17 November 2009

Technical Memorandum

To: Matthew Winegar, Development Services Director

Via: Ken Ortega, Public Works Director

From: Meredith Clement, Kennedy/Jenks Consultants
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Subject: City of Oxnard, 2010 to 2030 Projections of Water Supply and Demand
K/J 0889026

This memorandum, provided for City review, includes a summary of projections for City water supplies and demands and how they were developed for the 2030 General Plan. Water supply assessments evaluate the water supplier's (the City) total, reasonably projected water supplies available during normal, single dry and multiple dry water years to the year 2030 and compare this to anticipated water demands for the same period. Because these evaluations consider all existing and anticipated supplies and demands through 2030, they are a planning-level overview of City water resources.

1.0 Water Supply Sources

The City's current water supply consists of: (1) United Water Conservation District (UWCD) pumped groundwater delivered to the City through the Oxnard – Hueneme Pipeline, (2) local groundwater pumped from City wells, and (3) imported surface water from the Calleguas Municipal Water District (CMWD). The City desalts a portion of its local groundwater supplies at its Blending Station No. 1 Desalter and blends these three sources to achieve an appropriate balance between water quality, quantity, and cost. Historically, the City's overall water supplies include an equal blend of low mineral content (softer) water (imported water and desalted groundwater), with the higher total dissolved solid (harder) content local groundwater. The detailed characteristics of each of these sources is described in the following paragraphs and summarized in Table 1.

1.1 UWCD and City Groundwater

Groundwater purchased from UWCD has historically made up approximately 25% of the City's water supply and the groundwater pumped from City wells another 25%. However, with the recent addition of the Blending Station No. 1 Desalter, the City intends to rely increasingly on local groundwater while fixing or reducing its imported water purchases. The City is capable of making this transition without compromise to its overall water quality because it can now desalt a portion of its local groundwater supplies. Local groundwater is generally pumped from the Oxnard Plain Groundwater Basin. A description of the local groundwater aquifers is provided in the City's 2005 Urban Water Management Plan (UWMP).

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1.1.1 Fox Canyon Groundwater Management Agency

The Fox Canyon Groundwater Management Agency (GMA) has jurisdiction over groundwater pumping for all of the land which overlies the Fox Canyon Aquifer. This encompasses approximately 185 square miles and includes the Oxnard Plain Forebay and the Oxnard Plain Pressure Basins underlying most of the City. This region is not subject to a formal, judicially enforced adjudication. But the regulatory oversight of the GMA provides the functional equivalent water management controls which are normally associated with adjudicated basins.

The GMA monitors and controls pumping within the GMA boundaries. As a method of reducing overall demands on local groundwater supplies, the GMA has implemented a staged "cutback" policy, through which it has reduced M&I allocation in increments of 5%, over a period of 25 years. As of July 1, 2009, municipal and industrial (M&I) pumpers have had a total of 20% cutback in their historical allocations. A final 5% cutback (for a total of 25%) is likely to be implemented on January 1, 2010. The GMA does not prohibit pumping beyond the M&I allocations, however extractions beyond the pumping allocations are subject to a surcharge.

The GMA also allows pumpers to carryover unused allocation from year-to-year; that is, if a pumper utilizes less than its pumping allocation, it accrues conservation credits. Similarly, if "foreign water" (including recycled water) is used in-lieu of groundwater pumping and/or recharged into the local aquifers, additional credits (either conservation or storage credits) may be accrued.

The City has undertaken both types of programs in the past, with GMA approval. The City has managed its total GMA allocation to establish and maintain approximately 30,000 acre feet (AF) in GMA groundwater conservation credits. The City uses its groundwater credit "bank" conjunctively with its imported supplies. During periods when imported supplies are restricted or when other operational considerations warrant it, the City relies more heavily on local groundwater, using a portion of its accumulated credits. During other periods, the City will reduce its groundwater use below its historical allocation to build back up its credit "bank."

The City obtains additional GMA allocations when agricultural land is converted to urban uses. In other words, the GMA allocates 2 acre-feet per acre per year of new allocation to the City when the City takes over water service obligation to lands that convert from agricultural use to M&I uses. The 2 acre-feet per acre, per year allocation is treated as "historical allocation" and is subject to the GMA regulatory cutbacks described above. Therefore, as of January 2010, the actual allocation the City receives in an agricultural to urban land use conversion is 1.5 acre-feet per acre per year.

Finally, the City receives a GMA baseline allocation for land which transitioned to urban use, but which had no prior water use history prior to the conversion. The baseline allocation is assigned at 1 acre-foot per acre per year (GMA Ordinance 8.1 Section 5.6.1.1). Baseline allocation is not subject to GMA regulatory cutbacks.

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The City has two existing allocation pools – one (a suballocation) held in trust through UWCD and the other is assigned directly to the City's own wells. Each of these allocations is discussed below.

1.1.2 Groundwater – City Wells

In 2005 the GMA passed Ordinance No. 8.1, also known as the "Ordinance Code." The main goal of the ordinance is to bring the basin to safe yield by 2010. The result of the Ordinance Code was that by year 2006 the City had the following allocations:

- 822.468 acre-feet per year (AFY) of GMA baseline allocation
- 8,415.984 AFY of historical allocation (after 15% reduction)
- 1,487.798 AFY of transferred allocation (after 15% reduction)

As of December 31, 2006 total City GMA groundwater allocation was 10,726.25 AFY.

