The exhibits in this section characterize the history and current state of land subsidence and ground fissuring in the Chino Basin using data from Watermaster's land-subsidence monitoring program.

One of the earliest indications of land subsidence in Chino Basin was the appearance of ground fissures in the City of Chino. These fissures appeared as early as 1973, but an accelerated occurrence of ground fissuring ensued after 1991 and resulted in damaged infrastructure.

In 1999, the OBMP Phase I Report (WEI, 1999) identified pumping-induced drawdown and subsequent aquifer-system compaction as the most likely cause of land subsidence and ground fissuring observed in MZ1. Program Element 1 – *Develop and Implement a Comprehensive Monitoring Program*, called for basin-wide analysis of land subsidence via ground-level surveys and remote sensing (InSAR) and ongoing monitoring based on the analysis of the subsidence data. 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 MZ1 that would:

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

In 2000, the Implementation Plan in the Peace Agreement called for an aquifer system and land subsidence investigation in the southwestern portion of MZ1 to support the development of a management plan for MZ1 (second and third bullets above). This investigation was titled the MZ1 Interim Monitoring Program (IMP). From 2001-2005, Watermaster developed, coordinated, and conducted the IMP under the guidance of the MZ1 Technical Committee, which was composed of representatives from all major producers in MZ1 and their technical consultants. The investigation methods, results, and conclusions are described in detail in the MZ1 Summary Report (WEI, 2006). The investigation provided enough information for Watermaster to develop Guidance Criteria for MZ1 that if followed, would minimize the potential for subsidence and fissuring in the investigation area. The Guidance Criteria also formed the basis for the MZ1 Subsidence Management Plan (WEI, 2007b).

The Subsidence Management Plan was developed by the MZ1 Technical Committee and approved by Watermaster in October 2007. In November 2007, the California Superior Court, which retains continuing jurisdiction over the Chino Basin Adjudication, approved the Subsidence Management Plan and ordered its implementation. The Subsidence Management Plan calls for (1) the continued scope and frequency of monitoring implemented during the IMP within the MZ1 Managed Area (see Exhibit 59) and (2) expanded monitoring of the aquifer system and land subsidence in other areas of the Chino Basin where the IMP indicated concern for future subsidence and ground fissuring.

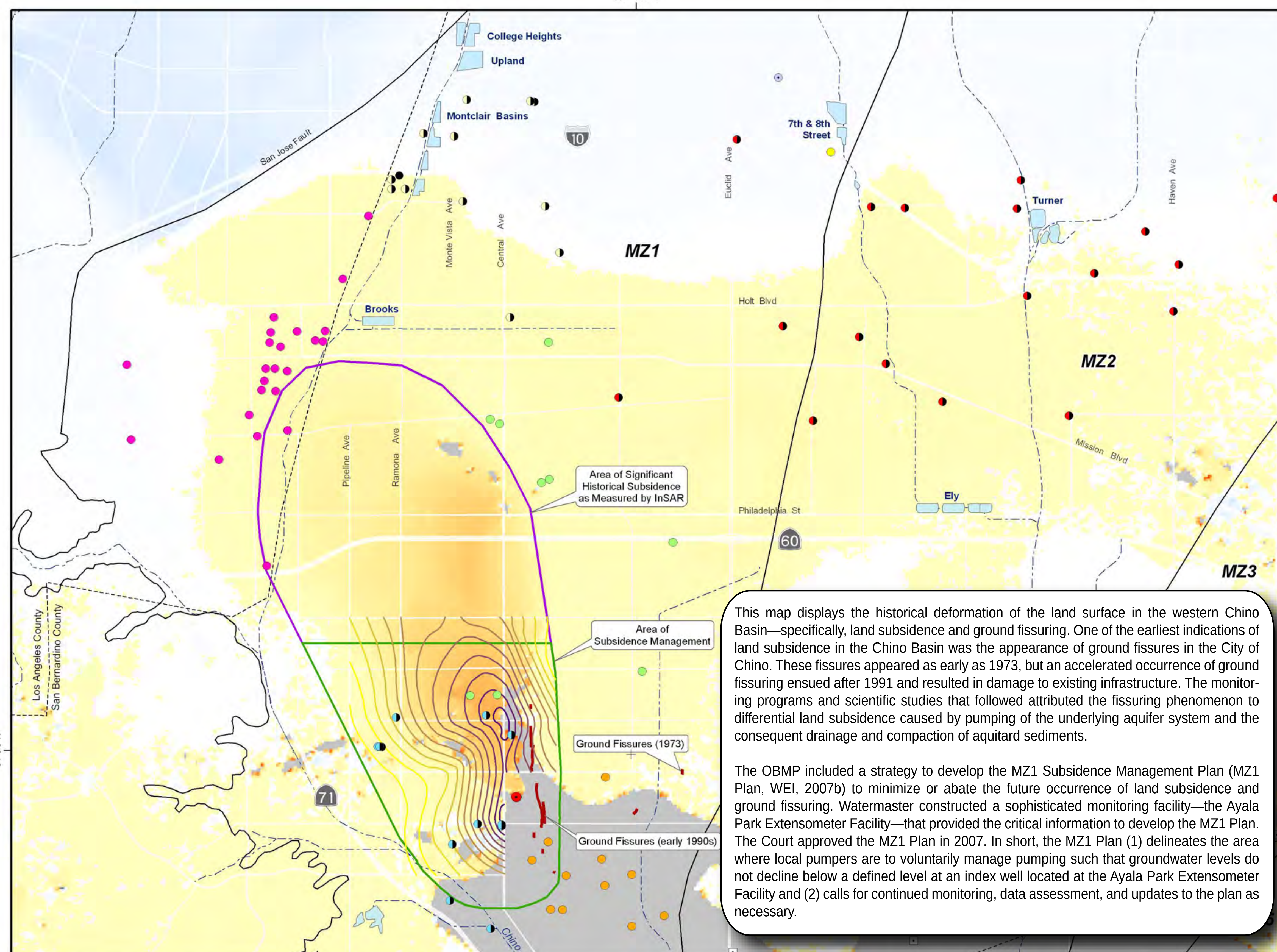
Watermaster's current subsidence monitoring program includes:

- *Piezometric Levels*. Piezometric levels are an important part of the ground-level monitoring program because piezometric changes are the mechanism for aquifer-system deformation and land subsidence. Watermaster monitors piezometric levels at about 33 wells in MZ1. Currently, a pressure-transducer/data-logger is installed at each of these wells and records one water-level reading every 15 minutes. Watermaster also records depth-specific water levels at the piezometers located at the Ayala Park Extensometer Facility every 15 minutes.
- *Aquifer-System Deformation*. Watermaster records aquifer-system deformation at the Ayala Park Extensometer Facility (see Exhibit 59). At this facility, two extensometers, completed at 550 ft-bgs (Shallow Extensometer) and 1,400 ft-bgs (Deep Extensometer). In 2012, Watermaster installed another extensometer facility, the Chino Creek Extensometer Facility (CCX), in the Southeast Area south of the Chino Airport. The CCX also consists of two extensometers: one completed to 140 ft-bgs (CCX-1) and the other to 610 ft-bgs (CCX-2). These facilities record the vertical component of aquifer-system compression and/or expansion once every 15 minutes which is synchronized with the piezometric measurements.
- *Vertical Ground-Surface Deformation*. Watermaster monitors vertical ground-surface deformation via the ground-level surveying and remote sensing (InSAR) techniques established during the IMP. Currently, ground-level surveys are being conducted in the MZ1 Managed Area and the Southeast Area once per year. InSAR is the only monitoring technique being employed outside of these two areas. InSAR data are collected and analyzed once per year.
- *Horizontal Ground-Surface Deformation*. Watermaster monitors horizontal ground-surface displacement across the historical zone of ground fissuring. These data are obtained by electronic distance measurements (EDMs) between benchmark monuments and by a horizontal extensometer, and are used to characterize the horizontal component of ground motion caused by groundwater production on either side of the fissure zone.

