INSIDE:

2014 CONSERVATION PLAN UPDATE

JORDAN VALLEY WATER
CONSERVANCY DISTRICT

GILMORE ENGINEERING INC.

1 INTRODUCTION

BACKGROUND

In 1998 the Utah State legislature passed the "Water Conservation Plan Act," which requires culinary water providers and conservancy districts to submit water conservation plan updates to Utah Division of Water Resources every five years. Jordan Valley Water Conservancy District (JVWCD or District) submitted its first conservation plan in March 1999 and updates in 2004 and 2009.

The 2014 Water Conservation Plan Update satisfies the requirements of the Water Conservation Plan Act as the update that is required every five years.

A copy of this plan has been sent to each JVWCD Member Agency, each county served by JVWCD, and to the media. It has also been posted on JVWCD's website and social media outlets.

RESOLUTION ADOPTING THE PLAN UPDATE

JVWCD's Board of Trustees passed the following resolution adopting the 2014 Water Conservation Plan Update on November 12, 2014.

MEETING THE REQUIREMENTS OF THE PLAN ACT

Section 73-10-32 of State Code requires the following to be included in each water conservation plan:

73-10-32-2 (a)(i) A clearly stated overall water use reduction goal is found on page 3, an implementation plan is found throughout section 8, a timeline for implementation is found in table 8.2, and an evaluation process to measure progress is found on page 13 and in figure 5.

(a)(ii) The requirement to devote at least one regular meeting every five years of its governing body is found on page 30.

(a)(iii) The notification requirements were met and are listed on page 30.

(a)(iv) Minutes and notification procedures are added in the appendix, starting on page 30.

RESOLUTION 14-26

APPROVING THE 2014 WATER CONSERVATION PLAN UPDATE

Whereas, pursuant to §73-10-32, Utah Code Ann. (1953) (the "Act"), Jordan Valley Water Conservancy District ("Jordan Valley") prepared a Water Conservation Plan in 1999, prepared updates to its Plan every five years as required, and has now prepared an additional update to its Plan as set forth in attached Exhibit 1 (the "Updated Plan");

Whereas, Jordan Valley has established in its Updated Plan a conservation goal to reduce water use within its service area by twenty-five percent by 2025;

Whereas, Jordan Valley has determined that achieving this conservation goal will sustain existing water supplies, eliminate or delay more expensive water supply and infrastructure projects, and assist in providing an adequate water supply for future generations;

Whereas, the Updated Plan identifies existing and proposed water conservation measures and programs needed to continue making progress towards achieving the goal; and,

Whereas, pursuant to the Act, Jordan Valley has held a public hearing, after reasonable and advance notice, for purposes of inviting and encouraging discussion and public comment on the Updated Plan.

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of the Jordan Valley Water Conservancy District:

1. Jordan Valley has met the requirements of the Act in its preparation of the Updated Plan.

2. The General Manager is authorized and directed to cause a copy of the Updated Plan to be filed with the Utah Division of Water Resources and with all other persons or entities deemed appropriate.

3. This Resolution shall take effect immediately upon execution by an authorized member of the Board of Trustees.

PASSED, ADOPTED AND APPROVED this 12th day of November, 2014.

_____
Gary C. Swensen
Chair of the Board of Trustees

ATTEST:

_____
Richard P. Bay
Clerk

2

WATER CONSERVATION GOAL

HISTORY OF JVWCD'S WATER CONSERVATION GOAL

JVWCD's water conservation goal has been set at 25 percent reduction per capita by 2025, but this was not always the case. In its original 1999 Water Conservation Plan, a conservation goal of 10 percent reduction by 2020 was established. Following is how this goal has changed over the years:

- August 2001- Utah Governor Michael Leavitt announces Water Conservation Goal of reducing consumption statewide 25 percent by 2050.
- State Division of Water Resources issues "Utah State Water Plan, Planning for the Future," with goal of reducing per capita water use 25 percent by 2050.
- May 2002- JVWCD's Board of Trustees adopt water conservation goal of 25 percent reduction per capita by 2025 in District boundaries.
- January 2013- Utah Governor Gary Herbert, in his State of the State address, announces new statewide goal of reducing water use 25 percent by 2025, matching JVWCD's goal.

The year 2000 is the baseline year for measuring water conservation. JVWCD water use in 2000 was calculated at 255 gallons per capita per day (gpcd), which means JVWCD must reduce per capita water use to 191 gpcd by 2025.

DEFINITION OF PER CAPITA WATER USE

Gross water use – the total volume of treated and untreated water entering the distribution systems of an urban retail water supplier excluding agricultural water and recycled water use. (Pressurized secondary water systems such as those operated by Riverton City and Draper Irrigation Company are considered part of their urban retail water supply systems.)

Per capita water use – the gross water use in a calendar year divided by the number of residents during that year divided by 365 days per year.