Since 2006 there have been several events that have impacted local groundwater. Lower than average precipitation over the last few years, efforts to protect endangered species on the Santa Clara River, intensification of water use by agricultural pumpers, and difficulty with recharge at some groundwater basins have strained local groundwater resources. Both agricultural and municipal groundwater pumpers have implemented significant conservation measures and the GMA continues to refine its regulatory practices to maintain the long-term integrity of local groundwater resources.

As previously described, in 2009 historical allocations have been reduced by a cumulative 20%, and another 5% reduction is scheduled to go into effect in January 2010. For the purposes of water supply planning, it is assumed that the City's baseline allocation will remain at 822.468 AFY, but the historical and transferred allocation will be reduced. Total anticipated City groundwater allocation is assumed to be 8,380 AFY, with no additional future cutbacks.

A projection of water supply from City groundwater wells is provided in Table 1.

1.1.3 Groundwater – United Water Conservation District

UWCD currently provides a portion of the City's groundwater supply through its El Rio Wellfield and Oxnard-Hueneme (O-H) Pipeline System. This arrangement has been in operation since 1954, with the current contractual commitment formalized in the 1996 Water Supply Agreement for Delivery of Water through the Oxnard/Hueneme Pipeline. UWCD holds a pumping suballocation for all users (Contractors) of the O-H Pipeline, which includes the City, the Port Hueneme Water Agency (PHWA), and a number of small mutual water companies.

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UWCD diverts Santa Clara River water at the Vern Freeman Diversion Dam southeast of Saticoy, provides some of the diverted water to agricultural irrigators on the Oxnard Plain, and delivers the rest to the Saticoy and El Rio Spreading Grounds. Water percolated in these spreading basins recharges the Oxnard Plain Forebay Basin. The UWCD El Rio Wellfield is optimally located to pump groundwater from the easily recharged Oxnard Plain Forebay Basin.

The City's groundwater suballocation of UWCD groundwater was historically 9,070 AFY, but this was cutback to 7,709 AFY in 2006 as a result of Ordinance No. 8.1. The final GMA cutback scheduled for January 2010 will reduce the City's suballocation from UWCD to 6,800 AFY.

UWCD also holds conservation credits accrued by the O-H contractors, including the City. Currently the City has approximately 7,000 AF of stored credits with UWCD (personal communication, Curtis Hopkins, August 2009).

Because the reductions in allocation are designed to bring the groundwater basins within safe yield, the City's groundwater suballocations are considered to be a reliable future water source.

A projection of water supply from UWCD is provided in Table 1.

1.1.4 Calleguas Municipal Water District (Imported)

The City annexed to CMWD in February of 1961. CMWD is a member agency of the Metropolitan Water District of Southern California (MWD) from which it purchases imported water through the State Water Project (SWP) from Northern California. CMWD receives treated water from MWD via the MWD West Valley Feeder and either stores the treated water in Lake Bard or the Las Posas Basin for later delivery or feeds the water directly to the Springville Reservoir near Camarillo. The City receives water from the Springville Reservoir through the City's Oxnard and Del Norte Conduits that feed the City's five (5) water blending stations

The imported water purchased from CMWD has historically comprised approximately 50% of the City's total water supply. Lower than average precipitation over the last several years, conveyance and storage deficiencies in the SWP system, and judicial decisions regarding endangered species in the Sacramento-San Joaquin Delta area have led to reduced SWP imported water deliveries. These reduced SWP deliveries led MWD, in mid-2009, to reduce water deliveries to its member agencies, including CMWD, and consequently retail water purveyors including the City of Oxnard. As the City of Oxnard and PHWA share the same CMWD turnout, the two agencies must reduce their usage of imported water by approximately 23% during the Fiscal Year 2009-2010 period, or face significant penalties by mid-2010. MWD applied the 23% reduction to the assumed base supply, using a baseline period between 2004 and 2006, and calculated City supply at 11,385 AFY. This reduction in supply is expected to remain in place until the constraints on MWD's supplies are relieved. The City is in negotiations with MWD to adjust upward this allocation to better reflect the typical imported water demand for the City.

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1.1.5 Recycled Water

Currently, the City does not supply recycled water; however, this source is a component of the City's future water supplies.

The Oxnard Wastewater Treatment Plant (OWTP) currently produces approximately 22 million gallons per day (mgd) of secondary treated wastewater and discharges the effluent to the Pacific Ocean through an ocean outfall. In an effort to identify a project that could take advantage of the water reclamation potential from the OWTP, the City completed a Water Reclamation Master Plan in 1993. In response to recommendations included in the 1997 progress report titled "Oxnard Water Reclamation Project Initial Implementation Elements of the Water Reclamation Master Plan," and with input from CMWD, UWCD, and GMA, the City developed a water recycling program – the Groundwater Recovery Enhancement and Treatment (GREAT) Program.