Exhibits 58 through 60 illustrate the historical occurrence of land subsidence in the Chino Basin as interpreted from InSAR and ground-level surveys. Historical ground-motion data (shown in Exhibit 58) and recent ground-motion data (shown in Exhibits 59 and 60) indicate that land subsidence concerns are primarily confined to the west side of Chino Basin.

Watermaster has determined from its studies that land subsidence that has occurred in the Chino Basin was mainly controlled by changes in groundwater levels, which, in turn, were mainly controlled by pumping and recharge. Exhibits 61 through 65 show the relationships between groundwater pumping, recharge, recycled water reuse, groundwater levels, and vertical ground motion. These graphics reveal cause and effect relationships, the current state of vertical ground motion, and the nature of the land subsidence (e.g. elastic, inelastic, differential, etc.).

Watermaster convenes a Land Subsidence Committee annually to review and interpret the data from the subsidence monitoring program. The committee can evaluate the appropriateness of the Guidance Criteria in the MZ1 Plan and recommend changes, if appropriate. The committee also recommends appropriate changes to the monitoring program. Watermaster's Subsidence Management Plan is a prime example of the success of the OBMP, and strategic basin management.



This map displays the historical deformation of the land surface in the western Chino Basin—specifically, land subsidence and ground fissuring. One of the earliest indications of land subsidence in the Chino Basin was the appearance of ground fissures in the City of Chino. These fissures appeared as early as 1973, but an accelerated occurrence of ground fissuring ensued after 1991 and resulted in damage to existing infrastructure. The monitoring programs and scientific studies that followed attributed the fissuring phenomenon to differential land subsidence caused by pumping of the underlying aquifer system and the consequent drainage and compaction of aquitard sediments.

The OBMP included a strategy to develop the MZ1 Subsidence Management Plan (MZ1 Plan, WEI, 2007b) to minimize or abate the future occurrence of land subsidence and ground fissuring. Watermaster constructed a sophisticated monitoring facility—the Ayala Park Extensometer Facility—that provided the critical information to develop the MZ1 Plan. The Court approved the MZ1 Plan in 2007. In short, the MZ1 Plan (1) delineates the area where local pumpers are to voluntarily manage pumping such that groundwater levels do not decline below a defined level at an index well located at the Ayala Park Extensometer Facility and (2) calls for continued monitoring, data assessment, and updates to the plan as necessary.

Contours of Relative Change in Land Surface Altitude as Measured by Leveling Surveys 1987 to 1999

0.0 ft

-2.2 ft

Relative Change in Land Surface Altitude as Measured by InSAR Oct. 1993 to Dec. 1995

+ 1 ft

0

- 1 ft

InSAR data absent (incoherent)

Active Production Wells by Owner

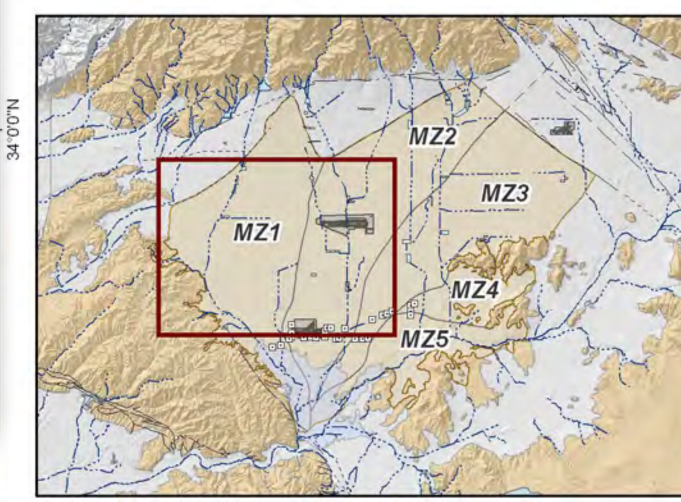
- Ontario
- Pomona
- SAWC
- Upland
- GSWC
- CIM
- Chino Hills
- Chino
- MVWD

Chino Basin Desalter Authority

Ground Fissures

Ayala Park Extensometer Facility

Flood Control & Conservation Basins



Produced by:
WILDERMUTH ENVIRONMENTAL INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

