MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

MEMORANDUM

Date: January 19, 2009
To: Darby Fuerst, PH, General Manager
From: Joseph Oliver, CHg, Water Resources Division Manager
Subject: **California American Water Ryan Ranch Unit Water Distribution System Production Capacity Analysis**

Ryan Ranch Wells Production and Demand Estimate

The following summarizes analysis of the existing California American Water (CAW) Ryan Ranch Unit well production capacity versus: (a) existing demand, and (b) the capacity needed to meet the Monterey Peninsula Water Management District (MPWMD) permitted Water Distribution System (WDS) capacity limit for this system. This analysis does not address certain considerations including existing or potential future system storage, fire protection, and pressure constraints.

A. Existing Well Production Capacity:

122 GPM	**(with both primary wells and standby well)**
101 GPM	**(with both primary wells and without standby well)**
67 GPM	**(with the largest producing well out of service)**

The 122 gallons per minute (GPM) value is from the individual well capacities shown in Table 5-2 (**Attachment 1**) of the CAW "Comprehensive Planning Study – 2008", prepared by CAW in conjunction with Hatch Mott MacDonald. This value is in close agreement with the 121 GPM current capacity listed in Table 1 of the June 27, 2006 report on the Ryan Ranch system options, prepared by Martin Feeney for CAW. Both of the above values include Well #7 and Well #11 as the primary wells, and Well #8 as the system's standby well. No system production has been reported from the standby well, Well #8, approximately five years. In addition, this well is located within approximately 80 feet of Well #11, and would create drawdown interference that would reduce pumping rates at both wells if operated simultaneously. When this well is subtracted, the total capacity is reduced to 101 GPM (122 GPM – 21 GPM [Well #8] = 101 GPM).

The California Drinking Water Standards require that water systems using only groundwater shall have a minimum of two well sources and be capable of meeting the Maximum Day Demand with the highest capacity source off line[1]. This is not currently a requirement in the MPWMD permit for the Ryan Ranch WDS, but is a required condition

[1] California Code of Regulations, Title 22, Section 64554 (c).

for the MPWMD permit of the nearby Monterra Ranch WDS, as approved by the MPWMD Board in 1996. The highest capacity well in the Ryan Ranch system is Well #7, and when this well is subtracted, the firm production capacity is reduced to 67 GPM (122 GPM – 55 GPM [Well #7] = 67 GPM) (**Attachment 1**).

B. Existing Demand:

51 GPM (Average Day Demand)
115 GPM (Maximum Day Demand)

To estimate the existing Average Day Demand (ADD), this analysis considers total annual production (well production plus water transferred through the intertie with the main CAW system), which accounts for both water deliveries and unaccounted-for-water (UAW) uses. The highest reported total annual production was 92.07 acre-feet (AF) in Water Year (WY) 2002 (**Attachment 2**). However, the total annual Ryan Ranch system production has deviated significantly from annual deliveries over the years, and WY 2002 had a very high UAW use of 38 percent. Therefore, WY 2008 was selected as more representative of existing demand conditions, with a total annual production of 81.93 AF and an UAW use of four percent (**Attachment 2**). This equates to an ADD of 51 GPM (81.93 AF / 365 days = 51 GPM). This value is lower than the ADD of 57 GPM based on the WY 2002 highest recorded production year (92.07 AF / 365 days = 57 GPM). The CAW Comprehensive Planning Study estimated the ADD for the Ryan Ranch system at 0.07 million gallons per day (MGD) (**Attachment 1**), equivalent to 49 GPM. Although the method of derivation for this calculation is not described, this value is close to the ADD of 51 GPM shown above.

The Maximum Day Demand (MDD) was estimated by using a daily peaking factor of 2.25, which is from the California Drinking Water Standards[2]. This value is in close agreement with the daily peaking factor of 2.18 estimated for the Ryan Ranch system by CAW's consultants working on analysis of the Ryan Ranch system in 2003[3]. Applying this daily peaking factor results in an existing MDD estimate of 115 GPM (51 GPM x 2.25 = 115 GPM). It should be noted that the MDD shown in **Attachment 1** is 0.32 MGD, which is equivalent to 222 GPM. This equates to a daily peaking factor of 4.57 (0.32 MGD / 0.07 MGD = 4.57). This peaking factor is higher than the typical range considered for municipal water systems (i.e., 1.5 to 2.5). The derivation of this peaking factor is not described in **Attachment 1**, and does not appear to be supported by the most recent monthly production or delivery data for the Ryan Ranch system in 2008.

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[2] California Code of Regulations, Title 22, Section 64554 (b) (3) (C).

[3] This value is from the November 2003 report "Ryan Ranch Water System, Demand and Capacity Analysis" prepared by Norris Associates and Martin Feeney for CAW. This peaking factor was derived by making various assumptions about existing daily and weekly commercial/industrial water use patterns in the Ryan Ranch Business Park. See footnote 3 on page 5 of report (draft but not finalized).

