

# Optimum Basin Management Program

Staff Status Report 2009-2: July to December 2009



CHINO BASIN WATERMASTER

Optimum Basin Management Program

## Highlighted Activities

- The Chino Basin Facilities Improvement Project (CBFIP) Phase II, a joint effort of Watermaster, the Chino Basin Water Conservation District (CBWCD), Inland Empire Utilities Agency (IEUA), and the San Bernardino County Flood Control District (SBCFCD) to increase the annual recharge of storm, imported, and recycled water and to reduce long-term maintenance costs, has shown considerable progress in its construction and is expected to be completed by March 2010. The project is co-funded by Watermaster and IEUA with matching funds from the California Department of Water Resources (DWR). The new MWD turnout CB-20 and improvements to CB-14 have been completed and successfully tested.
- Preparation of the Recharge Master Plan (RMP) update is underway. Wagner & Bonsignore is working on stormwater recharge improvement opportunities and Black & Veatch is completing the section on supplemental water, while Wildermuth Environmental Inc. (WEI) is coordinating the balance of the report and is overseeing the final product. During this reporting period, a series of workshops (8/27 & 12/17) and technical group meetings (9/9, 10/22, 11/2, & 12/8) were held at the Watermaster office to update the Watermaster parties on the RMP progress. The final updated Recharge Master Plan is due to the Court by July 1, 2010.



New and Improved MWD Turnout at CB-14

- The modeling work for the Peace II Subsequent Environmental Impact Report (SEIR) by WEI was completed in November 2009. The draft report will be circulated in February 2010 prior to public review.

- The Water Auction has been postponed until spring of 2010 due to the concerns raised by potential bidders about accessing the water.

## Program Element 1: Develop and Implement a Comprehensive Monitoring Program

### Groundwater Level Monitoring

Watermaster initiated a comprehensive monitoring program as part of the implementation of the OBMP. The current groundwater level monitoring program is comprised of about 700 wells. At about 170 of these wells, water levels are measured by the appropriators. Watermaster collects these water level data each quarter. At about 330 of these wells, water levels are measured by cooperating agencies such as the California Department of Toxic Substance Control (DTSC), the County of San Bernardino, and private consulting firms who collect samples at various plume monitoring sites across the basin. Watermaster collects these water level data four times per year. The remaining 200 wells are private wells or dedicated monitoring wells that are mainly located in the southern portion of the Chino Basin. Watermaster staff measures water levels at these wells using manual methods once

## Important Court hearings and orders

- JULY 7—STATUS UPDATE ON PROGRAM ELEMENT NOS. 7, 8, AND 9
- AUGUST 11—ORDER ON WATERMASTER MOTION FOR APPROVAL OF TEMPLATE STORAGE AND RECOVERY AGREEMENT
- SEPTEMBER 8—NOTICE OF MOTION FOR APPROVAL OF CASE MANAGEMENT ORDER
- SEPTEMBER 17—ORDER FOR APPROVAL OF TEMPLATE STORAGE AND RECOVERY AGREEMENT
- DECEMBER 4—NOTICE AND ORDER TO ATTEND STATUS CONFERENCE
- DECEMBER 11—COURT HEARING—STATUS CONFERENCE

# Optimum Basin Management Program

IN NOVEMBER 2009, THE CALIFORNIA STATE LEGISLATURE PASSED AN HISTORIC PACKAGE OF BILLS AND A BOND PROPOSAL THAT ARE DESIGNED TO BOTH ENSURE A RELIABLE AND CLEAN WATER SUPPLY FOR FUTURE GENERATIONS, BUT ALSO RESTORE THE ECOLOGICALLY SENSITIVE AREAS OF THE SACRAMENTO-SAN JOAQUIN DELTA.

## Program Element 1: Develop and Implement a Comprehensive Monitoring Program (Continued)

per month or with pressure transducers that record water levels once every 15 minutes. The wells in the monitoring program within the southern portion of the basin were preferentially selected to assist in Watermaster's monitoring programs for hydraulic control, land subsidence, and desalter impacts to private well owners. The remaining wells are monitored in support of the triennial re-computation of ambient water quality in the Chino-North management zone. The water level data are checked by Watermaster staff and uploaded to a centralized relational database.