Author: TCR
Date: 20130529
File: Exhibit_58.mxd

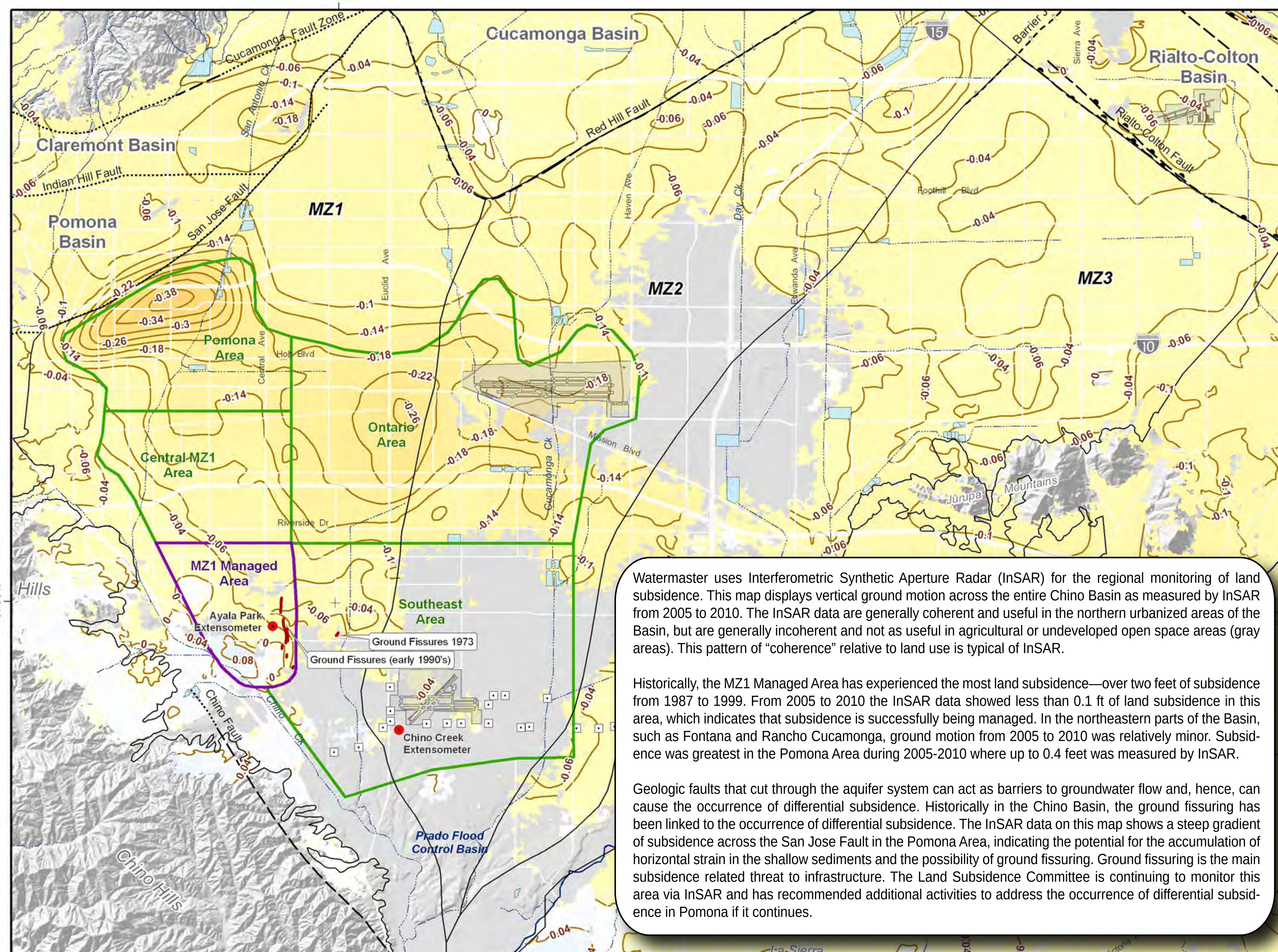
0 1 2 3 Miles
0 1 2 3 4 KM

2012 State of the Basin
Land Subsidence Monitoring

Historical Land Surface Deformation in Management Zone 1

Leveling Surveys (1987 to 1999) and InSAR (1993 to 1995)

Exhibit 58



Watermaster uses Interferometric Synthetic Aperture Radar (InSAR) for the regional monitoring of land subsidence. This map displays vertical ground motion across the entire Chino Basin as measured by InSAR from 2005 to 2010. The InSAR data are generally coherent and useful in the northern urbanized areas of the Basin, but are generally incoherent and not as useful in agricultural or undeveloped open space areas (gray areas). This pattern of "coherence" relative to land use is typical of InSAR.

Historically, the MZ1 Managed Area has experienced the most land subsidence—over two feet of subsidence from 1987 to 1999. From 2005 to 2010 the InSAR data showed less than 0.1 ft of land subsidence in this area, which indicates that subsidence is successfully being managed. In the northeastern parts of the Basin, such as Fontana and Rancho Cucamonga, ground motion from 2005 to 2010 was relatively minor. Subsidence was greatest in the Pomona Area during 2005-2010 where up to 0.4 feet was measured by InSAR.

Geologic faults that cut through the aquifer system can act as barriers to groundwater flow and, hence, can cause the occurrence of differential subsidence. Historically in the Chino Basin, the ground fissuring has been linked to the occurrence of differential subsidence. The InSAR data on this map shows a steep gradient of subsidence across the San Jose Fault in the Pomona Area, indicating the potential for the accumulation of horizontal strain in the shallow sediments and the possibility of ground fissuring. Ground fissuring is the main subsidence related threat to infrastructure. The Land Subsidence Committee is continuing to monitor this area via InSAR and has recommended additional activities to address the occurrence of differential subsidence in Pomona if it continues.

Relative Change in Land Surface Altitude as Measured by InSAR
June 2005 to September 2010

+ 1 ft / 0 / -0.50 / - 1 ft

InSAR data absent (incoherent)

Chino Desalter Well

Extensometer

Chino Basin OBMP Management Zones

MZ1 Managed Area

Areas of Subsidence Concern

Flood Control & Conservation Basins

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

0 1 2 3 4 Miles

0 1 2 3 4 5 6 KM

Produced by:

WILDERMUTH ENVIRONMENTAL INC

23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

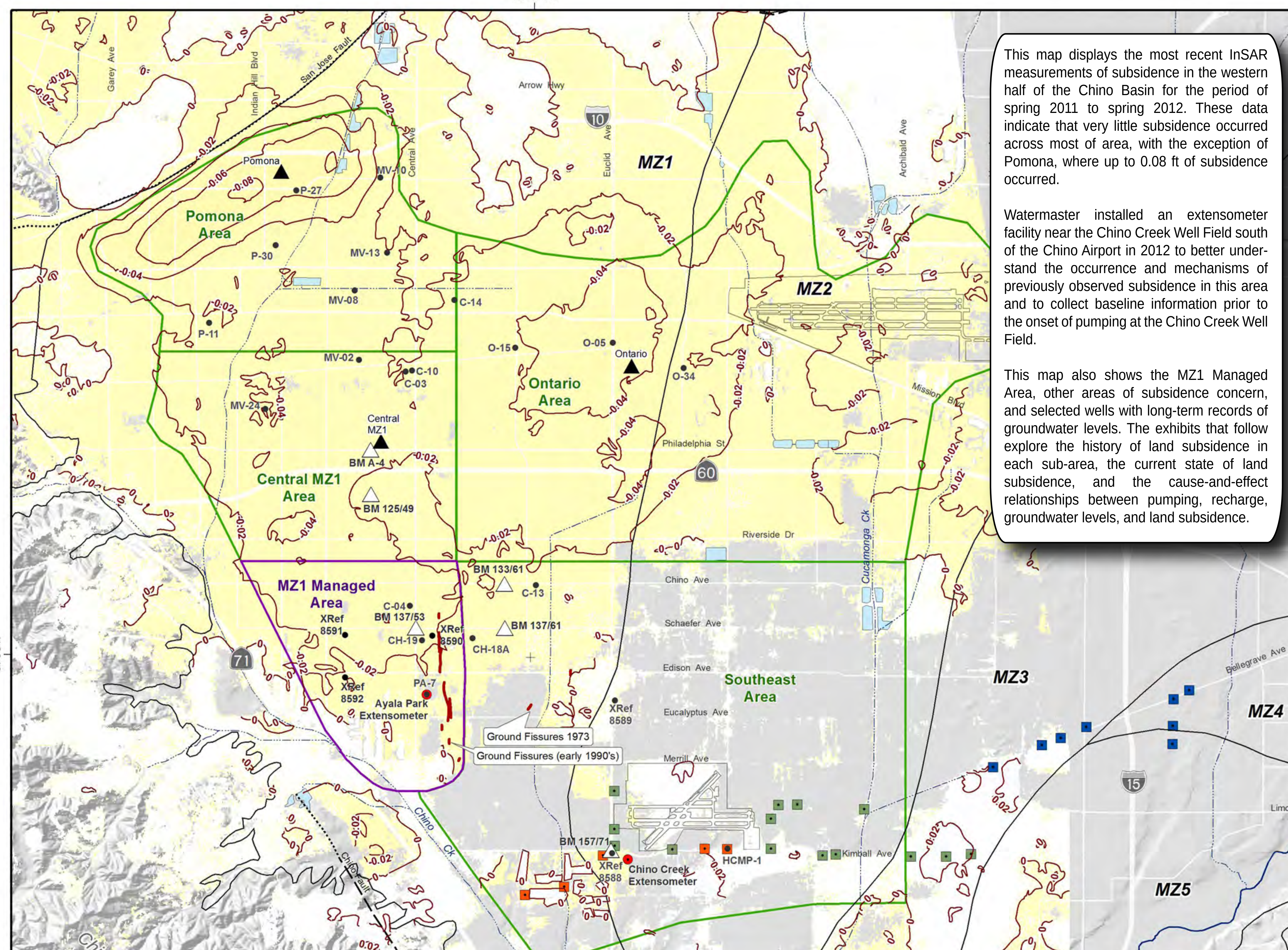
Author: TCR
Date: 20130529
File: Exhibit_59.mxd

