

TOWN OF WINDSOR POTABLE WATER MASTER PLAN

November 2009



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TABLE OF CONTENTS

Executive Summary	ES-1
Chapter 1 – Introduction	1
Chapter 2 – Water System Profile	2
Population and Water Service Area	2
Wholesale Water Providers	4
Chapter 3 – Water Demand	7
Current Water Demand	7
Future Water Demand	7
Chapter 4 – Current Water Supply	16
Colorado-Big Thompson	16
North Poudre Irrigating Company	19
Northern Integrated Supply Project	19
Water Dedication Policy	20
Sufficiency of Water Dedication Policy	21
Chapter 5 – Water Supply vs. Demand	23
Anticipated CBT Acquisition	23
Water Budget	24
Chapter 6 – Potential New Sources of Water Supply	26
Water Supply and Storage Company	26
Larimer and Weld Irrigation Company	29
Windy Gap	31
Chapter 7 – Water Conservation	33
Water Conservation Goals	33
Water Conservation Implementation	34
Chapter 8 – Funding Alternatives	35
New Water Dedication Policy	36
Chapter 9 – Recommended Water Portfolio	38
Chapter 10 – Staff Roles and Responsibilities for Water Measurement and Accounting	40
Chapter 11 – Conclusions and Recommendations	43

LIST OF TABLES

Table ES-1 -	Target Water Portfolio	ES-4
Table 2.1 -	Town of Windsor Historical Population	4
Table 2.2 -	Contracted Flow from Windsor Water Providers	5
Table 3.1 -	Land Use Acreage and Descriptions	9
Table 3.2 -	Future Residential Water Demands	11
Table 3.3 -	Future Potable Water Demands	12
Table 4.1 -	Town of Windsor Water Rights	16
Table 4.2 -	NISP Participants and Requested Yields	20
Table 5.1 -	Anticipated CBT Acquisition	24
Table 5.2 -	Water Budget at Build-Out	25
Table 6.1 -	Larimer and Weld Direct Diversion Information	30
Table 6.2 -	Cost and Yield of Potential Water Sources	32
Table 8.1 -	50% CBT – 50% CIL Scenario	36
Table 9.1 -	Target Water Portfolio	39
Table 10.1 -	Annual Water Delivered to Windsor from Water Providers	40
Table 10.2 -	Contracted Delivery Amounts from Water Providers	41

LIST OF FIGURES

Figure 2.1 - Windsor Vicinity Map	3
Figure 3.1 - Land Use Planning	8
Figure 3.2 - Non-potable Irrigation	14
Figure 3.3 - Build-out Potable Water Use	15
Figure 4.1 - Annual CBT Quota History	17
Figure 4.2 - CBT Ownership Transition	18
Figure 6.1 - Potable Water Supply Systems	27
Figure 9.1 - Future Water Supplies	38
Figure 10.1 - Water Monitoring Protocol	42

EXECUTIVE SUMMARY

The Town of Windsor is a growing Front Range community with a current population of 18,700 people. The Town's 2006 Comprehensive Plan shows a final build-out population of 102,321 people. The Town Board, guided by Windsor Vision 2025, is committed to providing a safe, vibrant and diversified environment where one can be proud to call home. Windsor has experienced tremendous growth over the last decade and will continue to attract new people to its wonderful community. Like other Colorado Front Range municipalities, Windsor is faced with the challenges of meeting water demands associated with this large anticipated growth. It is important that while the Town encourages growth, growth pays its own way. Ensuring that current Windsor residents are not subsidizing growth is an important piece of this plan.

Currently, the Town relies on the Colorado Big Thompson (CBT) project for all of its raw water. Being solely reliant on CBT makes Windsor "one-dimensional" with its water portfolio. The Town has taken a positive step with this Potable Water Master Plan and should be commended for its proactiveness and foresight.

Water Master Plan Objective

The goal of this Potable Water Master Plan is to provide the Town's decision makers with the information and education needed to make sound decisions associated with its water portfolio to best position the Town for its future. This Potable Water Master Plan is not designed to be strict and narrow, but flexible with the ability to evolve and adjust as the Town grows. This plan was developed to give Windsor a framework on how to move forward... a starting point. Because this plan is flexible, the key is to start. The Town will have the opportunity to adapt policies as it grows.

This plan was designed to work in conjunction with the Town's other master planning efforts. More specifically, this Potable Water Master Plan supports:

- 2002 Water Master Plan
- 2006 Comprehensive Plan
- 2008 Water Conservation Plan

This plan evaluates projected demands through build-out and identifies new sources of water to meet those demands. The demands included in this plan were developed consistent with the Land Use plan outlined in the 2006 Comprehensive Plan. Further, being reliant on water acquisition alone is not sufficient. This Potable Water Master Plan also relies on water savings through

conservation measures and programs outlined in the Town's 2008 Water Conservation Plan.

Key Findings and Recommendations

1. **Alter water dedication calculations.** When computing water dedication requirements, the Town should use a 60% quota vs. a 70% quota and include both the 17% surcharge from its water providers and the 9% Town distribution system loss. If the contracts with the water providers are ever renegotiated to reduce the surcharge or the Town's system loss is improved, this calculation can be adjusted.
2. **Shift water dedication policy from 100% CBT dedication to 50% water dedication and 50% cash-in-lieu (CIL) from 2010 through 2015.** This dedication policy will allow the Town to continue to collect sufficient water supplies to meet growth while generating revenue to pay for NISP and other water acquisition. The policy should remain flexible to allow some developers to dedicate 100% water or 100% CIL. However, Town staff must carefully monitor this ratio to ensure water shortages are not created through insufficient water dedication as the Town is collecting CIL. This policy should be implemented in 2010 for the next six years.
3. **Evaluate CIL price each year.** The Town should evaluate its CIL price each year. The CIL price should be set near the price of CBT. Since allowing CIL typically makes it easier for the developer, the CIL price can be higher than the market value of CBT for this convenience. We recommend an initial CIL of \$15,000 per ac-ft. This is equivalent to one unit of CBT at \$9,000 divided by a 60% quota.
4. **Maintain participation in NISP at 3,300 ac-ft.** Because NISP is still an inexpensive water source compared to other water rights on a per ac-ft basis, we recommend the Town stay at its current participation of 3,300 ac-ft.
5. **Initiate discussion with Windy Gap participants.** There may be existing Windy Gap participants that are looking to reduce their level of participation. Windsor should begin discussions with these entities to see if there is an opportunity to join as a participant of this project. Windy Gap water would work very well for Windsor, particularly since this water is reusable. Windy Gap effluent generated at Windsor's WWTP is fully consumable and thus can be applied to the Town's well augmentation needs.
6. **Focus on water acquisition before raw water storage (before treatment).** With limited financial resources, the Town should focus on water acquisition before water storage. The water rights the Town currently owns and the recommended future water supplies have a storage component that will benefit

the Town without the need for its own raw water storage. If an opportunity arises for potable water storage, this can be evaluated on a case-by-case basis.

7. **Begin accepting WSSC water for water dedication.** Of the water rights we evaluated, WSSC is the cheapest water right on a per ac-ft basis. This is of high water quality and is treatable by NWCWD. WSSC shares have a trans-mountain component that is fully consumable. WWTP effluent generated from use of this reusable component can be applied to well augmentation. Due to the complexity of the return flow requirements, these shares should be evaluated on a case-by-case basis.
8. **Aggressively pursue new NPIC shares.** Because the Town likely cannot acquire enough WSSC and Windy Gap water to fully meet its build-out demand and due to the fact that the Town cannot purchase CBT on the open market, Windsor should actively purchase NPIC shares whenever deals become available and the financial resources allow.
9. **Budget funds to actively acquire new water.** The Town has proactively budgeted funds to acquire water supplies as good deals become available. The Town should continue this practice.
10. **Budget funds for water conservation.** A key component of Windsor's long term plan includes water conservation. The Town invested resources to complete the 2008 Water Conservation Plan, which now qualifies the Town for water conservation implementation grants. The Town has applied for one grant and should continue to identify opportunities to obtain funding and conserve water.
11. **Initiate adding the future NWCWD Tap to Windsor's system.** The Town is reaching its delivery limits each year through its existing contracts with its water providers. The Town should initiate the process to add the second water tap with NWCWD immediately. Ideally, new development would drive the need for this connection. However, the amount of water provided by NWCWD is scheduled to decrease from 1,387 ac-ft to 1,129 ac-ft on January 1, 2013. Because of this and the Town already approach its limits, the Town should immediately begin negotiation with NWCWD either to extend the higher delivery amount beyond this date and/or add the second water tap. Windsor could outline a repayment plan should the need for the tap precede development in that area.
12. **Explore potential agreement with NWCWD to change WSSC shares and replace return flow obligations.** Because the WSSC system is so expansive, the requirements for return flows is quite complex. Windsor should complete an agreement with NWCWD detailing an arrangement if NWCWD were to change Windsor's future WSSC shares along with their ownership through Water Court and replace the return flows obligations.

13. **Connect the Greeley master meter to Windsor’s SCADA system.** Due to large system charges from Greeley if Windsor exceeds its delivery limit, this meter should be connect to SCADA to allow Public Works to monitor and manage flows through this meter effectively.

14. **Follow communication protocol between departments to manage quantity of water ordered from wholesale providers.** Town staff should follow the protocol represented in the flow chart in Figure 10.1 to ensure water orders are managed effectively and limits are not exceeded.

15. **Continue CBT carryover and rent additional supplies in the summer or fall if there is excess.** The Town should continue participating in the CBT carryover program. The Town should carryover its full entitlement each year to safeguard against and extended drought. If the Town has carried over CBT and, based on adequate weather conditions it has excess water, then the Town can rent out its surplus CBT supplies to recover the money spent on the Carryover Program. This is a low or no-cost insurance policy for the Town to protect itself from an unforeseen drought.

Target Water Portfolio

Table ES.1 – Target Water Portfolio

Water Supply	Target Ownership
CBT or NPIC	6043 CBT units
NISP	3300 ac-ft
WSSC/Windy Gap/Other Supplies	7998 ac-ft

Water Master Plan Update

As Windsor grows and acquires the recommended new water supplies, this progress can be monitored and the plan revised as necessary. Water supplies that are available today may not be in the future, so the Town will need to proactively adjust as we move forward.

CHAPTER 1 – INTRODUCTION

The Town of Windsor is centrally located between Fort Collins and Greeley in northern Colorado, approximately 50 miles north of Denver. Incorporated in 1890, Windsor's initial industry included wheat and flour production until the sugar beet industry grew strong in the early 1900's. Since this time, the Town has developed into a diverse mix of land uses, including residential, commercial and industrial customers. The Town Board, guided by Windsor Vision 2025, is committed to providing a safe, vibrant and diversified environment where one can be proud to call home. Windsor has experienced tremendous growth over the last decade and will continue to attract new people to its wonderful community.

This growth requires proactive water planning to ensure that Windsor has sufficient water supplies to meet the increasing water demand. The purpose of this Potable Water Master Plan is to provide the Town decision makers with information that will assist Windsor in identifying a preferred direction for its water policy as it relates to raw water development and acquisition. More specifically, this plan includes:

- Water demand projections
- Evaluation of existing water supplies
- Examination of potential new water sources and their availability to meet current and future potable water demands
- Analysis of the Town's current water policies
- Definition of staff roles as it relates to water use measurement and management
- Recommendations for a target water portfolio

This Potable Water Master Plan is different from other water master plans the Town has completed in the past; it evaluates future water demands and the water supply options available to meet those demands. The Water Master Plan completed in 2002 emphasizes infrastructure capacity needs of the Town's water distribution system. This Potable Water Master Plan is developed to supplement that plan, as well as the Town's 2006 Comprehensive Plan, to provide overall guidance to the Town Board and staff regarding raw water acquisition and policy.

The goal of this Potable Water Master Plan is to develop a strategy for the Town in terms of its water supplies, so it can make sound decisions for its future. It is important that while the Town encourages growth, growth pays its own way. Ensuring that current Windsor residents are not subsidizing growth is an important piece of this plan. In this report, we use a planning horizon through full build-out. However, the plan is designed to be flexible and will need to be monitored, re-evaluated and updated as the Town grows.

