The exhibits in this section characterize the physical state of the Chino Basin with respect to groundwater production and artificial recharge. Future re-determinations of Safe Yield for the Chino Basin will be based largely on accurate estimations of groundwater production and artificial recharge.

Since its establishment in 1978, Watermaster has collected information to estimate total groundwater production from the Chino Basin. The Watermaster Rules and Regulations require groundwater producers that produce in excess of 10 acre-feet per year (acre-ft/yr) to install and maintain meters on their well(s). Appropriative Pool, Overlying Non-Agricultural Pool, and Chino Basin Desalter well production estimates are based on flow-meter data that are provided by producers on a quarterly basis. Agricultural Pool estimates are based on flow-meter data collected by Watermaster staff on a quarterly basis. Minimal producer estimates are determined by Watermaster staff on an annual basis using water duty methods. All production data in the Chino Basin are entered into Watermaster's database. Watermaster summarizes and reports on groundwater production data over the fiscal year (FY) that begins on July 1. Exhibit 6 shows the locations of all active production wells in the Basin during FY 2013/2014.

Exhibit 7 depicts the annual groundwater production by Pool for FY 1977/1978 through 2013/2014. There are two bar charts in Exhibit 7: 7a shows the actual production by Pool as recorded in Watermasters' production database; 7b shows the actual production in Watermaster's database for the Appropriative Pool, Overlying Non-Agricultural Pool, and Chino Basin Desalter Authority (CDA), with the Agricultural Pool production amounts from the 2013 Chino Basin Groundwater Model. The pre-2002 modeled agricultural production was determined using historical land use data, and land use requirements. Prior to the implementation of the meter installation program during 2001 to 2003, the modeled historical agricultural production is regarded as more accurate than the estimates of Agricultural Pool production in Watermaster's database.

Total groundwater production in Chino Basin has ranged from a maximum of about 189,000 acre-ft during FY 2008/2009 to a low of about 123,000 acre-ft during FY 1982/1983, and has averaged about 154,000 acre-ft/yr. The spatial distribution of production has shifted since 1978. Agricultural Pool production, which has been mainly concentrated south of the 60 Freeway, dropped from about 55 percent of total production in FY 1977/1978 to 13 percent as of FY 2013/2014. During the same period, Appropriative Pool production increased from about 39 percent of total production in FY 1977/1978 to 84 percent as of FY 2013/2014 (for this characterization, this is the sum of production for the Appropriative Pool and the CDA). Increases in Appropriative Pool production have approximately kept pace with the decline in agricultural production. Production in the Overlying Non-Agricultural Pool declined from about six percent of total production in FY 1977/1978 to two percent as of FY 2013/2014.

Exhibits 8 through 10 are maps that illustrate the location and magnitude of groundwater production at wells in the Chino Basin for FYs 1977/1978 (Watermaster established), 1999/2000 (commencement of the OBMP), and 2013/2014 (current conditions). These figures indicate the following:

- There was a basin-wide increase in the number of wells producing over 1,000 acre-ft/yr between 1978 and 2014. This is consistent with (i) the land transition from agricultural to urban uses, (ii) the trend of increasing imported water costs, and (iii) the construction of the desalters.
- From FY 1977/1978 to 1999/2000, production south of the 60 Freeway deceased from 59 percent to 31 percent of total production in the Chino Basin, while production north of the 60 Freeway increased from 41 percent to 69 percent of total production. This shift in production patterns is due to a decline in irrigated agriculture and an increase in urbanization south of the 60 Freeway, and an increase in urbanization north of the 60 Freeway.
- From FY 1999/2000 to 2013/2014, production north of the 60 Freeway deceased from 69 percent to 66 percent of total production in the Chino Basin, while production at wells south of the 60 Freeway increased from 31 percent to 34 percent of total production. Since FY 1999/2000 the number of active agricultural wells in the southern portion of the Basin decreased by about 50 percent. The three percent increase in total groundwater production south of the 60 Freeway is due to the onset of Chino Basin Desalter well pumping, which progressively increased since start-up in 2000 and currently totals about 30,000 acre-ft/yr.

The Chino Basin Desalters were described in the OBMP Phase 1 Report (WEI, 1999) as facilities that would *"Enhance Basin Water Supplies"* and *"Protect and Enhance Water Quality."* Exhibit 11 is a map that displays the locations of the wells and desalter facilities, and summarizes the history of desalter production in the southern portion of the Chino Basin.

The objectives of the Chino Basin Groundwater Recharge Program are to enhance water supply reliability and improve groundwater quality throughout the Chino Basin by increasing the recharge of storm water, imported water, and recycled water. For further information on Watermaster's requirements for recharge, see Section 5.1 of the Peace Agreement, Article 8 of the Peace II Agreement, the 2010 Recharge Master Plan Update (WEI, 2010).

The Chino Basin Recycled Water Groundwater Recharge Program, which is implemented by IEUA and Watermaster, is subject to the following regulatory orders:

- California Regional Water Quality Control Board, Santa Ana Region, Order No. R8-2007-0039, Water Recycling Requirements for Inland Empire Utilities Agency and Chino Basin Watermaster, Chino Basin Recycled Groundwater Recharge Program, Phase I and Phase II Projects, San Bernardino County. June 29, 2007.
- California Regional Water Quality Control Board, Santa Ana Region. Order No. R8-2009-0057. Amending Order No. R8-2007-0039, October 30, 2009.
- California Regional Water Quality Control Board, Santa Ana Region. Revised Monitoring and Reporting Program No. R8-2007-0039 for the Inland Empire Utilities Agency and Chino Basin Watermaster, Chino Basin Recycled Groundwater Recharge Program, Phase I and Phase II Projects, San Bernardino County. October 27, 2010.

Exhibit 12 shows the locations of the recharge basins in Chino Basin symbolized by the types of waters that are recharged, including storm water, urban runoff, recycled water, and imported water. The volumes of recharge that occur at each basin are monitored and recorded by IEUA. Exhibit 13 lists the operable recharge facilities in the Chino Basin and summarizes annual recharge by type for the

period of July 1, 2000 through June 30, 2014 (FY 2000/2001 to FY 2013/2014).[2] The following are the general trends in recharge:

- Storm water recharge at the recharge basins was not measured prior to FY 2004/2005. Since then, annual storm-water recharge has ranged from about 4,300 acre-ft to 17,600 acre-ft and has averaged about 10,300 acre-ft/yr.
- Since FY 2000/2001, annual imported-water recharge has ranged from 0 to 34,567 acre-ft and has averaged about 13,400 acre-ft/yr. The wide range in annual imported water recharged is reflective of the MWDSC Dry Year Yield (DYY) conjunctive use storage program in the Chino Basin. During FYs 2004/2005, 2005/2006, and 2006/2007, imported water recharge was well above average because the MWDSC was doing a "put" operation pursuant to the DYY storage program.
- During FYs 2007/2008, 2008/2009, 2009/2010, and 2010/2011, imported water recharge was well below average due to the lack of low-cost replenishment water supplied by MWDSC. In FY 2011/2012, about 23,500 acre-ft of imported water was recharged in Chino Basin. This large amount of imported water recharged during that year, is because of the availability of low-cost Tier 1 water from MWDSC at that time.
- Since FY 2000/2001, annual recycled-water recharge has ranged from 49 to 13,600 acre-ft. In FY 2005/2006, recycled water recharge increased from an average of about 300 acre-ft/yr to about 6,000 acre-ft/yr after the implementation of the Recycled Water Groundwater Recharge Program. After the expansion of the program in 2007, the amount of recycled-water recharge continued to increase annually and reached a historical high of 13,593 acre-ft/yr in FY 2013/2014.

Since the late 1990s, the reuse of recycled water has increased in the Chino Basin. Recycled water is utilized two ways: (i) direct non-potable uses such as irrigation and (ii) indirect potable reuse via groundwater recharge. Exhibits 12, 13, and 14 characterize the reuse of recycled water in the Chino Basin from FY 2000/2001 through FY 2013/2014. Since the OBMP Implementation the reuse of recycled water for the combined uses of direct non-potable uses and recharge has increased ten-fold from about 3,700 acre-ft/yr to 38,000 acre-ft/yr in FY 2013/2014, which is about 70 percent of the total effluent produced from the IEUA's treatment plants.

[2] The IEUA does not distinguish storm water from urban runoff in the recharge tabulations it submits to Watermaster.