C. Permitted System Capacity:

108 GPM (Average Day Demand)
244 GPM (Maximum Day Demand)

The MPWMD permitted system capacity limit is 175 acre-feet per year (AFY). This value is equal to a future ADD estimate of 108 GPM (175 AFY / 365 days = 108 GPM), and a future MDD estimate of 244 GPM (108 GPM x 2.25 = 244 GPM).

D. Summary and Conclusion:

Based on the information above, this analysis is summarized in **Attachment 3**, which indicates the current Ryan Ranch well production capacity as:

1. **With both primary wells and standby well in service**, well capacity is sufficient to meet existing ADD and MDD, and permitted ADD, but not sufficient to meet permitted MDD.

2. **With both primary wells and without the standby well in service**, well capacity is sufficient to meet existing ADD, but not sufficient to meet existing MDD, permitted ADD or permitted MDD.

3. **With the largest producing well out of service**, well capacity is sufficient to meet existing ADD, but not sufficient to meet existing MDD, permitted ADD or permitted MDD.

recharge rate of the groundwater basin. CAW's allocated share is currently at 3,000 afy and will ultimately be reduced to 1,494 afy by 2031.

Currently, CAW is pursuing two primary projects that make up the Coastal Water Project (CWP), which will replace supplies reduced by Order 95-10 and the adjudication of the Seaside basin supplies. These components are as follows:

- Desalination Plant – a proposed 18 MGD plant located approximately 20 miles north at Moss Landing which would provide regional supply to CAW and other neighboring purveyors.
- Aquifer Storage and Recovery (ASR) Facilities – new groundwater injection and recovery wells in the Coastal sub-basin of the Seaside Basin Aquifer. The ASR facilities are planned to store excess winter-time flow from the Carmel River basin (a potential combination of surface supply from the San Clemente Reservoir and aquifer supply from the Upper and Lower Carmel Valley aquifers).

The CWP is currently projected to be placed into service by 2013. The analysis and discussions herein are predicated on this projected in-service date.

5.1.2 Ryan Ranch Service Area

The Ryan Ranch service area serves primarily commercial and industrial development in the Ryan Ranch area of Monterey. Ryan Ranch is predominantly a commercial district with an average day demand of 0.07 MGD and a maximum day demand of 0.32 MGD. The system is supplied by six (6) wells, of which three (3) are currently in service. The system has a diversion limit of 175 AFY and is included in the overall diversion allocation for the Laguna Seca Sub-basin, which totals 345 AFY and includes Hidden Hills and Bishop. **Table 5-2** summarizes the Ryan Ranch supply wells.

Table 5-2 Ryan Ranch Service Area Well Summary

Well Name / Number	Well Capacity (gpm)	Well Capacity (MGD)
Ryan Ranch No. 7	55	0.08
Ryan Ranch No. 8 (Standby)	21	0.03
Ryan Ranch No. 11	46	0.07
Total Capacity	**101**	**0.15**
Firm Capacity	**67**	**0.10**