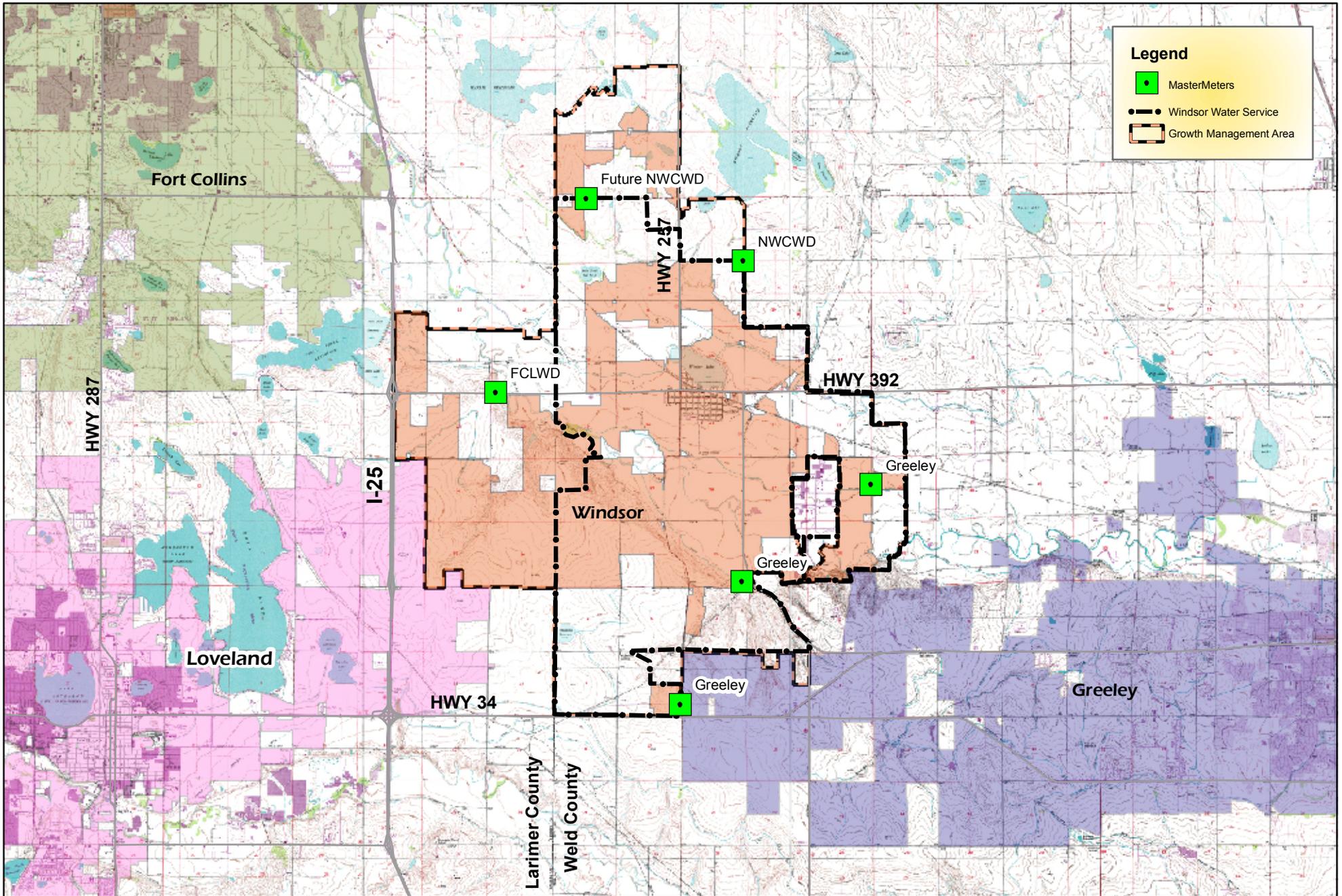
CHAPTER 2 – WATER SYSTEM PROFILE

Population and Water Service Area

Windsor currently serves a population of approximately 18,700. This estimate was provided by the Town and is based on issued building permits from April 2000 to January 2007. The Town's Growth Management Area (GMA) consists of approximately 44 square miles as shown in Figure 2.1. The GMA is bounded by Interstate 25 on the west and WCR 78 to the north, WCR 23 to the east and Highway 34 to the south. Windsor's Comprehensive Plan estimates a build-out population of 102,321 people. Windsor's existing water service area encompasses approximately 25 of the 44 square miles.

Figure 2.1 shows the Town's current water service boundary within the GMA and future growth areas that are not served by the Town's water utility. Some of the Town residents in the northern areas receive their water supply directly from North Weld County Water District (NWCWD). All residents west of the Larimer-Weld County Line (WCR 13) receive their water directly from Fort Collins-Loveland Water District (FCLWD). These residents are not included in any past or future water demands presented in this report.

The Town grew at a rapid rate in the 1990's, almost doubling its population. The populations according to the Colorado Department of Local Affairs (CDOLA) are shown in Table 2.1. This information is provided to give a general historical perspective. The Town considers other factors, including building permits issued, when estimating population, so Windsor's population estimates are higher than that projected by CDOLA.



**Figure 2.1
Windsor Vicinity Map**



Date:	7-23-09
Drawn By:	KKF
Scale:	1" = 1,000'
Job No:	09-130



Table 2.1 – Town of Windsor Historical Population

Year	Population	Change in Population	Population Growth
1990	5,062		
1991	5,162	100	2%
1992	5,292	130	3%
1993	5,550	258	5%
1994	5,874	324	6%
1995	6,288	414	7%
1996	6,897	609	10%
1997	7,371	474	7%
1998	8,082	711	10%
1999	9,115	1033	13%
2000	9,896	781	9%
2001	11,172	1276	13%
2002	11,876	704	6%
2003	12,193	317	3%
2004	12,716	523	4%
2005	13,542	826	6%
2006	14,205	663	5%
2007	14,915	710	5%
Average		580	7%

Wholesale Water Providers

Windsor receives its treated water from three separate water providers: FCLWD, NWCWD and the City of Greeley. Windsor is responsible for acquiring its own raw water supplies, which it transfers to the water suppliers on an annual basis for treatment and delivery. A surcharge of water is required in addition to the projected use for the year to cover losses from treatment and delivery to Windsor. Windsor has master meter connections with each entity and pays a rate for its annual water usage. Table 2.2 shows the contracted flows from each water provider.

Table 2.2 – Contracted Flow from Windsor Water Providers

	Annual Contracted Flow (MG)		Current Annual Contracted Flow (ac-ft)		Future Annual Contracted Flow (ac-ft)	
	Min	Max	Min	Max	Min	Max
FCLWD	110	110	338	338	338	338
NWCWD - WCR 19	120	452	368	1387	368	1387*
NWCWD - WCR 74	120	1800			368	5524
Greeley	130	197	400	604	400	604
TOTAL	480	2559	1106	2329	1474	7853

* 2nd amendment to NWCWD agreement states this volume will decrease to 1,129 ac-ft on Jan 1, 2013

Windsor has one treated-water storage tank and a booster pump station that delivers water to elevations above that which can be delivered by gravity. The existing two-million gallon (MG) water storage tank provides water for fire protection, daily operating levels and emergency water storage. In early 2007, construction of the water booster pump station was completed, which is located adjacent to Windsor's existing water storage tank. The pump station is necessary to supply water to future development above elevation 4,940 feet.

The current storage volume meets the State's recommendations for operating levels and emergency storage. The guideline requires the equivalent of at least 25% of the maximum daily demand for operating levels plus at least one average-day demand for an emergency supply.

Fort Collins-Loveland Water District Contract

The original agreement with FCLWD was dated August 23, 1999. This agreement was renewed in March 2008. The agreement is for ten years or 2018 with an option to renew for an additional five years. FCLWD supplies the Town with treated water through a 24-inch transmission main west of Windsor. As shown in Table 2.2, the agreement allows for 110 MG or 338 ac-ft to be delivered annually. This amount is "take or pay," which means the Town pays for the water regardless of whether or not Windsor actually takes delivery of the water. The agreement limits delivery to 360,000 gallons per day or 250 gallons per minute. Annually, Windsor conveys raw water supplies no later than May 1st in the amount of 110% of projected water needs for the upcoming year. The only water source listed to be conveyed is Colorado Big Thompson (CBT) water. A master meter located at Colorado State Highway 392 is the point of delivery for this water supply (Figure 2.1).

North Weld County Water District Contract

Windsor originally signed on with NWCWD as a customer in November 2000. This agreement was amended in June 2001 and again in February 2004 and sets future

renewals to be on a five-year basis. NWCWD supplies treated water through a 14-inch transmission main through a connection off of their main line, 2.5 miles north of Town. Windsor conveys water annually in the amount of 110% of previous year's usage plus any anticipated increase in Windsor's use for the upcoming year. Currently, Windsor has one master meter connection with NWCWD's system at WCR 19 and WCR 72 (Figure 2.1). This master meter allows for 1,387 ac-ft annually, but is scheduled to reduce to 1,129 ac-ft on January 1, 2013. A plant investment fee will apply for any requests above peak demand. The agreement calls for a future master meter at WCR 15 and WCR 76 for an additional 5,524 ac-ft annually, although Windsor staff anticipates the master meter will be located ½ mile west of the intersection of WCR 15 and WCR 74. Water sources allowed to be treated include CBT, Windy Gap, North Poudre Irrigation Company (NPIC), and any other source acceptable to NWCWD. NWCWD treats and delivers a majority of the Town's water supply.

City of Greeley

Windsor entered into an agreement with the City of Greeley in January 1996. The agreement is for 25 years or until 2021 with automatic ten-year renewals. The City of Greeley supplies Windsor with treated water through a 16-inch transmission main from a connection with Greeley's 20-inch transmission line on the east side of Town. Additional water is supplied to Windsor through an eight-inch meter that is connected to Greeley's two transmission lines that run parallel to Highway 34. This connection is used as water supply for the South Gate Business Park area to the west of WCR 17 (Figure 2.1). Windsor conveys water to Greeley annually no later than April 1st in the amount of 130% of projected needs for that calendar year. Windsor can take a minimum delivery of 400 ac-ft and a maximum delivery of 604 ac-ft on an annual basis. The 400 ac-ft minimum is "take or pay," so Windsor is charged for this amount whether or not the Town takes delivery of this water. If the 604 ac-ft amount is exceeded, a system development charge is assessed. Once this system development charge is paid for the overage, this amount becomes the new contract delivery limit.

CHAPTER 3 - WATER DEMAND

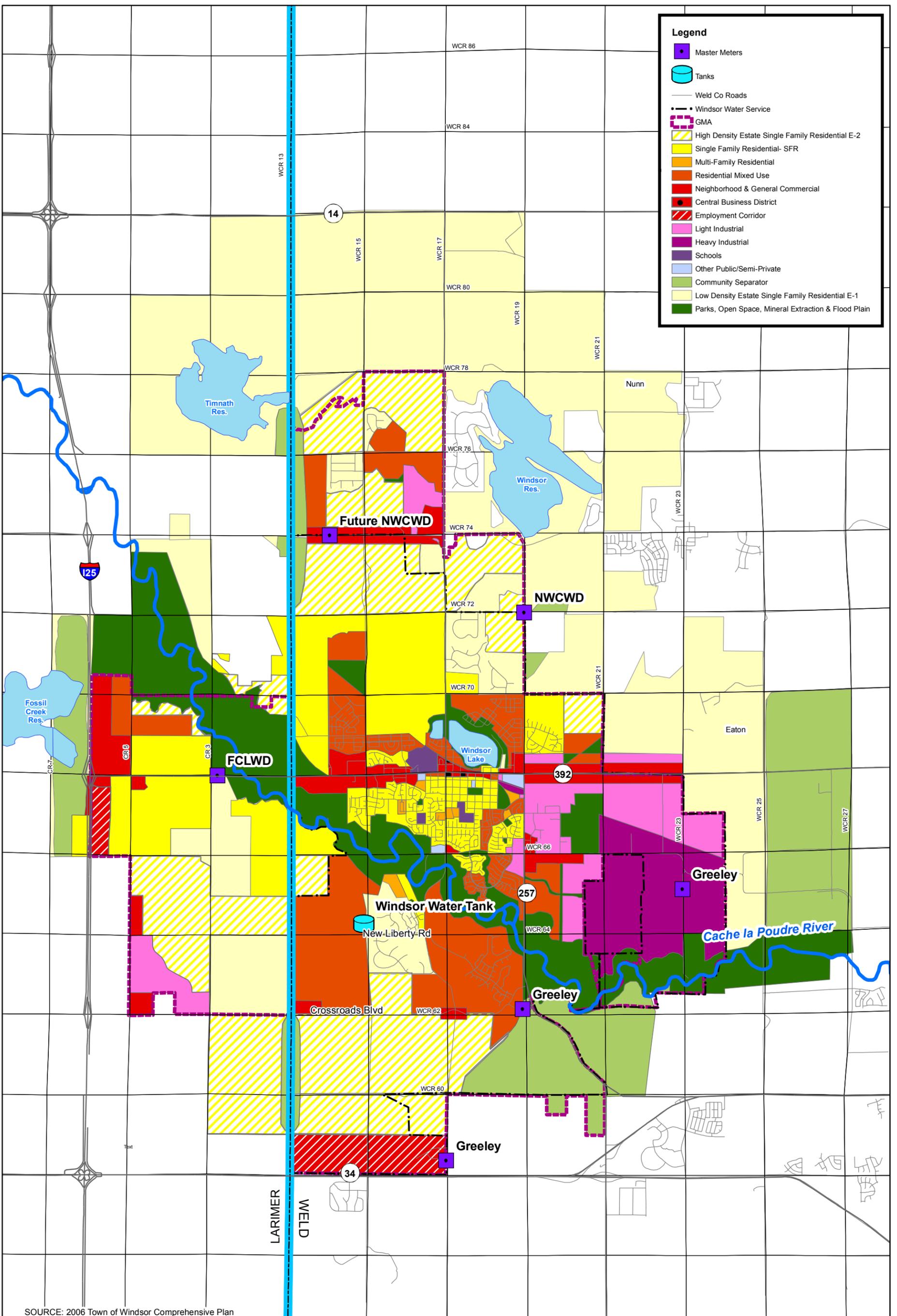
Current Water Demand

By the end of 2008, Windsor was serving 4,853 taps with a total water demand of 1,749 ac-ft. In 2007, the potable demand was slightly higher at 1,909 ac-ft. The average demand for these two years is 1,829 ac-ft, which is the level of current potable water demand we use in this master plan.

