



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7

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ORIGINATING SECTION: Water Supply Engineering
CONTACT: Brad Ledesma\ Jarnail Chahal

AGENDA DATE: May 18, 2011

ITEM NO. 12f

SUBJECT: Annual Review of Sustainable Water Supply for Zone 7 Water Agency

SUMMARY:

- Water demands over the next five years are projected to increase from 51,900 to 53,800 acre-feet (AF) by 2015 (a 3.7% increase) without water conservation, and could decrease by 1,100 AF pending the success of implementing the Water Conservation Act of 2009 (SBX7-7).
- Water supply yield in 2011 from existing water supply contracts and Zone 7's existing water right permit is projected at approximately 67,400 AF based on Department of Water Resources current allocation of State Water Project Table A amount (80%). DWR's final allocation is expected to be between 80 and 85%.
- Long-term average water supply available from existing water supply sources has remained constant at approximately 55,050 AF.
- Approximately 197,500 AF of stored water is available to Zone 7 in the local and out-of-basin facilities, of which, about 54,600 AF is available for use in 2011 through existing pump back and conveyance facilities. Between 2012 and 2015, Zone 7 can count on an average of approximately 35,600 AF per year of stored water.
- Zone 7 has sufficient water supplies to meet projected water demands over the next five years—with or without water conservation. However, Zone 7's long-term water supply is at risk and subject to a very uncertain future due to court rulings and biological opinions associated with the Sacramento-San Joaquin Delta (Delta), and climate change.
- In response to these findings, Zone 7 staff has nearly completed a detailed evaluation of Zone 7's water supplies that will make recommendations to help minimize near-term risks of water supply shortages while maximizing long-term flexibility until more information is known regarding a fix in the Delta. Zone 7 staff hopes to present this 2011 Water Supply Evaluation (WSE) to the Board in June 2011.

FUNDING: No funding impact.

RECOMMENDED ACTION: Discussion only.

ATTACHMENTS: Interoffice memorandum providing additional background and discussion of the agenda item.

INTEROFFICE MEMORANDUM

DATE: May 18, 2011
TO: Jill Duerig, General Manager
FROM: Brad Ledesma, Associate Engineer
SUBJECT: Annual Review of Sustainable Water Supply for Zone 7 Water Agency

On August 18, 2004, Zone 7 Water Agency (Zone 7) adopted the Reliability Policy for Municipal and Industrial (M&I) Water Supplies (Resolution 04-2662).¹ Resolution 04-2662 requires that Zone 7 staff complete an annual review of sustainable water supplies (Annual Review); the purpose of this memorandum is to comply with this requirement.

The 2011 Annual Review covered the following:

- Projected Water Demands: Next Five Years
- Available Water Supplies to Zone 7 at the Beginning of 2011
- Comparison of Supply and Demand: Next Five Years
- Programs Necessary to Meet Water Demands

The review completed in this memorandum indicates that Zone 7 has sufficient water supplies to meet projected water demands over the next five years with or without additional water conservation.

Zone 7's long-term water supply, however, is at risk and subject to a very uncertain future due to court rulings and biological opinions associated with the Sacramento-San Joaquin Delta (Delta), and climate change. In response, Zone 7 staff has nearly completed a detailed evaluation of Zone 7's water supplies that will make recommendations to help minimize near-term risks of water supply shortages while maximizing long-term flexibility until more information is known regarding a fix in the Delta. Zone 7 staff hopes to present this 2011 Water Supply Evaluation (2011 WSE) to the Board in June 2011.

PROJECTED WATER DEMANDS: NEXT FIVE YEARS

Every year Zone 7 obtains water demand projections from all of its customers for the next five years—Table 1 summarizes these projections for 2011 to 2015 without additional water conservation.² As shown in Table 1, Zone 7's total water demands are projected to increase by 3.7 percent between 2011 and 2015, while water demands for Zone 7's untreated customers are expected to remain constant; this is the same rate observed in the 2010 Annual Review. Additionally, the 2011 estimates are only about 2% higher than the 2010 estimates and therefore, projected water demands—without water conservation—have not changed.

