APPENDIX I
WATER SUPPLY

Recommended Clarification Notes To City of Chino
Water Supply Assessment
Dated January 28, 2002, Updated July 19, 2002

March 14, 2003

EXECUTIVE SUMMARY

Page 1, par. 6, first sentence: Strike "over entitlement."

SECTION 3.1 OVERVIEW OF SUPPLY AND DEMAND

Page 6, par. 5, Water Demand: Change "15,145" to "15,345," to be consistent with Table 3-1.

Page 7, par. 1, sentence 2: Strike the words "begin lower and," to clarify that demands increase according to development phasing.

Page 7, par. 3, sentence 3: Replace "overproduction" with "production," to clarify that production is consistent with safe yield.

Page 7, par. 4, second to last sentence: In second to the last line, replace "Ann" with "Ana."

Page 8, Table 3-1:

- Change year 2005 Recycled – Subarea 2 demand from "325" to "650,"
  change Total Water Demand in year 2005 from "18,055" to "18,380."
- Change Imported supply amounts in years 2005 through 2022 from "5,357" to "5,353."
- Change year 2005 Total Water Supply from "22,914" to "22,910"; change year 2010 Total Water Supply from "25,314" to "25,310"; change year 2015 Total Water Supply from "25,824" to "25,820"; change year 2020 Total Water Supply from "27,084" to "27,080"; change year 2022 Total Water Supply from "27,448" to "27,444."
- Change year 2005 Surplus Supply from "4,859" to "4,530"; change year 2010 Surplus Supply from "5,264" to "6,260"; change year 2015 Surplus Supply from "4,814" to "4,810"; change year 2020 Surplus Supply from "4,110" to "4,234"; and change year 2022 Surplus Supply from "3,838" to "3,834".

Page 8, Demand Assumptions, 1. City Potable Demand: Add "Year 2000 is actual demand."

Page 8, Supply Assumptions, 1. Groundwater: Change "use" to "available," to clarify the Year 2000 data presented represents the amount available in 2000.

Page 8, Supply Assumptions 3, Imported: Change "5,357" to "5,353."

Page 9, par. 4, sentence 1: Change "this" to "the," and insert "land use" between "from" and "conversion."

Page 9, par. 5, sentence 2: Change "1000" to "2000," to correct year of Inland Empire Utility Agency's Urban Water Management Plan Update.

Page 10, par. 2, sentence 1: Strike "From" and replace with "Imported water is supplied to the City by," and end the sentence with "IEUA". Then start a new (2^{nd}) sentence with "The City of Chino is entitled...," to clarify the relationship between MWD, IEUA and the City.

Page 10, par. 2, (original) sentence 2: Strike "and plans to continue this level of imported supply," to reflect the City's plan as shown in Table 3-1.

Page 10, par. 4, sentence 2: Strike "approximately 350" and replace with "368."

Page 10, par. 6, sentence 1: Insert the word "regional" between "current" and "recycled."

SECTION 3.2 GROUNDWATER – CHINO WATER BASIN

Page 12, par. 3, sentence 2: Strike the "s" on "rights."

Page 15, par. 2, Overdraft – 1978 Judgement: Add "the Appropriative Pool's share of Safe Yield" before "or," and add "more than" before "10,000 acre-feet."

Page 16, last par., Item 2: Strike the last sentence.

Page 17, par. 4, sentence 1: Insert "Individual" before "Producers," to clarify that an individual producer's production ability is different from the pools' total production ability.

Page 19, par. 1, sentence 3: Insert "was" between "City" and "also."

Page 19, par. 4, last sentence: Insert a period at end of sentence.

Page 21, par. 2, sentence 1: Insert "I" after "Chino Basin Desalter."

SECTION 3.3 IMPORTED WATER

Page 24, par. 2, sentence 2: Change "seven" to "five," strike "Fontana Water Company" and "and San Antonio Water Company," and insert "and" before "Monte Vista..."

Page 24, par. 5, sentence 1: Insert "located" between "water connection" and "in the City of Upland."

Page 24, par. 6, sentence 1: Change "5,357" to "5,353."

Page 24, par. 6, sentence 3: Add an "s" to the end of "standard," and insert "and" before "demand," to clarify that the City uses imported water for two purposes.

Page 25, par. 4, sentence 2: Change "their" to "its."

Page 25, par. 5, sentence 2: Strike the "s" from "frameworks."

Page 26, Notes to Table 3-5: Add an "n" after the "r" in "Easter" to read "Eastern."

SECTION 3.4 RECYCLED WATER

Page 27, par. 3, sentence 2: Strike ":1" after "500."

Page 27, par. 6, sentence 3: Strike "approximately 350" and replace with "368;" also add "landscape irrigation and industrial" before "customers."

Page 28, par. 4, sentence 5: Strike the "for."

Page 28, par. 5, sentence 3: Replace "1984" with "1982."

Page 28, par. 5, sentence 1: Change "thirty-seven" to "thirty-eight."

Page 28, par. 5, sentence 2: Add "24 users with a total of" before "45," and strike "of these."

Page 29, Table 3-6: Change "1984-83" to "1982-83."

Page 29, Table 3-7, Second Source: Add "Draft" before "Water Master Plan," and strike the remaining source information, and add "April 2002."

Page 30, par. 4, sentence 2: Change "350" to "368," and add "from the CCWRF" following "afy."

Page 30, par. 6, end sentence: Add footnote "7a" as "7a, Inland Empire Utilities Agency Urban Water Management Plan 2000 Update, Page 2-14."

SECTION 4.0 RELIABILITY OF WATER SUPPLIES

Page 33, par. 3, last sentence: Add a "d" after the "e" in "place" to read "placed."

Page 33, par. 4, sentence 1: Add "after" before "the conversion."

Page 33, par. 4: Change "CDA" to "IEUA and WMWD acting independently, or in their complete discretion, acting through Project Committee 14 consistent with the "Peace Agreement" dated June 29, 2000 by the major producers in the Chino Basin, including the Appropriative Pool, Overlying Non-Agricultural Pool, Overlying Agricultural Pool, MWD member agencies IEUA, WMWD, TVMWD and the State of California."

Page 34, par. 1, sentence 2: Change "use is expected" to "production is expected."

Page 34, par. 1, sentence 2: Add a "0" to "28,00" to read "28,000."

Page 34, par. 1, sentence 2: Change "100 af" to "1,000 af."

Page 34, par. 5, sentence 2: Change "two-" to "multi-."

Page 34, Footnote 9: Add "Tables 3-11, 6-2, and 6-10" after "October 2001."

Page 36, par. 1, sentence 3: Add "located" before "in the City of Upland."

Page 36, par. 1, sentence 4: Capitalize "f" in "feeder" to read "Feeder."

Page 36, par.1, sentence 5: Change "5,267" to "5,353."

Page 36, par. 3, sentence 2: Capitalize "o" in "optimum", "b" in "basin", the first "m" in "measurement" and "p" in "program."

Page 36, par. 4, sentence 2: Add an "n" after the "w" in "know" to read "known."

Page 37, par. 5, sentence 1: Change "Enhancement" to "Expansion."

Page 38, par. 2, sentence 3: Change "Plan" to "Program."

Page 38, par. 6, last sentence: Strike "ing" from "finding" to read "find."

Page 39, Table 4-1: Demand and supply figures are expressed in terms of million acre feet (MAF).

Page 40, par. 1, sentence 4: Add "and multiple-dry years" after "single dry year," and strike "single" before "worst dry year scenario."

Page 40, par. 2, sentence 3: Change " .," between "Conservation" and "while" to ";".

Page 42, par. 9, sentence 1: Add "in diameter" after "2 inches."

Page 42, par. 9, sentence 3: Add "in diameter" after "2 inches."

Page 42, par. 9, sentence 4: Add "and" before "therefore encourages conservation."

Page 43, par. 5, sentence 3: Add "Chino" before "Public Works" and strike "Services."

Page 44, par. 7, sentence 4: Strike "According to "MWD," and begin the sentence with "Data shows."

Page 45, Clarify Table 4-3 as follows: Further analyses by MWD and IEUA contained within their Urban Water Management Plan 2000 Updates demonstrate that projected water use during periods of multiple-year drought reflect that water demand would increase in the first and second years of the drought and then decrease in the third year of the drought. This is based on the 1990-1991-1992 hydrologic sequence, with the first of the three years being the worst, so conditions improved over the next two years. No other three-year sequences in the 77-year hydrologic record had as great an impact on the supply/demand balance. The tabulation below presents the 20-year water supply and demand comparison in dry-year scenarios based on this model, which is consistent with MWD and IEUA projections.

Page 45, Table 4-3: Add sub-heading as "Current Condition Water Supply and Demand Comparison during single and multiple dry years."

Page 45, Table 4-3: Add note as "Recycled Water: Average/Normal Water Year reflects current use; Recycled Factors: single-dry year = 1.00, multiple-dry year 2 = 1.107, dry year 3 = 1.145."

Table 45, Table 4-3:

1. Change Total Supply in Average/Normal Year from "17,202" to "17,852."
2. Change Total Supply in Multiple-Dry Years, Year 2, from "17,912" to "18,182."
3. Change Surplus Supply in Average/Normal Water Year from "4,000" to "4,650."
4. Change Surplus Supply in Multiple-Dry Years, Year 2, from "848" to "1,118."

20-Year Water Supply and Demand Comparison (afy) during single and multiple dry years ***including*** Subarea 2

2020 Supply & Demand Through Year 2022	Normal	Single Dry	Multiple 1	Multiple 2	Multiple 3
Demand Total	**22,850**	**24,787**	**24,787**	**25,846**	**24,447**
Groundwater	11,557	12,181	12,181	13,034	14,142
Imported	5,353	4,603	4,603	4,077	3,611
Desalted	5,000	5,000	5,000	5,000	5,000
Recycled	5,170	5,170	5,170	5,723	6,553
Supply Total	**27,080**	**26,954**	**26,954**	**27,834**	**29,306**
Surplus	**4,230**	**2,167**	**2,167**	**1,988**	**4,859**

Dry Year Factors Used for Comparison: Consistent with IEUA Urban Water Management Plan Year 2000 Update, Table 3-14.

Dry Year Factors	Single Dry	Multiple 1	Multiple 2	Multiple 3
Demand	1.08478	1.08478	1.04270	0.94589
Supply				
Groundwater	1.054	1.054	1.070	1.085
Imported	0.85984	0.85984	0.88574	0.88574
Desalted	1.000	1.000	1.000	1.000
Recycled	1.000	1.000	1.107	1.145

Page 45, par. 1: Strike sentences 2 and 3.

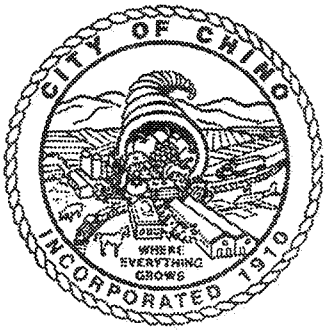
Page 46, par. 4, sentence 1: Change "2035" to "2022."

Page 46, par. 5, sentence 1: Strike "over entitlement."

EXHIBIT 1

REVISED TEXT FOR OPEN SPACE DESIGNATIONS

(THIS PAGE NOT INCLUDED)



CITY OF CHINO
WATER SUPPLY ASSESSMENT

January 28, 2002
(July 19, 2002 Updated)

Prepared for
The City of Chino

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CITY OF CHINO WATER SUPPLY ASSESSMENT
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CHINO WATER SUPPLY ASSESSMENT

EXECUTIVE SUMMARY

The City of Chino ("City") is responsible for the preparation of The Preserve Environmental Impact Report (EIR). The EIR includes an assessment on utilities, including water supply. Recent legislation, SB 221 and SB 610, require that a water supply assessment be prepared to document the sufficiency of an available water supply for the City and the proposed project. This water supply assessment identifies water supply and reliability to the City, now and into the future, including a sufficient water supply for Chino Subarea 2; also known as The Preserve.

The City currently obtains water from the following primary water sources: 1) naturally recharged groundwater, 2) imported SWP water (surface water), 3) desalted water, and most recently 4) recycled water. The City receives approximately 38 percent of its water supply from groundwater, 40 percent from imported water, 20 percent from desalted water, and 2 percent from recycled water. Current and planned improvements will increase the use of recycled and desalted water.

Water Demand

The City's current average demand is approximately 15,345 acre-feet per year (afy). The annexation and build out of Subarea 2 will increase water demand by approximately 11,317 afy of water (6,835 afy of potable water and 4,482 afy of recycled water).

Phasing of Subarea 2 will occur over time in approximately a 30-year period, intended to minimize impacts to local areas. This development phasing plan allows for water demands to be met almost entirely from sources that are currently being planned, developed and implemented, including desalter water, recycled water, and conservation programs. Groundwater demand could remain relatively stable throughout the forecast period with maximum use of these alternative sources.

Demand and Supply Projections

Analysis of water demand and supply projections for the City, including Subarea 2 (Section 3.0, City of Chino Water Demand and Supplies), demonstrate that projected supplies exceed demand through the Year 2022. These projections consider land use, water development programs and projects, and water conservation. Analysis shows that as desalted water and recycled water use are maximized, groundwater and imported water will remain stable. Recycled water will supply certain areas currently supplied with potable water, and desalted water will supply areas currently using available groundwater and imported water.

Additionally, the City has the opportunity to increase supply to meet demand through the following measures: 1) production of groundwater over entitlement based on safe yield limitations; 2) increasing imported water purchases; 3) purchasing additional desalted water if more is produced than needed to satisfy requirements of other purchasers, and 4) purchasing additional recycled water when other members of the IEUA's regional wastewater contract program are not taking their full entitlement, which will be changed

to no maximum entitlement with completion of the Regional Recycled Water System, which merges all the recycled plants together. Collectively, these additional options will enable water supply to exceed water demand for the City of Chino now and into the future.

Reliability of future water supplies to the region will be ensured through continued implementation of the Optimum Basin Management Program, implementation of local agency programs, and combined efforts and programs among member and cooperative agencies, including all water retailers, and the Chino Basin Watermaster, the Inland Empire Utilities Agency, Metropolitan Water District of Southern California, Santa Ana Regional Water Quality Control Board, Santa Ann Watershed Project Authority, and the Chino Basin Water Conservation District.