Future Water Demand

Windsor's 2006 Comprehensive Plan includes a land use area that includes residential, commercial, and industrial/manufacturing areas. This is shown in Figure 3.1. The Town has adopted the Comprehensive Plan and staff relies on it for planning, particularly for sewer system decisions. Due to this, we chose to project future water demand using this same land use plan.

Windsor's future land use is separated into the categories shown in Table 3.1. We used Geographic Information Systems (GIS) to determine the acreages associated with each land use category. The build-out land use area within Windsor's GMA area totals 26,869 acres. However, only 18,698 acres will be within Windsor's water service area. The balance of acres will be served directly by one of the three wholesale providers.



Legend

- Master Meters
- Tanks
- Weld Co Roads
- Windsor Water Service
- GMA
- High Density Estate Single Family Residential E-2
- Single Family Residential- SFR
- Multi-Family Residential
- Residential Mixed Use
- Neighborhood & General Commercial
- Central Business District
- Employment Corridor
- Light Industrial
- Heavy Industrial
- Schools
- Other Public/Semi-Private
- Community Separator
- Low Density Estate Single Family Residential E-1
- Parks, Open Space, Mineral Extraction & Flood Plain

SOURCE: 2006 Town of Windsor Comprehensive Plan



TOWN OF WINDSOR

**Figure 3.1
Land Use Planning**



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Table 3.1 – Land Use Acreage and Descriptions

CODE	NAME	ACRES	DESCRIPTION
CBD	Central Business District	43	Downtown area - retail, offices, restaurants, bed & breakfast, marina
NGC	Neighborhood & General Commercial	810	Retail, office and restaurants
OPUB	Other Public/Semi-Private	45	All Town buildings - Town Hall, etc.
I-L	Light Industrial	1,174	Highland Industrial Park, etc.
I-H	Heavy Industrial	1,089	Manufacturing such as Vestas, Owens-Illinois Bottling Co. and Front Range Energy ethanol plant
EC	Employment Corridor	620	Targeted development with significant office, commercial and housing
MFR	Multi-Family Residential	88	Condos, townhouses; 14 units per acre, 1.7 persons/unit, 80 gpcd
E-1	Low Density Estate Single Family Residential	881	One home per 2.5 acres; 8,000 sq ft of irrigation per lot, 2.8 persons/house, 80 gpcd
E-2	High Density Estate Single Family Residential	3,179	1.25 homes per acre; 6,000 sq ft of irrigation per lot, 2.8 persons/house, 80 gpcd
RMU	Residential Mixed Use	3,330	Assume 20% commercial and 80% residential; six houses per gross acre density with 3,000 sq ft of irrigation, 2.8 persons/house, 80 gpcd
SFR	Single Family Residential	2,760	Four houses per acre with 4,000 sq ft of irrigation per lot, 2.8 persons/house, 80 gpcd
SCHL	Schools	98	15 gpcd; outdoor is irrigated with non-potable
POSF	Parks, Open Space, Mineral Extraction & Flood Plain	2,745	Assume all to be irrigated with non-potable sources
CS	Community Separator	1,837	Assume all to be irrigated with non-potable sources
TOTAL		18,698	

We used the 18,698 acres within Windsor’s water service area and the criteria described in Table 3.1 to calculate the potable water demand for the Town at full build-out. Not all of the gross acreage will include a water demand as streets and other infrastructure will be included as part of the development. Assumptions were made to determine how much of the gross acreage calculated is expected to have potable water use in the future. A ten to 15% reduction per land use category was used to determine net acreage.

Residential Water Use

Table 3.2 shows the calculations for residential potable water demand. We worked closely with Windsor staff to develop the criteria used to project future water use. Based on this criteria, we calculated Windsor will have approximately 32,547 homes at build out. For the E1, E2 and SFR categories, we assumed 2.8 people per house and a per capita water use of 80 gallons per day. For multi-family residential, we assumed 1.7 people per unit and a water use of 80 gallons per person per day. For the RMU category, we assume 80% of this acreage is made up of residential with 2.8 people per house and a per capita water use of 80 gallons per day.

To determine residential irrigation demand, we estimated an irrigated acreage for the various residential land use categories which will use potable water. These amounts are described in Table 3.1. The acreages were multiplied by 2.28 ac-ft per acre. Table 3.2 shows the total calculated potable demand for the residential areas to be 9,900 ac-ft.

Commercial and Industrial Water Use

Table 3.3 shows the calculated demands for commercial and industrial. Commercial and industrial water use is much more difficult to predict than residential because of the varying types of business in this category. For example a restaurant and a bank, although both within the Commercial land use category, have distinctly different water use patterns. Our approach utilized billed water usage to develop an ac-ft per acre ratio for each land use category. As stated earlier, the Town has a current potable water use of 1,829 ac-ft. We allocated this billed water use into the various land use categories to develop the ac-ft per acre ratio. To illustrate, the industrial sector used on average of 212.7 ac-ft over 456 currently developed acres, which equates to 0.47 ac-ft per acre. We multiplied this ratio by the total projected 2,263 acres of future industrial development to determine the 1,056 ac-ft of demand. Including outdoor irrigation, the total potable demand for industrial use is estimated to be 1,641 ac-ft.

This same procedure was used for the Commercial land use category. On average, commercial customers are using 0.36 ac-ft per acre. The total potable demand for commercial use is projected to be 935 ac-ft.

School Water Use

The Town conducted a study to determine the daily per capita water use for the School land use category. The schools that were part of this study were Grand View, Tozer, Mountain View, Sky View, Windsor Middle School, and Windsor High School. We verified the Town's information with Weld County School District RE-4 to determine the maximum capacity of these institutions. The results showed a water use range from 10 to 15 gpcd. To be conservative, we used 15 gpcd in our analysis. Weld County School District RE-4 estimates a population for the existing schools to be 3,890 people, which includes both students and staff. They projected another 2,700 people for a new

Table 3.2 - Future Residential Water Demands

Within Windsor Water Service Area

WINDSOR WATER SERVICE AREA					POTABLE DEMAND						
CODE	DESCRIPTION	Windsor Gross Acres	Windsor Net Acres	No. of homes	Indoor (ac-ft)	Total Irrigated Acres	Potable Irrigated Acres	Non-potable Irrigated Acres	Potable Irrigation (ac-ft)	Non-Potable Irrigation (ac-ft)	Total (ac-ft)
MFR	Multi-Family Residential	88	84	1,232	188	13	8	4	19	10	207
E-1	Low Density Estate Single Family Residential	881	793	317	80	58	5	53	11	122	90
E-2	High Density Estate Single Family Residential	3,179	2,702	3,973	998	547	27	520	62	1,186	1,059
RMU	Residential Mixed Use	3,330	2,831	15,984	4,251	1,101	388	713	884	1,626	5,135
SFR	Single Family Residential	2,760	2,484	11,040	2,772	1,014	279	735	636	1,676	3,408
	TOTAL	10,238	8,893	32,547	8,288	2,733	707	2,026	1,611	4,619	9,900

Notes:

MFR assumes 1.7 people per unit * 80 gpcd for potable calculation.

E1, E2 and SFR assume 2.8 people per house * 80 gpcd for potable calculation.

RMU assumes 20% commercial & 80% residential. Assume 2.8 people per house * 80 gpcd for potable calculation.

Lawn size for SFR = 4000 sq. ft.; E-1 = 8000 sq.ft.; E-2 = 6000 sq.ft.; RMU = 3000 sq.ft.

Some of the SFR area has private wells and they were subtracted from the total number of acres needed to irrigate shown above.

SFR assumes 4 homes/gross acre

E-1 = 0.4 homes/net acre

E-2 = 1.25 homes/gross acre

RMU = 6 homes/gross acre;

MFR = 14 units/gross acre & 15% of net acres will be in irrigation.

Table 3.3 - Future Potable Water Demands

Within Windsor Water Service Area

WINDSOR WATER SERVICE AREA					POTABLE DEMAND			
CODE	DESCRIPTION	Windsor Gross Acres	Windsor Net Acres	No. of homes	Indoor (ac-ft)	No of Irrigated Acres	Outdoor (ac-ft)	Total (ac-ft)
MFR	Multi-Family Residential	88	84	1,232	188	13	19	207
E-1	Low Density Estate Single Family Residential	881	793	317	80	58	11	90
E-2	High Density Estate Single Family Residential	3,179	2,702	3,973	998	547	62	1,059
RMU	Residential Mixed Use	3,330	2,831	15,984	4,251	1,101	884	5,135
SFR	Single Family Residential	2,760	2,484	11,040	2,772	1,014	636	3,408
SCHL	Schools	98			65			65
POSF	Parks, Open Space, Mineral Extraction & Flood Plain	2,745						
CS	Community Separator	1,837						
CBD	Central Business District	43	32		15	5	11	26
NGC	Neighborhood & General Commercial	810	608		289	91	210	499
OPUB	Other Public/Semi-Private	45	34		16	5	12	28
I-L	Light Industrial	1,174	880		547	132	304	851
I-H	Heavy Industrial	1,089	817		508	123	282	790
EC	Employment Corridor	620	465		222	47	161	382
	TOTAL	18,698	11,728	32,547	9,952	3,135	2,590	12,542

Notes:

Commercial and Industrial irrigation was assumed to be potable.

Parks/Open Space and Community Separator will be irrigated with nonpotable water.

Nonpotable water demand is not part of this analysis.

2.28	af/ac Irrigation Requirement
0.36	af/ac for CBD, NGC, OPUB, EC
0.47	af/ac for I-L, I-H
0.33	af/ac for SCHL
0.35	af/ac for Landscape

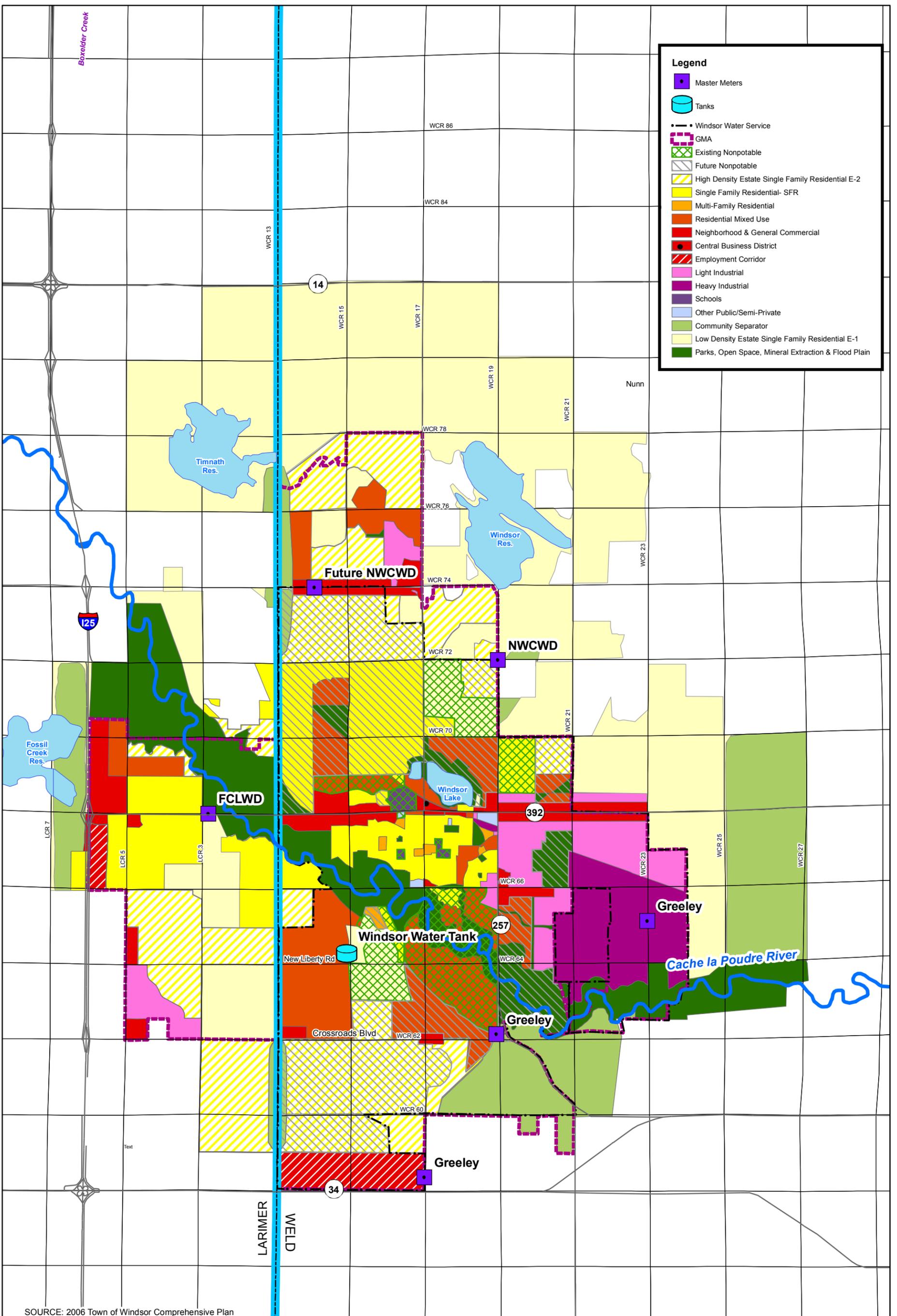
elementary, middle school and high school within the next six to eight years, but these new schools will be outside of the Windsor water service area. Therefore, we used the 3,890 population estimate to derive a water use of 65 ac-ft. We do not estimate additional schools within the Windsor water service area. Additional water use in this land use category may occur, but should not alter the water demand significantly. The schools currently within the Windsor water service area use well water, so no outdoor potable irrigation is included.