3 EXISTING AND FUTURE WATER USE

JORDAN VALLEY WATER CONSERVANCY DISTRICT

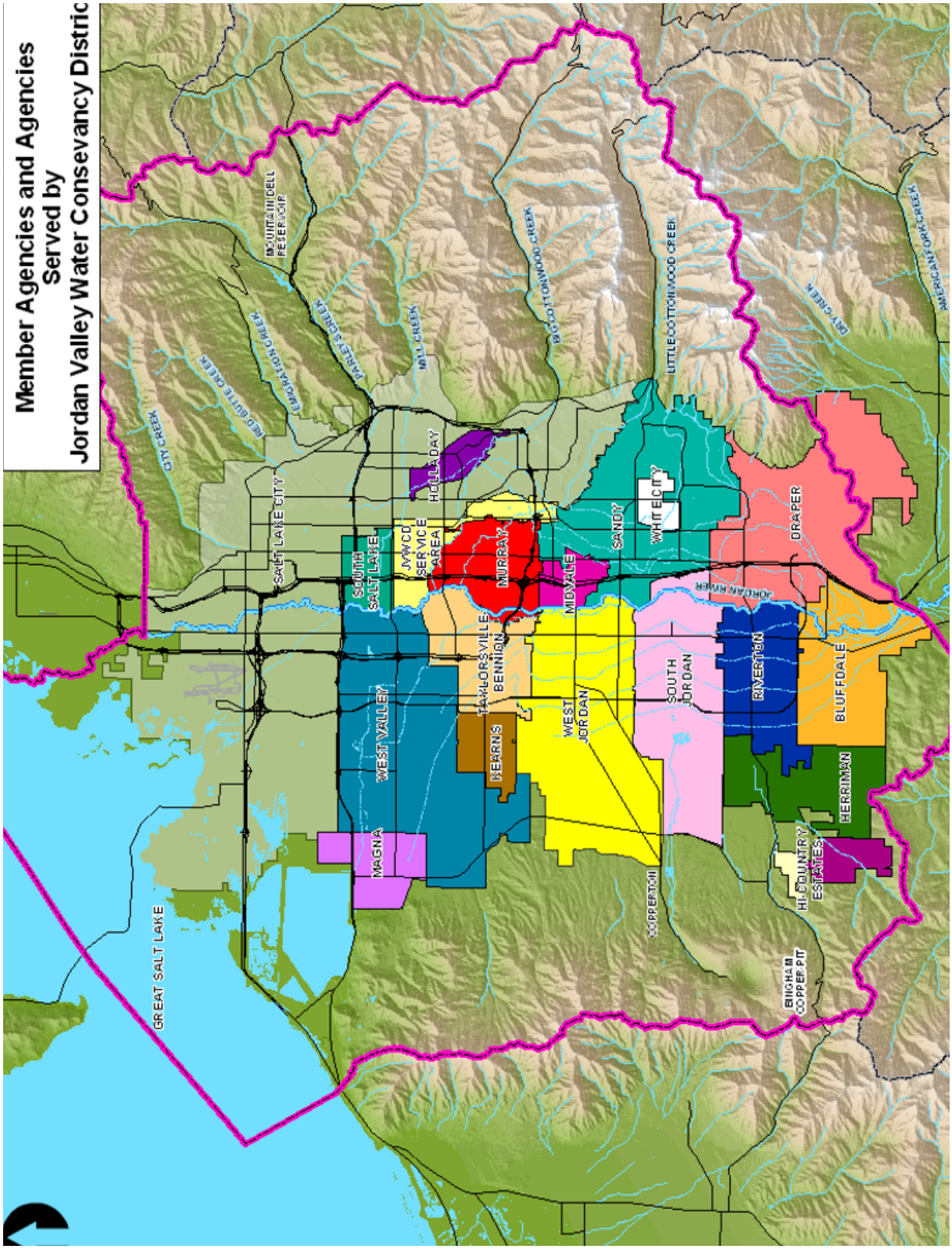
Jordan Valley Water Conservancy District was created in 1951 to provide water to residents of a growing Salt Lake County. A wholesaler of water to cities and improvement districts within Salt Lake County, JVWCD also has a retail service area in parts of Salt Lake County and unincorporated areas of the county.

Currently JVWCD serves 17 member agencies listed in Table 3.1. Figure 3.1 is a map of JVWCD's member agency service areas.

TABLE 3.1 – MEMBER AGENCIES OF JVWCD

Bluffdale City
Draper City
Granger-Hunter Improvement District
Herriman City
Hexcel Corporation
Kearns Improvement District
Magna Water District
Midvale City
Riverton City
City of South Jordan
City of South Salt Lake
Taylorsville-Bennion Improvement District
Utah Department of Corrections
WaterPro, Inc.
City of West Jordan
White City Water Improvement District
Willow Creek Country Club

FIGURE 3.1 – MEMBER AGENCIES OF JVWCD



POPULATION PROJECTIONS

The Governor's Office of Management and Budget's 2012 Baseline Report includes population projections through 2060.

Table 3.2 shows projections for all of Salt Lake County and for JVWCD's service area.

TABLE 3.2 – JVWCD SERVICE AREA POPULATION PROJECTIONS 2010–2060

Year	Total Salt Lake County	JVWCD Service Area[a]
2010[b]	1,029,655	585,372
2020[c]	1,178,948	673,179
2025[d]	1,262,046	723,991
2030[c]	1,345,143	774,802
2040[c]	1,517,431	883,904
2050[c]	1,668,359	989,337
2060[c]	1,815,394	1,098,858

(a) JVWCD service area includes all lands currently annexed and likely to annex in the future.
(b) Based on 2010 US Census data
(c) Based on Governor's Office of Planning and Budget 2012 Baseline Report
(d) Estimated by interpolation between 2020 and 2030 estimates

WATER DELIVERIES

Potable water deliveries by JVWCD to its member agencies from 2000-2013 are shown in the second column below. JVWCD has about 8,500 retail connections including residential, commercial, industrial and institutional customers, whose water deliveries are shown in column 3.

Many of JVWCD's member agencies also have their own water sources. Column four shows total (gross) water deliveries within JVWCD's service area from 2000 through 2013, including groundwater, secondary water, and all other sources.

TABLE 3.3 – WATER DELIVERIES WITHIN JVWCD'S SERVICE AREA 2000–2013 IN ACRE FEET

Year	JVWCD Wholesale Deliveries	JVWCD Retail Deliveries	Gross Water Deliveries in JVWCD
2000	65,889*	11,412	132,681*
2001	61,984*	11,580	131,470*
2002	59,735	10,411	122,858
2003	63,289	9,463	119,725
2004	66,525	9,302	120,361
2005	62,815	8,875	120,528
2006	66,365	9,721	136,375
2007	75,838	10,240	154,061
2008	72,297	9,549	146,731
2009	72,264	8,573	138,444
2010	72,873	8,976	141,026
2011	69,933	8,160	136,946
2012	84,208	9,717	164,415
2013	80,234	8,748	157,508

* Although JVWCD served water to Sandy City in 2000 and 2001, a series of contracts executed in 1990 provided for Sandy City to de-annex from JVWCD with virtually all water deliveries to cease on December 31, 2001. Therefore, the population and water use data for Sandy City is omitted to provide a common comparison point for future population and water usage rates.

PROJECTED WATER DEMAND AND SUPPLY

Projected water demand is calculated by multiplying the projected population by the projected water use per person (per capita).

Table 3.4 shows municipal and industrial (M&I) water demand projections with no water conservation being achieved based on 2000 water usage and a water demand projection based on JVWCD meeting its 25 percent reduction goal.

TABLE 3.4 – JVWCD M&I WATER DEMAND PROJECTIONS AND CONSERVATION POTENTIAL 2000–2050

Year	JVWCD Service Area Population	No conservation from 2000 usage rates		Usage rates with 25% conservation by 2025		Amount conserved (AF)
		Usage Rates (gpcd)	M&I Demand (AF)	Usage Rates (gpcd)	M&I Demand (AF)	
2000[a]	464,763	255	132,753	255	132,753	0
2010	585,372	255	167,204	215	140,975	26,228
2020	673,179	255	192,285	199	150,057	42,227
2025[b]	723,991	255	206,798	191	154,896	51,902
2030	774,802	255	221,312	191	165,767	55,545
2040	883,904	255	252,475	191	189,109	63,366
2050	989,337	255	282,591	191	211,666	70,925

Notes:

a) Although JVWCD served water to Sandy City in 2000, a series of contracts executed in 1990 provided for Sandy City to de-annex from JVWCD with virtually all water deliveries to cease on December 31, 2001. Therefore, the population and water use data for Sandy City is omitted to provide a common comparison point for future population and water usage rates.

b) Estimated by interpolation between 2020 and 2030 estimates.