1.0 INTRODUCTION

The Preserve Planning area, also known as Chino Subarea 2, encompasses 5,435 acres within the Chino Valley Dairy Preserve. Chino Subarea 2 is located in the vicinity of the cities of Chino, Chino Hills, Ontario, Norco, and Corona, as well as the unincorporated community of Eastvale in Riverside County, and the Prado Flood Control Basin. This area is to be incorporated into the City in 2002.

The Preserve is proposed to allow up to 9,779 dwelling units on 1,236 acres; 626 acres of business uses (Community Core, Light Industrial, Airport Related, Regional Commercial, Neighborhood Commercial); 586 acres of Public Facilities and Rights-of-ways; and approximately 2,987 acres in Open Space (Recreation, Agricultural and Natural Open Space). Proposed development will be concentrated in the northern portion of The Preserve, above the Prado Dam high water inundation line. Lands generally south of the 566' elevation are planned for low intensity uses (Open Space).

The City of Chino is responsible for the preparation of The Preserve Environmental Impact Report (EIR). The EIR includes an assessment on utilities, including water supply. Recent legislation, SB 221 and SB 610, require that a water supply assessment be prepared to document the sufficiency of an available water supply for the City and the proposed project. The document will identify water supply and water reliability to the City of Chino, now and into the future, including a sufficient water supply for Chino Subarea 2; also known as The Preserve.

2.0 LEGISLATION

2.1 SB 221 – Kuehl – Land Use: Water Supplies

Senate Bill 221 was chaptered into law October 9, 2001. SB 221 prohibits approval of a tentative map, or a parcel map, or a development agreement for a subdivision of property of more than 500 dwelling units,....unless the legislative body of a city or county or the designated advisory agency provides written verification from the applicable public water system that a sufficient water supply is available or, in addition, a specified finding is made by the local agency that sufficient water supplies are, or will be, available prior to completion of the project. A true statement of the provisions that have been made for water is satisfied by submitting a copy of the written verification of the availability of a sufficient water supply. This is known as a water supply assessment.

Sufficient water supply means the total water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection that will meet the projected demand association with the proposed subdivision, in addition to existing and planned future uses. All of the following factors shall be considered:

1. The public water systems ability to provide sufficient water supply for the proposed subdivision shall be supported by substantial evidence including, but not limited to, any of the following: 1) urban water management plan; 2) Water supply assessment – Part 2.10 (commencing with Section 10910) of Division 6 of the Water Code; or 3) Other information relating to the sufficiency of the water supply that contains analytical information that is substantially similar to the assessment.

2. Availability of water supplies over a historical record of at least 20 years.
3. Applicability of an urban water shortage contingency analysis that includes action undertaken by the public water system in response to water supply shortages.
4. Reduction in water supply allocated to a specific water use sector pursuant to a resolution or ordinance adopted, or a contract entered into, by the public water system.
5. Amount of water that the water supplier can reasonably rely on receiving from other water supply projects, such as conjunctive use, reclaimed water, water conservation, and water transfer, including programs identified under federal, state, and local water initiatives such as CALFED and Colorado River tentative agreements.
6. When verification relies on projected water supplies not currently available, then written verification shall be based on the following:
   a. Written contracts or other proof of valid rights.
   b. Copies of capital outlay program for financing the delivery of a sufficient water supply.
   c. Securing of applicable federal, state, and local permits for construction of necessary infrastructure.
   d. Necessary regulatory approvals required to convey or deliver the water supply.

2.2 SB 610 – Costa – Water Supply Planning

Senate Bill 610 was also chaptered into law on October 9, 2001. SB 610 requires additional information to be included as part of an urban water management plan (UWMP) if groundwater is identified as a source of water available to the supplier. Information must include a description of all water supply projects and programs that may be undertaken to meet total projected water use.

SB 610 prohibits eligibility for funds from specified bond acts until the plan is submitted to the State. Until January 1, 2006, SB 610 requires the California Department of Water Resources to consider if an updated UWMP has been submitted in determining eligibility for funds made available from programs administered by DWR.

SB 610 also requires a city or county that determines a project subject to CEQA to identify any public water system that may supply water for the project and to request those public water systems to prepare a specified water supply assessment. The assessment is to include the following:

1. Discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing.
2. Identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project and water received in prior years pursuant to those entitlements, rights, and contracts.
3. Description of the quantities of water received in prior years by the public water system under the existing water supply entitlements, water rights or water service contracts.

4. Water supply entitlements, water rights or water service contracts shall be demonstrated by the following:
   a. Written contracts or other proof of entitlement to an identified water supply.
   b. Copies of capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.
   c. Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.
   d. Any necessary regulatory approvals that is required in order to be able to convey or deliver the water supply.
5. Identification of other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system.
6. If groundwater is included for the supply for a proposed project, the following additional information is required:
   a. Review of any information contained in the UWMP relevant to the identified water supply for the proposed project.
   b. Description of any groundwater basin(s) from which the proposed project will be supplied. Adjudicated basins must have a copy of the court order or decree adopted and a description of the amount of groundwater the public water system has the legal right to pump. For non-adjudicated basins, information on whether the DWR has identified the basin as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of DWR that characterizes the condition of the basin, and a detailed description of the efforts being undertaken in the basin to eliminate the long-term overdraft condition.
   c. Description and analysis of the amount and location of groundwater pumped by the public water system for the past 5 years from any groundwater basin which the proposed project will be supplied. Based on info that is reasonably available, including, but not limited to, historic use records.
   d. Description and analysis of the amount and location of groundwater projected to be pumped by the public water system from any groundwater basin which the proposed project will be supplied. Based on info that is reasonably available, including, but not limited to, historic use records.
   e. Analysis of sufficiency of the groundwater from the basin(s) from which the proposed project will be supplied.
   f. The water supply assessment shall be included in any environmental document prepared for the project.
   g. May include an evaluation of any information included in that environmental document. A determination shall be made whether the projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses.

SB 221 and SB 610 are similar and contain the same basic requirements for a water supply assessment. The following assessment analyzes the adequacy of water supplies for the City of Chino and Chino Subarea 2 now and into the future.

3.0 CITY OF CHINO WATER DEMAND AND SUPPLIES

3.1 Overview of Supply and Demand

The City of Chino ("City") currently serves water to an area of approximately 16.5 square miles and to approximately 14,395 customers. There are minimal portions currently not served by the City that extend beyond the westerly and northwesterly boundary of the water service area.

The City currently obtains water from the following primary water sources: 1) naturally recharged groundwater, 2) imported SWP water, 3) desalted water, and most recently 4) recycled water.

The City of Chino ("City") receives approximately 38 percent of its water supply from groundwater wells accessing the Chino Water Basin and 40 percent imported water from the Metropolitan Water District of Southern California (MWD) via the Water Facilities Authority-Joint Powers Agency (WFA) through the Inland Empire Utilities Agency (IEUA). Additionally, the City obtains about 20 percent of its supply from desalted water from the Chino I Desalter and 2 percent of its supply from recycled water from the Carbon Canyon Wastewater Reclamation Plant. Current and planned improvements will increase the use of recycled and desalted water. Each of the sources of water for the City are briefly discussed in this section and more fully discussed in the following subsections.

Growth Rate

The high cost of land in the Los Angeles area increased the attraction of the Chino Basin and other suburban area where land was still plentiful during the "urban sprawl" era. The 1950 population of Chino was less than 6,000, while the 1990 census population was almost 60,000. Chino's current population is approximately 67,000, and by the year 2010, the population projection is 72,900; by 2015, 76,700; and by 2020, 80,500.[1] This represents a five percent growth rate every five years, or about a one percent annual growth rate.

Water Demand

The City's current average daily demand is approximately 15,145 acre-feet per year (afy) or 13.52 million gallons per day (mgd). This demand is satisfied from groundwater and imported water, with minimal desalted and recycled water supplies being used. Current and planned improvements will increase the use of desalted and recycled water supplies.

The annexation and buildout of Subarea 2 will increase this demand, generating an additional build-out need of approximately 11,317 afy or 10.1 mgd of water. This 11,317-afy demand is projected from both potable and recycled sources based on use; 6,835 afy (6.1mgd) of potable water and 4,482 afy (4.0 mgd) of recycled water.

Phasing of Subarea 2 will occur over time in approximately a 30-year period, intended to minimize impacts to local areas. Development phasing will originate in the north/northwest section near Kimball Avenue and Chino Airport, and progress in a generally clockwise fashion to the northeast, southeast, and finally to the southwest sector. This phasing is consistent with a logical progression of infrastructure from

[1] City of Chino, Urban Water Management Plan Update, January 2002

surrounding developed and developing areas to the north and west. This development phasing plan provides a phasing of water demand, such that the areas identified begin with open space, light industrial, agricultural, and airport related development. Water demand for Subarea 2 will begin lower and increase as development moves into residential and community core. This allows for water demands to be met almost entirely from sources that are currently being planned, developed and implemented, including desalter water, recycled water, and conservation programs. Groundwater demand could remain relatively stable throughout the forecast period with maximum use of these alternative sources.

Demand and Supply

Table 3-1 shows the current and projected water demand and supply for the City of Chino inclusive of The Preserve, Subarea 2. Demand and supply projections consider land use, development of groundwater programs, desalter expansion and development, and connection to recycled water sources. Demand projections also consider water savings resulting from plumbing codes, price effects, and actual and projected implementation of water conservation Best Management Practices. Per capita water demand is forecast to remain relatively constant over a 20-year forecast horizon.

Analysis shows that as desalted water and recycled water use are maximized, groundwater and imported water will remain stable. Recycled water will supply areas currently supplied with potable water, and desalted water will supply areas currently using available groundwater and imported water. The City of Chino has the opportunity to increase supply to meet demand through the following additional measures: 1) overproduction of groundwater based on safe yield limitations; 2) purchasing additional desalted water if more is produced than needed to satisfy requirements of other purchasers, 3) purchasing additional recycled water when other members are not taking their full entitlement, which will be changed to no maximum entitlement with completion of the Regional Recycled Water System, which merges all the recycled plants together. Collectively, these additional options will enable water supply to exceed water demand for the City of Chino now and into the future.

Reliability of future water supplies to the region will be ensured through continued implementation of the Optimum Basin Management Program (see Section 3.2.5), implementation of local agency programs, and combined efforts and programs among member and cooperative agencies, including all water retailers, and the Chino Basin Watermaster, the Inland Empire Utilities Agency, Metropolitan Water District of Southern California, Santa Ana Regional Water Quality Control Board, Santa Ann Watershed Project Authority, and the Chino Basin Water Conservation District.

Table 3-1
Current and Projected Water Demand and Supply
City of Chino, including Subarea 2 (af)

Water Sources	2000	2005	2010	2015	2020	2022
DEMAND						
Potable City	14,977	15,700	13,910	13,290	12,930	13,088
Subarea 2	0	1,680	2,740	3,810	4,870	5,132
Recycled City	368	350	1,750	2,500	3,000	3,060
Subarea 2	0	325	650	1,350	2,050	2,330
Total Water Demand	**15,345**	**18,055**	**19,050**	**20,950**	**22,850**	**23,610**
SUPPLY						
Groundwater	9,694	11,557	11,557	11,557	11,557	11,557
Desalted	3,000	5,000	5,000	5,000	5,000	5,000
Imported	5,451	5,357	5,357	5,357	5,357	5,357
Recycled	368	1,000	3,400	3,910	5,170	5,534
Total Water Supply	**18,513**	**22,914**	**25,314**	**25,824**	**27,084**	**27,448**
Surplus Supply	**3,168**	**4,859**	**5,264**	**4,814**	**4,114**	**3,838**

Demand Assumptions:

1. City Potable Demand: City of Chino Urban Water Management Plan Update, January 2002, demand projections included potable, but not recycled, Subarea 2 demand projections. Through year 2020, this Assessment allocates the City's UWMP demand projections between City and Subarea 2 potable, and City recycled water projections.
2. Subarea 2 Potable Demand: Regional Water Quality Supply Plan from OBMP for years through 2020; straight line increase through Year 2022.
3. City Recycled Demand: Year 2000 is actual use; years 2005 through 2022 are based on completion of the Regional Recycled Water System by 2010 and additional efforts to connect customers.
4. Subarea 2 Recycled Demand: Assumed slower demand in earlier development years, increasing significantly by year 2010 through buildout demand of 4,482 afy.

Supply Assumptions:

1. Groundwater: Year 2000 is actual use; years 2005-2022 include assigned water rights (4,034 afy), early transfer rights (2,413 afy), and conversion rights for Subarea 2 (5,110 afy). Additional can be produced for an additional assessment on each acre-foot overproduced, limited to the safe yield of the basin; groundwater replenishment expands the opportunity to overproduce.
2. Desalted: Chino I Desalter existing contract: 3,000 afy; Chino I Expansion: 2,000 afy; total contract after expansion by December 2003: 5,000 afy; more can be purchased if unused capacity is available.
3. Imported: Entitlement to WFA production water: 5.9% of plant 81 mgd capacity = 4.78 mgd (5,357 afy); more can be purchased if unused capacity is available.
4. Recycled: Year 2000 is actual use; years 2005-2020 use demand projections from the IEUA Recycled Water System Feasibility Study, Final Draft, October 2001, adjusted in years 2015 and 2020 to more reasonable City projections. Years 2010 - 2022 assume development of Regional Recycled Water Systems by 2010, which merges all the recycled water plants together, creating no maximum entitlement to recycled water. Therefore, supply will meet demand.

The following briefly discusses each of the water sources for the City of Chino. Each source is more fully discussed in the subsequent sections.

Groundwater

The Chino Basin Watermaster manages groundwater production activities in the Chino Basin. The Watermaster is guided by the provisions of the Chino Basin adjudication and subsequent agreements between the parties to the Judgment. These agreements provide for groundwater production rights that are not fully utilized by the Basin's agricultural interests to be transferred to municipal water purveyors via two methods (i.e., agricultural land use conversion and early transfer.)

The City's current total water rights, based on a share of safe yield, is 4,034 afy from the Chino Groundwater Basin. Additional water rights are received from reallocations of Early Transfers and Land Use Conversions, although they are subject to availability. For FY 2001/02, the City of Chino received their assigned Early Transfer share of 2,413 af and a Land Use Conversion amount of 2,996 af; however, these amounts are subject to a share between the amount required and amount available. The City was assigned a debit for 2001/02 of 285 af based on their share of operating safe yield and the amount available. As a result, total available to the City for reallocation in 2001/02 is 5,125 af.[2] Together with assigned water rights, the City has total water rights of 9,159 af for 2001/02.