Non-Potable Irrigation

In the Town's municipal code, new residential developments in certain areas are required to build dual systems using the agricultural water that was historically used on that land. The native water is used for outside irrigation at the development, and thus reduces the burden on the Town's potable water supplies. Of the total acres within the Town's water service area, we deduct the current and future acreage to be irrigated with non-potable supplies. These areas are shown in Figure 3.2. This ordinance regarding irrigation with non-potable water only applies for residential developments. Non-potable systems are not required for non-residential areas at this time. In the future, some commercial and industrial areas will likely develop non-potable systems. However, for our analysis we considered all commercial, industrial and business areas will use potable water for outdoor irrigation as there is no certainty these categories will develop non-potable systems. We project that the schools, parks and community separator areas will all use non-potable irrigation sources. The total acreage was reduced to account for areas that will be irrigated with non-potable water.

Wells within Old Town

There are 412 private wells, each estimated to irrigate approximately 4,000 square feet of lawn at single-family dwellings within neighborhoods south of Downtown Windsor. This equates to 38 acres that are irrigated with well water. The total acreage was reduced to account for these areas irrigated with well water.



Legend

- Master Meters
- Tanks
- Windsor Water Service
- GMA
- Existing Nonpotable
- Future Nonpotable
- High Density Estate Single Family Residential E-2
- Single Family Residential- SFR
- Multi-Family Residential
- Residential Mixed Use
- Neighborhood & General Commercial
- Central Business District
- Employment Corridor
- Light Industrial
- Heavy Industrial
- Schools
- Other Public/Semi-Private
- Community Separator
- Low Density Estate Single Family Residential E-1
- Parks, Open Space, Mineral Extraction & Flood Plain

SOURCE: 2006 Town of Windsor Comprehensive Plan



TOWN OF WINDSOR

Figure 3.2 Nonpotable Irrigation

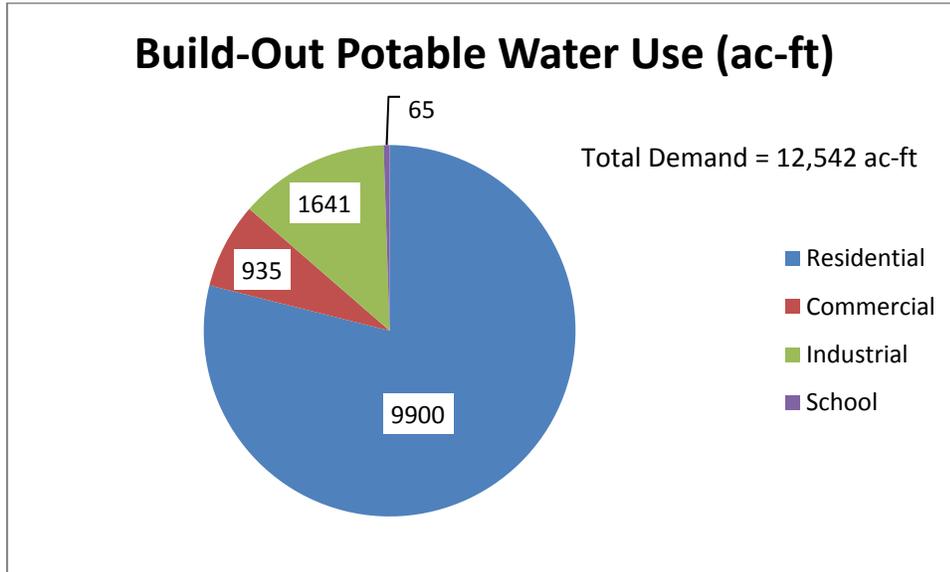


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Total Potable Water Demand

The total potable water demand at full build out is projected to be 12,542 ac-ft. This is depicted in the following graph.

Figure 3.3 – Build-Out Potable Water Use



CHAPTER 4 – CURRENT WATER SUPPLY

The Town of Windsor owns CBT units as well as NPIC shares. NPIC owns 40,000 units of CBT, which is delivered to its 10,000 shares, so essentially every share of NPIC has four units of CBT associated with it. There is an agricultural component in addition to the CBT component with each NPIC share. The table below summarizes the CBT component of NPIC as well as the other shares that Windsor owns.

Table 4.1 – Town of Windsor Water Rights

Source	Shares or Units	Average Yield (ac-ft/share)	Firm Yield (ac-ft/share)	Planning Yield (ac-ft/share)	Total Average Supply (ac-ft)	Total Firm Supply (ac-ft)	Total Planning Supply (ac-ft)
CBT - Fixed Quota	2,101.0	0.7	0.5	0.6	1,470.7	1,050.5	1,260.6
CBT - Variable Quota	1,349.0	0.7	0.5	0.6	944.3	674.5	809.4
NPIC	350.5	2.8	2.0	2.4	981.4	701.0	841.2
TOTAL					3,396.4	2,426.0	2,911.2

Notes:

NPIC yield only considers CBT portion; excludes agricultural component

Colorado-Big Thompson

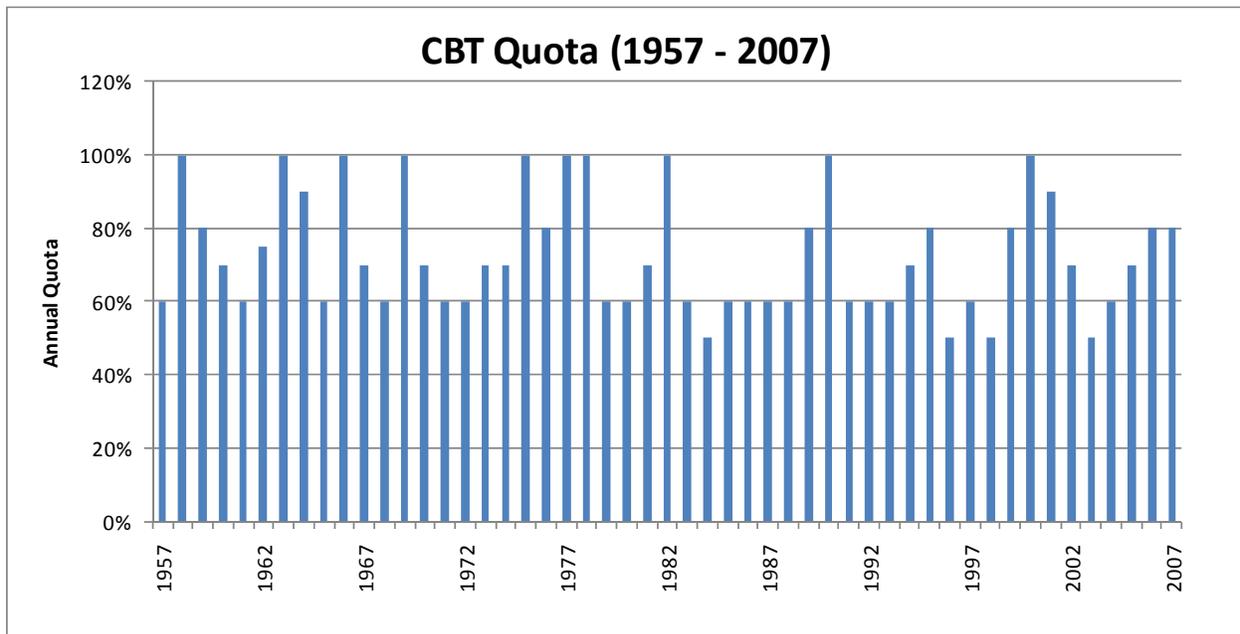
CBT Project facilities divert water from the western slope of Colorado to the Front Range to supplement the region's native water supplies. It is the largest trans-mountain water diversion project in Colorado. It was constructed by the Bureau of Reclamation between 1938 and 1957 and is maintained by the Northern Colorado Water Conservancy District (Northern Water). The Project imports an average of 213,000 ac-ft of water each year to many public and private water users along the northern Front Range and northeastern Colorado for agricultural, municipal and industrial uses.

The yield of CBT units is established each year by the Northern Water Board through what is known as the quota-setting process. The Northern Water Board examines the region's native supplies and local storage before declaring a quota that meets the supplemental need of the region as a whole.

As a result, the quota is typically lower in wet years because native supplies are plentiful and local reservoirs are full, so less CBT water is required to satisfy water demands. As CBT continues to transfer from agricultural to municipal use, the landscape of using the Project as a supplemental supply is changing.

In over fifty years of operation, the average yield has been 0.73 ac-ft per CBT unit. A generally accepted value is a 70% quota. The yield has never been less than 0.50 ac-ft per unit (50% quota) or more than 1.0 ac-ft per unit (100% quota). The years 2002 and 2003 were an exception when for the first time in the system's history the quota was set based on limited supply. The quota was initial set at 30%, but supplemental quotas increased the yield to 0.5 ac-ft per CBT unit. Figure 4.1 summarizes the annual quota established by the Northern Water Board over the years.

Figure 4.1 – Annual CBT Quota History



The Town currently owns 3,450 units of CBT. Over the years, Windsor has received more CBT water through dedication than allowed by Northern Water regulations. Resolution D-962-02-95 from Northern Water deals with limitations of ownership issues and is summarized as follows:

For municipalities and domestic water purveyors, the limitation on unit ownership will be calculated and determined as the lesser of the following:

1. $(Demand \times 2) - (Average \text{ Yield of Native Supplies}) = \text{Max. No. of CBT Units Allowed to be Owned}$

or

2. *(Demand) – (Firm Yield of Native Water Supplies) = Max. Volume of Firm Yield CBT Water Allowed to be Owned*

The maximum number of CBT units allowed to be owned shall be determined by dividing the volume of CBT water allowed to be owned by 0.5 for variable-quota contracts and 0.7 for fixed-quota contracts

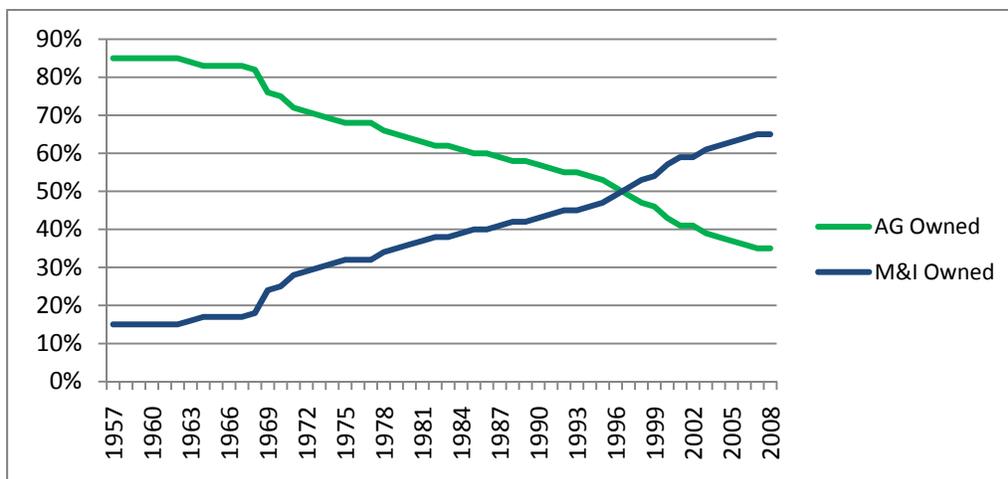
Demand is based on a ten-year average of per-tap usage times the total number of taps currently supplied and taps committed to supply in the future.

This Resolution was established to preserve the CBT system and prevent speculative purchases of its water. The CBT system was originally designed as a supplemental supply to native water rights with agriculture as the primary user.