117°40'0"W

117°20'0"W

34°0'0"N

San Gabriel Mountains

Cucamonga Fault Zone

Cucamonga Basin

Claremont Basin

Pomona Basin

Rialto-Colton Basin

Indian Hill Fault

San Jose Fault

Red Hill Fault

Barrier J

Loma Linda Fault

San Jacinto Fault

Rialto-Colton Fault

San Antonio Ck

Day Ck

Cucamonga Ck

Chino Ck

Santa Ana River

Foothill Blvd

Holt Blvd

Mission Blvd

Riverside Dr

Limonite Ave

Jurupa Mountains

Puente Hills

Chino Hills

Chino Fault

Prado Basin

Temescal Basin

San Bernardino County

Riverside County

Orange County

Riverside Basins

Haven Ave

Euclid Ave

Central Ave

Etiwanda Ave

Sierra Ave

Riverside Ave

Waterman Ave

Archibald Ave

Milliken Ave

Hamner Ave

Pedley Ave

Bellegrave Ave

15

210

71

10

215

60

## Groundwater Production Wells by Pool

- Agricultural Pool (Pool 1)
- Overlying Non-Agricultural Pool (Pool 2)
- Appropriative Pool (Pool 3)
- Chino Basin Desalter Authority

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

### *Geology*

Water-Bearing Sediments

- Quaternary Alluvium

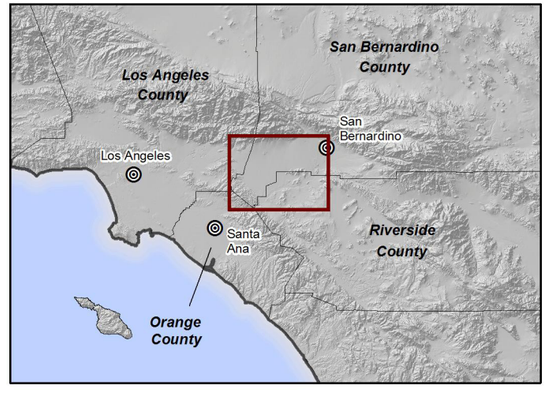
Consolidated Bedrock

- Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

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

This map shows the location of active production wells by pool as of FY 2013/2014. Since its establishment in 1978, Watermaster has collected information to develop groundwater production estimates. Appropriative Pool, Overlying Non-Agricultural Pool, and Chino Desalter well production estimates are based on meter data. Agricultural Pool estimates are based on meter data and water duty methods. The Watermaster Rules and Regulations require groundwater producers that produce in excess of 10 acre-ft/yr to install and maintain meters on their well(s). Many of the Agricultural Pool wells did not have properly functioning meters installed when the OBMP was adopted, and Watermaster initiated a meter installation program for those wells. Watermaster staff completed meter installation at the majority of agricultural wells in 2003, with the exception of minimal producer wells. Watermaster records production data from these meters on a quarterly basis. Production at an un-metered agricultural well is determined using a "water duty" by Watermaster staff on an annual basis. All Chino Basin production data are entered into Watermaster's database.




Prepared by:
WEI
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.weiwater.com

Author: amalone
Date: 6/23/2015
Document Name: Exhibit_06_ActiveProd_Wells

0 2 4 Miles
0 3 6 KM

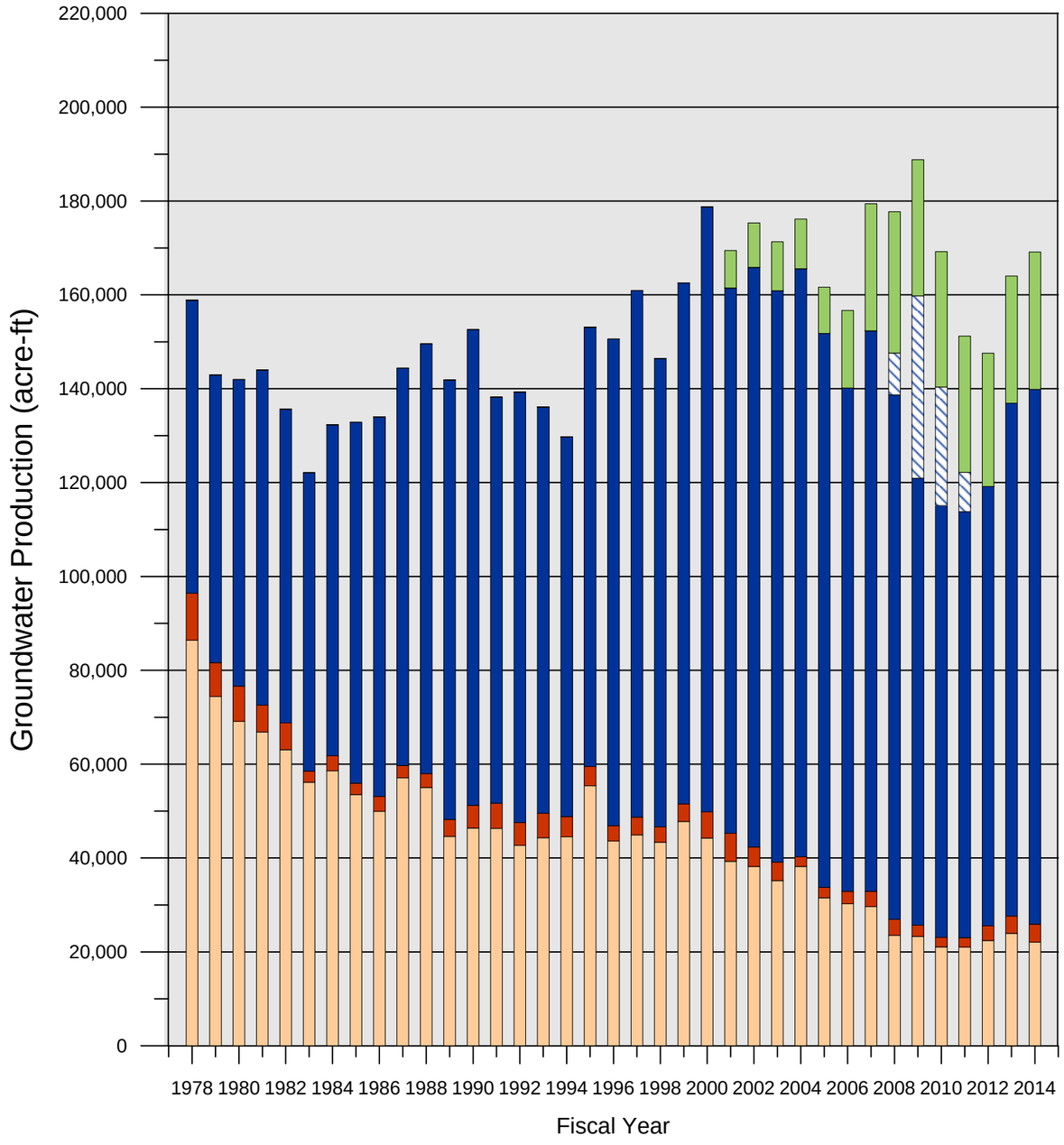
2014 State of the Basin
*Basin Production and Recharge*

