California Water Service Company
Water Supply Assessment Report for the
Rockwell Pond Specific Plan
Selma, California

October 17, 2008

1. Introduction

The City of Selma sent California Water Service Company (Cal Water) a letter on September 8, 2008 indicating that the project known as the Commercial Center was being expanded and that the August 14, 2006 SB 610 Water Supply Assessment (WSA) prepared by Cal Water needed to be revised to assess the water demand associated with a larger development area. The proposed development is now called the Rockwell Pond Specific Plan.

In July 11, 2008, Cal Water finalized a WSA for the South Selma Specific Plan (SP), which encompasses a large proposed development area along the southern boundary of the City of Selma. The methodology in developing a 20 year water demand forecast for that South Selma SP involved adjusting a land use based water demand forecast that was developed by the consulting firm CDM in preparing Cal Water's Selma District Water Supply and Facilities Master Plan (WSFMP), which was finalized in July 2008.

The demand forecast for the South Selma SP used data developed by CDM in preparing the WSFMP and Cal Water data from the Selma District and other California Districts. New water demands associated with areas in the South Selma SP that were outside the existing Selma Sphere of Influence (SOI) were added to the total revised forecasted demand for the Selma SOI to arrive at a new 20 year demand forecast. Since the demand associated with the initially defined Commercial Center project was contained within the total forecasted demand for the South Selma SP WSA, this WSA determines the additional 20 year demand of the Rockwell Pond SP and adds that to the estimated total demand in the South Selma SP WSA to arrive at a new total demand for an even greater Selma District service area.

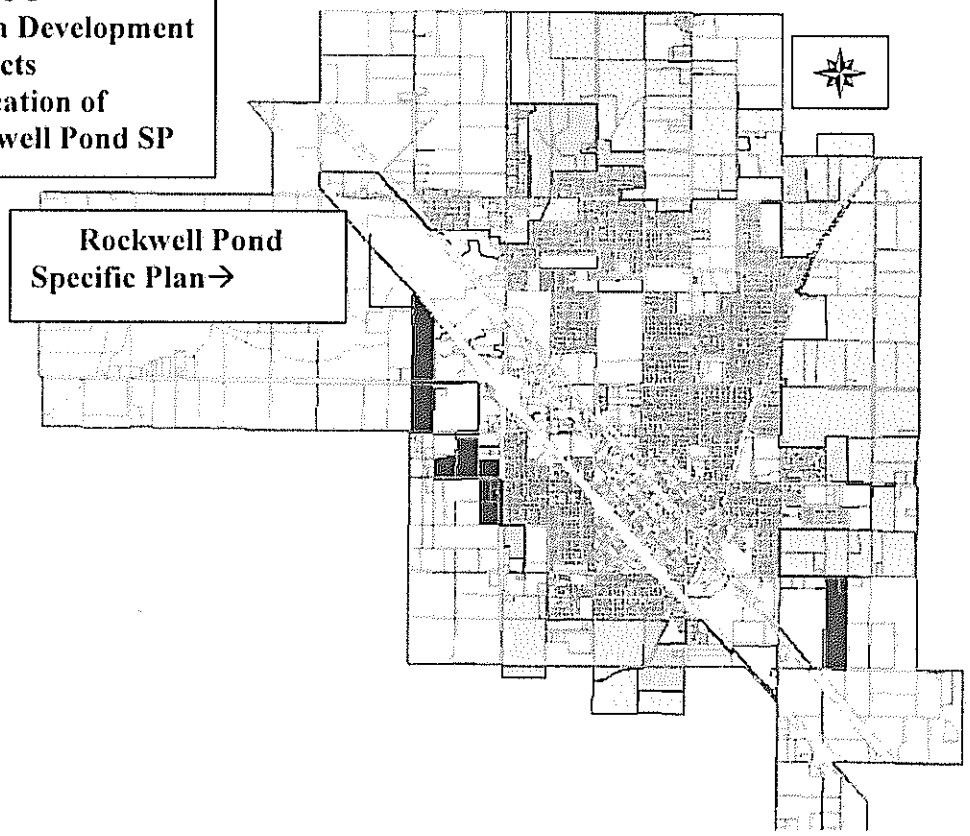
In summary the method for determining total demand for the Selma District service area is as follows:

1) New water demand for the Rockwell Pond SP is estimated.
2) Demand from the Commercial Center project is subtracted from the demand estimate for the Rockwell Pond SP to determine the increase
3) The increased demand is added to the total Selma demand estimated in the July 11, 2008 South Selma SP WSA to arrive a new total demand for the Selma District.

The initial proposed Commercial Center Project was approximately 600,000 square feet of commercial building space. The scale of that proposed development exceeds criteria set forth in California state law pertaining to the requirement for preparation of a Water Supply Assessment (WSA) report (Senate Bill (SB) 610, California Water Code Section 10912). Hence, the August 14, 2006 Commercial Center WSA was prepared.

The location of the Rockwell Pond SP is in the white triangular area bounded by a black line on the south and west and the red diagonal line on the east as shown in Figure 1. Also shown in different colors are a number of other proposed developments: Northeast Specific Plan, which covers 2,700 acres in Northeast Selma, the 585-acre Amberwood development in eastern Selma, and multiple smaller developments in the southeast, south, southwest and northwest areas. These smaller developments include: Country Rose Estates, Country Rose Estates II, Woodside Homes, Country View III, Valley View Estates, Canales, Bratten Homes, Floyd Hinesley, Synergy Land Group, Rosewood III, The Blossoms and others.