¹ A copy of Resolution 04-2662 is provided as Attachment A.

² Water conservation associated with the Water Conservation Act of 2009 (i.e., Senate Bill SBX7-7) is discussed in subsequent sections.

Table 1. Projected Zone 7 Water Demands: Next Five Years, acre-feet^(a)

Type	2011	2012	2013	2014	2015
M&I ^(b,c,d)	47,400	47,800	48,100	48,600	49,300
Untreated	4,500	4,500	4,500	4,500	4,500
Total	51,900	52,300	52,600	53,100	53,800
<i>2010 Annual Review</i>	<i>50,800</i>	<i>51,200</i>	<i>51,700</i>	<i>52,100</i>	<i>52,700</i>
% Increase	2.2%	2.1%	1.7%	1.9%	2.1%

(a) Demands were rounded to the nearest 100 acre-feet.

(b) M&I = Municipal and Industrial.

(c) Demands include California Water Service Company, Dublin San Ramon Services District, City of Livermore, City of Pleasanton, Zone 7's direct retail customers, and Zone 7's unaccounted-for water.

(d) Demands include unaccounted-for water and groundwater-pumping quota for Dublin San Ramon Services District.

Water Conservation Act of 2009 (20 Percent Reduction by 2020)

In November 2009, the California legislature passed the Water Conservation Act of 2009 (Conservation Act), also known as Senate Bill X7-7. The Conservation Act created a framework for future planning and actions by water supply retailers and agricultural water suppliers to reduce California's water use. More specifically, the Conservation Act requires water supply retailers to reduce their per capita water consumption 20% from their baseline by 2020.

Although Zone 7 is not directly subject to the requirements of the Conservation Act because it is a wholesale water agency, Zone 7 fully supports the existing and planned efforts of the local water supply retailers³ to comply with this new law. Unfortunately, the local water supply retailers are still refining their own estimates of potential conservation savings; consequently, Zone 7 staff developed a preliminary estimate using service area-wide average daily per capita demands. The total potential savings was estimated to be approximately 6,000 acre-feet (AF). Approximately 50% of this (or 3,000 AF) was assumed implemented by 2015 per Conservation Act guidelines. These planning-level estimates were shared with the local water supply retailers as part of completing the 2011 WSE.

Table 2 compares projected water demands over the next five year with and without potential water conservation savings associated with the Conservation Act. As shown in Table 2, projected water demands could decrease between 2011 and 2015 depending on the success of regional conservation efforts.

³ The local water supply retailers include California Water Service Company, City of Livermore, City of Pleasanton, and Dublin San Ramon Services District.

Table 2. Projected Zone 7 Water Demands with Water Conservation, acre-feet^(a)

Type	2011	2012	2013	2014	2015
Total Water Demand	51,900	52,300	52,600	53,100	53,800
Additional Water Conservation	(600)	(1,200)	(1,800)	(2,400)	(3,000)
Revised Water Demand	51,900	51,100	50,800	50,700	50,800

^(a) Demands were rounded to the nearest 100 acre-feet.

^(b) Water conservation is based on preliminary estimates determined by Zone 7 staff and reviewed by Zone 7's Retailers; these estimates will likely change as the Retailers better refine their own estimates.

For planning purposes in this review, Zone 7 staff compared projected water supplies with projected water demands, with and without water conservation, over the next five years.

AVAILABLE WATER SUPPLIES TO ZONE 7 AT THE BEGINNING OF 2011

Zone 7 has developed a robust water supply system consisting of imported surface water, local runoff, groundwater recharge activities, local storage (Lake Del Valle, groundwater basin, and future Chain of Lakes), and non-local storage.⁴ This diverse water supply system allows Zone 7 to store excess water during normal and wet years, and draw on these reserves during dry years to create a sustainable and reliable water supply for the Livermore-Amador Valley.

The purpose of this section is to review the water supplies, including contracted supply and stored water, available to Zone 7 at the beginning of 2011. Attachment B provides a more detailed description of all of Zone 7's water supplies and their status.

