CHINO BASIN WATERMASTER

NOTICE OF MEETINGS

Thursday, April 13, 2006

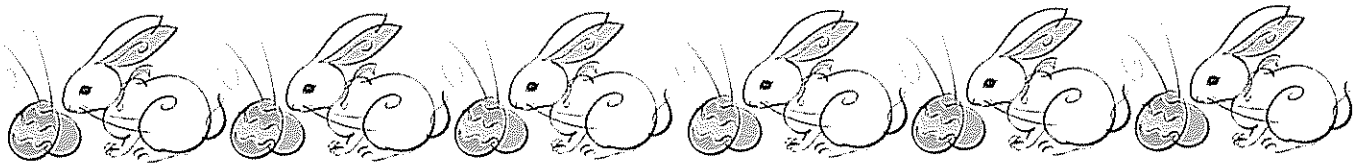
9:00 a.m. – Joint Appropriative and Non-Agricultural Pool Meeting

AT THE CHINO BASIN WATERMASTER OFFICES
9641 San Bernardino Road
Rancho Cucamonga, CA 91730
(909) 484-3888

Tuesday, April 18, 2006

9:00 a.m. – Agricultural Pool Meeting

AT THE INLAND EMPIRE UTILITIES AGENCY OFFICES
6075 Kimball Ave. Bldg. A Board Room
Chino, CA 91710
(909) 993-1600



CHINO BASIN WATERMASTER

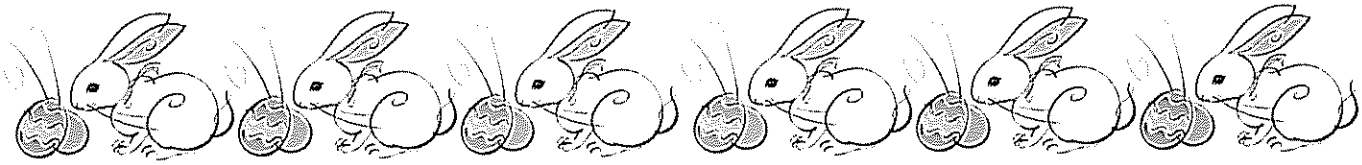
April 13, 2006

9:00 a.m. - Joint Appropriative & Non-Agricultural Pool Meeting

April 18, 2006

9:00 a.m. - Agricultural Pool Meeting

AGENDA PACKAGE



CHINO BASIN WATERMASTER
JOINT MEETING APPROPRIATIVE & NON-AGRICULTURAL POOLS

9:00 a.m. – April 13, 2006
At The Offices Of
Chino Basin Watermaster
9641 San Bernardino Road
Rancho Cucamonga, CA 91730

AGENDA

CALL TO ORDER

AGENDA - ADDITIONS/REORDER

I. **CONSENT CALENDAR**

Note: All matters listed under the Consent Calendar are considered to be routine and non-controversial and will be acted upon by one motion in the form listed below. There will be no separate discussion on these items prior to voting unless any members, staff, or the public requests specific items be discussed and/or removed from the Consent Calendar for separate action.

A. **MINUTES**

1. Minutes of the Joint Appropriative and Non-Agricultural Pool Meeting held March 9, 2006 *(Page 1)*

B. **FINANCIAL REPORTS**

5. Cash Disbursements for the month of March 2006 *(Page 15)*
6. Combining Schedule of Revenue, Expenses and Changes in Working Capital for the Period July 1, 2005 through February 28, 2006 *(Page 19)*
7. Treasurer's Report of Financial Affairs for the Period February 1, 2006 through February 28, 2006 *(Page 21)*
8. Profit & Loss Budget vs. Actual July through February 2006 *(Page 23)*

II. **BUSINESS ITEMS**

A. **MZ1 SUMMARY REPORT**

Consider Approval of the February 2006 MZ-1 Summary Report *(Page 25)*

III. **REPORTS/UPDATES**

A. **WATERMASTER GENERAL LEGAL COUNSEL REPORT**

1. Peace II Process
2. Santa Ana River Water Rights Application

B. **WATERMASTER ENGINEERING CONSULTANT REPORT**

1. Update on Report on Balance of Recharge and Discharge

C. **CEO/STAFF REPORT**

1. Consequences of Non-Implementation of Peace II
2. DataX Presentation
3. Legislative Update
4. MWD Groundwater Study

5. Workshops Update
6. Storm Water/Recharge Update

IV. INFORMATION

1. Newspaper Articles *(Page 95)*

V. POOL MEMBER COMMENTS

VI. OTHER BUSINESS

VII. FUTURE MEETINGS

April 11, 2006	9:00 a.m.	GRCC Committee Meeting
April 13, 2006	8:00 a.m.	MZ1 Technical Committee Meeting
April 13, 2006	9:00 a.m.	Joint Appropriative & Non-Agricultural Pool Meeting
April 18, 2006	9:00 a.m.	Agricultural Pool Meeting @ IEUA
April 18, 2006	1:00 p.m.	Confidential Negotiation Session
April 20, 2006	9:30 a.m.	DHS & RWQCB Public Hearing
April 20, 2006	1:00 p.m.	Water Quality Committee Meeting
April 25, 2006	9:00 a.m.	GRCC Committee Meeting
April 27, 2006	9:00 a.m.	Advisory Committee Meeting
April 27, 2006	11:00 a.m.	Watermaster Board Meeting
April 27, 2006	1:00 p.m.	Boardsmanship Workshop
May 2, 2006	9:00 a.m.	Budget Workshop

Meeting Adjourn

CHINO BASIN WATERMASTER
AGRICULTURAL POOL MEETING

9:00 a.m. – April 18, 2006
At The Offices Of
Inland Empire Utilities Agency
6075 Kimball Ave., Bldg. A, Board Room
Chino, CA 91710

AGENDA

CALL TO ORDER

AGENDA - ADDITIONS/REORDER

I. CONSENT CALENDAR

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April 27, 2006	1:00 p.m.	Boardsmanship Workshop
May 2, 2006	9:00 a.m.	Budget Workshop

Meeting Adjourn

CHINO BASIN WATERMASTER

I. CONSENT CALENDAR

A. MINUTES

1. Joint Appropriative & Non-Agricultural Pool Meeting – March 9, 2006

Draft Minutes
CHINO BASIN WATERMASTER
JOINT APPROPRIATIVE & NON-AGRICULTURAL POOL MEETING
March 9, 2006

The Joint Appropriative and Non-Agricultural Pool Meeting were held at the offices of Chino Basin Watermaster, 9641 San Bernardino Road, Rancho Cucamonga, CA, on March 9, 2006 at 9:00 a.m.

APPROPRIATIVE POOL MEMBERS PRESENT

Robert DeLoach, Chair	Cucamonga Valley Water District
Raul Garibay	City of Pomona
Dave Crosley	City of Chino
Ken Jeske	City of Ontario
Charles Moorrees	San Antonio Water Company
Rosemary Hoerning	City of Upland
Frank LoGuidice	Fontana Water Company
Mark Kinsey	Monte Vista Water District
J. Arnold Rodriguez	Santa Ana River Water Company
Gerald J. Black	Fontana Union Water Company
Mike Maestas	City of Chino Hills

NON-AGRICULTURAL POOL MEMBERS PRESENT

Justin Scott-Coe	Vulcan Materials Company (Calmat Division)

WATERMASTER BOARD MEMBERS PRESENT

Ken Willis	West End Consolidated Water Company

Watermaster Staff Present

Kenneth R. Manning	Chief Executive Officer
Danielle Maurizio	Senior Engineer
Gordon Treweek	Project Engineer
Sherri Lynne Molino	Recording Secretary

Watermaster Consultants Present

Michael Fife	Hatch & Parent
Mark Wildermuth	Wildermuth Environmental Inc.
Andy Malone	Wildermuth Environmental Inc.

Others Present

Bill Kruger	City of Chino Hills
Craig Stewart	Geomatrix
Robert Tock	Monte Vista Water District
Ashok K. Dhingra	City of Pomona

Chair DeLoach called the meeting to order at 9:04 a.m.

AGENDA - ADDITIONS/REORDER
There were no additions or reorders made to the agenda.

I. **CONSENT CALENDAR**
   A. **MINUTES**
      1. Minutes of the Joint Appropriative and Non-Agricultural Pool Meeting held February 9, 2006

B. FINANCIAL REPORTS

1. Cash Disbursements for the month of February 2006
2. Combining Schedule of Revenue, Expenses and Changes in Working Capital for the Period July 1, 2005 through January 31, 2006
3. Treasurer's Report of Financial Affairs for the Period January 1, 2006 through January 31, 2006
4. Profit & Loss Budget vs. Actual July through January 2006

Motion by Black, second by Jeske, and by unanimous vote – non-Ag concurred
Moved to approve Consent Calendar Items A through B, as presented

II. BUSINESS ITEMS

A. CONTRACT FOR DRILLING AND CONSTRUCTION OF A NESTED PIEZOMETER

Mr. Manning stated the presented contract is for replacements on the nested piezometers at Ayala Park. Mr. Malone stated a nested set of piezometers needs to be drilled and constructed to replace a malfunctioning set of piezometers that are used for monitoring and management of subsidence in MZ1. It was noted that through a competitive bidding process, Layne Christensen Company of Fontana has been selected as the drilling contractor, and pending approval of Watermaster, is ready to sign the contract and begin work. Mr. Malone stated that accurate, depth-specific water level data is necessary to effectively monitor and manage land subsidence in the southern portion of MZ1. A nested set of piezometers located at Ayala Park in Chino were designed to monitor water levels in the deep portions of the aquifer system. These piezometers have periodically malfunctioned, and needed to be replaced; this was a consensus decision of the MZ1 Technical Committee. In reviewing requirements it was decided that the piezometer replacement process will include the drilling of a 1,200 foot borehole, the construction of two, 4-inch, stainless steel piezometers, and a well-head completion within an underground vault. Mr. Malone stated that the park property that is impacted during the drilling and construction process will be restored to pre-project conditions to the satisfaction of the City of Chino. It was noted that Layne Christensen was the drilling contractor for the extensometer facility at Ayala Park in 2003, the monitoring wells that were constructed in the southern Chino Basin to support the Hydraulic Control Monitoring Program in 2005, and the recently completed monitoring wells that percolate recycled water in Chino Basin. Mr. Malone stated Watermaster staff and legal counsel has reviewed and approved the contract, all supporting documents and construction specifications. A lengthy discussion ensued with regard to the other companies who bid on the contract and that led to several questions and answers being presented to the parties. Chair DeLoach noted that staff is recommending the approval of this contract to be forwarded to the Advisory Committee and the Watermaster Board.

Motion by Crosley, second by Garibay, and by unanimous vote – non-Ag concurred
Moved to approve the Layne Christensen Company contract for drilling and construction of a nested piezometer at Ayala Park in Chino, as presented

B. MZ1 SUMMARY REPORT

Mr. Manning stated the Optimum Basin Management Plan (OBMP) called for this aquifer system investigation of the suspected pumping induced land subsidence and ground fissuring which occurred in the southern end of the basin. Mr. Manning stated that along with the OBMP and pursuant to the Special Referee's report dated June 16, 2005, Watermaster staff prepared a report titled, "Management Zone 1 Interim Monitoring Program, MZ1 Summary Report". There is a copy of the summary report in the packet, however, since it is not in color it loses some resolution; the full color report is available on the Wildermuth Environmental web site. Mr. Manning noted this MZ1 report presents a summary of all the data collected as part of the MZ1 monitoring program (through September 2005) and the conclusions reached from the analysis of the monitoring data. The report also includes MZ1 Guidance Criteria, which are recommended groundwater management criteria for the management of subsidence in the southern part of MZ1 in Chino. The guidance criteria will be the basis of the long-term subsidence management plan. Mr. Malone gave the presentation titled, "Special Referee's

Report on MZ1 Progress" and noted the recommendations from that report were to prepare a summary report on MZ1 technical work, issue "guidance criteria" to MZ1 producers, develop a schedule to complete the long-term plan, and to expand monitoring to the central portions of the MZ1 area on an as-needed basis. Mr. Malone stated the MZ1 guidance criteria will consist of, "guidance" water levels. Counsel Fife stated the motion would be to approve this report; we are issuing this as a Watermaster report about subsidence and then the guidance criteria is to put the parties on notice that Watermaster has made these findings concerning subsidence in the MZ1 area and is recommending that parties do not produce water in a way that would cause further subsidence. Questions were presented regarding pumping tests and drawing water levels down. A discussion ensued with regard to subsidence in MZ1. Mr. Manning noted that staff is looking at additional ways to satisfy Chino Hills need for water, although, that issue is being kept separate from the MZ1 discussions. Counsel Fife stated there are two processes going on in this item; there are the guidance criteria, which are what is being presented to this pool today; the other item is the question of the long-term plan which needs to be developed. The MZ1 Technical Committee is currently working on the long-term plan and has committed to having that done by June of 2006. The guidance criteria advises the parties of the technical data that has been collected and advises them they should voluntarily alter their production patterns if they are going to cause water levels to go below the stated guidance level. The long-term plan is not currently including things like continuation of the forbearance program etc. that would provide financial assistance to various parties to help it comply with the guidance criteria. The financial issue was brought up at the MZ1 Technical Committee meeting this morning and it was the Technical Committee's view that issues regarding financial assistance to parties are not an issue for the Technical Committee to resolve; this is an Appropriative Pool topic to consider whether those elements should be a part of the long-term plan or not. It was noted at the MZ1 meeting this subject will be brought up at this pool meeting, as an introduction to discuss this item further. Mr. Jeske inquired into the costs of this project and how they will be funded. Mr. Manning stated he strongly feels there is a project out there that has mutual benefits for everybody in this case and that Chino Hills might be interested in helping us pursue it; a meeting with Chino Hills is being scheduled in the near future. Mr. Manning stated the guidance criteria which are outlined today is prudent and in accordance with what the court has asked us to do. A discussion ensued with regard to the overall approval of the guidance criteria. Mr. Maestas offered comment on the presented guidance criteria and noted that Chino Hills is not in a position presently to approve what is being presented today. Counsel Fife stated the summary report and the guidance criteria are only to report technical information that has been collected over the past three years; it is not intended to be the management plan or to indicate how we are going to go forward managing subsidence based on the technical knowledge we have collected. Counsel Fife stated the concerns that were raised at today's meeting, as valid as they may be; apply to the long-term plan and not to the summary report or the guidance criteria. Mr. Manning offered comment on adopting the guidance criteria and noted meetings with Chino Hills are in the works. Mr. Crosley stated that the City of Chino has participated in all MZ1 Technical Committee meetings and discussions and that it is fully understood that the MZ1 summary report is a summarization of the technical data that has been gathered by Watermaster and evaluated. The City of Chino also understands that the guidance criteria is a summarization of the kinds of activities that should be taken under consideration by water producing parties in this affected area; it is understood there are unresolved issues regarding financial assistance. The City of Chino reviews these documents as purely technical information. Mr. Jeske inquired into the ramifications of putting this item off for one month for review and development. Mr. Manning stated that it is staff's opinion that if a motion to move forward was put off for one month would be no harm to the MZ1 area; the concern would be that discussions need to begin quickly on the long-term plan. A discussion ensued with regard to the MZ1 Technical Committee reviewing any new or revised guidance criteria prior to it being brought back through the Watermaster process.

Motion by Crosley, second by Black, and by unanimous vote – non-Ag concurred
Motion to table a motion until this item is brought back at the April 2006 meeting, as discussed

C. IEUA/DWR GRANT FUNDING AGREEMENT

Mr. Manning stated in January 2005, Inland Empire Utilities Agency (IEUA) received a grant of $15,500,000 from the Department of Water Resources (DWR) through the Proposition 13 Groundwater Recharge and Storage Programs. Mr. Manning noted that the purpose of this grant was to fund IEUA's Chino Basin Conjunctive Use Expansion Program. The total project cost for this program was estimated to be $39,026,300, with the local share being funded through IEUA's Water and Sewer Rate revenue and a combination of various State and Federal funds. Mr. Manning stated in 2002, a separate grant of Proposition 13 money was given to IEUA that was used to fund implementation of Watermaster's Recharge Master Plan. That project involved a total cost of approximately $40 million. One half of this project cost was paid through grant funds, and the one-half local share was split evenly between IEUA and Watermaster. Through the initial implementation of the Recharge Master Plan, most, but not all, of the identified recharge basin improvements were constructed; the available funding fell short of being able to fund all of the identified improvements. Mr. Manning noted that additional improvement work was identified as necessary over the course of initial project construction and over the past year of use of the facilities. IEUA has proposed using a portion of the most recent grant funding to perform further improvement work on the recharge basins. IEUA has also proposed using $5,250,000 of grant money for this purpose, using the same cost sharing arrangement that was used for the grant money that was used for initial implementation of the Recharge Master Plan. A discussion ensued with regard to the work that will be performed. Mr. Jeske inquired into the involvement of the Conservation District. Mr. Manning stated the Conservation District was involved with the negotiation of projects; however, they are not included in the financial aspect. Chair DeLoach confirmed that we are making improvements to some of the basins that they operate. A discussion ensued with regard to the maintenance and ownership of the improvements.

Motion by Jeske, second by Garibay, and by unanimous vote – non-Ag concurred

Moved to approve the agreement regarding recharge facilities improvements matching funds Cost Sharing Agreement between Inland Empire Utilities Agency and the Chino Basin Watermaster dated March, 2006, as presented

D. ALLOCATION OF VOLUME VOTE

Mr. Manning stated following the Appropriative Pool meeting on February 9, 2006, staff was asked to compare various approaches to calculating the Appropriative Pool's allocation of volume votes. Mr. Manning reviewed the handout titled, "Comparison of Approaches" for fiscal year 2004-2005 (based on 2003-2004 production). Mr. Manning stated the Appropriative Pool rarely invokes a volume vote and any parties purchase of water or lack of purchase of water has never been influenced by willingness to change the volume vote calculations. Whether this is an issue or is a non issue is something that may want to be addressed; how it is allocated is strictly decided by this pool. A discussion on how a volume vote is called ensued. Chair DeLoach noted there has been very few volume votes called in the ten years he has been coming to these types of meetings.

Committee members decided to take no action regarding this item and to save this item for future discussions noting counsel's recommendations will be filed, as discussed

III. REPORTS/UPDATES

A. WATERMASTER GENERAL LEGAL COUNSEL REPORT

1. Attorney Manager Process/Discussion of Peace II Agreement

Counsel Fife stated we are at the eve of being able to put out the report that will respond to the questions that were brought up during the workshops in November and December, 2005. Wildermuth Environmental is just about finished with their work and then there are some legal issues that counsel needs to respond to. Staff is anticipating those responses will be out within the next week. After that release, staff and counsel will be prepared to

move into finishing the Peace II process. This might involve coming back to the parties with the original agreement which was distributed in October 2005, or if there is a need to modify that document, we can then discuss how we will go about that process.

2. 85/15 Update

Counsel Fife stated this item along with the volume vote issue was brought up a few months ago and staff agreed at that time to look into this and report back to the parties. Counsel Fife referred to the volume vote handout on the last page titled, "Watermaster Assessment Categories", noting this is a chart that was produced to explain the different calculations that were used with the volume vote. Counsel Fife noted that on this chart a few of the mentioned categories apply to the 85/15 rule. Counsel Fife stated the chart is divided into two categories, one with replenishment assessments to which the 85/15 rule was applied and the other is where water transaction activity to which the 85/15 rule was applied. The Judgment is specific in stating the 85/15 applies to water purchased for replenishment purposes. As the Assessment Package is becoming a more familiar and easier to understand document, as was reported at the last Assessment Package workshop, as we move through this document with improvements things will come to light that have gone unnoticed or undetected. In reviewing this subject it seems there are a certain category of water transactions to which the 85/15 rule has historically been applied and it is unclear if the 85/15 rule was correctly applied in those instances. The issue which bought this subject up was a request by the City of Chino to explain how a few of the transactions between a couple appropriators and a couple of non-agricultural pool members to which the 85/15 rule was applied – why that was correct and why was Watermaster applying it the way they were. The policy issue behind that question is currently non-agricultural pool water is not available to appropriators for replenishment purposes; then how could the 85/15 rule be applied to a transaction between and appropriator and a non-agricultural pool member. Counsel Fife stated the question that was presented to inquire about this subject was a very good question, however, staff and counsel has not yet come up with a complete answer. The report today, in response to the question of, "Is the 85/15 rule being applied correctly?" staff and counsel have checked with the appropriators and the non-agricultural pool members involved and nobody knows why the 85/15 rule has been applied to these certain transactions; concluding they very well could be miss-applied. Staff and counsel will continue to look into this subject matter and counsel noted this will not become any sort of an issue until the next Assessment Package is formulated, when we will need to determine the application of the 85/15 rule. Counsel Fife stated that if indeed the 85/15 rule has been miss-applied, changes in how Watermaster has been historically applying the rule might be made at the next Assessment Package go around. A discussion ensued with regard to the 85/15 rule. It was noted this item will be looked at on a go forward basis and there will be no look back. Mr. Manning stated this item will continue to be reviewed and will be brought back with options on how to possibly proceed if the 85/15 rule has been miss-applied at a future meeting.

B. WATERMASTER ENGINEERING CONSULTANT REPORT

1. Update on Report on Balance of Recharge and Discharge

Mr. Wildermuth stated at the last Appropriative and Non-Agricultural pool meeting it was noted that the administrative draft of the Summary of Hydraulic Control and Basin Re-Operation Modeling Results would be completed shortly. As to date, this report is now even closer to being finished, and this report is to update the parties on its advancements. Mr. Wildermuth gave the presentation and noted his staff is very carefully checking over simulation results and putting the final touches on economics. Mr. Wildermuth stated several charts and map graphics are being created to support studies and will be reviewed in detail and noted a copy of today's presentation will be handed out after the meeting for reference. One of the questions that was presented previously is, "How much new yield is truly generated by the desalter program and by re-operation". To solve that question we needed to come up with a scenario, for planning purposes, that would reflect how the basin and river would respond if there were no desalters. Mr. Wildermuth reviewed findings from

the performed studies and made reference to several chart slides. A discussion ensued with regard to the presentation and findings presented.

C. CEO/STAFF REPORT

1. USGS-GAMA Program

Mr. Manning stated in May this pool is going to be given a presentation on the USGS-GAMA Program which is a groundwater ambient water monitoring and assessment program. This is where the USGS comes into various groundwater basins and tests and evaluates water quality (called the GAMA Program). Mr. Manning stated he recently had a conversation with Robert Kent from USGS, who is the person who will be giving the May presentation, by letting him know that this basin is already light years ahead of other basins in data collection and data management and that we will gladly cooperate in assisting him in his quest by offering data that we have already gathered. Staff is trying to avoid letting the USGS come in and test where they want and then take incorrect or uncorroborated data back to our legislature and let legislature make assumptions against isolated tests. This is an awareness issue and a full presentation will be given in May on this item.

2. Legislative Update

Mr. Manning stated a number of people were in Washington last week talking with members of congress about issues relative to California. This was the ACWA Legislative Agenda that was being discussed. This agenda gave us an opportunity to talk about the issues which are taking place within our own basin. Because of the tight schedules and the hastiness at those ACWA meetings, we will be returning in a few weeks to talk in greater detail about specifically the Chino Basin issues and where we think congress can be effective in meeting our mission in delivering an affordable water supply.

Mr. Manning stated that there is a meeting being held, as we speak, with Senator Margett and Senator Dutton who are currently negotiating, on our behalf, to put money into the bond for the Chino Basin. The deadline for getting our bond issue onto the ballot is March 10, 2006. It appears by several conversations with legislatures that our interests are being protected and staff is in contact with them quite frequently.

3. SAW DMS Data Coordination

Mr. Manning stated there are a few letters provided in the meeting packet which parties have probably already received a copy of wherein SAWPA is asking to come in and talk to the parties about data at each agency. After Watermaster staff received this letter, an email was sent to Daniel Cozad at SAWPA which expressed to him that staff would like to coordinate this through Watermaster; it is preferred that SAWPA not work with all the individual parties that there are reasons and benefits to work with Watermaster in a joint effort on this item. By working together Watermaster can eliminate a lot of duplicated work efforts on their part and also possibly save them some money. Mr. Manning stated this is an awareness issue and that Daniel was open and receptive to the idea.

4. Department of Health Services Public Hearing on Recycled Water

Mr. Manning noted the flyer for the Department of Health Services Public Hearing on Recycled Water is available on the back table. This meeting is co-sponsored by Watermaster and Mr. Manning encouraged all members to attend this important hearing in support of recycled water. The hearing is on April 20, 2006 at 9:30 a.m. here at the Watermaster offices.

5. Monthly Recharge Update

Mr. Manning noted that by commitments made at previous meetings in which Watermaster would provide the parties with monthly recharge updates at these meetings, a copy of the most recent update is available on the back table. Mr. Treweek stated we have been lucky recently in having some late spring storm events. Mr. Treweek reviewed the handout in detail and noted we are pretty much on target as far as capturing water; our goal for the

year is 50,000 acre-feet and in order to achieve that we need more months like February with its heavier rain storms. Some of our basins are only recharged, at this point in time, with only storm water and this recharge situation will be rectified shortly via our DWR grant for improvements.

IV. INFORMATION

1. Newspaper Articles
   No comment was made regarding this item.

V. POOL MEMBER COMMENTS

Mr. Manning thanked Cucamonga Valley Water District for their quick service on repairs to our building due to some faulty roof work which caused a flood in the board room.

Mr. Garibay thanked all the committee members for putting up with all is many-many questions over the years and stated that he has learned a lot from attending these meetings and participating on various Watermaster committees.

Ms. Hoerning inquired to the Watermaster staff if would be possible to have the packages out on Thursdays instead of Fridays due to time constraints in reviewing the package details when so many people observe their flex days on Fridays. Mr. Manning stated our staff would attempt to provide the packages on Thursdays; however, sometimes information needed for the package is not turned into Sherri Lynne until Friday mornings.

VI. OTHER BUSINESS

No comment was made regarding this item.

VII. FUTURE MEETINGS

March 9, 2006	9:00 a.m.	Joint Appropriative & Non-Agricultural Pool Meeting
March 14, 2006	9:00 a.m.	GRCC Meeting
March 21, 2005	9:00 a.m.	Agricultural Pool Meeting @ IEUA
March 23, 2006	9:00 a.m.	Advisory Committee Meeting
March 23, 2006	11:00 a.m.	Watermaster Board Meeting
March 28, 2006	9:00 a.m.	GRCC Meeting

The Joint Appropriative & Non-Agricultural Pool Meeting Adjourned at 10:45 a.m.

Secretary: _____

Minutes Approved: _____

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CHINO BASIN WATERMASTER

I. CONSENT CALENDAR

A. MINUTES

1. Agricultural Pool Meeting –
   March 23, 2006

Draft Minutes
CHINO BASIN WATERMASTER
AGRICULTURAL POOL MEETING
March 23, 2006

The Agricultural Pool Meeting was held at the offices of Chino Basin Watermaster, 9641 San Bernardino Road, Rancho Cucamonga, CA, on March 23, 2006 at 7:30 a.m.

Agricultural Pool Members Present

Nathan deBoom, Chair	Dairy
Glen Durrington	Crops
Gene Koopman	Milk Producers Counsel
John Huitsing	Dairy
Pete Hettinga	Dairy
Robert Nobles	State of California CIW

Watermaster Staff Present

Kenneth R. Manning	Chief Executive Officer
Sheri Rojo	CFO /Asst. General Manager
Gordon Treweek	Project Engineer
Danielle Maurizio	Senior Engineer
Sherri Lynne Molino	Recording Secretary

Watermaster Consultants Present

Michael Fife	Hatch & Parent
Mark Wildermuth	Wildermuth Environmental Inc.