Figure 1
Selma Development Projects
+ Location of Rockwell Pond SP



Section 5, Water Code 10910, Paragraph (c) (3) states: *"If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water supply system has no urban water management plan, the water assessment for the project shall include a discussion with regard to whether the public water supply system's total projected water supplies during normal, single dry, and multiple dry water years during a 20 year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned for future uses, including agricultural and manufacturing uses."*

In the Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 prepared by the California Department of Water Resources (October 8, 2003) on Page 23,

Section 5, Step Three: Documenting project demand (Project Demand Analysis) Definitions, 3rd Paragraph, Planned Future Uses, it states that *"Planned future uses may include: projects that are expected to be completed during the same time frame as the proposed project. These include all new demands ranging from an individual single-family home to large-scale developments."*

The Rockwell Pond SP is not covered in Cal Water's 2006 Urban Water Management Plan (UWMP) for the Selma District; therefore, proposed water requirements and how they are to be met are addressed in this WSA. The Selma District UWMP document provides historic and forecasted water demand and supply data and analyses and can be referenced for more detailed information on water demand by sectors. Cal Water updates its Urban Water Management Plans every three years. In the next update of the UWMP document, water demands for this proposed project and other developments will be incorporated into the overall demand forecast for the Selma District.

Following is information on the Rockwell Pond SP, its projected water demands, and a description and assessment of the proposed water supply to meet those demands in accordance with the requirements of SB 610.

2. Project Description

The City of Selma is preparing a Draft EIR for the Rockwell Pond Specific Plan Project that contains the original Commercial Project. The Rockwell SP is a planned phased development of 229 acres on the western edge of Selma. Proposed land uses include regional commercial, light industrial (business park) and open space land uses. Phases 1 and 2 of the project, which are located south of Rockwell Pond and cover 94 acres, are to be developed in the next 5 – 10 years. Other phases of the project located north of the Pond are to be developed in a 10 -20 year timeframe. Since a WSA must assess the demands of a proposed project over a 20 year period, all phases of this project are addressed here.

Based on Table 2.0-1 in the Draft EIR, the proposed development will have approximately 1,544,900 square feet of commercial space allocated as follows:

- 2 Auto Dealerships: 77,000 sq ft
- 4 Anchor Stores: 568,000 sq ft
- General Retail: 328,100 sq ft
- Center for Agriculture and Food Safety: 153,300 sq ft
- Regional Commercial: 19.4 acres or an estimated 307,600 sq ft
- Hotel (102) rooms: 3.7 acres or an estimated 120,900 sq ft
- Total facilities space: 1,544,900 sq ft

Rockwell Pond and open space occupies 51.7 acres, which is assumed to be non-irrigated.

3. Water Demand Forecasts

Water Demand Forecast for the Rockwell Pond Specific Plan Project

Most facility space in the Rockwell Pond SP is for commercial retail, but some smaller amount of space will likely include restaurants, supermarkets and a hotel.

For another recent development project in Cal Water's Dominguez District in Torrance, CA, PCR Services Corporation (PCR) using data derived by the County Sanitation Districts of Los Angeles (CCDLA) developed a table of estimated demand for various types of commercial activities.

Since there was good agreement between the estimate of residential water usage derived from Cal Water data and those developed by PCR using CCDLA data, estimates of water demand for commercial activities developed by PCR using CCDLA factors are used for the Rockwell Pond Specific Plan and are summarized in below.

Commercial Activities Water Use Factors

Category	Average Use gallons/sq ft/day
Retail:	
Shopping Center	0.358
Electronic Superstore	0.110
Home Improvement	0.110
Discount Club	0.110
Home Furnishing	0.110
Office Supplies	0.110
Pet Supply	0.110
Supermarket	0.65
Restaurants:	
High turnover	1.100
Fast Food	1.100
Quality	1.100

Commercial office space water usage was not included in the above figures. In Cal Water's Bayshore District in the City of San Mateo, three years of sales records for the Franklin Templeton offices were obtained and analyzed along with data on the square footage of the office complex. Because these offices had more than the usual landscaped area compared to typical office complexes, consumption data for the months from June through October was excluded due to significant increases in water consumption due to irrigation. Data from 23 months of records for the nearby Siebel offices with more representative landscaped area was obtained and reviewed along with square footage. The water use factor (gallons per day/ ft^2) for this complex was found to be 68% of that at the Franklin Templeton complex even after correcting for excessive landscape irrigation.

Nonetheless, to be conservative the Franklin Templeton office factor of 0.01227 gallons per day/ft^2 will be used here.

No specific designation of commercial activities was provided for the Rockwell Pond Specific Plan; therefore, it is assumed that there will be a mix with the weighting as follows:
65 % retail (0.20) + 10% restaurants (1.10) + 25% (office space) (0.0123) = 0.243 g/d/ft^2

Estimated Average Annual Day Use for the Rockwell Pond Specific Plan at full development: 1,544,900 ft^2 x 0.243 g/d/ft^2 = 375,400 gallons/day

The estimated water use for the previous Commercial Center with 600,000 sq ft of facility space was 60,000 gallons/day.

Therefore, the net increase in water demand for the Rockwell Pond SP is 315,400 gallons/day

Estimated Maximum Day Demand: 375,400 gallons/day x 1.85 = 694,500 gallons/day.

Reclaimed Water Demand Forecast: None for Rockwell Pond SP

All wastewaters generated in the plan area will be collected, conveyed and treated in the S-K-F CSD Regional Treatment Plant wastewater treatment plant, which is approximately 6 miles from the City. Currently, the S-K-F CSD plant provides secondary treatment with activated sludge and filtration with dual media filters, prior to discharge to percolation/evaporation ponds. The treated effluent is not disinfected. The S-K-F CSD Regional Treatment Plant has a capacity to treat 8 mgd but currently receives 3.1 mgd. Approximately 1.8 mgd is received from customers in Cal Water's Selma service area. For reclaimed water to be used for urban irrigation or industrial proposes, additional treatment facilities (at a minimum chlorination) would be required. In addition, storage, pumping, transmission and distribution facilities would be required to convey the reclaimed water to urban reuse sites. Consequently, at this time urban reuse is not considered economically feasible.

Use of reclaimed water from the S-K-F CSD plant by farmers for crop irrigation instead of pumped groundwater may be feasible. Irrigation canals exist near the treatment plant with the potential to supply water to over 10,000 acres of agricultural land (not within in Cal Water's service area).

Water Demand Forecast for the Selma District:

In the July 11, 2008 South Selma Specific Plan WSA a combined water demand forecast for the existing City of Selma Sphere of Influence and all of the area in the South Selma SP that lies outside of it was developed and presented in Table 4. It is summarized below. For the specific data underlying this demand forecast, refer to the South Selma Specific Plan WSA.