Projected Yield from Contracted Water Supplies in 2011

Each year Zone 7 receives water supply from its contracts with the Department of Water Resources (DWR) for State Water Project (SWP) water, its water rights permit for diversions from Arroyo del Valle, its contract with Byron Bethany Irrigation District (BBID), and DWR for Yuba Accord Water. The exact quantity of water supply available through these contracts is unknown at the beginning of the year because the yield depends on many factors, including local precipitation and snowfall in the Sierras.

For planning-level purposes, Zone 7 staff estimates the projected yield from these water supplies at the beginning of the year, along with an estimate of the long-term average yield. Table 3 presents the projected yield in 2011 and the long-term average yield based on a review of actual deliveries, rainfall, DWR projections from January to May 2011, and a review of any new planning-level documents.⁵ Table 3 also includes the long-term operational losses associated with both artificial recharge in the local groundwater basin and participation in non-local groundwater banking programs.

As shown in Table 3, the projected yield in 2011 from Zone 7's existing contracted water supplies is approximately 67,400 AF based on DWR's current allocation of SWP Table A amount (80%); the final allocation is expected to be between 80 and 85%. Table 3 also indicates

⁴ Additional information on each of Zone 7's water supply and storage components is available in Attachment B.

⁵ New planning-level documents include DWR's Final 2009 Reliability Report.

that the long-term average yield is projected to be approximately 55,050 AF after considering operational losses and that Zone 7 has 50% more water in 2011 than in 2010 due to wet conditions—especially, the significant amount of rain and snow in February and March of 2011.

Table 3. Projected Yield from Existing Contracted Water Supplies, acre-feet

Source ^(a)	Available in 2011		Long-term Average	
	Yield	% of Total	Yield	% of Total
State Water Project	64,500 ^(b)	86.5 %	48,400 ^(c)	83.5 %
Arroyo del Valle Runoff	9,500	12.7 %	7,300	12.6 %
Byron Bethany Irrigation District	600 ^(d)	0.8 %	2,000	3.5 %
Yuba Accord (via DWR)	0	0.0 %	250	0.4 %
Subtotal	74,600	100.0 %	57,950	100.0 %
Operational Losses ^(e)	(7,100)	0.0 %	(2,900)	5.0%
Total	67,400	100.0 %	55,050	95.0%
<i>2010 Annual Review</i>	<i>44,800</i>		<i>55,050</i>	
<i>% Increase</i>	<i>50%</i>		<i>0%</i>	

(a) Attachment B provides additional detail on each contract.

(b) 2011 Yield is based on 80% (current 2011 allocation) of Zone 7's Table A amount of 80,619 AF.

(c) Long-term average yield is based on 60% of Zone 7's Table A amount of 80,619 AF, as presented in DWR's Final 2009 Reliability Report.

(d) Although Zone 7 has up to 5,000 AF available for purchase, only about 600 AF will be purchased this year due to increased yield from other water supply sources.

(e) Operational losses include the losses associated with artificial recharge in the local groundwater basin, and contractual losses associated with putting water into either Semitropic and/or Cawelo. Quantity is based on the Annual Operations Plan for 2011, updated on 4/25/11.

AVAILABLE STORAGE AT THE BEGINNING OF 2011

Zone 7 currently stores water in various storage facilities or programs to help meet water demands during acute or prolonged droughts. Table 4 summarizes the total accumulated stored water available to Zone 7 over the next five years, the maximum stored water available for use in 2011, and minimum annual stored water available for use between 2012 and 2015. A more detailed description of Zone 7's available storage is provided in Attachment B. As shown in Table 4, Zone 7 has about 8% more total accumulated stored water and 7.5% more annual minimum stored water available for use between 2012 -2015 in 2011 than in 2010, while the stored water available for use in 2011 is about 10% lower due to SWP carry over losses associated with the filling of San Luis Reservoir in March 2011.