Because Windsor has exceeded its CBT ownership per the above Resolution, the Town is “capped” and cannot purchase additional CBT supplies through the open market. Therefore, the Town must rely on CBT acquisition through dedication from new development. This Northern Water requirement puts a burden on the Town to figure out other sources of domestic supply since it cannot purchase additional CBT water.

CBT water is in great demand and is converting from agricultural use to municipal/industrial (M&I) use rapidly. In the late 1950’s, CBT ownership was 85% agricultural owned and 15% M&I owned. Today, the estimated ownership is 65% M&I and 35% agricultural. The chart below shows the ownership transition.

Figure 4.2 – CBT Ownership Transition



Because of this transition, the market for CBT water has become very competitive. Windsor must be prepared with other sources of water when CBT is no longer available.

North Poudre Irrigation Company

As described earlier, NPIC owns 40,000 CBT units, so their shares include a CBT portion and a native agricultural portion. The CBT water is delivered equally among the 10,000 shares within the NPIC system. Delivery of the CBT portion can be taken anywhere that CBT units can be delivered, so an entity outside of the NPIC service area can actually own NPIC shares and lease the native portion back to shareholders within the NPIC service area.

NPIC diverts their Poudre basin rights and CBT water through the Munroe Canal and uses the Livermore Diversion for their North Poudre Basin rights. NPIC has numerous reservoirs with an estimated total storage capacity of 63,000 ac-ft. Municipal ownership in NPIC has increased over the years and is currently 65%. Windsor currently owns 350.5 shares of NPIC.

Northern Integrated Supply Project

The Northern Integrated Supply Project (NISP) is a regional water supply project for 15 Front Range entities to provide approximately 40,000 ac-ft of water. The project consists of 170,000 ac-ft of storage in proposed Glade Reservoir northwest of Fort Collins and 40,000 ac-ft of storage in proposed Galeton Reservoir, which is east of Ault. The South Platte Water Conservation portion of NISP (Galeton) would construct pipelines to divert water from the South Platte River to fill Galeton Reservoir. Water would be subsequently released from Galeton Reservoir to Larimer and Weld Irrigation Company and New Cache Irrigating Company to satisfy the shareholders lower in these two systems. Because the Larimer and Weld and New Cache systems are so expansive, this arrangement saves a tremendous amount of ditch loss. In exchange, NISP would divert an equal amount of water into Glade Reservoir.

Northern Water has worked with the NISP participants to conduct several feasibility studies. Current estimates project NISP to cost \$490,000,000 or \$12,250 per ac-ft. According to Northern Water staff, approximately 60% of the water on average will be fully consumable and able to be used and reused to extinction, which is essentially the Galeton portion of the project. The following table shows the NISP participants and their respective amounts of the 40,000 ac-ft project.

Table 4.2 – NISP Participants and Requested Yields

	Participants	Requested Yield (ac-ft)
1	Central Weld County Water District	3,500
2	Dacono	1,000
3	Eaton	1,300
4	Erie	6,500
5	Evans	1,600
6	Firestone	1,300
7	Fort Collins-Loveland Water District	3,000
8	Fort Lupton	3,000
9	Fort Morgan	3,600
10	Frederick	2,600
11	Lafayette	1,800
12	Left Hand Water District	4,900
13	Morgan County Water quality	1,300
14	Severance	1,300
15	Windsor	3,300

Water Dedication Policy

Residential

The Town currently has the following Raw Water Requirement (RWR) for residential development:

- 3.0 ac-ft per gross acre for SFR, includes indoor and outdoor use
- 1/3 ac-ft per dwelling unit for E1, E2, RMU, MFR for indoor use and 2.5 ac-ft per acre for outdoor use.

For a SFR development, the Town requires 3.0 ac-ft per gross acre of the development. For example, if a 50-acre site will be developed without any non-potable irrigation, the raw water dedication requirement will be 150 ac-ft. For E1, E2, RMU, and MFR developments, the Town requires 1/3 ac-ft per house for indoor use plus 2.5 ac-ft per acre of outdoor irrigation. Non-potable irrigation is deducted when calculating the RWR for outdoor use.

Once the Town makes the calculation to determine the volume of water (in ac-ft) required to meet the proposed development, a 70% quota is used to determine the number of CBT units required. Currently, the developer can acquire and dedicate CBT

units or NPIC shares in an amount sufficient to cover the calculated demands associated with that development.

Commercial and Industrial

The water requirements for commercial and industrial are determined on a case-by-case basis, which is the best way to accurately calculate water demands for these categories as water use varies so widely. The municipal code outlines a procedure that allows the Town to go back and collect more water should the commercial or industrial business ultimately use more water than it originally dedicated. The Town has not had to do this to-date.

Sufficiency of Water Dedication Policy

We investigated how the 3.0 ac-ft per gross acre of water dedication for the SFR land use category compared to the RWR for the other residential categories. It is projected that 11,040 new single-family homes will be built on 2,760 acres in the future within the Windsor water service area. Using the 3.0 ac-ft per acre requirement, this would equate to 8,280 ac-ft of raw water dedication. If we used the 1/3 ac-ft per house for indoor use plus 2.5 ac-ft per acre for outdoor use (assuming 4,000 square feet of lawn per house), the Town would receive 6,215 ac-ft of raw water dedication. The current policy for the SFR land use category requires a larger amount of water to be dedicated.

As described earlier in the report, the Town's wholesale providers have a surcharge ranging from 10% to 30%, which requires the Town to transfer, on an annual basis, 10% to 30% of additional water to cover the wholesale provider's system losses. Town staff completed an analysis using billing data to determine a weighted average of 17%. We completed a similar analysis using 2007 and 2008 data and calculated 16.8% and 16.3%, respectively. Windsor's system loss after the master meters was determined to be approximately 9% in the 2008 Water Conservation Plan. This 9% is the difference between the master meters and the billed water use at the customer. The Town currently includes the 17% weighted average surcharge to cover the requirement from its water suppliers, but does not include the 9% Town system loss. We recommend the Town consider both losses, or use 26%, in the future when determining the RWR. Should the agreements ever get renegotiated and the surcharges reduced, the Town can subsequently reduce this requirement. However, unless the Town includes the 9% system loss, growth is not paying its own way.

Windsor currently uses a 70% quota estimate to determine the number of CBT units required for dedication by developers. Most water providers use a quota of 50% when calculating their RWR. In this plan, we use a 60% quota. The basis for the 60% quota assumes a 50% quota allocation plus an additional 10% through carryover. Per Northern Water's Annual Carryover Program Procedures,

The Board and District staff will review the advantages and consequences of the Annual Carryover Program on a continuing basis. While the Board recognizes the Program's benefit to many CBT Allottees, it may modify or discontinue the Annual Carryover Program at any time.

Considering this procedure, a 50% planning quota would be the most conservative, which is why many water providers use 50%. However, this Potable Water Master Plan is developed with the position that this Carryover Program is much too valuable to the CBT Allottees, and Northern Water will do everything it can to keep the program intact. On an annual basis the Town is allowed to carryover up to 20% of its CBT Quota water, so including a 10% firm carryover is reasonable.

We recommend that the Town alter its water dedication policy to use a 60% quota versus the average quota of 70% when determining the number of CBT units required.

CHAPTER 5 – WATER SUPPLY VS. DEMAND

Anticipated CBT Acquisition

CBT is transitioning from agricultural to M&I ownership at approximately one percent per year. It is difficult to project when CBT will no longer be available, particularly in the context of other regional water projects such as the Windy Gap Firming Project and NISP. These projects may take some pressure off of the current CBT demand, thus slowing the rate CBT shifts from agricultural to M&I. It is anticipated that there will be a small portion of CBT that will permanently remain in agriculture. Projections indicate that available CBT will be in M&I ownership by 2028 to 2030. For purposes of this analysis, it is assumed that CBT will be available until 2025.

The following table shows the anticipated new CBT units that the Town would acquire through annexation if its raw water dedication policy was changed in 2010 to use a 60% quota and to include the 26% for the weighted-average surcharge and the Town's system loss.

Table 5.1 – Anticipated CBT Acquisition

Year	Growth in Water Use (%)	Total Water Use (AF)	Total Water Requirement (AF)	Additional CBT (Units)	Total CBT Ownership (Units)
2009		1,839	2,317		4,850
2010	2%	1,874	2,361	73	4,923
2011	2%	1,911	2,408	79	5,002
2012	2%	1,950	2,456	80	5,082
2013	2%	1,989	2,506	82	5,164
2014	2%	2,028	2,556	84	5,248
2015	2%	2,069	2,607	85	5,333
2016	2%	2,110	2,659	87	5,420
2017	2%	2,153	2,712	89	5,508
2018	2%	2,196	2,766	90	5,599
2019	2%	2,239	2,822	92	5,691
2020	2%	2,284	2,878	94	5,785
2021	2%	2,330	2,936	96	5,881
2022	2%	2,377	2,994	98	5,979
2023	2%	2,424	3,054	100	6,079
2024	2%	2,473	3,115	102	6,180
2025	2%	2,522	3,178	104	6,284

Notes:

Total Water Requirement includes 17% surcharge to the water suppliers plus 9% Town system loss

Current CBT ownership of 4,850 units includes CBT component of NPIC shares

Assumes CBT no longer available after 2025

2% growth in water use from Windsor staff

Water Budget

The projected potable water demand at build-out is 12,542 ac-ft. Including both 17% surcharge from Windsor’s water providers and 9% for the Town’s system loss, the total water requirement is 15,803 ac-ft.

The Town’s current water rights provide 2,911 ac-ft. As shown in Table 5.1 above, we anticipate Windsor will own a total of 6,284 CBT units in 2025 (projected last year of available CBT), assuming a 100% water dedication policy. We recommend a change to this policy later in the report, so the Town’s ultimate CBT ownership is less. Using a 60% quota, this equates to an additional 860.4 ac-ft of CBT water. For the purposes of

this water budget, we do not attempt to distinguish if this new CBT water will be CBT or CBT through NPIC shares. In addition to the CBT, Windsor is currently participating in NISP at a level of 3,300 ac-ft. Considering all water supplies, the Town will have 7,072 ac-ft of water supplies at build-out. Table 5.2 below shows the anticipated shortage of 8,731 ac-ft.

Table 5.2 – Water Budget at Build-Out

	Volume (ac-ft)	Comments
Demand		
Projected Build-Out Demand	12,542	
Build-Out Water Requirement	15,803	Includes 17% surcharge and 9% system loss
Supply		
Current Water Supply	2,911	(3450 units + 1400 units (NPIC))*0.6 ac-ft/unit
Anticipated New CBT Acquisition	861	(6284 units - 4850 units)*0.6 ac-ft/unit
NISP Participation	3,300	
Total Supply	7,072	
Build-Out Water Supply Shortage	8,731	

This water supply shortage can be met through water acquisition and water conservation. We visit both alternatives in the following chapters of this report.

CHAPTER 6 – POTENTIAL NEW SOURCES OF WATER SUPPLY

Due to Windsor's wholesale contracts with FCLWD, NWCWD and Greeley, future water supplies need to have the ability to be treated by these entities, unless the Town wants to construct its own water treatment facility. More specifically, as shown in Table 2.2, the Town's contract with NWCWD allows for an additional master meter and increased treatment and transmission capacity. Greeley's contract also allows for expansion with the payment for additional system capacity. However, NWCWD will be the primary provider in the future for Windsor. For this reason, future water supplies will need to be treatable by NWCWD. The existing contract states that NWCWD will accept CBT, Windy Gap, NPIC, and any other source acceptable to the NWCWD. In our analysis of potential future water supplies for Windsor, we only consider the sources that can be treated by NWCWD.

Water Supply and Storage Company

The Water Supply and Storage Company (WSSC), a non-profit Colorado mutual ditch corporation, was founded in 1891 and has 600 shares and approximately 165 shareholders. The municipal shareholder group includes Thornton, Fort Collins, East Larimer County Water District, NWCWD and Greeley totaling 365 shares or 61% of the outstanding shares. The remaining shares are owned by approximately 160 family farmers. All WSSC water is and has been historically diverted for agricultural uses, principally flood and sprinkler irrigation of 40,000 acres in northern Colorado.

The Larimer County Ditch distributes to shareholders water from its headgate on the Cache la Poudre River, typically between mid-May through the first week of September. WSSC presently uses all the water it diverts for agricultural purposes. The municipal owners lease their water to farmers in the area. Figure 6.1 delineates the WSSC service area.

WSSC annually collects, diverts and delivers approximately 56,000 ac-ft of water primarily from direct flow rights in the Cache la Poudre River and two trans-mountain diversions that include: (1) diversion from the headwaters of the Colorado River in the Kawuneeche Valley of Rocky Mountain National Park via the Grand River Ditch and over the Continental Divide at la Poudre Pass; (2) diversion from the headwaters of the Laramie River via the Rawah Ditch (via the Laramie-Poudre Tunnel); and (3) Skyline Ditch, which diverts directly into Chambers Lake.