2012 State of the Basin
Land Subsidence Monitoring

Vertical Ground Motion as Measured by InSAR

2005 to 2010

Exhibit 59



This map displays the most recent InSAR measurements of subsidence in the western half of the Chino Basin for the period of spring 2011 to spring 2012. These data indicate that very little subsidence occurred across most of area, with the exception of Pomona, where up to 0.08 ft of subsidence occurred.

Watermaster installed an extensometer facility near the Chino Creek Well Field south of the Chino Airport in 2012 to better understand the occurrence and mechanisms of previously observed subsidence in this area and to collect baseline information prior to the onset of pumping at the Chino Creek Well Field.

This map also shows the MZ1 Managed Area, other areas of subsidence concern, and selected wells with long-term records of groundwater levels. The exhibits that follow explore the history of land subsidence in each sub-area, the current state of land subsidence, and the cause-and-effect relationships between pumping, recharge, groundwater levels, and land subsidence.

Relative Change in Land Surface Altitude as Measured by InSAR
March 2011 to February 2012

+ 0.25 ft
0
-0.50
- 0.25 ft

InSAR data absent (incoherent)

- Water Level Wells (Exhibits 61 to 65)
- Chino-I Desalter Well
- Chino-II Desalter Well
- Chino Creek Desalter Well
- Extensometer
- Benchmark Monument (Exhibits 61 to 65)
- InSAR Measurement Point (Exhibits 62 to 64)
- Chino Basin OBMP Management Zones
- MZ1 Managed Area
- Areas of Subsidence Concern

Produced by:

WILDERMUTH ENVIRONMENTAL INC.

23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

Author: TCR
Date: 20130530
File: Exhibit_60.mxd

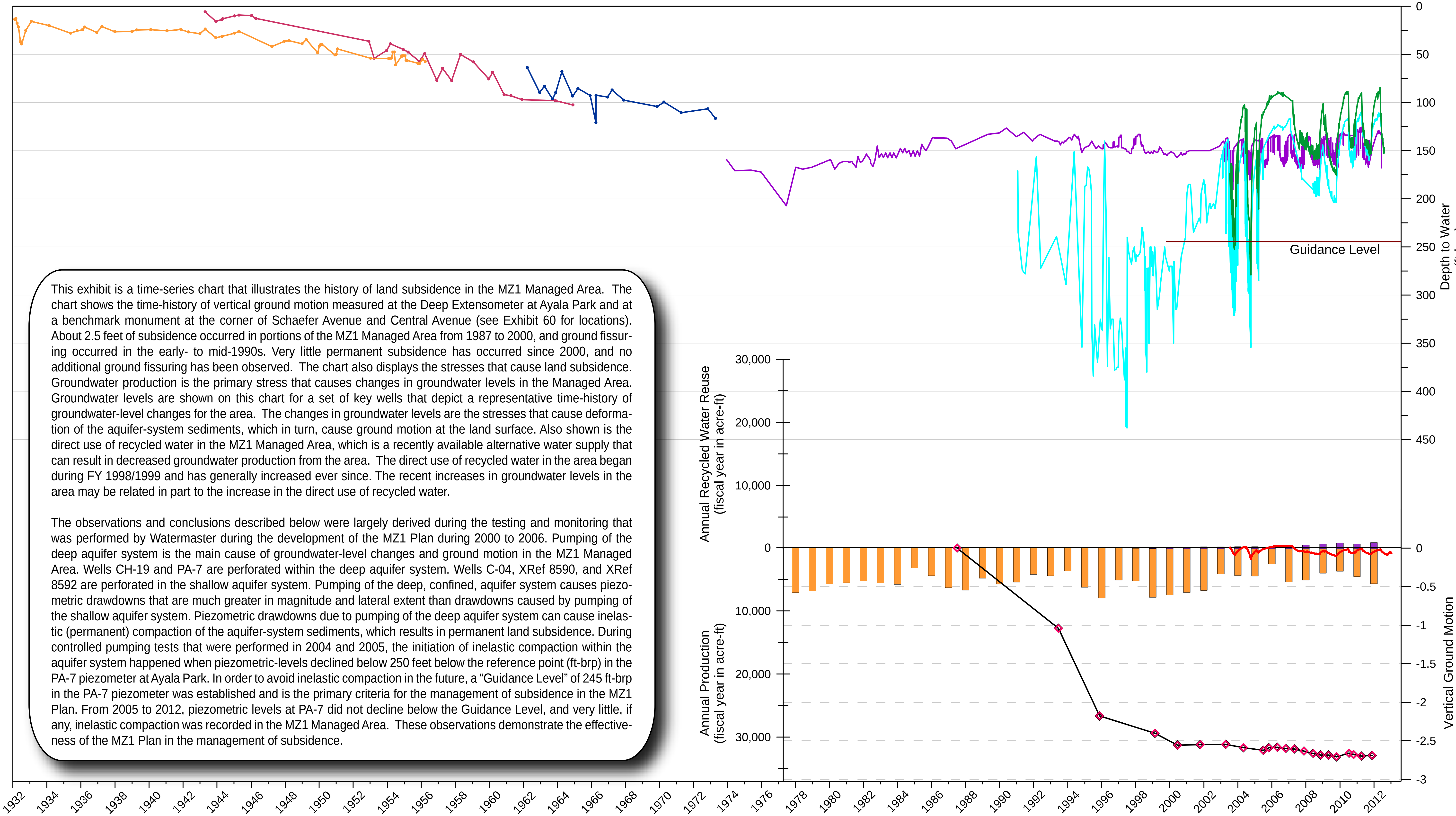
0 1 2 3 Miles
0 1 2 3 4 KM

2012 State of the Basin
Land Subsidence Monitoring

Vertical Ground Motion as Measured by InSAR

2011 to 2012

Exhibit 60



This exhibit is a time-series chart that illustrates the history of land subsidence in the MZ1 Managed Area. The chart shows the time-history of vertical ground motion measured at the Deep Extensometer at Ayala Park and at a benchmark monument at the corner of Schaefer Avenue and Central Avenue (see Exhibit 60 for locations). About 2.5 feet of subsidence occurred in portions of the MZ1 Managed Area from 1987 to 2000, and ground fissuring occurred in the early- to mid-1990s. Very little permanent subsidence has occurred since 2000, and no additional ground fissuring has been observed. The chart also displays the stresses that cause land subsidence. Groundwater production is the primary stress that causes changes in groundwater levels in the Managed Area. Groundwater levels are shown on this chart for a set of key wells that depict a representative time-history of groundwater-level changes for the area. The changes in groundwater levels are the stresses that cause deformation of the aquifer-system sediments, which in turn, cause ground motion at the land surface. Also shown is the direct use of recycled water in the MZ1 Managed Area, which is a recently available alternative water supply that can result in decreased groundwater production from the area. The direct use of recycled water in the area began during FY 1998/1999 and has generally increased ever since. The recent increases in groundwater levels in the area may be related in part to the increase in the direct use of recycled water.