Table 4. Stored Water, acre-feet

Storage Facility or Program	Total Accumulated Water in Storage ^(a)	Stored Water Available for use in 2011	Minimum Annual Stored Water Available between 2012 and 2015
Main Groundwater Basin	80,000	20,200 ^(b)	14,000 ^(c)
Lake Del Valle Carryover	7,700	7,700	10,000 ^(e)
State Water Project Carryover	19,000	11,000 ^(d)	
Semitropic	80,800	15,700 ^(f)	9,100 ^(g)
Cawelo	10,000	0 ^(h)	2,500 ^(h)
Total	197,500	54,600	35,600
<i>2010 Annual Report</i>	<i>182,500</i>	<i>60,600</i>	<i>33,100</i>
<i>% Increase</i>	<i>8.2%</i>	<i>(9.9%)</i>	<i>7.5%</i>

- (a) Accumulated water in storage (above historic low) is an estimate through April 2011.
- (b) As the available water in storage decreases in the main basin, the capacity to pump groundwater in any given year also decreases due to well locations and defined historic lows. For 2011, 20,200 acre-feet was used as a conservative estimate for planning-level purposes in this memorandum.
- (c) A conservatively small pumping amount of 14,000 acre-feet per year was used assuming the next few years were dry.
- (d) Zone 7 lost approximately 8,000 acre-feet of SWP carryover this year when San Luis Reservoir filled.
- (e) Zone 7 typically carry's approximately 10,000 acre-feet from one year to the next.
- (f) 2011 availability includes pump back of 9,100 acre-feet, and potential exchange water of approximately 6,600 AF assuming the SWP delivery remains at 80% of Zone 7's Table A amount.
- (g) The minimum pump back from Semitropic is 9,100 acre-feet.
- (h) Zone 7 plans to send water to Cawelo in 2011; therefore, no water would likely be pumped back. For comparative purposes in the 2011 Annual Review, Zone 7 staff assumed that water stored in Cawelo storage could be used in equal amounts between 2012 and 2015, or about 2,500 acre-feet per year over four years.

COMPARISON OF SUPPLY AND DEMAND: NEXT FIVE YEARS

Table 5 compares available water supplies in 2011 to projected water demands over the next five years. For comparative purposes in this memorandum, long-term average supplies and minimum available from storage over the next five years were used to compare with projected water demands between 2012 and 2015. As shown in Table 5, Zone 7's existing water supply exceeds projected water demands over the next five years, with or without water conservation. Additional analysis also showed that Zone 7 could meet projected water demands during Single Dry and Multiple Dry years over the same period.⁶

⁶ Analysis completed as part of the 2011 WSE; Zone 7 staff hopes to present the results to the Board in June.

Table 5. Comparison of Supply and Demand: Next Five Years

Component		2011	2012	2013	2014	2015
Without Conservation	Water Supply	67,400	55,050	55,050	55,050	55,050
	Available from Storage	54,600	35,600	35,600	35,600	35,600
	Water Demand ^(a)	(51,900)	(52,300)	(52,600)	(53,100)	(53,800)
	Total	70,100	38,350	38,050	37,550	36,850
With Conservation	Water Supply	67,400	55,050	55,050	55,050	55,050
	Available from Storage	54,600	35,600	35,600	35,600	35,600
	Water Demand ^(a)	(51,900)	(51,100)	(50,800)	(50,700)	(50,800)
	Total	70,100	39,550	39,850	39,950	39,850

^(a) Includes both M&I and Untreated water demands.

PROGRAMS NECESSARY TO MEET WATER DEMANDS

The review completed as part of this memorandum indicates that Zone 7 has sufficient water supplies to meet projected water demands over the next five years with or without additional water conservation. As demonstrated in previous water supply analyses completed by Zone 7 staff, however, Zone 7's water supply is at risk and subject to a very uncertain future due to court rulings and biological opinions associated with the Delta, and climate change.⁷

In response to these findings, Zone 7 staff has nearly completed a detailed evaluation of Zone 7's water supplies that will make recommendations to help minimize near-term risks of water supply shortages while maximizing long-term flexibility until more information is known regarding a fix in the Delta. Zone 7 staff hopes to present this 2011 WSE to the Board in June.

⁷ Zone 7, 2009. Water System Update. November 18.

