
Aug-20			337,000	495,000	5,067,063	685,801,111		5.4%	724,695,240
Sep-20			403,000	330,500	4,965,514	636,524,667		-7.4%	592,867,174
Oct-20			223,063	324,000	5,588,516	475,285,279		-30.9%	363,211,199
Nov-20			13,500	251,500	5,194,585	218,767,069		2.8%	225,054,008
Dec-20			2,500	258,500	3,449,467	179,603,827		20.0%	224,517,224

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Inside Residential	Inside Multi-Family	Inside Irrigation	Inside Residential Total SF+ MF	Outside Residential	Outside Multi-Family	Outside Irrigation	Outside Res - Special Base	Outside Residential Total SF+ MF
Jan-05	109,547,839	-	-	109,547,839	8,390,000	-	-	-	8,390,000
Feb-05	91,946,900	-	-	91,946,900	6,731,000	-	-	-	6,731,000
Mar-05	95,470,039	-	-	95,470,039	7,029,100	-	-	-	7,029,100
Apr-05	121,536,723	-	-	121,536,723	7,677,600	-	-	-	7,677,600
May-05	160,891,579	-	-	160,891,579	9,462,300	-	-	-	9,462,300
Jun-05	279,120,014	-	-	279,120,014	13,130,000	-	-	-	13,130,000
Jul-05	424,146,200	-	-	424,146,200	18,902,000	-	-	-	18,902,000
Aug-05	425,802,200	-	-	425,802,200	18,743,000	-	-	-	18,743,000
Sep-05	394,132,748	-	-	394,132,748	17,333,000	-	-	-	17,333,000
Oct-05	279,788,600	-	-	279,788,600	11,881,800	-	-	-	11,881,800
Nov-05	128,564,600	-	-	128,564,600	6,710,200	-	-	-	6,710,200
Dec-05	112,596,900	-	-	112,596,900	7,637,100	-	-	-	7,637,100
Jan-06	117,025,547	-	-	117,025,547	8,404,900	-	-	-	8,404,900
Feb-06	103,678,953	-	-	103,678,953	7,021,000	-	-	-	7,021,000
Mar-06	102,035,487	-	-	102,035,487	7,009,000	-	-	-	7,009,000
Apr-06	138,511,159	-	-	138,511,159	8,567,000	-	-	-	8,567,000
May-06	293,578,622	-	-	293,578,622	13,179,800	-	-	-	13,179,800
Jun-06	496,795,889	-	-	496,795,889	21,564,200	-	-	-	21,564,200
Jul-06	525,171,479	-	-	525,171,479	23,378,000	-	-	-	23,378,000
Aug-06	477,540,475	-	-	477,540,475	19,200,600	-	-	-	19,200,600
Sep-06	404,186,500	-	-	404,186,500	16,057,400	-	-	-	16,057,400
Oct-06	279,511,911	-	-	279,511,911	11,880,000	-	-	-	11,880,000
Nov-06	123,457,000	-	-	123,457,000	6,932,914	-	-	-	6,932,914
Dec-06	125,055,758	-	-	125,055,758	6,988,123	-	-	-	6,988,123
Jan-07	103,665,559	-	-	103,665,559	7,801,189	-	-	-	7,817,189
Feb-07	100,225,253	-	-	100,225,253	6,533,383	-	-	-	6,543,383
Mar-07	99,508,230	-	-	99,508,230	6,596,000	-	-	-	6,639,000
Apr-07	115,275,789	-	-	115,275,789	7,286,000	-	-	-	7,272,000
May-07	178,867,000	-	-	178,867,000	9,201,800	-	-	-	9,259,800
Jun-07	363,240,631	-	-	363,240,631	15,624,200	-	-	-	15,683,200
Jul-07	550,764,689	-	-	550,764,689	22,827,000	-	-	-	22,998,000
Aug-07	493,982,153	-	-	493,982,153	18,844,000	-	-	-	19,067,000
Sep-07	432,263,247	-	-	432,263,247	16,830,000	-	-	-	16,000
Oct-07	293,196,700	-	-	293,196,700	11,589,000	-	-	-	58,000
Nov-07	142,514,904	-	-	142,514,904	14,512,000	-	-	-	16,000
Dec-07	116,274,289	-	-	116,274,289	7,198,000	-	-	-	11,000
Jan-08	90,773,689	-	-	90,773,689	113,521,089	6,864,000	244,000	1,000	19,000
Feb-08	80,380,636	-	-	80,380,636	101,703,636	6,330,000	230,000	1,000	12,000
Mar-08	83,119,897	-	-	83,119,897	21,065,300	104,233,897	6,384,000	231,000	58,000
Apr-08	91,141,367	-	-	91,141,367	14,630,000	114,142,567	244,000	118,000	33,000
May-08	194,434,100	-	-	194,434,100	28,272,300	31,814,000	254,124,400	10,986,300	598,000
Jun-08	245,541,100	-	-	245,541,100	34,400,000	354,154,100	17,763,000	444,000	1,157,000
Jul-08	335,981,000	-	-	335,981,000	39,914,000	98,411,500	472,306,500	18,422,000	530,000
Aug-08	373,924,800	-	-	373,924,800	49,564,000	131,371,000	555,225,800	20,187,000	662,000
Sep-08	242,903,000	-	-	242,903,000	38,169,000	14,143,485	370,215,485	14,888,000	244,000
Oct-08	186,940,500	-	-	186,940,500	28,272,300	61,023,287	280,190,327	10,003,000	355,000
Nov-08	100,178,000	-	-	100,178,000	22,921,000	11,371,809	134,470,809	6,895,000	51,000
Dec-08	98,803,000	-	-	98,803,000	21,571,000	439,343	112,813,343	7,074,000	239,000
Jan-09	91,414,696	-	-	91,414,696	22,682,000	(38,000)	114,058,696	7,097,000	234,000
Feb-09	79,107,256	-	-	79,107,256	20,625,000	1,000	99,733,256	6,145,000	7,000
Mar-09	87,262,000	-	-	87,262,000	20,671,000	77,505	108,010,505	7,074,000	206,000
Apr-09	98,029,000	-	-	98,029,000	22,648,440	1,149,554	121,826,994	7,138,000	246,000
May-09	134,661,000	-	-	134,661,000	25,045,000	180,555,518	285,239,486	9,038,000	231,000
Jun-09	196,335,000	-	-	196,335,000	31,328,000	57,576,486	350,240,899	11,347,000	566,000
Jul-09	241,904,000	-	-	241,904,000	40,609,000	94,380,799	391,729,799	14,110,000	820,000
Aug-09	256,740,000	-	-	256,740,000	38,203,000	88,816,521	384,359,521	443,000	975,000
Sep-09	257,340,000	-	-	257,340,000	38,203,000	88,816,521	384,359,521	988,000	86,000

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Inside Residential	Inside Multi-Family	Inside Irrigation	Inside Residential Total SF+ MF	Outside Residential	Outside Multi-Family	Outside Irrigation	Outside Res - Special Base	Outside Residential Total SF+ MF
Oct-09	165,580,000	32,517,000	57,633,397	255,730,397	9,455,000	327,000	486,000	36,000	10,304,000
Nov-09	94,864,000	21,626,000	8,039,374	114,599,374	6,412,000	181,000	4,000	9,000	6,506,000
Dec-09	87,938,000	22,192,000	93,420	110,223,420	7,190,000	203,000	4,000	16,000	7,413,000
Jan-10	85,909,000	24,246,207	1,000	114,156,207	6,886,000	197,000	3,000	19,000	7,105,000
Feb-10	79,070,000	20,040,415	1,000	99,111,415	5,748,000	848,000	3,000	58,000	6,657,000
Mar-10	79,763,000	20,984,000	1,000	100,748,000	5,812,000	981,000	2,000	20,000	6,815,000
Apr-10	91,306,741	21,893,000	1,972,756	115,170,497	6,476,000	934,000	9,000	27,000	7,443,000
May-10	111,989,000	23,348,066	14,585,668	149,922,734	6,948,000	1,016,000	7,000	61,000	8,034,000
Jun-10	197,113,000	30,122,000	46,840,249	273,875,249	10,789,000	1,496,500	563,000	110,000	12,978,500
Jul-10	291,054,000	40,181,000	91,094,682	422,309,682	14,434,000	1,981,500	603,000	118,000	16,551,500
Aug-10	290,154,456	42,380,000	102,858,870	435,393,326	15,188,000	2,171,000	730,000	135,000	18,224,708
Sep-10	322,030,959	44,587,000	109,023,407	475,641,072	15,901,000	2,256,000	817,000	87,000	19,064,000
Oct-10	242,319,538	40,218,092	92,436,758	374,974,388	12,495,000	1,749,000	1,076,000	252,000	15,512,000
Nov-10	106,406,559	23,847,000	15,873,137	145,126,696	6,543,000	976,000	30,000	3,000	7,552,000
Dec-10	86,848,200	21,987,500	40,123	108,875,823	6,565,000	951,000	6,000	92,000	7,614,000
Jan-11	88,431,400	23,179,806	2,000	111,613,206	6,280,000	1,121,000	3,000	40,000	7,454,000
Feb-11	76,327,935	21,297,182	-	97,625,117	5,915,000	1,147,000	2,000	81,000	7,145,000
Mar-11	77,560,044	21,559,143	3,700	99,112,887	4,387,851	2,316,000	3,000	34,000	6,739,851
Apr-11	98,181,392	22,716,368	34,157,776	124,313,436	5,373,123	2,556,000	7,000	45,000	7,883,123
May-11	143,207,466	27,613,392	29,770,595	200,591,953	6,672,553	2,617,000	81,000	98,000	9,368,553
Jun-11	198,577,986	34,673,193	54,373,825	283,825,014	8,976,000	4,881,000	405,000	131,000	12,930,000
Jul-11	284,351,642	43,333,408	84,674,358	412,259,408	12,417,255	3,821,000	577,000	154,000	16,069,255
Aug-11	310,674,227	47,285,797	105,545,888	463,385,922	13,683,000	4,840,000	781,000	173,000	19,147,000
Sep-11	324,823,276	48,787,117	112,669,890	485,280,583	12,825,221	4,823,000	778,000	171,000	18,603,221
Oct-11	217,096,887	39,565,886	334,760,681	9,033,270	3,386,000	564,000	115,000	13,292,270	7,069,588
Nov-11	101,741,384	24,849,245	16,782,581	143,230,210	4,887,388	2,144,000	17,000	21,000	13,053,471
Dec-11	88,035,195	24,819,734	158,510	113,013,379	4,822,685	2,760,436	11,000	28,000	7,622,121
Jan-12	91,971,580	24,078,211	70,469	116,120,259	7,130,087	897,456	3,207	34,750	8,065,500
Feb-12	80,912,068	21,544,549	26,582	102,483,199	6,290,034	1,074,466	5,880	75,205	7,445,585
Mar-12	86,671,725	21,568,001	70,275	108,310,001	7,043,996	1,922,115	90,138	30,528	9,086,777
Apr-12	99,230,346	22,900,594	3,014,975	125,145,915	7,348,755	2,013,288	92,694	42,343	9,497,081
May-12	181,989,124	32,527,114	32,430,753	242,946,991	10,406,548	2,079,907	465,384	101,633	13,053,471
Jun-12	235,016,235	35,097,917	70,382,587	340,496,739	13,193,952	2,852,944	1,005,830	197,914	17,250,639
Jul-12	328,788,928	43,399,302	96,802,255	468,290,485	17,299,251	3,145,516	1,429,382	205,620	22,079,770
Aug-12	359,342,753	49,416,805	125,501,513	534,261,071	18,789,352	3,842,450	1,326,590	186,973	24,145,366
Sep-12	334,497,599	47,921,786	113,301,964	492,721,349	15,620,938	4,068,683	959,123	149,097	20,558,097
Oct-12	238,083,628	40,726,277	88,967,307	36,777,211	11,753,226	3,038,551	1,049,912	237,850	16,079,548
Nov-12	108,181,615	24,830,623	17,183,412	150,295,651	7,072,667	1,798,784	45,542	40,206	8,957,198
Dec-12	90,632,748	24,261,532	362,729	115,257,009	7,507,279	2,236,967	9,703	74,292	9,828,240
Jan-13	94,454,812	24,728,322	72,372	119,255,506	7,130,087	897,456	3,207	34,750	8,065,500
Feb-13	83,096,694	22,126,252	27,299	105,550,246	6,290,034	1,074,466	5,880	75,205	7,445,585
Mar-13	89,011,862	22,150,337	72,172	112,134,371	7,043,996	1,922,115	90,138	30,528	9,086,777
Apr-13	101,909,565	23,518,910	3,096,379	128,524,854	7,348,755	2,013,288	92,694	42,343	9,497,081
May-13	186,902,830	29,297,347	33,306,384	249,206,560	10,406,548	2,079,907	465,384	101,633	13,053,471
Jun-13	241,361,673	36,045,560	72,288,917	349,690,151	13,193,952	2,052,944	1,005,330	197,914	11,250,639
Jul-13	337,666,229	44,571,083	99,415,916	481,096,228	17,299,251	3,145,516	1,429,382	205,620	22,079,770
Aug-13	369,045,008	50,751,059	128,890,054	548,586,120	18,789,352	3,842,450	1,326,590	186,973	24,145,366
Sep-13	340,448,034	49,215,674	116,361,117	505,024,825	15,680,938	4,068,683	959,123	149,352	20,558,097
Oct-13	244,111,886	41,825,886	91,369,424	377,707,196	11,753,226	3,038,551	1,049,912	237,860	16,079,548
Nov-13	111,205,219	25,501,050	17,647,364	154,353,633	7,072,667	1,798,784	45,542	40,206	8,957,198
Dec-13	93,079,832	24,916,593	372,523	100,748,000	7,507,279	2,236,967	9,703	74,292	9,828,240
Jan-14	96,249,454	25,198,160	73,747	121,521,361	7,130,087	897,456	3,207	34,750	8,065,500
Feb-14	84,675,531	22,546,651	27,818	107,550,000	6,290,034	1,074,466	5,880	75,205	7,445,585
Mar-14	90,703,087	22,571,194	73,543	113,347,824	7,043,996	1,922,115	90,138	30,528	9,086,777
Apr-14	103,845,847	23,965,769	31,521,211	130,945,827	7,348,755	2,013,288	42,343	49,751,081	
May-14	190,453,384	29,853,96	33,839,205	254,247,185	10,406,548	2,079,907	465,384	101,633	13,053,471
Jun-14	245,947,545	36,730,426	73,656,293	356,334,264	13,193,952	2,852,944	1,005,830	197,914	17,250,639

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Inside Residential	Inside Multi-Family	Inside Irrigation	Inside Residential Total SF+ MF	Outside Residential	Outside Multi-Family	Outside Irrigation	Outside Res - Special Base	Outside Residential Total SF+ MF
Jul-14	344,081,888	45,147,933	101,304,818	490,504,639	17,299,251	3,145,516	1,429,382	205,620	22,079,770
Aug-14	376,056,863	51,715,329	131,328,965	559,111,56	18,789,352	3,802,450	1,286,973	205,620	241,453,566
Sep-14	346,916,546	50,150,772	118,571,979	515,639,297	15,680,938	4,068,683	959,123	149,352	20858,097
Oct-14	249,157,611	42,620,578	93,105,443	384,883,633	11,753,226	3,038,551	1,049,912	237,860	16,079,548
Nov-14	113,218,118	25,985,570	17,982,664	157,286,352	7,072,667	1,798,784	45,542	40,206	8,957,198
Dec-14	94,848,349	25,390,008	379,601	120,617,958	7,507,279	2,236,967	9,703	74,292	9,828,240
Jan-15	98,174,443	25,702,124	123,529,178	363,160,949	12,300,087	2,897,456	3,207	34,750	8,065,500
Feb-15	86,369,042	22,997,584	28,374	109,395,000	6,290,034	1,074,466	5,880	75,205	7,445,585
Mar-15	92,217,149	23,022,618	75,014	115,614,780	7,043,996	1,922,115	90,138	30,528	9,086,777
Apr-15	105,922,764	24,445,084	3,218,315	133,386,163	7,348,755	2,013,288	92,694	42,343	9,497,081
May-15	194,263,063	30,405,076	34,617,989	259,332,129	10,406,548	2,079,907	4,653,384	101,633	13,053,471
Jun-15	250,866,96	37,465,034	75,129,418	363,160,949	13,193,952	2,852,904	1,005,830	197,914	17,750,639
Jul-15	350,663,525	46,326,292	103,330,914	500,620,732	17,299,251	3,145,516	1,429,382	205,620	22,079,770
Aug-15	383,578,000	52,749,636	133,965,744	570,293,380	18,789,352	3,842,450	1,326,590	186,973	24,145,366
Sep-15	353,854,877	51,153,787	120,943,418	529,552,083	15,680,938	4,068,683	959,123	149,352	20858,097
Oct-15	254,140,764	43,967,552	94,967,552	392,581,305	11,753,226	3,038,551	1,049,912	237,860	16,079,548
Nov-15	115,584,481	26,505,281	18,342,318	160,632,043	7,072,667	1,798,784	45,542	40,206	8,957,198
Dec-15	96,745,316	25,897,808	387,193	123,030,318	7,507,279	2,236,967	9,703	74,292	9,828,240
Jan-16	100,236,106	26,241,868	76,801	125,554,776	7,130,087	17,299,251	3,145,516	34,750	8,065,500
Feb-16	88,182,792	23,480,533	28,970	111,692,295	6,290,034	1,074,466	5,880	75,205	7,445,585
Mar-16	94,460,009	23,506,093	76,589	118,042,691	7,043,996	1,922,115	90,138	30,528	9,086,777
Apr-16	108,147,142	24,958,431	3,285,889	136,391,473	7,348,755	2,013,288	92,694	42,343	9,497,081
May-16	198,342,588	31,090,549	35,344,967	264,778,103	10,406,548	2,079,907	4,653,384	101,633	13,053,471
Jun-16	256,134,693	38,251,800	76,707,136	371,093,629	13,193,952	2,852,904	1,005,830	197,914	17,750,639
Jul-16	358,333,759	47,299,144	100,500,864	171,133,767	17,299,251	3,145,516	1,429,382	205,620	22,079,770
Aug-16	391,633,138	53,857,378	136,779,025	582,269,541	18,789,352	3,842,450	1,326,590	186,973	24,145,366
Sep-16	361,285,330	52,228,017	123,483,230	536,997,076	15,680,938	4,068,683	959,123	149,352	20858,097
Oct-16	259,477,720	44,385,922	96,961,871	400,825,513	11,753,226	3,038,551	1,049,912	237,860	16,079,548
Nov-16	118,011,755	27,061,892	18,727,506	163,801,153	7,072,667	1,798,784	45,542	40,206	8,957,198
Dec-16	98,776,668	26,441,662	395,324	125,613,954	7,507,279	2,236,967	9,703	74,292	9,828,240
Jan-17	102,341,064	26,792,948	78,414	129,212,426	7,130,087	17,299,251	3,145,516	34,750	8,065,500
Feb-17	90,034,630	23,973,624	29,579	114,037,833	6,290,034	1,074,466	5,880	75,205	7,445,585
Mar-17	96,443,669	23,999,721	78,198	120,521,587	7,043,996	1,922,115	90,138	30,528	9,086,777
Apr-17	110,418,232	25,482,558	3,354,903	139,255,694	7,348,755	2,013,288	92,694	42,343	9,497,081
May-17	202,507,782	31,743,450	36,087,211	270,388,443	10,406,548	2,079,907	4,653,384	101,633	13,053,471
Jun-17	261,513,521	39,055,088	78,317,986	378,388,595	13,193,952	2,852,904	1,005,830	197,914	17,750,639
Jul-17	365,858,768	48,292,426	10,771,630	52,867,576	17,299,251	3,145,516	1,429,382	205,620	22,079,770
Aug-17	399,857,434	54,988,383	139,651,384	594,497,201	18,789,352	3,842,450	1,326,590	186,973	21,145,366
Sep-17	368,372,832	53,324,805	126,076,378	543,274,015	15,680,938	4,068,683	959,123	149,352	20,858,097
Oct-17	264,926,752	45,382,027	98,998,070	404,242,849	11,753,226	3,038,551	1,049,912	237,860	16,079,548
Nov-17	120,490,002	27,630,192	19,120,784	16,724,097	7,072,667	1,798,784	45,542	40,206	8,957,198
Dec-17	100,851,284	26,996,937	403,626	128,251,847	7,507,279	2,236,967	9,703	74,292	9,828,240
Jan-18	104,387,886	27,328,806	79,983	131,796,674	7,130,087	18,789,352	3,842,450	1,055,330	197,914
Feb-18	91,835,323	24,453,997	30,170	116,318,590	6,290,034	1,074,466	5,880	75,205	7,445,585
Mar-18	98,372,542	24,479,715	79,762	122,320,019	7,043,996	1,922,115	90,138	30,528	9,086,777
Apr-18	112,626,597	34,422,001	128,597,905	142,040,807	7,348,755	2,013,288	92,694	42,343	9,497,081
May-18	206,557,938	32,378,319	36,808,955	275,745,212	10,406,548	2,079,907	4,653,384	101,633	13,053,471
Jun-18	266,743,791	39,836,190	79,384,346	385,164,327	13,193,952	2,852,904	1,429,382	186,973	17,750,639
Jul-18	373,75,944	49,258,275	109,870,709	53,230,928	17,299,251	3,145,516	1,429,382	205,620	22,079,770
Aug-18	4,07,854,583	56,088,151	142,444,412	60,387,145	18,789,352	3,842,450	1,326,590	186,973	21,145,366
Sep-18	376,250,289	54,391,301	128,597,905	559,239,495	15,680,938	4,068,683	959,123	149,352	20,858,097
Oct-18	270,225,287	46,224,387	10,978,031	417,427,705	11,753,226	3,038,551	1,049,912	237,860	16,079,548
Nov-18	122,899,802	28,182,796	19,503,200	17,038,797	7,072,667	1,798,784	45,542	40,206	8,957,198
Dec-18	102,868,310	27,536,876	411,698	130,816,884	1,074,466	5,880	74,292	74,292	9,828,240
Jan-19	106,475,643	27,873,833	134,432,608	134,432,608	7,130,087	897,456	3,207	34,750	8,065,500
Feb-19	93,672,029	24,942,159	30,774	118,644,962	6,290,034	1,074,466	5,880	75,205	7,445,585
Mar-19	100,339,993	24,969,309	81,357	125,390,659	7,043,996	1,922,115	90,138	30,528	9,086,777

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Inside Residential	Inside Multi-Family	Inside Irrigation	Inside Residential Total SF+ MF	Outside Residential	Outside Multi-Family	Outside Irrigation	Outside Residential Total SF+ MF
Apr-19	14,879,129	26,512,054	3,490,441	144,381,624	7,348,755	2,013,288	92,694	42,343
May-19	20,689,096	33,075,896	37,545,134	281,260,117	10,406,548	2,079,907	465,384	9,497,081
Jun-19	27,078,667	40,632,914	81,482,033	394,193,613	13,193,952	2,852,944	1,005,830	101,633
Jul-19	380,539,463	50,243,440	112,068,124	542,551,026	17,299,251	3,145,516	1,429,382	17,250,639
Aug-19	416,011,674	57,209,914	145,293,300	618,514,888	18,789,352	3,842,450	1,326,590	20,079,770
Sep-19	383,775,295	55,479,127	131,169,863	570,424,285	15,680,938	4,068,683	959,123	24,145,366
Oct-19	275,529,792	47,148,875	102,997,592	425,776,260	11,753,226	3,938,551	1,049,912	20,858,097
Nov-19	125,357,798	28,746,451	19,893,264	173,997,513	7,072,667	1,798,784	45,542	16,079,548
Dec-19	104,925,676	28,087,614	419,932	133,333,222	7,507,279	2,236,967	9,703	8,957,198
Jan-20	108,605,156	28,432,890	83,214	137,121,260	7,130,087	897,456	3,207	74,292
Feb-20	95,545,470	25,441,002	31,389	121,017,861	6,290,034	1,074,466	5,880	8,065,500
Mar-20	102,346,793	25,458,96	82,984	127,898,473	7,043,996	1,927,115	90,138	7445,585
Apr-20	117,176,711	27,042,295	3,560,250	147,779,256	7,348,755	2,013,288	92,694	42,343
May-20	214,902,878	33,686,403	38,296,037	285,885,319	10,406,548	2,079,907	465,384	101,633
Jun-20	277,520,241	41,445,572	83,111,673	402,077,486	13,193,952	2,852,944	1,005,830	17,250,639
Jul-20	388,252,252	51,248,309	114,309,486	553,810,047	17,299,251	3,145,516	1,429,382	20,5620
Aug-20	424,331,908	58,354,112	148,199,166	630,885,186	18,789,352	3,842,450	1,326,590	22,079,770
Sep-20	391,450,801	56,538,710	133,793,261	58,1832,771	15,680,938	4,068,683	959,123	9,497,081
Oct-20	281,142,388	48,091,853	105,057,544	434,391,785	11,753,226	3,038,551	1,049,912	20,858,097
Nov-20	127,864,054	29,321,380	20,291,129	177,477,463	7,072,667	1,798,784	45,542	16,079,548
Dec-20	107,024,190	28,649,66	428,331	135,101,886	7,507,279	2,236,967	9,703	8,957,198

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Total Residential	Inside Commercial	Outside Commercial	Outside Com - Special Base	Outside Com Total	Total Commercial	Inside - City	Outside - City	City Uses
Jan-05	23,395/1,000	1,428,340	-	-	1,428,340	24,824,040	860,000	-	860,000
Feb-05	20,140/1,000	1,267,960	-	-	1,267,960	21,408,360	970,000	-	970,000
Mar-05	20,826/600	1,288,110	-	-	1,288,110	23,034,710	729,000	-	729,000
Apr-05	22,561,800	1,247,040	-	-	1,247,040	23,808,240	960,000	-	960,000
May-05	28,669,600	1,367,240	-	-	1,367,240	30,036,840	1,993,800	-	1,993,800
Jun-05	45,763,111	2,041,240	-	-	2,041,240	47,804,351	6,301,000	-	6,301,000
Jul-05	62,489,089	2,544,070	-	-	2,544,070	65,530,159	11,993,000	-	11,993,000
Aug-05	71,918,000	2,607,370	-	-	2,607,370	74,527,170	13,023,000	-	13,023,000
Sep-05	63,051,800	2,722,200	-	-	2,722,200	65,774,000	9,669,000	-	9,669,000
Oct-05	54,501,022	2,053,160	-	-	2,053,160	56,554,182	5,632,000	-	5,632,000
Nov-05	26,671,000	995,579	-	-	995,579	27,672,579	69,000	-	69,000
Dec-05	26,991,600	1,538,120	-	-	1,538,120	27,536,720	588,000	-	588,000
Jan-06	22,416/600	1,287,070	-	-	1,287,070	23,697,670	739,000	-	739,000
Feb-06	21,364,400	1,154,330	-	-	1,154,330	22,218,730	615,000	-	615,000
Mar-06	22,051,400	1,197,530	-	-	1,197,530	23,254,930	802,000	-	802,000
Apr-06	24,236,000	1,307,580	-	-	1,307,580	25,543,580	1,042,000	-	1,042,000
May-06	41,124,310	1,797,860	-	-	1,797,860	43,524,170	4,705,000	-	4,705,000
Jun-06	62,753,890	2,553,730	-	-	2,553,730	65,307,620	11,930,000	-	11,930,000
Jul-06	77,071,800	2,720,570	-	-	2,720,570	79,795,370	15,421,000	-	15,421,000
Aug-06	69,551,800	3,326,800	-	-	3,326,800	72,881,600	14,329,000	-	14,329,000
Sep-06	66,675,900	2,673,210	-	-	2,673,210	69,349,110	12,624,000	-	12,624,000
Oct-06	54,338,000	1,967,490	-	-	1,967,490	56,302,490	5,054,000	-	5,054,000
Nov-06	29,062,000	1,313,140	-	-	1,313,140	30,375,840	913,000	-	913,000
Dec-06	26,172,152	989,063	-	-	989,063	27,161,215	694,029	-	694,029
Jan-07	23,925,302	1,128,687	-	-	1,128,687	24,753,999	702,971	-	702,971
Feb-07	23,183,881	1,451,000	-	-	1,451,000	24,634,881	936,000	-	936,000
Mar-07	23,339,900	1,724,000	-	-	1,724,000	25,754,900	814,000	-	814,000
Apr-07	26,258,200	1,129,000	-	-	1,129,000	27,387,200	1,233,000	-	1,233,000
May-07	32,112,400	1,261,330	-	-	1,261,330	33,373,730	2,136,000	-	2,136,000
Jun-07	54,923,600	2,012,670	-	-	2,012,670	56,936,270	10,475,000	-	10,475,000
Jul-07	79,127,000	2,934,720	-	-	2,934,720	82,061,720	15,282,000	-	15,282,000
Aug-07	71,768,200	2,536,280	-	-	2,536,280	74,405,480	14,333,000	-	14,333,000
Sep-07	69,575,511	2,215,620	-	-	2,215,620	71,795,131	11,958,000	-	11,958,000
Oct-07	53,442,909	2,092,380	-	-	2,092,380	55,525,289	8,122,000	-	8,122,000
Nov-07	31,442,400	1,408,000	-	-	1,408,000	33,851,400	1,489,000	-	1,489,000
Dec-07	26,277,800	1,097,000	-	-	1,097,000	27,781,000	781,000	-	781,000
Jan-08	28,095,400	1,168,610	-	-	1,168,610	29,261,010	673,000	-	673,000
Feb-08	28,822,000	1,002,390	-	-	1,002,390	29,523,390	698,000	-	698,000
Mar-08	29,161,800	994,000	-	-	994,000	30,162,800	870,000	-	870,000
Apr-08	30,038,848	1,034,880	-	-	1,034,880	31,073,708	1,214,000	-	1,214,000
May-08	44,423,500	1,443,140	-	-	1,443,140	45,863,640	4,640,000	-	4,640,000
Jun-08	65,375,000	1,849,000	-	-	1,849,000	67,228,000	9,119,000	-	9,119,000
Jul-08	70,981,400	2,214,000	-	-	2,214,000	73,195,400	13,867,000	-	13,867,000
Aug-08	91,172,600	2,521,000	-	-	2,521,000	93,293,600	940,000	-	940,000
Sep-08	72,865,000	2,367,000	-	-	2,367,000	75,036,000	17,030,000	-	17,030,000
Oct-08	61,045,000	1,502,000	-	-	1,502,000	27,162,072	682,000	-	682,000
Nov-08	38,419,475	1,137,000	-	-	1,137,000	39,347,475	2,063,000	-	2,063,000
Dec-08	30,395,643	1,033,000	-	-	1,033,000	31,728,643	976,000	-	976,000
Jan-09	29,542,816	1,016,000	-	-	1,016,000	30,560,816	940,000	-	940,000
Feb-09	25,419,725	846,000	-	-	846,000	26,665,725	973,000	-	973,000
Mar-09	26,154,072	1,008,000	-	-	1,008,000	27,162,072	682,000	-	682,000
Apr-09	28,956,000	1,004,000	-	-	1,004,000	29,962,000	1,079,110	-	1,079,110
May-09	34,935,965	1,222,000	-	-	1,222,000	36,057,965	2,852,000	-	2,852,000
Jun-09	55,940,018	1,561,000	-	-	1,561,000	57,509,018	5,757,000	-	5,757,000
Jul-09	57,519,324	1,669,000	-	-	1,669,000	59,181,324	12,163,000	-	12,163,000
Aug-09	73,561,946	1,676,000	-	-	1,676,000	75,240,946	13,419,000	-	13,419,000
Sep-09	68,556,627	1,597,000	-	-	1,597,000	70,156,627	10,164,000	-	10,164,000