Others Present

Steve Lee	Reid & Hellyer
Tom Love	Inland Empire Utilities Agency
Martha Davis	Inland Empire Utilities Agency
Ben Pak	Inland Empire Utilities Agency
Rick Rees	Geomatrix for CIM
Craig Steward	Geomatrix for CIM
Frank Brommenschenkel	Frank B & Associates
Ken Jeske	City of Ontario

Chair deBoom called the meeting to order at 7:40 a.m.

AGENDA - ADDITIONS/REORDER
There were no additions or reorders made to the agenda.

I. **CONSENT CALENDAR**

A. **MINUTES**

1. Minutes of the Agricultural Pool Meeting held February 21, 2006

B. **FINANCIAL REPORTS**

1. Cash Disbursements for the month of February 2006
2. Combining Schedule of Revenue, Expenses and Changes in Working Capital for the Period July 1, 2005 through January 31, 2006
3. Treasurer's Report of Financial Affairs for the Period January 1, 2006 through January 31, 2006
4. Profit & Loss Budget vs. Actual July through January 2006

Motion by Koopman, second by Durrington, and by unanimous vote
Moved to approve Consent Calendar Items A through B, as presented

II. BUSINESS ITEMS

A. CONTRACT FOR DRILLING AND CONSTRUCTION OF A NESTED PIEZOMETER

Mr. Manning stated Watermaster has an extensive monitoring program in place in the MZ1 area for subsidence and the nested set of piezometers that are currently located at Ayala Park are presently providing us with some miss-information and possibly malfunctioning. A recommendation has been made to Watermaster staff and to the several parties to replace the piezometers and re-drill to put in a whole new set of nested piezometers. Mr. Manning noted this item represents the final end of the bidding process and what is presented in the meeting packet is a bid from Layne Christenson Company for $292,000.00, which is slightly lower than our budgeted amount. Staff is recommending moving ahead with the approval of the contract. Mr. Wildermuth offered additional information about the faulty piezometers and noted these new piezometers will be used for the long-term monitoring uses. A discussion ensued with regard to the contract and the abandonment of the current site to put the piezometers in another location.

Motion by Koopman, second by Durrington, and by unanimous vote
Moved to approve the Layne Christensen Company contract for drilling and construction of a nested piezometer at Ayala Park in Chino, as presented

B. MZ1 SUMMARY REPORT

Mr. Manning stated when this item came before the Appropriative and Non-Agricultural pool on March 9; they asked that this item be tabled in order to allow Chino Hills to provide some additional information. Chino Hills had indicated they have issues with the presented guidance criteria and staff is trying to work with them on this issue so that this item can be brought back at the April meetings for approval. Mr. Manning stated in May of 2005 there was a special referee workshop wherein staff provided the special referee with information about investigations in the MZ1 area having to do with subsidence. Following that workshop the special referee came back with a written comment report and in that report there were requests made to Watermaster. The requested items were, an MZ1 Summary Report which describes the investigation in more detail than the presentation that was given at the workshop, to notify the court of the schedule for the completion of a long-term plan, and to provide guidance criteria in-between. Staff is asking to table this item for one month.

C. IEUA/DWR GRANT FUNDING AGREEMENT

Mr. Manning stated in January 2005, Inland Empire Utilities Agency (IEUA) received a grant of $15,500,000 from the Department of Water Resources (DWR) through the Proposition 13 Groundwater Recharge and Storage Programs. Through the initial implementation of the Recharge Master Plan, most, but not all, of the identified recharge basin improvements were constructed; the available funding fell short of being able to fund all of the identified improvements. Mr. Manning noted that additional improvement work was identified as necessary over the course of initial project construction and over the past year of use of the facilities. IEUA has proposed using a portion of the most recent grant funding to perform further improvement work on the recharge basins, using the same cost sharing arrangement that was used for the grant money that was used for initial implementation of the Recharge Master Plan. A discussion ensued with regard to recycled water.

Motion by Koopman, second by Durrington, and by unanimous vote
Moved to approve the agreement regarding recharge facilities improvements matching funds Cost Sharing Agreement between Inland Empire Utilities Agency and the Chino Basin Watermaster dated March, 2006, as presented

III. REPORTS/UPDATES

A. WATERMASTER GENERAL LEGAL COUNSEL REPORT

1. Attorney Manager Process/Discussion of Peace II Agreement

Counsel Fife stated we are at the eve of being able to put out the report that will respond to the questions that were brought up during the workshops in November and December, 2005. Wildermuth Environmental is just about finished with their work and then there are some legal issues that counsel needs to respond to. Staff is anticipating those responses will be out within the next week. After that release, staff and counsel will be prepared to move into finishing the Peace II process. This might involve coming back to the parties with the original agreement which was distributed in October 2005, or if there is a need to modify that document, we can then discuss how we will go about that process.

B. WATERMASTER ENGINEERING CONSULTANT REPORT

1. Update on Report on Balance of Recharge and Discharge

Mr. Wildermuth stated one of the many things Wildermuth Environmental is doing for the Watermaster is this presented item which deals with certain provisions of the Peace Agreement and with the Peace II. This report, as of late last night, was completed in an administrative draft form. Mr. Wildermuth stated that an "draft administrative form" is a document, for all intensive purposes, 95% to 97% complete. The report will first be circulated through the Watermaster staff and Watermaster legal counsel to ensure all the technical questions are answered that were presented at the workshops regarding the Peace II Term Sheet. It is most likely staff and counsel will turn this document around quickly and staff is anticipating very little changes to be made. Chair deBoom inquired if a workshop will be held on the presentation of the completed report. Mr. Manning stated that due to time constraints a workshop will be difficult to schedule and this will most likely go through the Watermaster process and then we will have an extensive question and answer process at the actual meetings on this report. A lengthy discussion ensued with regard to Hydraulic Control and the release of this report.

C. CEO/STAFF REPORT

1. USGS-GAMA Program

Mr. Manning stated in May this pool is going to be given a presentation on the USGS-GAMA Program which is a groundwater ambient water monitoring and assessment program. This is where the USGS comes into various groundwater basins and tests and evaluates water quality (called the GAMA Program). Mr. Manning stated he recently had a conversation with Robert Kent from USGS, who is the person who will be giving the May presentation, by letting him know that this basin is already light years ahead of other basins in data collection and data management and that we will gladly cooperate in assisting him in his quest by offering data that we have already gathered. Staff is trying to avoid letting the USGS come in and test where they want and then take incorrect or uncorroborated data back to our legislature and let legislature make assumptions against isolated tests. This is an awareness issue and that a full presentation will be given in May on this item.

2. Legislative Update

Mr. Manning stated a number of people were in Washington last week talking with members of congress about issues relative to California. This was the ACWA Legislative Agenda that was being discussed. This agenda gave us an opportunity to talk about the issues which are taking place within our own basin. Because of the tight schedules and the hastiness at those ACWA meetings, we will be returning in a few weeks to talk in greater detail about specifically the Chino Basin issues and where we think congress can be effective in meeting our mission in delivering an affordable water supply.

Mr. Manning stated that there is a meeting being held, as we speak, with Senator Margett and Senator Dutton who are currently negotiating, on our behalf, to put money into the bond for the Chino Basin. The deadline for getting our bond issue onto the ballot is March

10, 2006. It appears by several conversations with legislatures that our interests are being protected and staff is in contact with them quite frequently.

3. SAW DMS Data Coordination
Mr. Manning stated there are a few letters provided in the meeting packet which parties have probably already received a copy of wherein SAWPA is asking to come in and talk to the parties about data that is collected at each agency. After Watermaster staff received this letter, an email was sent to Daniel Cozad at SAWPA which expressed to him that staff would like to coordinate this through Watermaster; it was noted that there are reasons and benefits to work with Watermaster in a joint effort on this item. By working together Watermaster can eliminate a lot of duplicated work efforts on their part and also possibly save them some money. Mr. Manning stated this is an awareness issue and that Daniel was open and receptive to the idea.

4. Department of Health Services Public Hearing on Recycled Water
Mr. Manning noted the flyer for the Department of Health Services Public Hearing on Recycled Water is available on the back table. This meeting is co-sponsored by Watermaster and Mr. Manning encouraged all members to attend this important hearing in support of recycled water. The hearing is on April 20, 2006 at 9:30 a.m. here at the Watermaster offices.

5. Monthly Recharge Update
Mr. Manning noted that by commitments made at previous meetings in which Watermaster would provide the parties with monthly recharge updates at these meetings, a copy of the most recent update is available on the back table. Mr. Treweek stated we have been lucky recently in having some late spring storm events. Mr. Treweek reviewed the handout in detail and noted we are pretty much on target as far as capturing water; our goal for the year is 50,000 acre-feet and in order to achieve that we need more months like February with its heavier rain storms. Some of our basins are only recharged, at this point in time, with only storm water and this recharge situation will be rectified shortly via our DWR grant for improvements.

6. Data Request/SAWPA
This item was discussed under item no. 3; no further comment was made.

IV. INFORMATION

1. Newspaper Articles
No comment was made regarding this item.

V. POOL MEMBER COMMENTS

No comment was made regarding this item.

VI. OTHER BUSINESS

No comment was made regarding this item.

VII. FUTURE MEETINGS

March 9, 2006	9:00 a.m.	Joint Appropriative & Non-Agricultural Pool Meeting
March 14, 2006	9:00 a.m.	GRCC Meeting
March 21, 2005	9:00 a.m.	Agricultural Pool Meeting @ IEUA
March 23, 2006	9:00 a.m.	Advisory Committee Meeting
March 23, 2006	11:00 a.m.	Watermaster Board Meeting
March 28, 2006	9:00 a.m.	GRCC Meeting

The Agricultural Pool Meeting Adjourned at 8:55 a.m.

Secretary: _____

Minutes Approved: _____

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CHINO BASIN WATERMASTER

I. CONSENT CALENDAR

B. FINANCIAL REPORTS

1. Cash Disbursements for the month of March 2006
2. Combining Schedule of Revenue, Expenses and Changes in Working Capital for the Period July 1, 2005 through February 28, 2006
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CHINO BASIN WATERMASTER

9641 San Bernardino Road, Rancho Cucamonga, Ca 91730
Tel: 909.484.3888 Fax: 909.484.3890 www.cbwm.org

KENNETH R. MANNING
Chief Executive Officer

STAFF REPORT

DATE: **April 13, 2006**
April 18, 2006
April 27, 2006

TO: **Committee Members**
Watermaster Board Members

SUBJECT: **Cash Disbursement Report – March 2006**

SUMMARY

Issue – Record of cash disbursements for the month of March 2006.

Recommendation – Staff recommends the Cash Disbursements for March 2006 be received and filed as presented.

Fiscal Impact – All funds disbursed were included in the FY 2005-06 Watermaster Budget.

BACKGROUND
A monthly cash disbursement report is provided to keep all members apprised of Watermaster expenditures.

DISCUSSION
Total cash disbursements during the month of March 2006 were $2,097,843.49. The most significant expenditures during the month were Inland Empire Utilities Agency in the amount of $880,331.90, Inland Empire Utilities Agency in the amount of $860,601.70, Wildermuth Environmental Inc. in the amount of $161,921.61, and Hatch and Parent in the amount of $56,282.51.

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CHINO BASIN WATERMASTER
Cash Disbursement Detail Report
March 2006

Type	Date	Num	Name	Amount
Mar 06				
Bill Pmt -Check	3/3/2006	10308	CAFE CALATO	-102.90
Bill Pmt -Check	3/7/2006	10309	A & R TIRE	-282.42
Bill Pmt -Check	3/7/2006	10310	ANDERSON, JOHN	-125.00
Bill Pmt -Check	3/7/2006	10311	APPLIED COMPUTER TECHNOLOGIES	-1,635.70
Bill Pmt -Check	3/7/2006	10312	ARROWHEAD MOUNTAIN SPRING WATER	-83.77
Bill Pmt -Check	3/7/2006	10313	BLACK & VEATCH CORPORATION	-1,177.50
Bill Pmt -Check	3/7/2006	10314	BOWCOCK, ROBERT	-125.00
Bill Pmt -Check	3/7/2006	10315	CUCAMONGA VALLEY WATER DISTRICT	0.00
Bill Pmt -Check	3/7/2006	10316	DIRECTV	-74.98
Bill Pmt -Check	3/7/2006	10317	HAMRICK, PAUL	-125.00
Bill Pmt -Check	3/7/2006	10318	INLAND EMPIRE UTILITIES AGENCY	-880,311.90
Bill Pmt -Check	3/7/2006	10319	KUHN, BOB	-125.00
Bill Pmt -Check	3/7/2006	10320	MONTE VISTA WATER DIST	-250.00
Bill Pmt -Check	3/7/2006	10321	PETTY CASH	-713.95
Bill Pmt -Check	3/7/2006	10322	PRINTING RESOURCES	-322.93
Bill Pmt -Check	3/7/2006	10323	PURCHASE POWER	-15.28
Bill Pmt -Check	3/7/2006	10324	RAUCH COMMUNICATION CONSULTANTS, LLC	-979.80
Bill Pmt -Check	3/7/2006	10325	RICOH BUSINESS SYSTEMS-Maintenance	-745.50
Bill Pmt -Check	3/7/2006	10326	SANTA ANA WATERSHED PROJECT AUTHORITY	-356.96
Bill Pmt -Check	3/7/2006	10327	UNION 76	-128.41
Bill Pmt -Check	3/7/2006	10328	VANDEN HEUVEL, GEOFFREY	-633.10
Bill Pmt -Check	3/7/2006	10329	VELASQUEZ JANITORIAL	-1,200.00
Bill Pmt -Check	3/7/2006	10330	VERIZON	-41.44
Bill Pmt -Check	3/7/2006	10331	WILLIS, KENNETH	-375.00
Bill Pmt -Check	3/7/2006	10332	YUKON DISPOSAL SERVICE	-134.72
Bill Pmt -Check	3/7/2006	10333	CUCAMONGA VALLEY WATER DISTRICT	-5,076.00
Bill Pmt -Check	3/7/2006	10334	SOUTHERN CALIFORNIA WATER COMMITTEE	-50.00
Bill Pmt -Check	3/9/2006	10335	COMPUSA, INC.	-403.25
Bill Pmt -Check	3/9/2006	10336	LOS ANGELES TIMES	-42.40
Bill Pmt -Check	3/9/2006	10337	MCCALL'S METER SALES & SERVICE	-9,347.32
Bill Pmt -Check	3/9/2006	10338	PARK PLACE COMPUTER SOLUTIONS, INC.	-2,200.00
Bill Pmt -Check	3/9/2006	10339	PAYCHEX	-172.38
Bill Pmt -Check	3/9/2006	10340	UNITED PARCEL SERVICE	-375.96
Bill Pmt -Check	3/9/2006	10341	VERIZON	-364.25
General Journal	3/15/2006	06/03/3	PAYROLL	-5,629.68
General Journal	3/15/2006	06/03/3	PAYROLL	-20,248.82
Bill Pmt -Check	3/22/2006	10362	ACWA SERVICES CORPORATION	-234.16
Bill Pmt -Check	3/22/2006	10363	PUMP CHECK	-2,509.99
Bill Pmt -Check	3/22/2006	10364	REID & HELLYER	-8,866.32
Bill Pmt -Check	3/22/2006	10365	THE FURMAN GROUP, INC.	-2,695.00
Bill Pmt -Check	3/22/2006	10342	BANK OF AMERICA	-5,644.55
Bill Pmt -Check	3/22/2006	10343	CAL CPA	-320.00
Bill Pmt -Check	3/22/2006	10344	CALPERS	-2,650.83
Bill Pmt -Check	3/22/2006	10345	ELLISON, SCHNEIDER & HARRIS, LLP	-13,911.12
Bill Pmt -Check	3/22/2006	10346	FIRST AMERICAN REAL ESTATE SOLUTIONS	-125.00
Bill Pmt -Check	3/22/2006	10347	GREENLEE, GAIL	-69.61
Bill Pmt -Check	3/22/2006	10348	HATCH AND PARENT	-56,282.51
Bill Pmt -Check	3/22/2006	10349	INLAND EMPIRE UTILITIES AGENCY	-860,601.70
Bill Pmt -Check	3/22/2006	10350	MCI	-908.17
Bill Pmt -Check	3/22/2006	10351	OFFICE DEPOT	-641.56
Bill Pmt -Check	3/22/2006	10352	PRE-PAID LEGAL SERVICES, INC.	-103.60
Bill Pmt -Check	3/22/2006	10353	PREMIERE GLOBAL SERVICES	-126.14
Bill Pmt -Check	3/22/2006	10354	RAUCH COMMUNICATION CONSULTANTS, LLC	-5,146.43
Bill Pmt -Check	3/22/2006	10355	RICOH BUSINESS SYSTEMS-Lease	-3,591.31
Bill Pmt -Check	3/22/2006	10356	STANDARD INSURANCE CO.	-579.88
Bill Pmt -Check	3/22/2006	10357	STAULA, MARY L	-136.61
Bill Pmt -Check	3/22/2006	10358	WHEELER METER MAINTENANCE	-900.00
Bill Pmt -Check	3/22/2006	10359	WILDERMUTH ENVIRONMENTAL INC	-161,921.03
Bill Pmt -Check	3/22/2006	10360	RICOH BUSINESS SYSTEMS-Lease	-888.94
Bill Pmt -Check	3/22/2006	10361	RICOH BUSINESS SYSTEMS-Maintenance	-26.60
Bill Pmt -Check	3/23/2006	10366	EL TORITO	-261.55
Bill Pmt -Check	3/24/2006	10367	VIP AUTO DETAILING	-499.20
General Journal	3/25/2006	06/03/5	PAYROLL	-5,058.95
General Journal	3/25/2006	06/03/5	PAYROLL	-19,166.41
Mar 06				-2,087,843.49

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CHINO BASIN WATERMASTER
COMBINING SCHEDULE OF REVENUE, EXPENSES AND CHANGES IN WORKING CAPITAL
FOR THE
PERIOD JULY 1, 2005 THROUGH FEBRUARY 28, 2006

	WATERMASTER ADMINISTRATION	OPTIMUM BASIN MANAGEMENT	POOL ADMINISTRATION AND SPECIAL PROJECTS APPROPRIATIVE POOL	AGRICULTURAL POOL	NON-AGRIC. POOL	GROUNDWATER OPERATIONS GROUNDWATER REPLENISHMENT	SB222 FUNDS	EDUCATION FUNDS	GRAND TOTALS	BUDGET 2004-05
Administrative Revenues			4,781,347		66,160				4,847,507	$3,984,888
Administrative Assessments			100,514	10,433	3,278			37	114,262	78,330
Interest Revenue									29,763	0
Mutual Agency Project Revenue		29,763							-	0
Grant Income									-	0
Miscellaneous Income									-	0
Total Revenues	-	29,763	4,881,861	10,433	69,438	-	-	37	4,991,532	4,063,218
Administrative & Project Expenditures									371,958	621,784
Watermaster Administration	371,958								37,185	37,018
Watermaster Board-Advisory Committee	37,185								103,088	91,153
Pool Administration			14,040	85,761	3,287				903,659	1,019,183
Optimum Basin Mgnt Administration		903,659							1,227,637	3,733,694
OBMP Project Costs		1,227,637						375	375	375
Education Funds Use									21,075	80,004
Mutual Agency Project Costs	21,075									
Total Administrative/OBMP Expenses	430,218	2,131,296	14,040	85,761	3,287			375	2,664,977	5,583,211
Net Administrative/OBMP Income	(430,218)	(2,101,533)							-	0
Allocate Net Admin Income To Pools	430,218		334,086	90,050	6,082				-	0
Allocate Net OBMP Income To Pools		2,101,533	1,631,945	439,878	29,710				-	0
Agricultural Expense Transfer			609,539	(609,539)					2,664,977	5,583,211
Total Expenses			2,589,610	6,150	39,079	-	-	375	2,326,555	(1,519,993)
Net Administrative Income			2,292,251	4,283	30,359			(338)		
Other Income/(Expense)						6,635,065			6,635,065	0
Replenishment Water Purchases									-	2,179,500
MZ1 Supplemental Water Assessments									-	0
Water Purchases									-	(2,278,500)
MZ1 Imported Water Purchase						(5,748,143)			(5,748,143)	0
Groundwater Replenishment						886,922			886,922	(99,000)
Net Other Income			-	-	-	886,922	-	-		
Net Transfers To/(From) Reserves			2,292,251	4,283	30,359	886,922	-	(338)	3,213,477	(1,618,993)
Working Capital, July 1, 2005			4,450,869	464,653	187,298	3,580,499	158,251	2,238	8,843,808	
Working Capital, End Of Period			6,743,120	468,936	217,657	4,467,421	158,251	1,900	12,057,285	
04/05 Production			127,810.967	34,450.449	2,326.836				164,588.252	
04/05 Production Percentages			77.655%	20.931%	1.414%				100.000%	

Q:\Financial Statements\05-06\06 Jan\[CombiningSchedule Jan.xls]Sheet1

Prepared by Sheri Rojo, Chief Financial Officer /Assistant General Manager

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CHINO BASIN WATERMASTER
TREASURER'S REPORT OF FINANCIAL AFFAIRS FOR THE PERIOD
FEBRUARY 1 THROUGH FEBRUARY 28, 2006

DEPOSITORIES:			
Cash on Hand - Petty Cash			$ 500
Bank of America			
Governmental Checking-Demand Deposits		$ 204,976	
Savings Deposits		9,685	
Zero Balance Account - Payroll		25,423	240,084
Vineyard Bank CD - Agricultural Pool			416,453
Local Agency Investment Fund - Sacramento			12,945,566
TOTAL CASH IN BANKS AND ON HAND	2/28/2006		**$ 13,602,603**
TOTAL CASH IN BANKS AND ON HAND	1/31/2006		12,952,000
PERIOD INCREASE (DECREASE)			**$ 650,603**

CHANGE IN CASH POSITION DUE TO:		
Decrease/(Increase) in Assets:	Accounts Receivable	$ 9,883
	Assessments Receivable	1,963,906
	Prepaid Expenses, Deposits & Other Current Assets	17,183
(Decrease)/Increase in Liabilities	Accounts Payable	(77,298)
	Accrued Payroll, Payroll Taxes & Other Current Liabilities	959
	Transfer to/(from) Reserves	(1,264,030)
	PERIOD INCREASE (DECREASE)	**$ 650,603**

SUMMARY OF FINANCIAL TRANSACTIONS:	Petty Cash	Govt'l Checking Demand	Zero Balance Account Payroll	Savings	Vineyard Bank	Local Agency Investment Funds	Totals
Balances as of 1/31/2006	$ 500	$ 180,974	$ -	$ 9,685	$ 415,275	$ 12,345,566	$ 12,952,000
Deposits	-	1,973,790	-	-	1,178	600,000	2,574,968
Transfers	-	(677,951)	77,951	-	-	-	(600,000)
Withdrawals/Checks	-	(1,271,837)	(52,528)	-	-	-	(1,324,365)
Balances as of 2/28/2006	$ 500	$ 204,976	$ 25,423	$ 9,685	$ 416,453	$ 12,945,566	$ 13,602,603
	-	-	-	-	-	-	-
PERIOD INCREASE OR (DECREASE)	**$ -**	**$ 24,002**	**$ 25,423**	**$ -**	**$ 1,178**	**$ 600,000**	**$ 650,603**

CHINO BASIN WATERMASTER
TREASURER'S REPORT OF FINANCIAL AFFAIRS FOR THE PERIOD
FEBRUARY 1 THROUGH FEBRUARY 28, 2006

INVESTMENT TRANSACTIONS

Effective Date	Transaction	Depository	Activity	Redeemed	Days to Maturity	Interest Rate(*)	Maturity Yield
2/24/2006	Deposit	L.A.I.F.	$ 600,000				
TOTAL INVESTMENT TRANSACTIONS			**$ 600,000**	-			

* The earnings rate for L.A.I.F. is a daily variable rate; 3.63% was the effective yield rate at the Quarter ended December 31, 2005

INVESTMENT STATUS
February 28, 2006

Financial Institution	Principal Amount	Number of Days	Interest Rate	Maturity Date
Local Agency Investment Fund	$ 12,945,566			
TOTAL INVESTMENTS	**$ 12,945,566**			

Funds on hand are sufficient to meet all foreseen and planned Administrative and project expenditures during the next six months.

All investment transactions have been executed in accordance with the criteria stated in Chino Basin Watermaster's Investment Policy.