ATTACHMENT A: RELIABILITY POLICY

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO 04-2662

INTRODUCED BY DIRECTOR MARCHAND
SECONDED BY DIRECTOR CONCANNON

Reliability Policy for Municipal & Industrial Water Supplies

WHEREAS, the Zone 7 Board of Directors desires to maintain a highly reliable Municipal and Industrial (M&I) water supply system so that existing and future M&I water demands can be met during varying hydrologic conditions; and

WHEREAS, the Board has an obligation to communicate to its M&I customers and municipalities within its service area the ability of the Zone's water supply system to meet projected water demands.

WHEREAS, the Board on May 15, 2002 adopted Resolution No. 02-2382 setting forth its Reliability Policy for Municipal & Industrial Water Supplies; and

WHEREAS, the Zone's current water supply policy includes a provision for a valley-wide groundwater production capability to meet 75% of valley-wide M&I demand in the event of an outage of the South Bay Aqueduct; and

WHEREAS, the Board desires to revise the Reliability Policy to include all Zone 7 water supply facilities and to clarify demand levels for planning purposes;

NOW, THEREFORE, BE IT RESOLVED that the Board hereby rescinds Resolution No. 02-2382 adopting the May 15, 2002 Reliability Policy for Municipal & Industrial Water Supplies; and

BE IT FURTHER RESOLVED that the Board hereby adopts the following policy goals regarding reliability¹ to guide the management of the Zone's M&I water supplies as well as its Capital Improvement Program (CIP)²:

- GOAL 1. Meet 100% of its treated water customers water supply needs in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands for the next 20 years as specified in Zone 7's Urban Water Management Plan, (UWMP), which will be coordinated with Zone 7's M&I water Contractors. Zone 7 will endeavor to meet this goal during an average water year³, a single dry water year⁴, and multiple dry water years⁵, and

GOAL 2: Provide sufficient treated water production capacity and infrastructure to meet at least 75% of the maximum daily M&I contractual demands should any one of Zone 7's major supply, production or transmission facilities experience an extended unplanned outage.

BE IT FURTHER RESOLVED that to ensure that this Board policy is carried out effectively, the Zone 7 General Manager will provide a water supply status report to the Board every five years with the Zone 7 Urban Water Management Plan that specifies how these goals can be, or are being, achieved.

If the General Manager finds that the goals might not be met, then the Board will hold a public hearing within two months of the General Manager's finding to consider remedial actions that will bring the Zone into substantial compliance with the stated reliability goals. Remedial actions may include, but are not limited to, voluntary conservation or mandatory rationing to reduce water demands, acquisition of additional water supplies, and/or a moratorium on new water connections. After reviewing staff analyses and information gathered at the public hearing, the Board shall, as expeditiously as is feasible, take any additional actions that are necessary to meet the reliability goals during the following five-year period; and

BE IT FURTHER RESOLVED that the Zone 7 General Manager shall prepare an Annual Review of the Sustainable Water Supply Report which includes the following information:

- (1) An estimate of the current annual average water demand for M&I water as well as a five-year projection based on the same information used to prepare the UWMP and CIP;
- (2) A summary of available water supplies⁶ to Zone 7 at the beginning of the calendar year;
- (3) A comparison of current water demands with the available water supplies; and
- (4) A discussion of water conservation requirements and other long-term water supply programs needed to meet Zone 7 M&I water demands for a single dry water year and multiple dry years, as specified in the Zone's UWMP.

A summary of this review will be provided to M & I customers.

Definitions

¹Reliability—the ability of a water supply system to provide water during varying hydrologic conditions without the need for reductions in water use.

³Capital Improvement Program (CIP)—the CIP is the Zone's formal program for developing surface and ground water supplies, along with associated infrastructure, including import water conveyance facilities, surface water treatment plants, groundwater wells, and M&I water transmission system to meet projected water demands.

³**Average water year**—the statistical average quantity of water from all of the water supplies available to Zone 7 on a contractual or legal basis (e.g., surface water runoff to Del Valle reservoir), based on the historical hydrologic records available to Zone 7.

⁴**Single dry water year**—for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of a calendar year from the historic record that represents the lowest yield from all normally contracted or legally available supplies.