Selma Existing Sphere of Influence 2008 + Portion of South Selma Specific Plan Area Outside SOI
Average Annual Day Water Demand Forecast

Year	MGD	Acre-ft/year
2008	7.15	8,022
2013	9.14	10,250
2018	11.54	12,930
2023	14.18	15,895
2028	17.09	19,160

According to the Draft EIR for the Rockwell Pond SP, the following development schedule is proposed:

Phase 1(next 5 years): 571,800 square feet of development
Phase 2 (next 5 to 10 years): 401,300 square feet of development
Phase 3 (next 10 to 20 years): 571,800 square feet of development

Using this schedule and assuming a linear rate of development for each of the three phases, the estimated water demand forecast for the Rockwell Pond SP is as follows:

Rockwell Pond Specific Plan Area
Average Annual Day Water Demand Forecast

Year	MGD	Acre-ft/year
2008	0.0	0
2013	0.139	156
2018	0.236	265
2023	0.305	342
2028	0.375	420

The increase in water demand of the Rockwell Specific Plan Area over the initially proposed Commercial Center project is:

Net Increase of Rockwell Pond Specific Plan Area over Commercial Center Project
Average Annual Day Water Demand Forecast

Year	MGD	Acre-ft/year
2008	0.0	0
2013	0.085	95
2018	0.144	162
2023	0.187	209
2028	0.229	257

The new total Selma District demand including all known and proposed developments within the SOI and that portion of the South Selma SP outside the SOI and the additional increase in demand for the Rockwell Pond SP is shown below.

Selma Existing Sphere of Influence 2008 +
Portion of South Selma Specific Plan Area Outside SOI +
Additional Demand Increase for Rockwell Pond SP
Average Annual Day Water Demand Forecast

Year	MGD	Acre-ft/year
2008	7.15	8,022
2013	9.22	10,345
2018	11.68	13,092
2023	14.37	16,104
2028	17.32	19,417

As shown in the preceding analysis, the combination of all the proposed developments mentioned plus the South Selma SP plus the additional demand of the Rockwell Pond SP represents a more than 10 mgd increase in demand for the next 20 years

The projected maximum day demand in 2028 using a maximum day factor of 1.80 times the annual average day is 31.18 mgd.

4. Water Supply Assessment

Selma District Water Supply

Well Capacity:

Cal Water currently and for at least the next 25 years anticipates meeting its forecasted demand by using groundwater extracted from the Kings River fan aquifers that underlie the District. The Kings River fan is in the Fresno County sub-area of the Tulare Lake Hydrologic Region. This has been and is the sole source of water furnished to customers in the Selma District.

Groundwater is extracted by 14 active wells located throughout the District service area. Four other wells are currently inactive or non-operational. Based on maximum monthly production of each well between 2000 and 2005, for the current production capacity for all operational wells is 12,040 gpm, equivalent to 17.33 mgd. Average pumping rates for the 14 active wells ranges from 400 gpm to 1,090 gpm with the overall average being 860 gpm or 1.24 mgd.

Cal Water has a newly constructed 2,000 gpm well scheduled to go into production in 2008, thus bringing the total supply capacity to 14,040 gpm or 20.21 mgd. It plans to construct and put into operation another new well in 2009 with an estimated production capacity of 1,750 gpm. In 2011, it plans on constructing and installing a third new well with an estimated production capacity of 1,750 gpm bringing estimated total well capacity in 2013 to 17,540 gpm or 25.25 mgd.

Cal Water plans on providing additional well capacity as needed so that there is never an insufficiency of supply with respect to meeting maximum day demands. So for the period between 2018 and 2023, based on demands at that time, it would add another 2 wells with an estimated production capacity of 1,750 gpm/well or 3,500 gpm combined resulting in a total system capacity of 21,040 gpm or 30.30 mgd. For the period between 2023 and 2028, based on demands at that time, it would add 2 more wells with a combined capacity of 3,500 gpm for an estimated total of 24,540 gpm or 35.34 mgd.

Cal Water will monitor:

- Increases in actual demand from one year to the next
- Actual increases in new residences and commercial activities as measured by new service connections
- Approved and permitted developments that are under construction
- New permits for construction
- Plans for new development that are going through the City's review and approval process
- Longer term plans submitted to the City for initial consideration

Presently, Cal Water has a new surface storage tank, which provides storage for peak hour demand and thereby reduces the requirement that the wells operate in response to real time demands. Cal Water has other surface storage tanks it plans on constructing as well so that well capacity will need to meet maximum day demand only.

Groundwater Basin Management:

The Consolidated Irrigation District (CID), which was set up in September 1921 in accordance with the Water Code for Irrigation Districts, manages the groundwater basin from which water for the Selma District is pumped. The District is located mainly in Fresno County and small portions of Kings and Tulare Counties. In 1995, the irrigable acreage in the District was 145,000 acres of which 92,000 are capable of receiving surface waters from the Kings River. The balance, 53,000 acres, obtains its water solely from groundwater. In drought years, District irrigators have the capability of pumping groundwater to meet their irrigation needs. The District does not own or operate irrigation wells of which there are approximately 4,500 CID's average annual deliveries of surface water for irrigation are 238,000 acre feet (ac-ft). CID's water delivery system is comprised of about 350 miles of open channels including ditches, natural drains and sloughs. There are many lateral pipelines and piped portions of the main channel. In addition to gravity surface water deliveries, CID recharges groundwater in the underlying basin through seepage from its channels and through dedicated recharge or spreading basins. Native soils are sandy and allow for rapid infiltration. Aquifers in the groundwater basin are mostly unconfined, which means recharge provides a direct contribution to groundwater storage. CID has 46 dedicated recharge basins totaling 1,300 acres. Water is delivered to these basins through CID's existing conveyance system. Deliveries to recharge basins are based on runoff conditions and available supplies and typically occur when there are flood releases from the Kings River or the Friant-Kern

Canal. In-lieu storage of groundwater is also practiced when irrigators who can irrigate with either surface or groundwater use surface water and thereby "bank" the groundwater.