Based on The Preserve Specific Plan, which has 2,555 acres of developable land, this production right from conversion will represent 5,110 acre-feet of water rights. Combined with the City's current share of water rights of 4,034 afy under the operating safe yield, and an Early Transfer share of 2,413 afy, this equals approximately 11,557 afy water rights.

Additional groundwater may also be available via a conjunctive use program for the Chino Basin in partnership with the Chino Basin Watermaster, IEUA, and MWD. According to the IEUA 1000 Urban Water Management Plan Update, the program will reduce summertime peaking, deliver State Water Project supplies, minimize or eliminate MWD surface water deliveries during future droughts/emergencies, and allow MWD to export stored water for other member agencies. The program will create improved regional reliability by establishing an initial 150,000 af storage account for MWD and providing a financial incentive to member agencies for shifting demand on MWD surface deliveries to the winter months.

Desalted Water

The City of Chino entered into a contract with Chino Basin Municipal Water District (now IEUA) in 1996 committing to purchase a minimum of 3,000 afy on a "take or pay" basis. Future expansion of the Desalter will increase the City's flow allocation to 5,000 afy by December 2003, and an agreement to purchase the future desalted water will contain a minimum annual quantity of water to be purchased.

The current contract allows the City of Chino to obtain additional product water if the Chino Basin Desalter is capable of producing more Product Water than is necessary to

[2] Chino Basin Watermaster, Fiscal Year 2001-2002, Assessment Package, October 2001

satisfy the requirements of the purchasers. The City shall be entitled to purchase a minimum proportionate share of additional Product Water based on the ratio of the City's minimum annual quantity (3,000 acre-feet) to the total minimum quantity of all purchasers; currently 33 percent for the City of Chino. With the Chino I Expansion, the percentage will increase to 35 percent. Under this contract, Chino would also be entitled to more than its percentage of unused Product Water if it remains available after offered to all purchasers up to their percentage. Chino also has the opportunity to negotiate the purchase of contracted desalted water with purchasers that are constrained by the "take-or-pay" obligation, but have optimized other sources of local water and do not need to take their full entitlement. The desalter is supplied from groundwater wells. The amount of water produced by the desalter is subject to replenishment by Watermaster to prevent overdrafting. Watermaster has identified a hierarchy of water sources/supplies for replenishment purposes.

Imported Water (Surface Water)

From MWD through IEUA, the City of Chino is entitled to 5.9 percent of the Water Facilities Authority Agua de Lejos plant capacity (5,357 afy or 4.78 mgd). However, the City regularly takes up to 7.0 percent of the capacity, and plans to continue this level of imported supply. The City can take delivery of more than its entitlement when other WFA members are not taking delivery of their full entitlements.

The WFA is permitted to treat 81 mgd of State Water Project water through an MWD import water connection, which delivers water to the Agua de Lejos Plant for treatment. The actual quantity of treated water ranges from 12 mgd in the winter months to as high as 71 mgd during the summer. Historically, there has always been unused capacity available, and Chino has always had an opportunity to meet demands through additional WFA imported water. Many of the WFA members desire lesser dependence on imported water, and greater reliability and control on local supplies. As a result, development of local water supply programs has increased, and continued opportunity for utilization of unused capacity is anticipated.

Recycled Water

The City of Chino recycled water supplies are received from the Carbon Canyon Water Recycling Facility (CCWRF), which has a current capacity of 10 mgd or 11,205 afy of reliable non-potable recycled water. CCWRF treats an annual average of 8 mgd or 8,964 afy.[3] The City currently provides approximately 350 afy of recycled water to 45 customers. Total CCWRF recycled water supply use equals only 24 percent of the total effluent flow.

Under the current contract the City may take delivery of more than their entitlement when other members are not taking delivery of their full entitlements. However, upon completion of the Regional Recycled Water System, phased through 2010, which merges all the recycled water plants together, there will be no maximum entitlement to recycled water.

Based on current recycled water production of 65,000 afy, expected to increase to 89,000 afy by 2020, and current annual recycled water use at approximately 5,600 afy, projected

[3] IEUA Recycled Water System Feasibility Study, Final Draft, October 2001

to increase to 71,100 afy by 2020, the City of Chino would have sufficient opportunity to take delivery to meet their projected recycled water demand.

Current Supplies to The Preserve, Subarea 2

The City of Chino does not currently supply the project area with groundwater or imported water, with the exception of the airport, located north of Kimball Avenue and west of Grove Avenue and another area of approximately 220 acres. All other water in Subarea 2 is supplied from groundwater by private wells for use on their lands, which overly the groundwater basin, and as contained in the 1978 Chino Basin Adjudication Judgment, the Peace Agreement, and the Optimum Basin Management Program (OBMP).

3.2 Groundwater - Chino Water Basin

The Chino Groundwater Basin provides the groundwater to the City of Chino. The Basin consists of about 235 square miles in the upper Santa Ana River Watershed. The Basin is a relatively flat alluvial valley from east to west and slopes from north to south at a one to two percent grade. Valley elevations range from about 2,000 feet in the foothills below the San Gabriel Mountains to about 500 feet near Prado Dam. The principal drainage course for the Basin is the Santa Ana River. Year-round flow occurs along the entire reach of the Santa Ana River due to surface inflows at Riverside Narrows, discharges from municipal water recycling plants to the Santa Ana River, and rising groundwater. While still considered to be a single basin, the Basin has been divided into five management zones, based upon similar hydrologic conditions, and three sub-basins, as defined in the Optimum Basin Management Program, June 2000, and the 1995 Water Quality Control Plan for the Santa Ana Watershed (Region 8).

The Chino Groundwater Basin stores approximately 5 million acre-feet (maf) of groundwater and has the capability of storing an additional 1 maf. The legally designated safe yield from the basin is 140,000 acre-feet (af), which is the amount of groundwater that can be pumped from the basin each year while maintaining adequate groundwater levels. Purchasing imported water from MWD through the Inland Empire Utilities Agency (IEUA) for basin recharge generally makes up any excess of pumping over the safe yield of the Basin, although supplemental water may be obtained from any available source including recycled water, State water, local import, and Colorado River supplies.

Three documents govern the adjudication and management of the Chino Basin: 1) the 1978 Chino Basin Judgment, 2) the Peace Agreement, and 3) the Optimum Basin Management Program (OBMP). The following sections discuss each of these documents as they pertain to basin management and the City of Chino water supply from groundwater.

3.2.1 Adjudication – 1978 Judgment

In 1978, the Superior Court of the State of California entered a Judgment that adjudicated the water rights of the Chino Basin, and imposed a physical solution, which is the heart of the Judgment.

According to the Judgment, there are significant imported water supplies available to supplement the native safe yield of the Basin. Therefore, the purpose of the physical

solution was to establish a legal and practical means for making the maximum reasonable beneficial use of the waters of the Chino Basin by providing the optimum economic, long-term, conjunctive utilization of surface waters, ground waters and supplemental water, to meet the requirements of water users having rights in or dependent upon Chino Basin. A fundamental premise of the physical solution was that all water users dependent upon the Chino Basin would be allowed to pump sufficient waters to meet their requirements. To the extent that pumping exceeds the share of the Safe Yield or the Operating Yield, funds are provided by producers to enable the Watermaster to replace overproduction.

Water Rights – 1978 Judgment

Three operating pools were established by the Judgment for Watermaster administration: the Overlying Agricultural Pool, the Overlying Non-Agricultural Pool, and the Appropriative Pool. Allocation of rights to the safe yield of the Chino Basin was allocated to each operating pool.

Overlying right is defined as the appurtenant right of an owner of lands overlying the Chino Basin to produce water from the Basin for overlying beneficial use on such lands. Appropriative rights is defined as the annual production right of a producer from the Chino Basin other than pursuant to an overlying right.

According to the 1978 Judgment, the safe yield of Chino Basin is 140,000 acre-feet per year (afy). Safe Yield is defined as the long-term average annual quantity of groundwater (excluding replenishment water or stored water but including return flow to the Basin from use of replenishment or storage water) which can be produced from the Basin under cultural conditions of a particular year without causing an undesirable result.

Aggregate preserved overlying rights in the safe yield for agricultural pool use, including the rights of the State of California, total 82,800 afy, or 414,000 af in any five consecutive years, for over 1,200 parties. Overlying rights for non-agricultural pool use total 7,366 afy for 12 parties. All overlying rights are appurtenant to the land and are fixed, and cannot be assigned or conveyed separate or apart therefrom. However, in accordance with the provisions of the Chino Basin Wastermaster process, when land converts from agricultural use to non-agricultural use, the purveyor that will supply water to the converted land may apply for additional groundwater production credit.

Appropriative rights allocated by the Judgment include initial operating safe yield rights of 54,834 afy, as shown in Table 3-2. The City of Chino share of Initial Safe Yield was 3,670 afy. Appropriative rights include rights by prescription and are entitled under the physical solution to share in the remaining safe yield, after satisfaction of overlying rights and rights of the State of California. Operating Safe Yield is defined as the amount of groundwater which the Watermaster shall determine can be produced from the Chino Basin by the Appropriative Pool parties free of replenishment obligation under the physical solution. Any subsequent change in the safe yield would debit or credit the Appropriative Pool.

Water Rights Priority

By reason of the long continued overdraft in Chino Basin, and in light of the complexity of determining appropriative priorities and the need for conserving and making maximum

beneficial use of the water resources of the State, each party with appropriative rights are barred from asserting special priorities or preferences. All appropriative rights are deemed and considered of equal priority.

Table 3-2
1978 Chino Basin Judgment Appropriative Rights

Party	Appropriative Right (af)	Share of Initial Operating Safe Yield (af)	Share of Operating Safe Yield (%)
City of Chino	**5,271.7**	**3,670.067**	**6.693**
City of Norco	289.5	201.545	0.368
City of Ontario	16,337.4	11,373.816	20.742
City of Pomona	16,110.5	11,215.852	20.454
City of Upland	4,097.2	2,852.401	5.202
Cucamonga County Water District	4,431.0	3,084.786	5.626
Jurupa Community Services District	1,104.1	768.655	1.402
Monte Vista County Water District	5,958.7	4,148.344	7.565
West San Bernardino County Water District	925.5	644.317	1.175
Etiwanda Water Co.	768.0	534.668	0.975
Felspar Gardens Mutual Water Co.	68.3	47.549	0.087
Fontana Union Water Co.	9,188.3	6,396.736	11.666
Marygold Mutual Water Co.	941.3	655.317	1.195
Mira Loma Water Co.	1,116.0	776.940	1.417
Monta Vista Irrigation Co.	972.1	676.759	1.234
Mutual Water Co. of Glen Avon Heights	672.2	467.974	0.853
Park Water Co.	236.1	164.369	0.300
Pomona Valley Water Co.	3,106.3	2,162.553	3.944
San Antonio Water Co.	2,164.5	1,506.888	2.748
Santa Ana River Water Co.	1,869.3	1,301.374	2.373
Southern California Water Co.	1,774.5	1,235.376	2.253
West End Consolidated Water Co.	1,361.3	947.714	1.728
TOTAL	**78,763.8**	**54,834.000**	**100.00**

Source: 1978 Superior Court Judgment of Adjudication

Reallocation of Water Rights

According to the Judgment, in any five years any portion of the share of safe yield allocated to the Overlying Agricultural Pool is not produced, that water is available for reallocation to the Appropriative Pool. Priority of that water is first to supplement water available from Operating Safe Yield to compensate for any reduction in the safe yield after the tenth year of operation (1988), conversion claims, and then for supplement to the Operating Safe Yield without regard to reductions in safe yield. Conversion claims

include converting agricultural lands to other uses and permanently is provided water by a party of the Appropriative Pool.

Appropriative rights, and corresponding shares of Operating Safe Yield, may be assigned or may be leased or licensed to another appropriator, as approved by the Watermaster.

Overdraft - 1978 Judgment

In adopting the Operating Safe Yield for any year, the Watermaster is limited to 200,000 acre-feet of accumulated overdraft and will not be less than or exceed the Appropriative Pool's share of Safe Yield by 10,000 acre-feet.

Groundwater Replenishment – 1978 Judgment

Overdraft is defined as a condition wherein the total annual production from the Basin exceeds the safe yield. The Judgment states that the Chino Basin is, and since at least 1953 has been, in a condition of overdraft.

The Watermaster levies an annual Replenishment Assessment in an amount sufficient to purchase replenishment water to replace production during the preceding year which exceeds the safe yield. Assessments are based on the Pooling Plan for each pool. The Replenishment Assessment for the Appropriative Pool is recovered by a uniform assessment against all production during the proceeding year equaling 15 percent of replenishment cost of water, and a uniform assessment on each acre-foot of production by each party in excess of his allocated share of Operating Safe Yield during the preceding year equaling 85 percent of costs.

Supplemental water may be used to recharge the Basin either directly by spreading and percolating or injecting the water into the Basin, or indirectly by delivering the water for use in lieu of production and use of safe yield or operating safe yield. Supplemental water may be obtained from any available source including recycled water, State water, local import, and Colorado River supplies.

Much of the available natural surface water runoff in the Santa Ana River Watershed is captured and recharged to the groundwater aquifers. A system of flood control channels and percolation basins have been developed to increase the natural recharge capacity of the Basin. A limited quantity of excess storm water is captured for recharge; however, the groundwater recharge program is being expanded to include greater quantities of storm water, recycled water and lesser quantities of imported water.

Carryover – 1978 Judgment

Any Appropriator who produces less than his assigned share of Operating Safe Yield may carry such unexercised right forward for use in subsequent years. The first water used in any such subsequent year is to be an exercise of that carryover right. If the aggregate carryover of any appropriator exceeds its share of Operating Safe Yield, a storage agreement is executed with the Watermaster as a condition of preserving the surplus carryover.