In 2002, the City Council formally directed City staff to begin implementation of the GREAT Program, as further documented in the "GREAT Program Advanced Planning Study" (Kennedy/Jenks, 2002). Recycled water represents a new water supply that can be developed locally, reducing future reliance on imported water deliveries from northern California.

Since 2002, the City has certified a final environmental impact report and environmental impact statement for the GREAT Program, fully approved funding for the Phase 1 portion of the Program, along with acceptance of significant federal and state grants in support of the GREAT Program elements. The Blending Station No. 1 Desalter is the first completed major element of the GREAT Program.

Construction of the next major element of the GREAT Program -- the Advanced Water Purification Facility (AWPF) -- is scheduled to begin in December 2009. The AWPF, will treat secondary-treated wastewater from the OWTP using microfiltration, reverse osmosis and advanced oxidation, to produce purified recycled water. This highly treated, recycled water will be used for landscape irrigation, industrial processes, agricultural irrigation and future groundwater recharge.

Construction bidding for the AWPF began October 9, 2009 and will close December 2, 2009. The City Council is scheduled to issue tax exempt revenue bonds in late 2009 or early 2010 to fund a portion of the Phase I recycled water project. As noted, the City expects to start construction of the AWPF Phase I before the end of 2009. Requirements from a $20,000,000 Department of Interior, US Bureau of Reclamation grant received for the project require that the AWPF be completed and producing recycled water by September 30, 2011.

The AWPF is designed so that its capacity can be increased at relatively nominal incremental cost. In other words, the major facilities will be sized so that additional treatment capacity can be installed in modular components. Thus, the Phase 2 GREAT Program can be implemented

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much more quickly, at lower incremental costs, and with minor environmental review, in comparison to the Phase 1 element of the GREAT Program. The City intends to implement subsequent expansion(s) of the AWPF based on its then existing water supply and demand projections as they develop over the coming years. Subsequent phases of the AWPF will increase recycled water production from 6.25 mgd to as much as 26 mgd.

The City Council has also fully approved, and the City is in the final design of, the Recycled Water Backbone Pipeline Phase I. This pipeline and distribution project will deliver recycled water to customers along the Hueneme Road and Ventura Road corridors within the City, substituting recycled water for use of potable water where appropriate. The City expects to complete design work within the next few months and to start construction in early 2010. To meet the terms of the US Bureau of Reclamation grant, the Recycled Water Backbone Pipeline must also be completed by September 30, 2011.

Additional details on the City's proposed recycled water system are described in the City's Recycled Water Masterplan Phase I.

For the purposes of water supply projections it is assumed that the GREAT AWPF Phase 1 will produce 6.25 mgd (7,000 AFY net production) by year 2012 (personal communication, Thien Ng, September 2009). It is anticipated that recycled water infrastructure will serve 2,450 AFY of M&I demands by year 2012; approximately 2,700 AFY of recycled water supply would be delivered to City M&I by year 2013; 3,150 AFY by 2016; and 5,050 AFY by year 2020 (Recycled Water Master Plan 2009). Recycled water produced in excess of M&I recycled water demands will be used for irrigation of agricultural lands or groundwater recharge, in exchange for GMA groundwater credits.

The AWPF is conveniently located in close proximity to agricultural lands which could be easily served with recycled water. The infrastructure necessary to support groundwater recharge will also be located in the area nearby the AWPF and is expected to be in place by 2015.

The initial Phase 1 construction of the AWPF includes the completion of the main facility and infrastructure required for the future expansion of the facility's capacity. Additional treatment trains, or modules, can be added as needed, with significantly less comparative investment, to address future changes in water supply. The AWPF Phase 2A could be built as early as year 2015 and would supply an additional 7,000 AFY. AWPF Phase 2B is estimated to be complete by 2020, producing an additional 7,000 AFY. Dates for these AWPF expansions may be modified as water supply conditions change or circumstances require. AWPF Phase 2A and 2B may provide recycled water to M&I, agriculture, and groundwater recharge projects. Funding for AWPF Phase 2A and 2B will primarily be generated from fees paid by projects that increase water demands beyond the Phase I capacity of the GREAT Program. Future expansions of the AWPF, up to 25 mgd, will be undertaken by the City as needed.

A projection of water supply from the GREAT Program Phases 1 and 2 is provided in Table 1.

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1.1.6 Other Projected City Water Supplies

The City has identified other potential water supplies in addition to those described above:

- Ferro Property Program. UWCD has approved, and is in the process of completing, the purchase of certain property located in the Oxnard Plain Forebay, which UWCD will convert into additional spreading basins. UWCD has approved a transfer agreement with the City through which the City will access additional local groundwater supplies. The City Council will consider this transfer agreement in December 2009. Through this program, the City will obtain 11,000 AF of groundwater credits. The City plans to use these transferred credits within the period 2010-2011. This program also provides the City with an additional access to 1,000 acre-feet per year of groundwater, through 2019 (a total of an additional 8,000 acre-feet) (personal communication, Tony Emmert, September 2009). The groundwater obtained through this program will be delivered through City wells and the O-H pipeline.