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Total Residential	Inside Commercial	Outside Commercial	Outside Com - Special Base	Outside Com Total	Total Commercial	Inside - City	Outside - City	City Uses
Oct-09	53,383,518	1,206,000	38,000	1,244,000	54,632,518	6,295,000	-	-	6,295,000
Nov-09	31,955,956	893,000	-	893,000	32,846,956	1,279,000	-	-	1,279,000
Dec-09	27,188,282	1,050,000	-	1,050,000	28,239,282	524,000	-	-	524,000
Jan-10	28,833,065	977,000	-	977,000	29,810,065	837,000	-	-	837,000
Feb-10	25,974,413	982,000	-	952,000	26,926,413	513,000	-	-	513,000
Mar-10	26,593,375	972,000	-	972,000	27,563,375	820,000	-	-	820,000
Apr-10	28,135,184	1,108,000	8,000	1,108,000	29,241,184	765,000	-	-	765,000
May-10	32,745,064	1,268,000	46,000	1,314,000	34,057,064	4,986,000	-	-	4,986,000
Jun-10	45,777,921	1,741,000	95,000	1,836,000	47,807,921	7,579,000	-	-	7,579,000
Jul-10	64,731,690	1,692,000	84,000	1,776,000	66,507,690	12,388,000	-	-	12,388,000
Aug-10	75,010,013	1,598,000	99,000	1,697,000	76,716,013	12,450,143	-	-	12,450,143
Sep-10	73,961,802	1,996,000	98,000	2,092,000	75,546,892	15,011,000	-	-	15,011,000
Oct-10	69,486,929	1,563,260	70,000	1,633,260	71,122,189	10,946,024	-	-	10,946,024
Nov-10	38,855,819	1,098,000	-	1,098,000	40,055,819	1,334,000	-	-	1,334,000
Dec-10	28,655,267	974,000	-	974,000	29,528,267	527,000	-	-	527,000
Jan-11	28,616,074	922,000	-	922,000	29,538,074	676,405	-	-	676,405
Feb-11	26,750,447	943,000	-	943,000	27,201,447	684,211	-	-	684,211
Mar-11	26,333,929	<b>2,591,000</b>	-	2,591,000	28,928,929	706,000	-	-	706,000
Apr-11	27,399,680	905,106	9,000	914,106	28,110,786	789,268	-	-	789,268
May-11	37,711,753	1,185,000	21,000	1,206,000	38,921,753	1,663,300	-	-	1,663,300
Jun-11	53,860,633	1,366,000	62,000	1,418,000	54,920,633	7,482,579	-	-	7,482,579
Jul-11	67,286,653	1,714,000	97,000	1,811,000	69,096,653	13,535,000	-	-	13,535,000
Aug-11	82,416,628	1,823,000	88,000	1,911,000	84,329,628	16,657,000	-	-	16,657,000
Sep-11	83,086,966	1,769,642	93,000	1,862,642	84,949,608	16,346,000	-	-	16,346,000
Oct-11	71,814,787	1,350,000	72,000	1,422,000	73,236,787	10,505,000	1,000	1,000	10,506,000
Nov-11	38,270,720	870,000	-	870,000	39,140,720	1,610,000	-	-	1,610,000
Dec-11	30,076,664	809,000	-	809,000	30,887,664	660,000	-	-	660,000
Jan-12	29,549,811	1,133,415	-	1,133,415	30,683,226	950,644	550,644	550,644	550,644
Feb-12	28,074,472	1,007,206	-	1,007,206	29,081,679	955,592	555,592	555,592	555,592
Mar-12	28,649,152	2,204,368	-	2,204,368	30,853,520	809,729	809,729	809,729	809,729
Apr-12	29,663,153	1,098,688	9,229	1,107,917	30,771,071	1,182,347	1,182,347	1,182,347	1,182,347
May-12	42,771,325	1,402,130	38,851	1,440,980	44,121,320	5,094,831	5,094,831	5,094,831	5,094,831
Jun-12	63,611,275	1,853,891	87,051	1,940,942	65,552,217	8,858,535	8,858,535	8,858,535	8,858,535
Jul-12	71,241,054	2,096,566	98,356	2,194,922	73,335,976	13,827,391	13,827,391	13,827,391	13,827,391
Aug-12	89,152,527	2,339,909	101,524	2,441,133	91,593,960	17,185,310	17,185,310	17,185,310	17,185,310
Sep-12	81,095,821	2,278,619	102,434	2,381,054	83,476,874	16,150,915	16,150,915	16,150,915	16,150,915
Oct-12	72,785,016	1,575,001	79,276	1,654,277	74,439,293	11,110,465	11,110,465	11,110,465	11,110,465
Nov-12	40,598,776	1,143,825	-	1,143,825	41,742,601	1,585,037	1,585,037	1,585,037	1,585,037
Dec-12	30,732,944	1,082,893	-	1,082,893	31,815,838	648,001	648,001	648,001	648,001
Jan-13	30,347,656	1,164,017	-	1,164,017	31,511,673	950,644	950,644	950,644	950,644
Feb-13	28,832,483	1,034,017	-	1,034,017	29,866,884	955,592	955,592	955,592	955,592
Mar-13	29,422,680	2,263,386	-	2,263,386	31,686,565	809,729	809,729	809,729	809,729
Apr-13	30,464,059	1,128,352	9,479	1,137,831	31,601,830	1,182,347	1,182,347	1,182,347	1,182,347
May-13	43,926,151	1,439,987	39,900	1,479,887	45,406,037	5,094,831	5,094,831	5,094,831	5,094,831
Jun-13	65,328,779	1,903,946	89,402	1,993,347	67,322,127	8,858,535	8,858,535	8,858,535	8,858,535
Jul-13	73,164,562	2,153,174	101,011	2,254,185	75,118,747	13,827,391	13,827,391	13,827,391	13,827,391
Aug-13	91,559,605	2,403,087	104,265	2,507,352	94,066,997	17,185,310	17,185,310	17,185,310	17,185,310
Sep-13	83,285,408	2,340,142	105,200	2,445,342	85,730,750	16,150,915	16,150,915	16,150,915	16,150,915
Oct-13	74,750,211	1,617,526	81,417	1,698,943	76,449,154	11,110,465	11,110,465	11,110,465	11,110,465
Nov-13	41,694,943	1,174,708	-	1,174,708	42,869,651	1,585,037	1,585,037	1,585,037	1,585,037
Dec-13	31,562,132	1,112,132	-	1,112,132	32,674,865	648,001	648,001	648,001	648,001
Jan-14	30,924,261	1,186,133	-	1,186,133	32,110,394	950,644	950,644	950,644	950,644
Feb-14	29,380,300	1,054,055	-	1,054,055	30,034,355	955,892	955,892	955,892	955,892
Mar-14	29,981,710	2,306,900	-	2,306,900	32,288,610	809,729	809,729	809,729	809,729
Apr-14	31,042,876	1,149,791	9,659	1,159,450	32,202,326	1,182,347	1,182,347	1,182,347	1,182,347
May-14	44,760,747	1,467,347	40,558	1,508,004	46,168,747	5,094,831	5,094,831	5,094,831	5,094,831
Jun-14	66,570,026	1,940,121	91,100	2,031,221	68,601,247	8,858,535	8,858,535	8,858,535	8,858,535

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Total Residential	Inside Commercial	Outside Commercial	Outside Com - Special Base	Outside Com Total	Total Commercial	Inside - City	Outside - City	City Uses
Jul-14	74,554,689	2,194,084	102,930	2,297,015	76,851,703	13,827,391			13,827,391
Aug-14	93,299,278	106,246	2,554,992	95,954,270	17,185,310				17,185,310
Sep-14	84,867,830	2,384,605	107,199	2,491,804	87,359,634	16,150,915			16,150,915
Oct-14	76,110,465	1,648,259	82,964	1,731,222	77,901,688	11,110,465			11,110,465
Nov-14	42,487,147		1,197,027		1,197,027				1,585,037
Dec-14	32,162,426		1,133,262		1,133,262				648,001
Jan-15	31,542,706	1,209,856	-	1,209,856	32,752,602	950,504			950,504
Feb-15	29,967,906	1,075,136	-	1,075,136	31,043,042	955,392			955,392
Mar-15	30,581,345	2,253,038	-	2,253,038	32,834,382	809,729			809,729
Apr-15	31,663,733	1,172,787	9,852	1,182,639	31,846,372		1,182,347		1,182,347
May-15	45,655,962	1,496,694	41,471	1,538,165	41,794,127	5,094,831			5,094,831
Jun-15	67,901,426	1,978,923	92,922	2,071,846	69,973,272	8,858,535			8,858,535
Jul-15	76,045,783	2,237,966	104,989	2,342,955	78,388,737		13,827,391		13,827,391
Aug-15	95,165,264	2,497,720	108,371	2,606,092	97,771,356		17,185,310		17,185,310
Sep-15	86,565,187		2,432,297	109,343	2,541,640	88,106,827			16,150,915
Oct-15	77,693,874	1,681,224	84,623	1,765,847	79,159,721	11,110,465			11,110,465
Nov-15	43,336,890	1,220,968	-	1,220,968	44,557,858		1,585,037		1,585,037
Dec-15	32,805,674	1,155,927	-	1,155,927	33,961,601		648,001		648,001
Jan-16	32,205,144	1,235,163	-	1,235,163	33,140,407	950,544			950,544
Feb-16	30,597,323	1,097,714	-	1,097,714	31,694,946	955,392			955,392
Mar-16	31,223,553	2,402,451	-	2,402,451	33,626,004	809,729			809,729
Apr-16	32,328,672	1,197,416	10,059	1,207,474	33,536,146		1,182,347		1,182,347
May-16	46,614,738	1,528,124	42,342	1,570,466	48,185,204	5,094,831			5,094,831
Jun-16	69,327,356	2,020,481	94,874	2,115,354	74,142,711	8,858,535			8,858,535
Jul-16	77,642,744	2,284,963	107,194	2,392,157	80,134,901		13,827,391		13,827,391
Aug-16	97,163,734	2,550,173	110,647	2,660,820	99,324,554	17,185,310			17,185,310
Sep-16	88,383,056	2,483,175	111,639	2,595,014	90,978,070	16,150,915			16,150,915
Oct-16	79,325,446	1,716,530	86,400	1,802,930	81,128,375		11,110,465		11,110,465
Nov-16	44,246,964	1,246,608	-	1,246,608	45,493,573		1,585,037		1,585,037
Dec-16	33,494,593		1,180,202		1,180,202		648,001		648,001
Jan-17	32,881,452	1,261,203	-	1,261,203	34,142,555	950,544			950,544
Feb-17	31,239,774	1,120,766	-	1,120,766	32,360,540		955,392		955,392
Mar-17	31,879,247	2,452,903	-	2,452,903	34,332,150	809,729			809,729
Apr-17	33,007,574	1,222,561	10,270	1,232,831	34,240,405		1,182,347		1,182,347
May-17	47,593,647	1,560,215	43,231	1,603,446	49,197,093	5,094,831			5,094,831
Jun-17	70,793,231	2,062,911	96,866	2,159,777	72,943,007	8,858,535			8,858,535
Jul-17	79,232,242	2,332,947	109,445	2,442,392	81,715,634		13,827,391		13,827,391
Aug-17	99,204,173	2,603,726	112,971	2,716,697	101,920,870		17,185,310		17,185,310
Sep-17	90,239,100	2,535,526	113,983	2,649,509	92,288,609	16,150,915			16,150,915
Oct-17	80,991,280	1,752,577	88,214	1,840,791	83,832,071		11,110,465		11,110,465
Nov-17	45,176,150	1,272,787	-	1,272,787	46,448,382		1,585,037		1,585,037
Dec-17	34,197,980	1,204,986	-	1,204,986	35,402,966		648,001		648,001
Jan-18	33,539,081	1,286,428	-	1,286,428	34,825,509	950,544			950,544
Feb-18	31,864,570	1,143,181	-	1,143,181	33,907,750		955,392		955,392
Mar-18	32,516,832	2,655,801	-	2,501,961	32,518,793		809,729		809,729
Apr-18	92,043,882	2,586,236	116,263	2,702,500					
May-18	48,545,520	1,591,419	44,096	1,635,515	50,181,035		5,094,831		5,094,831
Jun-18	72,198,895	2,104,169	98,803	2,202,972	74,401,868		8,858,535		8,858,535
Jul-18	80,858,706	2,379,606	111,634	2,491,240	83,349,946		13,827,391		13,827,391
Aug-18	101,188,256	2,655,801	115,230	2,771,031					
Sep-18	92,043,882	1,312,156	-	1,312,156	94,746,382		16,150,915		16,150,915
Oct-18	82,611,106	1,787,628	89,979	1,877,607	84,488,713		11,110,465		11,110,465
Nov-18	46,079,673	1,298,243	-	1,298,243	47,377,916		1,585,037		1,585,037
Dec-18	34,881,939	1,229,086	-	1,229,086	36,111,025		648,001		648,001
Jan-19	34,209,863	1,312,156	-	1,312,156	34,522,019		950,644		950,644
Feb-19	32,501,861	1,166,044	-	1,166,044	33,667,905		955,392		955,392
Mar-19	33,167,169	2,552,000	-	2,552,000	35,719,169		809,729		809,729

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Total Residential	Inside Commercial	Outside Commercial	Outside Com - Special Base	Outside Com Total	Total Commercial	Inside - City	Outside - City	City Uses
Apr-19	34,341,080	1,271,953	10,685	1,282,638	35,623,717	1,182,347			1,182,347
May-19	49,516,430	1,623,248	44,977	1,668,225	51,184,555	5,094,331			5,094,331
Jun-19	73,642,873	2,146,252	100,779	2,247,032	75,889,905	8,858,335			8,858,335
Jul-19	82,475,881	2,427,198	113,867	2,541,065	85,016,945	13,827,391			13,827,391
Aug-19	103,212,021	2,708,917	117,535	2,826,451	106,038,473	17,185,310			17,185,310
Sep-19	93,884,760	2,637,961	118,588	2,756,550	96,641,309	16,150,915			16,150,915
Oct-19	84,263,328	1,823,381	91,778	1,915,159	86,178,487	11,110,465			11,110,465
Nov-19	47,001,267	1,324,208	-	1,324,208	48,325,475	1,585,037			1,585,037
Dec-19	35,579,578	1,253,667	-	1,253,667	36,833,246	648,001			648,001
Jan-20	34,894,060	1,338,399	-	1,338,399	36,232,459	950,644			950,644
Feb-20	33,151,898	1,189,365	-	1,189,365	34,341,264	955,892			955,892
Mar-20	33,830,512	2,603,040	-	2,603,040	36,533,553	809,729			809,729
Apr-20	35,027,901	1,297,392	10,839	1,308,290	36,536,192	1,182,347			1,182,347
May-20	50,506,759	1,655,713	45,877	1,701,590	52,208,348	5,094,331			5,094,331
Jun-20	75,115,731	2,189,177	102,795	2,291,972	77,407,703	8,858,335			8,858,335
Jul-20	84,125,398	2,475,742	116,144	2,591,886	86,717,284	13,827,391			13,827,391
Aug-20	105,276,262	2,763,095	119,885	2,882,980	108,159,242	17,185,310			17,185,310
Sep-20	95,762,455	2,690,720	120,960	2,811,680	98,574,335	16,150,915			16,150,915
Oct-20	85,948,594	1,859,849	93,614	1,953,462	87,902,057	11,110,465			11,110,465
Nov-20	47,941,292	1,350,692	-	1,350,692	49,291,984	1,585,037			1,585,037
Dec-20	36,291,170	1,278,741	-	1,278,741	37,569,911	648,001			648,001

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Industrial	Inside - Wholesale	Outside - Wholesale	Total Other	Hydrant	Ranch	Total Consumption	% Non-Revenue	Treated Water Demand
Jan-05	3,921,000	1,384,500	-	5,305,500	1,069,100	4,377,700	154,374,179	10.7%	172,900,000
Feb-05	3,999,000	1,478,000	-	4,987,000	4,536,200	120,579,450	15.5%	154,500,000	
Mar-05	3,624,000	1,480,000	-	5,104,000	-	4,026,700	134,393,549	24.8%	178,800,000
Apr-05	4,156,000	1,610,100	-	5,766,100	207,000	7,768,900	167,725,163	21.3%	213,000,000
May-05	4,649,000	1,743,900	-	6,392,900	428,000	8,017,000	217,222,419	38.8%	355,000,000
Jun-05	4,167,000	3,547,500	-	8,314,500	362,000	10,162,300	365,194,165	43.1%	436,300,000
Jul-05	4,982,000	4,003,500	-	8,986,500	555,000	11,601,800	541,414,659	17.3%	654,400,000
Aug-05	6,783,000	7,250,407	-	14,033,407	463,000	13,149,300	559,740,977	-1.0%	554,200,000
Sep-05	5,039,000	6,325,000	-	11,364,000	453,000	10,567,200	509,232,948	0.5%	511,700,000
Oct-05	5,458,000	5,655,000	-	11,113,000	434,000	8,990,400	374,363,982	-36.0%	275,200,000
Nov-05	3,876,000	2,865,000	-	6,741,000	303,300	10,628,300	181,588,979	10.9%	203,700,000
Dec-05	3,977,000	1,163,000	-	5,140,000	355,700	3,174,332	157,109,252	28.5%	215,600,000
Jan-06	4,044,000	1,281,400	-	5,325,400	332,000	12,375,350	167,899,867	19.5%	208,700,000
Feb-06	2,872,000	1,593,600	-	4,465,600	330,000	7,982,600	146,611,833	20.0%	183,200,000
Mar-06	3,244,000	1,603,000	-	4,847,000	323,000	9,696,090	147,967,507	27.2%	201,200,000
Apr-06	3,556,000	2,162,000	-	5,720,000	384,000	8,455,200	188,222,939	45.4%	344,500,000
May-06	4,599,000	3,314,000	-	7,973,000	502,000	9,015,700	372,478,292	32.3%	550,500,000
Jun-06	4,636,000	7,503,000	-	12,139,000	625,000	13,238,400	621,600,109	12.2%	707,900,000
Jul-06	6,684,000	7,842,000	-	14,526,000	579,000	8,827,300	667,698,149	1.2%	675,900,000
Aug-06	6,764,900	6,605,000	-	13,369,900	621,000	12,736,995	610,679,170	5.7%	641,300,000
Sep-06	5,296,000	6,262,000	-	11,558,000	468,000	10,225,300	524,468,310	-14.2%	455,300,000
Oct-06	5,028,000	4,115,000	-	9,523,000	373,000	12,306,330	374,920,931	-28.7%	291,300,000
Nov-06	3,982,000	2,369,000	-	6,351,000	299,000	10,742,100	179,070,854	9.2%	197,200,000
Dec-06	4,320,000	1,108,700	-	5,428,700	266,000	7,871,900	173,435,930	10.5%	193,700,000
Jan-07	3,564,500	-	-	3,564,500	230,000	3,512,800	144,246,818	27.1%	197,900,000
Feb-07	3,125,500	-	-	3,123,500	206,000	3,240,100	138,909,117	25.1%	185,500,000
Mar-07	4,048,000	-	-	4,048,000	289,000	6,089,900	142,653,030	31.0%	206,600,000
Apr-07	4,737,000	-	-	4,737,000	275,000	3,618,000	159,797,989	33.7%	241,500,000
May-07	4,487,000	-	-	4,487,000	297,000	3,671,400	222,091,930	47.3%	440,000,000
Jun-07	4,605,000	-	-	4,605,000	339,000	2,668,84	453,947,585	26.2%	614,700,000
Jul-07	5,507,000	-	-	5,507,000	709,000	3,477,700	680,800,109	6.9%	731,600,000
Aug-07	5,951,000	1,438	-	5,952,838	384,000	2,911,857	610,886,128	-0.3%	609,300,000
Sep-07	5,433,000	-	-	5,433,000	282,000	5,501,700	544,170,078	-8.1%	503,700,000
Oct-07	4,834,000	-	-	4,834,000	277,000	7,319,934	381,124,823	-23.0%	309,900,000
Nov-07	4,235,000	-	-	4,233,000	242,000	6,895,000	195,910,304	1.6%	199,100,000
Dec-07	4,285,000	-	-	4,285,000	193,000	4,959,000	161,076,389	21.0%	203,900,000
Jan-08	-	-	-	-	227,000	1,889,000	152,700,099	22.7%	211,900,000
Feb-08	-	-	-	-	251,000	3,873,400	142,622,426	26.8%	194,800,000
Mar-08	-	-	-	-	308,000	7,891,900	150,130,597	29.5%	212,900,000
Apr-08	-	-	-	-	285,000	9,682,200	163,799,175	40.4%	275,000,000
May-08	-	-	-	-	343,000	7,898,300	325,262,640	32.5%	482,200,000
Jun-08	-	-	-	-	450,000	6,113,100	452,723,240	22.7%	583,300,000
Jul-08	-	-	-	-	451,000	5,792,200	556,459,100	20.7%	739,100,000
Aug-08	-	-	-	-	354,000	6,936,900	695,740,200	15.6%	596,400,000
Sep-08	-	5,078	-	5,078	406,000	7,112,500	479,148,763	-5.7%	453,300,000
Oct-08	-	-	-	-	329,000	8,889,000	371,050,377	30.6%	303,300,000
Nov-08	-	-	-	-	334,000	4,418,800	188,047,884	5.8%	199,600,000
Dec-08	-	-	-	-	285,000	8,759,300	161,598,286	17.0%	194,800,000
Jan-09	-	-	-	-	277,000	4,552,700	157,741,212	15.6%	187,000,000
Feb-09	-	-	-	-	285,000	2,668,300	136,199,281	20.2%	217,700,000
Mar-09	-	-	-	-	361,000	5,615,800	149,231,377	21.5,100,000	215,100,000
Apr-09	-	-	-	-	203,000	3,143,100	161,640,204	26.1%	218,700,000
May-09	-	-	-	-	228,000	2,748,300	231,635,783	45.1%	422,000,000
Jun-09	-	-	-	-	319,000	2,776,578	364,009,082	12.9%	417,700,000
Jul-09	-	179	-	179	288,000	3,648,147	439,988,575	22.6%	568,300,000
Aug-09	-	-	-	-	311,000	1,535,051	497,796,756	12.7%	570,500,000
Sep-09	-	-	-	-	262,000	3,482,027	483,809,175	-4.5%	463,500,000

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Industrial	Inside - Wholesale	Outside - Wholesale	Total Other	Hydrant	Ranch	Total Consumption	% Non-Revenue	Treated Water Demand	
Oct-09	-	-	-	233,000	3,891,639	331,086,554	331,086,554	-39.2%	23,900,000	
Nov-09	-	-	-	239,000	5,155,960	160,125,390	9,986	17.500,000	17,500,000	
Dec-09	-	-	-	170,000	1,986,800	148,556,502	21.0%	188,000,000	188,000,000	
Jan-10	-	-	-	188,000	2,680,960	154,777,132	18.1%	189,000,000	189,000,000	
Feb-10	-	6,830	-	202,000	3,377,500	136,794,158	20.3%	171,700,000	171,700,000	
Mar-10	-	-	-	289,000	4,325,250	140,560,625	27.5%	193,900,000	193,900,000	
Apr-10	-	-	-	253,000	2,344,250	155,187,181	28.6%	217,400,000	217,400,000	
May-10	-	-	-	227,000	2,155,900	199,382,698	39.5%	328,700,000	328,700,000	
Jun-10	-	47,700	28,000	75,000	2,794,500	345,332,170	33.5%	519,600,000	519,600,000	
Jul-10	-	214,000	-	214,000	379,000	2,655,465	521,005,337	13.3%	601,200,000	601,200,000
Aug-10	-	377,000	1,000	378,000	435,000	2,683,100	546,280,290	12.2%	622,500,000	622,500,000
Sep-10	-	319,000	40,000	359,000	363,000	1,476,600	587,561,560	0.9%	593,100,000	593,100,000
Oct-10	-	246,000	-	246,000	322,000	3,338,100	476,460,701	-39.4%	341,900,000	341,900,000
Nov-10	-	14,000	-	14,000	305,000	3,794,200	199,181,715	-6.0%	187,900,000	187,900,000
Dec-10	-	1,000	1,000	2,000	322,000	1,173,000	148,142,090	21.0%	187,500,000	187,500,000
Jan-11	-	1,000	(1,000)	-	362,000	3,704,300	153,347,985	19.5%	190,600,000	190,600,000
Feb-11	-	1,000	-	1,000	233,000	3,265,300	136,155,066	21.9%	174,400,000	174,400,000
Mar-11	-	-	-	-	273,000	1,706,846	137,466,512	30.2%	196,900,000	196,900,000
Apr-11	-	11,000	-	1,000	255,000	1,191,700	162,624,313	36.8%	257,500,000	257,500,000
May-11	-	10,000	-	10,000	316,000	301,200	251,172,759	31.2%	363,300,000	363,300,000
Jun-11	-	10,000	-	10,000	310,000	3,222,500	367,499,726	34.0%	556,800,000	556,800,000
Jul-11	-	224,000	15,675	239,675	343,000	3,634,000	516,176,991	18.1%	630,200,000	630,200,000
Aug-11	-	267,000	29,000	296,000	495,000	2,514,300	586,924,850	18.8%	722,500,000	722,500,000
Sep-11	-	447,000	-	447,000	298,000	3,250,300	610,174,712	-19.5%	510,800,000	510,800,000
Oct-11	-	200,000	125	200,125	326,000	2,284,700	434,606,563	-30.4%	333,200,000	333,200,000
Nov-11	-	13,000	-	13,000	198,000	1,847,200	193,251,718	2.8%	198,805,395	198,805,395
Dec-11	-	3,000	-	3,000	195,000	984,714	153,365,878	20.0%	191,717,971	191,717,971
Jan-12	-	-	-	398,037	4,838,120	161,075,785	21.7%	205,635,979	205,635,979	
Feb-12	-	8,037	239,420	4,602,170	144,815,983	22,9%	187,766,371	187,766,371		
Mar-12	-	-	292,314	5,234,987	154,587,328	29.8%	220,053,603	220,053,603		
Apr-12	-	1,207	256,728	5,037,586	171,891,586	33.1%	257,078,927	257,078,927		
May-12	-	12,071	334,433	4,901,136	310,555,238	39.1%	510,237,893	510,237,893		
Jun-12	-	88,462	445,196	5,332,750	438,024,537	25.8%	596,037,023	596,037,023		
Jul-12	-	244,992	386,456	5,240,113	584,205,183	16.3%	698,152,055	698,152,055		
Aug-12	-	394,983	507,426	5,422,591	673,510,708	5.4%	711,709,083	711,709,083		
Sep-12	-	465,225	376,462	5,371,338	619,420,259	-7.4%	579,935,311	579,935,311		
Oct-12	-	255,501	326,828	5,684,767	475,673,613	-30.9%	361,507,962	361,507,962		
Nov-12	-	14,207	327,160	5,486,954	208,408,808	2.8%	214,398,070	214,398,070		
Dec-12	-	3,207	348,303	4,606,156	162,506,764	20.0%	203,144,712	203,144,712		
Jan-13	-	-	398,037	5,440,626	165,621,985	21.7%	211,439,845	211,439,845		
Feb-13	-	8,037	239,420	5,109,867	148,875,931	22.9%	193,030,443	193,030,443		
Mar-13	-	-	292,314	5,927,644	159,037,401	29.8%	226,388,240	226,388,240		
Apr-13	-	1,207	256,728	5,672,547	176,736,654	33.1%	264,324,614	264,324,614		
May-13	-	12,071	334,433	5,496,214	488,437,580	-30.9%	373,262,137	373,262,137		
Jun-13	-	88,462	445,196	5,035,982	318,903,618	39.1%	523,954,164	523,954,164		
Feb-13	-	244,992	507,426	5,155,030	166,986,595	20.0%	220,520,336	220,520,336		
Mar-13	-	394,983	507,426	6,170,082	691,156,285	5.4%	714,484,077	714,484,077		
Apr-13	-	465,225	376,462	6,103,848	635,710,122	-7.4%	594,083,496	594,083,496		
May-13	-	255,501	326,828	6,508,888	449,709,091	2.8%	606,992,602	606,992,602		
Jun-13	-	14,207	327,160	6,253,257	214,360,144	25.8%	208,744,810	208,744,810		
Jan-14	-	-	3,207	348,303	5,109,867	16.3%	714,880,135	714,880,135		
Feb-14	-	8,037	239,420	5,644,600	151,977,890	22.9%	197,052,399	197,052,399		
Mar-14	-	-	292,314	6,637,189	162,482,443	29.8%	231,292,226	231,292,226		
Apr-14	-	1,207	256,728	6,341,323	180,447,838	33.1%	265,875,003	265,875,003		
May-14	-	12,071	334,433	6,122,984	325,133,726	39.1%	534,190,145	534,190,145		
Jun-14	-	88,462	445,196	6,813,623	458,391,965	25.8%	618,100,683	618,100,683		

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Industrial	Inside - Wholesale	Outside - Wholesale	Total Other	Hydrant	Ranch	Total Consumption	% Non-Revenue	Treated Water Demand
Jul-14				244,992	386,456	6,665,392	610,860,344	16.3%	730,006,617
Aug-14				394,983	507,426	6,937,391	704,155,892	5.4%	744,092,319
Sep-14				465,225	376,462	6,875,368	647,724,988	-7.4%	603,299,305
Oct-14				255,501	326,828	7,376,896	497,934,559	-30.9%	380,519,692
Nov-14				14,207	327,160	7,060,369	218,914,499	2.8%	225,205,674
Dec-14				3,207	348,303	5,650,993	170,392,391	20.0%	213,002,291
Jan-15				-	398,037	6,608,643	172,767,213	21.7%	225,561,738
Feb-15				8,037	239,420	6,162,741	155,249,718	22.9%	201,294,606
Mar-15				-	292,314	7,364,097	166,102,080	29.8%	234,444,744
Apr-15				1,207	256,728	6,989,347	184,359,245	33.1%	275,724,844
May-15				12,071	334,433	6,730,305	331,751,366	39.1%	543,062,835
Jun-15				88,462	445,936	7,549,693	467,626,745	25.8%	630,552,961
Jul-15				244,992	386,456	7,373,829	622,921,908	16.3%	744,420,749
Aug-15				394,983	507,426	7,720,250	718,018,070	5.4%	756,740,695
Sep-15				465,225	376,462	7,622,949	660,532,558	-7.4%	615,228,428
Oct-15				255,501	326,828	8,217,972	508,031,341	-30.9%	388,235,615
Nov-15				14,207	327,160	7,842,438	223,715,978	2.8%	230,145,138
Dec-15				3,207	348,303	6,170,326	173,989,997	20.0%	217,499,548
Jan-16				-	398,037	6,986,238	176,395,601	21.7%	225,193,388
Feb-16				8,037	239,420	6,456,980	158,493,156	22.9%	205,500,002
Mar-16				-	292,314	7,765,532	169,623,047	29.8%	241,456,808
Apr-16				1,207	256,728	7,357,343	188,222,325	33.1%	285,024,406
May-16				12,071	334,433	7,075,188	338,533,300	39.1%	552,025,457
Jun-16				88,462	445,196	7,967,688	477,146,859	25.8%	643,389,986
Jul-16				244,992	386,456	7,776,133	635,483,410	16.3%	755,432,330
Aug-16				394,983	507,426	8,153,464	732,460,644	5.4%	770,023,518
Sep-16				465,225	376,462	8,047,481	673,873,327	-7.4%	627,654,191
Oct-16				255,501	326,828	8,695,597	518,421,828	-30.9%	396,175,385
Nov-16				14,207	327,160	8,286,555	228,464,883	2.8%	235,030,518
Dec-16				3,207	348,303	6,465,242	177,581,743	20.0%	221,989,380
Jan-17				-	398,037	6,986,238	179,755,273	21.7%	229,983,273
Feb-17				8,037	239,420	6,456,980	161,504,288	22.9%	205,404,194
Mar-17				-	292,314	7,765,532	172,808,090	29.8%	245,990,686
Apr-17				1,207	256,728	7,357,343	191,790,805	33.1%	286,839,370
May-17				12,071	334,433	7,075,188	345,105,530	39.1%	567,003,538
Jun-17				88,462	445,196	7,967,688	486,440,122	25.8%	655,921,122
Jul-17				244,992	386,456	7,776,133	647,897,952	16.3%	774,268,287
Aug-17				394,983	507,426	8,153,464	746,804,620	5.4%	783,159,683
Sep-17				465,225	376,462	8,047,481	687,060,805	-7.4%	635,937,175
Oct-17				255,501	326,828	8,695,597	528,542,860	-30.9%	405,910,439
Nov-17				14,207	327,160	8,286,555	232,880,073	2.8%	235,552,016
Dec-17				3,207	348,303	6,465,242	180,947,807	20.0%	226,197,292
Jan-18				-	398,037	6,813,834	182,850,198	21.7%	234,340,014
Feb-18				8,037	239,420	6,306,718	164,281,993	22.9%	213,005,727
Mar-18				-	292,314	7,560,527	175,700,159	29.8%	250,107,519
Apr-18				1,207	256,728	7,169,414	195,072,797	33.1%	291,747,867
May-18				12,071	334,433	6,899,062	351,320,115	39.1%	411,244,876
Jun-18				88,462	445,196	7,754,225	495,263,252	25.8%	667,818,325
Jul-18				244,992	386,456	7,570,684	659,764,167	16.3%	788,448,968
Aug-18				394,983	507,426	7,932,230	760,511,747	5.4%	803,644,414
Sep-18				465,225	376,462	7,830,681	699,667,256	-7.4%	655,678,985
Oct-18				255,501	326,828	8,451,683	538,140,443	-30.9%	411,244,876
Nov-18				14,207	327,160	8,059,752	236,907,068	2.8%	243,715,315
Dec-18				3,207	348,303	6,314,634	184,070,295	20.0%	230,100,619
Jan-19				-	398,037	6,648,643	186,017,450	21.7%	234,477,535
Feb-19				8,037	239,420	6,162,741	167,124,544	22.9%	216,691,338
Mar-19				-	292,314	7,364,097	178,662,746	29.8%	254,324,734

**Table C-4 - Monthly Water Demands Past and Future for Above Average Conditions**

**City of Loveland**

Date	Industrial	Inside - Wholesale	Outside - Wholesale	Total Other	Hydrant	Ranch	Total Consumption	Non-Revenue	%	Treated Water Demand
Apr-19				1,207	256,728	6,989,347	198,432,051		33.1%	296,771,915
May-19				12,071	334,433	6,730,305	357,669,893		39.1%	587,646,394
Jun-19				88,462	445,196	7,549,693	504,276,043		25.8%	675,971,270
Jul-19				244,992	386,456	7,373,829	671,880,411		16.3%	803,928,444
Aug-19				394,983	507,426	7,720,250	774,506,696		5.4%	818,433,091
Sep-19				465,225	376,462	7,622,949	712,539,243		7.4%	663,668,117
Oct-19				255,501	326,828	8,217,972	547,945,061		30.9%	418,737,522
Nov-19				14,207	327,160	7,842,438	241,049,028		2.8%	241,976,307
Dec-19				3,207	348,303	6,170,326	187,264,545		20.0%	234,093,553
Jan-20				-	398,037	6,813,834	189,581,734		21.7%	244,027,847
Feb-20				8,037	239,420	6,306,718	170,314,777		22.9%	220,827,750
Mar-20				292,314	7,560,527	182,081,372		29.8%	255,191,115	
Apr-20				1,207	256,728	7,169,414	202,222,225		33.1%	302,440,441
May-20				12,071	334,433	6,899,062	364,487,535		39.1%	598,847,901
Jun-20				88,462	445,196	7,754,225	513,882,246		25.8%	692,924,379
Jul-20				244,992	386,456	7,570,684	684,636,624		16.3%	818,172,714
Aug-20				394,983	507,426	7,932,230	789,209,742		5.4%	833,970,025
Sep-20				465,225	376,462	7,830,681	726,088,286		7.4%	676,287,868
Oct-20				255,501	326,828	8,451,683	558,417,867		30.9%	426,740,805
Nov-20				14,207	327,160	8,059,752	245,712,802		2.8%	254,774,109
Dec-20				3,207	348,303	6,314,634	190,814,182		20.0%	238,530,945

