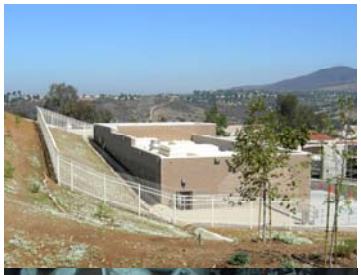



San Diego County
Water Authority

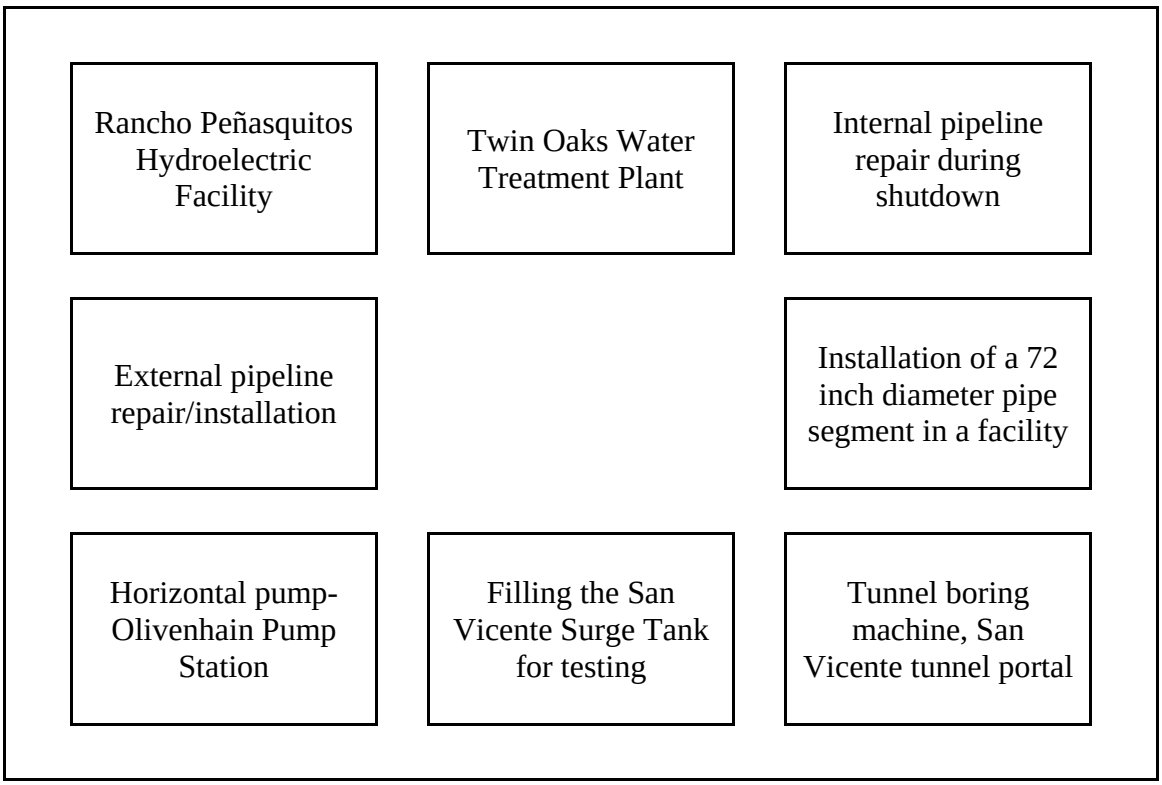


AQUEDUCT OPERATING PLAN

JULY 1, 2009 to JUNE 30, 2010

Volume 4

On the Cover


Rancho Peñasquitos Hydroelectric Facility
Twin Oaks Water Treatment Plant
Internal pipeline repair during shutdown
External pipeline repair/installation
Installation of a 72 inch diameter pipe segment in a facility
Horizontal pump-Olivenhain Pump Station
Filling the San Vicente Surge Tank for testing
Tunnel boring machine, San Vicente tunnel portal

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Executive Summary

The annual Aqueduct Operating Plan reflects on-going efforts to optimize the delivery, treatment, and storage of water in the San Diego region through coordination between member agency Operating Heads, Water Authority Staff, and the Metropolitan Water District of Southern California (MWD). Staff has updated the Aqueduct Operating Plan for Fiscal Year 2010 (FY 2010) to reflect anticipated Operational opportunities and constraints, and evaluate our past years' performance.

The Aqueduct Operating Plan complies with the interim untreated water distribution priorities and includes a summary of the Water Authority's scheduled shutdowns that affect the delivery of water to the region (see Figure 1), Water Authority pump station operating schedules, and member agency water treatment plant outages.

The plan was developed based on information received from Member Agencies, historical delivery/production data, allocated delivery volumes, constraints within the Aqueduct system, and scheduled shutdowns. Key items that affect the region for fiscal year 2010 include:

- M&I supplies for FY 2010 will be 556,740.7 acre feet.
- MWD- IAWP and SAWR allocations for FY 2010 total 64,574.5 acre feet.
- Based on allocated supply and reduced demand resulting from both voluntary and mandatory conservation, system capacity should not be an issue during delivery of the region's anticipated treated and untreated water allotments.
- Maximum treated water system utilization should be approximately 52 percent of treated aqueduct capacity in FY 2010.
- Maximum untreated water system utilization should be approximately 93 percent of untreated aqueduct capacity in FY 2010.
- There are two untreated 10-day shutdowns scheduled for FY 2010.
- There are NO scheduled treated water shutdowns during this fiscal year.

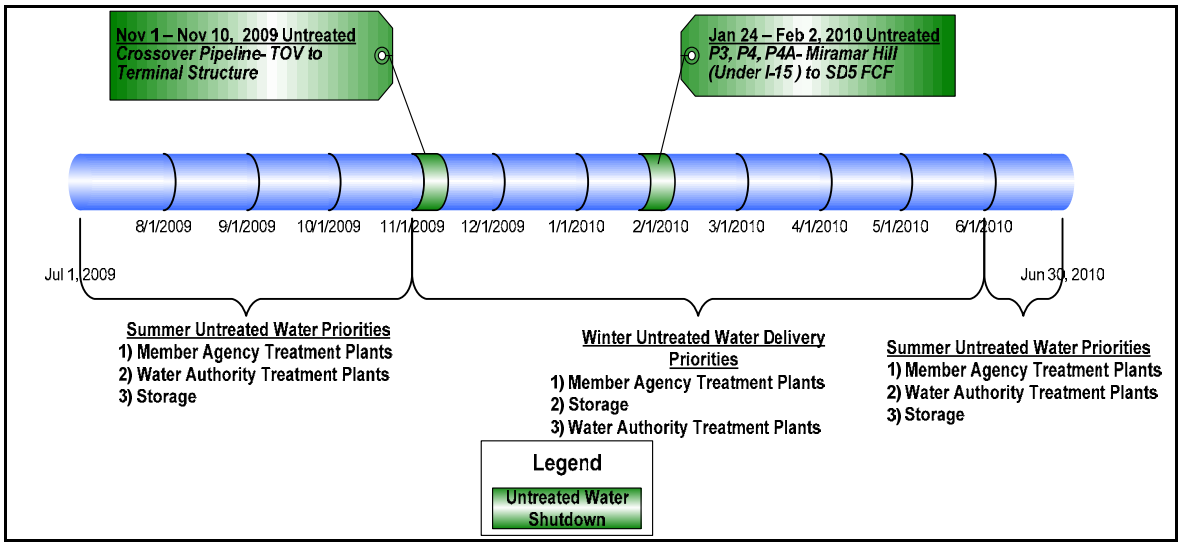

Figure 1 - Aqueduct Operating Plan Summary Timeline FY 2010.