# Active Groundwater Production Wells

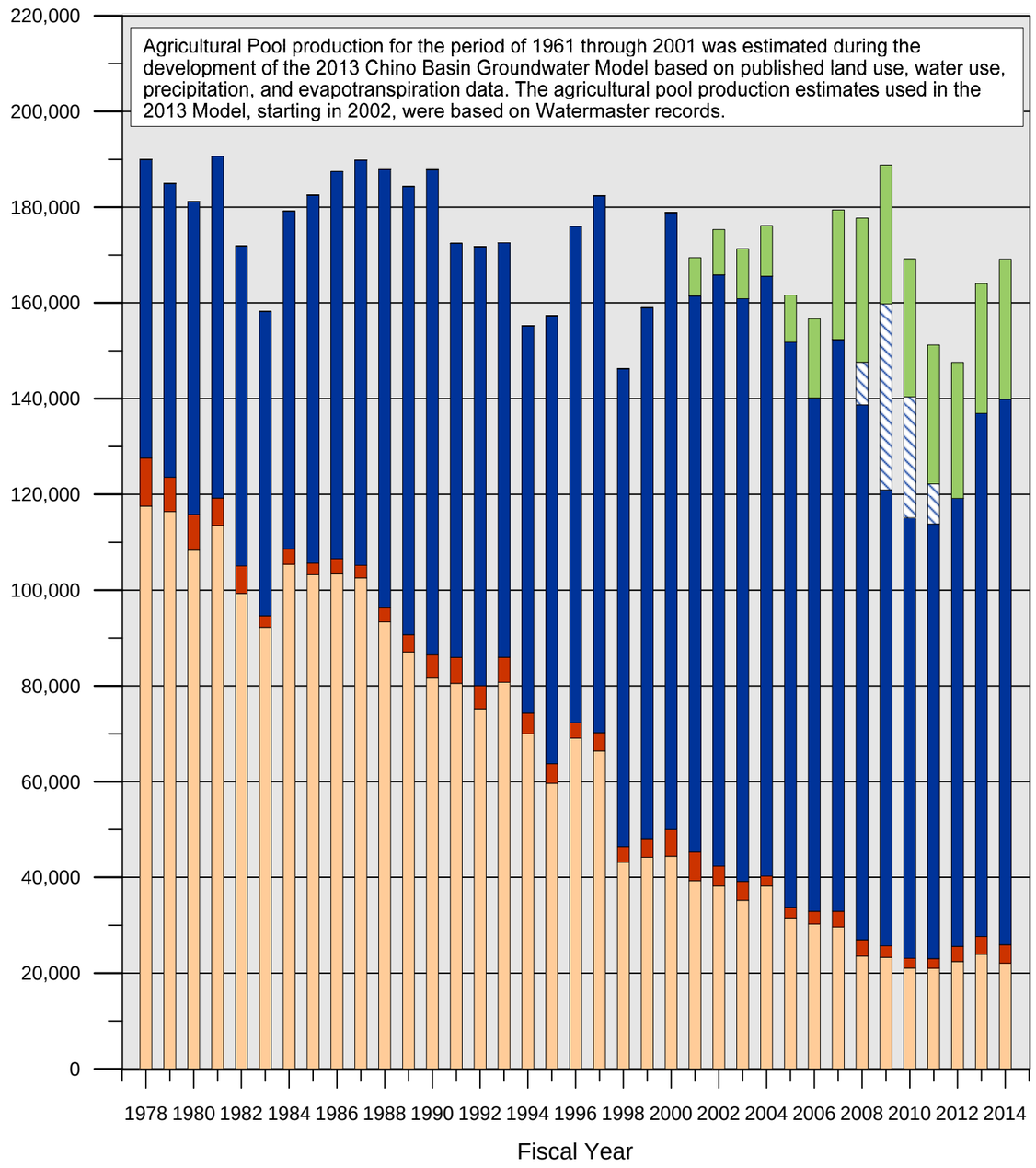
*Fiscal Year 2013/2014*

**Exhibit 6**

## 7a
## Distribution of Groundwater Production in the Chino Basin
## Agricultural Pool Production Amounts from Watermaster Database




## 7b
## Distribution of Groundwater Production in the Chino Basin with
## Agricultural Pool Production Amounts from the Chino Basin Model Prior to 2002





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WEI
Wildermuth Environmental, Inc.
*23692 Birtcher Drive*
*Lake Forest, CA 92630*
*949.420.3030*
*www.wildermuthenvironmental.com*

Author: VMW
Date: 06/25/2015
File: Exhibit_7_Production by Pool


- Agricultural Pool
- Overlying Non-Agricultural Pool
- Appropriative Pool
- Appropriative Pool - MWDSC Dry Year Yield Program
- Chino Basin Desalter Authority

Chino Basin Watermaster — Partners in Basin Management

**2014 State of the Basin**
Basin Production and Recharge

**Distribution of Groundwater Production**
**Fiscal Year 1978 to 2014**

**Exhibit 7**

117°40'0"W

117°20'0"W

34°0'0"N

San Gabriel Mountains

Cucamonga Fault Zone

San Antonio Ck

Cucamonga Basin

Claremont Basin

Indian Hill Fault

Red Hill Fault

Haven Ave

Day Ck

Barrier J

Sierra Ave

Loma Linda Fault

Rialto-Colton Basin

Riverside Ave

Waterman Ave

Pomona Basin

San Jose Fault

Euclid Ave

Etiwanda Ave

Foothill Blvd

San Jacinto Fault

Rialto-Colton Fault

Central Ave

Holt Blvd

Mission Blvd

Cucamonga Ck

Riverside Dr

Jurupa Mountains

San Bernardino County

Riverside County

Puente Hills

Riverside-Basins

Mission Blvd

River

Santa Ana

Limonite Ave

Chino Fault

Chino Ck

Chino Hills

San Bernardino County

Orange County

Prado Basin

La Sierra Hills

Van Buren Blvd

Victoria Ave

Temescal Basin

15 210 215 71 10 60

This map shows the locations of wells and the magnitude of production in FY 1977/1978 when the Chino Basin Watermaster was established. Total production during this year was about 158,800 acre-ft, based on Watermaster records. According to Watermaster records, the Agricultural Pool pumped 55 percent, the Appropriative Pool pumped 39 percent, and the Overlying Non-Agricultural Pool pumped 6 percent of total production. South of Highway 60, production was about 93,500 acre-ft, accounting for about 59 percent of total production. North of Highway 60, production was about 65,300 acre-ft, accounting for about 41 percent of the total production.

## Groundwater Production
## Fiscal Year 1977/1978 (acre-ft)

- < 10
- 10 - 100
- 100 - 500
- 500 - 1,000
- 1,000 - 2,500
- 2,500 - 5,000
- > 5,000

OBMP Management Zones

Chino Basin Desalter Wells

Streams & Flood Control Channels

Flood Control & Conservation Basins

### *Geology*

Water-Bearing Sediments

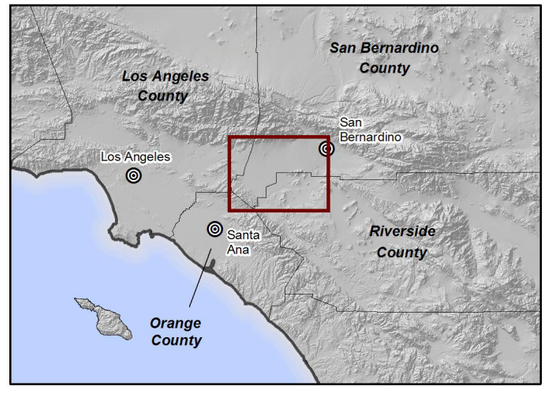
Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

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





Prepared by:

WEI
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.weiwater.com


Author: amalone

Date: 6/4/2015

Document Name: Exhibit_08_Prod_FY78

0 2 4 Miles

0 3 6 KM

Chino Basin Watermaster — Perform to Basin Management

**2014 State of the Basin**

*Basin Production and Recharge*

# Groundwater Production by Well

*Fiscal Year 1977/1978*

**Exhibit 8**

117°40'0"W

117°20'0"W

34°0'0"N

San Gabriel Mountains

Cucamonga Fault Zone

San Antonio Ck

Cucamonga Basin

Claremont Basin

Indian Hill Fault

Pomona Basin

San Jose Fault

Red Hill Fault

Haven Ave

Day Ck

Etiwanda Ave

Euclid Ave

Central Ave

Holt Blvd

Foothill Blvd

Barrier J

Sierra Ave

Rialto-Colton Basin

Riverside Ave

Loma Linda Fault

Waterman Ave

San Jacinto Fault

Rialto-Colton Fault

Mission Blvd

Cucamonga Ck

Riverside Dr

Jurupa Mountains

San Bernardino County

Riverside County

Riverside Basins

Puente Hills

Chino Fault

Chino Ck

Limonite Ave

Santa Ana River

Chino Hills

San Bernardino County

Orange County

Prado Basin

La Sierra Hills

Temescal Basin

15

210

215

10

71

60

This map shows the locations of wells and the magnitude of production in FY 1999/2000. Total production during this year was about 178,700 acre-ft, based on Watermaster records. According to Watermaster records, the Agricultural Pool pumped 25 percent, the Appropriative Pool pumped 72 percent, and the Overlying Non-Agricultural Pool pumped 3 percent of the total production.

Since FY 1977/1978, the location of groundwater production has shifted north, with groundwater production south of Highway 60 declining from 59 to 31 percent of total production. North of Highway 60, production has increased from 41 to 69 percent of total production. This shift in production was caused by dairy land replacing irrigated agricultural uses south of Highway 60 and an increase in appropriator production north of Highway 60 in response to urbanization.