⁵**Multiple dry water years**—for the purposes of meeting the requirements of the UWMP, the Zone 7 staff will identify and justify the selection of three or more consecutive dry years from the historic record that represent the lowest yields from all normally contracted or legally available supplies.

⁶**Available water supplies** consist solely of (1) water supplies that the Zone 7 has contracted for (e.g., listed under Schedule A of the State Water Contract, dry-year water options, special contracts with other water districts, etc.) and (2) water actually stored in surface and subsurface reservoirs.

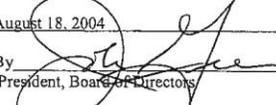
ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS CONCANNON, GRECI, KOHNEN, MARCHAND, QUIGLEY

NOES: NONE

ABSENT: DIRECTORS KALTHOFF, STEVENS

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a resolution
Adopted by the Board of Directors of Zone 7 of Alameda
County Flood Control and Water Conservation District on
August 18, 2004
By 
Vice President, Board of Directors

ATTACHMENT B

ZONE 7'S EXISTING WATER SUPPLY CONTRACTS AND STORAGE

Over the past few decades, Zone 7 Water Agency (Zone 7) has developed a robust water supply system consisting of water supply contracts, local water rights, and local and non-local storage; each is discussed in more detail below.

WATER SUPPLY CONTRACTS

Zone 7 currently has contracts with the Department of Water Resources (DWR) and Byron Bethany Irrigation District (BBID) to augment existing local runoff with imported surface water supplies. These contracts are discussed below.

Contracts with DWR

Zone 7 currently holds two contracts with DWR. One contract is for State Water Project (SWP) water, while the other is associated with the Yuba Accord; both are discussed below.

State Water Project

Zone 7 currently has a long-term contract⁸ with DWR for 80,619 acre-feet of Table A amount, which represents Zone 7's maximum annual allocation through this contract. Each year, DWR only allocates a portion of this amount depending on hydrologic conditions, DWR's operation of the SWP, and legal and environmental constraints.

Prior to 2007, DWR indicated that the long-term average yield from the SWP was approximately 75% of Zone 7's Table A amount, or approximately 60,500 acre-feet annually.⁹ However, in 2007, DWR downgraded the water delivery reliability of the SWP due to federally imposed pumping restrictions – the restrictions were put in place due to concerns over declines in pelagic organisms in the Delta, primarily the decline of the Delta Smelt.

In August 2008, DWR published the final State Water Project Delivery Reliability Report 2007, which officially reduced the projected long-term average yield from the SWP to 66% of Zone 7's Table A amount, or approximately 53,200 acre-feet annually. Then, in August 2010, DWR released a Final of the State Water Project Delivery Reliability Report 2009 that further reduced the long-term average yield from the SWP to 60% of Zone 7's Table A amount, or approximately 48,400 acre-feet annually. Consequently, Zone 7 has lost a total of 12,100 acre-feet $(0.75 - 0.6 * 80,619)$ of sustainable supply over the past three years.

Article 21 Water and Turn-back Water

As a contractor of the SWP, Zone 7 also has access to Article 21 (formerly called surplus water) and Article 56d water (turn-back water). Zone 7 generally incorporates any Article 21 water into its long-term average supplies; however, the projected yield from Article 21 water is very low due to pumping restrictions in the Delta, and was not included in this year's review.

⁸ Zone 7's contract with DWR expires in 2036 with an option to renew for 75 years.

⁹ DWR, 2005. The State Water Project Delivery Reliability Report 2005.

Article 56d is a provision that allows contractors with excess water to sell their water to contractors that have water needs. Typically, there is very little water available in dry years but more available in wet years. However, Zone 7 staff does not expect a significant amount of Article 56d water to be available in the future until there is a resolution to existing pumping restrictions in the Delta and therefore, Article 56d water was not included in this year's review.

Carryover

As a State Water Contractor, Zone 7 has the ability to carry water from one year to the next in San Luis Reservoir – also called Article 56(c) water. As part of its operating agreement with DWR, Zone 7 also has the ability to carry inflow from Arroyo del Valle from one year to the next. Zone 7 typically tries to carry over 10,000 to 15,000 acre-feet of water to help year-to-year operations and mitigate the potential impacts of acute drought conditions.