### *Groundwater Quality Monitoring*

Watermaster initiated a comprehensive monitoring program as part of the implementation of the OBMP. The groundwater quality monitoring program consists of the following four components:

1. An Annual Key Well Water Quality Monitoring Program designed to target privately owned agricultural wells in the southern portion of Chino Basin that are otherwise not included in an established sampling program.
2. Annual sampling at nine HCMP multi-port monitoring wells strategically placed between the Chino Basin Desalter well fields and the Santa Ana River. Results of the quarterly sampling are used to analyze the effect of the desalter pumping over time by comparing water quality of the native groundwater and the Santa Ana River.
3. Monthly sampling at four near-river wells to characterize the Santa Ana River's influence to nearby groundwater. These shallow monitoring wells along the Santa Ana River consist of two former United States Geologic Survey (USGS) National Water Quality Assessment Program (NAWQA) wells (Archibald 1 and Archibald 2), and two wells (well 9 and well 11) owned by the Santa Ana River Water Company (SARWC).
4. A cooperative basin-wide data collection effort known as the Chino Basin Data Collection (CBDC) program which relies on municipal producers and other government agencies to supply groundwater quality data on a cooperative basis. These sources include the appropriators, Department of Toxic Substance Control (DTSC), Regional Water Quality Control Board (RWQCB), US Geological Survey (USGS), the Counties, and other cooperators. All water quality data are routinely collected, QA/QC'd, and loaded into Watermaster's relational database.

### *Groundwater-Production Monitoring*

All active wells (except for minimum user wells) are now metered. Watermaster reads the agricultural production data from the meters on a quarterly basis and enters these data into Watermaster's relational database.

### *Surface Water Monitoring*

**Water Quality and Quantity in Recharge Basins.** Watermaster measures the quantity and quality of storm and supplemental water entering the recharge basins. Pressure transducers or staff gauges are used to measure water levels during recharge operations. In addition to these quantity measurements, imported water quality data for State Water Project water are obtained from the Metropolitan Water District of Southern California (MWDSC) and recycled water quality data for the RP-1 and RP-4 treatment plant effluents are obtained from IEUA. Watermaster monitors the storm water quality in the eight major channels (San Antonio, West Cucamonga, Cucamonga, Deer Creek, Day Creek, San Sevaine, West Fontana, and DeClez), usually after each major storm event. Combining the measured flow data with the respective water qualities enables the calculation of the blended water quality in each recharge basin, the "new yield" to the Chino Basin, and the adequate dilution of recycled water.



New MWD Turnout (CB-20)

# Optimum Basin Management Program

## Program Element 1: Develop and Implement a Comprehensive Monitoring Program (Continued)

**Surface Water Monitoring in the Santa Ana River (SAR).** Watermaster measures the discharge of the River and selected water quality parameters to determine those reaches of the SAR that are gaining flow from the Chino Basin and/or, conversely, those reaches that are losing flow into the Chino Basin. These bi-weekly flow and water quality measurements are combined with discharge data from permanent USGS and Orange County Water District (OCWD) stream gauges and discharge data from publicly owned treatment works (POTWs). These data are used along with groundwater modeling to assess the extent of hydraulic control.

### *HCMP Annual Report*

In January 2004, the RWQCB amended the Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin to incorporate an updated total dissolved solids (TDS) and nitrogen (N) management plan. The Basin Plan Amendment includes both "antidegradation" and "maximum benefit" objectives for TDS and nitrate-nitrogen for the Chino and Cucamonga groundwater management zones. The application of the "maximum benefit" objectives relies on Watermaster and IEUA's implementation of a specific program of projects and requirements, which are an integral part of the OBMP. On April 15, 2005, the RWQCB adopted resolution R8-2005-0064; thus approving the Surface Water Monitoring Program and Groundwater Monitoring Program in support of maximum benefit commitments in the Chino and Cucamonga Basins.

Pursuant to the Basin Plan and the Watermaster/IEUA permit to recharge recycled water, Watermaster and IEUA have conducted groundwater and surface water monitoring programs since 2004. During this reporting period, Watermaster measured 377 manual water levels at private wells throughout the Chino Basin, conducted two quarterly downloads at the 125 wells containing pressure transducers, collected 90 groundwater quality samples, and 221 surface water quality samples. Quarterly Surface Water Monitoring Program reports that summarize data collection efforts were submitted to the RWQCB in July and October of 2009. The Chino Basin Maximum Benefit Monitoring Program 2009 Annual Report will be submitted to the RWQCB in April 2010.