Respectfully submitted,

Sheri M. Rojo, CPA
Chief Financial Officer & Assistant General Manager
Chino Basin Watermaster

CHINO BASIN WATERMASTER
Profit & Loss Budget vs. Actual
July 2005 through February 2006

	Jul '05 - Feb 06	Budget	$ Over Budget	% of Budget
Ordinary Income/Expense				
Income				
4010 · Local Agency Subsidies	29,763	132,000	-102,238	22.55%
4110 · Admin Asmnts-Approp Pool	4,781,347	4,804,121	-22,774	99.53%
4120 · Admin Asmnts-Non-Agri Pool	66,160	73,425	-7,265	90.11%
4700 · Non Operating Revenues	114,262	78,330	35,932	145.87%
Total Income	4,991,532	5,087,876	-96,344	98.11%
Gross Profit	4,991,532	5,087,876	-96,344	98.11%
Expense				
6010 · Salary Costs	323,692	404,153	-80,461	80.09%
6020 · Office Building Expense	57,589	97,850	-40,261	58.85%
6030 · Office Supplies & Equip.	15,067	47,500	-32,433	31.72%
6040 · Postage & Printing Costs	52,107	75,700	-23,593	68.83%
6050 · Information Services	80,034	103,500	-23,466	77.33%
6060 · Contract Services	14,163	130,500	-116,337	10.85%
6080 · Insurance	16,525	24,210	-7,685	68.26%
6110 · Dues and Subscriptions	3,250	14,000	-10,750	23.21%
6140 · WM Admin Expenses	1,032	6,500	-5,468	15.87%
6150 · Field Supplies	-1,827	4,050	-5,877	-45.1%
6170 · Travel & Transportation	48,000	45,200	2,800	106.19%
6190 · Conferences & Seminars	12,084	17,500	-5,416	69.05%
6200 · Advisory Comm - WM Board	9,562	14,082	-4,520	67.91%
6300 · Watermaster Board Expenses	27,623	29,782	-2,159	92.75%
8300 · Appr PI-WM & Pool Admin	14,040	15,347	-1,307	91.48%
8400 · Agri Pool-WM & Pool Admin	13,128	18,756	-5,628	70.0%
8467 · Agri-Pool Legal Services	66,483	45,000	21,483	147.74%
8470 · Ag Meeting Attend -Special	6,150	10,000	-3,850	61.5%
8500 · Non-Ag PI-WM & Pool Admin	3,287	7,423	-4,136	44.28%
6500 · Education Funds Use Expens	375	375	0	100.0%
9500 · Allocated G&A Expenditures	-249,756	-378,284	128,528	66.02%
Subtotal G&A Expenditures	512,605	733,144	-220,539	69.92%
6900 · Optimum Basin Mgmt Plan	820,172	996,767	-176,595	82.28%
6950 · Mutual Agency Projects	21,075	75,000	-53,925	28.1%
9501 · G&A Expenses Allocated-OBMP	83,487	109,541	-26,054	76.22%
Subtotal OBMP Expenditures	924,734	1,181,308	-256,574	78.28%
7101 · Production Monitoring	44,179	68,755	-24,576	64.26%
7102 · In-line Meter Installation	40,688	97,954	-57,266	41.54%
7103 · Grdwtr Quality Monitoring	48,829	66,503	-17,674	73.42%
7104 · Gdwtr Level Monitoring	86,292	184,812	-98,520	46.69%
7105 · Sur Wtr Qual Monitoring	8,016	90,223	-82,207	8.88%
7106 · Wtr Level Sensors Install	0	5,734	-5,734	0.0%
7107 · Ground Level Monitoring	91,109	554,825	-463,716	16.42%
7108 · Hydraulic Control Monitoring	162,347	495,368	-333,021	32.77%
7109 · Recharge & Well Monitoring Prog	143,234	133,061	10,173	107.65%
7200 · PE2- Comp Recharge Pgm	246,456	759,105	-512,649	32.47%
7300 · PE3&5-Water Supply/Desalte	339	12,548	-12,209	2.7%

CHINO BASIN WATERMASTER
Profit & Loss Budget vs. Actual
July 2005 through February 2006

	Jul '05 - Feb 06	Budget	$ Over Budget	% of Budget
7400 · PE4- Mgmt Plan	134,082	1,081,014	-946,932	12.4%
7500 · PE6&7-CoopEfforts/SaltMgmt	48,849	255,769	-206,920	19.1%
7600 · PE8&9-StorageMgmt/Conj Use	6,849	77,268	-70,419	8.86%
7690 · Recharge Improvement Debt Pymt	0	300,000	-300,000	0.0%
7700 · Inactive Well Protection Prgm	0	12,128	-12,128	0.0%
9502 · G&A Expenses Allocated-Projects	166,269	268,742	-102,473	61.87%
Subtotal Special Project Expenditures	1,227,537	4,463,809	-3,236,272	27.5%
Total Expense	2,664,877	6,378,261	-3,713,384	41.78%
Net Ordinary Income	2,326,655	-1,290,385	3,617,040	-180.31%
Other Income/Expense				
Other Income				
4231 · MZ1 Assigned Water Sales	0	600,000	-600,000	0.0%
4210 · Approp Pool-Replenishment	6,635,065	0	6,635,065	100.0%
Total Other Income	6,635,065	600,000	6,035,065	1,105.84%
Other Expense				
5010 · Groundwater Replenishment	5,748,143	699,000	5,049,143	822.34%
9999 · To/(From) Reserves	3,213,578	-1,389,385	4,602,963	-231.3%
Total Other Expense	8,961,721	-690,385	9,652,106	-1,298.08%
Net Other Income	-2,326,655	1,290,385	-3,617,040	-180.31%
Net Income	0	0	0	0.0%

CHINO BASIN WATERMASTER

II. BUSINESS ITEMS

A. MZ1 SUMMARY REPORT

1. Consider Approval of the February 2006 MZ1 Summary Report

CHINO BASIN WATERMASTER

9641 San Bernardino Road, Rancho Cucamonga, Ca 91730
Tel: 909.484.3888 Fax: 909.484.3890 www.cbwm.org

KENNETH R. MANNING
Chief Executive Officer

STAFF REPORT

DATE: **April 13, 2006**
April 18, 2006
April 27, 2006

TO: **Committee Members**
Watermaster Board Members

SUBJECT: **MZ-1 Summary Report**

SUMMARY

Issue – Pursuant to the Special Referee's report dated June 16, 2005, Watermaster staff prepared a report titled *Management Zone 1 Interim Monitoring Program, MZ-1 Summary Report.* This report presents a summary of all the data collected as part of the MZ-1 monitoring program (through September 2005) and the conclusions reached from the analysis of the monitoring data. The report also includes MZ-1 Guidance Criteria, which are a recommended groundwater management criteria for the management of subsidence in the southern part of MZ-1 (Chino). These guidance criteria will be the basis of the long-term subsidence management plan.

Recommendation – Approve the February 2006 MZ-1 Summary Report.

Fiscal Impact – To be determined. The MZ-1 Summary Report recommends the continuation of the monitoring activities that have been implemented to date. The cost to Watermaster to provide this monitoring and reporting will be about $175,000 per year in 2006 dollars.

BACKGROUND

The Implementation Plan of the Optimum Basin Management Program (OBMP) called for an aquifer-system investigation of suspected pumping-induced land subsidence and ground fissuring that has occurred in the southern region of Management Zone 1 (MZ-1). Watermaster has coordinated and conducted the investigation 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 results of the investigation are being used in the development of a long-term plan to minimize or abate future land subsidence and ground fissuring.

To date, the main conclusions derived from the investigation are:

1. The current state of aquifer-system deformation in south MZ-1 (in the vicinity of Ayala Park) is essentially elastic. Little, if any, inelastic (permanent) compaction is now occurring in this area, which is in contrast to the past when about 2.2 feet of land subsidence occurred, accompanied by ground fissuring, from about 1987-1995.

2. Groundwater production from the deep, confined aquifer system in this area causes the greatest stress to the aquifer system. In other words, pumping of the deep aquifer system causes water level drawdowns that are much greater in magnitude and lateral extent than drawdowns caused by pumping of the shallow aquifer system.

3. Water level drawdowns due to pumping of the deep aquifer system can cause inelastic (permanent) compaction of the aquifer-system sediments, which results in permanent land subsidence. The initiation of inelastic compaction within the aquifer system was identified during this investigation when water levels fell below a depth of about 250 feet in the PA-7 piezometer at Ayala Park.

4. Through this study, a previously undetected barrier to groundwater flow was identified. The barrier is located within the deep aquifer system and is aligned with the historical zone of ground fissuring. Pumping from the deep aquifer system is limited to the area west of the barrier, and the resulting drawdowns do not propagate eastward across the barrier. Thus, compaction occurs within the deep system on the west side of the barrier, but not on the east side, which causes concentrated differential subsidence across the barrier and creates the potential for ground fissuring.

5. InSAR and ground level survey data indicate that permanent subsidence in the central region of MZ-1 (north of Ayala Park) has occurred in the past and continues to occur today. The InSAR data also indicate that the groundwater barrier extends northward into central MZ-1. These observations suggest that the conditions that very likely caused ground fissuring near Ayala Park in the 1990s are also present in central MZ-1, and should be studied in more detail.

A workshop was held May 25, 2005 to update the Special Referee on progress of the investigation and development of the long-term plan for MZ-1. After the workshop, the Special Referee issued a report to the Court that summarized the workshop and requested that Watermaster:

- produce a MZ-1 Summary Report that describes the investigation results and conclusions to date
- notify the Court of the schedule for the completion of the long-term plan
- provide "guidance criteria" to the MZ-1 producers in an effort to minimize the potential for future subsidence and fissuring, pending completion of the long-term plan

The MZ-1 Summary Report contains the guidance criteria, which consist mainly of setting a "guidance" water level – 245 feet below the reference point for the PA-7 piezometer at Ayala Park – and recommends that groundwater production from a selected list of wells in MZ-1 not cause water levels to fall below the guidance level.

The report also outlines the process and schedule for developing a long-term management plan by June 2006. The primary objective of the long-term plan is to prevent additional permanent land subsidence that could initiate additional ground fissuring. A developing secondary objective is to optimize the use of existing groundwater production infrastructure. A key element of the long-term plan will be its adaptive nature, as new data are collected and periodically analyzed to evaluate the effectiveness of the long-term plan.

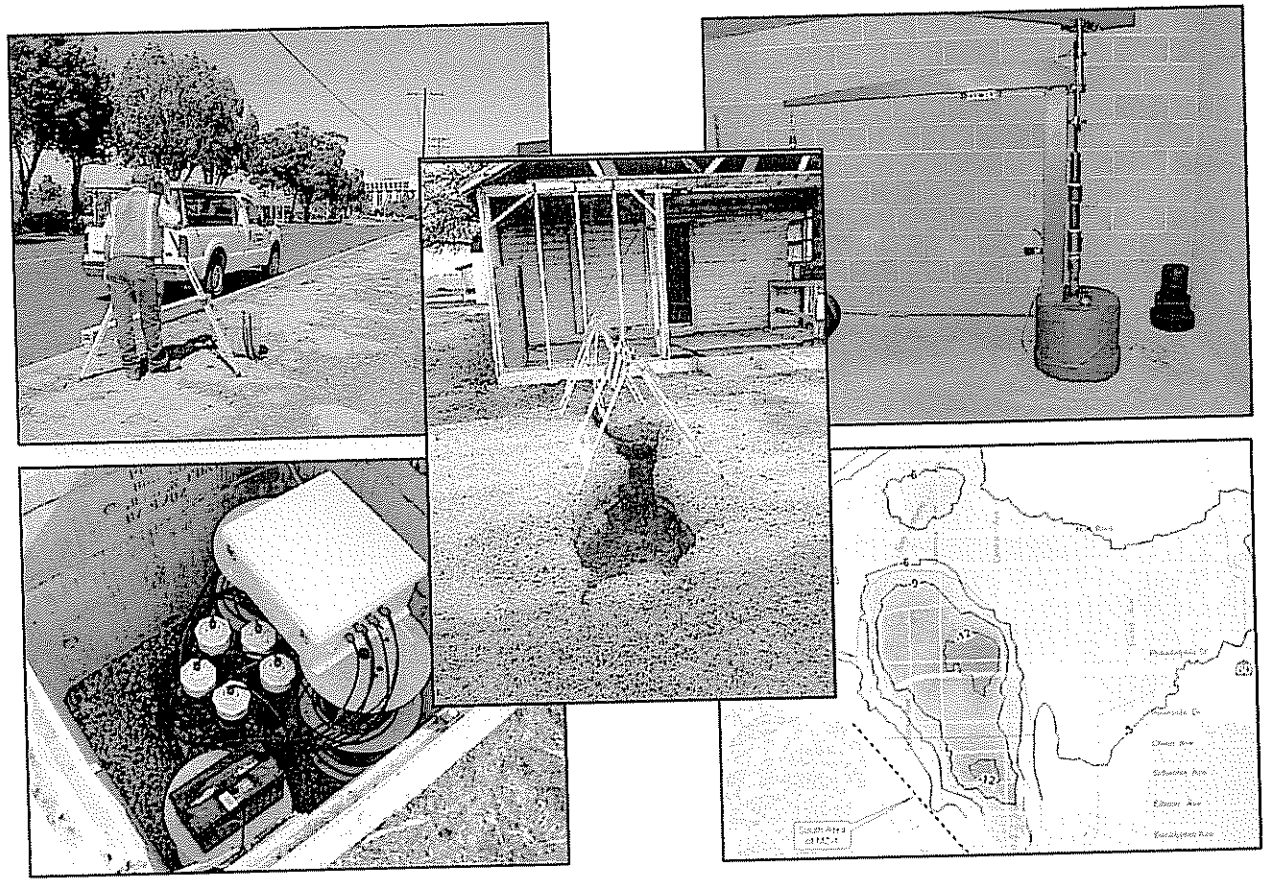
The guidance criteria and the long-term plan discussed above relate to the management of pumping-induced subsidence within the southern region of MZ-1, where associated ground fissuring damaged infrastructure in the early 1990s. However, this investigation has also revealed that the central region of MZ-1 has experienced in the past, and is currently experiencing, measurable land subsidence. This discovery has initiated an additional effort by Watermaster to characterize the subsidence mechanisms in this region through a slightly expanded monitoring effort. The adaptive nature of the long-term plan should accommodate the results that will emerge from the expanded monitoring effort in central MZ-1, so as to minimize the risk of future ground fissuring in this heavily urbanized region of Chino Basin.

The MZ1 Summary Report is best viewed in color which may done by downloading this document from:
ftp://citrix.wildermuthenvironmental.com/MZ1

CHINO BASIN
OPTIMUM BASIN MANAGEMENT PROGRAM

Management Zone 1
Interim Monitoring Program

MZ-1 Summary Report



Prepared for

MZ-1 Technical Committee

Prepared by

Wildermuth Environmental, Inc.

February 2006

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CHINO BASIN
OPTIMUM BASIN MANAGEMENT PROGRAM

Management Zone 1
Interim Monitoring Program

MZ-1 Summary Report

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ACRONYM AND ABBREVIATIONS LIST

AE	Associated Engineers
CA	California
CBWM	Chino Basin Watermaster
CIM	California Institution for Men
IMP	Interim Monitoring Program
MZ-1	Management Zone 1
OBMP	Optimum Basin Management Program
CH	Chino Hills
InSAR	Synthetic Aperture Radar Interferometry
MSL	mean sea level
PA	Piezometer A at Ayala Park Piezometer/Extensometer Facility
USGS	United States Geological Survey
WEI	Wildermuth Environmental Inc

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EXECUTIVE SUMMARY

The Implementation Plan of the Optimum Basin Management Program (OBMP) called for an aquifer-system investigation of suspected pumping-induced land subsidence and ground fissuring that has occurred in the southern region of Management Zone 1 (MZ-1). Watermaster has coordinated and conducted the investigation 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 results of the investigation are being used to develop management tools (models) that will assist in the development of a long-term plan to minimize or abate future land subsidence and ground fissuring.

To date, the main conclusions derived from the investigation are:

1. The current state of aquifer-system deformation in south MZ-1 (in the vicinity of Ayala Park) is essentially elastic. Little, if any, inelastic (permanent) compaction is now occurring in this area, which is in contrast to the past when about 2.2 feet of land subsidence occurred, accompanied by ground fissuring, from about 1987-1995.

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A workshop was held May 25, 2005 to update the Special Referee on progress of the investigation and development of the long-term plan for MZ-1. After the workshop, the Special Referee issued a report to the Court that summarized the workshop and requested that Watermaster:

- produce a MZ-1 Summary Report (this report) that describes the investigation results and conclusions to date
- notify the Court of the schedule for the completion of the long-term plan
- provide "guidance criteria" to the MZ-1 producers in an effort to minimize the potential for future subsidence and fissuring, pending completion of the long-term plan

This report contains the guidance criteria, which consist mainly of setting a "control" water level – 245 feet below the reference point for the PA-7 piezometer at Ayala Park – and recommend that groundwater production from a selected list of wells in MZ-1 not cause water levels to fall below the control level.

This report also outlines the process and schedule for developing a long-term management plan by June 2006. The primary objective of the long-term plan is to prevent additional permanent land subsidence that could initiate additional ground fissuring. A developing secondary objective is to optimize the use of existing groundwater production infrastructure. A key element of the long-term plan will be its *adaptive* nature, as new data are collected and periodically analyzed to evaluate the effectiveness of the long-term plan.

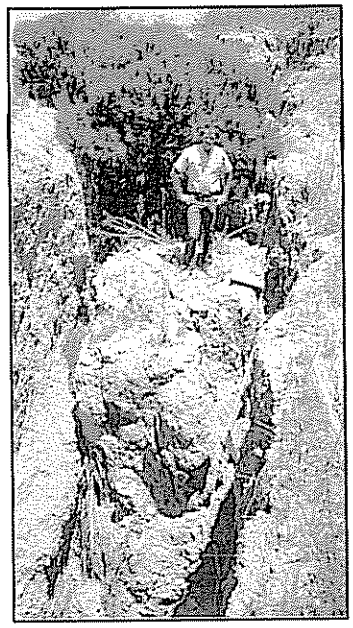
The guidance criteria and the long-term plan discussed above relate to the management of pumping-induced subsidence within the southern region of MZ-1, where associated ground fissuring damaged infrastructure in the early 1990s. However, this investigation has also revealed that the central region of MZ-1 has experienced in the past, and is currently experiencing, measurable land subsidence. This discovery has initiated an additional effort by Watermaster to characterize the subsidence mechanisms in this region through a slightly expanded monitoring effort. The adaptive nature of the long-term plan should accommodate the results that will emerge from the expanded monitoring effort in central MZ-1, so as to minimize the risk of future ground fissuring in this heavily urbanized region of Chino Basin.

The monitoring and analyses associated with this investigation dovetail nicely with other Watermaster efforts associated with basin re-operation and hydraulic control.

1. BACKGROUND

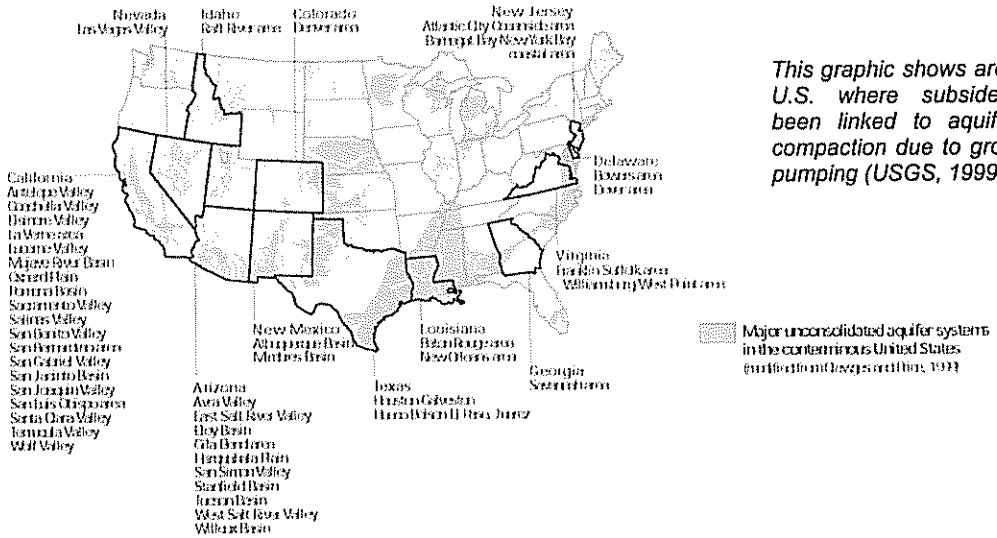
Groundwater Withdrawals and Land Subsidence

Land subsidence is the sinking of the Earth's surface due to the rearrangement of subsurface Earth materials. In the United States alone, over 17,000 square miles in 45 states have experienced land subsidence (USGS, 1999). In many instances, land subsidence is accompanied by adverse impacts at the land surface, such as sinkholes, earth fissures, encroachment of adjacent water bodies, modified drainage patterns, and others. In populated regions, these subsidence-related impacts can result in severe damage to man-made infrastructure and costly remediation measures.



This earth fissure near Mesa, Arizona formed as a result of differential compaction of the aquifer system (USGS, 1999).

Over 80% of all documented cases of land subsidence in the United States have been caused by groundwater extractions from the underlying aquifer system (USGS, 1999). Subsidence due to groundwater extraction is especially well-documented in the arid southwestern United States, where the aquifer systems are typically composed of unconsolidated sediments that are susceptible to permanent compaction when groundwater is extracted. Some infamous examples include the San Joaquin and Santa Clara Valleys in California, the Las Vegas Valley in Nevada, the Houston-Galveston area in Texas, and

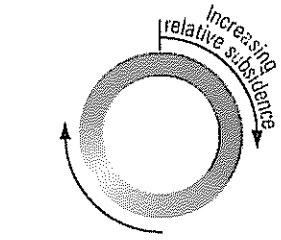


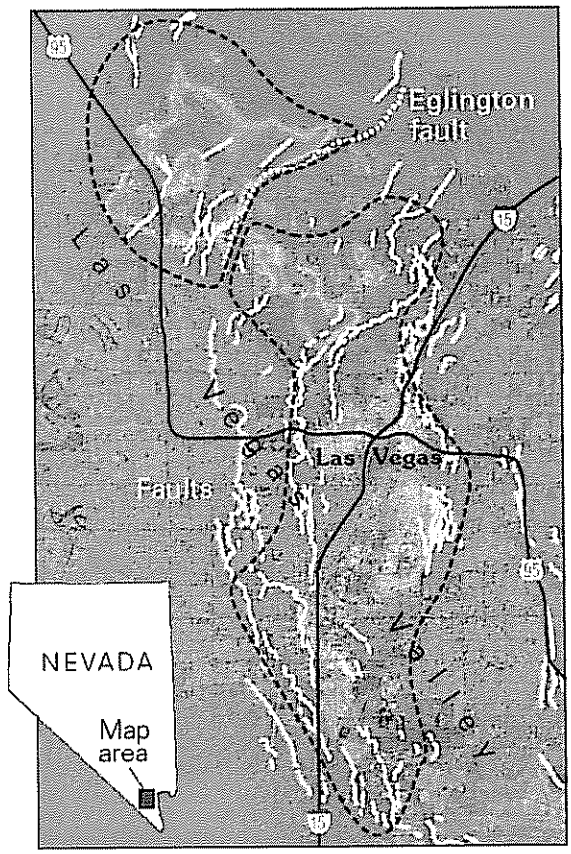
This graphic shows areas in the U.S. where subsidence has been linked to aquifer-system compaction due to groundwater pumping (USGS, 1999).

several basins in Arizona. In many of these regions, earth fissuring occurred in areas of differential subsidence (*i.e.* where rates and accumulated magnitudes of subsidence vary over short horizontal distances).

Although drawdown of water levels is the driving force that causes land subsidence due to groundwater pumping, the geology of a groundwater basin also plays an important role in this process. Clay layers within the aquifer-system are relatively compressible materials. Therefore, aquifer-systems that contain thick and/or numerous clay layers are most susceptible to permanent compaction and land subsidence when groundwater is extracted. In addition, faults that act as groundwater barriers can focus and augment drawdown in the aquifer-system when pumping wells are located near these faults. When pumping and drawdown are concentrated on one side of a fault barrier, then differential land subsidence and ground fissuring are a common result (see Las Vegas, as an example).

This map graphic depicts land subsidence in the Las Vegas Valley that occurred from April 1992 to December 1997. The subsidence, attributed to aquifer-system compaction caused by groundwater production, was measured by remote sensing techniques (InSAR). Geologic faults (shown in white) appear to control the location of subsidence, and have been the focal point of earth fissure formation (USGS, 1999).





The scientific model that describes the phenomenon of pumping-induced land subsidence is termed the *aquitard-drainage model.* This model has been successfully applied to numerous cases of land subsidence world-wide. It has been incorporated into the industry-standard computer models of groundwater flow and is increasingly recognized as critical to the understanding of aquifer-system hydraulics (flow and storage) and mechanics (deformation). A brief summary of the aquitard-drainage model is below:

Aquitard-Drainage Model. Simply stated, an aquifer system consists of permeable sand and gravel layers (the aquifers) interbedded with less-permeable silt and clay layers (the aquitards). Pumping wells cause water-level drawdowns in the aquifers which, in turn, cause the aquitards to slowly drain into the aquifers. The draining allows aquitard pore pressures to decay toward equilibrium with the reduced heads in the adjacent aquifers. Since the pressure of the pore water provides some internal support for the sedimentary structure of the aquitards, this loss of internal support causes the aquitards to compress, resulting in a small amount of subsidence at the land surface. When the pumping wells turn off, and water levels recover in the aquifers, groundwater migrates back into the aquitards and they expand, resulting in a small amount of rebound at the land surface. Over a limited range of seasonal water level fluctuations this process can occur in a purely elastic fashion. That is, a recovery of water levels to their original values causes the land surface to rebound to its original elevation. However, when drawdown falls below a certain "threshold" level, elastic compression transitions to a non-recoverable inelastic compaction of the aquitards, resulting in permanent land subsidence. The "threshold" water level, referred to as the *preconsolidation stress*, is taken to be the maximum past stress to which the sedimentary structure had previously equilibrated under the gradually increasing load of accumulating sediments. [Note: The probable value of the virgin preconsolidation stress in the Chino Basin has not been documented, but studies in similar areas suggest that drawdowns in the range of 40 to 100 feet will typically exceed the initial threshold value.]

Drawdowns exceeding a previous threshold water level result in an increase in the value of maximum past stress, and thus the establishment of a deeper threshold, accompanied by an increment of inelastic aquitard compaction. Concomitantly, the compaction results in the one-time irreversible mining of groundwater from the aquitards. The benefits of this process include not only the obvious economic value of the water produced but also the often overlooked fact that, by establishing deeper thresholds, it increases the volume of confined groundwater storage available for cyclical drawdown and replenishment under strictly elastic conditions. The cost, of course, is the resulting deformation of the land surface and its impact on vulnerable infrastructure.

History of Ground Fissuring and Land Subsidence in Chino Basin

Ground Fissuring. One of the earliest indications that land subsidence was occurring in Chino Basin was the appearance of ground fissures in the City of Chino. These fissures appeared as early as 1973 (Fife et al., 1976), but an accelerated occurrence of ground fissuring ensued after 1991. Figure 1-1 shows the location of the fissures within the larger context of Management Zone 1 (MZ-1) and the Chino Basin. Figure 1-2 shows a detailed view of this area.

Surface expression of earth fissure that developed in a field north of CIM in February 1991.

Photo source: Geomatrix Consultants

Subsequent studies of the fissuring attributed the phenomenon to land subsidence (Fife et al., 1976; Kleinfelder, 1993, 1996; Geomatrix, 1994). The evidence to support this cause-and-effect relationship between the subsidence and fissuring is shown in Figure 1-2. In this figure, and as pointed out by Geomatrix (1994), the north-south trend of fissuring is located on the steep eastern limb of the main trough of subsidence that was mapped by ground level surveying (discussed below) – an area where east-west directed extensional stress should be associated with subsidence to the west. These observations and conclusions prompted efforts to quantify the magnitude of historical subsidence and to monitor the rates of on-going subsidence. These efforts included:

- Compilation and analysis of leveling survey data to estimate historical subsidence
- Compilation and analysis of remote sensing data to estimate historical subsidence
- Initiation of monitoring efforts to track on-going subsidence

Through these efforts, the history of land subsidence near the area of ground fissuring was characterized in good detail for the period after 1987, and in lesser detail for the period prior to 1987.

Recent Land Subsidence (Post-1987). Repeated leveling surveys were conducted within the City of Chino from 1987-1999 (Kleinfelder, 1993, 1996, 1999). Figure 1-1 shows the location and extent of the surveys within the larger context of MZ-1 and the Chino Basin. Figure 1-2 shows a close-up view of this area, and subsidence contours of the survey data. These contours delineate a subsidence trough generally aligned north-south with maximum subsidence during the 12-year period of 2.4 feet along Central Avenue between Eucalyptus and Schaefer Avenues (the trough axis). The subsidence trough extends approximately from Pipeline Avenue on the west to Benson Avenue on the east, and from Merrill Avenue on the south to the edge of the survey area on the north (Riverside Drive). The contours suggest that the subsidence trough extends further north of Riverside Drive, but the surveys did not include benchmarks north of Riverside Drive.

Remote sensing studies of subsidence were conducted (Peltzer, 1999a, 1999b) to further analyze subsidence in MZ-1. These studies employed Synthetic Aperture Radar Interferometry (InSAR), which utilizes radar imagery from an Earth-orbiting spacecraft to map ground surface deformation. Figures 1-1 and 1-2 show the results of these InSAR studies that independently confirmed the location and relative magnitude of subsidence in MZ-1 as defined by the leveling surveys, and indicated the occurrence of subsidence north of the area monitored by the leveling surveys (north of Riverside Drive).

The leveling surveys and the InSAR analyses both indicated that subsidence rates have slowed significantly since about 1995. In fact, the leveling surveys indicated that about 90% of the total subsidence measured along Central Avenue from 1987-1999 occurred prior to 1996.

Historical Land Subsidence (Pre-1987). Much less data is available to estimate regional subsidence prior to 1987. Geomatrix (1994) and Geoscience (2002) compared the leveling survey data (post-1987) to elevation data published on USGS 7.5-minute quadrangle maps (1933 and 1967). Geomatrix (1994) estimated as much as 3-4 feet of subsidence from 1967-1993 in some areas shown on Figure 1-2. Geoscience (2002) estimated a maximum of 3.7 feet of subsidence from 1933-1987 at the intersection of Pipeline Avenue and Riverside Drive. These subsidence estimates and their assumptions and limitations are currently being reviewed by Watermaster. If generally accurate, these estimates combined with the post-1987 survey data suggest that as much as 4-5 feet of subsidence has occurred during 1933-1999 in some areas of Chino south of State Highway 60.