The last column in table 3.4 shows that the voume of water conserved by 2025 (51,902 AF) is more than half of the total water delivered by JVWCD in 2013. In addition, current conservation efforts have contributed to postponing development of the Bear River by approximately 20 years. If JVWCD doesn't meet its conservation goal, future water supplies will need to be developed much sooner.

VALUE OF DEFERRING WATER RESOURCE DEVELOPMENT PROJECTS

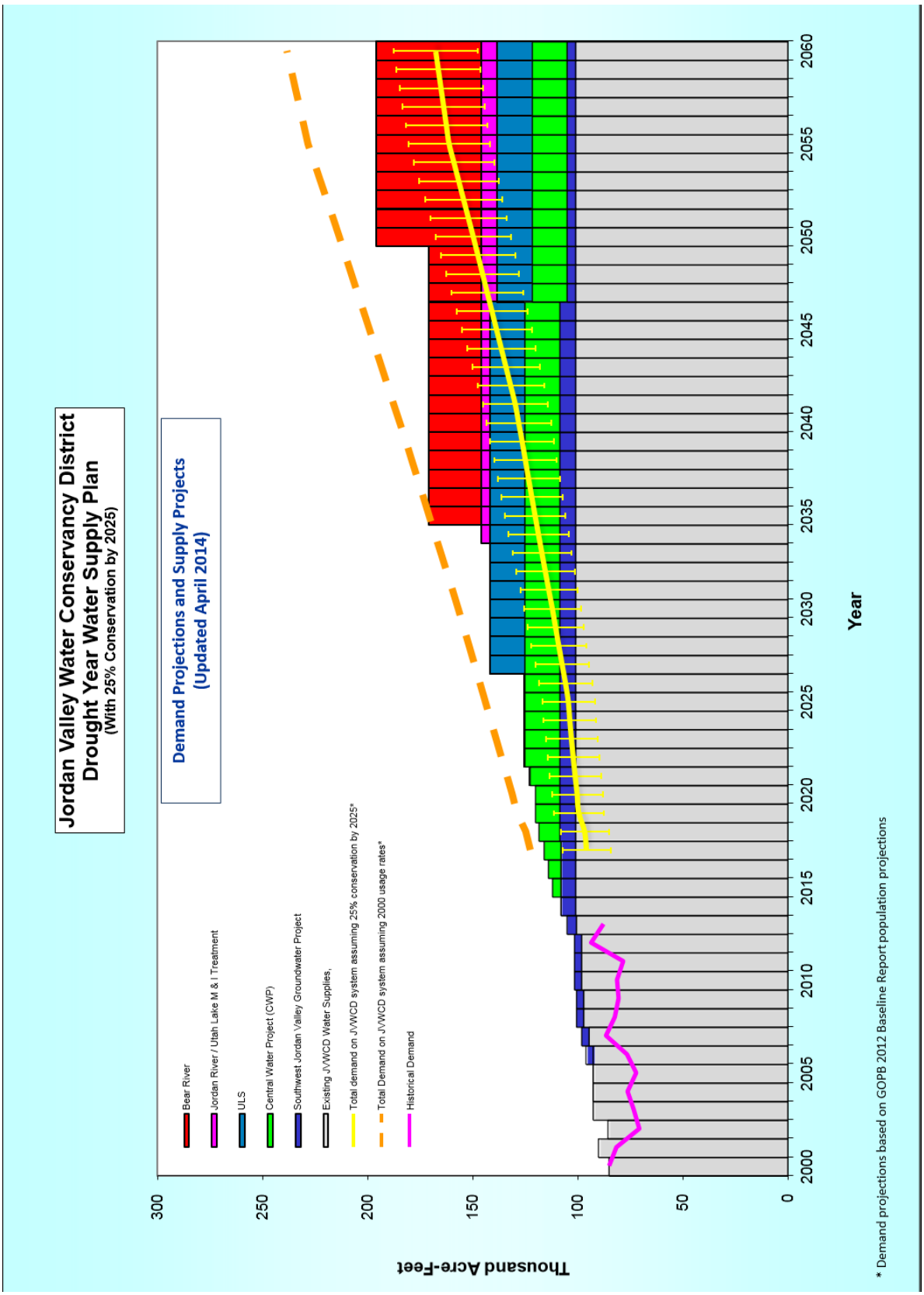
JVWCD's water supply plan is based on projected population growth within its current boundaries. Figure 3.2 displays JVWCD's recommended water supply plan for drought years through 2060. The plan is based on a drought year water supply scenario to ensure that water supply can be sustained during dry years.

Achieving the conservation goal will reduce potable water demand 52,000 acre-feet per year within JVWCD's current service area boundaries by 2025. That reduction will increase to 71,000 AF/year by 2050.

Current estimated capital costs to construct water supply projects range from $3,250/AF for the Southwest Jordan Valley Groundwater Project to $14,200/AF for the future Bear River Project. An average cost based on these and other projects equals $11,400/AF for six future water supply projects proposed by JVWCD. Developing 71,000 AF of additional water at that cost would total more than $800 million. Assuming a 30-year bond financed at 3 percent, the total capital cost of developing this amount of water is about $1 billion, which does not include any environmental, water treatment, or operation and maintenance costs.

Conserving water and deferring future water supply projects could save in excess of $1 billion.

FIGURE 3.2


Jordan Valley Water Conservancy District
Drought Year Water Supply Plan
(With 25% Conservation by 2025)
Demand Projections and Supply Projects
(Updated April 2014)
Bear River
Jordan River / Utah Lake M & I Treatment
ULS
Central Water Project (CWP)
Southwest Jordan Valley Groundwater Project
Existing JVWCD Water Supplies,
Total demand on JVWCD system assuming 25% conservation by 2025*
Total Demand on JVWCD system assuming 2000 usage rates*
Historical Demand
Thousand Acre-Feet
300
250
200
150
100
50
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
2060
Year
* Demand projections based on GOPB 2012 Baseline Report population projections

4 CURRENT WATER CONSERVATION ACTIVITIES

Conservation initiatives implemented by JVWCD since 1999:

- Hiring a water conservation programs manager and staff
- Establishing a public information and education campaign including "Slow the Flow, Save H2O" ad campaign
- Constructing the Conservation Garden Park
- Developing model water-efficient landscape ordinances
- Implementing a low flow toilet replacement program
- Conducting residential and commercial water audits
- Holding Garden Fairs
- Teaching waterwise landscaping classes
- Conducting large water-user workshops
- Sponsoring Water Quest: Saving Water by the Yard
- Re-landscaping JVWCD facilities
- Giving waterwise landscape awards
- Establishing water conservation rates
- Adopting the WaterSense Program
- Constructing the Water Conservation Education Center
- Creating the Member Agency Grant Program

In 2013, JVWCD implemented and or continued the following programs:

PUBLIC INFORMATION AND EDUCATION CAMPAIGN

JVWCD's "Slow the Flow" campaign was expanded statewide in 2001, providing an umbrella campaign for conservation activities throughout the state. JVWCD continues to provide significant input and financial support to this campaign.