The observations and conclusions described below were largely derived during the testing and monitoring that was performed by Watermaster during the development of the MZ1 Plan during 2000 to 2006. Pumping of the deep aquifer system is the main cause of groundwater-level changes and ground motion in the MZ1 Managed Area. Wells CH-19 and PA-7 are perforated within the deep aquifer system. Wells C-04, XRef 8590, and XRef 8592 are perforated in the shallow aquifer system. Pumping of the deep, confined, aquifer system causes piezometric drawdowns that are much greater in magnitude and lateral extent than drawdowns caused by pumping of the shallow aquifer system. Piezometric 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. During controlled pumping tests that were performed in 2004 and 2005, the initiation of inelastic compaction within the aquifer system happened when piezometric-levels declined below 250 feet below the reference point (ft-brp) in the PA-7 piezometer at Ayala Park. In order to avoid inelastic compaction in the future, a "Guidance Level" of 245 ft-brp in the PA-7 piezometer was established and is the primary criteria for the management of subsidence in the MZ1 Plan. From 2005 to 2012, piezometric levels at PA-7 did not decline below the Guidance Level, and very little, if any, inelastic compaction was recorded in the MZ1 Managed Area. These observations demonstrate the effectiveness of the MZ1 Plan in the management of subsidence.

Groundwater Levels at Wells (Perforated Interval Depth)

- C-04 (160-275 ft-bgs)
- CH-19 (340-1000 ft-bgs)
- PA-7 (438-448 ft-bgs)
- XRef 8590 (80-225 ft-bgs)
- XRef 8591 (no perf data)
- XRef 8592 (90-230 ft-bgs)

Vertical Ground Motion

- BM 137/53 Cumulative Displacement
- Ayala Park Deep Extensometer Measurements Between 30 to 1,400 ft-bgs

Recharge and Production

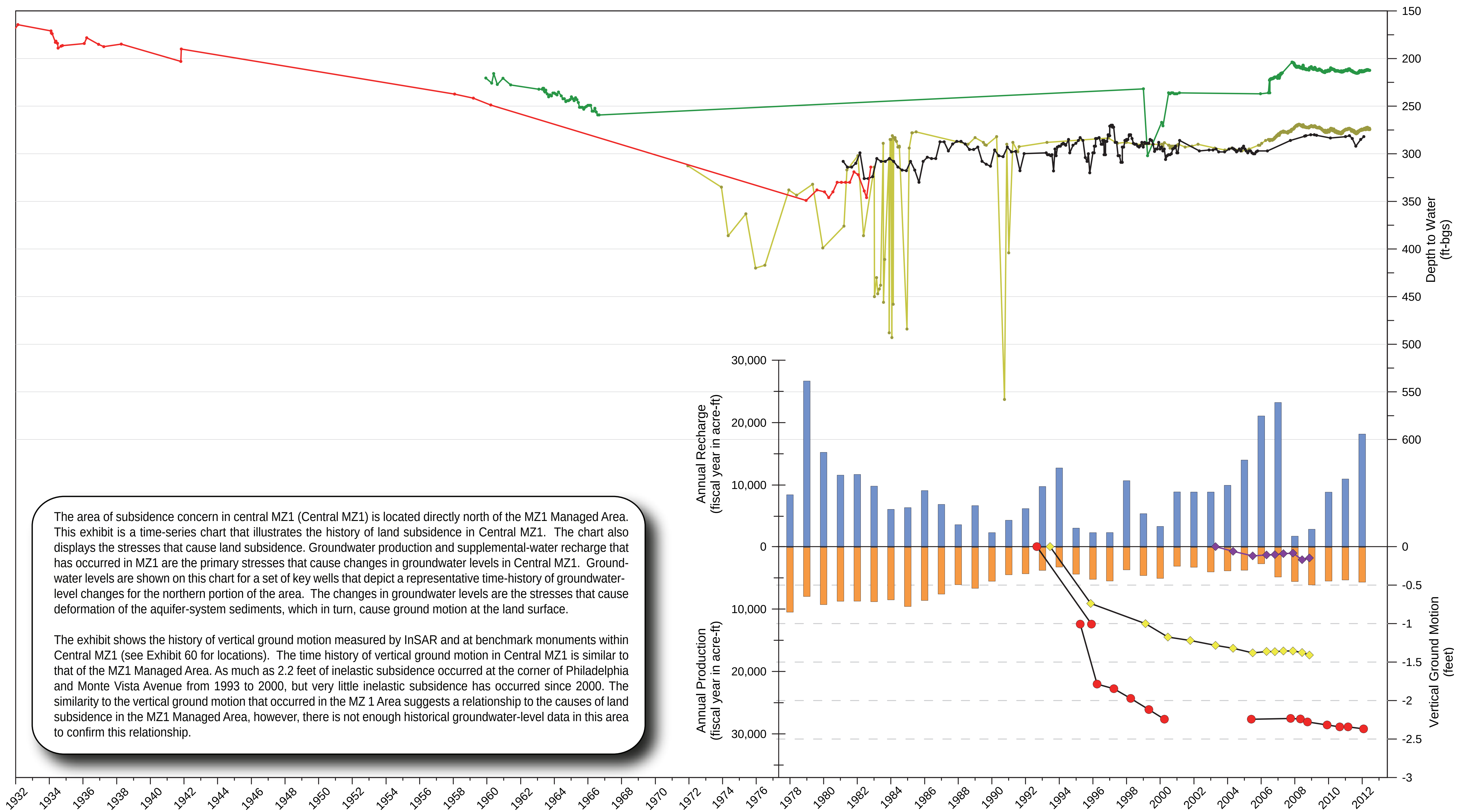
- Recycled Water Reuse Applied in MZ1 Managed Area
- Groundwater Production from Wells in MZ1 Managed Area

Produced by:
WILDERMUTH ENVIRONMENTAL INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com
Author: TCR
Date: 06/26/2013
File: Exhibit_61.grf

2012 State of the Basin
Land Subsidence Monitoring

The History of Land Subsidence in the MZ1 Managed Area

Exhibit 61



The area of subsidence concern in central MZ1 (Central MZ1) is located directly north of the MZ1 Managed Area. This exhibit is a time-series chart that illustrates the history of land subsidence in Central MZ1. The chart also displays the stresses that cause land subsidence. Groundwater production and supplemental-water recharge that has occurred in MZ1 are the primary stresses that cause changes in groundwater levels in Central MZ1. Groundwater levels are shown on this chart for a set of key wells that depict a representative time-history of groundwater-level changes for the northern portion of the area. The changes in groundwater levels are the stresses that cause deformation of the aquifer-system sediments, which in turn, cause ground motion at the land surface.

