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2 INTRODUCTION

2.1 Plan Description and History

EMWD adopted the West San Jacinto Groundwater Basin Management Plan (Management Plan) in June 1995 in accordance with Assembly Bill 3030 (AB3030) enacted in 1992, which is now codified in the California Water Code Sections 10750 through 10755.

The Management Plan is intended to protect the vested interests of existing groundwater producers while providing a planning framework for new water supply projects for the benefit of groundwater producers and the public. The Management Plan goal includes:

- Establishment of a Groundwater Basin Manager
- Monitoring of Groundwater Production
- Monitoring of Groundwater Level and Quality
- Development of Well Construction Policies
- Development of a Well Abandonment and Destruction Program
- Monitoring of Well Construction, Abandonment, and Destruction
- Groundwater Quality Protection
- Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use
- Maximize Yield Augmentation with Local Resources – Local Runoff and Reclaimed Water
- Maximize Conjunctive Use
- Groundwater Treatment

Stakeholders in the Management Plan include the cities of Moreno Valley and Perris; water purveyors such as EMWD and the Nuevo Water Company; and private groundwater producers. EMWD oversees a Groundwater Monitoring Program within the Management Plan area. A well owner's participation in the Groundwater Monitoring Program is voluntary and at no cost to the well owner. Water quality samples are taken annually, water levels are measured bi-annually, and groundwater extraction is read monthly. This data is provided to the well owners in the form of an Annual Well Owner's Report.

2.2 Advisory Committee

In accordance with the Management Plan, an Advisory Committee was established. The purpose of the Advisory Committee is to:

- 1) Study, review, and provide comments and recommendations on all plan activities;
- 2) Assist in the development of rules and regulations for the plan and for groundwater resources evaluation projects; and
- 3) Evaluate feasibility plans, demonstration projects, and implementation plans.

The Advisory Committee consists of representatives of the cities, water purveyors, and private groundwater producers within the Management Plan area. The members representing the cities or water purveyors are appointed by their respective agencies. Those members representing the private groundwater producers are elected by the private well owners. Members (and officers) serve two-year terms, which expire in August of odd-numbered years.

Following EMWD's purchase of the Moreno Valley Mutual Water Company (MVMWC), the seat on the Advisory Committee formerly held by the MVMWC representative remained vacant until 2005 when the Advisory Committee determined that this vacant seat should be filled by the McCanna Ranch Water Company representative. During 2008, the City of Perris purchased the McCanna Ranch Water Company, and as a result, the seat is once again vacant. Committee members and officers as of the August 2007 election are as follows:

Chairman:	Mrs. Essie Bootsma	Private Producer, John Bootsma Dairy
Vice-Chairman	Mr. Ed Piester	Nuevo Water Company
Members:	Mr. Leon Motte	Private Producer, Motte Mutual Water Co.
	Mr. Kent Wegelin	City of Moreno Valley
	Mr. Anthony J. Pack	Eastern Municipal Water District
	Mr. Ron Carr	City of Perris
	Mr. Lou Ochoa	McCanna Ranch Water Company

Mr. Bruce Scott, Scott Brothers Dairy Farms, serves as the Hemet/San Jacinto Valley area Liaison to the Advisory Committee. Mr. Piester attends the Hemet/San Jacinto Valley meetings as liaison observer.

At the March 2004 meeting, the Advisory Committee agreed to hold an annual meeting to review and approve the annual report and hold other meetings for specific purposes, to be either called by the Advisory Committee or requested by EMWD staff. In addition, the Monthly Report to the Advisory Committee should be expanded to include issues raised by the Advisory Committee, current industry topics, or technical issues that may be of interest

to the Advisory Committee. Copies of the 2008 Monthly Reports to the Advisory Committee may be found in Appendix D.