Potential Causes of Land Subsidence

The main studies that were commissioned subsequent to the fissuring events in the early 1990s (Kleinfelder, 1993, 1996; Geomatrix, 1994) attributed the subsidence and fissuring phenomenon to the aquitard-drainage model. Watermaster arrived at the same conclusion (WEI, 1999) based on the presence of all requisite elements of the aquitard-drainage model in the southern portion of MZ-1 and other supporting evidence:

- **Presence of aquitards.** Geophysical and lithologic logs from numerous wells in the region indicate that the aquifer-system sediments that underlie the area of subsidence in MZ-1 contain many interbedded aquitard layers, which are susceptible to permanent compaction under reduced piezometric heads. In addition, during the early 1900s, much of the southern part of MZ-1 was an area of flowing-artesian wells (Mendenhall, 1908), indicating the existence of fine-grained confining layers (aquitards) at depth.
- **Reduced pore pressures within the aquifer-system.** The flowing-artesian groundwater conditions in southern MZ-1 also indicate that piezometric heads were at or above the land surface during the early 1900s. Water level histories at numerous relatively shallow wells in the region demonstrate that the piezometric heads (water levels) declined by about 140 feet from about 1940 to 1977, but then recovered by about 40 feet by 1999 (see Figure 1-3).

  In addition, the accelerated occurrence of fissuring that commenced in 1991 was preceded by the completion and initial operation of a number of the deep production wells in 1989-1990. These wells are owned by the City of Chino Hills. Water level histories at these wells indicate that drawdowns within the deeper portions of the aquifer system caused by pumping these wells have exceeded 300 feet.

  In both the shallow and deep zones of the overall aquifer system, the historical drawdowns were substantially greater than probable maximum value of the virgin threshold of inelastic compaction.
- **Other evidence.** The axis of maximum subsidence along Central Avenue, as delineated by ground level surveys (1987-1999), is aligned with the locations of several deep production wells owned by Chino Hills—suggesting a cause-and-effect relationship.
- **Similarity to other subsidence case studies.** There are numerous examples throughout the western United States where ground fissures have accompanied aquifer-system compaction and land subsidence within alluvial groundwater basins (Holzer, 1984). Geomatrix (1994) studied the ground fissures on CIM property and also reviewed case histories of fissuring throughout the southwestern United States. Their study noted similarities between the physical structure of the CIM fissures and the fissures described in the literature that were associated with areas of subsidence due to groundwater pumping and aquifer-system compaction.

There exist other potential causes of land subsidence that have been documented in other locations world-wide. Most of these causes can be immediately dismissed as explanations for the subsidence observed in Chino Basin, but others can not. Table 1-1 lists all potential causes of land subsidence, and a qualitative description of their applicability to subsidence and fissuring in Chino Basin.

Even though some of these potential subsidence mechanisms cannot be immediately dismissed as contributing to subsidence in Chino Basin, they are not likely. The aquitard-drainage model is based on physical laws of nature—namely, gravity and the compressibility of materials under load. And when the requisite elements of this model are all present (*i.e.* presence of aquitards, piezometric head declines, *etc.*), the question is not whether subsidence occurred, but rather, how much is the inevitable result of the aquitard-drainage mechanism?

By comparison, other potential causes of subsidence were reduced to unlikely and, at the most, minor contributory factors in Chino Basin, and as such, were never directly investigated by Watermaster.

Development of the MZ-1 Interim Monitoring Program

In the Optimum Basin Management Program (OBMP) Phase I Report (WEI, 1999), Watermaster identified the aquitard-drainage model as the most likely cause of the land subsidence and ground fissuring observed in MZ-1. Program Element 4 of the OBMP – *Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1* 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
- Formulate a long-term management plan to reduce to tolerable levels or abate future subsidence and fissuring

The main part of the interim management plan was to develop and implement a monitoring and testing program in MZ-1 that would answer certain questions to enable the development of a long-term plan to minimize or abate subsidence and fissuring. These questions included:

1. How much subsidence is currently occurring in MZ-1?
2. How much of the current subsidence is an elastic, reversible process that will restore the land surface to its original elevation if water levels recover to their original values; or, in the alternative phraseology, how much, if any, is irreversible (permanent subsidence)?
3. How much subsidence did historical pumping cause in MZ-1?
4. How much of the historical subsidence was an elastic, reversible process, and how much, if any, was irreversible?
5. These questions give rise to the most critical questions: What was the historical threshold value of head decline at which the deformation of the sedimentary structure would have changed from an elastic compression to inelastic compaction? And additionally, what is that threshold value of head decline today?

In an attempt to minimize subsidence and fissuring in the short-term, the cities of Chino and Chino Hills agreed to jointly reduce groundwater production in MZ-1 by 3,000 acre-feet per year for the duration of the interim management plan. This agreement between the cities was termed the *Forbearance Agreement*.

Formation of the MZ-1 Technical Committee. The MZ-1 Technical Committee was formed to serve as a clearing house for technical information, as well as the source for full professional discussion, input and peer review by its members, for the benefit of Watermaster. The Technical Committee provides comment and assists Watermaster in the development of recommendations for consideration and potential action by Watermaster under the Interim Management Plan. In addition, the Technical Committee provides similar assistance to Watermaster in its effort to develop a long-term plan as provided in Program Element 4. The Technical Committee consists of representatives (and their technical consultants) from those parties to the Judgment that are presently producing groundwater within MZ-1. Each of the following producers is entitled to representation on the Committee: Chino, Chino Hills, Ontario, Upland, Pomona, Monte Vista

Water District, San Antonio Water Company, Southern California Water Company, CIM and the Agricultural Pool. Figure 1-1 shows the locations of wells owned by the producers listed above. The MZ-1 Technical Committee first convened on March 6, 2002, and has continued to meet once every 1-3 months.

Composition of the MZ-1 Interim Monitoring Program. The MZ-1 Technical Committee approved the scope and schedule for the MZ-1 Interim Monitoring Program (IMP) at the January 29, 2003 meeting. The IMP was developed and implemented by Watermaster to collect the information necessary to answer the five questions listed above. The data collected and analyzed as part of this effort are being utilized to develop effective management tools and, ultimately, a long-term management plan that will minimize or completely abate ground fissuring and subsidence in MZ-1.

The IMP is described in detail in the IMP Work Plan dated January 8, 2003 (WEI, 2003), but generally consists of three main elements: benchmark survey, InSAR, and aquifer-system monitoring. The benchmark surveys and the InSAR analyses monitor deformation of the land surface. Aquifer-system monitoring measures the hydraulic and mechanical changes within the aquifer-system that cause the land surface deformation. The methods involved in the implementation of each element are briefly described below:

Methods: Aquifer-System Monitoring. This work involves the measuring of stresses within the aquifer system (water-level changes) that cause land surface deformation as measured by benchmark surveys, InSAR, and the extensometers (described below). The objective is to establish the relationships between water-level changes in the aquifer system (stress) and aquifer-system deformation (strain).

Figure 1-4 shows location of the centerpiece of the aquifer-system monitoring program – the Ayala Park Extensometer – a highly sophisticated monitoring facility consisting of two multi-piezometers and a dual-extensometer. As the aquifer system undergoes various stresses due to groundwater production and recharge, the facility monitors the hydraulic response of the aquifer system at the piezometers and the mechanical response of the aquifer system at the extensometers. The facility is equipped with pressure transducers to measure water levels in the piezometers, linear potentiometers to measure the vertical aquifer-system deformation at the extensometers, and data loggers to record the data at frequent intervals (e.g. 15 minutes).

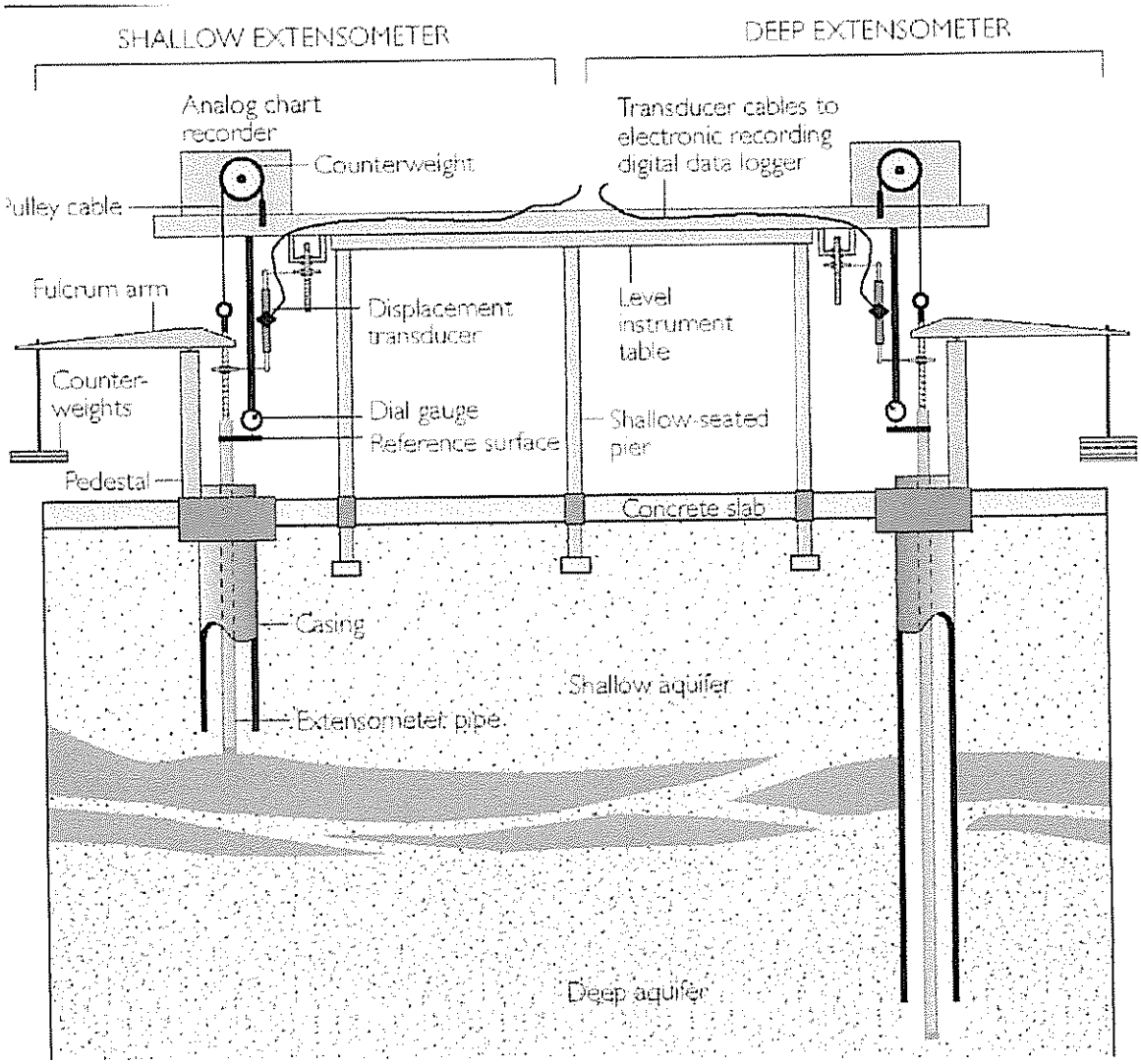
Piezometer construction and instrumentation was completed in mid-November 2002, at which time collection of piezometric data commenced. Dual-extensometer construction and instrumentation was completed in mid-July 2003, at which time collection of aquifer-system deformation data commenced.

Figure 1-4 also shows the nearby wells owned by CIM and the cities of Chino and Chino Hills that were equipped with pressure transducers and data loggers to record (1) water-level data and (2) the specific timing of pumping cycles at production wells.

The IMP also called for Watermaster, with the assistance of the well owners, to conduct controlled aquifer stress tests (pumping tests) while monitoring water levels and groundwater production at nearby monitoring wells and production wells, as well as aquifer-system compaction and/or expansion at the dual-extensometer. These tests were performed in fall 2003, spring 2004, and fall 2004.

The data collected from this monitoring effort are being used to: (1) quantify and characterize the current state of aquifer-system deformation (i.e. elastic vs. inelastic), (2) determine the threshold value of head decline at which the deformation of the aquifer-system sediments changes from an elastic compression to

inelastic compaction, (3) estimate aquifer-system parameters, such as the conductive and storage parameters of the aquifer and aquitard sediments, (4) reveal the existence of groundwater barrier(s) within the aquifer sediments, and (5) use all the above data as input to predictive computer models of compaction, subsidence, and groundwater flow to support the development of a long-term management plan.



A conceptual graphic of a dual extensometer, very similar to the facility at Ayala Park in Chino. Extensometers measure vertical deformation within an aquifer system. Typically, they are accompanied by piezometers that measure pore water pressure changes that cause deformation within the aquifer system.

Methods: Ground-Level Surveying. This work involves repeated benchmark surveying to measure vertical (and in some cases horizontal) ground surface deformation along selected profiles within Chino Basin – mainly in MZ-1. The benchmark surveys are being used to (1) establish a datum from which to measure land surface deformation during the IMP period, (2) allow determination of historical subsidence at any historical benchmarks that can be recovered, (3) "ground-truth" the InSAR data, and (4) assist in the development and evaluation of the long-term management plan.

A network of stable benchmark monuments was installed to supplement an existing network of benchmarks that was installed for the City of Chino in 1987. Associated Engineers (AE) completed monument installations (see Figure 1-5) and an initial survey of all monument elevations in April 2003. Repeat surveys are planned for April of each year during the IMP period.

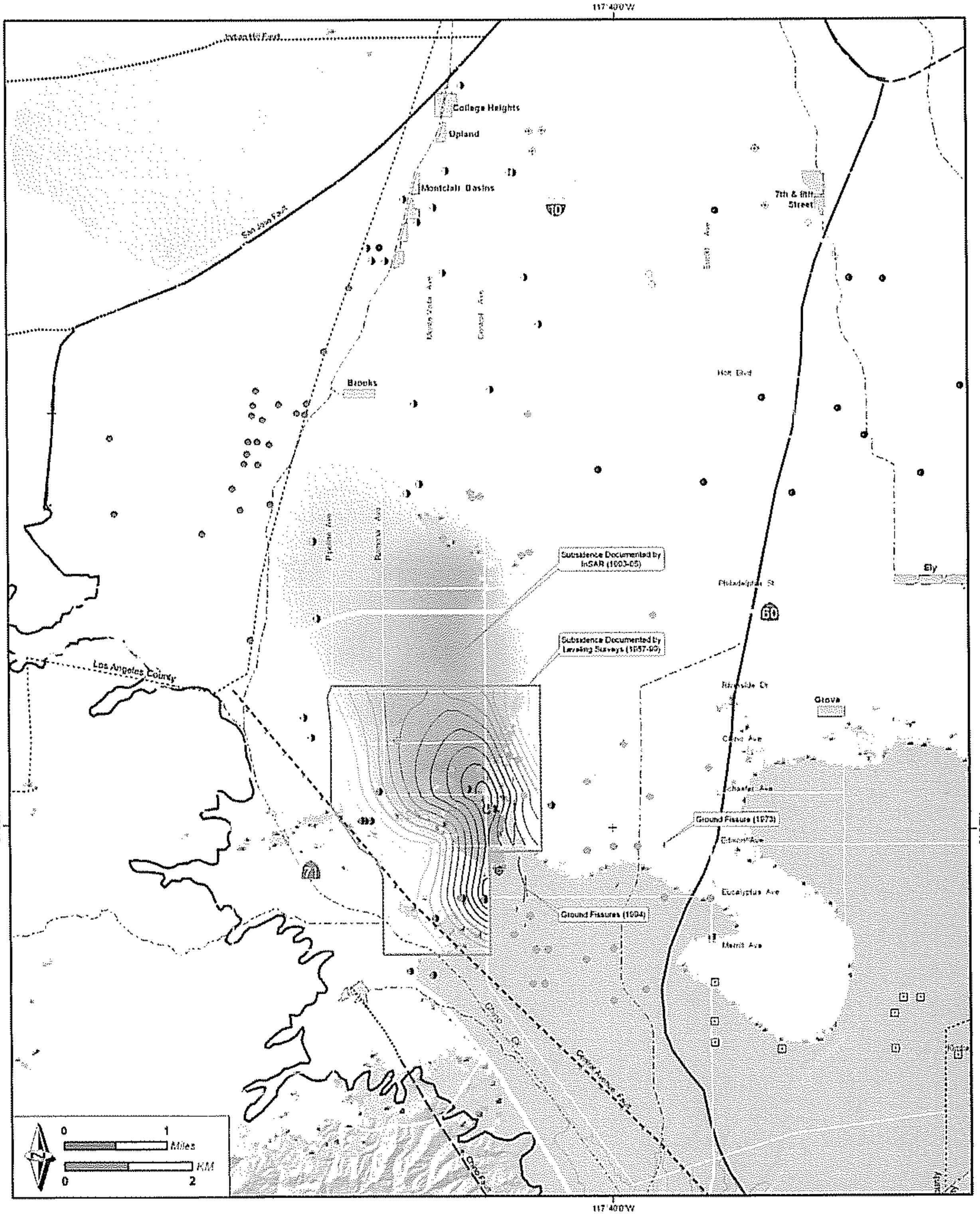
The IMP work plan also called for the deep extensometer at Ayala Park (discussed below), which is anchored in sedimentary bedrock at about 1,400 ft bgs, to be used as the "starting benchmark" for all survey loops. To accomplish this, a Class-A benchmark was constructed outside the extensometer building to serve as the practical (i.e. actual) starting benchmark. To link this benchmark to the deep extensometer pipe, each survey event begins by referencing the benchmark to a marked spot on one of the piers that supports the extensometer instrument platform. These piers and the instrument platform represent a stable ground surface datum that is used to measure relative vertical displacement between the ground surface and the deep extensometer pipe (recorded every 15 minutes). The vertical displacement recorded at the deep extensometer between survey events, in addition to any vertical displacement measured between the starting benchmark and the pier, is then used to calculate the elevation at the starting benchmark outside the extensometer building. Then, relative vertical displacement between benchmarks is measured across the entire network to obtain current elevations.

A key element of the MZ-1 benchmark network is the array of closely spaced benchmarks that have been established across the historic fissure zone in the immediate vicinity of the Ayala Park extensometers (Ayala Park Array). At this array, located along Edison and Eucalyptus Avenues, both vertical and horizontal displacements are measured. These horizontal and vertical displacements are defining two-dimensional profiles of land-surface deformation that can be related to the vertical distribution of aquifer-system compaction and expansion that is being recorded continuously at the extensometers. These surveys are being repeated semi-annually during the late spring and early fall periods of highest and lowest water levels in an attempt to monitor fissure movement, if any, that may be associated with elastic and/or inelastic aquifer-system deformation. (Note: the semi-annual survey frequency of the Ayala Park Array monuments is a modification to the IMP work plan, and was agreed upon by the MZ-1 Technical Committee at the September 24, 2003 meeting).

Methods: InSAR Analyses. InSAR is being used to characterize ground surface deformation in Chino Basin. This analysis will be performed for a historical period (1992-2000) and on an on-going basis thereafter. The advantage of InSAR is that it provides an aerially continuous representation of land surface deformation. These data are planned to be used to: (1) characterize the time history of land surface deformation in greater spatial and temporal detail than can be accomplished from the available historical ground-level survey data, (2) calibrate computer simulation models of subsidence and groundwater flow, and (3) assist in the evaluation of the effectiveness of the long-term management plan.

Table 1-1
Applicability of Potential Causes of Subsidence in Chino Basin

Potential Cause of Subsidence	Applicability to Chino Subsidence
Collapse of underground caverns	No caverns or soluble rocks are known to underlie the Chino Basin, and the geologic environment and history of the basin make their existence extremely unlikely.
Consolidation due to surface loading	No substantial surface loading has been applied, other than the construction of Prado Dam and the occasional short-lived accumulation of flood waters behind it. These are well south of the area of significant subsidence.
Consolidation of sediments over geologic time scales	This process is presumably occuring under the gradually increasing load of accumulating alluvial sediments, but at rates much too slow to be readily detectable over a period of decades. Under conditions of subaerial deposition the buildup of surfical sediments far exceeds their compaction at depth.
Desiccation and shrinkage of expansive soils	Swell/shrink properties of soils in the subsiding area have not been investigated. However, most of the area has been subject to agricultural and/or residential irrigation and is unlikely to have experienced serious dessication, despite substantial lowering of the water table.
Settlement of soils due to ground shaking	Significant cosiesmic settlement of unconsolidated soils typically involves temporary liquifaction manifested in localized slumping and sand boils.These phenomena have not been reported during the seismic events of recent decades.
Drainage of organic soils	High organic soils do not occur in the subsiding area.
Hydrocompaction	Hydrocompaction occurs where thick accumulations of very dry soils are rewetted for the first time since deposition. The very shallow water tables and artesion conditions that historically characterized the area of recent subsidence rule out this phenomenon.
Solution of soluble subsurface deposits like salt	There is no evidence for the existence of soluble rocks underlying the Chino Basin.
Subsurface extraction of hydrocarbons	Not applicable. There are no known oil or gas extraction wells currently in operation in Chino Basin.
Tectonism	While the alluvial basins of California have obviously been subsiding over geologic time relative to their bounding mountain ranges, there is no evidence for a tectonic mechanism that would account for the localized and relatively rapid subsidence observed in the southwestern part of Chino Basin.
Thawing permafrost	Not applicable. Permafrost is soil or rock that remains below 0°C throughout the year, and forms when the ground cools sufficiently in winter to produce a frozen layer that persists throughout the following summer. These conditions do not occur in Chino Basin.
Aquifer-system compaction	Probable cause.



Subsidence Features

- -2.2
- -2.1 - -2.0
- -1.9 - -1.6
- -1.5 - -1.4
- -1.3 - -1.2
- -1.1 - -1.0
- -0.9 - -0.8
- -0.7 - -0.6
- -0.5 - -0.4
- -0.3 - 0.0

Relative Change in Land Surface Altitude as Measured by Leveling Surveys 1987 - 1999 (feet)

+ 1.0 / 0.0 / - 1.0

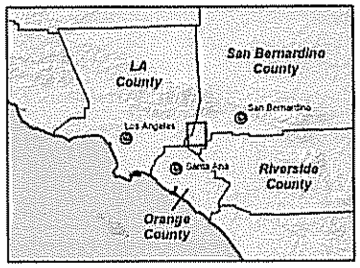
Relative Change in Land Surface Altitude as Measured by InSAR Oct 1993 - Dec 1995 (feet)

Wells in MZ-1 by Owner

- Ontario
- Pomona
- SAWC
- Upland
- SCWC
- CIM
- Chino Hills
- Chino
- MVWD

Other Features

- Ayala Park Extensometer Facility
- Chino Basin Desalter Well (Existing)
- Management Zone 1 Boundary
- No InSAR Data



Prepared by:

WILDERMUTH ENVIRONMENTAL INC

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Author: AEM
Date: 20050927
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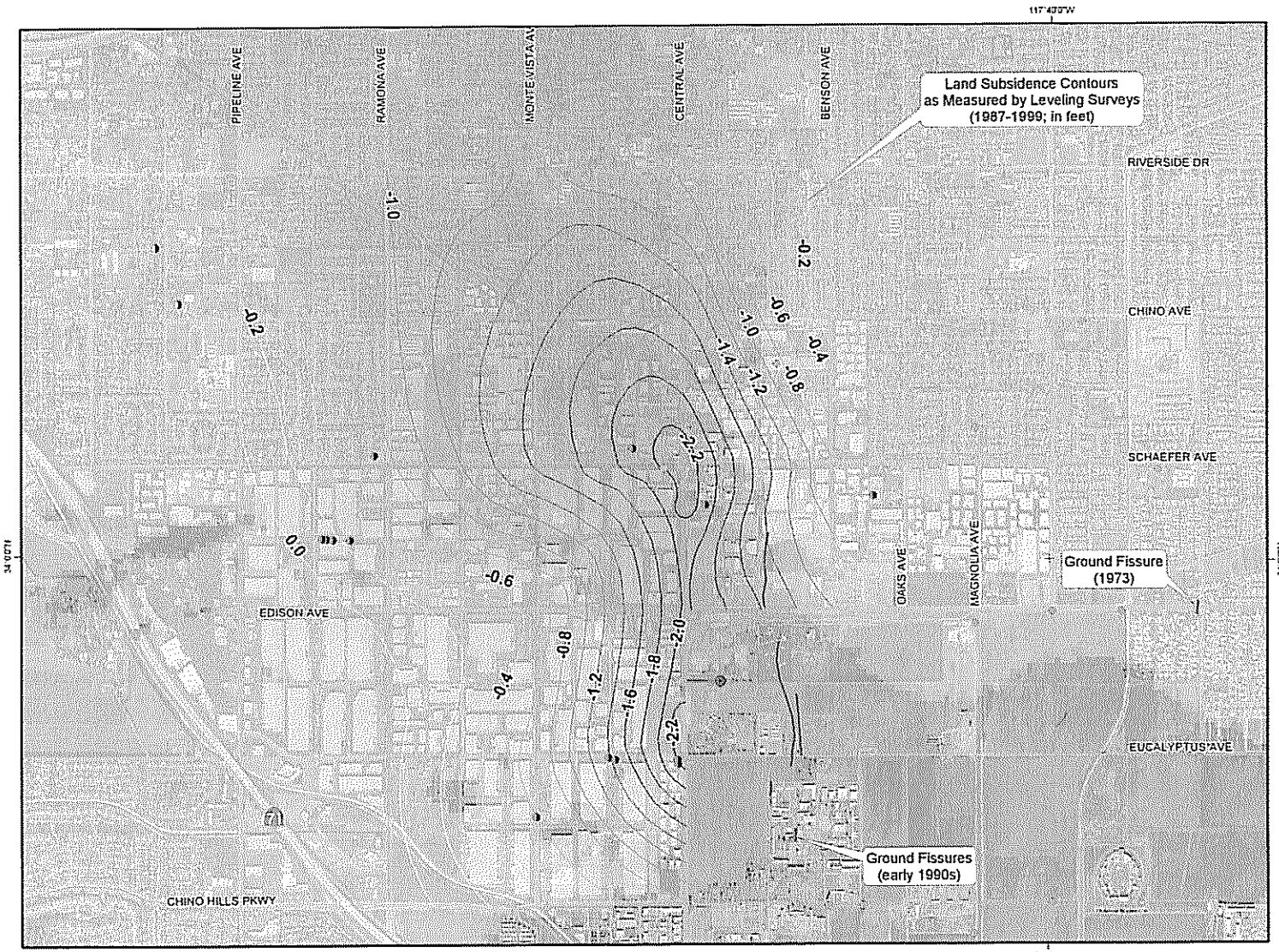
Land Surface Deformation in Management Zone 1
Leveling Surveys and InSAR

Figure 1-1



Subsidence Features

Ground Fissure
(dashed where approximated)

+ 1.0
0.0
- 1.0
Relative Change in
Land Surface Altitude
as Measured by InSAR
Oct 1993 - Dec 1995
(feet)

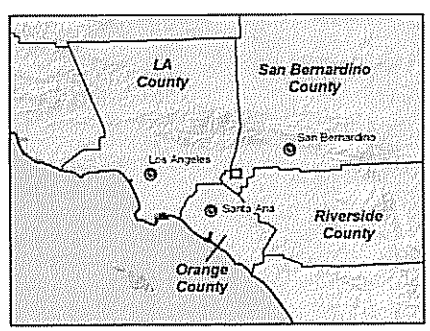
Wells in MZ-1 by Owner

- Ontario
- Pomona
- SAWC
- Upland
- SCWC
- CIM
- Chino Hills
- Chino
- MWD

Other Features

- Ayala Park Extensometer Facility

Note: Air photo background flown in April 2004.