### *Chino Basin Groundwater Recharge Program*

IEUA, Watermaster, CBWCD, and the SBCFCD jointly sponsor the Chino Basin Groundwater Recharge Program. This is a comprehensive water supply program to enhance water supply reliability and improve the groundwater quality in local drinking water wells throughout the Chino Basin by increasing the recharge of storm water, imported water, and recycled water. The recharge program is regulated under RWQCB Order No. R8-2007-0039 and Monitoring and Reporting Program No. R8-2007-0039.

**Recharge Activities.** On-going recycled water recharge occurred in the Brooks, 8th Street, Hickory, Turner, RP-3, and Ely Basins this reporting period.

**Monitoring Activities.** Watermaster and IEUA collect weekly water quality samples from basins that are actively recharging recycled water and from lysimeters installed within those basins. During this reporting period, approximately 271 basin and lysimeter samples were collected and two recycled water samples were collected for alternative monitoring plans that include the application of a correction factor for Soil-Aquifer Treatment determined from each basin's start-up period. Monitoring wells located down-gradient of the recharge basins were sampled quarterly at a minimum, however,

“AS THE WATER PICTURE FOR THIS YEAR BECOMES CLEARER, WE CAN INCREASE OUR DELIVERIES TO FARMS AND COMMUNITIES THROUGHOUT THE STATE,” SAID DWR DIRECTOR MARK COWIN. “BUT THE AFTERMATH OF THREE YEARS OF DROUGHT AND REGULATORY RESTRICTIONS ON DELTA PUMPING TO PROTECT FISH SPECIES WILL KEEP THIS YEAR’S ALLOCATION FAR BELOW NORMAL. THIS UNDERSCORES, ONCE AGAIN, THE NEED TO IMPLEMENT LONG-TERM SOLUTIONS TO IMPROVE WATER SUPPLY RELIABILITY.”



# Optimum Basin Management Program

## Program Element 1: Develop and Implement a Comprehensive Monitoring Program (Continued)



New Telemetry system being tested

some monitoring wells were sampled more frequently during the reporting period for a total of 108 samples.

**Construction Activities.** Lysimeters and monitoring wells associated with the 7th and 8th Street Basins were installed in the first half of Fiscal Year (FY) 2007/08. There have been no further construction activities since that time.

**Reporting.** Watermaster and IEUA completed the following required reports concerning the recharge program during the reporting period:

- 2Q09 Quarterly Report, submitted to the RWQCB – August 2009
- 3Q09 Quarterly Report, submitted to the RWQCB – November 2009

### Land Surface Monitoring

The MZ-1 Subsidence Management Plan (MZ-1 Plan) was approved by Watermaster in October 2007, and was approved by the Court in November 2007 which ordered its implementation (see Program Element 4: Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1). The MZ-1 Plan calls for a number of activities with the goal of minimizing or completely abating the future occurrence of land subsidence and ground fissuring in Chino Basin. Some of these activities include:

- Continuing the scope and frequency of monitoring within the so-called Managed Area (southwest MZ-1) that was conducted during the period when the MZ-1 Plan was being developed.
- Expanding the monitoring of the aquifer system and land subsidence into other areas of MZ-1 and Chino Basin where the data indicate concern for future subsidence and ground fissuring.
- Monitoring of horizontal strain across the historical fissure zone.
- Further evaluating the potential contribution of pumping in the central and northern portions of MZ-1 on groundwater conditions in the central and southern portions of MZ-1.
- Conducting additional testing and monitoring to refine the Guidance Criteria.
- Developing alternative pumping plans for the MZ-1 producers that are impacted by the MZ-1 Plan.
- Constructing and testing a lower-cost extensometer facility at Ayala Park.
- Evaluating and comparing ground-level surveying and Interferometric Synthetic Aperture Radar (InSAR), and recommending future monitoring protocols for both techniques.
- Conducting an ASR (aquifer injection and recovery) feasibility study at a production well owned by the City of Chino Hills within the Managed Area.
- Providing for recovery of groundwater levels.