## Groundwater Production
## Fiscal Year 1999/2000 (acre-ft)

- < 10
- 10 - 100
- 100 - 500
- 500 - 1,000
- 1,000 - 2,500
- 2,500 - 5,000
- > 5,000

OBMP Management Zones

Chino Basin Desalter Wells

Streams & Flood Control Channels

Flood Control & Conservation Basins

### *Geology*

*Water-Bearing Sediments*

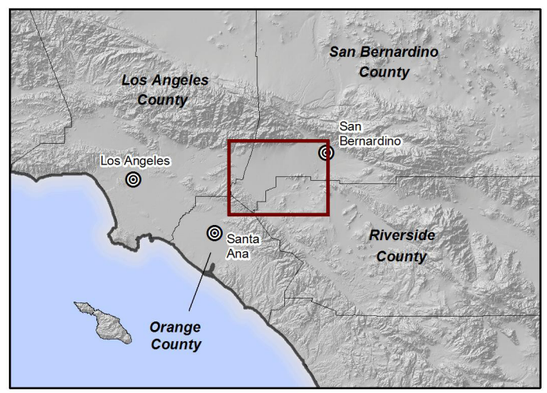
Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

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




Prepared by:
WEI
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.weiwater.com

Author: amalone

Date: 6/23/2015

Document Name: Exhibit_09_Prod_FY00

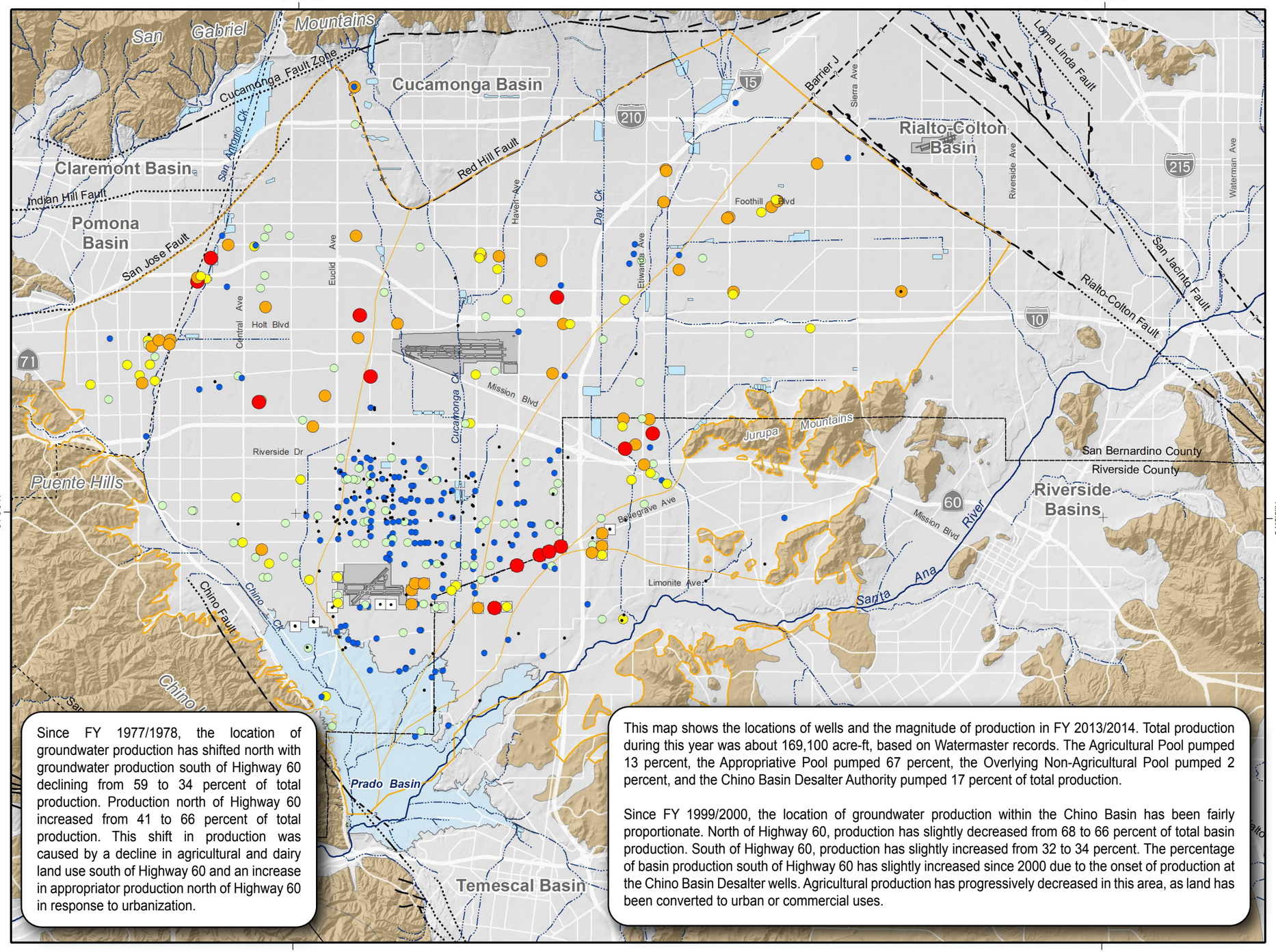
0 2 4 Miles

0 3 6 KM

2014 State of the Basin
*Basin Production and Recharge*

# Groundwater Production by Well
*Fiscal Year 1999/2000*

**Exhibit 9**




Since FY 1977/1978, the location of groundwater production has shifted north with groundwater production south of Highway 60 declining from 59 to 34 percent of total production. Production north of Highway 60 increased from 41 to 66 percent of total production. This shift in production was caused by a decline in agricultural and dairy land use south of Highway 60 and an increase in appropriator production north of Highway 60 in response to urbanization.

This map shows the locations of wells and the magnitude of production in FY 2013/2014. Total production during this year was about 169,100 acre-ft, based on Watermaster records. The Agricultural Pool pumped 13 percent, the Appropriative Pool pumped 67 percent, the Overlying Non-Agricultural Pool pumped 2 percent, and the Chino Basin Desalter Authority pumped 17 percent of total production.

Since FY 1999/2000, the location of groundwater production within the Chino Basin has been fairly proportionate. North of Highway 60, production has slightly decreased from 68 to 66 percent of total basin production. South of Highway 60, production has slightly increased from 32 to 34 percent. The percentage of basin production south of Highway 60 has slightly increased since 2000 due to the onset of production at the Chino Basin Desalter wells. Agricultural production has progressively decreased in this area, as land has been converted to urban or commercial uses.

Groundwater Production
Fiscal Year 2013/2014 (acre-ft)

- < 10
- 10 - 100
- 100 - 500
- 500 - 1,000
- 1,000 - 2,500
- 2,500 - 5,000
- > 5,000


OBMP Management Zones

Chino Basin Desalter Wells

Streams & Flood Control Channels

Flood Control & Conservation Basins

***Geology***

Water-Bearing Sediments

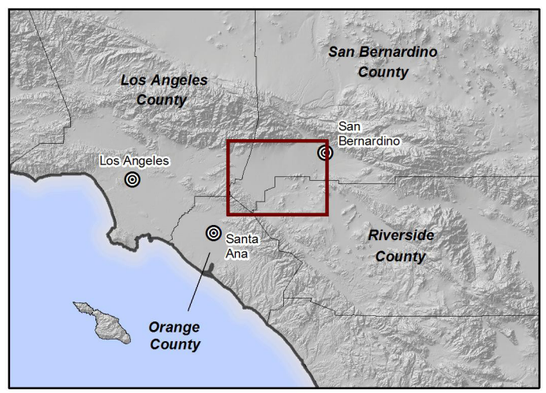
Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

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





Prepared by:
WEI
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.weiwater.com


Author: amalone
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Document Name: Exhibit_10_Prod_FY14