Additionally, JVWCD has developed and conducts a public information and education program within its own service area boundaries.

CONSERVATION GARDEN PARK AND EDUCATION CENTER

JVWCD recognized early that reducing outdoor water use will conserve the most water, so the Conservation Garden Park was built. The Garden Park demonstrates how to have an attractive landscape suited to Utah's climate, and emphasizes proper landscape design, irrigation technologies and a wide variety of low-water-use plants. You can have a beautiful waterwise landscape without resorting to cactus and lava rock.

JVWCD opened the Garden Park Education Center to the public in 2013. The Education Center is used to educate the public on how to achieve indoor and outdoor water conservation, with emphasis on the region's important water resources.

GARDEN EVENTS/PARTY IN THE PARK/BUTTERFLY RELEASE

Public events are held annually in the Garden Park with an average attendance of 1,750 people.

EDUCATIONAL MATERIALS

A series of educational handouts covering topics from the basics of waterwise gardening to proper lawn care are available at the Conservation Garden Park and are posted on its website (conservationgardenpark.org). They are also distributed at events and classes. A database of the Garden's more than 800 waterwise plants is also available at the website listed above.

VOLUNTEERS

Volunteers work alongside Garden staff to accomplish a wide variety of garden tasks. In 2013, the Garden benefited from more than 273 volunteer hours.

GARDEN TOURS

Tours of the Garden are available on request. In 2013, 166 schools and more than 5,000 school children visited the Garden through a school tour program.

RESIDENTIAL AND COMMERCIAL WATER AUDITS

This program began in 1999 for homeowners and was expanded to include commercial, industrial and institutional landscapes in 2001. A typical water check determines soil type, root depth, sprinkler pressure, distribution uniformity, and precipitation rate. The participant is left with recommendations to improve watering efficiency and a customized irrigation schedule.

WATERWISE LANDSCAPING CLASSES

Free waterwise landscaping classes have been taught at JVWCD since 2003. Classes continue today in the Education Center, and range from "Landscape Design Basics" to "Landscaping with Utah Native Plants." Water conservation principles demonstrated in the Garden are taught in these classes, and the guest lecturers are well-known professionals in the horticulture and water conservation industry. In 2013, 92 classes were taught.

MEMBER AGENCY GRANT PROGRAM

Member agencies can apply for and receive matching grants to implement water conservation programs within their service areas. JVWCD provides up to 80 percent of the cost of programs with a cap of $50,000.

A review of this program has found that a wide variety of conservation measures have been funded through this program. The following list shows the type of programs funded with the number that have been funded in parentheses:

- Education (13)
- Homeowner irrigation controllers (7)
- Toilet Replacement Programs (7)
- Park irrigation upgrades (6)
- Irrigation products rebates or giveaways (5)
- Demonstration garden (2)
- Conservation based rate study (2)
- Conservation plan (2)
- Secondary water meters (2)
- Reuse water feasibility study (1)
- Secondary water system review (1)

As part of the program, participants are required to estimate water savings and then track the amount of water conserved by each measure, but because tracking is difficult or impossible, the actual water savings that can be attributed to the Grant Program is uncertain. Table 4.1 shows total dollars spent by JVWCD, and estimated dollars spent by member agencies since 2006 (based on their proposals).

TABLE 4.1
GRANT PROGRAM EXPENDITURES 2006–2013

Member Agency	# Times Participated	MA Total $ Since 2006	JVWCD Total $ Since 2006	Total $
Bluffdale City	2	72,700	71,614	144,314
GHID	5	178,288	218,994	397,282
Kearns ID	5	25,058	171,523	196,581
Magna Water Co.	2	58,995	103,940	162,935
City of S. Jordan	5	106,583	102,728	209,311
South SLC	1	71,500	37,500	109,000
WaterPro	3	21,080	13,360	34,440
City of W. Jordan	4	130,416	116,760	247,176
TOTALS:	27	513,124*	836,419	1,501,039

*Actual MA expenditures may be different. Numbers are estimated based on agencies' proposals.

5 EXISTING WATER SAVINGS

ESTIMATED WATER SAVINGS

JVWCD collects water delivery data from its member agencies, from which an estimated annual per capita water use has been calculated. Table 5.1 shows the annual per capita water use within JVWCD based on water deliveries and population from 2000 through 2013.

TABLE 5.1
JVWCD PER CAPITA WATER USE 2000–2013

Year	Calculated Water Usage Rate (gpcd)
2000	255
2001	249
2002	229
2003	217
2004	213
2005	207
2006	228
2007	251
2008	231
2009	214
2010	215
2011	204
2012	244
2013	227

Figure 5.1 graphically shows the reduction in per capita water use since 2000.

Since per capita water use is greatly affected by weather, a best fit line gives JVWCD a better understanding of progress towards meeting its goal. Based on the best fit line, the per capita use in 2013 was 219 gpcd, or a 14 percent decrease in water use since 2000.