The amount of annual recharge varies considerably from year to year. In 1969, it is estimated that 308,000 ac-ft were recharged; whereas, during the drought in 1978, it was estimated to be 180,000 acre-ft. In 1982, it was again about 300,000 ac-ft. CID reports that its long-term recharge rate capability is about 1,400 ac-ft/day with present facilities. So it would take about 214 days or 7 months to infiltrate 300,000 acre-ft.

The easterly and southeasterly portions of CID follow the alignment of the Kings River, which has deposited an alluvial fan throughout the area. The apex of the fan is in the northeast corner of CID. Fan deposits spread radially to the southwest covering most of CID's area. Soils are permeable to moderately permeable and comprised of sands and silt and some gravel in the Northeast. There are no confined or semi-confined layers in the basin. The USGS in a review of well driller logs reports that in the 10 to 200 foot depth, sand and gravel make up about 38% of the soil (35% sand, 3% gravel). The average specific yield (13.4%) of these deposits is quite high. Wells in the CID area vary from 80 to 400 feet deep with the average being 200 feet. The specific capacity of wells varies from 40 to 70 gallons per minute (gpm) per foot with irrigation typical wells yielding 500 to 800 gpm.

In CID's July 26, 1995 Groundwater Management Plan, it is reported that groundwater levels in basin underlying CID, have been gradually declining over a period of 50 to 60 years. The estimated annual overdraft is about 53,000 ac-ft/yr. This is based on monthly monitoring data acquired from 82 wells in a two square mile grid. CID uses this data as the basis for the actions it formulates with respect to its groundwater management plan. Its overall objective is to protect and maintain a sustainable groundwater supply for users in the CID area. As mentioned, one of CID's major means to reduce over-pumping of groundwater is through a conjunctive use program involving direct use of surface waters, active recharge of groundwater and in-lieu recharge. Although the goal of this program is to achieve a balance of recharge and extraction of groundwater over time, the decline in water levels has continued. One of CID's plans, as a correction to this trend, is to identify lands for purchase that could be used to increase the size and number of spreading basins in order to increase the rate of recharge during the wet months when runoff is high and there is minimal irrigation needs.

CID recovers its operating expenses and retires capital debt for improvement projects through annual acreage assessments on lands within its boundaries. It has three primary assessment rates: 1) a gravity rate for users eligible to receive surface supplies, 2) the "Church" gravity rate for select users eligible to receive water through the Lone Tree Canal system and 3) the pump rate for users that obtain their supplies only from groundwater. Cities, such as Selma, are within the CID area but are excluded from its boundary and pay 90% of the pump rate charged agricultural users. Assessments to the cities are based on the acreage of land annexed to them since 1979.

Because Cal Water owns and operates the water supply system for Selma, it pays a fee to CID based on the acreage within its Selma District. The City provides assessment collection services for CID. Since CID's revenue is based on assessments from a fixed acreage, its income is fixed irrespective of the amount of water delivered and recharged. Because the areas of cities within the CID area have been growing due to annexation and urban development, CID assessment revenues have slightly declined over time. So periodically, it is necessary for CID to increase assessment rates to cover its costs. Currently, Cal Water is assessed at a rate of $6.48/acre.

Adequacy of Well Capacity:

The table below is a comparison of forecasted Total Demand for the District (includes all known developments and the additional demand of the Rockwell Pond SP) with existing and planned additional well capacity.

Selma Forecasted Water Demand Versus Supply (Normal Hydrologic Conditions)

Year	Total Selma District Annual Ave Demand		Max Day Demand	Well Capacity	Capacity - MDD
	MGD	Acre-ft/Yr	MGD	MGD	MGD
2005	6.75	7,567	12.49	15.9	3.41
2008	7.15	8,022	12.87	20.22	7.35
2013	9.22	10,345	16.60	25.25	8.65
2018	11.68	13,092	21.02	25.25	4.23
2023	14.37	16,104	25.87	30.30	4.43
2028	17.32	19,417	31.18	35.34	4.16

If the American Water Works Association (AWWA) standard of having the largest well (2,000 gpm or 2.9 mgd) down is applied to the above table, there is more than sufficient capacity to meet maximum day demand (MDD) in every year for the next 20 years as shown in the above table.

This additional capacity will not only allow Cal Water to meet MDD with its largest well down (2,000 gpm or 2.88 mgd), but also provide a supply cushion in the event that growth should resume at higher rates such as occurred during the 2004 – 2006 period.

With respect to the projected average annual day demand, the existing 2008 well capacity of 20.22 mgd would be more than adequate to meet forecasted demand in 2028 if all existing wells remained in operation at current production rates and the largest well were out of operation.

Additional storage facilities with booster pumps beyond the newly constructed tank will be added to meet peak hour flow demands. Presently, the District has sufficient

groundwater production and storage capacity to meet annual average day and maximum day demand and peak hour flow conditions.

Adequacy of Groundwater Supply:

Measurements by Cal Water of static groundwater elevations in Selma district wells show water levels have been relatively constant for the past thirty-five years. However, groundwater levels recorded by CID for all of its wells in its two square mile area for a longer period show a gradual decline in static water levels. There have been short periods where groundwater elevations declined more rapidly and then recovered during periods of above normal precipitation. In the Selma District, the combination of increased demand due to growth coupled with the late 1980s multi-year drought, which greatly reduced availability of surface water for aquifer recharge, resulted in a 45-foot decline in static groundwater elevation. High levels of rainfall and storm runoff in the early 1990s enabled CID to supply more surface irrigation water and increase the amount of groundwater recharged. As a result, the average static water level in Cal Water's Selma wells rose to within ten feet of pre-drought elevations.

Managing the quantity of water recharged to and extracted from the aquifers in the basin is necessary to maintain adequate groundwater storage and hence supply of this resource.

The Draft EIR for the Rockwell Pond SP indicates that most of the land to be developed is in agricultural use. The major crop in the Selma area is raisin grapes.