**Table C-5 - Estimates of Passive Savings - Past and Future  
City of Loveland**

Year	Population	Passive Savings (in gpcd)						Reduced Demand (1000s of gallons/day) High	Reduced Demand (1000s of gallons/day) Low
		High	Toilet	Low	D/W + Clothes Washers*	Low	High		
2005	68495	6.61	1.98	0.95	0.62				
2006	69690	7.27	2.18	1.91	1.25				
2007	70991	7.93	2.38	2.86	1.87				
2008	72403	8.59	2.58	3.82	2.49				
2009	73926	9.25	2.78	4.77	3.12				
2010	75449	9.91	2.97	5.73	3.74	4.84	2.46	326.81	166.19
2011	76975	10.57	3.17	6.68	4.36	1.61	0.82	110.62	56.25
2012	78502	11.23	3.37	7.63	4.98	3.23	1.64	225.09	114.46
2013	79911	11.89	3.57	8.59	5.61	4.84	2.46	343.94	174.90
2014	80086	12.56	3.77	9.54	6.23	6.46	3.28	467.71	237.84
2015		12.91	3.95	10.50	6.85	7.77	4.09	574.30	302.25
2016		13.26	4.13	11.45	7.48	9.08	4.89	684.88	369.12
2017		13.62	4.31	11.45	8.10	9.43	5.70	726.03	438.44
2018		13.97	4.49	11.45	8.72	9.79	6.50	768.27	510.23
2019		14.33	4.67	11.45	9.35	10.14	7.30	812.16	584.88
2020									

\* dish washers plus clothes washers

**Table C-6 - Past and Forecasted Annual Water Demands without Passive Savings**  
**City of Loveland**  
**Average Conditions**

Billed Water (in 1000s of gallons)						
Year	Residential			Commercial		
	Inside City	Outside City	Inside City	Outside City	City Use	Other Uses
2005	2,623,544	133,597	466,292	21,020	53,628	93,248
2006	3,186,549	150,123	517,424	22,288	68,868	101,227
2007	2,989,778	139,242	515,274	20,981	68,262	54,810
2008	2,967,702	140,831	590,295	18,266	69,194	5
2009	2,516,008	120,300	510,429	14,786	56,127	0
2010	2,816,305	133,651	538,454	16,429	68,156	1,295
2011	2,875,155	134,224	572,683	16,680	71,316	1,221
2012	2,810,555	132,251	556,283	16,639	65,942	1,258
2013	2,886,440	132,251	571,303	17,089	65,942	1,258
2014	2,941,283	132,251	582,157	17,413	65,942	1,258
2015	3,000,108	132,251	593,800	17,762	65,942	1,258
2016	3,063,110	132,251	606,270	18,135	65,942	1,258
2017	3,127,436	132,251	619,002	18,516	65,942	1,258
2018	3,189,984	132,251	631,382	18,886	65,942	1,258
2019	3,253,784	132,251	644,010	19,264	65,942	1,258
2020	3,318,860	132,251	656,890	19,649	65,942	1,258
	47,566,602	2,142,230				
		96%		4%		

### Above Average Conditions

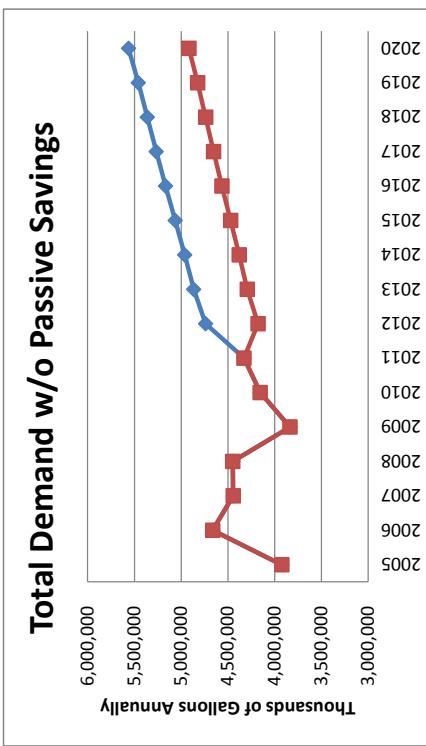
Billed Water (in 1000s of gallons)						
Year	Residential			Commercial		
	Inside City	Outside City	Inside City	Outside City	City Use	Other Uses
2005	2,623,544	133,597	466,292	21,020	53,628	93,248
2006	3,186,549	150,123	517,424	22,288	68,868	101,227
2007	2,989,778	139,242	515,274	20,981	68,262	54,810
2008	2,967,702	140,831	590,295	18,266	69,194	5
2009	2,516,008	120,300	510,429	14,786	56,127	0
2010	2,816,305	133,651	538,454	16,429	68,156	1,295
2011	2,875,155	134,224	572,683	16,680	71,316	1,221
2012	3,164,806	166,347	607,925	19,733	78,359	1,488
2013	3,250,256	166,347	624,339	20,266	78,359	1,488
2014	3,312,010	166,347	636,202	20,651	78,359	1,488
2015	3,378,251	166,347	648,926	21,064	78,359	1,488
2016	3,449,194	166,347	662,553	21,506	78,359	1,488
2017	3,521,627	166,347	676,467	21,958	78,359	1,488
2018	3,592,060	166,347	689,996	22,397	78,359	1,488
2019	3,663,901	166,347	703,796	22,845	78,359	1,488
2020	3,737,179	166,347	717,872	23,302	78,359	1,488

**Table C-6 - Past and Forecasted Annual Water Demands without Passive Savings**  
**City of Loveland**

<b>Average Conditions</b>					
Year	Total Billed	Total Non-Revenue	Total Demand (1,000 gallons)	Total Acre-Feet of Demand	
2005	3,492,940	430,360	3,923,300	12,040	
2006	4,175,054	487,646	4,662,700	14,309	
2007	3,845,950	597,250	4,443,200	13,636	
2008	3,869,283	579,317	4,448,600	13,652	
2009	3,261,820	574,580	3,836,400	11,773	
2010	3,610,666	544,734	4,155,400	12,752	
2011	3,702,767	625,956	4,328,723	13,284	
2012	3,613,971	563,532	4,177,503	12,820	
2013	3,713,332	579,385	4,292,717	13,174	
2014	3,787,788	591,383	4,379,171	13,439	
2015	3,866,777	604,074	4,470,851	13,721	
2016	3,947,263	616,825	4,564,088	14,007	
2017	4,024,701	628,876	4,653,577	14,281	
2018	4,097,630	640,110	4,737,740	14,540	
2019	4,172,164	651,599	4,823,763	14,804	
2020	4,252,776	664,254	4,917,031	15,090	
		13.5%			

<b>Above Average Conditions</b>					
Year	Total Billed	Total Non-Revenue	Total Demand (1,000 gallons)	Total Acre-Feet of Demand	
2005	3,492,940	430,360	3,923,300	12,040	
2006	4,175,054	487,646	4,662,700	14,309	
2007	3,845,950	597,250	4,443,200	13,636	
2008	3,869,283	579,317	4,448,600	13,652	
2009	3,261,820	574,580	3,836,400	11,773	
2010	3,610,666	544,734	4,155,400	12,752	
2011	3,702,767	625,956	4,328,723	13,284	
2012	4,104,676	634,582	4,739,258	14,544	
2013	4,215,080	651,925	4,867,005	14,936	
2014	4,297,517	665,000	4,962,516	15,229	
2015	4,385,066	678,846	5,063,912	15,541	
2016	4,474,720	692,834	5,167,555	15,859	
2017	4,561,518	706,149	5,267,667	16,166	
2018	4,643,549	718,611	5,362,161	16,456	
2019	4,727,368	731,353	5,458,721	16,752	
2020	4,817,449	745,287	5,562,736	17,071	
		13.4%			



**Table C-7 - Past and Forecasted Annual Water Demand with Passive Savings**  
**City of Loveland**

**Average Conditions**

Billed Water (in 1000s of gallons)						
Year	Residential			Commercial		
	Inside City	Outside City	Inside City	Outside City	City Use	Other Uses
2005	2,623,544	133,597	466,292	21,020	53,628	93,248
2006	3,186,549	150,123	517,424	22,288	68,868	101,227
2007	2,989,778	139,242	515,274	20,981	68,262	54,810
2008	2,967,702	140,831	590,295	18,266	69,194	5
2009	2,516,008	120,300	510,429	14,786	56,127	0
2010	2,816,305	133,651	538,454	16,429	68,156	1,295
2011	2,875,155	134,224	572,683	16,680	71,316	1,221
2012	2,781,414	130,939	556,283	16,639	65,942	1,258
2013	2,827,141	129,581	571,303	17,089	65,942	1,258
2014	2,850,674	128,171	582,157	17,413	65,942	1,258
2015	2,876,894	126,702	593,800	17,762	65,942	1,258
2016	2,910,033	125,357	606,270	18,135	65,942	1,258
2017	2,943,371	123,962	619,002	18,516	65,942	1,258
2018	2,986,628	123,093	631,382	18,886	65,942	1,258
2019	3,030,515	122,196	644,010	19,264	65,942	1,258
2020	3,074,886	121,264	656,890	19,649	65,942	1,258

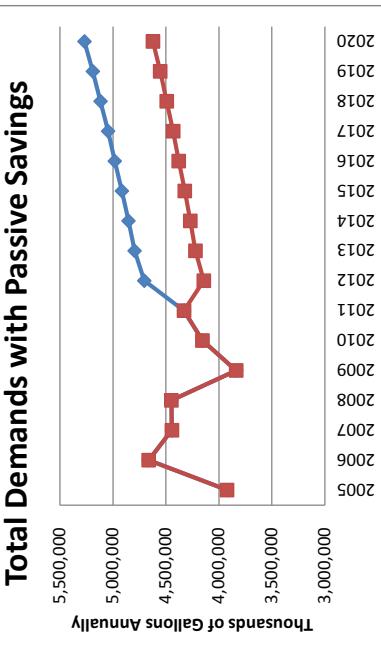
**Above Average Conditions**

Billed Water (in 1000s of gallons)						
Year	Residential			Commercial		
	Inside City	Outside City	Inside City	Outside City	City Use	Other Uses
2005	2,623,544	133,597	466,292	21,020	53,628	93,248
2006	3,186,549	150,123	517,424	22,288	68,868	101,227
2007	2,989,778	139,242	515,274	20,981	68,262	54,810
2008	2,967,702	140,831	590,295	18,266	69,194	5
2009	2,516,008	120,300	510,429	14,786	56,127	0
2010	2,816,305	133,651	538,454	16,429	68,156	1,295
2011	2,875,155	134,224	572,683	16,680	71,316	1,221
2012	3,135,665	165,035	607,925	19,733	78,359	1,488
2013	3,190,957	163,677	624,339	20,266	78,359	1,488
2014	3,221,402	162,267	636,202	20,651	78,359	1,488
2015	3,255,036	160,798	648,926	21,064	78,359	1,488
2016	3,296,116	159,453	662,553	21,506	78,359	1,488
2017	3,337,563	158,058	676,467	21,958	78,359	1,488
2018	3,388,703	157,189	689,996	22,397	78,359	1,488
2019	3,440,631	156,292	703,796	22,845	78,359	1,488
2020	3,493,205	155,360	717,872	23,302	78,359	1,488

**Table C-7 - Past and Forecasted Annual Water Demand with Passive Savings**  
**City of Loveland**

**Average Conditions**

Year	Total Billed	Total Non-Revenue	Total Demand (1,000 gallons)	Acre-Feet of Demand
2005	3,492,940	430,360	3,923,300	12,040
2006	4,175,054	487,646	4,662,700	14,309
2007	3,845,950	597,250	4,443,200	13,636
2008	3,869,283	579,317	4,448,600	13,652
2009	3,261,820	574,580	3,836,400	11,773
2010	3,610,666	544,734	4,155,400	12,752
2011	3,702,767	625,956	4,328,723	13,284
2012	3,583,517	558,784	4,142,301	12,712
2013	3,651,363	569,716	4,221,079	12,954
2014	3,693,099	576,599	4,269,698	13,103
2015	3,738,014	583,958	4,321,972	13,264
2016	3,787,292	591,827	4,379,118	13,439
2017	3,832,347	598,820	4,431,167	13,599
2018	3,885,115	606,912	4,492,027	13,786
2019	3,938,840	615,159	4,553,998	13,976
2020	3,997,815	624,431	4,622,247	14,185
		13.5%		



**Above Average Conditions**

Year	Total Billed	Total Non-Revenue	Total Demand (1,000 gallons)	Acre-Feet of Demand
2005	3,492,940	430,360	3,923,300	12,040
2006	4,175,054	487,646	4,662,700	14,309
2007	3,845,950	597,250	4,443,200	13,636
2008	3,869,283	579,317	4,448,600	13,652
2009	3,261,820	574,580	3,836,400	11,773
2010	3,610,666	544,734	4,155,400	12,752
2011	3,702,767	625,956	4,328,723	13,284
2012	4,074,223	629,874	4,704,096	14,436
2013	4,153,111	642,341	4,795,451	14,717
2014	4,202,827	650,348	4,853,175	14,894
2015	4,256,302	658,912	4,915,214	15,084
2016	4,314,748	668,066	4,982,814	15,292
2017	4,369,164	676,371	5,045,536	15,484
2018	4,431,034	685,723	5,116,758	15,703
2019	4,494,043	695,256	5,189,299	15,925
2020	4,562,488	705,843	5,268,331	16,168
		13.4%		

## **Appendix D**

### **Public Notices**

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February, 2013





## CITY OF LOVELAND

WATER & POWER DEPARTMENT

200 North Wilson • Loveland, Colorado 80537

(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

**AGENDA ITEM:** 5

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Larry Howard, Sr. Civil Engineer

**TITLE:** Oil & Gas Aquifers as Potential Raw Water Supply

### DESCRIPTION:

In the November LUC meeting, local attorney John Chilson spoke to the LUC and addressed the need for continued water management and the importance of completing the Windy Gap Firming Project. He expressed his concerns about climate change and about how drought and politics on the Colorado River could negatively affect future water supplies in this state. John proposed the possibility of using groundwater from aquifers in which oil and gas wells are being drilled in the vicinity as a future source of raw water for the city, or from springs in the vicinity of Chimney Hollow west of Carter Lake. This item provides information about the feasibility of using these source, based on information from the Colorado Oil & Gas Conservation Commission website at <http://cogcc.state.co.us/>, other web sources, and discussion with staff member Greg Deranleau, Oil & Gas Location Assessment Supervisor.

### SUMMARY:

The information staff has obtained indicates that under current conditions, recovery and use of the deep sources of water in the Niobrara formations in which oil and gas drilling is occurring does not represent a feasible option for municipal raw water supply. Water does exist in the formation shown on the attached map and could be used if the process, economics and legality were all aligned, but it is much less accessible and of significantly lower quality than the Dawson, Denver, Arapahoe and Laramie-Fox Hills aquifers all located within portions of the 13,000 ft. deep Denver Basin or the enormous Ogallala High Plains aquifer underlying portions of eastern Colorado, southeastern Wyoming, southern South Dakota, much of Nebraska, western Kansas, and much of the Oklahoma and Texas panhandle areas. None of these productive aquifers underlie the Loveland area, as shown in the attached aquifer maps from the USGS. The Niobrara was referred to by Mr. Deranleau as a relatively 'dry' formation.

A significant hurdle to domestic use is that the produced water recovered in the Northern Colorado area during operation of oil and gas wells is very saline and also has a high percentage of dissolved hydrocarbons, rendering it effectively undrinkable. Produced, or formation water is that which is recovered during production after the drilling and fracking operations are complete and the water quality has stabilized, so it reasonably represents the natural conditions in the formation. Treating it to CDPHE drinking water standards would require a high level of treatment such as using a reverse osmosis process and would be very expensive. The drilling industry is moving more toward treating this produced water and reusing

it for further drilling and fracking operations, but treatment for those purposes is also very expensive.

Successful uses of produced water are made in some areas of the state for irrigation or other purposes. This has been an effective procedure where water is taken from coal beds, as is occurring in Las Animas County (see attachment 6.d). Treating and using water obtained from the Niobrara shale in our area is not currently done as the water unfortunately has both high salinity and high hydrocarbon levels. Treatment is expensive and leads to its own set of disposal issues. Currently, most of this water is filtered then pumped deep underground for disposal.

The separate issue of springs in the foothills above Chimney Hollow presents a question about priorities under the Prior Appropriation doctrine in Colorado. Any water, whether from springs, surface, or groundwater sources, are subject to appropriation by diverters. Administration by the State Engineer's Office is conducted under the terms and conditions of the various decrees adjudicated by the courts pursuant to applications made by appropriators. Undoubtedly, these springs have historically contributed to river flows, either overland or through the alluvial aquifers, and are therefore subject to calls by senior diverters downstream. Current filings on those sources are possible, but would be analogous to drilling a new well and would be very junior to the senior calls. Except during periods of free river, an augmentation plan would be required for their diversion to make the river whole downstream, and there would be little to no net gain from their use by the city.

**RECOMMENDATION:**

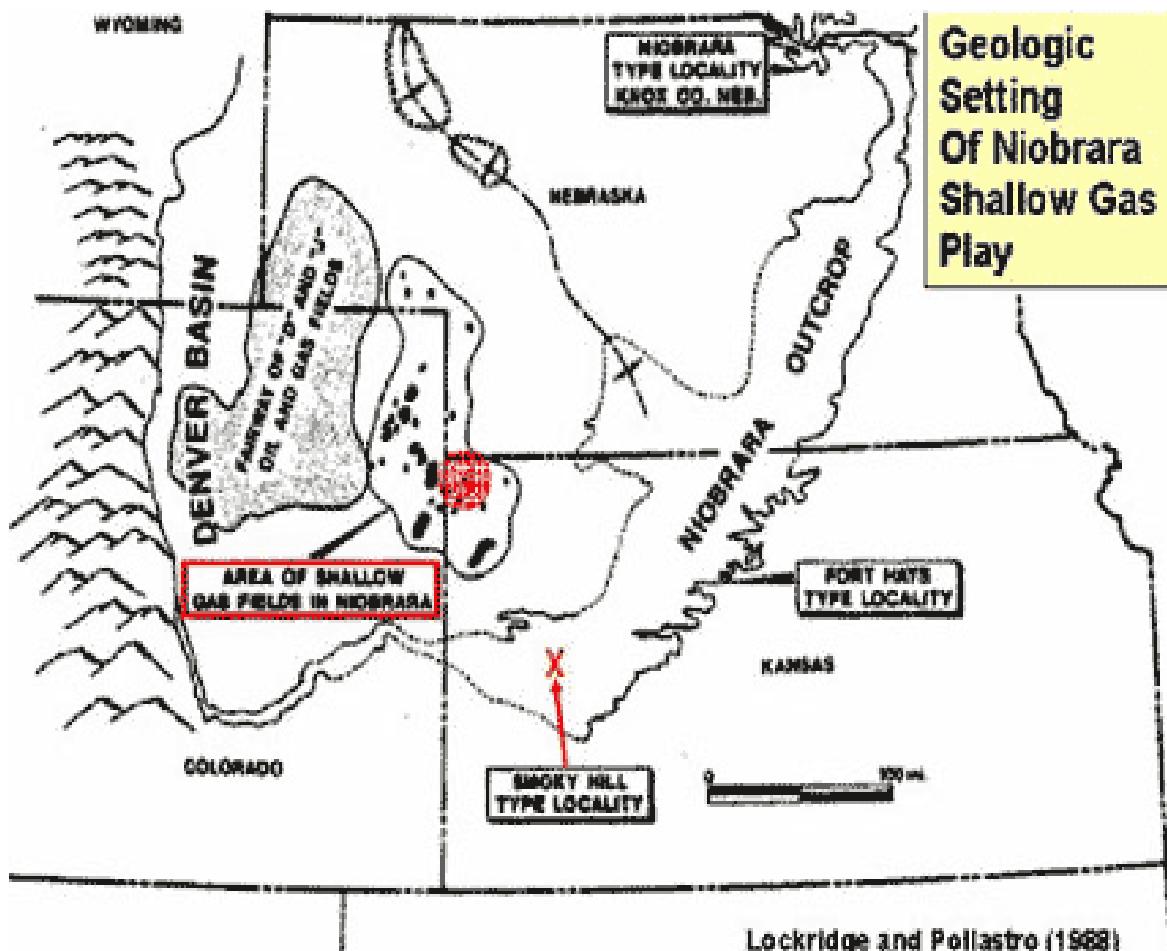
Staff item only. No action required.

**REVIEWED BY DIRECTOR:** *MS for SA*

**ATTACHMENTS:**

- Geologic Setting of Niobrara Shallow Gas Play
- Denver Basin Aquifer System
- High Plains (Ogallala) Aquifer
- Benefits of Produced Water

# Attachment A



Lockridge and Pollastro (1988)



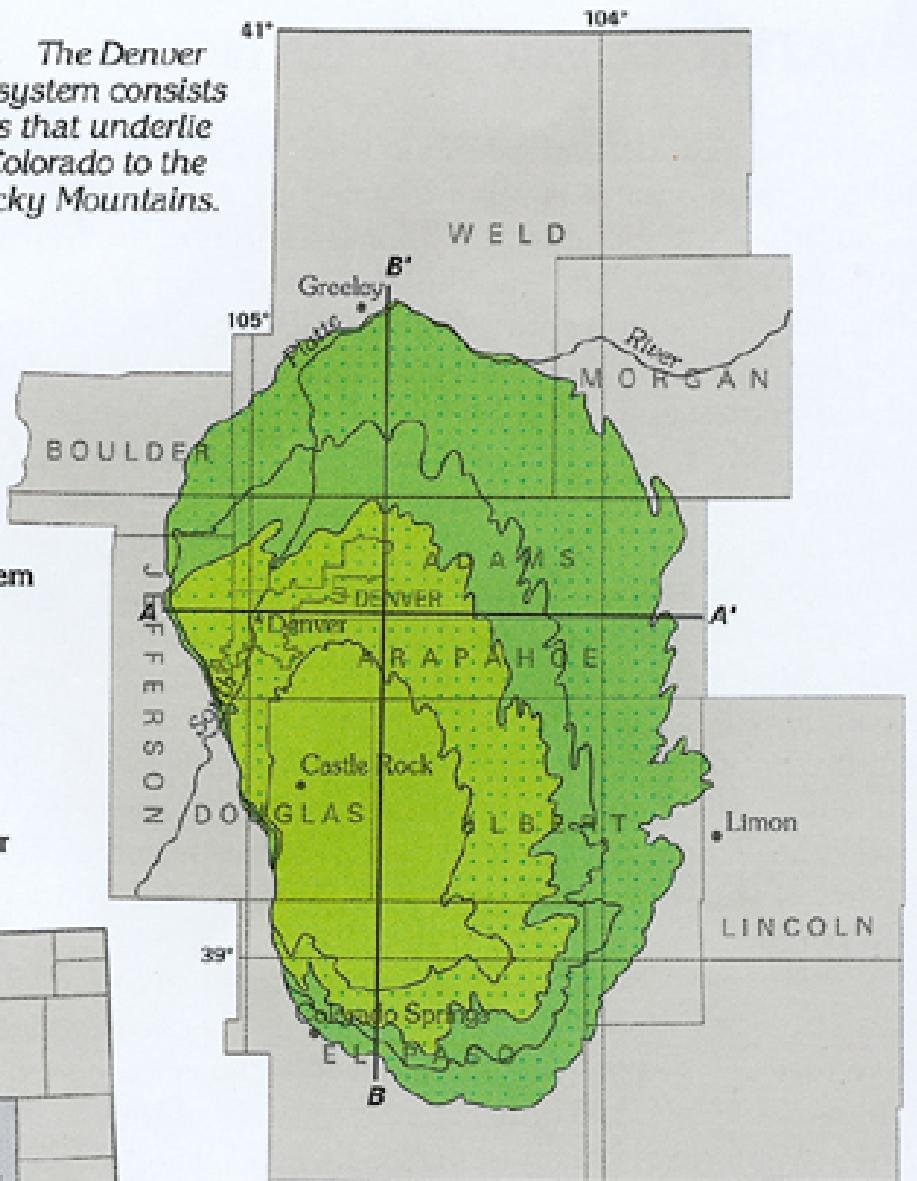
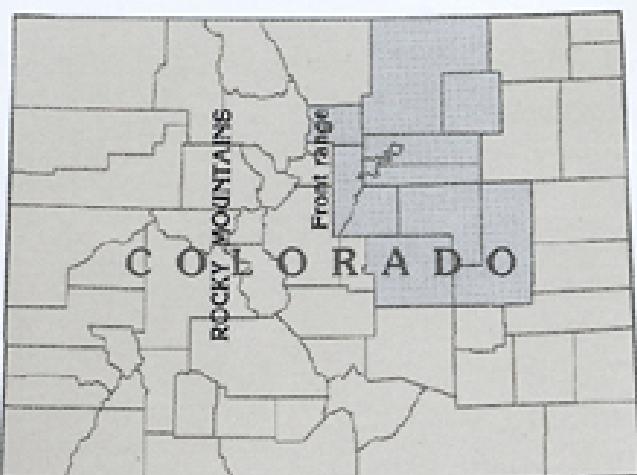
# Attachment B

**Figure 80.** The Denver Basin aquifer system consists of four aquifers that underlie the plains of Colorado to the east of the Rocky Mountains.

## EXPLANATION

Denver Basin aquifer system

- Dawson aquifer
- Denver aquifer
- Arapahoe aquifer
- Laramie-Fox Hills aquifer



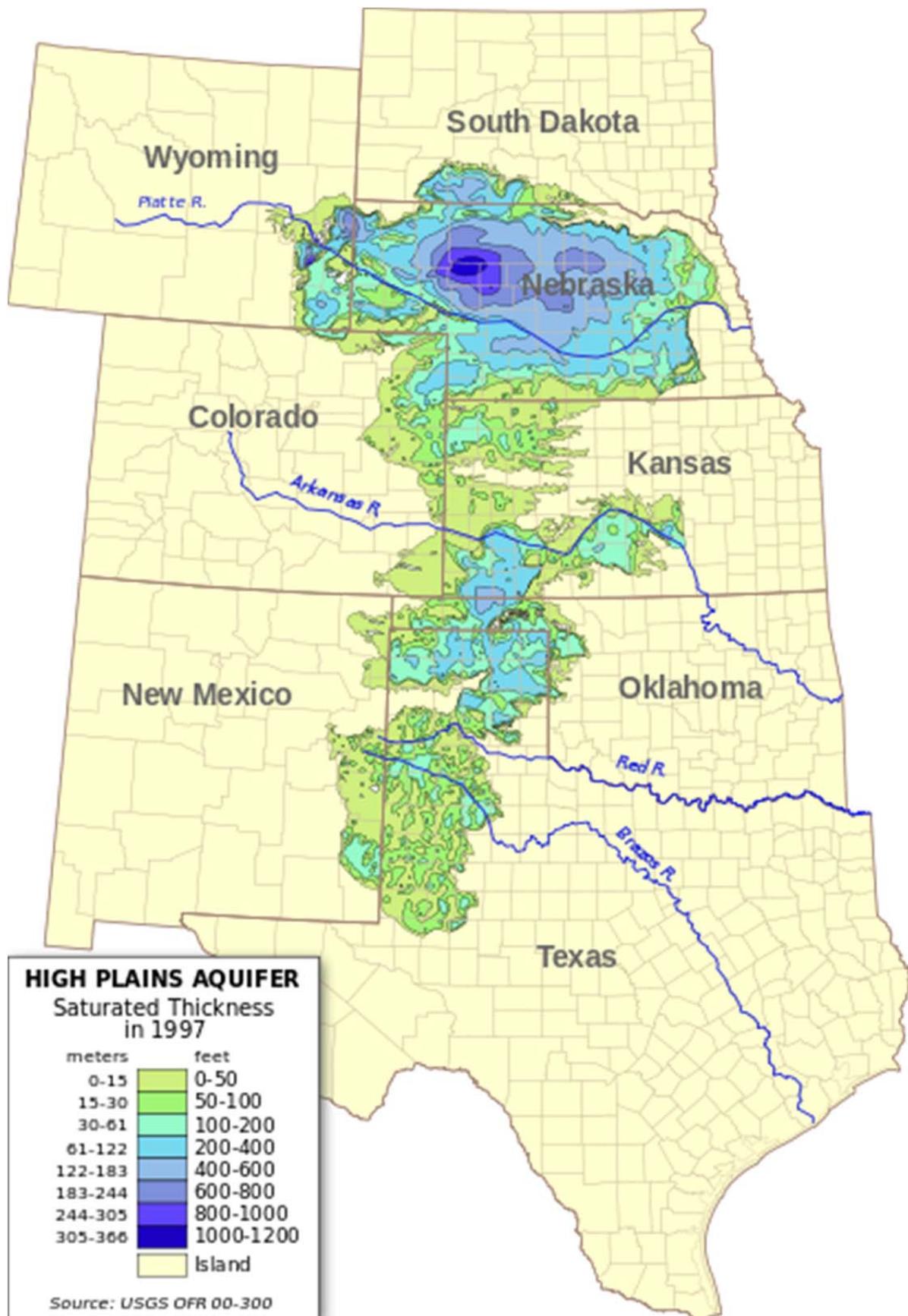
Base modified from U.S. Geological Survey, digital data, 1:2,000,000, 1972

SCALE 1:2,500,000

0 25 MILES  
0 25 KILOMETERS



# Attachment C





## Benefits of Produced Water

Las Animas County, located in south central Colorado, is known for its dry, arid climate with rainfall averaging only 14 inches per year, even less than Denver averaging 15.8 inches. Compare our climate to a desert that receives 10 inches or less per year. Sadly, it's pretty close. In contrast, a city like Houston can generally count on at least 50 inches of precipitation per year! That's why any opportunity providing access to more good water is considered a gift – welcomed with open arms.

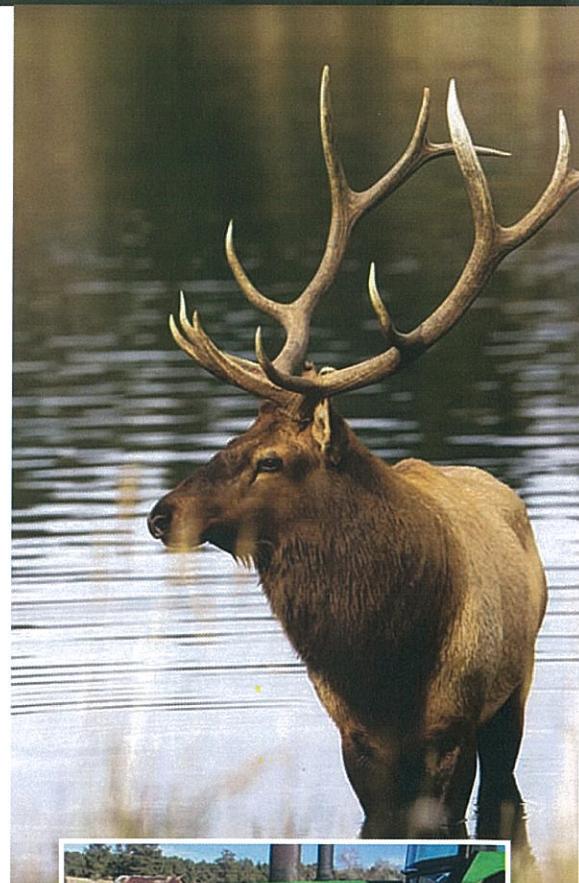
For many landowners, like the Salapich's, who have agricultural operations in the western portion of the county, coal bed methane water is a much appreciated resource. This additional water is a by-product of producing natural gas from the coal beds, up to 3500 feet in depth.

### This extra produced water has:

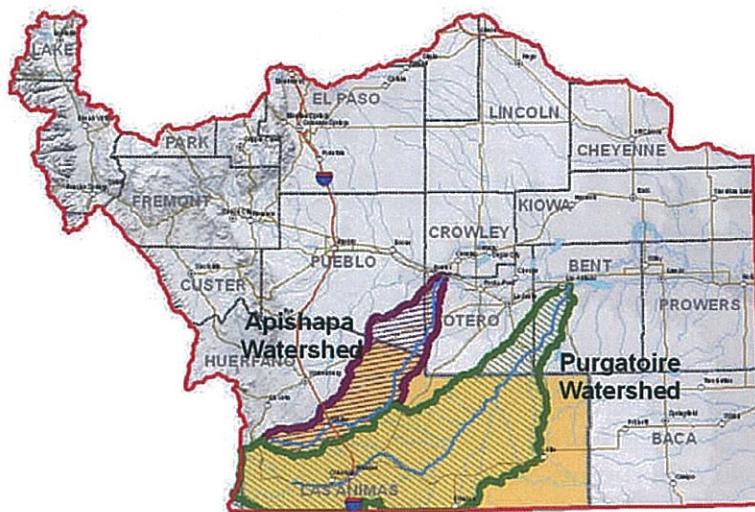
- Allowed local landowners to continue their agricultural operations, especially helpful during drought years
- Improved range management by dispersing cattle grazing across a ranch by having multiple access points for water
- Reduced costs during drought or dry seasons because ranchers are not paying high costs to haul water in for cattle or crop development for cattle feed
- Improvement in wetland areas and enhanced growth of vegetation and natural grasses

"Since the addition of the discharge pond on our ranch, it has been beneficial in many ways. Our horses and the indigenous wildlife, including elk, deer, bear, turkey and small game have all utilized this additional water source. This has drawn more wildlife into our area and helped us significantly increase the amount of wildlife on our property. Additionally, the quality of the water is so good that we have stocked the pond with bluegills, minnows and catfish that are now thriving and have been for the past three years. It has also created a year round wetland area that is being utilized by ducks and geese as well," said Fred Eichler, Apishapa landowner.