The City of Chino's carryover to 2001-02 was 4,034 af.[4] This amount was determined based on the amount of carryover from 1999-00 (2,854 af), plus the assigned share of

[4] Chino Basin Watermaster, Fiscal Year 2001-2002, Assessment Package, October 2001

safe yield (4,034 af), plus water transaction activity (2,804 af), plus Ag Pool safe yield reallocation (5,125 af) for a total 2000-01 production right (14,814 af), less 2000-01 actual production (7,147 af). This amount equaled 7,667 af, of which 4,034 af is carried over to 2001-02 production and the excess carryover of 3,633 af is eligible for storage. Carry-over water has no limit at this time; however, limitations will be reevaluated in 2005.

Groundwater Storage Capacity – 1978 Judgment

The Judgment states that a substantial amount of available groundwater storage capacity exists in Chino Basin which is not utilized for storage or regulation of Basin waters. The Basin stores approximately 5 maf of groundwater and has the capability of storing an additional 1 maf. Reservoir capacity can appropriately be utilized for storage and conjunctive use of supplemental water with Basin waters. Any person or public entity may make reasonable beneficial use of the available groundwater storage capacity for storage of supplemental water, with allocation preference of storage capacity to the needs and requirements of the lands overlying the Basin and the owners of rights in the Safe or Operating Safe Yield of the Basin.

3.2.2 Interim Watermaster

In February 1998, the Superior Court appointed a nine-member Board as Interim Watermaster for 26 months; March 1998 to June 2000. The Court directed the Interim Watermaster to develop and submit the optimum basin management program (OBMP) for the Chino Basin. The effort to complete the OBMP for the Chino Basin has been divided into two phases. The first phase culminated in submittal of the draft Phase I Report to the Court in September 1999 with continuing jurisdiction over the Basin groundwater resources. The second phase, including a programmatic EIR was completed and adopted in July 2000, as the Implementation Plan. The OBMP is further discussed in Section 3.2.5.

3.2.3 Peace Agreement

The Peace Agreement was adopted in June 2000, amending the 1978 Chino Basin Judgment, and has a term of 30 years. The Peace Agreement facilitates the implementation of the OBMP, and considers Orange County Water District's petition to change the Santa Ana River to fully appropriated and to appropriate up to 507,000 af of newly declared surplus water.

The Peace Agreement amended the judgment in three areas:

1) Members of the Overlying Non-Agricultural Pool have the right to transfer or lease their quantified production rights within the same pool or to the Watermaster in conformance with specified procedures.

2) Any appropriator who provides water service to overlying lands may exercise overlying rights to the extent necessary to provide water service to overlying lands. Overlying Non-Agricultural Pool members have the right to transfer or lease these rights.

3) For the term of the Peace Agreement, in any year in which sufficient unallocated safe yield from Overlying Agricultural Pool is available for conversion claims, the Watermaster can allocate each appropriator with a conversion claim, 2.0 af of unallocated safe yield water for each converted acre approved.

Overdraft – Peace Agreement

The Watermaster is responsible to conduct recharge and replenishment of the Basin. The Peace Agreement directs that during the five years from fiscal year 2000/2001, the Watermaster will conduct physical recharge of supplemental water of 6,500 afy in one or more of the areas known as Montclair, Brooks, and Upland spreading facilities (Management Zone 1 – MZ1). If the cumulative total of 32,500 af of recharge has not been accomplished at the end of the five years, then recharge will continues at the same annual rate until 32,500 af has been reached.

Recharged supplemental water increases the Operating Safe Yield under the Judgment. Cost and allocation of supplemental water is apportioned pro-rata among members of the Appropriative Pool according to the producer's share of the Initial Safe Yield. At the conclusion of FY 2004/2005, the need to continue recharge activities will be evaluated. The Watermaster provides an annual accounting of the amount and location of recharge. Current recharge is being accomplished at 6,500 afy, and the City of Chino is being assessed on 478.205 afy, which is their share of safe yield at 7.357 percent.

Producers do not currently have a limit on how much they can over-produce; however, they are assessed an amount to replenish the Basin for all overproduction. Producers generally develop annual demand projections that assist in making arrangement with other appropriators for prepurchase of replenishment water through transfers and other agreements. This allows the Watermaster to optimize planning within the OBMP.

In-Lieu

Recharging the Basin may be accomplished either directly by spreading and percolating or injecting the water into the Basin, or indirectly by delivering the water for use in lieu of production and use of safe yield or operating safe yield.

In lieu areas are designated by the Watermaster, and has previously designated the entire Chino Basin as an in-lieu area. Any member of the Appropriative Pool who is willing to abstain for any reason from producing any portion of its share of operating safe yield in any year, may offer the unproduced water to the Watermaster. The Watermaster then may purchase water in place of spreading replenishment water for a calculated price to the appropriator as determined in the Peace Agreement. The price is the lesser of the cost of replenishment water plus the cost of spreading, or the cost of supplemental surface supplies less the appropriator's average cost of groundwater production and the applicable production assessment.

Storage and Recovery– Peace Agreement

Local Storage

Local storage is protected and each party has the right to store its un-Produced carry-over water in the Basin. Local storage agreements are approved so long as the total quantity of

supplemental water under local storage agreements does not exceed the cumulative total of 50,000 af. Water held in storage is transferable, but storage capacity is not. The City of Chino currently has 5,417.5 af in local storage.

Parties may continue to produce the actual quantity of carry-over water and supplemental water held in its storage account, subject only to the loss provisions. Rate of loss from local storage is zero percent until 2005, and then it will increase to 2 percent until it is recalculated based on the best available scientific information. Losses will be deducted annually from each storage account.

At the end of FY 2004-05, the Watermaster shall have the general discretion to place reasonable limits on the further accrual of carry-over and supplemental water in local storage. This may be necessary to provide priority for the use of storage capacity for Storage and Recovery Programs that provide broad mutual benefits to all parties.

Storage and Recovery Program

Initial target for cumulative quantity of water held in storage in the Basin is 500,000 af in addition to existing storage accounts. This program is still in development by the Watermaster and current agreements are not yet fully defined.

Appropriative and Non-Agricultural Pool members are entitled to the compensation paid for a Storage and Recovery Program paid in any form, including money, revenues, credits, proceeds, programs, facilities, or other contributions. Compensation may also be used to offset the cost of operations, to reduce assessments on the members, and to defray the costs of capital projects of the request of the members.

The Watermaster is responsible to conduct best efforts to do the following: 1) complete the short-term conjunctive use project conducted by IEUA, Three Valleys Municipal Water District (TVMWD) and MWD; 2) develop a seasonal peaking program for in-Basin use and dry year yield to reduce the Basin's demand on MWD water; 3) develop a dry year export program; and 4) develop a seasonal peaking export program.

The short-term conjunctive use project includes construction of facilities to store water and later withdraw it for conjunctive use. The program goals are to reduce summertime peaking on MWD, deliver State Water Project supplies to Chino Basin, minimize MWD surface water deliveries during future droughts/emergencies, and to allow MWD to export storage water for other member agencies. The program will create improved reliability by establishing an initial 150,000 af storage account for MWD and providing a financial incentive for shifting demand on MWD surface deliveries to the winter months. This program is just one example of storage programs that are necessary to optimize Basin storage and supplies, reduce demand on imported water supplies, and make water available that may not have been otherwise.

Transfers – Peace Agreement

Transfers must have the approval of the Watermaster. Transfers include the assignment, lease, or sale of a right to produce water to another producer within the Chino Basin or to another person or entity for use outside the Basin whether the transfer is temporary or permanent. Lease of water rights are also permissible to allow producers to make up for the lessee's over-production.

According to the Watermaster Fiscal Year 2001/02 Assessment Package, the City of Chino has one transfer and two assignments. Transfers are recorded annually as arrangements are made. For 2001-02, the San Antonio Water Company transferred 2,700 af of water rights to the City of Chino. The City also assigned rights to the Chino Airport and the El Prado Golf Course, 73.8 af to the Non-Ag Pool and 398.3 af to Ag Pool respectively. The City also receives a share of Early Transfers and Land Use Conversion rights as discussed in the following sections.

Non-Agricultural Pool members have the right to transfer or lease within the pool, and the right to transfer to the Watermaster for the purpose of replenishment for a desalter or for a storage and recovery program.

Early Transfer

An "early transfer" means the reallocation of safe yield not produced by the Agricultural Pool to the Appropriative Pool on an annual basis rather than according to the five-year increment described in the Judgment. The Early Transfer of not less than 32,800 afy was the expected approximate amount of water not produced by the Agricultural Pool. Early transfer is to be the greater of 32,800 af or 32,800 plus the actual quantity of water not produced in a given year after all the land use conversions are satisfied. Early transfer water is allocated among members of the Appropriative Pool in accordance with their pro-rata share of the initial safe yield. The City of Chino's share of the initial safe yield is 6.693 percent, equaling 2,413 afy.

Land Use Conversion of Water Rights

With the effective date of the Peace Agreement (June 2000), the amount of water rights converted from agricultural land to urban use was changed from 2.6 af per acre with allocation between initial shares of safe yield and service provider to 2.0 af per acre, all of which is allocated upon conversion of the land to the Appropriative Pool member, service provider. Upon conversion of water rights, the purveyor pledges the amount of water needed for the urban land use, and up to 2 afy per acre of land will be made available. Based on The Preserve Specific Plan which has 2,555 acres of development, this production right from conversion will represent 5,110 acre-feet of water rights. Combined with the City's current share of water rights of 4,042 afy under the operating safe yield, an Early Transfer share of 2,413 afy, this equals total 11,565 of water rights through the year

An Agricultural Pool member has the right to a voluntary agreement with an appropriator which has a service area contiguous to or inclusive of the agricultural land, to provide the required water to the overlying land on behalf of the Ag Pool member. The appropriator is then entitled to a credit to off-set production to the extent it is serving the overlying land up to the amount of the historical maximum annual quantity previously used on that property. The credit is debited to the Ag Pool's collective production right.

Total required reallocations from Early Transfers and Land Use Conversions are subject to availability. For FY 2001/02, the City of Chino received their Early Transfer share of 2,413 af and a Land Use Conversion amount of 2,996 af; however, these amounts are subject to a share between the amount of af required and the amount of af available based on Agricultural Pool under (over) production. The City was assigned a debit for 2001/02

of 285 af based on their share of operating safe yield and the amount of under production. Therefore, total available to the City for reallocation in 2001/02 is 5,125 af.[5] Together with assigned water rights, the City has total water rights of 9,159 af for 2001/02.

3.2.4 Desalter Water

The existing Chino I Desalter facility is located in the City of Chino. The Chino I Desalter facility was previously owned and operated by IEUA and Western Municipal Water District (WMWD), acting through Project Committee No. 14 (PC14). PC14 is comprised of Santa Ana Watershed Project Authority (SAWPA) members, IEUA, WMWD, and the Orange County Water District (OCWD).

Chino Basin Desalter Authority

A newly formed joint powers agency, the Chino Basin Desalter Authority (CDA) has purchased the Chino I Desalter from SAWPA, and, is serving as the lead agency on behalf of several agencies to design, manage, construct and operate both the proposed Chino I Desalter expansion and the proposed Chino II Desalter Project. The CDA participants include: cities of Ontario, Chino Hills, Chino and Norco, Santa Ana River Water Company, Jurupa Community Services District, and Inland Empire Utilities Agency.

The Chino I Desalter is currently operated under the following: 1) "take-or-pay" agreements with the purchasers of the water; 2) an agreement with MWD subsidizing the Desalter to reduce the cost of the water from the Desalter compared to uninterruptible treated imported water; and 3) an agreement with the Watermaster, all groundwater producers, Kaiser Ventures, Inc., and the California Regional Water Quality Control Board, Santa Ana Region, regarding replenishment obligations for operating the Desalter.

Replenishment Water for Desalters

Replenishment water is provided from 1) the Watermaster Desalter Replenishment account, 2) new yield of the Basin, 3) safe yield of the Basin, and 4) additional replenishment water purchased by the Watermaster.

Desalted Water Deliveries

CDA is currently contracted to provide a combined total of 9,200 acre-feet per year (afy) of product water from the Chino I Desalter to Jurupa Community Service District (JFSD) and the cites of Chino, Chino Hills, and Norco. The Chino I Desalter Expansion would result in an additional 5,000 afy of potable water being made available for use. The resultant total of 14,200 afy will be allocated between the cities of Chino, Chino Hills, Norco and Ontario, and the JCSD and the Santa Ana River Water Company. A desire for additional capacity has prompted the proposed expansion of the existing facility with up to five more wells and additional treatment capacity.

Table 3-3 shows the water deliveries under the existing contracts and the proposed integrated project contracts for the Chino I Desalter and its expansion.

[5] Chino Basin Watermaster, Fiscal Year 2001-2002, Assessment Package, October 2001

Table 3-3
Desalted Water Deliveries from Chino I Desalter
Under the Proposed Integrated Project Contracts
(afy)

Agency	Existing Contracts	Proposed Contracts	
	Chino I Existing	Chino I Existing	Chino I Expansion
City of Chino	3,000	3,000	2,000
City of Chino Hills	2,000	2,000	2,200
Jurupa Community Service Dist	3,200	2,700	
City of Norco	1,000		
City of Ontario		1,500	
Santa Ana River Water Co.			800
Subtotal		9,200	5,000
TOTAL	9,200	14,200	

Source: Chino I Desalter Expansion and Chino II Desalter Project, Draft Subsequent Environmental Impact Report, November 2001

City of Chino Contract

The City of Chino entered into a contract with Chino Basin Municipal Water District (now IEUA) in 1996 committing to purchase a minimum of 3,000 afy on a "take or pay" contractual basis. That contract has been replaced by a commitment by Chino to purchase 3,000 afy from the CDA. According to the agreement, the current Chino Desalination Project is sufficient to supply 4,482 afy (4.0 mgd), although the minimum was set at 3,000 afy. Future expansion of the Desalter will increase the City's flow allocation to 5,000 afy, and an agreement to purchase the future desalted water will contain a minimum annual quantity of water to be purchased.

The current contract allows the City of Chino to obtain additional product water if the Chino Basin Desalter is capable of producing more Product Water than is necessary to satisfy the requirements of the purchasers. The City shall be entitled to purchase a minimum proportionate share of additional Product Water based on the ratio of the City's minimum annual quantity (3,000 acre-feet) to the total maximum quantity of all purchasers; currently 33 percent for the City of Chino. With the Chino I Expansion, the percentage will increase to 35 percent. Under this contract, Chino could also be entitled to more than its percentage of unused Product Water if it remains available after offered to all purchasers up to their percentage. Chino also has the opportunity to negotiate the purchase of contracted desalted water with purchasers that are constrained by the "take-or-pay" obligation, but have optimized other sources of local water and do not need to take their full entitlement.