All water diverted from outside the Cache la Poudre River basin flows either into Long Draw Reservoir or Chambers Lake and then into the Cache la Poudre

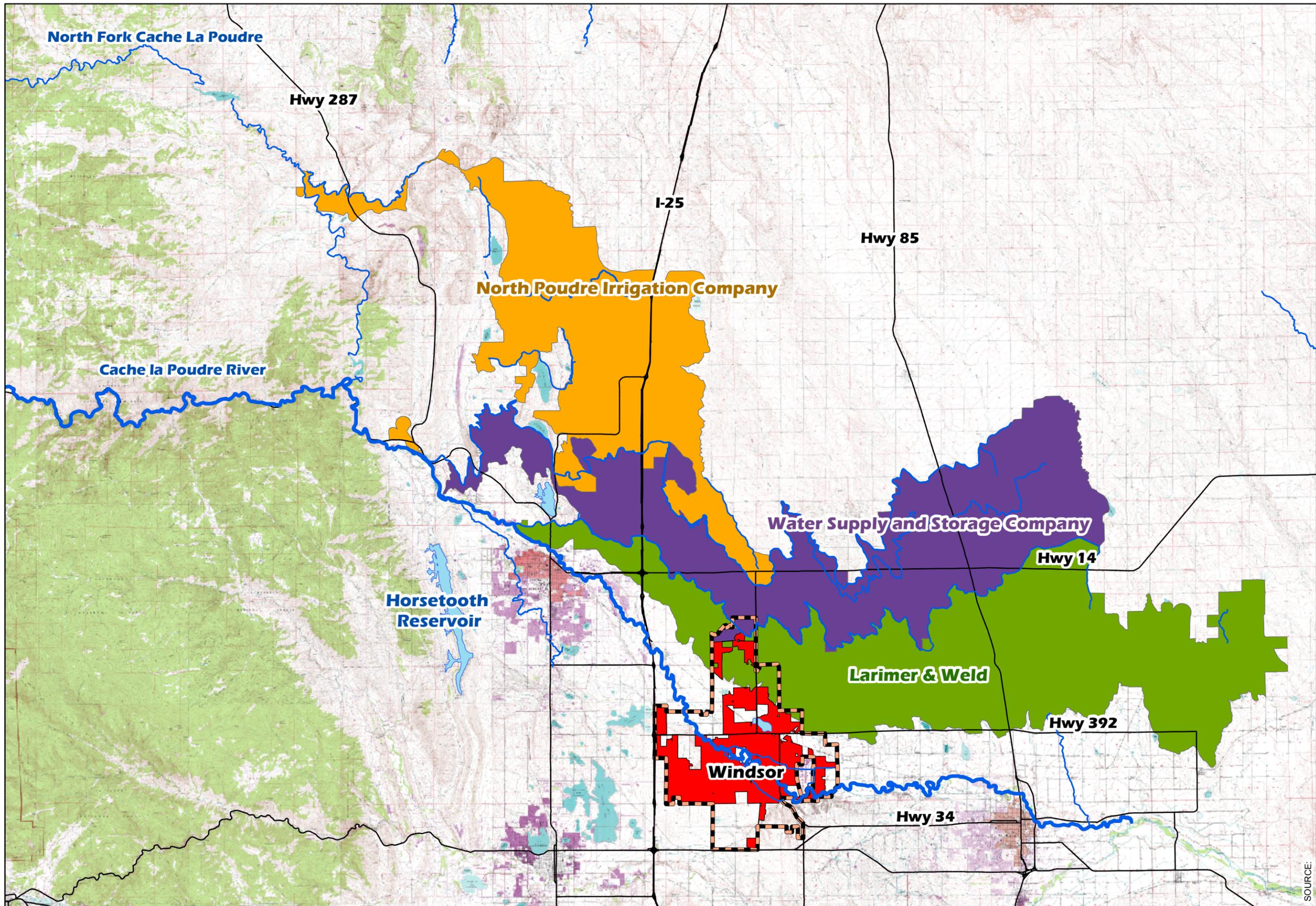


Figure 6.1
 Potential Water
 Supply Systems

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SOURCE:



River. All water taken by WSSC for distribution to its shareholders is taken out about 50 miles downstream through its headgate on the Cache la Poudre River. This headgate is the upper end of the WSSC's main distribution canal called the Larimer County Canal. WSSC also draws exchanged flows for shares of CBT water through this headgate.

Water is distributed to shareholders based upon a schedule set by WSSC's Board of Directors. Deliveries are usually made four or five days per week from the mid-May through the first week of September season. The schedule is variable, depending on water supplies and the frequency and sufficiency of natural rainfall over the service area.

The municipalities and water districts that currently own WSSC shares continue to pursue additional shares. The competition for this water consequently has increased the price. There has been several change of use cases on this system, so some precedence has been set for what these shares will yield. On average, WSSC shares will yield 65 ac-ft per share with a firm yield of 45.6 ac-ft per share. The current cost of one share is approximately \$450,000, which equates to \$9,868 per ac-ft of firm yield. This cost can fluctuate with the market, but in general shows an overall rise with time.

Because the WSSC system is so expansive, the system was divided into several sectors per the City of Thornton decree. This decree outlines the procedures to replace return flow obligations for entities acquiring and changing the use of these shares from irrigation to municipal use. Shares originating within a particular sector accrue return flows to various defined locations, some of which are not within the same sector.

Windsor's wastewater treatment plant (WWTP) is located in the SE ¼, Section 34, Township 6N, Range 67W, in the 6th P.M. If Windsor acquired WSSC water, it would begin generating fully consumable water at its WWTP. This fully consumable water could potentially be used to replace a portion of the required return flow obligations. Kern Reservoir water could also be used to replace WSSC return flow obligations, although this water is currently needed by the Town for other obligations. The return flow replacements outlined in the Thornton decree are complicated and expand to various ditches and locations along the Cache la Poudre River that Windsor currently could not cover. However, NWCWD has the ability to replace return flows in most WSSC sectors due to their expansive system and return flows from their customer septic systems. An agreement could potentially be reached to have NWCWD replace Windsor's return flows. However, if NWCWD assumes the cost of changing Windsor's WSSC water and the responsibility of replacing return flow obligations, they will certainly require something in return. The details of a possible arrangement should be investigated further.

Advantages

- WSSC is a very good water right in terms of seniority and water quality.
- It is the cheapest per firm yield of all water rights we have currently evaluated.

- WSSC shares have a trans-mountain component that is reusable. This reusable water can be applied to Windsor's well augmentation.
- This water right is in high demand, so Windsor should be able to sell this asset in the future should it need to for whatever reason.

Disadvantages

- Because the shares are in high demand, shares available on the market disappear quickly and can be difficult to find.
- Windsor would need to change the use of this water through Water Court or potentially give up some of its value to have NWCWD change the use of this water.
- Expansive return flow obligations may make this somewhat problematic for the Town.

Recommendation

The Town should begin accepting WSSC shares for its raw water dedication on a case-by-case basis. This is a very good water right with a good firm yield and is of high water quality. This water will also generate reusable effluent credit at the Town's WWTP from the trans-mountain component of the WSSC water. The Town could use this reusable water for future augmentation of well pumping for irrigation within Town. If Windsor cannot replace return flows on its own, an agreement could potentially be reached with NWCWD for a portion of the supply. Due to the complexity of the system and future return flow obligations resulting from a change of use, potential acquisition of WSSC shares should be evaluated on a case-by-case basis.

Larimer and Weld Irrigation Company

There are two principal components to the Larimer and Weld (L&W) System - the Larimer and Weld Irrigation Company and the Larimer and Weld Reservoir Company. The service area for L&W extends from north of Fort Collins east to near the Town of Galeton (Figure 6.1). The L&W Canal, also known as the Eaton Ditch, is about 65 miles long and has a physical capacity of 1,000 cfs. There are approximately 63,500 acres of irrigation under this system.

L&W provides direct flow water and storage water to its shareholders under its system. The direct flow rights are relatively junior in the basin and are as follows:

Table 6.1 – Larimer and Weld Direct Diversion Information

District Priority Number	Basin-Wide Priority Number	Appropriation Date	Adjudication Date	Decreed Amount in Original Case * (cfs)
10	5266.00000	06/01/1864	04/11/1882	3.00
TR15	5935.00000	04/01/1866	04/11/1882	1.47
21	6300.00000	04/01/1867	04/11/1882	16.67
45	7933.00000	09/20/1871	04/11/1882	75.00
73	9146.00000	01/15/1875	04/11/1882	54.33
88	10488.00000	09/18/1878	04/11/1882	571.00

L&W Reservoir Company owns 60% of the Divide Reservoir and Canal Company, which includes Worster Reservoir, Wilson Ditch and Deadman Ditch. The Wilson Ditch diverts from the Sand Creek Basin into the North Fork of the Cache la Poudre River and is considered to be trans-basin water. Worster Reservoir is located on Sheep Creek, a tributary to the North Fork of the Cache la Poudre River. Trans-basin water can be reused to extinction and thus reusable effluent generated by the Town could be used for augmentation.

L&W Reservoir, also known as Terry Lake, has an absolute decreed capacity of 8,094 ac-ft with an absolute refill right of 2,296 ac-ft. The Little Cache la Poudre Irrigation Ditch is on this system and has a right for 82.5 cfs.

The L&W system operates exchanges with other large irrigation and reservoir companies in Water District 3, including NPIC, WSSC, and the New Cache la Poudre Irrigating Company. Due to this fact, L&W is an extremely complicated system and would be extremely difficult to change through Water Court.

Advantages

- L&W is a very good water right in terms of water quality, although not as senior as other water rights on the Poudre River.
- L&W Reservoir has a trans-mountain component that is reusable. This reusable water can be applied to Windsor’s well augmentation.

Disadvantages

- L&W shares have never been changed through Water Court. It is difficult and very expensive to be the first Applicant to change the use of a water right.
- L&W is a fairly junior right on the Poudre system compared to WSSC and NPIC.

- It is an extremely complicated system, which means any change of use will likely be met with much opposition.

Recommendation

The Town should not accept L&W shares for water dedication at this time. This water right is extremely complicated and will be difficult to change through Water Court. Further, since this water right has never been changed, Windsor does not want to be the first applicant to do so. There are other water rights that are better suited for Windsor's needs at this time.

Windy Gap

Windy Gap water is delivered through the CBT system infrastructure, and thus can be delivered to Horsetooth Reservoir and treated by NWCWD. Windy Gap water is junior to CBT. If storage in the CBT system spills (Lake Granby), the Windy Gap account spills first. Northern Water is in the permitting process to construct Windy Gap firming storage. Although several alternatives are being evaluated, Chimney Hollow near Carter Lake is the preferred alternative. A storage vessel such as Chimney Hollow would allow Windy Gap water that would otherwise spill to be stored and subsequently used, thus "firming" up this water source.

The true benefit of Windy Gap is that the water is fully consumable and thus can be used and reused to extinction. Similar to CBT, Windy Gap water is sold in units. One unit of Windy Gap equals 100 ac-ft. The estimated price of Windy Gap is \$8,500 per ac-ft un-firmed. Firming storage may add an additional \$10,000 per ac-ft.

Advantages

- This water is fully consumable.
- Windy Gap is delivered through the CBT system and is a source that NWCWD can treat and deliver to the Town.
- This water does not require a change of use through Water Court.

Disadvantages

- Until firming storage is constructed, this water right is vulnerable to CBT system spills.
- There are uncertainties associated with the project, which may affect the final yield of Windy Gap units.
- All of this water is already spoken for, so Windsor would have to find someone who wants to reduce their participation.

Recommendation

Windy Gap is a very good alternative for the Town. The water right utilizes the CBT delivery system and can readily be treated by NWCWD. The Town also has an immediate need for the reusable component of Windy Gap. It is uncertain at this time if any of the Windy Gap participants will decrease their level of participation in the project. The Platte River Power Authority (PRPA) is the largest participant of Windy Gap. Windsor should meet with PRPA or other Windy Gap participants to see if they intend to reduce their current level of participation. If so, the Town should strongly consider obtaining some Windy Gap water.

Table 6.2 – Cost and Yield of Potential Water Sources

Water Supply	No. of Shares	Cost per share (\$)	Average Annual Yield per Share (ac-ft)	Firm Annual Yield per Share (ac-ft)	Cost per Firm Yield (\$/ac-ft)	% in Municipal Ownership
NPIC	10,000	\$24,000	2.8	2	\$12,000	65%
CBT	310,000	\$8,000	0.7	0.5	\$16,000	65%
WSSC	600	\$450,000	65.2	45.6	\$9,868	61%
Larimer and Weld	118	\$20,000	17	1.33	\$15,038	
Windy Gap	480	\$1,840,000	100	100	\$18,400	100%
NISP	40000 ac-ft		3300		\$12,250	100%

Notes:

The prices in this table are 2009 estimated values, which reflect the downturn in the economy. NISP is allocated based on volume, so numbers are in ac-ft vs. shares.