Installation of CB-14 Turnout

With regard to monitoring and testing, Watermaster began or continued the implementation of some of these activities called for in the MZ-1 Plan. During this reporting period these activities included:

# Optimum Basin Management Program

## Program Element 1: Develop and Implement a Comprehensive Monitoring Program (Continued)

- The continuation of detailed water-level monitoring at wells within the Managed Area and at wells in central MZ-1. Replacement of water-level-recording transducers at wells where these transducers have failed after about seven years of reliable service.
- Continuation of monitoring and maintenance at the Ayala Park Extensometer Facility. This includes monitoring at the newly installed lower-cost pair of cable extensometers within two piezometers at Ayala Park to test this technology for possible application in other parts of the Basin.
- Began to develop a new testing and monitoring program within and east of the Managed Area with the goals of (1) refining the Guidance Criteria, (2) confirming the existence of the Riley Barrier, (3) testing the feasibility of injection in the Managed Area, (4) better understanding the potential for subsidence and fissuring east of the Managed Area, and (5) evaluating the effect of pumping and drawdown on the fissure zone.
- Collection of InSAR data from radar satellites during all six months of the reporting period, which will be analyzed for land surface displacement in early 2010.

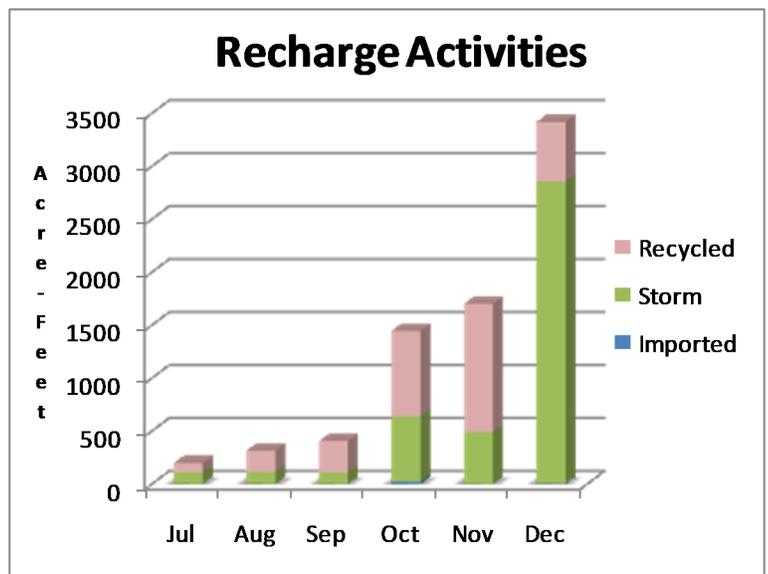
## Program Element 2: Develop and Implement a Comprehensive Recharge Program

Construction on the Chino Basin Facilities Improvement Project (CBFIP) Phase I was completed by December 31, 2005 at a cost of \$38M; 50-percent from a State Water Resources Control Board (SWRCB) Proposition 13 Grant, and 25-percent each from Watermaster and IEUA. A CBFIP Phase II list of projects was developed by Watermaster and IEUA, including monitoring wells, lysimeters, recycled water connections, Supervisory Control And Data Acquisition (SCADA) system expansions, three MWDSC turnouts, and berm heightening and hardening. At a cost of approximately \$10.5M, these Phase II facilities were financed through a 50-percent Grant from DWR and 25-percent each from Watermaster and IEUA.

In FY 2007/08, the CBFIP Phase I facilities were able to recharge approximately 13,000 Acre-Feet (AF) of storm and recycled water. With the completion of the Phase II facilities by March 2010, the total recharge capacity will be about 96,000 AF. By the start of FY 2009/10, most of the basins will be able to operate on a 12 months-per-year basis with combinations of storm, imported, and recycled water, with occasional downtime for silt and organic growth removal. Operations and basin planning are coordinated through the Groundwater Recharge Coordinating Committee (GRCC), which met quarterly during this reporting period.

Because of the drought, Delta water quality, water supply, and environmental issues, MWDSC has been unable to provide replenishment water to southern California since May 1, 2007. This greatly restricts Watermaster's ability to recharge recycled water, since the California Department of Public Health (DPH) requires that approximately four parts of diluent water (imported or storm water) be blended with each part of recycled water. Watermaster and IEUA are working closely with DPH and the Regional Water Quality Control Board to reduce the blend ratio. For this reporting period, about 7,474 AF of storm and recycled water were recharged. This includes 26 AF of imported water that was used for testing the new MWD turnouts.