Chino I Expansion and Chino II Desalter Project

The Chino I Desalter currently treats groundwater supplied by 11 wells. The proposed expansion of the Chino I Desalter will require the installation of up to five new wells to meet the capacity goals for the water supply facility. The major components of the proposed expansion project include the following: 1) addition of treatment facilities; 2) pipeline for in-plant conveyance of bypass water; 3) clearwell pump station modifications; 4) miscellaneous plant modifications; 5) additional treatment component; 6) new groundwater pumping wells; 7) new raw water pipelines; 8) new potable water pipelines; and 9) two new pump stations. The Chino II Desalter is proposed to deliver product water to JCSD, City of Ontario, City of Norco, and the Santa Ana River Company. Development of the Chino II Desalter would result in a shift in deliveries from the Chino I Desalter after expansion, as shown in Table 3-3.

The Chino I Desalter expansion is anticipated to occur between June 2002 and December 2003. Chino II Desalter construction is anticipated to occur between June 2002 and May 2004. Environmental impacts of these projects are considered in the Draft Subsequent Environmental Impact Report, Chino I Desalter Expansion and Chino II Desalter Project, November 2001.

Sale of Chino I Expansion and Chino II Desalter Water

Chino I Expansion and Chino II Desalter purchase agreements will contain a minimum annual quantity of water available to purchase. Members of the Appropriative Pool and the State of California shall have the first priority right to purchase desalted water, OCWD will have the second priority right, and then it will be open to purchase by other persons. The term of a water supply contract for the Desalters is not to be less than 30 years if requested. A large benefit to purchasers of desalter water is that there is no replenishment assessment obligation on desalter water.

3.2.5 Optimum Basin Management Program for the Chino Basin

In February 1998, the Interim Watermaster (nine-member court appointed Board) was directed by the Court to develop and submit the optimum basin management program (OBMP) for the Chino Basin. The OBMP is intended to formulate and implement a groundwater management program that will preserve and enhance the safe yield and the water quality of the Chino Basin. The Watermaster's goal is to make it possible for all groundwater users to produce water from the basin for beneficial uses at an affordable cost. The OBMP is intended to allow continued reliance on groundwater for beneficial use within the basin while minimizing demand for imported water, and to encourage beneficial use of the large available storage space in the aquifer system. OBMP actions are intended to benefit both local and regional water supply programs.

The effort to complete the OBMP for the Chino Basin has been divided into two phases. The first phase culminated in submittal of the draft Phase 1 Report to the Court in September 1999 with continuing jurisdiction over the Basin groundwater resources. The second phase, including a programmatic EIR, was completed and adopted in July 2000, as the Implementation Plan. Since the City of Chino receives approximately 38 percent of its water supply from the Chino Basin, it supports the OBMP Implementation Plan.

Phase 1 of the OBMP defined the state of the Chino Groundwater Basin, established the goals and objectives concerning major issues identified by stakeholders, and affirmed a management plan for the achievement of the stated goals and objectives. Phase 2 of the OBMP is the Implementation Plan for the installation and operation of OBMP facilities. The major OBMP facilities include pipelines, desalters, possibly an ion exchange facility, recharge basins, pump stations, production wells, and monitoring devices.

The four primary OBMP management goals are to enhance basin water supplies, to protect and enhance water quality, to enhance management of the basin, and to equitably finance the OBMP.

The OBMP includes nine program elements that were developed during the Phase 1 OBMP Report that collectively will meet the goals of the OBMP. The scope of implementation of some of the programs have been combined since they overlap and have synergies between them.

The program elements include developing and implementing each of the following:

Element 1 – Comprehensive Monitoring Program

Element 2 – Comprehensive Recharge Program

Element 3 – Water Supply Plan for the Impaired Areas of the Basin

Element 4 – Comprehensive Groundwater Management Plan for Management Zone 1

Element 5 – Regional Supplemental Water Program

Element 6 – Cooperative Programs With the Regional Water Quality Control Board, Santa Ana Region, and Other Agencies to Improve Basin Management

Element 7 – Salt Management Program

Element 8 – Groundwater Storage Management Program

Element 9 – Storage and Recovery Programs

3.3 IMPORTED WATER

The Metropolitan Water District of Southern California (MWD) provides imported water supplies to IEUA. MWD is the wholesale water agency that serves supplemental imported water from northern California (State Water Project) and the Colorado River to 27 member agencies located in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties.

IEUA is the wholesaler of imported water for MWD, and the City of Chino is a member of IEUA. Seven other agencies also receive MWD water through IEUA including the cities of Chino Hills, Ontario, and Upland, Cucamonga County Water District, Fontana Water Company, Monte Vista Water District, and San Antonio Water Company.

IEUA wholesales the water to the City of Chino through the Water Facilities Authority-Joint Powers Agency (WFA). Additional imported water supplies are also used for groundwater replenishment, contributing to the annual production of the Chino Basin. On average, 6,000 afy of imported water has been used for this purpose. During the times of severe drought, significant more amounts of imported water are purchased for groundwater replenishment.

3.3.1 Water Facilities Authority

A joint powers agreement was entered into in February 1989, creating the WFA, between the IEUA, the Monte Vista County Water District, and the cities of Chino, Upland, Ontario, and Chino Hills. The Agreement provides authority to study, plan and provide facilities for the treatment of water and a distribution system to their members. Other public agencies may join the WFA, through an amendment to the joint powers agreement.

The WFA is permitted to treat 81 mgd of State Water Project water through an MWD import water connection in the City of Upland. MWD's Rialto Branch of the Foothill feeder delivers water to the Agua de Lejos Plant for treatment. The actual quantity of treated water ranges from 12 mgd in the winter months to as high as 71 mgd during the summer. WFA water enters the City's potable water distribution system at Benson Avenue and State Street. Since it is of higher quality that the City's groundwater, it is then blended with water from City wells to maintain the nitrate levels within State standards.

The City of Chino is entitled to 5.9 percent of the plant capacity (5,357 afy or 4.78 mgd); however, the City of Chino consistently takes up to 7.0 percent of the capacity. The City can take delivery of more than its entitlement when other WFA members are not taking delivery of their full entitlements. Historically, there has always been unused capacity and Chino has always had an opportunity to meet water quality standard demands through additional WFA imported water. Many of the WFA members desire less dependence on imported water and greater reliability and control on local supplies. As a result, development of water supply programs has increased and the continued opportunity for purchase of unused capacity is anticipated.

Discussions on the opportunity to increase the capacity of the WFA treatment plant have occurred; however, analysis would need to be done to determine feasibility and economic

benefits considering the climate of imported water reliability. The plant could be increased to 88 mgd through re-rating of the existing plant, and further capacity increases would need to be accomplished by plant expansion.

3.3.2 Inland Empire Utilities Agency (IEUA)

IEUA was formed in 1950 to become a member of MWD for the purpose of importing supplemental water, augmenting local stream and groundwater supplies. Since its formation the agency has expanded its services to include production of recycled water, distribution of imported and recycled water supplies, sewage treatment, co-composting of manure and municipal biosolids, desalinization of groundwater supplies and disposal of non-reclaimable industrial wastewater and brine. IEUA serves a population of approximately 700,000.

3.3.3 Metropolitan Water District of Southern California (MWD)

MWD member agencies receive MWD water at various delivery points on its system, and they pay for it at uniform rates for each class of service established by the Board. Historically, MWD has been responsible for importing water into the region through its Colorado River Aqueduct and the State Water Project. Recently, MWD has increased its ability to supply water, particularly in dry years, through implementation of storage and transfer programs.

Municipal and institutional use accounts for 92 percent of water use, while agricultural use is 8 percent and declining. MWD supplies approximately 50 percent of all water demands in their service area 100 percent of the time.

MWD's ability to provide 100 percent reliability is expected to decline as existing imported water supplies from the Colorado River and State Water Project face increasing challenges unless new programs are implemented. Due to competing needs and uses on all of the water sources, and regional water operation issues, MWD undertook a number of planning processes: the Integrated Resources Planning (IRP) Process, the Water Surplus and Drought Management (WSDM) Plan, the Strategic Planning Process, and the Regional Urban Water Management Plan to provide a frameworks and guideline for optimum water planning into the future.

Historical water demands in the MWD service area have increased from 3.1 maf in 1980 to 3.9 maf in 1990. Total water use is projected to grow from a projected 3.8 maf in 2000 to 4.8 maf in 2020. For the San Bernardino County service area, demands are projected to increase 50.6 percent between 2000 and 2020. This is all attributable to IEUA member agencies since IEUA is the only MWD member agency in San Bernardino County. Table 3-4 shows the historic and projected demands for MWD's San Bernardino County service area.

Reliability of MWD's supply is further discussed in Section 4.0, Reliability of Water Supplies.

Table 3-4
Total Retail Water Demand in MWD's Service Area for San Bernardino County (af)

	Actual				Est.	Projected			
County	1980	1985	1990	1995	2000	2005	2010	2015	2022
San Bernardino	169,700	188,000	209,700	184,300	214,100	239,400	265,900	292,900	334,500

Source: The Regional Urban Water Management Plan for the Metropolitan Water District of Southern California, December 2000

Note: Includes total Agricultural and M&I use

Table 3-5 shows the water demands on MWD as a portion of the service area total water demands. The water demand forecasts account for water savings resulting from plumbing codes, price effects, and actual and projected implementation of Best Management Practices. Per capita water demand is forecast to remain relatively constant over the 20-year forecast horizon.

Table 3-5
Actual and Projected Demands on MWD (af)

	Actual				Est.	Projected			
	1980	1985	1990	1995	2000	2005	2010	2015	2022
Agricultural	179,963	176,810	205,653	89,551	125,687	91,020	80,977	71,146	64,138
Full Service	947,856	1,060,689	1,605,061	1,195,558	1,705,008	1,618,972	1,689,550	1,827,681	2,135,635
Long Term	-	-	-	-	265,065	134,213	126,047	120,286	123,379
Seasonal Shift	-	-	-	-	129,034	119,409	119,771	120,066	124,848
Seasonal Unclassified	-	-	404,568	94,464	-	-	-	-	-
Other*	174,892	422,350	400,695	50,000	37,813	-	-	-	-
MWD Total	1,302,711	1,659,849	2,615,978	1,429,573	2,262,607	1,963,614	2,016,345	2,139,179	2,448,000

Source: The Regional Urban Water Management Plan for the Metropolitan Water District of Southern California, December 2000

* Includes Bank, Cooperative Storage, Cyclic Storage, Demonstration Storage, Local Storage, Reimbursable Construction, Pre-deliveries and/or Wheeling

Notes: Sales forecast does not include SDCWA/IID Transfer and Easter Seepage Water
1980 and 1995 are wet years; 1985, 1990, and 2000 are dry years

3.4 Recycled Water

Water recycling is a critical component of the water resources management strategy for the region. Reuse of highly treated tertiary water is the only new source of water available to meet the growing water demands of the IEUA service area. Recycled water is a proven technology and will provide a more dependable local supply of water as well as reduce the likelihood of water rationing during droughts. In addition, the use of recycled water for groundwater recharge is an integral part of the OBMP. Region-wide implementation of recycled water projects are vital to the protection and enhancement of the safe yield and water quality of the Chino Groundwater Basin.

IEUA recognizes that a mix of water management strategies will be needed to enable IEUA to continue to provide a high quality, reliable water supply at an affordable rate. The water supply mix will include implementing water conservation programs, increasing the safe storage capacity of the Basin, minimizing dependence on imported water supplies, and maximizing use of available storm water, and achieving a maximum reuse of all available recycled water.

3.4.1 IEUA Regional Wastewater Treatment Plants

IEUA operates four regional wastewater treatment plants that produce disinfected and filtered tertiary treated recycled water in compliance with California's Title 22 regulations: RP-1, RP-2, RP-4 and the Carbon Canyon Water Reclamation Facility. The water quality from these plants is outstanding, with an average level of total dissolved solids (TDS) well below 500:1 mg/l and a total nitrogen level of less than 10 mg/liter. A fifth plant is under construction and is expected to be on line by 2003.

IEUA's total current production of recycled water is 65,000 afy and is expected to increase to 89,000 afy by 2020. Current annual water sales are estimated at 5,600 acre-feet for the year 2000. IEUA initiated a recycled water marketing program in 1999, which has been successful in additional recycled water sales.

3.4.2 City of Chino Recycled Water Supplies

The IEUA Regional Sewerage Service Contract defines the manner for a Contracting Agency to claim its respective percentage of the recycled water from the treatment plants. In March of each year, each agency gives IEUA an estimated flow and quantity of recycled effluent demand from each reclamation facility from which that agency is entitled. In April each year, each local agency gives IEUA a purchasing schedule, and in May of each year, IEUA allocates recycled water. With 60 days notice, a local agency can increase its previous request for delivery of recycled water.

The City of Chino recycled water supplies are received from the Carbon Canyon Water Recycling Facility (CCWRF), which has a current capacity of 10 mgd or 11,205 afy of reliable non-potable recycled water. CCWRF treats an annual average of 8 mgd or 8,964 afy.[6] The City currently provides approximately 350 afy of recycled water to 45 customers. Total CCWRF recycled water supply used equals only 24 percent of the total effluent flow.

[6] IEUA Recycled Water System Feasibility Study, Final Draft, October 2001

Under the current contract the City may take delivery of more than their entitlement when other members are not taking delivery of their full entitlements. However, upon completion of the Regional Recycled Water System, phased through 2010, which merges all the recycled water plants together, there will be no limit on entitlement to recycled water.

IEUA facilities serve seven other contracting agencies, including: the cities of Chino Hills, Fontana, Montclair, Ontario, and Upland, plus Cucamonga County Water District and unincorporated areas of San Bernardino County within the IEUA service area.

Additional sources of recycled water within IEUA's service area include the Pomona Water Reclamation Plant (operated by the Los Angeles County Sanitation District), the Upland Hills Water Reclamation Plant (operated by the City of Upland), CIM Water Reclamation Plant (operated by the California Institute for Men at Chino), and the Indian Hills Water Reclamation Plant (operated by Jurupa Community Services District).