CHAPTER 7 – WATER CONSERVATION

A key component in water resource planning includes water conservation, particularly for the drier western United States. In 2008, Windsor completed a Water Conservation Plan in accordance with the Water Conservation Act of 2004 and to meet the provisions of Colorado Revised Statute 37-60-126. As part of CRS 37-60-126, a State-approved Plan will qualify Windsor for funding from the Colorado Water Conservation Board (CWCB) and the Colorado Water Resources and Power Development Authority for water supply storage and delivery projects. These two organizations have the most favorable rates when it comes to funding for water projects.

By the end of 2007, Windsor was serving 4,583 residential, business, industrial, landscape, and public water users within its water service area. The 2008 Water Conservation Plan predicted that by 2017, Windsor will be serving 7,044 taps for a total annual water demand of 3,353 ac-ft. In this Potable Water Master Plan, we have revised the water use projection considering the slower growth due to the recent downturn in the economy and per recommendations by Windsor staff. This plan projects the 2017 water demand to be 2,153 ac-ft. Most entities implementing water conservation experience higher water savings at the beginning when new programs are first introduced, but this level of water savings tapers off in the future. As the Town becomes more and more efficient with water conservation, it will become more difficult to achieve the same level of savings.

Water Conservation Goals

Windsor began implementing water conservation practices in 2003 as a result of severe drought conditions that identified the need for efficient water use. The Town's conservation practices have included:

- Public information sent out as bill stuffers
- Ads posted in the newspaper
- Lawn water restrictions
- Regular leak detection and repair
- Inclining block water rate structure
- Xeriscape gardening classes and demonstration area
- Education trailer used at schools and Town events

We established an overall water use reduction goal of 12% in the 2008 Water Conservation Plan.

Water Conservation Implementation

All of the proposed water conservation measures and programs chosen will require staff and financial resources for implementation. This will require some strategy in implementing the most beneficial measures first. The Town Board has adopted the Water Conservation Plan and is committed to implementing the selected water conservation programs. Windsor staff has budgeted money annually and will pursue CWCB water-efficiency grant money for water conservation implementation.

In the 2008 Water Conservation Plan, we used a ten-year planning horizon. If the Town implements water conservation according to the plan outlined in the 2008 Water Conservation Plan, we can expect a savings of 12% over the next ten years, which equates to 287 ac-ft per year. As described above, actual water savings will likely taper down once the Town becomes more sophisticated and efficient with its water use and conservation programs and education have reached a majority of its customers. For this Potable Water Master Plan, we assume the Town can achieve a 7% savings of the build-out demand or 878 ac-ft.

CHAPTER 8 – FUNDING ALTERNATIVES

The Town is currently participating in 3,300 ac-ft of NISP, which has an estimated price tag of \$40.4M. Much of this amount will be needed at the start of the construction phase of the project. Due to the level of NISP opposition, the start of construction for this project has been delayed. Originally, construction was anticipated to commence in the 2010/2011 timeframe. For the purposes of this plan, we anticipate it will be 2015 at the earliest before NISP will deliver usable water for Windsor.

Windsor has been proactive in its water acquisition. Because of this, Windsor has excess water supplies beyond its current needs. In our analysis of funding alternatives, we consider the Town's current excess water supplies and evaluate a plan to ensure that growth pays for itself. Since CBT (either CBT or NPIC) is currently the only raw water asset the Town owns, the analysis needed to consider how the Town could leverage its CBT to acquire additional water rights, i.e. participate and pay for NISP. One option would be to sell some CBT to generate revenue for water acquisition. However, this is not recommended since CBT is in such high demand. This Potable Water Master Plan considers alternatives to pay for NISP while avoiding the sale of Windsor's CBT and limiting impacts to its current ratepayers. The ideal method to maintain ownership of the Town's water supplies while generating cash for the funding of NISP is a blended CBT and cash-in-lieu (CIL) dedication policy.

We consider various CBT-CIL alternatives for the Town. Although several levels of CIL were analyzed, we only present the recommended scenario. The following table expands Table 5.1 for a 50% CBT, 50% CIL scenario. Because this alternative allows future development to grow into the Town's current excess supplies, we need to verify that there are sufficient excess supplies to sustain a partial CIL policy until NISP comes online. From a water supply sufficiency standpoint, if Windsor switched to a partial CIL policy in 2010, this 50% CBT-50% CIL could be maintained through 2025. We anticipate NISP to come online in 2015, so the Town should have adequate supplies to change to this new policy.

Table 8.1 – 50% CBT- 50% CIL Scenario

Year	Growth in Water Use (%)	Total Water Use (AF)	Total Water Requirement (AF)	Additional CBT (Units)	CIL (\$)	Total CBT Ownership (Units)	Total CBT Water (ac-ft)	Shortage
2009		1,839	2,317			4,850	2910	no
2010	2%	1,874	2,361	37	\$329,731	4,887	2932	no
2011	2%	1,911	2,408	39	\$354,166	4,926	2956	no
2012	2%	1,950	2,456	40	\$361,249	4,966	2980	no
2013	2%	1,989	2,506	41	\$368,474	5,007	3004	no
2014	2%	2,028	2,556	42	\$375,843	5,049	3029	no
2015	2%	2,069	2,607	43	\$383,360	5,091	3055	no
2016	2%	2,110	2,659	87		5,178	3107	no
2017	2%	2,153	2,712	89		5,267	3160	no
2018	2%	2,196	2,766	90		5,357	3214	no
2019	2%	2,239	2,822	92		5,450	3270	no
2020	2%	2,284	2,878	94		5,544	3326	no
2021	2%	2,330	2,936	96		5,640	3384	no
2022	2%	2,377	2,994	98		5,737	3442	no
2023	2%	2,424	3,054	100		5,837	3502	no
2024	2%	2,473	3,115	102		5,939	3563	no
2025	2%	2,522	3,178	104		6,043	3626	no

Although Table 8.1 shows a blended CBT-CIL policy to project potential revenue that can be generated, the water dedicated does not have to be CBT. If the Town switches to a partial CIL policy, the water dedicated can be any of the other water rights targeted per recommendations from this plan.

New Water Dedication Policy

We recommend the Town switch to a 50% water and 50% CIL policy in 2010. Although the Town could sustain this policy through Year 2025, we suggest the Town move to this policy for the next six years through 2015. This would generate an estimated \$2.2M by the end of 2015. Although this does not pay for NISP in entirety, this revenue generated will help the Town find financing and ultimate give the Town options when it comes to water acquisition.

Most developers may prefer bringing CIL as it is typically easier than finding and purchasing water. However, there will be developments proposed within the Town where the developer already owns CBT, NPIC or WSSC. This policy should remain flexible in that some developers are allowed to bring all water and others all cash to

meet their dedication requirement. That said, Town staff will need to closely monitor water dedication to ensure that the Town is maintaining approximately a 50% water and 50% CIL balance as it collects raw water dedication over the next six years. It will be important that this ratio is maintained, so water supply shortages are not created while the Town is generating cash for water acquisition.

The Town can evaluate its water supplies and cash generated through this policy change on an annual basis. The level of CIL can be adjusted annually should the rate of development or need for water justify a different policy. The blend of water dedication and CIL can also be extended past 2015 should the Town be in a good water position and still want to generate more cash to pay down the debt service associated with NISP or other water acquisition.

CHAPTER 9 – RECOMMENDED WATER PORTFOLIO

As discussed in Chapter 5, the water supply shortage at build-out is 8,731 ac-ft, which increases with the proposed partial CIL policy. This is if Windsor continues to participate in 3,300 ac-ft of NISP. In our opinion, Windsor should not decrease its participation in NISP. There are several reasons for this:

When comparing the cost of NISP to the other supplies shown in Table 6.2, NISP is still one of the most inexpensive water rights on a per ac-ft basis. Windsor needs additional supplies in the future and NISP is likely one of the last regional water projects that will occur for some time considering the level of opposition that seemingly comes with projects of this size. NISP is readily accepted and can be treated by NWCWD. Once NISP is constructed, future development can pay the Town back for this water. A readily available supply will make new development easier and encourage growth.

We recommend the Town maintain its level of participation in NISP, and alter its water dedication policy to a partial CIL to generate revenue to fund the project.

The total anticipated water demand at build out is 15,803 ac-ft, which includes the 17% surcharge from Windsor's wholesale water providers and the 9% Town distribution system loss. We anticipate this water demand will be met as follows:

Figure 9.1 – Future Water Supplies

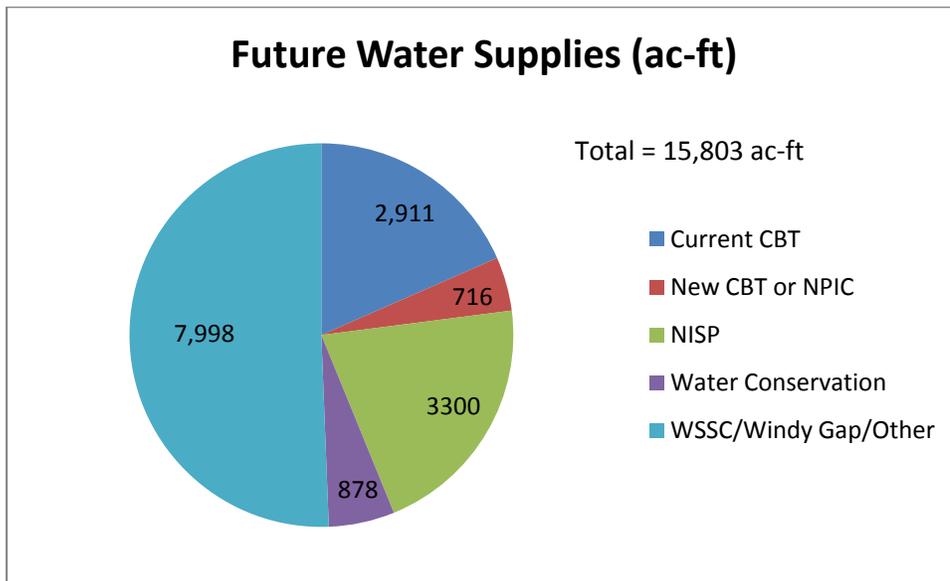


Figure 9.1 details how future water demand will be met with various water supplies. This chart is based on the following:

- The Town will shift its water dedication calculation to use a 60% quota.
- In addition to the 17% surcharge by Windsor’s water providers, the Town will also include the 9% Town distribution system loss.
- The Town shifts to a 50% water dedication and a 50% CIL raw water dedication policy for the next six years starting in 2010 through 2015.
- The Town maintains its 3,300 ac-ft level of NISP participation.
- The Town commits to water conservation implementation per the 2008 Water Conservation Plan.
- The Town acquires WSSC, Windy Gap or other supplies through future development and purchase.

We recommend the Town target the following ownership.

Table 9.1 – Target Water Portfolio

Water Supply	Target Ownership
CBT or NPIC	6043 CBT units
NISP	3300 ac-ft
WSSC/Windy Gap/Other Supplies	7998 ac-ft

In this plan, in addition to NPIC and CBT, we have recommended the Town acquire Windy Gap and WSSC. However, there is likely not enough available supply in these two systems to meet the entire 7,998 ac-ft needed at build-out. Additional sources will need to be considered as the Town grows. The Town has been proactive in its water acquisition philosophy. The Town budgets funds to purchase water when good deals become available. Since the Town is “capped” and cannot purchase additional CBT in the open market, the Town should proactively acquire WSSC and NPIC as shares become available. The Town should initiate discussions with existing Windy Gap participants to see if any entity intends to reduce their level of participation. These water rights will work very well to meet the Town’s future potable water demand in addition to providing reusable water at the Town’s WWTP. As we move into the future, if the Town purchases or acquires through development more of a certain water right, this may ultimately reduce the number of other water rights needed. This will be monitored and managed as the Town moves forward.

Raw water storage (before treatment) may eventually be needed by the Town. However, the Town’s current and recommended future water portfolio includes water rights that have a storage component. With limited financial resources, we recommend water acquisition before water storage for Windsor at this stage. We can evaluate potential raw water storage sites in the future on a case-by-case basis, but the Town should focus its efforts on water acquisition.

CHAPTER 10 – STAFF ROLES AND RESPONSIBILITIES FOR WATER MEASUREMENT AND ACCOUNTING

As described in Chapter 2, the Town has accounts with three wholesale providers: NWCWD, FCLWD and the City of Greeley. On an annual basis the Town has the following delivery limits:

- North Weld (existing meter) = 1,387 ac-ft
- Fort Collins-Loveland Water District = 338 ac-ft
- Greeley = 604 ac-ft
- Total = 2,329 ac-ft

As can be seen in Table 10.1, the Town has exceeded this maximum delivery each of the last three years (2006, 2007 and 2008). Depending on the supplier, the Town has to pay significant fees if they exceed their limits, particularly with the City of Greeley.