*Note from Staff to LUC: This article describes feasible beneficial uses of produced coal bed methane water in Las Animal County. These uses are not currently being made from water originating from the Niobrara shale in our area. The Niobrara water has high salinity and high levels of hydrocarbons and is very expensive to treat to acceptable levels.*



# Attachment D



*Colorado Division of Water Resources – Water Division 2  
Arkansas River Basin*



## The More You Know...

The coal bed methane (CBM) operators have many surface discharge points on the Apishapa and Purgatoire River Watersheds. These surface discharge points, permitted and regulated by the Colorado Department of Health and Environment (CDPHE), afford local landowners access to water in excess of what nature itself would bring via rain and snowfall.

Norwest Corporation and Tetra Tech, with funding and operational support from CBM operators designed, installed, maintain and monitor the gauging stations on the Apishapa and Purgatoire Rivers. CBM operators specifically chose these companies because of their technical expertise and recognition as leaders in project design and third party interpretation and analysis.

So, the more you know about the Apishapa and the Purgatoire Watershed Monitoring Projects, the more you'll understand how the collected data and analysis ensure the quality of the produced water.

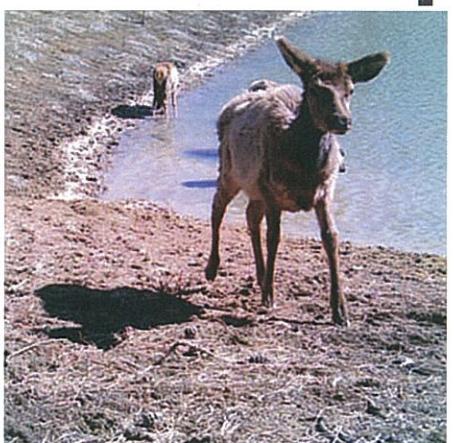
We encourage you to periodically review the ongoing data summaries on both websites below.

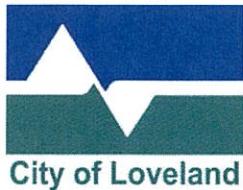
Apishapa Watershed Monitoring Project

[www.apishapawatershed.org](http://www.apishapawatershed.org)

Purgatoire Watershed Monitoring Project

[www.purgatoirewatershed.org](http://www.purgatoirewatershed.org)





**CITY OF LOVELAND**  
WATER & POWER DEPARTMENT  
200 North Wilson • Loveland, Colorado 80537  
(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

**AGENDA ITEM:**

**6**

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Jim Lees, Utility Accounting Manager

**TITLE:** December 2012 Financial Report Update

**DESCRIPTION:**

This item summarizes the monthly and year-to-date financials for December.

**SUMMARY:**

The December 2012 financial reports are submitted for commission review. The following table summarizes the sales and expense results for the month of December, and the December Year-To-Date results in comparison to the same periods from 2011. The summarized and detailed monthly financial statements that compare December Year-To-Date actuals to the 2012 budgeted figures are attached.

	Dec				Dec Year-To-Date			
	2012	2011	\$ Ovr/(Und)	% Ovr/(Und)	2012	2011	\$ Ovr/(Und)	% Ovr/(Und)
	vs. 2011	vs. 2011			vs. 2011	vs. 2011		
<b>WATER</b>								
Sales	\$498,389	\$393,805	\$104,584	26.6%	\$9,448,406	\$7,885,017	\$1,563,389	19.8%
Operating Expenses	\$1,299,377	\$687,126	\$612,251	89.1%	\$7,353,478	\$7,071,873	\$281,605	4.0%
Capital (Unrestricted)	\$433,166	\$658,033	(\$224,867)	-34.2%	\$2,054,068	\$2,269,637	(\$215,569)	-9.5%
<b>WASTEWATER</b>								
Sales	\$568,917	\$557,724	\$11,193	2.0%	\$6,946,559	\$6,829,853	\$116,706	1.7%
Operating Expenses	\$944,618	\$583,192	\$361,426	62.0%	\$6,045,892	\$5,678,035	\$367,857	6.5%
Capital (Unrestricted)	\$27,638	\$608,388	(\$580,750)	-95.5%	\$1,585,766	\$1,971,865	(\$386,099)	-19.6%
<b>POWER</b>								
Sales	\$4,070,618	\$3,826,324	\$244,294	6.4%	\$49,601,066	\$45,874,573	\$3,726,493	8.1%
Operating Expenses	\$5,281,575	\$3,674,729	\$1,606,846	43.7%	\$46,199,428	\$42,539,914	\$3,659,514	8.6%
Capital (Unrestricted)	\$1,023,330	\$481,347	\$541,983	112.6%	\$6,229,837	\$3,514,901	\$2,714,936	77.2%

**RECOMMENDATION:**

Staff report only. No action required.

**REVIEWED BY DIRECTOR:**

**LIST OF ATTACHMENTS:**

- Water & Power Financial Report Presentation PowerPoint slides
- City of Loveland Financial Statement-Raw Water
- City of Loveland Financial Statement-Water
- City of Loveland Financial Statement-Wastewater
- City of Loveland Financial Statement-Power





## DECEMBER PRELIMINARY SUMMARY

- Sales above budget
- Operating Expenses well above budget
  - Power Distrib. O&M expense well above budget
  - Water Source of Supply expense well above budget
  - Transfers for Services Rendered expense way above budget
- General Capital expenditures below budget
- PIF/SIF Revenues well above budget
- PIF/SIF Capital Expenditures below budget

## DECEMBER YTD PRELIMINARY SUMMARY

- Net income \$4.7 million above YTD budget of \$3.9 million
- Sales \$4.5 million above YTD budget of \$61.5 million
  - Power sales \$3.2M above YTD budget of \$46.4 million
  - Water sales \$1.2M above YTD budget of \$8.2 million
  - Wastewater sales \$38K above YTD budget of \$6.9 million
- Operating expenses \$245K above YTD budget of \$59.4M
- General Capital expenditures \$3.4M below YTD budget of \$13.3 million
- PIF/SIF Revenues \$1.2M above YTD budget of \$4.1M
- PIF/SIF Capital expenditures \$1.8M below YTD budget of \$3.6 million

## KEY FINANCIAL RESULTS

(\$ in Millions)	December Preliminary			Year To Date		
	Actual	Budget	Variance	Actual	Budget	Variance
<b>UNRESTRICTED FUNDS</b>						
Net Income	(\$2.2)	(\$0.8)	(\$1.4)	\$8.6	\$3.9	\$4.7
Sales	\$5.1	\$4.7	\$0.4	\$66.0	\$61.5	\$4.5
Interest and Other Income	0.2	(0.2)	0.4	2.8	2.5	0.3
Operating Expenses	7.5	5.3	2.2	59.6	59.4	0.2
Capital Expenditures	1.5	1.7	(0.2)	9.9	13.3	(3.4)
<b>RESTRICTED FUNDS</b>						
PIF/SIF Revenues and Interest	\$0.6	\$0.3	\$0.3	\$5.3	\$4.1	\$1.2
Capital Expenditures	0.4	0.5	(0.1)	1.8	3.6	(1.8)
Net Income and Operating Expenses both exclude Depreciation						

## PURCHASED POWER

**December YTD Purchased Power Demand**



**December YTD Purchased Power Energy**



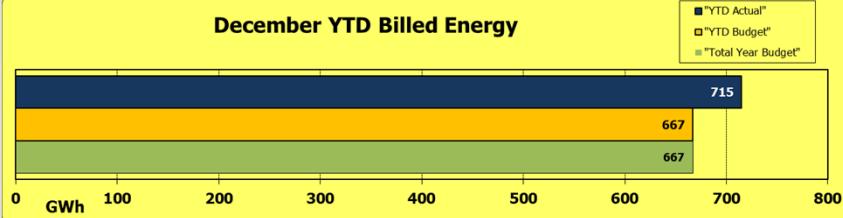
- Demand MW: Year-to-Date 5.9% above budget
- Energy GWh: Year-to-Date 6.0% above budget

## POWER SALES

**December YTD Billed Demand**



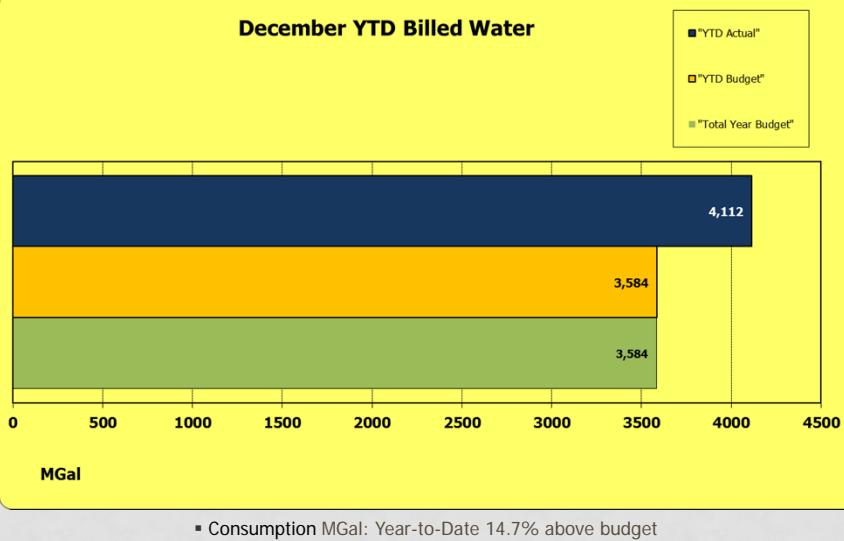
**December YTD Billed Energy**



- Demand MW: Year-to-Date 1.8% above budget
- Energy GWh: Year-to-Date 7.2% above budget

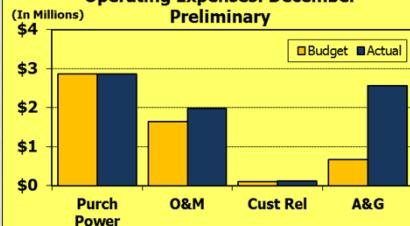
## WATER SALES

### December YTD Billed Water

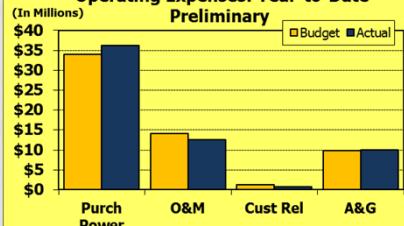


## OPERATING EXPENSES

### Operating Expenses: December Preliminary



### Operating Expenses: Year-to-Date Preliminary



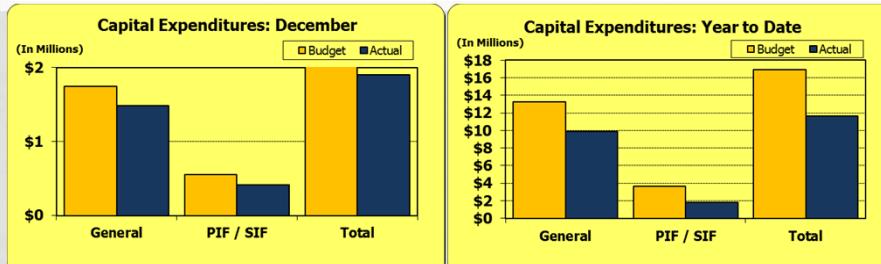
#### DECEMBER PRELIMINARY (42.9% above budget or \$2.3M)

- Purchased Power 0.1% above budget
- O&M 20.3% above budget (Source of Supply, Treatment, Distribution, Collection and Hydro operating and maint)
- Cust Rel 21.9% above budget
- A&G 288.5% above budget (Administration, PILT, Services Rendered Transfers, 1% For The Arts Transfer)

#### YTD (0.6% above budget or \$345K)

- Purchased Power 6.8% above budget
- O&M 10.9% below budget (Source of Supply, Treatment, Distribution, Collection and Hydro operating and maint)

## CAPITAL EXPENDITURES



### DECEMBER

General 14.8% below; PIF/SIF 25.1% below  
General \$257K below; PIF/SIF \$140K above

### YTD

General 25.7% below; PIF/SIF 51.0% below  
General \$3.4M below; PIF/SIF \$1.9M below

## QUESTIONS



**City of Loveland**  
**Financial Statement-Raw Water**  
For Period Ending 12/31/2012  
*Preliminary*

	* <b>TOTAL BUDGET</b> * <b>FYE 12/31/2012</b>	YTD ACTUAL	YTD BUDGET	OVER <UNDER>	VARIANCE
<b>1 REVENUES &amp; SOURCES</b>					
2 Hi-Use Surcharge	* 41,800	* 71,879	41,800	30,079	72.0%
3 Raw Water Development Fees/Cap Rec Surcharge	* 263,620	* 353,153	263,620	89,533	34.0%
4 Cash-In-Lieu of Water Rights	* 25,000	* 71,726	25,000	46,726	186.9%
5 Native Raw Water Storage Fees	* 25,000	* 0	25,000	(25,000)	-100.0%
6 Loan Payback from Wastewater	* 440,000	* 440,000	440,000	0	0.0%
7 Raw Water 1% Transfer In	* 545,910	* 620,710	545,910	74,800	13.7%
8 Interest on Investments	* 449,730	* 259,218	449,730	(190,512)	-42.4%
<b>9 TOTAL REVENUES &amp; SOURCES</b>	<b>* 1,791,060</b>	<b>* 1,816,687</b>	<b>1,791,060</b>	<b>25,627</b>	<b>1.4%</b>
<b>10 OPERATING EXPENSES</b>					
11 Windy Gap Payments	* 834,060	* 833,999	834,060	(61)	0.0%
<b>12 TOTAL OPERATING EXPENSES</b>	<b>* 834,060</b>	<b>* 833,999</b>	<b>834,060</b>	<b>(61)</b>	<b>0.0%</b>
<b>13 NET OPERATING REVENUE/(LOSS) (excl depr)</b>	<b>* 957,000</b>	<b>* 982,688</b>	<b>957,000</b>	<b>25,688</b>	<b>2.7%</b>
<b>14 RAW WATER CAPITAL EXPENDITURES</b>	<b>* 3,923,210</b>	<b>* 2,385,025</b>	<b>3,923,210</b>	<b>(1,538,185)</b>	<b>-39.2%</b>
<b>15 ENDING CASH BALANCES</b>					
16 Total Available Funds	* 12,930,746				
17 Reserve - Windy Gap Cash	* 4,180,086				
18 Reserve - 1% Transfer From Rates	* 2,237,287				
19 Reserve - Native Raw Water Storage Interest	* 1,546,845				
<b>20 TOTAL RAW WATER CASH</b>	<b>* 20,894,965</b>				
<b>21 MINIMUM BALANCE (15% OF OPER EXP)</b>	<b>* 125,109</b>				
<b>22 OVER/(UNDER) MINIMUM BALANCE</b>	<b>* 20,769,856</b>				

NOTE: YTD ACTUAL DOES NOT INCLUDE ENCUMBRANCES TOTALING: 99,251

**City of Loveland**  
**2013 Financial Statement-Water**  
For Period Ending 12/31/2012  
*Preliminary*

	* <b>TOTAL BUDGET</b>	* <b>FYE 12/31/2012</b>	* <b>YTD ACTUAL</b>	* <b>YTD BUDGET</b>	OVER <UNDER>	OVER VARIANCE
<b>1 **UNRESTRICTED FUNDS**</b>						
2 <b>REVENUES &amp; SOURCES</b>						
3 Water Sales	*	8,233,180	*	9,448,406	8,233,180	1,215,226
4 Raw Water Transfer Out	*	(545,910)	*	(620,710)	(545,910)	(74,800)
5 Wholesale Sales	*	81,330	*	89,956	81,330	8,626
6 Meter Sales	*	30,050	*	73,460	30,050	43,410
7 Interest on Investments	*	34,650	*	45,324	34,650	10,674
8 Other Revenue	*	368,590	*	526,394	368,590	157,804
<b>9 TOTAL REVENUES &amp; SOURCES</b>	*	<b>8,201,890</b>	*	<b>9,562,831</b>	<b>8,201,890</b>	<b>1,360,941</b>
<b>10 OPERATING EXPENSES</b>						
11 Source of Supply	*	1,609,450	*	1,182,642	1,609,450	(426,808)
12 Treatment	*	2,072,060	*	2,020,762	2,072,060	(51,298)
13 Distribution Operation & Maintenance	*	2,215,260	*	2,101,220	2,215,260	(114,040)
14 Administration	*	439,610	*	366,266	439,610	(73,344)
15 Customer Relations	*	157,380	*	63,821	157,380	(93,559)
16 PILT	*	538,110	*	611,805	538,110	73,695
17 1% for Arts Transfer	*	15,910	*	19,031	15,910	3,121
18 Services Rendered-Other Departments	*	984,690	*	987,931	984,690	3,241
<b>19 TOTAL OPERATING EXPENSES</b>	*	<b>8,032,470</b>	*	<b>7,353,478</b>	<b>8,032,470</b>	<b>(678,992)</b>
<b>20 NET OPERATING REVENUE/(LOSS)(excl depr)</b>	*	<b>169,420</b>	*	<b>2,209,353</b>	<b>169,420</b>	<b>2,039,933</b>
<b>21 CAPITAL EXPENDITURES</b>						
<b>22 ENDING CASH BALANCE</b>			*	<b>4,230,713</b>		
<b>23 MINIMUM BALANCE (15% OF OPER EXP)</b>			*	<b>1,204,871</b>		
<b>24 OVER/(UNDER) MINIMUM BALANCE</b>			*	<b>3,025,843</b>		
<b>25 **RESTRICTED FUNDS**</b>						
<b>26 REVENUES &amp; SOURCES</b>						
27 SIF Collections	*	1,312,880	*	1,830,958	1,312,880	518,078
28 SIF Interest Income	*	105,550	*	100,030	105,550	(5,520)
<b>29 TOTAL SIF REVENUES &amp; SOURCES</b>	*	<b>1,418,430</b>	*	<b>1,930,988</b>	<b>1,418,430</b>	<b>512,558</b>
<b>30 SIF Capital Expenditures</b>						
<b>31 SIF ENDING CASH BALANCE</b>			*	<b>8,946,414</b>		
<b>32 TOTAL ENDING CASH BALANCE</b>	*	*	*	<b>13,177,127</b>		

NOTE: YTD ACTUAL DOES NOT INCLUDE ENCUMBRANCES TOTALING 2,381,427

**City of Loveland**  
**2012 Financial Statement-Waste**  
For Period Ending 12/31/2012  
*Preliminary*

	* <b>TOTAL BUDGET</b> * <b>FYE 12/31/2012</b>	YTD ACTUAL	YTD BUDGET	OVER <UNDER>	OVER VARIANCE
<b>1 **UNRESTRICTED FUNDS**</b>					
3 Sanitary Sewer Charges	* 6,908,420	* 6,946,559	6,908,420	38,139	0.6%
4 High Strength Surcharge	* 243,750	* 248,183	243,750	4,433	1.8%
5 Interest on Investments	* 66,190	* 93,350	66,190	27,160	41.0%
6 Other Revenue	* 5,470	* 40,000	5,470	34,530	631.3%
<b>7 TOTAL REVENUES &amp; SOURCES</b>	<b>* 7,223,830</b>	<b>* 7,328,092</b>	<b>7,223,830</b>	<b>104,262</b>	<b>1.4%</b>
<b>8 OPERATING EXPENSES</b>					
9 Treatment	* 2,736,270	* 2,721,815	2,736,270	(14,455)	-0.5%
10 Collection System Maintenance	* 1,916,050	* 1,497,073	1,916,050	(418,977)	-21.9%
11 Administration	* 285,420	* 225,424	285,420	(59,996)	-21.0%
12 Customer Relations	* 30	* 17,035	30	17,005	56684.5%
13 PILT	* 506,190	* 503,632	506,190	(2,558)	-0.5%
14 Interfund Loan Payback to Raw Water	* 440,000	* 440,000	440,000	0	0.0%
15 1% for Arts Transfer	* 15,950	* 13,642	15,950	(2,308)	-14.5%
16 Services Rendered-Other Departments	* 614,790	* 627,270	614,790	12,480	2.0%
<b>17 TOTAL OPERATING EXPENSES</b>	<b>* 6,514,700</b>	<b>* 6,045,892</b>	<b>6,514,700</b>	<b>(468,808)</b>	<b>-7.2%</b>
<b>18 NET OPERATING REVENUE/(LOSS)(excl depr)</b>	<b>* 709,130</b>	<b>* 1,282,200</b>	<b>709,130</b>	<b>573,070</b>	<b>80.8%</b>
<b>19 CAPITAL EXPENDITURES</b>	<b>* 2,515,680</b>	<b>* 1,585,766</b>	<b>2,515,680</b>	<b>(929,914)</b>	<b>-37.0%</b>
<b>20 ENDING CASH BALANCE</b>			<b>7,667,717</b>		
<b>21 MINIMUM BALANCE (15% OF OPER EXP)</b>			<b>977,205</b>		
<b>22 OVER/(UNDER) MINIMUM BALANCE</b>			<b>6,690,512</b>		
<b>23 **RESTRICTED FUNDS**</b>					
<b>24 REVENUES &amp; SOURCES</b>					
25 SIF Collections	* 810,000	* 1,085,432	810,000	275,432	34.0%
26 SIF Interest Income	* 44,440	* 59,092	44,440	14,652	33.0%
<b>27 TOTAL SIF REVENUES &amp; SOURCES</b>	<b>* 854,440</b>	<b>* 1,144,524</b>	<b>854,440</b>	<b>290,084</b>	<b>34.0%</b>
28 SIF Capital Expenditures	* 1,325,950	* 325,143	1,325,950	(1,000,807)	-75.5%
<b>29 SIF ENDING CASH BALANCE</b>			<b>5,132,121</b>		
<b>30 TOTAL ENDING CASH BALANCE</b>			<b>12,799,839</b>		

NOTE: YTD ACTUAL DOES NOT INCLUDE ENCUMBRANCES TOTALING 616,720

**City of Loveland**  
**Financial Statement-Power**  
For Period Ending 12/31/2012

*Preliminary*

	* TOTAL BUDGET	* YTD ACTUAL	YTD BUDGET	OVER <UNDER>	OVER VARIANCE
<b>**UNRESTRICTED FUNDS**</b>					
1 REVENUES & SOURCES:					
2 Electric revenues	* \$46,361,300	* \$49,601,066	\$46,361,300	\$3,239,766	7.0%
3 Wheeling charges	* \$310,000	* \$247,312	\$310,000	(\$62,688)	-20.2%
4 Interest on investments	* \$150,920	* \$255,333	\$150,920	\$104,413	69.2%
5 Aid-to-construction deposits	* \$632,680	* \$467,415	\$632,680	(\$165,265)	-26.1%
6 Customer deposit-services	* \$120,930	* \$150,248	\$120,930	\$29,318	24.2%
7 Doorhanger fees	* \$400,000	* \$416,604	\$400,000	\$16,604	4.2%
8 Connect Fees	* \$125,000	* \$169,439	\$125,000	\$44,439	35.6%
9 Services rendered to other depts.	* \$257,450	* \$201,806	\$257,450	(\$55,644)	-21.6%
10 Other revenues	* \$246,210	* \$440,264	\$246,210	\$194,054	78.8%
11 Year-end cash adjustments	* \$0	* \$0	\$0	\$0	0.0%
<b>12 TOTAL REVENUES &amp; SOURCES</b>	<b>* \$48,604,490</b>	<b>* \$51,949,485</b>	<b>\$48,604,490</b>	<b>\$3,344,995</b>	<b>6.9%</b>
13 OPERATING EXPENSES:					
14 Hydro oper. & maint.	* \$159,670	* \$23,087	\$159,670	(\$136,583)	-85.5%
15 Purchased power	* \$34,000,000	* \$36,301,582	\$34,000,000	\$2,301,582	6.8%
16 Distribution oper. & maint.	* \$3,441,190	* \$3,068,542	\$3,441,190	(\$372,648)	-10.8%
17 Customer Relations	* \$1,130,380	* \$738,481	\$1,130,380	(\$391,899)	-34.7%
18 Administration	* \$736,310	* \$417,400	\$736,310	(\$219,157)	-29.8%
19 Payment in-lieu-of taxes	* \$3,255,000	* \$3,421,552	\$3,255,000	\$166,552	5.1%
20 1% for Arts Transfer	* \$38,300	* \$15,559	\$38,300	(\$22,741)	-59.4%
21 Services rendered-other depts.	* \$2,045,390	* \$2,213,226	\$2,045,390	\$167,836	8.2%
<b>22 TOTAL OPERATING EXPENSES (excl depn)</b>	<b>* \$44,806,240</b>	<b>* \$46,199,428</b>	<b>\$44,806,240</b>	<b>\$1,393,188</b>	<b>3.1%</b>
<b>23 NET OPERATING REVENUE/(LOSS) (excl depn)</b>	<b>* \$3,798,250</b>	<b>* \$5,750,057</b>	<b>\$3,798,250</b>	<b>\$1,951,807</b>	<b>51.4%</b>
24 CAPITAL EXPENDITURES:					
25 General Plant/Other Generation & Distribution	* \$7,154,690	* \$5,540,528	\$7,154,690	(\$1,614,162)	-22.6%
26 Aid-to-construction	* \$646,890	* \$421,843	\$646,890	(\$225,047)	-34.8%
27 Service installations	* \$120,930	* \$267,466	\$120,930	\$146,536	121.2%
<b>28 TOTAL CAPITAL EXPENDITURES</b>	<b>* \$7,922,510</b>	<b>* \$6,229,837</b>	<b>\$7,922,510</b>	<b>(\$1,692,673)</b>	<b>-21.4%</b>
<b>29 ENDING CASH BALANCE</b>		<b>* \$19,851,029</b>			
30 MINIMUM BAL. (15% of OPER EXP excl depn)		* \$6,720,936			
<b>31 OVER/(UNDER) MINIMUM BALANCE</b>		<b>* \$13,130,093</b>			
<b>32 **RESTRICTED FUNDS**</b>					
33 PIF Collections	* \$1,700,000	* \$2,132,238	\$1,700,000	\$432,238	25.4%
34 PIF Interest Income	* \$92,670	* \$94,581	\$92,670	\$1,911	2.1%
<b>35 TOTAL REVENUES</b>	<b>* \$1,792,670</b>	<b>* \$2,226,819</b>	<b>\$1,792,670</b>	<b>\$434,149</b>	<b>24.2%</b>
36 PIF Feeders	* \$50,000	* \$1,358	\$50,000	(\$48,642)	-97.3%
37 PIF Substations	* \$706,000	* \$748,871	\$706,000	\$42,871	6.1%
<b>38 TOTAL EXPENDITURES</b>	<b>* \$756,000</b>	<b>* \$750,229</b>	<b>\$756,000</b>	<b>(\$5,771)</b>	<b>-0.8%</b>
<b>39 ENDING PIF CASH BALANCE</b>		<b>* \$8,238,949</b>			
<b>40 TOTAL ENDING CASH BALANCE</b>		<b>* \$28,089,978</b>			

NOTE: YTD ACTUAL does NOT include encumbrances totalling \$836,083



**CITY OF LOVELAND**  
WATER & POWER DEPARTMENT  
200 North Wilson • Loveland, Colorado 80537  
(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

**AGENDA ITEM:** 7

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Steve Adams, Director *MS for SA*

**TITLE:** Commission/Council Report

**SUMMARY:**

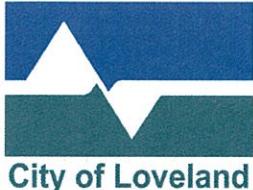
- Colorado Water Congress –January 31, 2013-February 1, 2013
- City Council Meeting on Water Financing – February 19, 2013

**RECOMMENDATION:**

Commission/council report only.

**REVIEWED BY DIRECTOR:** *MS for SA*





## CITY OF LOVELAND

WATER & POWER DEPARTMENT

200 North Wilson • Loveland, Colorado 80537

(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

AGENDA ITEM: **8**

MEETING DATE: 2/20/2013

SUBMITTED BY: Steve Adams, Director *MS for SA*

**TITLE:** Director's Report

### SUMMARY:

- **New Employee Introductions** - Cindi Rutledge Wastewater Treatment Plant Lead Operator – Michael McCrary
- **Shift the April LUC Meeting** – Can we move the April LUC meeting out one week from Wednesday, April 17, 2013 to Wednesday, April 24, 2013 in order to accommodate the required 60 day comment period for the Water Conservation Plan prior to the April meeting? – Steve Adams
- **Draft of Water & Power Presentation** – This is a draft of the 5 minute presentation for the Boards & Commissions Summit on March 14, 2013. (See Attachment A.) – Michelle Stalker
- **Forest-Thinning to Protect Watersheds** – Because of the devastating consequences of forest fires on the watersheds vital to municipal water supplies, the Pueblo Board of Water Works voted to pay the Forest Service \$50,000 to thin forests. (See Attachment B for the full article.) – Greg Dewey
- **Big Thompson Watershed Forum's 2013 Watershed Meeting** – This year's forum titled *Critical Surface Water Issues* with Patty Limerick as the keynote speaker will be held in Greeley on February 28, 2013 from 8:00 am to 3:45 pm. Please let Michelle Stalker know if you would like to attend. (See Attachment C for the agenda, panel topics and speakers.) – Steve Adams
- **National Renewable Energy Laboratory (NREL) Tour & Lunch** – The tour lasts 3 hours; at the conclusion we will provide lunch at a nearby restaurant before heading home. We will return to Loveland, arriving here between 2:30 pm and 3:00 pm. A firm headcount will be needed no later than March 15, as names need to be provided ahead of time to NREL for clearance. NREL asked us to identify any attendees who are not citizens of the United States. Please let Michelle Stalker know if you are interested in attending.

Date: Thursday, April 4, 2013

Time: Meet at 8:00 am. Return about 3:00 pm.

Place: Meet at Service Center Boardroom – we will provide transportation

- **High Plains Landscape Workshop** - LW&P is sponsoring the High Plains Landscape Workshop on February 23, 2013 at the Drake Center. The event is sold out with over 300 people attending to discuss plants, water conservation, xeriscaping and more. – Gretchen Stanford

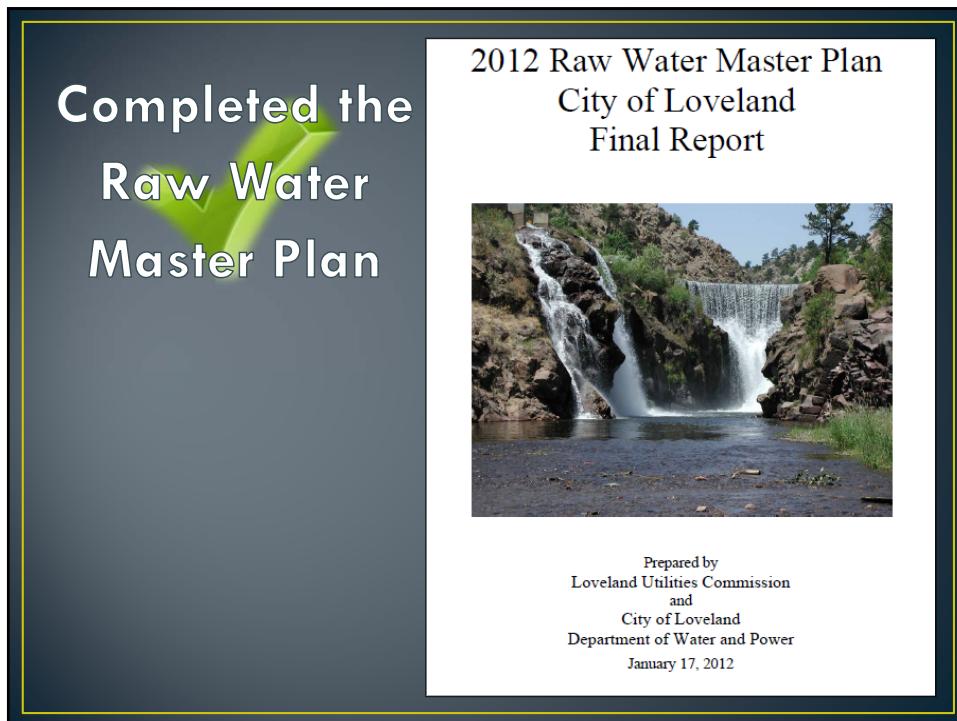
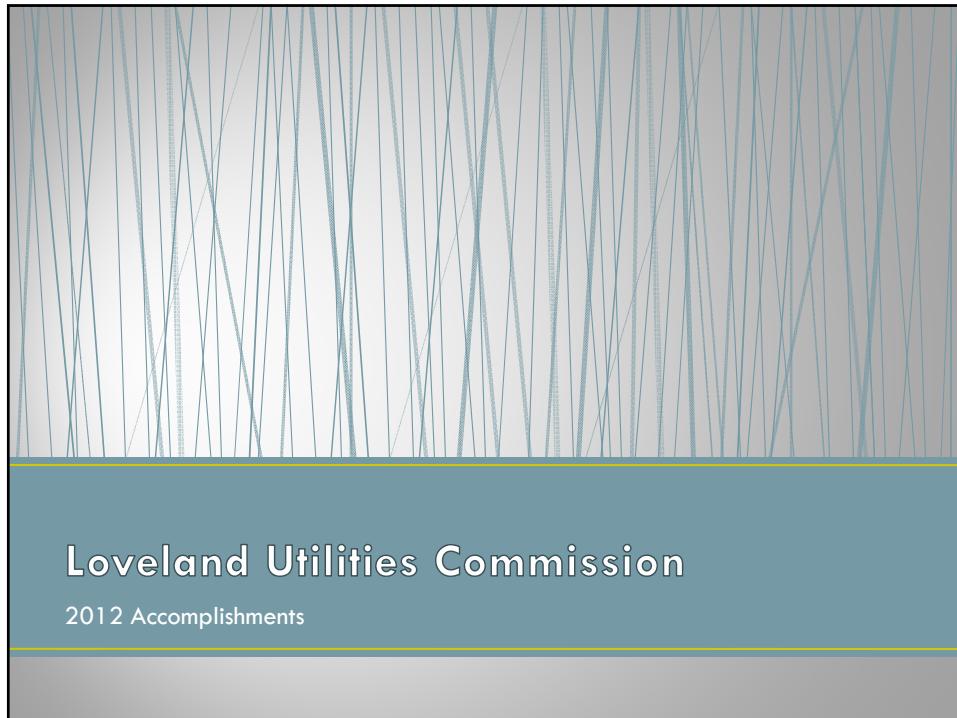
- **Drive Electric Northern Colorado** is launching at the Museum of Discovery in Fort Collins on February 25, 2013 from 9:00 am to 11:00 am. All LUC members are invited to attend. (See Attachment D.) – Gretchen Stanford
- **Carter Lake Hydro Production** – The hydro plant is located on the second water release outlet of Carter Lake. Summer 2012 releases were high resulting in the reservoir being drawn down fairly low. Releases in the winter have been about one eighth of the summer releases. In mid-October 2012, Northern Water had to stop power production due to flows being too low to generate power. Starting January 1, 2013, one hydro plant turbine was brought back on-line to produce about 200 kW. The hydro plant has two turbines with 1,300 kW capacity. (See Attachment E.) – Gretchen Stanford
- **Open House** - LW&P will be hosting their first of many Open Houses on March 6, 2013 at 5:30 pm. We encourage all of you to attend this event that is open to the public. (See Attachment F.) – Gretchen Stanford
- **Booth at the Garfield Community Circle** - On February 4, 2013, we provided a booth and information on our Larimer County Conservation Corps energy and water assessment program for low income customers at the Garfield Community Circle at Garfield Elementary School. – Gretchen Stanford
- **Tri-City Conference** – Save the date May 16, 2013 at the Rialto Center. We need to decide on the speakers and who to invite. – Larry Howard/Glenna Depperschmidt

**RECOMMENDATION:**

Director's report only.