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Water Supply

Figure 2 - Delta Smelt

An unprecedented combination of challenges has culminated in severe impacts to the region's water supply. Most significant among these challenges are regulatory restrictions imposed on water imports from the Sacramento-San Joaquin Bay-Delta, which channels water from the Sierra Nevada Mountains into the State Water Project (SWP). These restrictions were enacted to protect threatened fish species such as the Delta smelt, and have severely limited operations at state and federal water pumping plants. Additional restrictions to protect more fish species are possible as early as mid-2009. This has created a man-made supply bottleneck that will continue to adversely impact SWP deliveries to southern California for several years to come.

In addition to the judicial pumping restrictions, California is also recovering from multiple dry years. Even with recent storms in spring 2009, Sierra Nevada snow pack is only now approaching annual average levels. Consecutive years of below average precipitation have lead to significant drafting of SWP and Colorado River surface storage reservoirs. In the absence of sufficient runoff to replenish these reservoirs, storage levels dropped dramatically; as of May 2009 total storage on the Colorado River was approximately 55 percent of capacity.

Figure 3 - Lake Mead

Facing these significant supply constraints, along with uncertainties regarding projected water demands, on April 14, 2009 the MWD Board of Directors voted to allocate or cutback supplies to its municipal and industrial (M&I) customers. The MWD M&I cutback will begin July 1, 2009 and is scheduled to last at least through June 30, 2010. Based on the allocation methodology contained in MWD's Water Supply Allocation Plan, the Water Authority will receive 410,381 AF of firm supply for FY2010. When compared to the Water Authority's base period M&I demand on MWD, this equates to a regional 13.3 percent reduction.

As a consequence of MWD's actions, the Water Authority Board declared a "Drought Alert" Level 2 condition under its Model Drought Response Conservation Program. This declaration marked the region's transition from voluntary conservation measures to mandatory water use restrictions. In concert with this action, the Water Authority Board also voted to establish specific M&I supply allocations for each of its 24 member agencies for FY2010. However, due to the Water Authority's development of additional imported supplies (IID transfer, canal linings, and dry-year transfers), actual Water Authority M&I cutbacks will be less than MWD's 13.3 percent regional cut. These additional supplies will allow the Water Authority to reduce the overall regional M&I shortage to approximately 8 percent. A summary of available M&I supplies for FY 2009-2010 is shown in Table 1 below.

Table 1- Water Authority M&I Supplies for FY 2009-2010

Supply Source	Available Supply (AF)
MWD M&I Allocation	381,659.7
Imperial Irrigation District Transfer	65,000
Coachella Canal Lining Project	24,000
All American Canal Lining Project	70,561
Dry-Year Transfer	15,520
Total M&I Supply	556,740.7

Water Authority member agencies participating in agricultural rate discount programs are also subject to mandatory supply allocations. Participants in MWD's Interim Agricultural Water Program (IAWP) have sustained a mandatory 30 percent reduction in supply since January 2008, and will continue to see cutbacks for the foreseeable future. Member agencies enrolled in the Water Authority's separate stand-alone Special Agricultural Water Rate (SAWR) have different provisions for reductions during supply shortages. In general, SAWR cutbacks are linked to the MWD's regional M&I reduction percentage. As a result, beginning July 1, 2009 SWAR customers will see a 13.3 percent cutback in their supply for FY 2009-2010. Table 2 contains a breakdown of available agricultural program supplies for FY 2009-2010.

Table 2 - Water Authority IAWP and SAWR Supplies for FY 2009-2010

Supply Source and Customer Class	Available Supply (AF)
MWD IAWP Supply	35,853.2
Water Authority SAWR Supply	28,721.3
Total IAWP/SAWR Supply	64,574.5

MWD allocations for FY2010 will not have an operational impact on the Aqueduct. While Treated Water deliveries for the high demand months of July through October 2008 ranged between 40 percent and 48 percent of capacity (Figure 6), historic distribution trends and supply allocation for the same period in FY2010 could result in flows ranging from 43 percent and 52 percent (Figure 4). Likewise, the Untreated Water system utilization could increase. Average flows from July through October 2008 were between 74 percent and 86 percent (Figure 7). For this same period in FY 2010, historic distribution trends and allocated supplies could result in flows between 80 percent and 93 percent of the Untreated Water capacity of the Aqueduct system (Figure 5).