Irrigation methods include traditional flood irrigation or drip irrigation. Source of supply is either surface waters diverted mostly from the Kings River by CID when available or pumped groundwater. Normal practice results in a combination of both surface water and groundwater being used by irrigators.

University of California Cooperative Extension in a Best Management Practices document dated 1998 indicates that for raisin grapes the range of irrigation rates in nearby Tulare County is 2.0 – 4.5 ac-ft/acre/year. The Consolidated Irrigation District in a June 2, 2006 letter to Cal Water indicates that the average agricultural irrigation rate in the Selma area is 3.05 ft/yr.

Groundwater recharge from irrigated agricultural is a function of a many variables which include weather, hydrologic conditions, irrigation practices, crops, soils, geologic conditions. One way to calculate recharge is to collect data and make estimates of monthly irrigation, monthly precipitation, runoff, plant evapo-transpiration, evaporation, initial soil moisture and soil's available water holding capacity. Recharge is the net of irrigation and precipitation minus water losses associated with other factors.

Since this data was not available and obtaining and analyzing it is beyond the scope of this assessment, a general estimate of recharge to the groundwater is provided here.

CID provided Cal Water with a Memorandum titled "Urban Versus Agricultural Water Use Comparison" prepared by Summers Engineering dated March 24, 2006. In that report, Summers Engineering estimates that 1.60 acre-ft/acre/year (1.60 ft/yr) of irrigation water is from surface water and 1.45 ft/yr is from groundwater.

If it is assumed that groundwater recharge for both flood and drip irrigation over wet and dry years on average is 25%, then the amount of recharge that agriculture provides is estimated to be: 0.25 x 3.05 ft/yr or 0.762 ft/yr.

However, it can be argued that surface water not used at the Rockwell Pond Specific Plan site for agricultural irrigation would be used for the same purpose in the vicinity of Selma and therefore there would be no area loss of the contribution of surface water. If it is assumed that this surface water would replace use of groundwater elsewhere, then the reduction in consumptive use of groundwater due to the Rockwell Pond SP being implemented would be 0.75 x 1.6 ft/yr = 1.2 ft/yr. On that basis, net consumptive use of groundwater for existing agriculture could be calculated as 0.75 x 1.45 ft/yr = 1.088 ft/yr + 1.2 ft/yr = 2.288 ft/yr

The estimated annual average day water demand for Rockwell Specific Plan at build out is 0.375 mgd (420 acre-ft/yr) for an area of 229 acres or about 1.83 acre-ft/yr per year or 1.83 ft/yr.

Based on Cal Water historical data for the Selma District, the 10 year average maximum day demand during the five month (Jan, Feb, Mar, Nov, Dec) non irrigation period is 3.46 million gallons whereas it averages 7.76 million gallons for the seven month (Apr, May, Jun, Jul, Aug, Sep, Oct) irrigation period. If annual average day use follows a similar pattern, then the percentage of Selma District water used for irrigation is estimated as follows: (7.76 – 3.46) x 7/(3.46 x 12) = 30.1/41.32 = 72.8%. As a check, 2005 average consumption was 314 gallons per person per day and if 27.2% were used for indoor domestic consumption, then average indoor use per person is 85 gallons per person per day, which agrees with general planning estimates.

If outdoor water use is 95% landscape irrigation and it is assumed that 25% of applied irrigation water infiltrates below the plant root and vadose zones into the groundwater, then 0.95 x 0.25 x 0.728 = 0.173 or 17.3% of average annual day demand is recharged to the groundwater system.

In terms of the Rockwell Pond Specific Plan, groundwater recharge would be as follows: 0.173 x 1.83 ft/yr = 0.316 ft/yr

Net consumptive use for the Rockwell Pond Specific Plan would be 1.83 ft/yr – 0.316 ft/yr = 1.514 ft/yr.

Water used indoors equals 0.272 x 1.83 ft/yr = 0.498 ft/yr, which becomes wastewater that is conveyed and treated in the Selma-Fowler-Kingsburg wastewater treatment facility. Treated plant effluent is applied to disposal fields in the vicinity of the plant. It is

assumed that 50% of the applied effluent recharges to groundwater (disposal objective), so that 0.5 x 0.498 ft/yr = 0.249 ft/yr of additional recharge can be credited to the Rockwell Pond Specific Plan.

Therefore, estimated total groundwater recharge for the Rockwell Pond SP is estimated to be 0.316 ft/yr + 0.249 ft/yr = 0.565 ft/yr and net consumptive use of groundwater would be 1.265 ft/yr (1.83 – 0.565).

Existing agricultural net "consumptive use" of groundwater is estimated to be 2.288 ft/yr and therefore appears to be 0.774 ft/yr more than Rockwell Pond SP use (2.288 - 1.265).

For the Rockwell Pond Specific Plan as a whole this equates to a decrease in consumptive use of groundwater of 229 acres x 0.774 ft/yr = 177 acre-ft/yr or 158,100 gallons/day – a potentially significant benefit.

In order to provide a mechanism to address groundwater basin management, in 1996, Cal Water signed a Memorandum of Understanding (MOU) with the CID, the lead agency, to implement a Groundwater Management Plan under the provisions of Assembly Bill 3030.

As previously mentioned, CID conveys flood flows from the Kings River and Friant-Kern Canal via its canal and distribution system to irrigators and pond areas for recharging groundwater.

It appears that due to the gradual decline in the area's groundwater table as demonstrated by CID groundwater well monitoring data that additional surface supplies and infiltration or spreading basins are needed to increase the annual quantity of groundwater recharge. Conversion of agricultural land to urbanized use of land can increase groundwater consumptive use depending upon the type and density of urban development.

Cal Water believes that use of groundwater for the next 20 years will provide a reliable supply to meet forecasted demands for Selma providing measures are taken by CID and other water agencies to reduce withdrawals and/or increase recharge to the groundwater basin. With respect to increasing recharge to the groundwater basin, Cal Water plans to work with the City of Selma and CID to develop plans for additional facilities that will accomplish that objective.