Preparation of the Recharge Master Plan update is underway in satisfaction of Condition Subsequent No. 5. On March 28, 2008, the initial meeting of the Recharge Master Plan group occurred. A detailed outline of the scope and content of the Recharge Master Plan update was filed with the Court for approval on June 30, 2008. A progress report was provided to the Court on January 1, 2009. Since that time the Court has relieved Watermaster of the semi-annual project reporting. During the reporting period two technical



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## Program Element 2: Develop and Implement a Comprehensive Recharge Program (Continued)

memoranda have been prepared and workshops were conducted for project stakeholders. The project website has been maintained as a receptacle for project references, memoranda, meeting notes and presentations. The final updated Recharge Master Plan is due to the Court by July 1, 2010.

## Program Element 3: Develop and Implement Water Supply Plan for the Impaired Areas of the Basin; and

## Program Element 5: Develop and Implement Regional Supplemental Water Program

Construction of the Chino I Desalter Expansion and the Chino II Desalter facilities was completed in February 2006. As currently configured, the Chino I Desalter provides 2.6 million gallons per day (MGD) of treated (air stripping for VOC removal) water from Wells Nos. 1-4, 4.9 MGD of treated (ion exchange for nitrate removal) water from Well Nos. 5-15, and 6.7 MGD of treated (reverse osmosis for nitrate and TDS removal) water from Wells Nos. 5-15 for a total of 14.2 MGD (15,900 AFY). The Chino II Desalter provides 4.0 MGD of ion exchange treated water and 6.0 MGD of reverse osmosis treated water from eight additional wells for a total of 10.0 MGD (11,200 AFY).

During the reporting period, negotiations continued between the Chino Desalter Authority (CDA) and Western Municipal Water District (WMWD) to allow WMWD to join the CDA and to expand the Chino II Desalter by 10.5 MGD (11,800 AFY). The CDA approved WMWD membership in November 2008. Planning and engineering investigations related to the expansion are ongoing. Watermaster is working with the CDA parties to produce a realistic schedule to be approved by the RWQCB. Raw water will be drawn from existing CDA II wells, and possible additional new wells, if needed. In addition, a new Chino Creek Desalter Well Field, required for the hydraulic control commitment associated with Maximum Benefit, will provide additional raw water to the Chino I Desalter, enabling some existing wells to direct production to the expanded Chino II Desalter facility, if approved by the Chino Basin Desalter Authority.

## Program Element 4: Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1 and Management Zone 3

### *MZ-1 Management Plan*

Because of the historical occurrence of pumping-induced land subsidence and ground fissuring in southwestern Chino Basin (southern MZ-1), the OBMP called for the development and implementation of an interim management plan for MZ-1 that would:

- Minimize subsidence and fissuring in the short-term,
- Collect information necessary to understand the extent, rate, and mechanisms of subsidence and fissuring, and
- Formulate a management plan to reduce to tolerable levels or abate future subsidence and fissuring.

From 2001-2005, Watermaster developed, coordinated, and conducted an Interim Monitoring Program (IMP) under the guidance of the MZ-1 Technical Committee, which is composed of representatives from all major MZ-1 producers and their technical consultants. The IMP was an aquifer-system and land subsidence investigation focused in the southwestern region of MZ-1 that would support the development of a long-term management plan to minimize and abate subsidence and fissuring (MZ-1 Plan). The IMP involved the construction of highly-sophisticated monitoring facilities, such as deep borehole extensometers and piezometers, the monitoring of land surface displacements through traditional ground-level surveys and remote-sensing techniques, the detailed monitoring of the aquifer system with water-level-recording transducers installed at an array of production and monitoring wells, and the purposeful stressing of the aquifer system through multiple controlled pumping tests.