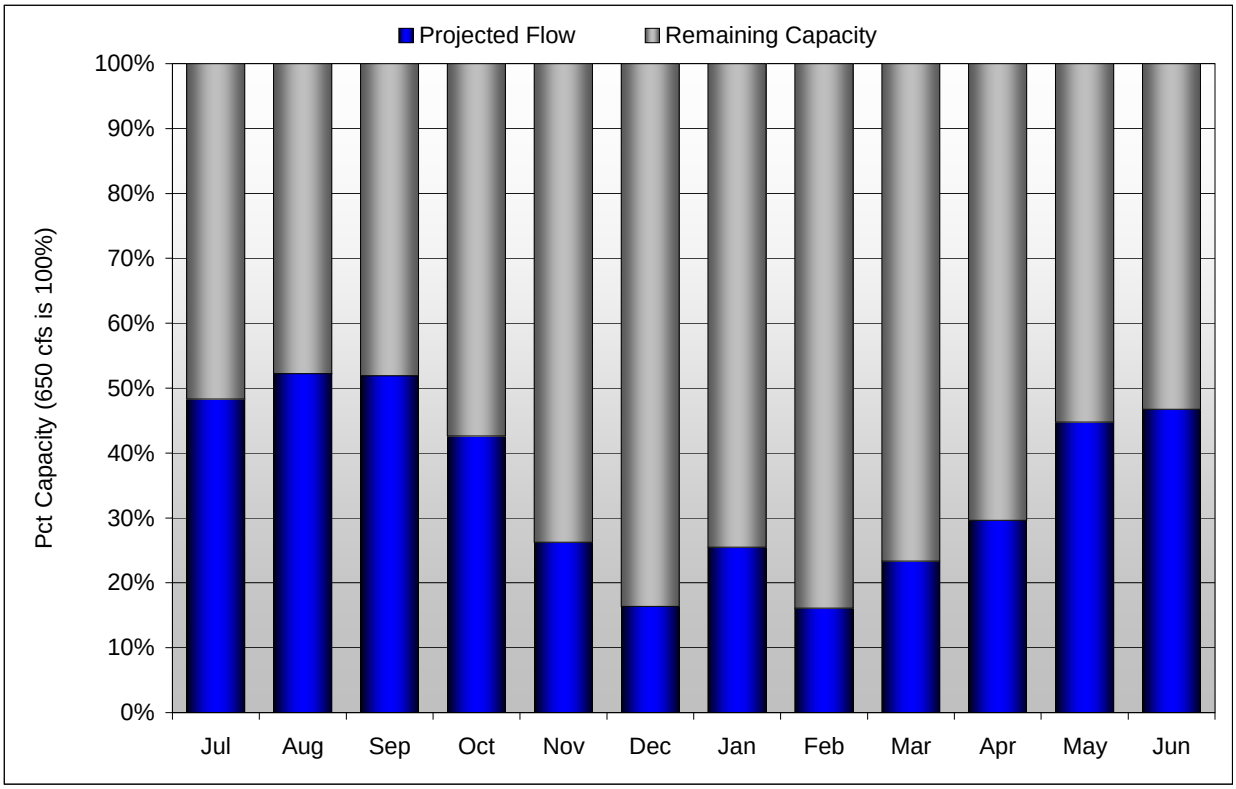


Figure 4- FY2010 Projected Treated Water System utilization

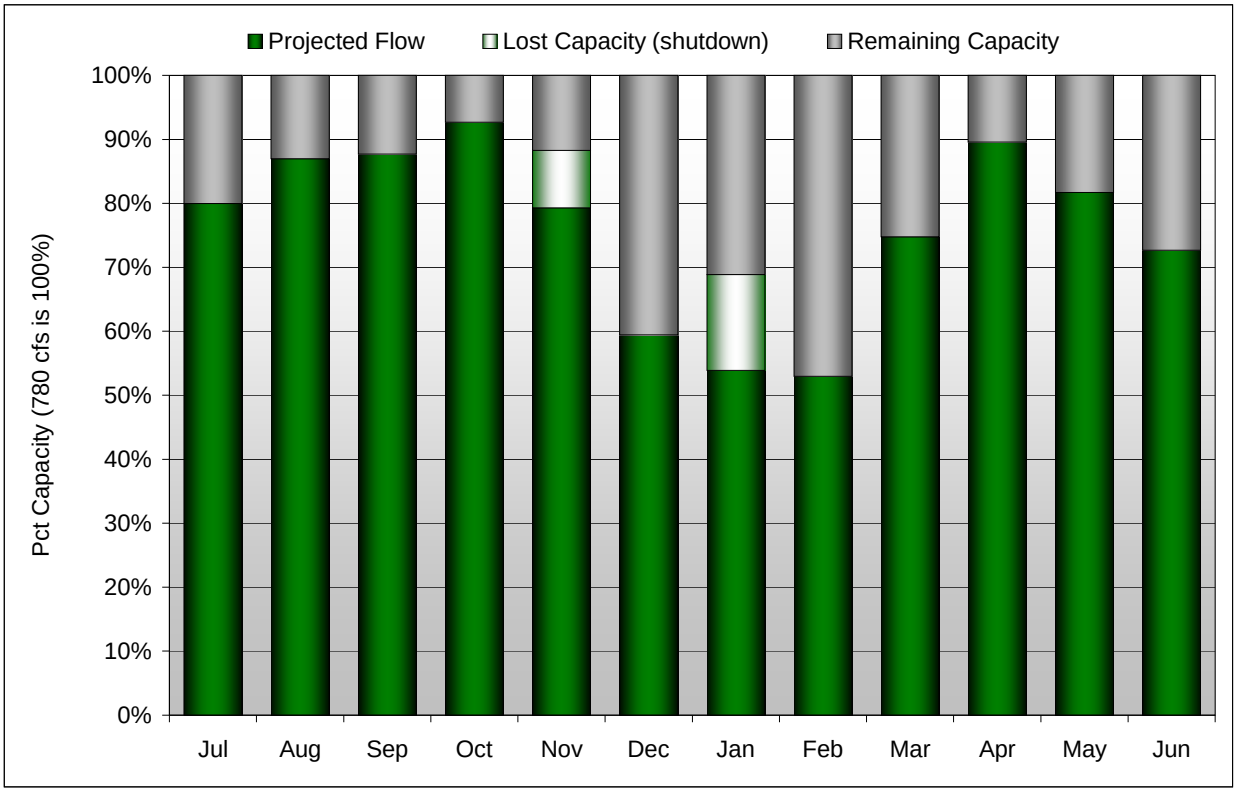
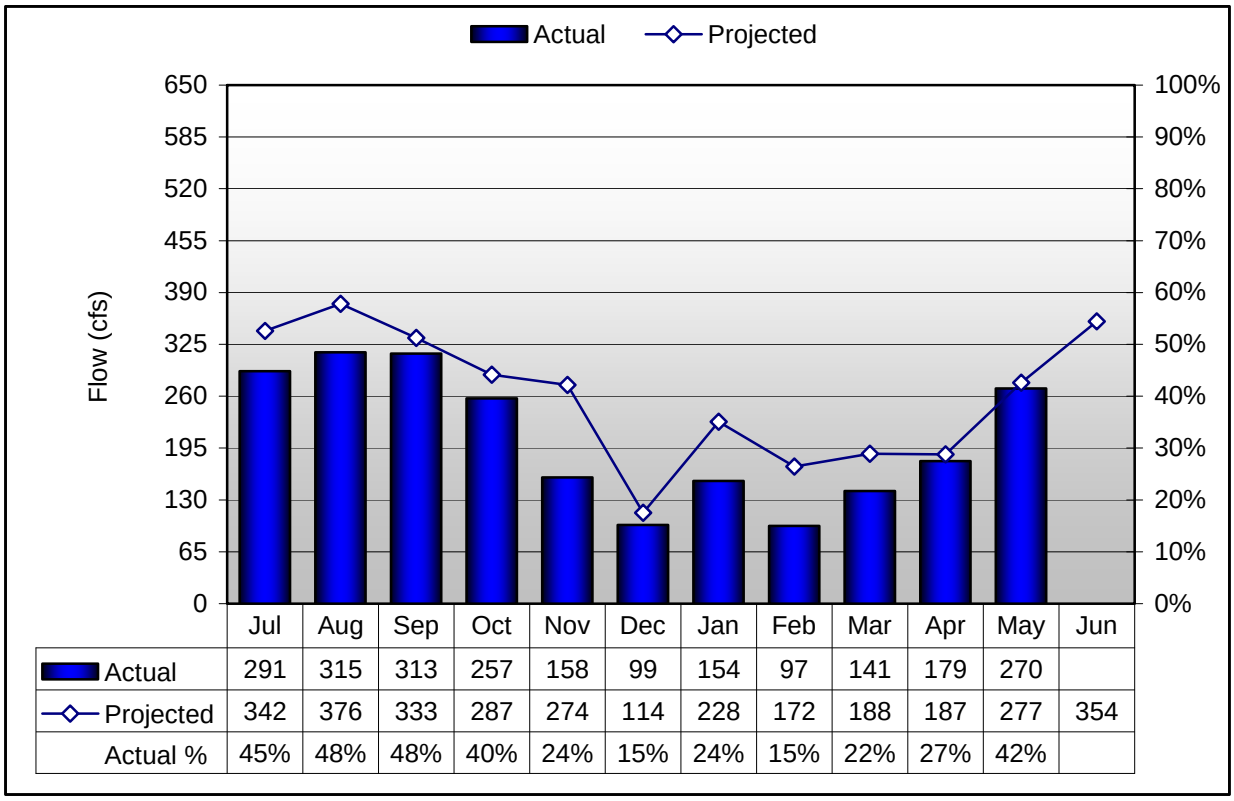
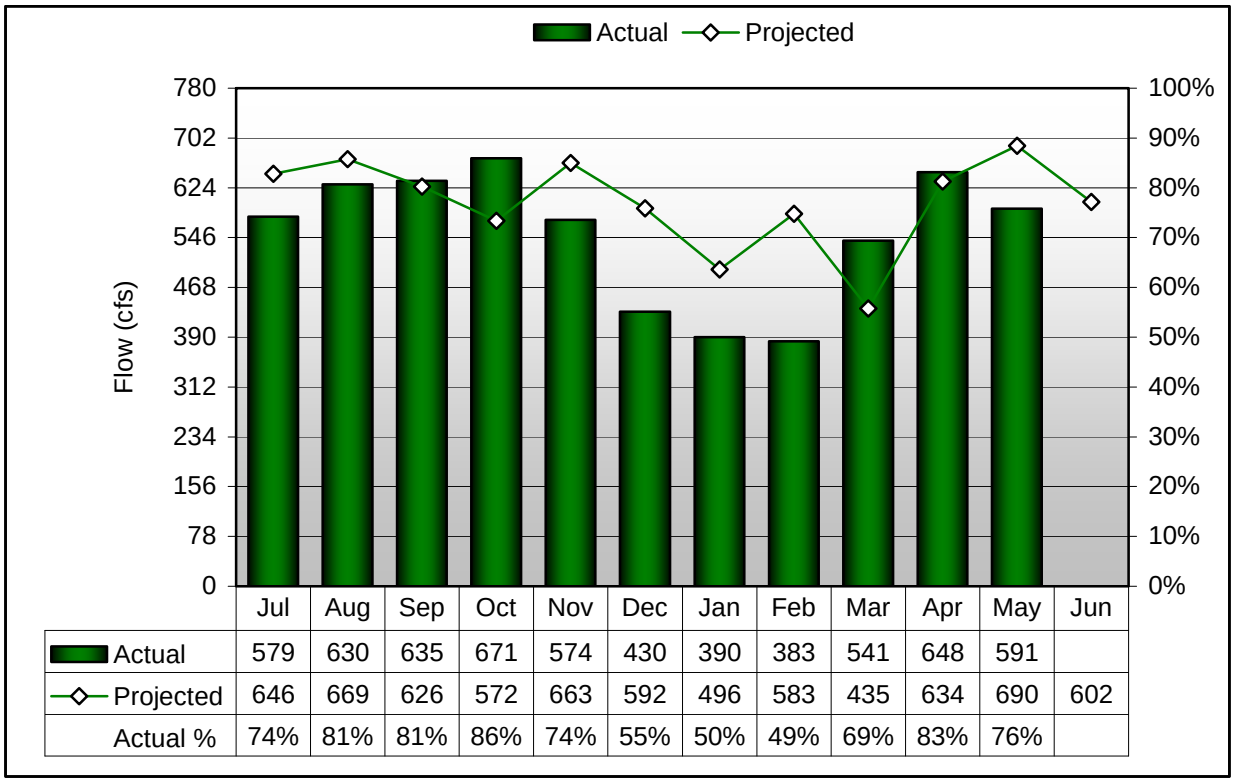