REVIEWED BY DIRECTOR: *MS for SA*

# Attachment A







**Briefed City Council  
on the City's power  
infrastructure &  
received direction to  
continue the current  
pace of  
undergrounding**



**Used new  
technological  
advances to slip  
line the first  
waterline in  
Loveland**

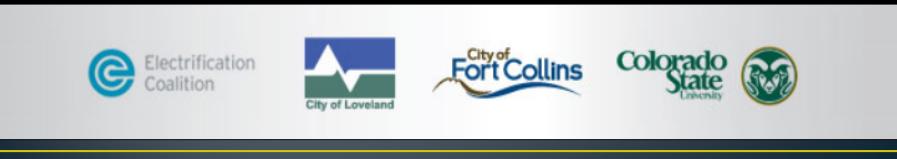
Leased two all-electric  
Nissan Leaf vehicles and  
installed two charging stations



Joined the Electrification  
Coalition to initiate  
Drive Electric Northern Colorado



A model plug-in electric vehicle deployment community.  
[www.DriveElectricNorthernColorado.org](http://www.DriveElectricNorthernColorado.org)



Selected an Outage Management System & studied how fault indicators could help locate power outages



### Responder

Web Portal

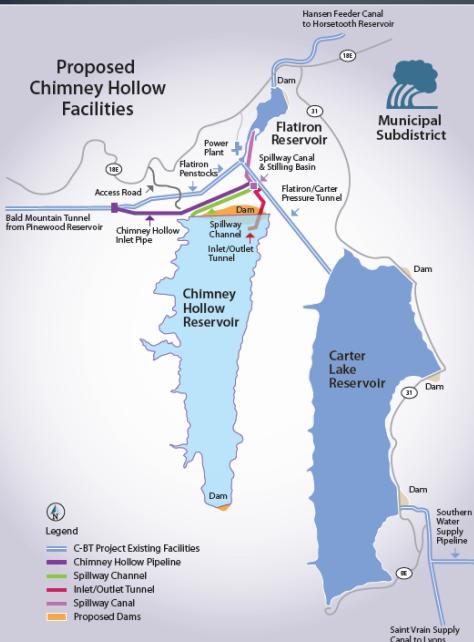


Version 10.0.2

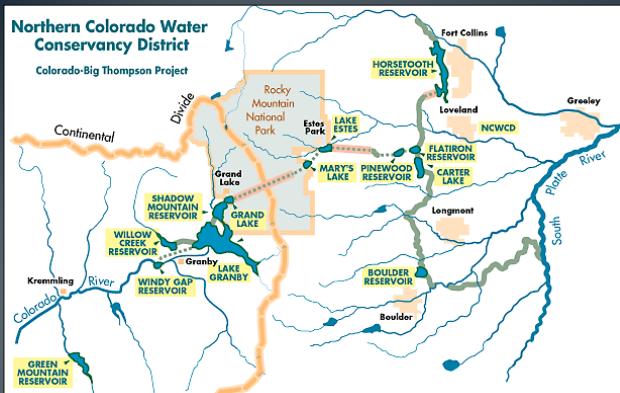
Copyright© 2011 Telvent USA Corporation  
All rights are reserved. This program protected by international  
copyright laws.



Continued participation in the Windy Gap Firming Project



Provided \$100,000 fire mitigation assistance to the City of Greeley due to the Hyde Park fire that negatively impacted their water supply



Purchased 282 units of Colorado Big Thompson water



**City of Loveland**

Community Sustainability Plan

Version 2012-01



<http://www.cityofloveland.org/sustainability>



**Supported**

the

development

of a City

wide

**Sustainability**

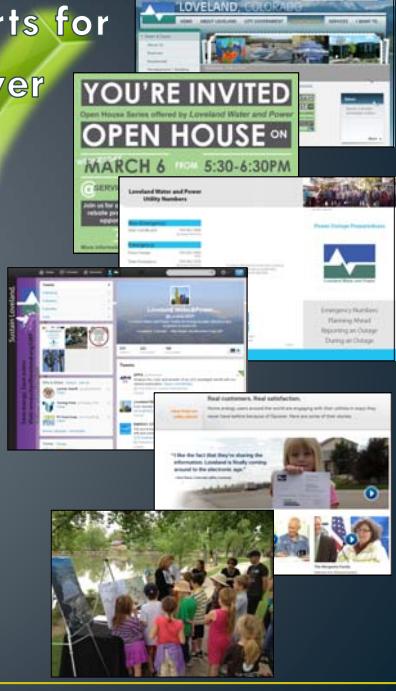
**Plan**

**Increased Marketing Efforts for**

**Loveland Water & Power**

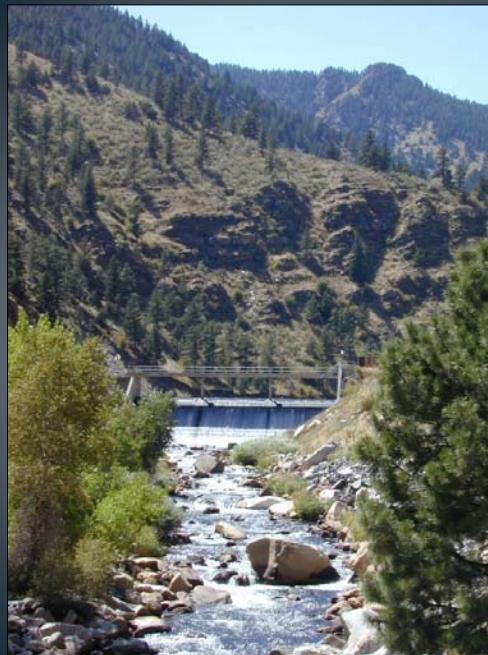
- Website updates
- Educational videos
- New software
- Social media
- Press releases
- Community events





Achieved national recognition with the Home Energy Reports Program

[http://opower.com/customers/real\\_people](http://opower.com/customers/real_people)

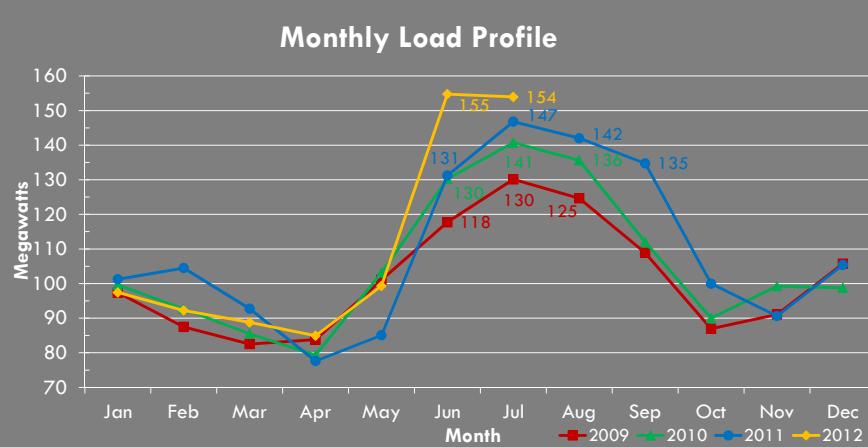


Continued to evaluate and pursue Federal Energy Regulation Committee relicensing of the hydro generating facility

## Participated in the Highway 402 Corridor Master Plan



Continued to develop an electric rate to encourage customers to lower their peak during system peaks



## Continued to support infrastructure improvements for downtown revitalization

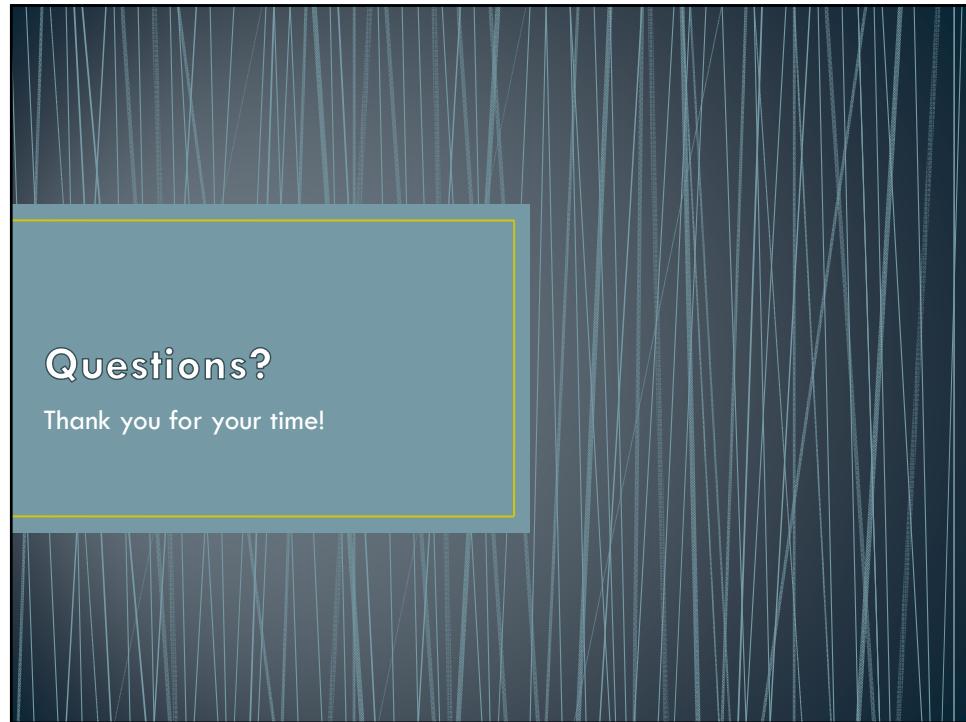


**Developed and marketed the Cross Connection Control Program**

[www.CityofLoveland.org/CrossConnection](http://www.CityofLoveland.org/CrossConnection)

The City of Loveland's Cross Connection Control Program is designed to protect the public drinking water supply from contamination. The program requires the installation of backflow prevention assemblies on all cross connections to the public water system. The City also provides educational materials and resources to help homeowners and businesses understand the importance of backflow prevention.

**Backflow Preventer** **Hose Bib Vacuum Breaker**





## Attachment B

### Water board OKs forest-thinning pac

By CHRIS WOODKA | [cwoodka@chieftain.com](mailto:cwoodka@chieftain.com) | Posted: Wednesday, January 16, 2013  
4:00 am

Forest fires can have devastating consequences to watersheds cities depend on, so the U.S. Forest Service is reaching out to municipal water providers to take measures to thin forests.

The Pueblo Board of Water Works Tuesday voted to pay the Forest Service \$50,000 to thin about 81 acres near Twin Lakes. The Forest Service provides the expertise and manpower to do the work.

The water board will join other water providers throughout the West to reduce the impact of fires.

Last summer, large fires near Fort Collins and Colorado Springs burned thousands of acres, raising the specter that those cities will face the same challenges Denver and Aurora have had from the 2002 Hayman Fire.

"A movement is under way for the Forest Service to go into watersheds that are vital to municipal water supply to thin the forests and reduce the impact of fires," said Alan Ward, water resources manager for the water board.

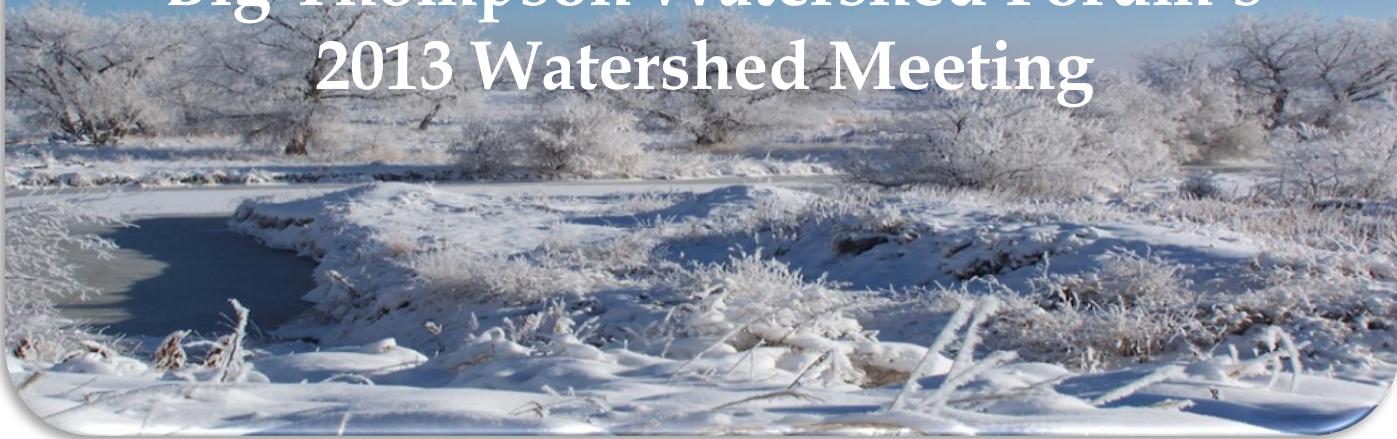
Colorado Springs and Aurora already have paid the Forest Service to clear other large areas near the Mount Elbert Forebay, located just north of Twin Lakes. Twin Lakes is a vital transfer point for the Homestake Project which the two cities jointly operate. Pueblo also stores water in Twin Lakes, as well as Clear Creek Reservoir and Turquoise Lake in the same general area.

"There are lots of areas in our watershed that are at extreme risk," Ward said.

The water board and Forest Service are studying the possibility for future agreements in the watersheds of transmountain ditches in the Tennessee Creek area, he added.



## Big Thompson Watershed Forum's 2013 Watershed Meeting



### **Please Save the Date for February 28, 2013!**

Hello Northern Colorado Watershed Communities:

Please spread the word and *save the date* and join the Forum for our 2013 Watershed Meeting, **CRITICAL SURFACE WATER ISSUES ~ 2013**, to be held in Greeley, Colorado, on Thursday, February 28, 2013. We will welcome 12 speakers, with *Patty Limerick* as our keynote speaker. Dr. Limerick is a Professor of History at the University of Colorado and is the Faculty Director and Chair of the Center for the American West.

We will also recognize and congratulate our 2011 and 2012 Dave Cole Environmental Scholarship winners, Donal O'Leary and Elisa Baebler, and have two gift raffles. **Our next meeting will not be until 2015, so please join us!**

The Meeting includes a South of the Border theme buffet lunch, snacks, drinks, and continental breakfast.

**Details provided below:**

**When:** *February 28, 2013*

**Where:** *The Island Grove Regional Park*

*501 N. 14<sup>th</sup> Avenue Greeley, CO 80631 (<http://greeleygov.com/Parks/islandgrove.aspx>)*

**Time:** *8:00 to 3:45*

**Cost:** *\$40 at the door or via mail (check only please through mail); check or cash....sorry, no credit cards (Note: University/college student fee is half-price; first 5 students to register may attend for free ☺)*

If you would like to attend, please contact Zack Shelley at 970-613-6163 or email at  
[zshelley@btwatershed.org](mailto:zshelley@btwatershed.org).

**Thank you, The Forum**

**See agenda, panel topics and speakers for 2013 below....**

# Attachment C



## Watershed Conference Agenda

Thursday, February 28, 2013

8:00 A.M. to 4:00 P.M.

8:00 AM	<b>Registration and Continental Breakfast</b>
8:30 AM	<b>Opening Remarks and Forum Update -</b> John Matis and Zack Shelley
9:00-10:00 AM	<b>Session I Panel: 'Agriculture Water Sharing &amp; Development, Ecosystem Initiatives in Northern Colorado and Sylvan Dale Guest Ranch Nutrient Pilot Project'</b> George Wallace, Ph.D., Professor Emeritus, Colorado State University and Larimer County Agricultural Advisory Board David Jessup, General Partner and Owner, Sylvan Dale Guest Ranch Zack Shelley, Program Director, The Forum
10:00-10:30 AM	<b>Break &amp; Refreshments</b>
10:30 -11:30 AM	<b>Session II Panel: 'Fire Effects on our Water Quality, Wildlife and Watershed Management'</b> John Stednick, Ph.D., Professor, Warner College of Natural Resources, Colorado State University Ken Neubecker, Past President & Board Member, Colorado Trout Unlimited Brad Piehl, Principal and Partner, JW Associates
11:30 AM - 1:00 PM ~Luncheon~	<b>Keynote Speaker, Dr. Patricia Limerick: "A Ditch in Time - The City, the West, and Water"</b> Dr. Limerick is a Professor of History at the University of Colorado and Faculty Director and Chair of the Board of the Center of the American West <b>Dave Cole Environmental Scholarship Award Presentation &amp; Recipients</b>
1:00-2:30 PM	<b>Session III Panel: 'Hydraulic Fracturing in the Front Range and Colorado'</b> Laura Belanger, Water Resources Engineer, Western Resource Advocates Shane Davis, Chair, Poudre Canyon Group, Sierra Club Regulatory Perspective (TBD) Ken Carlson, Ph.D., Professor, Department of Civil & Environmental Engineering, Colorado State University
2:30-2:45 PM	<b>Break &amp; Refreshments</b>
2:45-3:45 PM	<b>Session IV Panel: 'Water Supply Taste and Odor Issues and Treatment Approaches in our Region'</b> Paul Swaim, Global Technology Leader, CH2M HILL, Inc. Pinar Omur-Ozbet, Ph.D., Professor, Department of Civil & Environmental Engineering, Colorado State University
3:45 PM	<b>Wrap-Up and Closing Remarks -</b> John Matis and Zack Shelley
4:00 PM	<b>Adjourn</b>

# Attachment D

On Behalf of the Electrification Coalition, the City of Loveland,  
the City of Fort Collins, and Colorado State University

PLEASE JOIN US  
FOR THE LAUNCH OF



Drive Electric Northern Colorado is a first-in-the-nation initiative to establish a comprehensive electric vehicle deployment community ecosystem.

This kick-off event will highlight DENC's plan, key participants and early progress. There will also be an opportunity for attendees to experience electric vehicles first-hand.

**February 25th, 2013**

**9:00 A.M to 11:00 AM**

**The Fort Collins Museum of Discovery | 408 Mason Ct.**

Kick-off press conference followed by vehicle demonstrations and “ride and drive” opportunities.

**RSVP: [JGouss@electrificationcoalition.org](mailto:JGouss@electrificationcoalition.org) or 202-461-2366**

**A model plug-in electric deployment community.**

[www.DriveElectricNorthernColorado.org](http://www.DriveElectricNorthernColorado.org)



Electrification  
Coalition



291





## Hydro facilities

**TURBINES** Two 1,300-kilowatt Francis turbines that contain water's flow and harness its power

### GENERATORS

480-volt generators and controls

### POWERHOUSE

3,000-square-foot turbine facility next to building for energy dissipation valves

**CONNECTIONS TO TOWER & CANAL**  
250 feet of pipeline to outlet;  
connection to St. Vrain Supply Canal

**CONNECTION TO POWER**  
600-foot power line to Poudre Valley REA

Hydro supports Colorado's renewable energy ethic, which has been demonstrated by state standards and officials' directives.

It is a reliable option, with a track record that extends well beyond a century.

## Why hydro?

**LOANS**  
\$2 million through the Colorado Water Resources and Power Development Authority's low-interest hydro program

Remainder from Northern Water district to its hydropower enterprise fund

**REVENUE**  
\$600,000 (annual gross); defrays construction and maintenance costs

## Robert V. Trout

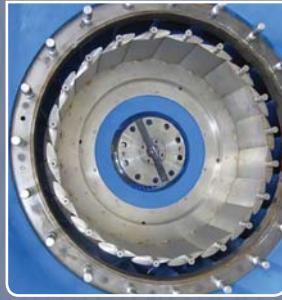
### Robert V. Trout Hydropower Plant

#### Carter Lake, CO

Northern Water's Board of Directors passed a resolution in 2012 naming the plant after Bob Trout, Northern Water legal counsel for more than 35 years.

Just like many other initiatives, Bob was instrumental to the hydro project, from creation of its money management fund to negotiations with key agencies.

The resolution affirms his work: "Bob has been a true warrior in his efforts to protect and defend, as well as promote, the interests of Northern Water."



## Attachment E

## Carter Lake

The plant is connected to Carter Lake's second outlet, which Northern Water and Reclamation built as a second water release structure for Carter Lake, a Colorado-Big Thompson Project reservoir near Loveland.

## Robert V. Trout Hydropower Plant

The plant, attached to the tower outlet at Carter Lake, started generating power in May 2012. It is the first power structure built, owned and operated by Northern Water.

## Hydro

Northern Water, which under state law can pursue hydro projects, designed Carter Lake's second outlet with the possibility of adding future power in mind and began planning hydro facilities soon after outlet completion in 2008.

This was the first project in the region to receive a Lease of Power Privilege from the U.S. Bureau of Reclamation, granting the ability to pursue hydro on the federally-owned facility.

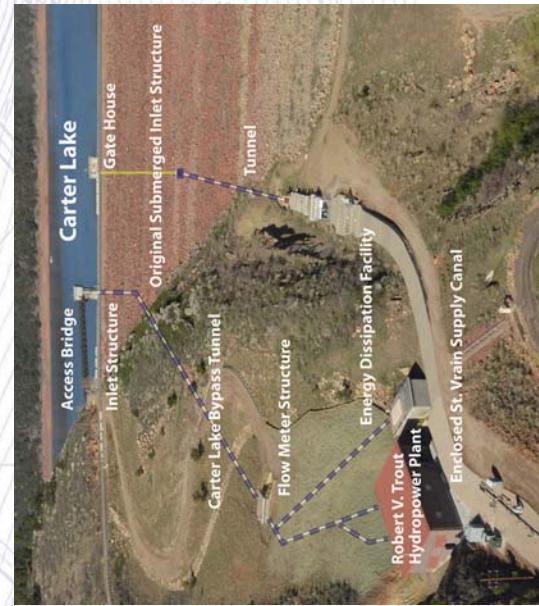
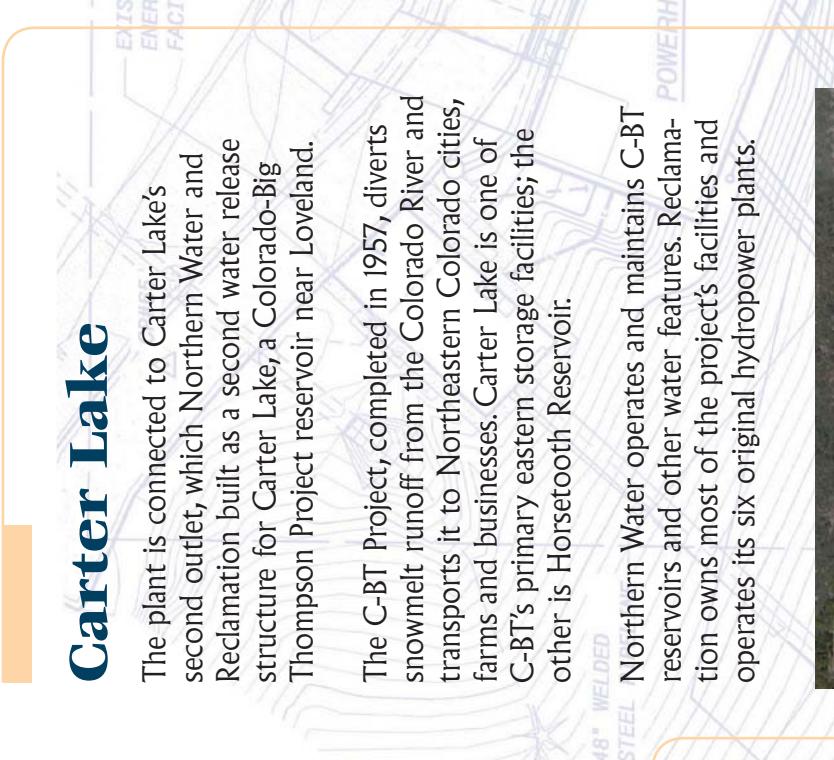
In 2011, the Poudre Valley Rural Electric Association signed an agreement with Northern Water to purchase the project's projected output of 7 to 10 million kilowatt-hours a year, or enough to power about 1,000 homes.

Construction began in fall 2011 and power generation started in May 2012.

# Attachment



EXISTING  
ENERGY  
FACILITY



Carter Lake's original outlet, in the reservoir's southern dam, was built to deliver water during the crop irrigation season and came off-line each winter. But the outlet began making year-round deliveries in 1995, when Northern Water completed the Southern Water Supply Project, a 110-mile underground pipeline that serves municipalities. The switch to all-season operation made repairs and maintenance difficult.

The \$12 million outlet, completed in 2008, has a three-level intake tower and connects to the St. Vrain Supply Canal using 1,200 feet of tunnel and pipeline. It offers additional reliability to those who depend on reservoir deliveries.



Northern Water operates and maintains C-BT reservoirs and other water features. Reclamation owns most of the project's facilities and operates its six original hydropower plants.

**F**IRE

Carter Lake's original outlet, in the reservoir's southern dam, was built to deliver water during the crop irrigation season and came off-line each winter. But the outlet began making year-round deliveries in 1995, when Northern Water completed the Southern Water Supply Project, a 110-mile underground pipeline that serves municipalities. The switch to all-season operation made repairs and maintenance difficult.

The \$12 million outlet, completed in 2008, has a three-level intake tower and connects to the St. Vrain Supply Canal using 1,200 feet of tunnel and pipeline. It offers additional reliability to those who depend on reservoir deliveries.

# Attachment F

# YOU'RE INVITED

Open House Series offered by Loveland Water and Power

# OPEN HOUSE ON

**WEDNESDAY  
MARCH 6**

**FROM 5:30-6:30PM**

295



**SERVICE CENTER - 200 N. WILSON AVE. LOVELAND**

Join us for a short presentation about your residential utility rates and rebate programs offered by Loveland Water and Power. Take the opportunity to get your questions answered by utility staff!

**88**

All attendees receive a special care package.



More information at: [www.cityofloveland.org/LWP](http://www.cityofloveland.org/LWP) or call: (970)-962-3000





**CITY OF LOVELAND**  
WATER & POWER DEPARTMENT  
200 North Wilson • Loveland, Colorado 80537  
(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

**AGENDA ITEM:** 9

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Greg Dewey, Civil Engineer – Water Resources



**TITLE:** Status of Forest / Watershed Health Efforts

**DESCRIPTION:**

This is a summary of forest management efforts related to benefitting municipal water supplies.

**SUMMARY:**

Recently, Loveland decided to contribute \$100,000 to the City of Greeley to share the cost of the High Park Fire mitigation in the Buckhorn Creek watershed (See Attachment 1). This is the latest in many actions related to forest management efforts related to benefitting water supplies.

In 2006, Denver Water, the Colorado State Forest Service and the U.S. Forest Service started an assessment of wildfire hazards on the Front Range. Findings were presented in August 2007 to a group of Front Range Water Providers as well as the American Association of Water Works. From that meeting the Front Range Watershed Wildfire Protection Working Group (WWPWG) was started. Accomplishments of this group through 2009 are listed on Attachment 2 and Attachment 3. This group gained a renewed momentum with the devastating wildfire season of 2012. The minutes of the latest group meeting are in Attachment 4.

The U.S. Forest Service and the Colorado State Forest Service continue to provide information. For example, Attachment 5 is a press release regarding 2012 forest health. And Attachment 6 is a white paper summarizing the U.S. Forest Service's role in Water and Watershed Stewardship.

**RECOMMENDATION:**

Information item only. No action required.

**REVIEWED BY DIRECTOR:** *MS for SA*

**ATTACHMENTS:**

- 1 – Press Release regarding \$100,000 from Loveland to Greeley
- 2 – Front Range WWPWG – Strategy and Action Plan
- 3 – Appendix A – WWPWG Accomplishments, dated February 8, 2010
- 4 – WWPWG minutes from January 25, 2013
- 5 – Press Release regarding 2012 forest health survey
- 6 – U.S. Forest Service's Role in Water and Watershed Stewardship



# Attachment 1

**FOR IMMEDIATE RELEASE**  
February 12, 2013  
Loveland Water and Power

**Contact for Media Relations:**

Greg Dewey  
Loveland Water and Power  
200 North Wilson Avenue  
Loveland, CO  
970-962-3717  
[greg.dewey@cityofloveland.org](mailto:greg.dewey@cityofloveland.org)

## **Media Advisory: City of Loveland**

**Loveland, Colorado:** On November 6, 2012, the Loveland City Council approved a donation from the City of Loveland to the City of Greeley in the amount of \$100,000 to share the cost of wildfire mitigation on approximately 494 acres of identified burned areas in the Stove Prairie, Red Stone Creek and Paradise Park areas within the Buckhorn Creek drainage. The City of Greeley entered into a contract with Western State Reclamation for mitigation work along areas of the Buckhorn Creek affected by the High Park Fire to protect Greeley's water source from pollution caused by fire-related runoff and to protect the Big Thompson River from ash-filled "black water" flows.

Loveland's water source on the Big Thompson River is not affected by the High Park Fire because Loveland's diversion point is above the Big Thompson River's confluence with Buckhorn Creek. However, Loveland will benefit from the reclamation work because Greeley stores some of its water in reservoirs in Loveland including Lake Loveland, Horseshoe Lake, Rist Benson Lake, George Rist Reservoir, Boedecker Lake and Boyd Lake. If left untreated, Loveland could expect to see "black water" flows during snowpack and runoff events and also in the lakes.

The City of Greeley has paid more than \$1.9 million for mitigation resulting from the High Park Fire. Greeley's net cost for work in the Buckhorn Basin is currently \$443,593. The \$100,000 contribution came from the City of Loveland Water Utility.

###



# Attachment 2

## FRONT RANGE WATERSHED WILDFIRE PROTECTION WORKING GROUP

### A STRATEGY AND ACTION PLAN FOR PROTECTING COLORADO'S FRONT RANGE WATERSHEDS FROM HIGH-SEVERITY WILDFIRES

**Purpose:** A strategy and action plan that will help guide the successful implementation of strategic goals aimed at protecting critical Front Range watersheds by reducing the threat of high-severity wildfires and their potential impacts on water collection, storage, transportation system infrastructure and watershed function.

**Background:** the following documents provide information and background (1) Pinchot Institute Assessment Report or Executive Summary, (2) Report or Executive Summary of A Technical Approach to Watershed Assessment and Prioritization (3) Critical Community Watershed Wildfire Protection Planning (CWP2): These documents are available at [http://www.frftp.org/docs/FINAL\\_Protecting\\_Front\\_Range\\_Forest\\_Watersheds\\_081407.pdf](http://www.frftp.org/docs/FINAL_Protecting_Front_Range_Forest_Watersheds_081407.pdf)

**Introduction:** During 2006-07, Denver Water, the Colorado State Forest Service, and the U.S. Forest Service contracted with the Pinchot Institute, a conservation organization in Washington, D.C., to assess wildfire hazards on the Front Range and develop an initial report on the risk to watershed values and water collection, storage, and transport infrastructures within ten counties along the Front Range.