0 2 4 Miles
0 3 6 KM

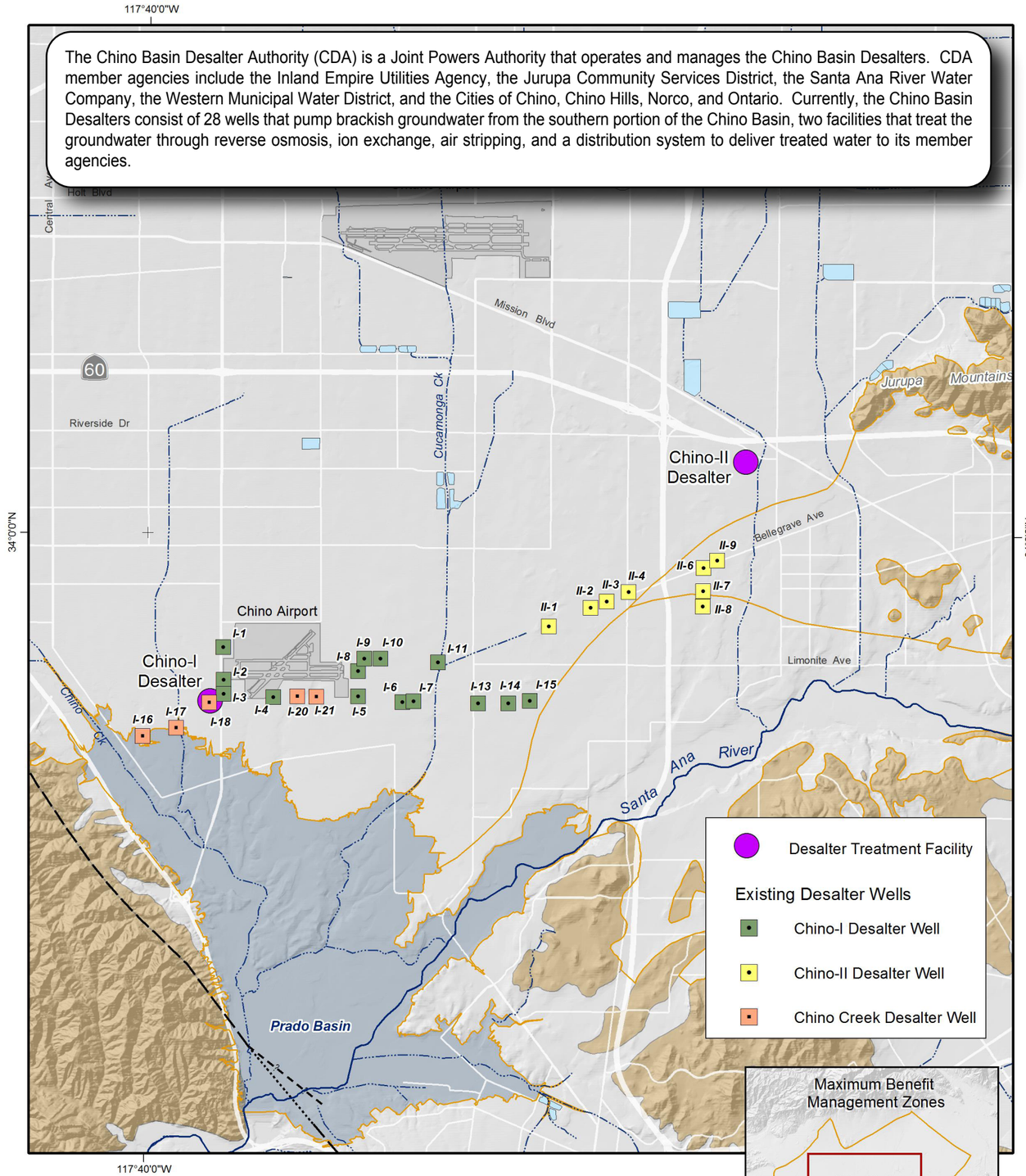
2014 State of the Basin
*Basin Production and Recharge*

# Groundwater Production by Well

*Fiscal Year 2013/2014*

**Exhibit 10**

The Chino Basin Desalter Authority (CDA) is a Joint Powers Authority that operates and manages the Chino Basin Desalters. CDA member agencies include the Inland Empire Utilities Agency, the Jurupa Community Services District, the Santa Ana River Water Company, the Western Municipal Water District, and the Cities of Chino, Chino Hills, Norco, and Ontario. Currently, the Chino Basin Desalters consist of 28 wells that pump brackish groundwater from the southern portion of the Chino Basin, two facilities that treat the groundwater through reverse osmosis, ion exchange, air stripping, and a distribution system to deliver treated water to its member agencies.





Prepared by:
WEI
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.weiwater.com


Author: VMW
Date: 20130204
File: Exhibit_11_Desalters

The need for the Chino Basin Desalters was described the OBMP Phase 1 Report. During the 1900s, the land uses in southern portion of the Chino Basin were primarily agricultural. Over time, groundwater quality degraded in this area and currently is not suitable for municipal use unless it is treated to reduce TDS, nitrate, and other contaminant concentrations. The OBMP recognized that urban land uses and their water demands would ultimately replace agriculture. If municipal pumping did not replace the decreased agricultural pumping, groundwater levels would rise and discharge to the Santa Ana River. The potential consequences of this occurrence would be (i) loss of Safe Yield in the Chino Basin and (ii) degradation of the quality of the Santa Ana River, which could impact the downstream beneficial uses of the River in Orange County. These consequences would come with high costs to the Chino Basin parties to mitigate the loss of Safe Yield and to comply with water-quality regulations.

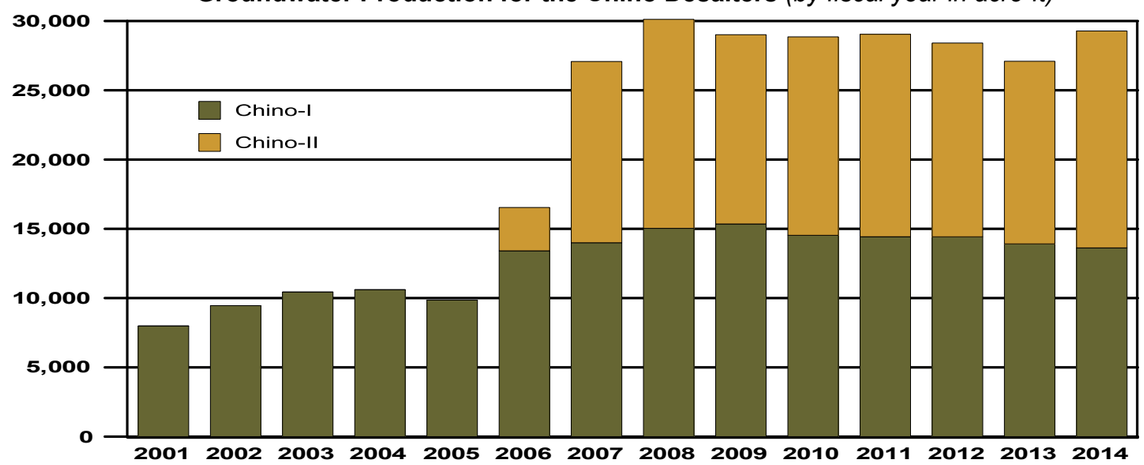
The Chino Basin Desalters were hence designed to replace the expected decrease in agricultural production and accomplish the following objectives: meet emerging municipal demands in the Chino Basin, maintain or enhance Safe Yield, remove groundwater contaminants, and protect the beneficial uses of the Santa Ana River. The first desalter facility and well field, the Chino-I Desalter, began operation in 2000 and had an original design capacity of 8 mgd (about 9,000 acre-ft/yr). In 2005, Chino-I was expanded to a capacity of 14 mgd (about 17,000 acre-ft/yr). The Chino-II Desalter began operating in June 2006 at a capacity of 15 mgd (about 16,000 acre-ft/yr). Currently, the Chino-I and Chino-II Desalters produce about 30,000 acre-ft/yr of groundwater. The chart below shows annual groundwater-production for the Chino Basin Desalters.

The Chino Basin Desalters are fundamental to achieving "Hydraulic Control" in the southern portion of Chino Basin. Hydraulic Control is achieved when groundwater discharge from the Chino-North Management Zone to Prado Basin is eliminated or reduced to de minimis levels. The RWQCB made Hydraulic Control a commitment for Watermaster and the IEUA in the Basin Plan, in exchange for relaxed groundwater-quality objectives in Chino-North. These so-called "maximum-benefit" objectives allow for the implementation of recycled-water reuse in the Chino Basin for both direct use and recharge while simultaneously assuring the protection of beneficial uses of the Santa Ana River.

Pursuant to the Peace and Peace II Agreements, desalter production is to reach 40,000 acre-ft/yr. The CDA's most recent expansion was the construction of five Chino Creek Well Field (CCWF) wells in 2012. Production at some of the CCWF wells began in late 2014, and production will commence at the other CCWF wells in 2015. An additional scheduled expansion of the Chino Basin Desalters consists of three additional wells for the Chino-II well field in the south-central portion of the Chino Basin. These wells are anticipated to begin production in 2016 and will facilitate the achievement of 40,000 acre-ft/yr of desalter production.

As described in the Peace II Agreement, through re-operation and pursuant to a Judgment Amendment, Watermaster will engage in the controlled overdraft of 400,000 acre-ft through 2030, allocated specifically to meet the replenishment obligation of the desalter well production (WEI, 2009b). Previous investigations have shown that re-operation is required to achieve Hydraulic Control (WEI, 2007). Re-operation water is divided into two tranches: the first tranche of 225,000 acre-ft is dedicated for the replenishment of groundwater produced by existing desalter wells; the second tranche of 175,000 acre-ft will be used at a rate of 10,000 acre-ft/yr through 2030 for the replenishment obligation of the current desalter expansion.