Yuba Accord Supply

In 2008, Zone 7 entered into an agreement to purchase additional water from DWR as part of the Yuba Accord; the contract expires in 2025. The contract specifies four different conditions (four components) for which Zone 7 can obtain water. The first component is not available to Zone 7, while the second and third components are available during drought conditions. The fourth component is available when Yuba County Water Agency has determined it has water supplies available to sell. As Zone 7 gains experience using this new contract and is able to better define potential long-term yields, then Zone 7 may incorporate more of it into our sustainable supply. For planning-level purposes, Zone 7 assumed that the long-term average yield was 250 acre-feet for this year's review.¹⁰

Byron Bethany Irrigation District (BBID)

BBID diverts water from the Sacramento-San Joaquin Delta (Delta) pursuant to a “Notice of Appropriation of Water” dated May 18, 1914.¹¹ Zone 7 entered into a long-term¹² contract with BBID for up to 5,000 acre-feet annually of water supply under this appropriation.¹³ The current contract expires in 2030.

Although Zone 7 could request up to 5,000 acre-feet per year, Zone 7 staff uses 2,000 acre-feet as a conservative estimate of the long-term average yield from this source because additional analysis is required to justify this water is available during all hydrologic conditions.¹⁴ Water purchased from BBID via this contract is delivered to Zone 7 via the South Bay Aqueduct for use in our service area.

¹⁰ The long-term average is based on varying the maximum yield of 676 acre-feet (only Components 2 and 3) during critically dry years to no water in wet years without considering Component 4 water.

¹¹ Source: Mountain House Master Plan.

¹² 15-year contract, renewable every five years.

¹³ The Zone 7 Board certified the Environmental Impact Report for this water supply in 1999.

¹⁴ Zone 7 is currently reviewing the potential to increase projected long-term average yields from its contract with BBID as part of the Water System Master Plan update.

LOCAL WATER RIGHTS: ARROYO DEL VALLE RUNOFF

Zone 7, along with Alameda County Water District (ACWD), holds a water right permit¹⁵ to divert runoff from Arroyo del Valle, and stores this local runoff in Lake Del Valle under operating agreements with the Department of Water Resources (DWR). All inflow to Lake Del Valle, after accounting for prior rights, is equally divided with ACWD.

Due to operational limitations associated with Lake Del Valle, Zone 7's current use of this local runoff is limited to a long-term average of approximately 7,300 acre-feet. The remaining supply is currently lost as flood releases. However, as discussed in more detail in subsequent sections, existing gravel quarry operations will create a series of gravel quarry pits overlying the main groundwater basin; this will provide Zone 7 with approximately 70,000 acre-feet of storage capacity located over the Main Groundwater Basin between now and 2030. This local storage will provide Zone 7 with the ability to capture these additional flood releases and increase Zone 7's long-term average yield from Arroyo del Valle runoff.

LOCAL STORAGE

Zone 7 has local storage available in the Main Groundwater Basin and in two quarry gravel pits (Lake I and Cope Lake) that overlie the Main Groundwater Basin. Both are discussed below.

Main Groundwater Basin

Zone 7's service area overlies the Livermore Valley Groundwater basin (Basin); the Main Basin is a portion of the Livermore Valley Groundwater Basin that contains the highest yielding aquifers and best quality groundwater.¹⁶ For Zone 7, the Basin is considered a storage facility and not a long-term water supply because Zone 7 does not have a groundwater pumping quota, and only pumps groundwater it artificially recharges. Consequently, Zone 7 has actively managed the Basin for over 40 years, and administers conjunctive use programs that integrate both surface and groundwater supplies.¹⁷

As part of its conjunctive use program, Zone 7 maintains groundwater levels above historic lows in the Main Basin through artificial recharge of SWP water to the arroyos for subsequent percolation and replenishment of existing aquifers.¹⁸ Additionally, Zone staff established historic lows based on historical-low groundwater elevations in various wells in the Main Basin.¹⁹ In general, the difference between water surface elevations when the Main Basin is full and water surface elevations when the Main Basin is at historic lows defines Zone 7's operational storage – operational storage is about 126,000 acre-feet based on Zone 7's experience operating the Main Basin.