Findings from this assessment and report were presented in August 2007 to the major Front Range water providers including Denver Water, Colorado Springs, Aurora, Westminster, Boulder, Fort Collins, Northern Colorado Water Conservancy District, and FRICO. This assessment revealed, among other things, that within these counties and major watersheds, more than 2 million acres were classified as high hazard for wildfire and, potentially, to subsequent erosion and sedimentation; all major collection, storage, and transportation infrastructures are threatened; the current level of forest treatments are inadequate to address these hazards; and that increasing the level of forest treatments on a significant scale within the watersheds will require a considerable increase in funding above current levels.

Because key water providers and land management agencies are concerned about the increasing threat of wildfire to our watersheds, they agreed it would be beneficial to establish a Watershed Wildfire Protection Working Group (Work Group) to evaluate ways to reduce the risks outlined in the Pinchot Institute report. The key water providers and management agencies also offered additional comments to be considered. They felt it would be beneficial to coordinate this effort with the Front Range Roundtable.

In the fall of 2007, the Front Range Watershed Wildfire Protection Working Group established three workgroups to expand on the Pinchot Institute assessment and report, and assembled comments to develop a strategic action plan that would help guide successful implementation of strategic goals. After a year of coordinated effort, on March 18, 2009, the Work Group presented its accomplishments and a report to a list of invitees that was similar to the August 2007 meeting. The meeting was followed by discussion and a list of next steps for the Work Group to consider. The information was used to inform the development of a list of actions necessary to address the continuing watershed protection effort. The Work Group has re-adjusted its three sub-work

# **Attachment 2**

groups to take on the next steps work identified during the March 18, 2009, meeting. The following is a revised Watershed Wildfire Protection Strategy that will expand efforts to implement the overall goals and objectives that will help protect critical watersheds from high-intensity wildfires.

## **THE WATERSHED WILDFIRE PROTECTION STRATEGY (Revised June 22, 2009)**

### **I. Strategy Goals**

1. Reduce the potential impacts and effects of high-severity wildfires on water users in the most critical Front Range watersheds through a variety of forest management practices, including, but not limited to, forest thinning, harvests, fuelbreaks, prescribed fire, and natural use of fire.
2. Develop and implement a plan to mitigate the potential effects of post-fire impacts on sixth-level watersheds that supply water to the Front Range.
3. Expand information and presentations to water users throughout Colorado to further address the impacts of high-severity wildfires in critical watersheds.

### **II. Strategy Objective**

1. Further assess watersheds critical to Front Range communities to develop a prioritized ranking of their sixth-level sub-watersheds for treatment through a Critical Community Wildfire Protection Plan (CWP)<sup>2</sup>.

### **III. Strategy Actions (develop specifics within workgroups)**

1. Develop and implement fifth-level watershed assessments to reduce wildfire risk and protect priority sixth-level watersheds.
2. Develop and maintain a strong coalition(s) among diverse interest groups, including those established through the Front Range Roundtable process.
3. Increase public awareness and understanding.

# Attachment 3

## APPENDIX A WATERSHED WILDFIRE PROTECTION STRATEGY WORKING GROUP ACTIONS AND ACCOMPLISHMENTS 9/30/2007 TO 12/30/2009 FEBRUARY 8, 2010

### General Accomplishments

- Pinchot Institute Assessment/Report completed June 2007; posted at [www.frftp.org](http://www.frftp.org).
- Presentation to key water providers and land management agency leadership in August of 2007; notes available at [www.frftp.org](http://www.frftp.org).
- Organized the Front Range Watershed Wildfire Protection Working Group and three sub-workgroups in September 2007; notes available at [www.frftp.org](http://www.frftp.org).
- Watershed Wildfire Protection Planning sub-workgroup completed implementation guidelines for Critical Community Watershed Wildfire Protection Plans (CWP)<sup>2</sup> in June 2008.
- Community and Outreach sub-workgroup developed a strategy for broader public support and produced numerous articles for target trade publications that focus on water quality and quantity issues; produced several one-page informational documents to hand out at presentations.
- A presentation on the watershed wildfire protection process was made at the 2008 EPA regional conference.
- The Data Refinement and Watershed Assessment sub-workgroups developed an assessment template to prioritize fifth-level watersheds and identify critical sixth-level watersheds that supply municipal water; identified fuels reduction treatment for protecting these watersheds and completed the assessment report in February 2009.
- On March 18, 2009, the Front Range Watershed Wildfire Protection Working Group made a presentation to key water providers and land management agency leadership about its accomplishments over the past year. Water Providers and agency leadership identified next steps for the workgroup, which were used to develop additional strategies and actions.
- Denver Water, Colorado Springs Utilities, Aurora, other water providers and the US Forest Service began watershed assessments in April 2009 (see listing at the end of this document).
- The CSFS, through its contract with Denver Water, has been gathering data and other information, preparing maps, and developing a prospective list of stakeholders for the development of the Strontia Springs (CWP)<sup>2</sup>.

### Watershed Assessments completed or underway using the process developed by the Front Range Watershed Wildfire Protection Working Group (developed by the Data Refinement Workgroup) as of January 2010

- Completed watershed assessments
  - Upper South Platte
  - Blue River
  - Upper Colorado Headwaters
  - Pikes Peak
- Watershed assessments near completion
  - Arkansas Headwaters
  - Saint Vrain

# Attachment 3

- Watershed assessments just underway  
South Platte Headwaters
- 13 watershed assessments are part of the US Forest Service Bark Beetle Incident (BBI) work that will be completed through the Composite Ranking only and without the Stakeholder process  
Eagle River  
North Platte Headwaters  
Upper North Platte  
Upper Yampa  
Little Snake  
Medicine Bow  
Upper Laramie  
Big Thompson  
Cache La Poudre  
Lower Colorado Headwaters  
Clear Creek and Bear Creek  
Upper Lodgepole and Crow  
Upper White  
(The Roaring Fork may be added to the above list)

# Attachment 4

## Watershed Wildfire Protection Group Meeting Minutes

January 25, 2013; 0900-1500; US Forest Service Regional Office Auditorium

- 1.) Introductions
- 2.) Revisit 21 Goals of the WWPG Mission from the Restart Meeting on 26 Oct 2012.
  - Watershed Management: CSFS High Priority(#5; 2-way tie)
  - State Action Plan-Watershed Driven(#3)
  - Key State Forestry Legislation (Biomass Watershed and Wildfire Related)
  - Existing Watershed Assessments
  - Connect Implementers with Funders (#2)
  - Leverage Funding Between Cooperators(#4)
  - Increase Treatment on Non-Federal Land(#5; 2-way tie)
  - Increase Outreach Awareness Throughout the State(#1)
  - 3 Buckets of Activity: Implementing, New, Future
  - Implementing 15 Watershed Assessments
  - Engage CWPP Regarding Water Assessments
  - Integrate CWPP's into Watershed Assessments
  - Soil and Water Processes – Consider Road Sediment
  - Collaborative "Marquis" Project
  - Pre and Post Activities – Proactive vs. Reactive
  - Identify Obstacles and Barriers and How We Overcome Them(#6; 3-way tie)
  - Merge "Green Trees" and "Dirt in River"
  - Community Based Prioritization of Treatments(#6; 3-way tie)
  - Create a Mission and Vision for the Group. How Are We Going to Lead, Empower, and Be Good Stewards?(#7)
  - Develop a Template to Identifying the Various Players and Their Roles to Implement-Funding and Permitting(#6; 3-way tie)
  - What Audiences Are We Targeting?
  - = Top Ten Focus Areas/Goals (#rank) - from survey
- 3.) Scott Woods, CSFS: In reference to the "Mission Prioritized List" – It would be an interesting exercise from all of the various stakeholders in the room. Once we have this prioritized list as a group, we can get a sense of where each of the entities are at in regards to these target items so we can figure out how

# Attachment 4

to share status and share capacity as a group. I think some of the ability to cooperate and interact towards each organization depends on what their approach is to these things. The quicker that we can get to an understanding on a base level what each of the entities piece of the pie is, the better we can interact. Which leads to the funding, the implementers, and getting stuff done on the ground. I think that's a big first step.

- 4.) Rich Edwards, CSFS – “Restart Meeting” Two Main Points:
  - WWPG decided the focus should switch from a Front Range focus to a statewide focus.
  - WWPG should strengthen relationships between water providers and the agencies.
- 5.) Rich Edwards, CSFS – Recent MOU signed between the Northern Colorado Water Conservation District, the USFS, the Bureau of Reclamation, and CSFS regarding management of watersheds and forest health.
- 6.) Jerry Gibbens, NCWCD – Brief overview of Northern Water and the Big Thompson Project:
  - MOU initiated by Secretary Harris Sherman
  - MOU completely signed by December 2012
  - MOU – “Restore forest and watershed health and replan post wildfire response to protect CBT facilities and water supplies.”
  - Northern Colorado Water Conservation District was established in 1937 under the Water Conservancy Act in the State of Colorado. Established to contract with the Bureau of Reclamation in building the Colorado Big Thompson Project.
  - CBT was constructed by the Bureau of Reclamation in 1938 – 1957. The project was completed in 1957.
  - CBT Project provides supplemental water to Northern Colorado.
  - Approximately 640,000 acres of irrigated farm land within our district; 850,000 people live within the district.
  - To agricultural communities we provide 5-30% of the water supply; to municipalities we provide 30-60% of the water supply.
  - CBT Project: Diverts water from the Western Slope of Colorado (Granby) → To the Eastern Slope of Colorado. District runs from north of Fort Collins up to Wyoming, to Broomfield and even to Nebraska. District includes 8 counties.
  - Lake Granby is the second largest storage reservoir in the state of Colorado. Holds 500,000 ac/ft.

# Attachment 4

- West Slope Watershed: Collection starts from the headwaters of the Colorado River -> Grand Lake -> Shadow Mountain Reservoir -> Lake Granby -> pumped from Lake Granby back into Shadow Mountain Reservoir -> through Grand Lake -> Adams Tunnel. Anything above Lake Granby is our key water supply. 70% of our water is collected from here. Willow Creek Drainage is also pumped into Lake Granby. Windy Gap Reservoir diverts water from the Colorado River/ Frasier River and is pumped into Lake Granby as well.
- Lake Granby is surrounded by poor health lodgepole pine, beetle kill trees.
- East Slope Watershed: Adams Tunnel -> Mary's Lake -> Lake Estes. Another key water supply is anything above Lake Estes (primarily in RMNP). Lake Estes -> Hydropower Plants -> 1.) Delivered South: Carter Lake 2.) Delivered North: Horsetooth Reservoir (FC, Greeley).
- CBT generates power for 58,000 homes
- CBT Deliveries: 66% Agricultural; 34% Municipalities and Industrial
- CBT Ownership: 67% by Municipalities and Industrial; 33% Agricultural
- RMNP sits in the middle of our watershed. Their management objectives aren't tied to water supply necessarily.
- Key MOU Goals: 1.) Protect Infrastructure (Dams, Power Lines, Power Plants/ Pump Stations, Canals/ Pipelines) and 2.) Protect Water Quality (Sediment, Ash, Organic Carbon)
- Jerry Gibbens – Northern Water; 970.622.2299; [jgibbens@northernwater.org](mailto:jgibbens@northernwater.org)

7.) Lady From the Crowd Q to Hal Gibbs, USFS: – I know the Frasier Experimental Forest has done some work on timber harvesting patterns that actually can increase water yield. Option? A: There's a misconception about what the work in the Experimental Forest showed. If you harvest 25% of watershed, in that sub- watershed there is a measurable increase in water yield from doing that. But once you move down to the next watershed it gets lost in the year to year fluctuation. Not obvious that timber harvest could have a substantial increase. More large openings would be a good thing not only from a water stand point, but from a forest health sustainability approach. The challenge is how to accomplish those large openings. We could use prescribed fire as a tool on a broad basis. Some of the adverse effects you're trying to avoid may actually come to be because of the prescribed fire so you have to be very careful. Doing it in lodgepole pine forest is relatively a risky thing.

8.) Lucy Maldonado, BOR – Infrastructure Protection a Critical Concern

# Attachment 4

- Electrical power to water operations is critical. A lot of our facilities are operated remotely.
- If during a wildfire the power lines are damaged, that can impact our ability to operate the system. The other concern is if we can't access it remotely then we have to be able to access the system manually. A wildfire could close the road due to it being in a high burn severity area. Access to get to the facilities to operate them manually is important as well as protecting the electrical system.
- BOR - "Water and Power for the Western United States"
- CBT provides 1 billion recreational user days on our facility.
- NEPA Regulation - Debris Management
- Mandate: Required to have a fire management plan for each of our facilities by 2018.

9.) Hal Gibbs, USFS - This is a unique MOU because it includes the CSFS. There's a lot of private land around the reservoirs. We're looking at NW and BOR providing funding to the CSFS to do treatments on private land. It's a bit of a change from the past.

10.) Ron Cousineau, CSFS - Granby District will be implementing these plans on non - federal lands. It's a great opportunity as a forester; I can now look past the last 15 years of beetle mitigation and fuel projects and start focusing on watershed projects once again.

11.) Scott Woods, CSFS - CSFS Mission Statement is about outreach education, fuels mitigation, and forest health. Even though a private land base within a particular MOU area is fairly small, it would still be great for us to be involved because of what we bring to the table.

12.) Shawna Crocker, CSFS - Outreach Upcoming Events:

- Fairplay High School Hosting an Energy Workshop
- "Watershed: Exploring a New Water Ethic for the New West" - showing a free screening at REI January 28, 2013

13.) Lucy Maldonado, BOR - One of the things we've learned from the Hayman Restoration Project Model that we have been applying to Waldo Canyon, is sediment catchment basins. We've been putting them on national forest lands to protect facility infrastructure. We did it under the emergency declaration so we didn't need NEPA.

14.) Hal Gibbs, USFS - If you can get an emergency permit from the Army Corps of Engineers after a fire that's really what you should do. If we have NEPA dealt with upfront, then we don't have to worry about if it's an emergency or not. Our approach is where

# Attachment 4

and what will work. I'm not confident that the sediment traps will work everywhere.

15.) Unknown Speaker – Even with the condition of the Hayman Fire that was ten years ago we're still one cloud bust in any one drainage away from a catastrophe again. We're lucky there was no decomposed granite on the High Park Fire because that really creates issues for drainage.

16.) Unknown Speaker – Does it help to have an MOU document in creating collaboration between agencies? The process leading to the signing and other ideas that develop lead you on your path. To CSFS it really is valuable in helping us kick start the project and get the work done. It's a vehicle. We're still working towards an interagency agreement in transferring of funds. Having a MOU hopefully will help the approval process.

17.) Rich Homann, CSFS – "CO WRAP" Colorado Wildfire Risk Assessment Portal

- The Colorado Risk Assessment is the foundation for the data layers of CO WRAP.
- CO WRAP is a web based mapping tool that uses data in the risk assessment and makes it available to anybody who has internet access.
- Its purpose is to inform decision makers or landowners of various risks and what you can do to mitigate it.
- Various assessments: surface fuels, canopy fuel characteristics, vegetation, topography, values at risk, fire occurrence, WUI drinking water, forest and riparian assessments and their resource response to a wildfire, fire suppression difficulty rating, wildfire threats, wildfire risks, and wildfire intensity scale.
- Maps will generate a summary report with all of the data you requested.
- You can import/export GIS layers from these maps.
- To access this risk assessment tool go to:  
<http://coloradowildfirerisk.com/>
- This will be available to the public the first week of March, 2013.

18.) John Bustos – WWPG Draft Mission Statement

- Vision – Protect Colorado water supplies from catastrophic wildfire threats.
- Mission – To reduce wildfire damages to critical infrastructure and water supplies.

# Attachment 4

## 19.) Topics of Discussion for Next Meeting:

- Actions 3-5
- Partnering Agencies – Defining What We Can Do
- Matrix of Organizations – Roles and Responsibilities Under Tasks

### Meeting Attendance List

<u>Name</u>	<u>Organization</u>
Alan Ward	Pueblo Board of Water Works
Anne Beierle	City of Golden
Berten Weaver	Clear Creek County
Brad Piehl	JW Associates
Chris Sturm	Colorado Water Conservation Board
Chuck Dennis	West Range Reclamation
Claire Harper	USFS R2 Regional Office S&PF
Craig Jones	CDJ Forestry Services
Dave Hard	Colorado Emergency Management
Dave Lighthart	Evergreen Metro District
Don Kennedy	Denver Water
Greg Dewey	City of Loveland
Hal Gibbs	USFS Arapahoe Roosevelt NF
Jerry Gibbens	Northern Water Conservancy District
Jill Ozarski	Senator Mark Udall
Jim Shelley	City of Boulder
John Duggan	Colorado Dept. Public Health & Environment
Jonathan Bruno	Coalition for the Upper South Platte
Justin Pipe	Colorado Dept. of Transportation
Kristy Muskopf	Colorado State Forest Service
Kyle Hamilton	CH2M Hill & South Platte Enhancement Board
Lucia Machado	Colorado Dept. Public Health & Environment
Lucy Maldonado	Bureau of Reclamation
Mark Martin	US Forest Service
Mike McHugh	Aurora Water
Paul Langowski	USFS R2 Regional Office
Rich Edwards	Colorado State Forest Service
Rich Homann	Colorado State Forest Service
Rodney Hansen	Soldier Canyon Filter Plant
Ron Cousineau	Colorado State Forest Service
Russell Clayshulte	Bear Creek Association
Sally Edwards	Xcel Energy
Sara Mayben	USFS Pike San Isabel NF
Scott Ellis	Colorado Dept. of Transportation
Scott Woods	Colorado State Forest Service
Shawna Crocker	Colorado State Forest Service
Travis Warziniack	USFS Rocky Mtn. Research Station
Trent Hyatt	Clear Creek County

# **Attachment 4**

Total Number of Participants = 38; 26 organizations



# Attachment 5



## NEWS RELEASE



**USDA Forest Service**  
**Rocky Mountain Region**  
740 Simms Street Golden, CO 80401  
**Contact:** Chris Strebig, 303-275-5346

**Colorado State Forest Service**  
3843 LaPorte Avenue  
Fort Collins, CO 80523  
**Contact:** Ryan Lockwood, 970-491-8970

### **U.S. FOREST SERVICE AND COLORADO STATE FOREST SERVICE ANNOUNCE RESULTS OF 2012 AERIAL FOREST HEALTH SURVEY**

**DENVER, Feb. 6, 2013** — The U.S. Forest Service and Colorado State Forest Service today released the results of the annual aerial forest health [survey](#) in Colorado, which indicates that the spread of the mountain pine beetle epidemic has slowed dramatically, while the spruce beetle outbreak is expanding.

The mountain pine beetle epidemic expanded by 31,000 acres, down from last year's reported increase of 140,000 acres. This brings the total infestation to nearly 3.4 million acres in Colorado since the first signs of the outbreak in 1996. Most mature lodgepole pine trees have now been depleted within the initial mountain pine beetle epidemic area. However, the infestation remains active from Estes Park to Leadville.

In contrast, the spruce beetle outbreak is expanding, with 183,000 new acres detected in 2012, bringing the total acreage affected since 1996 to nearly 1 million acres (924,000). The areas experiencing the most significant activity are on the San Juan and Rio Grande National Forests in southern Colorado. Spruce beetles typically attack spruce trees downed by high winds. Once the populations of spruce beetles build up in the fallen trees, the stressed trees surrounding them offer little resistance to attack. Similar to mountain pine beetle, the increase in spruce beetle activity is due to factors that increase tree stress, including densely stocked stands, ongoing drought conditions and warmer winters.

"Now more than ever it is important that we work across the entire landscape to ensure forests are more resilient for generations to come," said Dan Jirón, Regional Forester for the U.S. Forest Service, Rocky Mountain Region. "A vibrant forest products industry, aggressive community actions, strong collaborative efforts and targeted high-priority projects will allow us to make progress to promote forests more suitable for an uncertain future climate."

"The spruce beetle epidemic in our high-elevation forests demonstrates the breadth and complexity of issues affecting Colorado's forests," said Joe Duda, Interim State Forester and Director of the Colorado State Forest Service. "Active forest management and a viable forest products industry will allow landowners and land management agencies to expand forest treatments on lands available for management, while reducing wildfire risk and protecting important natural resources and infrastructure."

# Attachment 5

In late 2012, two 10-year stewardship contracts were awarded by the U.S. Forest Service to improve forest resiliency on 20,000 acres affected by the mountain pine beetle on the Medicine Bow-Routt and White River National Forests. These contracts are in addition to the Front Range and Pagosa Springs Long-Term Stewardship Contracts awarded previously. The contracts reduce forest health treatment costs and foster new uses of beetle-killed forest products to benefit forest resiliency and jobs.

The forest products industry is better positioned as mills come on line to take advantage of trees being removed from forested lands across Colorado. The U.S. Forest Service, Colorado State Forest Service and partners are working to provide a reliable and predictable supply of biomass for new markets.

“Over the past several years, the Forest Service has worked with local, state and private partners to increase our collective ability to improve forest health and reduce wildland fire and public safety risks,” said Jirón. “From encouraging biomass projects, to aggressively treating beetle-killed trees near communities, and partnering to protect water resources, the Forest Service is working to efficiently fund projects to treat as many priority forested acres as possible.”

Through the passage of legislation in recent years, the Colorado General Assembly has supported forest management actions that demonstrate community-based approaches to forest restoration and watershed health. The Colorado Forest Restoration Pilot Grant Program is a cost-share program that provides funding for up to 60 percent of the total cost for projects. To date, more than \$4.7 million in state funds and another \$1 million in leveraged federal funds have been awarded to 86 projects across the State. Those funds additionally leveraged more than \$8 million in matching funds to restore more than 12,000 acres of forest. In addition, the 17 projects currently in progress will result in treatments on another 1,200 acres.

###

# Attachment 6



U.S. Forest Service • Rocky Mountain Region



## U.S. Forest Service's Role in Water and Watershed Stewardship

### On Public Lands

- Manage 193 million acres of national forests & grasslands that contain 400,000 miles of streams, 3 million acres of lakes, many aquifer systems.
- Serve as the largest single managed source of drinking water in the US - 18% of the nation's supply.
- Maintain over 90,000 water rights in cooperation with states.
- Care for the survival of more than 700 rare, threatened and endangered aquatic species.
- Provide outdoor recreation to more than 130 million visitors per year at and near streams, lakes, snow and other water-related resources.
- Support access and operations of over 200 hydroelectric facilities.
- Protect or enhance watershed health through forest management.
- Address major watershed health and disturbance issues such as insects, disease, wildfires, tornadoes, hurricanes, floods, drought, chemical spills, erosion, gullies, landslides and others.
- Develop partnerships to protect, enhance, and restore forested watersheds.

### On Private Lands

- Help land owners, water utilities, and communities protect and manage the forest lands that most citizens rely on for their drinking water.
- Collaborate with state and local governments, NGO's and private land owners to protect, enhance, and restore forested watersheds.
- Promote the use of agroforestry practices in agricultural watersheds.
- Assist urban communities (where 80% of the population lives) to conserve, expand and manage green infrastructure to reduce development impacts.
- Work to permanently conserve open space critical to watershed health.
- Detect, suppress, eradicate or prevent destructive forest pests and invasive species that threaten watershed health.
- Work with communities to reduce wildfire's risk to priority watersheds.

FOR MORE INFORMATION:  
US Forest Service  
Rocky Mountain Region  
740 Simms Street  
Golden, CO 80401  
303-275-5354  
[www.fs.usda.gov/r2](http://www.fs.usda.gov/r2)  
Twitter:  
#USFSRockyMtns

# Attachment 6

## U.S. Forest Service's Role in Water and Watershed Stewardship

In Science and Education	<ul style="list-style-type: none"><li>• Continue long-term research studies and maintain experimental watersheds that increase understanding of water resources and watershed processes.</li><li>• Conduct investigations of water and watersheds affected by new and emerging issues, including climate change, land use change, natural disturbances, energy development, water management, and the cumulative effects of multiple stresses on water resources.</li><li>• Provide information on the effects of land and water management and innovative solutions to complex environmental issues.</li><li>• Develop methods and strategies for improving impaired waters and degraded watershed conditions.</li><li>• Monitor trends in air, water and forest health, condition, and extent, and evaluate socio-economic forces influencing forests and watersheds.</li><li>• Provides tools and training for watershed management and restoration.</li></ul>
Around The World	<ul style="list-style-type: none"><li>• Work with US international agencies, other countries, and non-profit partners to assist countries around the world in protecting and managing important forests, watersheds, and ecosystem services.</li><li>• Develop and implement management strategies that protect the mutually beneficial uses of trans-boundary watersheds.</li><li>• Share information and technology around the world to help address public health, response to emergencies, land, water and other issues.</li></ul>



**CITY OF LOVELAND**  
WATER & POWER DEPARTMENT  
200 North Wilson • Loveland, Colorado 80537  
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**AGENDA ITEM:** 10  
**MEETING DATE:** 2/20/2013  
**SUBMITTED BY:** Kim O'Field, Technical Specialist

**TITLE:** Electric Legislative Update

**DESCRIPTION:**

This item and the attachment are intended to give a brief update on electric-related legislation being contemplated by the Colorado General Assembly. Loveland staff relies primarily on the Colorado Association of Municipal Utilities (CAMU) for information on electric-related legislation.

**SUMMARY:**

*State Update*

The First Session of the 69th General Assembly convened Wednesday January 9, 2013. The first few days were filled with the swearing in of Senate and House members, opening day speeches from leadership, the Governor's annual State of the State speech and the Chief Justice's State of the Judiciary speech.

A record 34 new members were sworn into the House and Senate. Eight of these are transfers from the House to the Senate, regardless there are a lot of new faces, names and players at the Capitol. There is virtually a new roster of members on each of the committees in both houses.

Perhaps the only constant this session is Governor Hickenlooper who begins the third year of his first 4-year term and his third legislative session. Unlike the prior two sessions, he will be faced with strong Democratic majorities in both houses and likely have to manage and make decisions on political fringe issues from some of the traditional Democratic constituencies, including environmentalists, labor unions and the plaintiffs' attorney bar. In his State of the State speech, the Governor discussed several key areas including extolling the improvement of the State's economy and tax receipts, improved job outlook, more efficiencies in state government and the importance of setting aside political differences to work together in bipartisan fashion. Although the speech was primarily a 30,000-foot view of the state, he did urge support for a list of specific policy proposals, including expansion of Medicaid, improved fire mitigation, insurance reforms, universal background checks for all gun sales, civil unions, child welfare improvements, reduced in-state tuition for children of undocumented aliens, enterprise zone changes and constitutional reforms to address the TABOR, Gallagher and Amendment 23 conundrum.

In addition to the issues mentioned specifically by the Governor, a long list of policy challenges looms over the Capitol this session, potentially including school finance reform, gun control changes, a structure for the recent voter-passed Amendment 64 legalization of marijuana, oil and gas regulatory reforms and possibly changes to collective bargaining and tort reform.

To date a relatively small number of bills have been introduced and there are not many that merit CAMU's interest at this time. I have attached a legislative tracking sheet for your review which includes CAMU's current position on each tracked bill.

**Metrics:**

Total bills introduced (01/16): 166 Total bills tracked: 15 (9% of total)

Tracked bills defeated: 0 (0%) Tracked bills signed into law: 0 (0%)

**Positions on Active Bills:**

Monitor – 11

Amend – 1

Oppose – 2

Deliberating – 1

**RECOMMENDATION:**

Information item only. No action required.

**REVIEWED BY DIRECTOR:** *MS for SA*

**ATTACHMENTS:**

Attachment 1: CAMU Legislative Tracking Sheet



Colorado Assn. of Municipal Utilities  
2013 State Legislation of Interest

**CAMU**

**HB13-1027**

**PUC Director Report To GA On Rate Cases**

**Comment:**

**Position:** **Monitor**

**Short Title:** PUC Director Report To GA On Rate Cases

**Sponsors:** CONTI

**Summary:** The bill requires the director of the public utilities commission (PUC) or the director's designee to report annually to the joint house and senate transportation committees regarding matters discussed on the record in energy rate case hearings that were decided by the commission during the immediately preceding 2 years. For all rate cases included in the report, the bill directs the commission to estimate the economic impact of the rates involved, including the average increase or decrease in ratepayers' monthly bills.

**Status:** 02/08/2013 Introduced In Senate - Assigned to Transportation

**Amendments:**

**Status History:** [Status History](#)

**HB13-1037**

**Cost Of Providing Public Records Under CORA**

**Comment:**

**Position:** **Monitor**

**Short Title:** Cost Of Providing Public Records Under CORA

**Sponsors:** SALAZAR

**Summary:** In determining the fee that a custodian of public records is authorized to impose under the "Colorado Open Records Act" (CORA) for the copying of a public record, the bill provides that the fee may not exceed the actual costs of providing the copy in accordance with existing law as well as an amount representing any additional actual costs necessarily incurred by the custodian in complying with the request as long as any such additional component of the fee is a nominal amount. In connection with any such additional component of the fee as specified in the bill, the following additional requirements apply:

\* A custodian is required to use the least expensive means available to him or her in responding to a request for copying of a public record under CORA;

\* No copying fee imposed under CORA may reflect time spent by the custodian in determining whether the public record at issue is subject to inspection or copying under the act; and

\* No fee imposed under CORA may reflect time spent by a public employee in responding to the request for inspection or copying of a public record if the public employee already receives an hourly wage or other form of compensation for responding to requests for inspection or copying under the act.

**Status:** 01/30/2013 House Committee on Local Government Postpone Indefinitely

**Amendments:**

**Status History:** [Status History](#)

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### [HB13-1041](#)

### Procedures For Transmission Of Records Under CORA

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**Comment:**

**Position:** **Monitor**

**Short Title:** Procedures For Transmission Of Records Under CORA

**Sponsors:** PETTERSEN / KEFALAS

**Summary:** Upon request by a person seeking a copy of any public record for which a right to inspection exists under the "Colorado Open Records Act" (CORA), the records custodian must transmit a copy of the record by United States mail or by any other practicable means of delivery. No fees related to transmission may be charged to the record requester for transmitting public records via electronic mail. The custodian shall notify the record requester that a copy of the record is available but will only be sent to the requester once the custodian receives payment for postage if the copy is transmitted by United States mail, or payment for the cost of delivery if the copy is transmitted other than by United States mail, and payment for any other supplies used in the mailing, delivery, or transmission of the record and for all other costs associated with producing the record. Upon receiving such payment, the custodian shall send the record to the requester as soon as practicable but no more than 3 business days after receipt of such payment.

**Status:** 02/08/2013 Introduced In Senate - Assigned to Local Government

**Amendments:** [Amendments](#)

**Status History:** [Status History](#)

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### [HB13-1090](#)

### Construction Contractor Subcontractor Prompt Pay

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**Comment:**

**Position:** **Oppose**

**Short Title:** Construction Contractor Subcontractor Prompt Pay

**Sponsors:** FISCHER / TOCHTROP

**Summary:** Accelerated release of construction contract retainage to subcontractors is at the center of HB 13-090. The bill eliminates the ability to hold retainage until a project is completed and a final acceptance of the project is approved by the owner - in this case the public entity. Once retainage is released there is no incentive for the subcontractor to return to correct defects. The bill includes a disincentive for subcontractors to agree on costs for change orders by requiring a cost plus 15 percent payment if the parties cannot agree on a price. Compromise was supposedly reached in 2011, and municipalities made major concessions. CML's board will be asked to oppose this unnecessary legislation.

**Status:** 01/17/2013 Introduced In House - Assigned to Business, Labor, Economic, & Workforce Development

**Amendments:****Status History:**[Status History](#)[HB13-1093](#)**Bidding For Local Government Procurement Contracts****Comment:**

**Supercedes HOME RULE and imposes state control over local procurement practices. It also eliminates discretion to sole-source or even to RFP, throwing over everything to a blind, lowest-bidder IFB process, which most states & local governments are moving AWAY from because much professional/service work, at least, is more dependent for value on Quality, not merely lowest cost.**

**Position:****Oppose****Short Title:**

Bidding For Local Government Procurement Contracts

**Sponsors:**

LAWRENCE

**Summary:**

The bill requires an agency of local government (local government) to procure or dispose of supplies, services, or construction through competitive sealed bidding unless the appropriation or expenditure of moneys by the local government for a single contract for the supplies, services, or construction may be reasonably expected not to exceed \$50,000 in the aggregate in any fiscal year. The bill includes an exception to the competitive sealed bidding requirement if the local government does not receive any bids, the agency of local government has rejected all bids, or the responsible officer determines that it is necessary to make procurements or contracts under emergency conditions because there exists a threat to public health, welfare, or safety. The bill prohibits a local government from dividing the procurement or disposal of supplies, services, or construction into 2 or more separate projects for the sole purpose of evading or attempting to evade the competitive sealed bidding requirement.

**Status:**

02/06/2013 House Committee on Local Government Postpone Indefinitely

**Amendments:****Status History:**[Status History](#)[HB13-1110](#)**Special Fuel Tax & Electric Vehicle Fee****Comment:****Monitor****Position:**

Special Fuel Tax &amp; Electric Vehicle Fee

**Short Title:**

FISCHER / JONES

**Sponsors:****Summary:**

The bill makes the following changes to the special fuel tax:

- \* Section 3 of the bill modifies the definition of "distributor" to include persons who sell natural gas, certain fleet operators, and in limited circumstances, public utilities. It also modifies the definition of "gallon" to include gallon gasoline equivalents.
- \* Section 4 lowers the tax rates for compressed natural gas, liquefied natural gas, and liquefied petroleum gas. These rates are phased-in over 6 years.
- \* Section 5 repeals the annual fee that is charged in lieu of the special fuel tax and the related decal system, so that liquefied petroleum gas and natural gas are subject to the special fuel tax. Section 5 also exempts compressed natural gas that is supplied to a user at a residential home from the special fuel tax. This exemption ends on July 1, 2017.
- \* Sections 6, 7, and 8 make conforming amendments related to the preceding changes.
- \* Section 9 requires the department of transportation to prepare and submit a report to the transportation legislation review committee concerning related alternative fuels and

the public roads and highways. The bill requires the director of the division of oil and public safety to promulgate the following rules:

\* Section 2 requires rules for natural gas setting forth standards related to inspections; specifications; shipment notification; record keeping; labeling of containers; use of meters or mechanical devices for measurement; submittal of installation plans; and minimum standards for the design, construction, location, installation, and operation of natural gas systems and equipment and handling of the natural gas; and

\* Section 9 requires rules related to the accurate measurement of liquefied petroleum gas and natural gas. Section 10 requires county clerks and recorders to annually collect a \$30 fee at the time of registration on every motor vehicle that is propelled by plug-in electricity. The money is credited to the highway users tax fund. Upon payment of this fee, a person will receive a decal that the department of revenue creates, and this decal must be attached to the upper right-hand corner of the front windshield on the motor vehicle for which it was issued.