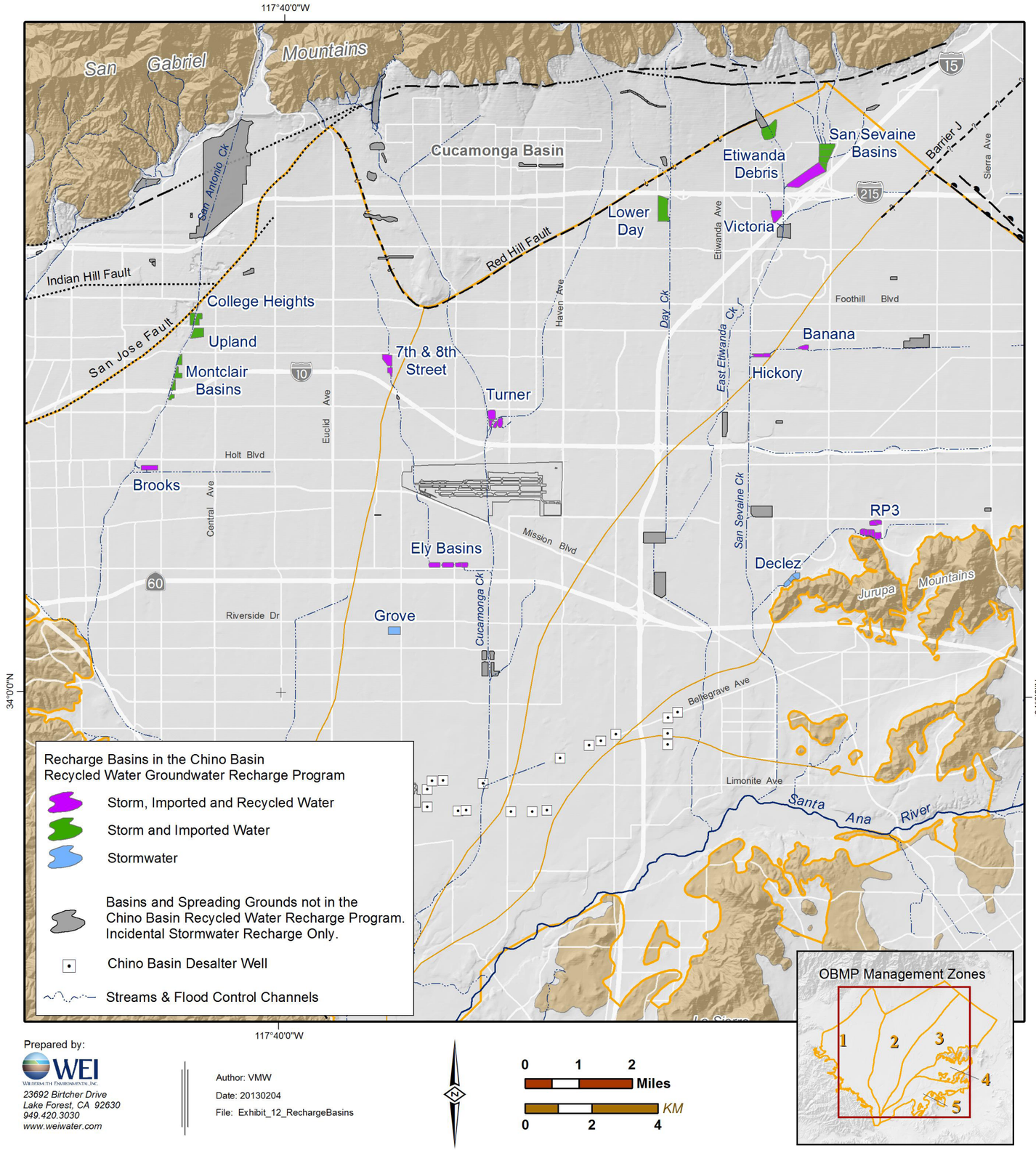
**Groundwater Production for the Chino Desalters** *(by fiscal year in acre-ft)*




**2014 State of the Basin**
*Basin Production and Recharge*

**Chino Basin Desalter Well Production**
*Fiscal Year 2013/2014*

**Exhibit 11**




Prepared by:


WEI
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.weiwater.com

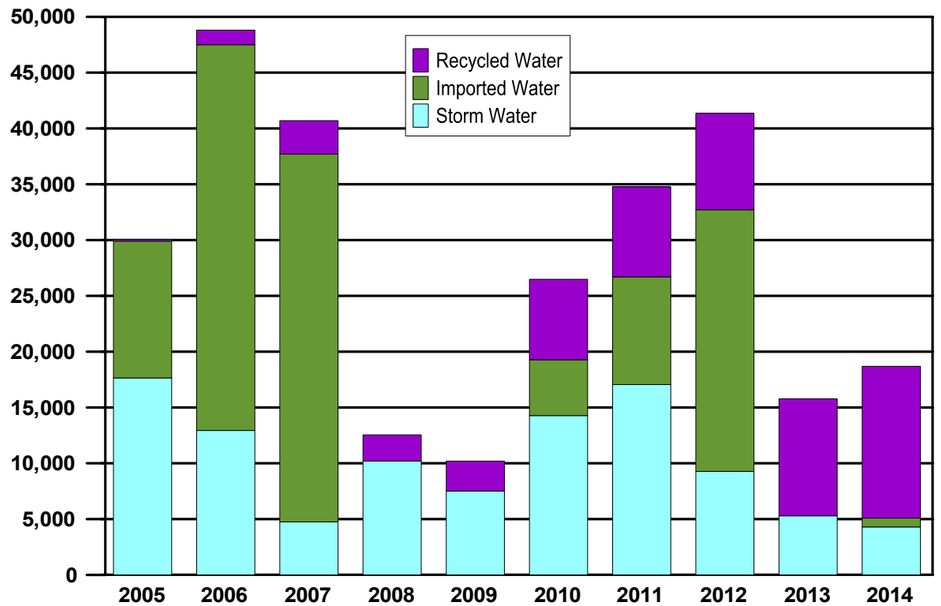

Author: VMW
Date: 20130204
File: Exhibit_12_RechargeBasins

The IEUA and Watermaster are partners in the implementation of the Chino Basin Recycled Water Groundwater Recharge Program. This program is an integral part of the OBMP's objective to enhance water supply reliability and improve groundwater quality. Since the implementation of the Chino Basin Recycled Water Groundwater Recharge Program in FY 2004/2005, the recharge of storm water and recycled water has increased in the Chino Basin, relieving some dependence on imported water for direct use and replenishment. The operation of the Chino Basin Desalters and the increase in storm water recharge have provided mitigation for the expanded use of recycled water in the Chino Basin.

Four types of water are recharged for the Chino Basin Recycled Water Groundwater Recharge Program: imported water, storm water, urban runoff, and recycled water. The IEUA records the daily volumes of all types of water routed to all recharge basins for the program. Since about 2004, sensors have been installed at some of the recharge basins to monitor stage, and the data are used to calculate recharge volumes. The IEUA does not distinguish storm water from urban runoff in the recharge tabulations it submits to Watermaster. Watermaster maintains a centralized database of the recharge volumes. See Exhibit 13 for the fiscal year totals of recharged water by type and by recharge basin for FY 2000/2001 through 2013/2014.

The chart below shows annual recharge by water type since the initiation of the Chino Basin Recycled Water Groundwater Recharge Program in FY 2004/2005.