FIGURE 5.1
CONSERVATION PROGRESS 2000–2013

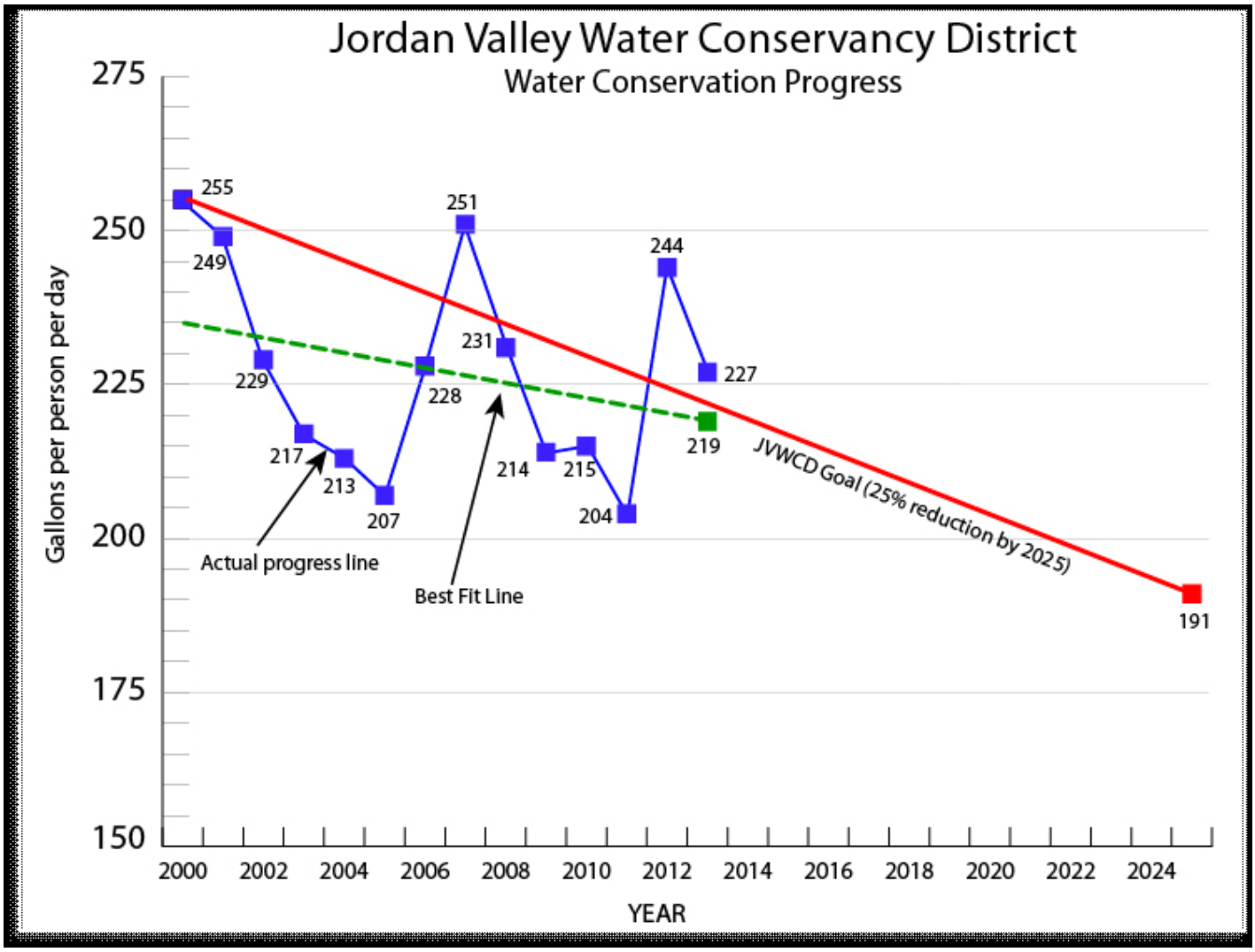


TABLE 5.2 – MEMBER AGENCY PER CAPITA WATER USE 2000–2013

Member Agency	Year 2000 (gpcd)	Year 2013 (gpcd)	% of Reduction
Bluffdale City	561	364	35%
Draper City	244	255	-5%
Granger-Hunter Improvement District	240	197	18%
Herriman City	170[a]	177	-4%
Kearns Improvement District	200	152	24%
Magna Water Company	176	178	-2%
Midvale City	271	166	39%
Riverton City	246	352	-43%
City of South Jordan	279	292	-5%
City of South Salt Lake	204	139	32%
Taylorsville-Bennion Improvement District	245	172	30%
WaterPro	483	320	34%
City of West Jordan	227	192	15%
White City Water Improvement District	226	204	10%

*Source: JVWCD (Based on annual reported deliveries from Member Agencies)
(a) Herriman City's gpcd for 2003 water 169.8. Since 2000 it is believed Herriman may have had a reduction of 15 percent.

PER CAPITA WATER USE BY AGENCY

Table 5.2 shows the per capita water use of 14 member agencies in 2000 and 2013, and the percentage reduction in per capita use during those 14 years, based on their population and water use data.

Water use by member agencies was broken down by indoor and outdoor usage. Table 5.3 displays indoor and outdoor water usage for 2013 by the same member agencies.

A detailed evaluation of the reasons for such a wide variance in per capita water use by member agencies is beyond the scope of this report. However, these tables demonstrate how widely water usage can vary among member agencies.

The US Environmental Protection Agency (EPA) estimates indoor water usage at 70 gpcd for the average American household. In 2013, indoor per capita water use among member agencies ranged from 56 to 98 gpcd.

Although indoor used varied greatly, the difference in outdoor per capita water use between agencies is even more striking. These differences may be attributed in part to lot size, household size, and socio-economic status, but it appears the largest contributing factor is the presence of secondary water systems. The agencies that have the highest per capita outdoor water use all have full or partial secondary water systems, which deliver non-potable water to their residents for outdoor water use. In 2013, this water was unmetered.

TABLE 5.3 – INDOOR AND OUTDOOR PER CAPITA WATER USE BY MEMBER AGENCIES, 2013

Member Agency	Indoor Use[a] (gpcd)	Outdoor Use[b] (gpcd)	Total Use (gpcd)
Bluffdale City	73	291	364
Draper City	90	165	255
Granger-Hunter Improvement District	98	99	197
Herriman City	56	121	177
Kearns Improvement District	76	76	152
Magna Water District	83	81	178
Midvale City	84	82	166
Riverton City	62	290	352
City of South Jordan	77	215	292
City of South Salt Lake	87	52	139
Taylorsville-Bennion Improvement District	71	101	172
WaterPro	71	249	320
City of West Jordan	85	107	192
White City Water Improvement District	64	140	204

*Source: JVWCD
(a) Based on winter use months (December, January, and February)
(b) Total Use minus Indoor Use

COST EFFECTIVENESS OF EXISTING CONSERVATION MEASURES

The cost effectiveness of JVWCD's conservation programs is presented in Table 5.4. The table lists the conservation program and its estimated cost for each acre foot of water saved.

TABLE 5.4 – ESTIMATED COSTS OF WATER SAVINGS OF JVWCD CONSERVATION PROGRAMS

Program	Annual Cost Per AF of Savings
Conservation Garden Park	$175
"Slow the Flow" Public Education Program	$7-$9
"Water Check" Audit Program	$302[a]
Toilet Replacement Programs	$293

Sources: (a) Residential and Commercial Water Audits Report to JVWCD Conservation Committee, February 8, 2010

VALUE OF SAVED WATER

From 2000 through 2013 JVWCD's water conservation expenditures have totaled $14,189,568. The total amount of water saved during that time was about 237,000 AF, meaning each AF of saved water cost about $60. The average wholesale water rate from 2000 through 2013 was about $370/AF. Compared to the average cost of wholesale water during that same period ($370/AF), the cost of saving water has a benefit-cost ratio of about 6. (For every dollar JVWCD spent on water conservation between 2000 and 2013, $6 was saved in water costs.)

6 ISSUES AND CONSTRAINTS

ISSUES AND CONSTAINTS

The biggest conservation question facing JVWCD is whether it can achieve its conservation goal of reducing per capita water use 25 percent by 2025.

Since adopting this goal, all of JVWCD's conservation planning has been designed to meet it. To succeed, JVWCD will have to implement additional conservation measures.

The following questions are important to consider as JVWCD moves forward with its conservation initiatives:

- What additional water conservation measures should JVWCD implement to meet its goal?
- How can JVWCD get its member agencies to participate more actively in water conservation?
- How can JVWCD get the public to change its mindset about conservation in general, and embrace waterwise landscaping?