**Status:** 01/18/2013 Introduced In House - Assigned to Transportation & Energy + Finance + Appropriations

**Amendments:**

**Status History:** [Status History](#)

### [HB13-1185](#)

### Low-income Energy Assistance Transfer From Sev Tax

**Comment:**

**Position:** **Monitor**

**Short Title:** Low-income Energy Assistance Transfer From Sev Tax

**Sponsors:** GEROU / STEADMAN

**Summary:** Joint Budget Committee. Current statute provides a schedule that determines when transfers to 3 funds are made in a fiscal year from the operational account of the severance tax trust fund to provide energy-related assistance to low-income households. The bill repeals that statutory section on July 1, 2013. The effect of this repeal is that the transfers for providing energy-related assistance to low-income households will then be made to all 3 funds 3 times in a fiscal year rather than each fund getting only one transfer in a fiscal year. This will help ensure that any proportional reductions that might need to occur as allowed by law are borne equally by the 3 funds throughout the fiscal year. The bill also provides a mechanism for the state treasurer to equalize the distributions for the 2012-13 state fiscal year.

**Status:** 01/31/2013 Introduced In House - Assigned to Public Health Care & Human Services

**Amendments:**

**Status History:** [Status History](#)

### [HB13-1216](#)

### Incentives for Distributed Energy

**Comment:**

**Position:**

**Short Title:** Incentives for Distributed Energy

**Sponsors:** DURAN

**Summary:** Existing law directs the Colorado public utilities commission (PUC) to adopt rules implementing the renewable energy portfolio standards for electric utilities, under which increasing amounts of electricity must be generated from renewable sources. The bill directs cooperative electric associations and municipally owned utilities that

are qualifying retail utilities to derive at least 0.5% of their retail electricity sales for 2016 through 2019, and 1% from 2020 forward, from distributed generation.

Cooperative electric associations and municipally owned utilities must also establish standard offers to purchase renewable energy credits from wind generation. The bill also increases the maximum customer generation capacity for cooperative electric associations so that they may allow net metering for up to 25 kilowatts of residential customer-generated electricity and up to 75 kilowatts of industrial or commercial customer-generated electricity.

<b>Status:</b>	02/04/2013 Introduced In House - Assigned to Transportation & Energy
<b>Amendments:</b>	
<b>Status History:</b>	<a href="#">Status History</a>

<b><a href="#">SB13-003</a></b>	<b>Coal Mine Methane Gas Capture</b>
<b>Comment:</b>	<b>Counts energy generated from coal mine methane as an eligible resource under 40-2-124. Calls for a 50MW cap. Unclear if this is per project or for all projects.</b>
<b>Position:</b>	<b>Monitor</b>
<b>Short Title:</b>	Coal Mine Methane Gas Capture
<b>Sponsors:</b>	BAUMGARDNER / CORAM
<b>Summary:</b>	The bill establishes a greenhouse gas mitigation project involving the capture of coal mine methane gas from active and inactive coal mines. Each kilowatt-hour of energy generated by captured coal mine methane gas is counted as one kilowatt-hour for purposes of compliance with the renewable energy standard.
<b>Status:</b>	01/09/2013 Introduced In Senate - Assigned to State, Veterans, & Military Affairs
<b>Amendments:</b>	
<b>Status History:</b>	<a href="#">Status History</a>

<b><a href="#">SB13-023</a></b>	<b>Increase Damages Caps Under CGIA</b>
<b>Comment:</b>	
<b>Position:</b>	<b>Monitor</b>
<b>Short Title:</b>	Increase Damages Caps Under CGIA
<b>Sponsors:</b>	CADMAN
<b>Summary:</b>	Currently, the "Colorado Governmental Immunity Act" (act) sets as a maximum amount that may be recovered by a person suing a public entity or public employee for loss or injury caused by the entity or employee in any single occurrence, whether from one or more public entities and public employees: * For any injury to one person in any single occurrence, the sum of \$150,000; and * For an injury to 2 or more persons in any single occurrence, the sum of \$600,000, and, in such circumstances, the act prohibits any single person from recovering in excess of \$150,000. To ensure these limitations on damages reflect the effects of inflation since the specific limitations were last increased by the general assembly, the bill increases the damages limitation for any injury to one person in any single occurrence to \$478,000. For an injury to 2 or more persons in any single occurrence, the bill increases the damages limitation to \$990,000 and further specifies that, in such circumstances, a single person is precluded from recovering in excess of \$478,000. The bill further provides that the increased damages amounts are: * Exclusive of interest awarded; and * Adjusted for inflation every 4 years. The bill requires the attorney general to make

this required adjustment on an every 4-year basis commencing January 1, 2018, to certify the amount of the adjustment, and to publish the amount of the adjustment on the attorney general's web site.

**Status:** 01/09/2013 Introduced In Senate - Assigned to Judiciary

**Amendments:**

**Status History:** [Status History](#)

**SB13-025**

## Collective Bargaining Firefighters

**Comment:** **PRPA notes concerns with the on-site fire unit they house at Rawhide. CAMU seeking to amend to exclude this group.**

**Position:** [Amend](#)

**Short Title:** Collective Bargaining Firefighters

**Sponsors:** TOCHTROP

**Summary:** The bill grants firefighters the right to:

- \* Organize, form, join, or assist an employee organization or refrain from doing so;
- \* Negotiate collectively or express a grievance through representatives of their choice;
- \* Engage in other lawful concerted activity for the purpose of collective bargaining or other mutual aid or protection; and
- \* Be represented by their exclusive representative without discrimination. An employee organization recognized or elected for collective bargaining becomes the exclusive representative of all firefighters for collective bargaining. The bill prohibits a fire department from bargaining on matters covered by the act with any other employee or group. The bill grants the exclusive representative the right to be present and express its views at the adjustment of a complaint made by a member of the bargaining unit without the intervention of the exclusive representative. An exclusive representative may have dues and other moneys deducted from the pay of firefighters who authorize the deduction. A fire department and an exclusive representative have to bargain collectively in good faith. Any agreements negotiated between an exclusive representative and a fire department, along with any terms approved by the voters of the political subdivision of the fire department, constitute the collective bargaining agreement between the parties. The bill requires the term of a collective bargaining agreement to be for between one and 3 years unless the parties agree to negotiate and reach a voluntary agreement on all terms of a new contract. The parties have to begin collective bargaining within a specified time after the notice. An impasse is deemed to exist if the parties fail to reach a collective bargaining agreement within a specified time after the beginning of collective bargaining. A collective bargaining agreement may require all members of the bargaining unit, as a condition of employment, to pay the exclusive representative's fees and expenses in negotiating and enforcing the agreement. If an impasse exists, the bill requires the parties to allow an arbitration organization to appoint an advisory fact finder to hold a hearing on the unresolved issues and make recommendations on which party's final offer on each issue should be accepted. The bill specifies the factors that the advisory fact finder must consider. The parties have a specified time to consider the advisory fact-finder's recommendations and conduct further negotiations. If either party rejects the recommendations, the final offers of the parties on the unresolved issues will be submitted to the voters of the political subdivision of the public employer at a special election. The bill prohibits firefighters from striking. Existing bargaining units, exclusive representatives, and bargaining relationships as of the effective date of the bill remain in effect unless modified by agreement or election in accordance with the bill. Firefighters may conduct secret-ballot elections to certify or decertify an employee organization as the

exclusive representative of a bargaining unit. The bill grants a firefighter or an employee organization the right to sue to enforce the provisions of the bill.

**Status:** 02/05/2013 Senate Third Reading Passed

**Amendments:** [Amendments](#)

**Status History:** [Status History](#)

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## [SB13-028](#)

## Track Utility Data High Performance State Building

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**Comment:**

**Position:** **Monitor**

**Short Title:** Track Utility Data High Performance State Building

**Sponsors:** JONES / TYLER

**Summary:** For all state-assisted facilities that complete the design process on or after July 1, 2013, each state agency is required to monitor, track, and verify utility vendor bill data pertaining to the state-assisted facility and annually report to the office of the state architect any necessary information used to ensure that the increased initial costs of the substantial renovation, design, or new construction, including the time value of money, to achieve the highest performance certification attainable are recouped. A state agency may use a commercial utility tracking software for this purpose. The annual report must include information related to building performance based on the state-assisted facility's utility consumption. State-assisted facilities that have achieved the highest performance certification attainable and completed the design process prior to July 1, 2013, are strongly encouraged to monitor, track, and verify utility vendor bill data pertaining to such state-assisted facility to ensure that the increased initial costs to achieve the highest performance certification attainable are recouped.

**Status:** 02/07/2013 Senate Second Reading Laid Over with Amendments to 02/07/2013

**Amendments:** [Amendments](#)

**Status History:** [Status History](#)

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## [SB13-057](#)

## Indep Review Of Solid Wastes Disposal Site App

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**Comment:**

**Position:** **Monitor**

**Short Title:** Indep Review Of Solid Wastes Disposal Site App

**Sponsors:** KING

**Summary:** In order to apply for a certificate of designation to own or operate a solid wastes disposal site and facility, an applicant must submit an engineered design and operations plan (plan) that assesses whether the proposed site and facility complies with regulations of the Colorado department of public health and environment (CDPHE). Currently, CDPHE or, at the applicant's election if given the option by CDPHE, a private contractor, reviews such plans. The bill divests CDPHE of the authority to review these plans, and instead requires applicants to utilize independent private parties to both prepare and review the plans. Completed plans are forwarded to CDPHE and the local governmental body to which the certificate of designation application is made. The bill also shifts the duty to solicit and accept public comments on a plan in an application for a solid wastes disposal site and facility from CDPHE to the governing body having jurisdiction over the application.

**Status:** 01/16/2013 Introduced In Senate - Assigned to State, Veterans, & Military Affairs

**Amendments:****Status History:**[Status History](#)**[SB13-063](#)****Recycled Energy Includes Gas Derived From Waste**


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<b>Comment:</b>	Similar to efforts introduced in 2012. Potential benefits to La Junta and Ft.Collins. CAMU generally supportive of additional qualifying resources.
<b>Position:</b>	<b>Monitor</b>
<b>Short Title:</b>	Recycled Energy Includes Gas Derived From Waste
<b>Sponsors:</b>	GRANTHAM / NAVARRO
<b>Summary:</b>	Currently, recycled energy is a type of eligible energy resource that may be used to meet renewable energy standards. The bill adds to the definition of "recycled energy" the energy that is produced by a generation unit with a nameplate capacity of not more than 15 megawatts that combusts gas generated from synthetic gas derived from waste materials through pyrolysis as the fuel source for generation.
<b>Status:</b>	01/16/2013 Introduced In Senate - Assigned to State, Veterans, & Military Affairs

**Amendments:****Status History:**[Status History](#)**[SB13-126](#)****HOA Condo Apt Electric Vehicle Charging Stations**


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<b>Comment:</b>	
<b>Position:</b>	<b>Monitor</b>
<b>Short Title:</b>	HOA Condo Apt Electric Vehicle Charging Stations
<b>Sponsors:</b>	GUZMAN / DURAN
<b>Summary:</b>	Sections 1, 2, and 3 of the bill prohibit a landlord or the unit owners' association of a condominium or common interest community, respectively, from restricting the right of a tenant or unit owner to install an electric vehicle charging system for his or her own use, at the tenant's or unit owner's expense, and subject to reasonable safety and insurance requirements. Section 4 allows grants to be made from the electric vehicle grant fund to apartment owners, condominiums, and common interest communities to install recharging stations for electric vehicles.
<b>Status:</b>	02/05/2013 Senate Committee on Local Government Witness Testimony and/or Committee Discussion Only

**Amendments:****Status History:**[Status History](#)



**CITY OF LOVELAND**  
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**AGENDA ITEM:** 11

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Greg Dewey, Civil Engineer

*Greg Dewey*

**TITLE:** Water Legislative Update

**DESCRIPTION:**

This item and the attachment are intended to give a brief update on water-related legislation being contemplated by the Colorado General Assembly. Loveland staff relies primarily on the Colorado Water Congress for information on water-related legislation. Their assistance has proved invaluable in providing the following information.

**SUMMARY:**

This item and the attachment are intended to give a brief update on water-related legislation being contemplated by the Colorado General Assembly. Loveland staff relies primarily on the Colorado Water Congress for information on water-related legislation. Their assistance has proved invaluable in providing the following information.

The First Regular Session of the Sixty-ninth Colorado General Assembly convened on January 9, 2013 and will run through May 8, 2013. The Colorado Water Congress, through its State Affairs Committee is currently tracking a handful of house bills and senate bills, all related to water. Attached is an extensive Bill dossier, documenting relevant actions.

Of these, there are three bills that City Staff finds interesting to Loveland:

1. HB-13-1012 CONCERNING THE EXTENSION OF FINANCIAL INCENTIVES FOR WILDFIRE MITIGATION
2. SB-13-019 CONCERNING THE PROMOTION OF WATER CONSERVATION MEASURES
3. SB-13-041 CONCERNING THE PROTECTION OF STORED WATER, AND, IN CONNECTION THEREWITH, PRESERVING SUPPLIES FOR DOUGHT AND LONG-TERM NEEDS

**RECOMMENDATION:**

Information item only. No action required.

**REVIEWED BY DIRECTOR:** *mg for SA*

**ATTACHMENTS:**

Colorado Water Congress, State Affairs Committee, Water Bill Summaries, February 6, 2013





**Colorado Water Congress  
State Affairs Committee  
Water Bill Summaries  
February 6, 2013**

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*For purpose of brevity, the initial summaries of bills are paraphrased from the summaries of the legislative staff bill drafster. When amended in committee or during floor debate, the summaries are revised to reflect those changes with amendments noted in italics. Summaries will be removed when the bills are killed in committee or lost in floor vote. Summaries are intended to be descriptive and are not a legal analysis. For up to date bill status, please refer to the CWC status sheet. These bill summaries are current as of February 6, 2013.*

**HB13-1012 CONCERNING THE EXTENSION OF FINANCIAL INCENTIVES FOR WILDFIRE MITIGATION**

Continues both 1) income tax deduction for a landowner who performs wildfire mitigation measures on private land in a wildland-urban interface area and 2) authority of the Colorado water resources and power development authority to issue bonds to fund watershed protection and forest health projects.

Sponsors: *Gerou and Levy/Roberts and Nicholson*

**HB13-1013 CONCERNING LIMITATIONS ON A LANDOWNER'S ABILITY TO IMPOSE CONDITIONS ON A WATER RIGHT OWNER AS A CONDITION OF PERMISSION TO USE LAND**

Prohibits a landowner from demanding, or a court from ordering, transfer of, or limiting alienation of, a water right as condition of granting a right of way or special use permit and makes such agreements void and unenforceable.  
*Amended in committee to apply restrictions only to federal agencies, by substituting "United States" for "landowner."*  
Sponsors: *Sonnenberg/Baumgardner*

**HB13-1018 CONCERNING THE BENEFICIAL USE OF PRODUCED WATER FOR DUST SUPPRESSION**

Gives Solid and Hazardous Waste Commission exclusive jurisdiction to regulate beneficial use of produced water from oil/gas operations for dust suppression on rural roads. Directs the Commission to adopt rules/standards to prevent water contamination and protect public from exposure to naturally occurring radioactive materials in water.

Sponsor(s): *Coram*

**HB13-1044 CONCERNING THE AUTHORIZATION OF THE USE OF GRAYWATER**

Defines graywater as that portion of wastewater that, before being treated or combined with other wastewater, is collected from fixtures within residential, commercial, or industrial buildings or institutional facilities for the purpose of being put to beneficial uses authorized by the water quality control commission. Graywater use must be in accordance with terms and conditions of applicable decrees and decrees, and all state, federal and local requirements and only as authorized by cities and municipalities.

*Sponsors: Fischer/Schwartz*

**HB13-1090 CONCERNING PAYMENT OF AMOUNTS DUE UNDER A CONSTRUCTION AGREEMENT**

Sets new standards for public and private construction contracts and voids any contract terms that fails to comply with the statutory requirements: Requirements include: regular progress payments every 30 days; submittal of progress payment invoices plus required documents; transmittal of progress payment from contractor to subcontractor within 5 days or end of billing cycle; interest on unpaid progress payments; extension of billing cycle to 60 days if contract warns; limit of 5% retainage on each progress payment. Additional requirements.

*Sponsors: Fischer/Tochtrup*

**HB13-1130 CONCERNING EXTENDED OPERATION OF INTERRUPTIBLE WATER 102 SUPPLY AGREEMENTS**

Allows the state engineer to reapprove operation of an interruptible water supply agreement for up to two additional three years within ten year periods.

*Sponsors: Fisher and Sonnenberg/Giron*

**HB13-1168 CONCERNING THE ABILITY OF A DITCH TO OPERATE AS AN ACEQUIA DITCH**

Current law recognizes acequia ditch corporations, but limits that status to irrigation systems that supply irrigation water to long lots that are perpendicular to the stream or ditch to maximize the number of landowners who have access to water. The bill repeals that limitation, so that a ditch corporation may be organized as an acequia ditch even if the land served by the ditch is not divided into long lots, and also allows an unincorporated association to operate as an acequia ditch.

*Sponsors: Vigil*

**HB13-1186 CONCERNING PROCEDURES FOR INCREASING TRANSPARENCY FOR CERTAIN SPECIAL DISTRICT BOARDS, AND IN CONNECTION THEREWITH, REQUIRING THAT A PUBLIC MEETING BE HELD BEFORE A DISTRICT SETS OR CHANGES DOMESTIC WATER OR SANITARY SEWER SERVICE RATES AND REQUIRING THAT ALL SPECIAL DISTRICTS FORMED PURSUANT TO THE SPECIAL DISTRICTS PROVISIONS FILE A SPECIAL DISTRICT PUBLIC DISCLOSURE DOCUMENT TO BE RECORDED BY THE COUNTY CLERK AND RECORDER FOR ALL PROPERTIES INCLUDED WITHIN THE DISTRICT BOUNDARIES**

The bill requires a special district that provides domestic water or sanitary sewer services to hold a public meeting before fixing or increasing fees or other charges for its services. Notice of the meeting must be provided in a specified manner at least 10 days prior to the public meeting.

Special districts are required to record a public disclosure document against all property within the district. The statement must include the name of the district, the powers of the district, information regarding the district's service

plan or statement of purpose, and a statement of the methods authorized by law for the district to raise revenues for capital needs and operations costs.

*Sponsors: Vigil/Schwartz*

**HB13-1191 CONCERNING GRANTS FOR DOMESTIC WASTEWATER TREATMENT PLANTS TO COMPLY WITH THE WATER QUALITY CONTROL COMMISSION'S NUTRIENT CONTROL MANAGEMENT REGULATIONS**

Creates a nutrients grant fund and directs the division of administration in the department of public health and environment to award grants from the fund to local governments pursuant to rules promulgated by the water quality control commission for the planning, design, construction, or improvement of domestic wastewater treatment works owned or operated by a local government that are needed to comply with the commission's nutrients management control regulation. The fund is repealed on September 1, 2016. Part of the budget plan announced by the Governor.

*Sponsors: Fischer/Schwartz (Capital Development Committee bill)*

**HJR13-1004 CONCERNING OPPOSITION TO NEW SPECIAL USE PERMIT WATER REQUIREMENTS**

States the opposition of the General Assembly to Forest Service directive requiring transfer of water rights. Encourages the Forest Service to immediately rescind the 2012 Directive and settle the pending litigation over the 2012 Directive and immediately reevaluate and discard its policy and actions whereby water rights are demanded in exchange for permitted uses; and appropriate water rights under state law rather than imposing extractions under permits.

*Sponsors: Sonnenberg/Baumgardner*

**HJR13-1007 CONCERNING APPROVAL OF WATER PROJECT REVOLVING FUND ELIGIBILITY LISTS ADMINISTERED BY THE COLORADO WATER RESOURCES AND POWER DEVELOPMENT AUTHORITY.**

Annual resolution to add projects for approval under drinking water revolving fund and water pollution control revolving fund.

*Sponsors: Fischer/Schwartz*

**SB13-019 CONCERNING THE PROMOTION OF WATER CONSERVATION MEASURES**

Directs the water judge to disregard the decrease in use of water from certain government sponsored conservation programs in its determinations of historical consumptive use in change of water right cases and adds to the list a decrease in water use to provide for compact compliance. Defines conserved water and directs water judge to allow change of water right for conserved water.

*Sponsors: Schwartz/Fischer*

**SB13-023 CONCERNING AN INCREASE IN THE LIMITATION ON THE AMOUNT OF DAMAGES THAT MAY BE RECOVERED BY AN INJURED PARTY UNDER THE "COLORADO GOVERNMENTAL IMMUNITY ACT".**

Increases the damages limitation for any injury to one person in any single occurrence to \$478,000. For an injury to 2 or more persons in any single occurrence, the bill increases the damages limitation to \$990,000; however, in the case of multiple persons injured a single individual cannot recover in excess

of \$478,000. Authorizes the Attorney General to increase the amount every four years commencing in 2018.

*Sponsors: Cadman and Morse/*

**SB13-041 CONCERNING THE PROTECTION OF STORED WATER, AND IN CONNECTION THEREWITH, PRESERVING SUPPLIES FOR DROUGHT AND LONG-TERM NEEDS**

Expands the definition of "beneficial use" to include the impoundment of water for firefighting or storage for any purpose for which an appropriation is lawfully made. States that 1) an applicant doesn't have to demonstrate that all existing absolute decreed water rights that are part of an integrated system have been utilized to their full extent to establish the need to exercise a conditional water storage right or to make it absolute, 2) that when conditional water storage rights are made absolute, the decreed volume should be the extent of the volume of the appropriation that has been captured, possessed, and controlled at the decreed storage structure; and 3) carrying water over in storage from one year to another is not grounds for a determination of abandonment. *Amended in committee to clarify that a conditional water right decreed for a separate feature of the project or integrated system may be made absolute, in whole or in part, without demonstration that all existing absolute decreed water rights in the system have been utilized to their full extent.*

*Sponsors: Hodge and Roberts/ Sonnenberg and Fischer*

**SB13-072 CONCERNING THE DELETION OF THE REQUIREMENT FOR A FINAL PERMIT FOR ALL WELLS WITHDRAWING DESIGNATED GROUND WATER FROM THE DENVER BASIN AQUIFERS**

Removes the July 1, 1991 threshold date for eliminating the requirement for persons holding a conditional water well permit to withdraw designated ground water from the Denver Basin to obtain a final permit and makes conditional permit a final permit for all such wells.

*Sponsors: Sonnenberg/Hodge*

**SB13-073 CONCERNING A REQUIREMENT THAT THE DIVISION OF ADMINISTRATION OF THE DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT FOLLOW RULE-MAKING PROCEDURES WHEN PROPOSING CHANGES TO GENERAL PERMITS RELATED TO WATER QUALITY**

Requires that when the water quality control division follow rulemaking procedures including a statement of basis and purpose, evidence and data in support of the changes, and a cost-benefit analysis of the effect of such changes when proposing new or amended permit requirements for General Permits,

*Sponsors: Brophy/Sonnenberg*

**SB13-074 CONCERNING THE RESOLUTION OF AMBIGUITIES IN OLD WATER RIGHT DECREES REGARDING THE PLACE OF USE OF IRRIGATION WATER (Legacy ditch bill)**

States that for purposes of administration and determination of historical consumption, for decrees entered prior to January 1, 1937, if an irrigation water right does not expressly limit the maximum number of acres that may be irrigated, the maximum number shall equal the maximum acres irrigated during the first fifty years after entry of the original decree absent a court order to the contrary. *(Numerous amendments may be offered in committee.)*

*Sponsors: Hodge/Sonnenberg*

**SB13-075 CONCERNING SAFEGUARDS TO PREVENT THE MODIFICATION OF A FINAL DESIGNATED GROUND WATER PERMIT BASED ON REDUCTIONS IN THE USE OF DESIGNATED GROUND WATER**

States that once a final well permit has been issued, reduction in use due to conservation shall not be grounds for reducing 1) maximum appropriation in acre feet per year; 2) the maximum pumping rate in gallons per minute; or 3) the maximum number of acres irrigated, if used for irrigation. Amendments may be offered in committee.

*Sponsors: Brophy/Sonnenberg*

**SB13-078 CONCERNING POINTS OF DIVERSION THAT ARE NOT LOCATED AT THE PHYSICAL LOCATION SPECIFIED IN THE DECREES FOR DIVERTED WATER RIGHTS**

Sets forth conditions under which a water diverter may apply for a correction to described physical point of diversion for surface or ground water without requirement to apply for a change to water right. Diverter must have diverted water from the same physical location since the applicable original decree unless relocated pursuant to statute or valid well permit; the physical point of diversion is not the location specified in the decree; and the diverter has diverted water in conformance with the decree. Burden of proof is on the diverter. (Additional amendments will be offered in committee)

*Sponsors: Giron/Sonnenberg*

**SB13-083 CONCERNING THE CREATION OF A PRESCRIBED BURNING PROGRAM UNDER THE DIVISION OF FIRE PREVENTION AND CONTROL IN THE DEPARTMENT OF PUBLIC SAFETY, AND IN CONNECTION THEREWITH, SPECIFYING THE POWER AND DUTIES OF THE DIVISION AND ITS DIRECTOR WITH RESPECT TO THAT PROGRAM**

In part, requires that persons be certified to conduct prescribed burns for fuel reduction. Exemptions for agricultural burning exist in the bill but there are concerns that language may not sufficiently cover burning of ditches. CWC has recommended amendments to be offered in committee to exempt the burning of ditches.

*Sponsors: Nicholson and Roberts/Gerou and Levy*

**SB13-135 CONCERNING THE ALLOCATION OF SEVERANCE TAX GROSS RECEIPTS**

Current law requires that the first \$1.5 million of severance tax gross receipts be credited to the innovative energy fund and the next \$100 million plus 50% of the remaining amount be credited in equal shares to the severance tax trust fund and the local government severance tax fund. The bill allocates the remaining 50% of additional receipts as follows: \$60 million to the perpetual base account with any remaining gross receipts credited in equal shares to a rainy day fund, property tax relief fund, and the highway users tax fund.

*Sponsors: Lundberg*

**SB13-150 CONCERNING THE CONTINUATION OF THE WATER & WASTEWATER FACILITY OPERATORS CERTIFICATION BOARD AND, IN CONNECTION THEREWITH IMPLEMENTING RECOMMENDATIONS OF THE 2012 SUNSET REPORT BY THE DEPARTMENT OF REGULATORY AGENCIES**

Continues the Water & Wastewater Operators Certification Board and 1) changes the representation from a member of a rural water association to a representative of water facilities serving less than 3,300 people and 2) expands the authority of the board to exempt facilities from having a certified operator to nonindustrial facilities and water facilities.

*Sponsors: May./Harvey*

SJR13-005 CONCERNING THE ADVERSE EFFECTS THAT THE DIVERSION OF REVENUES HAS HAD ON WATER INFRASTRUCTURE IN COLORADO

Urge the General Assembly to remain cognizant of the important role our water infrastructure plays in Colorado's economic and social well-being when prioritizing its expenditures.

*Sponsors: Roberts and Hodge*



**CITY OF LOVELAND**  
WATER & POWER DEPARTMENT

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**AGENDA ITEM:** 12

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Larry Howard, Senior Civil Engineer

**TITLE:** Water Supply Update

**DESCRIPTION:**

Snowpack condition and streamflow forecasts from US Bureau of Reclamation, and Northern Colorado Water Conservancy District are summarized for the Upper Colorado and Big Thompson basins.

**SUMMARY:**

The two reports attached tell the story of continuing drought. The first is from USBR, which uses the Natural Resources Conservation Service (NRCS) data. The second is from Northern Water.

- USBR / NRCS:
  - Precipitation over the CBT Project during January was well below average. Only 49% of average was reported on the Upper Colorado, and an even lower 11% of average was received on the Big Thompson basin. Fortunately, for this winter's October-January precipitation on the Big Thompson, the value is higher, at 62%.
  - CBT system reservoir storage is also low at only 72% of average.
  - The snow-water content accumulations are all well below average on both sides of the Continental Divide. On February 1, the Lake Granby snow-water content was 60% of average, with the Big Thompson at only 45% of average.
  - When soil moisture conditions are taken into account, the resulting water supply outlook is below average. The Upper Colorado flowing into Lake Granby is projected to be 76% of average. The Big Thompson River at the canyon mouth is projected to be 72% of average.
  - *Snowpack Update, Basinwide % of Average* graph compares 2013 levels with 2012 levels at the same time last year. As you can see, in every basin this year is lower than a year ago.
- Northern Water:
  - Early season snowpack and runoff estimates suggest that streamflows will be significantly below average on both the West Slope and East Slope of the Colorado-Big Thompson Project.
  - Snow-water content for the Upper Colorado for February 1 was measured at 57%, with the Big Thompson at 51%.
  - Most probably stream flow forecasts for April-July are very low. The Upper Colorado is projected to be 63%. The Big Thompson is estimated to be 55%.

**RECOMMENDATION:**

Staff Report Item – No action requested, except to ask that everyone continue hoping for substantial precipitation as we move ahead into the spring.

**REVIEWED BY DIRECTOR:** *MS for SA*

**ATTACHMENTS:**

- February 1, 2013 Water Supply and Utilization Report Western Division System, USBR
- Northern Water SnoWatch Snowpack Data, February, 2013

WESTERN DIVISION SYSTEM  
RESOURCES DIVISION  
LOVELAND, COLORADO

FEBRUARY 1, 2013  
WATER SUPPLY AND UTILIZATION REPORT  
WESTERN DIVISION SYSTEM  
PICK-SLOAN MISSOURI BASIN PROGRAM

PRECIPITATION BELOW AVERAGE  
TEMPERATURES VARIED

Precipitation was below average over the Colorado-Big Thompson Project (Project) during January. The Lake Estes and St Vrain watersheds were the lowest at 11 percent of average. The Willow Creek and Lake Granby watersheds were the highest at 49 percent of average.

Temperatures over the Project were above average for the East Slope and varied for the West Slope for the month.

PRECIPITATION

Watershed	January Precipitation			October-January Precipitation		
	2013 (Inches)	Avg 1/ (Inches)	% of Avg	WY2013 (Inches)	Avg 1/ (Inches)	% of Avg
Green Mtn.	.60	1.32	45	3.30	5.04	65
Willow Crk.	.70	1.42	49	2.80	5.04	56
L. Granby	.70	1.42	49	2.80	5.04	56
L. Estes	.09	0.81	11	2.36	3.78	62
St. Vrain	.09	0.81	11	2.36	3.78	62
Poudre	.10	0.42	24	1.53	2.58	59

1/ 30 year average, 1971-2000

INFLOWS VARIED

Inflows were varied over the Project during January. The inflow to Lake Granby was the lowest at 82 percent of average. The inflow to Lake Estes was the highest at 110 percent of average. Water year to date (October-January) inflows have been 89 percent of average.

RESERVOIR INFLOW

Reservoir	January Inflow			October-January Inflow		
	2013 (KAF)	Avg 1/ (KAF)	% of Avg	WY 2013 (KAF)	Avg 1/ (KAF)	% of Avg
Green Mtn.*	7.3	8.0	91	35.1	40.6	86
Willow Crk.	0.7	0.8	88	3.6	4.1	88
L. Granby	3.1	3.8	82	15.2	17.0	89
L. Estes 2/	1.1	1.0	110	6.6	6.6	100

\*Total runoff of the watershed above Green Mountain does not include depletions by Denver and Colorado Springs.

1/ 30 year average, 1971-2000

2/ Lake Estes Computed Inflow

### TRANSMOUNTAIN DIVERSIONS ABOVE AVERAGE

Transmountain diversions through Adams Tunnel during January were 144 percent of average. During January, 34,000 acre-feet of water was brought through the tunnel. Water year to date (October-January) diversions have been 115 percent of average.

### TRANSMOUNTAIN DIVERSION

Adams Tun.	January			October-January		
	2013 (KAF)	Avg 1/ (KAF)	% of Avg.	WY 2013 (KAF)	Avg 1/ (KAF)	% of Avg
	34.0	23.6	144	93.1	80.8	115

1/ 30 year average, 1971-2000

### RESERVOIR STORAGE BELOW AVERAGE

The Lake Granby storage of 250,500 acre-feet on January 31 was 119,500 acre-feet below average and 193,900 acre-feet lower than 1 year ago on this date. Terminal reservoir storage in Carter Lake and Horsetooth Reservoir was 84 and 76 percent of average, respectively.

Colorado-Big Thompson Project storage water in Lake Granby, Carter Lake, and Horsetooth was 404,600 acre-feet on January 31 which was 159,000 acre-feet below average and 50 percent of the total available storage capacity.