A more detailed description of the groundwater basin, supply and use is provided in an excerpted section from the Department of Water Resources Bulletin 118 and is included here as an attachment.

Water Quality

Water delivered to customers in the Selma District meets all federal and state drinking water regulations.

The quality of the groundwater produced by the district's active wells can vary depending on location. Nitrates are and the pesticide, Dibromochloropropane (DBCP) (which was used for control of nematodes in vineyards), are of concern. Water samples tested from several wells were found to contain concentrations that exceed the maximum concentration limit (MCL) for DBCP. Wells with excessive DBCP are either taken out of service or well head granulated activated carbon (GAC) treatment facilities are installed to remove the contaminant.

The presence of this organic chemical contaminant in district wells means that regular monitoring of all wells is being done because of the possibility of plume migration.

Emergency Supplies

During an emergency situation, the Selma District can only rely on its own production facilities to serve its customers.

Cal Water has a Master Disaster Plan in place that coordinates overall company response to a disaster in any or all of its districts. In addition, the Master Plan requires each district to have a local disaster plan that coordinates emergency responses with other agencies in the area.

Cal Water also inspects its facilities annually for earthquake safety. To prevent loss of these facilities during an earthquake, auxiliary generators and improvements to our water storage facilities have been budgeted for and installed as part of our annual capital budget process.

Demand Management

Cal Water has ongoing water demand management programs as part of its commitment to achieving more efficient uses of water and to specifically address drought conditions that might impact groundwater table levels. Cal Water actively promotes conservation through educational, informational, and customer assistance activities. Cal Water programs include distribution system water audits and leak detection, promotion of water efficient landscape guides, residential surveys, plumbing retrofits, high efficiency washing machine rebates, public education, school education and toilet retrofits.

State measure AB2577 requires that all unmetered services be converted to metered services within the next 20 years. As shown in Table 1, the forecast for water demand is based on an annual reduction in unmetered services of 5% per year.

Cal Water has conducted conservation programs in the Selma District for many years and sponsors conservation activities. The Company believes that managing demand is an important element in the overall management of water supply and has made efforts to promote conservation through educational, informational, and customer assistance activities.

External Measures to Achieve Conservation Support

In addition to its own programs, Cal Water also participates in cooperative conservation activities with area water suppliers through the Central Valley Water Awareness Committee. Committee members include the cities of Fresno, Clovis, and Kerman and the Westlands and Fresno Irrigation Districts. The table below indicates program implementation levels in Cal Water's Selma district.

Conservation Measure	Date Implemented	Program End Date
Public Information	1988	Ongoing
School Programs	1990	Ongoing
Conservation Demonstration Garden	1991	Ongoing
Plumbing Retrofit (showerhead, kitchen and bath aerator, toilet flapper, hose nozzle)	1992	Ongoing

Internal Measures to Achieve Efficient Water Management

Distribution System Water Audit and Leak Detection Program:

Cal Water implemented an in-house water audit and leak detection program for its distribution systems. The program was administered by a company employee equipped with state-of-the-art leak detection equipment and trained in accordance with the American Water Works Association's *Manual of Water Supply Practices: Water Audits and Leak Detection*. The plan is for each district to be audited every three years. In the Selma District's last audit, approximately 75 miles of main were surveyed with four leaks detected. Water loss was estimated to be 28,800 gallons per day (GPD).

Water Efficient Landscape Guidelines:

In 1992, water efficient landscape guidelines were developed and subsequently applied to all landscapes designed for Cal Water properties including renovations. For ease of adoption by districts with a multitude of climates and microclimates, the guidelines are generic and adhere to water efficient landscape (Xeriscape) principles.

Overall District Goals:

Cal Water recognizes the importance of conservation in managing its own water resources. While economic and regulatory constraints of integrating conservation into supply management have been challenging, Cal Water continues to develop demand management strategies, standards, and criteria by working with the California Urban Water Conservation Council. This Council was formed as part of the MOU primarily to oversee the implementation of the BMPs and to improve water conservation practices and

analyses. Cal Water is committed to this process and the development of an integrated resource plan.

Cal Water's conservation programs are intended to assist customers in their efforts to use water efficiently as well as to educate them about their water supply. This will lead them to make informed decisions concerning the efficient use of water and enable them to better respond to required reductions in water use should a water shortage or emergency occur. During periods of water shortages, the Company's conservation programs can be expanded and may include more restrictive measures such as mandatory reductions, rationing, and penalties.

Conservation Programs:

For the last three years, Cal Water has run six conservation programs in the Selma District at an annual cost of $14,750. They are summarized below:

Program	**2006**	**2007**	**2008**	**Total**
BMP 01 Residential Survey	$4,860	$4,860	$4,860	$14,580
BMP 02 Plumbing Retrofit	$610	$610	$610	$1,830
BMP 06 High Efficiency Washing Machine Rebate	$5,000	$5,000	$5,000	$15,000
BMP 07 Public Education	$2,500	$2,500	$2,500	$7,500
BMP 08 School Education	$2,500	$2,500	$2,500	$7,500
BMP 14 Toilet Retrofit	$2,500	$2,500	$2,500	$7,500
Total Per Year	**$17,970**	**$17,970**	**$17,970**	**$53,910**

Water Rights to Groundwater Supply

Cal Water owns all the land on which its wells are located and would be located if future wells are to be constructed. Under state law, the use of percolating groundwater in California is governed by the doctrine of correlative rights and reasonable use, which gives the overlying property owner a common right to reasonable, beneficial use of the basin supply on the overlying land until the basin is adjudicated. Aside from the correlative water rights, Cal Water does not have any other existing water supply entitlements or water rights.

It is noted that the District' wells are located in a non-adjudicated groundwater basin. The principal concern for this basin is to manage the groundwater system in order to achieve some overall balance between the rates of extraction (pumping) and recharge.

In July 2008, Cal Water completed the Selma District Water Supply and Facilities Master Plan (WSFMP), which included an assessment of groundwater use and management issues. Cal Water plans on working with the City of Selma and CID to develop a plan to insure long-term sustainability of the groundwater supply. One recommended action in the WSFMP is to conduct a feasibility study of a program to increase groundwater basin storage in the Selma area through recharge of surplus wet weather surface waters via the Kings River, CID canal conveyance system and new recharge areas.