- Transferred Allocations. As described in section 1.1, it is estimated that the City will acquire 1.5 acre-feet per acre per year for agricultural lands that convert to M&I uses. The City has identified several areas that are in agriculture that are anticipated to undergo urban development including the Teal Club Specific Plan (SP) area, Sakioka Farms SP area, Camino Real Business Park, Jones Ranch SP, Ormond Beach North SP, and Ormond Beach South SP. Based on the potential conversion area and timing of development the City Planning Division has developed projections of transferred allocations. Water supply projections assume transfers of allocation of 525 AF per year from the Teal Club SP; 219 AF per year from the Sakioka Farms SP; 69 AF per year from the Camino Real SP; 145 AF per year from the Ormond Beach North SP; and 98 AF per year from the Jones Ranch SP by year 2015. This projection also assumes the transfer of an additional 260 AF per year from the Sakioka Farms SP; an additional 150 AF per year from the Jones Ranch SP; an additional 338 AF per year from the North Ormond Beach SP; and 231 AF per year from the Ormond Beach South SP by year 2020. This projection also assumes the transfer of an additional 332 AF per year from the Ormond Beach South SP and an additional 148 AF per year from the Sakioka Farms SP by year 2030.

- Transfer of 700 AF of GMA groundwater credits from PHWA to the City as part of the Three Party Water Supply Agreement, December 2002 (personal communication, Tony Emmert, August 2009, Calleguas Municipal Water District "Three Party Agreement" dated December 10, 2002 and "Purchase Order" dated January 1, 2003).

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TABLE 1
PROJECTED ANNUAL WATER SUPPLIES AND CREDITS

	2010	2015	2020	2025	2030
ANNUAL SUPPLIES (acre feet per year)					
Groundwater-City Wells[a]	8,380	8,380	8,380	8,380	8,380
Brine Water Loss[b]	(2,100)	(4,200)	(6,300)	(8,400)	(8,400)
UWCD Allocation[c]	6,800	6,800	6,800	6,800	6,800
CMWD Allocation[d]	11,840	11,840	11,840	11,840	11,840
M&I Supplemental Water[e]	5,000	3,000	1,000	1,000	1,000
GREAT Program Recycled Water Phase 1 M&I[f]	0	2,700	5,050	5,050	5,050
GREAT Program Recycled Water Phase 1 Agriculture Use[f]	0	4,300	1,950	1,950	1,950
GREAT Program Recycled Water Phase 2[g]	0	7,000	14,000	14,000	14,000
Ferro Pit Program[h]	5,500	1,000	0	0	0
Transferred Allocations[i]	0	1,060	2,290	2,220	2,420
PHWA Program[j]	700	700	700	700	700
TOTAL ANNUAL SUPPLIES	**36,120**	**42,580**	**45,710**	**43,540**	**43,740**

GROUNDWATER BANKED CREDITS		
Fox Canyon GMA credits (k)	30,000	AF
UWCD credits (k)	7,000	AF
GREAT Program credits at 2,500 AFY minimum X 20 years (l)	50,000	AF
SUBTOTAL	**87,000**	**AF**

Notes: Values are rounded to the nearest 10 acre-feet.

a) Projection includes the existing cutbacks (Fox Canyon Groundwater Management Agency-GMA, up to 25 %) and no anticipated future cutbacks in City's allocation. Source: City Water Resources (personal communication, Curtis Hopkins, August 2009).

b) Brine Water Loss is the amount of brine reject water (approximately 20 % loss) associated with the City's potable water Desalters at Blending Stations No. 1 (BS1) (currently operating at 7.5 mgd product water capacity - 8,400 AFY) and future BS3. BS3 Phase 1 anticipated to be operating by 2013 (7.5 mgd product water capacity) and BS1 Phase 2 (15 mgd product water capacity) projected to be operating by 2017 (according to the City's Fiscal Year 2008-2009 Capital Improvement Plan). BS3 Phase 2 (15 mgd product water capacity) anticipated to be operating by 2021 (personal communication with City Water Division, Tony Emmert, August 2009). However, these dates may be modified as conditions change.

c) This assumes the most conservative availability of City's allocation from UWCD which includes a total of 6,800 AFY. Also assumes that the GMA implements the full 25% cutback by 2010; and no anticipated future GMA cutbacks. The City had approximately 7,000 AF of credits banked with UWCD (personal communication, Curtis Hopkins, August 2009).

d) MWD applied the 23% reduction to the assumed base supply, using a baseline period between 2004 and 2006, and calculated City supply at 11,385 AFY. However, the City's entitlement also includes sub allocations for P&G (2,800 AFY) and PHWA (3,262.5 AFY). The City is free to use any unused P&G and CMWD sub allocations. Program details provided by City Water Resources (2005 UWMP; personal communication, Tony Emmert, September 2009).

e) Through the M&I Supplemental Water Program, the City has received a total of 15,886.7 AF between the years 2005-2008 – approximately 4,000 AFY. However, UWCD may temporarily reduce or suspend deliveries of M&I Supplemental Water when Forebay groundwater levels drop below a certain threshold. For example, UWCD has tentatively suspended deliveries of M&I Supplemental water given the current conditions in the Forebay as of late 2009. Even though deliveries are suspended, M&I Supplemental water credits continue to accumulate. Once the suspended deliveries are reinitiated, it is expected that the accumulated credits will be made available in full in subsequent years. Based on current