**Water Recharged in the Chino Basin** *(by fiscal year in acre-ft)*




**Groundwater Recharge in the Chino Basin**

**2014 State of the Basin**
*Basin Production and Recharge*

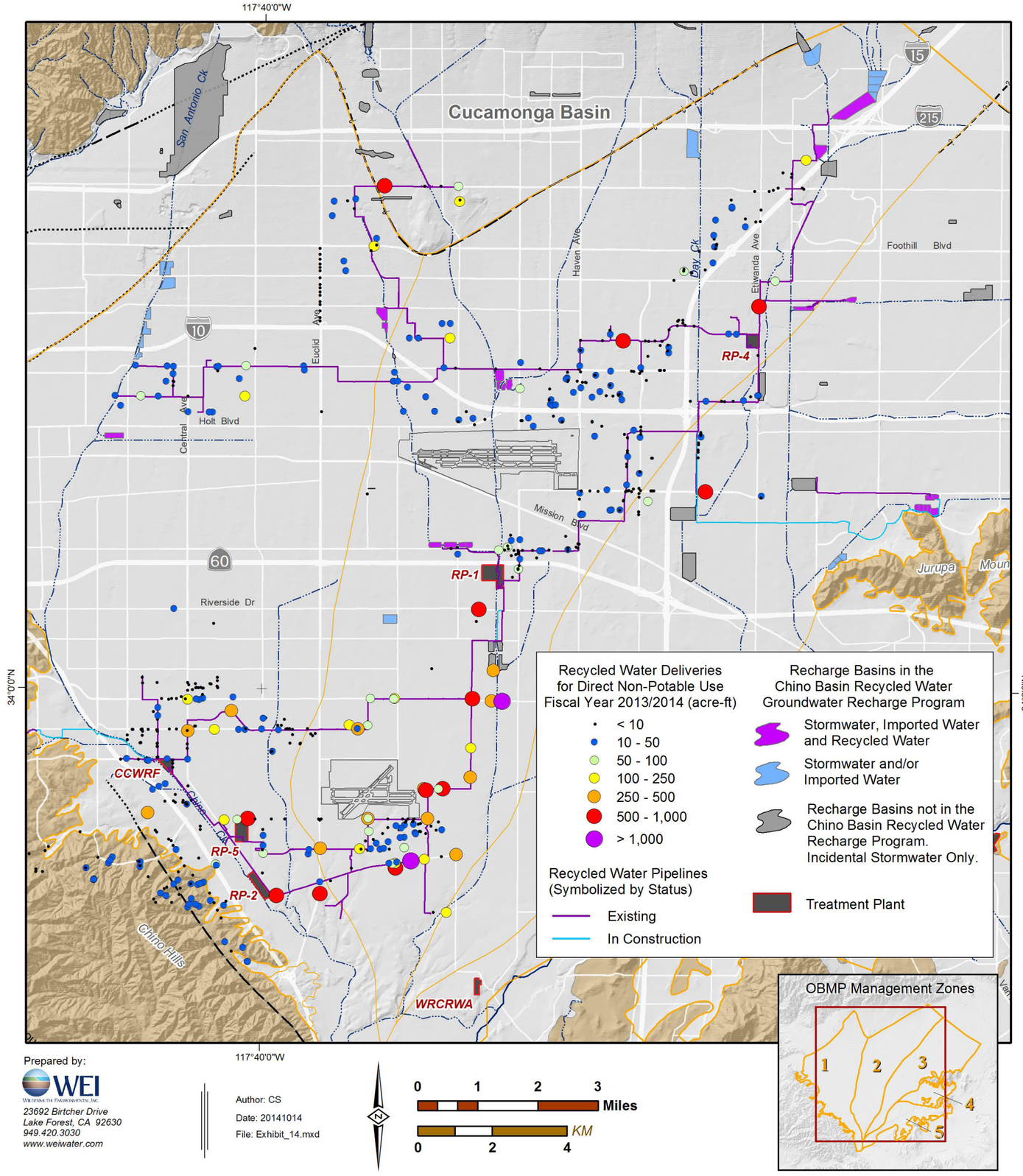
**Exhibit 12**

**Exhibit 13**
**Summary of Annual Wet Water Recharge Records in the Chino Basin**
**(acre-ft)**

| Basin Name | FY 2000/2001 | | | | FY 2001/2002 | | | | FY 2002/2003 | | | | FY 2003/2004 | | | | FY 2004/2005 | | | | FY 2005/2006 | | | | FY 2006/2007 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total |
| MVWD ASR Well | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| College Heights Basins | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 108 | 5,326 | 0 | 5,434 | 1 | 3,125 | 0 | 3,126 |
| Upland Basin | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 989 | 0 | 0 | 989 | 214 | 5,985 | 0 | 6,199 | 195 | 7,068 | 0 | 7,263 |
| Montclair Basins | NM | 6,530 | 0 | 6,530 | NM | 6,500 | 0 | 6,500 | NM | 6,499 | 0 | 6,499 | NM | 3,558 | 0 | 3,558 | 3,350 | 7,887 | 0 | 11,237 | 1,296 | 5,579 | 0 | 6,875 | 355 | 10,681 | 0 | 11,036 |
| Brooks Street Basin | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 1776 | 0 | 0 | 1,776 | 524 | 2,032 | 0 | 2,556 | 205 | 1,604 | 0 | 1,809 |
| 7th and 8th Street Basins | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 620 | 0 | 0 | 620 | 1,271 | 0 | 0 | 1,271 | 640 | 0 | 0 | 640 |
| Ely Basins | NM | 0 | 500 | 500 | NM | 0 | 505 | 505 | NM | 0 | 185 | 185 | NM | 0 | 49 | 49 | 2,010 | 0 | 158 | 2,168 | 1,531 | 0 | 188 | 1,719 | 631 | 0 | 466 | 1,097 |
| Grove Basin | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 | 0 | 0 | 133 | 166 | 0 | 0 | 166 |
| Turner Basins | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 1428 | 310 | 0 | 1,738 | 2,575 | 346 | 0 | 2,921 | 406 | 313 | 1,237 | 1,956 |
| Lower Day Basin | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 2798 | 107 | 0 | 2,905 | 624 | 2,810 | 0 | 3,434 | 78 | 2,266 | 0 | 2,344 |
| Etiwanda Debris Basins | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 2,812 | 0 | 2,812 | 0 | 2,137 | 0 | 2,137 | 20 | 2,488 | 0 | 2,508 | 0 | 1,160 | 0 | 1,160 |
| Victoria Basin | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 330 | 0 | 0 | 330 | 260 | 0 | 0 | 260 |
| San Sevaine | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 1,211 | 0 | 1,211 | 2,830 | 1,621 | 0 | 4,451 | 2,072 | 9,172 | 0 | 11,244 | 244 | 5,749 | 0 | 5,993 |
| Hickory Basin | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 298 | 197 | 0 | 495 | 438 | 636 | 586 | 1,660 | 536 | 212 | 647 | 1,395 |
| Banana Basin | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 425 | 0 | 0 | 425 | 300 | 193 | 529 | 1,022 | 226 | 783 | 643 | 1,653 |
| RP-3 Basins | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 1,105 | 0 | 0 | 1,105 | 767 | 0 | 0 | 767 | 802 | 0 | 0 | 802 |
| Declez Basin | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | NM | 0 | 0 | 0 | 19 | 0 | 0 | 19 | 737 | 0 | 0 | 737 | 0 | 0 | 0 | 0 |
| Totals: | NM | 6,530 | 500 | 7,030 | NM | 6,500 | 505 | 7,005 | NM | 6,499 | 185 | 6,684 | NM | 7,582 | 49 | 7,631 | 17,648 | 12,258 | 158 | 30,065 | 12,940 | 34,567 | 1,303 | 48,810 | 4,745 | 32,960 | 2,993 | 40,698 |