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Author: AEM
Date: 20050927
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0 1,000 2,000 3,000 Feet
0 500 1,000 Meters

MZ-1 Summary Report
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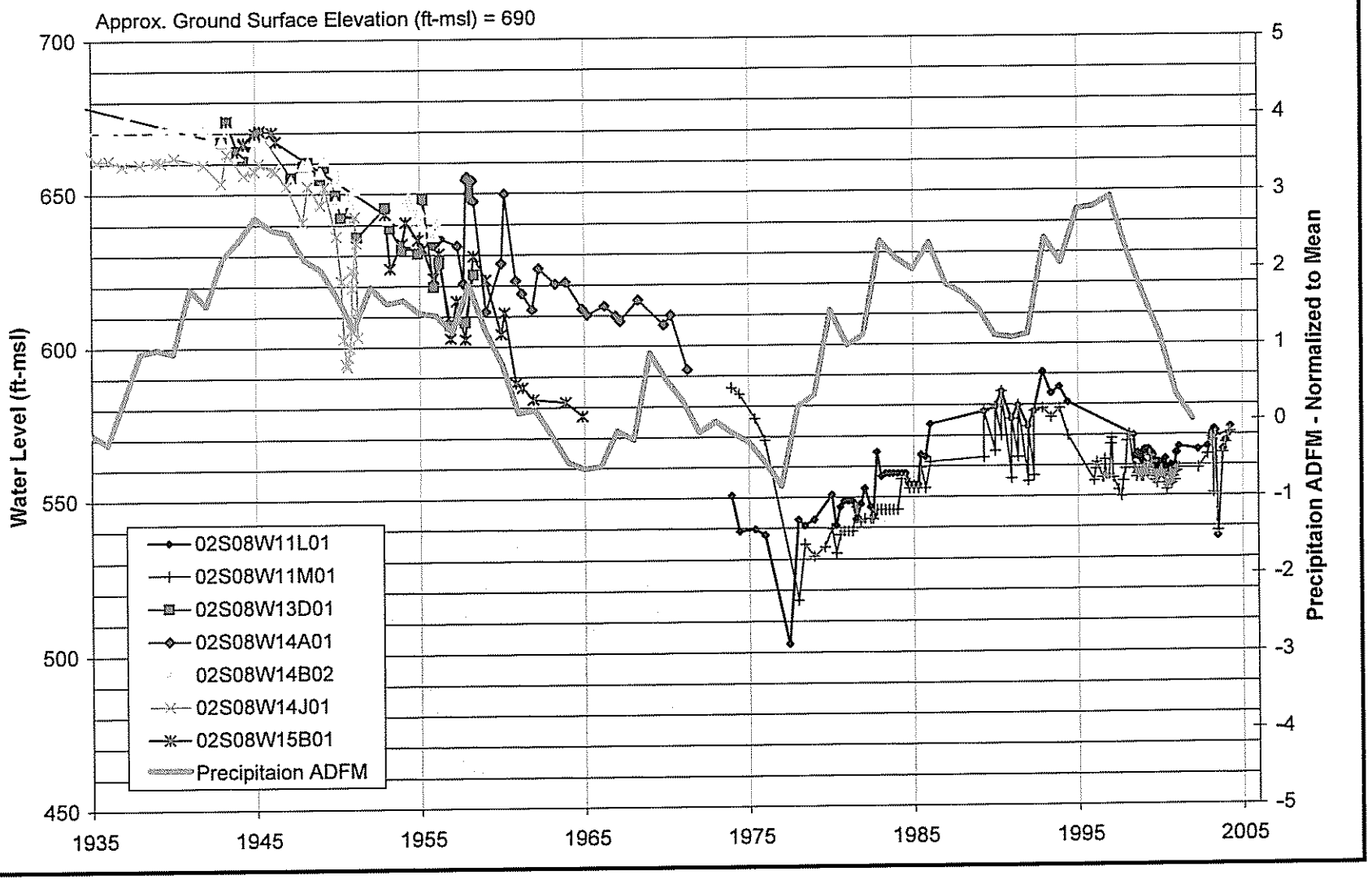
Land Surface Deformation in Chino, CA
Leveling Surveys and InSAR

Figure 1-2

Figure 1-3
Groundwater Level History in Southern MZ-1 (Shallow Wells)



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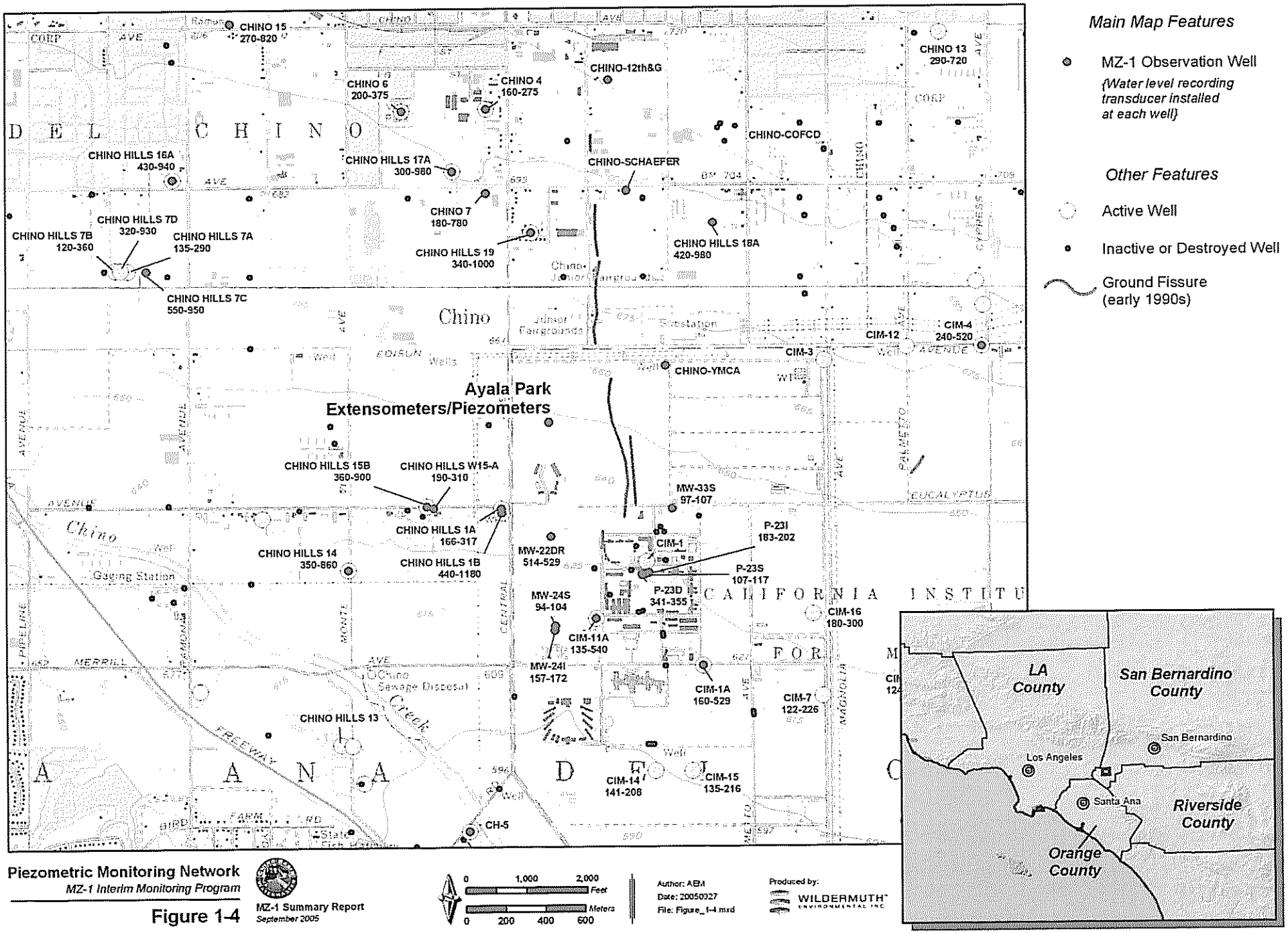
Wildermuth Environmental

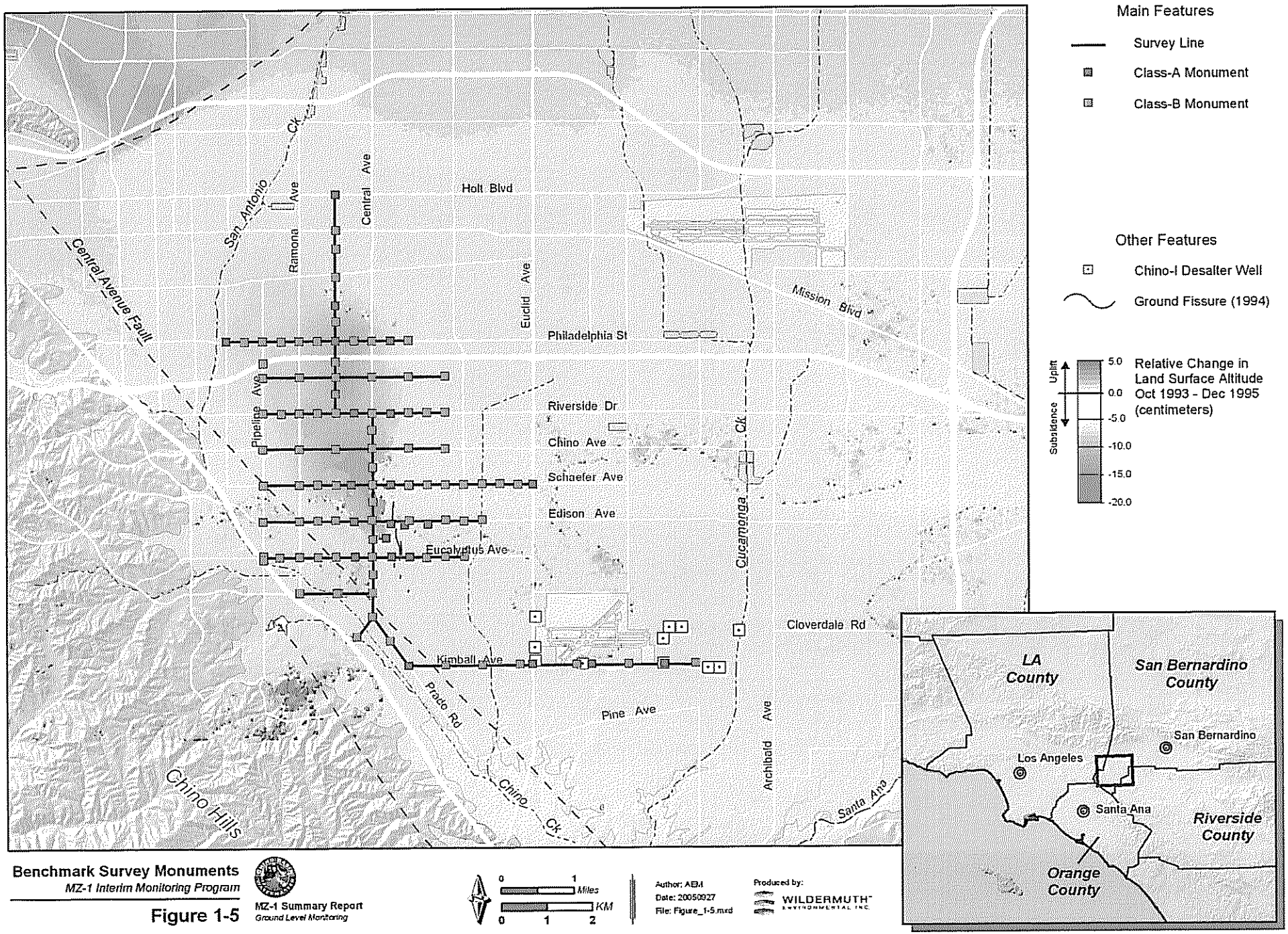


Piezometric Monitoring Network

MZ-1 Interim Monitoring Program

Figure 1-4

MZ-1 Summary Report
September 2005



Benchmark Survey Monuments
MZ-1 Interim Monitoring Program

Figure 1-5

MZ-1 Summary Report
Ground Level Monitoring

2. MZ-1 Interim Monitoring Program

This section describes the results, interpretations, and major conclusions derived from the Interim Monitoring Program (IMP) as of September 19, 2005.

Results and Interpretations

Aquifer-System Monitoring. The controlled testing and comprehensive monitoring of the aquifer-system (see Section 1) and subsequent data analyses has led to a number of key interpretations:

1. There appear to be two distinct aquifer systems in this area – a shallow, un-confined to semi-confined system from about 100-300 ft-bgs and a deep, confined system from about 400-1,200 ft-bgs.

2. Under current conditions of aquifer utilization in MZ-1, the aquifer-system deformation appears to be essentially elastic. At the Ayala Park Extensometer, about 0.14 feet of elastic land subsidence and rebound were observed during the pumping and recovery seasons of 2004-05. Minor amounts (~0.01 feet) of permanent compaction and associated land subsidence apparently occurred over this same period.

3. The relationships between aquifer-system stress (water level changes) and aquifer-system strain (vertical deformation of the sediment matrix) have been established by comparing piezometer data versus extensometer data. These relationships indicate the nature of the aquifer-system deformation (i.e. elastic vs. inelastic) and provide estimates of aquifer-system parameters for later use in aquifer-system models.

4. A deep aquifer-system pumping test in September 2004 appears to have transitioned the system from elastic to inelastic deformation. This provides a "threshold" water level at Ayala Park, below which further drawdown will result in inelastic compaction. The data derived from this test will assist in the creation of management tools for MZ-1 (e.g. groundwater flow and subsidence models).

A technical discussion related to the above interpretations follows:

Figure 2-1 shows the changes in thickness of the aquifer systems as recorded by the deep and shallow extensometers, completed at depths of 1,400 and 550 ft-bgs. It also shows the water-level fluctuations in two piezometers, PA-10 and PA-7, which are representative of the shallow aquifer system and the upper part of the deep aquifer system, respectively.

During periods of water-level decline in PA-7, both extensometers are recording compaction of the sediments. During periods of recovery in PA-7, both extensometers are generally recording elastic expansion. Note that for the data available, almost all of the compaction during the drawdown season is recovered as expansion during the recovery season.

During the late-spring (2004) pumping of the shallow aquifer system, while the deep system not pumped, the shallow extensometer recorded compression while the deep extensometer recorded an overall expansion. Subtracting the shallow record from the deep confirms that the deeper sediments continued a smooth expansion in response to continuing recovery of heads in the deeper parts of the aquifer system, as represented by the data from PA-7, which is screened from 438-448 ft-bgs. The shallow compression is seen to correlate closely with the drawdown recorded by PA-10, screened from 213-233 ft-bgs.

These observations clearly demonstrate the existence of the deep and shallow aquifer-systems in this region of MZ-1. Nearby pumping at wells that are screened in either the deep or shallow aquifer-systems result in distinct hydraulic and mechanical responses that are recorded at the Ayala Park piezometers and extensometers. These observations also demonstrate the importance, for analytical purposes, of

independently stressing the deep and shallow systems by pumping from only one at a time, so that the observed deformation can be more accurately attributed to production from a specific depth interval.

The relationships between water levels and aquifer-system deformation are further depicted in the stress-strain diagrams shown in Figure 2-2. In this diagram, increasing depth to water (drawdown due to pumping) is the measure of decreasing pore pressure and increasing effective intergranular stress. Increasing compression of the sediments is the resulting strain. When pumping diminishes or ceases, pore pressures recover, intergranular stress is reduced, and the aquifer system expands.

Figure 2-2 shows that the full thickness of sediments responds linearly to extended intervals of continuous drawdown or recovery, but with a large seasonal hysteresis attributable to the time lag involved in the delayed vertical propagation of pore pressure changes from the pumped aquifers into adjacent, poorly permeable aquitards. The parallel slopes of the compression and expansion trends represent the overall elasticity of the sedimentary section. Its inverse is the skeletal storativity, in hydrologic terminology.

Brief intervals of recovery during the drawdown season, and of drawdown during the recovery season, produce steeply sloping, more-or-less tight hysteresis loops. Their much steeper slope represents the (inverse) aggregate compressibility of the permeable pumped aquifers. The longer intervals of recovery and drawdown generate the more open hysteresis loops, as the delayed responses of immediately adjacent portions of the aquitards have time to influence the extensometers.

The parallelism of the seasonal drawdown and recovery stress-strain slopes in Figure 2-2 indicates that seasonal drawdown to 250 ft-bgs at this site is producing essentially elastic, recoverable deformation. However, the slope of the drawdown curve in 2004 begins to deviate from its elastic trend when the seasonal drawdown exceeds 250 ft-bgs indicating a transition to inelastic compaction within draining aquitard interbeds. A minor amount of non-recovered compaction is indicated by the offset of the recovery curve in 2005 to the right (direction of compression). On about September 19, 2005 water levels had recovered to the levels of pre-pumping conditions of 2004 (~105 ft-bgs at PA-7), and the offset of the stress-strain curve to the right (direction of compression) confirmed that about 0.01 ft of permanent compaction occurred during the pumping season of 2004.

The pumping and associate drawdown of water levels in 2004 was part of a controlled aquifer system stress test. The primary objective of this test was to transition the deformation of aquifer-system sediments from elastic compression to inelastic compaction. If successful, it would provide "threshold" piezometric heads at the extensometer location that should not be approached in the future if permanent (inelastic) compaction within the aquifer-system is to be avoided. This would also define a key parameter required for estimating the maximum elastic storage capacity of the confined aquifer-system.

For fear of exacerbating the ground fissuring, one limiting condition of the test that was agreed upon by the participating agencies was that pumping cease when inelastic compaction was identified. Although 0.01 feet of permanent compaction is relatively minor deformation, it is measurable and within the detection limits of the extensometer. The stress-strain diagram in Figure 2-2 indicates that at Ayala Park the aquifer-system transitioned from elastic compression to inelastic compaction when the water level in the PA-7 piezometer at Ayala Park fell below about 250 ft-bgs. The applicability of this limit at increasing distances from the piezometer/extensometer facility is dependent on an approximate replication of the tested pumping conditions (i.e. specific wells pumped, pumping rates, and pumping durations). A different areal distribution of pumping might cause localized inelastic compaction away from Ayala Park without drawing PA-7 below 250 feet or recording inelastic effects at the extensometer.

A different vertical distribution of extraction will stress the aquifer system in a different manner, and may result in a different threshold water level in PA-7.

Other objectives of the pumping test that were successfully accomplished were to (1) estimate key aquifer-system parameters that could be used in later modeling efforts, and (2) confirm and elucidate the existence of a groundwater barrier within the sediments below about 300 ft-bgs

Discovery of Groundwater Barrier. Multiple lines of evidence suggest that a previously unknown groundwater barrier exists within the deep aquifer-system in the same location as the fissure zone.

Controlled aquifer-system stress (pumping) tests in October 2003 and April 2004 provided piezometric response data that revealed a potential groundwater barrier within the sediments below about 300 ft-bgs and aligned north-south with the historic fissure zone. Figure 2-3 is a map that shows the locations of a pumping well perforated in the deep aquifer system (CH-19, 340-1,000 ft-bgs) and other surrounding wells that also are perforated exclusively in the deep system. Figure 2-4 shows the water level responses in these wells during various pumping cycles at CH-19. The groundwater barrier is evidenced by a lack of water level response in CH-18 (east of the fissure zone) due to pumping at CH-19 (west of the fissure zone). Image-well analysis of pumping-test responses also indicates that this barrier approximately coincides with the location of the historic zone of ground fissuring.

Ground level survey data (described in detail below) corroborate the water level data – also indicating the existence of the barrier and its coincident location with the fissure zone. Figure 2-6 shows that during the pumping season of 2003 (April to November) vertical displacement of the land surface (i.e. subsidence) was generally greater on the west side of the fissure zone where water-level drawdown was greatest. Figure 2-7 shows that during the recovery season of 2003-04 (November to April) vertical displacement of the land surface (i.e. rebound) was again greater on the west side of the fissure zone where water level recovery was greatest.

In other words, the groundwater barrier in the deep aquifer-system is aligned with the fissure zone and causes greater water level fluctuations on the west side of the barrier where the pumping is concentrated. These greater water level fluctuations on the west side of the barrier, in turn, cause greater deformation of the aquifer-system matrix which, in turn, causes greater vertical land surface deformation on the west side of the barrier. In addition, the pattern of horizontal displacement of benchmarks over the pumping and recovery seasons, as shown in Figures 2-6 and 2-7, likely reflects, in part, the differential compaction of the aquifer system across the fissure zone.

Similarly, the InSAR data in Figures 1-2 and 2-5 also corroborate the existence of the groundwater barrier by showing maximum subsidence west of the barrier and virtually no subsidence east of the barrier.

This spatial coincidence of the groundwater barrier and the historic fissure zone suggests a cause-and-effect relationship: the barrier causes differential water level declines, which cause differential aquifer-system compaction and a steep gradient of subsidence across the barrier, which can and likely has caused ground fissuring above the barrier.

Monitoring of Ground-Surface Deformation—Ground-Level Surveying. In late April 2004, AE performed the annual survey event across the entire network of benchmark monuments, including the measurements of horizontal displacements at the Ayala Park Array of monuments. The results of the ground level surveys were presented to the MZ-1 Technical Committee at its meeting. Also at this

meeting, the project manager from AE made a presentation to describe survey methodologies, accuracy, results, and challenges.

Figure 2-5 displays the vertical displacement at monuments that occurred from April 2003 to April 2004. Comparing monument elevations over the April-to-April period is meant to reveal the inelastic component of compaction, if any, which may be occurring in the region. The assumption here is that in April 2004 water levels in the region have recovered to the April 2003 levels; thus the measured vertical displacement does not include the elastic component of aquifer system deformation. Water levels measured as part of the IMP (in the vicinity of Ayala Park) support this assumption. Examination of Figure 2-5 shows that the monuments near Ayala Park experienced little to no subsidence over this time period. However, the monuments located in the northern portions of the surveyed area showed small but measurable subsidence of the land surface (on average about 0.04 feet). Maximum subsidence of about 0.08 feet was recorded at monuments located along Philadelphia Street between Pipeline and Ramona Avenues. Water level and groundwater production data have not been collected or analyzed as part of the IMP in these northern portions of the survey area; hence, it is not yet possible to classify the nature of the subsidence in this region (*i.e.* elastic vs. inelastic), since it is not known whether water levels in 2004 had recovered to their 2003 levels.

The color-coded background in Figure 2-5 represents the subsidence that occurred in the area over the October 1993 to December 1995 period as measured by InSAR. The subsidence shown by this InSAR data has been interpreted as primarily permanent subsidence caused by inelastic aquifer-system compaction. If so, the survey data in Figure 2-5 are indicating that the distribution of inelastic compaction in 2003-04 is significantly different than the distribution of inelastic compaction that occurred during the early 1990s. In particular, maximum permanent subsidence of about 1 foot in 1993-95 was measured in the vicinity of Ayala Park by InSAR, whereas in 2003-04 the survey data are indicating minimal permanent subsidence, if any, in this same area.

Figures 2-6 and 2-7 display the vertical and horizontal displacement at monuments of the Ayala Park Array that occurred from April 2003 to November 2003 and November 2003 to April 2004, respectively. The determination of horizontal displacement of monuments was accomplished through the processing of distance and angle measurements between adjacent monuments, and is based on the assumption that the southeastern monument was stable over the period of measurement. The methods used to measure the horizontal displacement of monuments at the Ayala Park Array are currently being refined by AE. These figures show:

- significant horizontal displacement of the ground surface over the course of the pumping and recovery seasons in the vicinity of the historic fissure zone
- the elastic nature of the land surface displacement over the course of the pumping and recovery seasons
- the apparent presence of a groundwater barrier within the deep aquifer system (see Section 5.3.4 below).

Groundwater production and water-level data show that pumping of wells perforated within the deep aquifer system (>300 ft-bgs) causes water-level drawdowns in the deep aquifer system on the order of 150 feet. However, these large drawdowns do not propagate east of the fissure zone. During the pumping season of 2003 (April to November) vertical displacement of the land surface (i.e. subsidence) was generally greater on the west side of the fissure zone where water-level drawdown was greatest. During

the recovery season of 2003-04 (November to April) vertical displacement of the land surface (i.e. rebound) was again greater on the west side of the fissure zone where water-level recovery was greatest.

In other words, the groundwater barrier in the deep aquifer system aligned with the fissure zone causes greater water-level fluctuations on the west side of the barrier where the pumping is concentrated. These greater water-level fluctuations west of the barrier cause greater deformation of the aquifer-system matrix which, in turn, causes greater vertical land surface deformation on the west side of the barrier. The InSAR data corroborate the existence of the groundwater barrier by showing maximum subsidence west of the barrier (0.2ft) and virtually no subsidence east of the barrier during the course of one pumping season (April-1993 to September 1993). In addition, the pattern of horizontal displacement of benchmarks over the pumping and recovery seasons likely reflects, in part, the differential compaction of the aquifer system across the fissure zone.

In June 2005, the entire network of monuments was surveyed for vertical displacement and, at the Ayala Park array of monuments, for horizontal displacement. The results of this survey are currently being processed.

Monitoring of Ground Surface Deformation—InSAR. Vexcel Corporation of Boulder, Colorado – a company that specializes in remote sensing and radar technologies – conducted a "proof of concept" study of historical synthetic aperture radar data that was acquired over the MZ-1 area. The objective of this study was to generate cumulative displacement maps over relatively short time steps (April to November 1993). The MZ-1 Technical Group deemed the study successful, and approved follow-up study by Vexcel to perform a comprehensive analysis of all historical synthetic aperture radar data (1992-2003) to characterize in detail the history of subsidence in MZ-1.

The comprehensive analysis was completed during the first quarter of calendar 2005. However, the usable data in this analysis only spanned the 1992-2000 period. Dr. David Cohen of Vexcel presented the InSAR results by to the MZ-1 Technical Committee in March 2005. Figures 2-8 and 2-9 display the summary results of the InSAR analysis of land subsidence for the periods of 1992-1995 and 1996-2000.

The InSAR results were generally consistent with the ground level survey data collected over a similar period with respect to the areal extent and magnitude of historical subsidence. The InSAR data show that:

- the rate of subsidence in the south area of MZ-1 has declined over time, particularly since about 1995.
- currently, the aquifer system is experiencing mainly elastic compression and expansion in the south area of MZ-1.
- the central area of MZ-1 is displaying greater rates of subsidence than the south area (near Ayala Park). This subsidence is probably due to aquifer system compaction, but pumping and water level data that would define this relationship have not yet been collected and analyzed in the central area of MZ-1.
- a steep gradient of subsidence exists across the fissure zone. The steep gradient extends north of the fissure zone to about Francis Street. In addition, the spatially continuous InSAR data show that the gradient of subsidence is steeper across the fissure zone than is shown by surveys of discrete benchmarks, which further supports the potential link between the subsidence and the fissuring. The existence of this steep gradient across the fissure zone also supports/reveals the existence and extent of the groundwater barrier.

Conclusions

There are five major conclusions that have been derived from the IMP to date:

1. The current state of aquifer-system deformation in south MZ-1 (in the vicinity of Ayala Park) is essentially elastic. Little, if any, inelastic (permanent) compaction is now occurring in this area, which is in contrast to the past when about 2.2 feet of land subsidence occurred, accompanied by ground fissuring, from about 1987-1995.

2. Groundwater production from the deep, confined aquifer system in this area causes the greatest stress to the aquifer system. In other words, pumping of the deep aquifer system causes water-level drawdowns that are much greater in magnitude and lateral extent than drawdowns caused by pumping of the shallow aquifer system.