3.4.3 IEUA Recycled Water Demand

Recycled water in 2000 was distributed from RP-1/RP-4 and CCWRF. A line connects RP-1 and RP-4 and serves the "northern" recycled water system of IEUA's service area. This system provides water for irrigation of parks and golf courses. CCWRF's "southern" recycled water distribution system delivers water through 21,400 linear feet of pipelines, to the cities of Chino and Chino Hills. Some effluent from RP-1 and RP-2 is discharged into Cucamonga Creek. Effluent from RP-1 is also used for to recharge the Chino Basin aquifer via Ely Basin No. 3. RP-2 serves segments of the cities of Chino and Chino Hills; however, portions of RP-2 are scheduled for demolition as the new RP-5 comes on line.

Thirty-seven users are currently connected to, and are taking deliveries of recycled water from, the IEUA recycled water distribution system. The City of Chino has 45 of these connections, including landscape irrigation, agricultural irrigation, industrial reuse, and construction. Total effluent flow and recycled water use beginning in 1984-83 for the IEUA service area is shown in Table 3-6.

Table 3-6
IEUA Regional Wastewater Treatment Plants
Effluent vs. Recycled Water Usage (af)

Year	RWRP-1 / RWRP-4		RWRP-2		CCWRF	
	Effluent Flow	Recycled Water Usage	Effluent Flow	Recycled Water Usage	Effluent Flow	Recycled Water Usage
1984-1983	20,790	1,550	4,290			
1983-1984	20,950	1,080	3,950			
1984-1985	25,160	1,267	4,280			
1984-1986	28,240	1,222	2,660			
1986-1987	27,160	1,306	5,000			
1987-1988	31,290	2,110	5,500			
1988-1989	35,510	2,038	6,180			
1989-1990	34,760	1,961	5,730			
1990-1991	36,840	1,792	6,100			
1991-1992	40,360	1,909	5,780		1,550	
1994-1993	41,510	1,205	5,640		4,720	
1993-1994	37,310	1,978	5,430		7,010	
1994-1995	39,680	3,794	5,360		8,690	
1994-1996	39,590	2,292	4,810		9,060	
1996-1997	39,940	2,075	4,790		9,750	
1997-1998	44,940	1,260	4,969		9,264	
1998-1999	43,354	2,444	5,345		9,534	100
1999-2000	47,269	3,089	4,737		9,310	2,221

Source: IEUA Recycled Water System Feasibility Study, Final Draft, October 2001

3.4.4 City of Chino Recycled Water Demand

The City of Chino introduced recycled water into its system from the Carbon Canyon Water Recycling Facility (CCWRF) in FY 1998-99 and Table 3-7 shows that 100 af was used that year. In FY 1999-00, the City used 368 af of recycled water, and projected recycled water use is expected to climb with the planned recycled water system improvements and marketing program.

Table 3-7
City of Chino
Historical and Projected Recycled Water Demands (af)

City of Chino	98-99	99-00	2005	2010	2015	2022
Recycled Water Demand	100	368	1,000	3,400	5,200	7,700
Recycled Water as % of Total Demand	0.7%	2.3%	6.09%	17.13%	24.0%	31.28%

Source: IEUA Recycled Water System Feasibility Study, Final Draft, October 2001
Source: Water Master Plan, Subarea 2 – Chino Sphere of Influence, Chino Agricultural Preserve Area, Final Draft of Technical Memorandum, February 2001

Since The Preserve is a newly developing area, dual (potable and recycled) water systems are being proposed, which will conserve potable water and make best use of available supplies. The planning and construction of a dual system at the beginning of development has several benefits, as opposed to implementation of a recycled water distribution

system into an area with existing development and potable water distribution system. Construction costs can be shared by both distribution systems, and the use of recycled water in lieu of potable water for irrigation demands and industrial requirements will reduce the need for additional potable water supplies as the population increases.

The Preserve is perfectly situated for the maximum use of recycled water because of the location of the IEUA's existing recycled water pipelines. The outfall pipeline from RP-1 that connects to RP-2 is aligned through The Preserve. Two branches of this 30-inch diameter RP-1 outfall pipe connect to Prado Lake (30-inch) and Mill Creek (30-inch). These existing pipelines form an excellent "backbone" transmission piping system to supply recycled water to future customers with low capital investments.

Utilizing demand factors and digitized land use areas, the potential recycled water demand for Subarea 2 was calculated [7]. In total, 85 percent of the potential recycled water demand was selected as the most feasible to be served with the recycled water system. The remaining 15 percent of the potential recycled water demand (the less feasible portion) was added back into the total potable water demand. A total demand of 4,482 afy or 4.0 mgd of recycled water was allocated for the non-potable water demand condition.

The City will obtain recycled water for The Preserve from the IEUA recycled water plants, initially from the CCWRF. Since the City is currently only taking approximately 350 afy, and projected recycled water use within their existing service area is limited, significant opportunity to fully meet the projected recycled water demand for The Preserve exists. Additionally, IEUA is currently completing the interconnection of all four wastewater treatment facilities they operate, of which the outfall pipeline from RP-1 that connects to RP-2 is aligned through The Preserve.

Finally, under the current contract the City may take delivery of more than their entitlement when other members are not taking delivery of their full entitlements. However, upon completion of the Regional Recycled Water System that merges all the recycled water plants together there will be no limit on entitlement to recycled water.

Based on current recycled water production of 65,000 afy, expected to increase to 89,000 afy by 2020, and current annual recycled water use at approximately 5,600 afy, projected to increase to 71,100 afy by 2020, the City of Chino would have sufficient opportunity to take delivery to meet their projected recycled water demand.

3.4.5 Recycled Water for Groundwater Basin Recharge

IEUA also assumes responsibility for delivery of recycled water to Chino Basin for recharge. All future direct use of recycled water will be given priority service over recharge deliveries. Recycled water recharge for the year 2000 was approximately 500 af. By the year 2020, it is projected that 28,000 afy will be recharged.

A major addition to the Regional Recycled Water Distribution System is the redevelopment and modification of the existing Chino Basin groundwater recharge facilities. These basin have been used primarily for flood control, and as part of the OBMP, the recharge basins will help "drought-proof" the Basin. Redevelopment of the basins will take place beginning in 2001 through the end of 2003. The Basins will be

[7] City of Chino, Urban Water Management Plan Update, January 2002

enhanced to capture storm water and provide for the greater ability to import and store water in the Basin.

Recycled recharge water is credited to signers of the Regional Sewer Service Contract, based on the percentage of wastewater flow delivered to the Regional Reclamation Plants by the respective agencies. This provides additional groundwater pumping rights calculated annually as stored water credits. In FY 2001-02, the City of Chino received 51.1 af (1/10 of the total af recharged) of water rights as a result of recycled water recharge activity. The City may chose to offset production with the credits or produce more.

4.0 RELIABILITY OF WATER SUPPLIES

The City of Chino and the region are facing increasing challenges and opportunities in its role as stewards of water resources in the region. IEUA's boundaries lie almost entirely within the Chino Groundwater Basin. IEUA is working in cooperation with each of the water management agencies within the Chino Basin to achieve water supply reliability, water quality and watershed management goals for the Santa Ana River Watershed and Southern California region.

The Southern California region faces a challenge between satisfying its water requirements and securing its firm water supplies. Increased environmental regulations and the collaborative competition for water from outside the region have resulted in reduced supplies of imported water. Continued population and economic growth increase water demand within the region, putting an even larger burden on local supplies.

The Preserve proposes 9,779 dwelling units on approximately 5,435 gross acres, including 626 acres for business use, 586 acres for public facilities, and 2,987 acres for open space. Total water demand for The Preserve is proposed at 11,317 afy (10.1 mgd): 6,835 afy (6.1 mgd) of potable water and 4,482 afy (4.0mgd) of recycled water. The Preserve presents an opportunity to demonstrate reliability of water supply for this project and the region into the future.

The following agencies work cooperatively to ensure reliability to the region: Inland Empire Utilities Agency, Metropolitan Water District of Southern California, Chino Basin Watermaster, Chino Basin Water Conservation District, Santa Ana Regional Water Quality Control Board, and Santa Ana Watershed Project Authority.

4.1 Inland Empire Utilities Agency (IEUA)

The City of Chino is a member agency of the IEUA. Other agencies within the IEUA service area include the City of Chino Hills, Cucamonga County Water District, Fontana Water Company, Monte Vista Water District, City of Ontario, San Antonio Water Company, and the City of Upland.

IEUA was formed in 1950 to become a member of MWD for the purpose of importing supplemental water, augmenting local stream and groundwater supplies. Since its formation the agency has expanded its services to include production of recycled water, distribution of imported and recycled water supplies, sewage treatment, co-composting of manure and municipal biosolids, desalinization of groundwater supplies and disposal of non-reclaimable industrial wastewater and brine. IEUA serves a population of approximately 700,000, through the following water supplies.

4.1.1 Imported Water

The Metropolitan Water District of Southern California (MWD) provides imported water supplies to IEUA. Since the 1980's the total regional retail water demands within MWD's service area has increased from about 3.0 maf to 3.9 maf in 1999. Between 1990 and 1999, MWD supplied approximately 40 percent of total water demand in the IEUA service area.

4.1.2 Desalter Water

Secondary Effect of Chino I Desalter Expansion and Chino II Desalter Project

The installation and operation of the Chino Basin Desalters is part of the overall OBMP program to enhance basin water supplies, enhance water quality and carry out management of the Chino Basin's groundwater aquifers for the long-term supply of the existing and future population of the areas. The key concept in the OBMP is that the whole program will be implemented to achieve these objectives. The OBMP evaluation of groundwater impacts concludes that implementation of the whole program would not cause significant changes in groundwater levels within the Basin's aquifers. According to the OBMP program element that encompasses the desalters, groundwater production supply to the desalters is to be offset by a program to recharge storm water, State Project Water and recycled water into the Basin. In fact, based on forecast demand, the net result of additional extraction by desalters will be less than one-half the estimated volume of recharge.

According to the Chino I Desalter Expansion and Chino II Desalter Project Environmental Impact Report, Geoscience's Chino Desalter System Projects model forecasts a lowering in groundwater level within the proposed project's area of potential effect. This change in elevation of the groundwater table within the area of potential effect has a potential to interfere with a number of private and public water production wells. However, implementation of mitigation measures will reduce the forecasted potential environmental effects of lowering the groundwater to the lowest achievable level.

One of the secondary or indirect effects of lowering the groundwater table near the Santa Ana River is an inducement of greater recharge from the river to the project area. One of the identified objectives of the OBMP is to increase the amount of safe yield within the Chino Basin and implementation of the proposed desalter projects will contribute to this objective. The OBMP PEIR discussed the existing volume of flow in the Santa Ana River and potential changes resulting from implementation of the OBMP. The five-year moving average flow in the Santa Ana River has ranged between 250,000 and 310,000 afy since 1992. The annual replenishment obligation that must be delivered downstream of Prado Dam to Orange County is 42,500 afy. The near-term (five-year) decrease in quantity of river outflow at Prado Dam is forecast to be 3,000 afy. Over the long-term, the average decrease in quantity of river outflow due to the project is forecast to be 6,000 afy. When place in the context of the five-year running average of 250,000 afy, the loss of 3,000 to 6,000 afy is not a significant impact[8].

Future Desalters

In ten years or the conversion of 20,000 acres of agricultural lands, the Watermaster will need to determine if future desalters are necessary to implement the OBMP. If it is determined they are necessary, then the CDA will have 36 months to secure sufficient funding from state or federal sources to pay for all the capital costs. If funding is unavailable, then there is no obligation to construct future desalters, and instead will

[8] Chino I Desalter Expansion and Chino II Desalter SEIR, November 2001

attempt to negotiate new terms and conditions with the producers within 24 months to accomplish implementation efforts of the OBMP.

4.1.3 Recycled Water

Current use of recycled water is 5,600 afy in the IEUA service area. Recycled water use is expected to increase to 100,000 afy with a total utilization of about 70,000 afy with the development of a recycled water program for landscape irrigation (29,000 af), groundwater recharge (producing 28,00 afy of increased yield from the Basin), industrial use (13,000 af) and agricultural use (100 af)[9]. As storm water recharge is increased, a greater percentage of recycled water can be recharged to the Basin through blending with the higher quality natural waters.

By the year 2020, over 70,000 afy of recycled water is expected to be available within the IEUA service area. This represents about 60 percent of the recycled flow in 2020. Over 40,000 afy will be discharged downstream into the Prado Basin flowing into the Santa Ana River to Orange County. IEUA's goal is to fully utilize the recycled water supply for local beneficial uses. When blended with storm water during wet years and with imported water, the recycled water will help replenish groundwater supplies within the Basin. Maximizing the use of recycled water will reduce the dependence on imported water within the Basin by 50,000 afy at the present rate of flow, and, by more than 70,000 afy within 20 years.

To accomplish this, IEUA has recently completed their Recycled Water System Feasibility Study of project alternatives. The feasibility study identifies that Phase 1 of the Regional Recycled Water Distribution System Program would include recharge basin upgrades/expansions, new basins, regional recycled water pipelines, pumping and storage facilities, and local recycled water pipelines.

IEUA's goal is to construct the Regional Recycled Water Distribution System within 10 years to maximize reuse. The regional system will reduce, and thereby conserve imported water to the Basin and will also conserve natural or storm water, in compliance with the existing Santa Ana River Basin Water Quality Control Plan, the OBMP, and the IEUA Urban Water Management Plan. The California State Legislature has made it mandatory for major water users to use recycled water, if the resource is readily available and meeting specific regulations.

According to IEUA Ten-Year Capital Improvement Plan (Fiscal Year 1997-98 through 2007-08) CCWRF, RP-5 and RP-1 have the potential to expand capacity significantly over the next forty years. This two-source supply increases the reliability of the system. For the supply of recycled water demands in Subarea 2, adequate resources are available. Such reliability is important to an emergency event whereby the potable source may be rendered incapable of supplying enough water.

IEUA has been active in seeking grant funding to match the capital investment of IEUA in the construction of the Regional Water Distribution System. IEUA has been seeking funding opportunities through the following sources: 1) Proposition 13, the Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act, funds through five agencies, 2) Clean Water Act and Water Quality Planning Grants through

[9] IEUA Recycled Water System Feasibility Study, Final Draft, October 2001

the US Environmental Protection Agency; 3) US Bureau of Reclamation under the Southern California Initiative, Southern California Comprehensive Water Reclamation and Reuse Program; and 4) an energy conservation funding grant through the California Energy Commission under AB 970.