The exhibit shows the history of vertical ground motion measured by InSAR and at benchmark monuments within Central MZ1 (see Exhibit 60 for locations). The time history of vertical ground motion in Central MZ1 is similar to that of the MZ1 Managed Area. As much as 2.2 feet of inelastic subsidence occurred at the corner of Philadelphia and Monte Vista Avenue from 1993 to 2000, but very little inelastic subsidence has occurred since 2000. The similarity to the vertical ground motion that occurred in the MZ 1 Area suggests a relationship to the causes of land subsidence in the MZ1 Managed Area, however, there is not enough historical groundwater-level data in this area to confirm this relationship.

Produced by:

WILDERMUTH ENVIRONMENTAL INC.

23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

Author: VMW
Date: 06/05/2013
File: Exhibit_62.grf

Groundwater Levels at Wells (Perforated Interval Depth)

- C-03 (230-450 ft-bgs)
- MV-24 (244-420 ft-bgs)
- MV-02 (397-962 ft-bgs)
- C-10 (355-1090 ft-bgs)

Vertical Ground Motion

- Central MZ1 InSAR Cumulative Displacement
- BM A-4 Cumulative Displacement
- BM 125/49 Cumulative Displacement

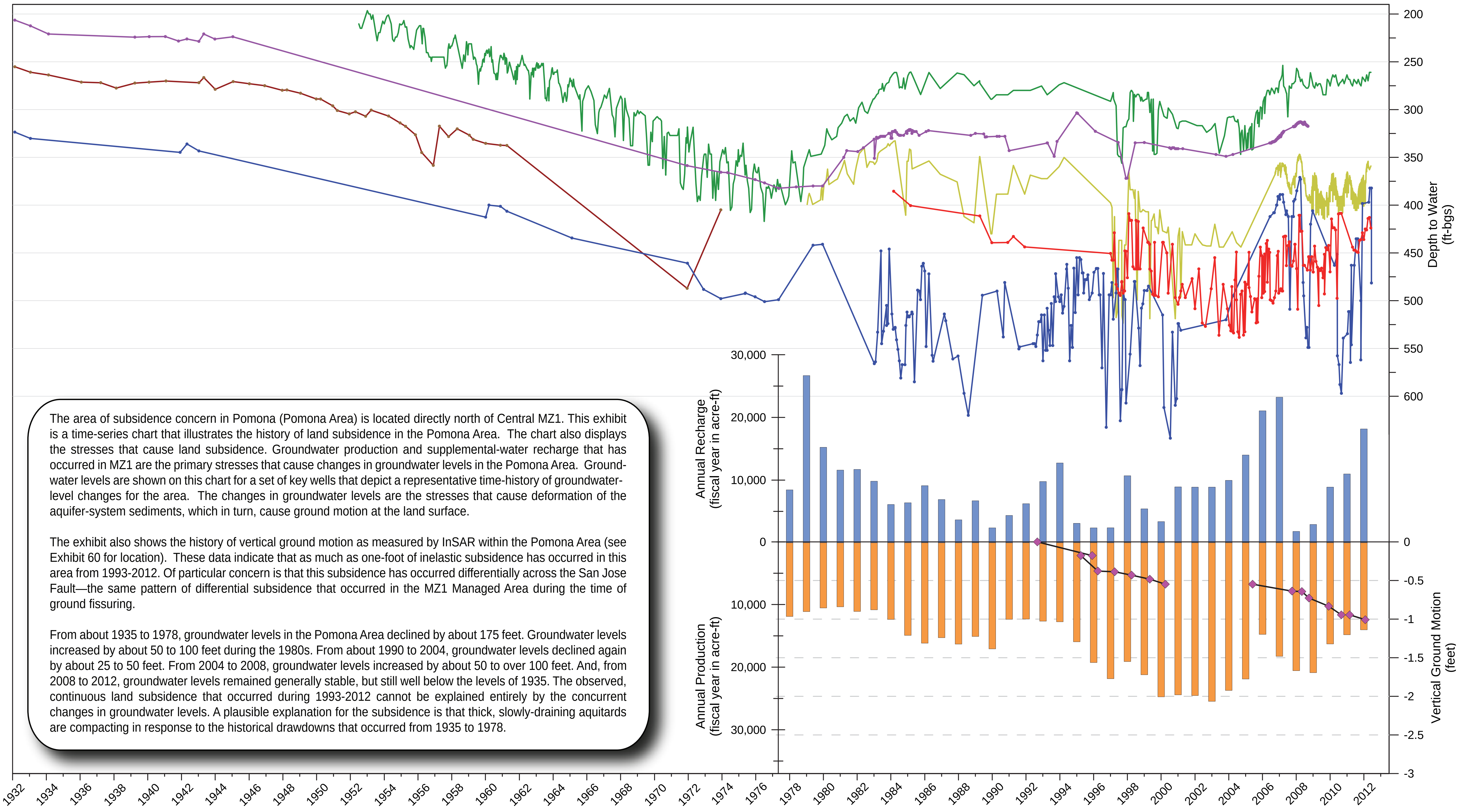
Recharge and Production

- Recharge of Recycled Water, Storm Water*, and Imported Water at the College Heights, Upland, Montclair, and Brooks Basins; and at MVWD ASR Wells
  *Storm Water is an estimated amount prior to Fiscal Year 04/05
- Groundwater Production from Wells in Central MZ1 Area

2012 State of the Basin
Land Subsidence Monitoring

The History of Land Subsidence in the Central MZ1 Area

Exhibit 62



The area of subsidence concern in Pomona (Pomona Area) is located directly north of Central MZ1. This exhibit is a time-series chart that illustrates the history of land subsidence in the Pomona Area. The chart also displays the stresses that cause land subsidence. Groundwater production and supplemental-water recharge that has occurred in MZ1 are the primary stresses that cause changes in groundwater levels in the Pomona Area. Groundwater levels are shown on this chart for a set of key wells that depict a representative time-history of groundwater-level changes for the area. The changes in groundwater levels are the stresses that cause deformation of the aquifer-system sediments, which in turn, cause ground motion at the land surface.

The exhibit also shows the history of vertical ground motion as measured by InSAR within the Pomona Area (see Exhibit 60 for location). These data indicate that as much as one-foot of inelastic subsidence has occurred in this area from 1993-2012. Of particular concern is that this subsidence has occurred differentially across the San Jose Fault—the same pattern of differential subsidence that occurred in the MZ1 Managed Area during the time of ground fissuring.