2.3 Purpose of the Annual Report

This is the thirteenth (13th) annual report resulting from the Management Plan. This report documents activities and implementation of previously identified recommendations during the 2008 calendar year in the Management Plan area. The purpose of this report is to:

- 1) Compile, review, evaluate, and analyze the 2008 Groundwater Quality and Water Level Monitoring Program data;
- 2) Summarize groundwater-related changes from previous years;
- 3) Review, analyze, and report the results of the Groundwater Extraction Monitoring Program;
- 4) Update the activities related to efforts in the various management zones;
- 5) Report on the status of efforts in response to recommendations presented in the previous year's report;
- 6) Provide a technical document on the status of the management zones for future efforts; and
- 7) Identify Plan implementation goals and recommendations for the next year.

2.4 Progress on Recommendations Since the Previous Report

The 2007 Annual Report contained eleven recommendations and future activities for year 2008. Those recommendations and activities, and the status of efforts with regard to each, are outlined below.

2.4.a Continue the Groundwater Quality and Water Level Monitoring Programs

During 2008, 102 wells were sampled in the Management Plan area to assess water quality. Water levels were measured twice annually, spring and fall, to provide a time-series dataset of water elevations, hydrologic conditions, and direction of groundwater flow. Spring water levels were monitored in 165 wells by EMWD field personnel and water levels from an additional 470 wells were reported by March Air Reserve Base (MARB). Fall water levels were monitored in 154 wells by EMWD field personnel and water levels from an additional 470 wells were reported by MARB. These data were compiled and entered into the Regional Water Resources Database (RWRD) and subsequently utilized in the 2008 analysis and calculations.

2.4.b Continue the Groundwater Extraction Monitoring Program

A total of 70 major extraction wells in the Management Plan area were considered under the 2008 extraction analyses. Groundwater extraction was metered in 52 wells, while extraction from 18 wells was estimated by EMWD staff. Seventy-five percent (75%) of the total groundwater extraction was metered. Estimation methods for non-metered extraction wells were refined and revised over the last year by comparing extraction of non-metered wells to metered wells serving similar acreage, crops, and/or number of livestock. Additionally, review of the Annual Notices of Recordation of Groundwater Extraction filed with EMWD, and reported to the State Division of Water Rights, provides data to crosscheck the accuracy of estimates as well as recordations of metered wells.

All significant extraction wells are believed to be accounted for within the program, and extraction figures for 2008 are believed to be the most comprehensive figures available.

2.4.c Continue the Inactive Well Capping/Sealing Program

Under the Inactive Well Capping/Sealing Program inactive wells and open casings are capped and/or sealed by field staff at no expense to the well owner. The wells, when possible, may be subsequently used as monitoring wells for water level and/or water quality. During the eight years the program has been in existence, sixty (60) wells in the Management Plan area have been capped/sealed. During 2008, one well was identified and capped/sealed under this program.

2.4.d Continue Providing Annual Reports to Well Owners Participating in the Groundwater Monitoring Programs

Annual reports were provided to well owners participating in the Groundwater Monitoring Programs. Participants were assisted with the filing of their Annual Notices of Recordation of Groundwater Extraction with EMWD, and subsequent reporting to the State Division of Water Rights. First Notice forms were provided to owners of new wells or wells never recorded.

In June 2008, well owners participating in the monitoring programs were provided with copies of 2008 water quality analyses, water level measurements, and annual groundwater extraction amounts for each well they own in the Management Plan area.

2.4.e Continue Monthly Reports to the Advisory Committee

Monthly Reports were sent to the Advisory Committee as a means of keeping the Committee informed of activities within the Management Plan area. The reports also included information regarding the Hemet/San Jacinto Valley area and general news relevant to groundwater issues. The Monthly Reports for 2008 may be found in Appendix D.

2.4.f Continue to Pursue Potential State or Federal Funding Sources for the Benefit of the Management Plan Area

In an ongoing effort to attain external funding sources, EMWD applied for a grant from the National Water Research Institute, Southern California Salinity Coalition for the Pilot Testing for the Management, Dewatering, and Disposal of Brine Softening Solids study in 2008. Grants are to be awarded in 2009.

2.4.g Support the Re-organization of the Annual Report

In an ongoing effort to improve the usefulness and effectiveness of the Annual Report, some minor changes were made to the tables, figures, and maps for 2008.