Figure 5 - FY2010 Projected Untreated Water System utilization



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Actual	291	315	313	257	158	99	154	97	141	179	270	
Projected	342	376	333	287	274	114	228	172	188	187	277	354
Actual %	45%	48%	48%	40%	24%	15%	24%	15%	22%	27%	42%	

Figure 6 - Projected Treated Water Flows from FY2009 AOP vs. actual deliveries



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Actual	579	630	635	671	574	430	390	383	541	648	591	
Projected	646	669	626	572	663	592	496	583	435	634	690	602
Actual %	74%	81%	81%	86%	74%	55%	50%	49%	69%	83%	76%	

Figure 7 - Projected Untreated Water Flows from FY2009 AOP vs. actual deliveries

Untreated Water Distribution Priorities

The untreated water delivery priorities were developed as a result of discussions with several member agencies and identification of their concerns. The priorities are intended to provide a framework for Water Authority operators to deal with potential conflicts arising during high demand untreated water delivery periods. The Board adopted the interim untreated water delivery priorities at the January 27, 2005 Board meeting. This plan complies with the interim untreated water distribution priorities and is shown in Figure 8.

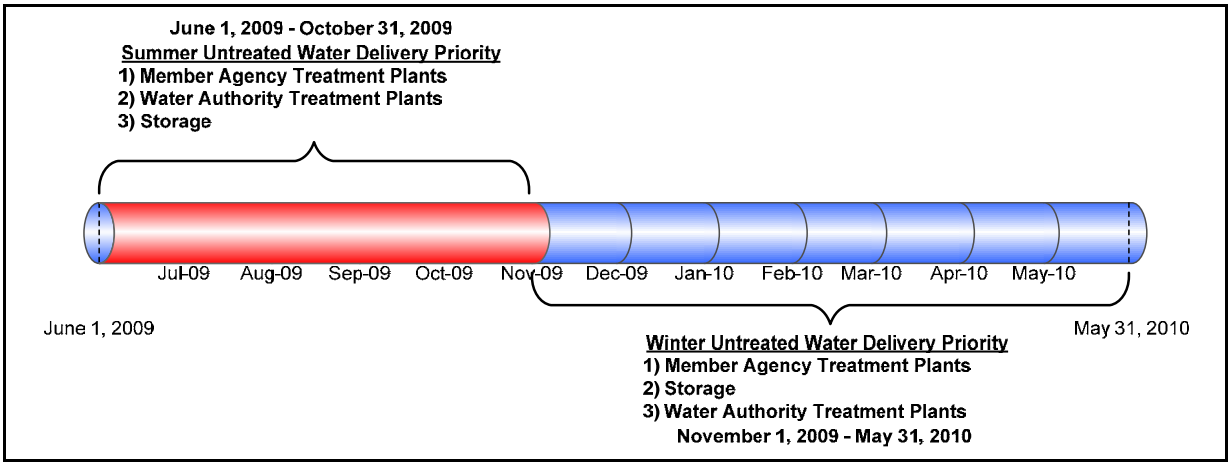


Figure 8 - Untreated Water Delivery Priorities

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San Diego County Water Authority Aqueduct Shutdowns

The Water Authority conducts scheduled shutdowns of sections of the aqueducts for internal inspection, maintenance, and CIP connections on an annual basis. These pipeline shutdowns are coordinated with the Metropolitan Water District of Southern California, Member Agencies, and all Water Authority Departments. The schedule includes three years of shutdowns to allow for the proper planning of maintenance and CIP activities for both the Water Authority and the Member Agencies. This three-year schedule is updated each January to facilitate the compilation of the Annual Aqueduct Operating Plan. At that time, the following fiscal year's (July to June) pipeline shutdowns are made available to member agency personnel for comment, prior to inclusion in the Annual Aqueduct Operating Plan.

