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8 ORANGE COUNTY WATER DISTRICT  
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13 STATE WATER RESOURCES CONTROL BOARD  
14 OF THE STATE OF CALIFORNIA  
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In the Matter of State Water Resources Control ) Application No. 31174  
Board Hearing on Water Rights Applications )  
31165 and 31370 of San Bernardino Valley ) DIRECT TESTIMONY OF BILL B.  
Municipal Water District and Western ) DENDY OFFERED JOINTLY ON  
Municipal Water District of Riverside County; ) BEHALF OF APPLICANTS  
Application 31174 of Orange County Water )  
District; Application 31369 of Chino Basin ) Date: May 2, 2007  
Watermaster; Application 31371 of San ) Time: 9:00 a.m.  
Bernardino Valley Water Conservation District; ) Location: Cal EPA Building  
and Application 31372 and Waste Water ) Coastal Hearing Room  
Change Petition WW-0045 of the City of )  
Riverside. )  

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1 as Executive Officer and served in that capacity until mid 1977. In the thirty years since  
2 then I have worked on many water resources management issues both within California and  
3 beyond, but I have always maintained a relationship with SAWPA and its Member  
4 Agencies as they expanded their efforts in IRWM. I also serve as a court-appointed  
5 member of the Santa Ana River Watermaster (SARWM). Exhibit JOINT 1-2 is my resume.

6 THE SANTA ANA RIVER.

7 6. The River is divided geographically into Upper and Lower Watersheds that  
8 are delimited by Prado Dam, a flood control facility located on the River where it cuts  
9 through the Santa Ana Mountains section of the Coast Ranges. The dam was completed in  
10 1941 in response to the devastating flood of 1938 that inundated much of Orange County.  
11 The caprices of the hydrologic cycle are well illustrated by the fact that the resident dam  
12 tender never once had to open the valves to let flood water pass through until 1969, twenty-  
13 five years later, but in the ensuing 37 years there have been six years when the annual flow  
14 through Prado exceeded the flow in 1969. The higher frequency of higher flows is  
15 attributable to more wet years on top of higher base flows that result mostly from higher  
16 upstream municipal wastewater discharges. During those 37 years the annual rainfall at the  
17 SARWM's index precipitation station has exceeded the long term average ten times.

18 7. Exhibits JOINT 1-3 and 1-4 are, respectively, a bar graph, labeled "Plate 5",  
19 of the annual base flow and storm flow at Prado since the 1934-35 water year, and a map,  
20 labeled "Plate 2", showing the locations of upstream municipal wastewater treatment  
21 plants and brine export pipelines. Both are excerpted from the annual report of the  
22 SARWM for Water Year 2005-06.

23 8. The River and most of its surface tributaries, which originate in the  
24 mountains that ring the Upper Watershed, have been physically altered to control flooding.  
25 Stream channels have almost all been realigned and armored by flood control agencies who  
26 are not party to the applications now before you. Onstream and offstream flood retention  
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1 basins are numerous. Most flood retention basins double as percolation basins for placing  
2 water into aquifer storage, but flood control gets first priority.

3 9. The Santa Ana's groundwater basins, which are both fed by and feed the  
4 River, provide the storage needed to bridge droughts, but some of the upstream basins also  
5 exacerbate water management problems in that their water quality reflects historical  
6 overlying agricultural land and water use. There are various chemicals of concern but in  
7 general management efforts have focused on the conservative elements represented by total  
8 dissolved solids (TDS) and, one of its constituents, total inorganic nitrogen (TIN), both of  
9 which are very expensive to remove by water treatment.

10 10. The combination of concerns over having enough water to cope with  
11 droughts and the increasingly evident water quality problem led to extensive and frequent  
12 litigation up and down the River.

### 13 SETTLING THE LAWSUITS.

14 11. IRWM in the Watershed dates from 1969 when two major water right  
15 lawsuits were settled, with stipulated judgments and physical solutions, in a manner that  
16 fostered cooperation instead of further litigation. The four major municipal water districts  
17 along the River agreed to represent all parties (there were thousands), negotiated the  
18 settlements and, as an adjunct, agreed to pursue joint planning to develop long term  
19 solutions that would meet the needs of all.

20 12. One 1969 settlement, the so-called *Orange County* Judgment or "1969  
21 Judgment", created an interbasin allocation of water whereby the Upper Watershed parties,  
22 represented by San Bernardino Valley Municipal Water District (SBVMWD), Inland  
23 Empire Utilities Agency (IEUA) and Western Municipal Water District (WMWD), have a  
24 duty to ensure that certain minimum and average annual flows of water reach the Lower  
25 Watershed, represented by Orange County Water District (OCWD). For the first time in  
26 such a judgment, water quality was a factor. The amount of water the Upper Basin parties  
27 must guarantee is higher if the TDS exceeds certain levels, and vice versa. This Judgment  
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1 created a Watermaster composed of five people appointed by the Court to monitor  
2 compliance with the physical solution and report annually thereon to the Court.

3 13. The other 1969 settlement, the so-called *Western Judgment*, established  
4 limits on the rights of parties, represented by WMWD, who were producing groundwater  
5 from the San Bernardino Basins for use elsewhere, and established the right and  
6 responsibility of the SBVMWD to manage the recharge of the Basins. This Judgment  
7 created a Watermaster composed of two people appointed by the Court to monitor  
8 compliance with the physical solution and report annually thereon to the Court .