2.4.h Support EMWD's Groundwater Salinity Management Program

A description of the status of programs and/or processes that EMWD supported during 2008 in regards to the Groundwater Salinity Management Program follows.

Perris Basin Desalination Program

During 2008, the Menifee and Perris I Desalters produced 1,544 AF and 1,148 AF of potable water for the Management Plan area, respectively, for a total of 2,692 AF. In addition, all twelve desalter wells have been completed and stand ready for operation. Five of these wells, Wells 76, 81, 82, 83, and 84, were operated in 2008 producing 4,117 AF of brackish groundwater, thereby removing approximately 12,000 tons of salt from the basin. Due to water quality issues, Wells 75, 77, 85, 86, 87, 88, and 89, remain off-line except for testing purposes.

Perris II Desalter

In July 2003, EMWD's Board of Directors approved and authorized an agreement with the Army Corps of Engineers (ACoE) in an amount not to exceed \$4 million for the design of the South Perris Water Supply Desalination Project (Perris II Desalter). This financial commitment is subject to the availability of federal appropriations of \$3 million

with the local share not to exceed \$1 million. The Board approved and authorized an appropriation of over \$300,000 as part of EMWD's 25% local share under the agreement with the ACoE. The project is currently in design and is scheduled for completion by October 2011. When completed, Perris II will be EMWD's third desalter in the Management Plan area.

Iron and Manganese Removal Facilities

In 2004, EMWD initiated an effort to evaluate alternative technologies for removal of iron and manganese prior to desalination. A removal process was selected and is in final design. Completion of construction is scheduled for August 2011.

Pilot Testing for Managing, Dewatering, and Disposal of Brine Softening Solids

EMWD's brackish groundwater contains high levels of silica, calcium, sulfates, iron, barium, strontium, and selenium. These elements polymerize and foul membranes, and have limited the Perris Basin Desalination Program (PBDP) to 70% recovery.

EMWD applied for, and in 2005 received, a grant from the California Department of Water Resources (DWR) to conduct the *Desalination Recovery and Enhancement and Concentrate Management Study 2008*. This study constructed pilot-scale facilities for the evaluation of chemical precipitation/softening, followed by secondary reverse osmosis (RO) and electro-dialysis reversal (EDR). As a result of the study, overall recovery was increased to the range of 90 to 96%, and development of capital and operating cost estimates for full-scale facilities were generated.

EMWD also applied for, and in 2005 received, a grant from the United States Bureau of Reclamation (USBR) to conduct the *Evaluation and Selection of Available Processes for a Zero Liquid Discharge System for the Perris, California, Groundwater Basin*. Desk-top models, bench-scale facilities, and pilot-scale facilities were incorporated into 14 treatment processes to achieve zero liquid discharge (ZLD) that included: secondary reverse osmosis (RO), electro-dialysis reversal (EDR), forward osmosis (FO), membrane distillation (MD), seeded reverse osmosis (SPARRO), brine concentrators (BC), crystallizers (XLZR), evaporation ponds, and salt recovery using SAL-PROC™. These processes were evaluated, compared for effectiveness and economics, and prioritized. Total costs were calculated as the sum of the amortized capital annual costs, plus operations and maintenance (O&M) costs, but did not include possible revenue generated from recovery. Some technologies still require further development before the processes can be commercially available at more competitive pricing in the future.

In 2007, EMWD initiated the *Pilot Testing for Managing, Dewatering, and Disposal of Brine Softening Solids* study as a second phase to the DWR study to address specific concerns from the original study. For this study, the pilot-scale facilities were re-designed

and constructed for the evaluation of chemical precipitation/softening, followed by secondary reverse osmosis (RO) and electro-dialysis reversal (EDR). This study specifically addresses issues and costs with the handling, dewatering, and disposal of sludge/solids generated by the pilot-scale facilities. Completion of the study is scheduled for August 2009.