Table 10.1 – Annual Water Delivered to Windsor from Water Providers

Year	Actual Delivery by NWCWD	Contract Amt MG	Actual Delivery by FCLWD	Contract Amt MG	Actual Delivery by GREELEY	Contract Amt MG
1994	202.6	452	111.3	110	2.0	195
1995	232.7	452	117.6	110	0.7	195
1996	308.4	452	76.4	110	13.4	195
1997	188.7	452	105.1	110	121.8	195
1998	234.4	452	108.0	110	145.9	195
1999	251.0	452	107.1	110	143.8	195
2000	309.3	452	109.9	110	147.4	195
2001	346.5	452	106.7	110	177.0	195
2002	329.3	452	107.2	110	196.6	195
2003	268.3	452	103.2	110	180.3	195
2004	249.1	452	108.3	110	187.3	195
2005	338.1	452	109.3	110	169.9	195
2006	392.1	452	111.3	110	180.0	195
2007	346.4	452	110.5	110	235.6	195
2008	324.7	452	109.8	110	201.2	195

Because the FCLWD contract is take or pay, the Town wants to use its full 110 MG each year. If the Town exceeds this amount, Windsor is required to pay the \$2.87 per 1,000 gallons. The Town dedicates the raw water for the entire 110 MG, so any overage costs the Town money, not additional water. If the Town does not deliver the full 110 MG, it loses both on the raw water dedicated and the money it must pay under the take-or-pay term.

The Town can use between 130 MG and 197 MG from the City of Greeley. The 130 MG lower limit is take or pay, so the Town wants to deliver at least this volume. If the Town exceeds the 197 MG, the Town pays for the water plus a charge for the system capacity that it used. Any use above the 197 MG limit requires large system capacity fees and should be avoided. In 2008, the Town exceeded this upper limit and paid the required plant investment fee, so the new delivery limit is 197 MG (604 ac-ft).

NWCWD allows delivery of water up to 452 MG. If Windsor exceeds this amount, Windsor must pay an additional fee for any potable water furnished to Windsor for which NWCWD had to provide raw water to meet Windsor's raw water obligation. NWCWD also has the authority to charge a plant investment fee. Exceeding NWCWD's delivery amount should be avoided as well.

Per the set up of these three contracts, Windsor should use all 110 MG of water from FCLWD and manage deliveries to not exceed Greeley's or NWCWD's limits. Between FCLWD and City of Greeley, it is much better to exceed FCLWD as there is only the cost of water charge vs. a water and system capacity charge. Should the Town require more than the 2,329 ac-ft in a given year, the additional deliveries should be ordered from NWCWD.

This chapter describes the protocol for monitoring the annual deliver amounts from each of the three water providers to ensure the maximum contracted amounts of those accounts are not exceeded. The monthly invoice from NWCWD and the City of Greeley comes in around the 1st and 2nd of the month, respectively, and from FCLWD on the 15th of the month. These invoices should be delivered from the Finance Department to the Engineering Department as they come in. The Engineering Department will track monthly water usage volumes. By the 20th of each month, Engineering shall report to Public Works the water usage volumes for the month and year-to-date. Public Works shall utilize this information and adjust the flows from the different entities as necessary to ensure Windsor remains within the annual contracted amounts. The contracted amounts are shown in the table below.

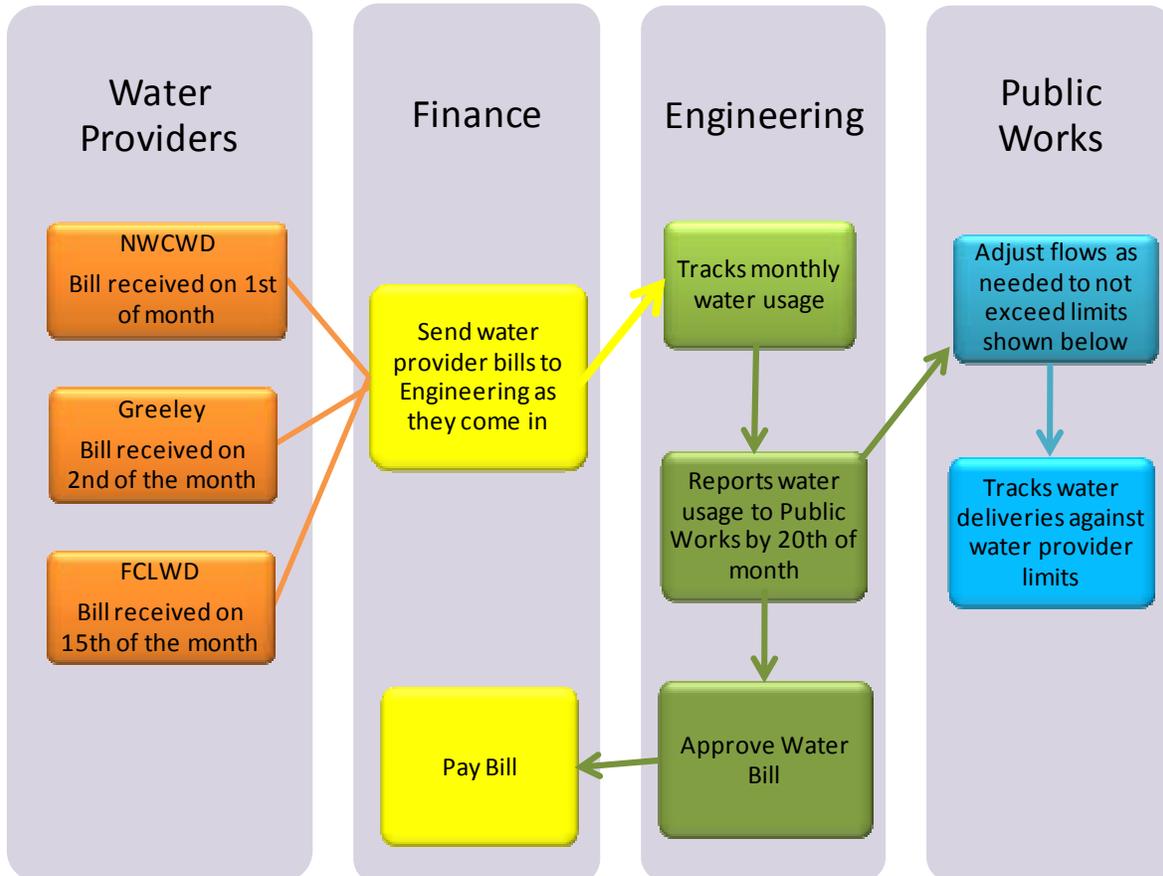
Table 10.2 – Contracted Delivery Amounts from Water Providers

	Water Provider	Current Max (MG)	Current Max (ac-ft)
1	FCLWD	110	338
2	Greeley	197	604
3	North Weld	452	1387

The problem is managing the water delivery volumes from the City of Greeley. Greeley serves the most southern part of Windsor. The master meter in this area is not connected to Windsor's SCADA system, so it must be read and operated manually. The overages in the past in part were due to the fact that this master meter cannot be controlled by Public Works with SCADA. It would greatly benefit the Town to connect this master meter to the SCADA system to better control flows and to ensure the Greeley contracted volume is not exceeded.

We propose the following procedure to improve communication and ensure contracted volumes are not exceeded.

Figure 10.1 – Water Monitoring Protocol



Water Provider Limits:

NWCWD	452	MG	or	1,387	ac-ft
Greeley	197	MG	or	604	ac-ft
FCLWD	110	MG	or	338	ac-ft

Water use reporting from Finance to Engineering to Public Works should follow the above protocol every month. Public Works should track water deliveries on a weekly basis up until December 1st of each year. On December 1st, water deliveries from each provider should be tracked on a daily basis and adjusted as necessary to avoid exceeding the contract limits.

CHAPTER 11 – CONCLUSIONS AND RECOMMENDATIONS

It is important for the Town Board and staff to have a clear understanding of the direction it will take regarding its water resources and policy. The conclusions and recommendations in this chapter will provide the needed steps that should be completed for successful implementation of this Potable Water Master Plan. The Town Board and staff can be confident that the recommendations proposed in this plan will adequately cover the Town's needs as it moves forward.

Following is a list summarizing the recommendations from this plan. The intent of this list is to provide the key decision makers an easy reference point upon which to guide the Town by keeping the decision makers on the same page. This chapter should be referenced periodically to ensure the proper steps are taken for successful implementation.

1. **Alter water dedication calculations.** When computing water dedication requirements, the Town should use a 60% quota vs. a 70% quota and include both the 17% surcharge from its water providers and the 9% Town distribution system loss. If the contracts with the water providers are ever renegotiated to reduce the surcharge or the Town's system loss is improved, this calculation can be adjusted.
2. **Shift water dedication policy from 100% CBT dedication to 50% water dedication and 50% CIL from 2010 through 2015.** This dedication policy will allow the Town to continue to collect sufficient water supplies to meet growth while generating revenue to pay for NISP and other water acquisition. The policy should remain flexible to allow some developers to dedicate 100% water or 100% CIL. However, Town staff must carefully monitor this ratio to ensure water shortages are not created through insufficient water dedication as the Town is collecting CIL. This policy should be implemented in 2010 for the next six years.
3. **Evaluate CIL price each year.** The Town should evaluate its CIL price each year. The CIL price should be set near the price of CBT. Since allowing CIL typically makes it easier for the developer, the CIL price can be higher than the market value of CBT for this convenience. We recommend an initial CIL of \$15,000 per ac-ft. This is equivalent to one unit of CBT at \$9,000 divided by a 60% quota.
4. **Maintain participation in NISP at 3,300 ac-ft.** Because NISP is still an inexpensive water source compared to other water rights on a per ac-ft basis, we recommend the Town stay at its current participation of 3,300 ac-ft.

5. **Initiate discussion with Windy Gap participants.** There may be existing Windy Gap participants that are looking to reduce their level of participation. Windsor should begin discussions with these entities to see if there is an opportunity to join as a participant of this project. Windy Gap water would work very well for Windsor, particularly since this water is reusable. Windy Gap effluent generated at Windsor's WWTP is fully consumable and thus can be applied to the Town's well augmentation needs.
6. **Focus on water acquisition before raw water storage (before treatment).** With limited financial resources, the Town should focus on water acquisition before water storage. The water rights the Town currently owns and the recommended future water supplies have a storage component that will benefit the Town without the need for its own raw water storage. If an opportunity arises for potable water storage, this can be evaluated on a case-by-case basis.
7. **Begin accepting WSSC water for water dedication.** Of the water rights we evaluated, WSSC is the cheapest water right on a per ac-ft basis. This is of high water quality and is treatable by NWCWD. WSSC shares have a trans-mountain component that is fully consumable. WWTP effluent generated from use of this reusable component can be applied to well augmentation. Due to the complexity of the return flow requirements, these shares should be evaluated on a case-by-case basis.
8. **Aggressively pursue new NPIC shares.** Because the Town likely cannot acquire enough WSSC and Windy Gap water to fully meet its build-out demand and due to the fact that the Town cannot purchase CBT on the open market, Windsor should actively purchase NPIC shares whenever deals become available and the financial resources allow.
9. **Budget funds to actively acquire new water.** The Town has proactively budgeted funds to acquire water supplies as good deals become available. The Town should continue this practice.
10. **Budget funds for water conservation.** A key component of Windsor's long term plan includes water conservation. The Town invested resources to complete the 2008 Water Conservation Plan, which now qualifies the Town for water conservation implementation grants. The Town has applied for one grant and should continue to identify opportunities to obtain funding and conserve water.
11. **Initiate adding the future NWCWD Tap to Windsor's system.** The Town is reaching its delivery limits each year through its existing contracts with its water providers. The Town should initiate the process to add the second water tap with NWCWD immediately. Ideally, new development would drive the need for this connection. However, the amount of water provided by NWCWD is scheduled to

decrease from 1,387 ac-ft to 1,129 ac-ft on January 1, 2013. Because of this and the Town already approach its limits, the Town should immediately begin negotiation with NWCWD either to extend the higher delivery amount beyond this date and/or add the second water tap. Windsor could outline a repayment plan should the need for the tap precede development in that area.

12. **Explore potential agreement with NWCWD to change WSSC shares and replace return flow obligations.** Because the WSSC system is so expansive, the requirements for return flows is quite complex. Windsor should complete an agreement with NWCWD detailing an arrangement if NWCWD were to change Windsor's future WSSC shares along with their ownership through Water Court and replace the return flows obligations.
13. **Connect the Greeley master meter to Windsor's SCADA system.** Due to large system charges from Greeley if Windsor exceeds its delivery limit, this meter should be connect to SCADA to allow Public Works to monitor and manage flows through this meter effectively.
14. **Follow communication protocol between departments to manage quantity of water ordered from wholesale providers.** Town staff should follow the protocol represented in the flow chart in Figure 10.1 to ensure water orders are managed effectively and limits are not exceeded.
15. **Continue CBT carryover and rent additional supplies in the summer or fall if there is excess.** The Town should continue participating in the CBT carryover program. The Town should carryover its full entitlement each year to safeguard against and extended drought. If the Town has carried over CBT and, based on adequate weather conditions it has excess water, then the Town can rent out its surplus CBT supplies to recover the money spent on the Carryover Program. This is a low or no-cost insurance policy for the Town to protect itself from an unforeseen drought.