ANNUAL WATER PRODUCTION SUMMARY: RYAN RANCH UNIT OF CALIFORNIA AMERICAN WATER

	Well Production																				
	RR#2 (Lot 26)		RR#7 (Lot 12A)		RR#8 (Lot 12)		RR#9 (Lot 27A)		RR#10 (Lot 12)		RR#11 (Lot 12)		Backwash	Total RR Well Production		Transfer from Main System	Total RR System Prod.	Total Delivery	System UAW	No. of Active Conn.	Prod. per Conn.	Delivery per Conn.
Year	cf	AF	cf	AF	cf	AF	cf	AF	cf	AF	cf	AF	+/- AF	cf	AF	AF	AF	AF	%		AF	AF
RY 1990	63	0.00	1,154,664	26.51	0	0.00	0.00	0.00	10,982	0.25				1,165,709	26.76		26.76	24.55	8	95	0.28	0.26
RY 1991	0	0.00	644,109	14.79	0	0.00	0.00	0.00	20,090	0.46				664,199	15.25		15.25	39.68	-160	115	0.13	0.35
RY 1992	440	0.01	1,510,380	34.67	0	0.00	0.00	0.00	202,642	4.65				1,713,462	39.34		39.34	51.50	-31	125	0.31	0.41
RY 1993	0	0.00	1,319,717	30.30	0	0.00	0.00	0.00	725,187	16.65				2,044,904	46.94		46.94	42.86	9	139	0.34	0.31
RY 1994	0	0.00	1,209,381	27.76	0	0.00	0.00	0.00	878,858	20.18				2,088,239	47.94		47.94	50.58	-6	148	0.32	0.34
RY 1995	105,056	2.41	1,277,085	29.32	0	0.00	4,612	0.11	1,198,170	27.51				2,584,923	59.34		59.34	54.88	8	152	0.39	0.36
RY 1996	2,385	0.05	1,742,188	40.00	109,063	2.50	13,413	0.31	1,270,046	29.16				3,137,095	72.02		72.02	57.67	20	170	0.42	0.34
RY 1997	875	0.02	1,123,345	25.79	194,963	4.48	10,026	0.23	488,963	11.23				1,818,172	41.74		41.74	60.91	-46	176	0.24	0.35
RY 1998	1,192	0.03	1,187,825	27.27	0	0.00	6,712	0.15	1,179,176	27.07				2,374,905	54.52		54.52	52.17	4	176	0.31	0.30
RY 1999	464	0.01	1,461,309	33.55	1,347	0.03	3,629	0.08	998,971	22.93			-1.70	2,465,720	54.91		54.91	56.55	-3	184	0.30	0.31
RY 2000	877	0.02	1,706,355	39.17	271	0.01	7,933	0.18	1,178,159	27.05			-1.26	2,893,595	65.17		65.17	58.83	10	194	0.34	0.30
RY 2001	0	0.00	1,738,668	39.91	1,019	0.02	0	0.00	1,698,164	38.98				3,437,851	78.92		78.92	61.24	22	198	0.40	NA
WY 2002	0	0.00	1,786,271	41.01	0	0.00	0	0.00	2,275,938	52.25			-1.19	4,062,209	92.07		92.07	56.69	38	131	0.70	0.43
WY 2003	0	0.00	1,336,870	30.69	235,157	5.40	0	0.00	1,352,539	31.05			-2.18	2,924,566	64.96	25.84	90.80	65.10	28	135	0.67	0.48
WY 2004		0.00		27.40		0.10	0	0.00		0.40		45.40	-1.40		71.90	14.42	86.32	68.57	21	137	0.63	0.50
WY 2005	0	0.00	2,658,564	61.03	0	0.00	0	0.00	retired		356,851	8.19	0.51	3,015,415	69.73	2.42	72.15	63.62	12	141	0.51	0.45
WY 2006	0	0.00	1,335,098	30.65	0	0.00	0	0.00	retired		772,617	17.74	0.00	2,107,715	48.39	24.20	72.59	66.16	9	148	0.49	0.45
WY 2007	retired		544,607	12.50	0	0.00	retired		retired		0	0.00	0.19	544,607	12.50	59.10	71.60	66.18	8	152	0.47	0.44
WY 2008	retired		2,437,042	55.95	0	0.00	retired		retired		996,671	22.88		3,433,713	78.83	3.10	81.93	78.36	4	159	0.52	0.49

NOTES:
1. Well production, transfer and delivery data are from California American Water (CAW) annual WDS reporting forms, unless indicated otherwise in the notes below.
2. Reporting Year (RY) extends from July 1 of the previous year to June 30 of the identified year; Water Year (WY) extends from October 1 of the previous year to September 30 of the identified year. The District switched to WY reporting in 2002 to be consistent with the State Water Resources Control Board and the reporting of other types of hydrologic data.
3. System unaccounted water is calculated as the difference between total production and total delivery, as a percentage of total production.
4. In RY 1991, CAW reported well production as 15.7 AF, but individual well totals (in cf) are shown here as 15.25 AF.
5. In RYs 1995 and 1996, delivery and connections not reported with WDS sheet; values shown are from CAW "Customers & Consumption by Political Jurisdiction & Classification" tables.
6. In RY 2001, production and delivery were reported for a 15-month period; reported values for Jul, Aug and Sep 2001 were subtracted to get 12-month totals shown.
7. In WY 2004, CAW reported well production and backwash were corrected by MPWMD.
8. In WY 2006, MPWMD corrected No. of Active Connections based on data in CAW "Net Consumption by Region" report (i.e., 213 total - 65 other = 148).
9. In WY 2007, backwash (8,204 cf) was not subtracted from total production, consistent with CAW annual report.
10. In WY 2008, MPWMD modified the reported No. of Active Conn. (226 to 159 [i.e., 226-67]), based on data in CAW "Cust. & Cons. by Pol .Jur. & Class." 1/7/2009 report.

Attachment 2

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Attachment 3

Monterey Peninsula Water Management District

Ryan Ranch Unit Well Production Capacity Summary

(all values in gallons per minute)

Current Well Production Capacity		Exisitng Demand		Permitted Demand	
		Average Day	Maximum Day	Average Day	Maximum Day
With both primary wells and standby well	122	51	115	108	244
With both primary wells and without standby well	101	51	115	108	244
With largest producing well out of service	67	51	115	108	244

NOTES:

1. "Existing Well Production Capacity" data are from Table 5-2 of California American Water, Monterey System, Comprehensive Planning Study - 2008; prepared by CAW Asset & Capital Planning, in conjunction with Hatch Mott MaDonald.
2. "Existing Well Production Capacity" based on Well #7 and Well #11 as primary wells, and Well #8 as standby well.
3. "Existing Demand" based on WY 2008 annual reported production of 81.93 AF. Maximum day demand to average day demand peaking factor is 2.25 (California Code of Regulations, Title 22, Section 64554 (b) (3) (C).
4. "Permitted Demand" based on MPWMD permitted Ryan Ranch Unit System Capacity Limit of 175 acre-feet per year.
5. Shaded cells indicate existing well production capacity does not meet indicated demand criteria.