Quantification of Nitrogen Removal under Recycled Water Recharge Ponds

The Basin Plan TIN Amendment was prompted by the RWQCB determination that the soils beneath the management zones have very little, if any, capacity to assimilate the TIN that is present in recycled water, as demonstrated by water quality objectives for nitrogen being exceeded. According to the RWQCB, of the nine management zones in the San Jacinto Watershed that are within EMWD's service area, six have no assimilative capacity and the remaining three have very little. The effect of the Basin Plan Amendment, by adopting a default 25% reduction in nitrogen concentrations, would be to severely restrict the use of recycled water.

In 2007, EMWD completed a study that evaluated and quantified nitrogen losses in recycled water as it percolates from recharge ponds through the unsaturated zone to the groundwater table using a system of nested lysimeters installed below the ponds. Funding for the \$288,279 study was provided by EMWD and a \$200,000 grant from the California Department of Water Resources.

In this effort, two clusters of lysimeters were installed to quantify site-specific nitrogen loss coefficients. The sites chosen were the ponds at the Moreno Valley Regional Water Reclamation Facility and the Alessandro ponds in San Jacinto. Each lysimeter cluster included four individual lysimeters installed to depths of approximately 5, 10, 15, and 25 feet. The results of the study suggested a 60% reduction in nitrogen concentrations.

During 2008, EMWD continued to monitor the lysimeters to further confirm reduction in nitrogen concentrations.

2.4.i Support Construction and Operation of the North San Jacinto Water Supply Initiative

At the request of property owners in the Lakeview/Hemet North, San Jacinto Lower Pressure, and San Jacinto Upper Pressure Management Zones, EMWD initiated the North San Jacinto Water Supply Initiative. Issues of concern were: rising groundwater levels in management zones with poor quality groundwater; falling groundwater levels in management zones with good water quality; and the threatened loss of local groundwater supplies. As a part of this effort, local dairy farmers along the Ramona Expressway are working cooperatively with EMWD to reduce groundwater production.

The second portion of the project includes construction of a pipeline along Ramona Expressway to serve raw water to the area.

In 2008, all facilities were completed and operational, and agreements were executed with the dairymen. During September 2008, the pipeline became operational serving 123 AF of raw water to the dairymen.

2.4.j Support EMWD's Participation in Regional Activities

Basin Monitoring Task Force

As an outgrowth of the TIN/TDS Task Force, the agencies responsible for implementing the Basin Plan Amendments formed The Basin Monitoring Task Force. The Santa Ana Watershed Project Authority (SAWPA) was identified to administer/facilitate the Task Force. EMWD participates on the Task Force and attended six meetings during 2008.

In 2008, Wildermuth Environmental Inc. was hired to prepare updates of the Santa Ana Watershed ambient water quality computation and the wasteload allocation. The Basin Plan requires that ambient water quality be recomputed every three years. Additionally, the Santa Ana Regional Water Quality Control Board utilizes the wasteload allocation to support changes to the agencies' NPDES permits. Since this report is based on 2000 data, it needs to be updated to reflect current activities. The *Recomputation of the Ambient Water Quality in the Santa Ana Watershed for the Period of 1987 to 2006* was completed in August 2008. The Task Force continues to work on the *2008 Santa Ana River Wasteload Allocation Model Report* to be completed in May 2009.

Total Maximum Daily Loading

Lake Elsinore and Canyon Lake were identified in 1994, 1998, and 2002 by the California Regional Water Quality Control Board, Santa Ana Region (Regional Board) on the Clean Water Act (CWA) Section 303(d) list of impaired waters for nutrients. In 2000, the Regional Board initiated the process to develop Total Maximum Daily Loads (TMDL) for nutrients for both Canyon Lake and Lake Elsinore, as required by the federal Clean Water Act and California's Nonpoint Source Pollution Control Plan. This process included the formation of the Lake Elsinore and Canyon Lake TMDL Task Force. EMWD participates in the Lake Elsinore and Canyon Lake TMDL Task Force, which is comprised of local stakeholders interested in water quality issues within the San Jacinto Watershed.