In addition, there are constraints to water conservation including:

- Lack of metering on secondary water systems discourages water conservation.
- Many residents lack an understanding of efficient water use.
- Homeowners typically apply twice as much water to their landscapes as necessary.

7 POTENTIAL CONSERVATION MEASURES

As part of the preparation of this Plan Update, a review of potential additional water conservation measures was conducted through other water agencies in the U.S. and Utah Division of Water Resources.

Table 7.1 shows the types of conservation programs other agencies conduct in the U.S. All the agencies have a water conservation education program and all but two offer some form of commercial rebate program. The next most common programs involve multi-family residential developments, commercial water audits, high efficiency (HE) washing machine rebates, irrigation controller rebates, high efficiency (HE) toilet rebates, and conservation gardens.

TABLE 7.1
CONSERVATION PROGRAMS IMPLEMENTED BY OTHER AGENCIES

	City of Denver	Metro Water District Southern California	City of Portland	San Diego County Water Authority	City of San Francisco	Santa Clara Valley Water District	City of Seattle	Southern Nevada Water Authority	No. of Agencies with Program
Education	x	x	x	x	x	x	x	x	all
Commercial Use Reduction Incentives	x	x	x	x	x	x	x	x	all
H.E. Toilet Rebates	x	x	x	x	x	x	x	x	all
Single Family Residential Water Audits	x	x	x	x	x	x		x	7/8
Irrigation Controller Rebates	x	x	x	x		x	x	x	7/8
Water Reuse	x	**		**	**	x		**	6/8
Sprinkler Nozzle Rebates	x	x		x		x		x	5/8
Conservation Garden	x	x		x		x		x	5/8
Multi-Family Commercial Water Audits		x	x	x		x	x		5/8
Low Water Use Landscape Rebates		x		x		x		x	4/8
Grass Removal Rebates		x		x		x		x	4/8
H.E. Washer Rebates		x			x	x			3/8
Greywater Reuse Incentives					x	x			2/8
Synthetic Turf Rebates		x		x					2/8
Rainwater Collection Incentives					x	x			2/8
Watering Restrictions		x						x	2/8
Irrigation Rain Sensor Rebates								x	1/8
Pool Cover Rebates								x	1/8
Showerhead Rebates						x			1/8

** reuse occurs in service area

UTAH DIVISION OF WATER RESOURCES RECOMMENDATIONS

The Utah Division of Water Resources has published a list of 14 recommended water conservation practices they refer to as Best Management Practices (BMPs).

JVWCD has implemented or is planning to implement each of them as follows:

BMP 1 – COMPREHENSIVE WATER CONSERVATION PLANS.
JVWCD has produced water conservation plans every five years as required by Utah Code §73-10-32.

BMP 2 – UNIVERSAL METERING.
JVWCD's retail area is fully metered, and every wholesale connection is also metered.

BMP 3 – INCENTIVE WATER CONSERVATION PRICING.
JVWCD has implemented a water conservation rate schedule with a summer surcharge for both its retail and wholesale water customers.

BMP 4 – WATER CONSERVATION ORDINANCES.
This BMP recommends measures such as a time-of-day watering ordinance, a water-efficient landscaping ordinance for all new commercial developments and a landscape ordinance that encourages water conservation. JVWCD developed a model commercial landscape ordinance and has assisted three of its member agencies, as well as Sandy City and Salt Lake County, in adopting the ordinance.

BMP 5 – WATER CONSERVATION COORDINATOR.
This BMP recommends designating a Water Conservation Coordinator in each city to facilitate water conservation programs. JVWCD has had a conservation coordinator since 2000 and employs a staff of 6 full-time conservation employees and several seasonal employees.

BMP 6 – PUBLIC INFORMATION PROGRAM.
This BMP encourages a public information program consistent with the recommendations of the Governor's Water Conservation Team such as the "Slow the Flow" program. JVWCD developed the "Slow the Flow" program and participates on the Governor's Water Conservation Team. Additionally, JVWCD conducts its own public education and information programs.

BMP 7 – SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR.
This BMP recommends specific goals to reduce unaccounted-for water (non-revenue water), including an annual audit. JVWCD conducts an annual audit of its water production and sales. From 2004 through 2013, the average non-revenue water for JVWCD's treatment and distribution system was less than 3 percent, well below the industry average. If non-revenue water ever exceeds 5 percent, JVWCD will conduct additional analyses to determine the cause.

BMP 8 – LARGE LANDSCAPE CONSERVATION PROGRAMS.
This BMP recommends providing incentives and programs for large landscape water users. JVWCD offers training classes for irrigation managers and water audits for large outdoor irrigators.

BMP 9 – WATER SURVEY PROGRAMS FOR RESIDENTIAL CUSTOMERS.
This BMP recommends water audits for residential water users. JVWCD participates in the Water Check Program that audits outdoor water use.

UTAH DIVISION OF WATER RESOURCES RECOMMENDATIONS (CONT'D)

BMP 10 – PLUMBING STANDARDS.
This BMP recommends identifying residences built prior to 1992 and developing a strategy to distribute indoor water saving devices. Indoor plumbing fixtures older than 1992 are high water use fixtures and replacing them with new, water-efficient fixtures will reduce water use. JVWCD implemented a toilet replacement program within its retail service area and funds similar programs with its member agencies.

BMP 11 – SCHOOL EDUCATION PROGRAMS.
BMP 11 recommends the support of local water education programs for elementary students. JVWCD supports the Utah Division of Water Resources' education programs. In addition, JVWCD has developed an "Environmental Encounters" program, designed around the 4th-grade school curriculum on water, and involves a tour of the Conservation Garden Park for 4th grade classes.

BMP 12 – CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL (CII) CUSTOMERS.
This BMP recommends programs for CII customers. Through its Member Agency Grant Program, JVWCD has implemented several incentive programs for commercial, industrial and institutional users.

BMP 13 – RECLAIMED WATER USE.
This BMP encourages the use of reclaimed wastewater where feasible. JVWCD is planning to assist its member agencies in implementing wastewater recycling. JVWCD's Water Supply Plan shows 13,000 AFY of recycled wastewater as part of its future water supplies, which would supplant drinking water that is currently being used to water landscapes.

JVWCD is working with south valley communities involved in the construction of the new wastewater treatment plant in Riverton, which will provide reclaimed wastewater to these communities for outdoor irrigation.

BMP 14 – "SMART CONTROLLER" TECHNOLOGY.
This BMP recommends the installation of "smart" controllers for irrigation of public spaces. South Jordan City, with funding from JVWCD, has implemented a rebate program for "smart" controllers, and other member agencies are considering similar programs.