For FY 2010, there are two planned shutdowns, both affecting untreated deliveries. A timeline (Figure 9) and brief description of the shutdowns are shown below.

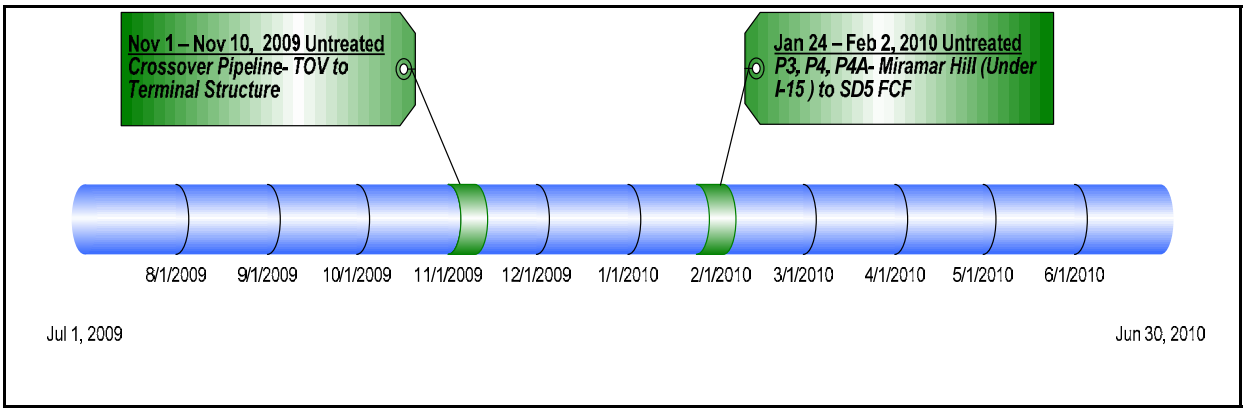

Figure 9 - Water Authority FY 2010 Pipeline Shutdowns

Untreated Water Shutdown November 1 to November 10, 2009 (10 Days)	
Description	10-Day untreated water shutdown of Pipeline 5 and the Crossover Pipeline.
Purpose	• APP to repair fiber optic cabling in the Crossover Pipeline. • Contractor will perform warranty work at Rancho Peñasquitos Hydroelectric Facility.
Affects on MWD	All untreated water flows from MWD on Pipeline 5 will be terminated during this outage.
Member Agency Connections Affected	The following untreated water connections will be out of service during this outage: OCS 5, ESC 3, ESC 4, SD 9, POW 3, RAM 1, POW 1 and 4, HLX 1, 6, 7, 8, and SD 1 and 2. The Crossover Pipeline and untreated water section of the First Aqueduct will also be shutdown for the entire period. Pipeline 3 will be in service up to its capacity of 280 cfs. TOWTP will be offline during this outage.

Untreated Water Shutdown January 24 to February 2, 2010 (10 Days)	
Description	Pipelines 3, 4, and 4A will be inspected from Miramar Hill to San Diego 5A, B, & C FCF.
Purpose	• Perform a warranty inspection of the relined portions of Pipelines 3, 4, and 4A under I-15. • Perform remote field eddy current inspection of accessible PCCP portions of the inspection area. • Installation of acoustic fiber optic cable monitoring for PCCP portions of the inspection area. • Replacement of the 36-inch plug valve at the SD-12 flow control facility. • Repair of the 36-inch butterfly valve at the SD-12 take-off structure. • Perform an interior inspection on Pipeline 4 from STA 4199+50 (Mission Trails) to 4416+09 (Alvarado).
Affects on MWD	There will be an untreated flow reduction of up to 350 cfs.
Member Agency Connections Affected	Flows will terminate at Rancho Penasquitos Hydroelectric Facility. All untreated water connections south of Miramar Vent will be shutdown. These include SD 5A, B, & C, NC/SB3, NC/SB1&2, SD7, SD6A&B, SD12 and SD20.

San Diego County Water Treatment Plant Shutdowns

In order to optimize the delivery, treatment, and storage of water in San Diego, a request was sent to the Member Agency Operating Heads to obtain schedules for treatment plant expansions, CIP tie-ins, and scheduled treatment plant maintenance. The goal is to have one schedule that all the member agencies could review and use to plan out their work in such a way that it has the least impact on the region. Response from Member Agencies confirmed upcoming maintenance activities including those shown in Figure 10. A number of other maintenance projects were identified through this process but lacked firm schedules. These types of projects, as well as Treatment Plant Shutdown coordination, will continue throughout the year as a standing discussion item at the regularly scheduled Operating Head meetings.

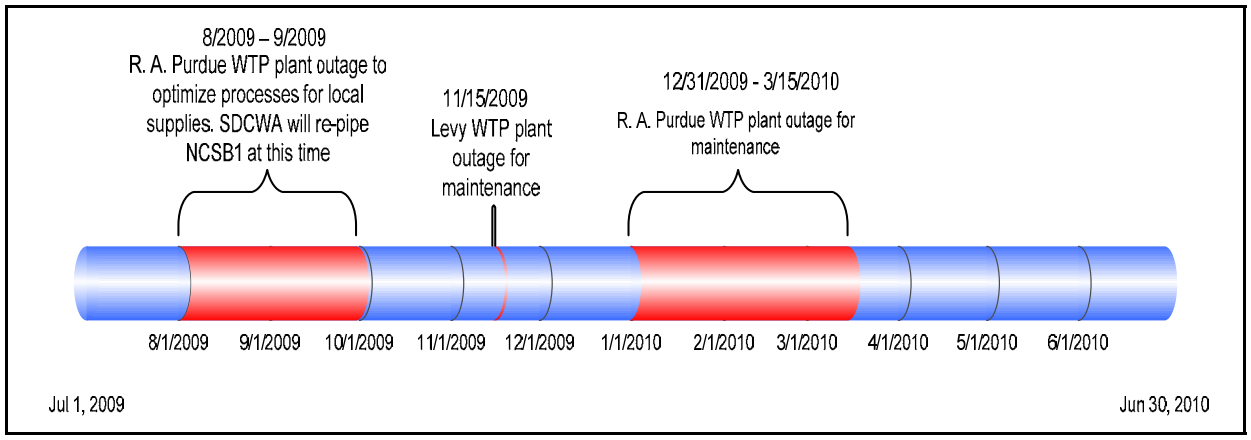

Figure 10 - Scheduled Member Agency maintenance coordination

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Water Authority Aqueduct Energy Production/Consumption