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information, the City anticipates 5,000 AF of M&I Supplemental Water will be available in 2010 and 0 AF in year 2011. As a conservative assumption, the City assumes that on average only 3,000 AFY of M&I Supplemental water credits will be available between the years 2012-2015. As the Camrosa Water District has a contractual first right of refusal of the Conejo Creek Diversion Project water, and has expressed plans to utilize most of this water within its district, the M&I Supplemental Water credits available will reduce to 1,000 AFY as the Camrosa non-potable water system infrastructure continues to develop. Based on the expected future expansion phases of the Camrosa system, this is projected to occur after year 2015.

f) GREAT AWPF Phase 1 (anticipated startup in 2010-2012) would produce a maximum of 6.25 mgd (7,000 AFY net production) (Source: UWMP, 2005; personal communication, Thien Ng, September 2009). Combined uses of recycled water from AWPF Phase 1 (M&I and agriculture) does not exceed 7,000 AFY from 2012-2030. City anticipates that recycled water infrastructure will serve 2,450 AFY M&I demands by year 2012; approximately 2,700 AFY of recycled water supply would be delivered to City M&I uses by 2013; 3,150 AFY by 2016; and 5,050 AFY by year 2020 (Recycled Water Master Plan 2009). City assumes water produced in excess of M&I recycled water demands will be used for agricultural uses and groundwater recharge. City assumes GMA will allow credits for 100% of recycled water used directly or for injection (groundwater recharge) (personal communication, Steve Bachman, August 2009). It is assumed infrastructure to allow groundwater recharge will be in place by year 2015.

g) This is a projected supply not previously utilized by the City. AWPF Phase 2A (anticipated 2015; based on 2009 Avoided Cost Model) would produce a maximum of an additional 7,000 AFY (net production). AWPF Phase 2B is anticipated to be operating by 2020 and produce a maximum of an additional 7,000 AFY (net production). Dates for these AWPF expansions may be modified as conditions change. AWPF Phase 2A and 2B may provide recycled water to M&I, agriculture, injection barrier, and groundwater recharge projects.

h) This is a projected supply not previously utilized by the City. Includes one-time transfer of 11,000 AF of groundwater credits to the City. City plans to use these transferred credits within the period 2010-2011. City will also obtain 1,000 AFY of credits from 2012-2019. Program details provided by City Water Resources (personal communication, Tony Emmert, September, 2009).

i) For agricultural property conversion - assume 1.5 acre-feet per acre per year. The credits depicted here are those used to meet demand and are not representative of the City's cumulative credit balance with the GMA. Transferred allocation values developed by City Planning Department (personal communication, Chris Williamson October 2009). Assumes transfers of 525 AF Teal Club SP; 219 AF Sakioka Farms SP; 69 AF Camino Real SP; 145 AF from the Ormond Beach North SP; and 98 AF Jones Ranch SP by year 2015. Assumes transfer of additional 260 AF Sakioka Farms SP; and additional 150 AF Jones Ranch SP; an additional 338 AF from the North Ormond Beach SP; and 231 AF Ormond Beach South SP by year 2020. Assumes additional 332 AF from Ormond Beach South SP and an additional 148 AF Sakioka Farms SP by year 2030.

j) Transfer of 700 AF of GMA groundwater Credits from PHWA to the City as part of the Three Party Water Supply Agreement, December 2002. Program details provided by City Water Resources (personal communication, Tony Emmert, August 2009).

k) The Credits depicted here are those used to meet demand and are not representative of the City's cumulative credit balance. Deliveries from the groundwater credits are shown only when there is insufficient supply to meet demand. At the end of 2008, the City had approximately 30,000 AF of groundwater credits with the GMA and 7,000 AF with UWCD. The groundwater credits are intended to be used to offset any reduced availability of imported water, or to mitigate unforeseen cutbacks, catastrophic events, facility failure, etc. The City can use these credits without GMA penalty. Program details provided by City Water Resources, personal communication, Tony Emmert, November 2009; personal communication, Curtis Hopkins, September 2009.

l) It is assumed future GREAT Program deliveries will be credited a minimum of 2,500 AFY starting in year 2015.

2.0 Water Demand Projections

A detailed water demand model was developed as part of the 2005 UWMP and includes: existing demand, demand from proposed buildout of the 2020 General Plan, unaccounted for water loss, potential increase in per-unit demand, and a contingency. The model also accounts for reductions in demand due to the increased use of recycled water and water conservation.

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This model has been updated for buildout of the proposed 2030 General Plan Alternative B and to reflect recent changes in water supply and consumption, as accurately and as reasonably possible.

Components of demand are shown in Table 2 and discussed below:

- 2009 Baseline Demand. This is an estimate of total demand for the calendar year 2009. As a conservative basis, water demand by existing customers is anticipated to remain fairly stable through 2030. In all likelihood current customers will continue to implement best management practices, which should reduce overall per capita water consumption.