The investigation methods, results, and conclusions are described in detail in the MZ-1 Summary Report, dated February 2006. The investigation provided enough information for Watermaster to develop Guidance Criteria for the MZ-1 producers in the investigation area that, if followed, would minimize the potential for subsidence and

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## Program Element 4: Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1 and Management Zone 3 (Continued)

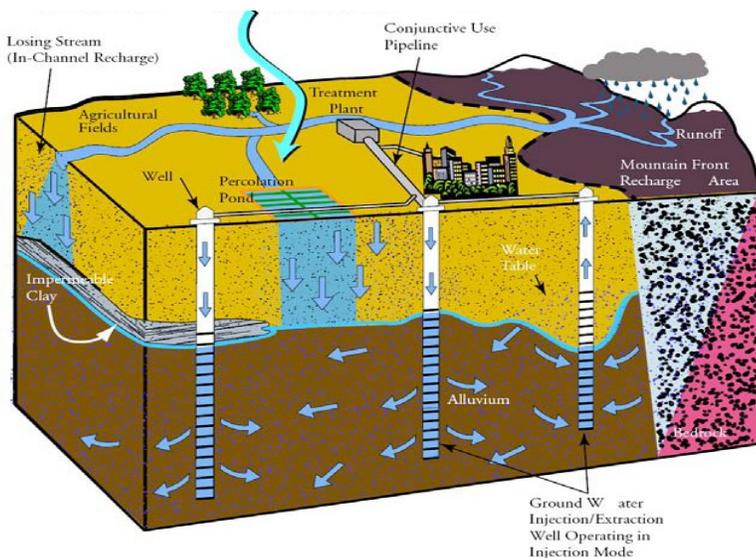
fissuring during the completion of the MZ-1 Plan. The Guidance Criteria included a listing of Managed Wells and their owners subject to the criteria, a map of the so-called Managed Area, and an initial threshold water level (Guidance Level) of 245 feet below the top of the PA-7 well casing. The MZ-1 Summary Report and the Guidance Criteria were adopted by the Watermaster Board in May 2006. The Guidance Criteria formed the basis for the MZ-1 Plan, which was approved by Watermaster in October 2007. The Court approved the MZ-1 Plan in November 2007 and ordered its implementation.

During this reporting period, Watermaster continued implementation of the MZ-1 Plan. Drawdown at the PA-7 piezometer did not fall below the Guidance Level during the reporting period, and very little, if any permanent compaction was recorded at the Ayala Park Extensometer. Data collection during 2009—including InSAR, ground-level survey, extensometer, and groundwater-level data—was completed and is being compiled and analyzed for inclusion in the 2008-09 MZ-1 Report which will be published during the next reporting period.

### MZ-3 Monitoring Program

Watermaster performed a groundwater investigation to characterize groundwater levels and quality in Management Zone 3 (MZ-3) of the Chino Basin. The OBMP Implementation Plan states that MZ-3 is hydrologically out of balance and that new storm water and supplemental water recharge will be required to keep MZ-3 in balance. The blend of storm water, imported water, and recycled water used in the future to hydrologically balance MZ-3 must be of a quality to protect beneficial uses and comply with the proposed Title 22 regulations for planned recharge projects that use recycled water. Watermaster drilled, installed, developed, and sampled two nested, multiple-depth piezometers in the projected path of the Kaiser Steel plume, which is an immediate threat to potable supply wells owned by the City of Ontario and Jurupa Community Services District. The monitoring program also incorporated four quarters of sample collection and analyses from 22 wells in MZ-3 to assess other groundwater quality issues, including total dissolved solids (TDS), nitrate, and perchlorate. Watermaster completed and submitted the final report to the California Department of Water Resources (DWR) in December 2008, in partial fulfillment of the AB303 Grant requirements. These wells have been added to the Groundwater Quality Monitoring Program. MZ3-1, the deepest well in the eastern nest of wells, has relatively

elevated TDS and sulfate, which may be an indication that the Kaiser plume has reached this well. MZ3-1 is about 2,300 feet up gradient of JCS D 19.



Managed Groundwater Basin

# Optimum Basin Management Program

## Program Element 6: Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region (Regional Board) and Other Agencies to Improve Basin Management; and Program Element 7: Develop and Implement a Salt Management Program

### *Ontario International Airport*

Watermaster reviewed EcoGeo monthly reports and received electronic data deliverables that were uploaded into Watermaster's database. Watermaster began coordination with the OIA parties for rounds of split sampling of the recently installed OIA monitoring wells.

Regional Water Quality Control Board minutes from 1953 state that there was a release of chromic acid waste in 1948 from GE's Flat Iron facility into the City of Ontario sanitary sewer system. Watermaster obtained historical data (1948 to 1961) for hexavalent and total chromium in groundwater south of OIA and plotted maps over several periods from 1948 to present. These maps show the formation and dissipation of a hexavalent chromium plume south of OIA. Watermaster created maps and tables showing the location of the four OIA monitoring wells, OIAS plume contours, the braided Cucamonga Creek in 1938, and TCE concentrations in wells. It was concluded that the hexavalent chromium plume dissipated to background concentrations by mid 1960.