3. Water-level drawdowns due to pumping of the deep aquifer system can cause inelastic (permanent) compaction of the aquifer-system sediments, which results in permanent land subsidence. The initiation of inelastic compaction within the aquifer system was identified during this investigation when water levels fell below a depth of about 250 feet in the PA-7 piezometer at Ayala Park.

4. Through this study, a previously undetected barrier to groundwater flow was identified. The barrier is located within the deep aquifer system and is aligned with the zone of historical ground fissuring. Pumping from the deep aquifer system is limited to the area west of the barrier, and the resulting drawdowns do not propagate eastward across the barrier. Thus, compaction occurs within the deep system on the west side of the barrier, but not on the east side, which causes concentrated differential subsidence across the barrier and creates the potential for ground fissuring.

5. InSAR and ground-level survey data indicate that permanent subsidence in the central parts of MZ-1 (north of Ayala Park) has occurred in the past and continues to occur today. The InSAR data also indicate that the groundwater barrier extends northward into central MZ-1. These observations suggest that the conditions that very likely caused ground fissuring near Ayala Park in the 1990s are also present in central MZ-1, and should be studied in more detail.

Figure 2-1 - Piezometric and Extensometer Data

Ayala Park Piezometer/Extensometer Facility

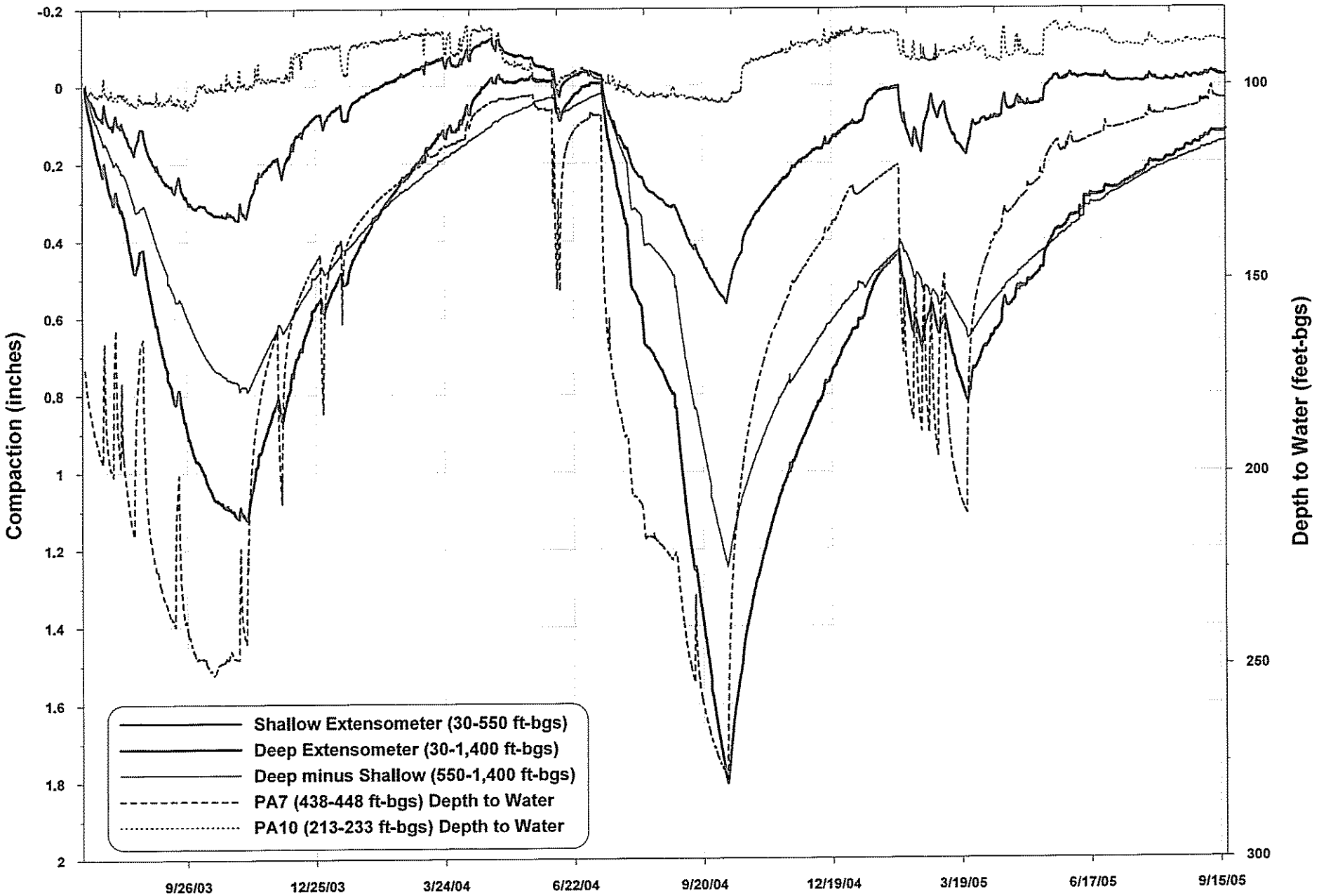
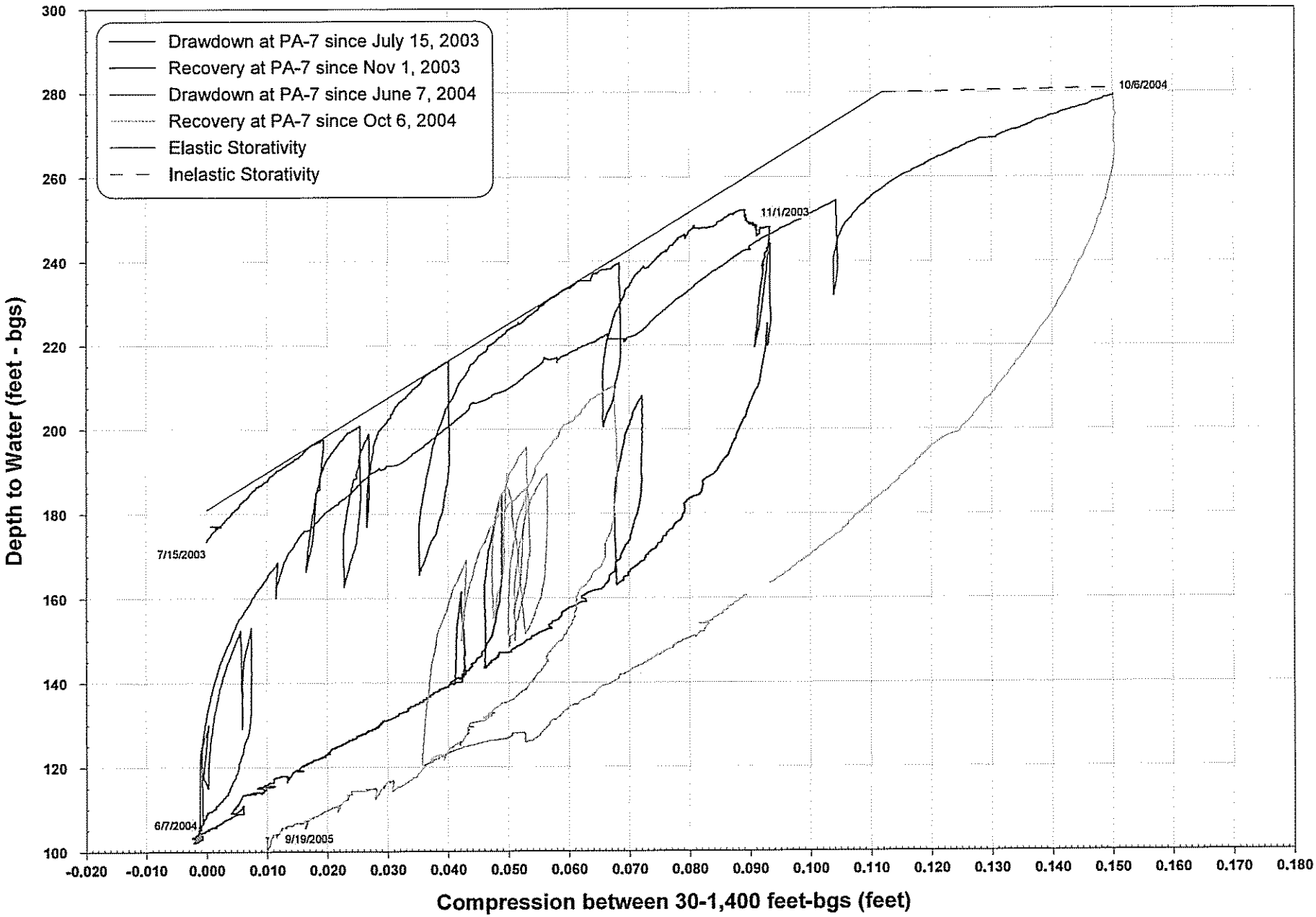
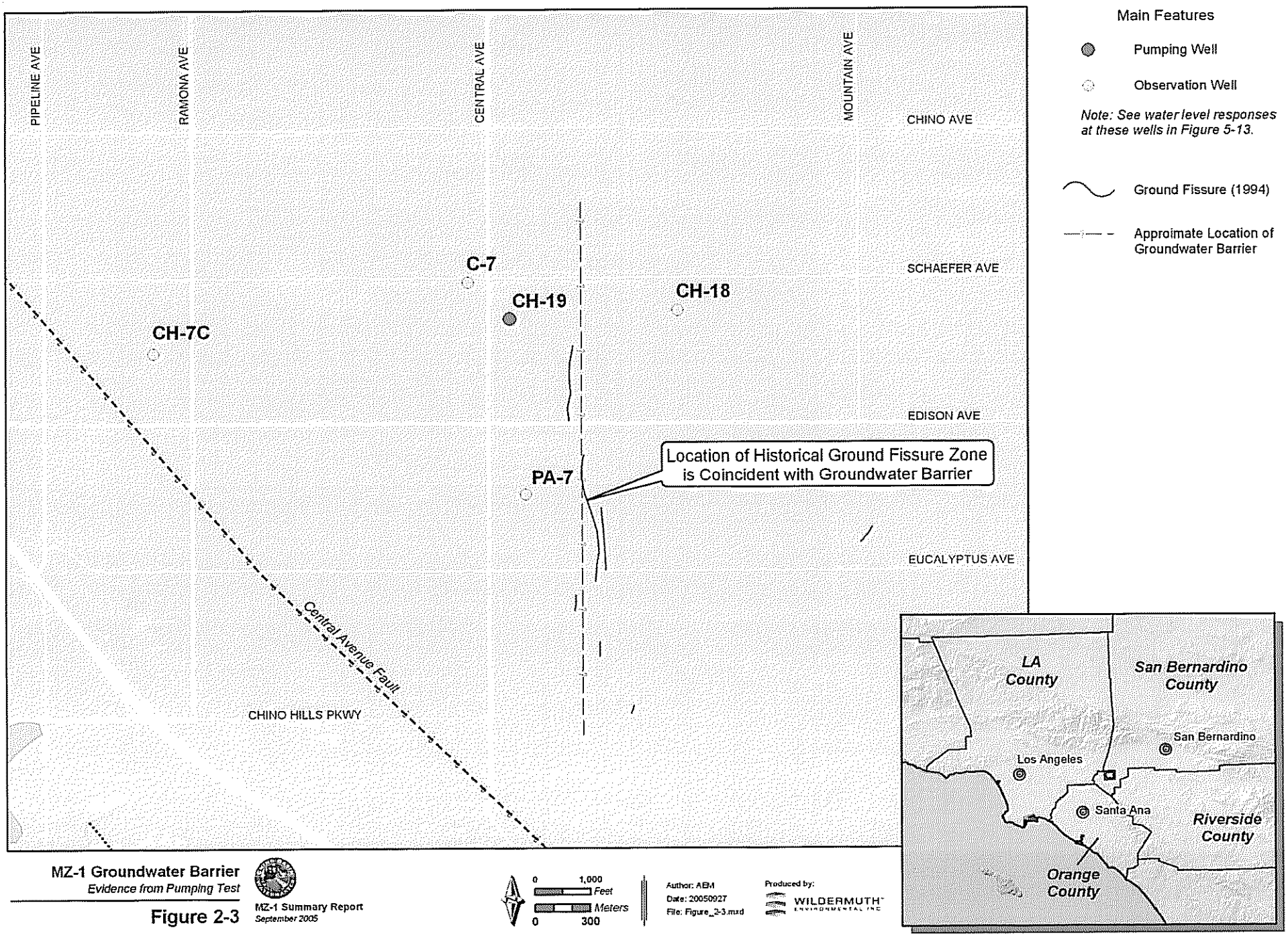


Figure 2-2 -- Stress-Strain Diagram

PA-7 vs. Deep Extensometer



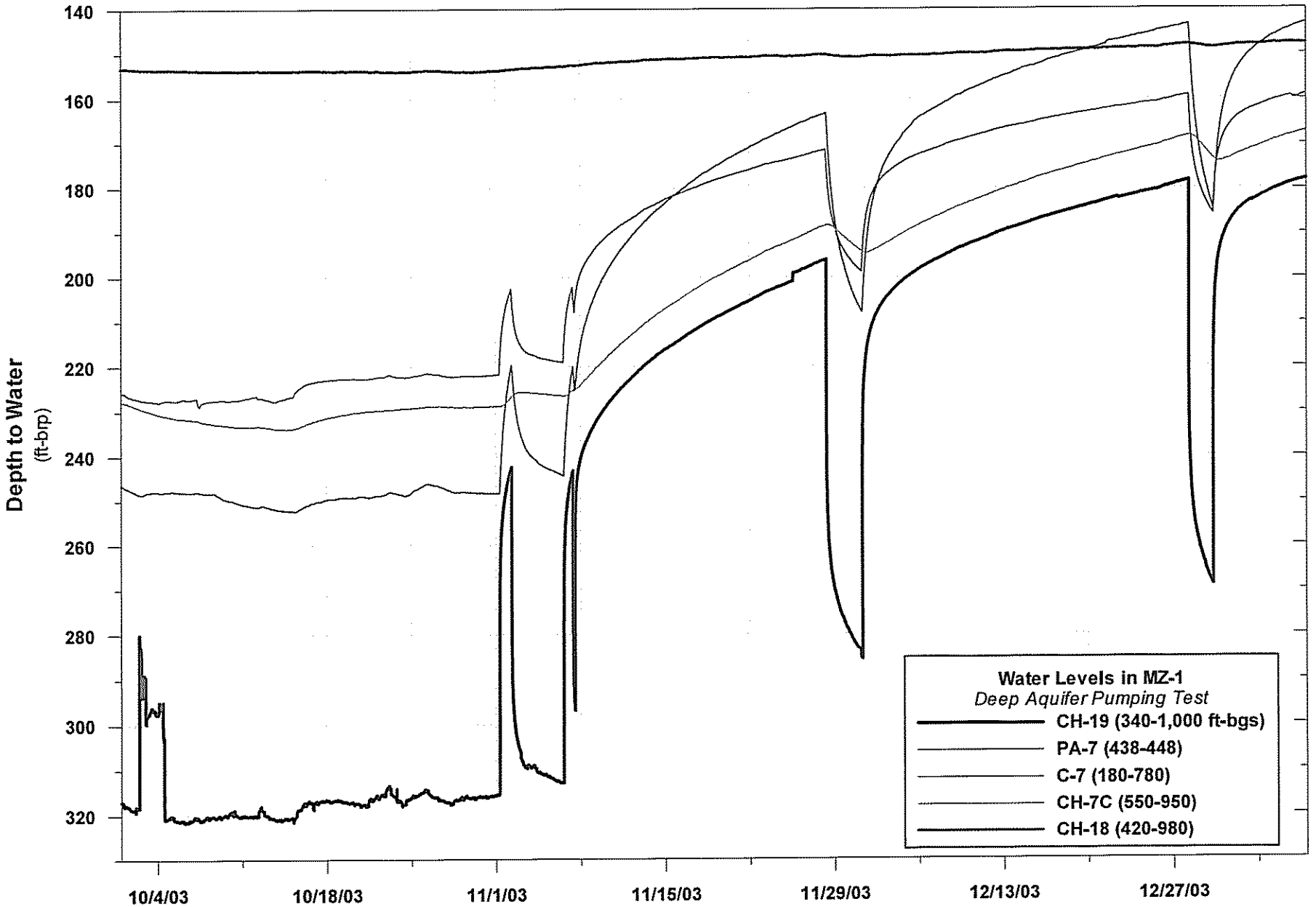


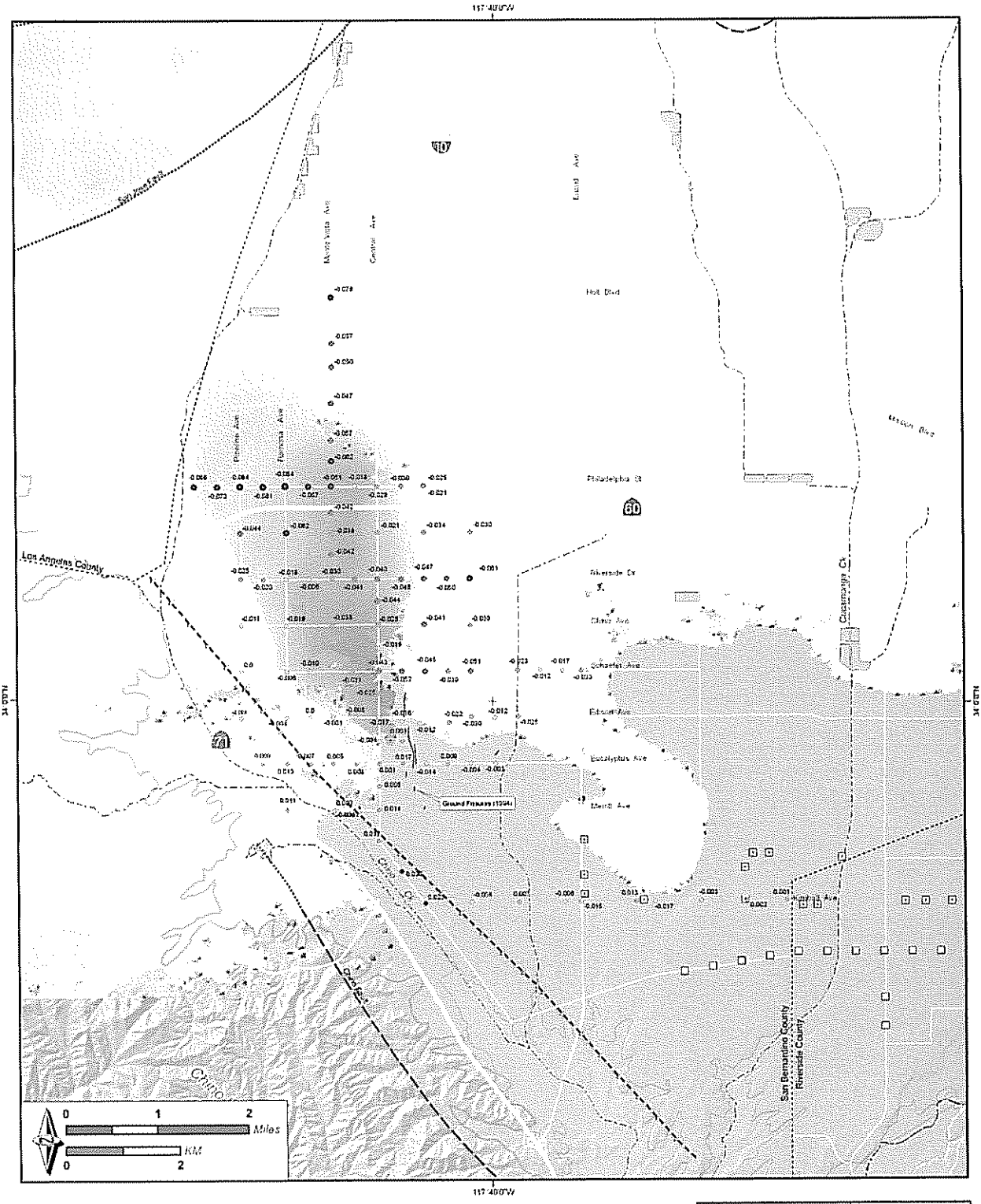
MZ-1 Groundwater Barrier
Evidence from Pumping Test

Figure 2-3

MZ-1 Summary Report
September 2005

Figure 2-4
Water Level Responses at Nearby Wells to Pumping at CH-19





Main Features

- -0.010 to -0.050
- -0.070 to -0.090
- -0.090 to -0.040
- -0.030 to -0.020
- -0.010 to -0.001
- 0.0
- 0.001 to 0.020

Relative Change in Land Surface Altitude as Measured by Leveling Surveys April 2003 - April 2004 (feet)

+1.0 / 0.0 / -1.0

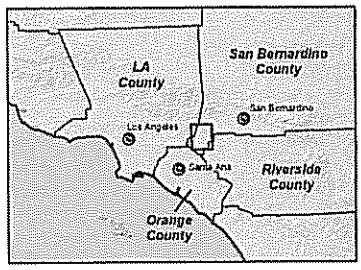
Relative Change in Land Surface Altitude as Measured by InSAR Oct 1993 - Dec 1995 (feet)

Other Features

- Ayala Park Extensometer Facility
- Chino Basin Desalter Well (Existing)
- Chino Basin Desalter Well (Planned)
- Chino Basin Hydrologic Boundary

Faults & Groundwater Divides

- Location Certain
- Location Approximate
- Location Concealed
- Location Uncertain
- Groundwater Divide

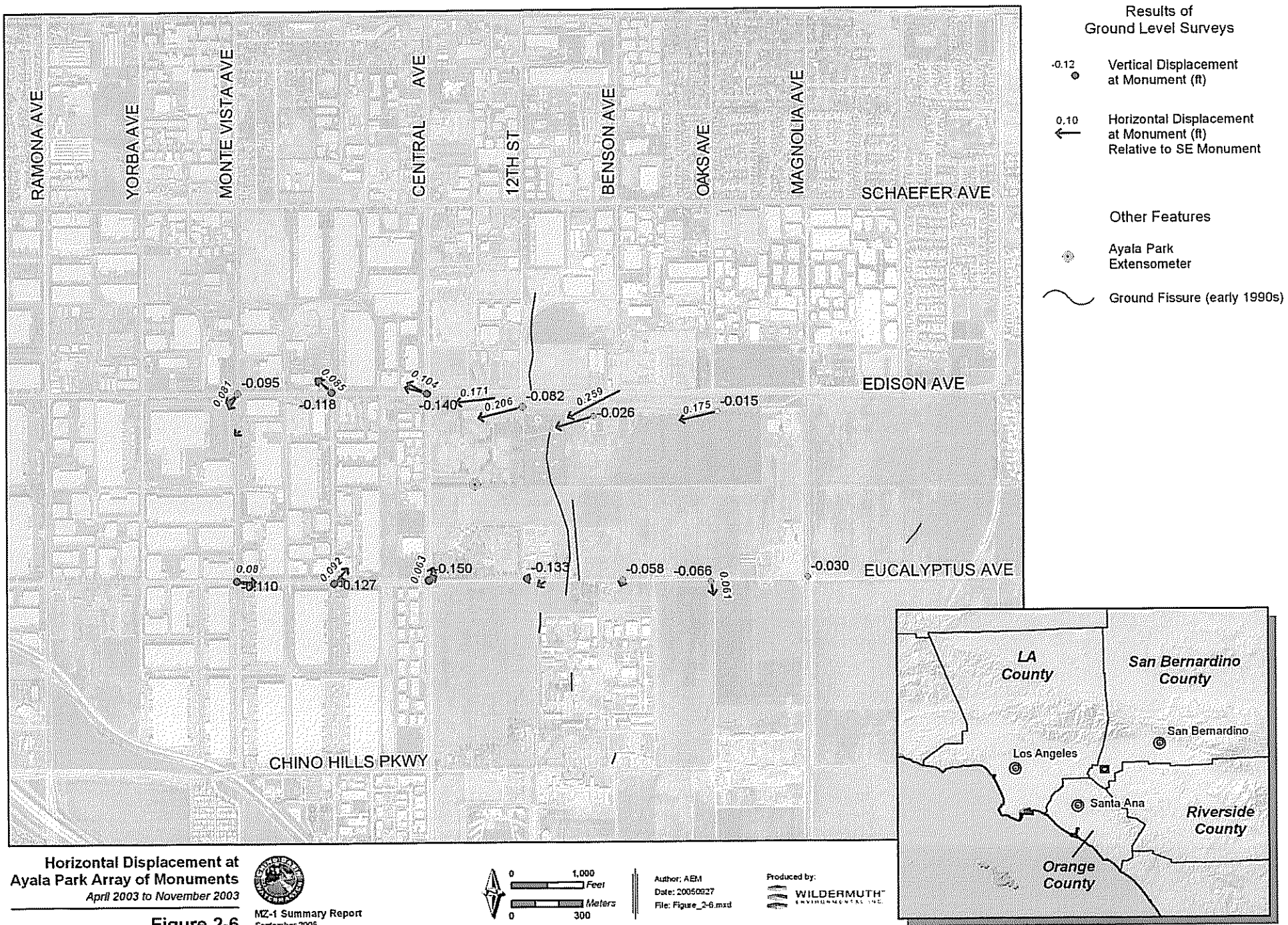


Prepared by:
WILDERMUTH ENVIRONMENTAL INC.
Author: AEM
Date: 20050927
File: Figure_2-5.mxd

MZ-1 Summary Report
September 2005

Ground Level Survey Results
April 2003 to April 2004

Figure 2-5

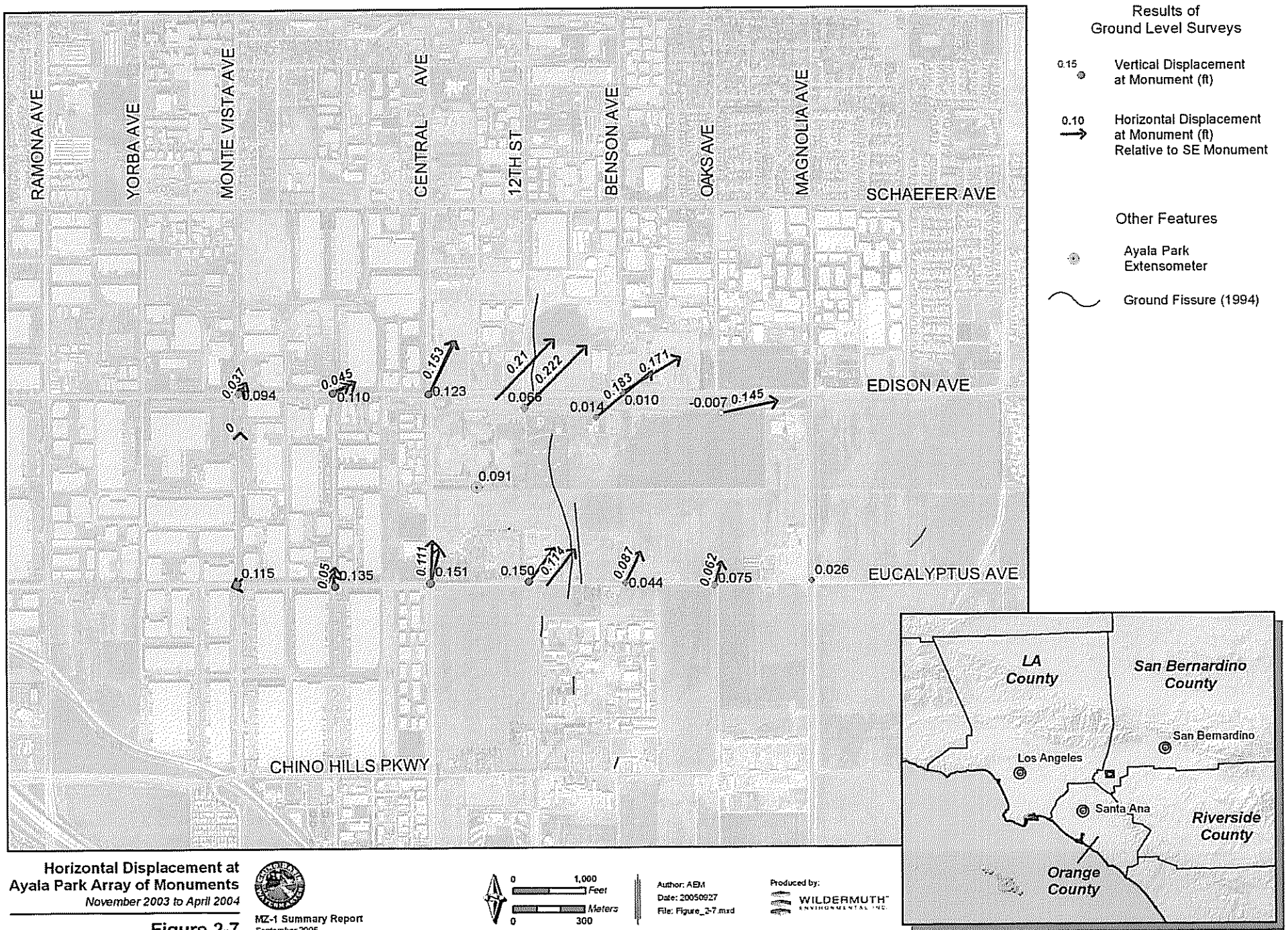


Horizontal Displacement at Ayala Park Array of Monuments

April 2003 to November 2003

Figure 2-6

MZ-1 Summary Report
September 2005



Horizontal Displacement at Ayala Park Array of Monuments
November 2003 to April 2004