- Non-Revenue Water (i.e., Water Loss). Water losses come from authorized, unmetered sources such as fire fighting and main flushing, or unauthorized sources such as leakage, illegal connections, and inaccurate flow meters. Non-Revenue water is estimated to be about 6% of water demand.

- Ocean View System (formerly Ocean View Municipal Water District [OVMWD]) primarily serves agricultural customers along East Hueneme Road. As part of a Local Agency Formation Commission action, the OVMWD district dissolved and the existing customers were added to the City of Oxnard water service area as the Ocean View System (OVS). Existing users in the OVS service area along East Hueneme Road receive water from the City through the UWCD O-H Pipeline System and the OVS system. Parcels within the former OVMWD service area also obtain water from private wells and from the UWCD PTP System. OVS customers use approximately 1,337 AFY of UWCD O-H water delivered via the City, according to UWCD data (average calculated for fiscal years 1999-2008).

- PHWA purchases water from the City per the Three Party Agreement which specifies a PHWA suballocation of CMWD water of 3,262.5 AFY. PHWA's mean annual purchase from the City was 1,911 AF for period 1999-2008 (personal communication, Steve Hickox, September 2009; personal communication, David Birch, September 2009). The City of Port Hueneme, the largest PHWA member agency, has implemented a meter retrofit program which should substantially reduce water demand within the City. PHWA is also implementing other water management programs which may decrease its per capita water demands.

- Proctor & Gamble is a private user within the City of Oxnard which receives unblended imported water from the City through a special water service agreement. Current annual water demand for Proctor & Gamble is approximately 2,300 AFY for the period 2001-2008. Proctor & Gamble estimated future water demands are approximately 2,800 AFY, assumed to occur after year 2015. Source: personal communication, Dakota Corey, August 2009. Proctor & Gamble has also indicated its intent to implement certain water reuse and conservation practices, and consider the use of recycled water to offset some

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of its demands. For the purpose of this analysis, the City assumes Proctor & Gamble's overall water use will increase from 2,300 AFY to 2,800 AFY after 2015.

- Projected New Demand Increase for Development Projects Under Review. Annual increase in water demand has been based on development applications received and under review and/or permitted. New 2010 to 2030 water demand is based on the buildout of the 2030 General Plan, Alternative B. Year to year projected new development demand based on the July 2009 City Project List, 2030 General Plan Background Report (2006), Ventura Council of Governments Decapolis Report, and UCSB Forecast.

- Projected New Demand Increase of Unknown Projects. It is assumed that for any given timeframe, water demand could be 10% higher due to approved amendments to the 2030 General Plan.

- Demand Management Programs. In February 2008, Governor Schwarzenegger called for a 20 percent reduction in per capita water use statewide by 2020. The State Water Resources Control Board has released a draft statewide implementation plan for achieving this goal (Draft 20x2020 Water Conservation Plan, April 2009) which establishes regional baseline and target per capita water use values by State hydrologic region. The 2020 targeted daily per capita water use value established for the South Coast hydrologic region is 149 gallons per capita per day. The draft plan proposes a series of enforcement mechanisms and financial incentives to facilitate water conservation at the local level. The City is preparing a Conservation Master Plan, due by the end of 2009, which will identify potential demand management measures and potential demand reductions which will help the City meet the gallons per capita per day goals of the 20x2020 plan. The City anticipates a reduction in City-wide water demands of approximately 500 AFY for period 2010-2012, ramping up to 5% of demand from 2016-2020, and 10% reduction for period 2021-2030. Demand reductions recommended by City staff (personal communication, Tony Emmert and Dakota Corey, August-September 2009).

Table 2 shows the estimated annual water demand projections through the year 2030. On a day-to-day basis there will be variations, with higher demands typically during the summer and lower demands during the winter.

The water demand projections in Table 2 are conservative and likely overestimate demand. General Plans rarely reach buildout and are rarely amended so often as to produce a gain of 10 percent. Nevertheless, because of reduced reliability of water imports from the SWP the Oxnard City Council, at its January 15, 2008 and October 19, 2009 meetings, directed staff to require that all new projects defined as discretionary and not exempt from CEQA be water demand neutral to the City's water system. Project proponents can contribute water rights, water supplies, or financial or physical offsets to achieve water neutrality. Typical options open to project proponents include transfers of GMA groundwater allocations to the City through

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agricultural conversion, participation in expansions of the City's GREAT Program recycled water system through physical or financial contributions, and participation in water conservation projects that produce measurable sustainable water savings. Several projects have already complied with this requirement and several others are currently in negotiations with the City. Projects that are ministerial and/or exempt from CEQA, such as single family residential projects or business tenant improvements, are not subject to the water demand neutral requirement.

At the October 27, 2009 meeting the City Council directed that the following components be incorporated into a written City water demand neutral policy:

- Proposed projects should either contribute new water supplies or the financial or physical equivalent to offset the estimated project demand.
- The City will develop a menu of mitigation options that may include financial contribution toward the GREAT Program's recycled water facilities, financial contribution toward a City controlled water conservation project or program that would generate verifiable long-term water savings, or implementation of a developer initiated water conservation project or program that would generate verifiable long-term water savings.