### RESERVOIR STORAGE

Reservoir	Total Storage on January 31						
	2013 (KAF)	2013 (%of Avg)	2012 (KAF)	2011 (KAF)	2010 (KAF)	1971-00 Avg(KAF)	Total Storage Cap.(KAF)
Green Mtn	61.9	72	87.1	77.0	79.4	86.3	153.6
L. Granby	250.5	68	444.4	450.9	402.5	370.0	539.8
Horsetooth	80.5	76	127.8	92.4	78.1	106.1	156.7
Carter L.	73.6	84	62.0	56.9	98.0	87.5	112.2
Dillon	171.9	77	242.7	220.9	240.2	222.7	254.0
Williams Fork	42.5	80	80.1	80.7	76.5	52.81/	96.8
Project	Total Storage Water in Lake Granby, Carter Lake, and Horsetooth Reservoir on January 31						
CBT	404.6	72	634.2	600.2	578.6	563.6	808.7

1/ 20 year average, 1970-1989.

## SNOWPACK WATER CONTENT WELL BELOW AVERAGE

Snowpack water content on February 1 was 54 percent of the 1971-2000 average throughout the Project watersheds.  
 The St. Vrain watershed was the lowest at 39 percent of average. The highest snowpack water content on the Project was recorded for the Willow Creek watershed at 80 percent of average

The snowpack update graph on the next page are readings from the Natural Resource Conservation Service automated SNOTEL sites (for snowpack telemetry). This system has replaced many of the manual measurements at the remote sites. The 1981-2010 average is being used.

Watershed	Feb 1 Snow-Water Content			Comparative Feb 1 Snow-Water Content			
	2013 (In.)	Avg. (In.)	% of Avg.	2012 (In.)	2011 (In.)	2010 (In.)	2009 (In.)
Green Mtn	4.8	9.0	53	6.4	13.9	6.4	11.3
Willow C	5.1	6.4	80	5.7	9.7	4.0	7.6
L. Granby	(4.7)	7.8	(60)	5.2	11.6	5.1	9.7
L. Estes	(3.1)	6.9	(45)	5.8	9.7	5.3	7.4
St. Vrain	2.4	6.1	39	6.0	7.7	4.1	6.5
Poudre	4.2	8.5	49	7.0	11.4	6.5	9.5

WATER SUPPLY OUTLOOK IS BELOW AVERAGE

Current February 1 water supply forecasts are below average over the Project watersheds. Forecasted April-July volumes range from 65 percent of average for the Willow Creek watershed to 81 percent of average for the Poudre River at Canyon Mouth watershed.

Feb 1 2013 Forecast of Apr-Jul Volume (KAF)									
Fore- Cast Point	Chance of Exceeding					Comparative Apr-Jul Volume (KAF)			
	95% Reason- able Min <u>1/</u>	75%	50% Most Probable	25% 2/	5% Reason- able Max <u>1/</u>	2012	2011	Avg <u>2/</u>	Most Probable % avg
Green Mtn Res	139	168	188	208	237	119	478	274	69
Willow Crk Res	20	26	31	36	42	20	125	48	65
Lake Granby	113	135	150	166	188	107	416	198	76
Big Thompson River	36	46	54	61	72	35	113	70	77
Above L.Estes									
Big Thompson R. at Canyon Mouth	28	51	67	82	105	3/	3/	93	72
St Vrain Crk at Lyons	31	47	57	68	83	3/	3/	87	66
Poudre R. at Canyon Mouth	93	147	184	221	274	3/	3/	226	81

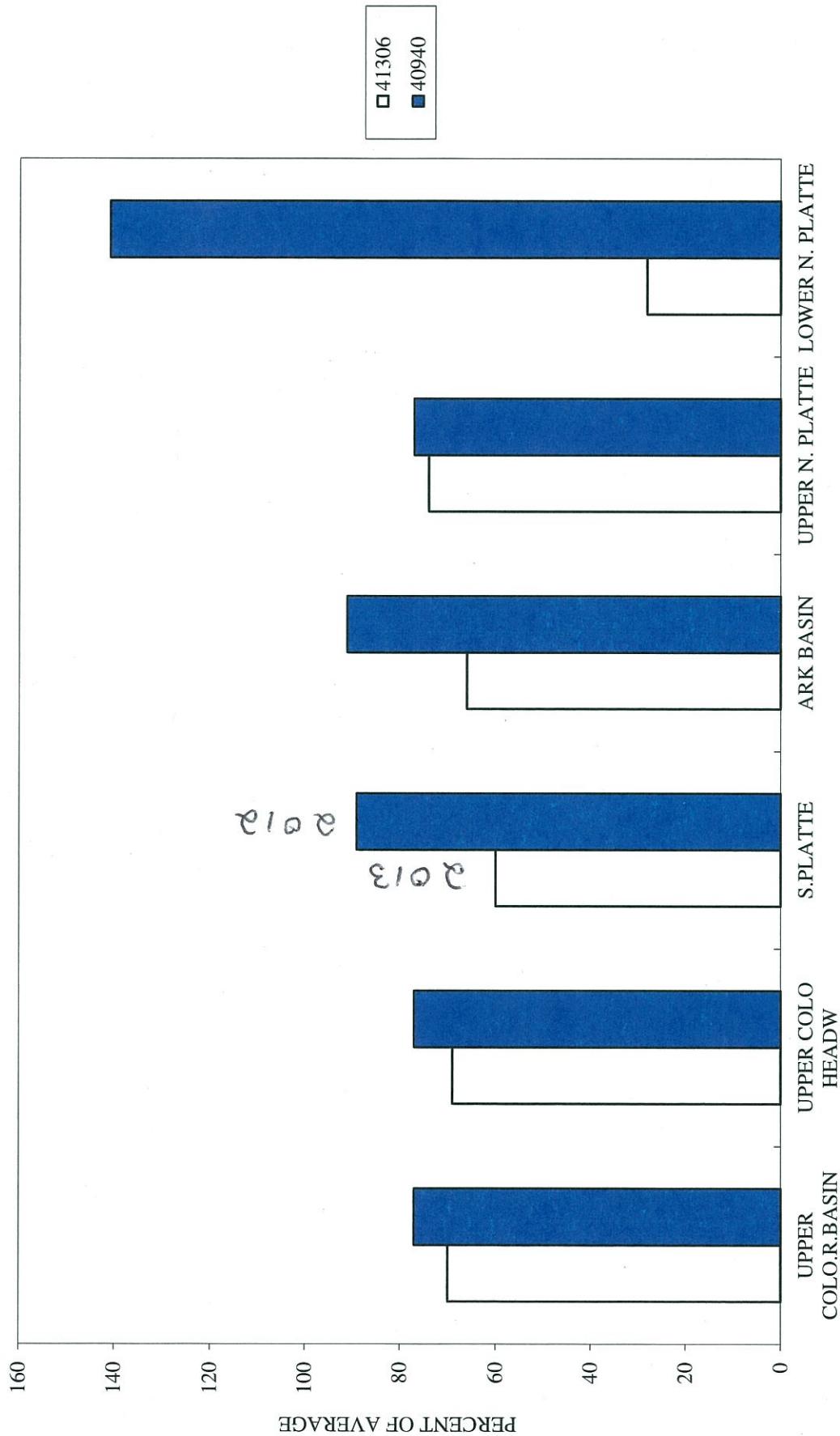
1/ The probability is estimated to be 9 chances in 10 that the actual volume will fall between the reasonable minimum and reasonable maximum.

2/ Historical average:

Green Mtn: 1928-2012, Willow C: 1920-2012, Granby: 1928-2012, BT above Estes: 1936-2012, BTR @Canyon: 1947-2010, ST Vrain: 1954-2010, Poudre: 1954-2010

3/ Not available at this time.

SNOWPACK UPDATE  
BASIN WIDE % OF AVERAGE




[Home](#) [About Us](#) [Water Projects](#) [Media & News](#) [Water Conservation](#) [Water Quality](#) [Board of Directors](#) [Allottee Info](#)
[Water Data](#) >> [East Slope Water Data](#) | [West Slope Water Data](#) | [SnoWatch Snowpack Data](#) | [Streamflow Forecasts](#)

## SnoWatch Snowpack Data

### February 2013 Streamflow Forecast

Early-season snowpack and runoff estimates suggest that streamflows will be significantly below average on both the West Slope and East Slope of the Colorado-Big Thompson Project. See the full February 2013 Streamflow Forecast report on the [Streamflow Forecasts](#) page.

### SnoWatch System

Northern Water's SnoWatch system displays snow accumulation (snowpack) data from remote Snowpack Telemetry (SNOTEL) platforms in eight watersheds, covering an area from west of Loveland, CO to east of Kremmling, CO.

Individual maps show the geographic location of each watershed, while the accompanying graphs display year-to-date snow accumulation compared to a normal (average) year. Each graph includes a select group of SNOTEL sites that are representative of that particular watershed.

### Melted Snow Key to Water Supply

Late spring and early summer snowmelt and runoff from the Rocky Mountains provides most of Colorado's water supply. Greater snowpack means favorable water supplies; lower amounts can signal an impending drought.

Northern Water's West Slope collection system managers use snowpack and runoff data for long-term planning. Colorado-Big Thompson Project allottees and water users also benefit by knowing how much water their native (East Slope) watersheds will yield.

### Updated Daily

Snowpack and runoff data is updated daily, usually before 8 a.m. Mountain Standard Time. Snowpack data is available on the website October through June.

The U.S. Department of Agriculture's [Natural Resource Conservation Service](#) collects all SnoWatch data. The NRCS network has 730 remote data collection platforms in the Western United States; approximately 90 are in Colorado. These SNOTEL sites continuously monitor snowpack and climate data and transmit it to a central computer in Portland, OR.

The SnoWatch pages provide SNOTEL site information in graph or tabular format, and include links to the NRCS SNOTEL web pages.

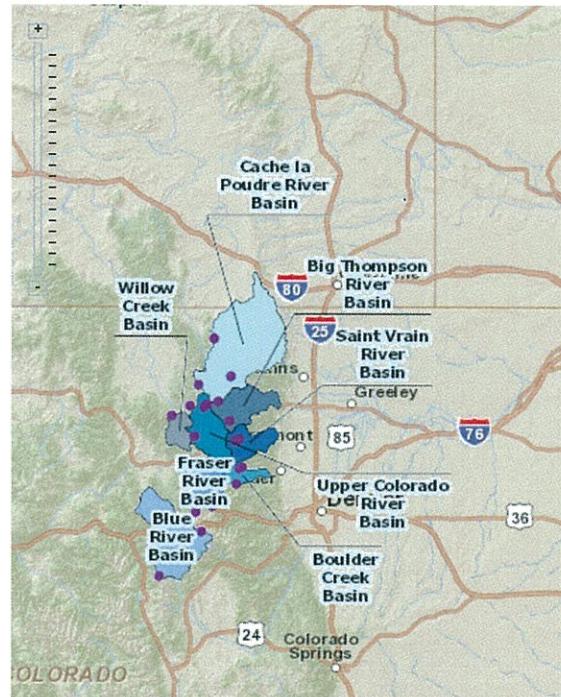
### Historical Data

Northern Water has calculated the median curves for each SNOTEL site using historical data.

The graphs illustrate the average snow water equivalent (SWE) from the median date of the first snow accumulation to the median date of peak snow accumulation, and the median SWE from the median date of peak snow accumulation to the median date of complete melt.

This methodology differs somewhat from similar graphs prepared by the NRCS. For more information about our methodology, contact Andy Pineda at [apineda@northernwater.org](mailto:apineda@northernwater.org).

Watershed: Select



**Snowpack and Streamflow Comparisons**  
**February 1, 2013**



**Snow Water Content**

**% of Average**

Colorado's Statewide Snowpack	75%
Upper Colorado River <sup>(1)</sup>	62%
South Platte Tributaries <sup>(2)</sup>	54%

**Snow-Water Content Comparisons (inches)**

Watershed	February 1, 2013 Snow-Water Content			February 1 Comparative Snow-Water Content			
	2013	Average	% Avg	2012	2011	2010	2002
Blue River	4.5	8.8	51%	69%	150%	70%	74%
Upper Colorado River	5.6	9.8	57%	74%	140%	72%	64%
Willow Creek	5.1	6.6	78%	76%	145%	60%	54%
Fraser River	5.6	8.9	62%	73%	137%	80%	69%
Poudre River	4.8	8.8	55%	87%	137%	78%	52%
Big Thompson River	4.4	8.6	51%	84%	143%	83%	58%
St. Vrain River	3.3	6.3	53%	104%	128%	78%	55%
Boulder Creek	4.0	6.9	58%	99%	112%	90%	59%

**Apr-Jul Maximum, Minimum  
and Most Probable Streamflow Forecasts (1000 af)**

Watershed	Forecast Minimum	Most Probable	Forecast Maximum	Apr-Jul Avg <sup>(3)</sup>	Most Prob % Average
Blue River	95	185	276	280	66%
Upper Colorado River	91	140	201	221	63%
Willow Creek	19	33	49	47	69%
Fraser River	43	68	98	115	59%
Poudre River	89	147	219	224	65%
Big Thompson River	24	49	74	90	55%
St. Vrain River	31	52	73	90	58%
Boulder Creek	24	35	49	55	63%
South Platte Tributaries		282		458	62%

**Precipitation within District Boundaries**

	Totals	Average	% Average
Jan	0.20	0.38	52%
Nov-Jan	0.76	1.47	52%

(1) Includes the Colorado, Willow Creek, Fraser and Blue River Watersheds  
(2) Includes the Poudre, Big Thompson, Saint Vrain and Boulder Creek Watersheds  
(3) Average for the period 1981-2010





**CITY OF LOVELAND**  
WATER & POWER DEPARTMENT

200 North Wilson • Loveland, Colorado 80537

(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

**AGENDA ITEM:** 13

**MEETING DATE:** 2/20/2013

**SUBMITTED BY:** Larry Howard, Senior Civil Engineer *Larry Howard*

**TITLE:** CBT Quota Setting Meeting Discussion

**DESCRIPTION:**

Snowpack levels are well below average, and runoff projections for 2013 are low. Users of CBT water will be looking to Northern's board to set the annual CBT Project quota in April as is done each year. Representatives from Ft. Collins, Estes Park, Berthoud and Loveland met in our offices on February 14 to consider our recommendations to Northern's board for the quota declaration.

**SUMMARY:**

On Thursday, February 14, representatives from Ft. Collins, Estes Park, Berthoud and Loveland met in our office to discuss the quota setting by Northern's board, which is scheduled for Friday, April 12, 2013. With the snowpack levels lower even than in 2012, it appears that unless significant snowfalls occur over the next two months, 2013 may be a very dry year. In the spring of 2012 stored water in the CBT Project and plains reservoirs stood at well above average levels, which contributed significantly to meeting demands throughout the year. Now in early 2013, storage levels in the CBT system and in the plains reservoirs are well below average.

In November Northern's board issued a 50% quota for 2013, with the expectation of making a final quota declaration in April, 2013 when drought and storage conditions are known. As of the first of February, supplies in the CBT reservoirs would only allow an additional declaration of 38%, for a total of 88% in 2013, which would drain the system. This estimate does not include runoff which will undoubtedly occur in the spring, but streamflow forecasts are currently in the vicinity of 60% of average, so that runoff is expected to be low.

CBT water is a supplemental supply, operated and administered so that less is made available in wet years when Front Range streams run full, and more is made available when native supplies are limited. If this year is as dry as current projections indicate, there will be a desire for a high quota to 'normalize' the overall supplies in our area, particularly from the agricultural perspective. However, from a municipal, industrial and domestic supplier point of view, this may be an important time to consider cutting back and conserving water this year to provide a more reliable supply in 2014 if drought conditions continue.

All those present expressed concern about conditions this year, and each entity depends upon CBT water for a significant portion of its raw water supply. After discussion it was felt each

entity should contact the Larimer County members of Northern's board to express its specific concerns and attend the board meetings on March 8 and April 12, 2013 to be able to address the board directly.

Shared concerns were discussed. Of particular notice was how quickly the CBT system changed from the conditions of 2011, with the system full and spilling, to 2012 which ended the year with well below average storage. Now in early 2013 the system has significantly lower storage than in 2012. We want to use the water in ways that will protect the integrity of the CBT system from year to year. Planning for a smaller quota on a dry year like 2013 may be and using our water conservatively and wisely is a step that any domestic supplier will desire to take.

**RECOMMENDATION:**

Staff Report Item – No action requested.

**REVIEWED BY DIRECTOR:** *MS for SA*

**ATTACHMENTS:**

- a. Agenda for February 14, 2013 meeting in Loveland offices
- b. *Historical Water Delivery Quotas* – Bar Graph
- c. *Colorado-Big Thompson Project Quota Declarations* – Table
- d. *CBT Ownership* – Table
- e. *CBT Project Deliveries* – Table
- f. *Historical Representative Market Prices Per Acre-Foot Unit* – Graph

## AGENDA

2013  
Quota Setting Discussion  
Loveland Water & Power Board Room  
14 February, 2013  
2:00 p.m.

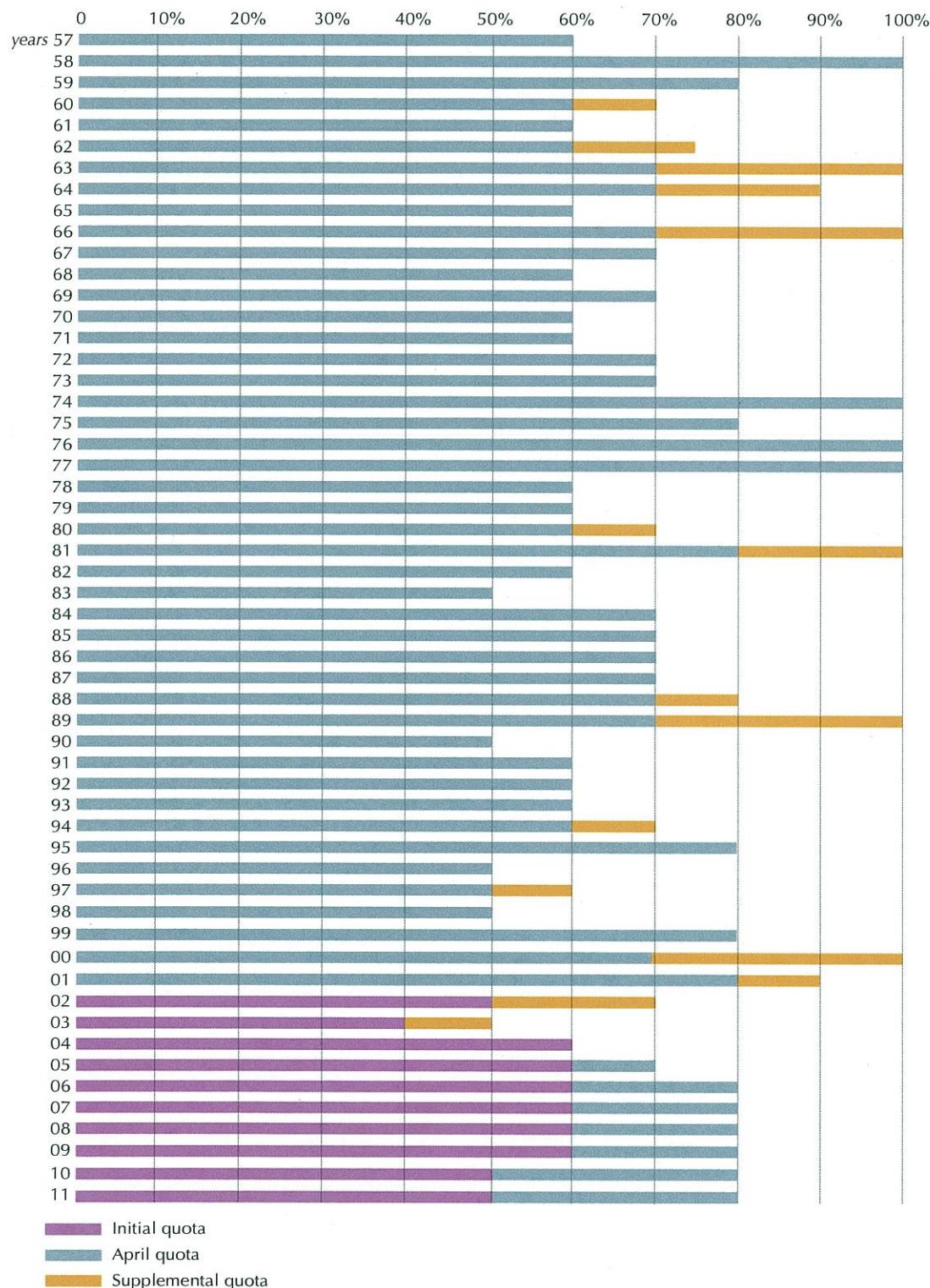
1. Introductions
2. Attachments
  - a. *Historical Water Delivery Quotas* – Bar Graph
  - b. *Colorado-Big Thompson Project Quota Declarations* – Table
  - c. *CBT Ownership* – Table
  - d. *CBT Project Deliveries* – Table
  - e. *Historical Representative Market Prices Per Acre-Foot Unit* – Graph
3. Agricultural Goals
  - a. Annual crop demand pattern
4. Municipal/Domestic/Industrial Goals
  - a. 24/7/365 demands
  - b. Wildfire Impacts
5. Desired Quota for 2013
6. Potential Actions:
  - a. Contact Larimer County Northern board representatives
    - i. Bill Brown
    - ii. Mike Applegate
    - iii. Bill Emslie
  - b. Present recommended quota at April quota setting
7. Adjourn

## Historical Water Delivery Quotas<sup>(1)</sup>

### District

Years ended September 30,

Unaudited



<sup>(1)</sup>Effective November 2002 the Board of Directors began issuing an initial quota for the water year (November-October). The Board also continued its tradition of setting April and supplemental quotas as needed.

**COLORADO-BIG THOMPSON PROJECT**

**QUOTA DECLARATIONS**

Year	Initial Quota	April Quota	Supplemental Quota	Yearly Quota	Month Supplemental Quota Declared
2013	50%				
2012	50%	40%	10%	100%	May
2011	50%	30%		80%	
2010	50%	30%		80%	
2009	60%	20%		80%	
2008	60%	10%	10%	80%	July
2007	60%	20%		80%	
2006	60%	20%		80%	
2005	60%	10%		70%	
2004	50%	10%		60%	
2003	30%	10%	10%	50%	June
2002	50%	20%		70%	
2001		80%	10%	90%	July
2000		70%	30%	100%	June
1999		80%		80%	
1998		50%		50%	
1997		50%	10%	60%	July
1996		50%		50%	
1995		80%		80%	
1994		60%	10%	70%	July
1993		50%	10%	60%	August
1992		60%		60%	
1991		60%		60%	
1990		50%		50%	
1989		70%	30%	100%	May
1988		70%	10%	80%	July
1987		70%	10%	80%	August
1986		70%		70%	
1985		70%		70%	

1984		70%		70%	
1983		50%		50%	
1982		60%		60%	
1981		80%	20%	100%	July
1980		60%	10%	70%	July
1979		60%		60%	
1978		60%		60%	
1977		100%		100%	
1976		80%	20%	100%	July
1975		80%		80%	
1974		80%	20%	100%	July
1973		70%		70%	
1972		70%		70%	
1971		60%		60%	
1970		60%		60%	
1969		70%		70%	
1968		60%		60%	
1967		70%		70%	
1966		70%	30%	100%	June
1965		60%		60%	
1964		70%	20%	90%	July
1963		70%	30%	100%	June
1962		60%	15%	75%	May
1961		60%		60%	
1960		60%	10%	70%	August
1959		80%		80%	
1958		100%	10%	100%	
1957		60%		60%	

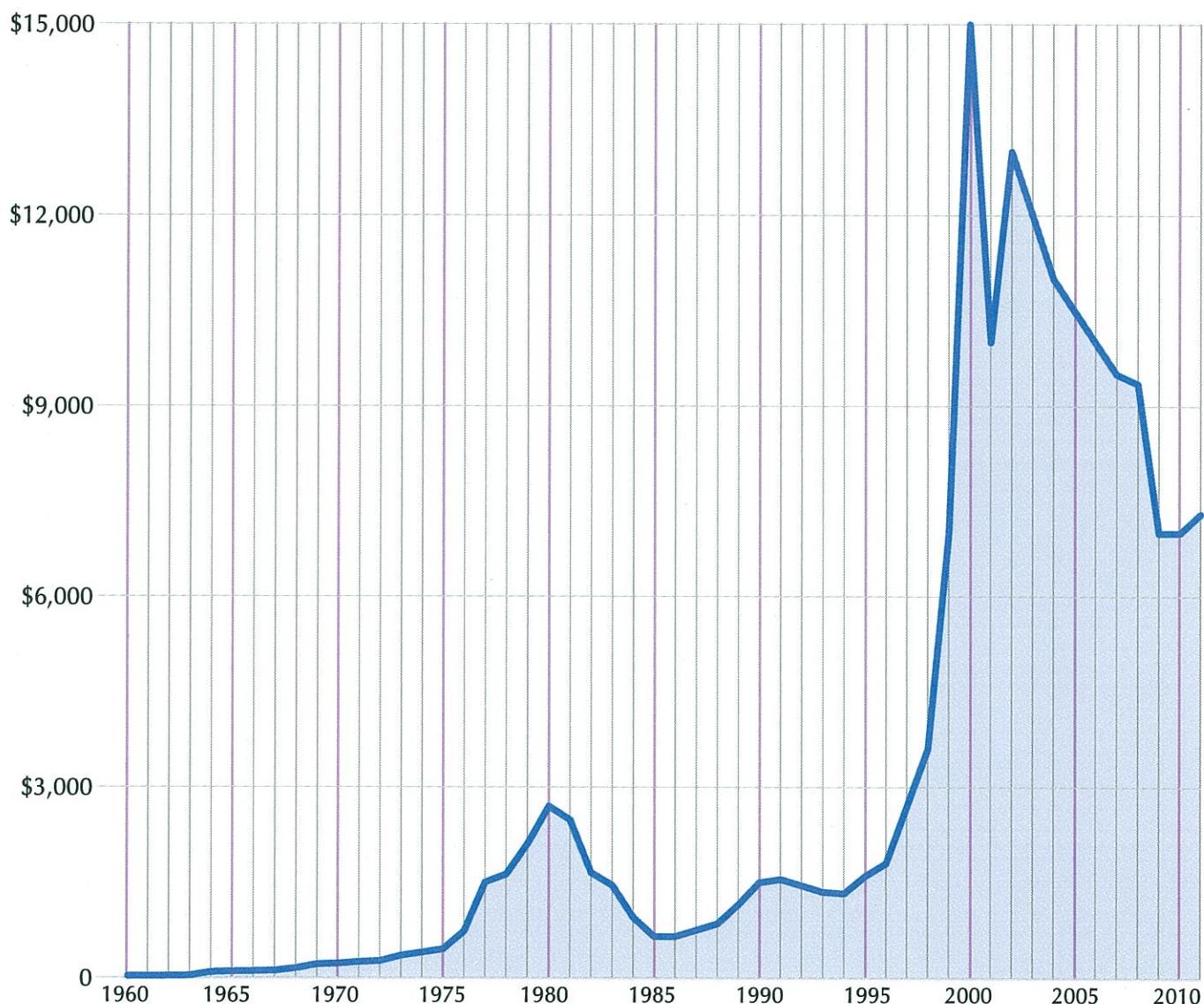
C-BT Ownership				
OCT 1	AG		M&I	
Year	Units	%	Units	%
2011	104,225	34	205,775	66
2010	106,263	34	203,737	66
2009	106,597	34	203,403	66
2008	109,264	35	200,736	65
2007	111,983	36	198,017	64
2006	114,852	37	195,148	63
2005	115,045	37	194,955	63
2004	117,884	38	192,116	62
2003	120,761	39	189,239	61
2002	126,216	41	183,784	59
2001	128,254	41	181,746	59
2000	132,919	43	177,081	57
1999	142,074	46	167,926	54
1998	146,162	47	163,838	53
1997	150,700	49	159,300	51
1996	156,776	51	153,224	49
1995	163,695	53	146,305	47
1994	165,892	54	144,108	46
1993	168,975	55	141,025	45
1992	170,909	55	139,091	45
1991	173,872	56	136,128	44
1990	177,234	57	132,766	43
1989	179,014	58	130,986	42
1988	181,297	58	128,703	42
1987	183,778	59	126,222	41
1986	185,265	60	124,735	40
1985	186,886	60	123,114	40
1984	189,806	61	120,194	39
1983	191,828	62	118,172	38
1982	193,394	62	116,606	38
1981	194,922	63	115,078	37
1980	197,377	64	112,623	36
1979	201,655	65	108,345	35
1978	204,648	66	105,352	34
1977	209,510	68	100,490	32
1976	210,722	68	99,278	32
1975	212,059	68	97,941	32
1974	214,507	69	95,493	31
1973	216,685	70	93,315	30
1972	219,381	71	90,619	29
1971	223,420	72	86,580	28
1970	234,023	75	75,977	25
1969	235,820	76	74,180	24
1968	255,139	82	54,861	18
1967	256,866	83	53,134	17
1966	257,584	83	52,416	17
1965	258,096	83	51,904	17
1964	258,211	83	51,789	17
1963	259,849	84	50,151	16
1962	264,297	85	45,703	15
1961	264,344	85	45,656	15
1960	264,691	85	45,309	15
1959	264,691	85	45,309	15
1958	264,870	85	45,130	15
1957	264,870	85	45,130	15

**C-BT Project Deliveries**  
 Agricultural - Municipal and Industrial Usage  
 Sources: quota, carryover, non-charge, operations, regional pool, (no repl)

Year	Ag	M&I	Total	Percent	
				Ag	M&I
1953	177,134	459	177,593	99.7%	0.3%
1954	296,161	4,341	300,502	98.6%	1.4%
1955	226,355	10,673	237,028	95.5%	4.5%
1956	168,417	6,936	175,353	96.0%	4.0%
1957	118,004	3,833	121,837	96.9%	3.1%
1958	281,130	5,789	286,919	98.0%	2.0%
1959	225,386	6,608	231,994	97.2%	2.8%
1960	206,966	5,645	212,611	97.3%	2.7%
1961	128,536	2,778	131,314	97.9%	2.1%
1962	272,502	9,701	282,203	96.6%	3.4%
1963	283,131	12,388	295,519	95.8%	4.2%
1964	260,294	14,602	274,896	94.7%	5.3%
1965	123,246	9,112	132,358	93.1%	6.9%
1966	289,427	12,203	301,631	96.0%	4.0%
1967	186,889	8,398	195,287	95.7%	4.3%
1968	163,201	13,299	176,499	92.5%	7.5%
1969	191,153	8,821	199,974	95.6%	4.4%
1970	139,859	11,358	151,217	92.5%	7.5%
1971	203,969	17,149	221,118	92.2%	7.8%
1972	213,888	17,163	231,051	92.6%	7.4%
1973	147,009	17,389	164,398	89.4%	10.6%
1974	242,152	28,264	270,416	89.5%	10.5%
1975	186,184	21,510	207,694	89.6%	10.4%
1976	275,656	32,021	307,677	89.6%	10.4%
1977	269,399	37,330	306,729	87.8%	12.2%
1978	146,948	26,367	173,315	84.8%	15.2%
1979	117,600	23,436	141,036	83.4%	16.6%
1980	164,714	32,708	197,422	83.4%	16.6%
1981	252,551	35,109	287,660	87.8%	12.2%
1982	128,764	30,831	159,595	80.7%	19.3%
1983	130,524	27,697	158,221	82.5%	17.5%
1984	170,597	35,289	205,886	82.9%	17.1%
1985	242,845	44,894	287,739	84.4%	15.6%
1986	220,583	43,166	263,749	83.6%	16.4%
1987	181,137	57,172	238,309	76.0%	24.0%
1988	172,492	63,923	236,415	73.0%	27.0%
1989	254,757	69,717	324,474	78.5%	21.5%
1990	80,005	40,921	120,926	66.2%	33.8%
1991	126,606	44,093	170,699	74.2%	25.8%
1992	124,267	49,316	173,583	71.6%	28.4%
1993	138,191	44,524	182,715	75.6%	24.4%
1994	175,158	64,684	239,842	73.0%	27.0%
1995	116,229	46,233	162,462	71.5%	28.5%
1996	141,296	63,072	204,368	69.1%	30.9%
1997	133,473	53,226	186,699	71.5%	28.5%
1998	149,357	83,765	233,122	64.1%	35.9%
1999	77,446	70,493	147,939	52.4%	47.6%
2000	215,211	102,988	318,200	67.6%	32.4%
2001	157,803	82,229	240,032	65.7%	34.3%
2002	97,300	90,500	187,800	51.8%	48.2%
2003	42,726	59,174	101,900	41.9%	58.1%
2004	98,829	67,820	166,650	59.3%	40.7%
2005	122,439	69,073	191,512	63.9%	36.1%
2006	137,112	89,644	226,756	60.5%	39.5%
2007	125,788	88,276	214,064	58.8%	41.2%
2008	128,676	89,206	217,882	59.1%	40.9%
2009	122,216	66,147	188,362	64.9%	35.1%
2010	150,534	73,331	223,864	67.2%	32.8%
2011	131,334	81,837	213,170	61.6%	38.4%
2012	167,375	125,533	292,909	57.1%	42.9%
Totals	10,418,930	2,454,165	12,873,095		
Average	173,649	40,903	214,552		

**Historical Representative Market Prices Per Acre-Foot Unit<sup>(1)</sup>**  
**District**

September 30, 2011  
Unaudited



<sup>(1)</sup> Allotees of C-BT water may transfer and sell their water allotment contracts to other parties within Northern Water boundaries. These transactions are subject to rules and regulations of the Board of Directors. The above table represents data gathered by voluntary action and serves as an indicator of how the price of water allotment contracts has fluctuated on the open market through the years. Actual transaction prices may vary.