| Basin Name | FY 2007/2008 | | | | FY 2008/2009 | | | | FY 2009/2010 | | | | FY 2010/2011 | | | | FY 2011/2012 | | | | FY 2012/2013 | | | | FY 2013/2014 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total | SW | IW | RW | Total |
| MVWD ASR Well | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 186 | 0 | 186 | 0 | 889 | 0 | 889 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| College Heights Basins | 172 | 0 | 0 | 172 | 0 | 0 | 0 | 0 | 65 | 382 | 0 | 447 | 593 | 559 | 0 | 1,152 | 4 | 578 | 0 | 582 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 |
| Upland Basin | 312 | 0 | 0 | 312 | 274 | 0 | 0 | 274 | 532 | 0 | 0 | 532 | 1,308 | 899 | 0 | 2,207 | 222 | 2,118 | 0 | 2,340 | 0 | 119 | 0 | 119 | 0 | 95 | 0 | 95 |
| Montclair Basins | 859 | 0 | 0 | 859 | 611 | 0 | 0 | 611 | 937 | 4,592 | 0 | 5,529 | 1,762 | 3,672 | 0 | 5,434 | 703 | 11,893 | 0 | 12,596 | 0 | 204 | 0 | 204 | 0 | 416 | 0 | 416 |
| Brooks Street Basin | 475 | 0 | 0 | 475 | 434 | 0 | 1,605 | 2,039 | 666 | 0 | 1,695 | 2,361 | 628 | 0 | 1,373 | 2,001 | 363 | 561 | 836 | 1,760 | 0 | 115 | 1,505 | 1,620 | 0 | 112 | 1,308 | 1,420 |
| 7th and 8th Street Basins | 959 | 0 | 1,054 | 2,013 | 1,139 | 0 | 352 | 1,491 | 1,744 | 6 | 1,067 | 2,817 | 1,583 | 543 | 1,871 | 3,997 | 1047 | 572 | 641 | 2,260 | 0 | 751 | 2,261 | 3,012 | 5 | 441 | 1,423 | 1,869 |
| Ely Basins | 1,603 | 0 | 562 | 2,165 | 927 | 0 | 364 | 1,291 | 1,164 | 0 | 246 | 1,410 | 1,415 | 83 | 757 | 2,255 | 1096 | 885 | 393 | 2,374 | 0 | 568 | 1,378 | 1,946 | 0 | 548 | 3,298 | 3,846 |
| Grove Basin | 326 | 0 | 0 | 326 | 405 | 0 | 0 | 405 | 351 | 0 | 0 | 351 | 431 | 0 | 0 | 431 | 400 | 0 | 0 | 400 | 0 | 177 | 0 | 177 | 0 | 258 | 0 | 258 |
| Turner Basins | 1,542 | 0 | 0 | 1,542 | 1,200 | 0 | 171 | 1,371 | 2,220 | 0 | 397 | 2,617 | 2,308 | 0 | 53 | 2,361 | 1879 | 199 | 1,034 | 3,112 | 0 | 1,120 | 176 | 1,296 | 0 | 596 | 1,565 | 2,161 |
| Lower Day Basin | 303 | 0 | 0 | 303 | 168 | 0 | 0 | 168 | 540 | 3 | 0 | 543 | 703 | 894 | 0 | 1,597 | 158 | 1,439 | 0 | 1,597 | 0 | 106 | 0 | 106 | 28 | 114 | 0 | 142 |
| Etiwanda Debris Basins | 10 | 0 | 0 | 10 | 28 | 0 | 0 | 28 | 775 | 7 | 0 | 782 | 1,213 | 147 | 0 | 1,360 | 100 | 567 | 0 | 667 | 0 | 33 | 0 | 33 | 0 | 45 | 0 | 45 |
| Victoria Basin | 427 | 0 | 0 | 427 | 250 | 0 | 0 | 250 | 494 | 2 | 0 | 496 | 461 | 69 | 773 | 1,303 | 221 | 281 | 665 | 1,167 | 0 | 94 | 842 | 936 | 0 | 192 | 1,379 | 1,571 |
| San Sevaine | 749 | 0 | 0 | 749 | 225 | 0 | 0 | 225 | 993 | 0 | 0 | 993 | 1,049 | 1,707 | 396 | 3,152 | 436 | 1,228 | 513 | 2,177 | 0 | 147 | 575 | 722 | 0 | 162 | 274 | 436 |
| Hickory Basin | 949 | 0 | 567 | 1,516 | 199 | 0 | 46 | 245 | 700 | 7 | 856 | 1,563 | 371 | 10 | 776 | 1,157 | 258 | 515 | 783 | 1,556 | 0 | 199 | 874 | 1,073 | 13 | 171 | 1,920 | 2,104 |
| Banana Basin | 278 | 0 | 157 | 435 | 383 | 0 | 40 | 423 | 416 | 0 | 898 | 1,314 | 149 | 0 | 267 | 416 | 247 | 0 | 1,915 | 2,162 | 0 | 114 | 670 | 784 | 24 | 87 | 1,071 | 1,182 |
| RP-3 Basins | 511 | 0 | 0 | 511 | 613 | 0 | 106 | 719 | 1,902 | 1 | 2,051 | 3,954 | 2,201 | 882 | 1,799 | 4,882 | 1339 | 1,724 | 1,789 | 4,852 | 0 | 1,021 | 2,198 | 3,219 | 350 | 717 | 1,355 | 2,422 |
| Declez Basin | 730 | 0 | 0 | 730 | 656 | 0 | 0 | 656 | 774 | 0 | 0 | 774 | 877 | 0 | 0 | 877 | 798 | 0 | 65 | 863 | 0 | 530 | 0 | 530 | 374 | 341 | 0 | 715 |
| Totals: | 10,205 | 0 | 2,340 | 12,545 | 7,512 | 0 | 2,684 | 10,196 | 14,273 | 5,000 | 7,210 | 26,483 | 17,052 | 9,650 | 8,065 | 34,767 | 9,271 | 23,449 | 8,634 | 41,354 | 0 | 5,298 | 10,479 | 15,777 | 795 | 4,299 | 13,593 | 18,687 |

NM - Not measured
SW - Surface Water
IW - Imported Water
RW - Recycled Water
FY - Fiscal Year





Prepared by:
WEI
Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.weiwater.com


Author: CS
Date: 20141014
File: Exhibit_14.mxd

The direct use of recycled water in Chino Basin was identified in the OBMP to achieve Goal No. 1 – Enhance Basin Water Supplies. The 2004 Basin Plan Amendment (RWQCB, 2004) was the instrumental regulatory construct that allowed for the aggressive expansion of recycled-water reuse in the Chino Basin. The IEUA owns and operates the four treatment facilities in the Chino Basin that produce recycled water for reuse: Regional Plant No. 1 (RP-1), Regional Plant No. 4 (RP-4), Regional Plant No. 5 (RP-5), and the Carbon Canyon Water Reclamation Facility (CCWRF).

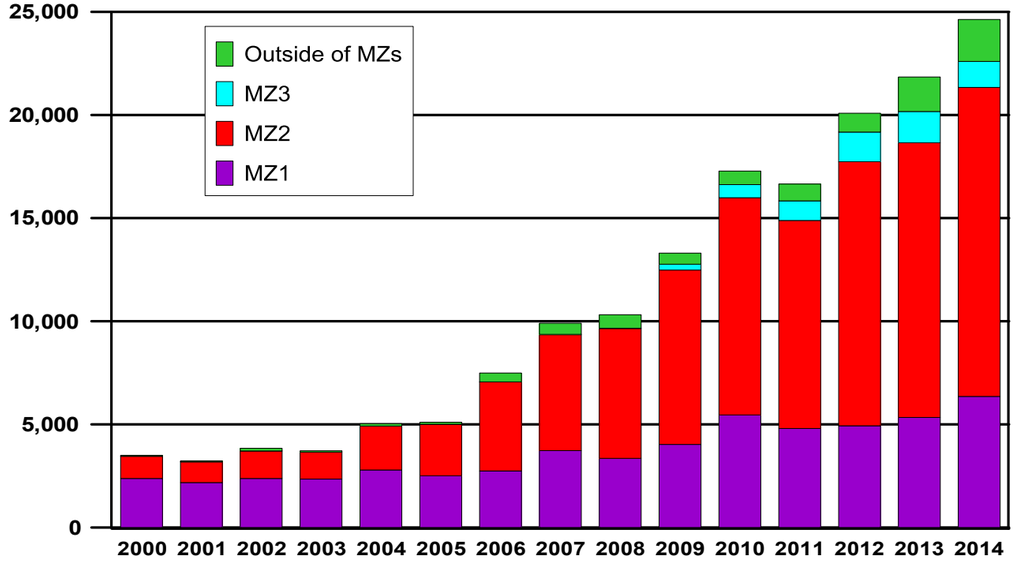
Recycled water is reused directly for non-potable uses, which include: irrigation of crops, animal pastures, freeway landscape, parks, schools, and golf courses; commercial laundry and car washes; outdoor cleaning and construction; toilet plumbing; and industrial processes. The direct use of recycled water began in 1997 after the completion of distribution pipelines from the CCWRF to the cities of Chino and Chino Hills. The direct use of recycled water in the Chino Basin has increased sevenfold since the OBMP implementation, from about 3,500 acre-ft in FY 1999/2000 to about 24,600 acre-ft in FY 2013/2014. The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses. The IEUA has progressively built infrastructure to deliver recycled water to all of its member agencies throughout much of the Chino Basin.

Recycled water also is used in the Chino Basin for indirect potable reuse via groundwater recharge. Currently, the recharge of recycled water can occur at the San Sevaine, Victoria, Banana, Hickory, Turner, 7th & 8th Street, Ely, RP-3, and Brooks Basins. This exhibit shows the locations of the recharge basins used to recharge recycled in the Chino Basin (also shown in Exhibit 12), and Exhibit 13 shows the amount of recycled water recharged by basin. In FY 2013/2014, about 13,600 acre-ft of recycled water was recharged.

Total recycled water reuse for direct use and recharge in the Chino Basin in FY 2013/2014 was about 38,000 acre-ft, which accounts for about 70 percent of the total effluent produced from the IEUA's treatment plants. This is the maximum annual amount of recycled water ever used in the Chino Basin to date. The IEUA is continuing its efforts to expand the recycled-water distribution system throughout the Chino Basin for direct non-potable uses and indirect potable reuse via recharge, further relieving demands on native and imported waters.

## Direct Use of Recycled Water by OBMP Management Zone

*(by fiscal year in acre-ft)*




2014 State of the Basin
*Basin Production and Recharge*

## Recycled Water Deliveries for Direct Use

*Fiscal Year 2013/2014*

**Exhibit 14**