8 RECOMMENDATIONS

RECOMMENDATIONS

Presented below are recommendations which will assist the District in achieving its conservation goal. Following are recommendations presented in detail in this chapter:

- Enhance existing conservation efforts
- Encourage metering of secondary water systems
- Encourage wastewater recycling
- Implement Advanced Metering Infrastructure
- Encourage outdoor irrigation efficiencies
- Expand the Member Agency Grant Program to include "turn-key" programs district wide

CONSERVATION POSSIBLE THROUGH PROGRAMS:

14%

CONSERVATION PROGRAMS FOR THE NEXT FIVE YEARS

PROGRAM #1 – ENHANCE EXISTING PROGRAMS.

Since 2000, per capita water use in the District has declined about 14 percent. The following programs have been successful and cost effective, and it is recommended they be continued:

- Education and public relations programs,
- Water Check Program (see Program #5), and
- Member Agency Grant Program.

The average expenditure on water conservation programs by JVWCD since 2000 has been about $1 million per year, including all programs, garden construction and personnel costs. With 25,000 AF of water saved per year, the cost per AF for conservation equals about $60/AF.

JVWCD should not only continue its ongoing conservation programs, but should also enhance and expand its efforts associated with existing programs. JVWCD should offer more educational classes, and focus on efforts to change the social norm regarding conservation. Doing this should maintain the current 14 percent reduction in per capita water use.

4%

PROGRAM #2 – ENCOURAGE METERING OF SECONDARY WATER SYSTEMS.

As presented in Chapter 5, JVWCD's member agencies with the highest per capita water use have complete or partial secondary water systems, which deliver unmetered, non-potable water for outdoor water use.

Metering secondary water use would cause per capita water use to decline. JVWCD should encourage these agencies to not only install meters on individual secondary water connections, but to also bill for this water based on the volume delivered.

Determining the cost of installing meters on secondary water systems is beyond the scope of this report; however, WaterPro has been installing some secondary water meters in the past two years, and report the cost of installation at $250 per connection.

Potential water savings from metering secondary water may be significant. Existing literature indicates the level of savings possible: the California Urban Water Conservation Council (CUWCC) (an organization of more than 400 water agencies and environmental groups dedicated to implementing water

conservation among its members) estimates that metering and establishing volumetric rates (water rates based on measured use) will result in a 20-percent reduction in demand. While this savings has been demonstrated by CUWCC for potable water, its application to metering secondary water has some validity. It is conservatively assumed that metering secondary water systems and charging rates based on use will result in between 5 percent and 20 percent water use reduction.

JVWCD calculates that metering and volumetric billing of secondary water will achieve an overall 4 percent reduction in water use District-wide.

Until secondary water systems are metered, JVWCD should work with its member agencies that operate secondary water systems to develop a reasonable and consistent method of estimating unmetered secondary water use.

3.4%

PROGRAM #3 – ENCOURAGE WASTEWATER RECYCLING

JVWCD's water supply plan includes wastewater recycling. By 2025, the District plans to reuse 7,000 AF of treated wastewater per year in secondary water systems.

Wastewater recycling will require costly treatment and distribution systems. JVWCD should immediately begin studying how it can accomplish its plan, as well as assist its member agencies with planning, funding and implementation of recycled water projects throughout the District. Recycling 7,000 AFY would equal a 3.4 percent reduction in water use District-wide.

3%

PROGRAM #4 – IMPLEMENT ADVANCED METERING INFRASTRUCTURE

JVWCD is implementing Advanced Metering Infrastructure (AMI) with approximately 8,600 new water meters in its retail area. The new water meters will use radio waves to send meter readings directly to the District, allowing near real-time monitoring of water use. Customers will be able to view their water use over the internet, compare their actual use to their budgeted use, and better manage their consumption. As part of its AMI program, the District will institute industry-recognized best practices to raise customer awareness, improve water management and reduce water use through social norming, leak alerts, Utah State University's landscape irrigation ratio (LIR), customized reports and improved billing formats. This technology will improve the water management capabilities of both JVWVD and its retail customers.

JVWCD plans to implement Utah State University (USU) WaterMAPS as part of the AMI customer feedback suite. WaterMAPS is a highly sophisticated program that provides a ratio displaying how efficient customers are in their outdoor water efforts.

The estimated cost of implementing the AMI program is $2.5 million. The estimated direct annual water savings to be achieved from the program is 485 AFY within the District's retail area, and 9,700 AF over a 20-year period. The estimated cost of the saved water is about $260/AF.

JVWCD intends to communicate the results of its AMI program with its member agencies. With the Member Agency Grant Program, JVWCD intends to provide technical and financial assistance to its member agencies so they can also implement AMI and other innovative communication strategies. JVWCD estimates that with the implementation of AMI systems by member agencies, a 3 percent reduction in water use (6,300 AFY) District-wide can be achieved by 2025.

0.8%

PROGRAM #5 – ENCOURAGE OUTDOOR IRRIGATION EFFICIENCIES

JVWCD should continue to encourage improved irrigation efficiency throughout its service area. Sixty percent of the water JVWCD delivers is used on landscapes. Existing programs include the Water Check program, the Conservation Garden Park and Education Building, and education classes offered by the District. It is recommended JVWCD increase efforts in these areas.

JVWCD should also revisit the landscape ordinances that it promoted ten years ago. JVWCD should review how those ordinances are working, and look in to expanding landscape ordinances to residential developments.
Another item the District could consider is providing waterwise landscape incentives to commercial and residential users. Some member agencies have received funding through the Member Agency Grant Program to provide rebates for sprinkler controllers, waterwise fixtures and low water use plants. JVWCD could expand its efforts in this area.

JVWCD could achieve a 0.8 percent reduction in water use (1,500 AFY) by 2025 through implementation of outdoor efficiency programs.

0.8%

PROGRAM #6 – EXPAND MEMBER AGENCY GRANT PROGRAM TO INCLUDE "TURN-KEY" PROGRAMS

Ninety-three percent of all water in the District is delivered to end users by JVWCD's member agencies. Without member agency participation, achieving the conservation goal will be impossible. Member agencies must be more active in achieving conservation if JVWCD is to meet its conservation goal.

JVWCD's Member Agency Grant Program will help accomplish this. While this program has been successful, increased participation will improve the likelihood of meeting the conservation goal.

Based on input from member agencies, it is recommended that JVWCD expand the Member Agency Grant Program to include "turn-key" programs (programs administered and managed by JVWCD on behalf of but including their member agencies). Member agencies have limited staff to plan and implement water conservation programs. Instead of just funding, they would like JVWCD to provide personnel to help plan and implement conservation programs.

It is recommended JVWCD consider funding and providing personnel for one or two conservation programs district-wide. Measures could be selected based on cost effectiveness and the ability to measure water savings. Member agencies could request that the programs be implemented in their area, and JVWCD's staff would take responsibility to do it. Such programs would make it easier for member agencies to participate.

It is estimated that JVWCD could reduce water use 0.8 percent (1,500 AFY) if the Member Agency Grant Program is expanded to include "turn-key" programs.