Based on a review of current well capacities and discussions with Zone 7's Groundwater Protection and Projects section, Zone 7 has the ability to pump approximately 26,200 acre-feet over a one-year period. Additionally, for this review, Zone 7 staff included limits on annual groundwater pumping to ensure that water surface elevations remain above historic lows during

¹⁵ Permit 11319 (Application 17002).

¹⁶ Zone 7, 2010. Annual Report for the Groundwater Management Program – 2009 Water Year. May.

¹⁷ Zone 7, 2010. Annual Report for the Groundwater Management Program – 2009 Water Year. May.

¹⁸ Zone 7, 2010. Annual Report for the Groundwater Management Program – 2009 Water Year. May.

¹⁹ Zone 7, 2010. Annual Report for the Groundwater Management Program – 2009 Water Year. May.

a multiple dry year event.²⁰ The pumping limit used in the analysis (14,000 acre-feet) was based on preliminary modeling conducted by Zone 7 staff and assuming no artificial recharge activities.²¹

Chain of Lakes – Lake I and Cope Lake

The Chain of Lakes (COL) is an area located between the cities of Pleasanton and Livermore, and refers to a series of ten mined out or active gravel quarry pits that have been or will be converted into surface water storage facilities and/or groundwater recharge basins once mining has been completed. The ten quarry pits or lakes are named Cope Lake, and Lakes A through I.

Although the Chain of Lakes will ultimately cover approximately 2,000 acres and store approximately 70,000 acre-feet of water, Zone 7 currently only owns Cope Lake and Lake I. Zone 7 expects to take ownership of Lake H sometime within the next five years, while the remaining lakes will be transferred to Zone 7 over the next 20 years. No additional storage or recharge capacity from the Chain of Lakes was assumed available to Zone 7 for this year's review.

NON-LOCAL STORAGE

In addition to local storage, Zone 7 also participates in two groundwater-banking programs with Semitropic Water Storage District (Semitropic) and Cawelo Water District (Cawelo). Each is discussed below.

Semitropic Water Storage District

Zone 7 has 78,000 acre-feet of groundwater banking storage available through Semitropic to augment water supplies during drought conditions. During non-drought periods, Zone 7 can put up to 5,883 acre-feet annually into the Semitropic groundwater bank. During droughts, Zone 7 has the ability to request 9,100 acre-feet of pump back and anywhere from 0 to 8,645 acre-feet of exchange water;²² the availability of exchange water depends on projected SWP deliveries. For conservative planning-level purposes in this year's review, Zone 7 staff assumed that only pump back capacity would be available between 2012 and 2015.

Cawelo Groundwater Banking Program

Zone 7 has 120,000 acre-feet of groundwater banking storage available with Cawelo to augment water supplies during drought conditions. During non-drought periods, Zone 7 can put 5,000 acre-feet annually into the bank.²³ During droughts, Zone 7 has the ability to request 10,000 acre-feet of pump back. For conservative planning-level purposes in this year's review, Zone 7 staff assumed that no pump back would be available from Cawelo in 2011 and that available storage (10,000 acre-feet) could be used in equal amounts over a 4-year period between 2012 and 2015.

²⁰ An example multiple dry year event is the 6-year drought that occurred between 1987 and 1992.

²¹ Zone 7 conducted a preliminary analysis using the calibrated groundwater model to determine the average annual pumping limit that maximizes the recovery of groundwater basin storage during a 6-year drought, assuming average conditions that existed between 1987 and 1992, and only with existing facilities.

²² The availability of exchange water depends on the allocation from the State Water Project.

²³ Zone 7 only gets storage credit for 50% of the water provided to Cawelo. Per the existing contract, Zone 7 can only send 10,000 acre-feet in any given year to Cawelo; therefore, the maximum contractual credit is 5,000 acre-feet.