From about 1935 to 1978, groundwater levels in the Pomona Area declined by about 175 feet. Groundwater levels increased by about 50 to 100 feet during the 1980s. From about 1990 to 2004, groundwater levels declined again by about 25 to 50 feet. From 2004 to 2008, groundwater levels increased by about 50 to over 100 feet. And, from 2008 to 2012, groundwater levels remained generally stable, but still well below the levels of 1935. The observed, continuous land subsidence that occurred during 1993-2012 cannot be explained entirely by the concurrent changes in groundwater levels. A plausible explanation for the subsidence is that thick, slowly-draining aquitards are compacting in response to the historical drawdowns that occurred from 1935 to 1978.

Produced by:
WILDERMUTH ENVIRONMENTAL INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com
Author: VMW
Date: 06/05/2013
File: Exhibit_63.grf

Groundwater Levels at Wells (Perforated Interval Depth)

- P-11(168-550 ft-bgs)
- MV-08 (225-447 ft-bgs)
- MV-13 (203-475 ft-bgs)
- P-30 (565-875 ft-bgs)
- P-27 (472-849 ft-bgs)
- MV-10 (520-1084 ft-bgs)

Vertical Ground Motion

- Pomona Area InSAR Cumulative Displacement

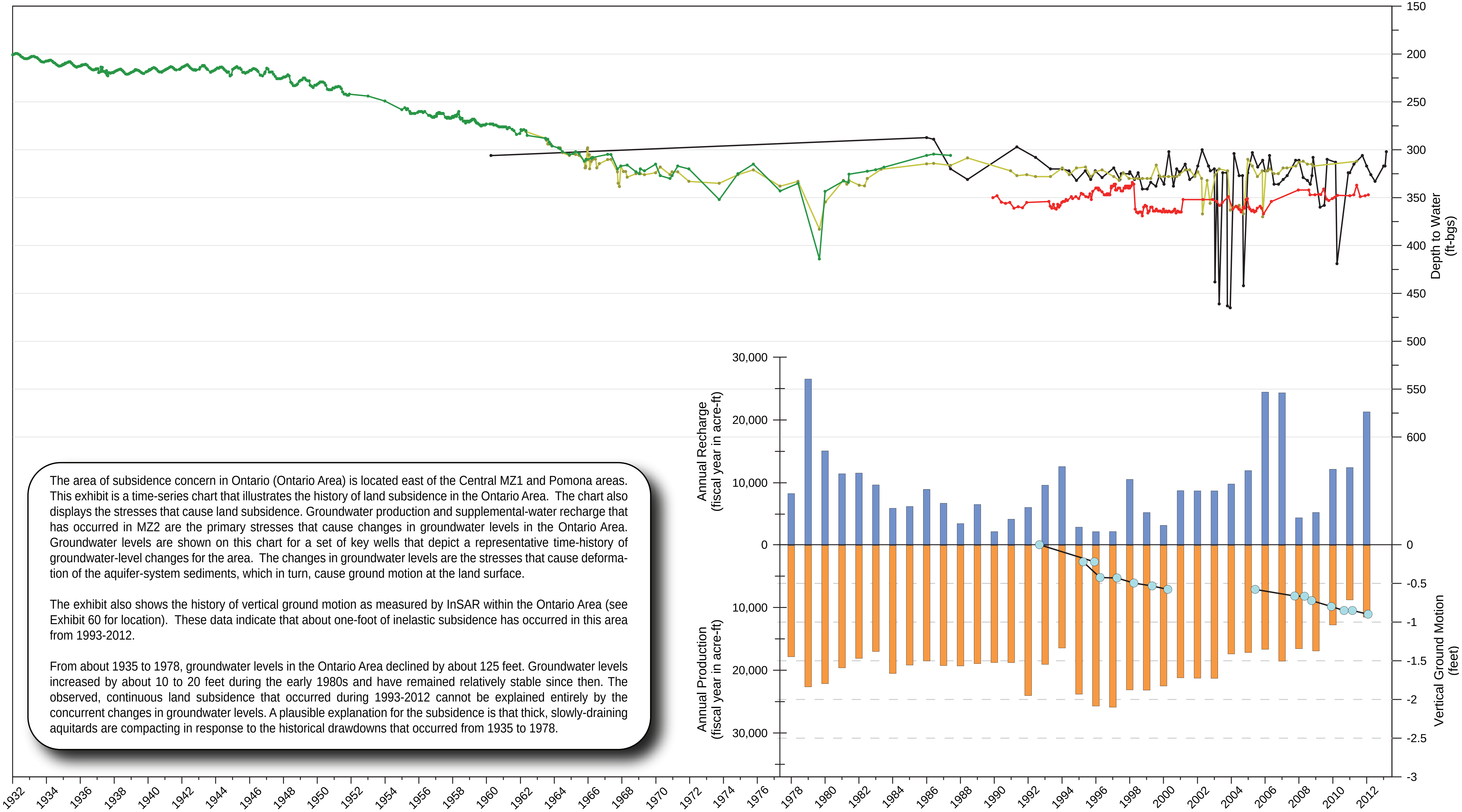
Recharge and Production

- Recharge of Recycled Water, Storm Water*, and Imported Water at the College Heights, Upland, Montclair, and Brooks Basins; and at MVWD ASR Wells
  *Storm Water is an estimated amount prior to Fiscal Year 04/05
- Groundwater Production from Wells in Pomona Area

2012 State of the Basin
Land Subsidence Monitoring

The History of Land Subsidence in the Pomona Area

Exhibit 63



The area of subsidence concern in Ontario (Ontario Area) is located east of the Central MZ1 and Pomona areas. This exhibit is a time-series chart that illustrates the history of land subsidence in the Ontario Area. The chart also displays the stresses that cause land subsidence. Groundwater production and supplemental-water recharge that has occurred in MZ2 are the primary stresses that cause changes in groundwater levels in the Ontario Area. Groundwater levels are shown on this chart for a set of key wells that depict a representative time-history of groundwater-level changes for the area. The changes in groundwater levels are the stresses that cause deformation of the aquifer-system sediments, which in turn, cause ground motion at the land surface.

The exhibit also shows the history of vertical ground motion as measured by InSAR within the Ontario Area (see Exhibit 60 for location). These data indicate that about one-foot of inelastic subsidence has occurred in this area from 1993-2012.

From about 1935 to 1978, groundwater levels in the Ontario Area declined by about 125 feet. Groundwater levels increased by about 10 to 20 feet during the early 1980s and have remained relatively stable since then. The observed, continuous land subsidence that occurred during 1993-2012 cannot be explained entirely by the concurrent changes in groundwater levels. A plausible explanation for the subsidence is that thick, slowly-draining aquitards are compacting in response to the historical drawdowns that occurred from 1935 to 1978.