Figure 2-7

MZ-1 Summary Report
September 2005

0 1,000 Feet
0 300 Meters

Author: AEM
Date: 20050927
File: Figure_2-7.mxd

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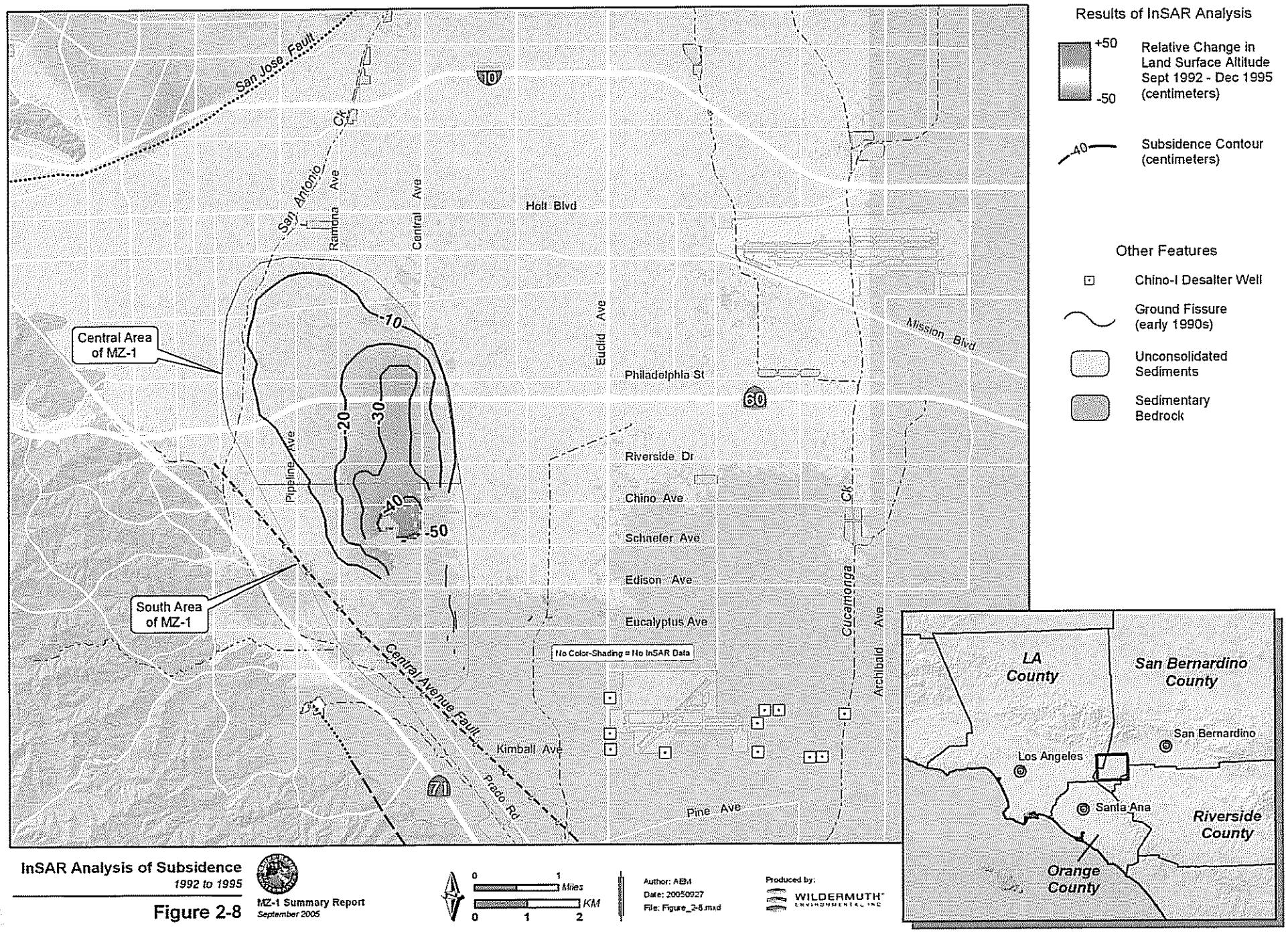
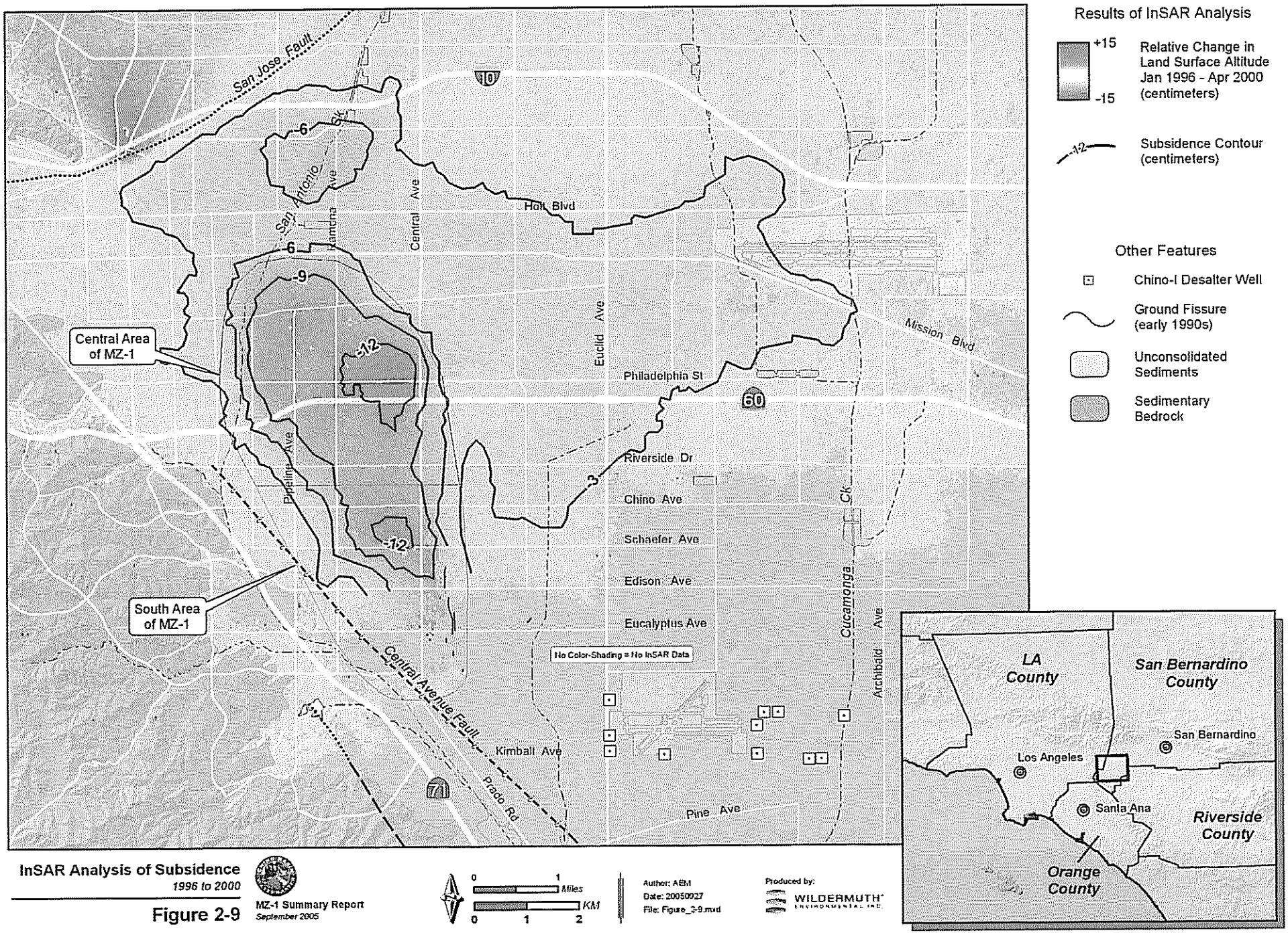


InSAR Analysis of Subsidence
1992 to 1995

Figure 2-8

MZ-1 Summary Report
September 2005



InSAR Analysis of Subsidence
1996 to 2000

Figure 2-9

MZ-1 Summary Report
September 2005

3. ONGOING AND RECOMMENDED WORK

This section describes:

- the ongoing work of the IMP, which includes the continued monitoring of the aquifer system and land surface deformation and the development of analytical and numerical models of groundwater flow and aquifer-system deformation.
- the work that is currently being implemented that was not initially part of the IMP, but has been recommended by MZ-1 Technical Committee and/or Watermaster based on data obtained during the IMP period. This work includes the expanded aquifer-system monitoring in the central area of MZ-1, and the monitoring of horizontal ground surface deformation along Schaefer Avenue.

Continued Monitoring

Aquifer-System Monitoring. Aquifer-system monitoring efforts will continue for the duration of the IMP. The MZ-1 Technical Committee will likely recommend that the aquifer-system monitoring efforts continue, albeit at a reduced scope, as part of the long-term management plan. Electronic data from the Ayala Park Extensometer facility and from water level recording transducers in surrounding wells will be collected and entered into the MZ-1 database once every two months. The purpose of this continued monitoring effort is to (1) continually evaluate the effectiveness of the long-term plan, and (2) verify the accuracy of the groundwater flow and subsidence models that are being used as management tools.

InSAR. The MZ-1 Technical Committee is recommending that on-going InSAR monitoring of land surface deformation be conducted on a semi-annual interval (spring and fall data acquisition and interferometric analysis) for the next two years. This analysis will (1) reveal seasonal and annual ground surface displacement across the entire MZ-1 area, and (2) be compared to ground-level survey data collected at the same interval (see Section 5.4.2 below) to help determine a long-term strategy to monitor ground surface deformation.

Ground Level Surveying. The MZ-1 Technical Committee is recommending that the entire network be surveyed twice per year for the next two years (during the spring and fall of each year). The ground level survey data will be compared against the InSAR data (see above) to help determine a long-term strategy to monitor ground surface deformation.

Development of Analytical and Numerical Models

The objectives of aquifer-system modeling in MZ-1 are:

- To evaluate fluid withdrawal as the mechanism of historical land subsidence and fissuring
- To predict the effects of potential basin management practices on groundwater levels and land subsidence and fissuring (forecasting tool)

In other words, if a model can be constructed that simulates past drawdown and associated land subsidence, then the model represents an additional line of evidence that fluid withdrawal was the mechanism of historical land subsidence. In addition, the model can be used to predict future drawdown and associated land subsidence that would result from potential basin management practices.

Three distinct modeling efforts will take place in sequence:

1. *Inverse analytical modeling.* This type of modeling will use groundwater level and production data collected as part of the aquifer-system stress testing (pumping tests) that were conducted in 2003 and

2004. The objectives are to determine the hydraulic and mechanical parameters of the aquifer-system and reveal XY-anisotropy. The results will be used in subsequent numerical modeling efforts.

2. *One-dimensional compaction modeling.* This type of modeling will use groundwater level and aquifer-system deformation data collected at the Ayala Park Piezometer/Extensometer Facility, as well as historical water level and subsidence data collected near Ayala Park. One objective is to determine the aquitard properties in the vicinity of Ayala Park. Areal extrapolation of aquitard properties will be based on geology and InSAR data, and the results will be used in the three-dimensional numerical modeling efforts (see Section 3). Another objective is to predict aquifer-system deformation due to predicted water level changes that may occur at Ayala Park in the future due to nearby pumping.

3. *Three-dimensional groundwater flow and subsidence modeling.* This type of modeling will use groundwater level and production data at all wells in the area and historical land subsidence data from ground level surveys and InSAR. Again, this model will attempt to match historical water level and subsidence data and, if successful, will serve as a forecasting tool for MZ-1 managers.

It is desirable that the calibration period for future groundwater flow and subsidence modeling begins before significant drawdown in MZ-1 (~1940). The comprehensive set of subsidence data in this region begins in 1987. If subsidence data exists prior to 1987, then it needs to be collected, evaluated, and linked to the post-1987 survey data if it is to be used in model calibration. Associated Engineers is currently investigating the quantity and quality of pre-1987 subsidence data in MZ-1, and will deliver a report containing these data in October 2005.

Expanded Monitoring

One of the key discoveries of the IMP has been the groundwater barrier located beneath the historic fissure zone. However, the northern and southern extent of this barrier is unknown. The MZ-1 Technical Committee is contemplating the expansion of the aquifer-system monitoring network to the north and south of its current extent to better characterize the location and effectiveness of the barrier. Further aquifer-system testing (i.e. pumping test) may be necessary as part of this effort.

The horizontal surveys will also be extended to the north over this two year period to include the benchmarks along Schaefer Avenue. The next survey of the entire monument network is planned for October 2005.

4. Development of the Long-Term Management Plan for MZ-1

Recall that the objective of the long-term management plan is to minimize or abate permanent land subsidence and ground fissuring in MZ-1. The modeling efforts described above will be critical to the development of the long-term plan, and the continual evaluation of plan in the future.

A workshop was held May 25, 2005 to update the Special Referee on IMP progress and development of the long-term management plan for MZ-1. The OBMP implementation plan called for the development of the long-term plan by June 2005. Because the modeling efforts were just begun in the summer of 2005, the Special Referee was notified before and during the workshop of the impending delay in the development of the long-term plan.

Subsequent to the workshop, the Special Referee issued a report to the Court (Appendix A). In the report, the Special Referee:

- indicated that the IMP progress and current activities are sufficient to warrant a delay in the development of a long-term plan
- indicated that it was incumbent upon Watermaster to request that the Court extend the period for completion of the long-term plan, and that Watermaster file with the Court a motion for an order to set a new schedule for the completion of the long-term plan
- requested that Watermaster produce a MZ-1 Summary Report (this report) that describes the IMP results and conclusions to date, and addresses outstanding issues such as other potential subsidence mechanisms and historical subsidence that pre-dates the 1990s
- requested that Watermaster provide "guidance criteria" to the MZ-1 producers in an effort to minimize the potential for future subsidence and fissuring until the completion of the long-term plan

Guidance Criteria to Minimize Subsidence and Fissuring

In response, Watermaster produced this summary report, and drafted a set of guidance criteria for MZ-1 producers. Again, the purpose of the guidance criteria is to minimize the risk of permanent subsidence and ground fissuring while the long-term plan is being developed. The guidance criteria are listed in Table 4-1 and below:

1. Table 4-2 lists the existing wells (hereafter the Managed Wells) and their owners (hereafter the Parties) that are the subject of these Guidance Criteria.

2. Figure 4-1 shows the area addressed by these Guidance Criteria (hereafter the Area of Subsidence Management). Within the boundaries of this area, both existing and newly-constructed wells are subject to being classified as Managed Wells. This is based upon the observed and/or predicted effects of pumping on groundwater levels and aquifer-system deformation. Initial Managed Well designations for wells that pumped during the IMP were based on effects measured at the Ayala Park Piezometer/Extensometer Facility. Additional Managed Well designations were made based on analysis of well construction and geology.

3. The Guidance Level is a specified depth to water measured in Watermaster's PA-7 piezometer at Ayala Park. It is defined as the threshold water level at the onset of inelastic compaction of the aquifer system as recorded by the extensometer, minus 5 feet. The 5-foot reduction is meant to be a safety factor to ensure that inelastic compaction does not occur. The Guidance Level is established by Watermaster based on the periodic review of monitoring data collected by Watermaster. The initial Guidance Level is 245 feet below the top of the PA-7 well casing.

4. If the water level in PA-7 falls below the Guidance Level, Watermaster recommends that the Parties curtail their production from designated Managed Wells as required to maintain the water level in PA-7 above the Guidance Level.

5. Watermaster will provide the Parties with real-time water level data from PA-7.

6. The Parties are requested to maintain and provide to Watermaster accurate records of the operation of the Managed Wells, including production rates and on-off dates and times. The Parties are requested to promptly notify Watermaster of all operational changes made to maintain the water level in PA-7 above the Guidance Level.

7. Watermaster recommends that the Parties allow Watermaster to continue monitoring piezometric levels at their wells.

8. Watermaster will evaluate the data collected as part of the MZ-1 Monitoring Program at the conclusion of each fiscal year (June 30) and determine if modifications, additions, and/or deletions to the Guidance Criteria are necessary. These changes to the Guidance Criteria could include (1) additions or deletions to the list of Managed Wells, (2) re-delineation of the Area of Subsidence Management, (3) raising or lowering of the Guidance Level, or (4) additions and/or deletions to the Guidance Criteria (including the need to have periods of water level recovery).

9. Watermaster cautions that some subsidence and fissuring may occur in the future even if these Guidance Criteria are followed. Watermaster makes no warranties that faithful adherence to these Guidance Criteria will eliminate subsidence or fissuring.

Development and Schedule of the Long-Term Plan

In a sense, the guidance criteria listed above are a *first draft* of the long-term plan. Over the next nine months (October 2005 to June 2006), Watermaster will conduct its modeling exercises and coordinate a series of meetings with MZ-1 producers that will likely lead to revisions of the guidance criteria.

Of particular interest to the affected Parties is the sixth criterion (6) listed above, which limits the timing of production from the Managed Wells to July through September of each year. It may be that the Managed Wells can be pumped at reduced rates over periods longer than three months, and still not cause drawdown below 245 feet at the PA-7 piezometer or inelastic compaction within the aquifer system. Watermaster's groundwater flow and subsidence models will help to address these unknowns prior to pumping by predicting:

- the water level response at PA-7 due to various proposed pumping scenarios, and
- the aquifer-system compaction response due to the water level responses.

In June 2006, after the MZ-1 meetings and modeling exercises, Watermaster will release an expanded *second draft* of the guidance criteria, which will be defined as the official long-term plan for MZ-1. A key element of the long-term plan will be the verification of the model predictions and the protective nature of the guidance criteria as related to permanent land subsidence and ongoing fissuring. This verification will be accomplished through continued monitoring and reporting by Watermaster and revision of the guidance criteria when appropriate (see Criterion 11 above). In this sense, the long-term plan will be adaptive.

The guidance criteria and the long-term plan discussed above relate to the management of pumping-induced subsidence within south MZ-1 (the Area of Subsidence Management in the terminology of the

guidance criteria). Recall that central MZ-1 is currently experiencing measurable land subsidence, and is the focus of an expanded effort to monitor piezometric levels and land surface deformation. An adaptive long-term plan will accommodate the results and modified recommendations that will emerge from the expanded monitoring of central MZ-1.

Table 4-1
Guidance Criteria for MZ-1 Producers

1. Table 4-2 lists the existing wells (hereafter the Managed Wells) and their owners (hereafter the Parties) that are the subject of these Guidance Criteria.
2. Figure 4-1 shows the area addressed by these Guidance Criteria (hereafter the Area of Subsidence Management). Within the boundaries of this area, both existing and newly-constructed wells are subject to being classified as Managed Wells. This is based upon the observed and/or predicted effects of pumping on groundwater levels and aquifer-system deformation. Initial Managed Well designations for wells that pumped during the IMP were based on effects measured at the Ayala Park Piezometer/Extensometer Facility. Additional Managed Well designations were made based on analysis of well construction and geology.
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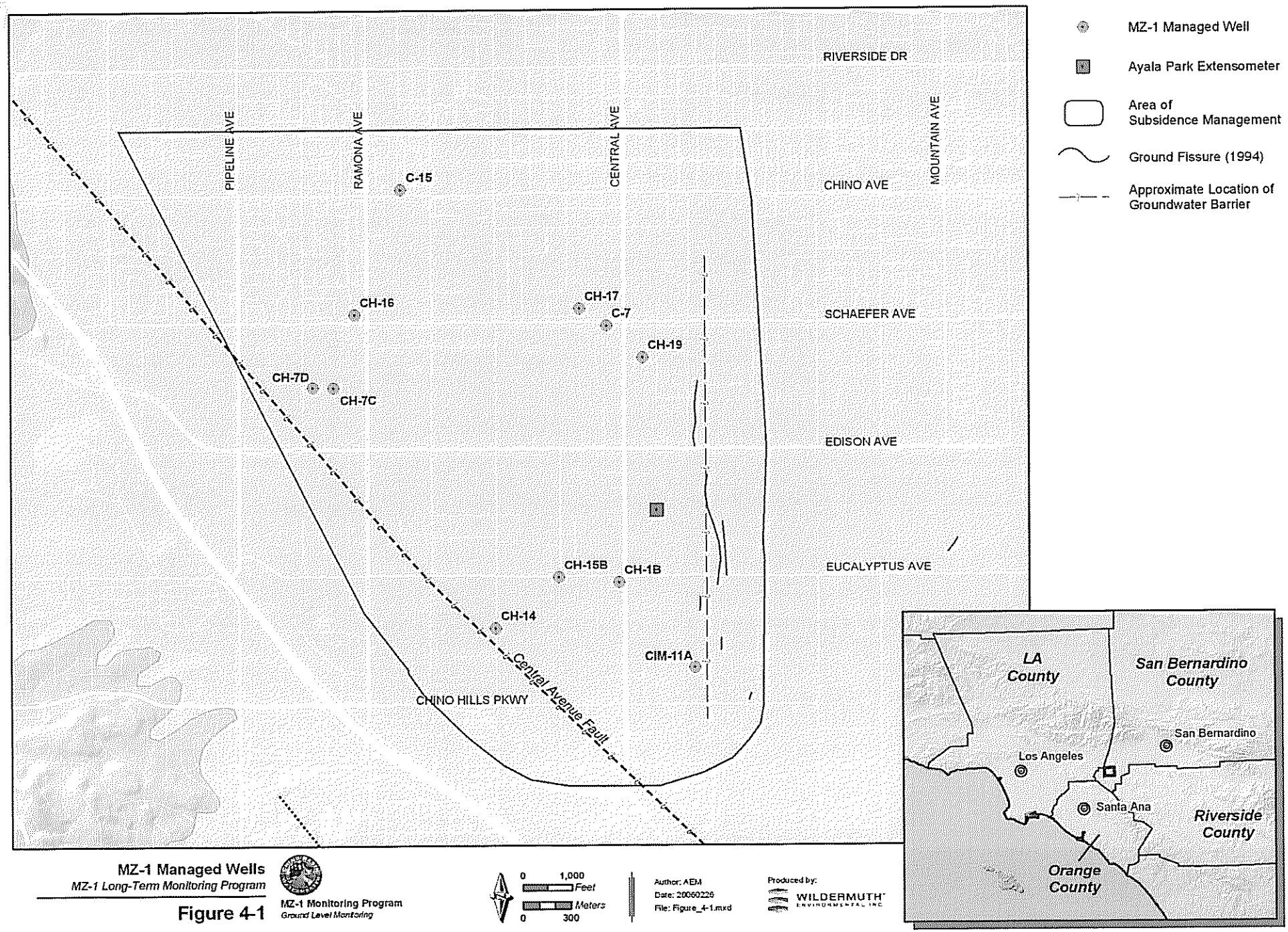
9. Watermaster cautions that some subsidence and fissuring may occur in the future even if these Guidance Criteria are followed. Watermaster makes no warranties that faithful adherence to these Guidance Criteria will eliminate subsidence or fissuring.

Table 4-2
MZ-1 Managed Wells

CBWM_ID	Owner	Well Name	Status	Screened Interval ft-bgs	Capacity gpm
600487	Chino Hills	1B	Inactive	440-470, 490-610, 720-900, 940-1180	up to 1200
600687	Chino Hills	7C	Inactive	550-950	--
600498	Chino Hills	7D	Inactive	320-400, 410-450, 490-810, 850-930	400
600495	Chino Hills	14	Inactive	350-860	300-400
600488	Chino Hills	15B	Active	360-440, 480-900	1500
600489	Chino Hills	16	Inactive	430-940	800
600499	Chino Hills	17	Active	300-460, 500-980	700
600500	Chino Hills	19	Active	340-420, 460-760, 800-1000	1100-1500
3600461	Chino	7	Inactive	180-780	
600670	Chino	15	Inactive	270-400, 626-820	
3602461	CIM	11A	Active	135-148, 174-187, 240-283, 405-465, 484-512, 518-540	500-600



MZ-1 Managed Wells

MZ-1 Long-Term Monitoring Program

Figure 4-1

MZ-1 Monitoring Program
Ground Level Monitoring

5. REFERENCES

Fife, D.L., Rodgers, D.A., Chase, G.W., Chapman, R.H., and E.C. Sprotte. 1976. Geologic Hazards in Southwestern San Bernardino County, California: California Division of Mines and Geology Special Report 113, 40 p.

Geomatrix Consultants, Inc. 1994. Final Report Ground Fissuring Study, California Department of Corrections, California Institution for Men, Chino, California. Project No. 2360. San Francisco, CA.

Geoscience Support Services, Inc. 2002. Preliminary Geohydrologic Analysis of Subsidence in the Western Portion of the Chino Basin (Draft). Prepared for: City of Chino Hills. August 29, 2002.

Holzer, T.L. 1984. Ground failure induced by ground-water withdrawal from unconsolidated sediment. Rev. Eng. Geol, 6:67-105.

Kleinfelder, Inc. 1993. Geotechnical Investigation, Regional Subsidence and Related Ground Fissuring, City of Chino, California. Project No. 58-3101-01. Diamond Bar, CA.

Kleinfelder, Inc. 1996. Chino Basin Subsidence and Fissuring Study, Chino, California. Project No. 58-5264-02. Diamond Bar, CA.

Kleinfelder, Inc. 1999. Update of Subsidence Map, Chino, California. Project No. 58-9040-01. Diamond Bar, CA.

Mendenhall, W. C. 1908. Ground waters and irrigation enterprises in the foothill belt, southern California: USGS Water-Supply Paper 219, p. 39-42, plates III and V.

Peltzer, G. 1999a. Subsidence Monitoring Project: City of Chino. March 14, 1999.

Peltzer, G. 1999b. Subsidence Monitoring Project: City of Chino. May 9, 1999.

United States Geological Survey (USGS). 1999. Land subsidence in the United States / edited by Devin Galloway, David R. Jones, S.E. Ingebritsen. USGS Circular 1182. 175 p.