TOTAL CONSERVATION POSSIBLE THROUGH PROGRAMS:

26%

ACHIEVING THE CONSERVATION GOAL BY 2025

As of 2013, JVWCD has reduced per capita water use about 14 percent, or about 25,000 AFY (based on a service area population of 620,000). To meet its goal JVWCD must reduce per capita water use another 11 percent or about 28,600 AFY. The following table lists recommended programs with an estimated percentage of reduction in per capita use for each and the total acre feet of reduction.

TABLE 8.1
ACHIEVING CONSERVATION GOAL BY 2025

Conservation Programs	% Reduction Per Capita Use	Demand [a] Reduction (acre feet)
Enhance Existing Programs	14.0%	29,000
Meter Secondary Water	4.0%	8,300
Wastewater Recycling	3.4%	7,000
Advanced Metering Infrastructure	3.0%	6,300
Outdoor Irrigation Efficiencies	0.8%	1,500
"Turn-key" Programs	0.8%	1,500
Total	26.0%	53,600

(a) Based on 2025 JVWCD service area population of 723,991

PROPOSED 5-YEAR IMPLEMENTATION SCHEDULE

Table 8.2 presents a proposed implementation schedule and costs of conservation programs for the next five years. The table shows each recommended conservation activity, the year of implementation, and the cost of the activity.

TABLE 8.2
IMPLEMENTATION SCHEDULE AND COSTS OF RECOMMENDED CONSERVATION PROGRAMS

Conservation Programs	Program Costs					5-Year Total
	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Enhance Existing Programs	$1,000,000	$1,030,000	$1,060,000	$1,090,000	$1,120,000	$5,300,000
Meter Secondary Water	More Study Needed					--
Wastewater Recycling	More Study Needed					--
AMI - Member Agencies Assistance	$0	$0	$100,000	$100,000	$100,000	$300,000
Outdoor Irrigation Efficiencies	$100,000	$100,000	$200,000	$200,000	$200,000	$800,000
"Turn-key" Programs	$50,000	$50,000	$100,000	$100,000	$100,000	$400,000
Additional Staffing Needs	$80,000	$160,000	$233,000	$313,000	$313,000	$1,099,000
Total Cost	$1,230,000	$1,340,000	$1,693,000	$1,803,000	$1,833,000	$7,889,000
Cost per Person	$1.95	$2.08	$2.60	$2.74	$2.75	

SUMMARY

Since 2000, JVWCD has spent an average of $60/AF for conserved water, including the cost of constructing the conservation garden. In 2013 JVWCD spent about $1 million for its conservation efforts, or a cost of about $40/AF of savings. Maintaining JVWCD's existing conservation efforts will cost $1 million annually, plus 3 percent inflation ($40/AF of savings). It is projected that funding existing and enhanced programs will result in the same per capita savings experienced to date.

Metering secondary water systems and constructing a wastewater recycling system will be implemented by member agencies and not directly owned or operated by JVWCD. Because JVWCD has yet to determine how and to what level they will assist financially with their implementation, more study is needed to complete the cost projections in table 8.2.

The cost of JVWCD's retail AMI program is not shown in Table 8.2 because it is not being funded as a conservation program. Annual costs of $100,000 begin in 2017 and will be used to provide technical and financial assistance to member agencies as they implement AMI in their service areas. JVWCD's implementation of an AMI system is projected to result in savings of 485 AFY, with another 1,000 AFY projected by 2020 from AMI systems implemented by member agencies.

For Outdoor Irrigation Efficiencies and turn-key programs, the proposed funding by JVWCD may be more or less than what is shown, depending on the specific conservation measures JVWCD decides to implement. JVWCD estimates water savings for the next five years from these two conservation measures would be 3,000 AFY (shown on Table 8.1).

Table 8.2 shows additional staffing needs for the next five years. To implement recommended conservation programs, four additional staff will be required—one person per year for the next four years.

JVWCD spent about $1 million on conservation in 2013, or about $1.60 per person in JVWCD's service area. Recommendations for the next five years will increase JVWCD's expenditure for water conservation to $2.75 per person.

Since 2000, JVWCD has been careful to plan and implement conservation measures that are cost effective. Going forward, measuring water savings and the cost effectiveness of new programs will continue to be important.

Table 8.3 displays the projected water savings per year and the cost per acre-foot of water saved based on the implementation schedule presented in the table above. Over the next five years, the average cost per acre-foot of water saved is projected to be $55/AF.

TABLE 8.3
WATER SAVINGS AND COST PER AF

						5-Year Total
	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Projected Total Cost	$1,230,000	$1,340,000	$1,693,000	$1,803,000	$1,833,000	$7,889,000
Projected Water Savings (AFY)	26,600	27,400	29,200	29,700	31,300	144,200
Projected Annual Cost per AF	$46	$49	$58	$61	$59	$55
Additional Reduction Needed in order to meet 22% interim goal	3,300	4,000	5,000	5,100	5,900	23,300
Projected Cost of Additional Reduction	TBD	TBD	TBD	TBD	TBD	TBD
Total Projected Water Savings (AFY)	29,900	31,400	34,200	34,800	37,200	167,500

Table 8.3 projects water savings per year and the cost of each acre foot saved based on the implementation schedule in table 8.2. if JVWCD's existing conservation programs continue and AMI, Outdoor Irrigation Efficiencies and turn-key Programs are implemented over the next five years, the average cost of each acre foot saved is projected to be $55/AF.

Between 2014 and 2025, per capita water use must decrease an additional 11 percent for JVWCD to achieve the 25 percent reduction goal. It is recommended JVWCD establish an interim goal of 22 percent reduction in the next five to six years. Getting from the current 14 percent reduction to 22 percent in the next five to six years will require metering secondary water and implementing wastewater recycling. Table 8.3 shows how much additional water savings must be achieved through these two programs to reach this interim goal. The estimated cost of achieving the additional savings has yet to be determined.

Failure to achieve the interim goal of 22 percent in the next five to six years will require increased conservation efforts and monetary investment. Additionally, JVWCD will need to develop additional water supplies sooner than currently projected if the conservation goal is not achieved.

JORDAN VALLEY WATER
CONSERVANCY DISTRICT

GILMORE ENGINEERING INC.

9 APPENDIX

NOTICE

Notice seeking public comment on the Conservation Plan Update was sent to or posted on the following:

- JVWCD's member agencies and Division of Water Resources
- Salt Lake Tribune and Deseret News
- JVWCD's and Utah State websites
- JVWCD's front doors

The notices posted in the newspapers and sent to member agencies are attached.

AGENDAS

Agendas for the public hearing held on October 8, 2014, and the November Board Meeting held on November 12, 2014, are attached.

MINUTES

Minutes from the public hearing and the November Board Meeting where the Plan Update was adopted are attached.

SLIDES

Slides presented at the public hearing are attached.

No comments were received during the comment period or at the public hearing.