Produced by:
WILDERMUTH ENVIRONMENTAL INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com
Author: VMW
Date: 06/05/2013
File: Exhibit_64.grf

Groundwater Levels at Wells (Perforated Interval Depth)
- C-14 (480-1200 ft-bgs)
- O-05 (360-470 ft-bgs)
- O-15 (474-966 ft-bgs)
- O-34 (522-1092 ft-bgs)

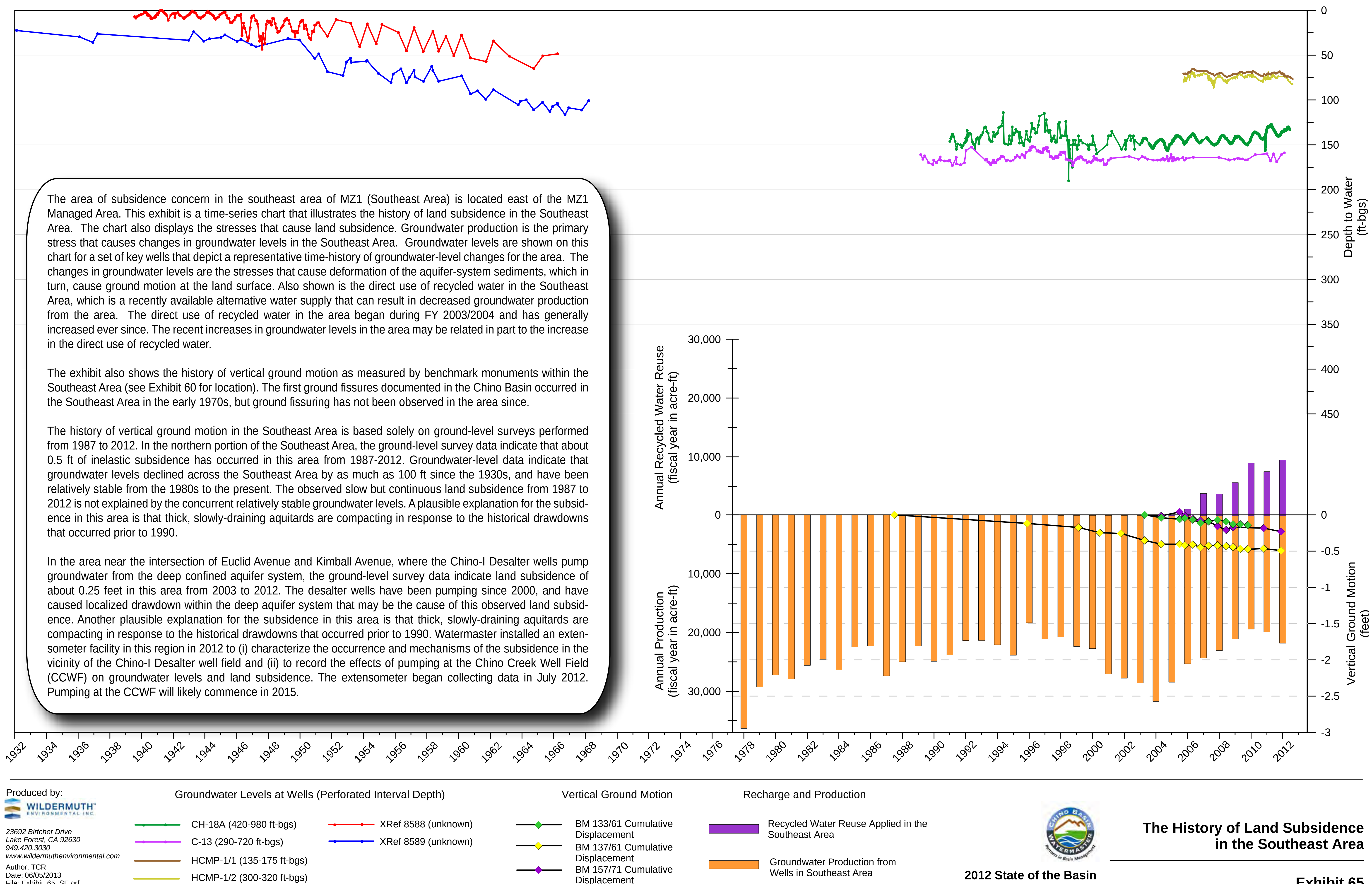
Vertical Ground Motion
- Ontario Area InSAR Cumulative Displacement

Recharge and Production
- Recharge of Recycled, Storm Water*, and Imported Water at Basins in MZ2 and the 7th and 8th Street Basins
  *Storm Water is an estimated amount prior to Fiscal Year 04/05
- Groundwater Production from Wells in Ontario Area

2012 State of the Basin
Land Subsidence Monitoring

The History of Land Subsidence in the Ontario Area

Exhibit 64



The area of subsidence concern in the southeast area of MZ1 (Southeast Area) is located east of the MZ1 Managed Area. This exhibit is a time-series chart that illustrates the history of land subsidence in the Southeast Area. The chart also displays the stresses that cause land subsidence. Groundwater production is the primary stress that causes changes in groundwater levels in the Southeast Area. Groundwater levels are shown on this chart for a set of key wells that depict a representative time-history of groundwater-level changes for the area. The changes in groundwater levels are the stresses that cause deformation of the aquifer-system sediments, which in turn, cause ground motion at the land surface. Also shown is the direct use of recycled water in the Southeast Area, which is a recently available alternative water supply that can result in decreased groundwater production from the area. The direct use of recycled water in the area began during FY 2003/2004 and has generally increased ever since. The recent increases in groundwater levels in the area may be related in part to the increase in the direct use of recycled water.

The exhibit also shows the history of vertical ground motion as measured by benchmark monuments within the Southeast Area (see Exhibit 60 for location). The first ground fissures documented in the Chino Basin occurred in the Southeast Area in the early 1970s, but ground fissuring has not been observed in the area since.

The history of vertical ground motion in the Southeast Area is based solely on ground-level surveys performed from 1987 to 2012. In the northern portion of the Southeast Area, the ground-level survey data indicate that about 0.5 ft of inelastic subsidence has occurred in this area from 1987-2012. Groundwater-level data indicate that groundwater levels declined across the Southeast Area by as much as 100 ft since the 1930s, and have been relatively stable from the 1980s to the present. The observed slow but continuous land subsidence from 1987 to 2012 is not explained by the concurrent relatively stable groundwater levels. A plausible explanation for the subsidence in this area is that thick, slowly-draining aquitards are compacting in response to the historical drawdowns that occurred prior to 1990.

In the area near the intersection of Euclid Avenue and Kimball Avenue, where the Chino-I Desalter wells pump groundwater from the deep confined aquifer system, the ground-level survey data indicate land subsidence of about 0.25 feet in this area from 2003 to 2012. The desalter wells have been pumping since 2000, and have caused localized drawdown within the deep aquifer system that may be the cause of this observed land subsidence. Another plausible explanation for the subsidence in this area is that thick, slowly-draining aquitards are compacting in response to the historical drawdowns that occurred prior to 1990. Watermaster installed an extensometer facility in this region in 2012 to (i) characterize the occurrence and mechanisms of the subsidence in the vicinity of the Chino-I Desalter well field and (ii) to record the effects of pumping at the Chino Creek Well Field (CCWF) on groundwater levels and land subsidence. The extensometer began collecting data in July 2012. Pumping at the CCWF will likely commence in 2015.

Produced by:
WILDERMUTH ENVIRONMENTAL INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com
Author: TCR
Date: 06/05/2013
File: Exhibit_65_SE.grf

2012 State of the Basin
Land Subsidence Monitoring

The History of Land Subsidence in the Southeast Area

Exhibit 65