4.2 Metropolitan Water District of Southern California (MWD)

Inland Empire Utilities Agency is a member agency of the MWD. MWD is a public agency that provides supplemental imported water from Northern California (State Water Project) and the Colorado River to 27 member agencies located in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura Counties.

As a water wholesaler, MWD has no retail customers. It distributes treated and untreated water directly to its member agencies. The district provides an average of 60 percent of the municipal, industrial and agricultural water used within its service area. The remaining 40 percent comes from local groundwater, local surface water, recycled water, and from the City of Los Angeles Aqueduct in the eastern Sierra Nevada.

MWD's primary goal is to provide reliable water supplies to meet the water needs of its service area at the lowest possible cost. MWD's 100 percent reliability has continued to decline as existing imported water supplies from the Colorado River and State Water Project face increasing challenges.

To address these challenges, MWD and its member agencies developed an Integrated Water Resources Plan (IRP) in 1996. The overall objective of the IRP process is the selection and implementation of a Preferred Resource Mix (or strategy) consisting of complementary investments in local water resources, imported supplies and demand-side management that meet the region's desired reliability goal in a cost-effective and environmentally sound manner. The 1996 IRP was reviewed as part of MWD's strategic plan and rate refinement to guide the development and implementation of revised MWD water management programs through the year 2005.

MWD also provides financial support for local water projects implemented by its member agencies that contribute to an increase in the reliable water supplies available to the region. Currently, MWD sponsors two programs: 1) Local Resources Program that promotes the construction of recycled water and recovered groundwater projects, and 2) financial and technical assistance for implementing water conservation Best Management Practices. MWD also is responsible for distributing $45 million in funds from Proposition 13 funding for development of conjunctive management programs in Southern California.

As demand forecasts are refined, supply goals are also refined. MWD has consistently supplied over 50 percent of water supplies to the Southern California region. To continue to accomplish this, MWD continues to approve new and innovative projects and programs to ensure reliability. For example, in August 2001, MWD took action to move forward initiatives to bolster future supplies by supporting seawater desalination projects, increased commercial conservation efforts, improve water quality by decreasing salinity in supplies from Northern California and the Colorado River, increased underground storage and retrieval facilities, adopted principles for establishing cooperative programs, and endorsed legislation that would further water reliability.

4.3 Water Facilities Authority – Joint Power Agency (WFA)

The City of Chino is one of five members of the WFA. Other members include the Monte Vista Water District, and the cities of Upland, Ontario, and Chino Hills. The WFA is permitted to treat and deliver 81 mg of State Water Project water through an MWD import water connection in the City of Upland. MWD's Rialto Branch of the Foothill feeder delivers water to the Agua de Lejos Plant for treatment. The City of Chino is entitled to 5.9 percent, or approximately 5,267 afy (4.7 mgd), of the 81 mg. The City can take delivery of more than its entitlement when other WFA members are not taking delivery of their full entitlements. This water enters the potable water distribution system of the City at Benson Avenue and State Street.

4.4 Chino Basin Watermaster

The Chino Basin Watermaster was established in 1978 by a judgment entered by the Superior Court of California. The Judgment required that the Watermaster develop a management plan for the Chino Groundwater Basin that meets water quality and water quantity objectives for the region.

In February 1998, the Superior County appointed a nine-member Board as Interim Watermaster for 26 months; March 1998 to June 2000. The Court directed the Interim Watermaster to develop and submit the optimum basin management program (OBMP) for the Chino Basin.

In 1998, the Chino Basin Watermaster developed an integrated set of water management goals and actions for the Basin. Know as the Optimum Basin Management Program (OBMP), this document describes nine program elements to meet the water quality and local production objectives in the Basin. The OBMP encourages the increased use of local supplies to help "drought proof" the Basin.

In July 2000, the Watermaster's planning process culminated with the adoption of a "Peace Agreement" that ended over 15 years of litigation within the Chino Basin. The Peace Agreement outlines the schedule and actions for implementing the OBMP.

Between 1990 and 1999, local sources supplied about 60 percent of the water demand within IEUA's service area and 38 percent within the City of Chino. In an effort to continually clean up and enhance the safe yield of the Chino Basin, the City of Chino has worked integrally with IEUA to explore various methods of Organics Management with the goal of reducing and ultimately eliminating the salts from the Basin. Pilot projects are currently being constructed within the City of Chino and other areas within the IEUA service area that will convert dairy manure to methane gas for generating electricity and composting manure for retail sale.[10]

[10] City of Chino, Urban Water Management Plan Update, January 2002

4.5 Chino Basin Water Conservation District (CBWCD)

CBWCD was established in 1949 to protect and replenish the Chino Groundwater Basin with rainfall and stormwater runoff from the San Gabriel Mountains. CBWCD uses an system of percolation ponds and spreading grounds to augment the natural capacity of the region to capture runoff for the recharge of the groundwater basin. CBWCD also promotes water conservation through public education programs.

4.6 Santa Ana Watershed Project Authority (SAWPA)

SAWPA was formed in 1972 as a joint powers agency for the purpose of coordinating regional planning within the Santa Ana Watershed to address water quality and supply improvements. SAWPA is comprised of five major water supply and wastewater management agencies within the Santa Ana Watershed; Inland Empire Utilities Agency, Eastern Municipal Water District, Orange County Water District, San Bernardino Valley Municipal Water District and Western Municipal Water District.

Since the early 1970's, SAWPA has held a key role in the development and update of the Regional Basin Plan for the Santa Ana Regional Water Quality Control Board. SAWPA conducts water-related investigations and planning studies, and builds facilities needed for regional water supply, wastewater treatment or water quality remediation. Current studies include the Chino Basin Water Resources Management Study, the Colton-Riverside Conjunctive Use Project, an investigation of water quality in Lake Elsinore and studies on the nitrogen and organic carbon levels in the Prado Basin.

In order to facilitate develop of improvements to the local water supply system, SAWPA adopted an Integrated Resource Plan in June 1998. SAWPA conducted a stakeholder process, which resulted in identifying potential projects with a total estimated cost of over $1 billion. Approved in March 2000, State Water Bond Act (Proposition 13) was approved including $235 million to the Southern California Integrated Watershed Program (SCIWP). On July 17, 2000 the State Water Resources Control Board (SWRCB) entered into a memorandum of understanding to set forth general procedures and criteria for selecting projects to be funded by SCIWP for the Santa Ana River Watershed. On August 1, 2000, SAWPA approved an Initial Project Priority List of 44 projects with an estimated cost of $689 million, and adopted a policy to ensure that the List is reviewed and updated periodically to ensure timely and cost-effective use of funds.

The Chino Basin received $87 million for the construction of water desalters, groundwater recharge facilities and new wells, of which $48 million has been allocated by SAWPA and the SWRCB for the Chino I Desalter Enhancement and construction of the new Chino II Desalter. This is part of the $235 million approved for the Santa Ana River Watershed, subject to administration by SAWPA.

4.7 Santa Ana Regional Water Quality Control Board

The Santa Ana Regional Water Quality Control Board (SARWQCB) is responsible for the development and enforcement of water quality objectives to meet the requirements of the Federal Clean Water Act, California Porter-Cologne Act, and the National Pollution Discharge Elimination System (NPDES).

In 1975, the SARWQCB completed the Water Quality Control Plan for the Upper portion of the Santa Ana Watershed. The plan outlines specific water quality management actions to address water quality and salt (total dissolved solids - TDS) build up in the Chino Groundwater Basin. These include the construction of a large well field and desalters in the lower part of the Basin to extract and treat poor quality water, the construction of a pipeline to export brines from the upper Basin to the ocean, and the use of large volumes of low TDS water for groundwater recharge. The desalter water projects render (via treatment) unusable groundwater usable for potable water purposes.

Since 1975, a brine line (Santa Ana River Interceptor or SARI line) has been built and is in operation. In addition, two groundwater desalting plants are in place. The 2000 Optimum Basin Management Plan by the Chino Basin Watermaster has been developed to meet the requirements of the 1975 plan.

4.8 Water Shortage Plans

4.8.1 City of Chino Water Shortage Contingency Plan

The City of Chino has adopted a Water Shortage Contingency Plan, known as the Water Conservation Ordinance, amended, Chapter 13.05 of the Municipal Code. This Plan includes catastrophic interruption, mandatory prohibition, penalties, consumption reduction methods, rationing allocation method, reduction measuring mechanism, and an emergency fund, and is further discussed in Section 4.9 below.

As a member agency of the IEUA, the City of Chino also has adopted and benefits from MWD's Water Surplus and Drought Management Plan.

4.8.2 MWD Water Surplus and Drought Management Plan

MWD has taken the lead on drought planning for the southern California region. In 1999, MWD developed the Water Surplus and Drought Management (WSDM) Plan. This plan addresses both surplus and shortage contingencies. IEUA, and the City of Chino as a member agency of IEAU, have adopted and follow the MWD WSDM Plan. Each year, MWD considers the level of supplies available and the existing levels of water in storage to determine the appropriate management stage for that year. Each stage is associated with specific resource management actions designed to avoid an Extreme Shortage to the maximum extent possible and minimize adverse impacts to retail customers should an Extreme Shortage occur. MWD's resource management will allow shortages to be mitigated without impacting municipal and industrial customers, except in severe or extreme shortages or emergencies. MWD's extensive analysis of system resources demonstrated that the expected occurrence of a Severe Shortage is four percent or less in most years and it never exceeds six percent. This equates to an expected shortage occurring once every 17 to 25 years.

MWD tested the WSDM Plan by analyzing its ability to meet forecasted demands. The results indicated 100 percent reliability for full-service non-discounted demands through the forecast period under foreseeable hydrologic conditions. To determine the data presented in Table 4-1, MWD examined the hydrologic record and its impacts on the supply/demand balance to finding the worst three-year sequence of 1990-1991-1992 for its service area.

Table 4-1
MWD Demand/Supply Balance
Multiple-Dry Year, Single-Dry Year, and Average Year

	Near Term			Long Term			
Scenario	**2001**	**2002**	**2003**	**2005**	**2010**	**2015**	**2020**
Multiple Dry Years							
Demands							
Retail	4.19	4.05	3.99	4.16	4.40	4.65	4.94
GW Replenishment	0.18	0.17	0.16	0.17	0.17	0.17	0.18
Total	**4.37**	**4.22**	**4.15**	**4.33**	**4.57**	**4.82**	**5.12**
Supply							
Local	2.05	2.04	2.06	2.13	2.32	2.46	2.55
Metropolitan	2.32	2.18	2.09	2.20	2.25	2.36	2.57
Total	**4.37**	**4.22**	**4.15**	**4.33**	**4.57**	**4.82**	**5.12**
Single Dry Year							
Demands							
Retail	4.04			4.21	4.46	4.71	5.03
GW Replenishment	0.17			0.17	0.17	0.18	0.19
Total	**4.21**			**4.38**	**4.63**	**4.89**	**5.22**
Supply							
Local	2.28			2.47	2.66	2.80	2.90
Metropolitan	1.93			1.91	1.97	2.09	2.32
Total	**4.21**			**4.38**	**4.63**	**4.89**	**5.22**
Average Year							
Demands							
Retail	3.91			4.07	4.31	4.55	4.85
GW Replenishment	0.16			0.16	0.16	0.17	0.18
Total	**4.07**			**4.23**	**4.47**	**4.72**	**5.03**
Supply							
Local	2.18			2.33	2.52	2.64	2.73
Metropolitan	1.89			1.90	1.95	2.08	2.30
Total	**4.07**			**4.23**	**4.47**	**4.72**	**5.03**

Source: The Regional Urban Water Management Plan for the Metropolitan Water District of Southern California, December 2000

Notes:

MWD supplies include imported supplies, storage programs and transfers

Multiple Dry Years for 2001-2003 are based on the worst three-year sequence from the historical hydrologic record (1990-1991-1992)

Single Dry Year is based on the single worst year from the historical hydrologic record (1977)

Average Year is based on the average over all years in the historical hydrologic record (1922-1998). In average years, MWD will be adding water to storage, but the additional water supplies are not reported in this table.

Using its resource simulation model IRPSIM, MWD projected the three-year water supply situation, including climate and watershed conditions, on the projected demands for 2001-2002-2003. The model simulated the supply, demands, and the operation of MWD's system to determine its ability to meet those demands. The simulation showed that, despite using the worst three-year sequence of hydrology, MWD would meet its demands through a combination of imported supply, withdrawals from storage programs, and transfers. The same model was used for a single dry year, and again, the simulations predicts that MWD would meet its demands under the single worst dry year scenario. The simulation also showed that MWD would be able to meet all full-service, non-discounted demands during average conditions. In fact, in average years MWD would be adding water to storage, but the additional water supplies are not reported in Table 4-1.

Additional MWD Catastrophic Loss Planning Measures

To safeguard the region from a catastrophic loss of water supply, MWD and its member agencies have made and are continuing to make substantial investments in emergency storage and interconnections with adjacent water purveyors. MWD's emergency plan assumes that demands are reduced 25 percent from the 2020 baseline demand forecast through extraordinary conservation., while the local supplies are largely undisrupted. With few exceptions, MWD asserts it can deliver emergency supply from its Diamond Valley Lake Reservoir throughout its service area via gravity, thereby eliminating dependence on power sources that could also be disrupted by a major earthquake. MWD's WSDM Plan will guide management of available supplies and resources during an emergency.

IEUA recently completed its emergency response plan for its service area. IEUA expects to meet emergency demands within the region through extraordinary conservation and groundwater pumping measures. Multiple sources of power exist within the service area making any electrical shortages a temporary disruption. In addition, IEAU is pursuing additional mutual aid agreements between local retail agencies.[11]

4.9 Water Conservation as a Reliable Water Source

As signatory to the Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California, IEUA has made the State-mandated Best Management Practices (BMP) for water conservation the cornerstone of its conservation programs and a key element in the overall regional water resource management strategy. As a member of IEUA, the City of Chino benefits from regional programs performed on behalf of its member agencies.

Current IEUA conservation programs are saving over 6,000 afy in the IEUA service area. Programs will be significantly expanded by 2020, and IEUA expects to reduce water demands by 24,000 acre-feet of water, or about 7 percent. During the period of 2000 – 2005, IEUA is increasing its funding of water conservation programs[12].