Water Supply Permits and Approvals

For prospective new well sites and other water facilities such as storage tanks and booster pump stations, Cal Water follows a standard procedure in which it establishes interest on the part of a property owner to sell all or a designated piece of its property to Cal Water for a water supply purpose. In the case of a well site, Cal Water first determines its suitability for a production well. This includes a conducting a sanitary survey, Phase 1 environmental assessment, a right of entry agreement, design and construction of a test well, testing of the yield and water quality of the test well and evaluation of findings. If a site is determined to be suitable, Cal Water generally purchases the property from the owner. In the case of public properties, it may enter into a long-term lease or obtain a permanent easement.

After a well is constructed and before use, Cal Water is required to demonstrate to California Department of Public Health (DPH) that water from the well complies with all drinking water standards. Cal Water also is required to file the well logs obtained by the driller with the Department of Water Resources.

Design and Construction of Water Supply System

Cal Water will provide the developer of Rockwell Pond Specific Plan with a will serve letter indicating its intention to serve as the water utility for providing water service to residents, businesses and other organizations within the development or plan area. Water system improvements may include new wells and pumps, transmission lines, storage facilities, distribution system, SCADA, meters, etc. As a developer proceeds further with the planning and preliminary design of the development, Cal Water will work with its planner and engineer, the City of Selma, DPH and other agencies that may be involved on the design and construction of the required water supply facilities.

Cal Water reviews all proposed design drawings and specifications for potable water system facilities for compliance with state standards and Cal Water's standards with respect to storage capacities, pipe sizes, booster pumps, fire flows, equipment, materials, communication and control systems and interconnection with Cal Water's Selma system.

Cal Water's Selma District, supported by engineering, water quality and customer service staff in San Jose, will be responsible for providing ongoing operations and maintenance services for the water system.

Capital costs for design and construction of the water distribution system, storage and booster pump stations if required are the responsibility of the developer, who may also be responsible for per lot assessment fees to cover costs associated with development of new wells in accordance with California Public Utility Commission (CPUC) rules.

With respect to the Selma District, Cal Water has an ongoing capital improvement program to upgrade and improve the distribution system, replace wells that have reached the end of their useful life, provide treatment of groundwater due to contaminants. The capital improvement program also provides for new facilities required by growth in demand. Cal Water's Selma District capital improvement program is separate from and will not include costs associated with the design and construction of water system facilities that may be required for the Rockwell Pond Specific Plan. However, upon complete transfer of ownership of the water system facilities to Cal Water by the developer, those facilities will be incorporated into Cal Water's capital improvement program.

SB 610 Section 10910 Paragraph (d)(2) requires an identification of existing water supply entitlements, water rights, or water service contracts held by the public water system shall be demonstrated by providing information related to all of the following. Information on these topics follows:

(A) *Written contracts or proof of entitlement to an identified water supply.*

Proof of entitlement to use of wells cited as the supply source for the development is demonstrated by Cal Water's ownership of its well properties and the wells and its legal right to use the underlying percolated waters. Aside from the correlative water rights, Cal Water does not have any other existing water supply entitlements, water rights or water service contracts for the property.

(B) *Copies of a capital outlay program for financing the delivery of a water supply system that has been adopted by the public water system.*

The developer of Rockwell Pond Specific Plan will prepare with Cal Water a preliminary water system facilities plan.

Capital costs for design and construction of required water system facilities are the responsibility of the developer. The developer may also be responsible for per lot assessment fees in accordance with California Public Utility Commission (CPUC) rules. Either the developer's or a Cal Water selected contractor will construct the system with Cal Water providing construction oversight.

Cal Water's Selma District capital improvement program is separate from and does not include any of the fore-mentioned costs associated with the design and construction of water system facilities for South Selma Specific Plan.

Cal Water has prepared a Water Supply and Facilities Master Plan for the Selma District. The Plan provides specific recommendations for water system facility or capital improvements over a 20-year period for the Selma District. It is Cal Water's intention to update this plan and recommended capital improvements every three to five years.

(C) *Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.*

Cal Water is required to obtain the following permits including:

1. Water system amendment permit from California Department of Public Health
2. A conditional use permit from the City of Selma Community Development Department
3. Well construction/building permit from the City Building Inspection Departments
4. An air quality permit from the Fresno County Air Pollution District

Cal Water is highly experienced in preparing applications and obtaining the necessary permits as they are needed in order to proceed with design, construction, start up and operation of required water facilities.

Supply Reliability Analysis

SB 610 requires an assessment as to whether the proposed water supply will meet the projected water demand of South Selma Specific Plan and existing and other anticipated future demands for the next 20 years during: 1) normal, 2) single dry and 3) multiple dry water years.

Normal Hydrologic Conditions

Cal Water's proposed water supply (existing and additional proposed wells described in the previous section) is viewed as adequate to meet forecasted annual average day and maximum day demand for the next 20 years under normal conditions for anticipated growth within the Selma SOI , South Selma Specific Plan and Rockwell Pond Specific Plan areas. An analysis of the existing system has been done to insure that maximum day demand can be met in all locations within the Selma water system. Cal Water developed a computerized hydraulic model of the system as part of its Water Supply and Facilities Master Plan to insure adequacy and reliability of supply to all existing and anticipated future customers.

The table below shows that the supply under normal hydrologic conditions is more than adequate to meet all existing and projected demands within Selma's existing SOI and for build out of the Rockwell Pond SP.