Wildermuth Environmental, Inc. 1999. Optimum Basin Management Program. Phase I Report. Prepared for the Chino Basin Watermaster. August 19, 1999.

Wildermuth Environmental, Inc. 2003. Management Zone 1 (MZ-1) Interim Monitoring Program Work Plan. Optimum Basin Management Program. Prepared for Chino Basin Watermaster. January 8, 2003.

APPENDIX A – SPECIAL REFEREE'S REPORT ON PROGRESS MADE ON IMPLEMENTATION OF THE WATERMASTER INTERIM PLAN FOR MANAGEMENT OF SUBSIDENCE

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SPECIAL REFEREE

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF SAN BERNARDINO, RANCHO CUCAMONGA DIVISION

CHINO BASIN MUNICIPAL WATER DISTRICT, Plaintiff, v. THE CITY OF CHINO, Defendants.	CASE NO. RCV 51010 Judge: Honorable J. Michael Gunn Date: TBD Time: Dept:

SPECIAL REFEREE'S REPORT ON PROGRESS MADE ON IMPLEMENTATION OF THE WATERMASTER INTERIM PLAN FOR MANAGEMENT OF SUBSIDENCE

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I. INTRODUCTION

A workshop was held May 25, 2005, as a follow-up to the workshop held August 29, 2002. The second workshop was originally scheduled to be held in 2003, pursuant to Court Order Concerning Watermaster's Interim Plan for Management of Subsidence, dated October 17, 2002 ("2002 Order"). The second workshop was postponed until substantial data collection and analysis had been completed.

The scope of the workshop was limited to presentation of technical data and analysis completed to date related to the Watermaster Interim Plan for Management of Subsidence ("Interim Plan"). The presentation was made by Mr. Malone of Wildermuth Environmental, Inc., Watermaster Engineering Consultant. Mr. Malone, Mr. Wildermuth, and Mr. Riley addressed questions posed

by the Special Referee, technical expert Joe Scalmanini, and several others. Consistent with use of a workshop format, cross-examination was not allowed. A transcript of the workshop has been prepared and will be filed with the Court by Watermaster.

II. 2002 COURT ORDER

In the 2002 Order, Judge Gunn directed Watermaster to:

(1) Implement the Interim Plan Monitoring Program for subsidence, including all work related to piezometers, extensometers, ground-level monitoring, aquifer testing, and other actions to study, analyze, and interpret subsidence and fissuring in MZ1 and to determine causes in sufficient detail that they can be managed through a long-term plan;

(2) Continue the MZ1 Technical Committee work and have the Technical Committee serve in an advisory capacity to assist Watermaster in developing a long-term subsidence management plan for MZ1;

(3) Develop a long-term management plan by fiscal year 2004/2005;

(4) Submit quarterly reports to the court on all interim and long-term efforts to address MZ1 subsidence and fissuring problems, including documentation of participation, forbearance, impacts, and other "noteworthy details that pertain to the goal of forbearance to minimize subsidence and fissuring";

(5) Schedule a follow-up workshop for July 17, 2003; and

(6) File reports at least quarterly to apprise the court of any actions pending that could cause the "jurisdiction issue" to resurface.

III. COMPLIANCE WITH 2002 COURT ORDER

A. Regular Reports by Watermaster

Watermaster has regularly reported to the court, through its status reports, on the progress of all work related to Management Zone 1 ("MZ1") subsidence issues. Watermaster has also reported that it is not aware of any pending legal actions which have raised issues concerning the court's jurisdiction related to subsidence. The City of Chino ("Chino") has annually asked for continuances of its Paragraph 15 Motion. The process has been that Chino requests continuance after both Chino and the City of Chino Hills ("Chino Hills") have committed to forbear some pumping. (Our files reflect that Chino requested a continuance to September 1, 2005, but we do not have a copy of a court order approving that continuance.) Watermaster has reported that the MZ1 Technical Advisory Committee has been actively meeting.

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B. Pumping Forbearance Agreements

Annual forbearance agreements have been entered into for the past three years by Chino and Chino Hills. On April 28, 2005, Watermaster approved continuation of the forbearance agreements for a fourth year. The fourth year of forbearance will be fiscal year 2005/2006.

C. Court Order and Deadlines

Two of the deadlines set forth in the 2002 Order have not been met. First, a long-term management plan for MZ1 was to have been completed this fiscal year (by July 1, 2005). Second, a follow-up Special Referee workshop was not held in July 2003, but, instead, was postponed in order that a substantial body of work could be completed to study and assess the MZ1 issues.

IV. INTERIM PLAN WORK

A. Technical Work Completed to Date

The purpose of the second workshop was to hear a description of the work and study that has been done since the MZ1 Interim Plan was begun, to ascertain whether any conclusions have been reached, and to obtain a description of the activities that are being undertaken now and that remain to be done. Mr. Malone's presentation on the technical work and analysis to date formed the bulk of the workshop. He provided a very detailed description of the monitoring and other technical work that has been undertaken. Ongoing efforts have included installation of piezometers and an extensometer, installation of transducers to monitor water levels in a network of wells, and ground-level and InSAR monitoring for subsidence. Mr. Malone reported several discoveries which he characterized as significant, including discovery of a groundwater barrier at depth in a location approximately coincident with the fissuring that has occurred, and that there are two very distinct aquifer systems. (Reporter's Transcription ("RT") at pp. 44-47)

Mr. Malone also indicated that all of the potential causes of the subsidence and fissuring which had been previously suggested had been reviewed, but that the Interim Plan work has focused on the hypothesis that the subsidence and fissuring have been caused by subsurface fluid withdrawal:

> We reviewed all these [other potential causes of subsidence], but what we zeroed in on was the subsurface withdrawal as our hypothesis. That's what we identified as the most likely cause of the subsidence that we had observed in the City of Chino . . . so our hypothesis was that the groundwater production caused land subsidence and fissuring in Chino Basin. . . We also noted that it was likely, or that we were

> hypothesizing that the production from the confined aquifer system was the main cause of this recent episode of subsidence and fissuring that was measured in the early 1990's. So this is what we designed our monitoring program to test, whether or not this hypothesis was correct.

(RT at pp. 32-33) There was no further discussion on the record regarding the nature of the review that was done as to other potential causes of the subsidence and fissuring.

A primary focus of the technical work has been to determine at what point subsidence creates inelastic compaction versus subsidence which is elastic and can recover. Mr. Malone described the process to identify:

> . . . the threshold where the deformation process transitions from elastic to inelastic. By doing that, we'd be defining the usable volume of the storage reservoir, under what range of water levels can we operate where we're not causing inelastic compaction. And that would be a very key finding to any long-term management plan that might develop out of this study.

(RT at pp. 43-44) The presentation included detailed descriptions of "stress-strain diagrams" which reflect data on the elastic versus inelastic response of the system to pumping. Mr. Malone drew attention to a "key point" that there appears to have been about two one-hundredths of a foot (0.02 ft.) of permanent compaction over the 2004 pumping season. (RT at pp. 58-59) He indicated that the ". . . inelastic threshold was crossed at about 250 feet below ground surface during the latter part of the pumping season." (RT at p. 60) Mr. Malone made it very clear that it is necessary to wait for "fully recovered water levels" before drawing any final conclusions that the system transitions from elastic to inelastic compaction when water levels are somewhere below 250 feet below ground surface. (RT at p. 95)

In response to questions as to whether there are sufficient data available now to develop a long-term plan, Mr. Malone responded that:

> . . . When we operate in the forbearance agreement where we pump during the pumping season, but we allow the system to recover during the wintertime months, . . . we've demonstrated that we're operating generally in an elastic range. . . And so to how far we can step out of that same pumping pattern and still operate within the elastic range, we have not determined that yet. But the models hold the promise of determining that.

(RT at p. 93)

Mr. Malone explained that the next step in the investigation is to create groundwater models

to ". . . simulate the groundwater production's effects on groundwater levels." (RT at p. 91) The model will: ". . . help us provide that linkage between groundwater production and groundwater levels that would provide a tool to evaluate any management plan that might come out of this." (RT at p. 107)

In response to a question, Mr. Malone indicated that there are not plans to do further testing in the southern part of MZ1:

> We feel like if the stress-strain diagram goes to where it seems to be going, that we've identified this threshold of preconsolidation stress that is the transition between inelastic and elastic compaction. . . I don't think we have any further questions that we're trying to answer in this southern part of Management Zone 1. We're going to be developing the models that will help us provide that linkage between groundwater production and groundwater levels. . .

(RT at p. 107)

B. Recommended Additional Technical Work

Mr. Malone recommended that technical work be continued in the southern part of MZ1 and that certain technical work be started in the central MZ1 area to the north. For the southern MZ1 area, the recommendation is that monitoring continue (RT at pp. 97-99) and that some of the dedicated piezometers be replaced (RT at pp. 103-104). In addition, numerical models would be developed (a one-dimensional compaction model and a three-dimensional groundwater flow and subsidence model). The three-dimensional model would link:

> . . . the areal and vertical distribution of pumpage to water level fluctuations and then the ultimate deformation that occurs in the aquifer system. . . We've been working mostly on this link between water level fluctuation and deformation. The model will, then, now take us from that to include pumpage, how it affects water level fluctuations, and then how the water level fluctuations affect deformation.

(RT at pp. 99-100)

Mr. Malone also discussed expanding the investigation of subsidence, initially via monitoring, to the central region of MZ1, including the installation of water level transducers in existing wells. (RT p. 107) Mr. Malone characterized as speculative the potential need to construct a new monitoring facility or facilities in the central region, including a multi-piezometer and/or extensometer. (RT at p. 102) He clarified that ground-level survey data, InSAR data, and water-level data should be collected in the central MZ1 area before any conclusion would be reached on

the need for piezometers or an extensometer. (*Id.*) Expansion of the subsidence investigation into the central region of MZ1 is prompted by the observation of some historical subsidence in the area, confounded to some degree by the lack of any known local pumping in the immediate subsidence area. (RT at pp. 76, 80, 83-84, 87)

C. Long-Term Plan Schedule

There was not extensive discussion at the workshop on either a long-term plan or a schedule for completion of a plan. Mr. Malone indicated that InSAR surveys and ground surveys will be conducted in both fall 2005 and spring 2006. (RT at p. 104) The modeling would be completed in the spring of 2006, with a modeling report to follow that summer. (*Id.*) Mr. Wildermuth responded to a question regarding scheduling by indicating that several more years of studies and model development and analysis would be required, followed by 12 months to reach an agreement on a long-term plan. (RT at p. 109) This timing is consistent with the discussion in the 2002 workshop. At that workshop, in response to the question of how long it would take to start developing a long-term plan given optimal agreement by all parties, Mr. Wildermuth stated that he thought it would take three to five years (2002 Workshop Transcript at page 101.) Mr. Slater also clarified at the 2002 workshop that Mr. Wildermuth's three to five years were for the "data development side" and that "the business deal probably follows soon thereon, and one would expect maybe twelve months to wrap that piece up." (2002 Workshop Transcript at p. 103.)

V. RECOMMENDATION OF SPECIAL REFEREE

A. Preparation of a Summary Report on MZ1 Technical Work

A substantial body of technical work has been completed in the southern MZ1 area. However, conclusions are still preliminary:

> . . . With our stress-strain diagram . . . we're seeing that these head declines can induce permanent compaction. But again this is a preliminary conclusion because it is still pending fully recovered water levels. We're waiting for those water levels to be fully recovered to see if any inelastic compaction did occur over the last pumping season.

(RT at p. 95) When sufficient time has elapsed for water levels to have fully recovered, it is our view that a summary report on all of the work presented at the workshop would be extremely helpful. Even though no modeling has been completed, there appear to be sufficient data to conclude that

there is a threshold depth to water that, if crossed, will likely lead to new inelastic compaction and subsidence and ground fissuring. That information should be made available to the parties in a summary report as soon as possible. Based on Mr. Malone's presentation, it should be feasible to prepare such a report by the middle of August. When the three-dimensional model is prepared, a modeling report will be written. In the meantime, there are important data and preliminary findings that can be made available very soon that will be of immediate use to the pumpers within MZ1.

A further recommendation related to a summary report is that the summary report should also address the other potential causes of subsidence and fissuring that have been suggested in the past. If any of those items cannot be readily addressed, then the summary report should recommend how they will be addressed. While the detailed monitoring and testing has been substantial, they have not apparently addressed whether subsidence and fissuring might have been partially the result of mechanisms other than deep groundwater pumping. The continuing possibility that other mechanisms may also be responsible for subsidence is a potential impediment to development of the long-term plan.

As part of this discussion, the summary report should discuss any information related to whether any significant subsidence predated the notable subsidence and fissuring since the early 1990's, and should describe the historical surveying investigation commissioned by Watermaster to address that issue. An important outstanding question is whether any pre-1990's subsidence that may have occurred correlates with, or can be attributed to, the large historical changes in groundwater levels that predated the Judgment.

B. Watermaster Issuance of Guidance Criteria.

Near the close of the workshop, there was some discussion of what would be included in a long-term plan, including possibly expanding the study area to include the central MZ1 region. (RT at pp. 123 *et seq.*) The concept of a long-term MZ1 management plan has been part of the Watermaster program since it was first articulated in 1999 in the Optimum Basin Management Program Phase 1 Report. A long-term management plan was to be formulated during the interim plan period, and would be based on investigations, monitoring programs and data assessment. It would be adaptive in nature. The workshop discussion noted that the technical work that has been

done and that will be done will form the basis for a long-term plan. Mr. Wildermuth indicated that:

> . . . we haven't felt until very recently, last maybe six or eight months, that we were at a point where we are getting close to coming up with conclusions from which we could build a plan on, pull the parties together and talk about their deal making to implement a plan.

(RT at p. 125) As discussed, above, however, development of a long-term plan itself does not appear to be imminent.

In response to questions regarding the possibility of phasing the long-term plan, Mr. Wildermuth discussed the option of bifurcating the ". . . southern and central portion, try to get the southern portion going, and then based on the interests of the stakeholders, do something in the central area." (RT at p. 125) Mr. Wildermuth also suggested that Watermaster's long-term plan could range from being "guidance information" to something more aggressive. (RT at p. 108)

The concept of providing guidance criteria is a compelling one. It appears, based on the presentation at the workshop, that Watermaster can very soon alert pumpers in the southern MZ1 area that there is a substantial risk that lowering water levels to below approximately 250 to 260 feet below ground surface will result in new inelastic compaction and subsidence. This type of information should formally be made available to the parties as soon as possible, presumably as soon as a summary report on the MZ1 technical work is completed. The guidance criteria would be issued by Watermaster in a timely fashion, to be followed by the long-term plan development which necessarily will require a longer period to complete.

C. Long-Term Plan and Schedule

It is incumbent upon Watermaster now to request that the court extend the period for completion of a long-term plan for MZ1. The overall testimony indicated that several more years of technical and modeling work will be required, followed by approximately a year of negotiations among the parties. The Watermaster should propose a schedule to the court which takes into account the continuation of data collection and modeling work in the main MZ1 area as well as technical work in the central MZ1 area. A date should be established for completion of a long-term plan.

Whether the long-term plan is ultimately characterized as a management plan is an issue for the parties to address. Based on presentation and discussion at the workshop, it is clear that, at the

very least, an ongoing monitoring program by Watermaster will be required so that the parties have full and sufficient information available to them to inform their decisions.

D. Expanded Monitoring in MZ1

The presentation at the workshop, while focused on monitoring and studies in the southern MZ1 area, indicated that some monitoring work can and should be done in the central MZ1 area, including installation of transducers in wells, and ground and InSar ground-level monitoring. More costly and complex efforts involving piezometers and an extensometer would logically be held in abeyance pending assessment of data collected. A phased long-term plan could include provision for central MZ1 monitoring work and studies, with future efforts considered and scheduled on an as-needed basis, while more definitive conclusions are drawn in the southern MZ1 area based on the extensive work already focused in that area. As noted above, the central MZ1 area appears to warrant additional investigation in light of detectable subsidence in spite of no significant pumping stress in the immediate subsidence area. Such additional investigation would also appear important in light of the overall concept of basin reoperation and hydraulic control, which could result in locally lower groundwater levels in parts of the basin.

VI. CONCLUSION

The workshop was very productive. Mr. Malone's presentation was excellent. The Watermaster does not require court approval to direct the preparation of a summary report on the MZ1 technical work or to issue guidance criteria. The Watermaster, however, should file with the court a motion for an order to set a schedule for the completion of a long-term plan.

Dated: June 16, 2005

Anne J. Schneider, Special Referee

CHINO BASIN WATERMASTER
Case No. RCV 51010
Chino Basin Municipal Water District v. The City of Chino

PROOF OF SERVICE

I declare that:

I am employed in the County of San Bernardino, California. I am over the age of 18 years and not a party to the within action. My business address is Chino Basin Watermaster, 9641 San Bernardino Road, Rancho Cucamonga, California 91730; telephone (909) 484-3888.

On June 21, 2005 I served the following:

Special Referee's Report on Progress Mad on Implementation of the Watermaster Interim Plan for Management of Subsidence

/_x_/ BY MAIL: in said cause, by placing a true copy thereof enclosed with postage thereon fully prepaid, for delivery by United States Postal Service mail at Rancho Cucamonga, California, addresses as follows:

See attached service list:
Mailing List 1

/___/ BY PERSONAL SERVICE: I caused such envelope to be delivered by hand to the addressee.

/___/ BY FACSIMILE: I transmitted said document by fax transmission from (909) 484-3890 to the fax number(s) indicated. The transmission was reported as complete on the transmission report, which was properly issued by the transmitting fax machine.

/_x_/ BY ELECTRONIC MAIL: I transmitted notice of availability of electronic documents by electronic transmission to the email address indicated. The transmission was reported as complete on the transmission report, which was properly issued by the transmitting electronic mail device.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on June 21, 2005 in Rancho Cucamonga, California.

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V. INFORMATION

1. Newspaper Articles

DailyBreeze.com

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Today is Monday, March 20, 2006
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Late-season storms leave California's water tank full

By The Associated Press

SAN FRANCISCO -- A series of late winter storms that blanketed the Sierra Nevada with snow has left California flush with water for the foreseeable future, according to meteorologists and hydrologists.

The Sierra Nevada snowpack, which serves as a holding tank for California, contains more water than last year, which also saw above-average snowfall.

Donner Summit, for example, has seen 390 inches of snow, compared with an average of 313 inches for this time of year, according to data compiled by Randall Osterhauber, a research scientist for the University of California, Berkeley.

Donner has 120 inches of snow on the ground, compared with 71 at this time last year, according to Osterhauber's statistics.

"If it stopped right now, we would have enough water in storage for two years of drought," said Mike Pechner, staff meteorologist for KCBS Radio. "They have already had an entire season's worth of accumulated rain and snow."

The situation has surprised many hydrologists and meteorologists who didn't expect such a flush year after the New Year got off to a balmy start. More rain than snow fell during the Christmas and New Year's storms, followed by a warm, dry February.

Almost all the major snowfall has come since March 1.

"As long as I've been keeping records, we haven't had a similar cold snap this late in the season," Pechner said. "The snowpack in the Sierra more than doubled in 17 days."

Most reservoirs are so full that officials are releasing water to make room for the snowmelt.

"We've got good reservoir storage and good snowpack," said Frank Gehrke, chief of snow surveys for the California Department of Water Resources.

Chino Champion

Van Dam takes over milk panel

By Melodie Henderson

The director of the Chino based Milk Producers Council left his recently acquired position on Wednesday to pursue other projects. He has been replaced on an interim basis by Bill Van Dam, who began his dairy career in Southern California and now commutes from Meridian, Idaho.

Nathan DeBoom, 29, stepped into the manager's position when Bob Feenstra resigned in October 2005, after a 38-year career with the council. Mr. DeBoom plans to take on some short-term programs in environmental permitting, working out of his home in Brea.

"I've been with the council for 7½ years, and I'm fairly mobile right now. I want to take advantage of some opportunities that have been offered to me, and try some new things," Mr. DeBoom said.

Mr. Van Dam, 62, began a six-month interim stint as manager of the council on Monday. During the week he stays at his brother's dairy in Chino, which was recently sold.

"My brother has relocated to New Mexico, but the house is still here until October, so I'm with the family," Mr. Van Dam said.

"The dairy industry is moving north," he said. "Many dairies are also heading to Texas and New Mexico, too. They are looking for space that they don't have in Chino."

Mr. Van Dam said, in Chino, the dairy industries are approaching the end of an era.

"It's time for the organization to do some soul searching," he said.

The uncertainty of the council may be the reason for Mr. Van Dam's short contract.

"At this point, the council wasn't willing to commit to a longer contract, and it fit my schedule nicely," he said.

Ontario councilman dies


Bois

Gerald DuBois, 57, stood firm in his vision for community, government

By Mason Stockstill
Staff Writer

ONTARIO — Councilman Gerald DuBois, who served on the Ontario City Council for nine years, died Tuesday morning from complications of a genetic disorder. He was 57.

The veteran councilman was described by many as a champion of Ontario's historic homes and other buildings and as a man who stood up for his own vision of how the city should be run.

"Jerry was extremely loved by those in the community," Mayor Paul Leon said. "He loved Ontario with all his soul. He was entrenched in our city."

DuBois, who also owned DuBois Advertising Agency in Ontario, had worked on City Council campaigns and served on the Planning Commission before he was appointed to the City Council in 1997. He was elected the following year and re-elected in 2002.

During his time on the council, he was active in efforts to increase business opportunities for Ontario, including traveling to China on the city's trade missions. He also served on the board of directors of Ontario Heritage, a neighborhood group

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DuBois

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focused on historic preservation.

Councilwoman Sheila Mautz, who was involved in the Ontario Kiwanis and Planning Commission with DuBois, said she was relieved the Tuesday night council meeting had been canceled, because it would have been painful for her to sit next to DuBois' empty chair.

The councilman appeared to have been in ill health in recent weeks, Mautz said, but he hadn't said anything to other council members about his condition.

"I can tell you I will miss him sorely," she said. "He loved the city passionately."

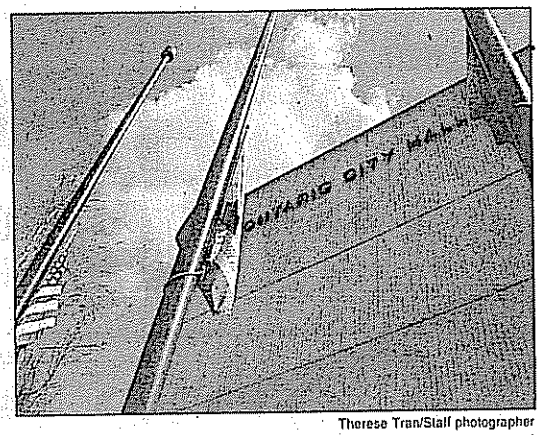
DuBois suffered from hemochromatosis, an inherited disease in which the body absorbs too much iron, causing organ damage, said his brother, Joe DuBois. He had been diagnosed with the illness in January and was hospitalized before dying Tuesday.

Born in North Carolina, DuBois moved to Ontario with his mother when he was 7 years old and lived with his aunt and uncle. He attended schools in Ontario and went to Chaffey College and San Diego State University.

As a business owner, he was involved with the Downtown Revitalization Association and the Downtown Business and Professional Association, and was integral to an effort to build a bandstand in the median of Euclid Avenue.

The structure was dedicated in 1997, after DuBois had been appointed to the council to fill the term of his mentor, Ray Wiltsey, who also died while in office.

"Jerry had always been known as our in-house historian," said


Therese Tran/Staff photographer

Flags outside Ontario City Hall fly at half-staff Tuesday in honor of Councilman Gerald DuBois, who died Tuesday morning from complications of a genetic disorder. He was 57.

was on the council for DuBois' entire nine years. "He knew the history of every single building in the city. ... And not just with buildings, but with people in the city as well."

He also played a strong role in building Ontario's image, said Councilman Jason Anderson. As an intelligent business owner, DuBois brought a level of professionalism to the council while avoiding drawing attention to himself, he said.

"He was really involved in a lot more than people might know about," Anderson said, citing examples such as supporting the renovation of the Gardiner Spring Auditorium at Chaffey High School. "He wasn't a grandstanding type of guy. He did things and let his actions speak for themselves, which was refreshing."

Many recalled DuBois' spirited efforts to support Ontario's history, both before he became a member of the City Council and after.

San Bernardino County Supervisor Paul Biane, who served on the council with DuBois, lauded his colleague's drive to "safeguard Ontario's history and the historical perspective of the downtown area."

Gino Filippi of the Joseph Filippi Winery in Rancho Cucamonga also said DuBois would be remembered for his work to preserve historic resources in the region.

Leon recalled DuBois as a force to be reckoned with: "He was the first guy to get in your face, and the first guy to run to your rescue."

DuBois' term would have ended in November, so the City Council will decide whether to appoint someone to fill the remainder of his term or leave it open until the election.

In addition to his brother, DuBois is survived by his wife, Sue, and their sons, Jared and Steven. Funeral arrangements were pending.

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Water anyone? Agreement on perchlorate cleanup near

By Andrew Silva, Staff Writer
Inland Valley Daily Bulletin

Stop it from spreading; clean up what's there; make sure there's plenty of water for everybody.

That's the gist of a $106 million plan to clean a rocket fuel ingredient from the groundwater in Rialto, Colton and Fontana.

"We got all the engineers together and decided if we're going to clean this up, how would we do it," said Peter Wulfman, manager of the county's solid waste division.

With five different agencies involved, getting all of them to agree on a common strategy for addressing the problem is a major step.

Paying for it is the tricky part, but the deal should make it easier to lobby for money, officials said.

"The word from legislators was, come to us with a collective effort and you have a better chance of receiving support," said Eric Fraser, Colton's director of water and wastewater.

Colton has had three wells contaminated by perchlorate, but all three have wellhead treatment facilities to remove the contaminant before it's delivered to customers.

North Rialto is the source of a plume of underground contamination that has spread about six miles to the southeast, affecting 22 wells, and could lead to water shortages unless the mess is cleaned up.

Perchlorate can limit thyroid function and is thought to be potentially dangerous to developing fetuses and small children. The salt is used in rocket fuel, fireworks, flares and certain munitions, all of which have been stored or manufactured by numerous businesses in north Rialto.

Nine of those 22 wells already have wellhead treatment facilities to remove the perchlorate and the others remain out of service. No residents are being served water with perchlorate in it.

The county waste division is involved because when it bought land to expand the Mid-Valley Landfill in Rialto, the land was right on top of one of the heaviest concentrations of perchlorate.

The county Board of Supervisors and the Rialto and Colton city councils are scheduled to vote today on an agreement tied to the plan.

The agreement, which also must be signed by the West Valley Water District and the Fontana Water Co., says the five agencies agree on the cleanup plan and will seek federal money to help pay for it.

The federal government has kicked in several million dollars toward the cleanup, and Goodrich Corp., which once operated in the area, paid $4 million to the affected agencies a few years ago and plans to spend up to $10 million more.

The county is almost ready to start up a new treatment plant near Rialto Municipal Airport that will treat water with the heaviest concentrations of perchlorate, Wulfman said.

Eventually, a "picket fence" of wells will intercept the contamination before it can spread farther, he said.

At the same time, the remaining production wells need to get treatment facilities on them to ensure a steady water supply.

The estimated cost for 10 wellhead treatment systems plus five years of maintenance and operations is $45.2 million.

Five years of operation and maintenance, plus the cost of installation, on the existing treatment facilities is tagged at $28.8 million.

The cost for the wells designed to intercept the contamination is estimated at $32.2 million.

Sen. Dianne Feinstein has introduced a bill that would provide $50 million for cleaning up perchlorate.

Rialto and Colton have also sued the Department of Defense and numerous businesses that operated in the areas in an attempt to recover the cleanup costs.