TABLE 2
ANNUAL WATER DEMAND PROJECTIONS (AFY)

WATER DEMANDS	2010	2015	2020	2025	2030
BASELINE DEMAND					
2009 Revenue Metered Demand[a]	28,900	28,900	28,900	28,900	28,900
2009 Non-Revenue Water[b]	2,150	2,150	2,150	2,150	2,150
OVS (formerly OVMWD)[c]	1,340	1,340	1,340	1,340	1,340
PHWA[d]	1,910	1,910	1,910	1,910	1,910
Proctor and Gamble[e]	2,300	2,800	2,800	2,800	2,800
SUBTOTAL	36,600	37,100	37,100	37,100	37,100
POTENTIAL DEMAND					
Projected Buildout of the 2030 General Plan[f]	550	3,040	5,440	6,600	7,750
10% Contingency for General Plan Amendments[g]	50	300	550	650	750
SUBTOTAL[h]	600	3,340	5,990	7,250	8,500
DEMAND REDUCTION PROGRAMS					
Demand Management Programs Reduction[i]	(500)	(1,620)	(2,150)	(4,440)	(4,560)
SUBTOTAL	(500)	(1,620)	(2,150)	(4,440)	(4,560)
TOTAL DEMAND	**36,700**	**38,820**	**40,940**	**39,910**	**41,040**

Source: City Planning, 2009.
Notes: Values are rounded to the nearest 10 AF.
a) Baseline water demand for fiscal year 2009. Water demand by existing customers is anticipated to remain fairly stable through 2030. Baseline demand excludes annual demands for Proctor & Gamble, agricultural water for the OVS, and annual demands for PHWA. These three demands are summarized separately in this table. Data

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provided by City Planning Department (personal communication, Chris Williamson, August 2009) and City Water Resources (personal communication, Dakota Corey and Tony Emmert, September 2009).

b) Non-revenue water = unaccounted-for water. Estimated at 6% of total demand (approximately 35,600 AFY x 6%). Source: personal communication, Dakota Corey, September 2009.

c) Based on available billing data, OVS customers have used approximately 1,337 AFY of UWCD O-H water delivered via the City.

d) PHWA purchases water from the City per the Three Party Agreement; Agreement specifies PHWA suballocation of CMWD water of 3,262.5 AFY. PHWA mean annual purchases from the City was 1,911 AF for period 1999-2008 (source: personal communication, Steve Hickox, September 2009; personal communication, David Birch, September 2009). PHWA will begin water demand management programs in 2009 which may decrease water demands.

e) Current annual water demand for Proctor & Gamble is approximately 2,300 AFY for the period 2001-2008. Proctor and Gamble estimated future water demands are approximately 2,800 AFY, assumed to occur after year 2015. Source: personal communication, Dakota Corey, August 2009.

f) Annual increase in water demand based on development applications received for known projects. New water demands also include 2030 General Plan buildout, infill, redevelopment, and densification. Values provided by City Planning Department (personal communication, Chris Williamson and Kathleen Mallory, August 2009) and based on the following sources: July 2009 City Project List, CA Department of Finance, 2030 General Plan Background Report (2006), Ventura Council of Governments data, and UCSB Forecast.

g) Annual increase in water demand for unknown projects. Can be as high as 10% of new demand for known projects. Source: personal communication, Ken Ortega, September 2009.

h) Cumulative total new demand based on the annual values for known and unknown projects.

i) City anticipates the reduction in City-wide water demands via implementing several demand management programs. Estimated reduction is approximately 500 AFY for period 2010-2012, 2% of demand in 2013, 3% of demand in 2014, 4% of demand in 2015, 5% of demand from 2016-2020, and 10 % reduction for period 2021-2030.

3.0 Water Supply and Demand Comparison

Tables 3 through 7 provide a comparison of the City's annual water supply and demands for normal, single dry, and multiple dry water years. The normal year scenario assumes the same supplies and demands presented in Tables 1 and 2. As the City's supplies in Table 1 are firm, no change in available supply is anticipated for the City in a single dry year. Demands are also assumed to remain the same for a single dry year. For a multiple dry year scenario, it was assumed that a 5% reduction in available supplies will occur between the years 2010 and 2015.

Tables 3 and 4 show that, under normal conditions for the period 2010 to 2014, the City will need to rely on a portion (up to 42%) of its bank of accumulated groundwater credits to meet anticipated demand. Once the GREAT Program recycled water system begins production and delivery of recycled water and consequently offsets potable demand or earns groundwater credits, the City will be able to replenish its groundwater credit bank. Both supply and demand have been conservatively estimated as supply estimates reflect the maximum anticipated cutbacks and demand estimates are also worst-case. Because the City requires that new development projects be water neutral, this requirement and the current economic conditions would tend to delay or cancel some anticipated development. As a result, water demand estimates are likely overstated and the draw on groundwater credits will be less than projected.