Rancho Peñasquitos Hydroelectric Facility is the only power generation plant in operation. The Alvarado Hydroelectric Facility will remain non-operational until the relining of Pipelines 3 and 4 are complete. During FY 2010 the Water Authority will be operating four pump stations and the new Twin Oaks Valley Water Treatment Plant, each of which will consume large quantities of electricity. Following is a list of those facilities along with their anticipated operation schedules and costs:

- Rancho Peñasquitos Hydroelectric Facility
  - Projected months of operation: July 2009 to June 2010
  - Power generating capacity: 4.5 megawatts.
  - Estimated Power: 25,000 MW hrs
  - Estimated Revenue: $1,300,000
  - Projected power consumption cost per month: $825
  - Total power consumption cost per year: $9,900

- Alvarado Hydroelectric Facility
  - Projected months of operation: Not in Service
  - Power generating capacity: 1.8 megawatts.
  - Estimated Power: 4,800 MW hrs
  - Estimated Revenue: $0
  - Projected power consumption and sundry charge cost per month: $450
  - Total power consumption cost per year: $5,400

- Olivenhain Pump Station
  - Projected months of operation: September 2009 and March 2010
  - Pumps (three available): One pump operation
  - Projected operational cost per month: $3,400
  - Projected pump cost per month: $43,350 (2 months pump operation)
  - Projected pump cost for the year: $86,700
  - Total power consumption cost per year: $127,500

- Escondido Pump Station
  - Projected months of operation: December 2009 through June 2010
  - Pumps: Two pump operation
  - Projected operational cost per month: $700
  - Projected pump cost per month: $9,425 (7 months pump operation)
  - Projected pump cost for the year: $60,000
  - Total power consumption cost per year: $74,000

- P2A Pump Station
  - Projected months of operation: Used during emergencies
  - Pumps: Two pump operation
  - Projected power consumption cost per month: $200
  - Projected pump cost per month: 0 (no planned operation)
  - Total power consumption cost per year: $2,400

- Miramar Pump Station
  - Projected months of operation: July 2009 through June 2010
  - Pumps: One pump operation
  - Projected power consumption cost per month: $120
  - Projected Water Authority pump cost per month: 0 (Energy cost for pumping paid by the City of San Diego)
  - Total power consumption cost per year: $1,440

- Twin Oaks Valley Water Treatment Plant
  - Projected months of operation: July 2009 to June 2010
  - Projected power consumption cost per month (average): $120,484
  - Total power consumption cost per year: $1,445,800

The total power consumption cost to operate the four pump stations, the Twin Oaks Valley WTP, and the Rancho Peñasquitos and Alvarado Hydroelectric Facilities is estimated to be $1,666,440.

During FY 2009, the Water Authority achieved approximately 77 percent of the operating goal of 25,000 MW hrs of energy production at the Rancho Peñasquitos Hydroelectric Facility. The shortfall of approximately 23 percent is the result of the October emergency pipeline repair, lower than anticipated raw water demand from November to January, and unscheduled warranty repair work at the Rancho Peñasquitos Hydroelectric Facility between early February and late April of 2009 (Figure 11 and Table 3).

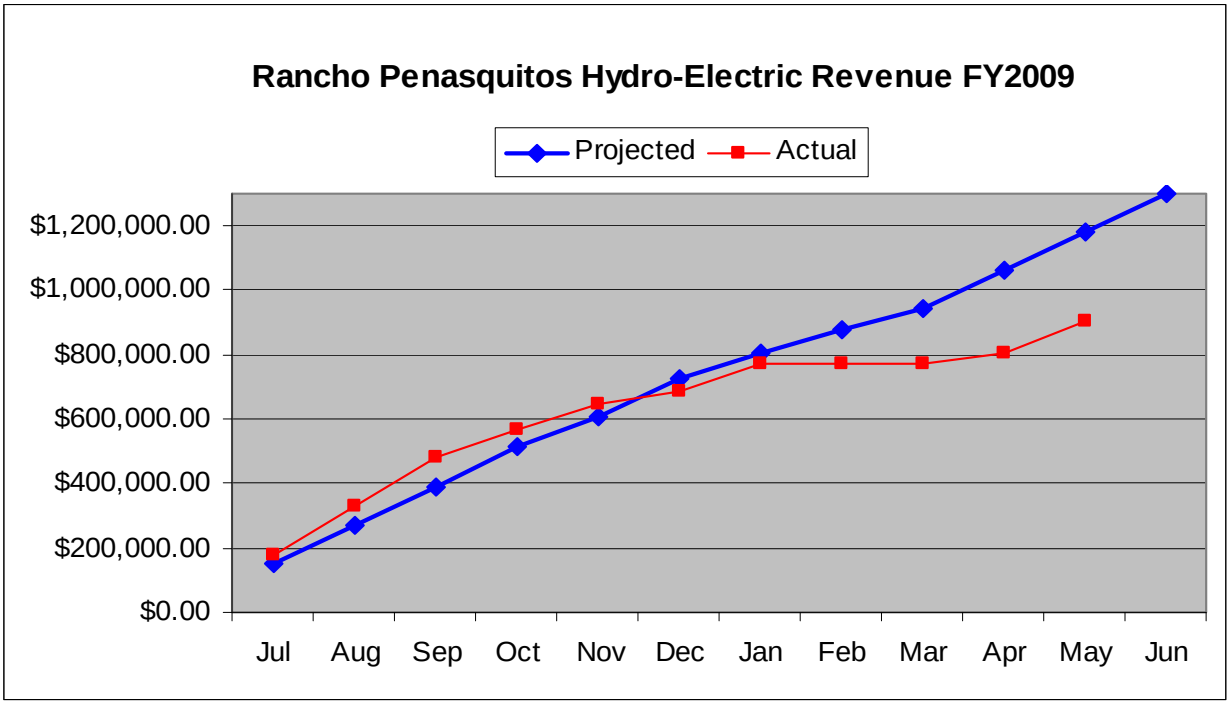

Figure 11 - Rancho Hydro Revenues vs. Projections

Table 3 - Rancho Hydro Revenues vs. Projections

	Projected Monthly Revenue	Actual Monthly Revenue	Running Total Projection	Running Total Actual	% above or below projected	Comments
Jul	$148,634	$176,501	$148,634	$176,501	18.7	
Aug	$121,110	$155,861	$269,744	$332,361	23.2	
Sep	$121,110	$152,532	$390,854	$484,894	24.1	
Oct	$121,110	$84,538	$511,963	$569,431	11.2	Unscheduled P04 Repair
Nov	$92,484	$74,910	$604,447	$644,341	6.6	Untreated Water Shutdown
Dec	$121,110	$41,195	$725,556	$685,537	-5.5	Low Flows & PLC Issues
Jan	$81,709	$84,682	$807,265	$770,218	-4.6	Untreated Water Shutdown
Feb	$70,948	$2,567	$878,213	$772,786	-12.0	Warranty Repair Shutdown
Mar	$63,085	$0.00	$941,298	$772,786	-17.9	Warranty Repair Shutdown
Apr	$118,247	$32,865	$1,059,545	$805,651	-24.0	Warranty Repair Shutdown
May	$122,208	$97,403	$1,181,753	$903,054	-23.6	Untreated Water Shutdown
Jun	$118,247		$1,300,000			