Selma Forecasted Water Demand Versus Supply (Normal Hydrologic Conditions)

Year	Total Selma District Annual Ave Demand MGD	Acre-ft/Yr	Well Capacity MGD	Acre-ft/Yr
2008	7.15	8,022	20.22	22,670
2013	9.22	10,345	25.25	28,310
2018	11.68	13,092	25.25	28,310
2023	14.37	16,104	30.30	33,970
2028	17.32	19,417	35.34	39,620

Single-dry year

Cal Water estimates that the availability of groundwater supplies to the Selma District and Rockwell Pond Specific Plan area will not be affected by a single dry year. The assumption with respect to demand for customers in the Selma District is that it will most likely be higher than a normal year. In the absence of an increased emphasis on water conservation by Cal Water and CID, many customers may increase landscape irrigation due to reduced precipitation offsetting reductions in water use by a smaller number of customers. Since District well capacity is sized to meet maximum day demand with the largest well down, an increase in average annual day demand by 20% would be met by pumping wells for longer durations.

The table below shows that the supply under one dry year hydrologic conditions with a conservative assumption of an increase in demand of 20% over normal is more than adequate to meet all existing and projected demands within Selma's existing SOI and for build out of the South Selma SP.

Selma Forecasted Water Demand Versus Supply (Single Dry Year)

Year	Total Selma District Annual Ave Demand MGD	Acre-ft/Yr	Well Capacity MGD	Acre-ft/Yr
2008	8.6	9,626	20.22	22,670
2013	11.0	12,300	25.25	28,310
2018	14.0	15,713	25.25	28,310
2023	17.2	19,332	30.30	33,970
2028	20.8	23,300	35.34	39,620

Multiple-dry years

With respect to what would be the effect of continuing to pump groundwater supplies at above average, average or reduced demands during multiple dry years, it is very likely that groundwater levels would temporarily decline when compared to those associated with normal hydrologic conditions – as CID groundwater monitoring records demonstrate in previous droughts, but the quantity of supply would be adequate to meet demands of the Selma District. Prior experience has shown that during ensuing periods of excessive annual precipitation, CID will increase the quantity of recharge to the groundwater basin, which most likely will restore static groundwater levels to near those observed prior to the drought. Cal Water has observed this cycle in hundreds of wells throughout its districts in California over the past 70 years. However, to insure a longer term sustainable groundwater supply, Cal Water has initiated discussions with the City and CID on conducting a feasibility study to evaluate a program to increase surface water recharge to the groundwater basin within the Selma area.

The assumption with respect to demand for customers in the Selma District is that it will15% less than normal due to strong conservation measures taken by Cal Water. Customers will be requested and/or mandated to reduce landscape irrigation and to apply conservation measures to indoor uses. A reasonable assumption is that a drought induced decrease in groundwater levels will reduce production capacity by 10%.

As shown in the table below, supply is forecasted to be more than adequate to meet demand under these assumptions for multiple dry year hydrologic conditions.

Selma Forecasted Water Demand Versus Supply (Multiple Dry Years Condition)

Year	Total Selma District Annual Ave Demand		Well Capacity	
	MGD	Acre-ft/Yr	MGD	Acre-ft/Yr
2008	6.1	6,819	18.2	20,401
2013	7.8	8,713	22.7	25,476
2018	9.9	11,130	22.7	25,476
2023	12.2	13,693	27.3	30,572
2028	14.7	16,504	31.8	35,657

If needed, to reduce overdrafting of groundwater during critically dry years, Cal Water has in place a four-stage rationing plan, which includes both voluntary and mandatory water use restrictions. Following is a summary of this program:

Stage	Shortage	Demand Reduction Goal	Type of Program
1	5 – 10%	10%	Voluntary
2	10 – 20%	20%	Voluntary or Mandatory
3	20 – 35%	35%	Mandatory
4	35 – 50%	50%	Mandatory

A description of the actions to be taken by Cal Water follows:

Stage 1: On going public information campaign consisting of distribution of literature, speaking engagements, monthly bill inserts, and conservation messages printed in local newspapers. Educational programs in area schools are ongoing.

Stage 2: Cal Water aggressively continues public information and education program. Requests customers to reduce consumption voluntarily 10% to 20%. If decision is to go to mandatory program, seek CPUC approval first. Support passage of drought ordinances by government agencies.

Stage 3: Implement mandatory reductions after receiving CPUC approval. Institute rationing programs through fixed allotments based on percentage cutbacks. Implement rate changes to penalize use over allotment. Maintain rigorous public information campaign explaining water shortage conditions. Implement water use restrictions such as those pertaining to lawn and landscape irrigation, banning the filling of pools and fountains, etc. Monitor production weekly for compliance with reductions. Install flow restriction devices on customers who consistently exceed their allocation.

Stage 4: Intensify all of the steps in Stage 3 and monitor production daily for compliance with necessary reductions.

With respect to demand and supply for multiple dry years, if groundwater level declines impact the yield of wells, users could be required to reduce consumption.
Cal Water believes that it could achieve a 10% to 20% reduction based on a voluntary reduction program (Stage 2) and 20% to 35% reduction (Stage 3) if a mandatory program is required. As an example, a 25% reduction in demand for Selma and South Selma Specific Plan in 2020 would amount to a decrease of 3.46 mgd or 3,882 acre-ft/year.

1. Conclusion

Based on Cal Water's:

- Existing and planned expansion of well production capacity in the Selma District,
- Recommended system and storage improvements set forth in its 2008 Water Supply and Facilities Master Plan
- Historical experience with being able to provide water to meet demands during single dry year and multiple dry years,
- In-place, ongoing conservation programs and best management practices for reducing customer demand during single and multi-year droughts including implementation of a water rationing program if required,
- Ongoing and planned future collaboration with the City of Selma and CID for developing a program to increase groundwater basin storage in the Selma area through recharge of surplus wet weather surface waters,

Cal Water believes it will have adequate water supplies to meet the projected demands of Rockwell Pond Specific Plan area and all of those of its existing customers and other anticipated future water users in the Selma District for the 20 year period from 2008 to 2028 under normal, single dry year and multiple dry year conditions.

Cal Water schedules preparation of plans, designs and construction of new wells and related distribution and storage facilities so as to increase supply capacity ahead of projected demand growth. This planning process provides the means to maintain excess supply capacity to accommodate more rapid growth than anticipated and dry weather periods that might result in temporary declines in the groundwater table level thereby reducing yields. The goal for supply capacity in the Selma District is to accommodate maximum day demand with additional capacity reserve to cover loss of the single largest well.