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TABLE 3
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
NORMAL YEAR SCENARIO

	2010	2015	2020	2025	2030
Supply Totals	36,110	42,570	45,930	44,090	44,300
Demand Totals	36,700	38,800	40,920	39,920	41,080
Net Difference Supply vs. Demand	(590)	3,770	5,010	4,170	3,220
Groundwater Debit/Credit	(590)	0	0	0	0
Net Difference to Annual Supply	-2%	9%	11%	9%	7%
Net Difference to Annual Demand	-2%	10%	12%	10%	8%
Draw on Credit Bank	2%	0%	0%	0%	0%
Supply vs. Demand with Credits	0	3,770	5,010	4,170	3,220

Note: Values are rounded to the nearest 10 AF.

TABLE 4
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
NORMAL YEAR 2010 TO 2014 ANNUAL

	2010	2011	2012	2013	2014
Supply Totals	36,110	31,290	32,430	30,760	30,940
Demand Totals	36,700	37,240	37,780	38,540	38,680
Net Difference Supply vs. Demand	(590)	(5,950)	(5,350)	(7,780)	(7,740)
Groundwater Debit/Credit	(590)	(5,950)	(5,350)	(7,780)	(7,740)
Net Difference to Annual Supply	-2%	-19%	-16%	-25%	-25%
Net Difference to Annual Demand	-2%	-16%	-14%	-20%	-20%
Draw on Available Credit Bank	2%	16%	18%	30%	42%
Supply vs. Demand with Credits	0	0	0	0	0

Notes: Values are rounded to the nearest 10 AF.

As shown in Table 5, under a dry year scenario, like the normal year scenario, in year 2010, the City will also have to rely on a portion of its groundwater credits.

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TABLE 5
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
DRY YEAR SCENARIO

	2010	2015	2020	2025	2030
Supply Totals	36,110	42,570	45,930	44,090	44,300
Demand Totals	36,700	38,800	40,920	39,920	41,080
Net Difference Supply vs. Demand	(590)	3,770	5,010	4,170	3,220
Groundwater Debit/Credit	(590)	0	0	0	0
Net Difference to Annual Supply	-2%	9%	11%	9%	7%
Net Difference to Annual Demand	-2%	10%	12%	10%	8%
Draw on Credit Bank	2%	0%	0%	0%	0%
Supply vs. Demand with Credits	0	3,770	5,010	4,170	3,220

Note: Values are rounded to the nearest 10 AF.

Tables 6 and 7 provide a comparison of supply and demand assuming a multiple dry year scenario. Table 6 provides projections for years 2010, 2015, 2020, 2025, and 2030. Table 7 provides projections for years 2010 through 2014, the more critical years in terms of supply. Tables 6 and 7 show that, under multiple dry year conditions for the period 2010 to 2014, the City will need to rely on a portion (up to 86%) of its bank of accumulated groundwater credits to meet anticipated demand.

TABLE 6
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
MULTIPLE DRY YEAR SCENARIO

	2010	2015	2020	2025	2030
Supply Totals	34,300	42,570	45,930	44,090	44,300
Demand Totals	36,700	38,800	40,920	39,920	41,080
Net Difference Supply vs. Demand	(2,400)	3,770	5,010	4,170	3,220
Groundwater Debit/Credit	2,400	0	0	0	0
Net Difference to Annual Supply	-7%	9%	11%	9%	7%
Net Difference to Annual Demand	-7%	10%	12%	10%	8%
Draw on Available Credit Bank	6%	0%	0%	0%	0%
Supply vs. Demand with Credits	0	3,770	5,010	4,170	3,220

Note: Values are rounded to the nearest 10 AF.

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TABLE 7
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
MULTIPLE DRY YEAR 2010 TO 2014 SCENARIO

	2010	2011	2012	2013	2014
Supply Totals	34,300	29,730	30,810	29,220	29,390
Demand Totals	36,700	37,240	37,780	38,540	38,680
Net Difference Supply vs. Demand	(2,400)	(7,510)	(6,970)	(9,320)	(9,290)
Groundwater Debit/Credit	2,400	7,510	6,970	9,320	9,290
Net Difference to Annual Supply	-7%	-25%	-23%	-32%	-32%
Net Difference to Annual Demand	-7%	-20%	-18%	-24%	-24%
Draw on Available Credit Bank	6%	22%	26%	46%	86%
Supply vs. Demand with Credits	0	0	0	0	0

Notes: Values are rounded to the nearest 10 AF.

4.0 Summary and Findings

Tables 3 through 7 confirm the importance of increased water conservation and implementation of the GREAT Program in achieving a reliable water supply for buildout of the proposed 2030 General Plan Alternative B. During the period 2010 to 2014, the City may draw on a portion of its groundwater credit bank of approximately 37,000 AF as an interim supply until the GREAT Program Phase I is completed. Further, under dry and multiple dry year conditions, it is possible that during the years 2010 to 2014, the cumulative draw on the groundwater credits could nearly exhaust the currently available credits. Note that in Table 3 (Normal Year), Table 5 (Dry Year scenario), and Table 6 (Multiple Dry Year scenario) there is surplus annual water supply after year 2015, which will be used to restore the groundwater credit bank. As noted in this summary, and the City 2005 Urban Water Management Plan, the City has available additional tools to impose response measures to further reduce customer demand to mitigate the impacts of prolonged drought or water shortage conditions.

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