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Reservoirs and Storage Opportunities

Serving multiple functions from surface water retention, to off-season water storage, to local sources of emergency water supplies, Member Agency and Water Authority reservoirs act as system capacity buffers during peak demand periods and offer a level of security for short and long-term emergency situations. The size and location of the reservoirs affects the extent to which each can perform the various functions as does the operational plan implemented at each location (Figure 12 and Table 4).

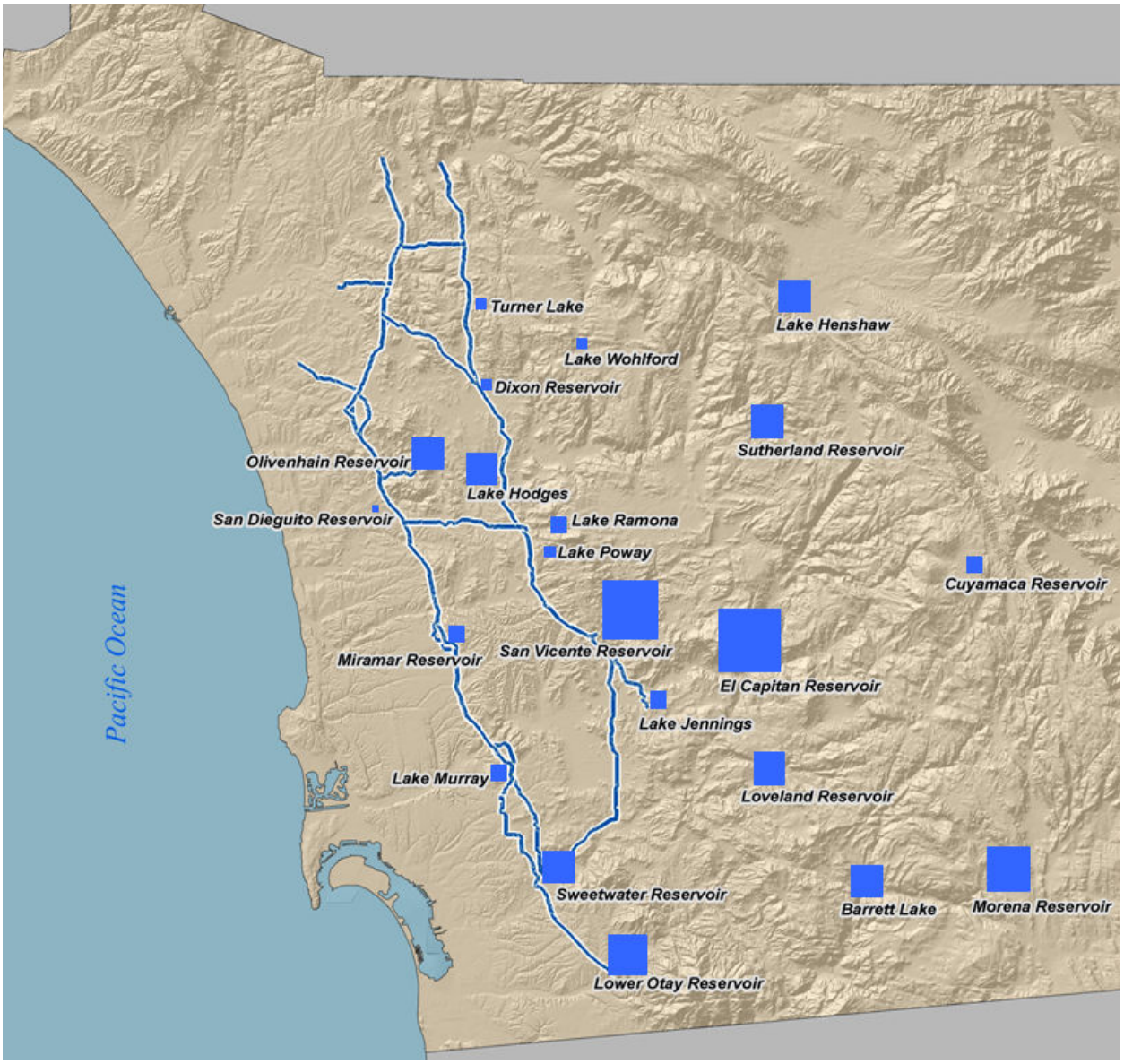

Figure 12 - Location and Relative Capacities of San Diego County Reservoirs

Table 4 – Storage/Capacity in Member Agency and Water Authority Reservoirs (AF)

Reservoir	[1]Total	Usable	Dead (unusable)	Storage As of May 1, 2009			
				Member Agency	Carryover	ESP	Total Usable
Henshaw	54,000	53,994	6	8,805			8,811
Wohlford	3,255	2,905	350	2,265			2,615
Dixon	2,610	2,545	65	2,458			2,523
Sutherland	29,508	29,396	112	3,807			3,807
Hodges	30,251	28,422	1,829	19,196			19,916
San Dieguito	883	717	166	392			558
[2]San Vicente ***(see Note 2 below)***	89,312	**38,680** *(88,971)*	341	26,856	13,899		40,755
El Capitan	112,807	109,992	2,815	51,564	13,795		65,359
Murray	4,684	4,292	392	4,091			4,091
Cuyamaca	8,190	8,190		1,086			1,086
Jennings	9,790	9,790		9,021			9,021
Loveland	25,400	25,225	175	11,535			11,710
Sweetwater	27,700	26,800	900	5,470	7,395		13,765
Morena	50,694	50,020	674	6,709			6,709
Barrett	34,806	34,207	599	26,433			26,433
Lower Otay	49,849	46,026	3,823	27,388	7,226		34,614
Miramar	6,682	5,774	908	5,521			5,521
Poway	3,320	2,550	770	3,034			3,144
Ramona	12,000	11,800	200	3,339			3,539
Turner	1,730	1,670	60	1,552			1,612
Olivenhain	24,375	24,332	43	1,779	2,926	18,000	22,705

Notes:

1. Capacity information: JMM Consulting Engineers, Inc. (1990), San Diego County Water Authority Optimal Storage Study: Reservoir Summary Report
2. San Vicente Reservoir's usable storage capacity prior to the dam raise was 88,971 AF. It will be drawn down to approx. 38,680 AF until 2012 to facilitate the dam raise portion of the Emergency Storage Project.
3. Data for City of San Diego Reservoirs was provided by the City on June 15, 2009.