### *Chino Airport*

Watermaster coordinated with the County of San Bernardino, Department of Airports (County) and exchanged pertinent well, water level, and water quality for wells that the County has installed and for wells that Watermaster samples; and researched property owner information for the commercial property at the corner of Kimball and San Antonio Ave; this property is being pursued as a potential alternate monitoring well location for one of the new Chino Airport monitoring wells. This alternate location would still meet the County's needs, while saving Watermaster parties the cost of a new monitoring well for the HCMP. Watermaster conducted meetings with the property owner, John Hancock Life Insurance, and the City of Chino.

Watermaster queried its database for 1,2,3-trichloropropane (TCP) in wells within the Chino Airport Plume and in other wells in the vicinity of the Chino Airport Plume; and created Box and Whisker Plot and performed statistical analyses on the TCP data. This analysis was used to convince the County that there is a plume of TCP emanating from the Chino Airport that will need to be remediated and that the TCP is not from non-point source fumigation for nematodes with a pesticide.

Watermaster ran the MT3D model exported results, including water level, flow velocity, and TCE plumes for the years: 2011, 2013, 2015, 2020, 2025, and 2030 for the currently proposed Chino Creek Well Field alignment in the preliminary design report (PDR) to estimate plume capture.

### *California Institute for Men*

Watermaster queried TCE and PCE data from the monitoring wells at the California Institute for Men (CIM) and created time histories of the monitoring well data by aquifer zones: undifferentiated A, A1, A2, B, C, and D. This work was performed in support of the Watermaster review and response to the Request for No Further Action submitted to the Regional Board by the State of California. Watermaster and the State began work on a memorandum of understanding that would allow Watermaster to continue to monitor a subset of wells on CIM.

### *Perchlorate in MZ-3*

A regional study, the Cross-Fault Isotope Study, whose objective is to determine the source of the widespread, low-level perchlorate in groundwater in MZ-3, was proposed and Watermaster was asked to participate. The project is to be funded by the Environmental Security Technology Certification Program (ESTCP), which is a Department of Defense (DoD) program that promotes innovative, cost-effective environmental technologies through demonstration and validation at DoD sites. Watermaster met with the parties involved in the study, contacted the University of Illinois/Chicago – who would perform the isotope work, and helped draft the study work plan. Watermaster's role in this study is to provide feedback and review, but not to fully participate or contribute funding to the study.

“ANYONE WHO  
CAN SOLVE THE  
PROBLEMS OF  
WATER WILL BE  
WORTHY OF  
TWO NOBEL  
PRIZES—ONE  
FOR PEACE AND  
ONE FOR  
SCIENCE.”  
JOHN F.  
KENNEDY

“WHEN THE  
WELL'S RUN DRY,  
WE KNOW THE  
WORTH OF  
WATER.”  
BENJAMIN  
FRANKLIN

# Optimum Basin Management Program

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## **Program Element 8: Develop and Implement a Groundwater Storage Management Program; and Program Element 9: Develop and Implement a Storage and Recovery Program**

The existing Watermaster/IEUA/MWDSC Dry-Year Yield (DYY) program continued during the reporting period. All DYY program construction projects have been completed and are currently being used for a DYY take, or removal from storage.

Due to the current drought conditions throughout the state of California, Metropolitan has not provided water for the DYY account since April 2007. As of April 30, 2008, about 86,000 AF had been stored in the Basin in Metropolitan's DYY account. On May 1, 2008, Metropolitan called for the parties to begin withdrawing water from the DYY account in the amount of 33,000 AF per 12-month period. At the end of the calendar year, the account balance was 17,890 AF.

In February 2008, the DYY Expansion Project was initiated by IEUA and Watermaster to evaluate increasing the DYY storage account. The purpose of the DYY Expansion Project was to determine the facilities needed to store up to 150,000 AF and to recover up to 50,000 AFY. The expansion project analysis was completed in December 2008. The expansion project evaluated the technical, financial, and institutional frame work for individual projects to move forward. Negotiations to-date related to actual projects and the amount of expansion have not resulted in any planned expansion projects.