[11] Agreement between City of Fontana and the Cucamonga County Water District was developed in 1999.
[12] IEUA Urban Water Management Plan Year 2000 Update, December 2000

These savings directly relate to additional available water, both groundwater and imported water, for beneficial use within the IEUA service area, including the City of Chino.

Regional programs implemented by IEUA that benefit all member agencies, including the City of Chino:

- BMP 1 – Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers. Free residential indoor and outdoor water use surveys offered to the top 20 percent of water users, and to others as requested.
- BMP 2 – Residential Plumbing Retrofits. Distribution of showerheads, aerators and toilet tank leak detection tablets at community fairs, business expos, and during Water Awareness Month.
- BMP 3 – System Water Audits, Leak Detectors, and Repair. Each local agency, including the City of Chino, maintains an active distribution system auditing program. This program evaluates the systems unaccounted-for water loss with a goal to stay under 6 percent. The City of Chino is consistently at 5 percent.
- BMP 4 – Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections. Assists local agencies with a feasibility study examine incentive programs to move landscape water uses on mixed-use meters to dedicated landscape meters. This program is expected to be complete in the near future.
- BMP 5 – Large Landscape Conservation Programs and Incentives. Large landscape irrigation surveys are offered resulting in Landscape Irrigation Budgets to cost effectively achieve quantifiable water savings.
- BMP 6 – High-Efficiency Washing Machine (HEWM) Rebate Programs. Promotion of HEWMs through consumer education and manufacturer incentives.
- BMP 7 – Public Information Programs. Promotes water conservation in coordination with local agencies. Distribution of public information through bill inserts, brochures, community speakers, special events, and Web pages.
- BMP 8 – School Education Programs. IEUA and the local agencies formed the Water Education Water Awareness Committee (WEWAC) in 1989. WEWAC works with the school districts to promote water conservation, acquaints children and adult consumers with the critical importance of water, provides them with information on water use efficiency, and sponsor teachers' Project Water Education for Teachers (WET) training. Promotion and use of water education programs developed and supported by MWD.
- BMP 9 – Conservation Programs for Commercial, Industrial and Institutional Accounts. Provide water use audits to commercial/industrial/institutional customers. During 1996, local agencies participated in MWD's CII Analyst Survey Program. Based on full implementation of the recommendations contained in he surveys, water demand in three participating agencies alone would be reduced by 420 acre-feet annually.

- BMP 10 – Wholesale Agency Assistance Program. IEUA provides conservation-related technical support and information to member agencies, including ULFT replacement, residential retrofits; CII surveys; residential and large turf irrigation; and conservation-related rates and pricing.
- BMP 11- Conservation Pricing. IEUA assists local agencies to implement inclining multi-block rate structures. IEUA also established a new rate for recycled water to provide an economic incentive for the use of the supply.
- BMP 12 – Conservation Coordinator. IEUA has a designated Conservation Coordinator for conservation programs and BMP implementation, and coordination with local agencies.
- BMP 13 – Water Waste Prohibition. IEUA supports "No Waste" ordinances adopted by local agencies, which are actively enforced.
- BMP 14 – Residential ULFT Replacement Program. IEUA initiated its ultra-low-flush-toilet (ULFT) program in 1991. Includes direct installation, rebate, and high school distribution programs. MWD co-sponsored ULFT programs with member agencies, each paying an equal portion of the cost per toilet. Water savings associated with the 13,000 ULFTs installed to date is equal to an estimated 521 afy, and $182,000 in avoided water purchases. IEUA plans to continue this program and retrofit an additional 15,000 toilets through 2005. Additional water savings for these 15,000 ULFTs is estimated at 601 afy for a total water savings from ULFT replacement at 1,122 afy by the year 2005.

Along with the regional benefit of IEUA BMP programs, the City of Chino has specifically implemented the following conservation programs:

- Ultra Low Flush Toilet Retrofit Program
- School Education Program
- Commercial/Industrial/Institutional Water Survey Program

Additional conservation or water use efficiency measures or programs implemented by the City of Chino include the following:

Metering

The City requires, including development of The Preserve, water meters throughout its distribution system, including all residential, commercial, industrial, government and landscaping accounts. Any unmetered use generally occurs at fire hydrants or from distribution system breaks. Annual estimates are made for this usage.

To increase the efficiency of water meter calibration, the City contracts with a company to calibrate meters greater than 2 inches. This calibration is generally performed on an annual basis. Meters 2 inches and smaller are replaced once every 10 years on the average. Meter calibration and periodic replacement insures that customers are paying for all of the water they consume, therefore encourages conservation.

Unaccounted-For Water Loss

The City's historic low unaccounted-for water loss suggests that leaking pipelines, uncalibrated water meters, service line breaks, and other unusual events are not significant factors within the City's water system. The industry standard, based on the American Water Works Association, for unaccounted-for water loss is no more than 9-10 percent. The City of Chino typically experiences a 5 percent water loss, which is well below the industry threshold.

Landscape Conservation

The City of Chino enforces landscaping requirements for all new industrial and commercial developments. Included is a requirement that landscape plans be designed by a registered landscape architect and that they include automatic irrigation systems, rain shutoff devices, in-line check valves to prevent low head drainage, and separate landscaping meters. Suggestions and recommendations are made regarding the use of xeriscape landscaping techniques based on conserving water through limiting the size of turf areas, maximizing the use of drought tolerant (low water consuming) plants, and appropriate maintenance.

A xeriscape garden has been planted on San Bernardino Avenue between Monte Vista Avenue and Ramona Avenue by the Chino Conservation District. The garden is open to the public and is designed to show that xeriscape can offer an attractive, cost-effective and water-efficient landscaping alternative.

The City requires that all new commercial and industrial landscape areas include rain-override devices. The rain override device cancels irrigation cycles when rain is present.

The California Irrigation Management Information System (CIMIS), developed by the University of Fresno, has a check-station in Chino, and monitors precipitation and evapotranspiration levels. The CIMIS information programs the irrigation cycles and watering time for the City's public lands, reducing irrigation when allowable. This program is quite effective and is being monitored by the Grounds Section of the Public Works Services Department. This program also benefits water quality through the management of runoff.

Current landscaping measures for City property include mulching to reduce evapotranspiration, seasonal adjusting of turf heights, and studies on the use of subterranean irrigation systems. These studies are being conducted at the Civic Center facilities. Initial observations indicate that plants watered by subterranean methods tend to accumulate more dirt and dust than plants that are watered by regular sprinklers; otherwise, the system is very efficient. The dirt/dust problem is mitigated by occasional conventional irrigation.

Telemetry

The City has implemented a telemetry system to monitor the City's water production and usage. The system alerts City personnel to water production levels, aids in the prevention of water reservoir overflows, and increases energy efficiency.

Public Education

The City's public education program includes water use efficiency and conservation literature available at the City's Department of Public Works Office.

Water Conservation Ordinance

The City adopted a Water Conservation Ordinance in 1991, amended, Chapter 13.05 of the Municipal Code. The Ordinance identifies actions to be taken by water consumers within the City during periods of adequate water supply, during moderate water shortages, and during high water shortages. Each shortage stage includes such actions as limiting outside irrigation, leak repair, avoiding water use during peak demand hours, and reduced overall water usage.

Water for public health, safety and welfare, water for maintenance of water facilities, and "grey water" use are all exempt from mandatory reductions. Hardship or special case guidelines are established by the City Manager's Office.

Penalties are imposed for violations of prohibited activities as follows:

1st Violation – Warning
2nd Violation – Final Warning
3rd Violation – $50 Fine
4th Violation – $100 Fine
5th Violation – Possible flow restricting device for domestic meters and termination of landscape meters

4.10 Reliability Comparison

The City's current average water demand is 15,145 afy (13.52 mgd). The annexation and buildout of Subarea 2 will significantly increase this demand, generating an additional need for 6,835 (10.1 mgd) of potable water and 4,482 afy (4.0 mgd) of recycled water.

Table 4-2 shows the historical water demands for the City of Chino as reported in the IEUA Urban Water Management Plan Year 2000 Update, Table 2-4.

Table 4-2
City of Chino Historical Water Demands

	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00
Groundwater	9,074	8,893	8,765	7,286	3,014	8,530	9,373	10,231	8,821	10,081	9,694
Imported	378	3,692	3,180	4,705	6,266	4,108	4,322	4,325	4,182	4,071	5,451
Recycled											100

Table 4-3 shows water demand in the City of Chino service area for an average or "normal" water year, a single-dry year, and multiple-dry years. Since 2000 was considered a drier than normal year, 1995/96 through 1998/99 were averaged to use a base normal year for groundwater and imported water. Desalted water is shown based on total contract availability and use, and recycled water is shown based on current use. According to MWD, data shows that San Bernardino semi-arid region, during periods of dry weather, would demand approximately 8 percent more urban water than in a "normal" weather year.

Table 4-3
Water Demand/Supply Reliability
City of Chino, including Subarea 2
(afy)

	Average/Normal Water Year	Single-Dry Year	Multiple-Dry Years		
			Year 1	Year 2	Year 3
Groundwater	9,627	10,147	10,147	10,857	11,780
Imported	4,225	3,633	3,633	3,218	2,850
Desalted	3,000	3,000	3,000	3,000	3,000
Recycled	1,000	1,000	1,000	1,107	1,268
Total Supply	17,202	17,780	17,780	17,912	18,898
Total Demand	13,202	14,258	14,258	17,064	17,064
Surplus Supply	4,000	3,522	3,522	848	1,834

Notes: Factors based on IEUA Urban Water Management Plan Update Year 2000, Table 3-14
Groundwater Factors: single-dry year = 1.054; multiple-dry year 2 = 1.07, dry year 3 = 1.085
Imported Factors: single-dry year factor = <1.163>; multiple-dry years 2 and 3 = <1.129>
Total Demand Single- and Multiple-Dry Year Factors = 1.08

Both MWD and IEUA have demonstrated that water supplies would meet demand in normal, single-dry, and multiple-dry years[13]. According to MWD, data shows that during periods of dry weather, the southern California semi-arid region would demand approximately 8 percent more urban water than in a "normal" weather year. Multiple-dry years would be met with increased conservation measures and programs, resulting in a constant demand increase from normal year of 8 percent.

IEUA demonstrates in the Regional Urban Water Management Plan Year 2000 Update that implementation of groundwater banking, the Regional Recycled Water System, and desalter projects, will enhance supply and reliability water sources, while dependence on imported water significantly decreases.

[13] The Regional Urban Water Management Plan for The Metropolitan Water District, December 2000, and IEUA Urban Water Management Plan Year 2000 Update, December 2000

5.0 CONCLUSION

The City of Chino optimizes its water resource supply through an integrated resource approach, utilizing available water programs and projects. The City receives its water supplies from groundwater, desalted water, imported water, and recycled water. Complexities and continuing refinement in groundwater management and rights, evolving development of the regional recycled water system and supplies, desalter expansion and projects, and challenges of imported water reliability make analysis of water demand and supply complicated. This water supply analysis is considered at a point in time when known future projects are considered. It is also understood that new and innovative programs and projects in concept are yet to be designed. Therefore, water supply assessments should be a part of the ongoing planning efforts of the City to optimize its water resource program.

This water supply assessment identifies water supply and reliability to the City, now and into the future, including a sufficient water supply for Chino Subarea 2. Phasing of Subarea 2 will generally occur over time intended to minimize impacts to local areas. This development phasing plan allows for water demands to be met almost entirely from sources that are currently being planned, developed and implemented, including desalter water, recycled water, and conservation programs. Groundwater demand could remain relatively stable throughout the forecast period with maximum use of these alternative sources.

Water Demand

The City's current average demand is approximately 15,345 acre-feet per year (afy). The annexation and build out of Subarea 2 will increase water demand by year 2035 by approximately 11,317 afy of water (6,835 afy of potable water and 4,482 afy of recycled water).

Demand and Supply Projections

Analysis of water demand and supply projections for the City, including Subarea 2, demonstrate that projected supplies exceed demand through the year 2035. These projections consider land use, water development programs and projects, and water conservation. Analysis shows that as desalted water and recycled water use are maximized, groundwater and imported water will remain stable. Recycled water will supply areas currently supplied with potable water, and desalted water will supply areas currently using available groundwater and imported water.

Additionally, the City has the opportunity to increase supply to meet demand through the following measures: 1) production of groundwater over entitlement based on safe yield limitations; 2) increasing imported water purchases; 3) purchasing additional desalted water if more is produced than needed to satisfy requirements of other purchasers, and 4) purchasing additional recycled water in proportion to its increased contribution of effluent, plus additional surplus when available when other members are not taking their full entitlement, which will be changed to no maximum entitlement with completion of the Regional Recycled Water System, which merges all the recycled plants together. Collectively, these additional options will enable water supply to exceed water demand for the City of Chino now and into the future.

6.0 BIBLIOGRAPHY

The following documents were used, in conjunction with discussions with the City of Chino, Chino Basin Watermaster, and Inland Empire Utilities Agency, in preparing this water supply assessment:

Chino Basin Desalter Authority, *Draft Subsequent Environmental Impact Report Chino I Desalter Expansion and Chino II Desalter Project,* November 2001

Chino Basin Desalter Authority, *Initial Study for the Chino I Desalter Expansion and Chino II Desalter Project,* October 2001

Chino Basin Watermaster, *1978 Chino Basin Adjudication Judgment,* January 1978

Chino Basin Watermaster, *Judgment Post Trial Memorandum,* July 1978

Chino Basin Watermaster, *Peace Agreement Chino Basin,* June 2000

Chino Basin Watermaster, *Implementation Plan, Optimum Basin Management Program for the Chino Basin,* June 2000

Chino Basin Watermaster, *Chino Basin Watermaster Rules and Regulations,* June 2001

Chino Basin Watermaster, *Fiscal Year 2001-2002 Assessment Package,* October 2001

City of Chino, *Urban Water Management Plan Update*, January 2002

Inland Empire Utilities Agency, *Urban Water Management Plan Year 2000 Update,* December 2000

Inland Empire Utilities Agency, *IEUA Recycled Water System Feasibility Study, Final Draft*, October 2001

Metropolitan Water District of Southern California, *The Regional Urban Water Management Plan for the Metropolitan Water district of Southern California,* December 2000