In addition to meeting local storage and operational demands, both the Olivenhain and San Vicente Reservoirs play a significant role in both the Emergency Storage Program (ESP) and the Emergency Storage Operations Guidelines (ESOG) and figure prominently in planned responses to regional emergency situations related to water supply and availability. Water Authority staff is working on a system-wide plan that utilizes a regional perspective on storage needs.

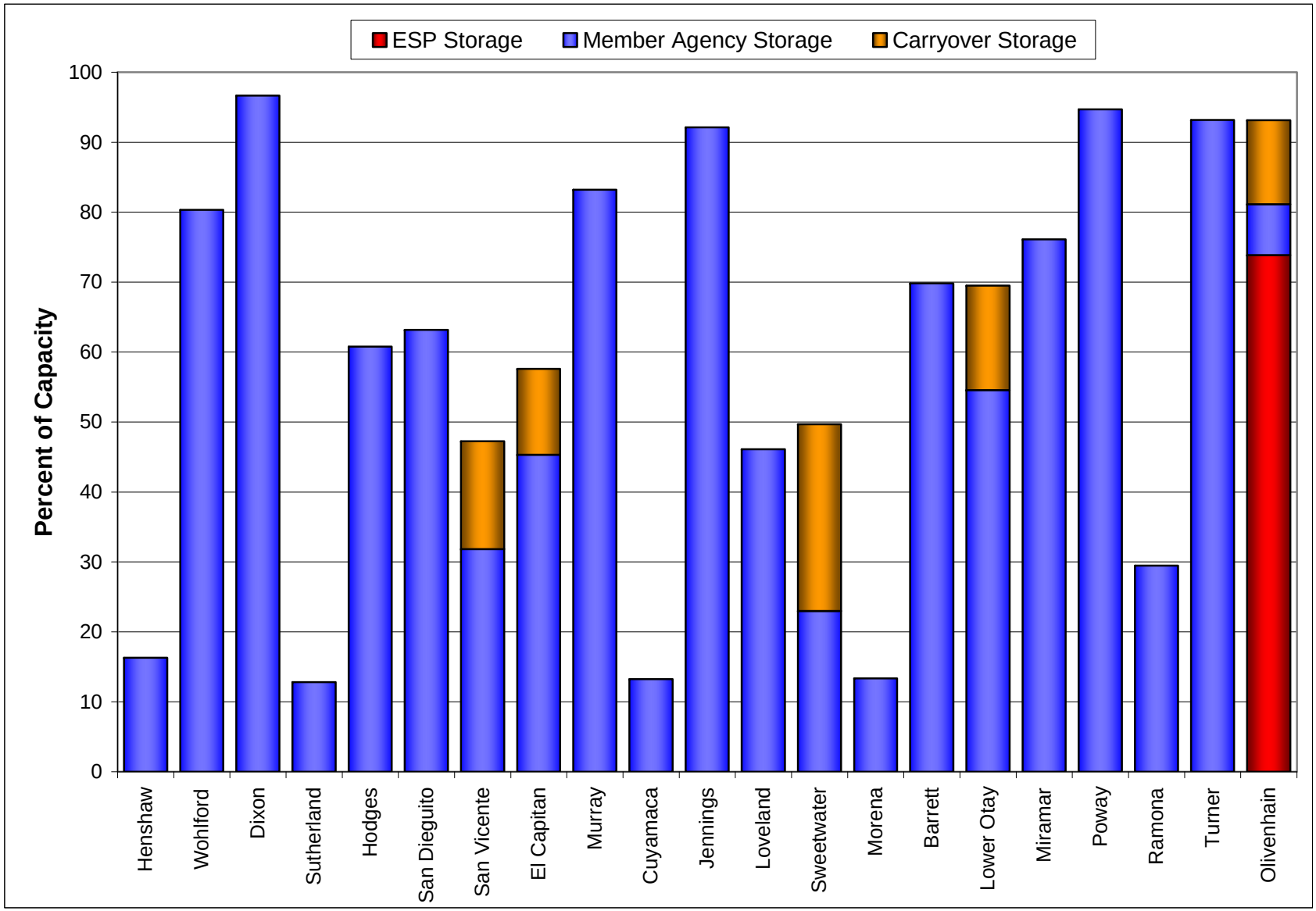

Figure 13 - Reservoir Levels (% of Capacity) as of May 1, 2009

(This Figure represents the Water Authority's Carryover Storage and ESP not the individual Member Agencies)

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Major Maintenance Activities

Major maintenance activities for FY2010 include start up activities at both the San Vicente Pump Station and the Lake Hodges Hydroelectric Facility, venturi replacement at Valley Center 1 FCF, valve replacements at Valley Center 5/6 and Fallbrook 3/Rainbow 1 FCFs, replacement of a 36-inch plug valve at San Diego 12, and major improvements at National City South Bay 1 FCF including venturi, control valve, and piping replacement (Figure 14).

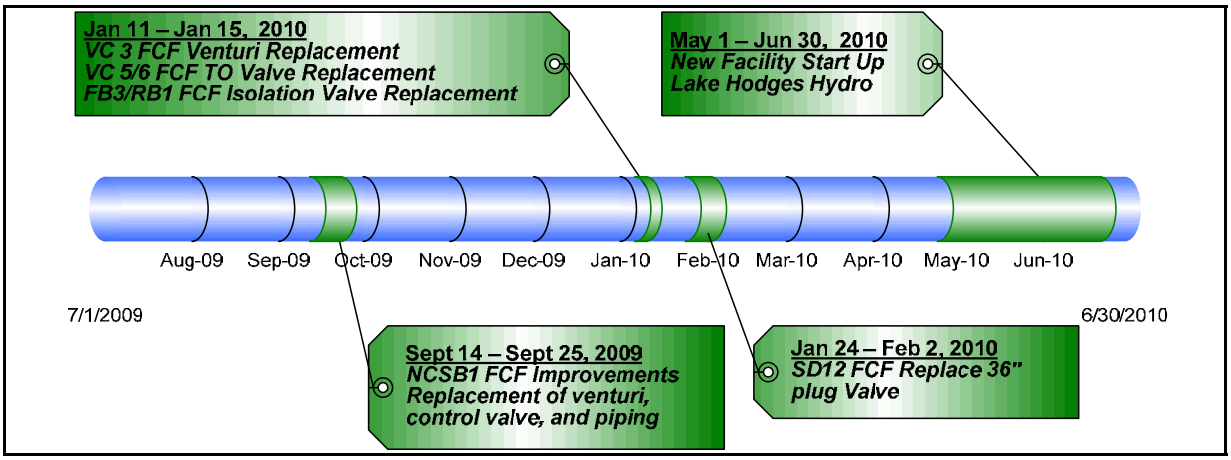

Figure 14 - Major Maintenance Activities for FY 2010