During 2008, the Task Force continued to make progress on the task elements required by the Final Nutrient TMDL for Lake Elsinore and Canyon Lake. These tasks include continuous monitoring and reporting for the watershed, lakes, dairies, agriculture, forest

service properties, as well as management plans and status reports for the various activities that occur in the Watershed. The Task Force shares the costs for the activities and collectively seeks grant funding. The Task Force met five times during 2008 and included representatives from local cities, Riverside County, agricultural and dairy interests, environmental groups, as well as the regulatory community.

Western Riverside County Agricultural Coalition

The Western Riverside County Agricultural Coalition (WRCAC) is a 501(c) 3 non-profit organization comprised of dairy and agricultural operators interested in environmental issues affecting the agricultural community in the San Jacinto Watershed. WRCAC is currently the representative for agricultural and dairy interests on the Lake Elsinore and Canyon Lake TMDL Workgroups and has participated for the past few years in this capacity.

WRCAC is currently working on two (2) grants:

In conjunction with the San Jacinto Basin Resource Conservation District (SJBRC), WRCAC is working on an Integrated Regional Dairy Management Plan (IRDMP) which comprehensively addresses dairy issues in the San Jacinto Watershed. Several critical issues are being addressed in this document. Specifically, salt offset options included in this grant explore two significant Best Management Practices (BMP's): New Logic's Vibratory Shear Enhancement Process for treating wastewater on a pilot scale, and the USDA Salinity Laboratory's Spatio-Temporal Assessment of Nutrient Management Plan Performance for Field Scale Lagoon Water Application at Scott Brothers Dairy. This grant was frozen with the State Budget Crisis. Some minor tasks are completed. However, the IRDMP and USDA Salinity Lab BMP are still outstanding. Other avenues for funding are being pursued.

WRCAC has the lead role on the second grant titled "TMDL Agricultural Operator Voluntary Agricultural Program in the San Jacinto Watershed." This grant provides the development of a process for implementing TMDL for the agricultural and dairy community in the San Jacinto watershed. This grant was frozen with the State Budget Crisis, but work continued on this grant. The TMDL stakeholder aspect of the grant is nearing completion and \$400,000 has been delivered to the LESJWA TMDL Task Force thus far. Completion of the grant is expected in 2010.

San Jacinto Watershed Council

The San Jacinto River Watershed Council (SJRWC), a non-profit organization, completed a Proposition 50, Chapter 8 Planning Grant in 2007. The project included the development of an Integrated Regional Watershed Management Plan for the San Jacinto Watershed with 110 projects identified for implementation. Additionally,

four specific analyses were completed on the project: the Gap Feasibility project, Canyon Lake waterbody/watershed monitoring, Sediment Flux Oxygen Demand Study with in-lake alternatives for Canyon Lake, and a Septic System Management Plan Assessment. During the course of the grant funding, an additional \$80,000 was funded (matching funds) through the US Bureau of Reclamation for an "Upper San Jacinto Sediment Transport Study."

The SJRWC continues to look for funding to implement various projects that have been identified and address strategic issues and goals. The SJRWC is 100% stakeholder donation driven.

March Air Reserve Base Superfund Clean-Up and Groundwater Modeling Effort

As part of Superfund Clean-Up Effort, March Air Reserve Base (MARB) hired Montgomery Watson Harza (MWH) to conduct soil and groundwater mitigation of volatile organic compounds in areas identified in and around MARB. MWH has also initiated efforts to develop a groundwater numerical model for MARB and adjacent areas. During 2008, EMWD and MARB continued to voluntarily participate in a data exchange program to fully support the goals of each agency, and MWH continued their work on the development of their model.

2.4.k Support the Design and Implementation of EMWD's Key Well Program.

EMWD initiated the implementation of a Key Well Program to increase the precision and efficiency of the groundwater monitoring effort. Areas of Key Well deficiencies were identified, and efforts were initiated to locate parcels for new monitoring wells in these areas. Also, efforts were initiated to coordinate with the County of Riverside to develop procedures that would ensure proper abandonment and destruction of wells within EMWD's service area. In addition, efforts were initiated with EMWD's New Business Development Department to develop procedures to coordinate with the developers and inform them of the County Ordinance for proper abandonment and destruction of wells, inform the developer that the County has been notified of the well, and negotiate a replacement well with the developer.