9 14. Since 1969 there have been other stipulated judgments that established  
10 management structures and watermasters for other groundwater basins in the watershed,  
11 notably the Chino and Beaumont Basins.

12 SAWPA.

13 15. At the same time the Parties were reaching agreement on the physical  
14 solutions they were already moving ahead with the next logical step: creation of a  
15 Watershed-wide Plan for management of water and water quality that could be the  
16 foundation for long term cooperation. To develop the Plan they created a joint-powers  
17 agency, the Santa Ana Watershed Planning Agency (SAWPA) whose Board of Directors  
18 was comprised of representatives of the Parties. By 1972 SAWPA had published its first  
19 Plan, which included a comprehensive analysis of each groundwater basin and the  
20 interaction of basins with each other and with the River, projected future water demands  
21 throughout the Watershed, identified existing and potential problems of water shortages and  
22 water quality degradation, and proposed a specific set of projects to begin to cope with  
23 them.

24 16. Some of the projects were earmarked to be implemented by SAWPA itself,  
25 so the Parties altered SAWPA's name slightly to make it a Project Authority instead of  
26 merely a Planning Agency, thereby retaining the acronym but, more importantly, certifying  
27 their intent to develop projects cooperatively for common interest. Included in the  
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1 SAWPA-implemented projects are the Santa Ana Regional Interceptor (SARI) which  
2 enables salt brine to be exported from the Upper Watershed; the Arlington Desalter which  
3 was the first of several such facilities that have been built to extract and desalt brackish  
4 groundwater; and a water pipeline that conveys lower TDS State Water Project water from  
5 Metropolitan Water District's Mills Water Treatment Plant in Riverside to WMWD service  
6 areas in the Watershed that were formerly served with saltier imported Colorado River  
7 water. A SAWPA PowerPoint presentation highlighting some of its accomplishments is  
8 numbered Exhibit JOINT 1-5.

9           17. Shortly after SAWPA's Plan was completed the Santa Ana Regional Water  
10 Quality Control Board (Regional Board) began to prepare its first ever region-wide Water  
11 Quality Control Plan pursuant to the Porter-Cologne Act and decided to borrow SAWPA's  
12 expertise. That marked the beginning of a cooperative effort that continues today. The  
13 coupling of the Regional Board's policy making and enforcement powers with the  
14 planning, coordination and project funding and development ability of SAWPA, its  
15 Member Agencies (which now include Eastern Municipal Water District) and other  
16 participants has been successful beyond anyone's hopes at the beginning. When the  
17 Regional Board makes a decision on, for instance, a nitrate water quality objective for a  
18 groundwater basin or for a stretch of the River, it knows that the ways and means exist to  
19 cause that objective to be met because stakeholders, usually led by SAWPA or one of its  
20 Member Agencies, has analyzed alternatives and brought to the Regional Board specific  
21 programs of implementation that they believe will work. Working together the Regional  
22 Board and SAWPA provide a model of how to implement Article 3 of the Porter-Cologne  
23 Act.

24           INTEGRATED REGIONAL WATER MANAGEMENT.

25           18. The essence of IRWM in the Santa Ana Watershed is this: In the uppermost  
26 reaches of the River and its tributaries, water users are served the lowest TDS water  
27 available, typically from groundwater basins that receive the lowest TDS natural recharge  
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1 from local precipitation. The sewer return flow from that water usage, carrying a higher  
2 TDS because of accretions during use, is discharged downstream to recharge other  
3 groundwater basins from which it is once again pumped and used. The objective is to  
4 manage the salt concentrations so that the last downstream users in Orange County have  
5 acceptable quality but produce a return flow that exceeds the desirable TDS level for  
6 municipal use and must be disposed of in the ocean rather than cycled back into usable  
7 groundwater. The water is virtually “worn out” by the time it reaches the coast.

8 19. Some examples of IRWM efforts are:

- 9 • Several of the groundwater basins (notably, Chino and Arlington Basins) that  
10 contribute water to the River contain water that is already too high in TDS and TIN,  
11 principally a legacy of irrigated agriculture in times past. To cope with that legacy  
12 local agencies are installing desalination plants. High TDS groundwater is pumped  
13 and treated, the good quality product water is distributed for municipal use, and the  
14 brine stream is exported via pipelines dedicated to that purpose. After treatment in  
15 municipal wastewater facilities on the coast the brine is commingled with other  
16 wastewater and discharged to the ocean. The export brine stream has grown  
17 steadily since the mid-1980’s as groundwater desalters have come on line. For  
18 Water Year 2005-06 the SARWM determined that the total amount of desalter brine  
19 exported was 17,932 acre-feet with an estimated average TDS of 4,118 mg/l.
- 20 • The increment of TDS added to water during use is controlled to the extent  
21 practicable by, for instance, barring high TDS industrial wastewater from sewer  
22 systems and, for residences, disallowing the use of home-regenerated water  
23 softeners. The importance of controlling salinity in sewer wastewater in the  
24 Upper Watershed is illustrated by the fact that the “base flow” at Prado Dam, i.e.,  
25 flow not associated with runoff from storms, is almost entirely attributable to  
26 upstream discharges of municipal wastewater.

- 1       • Programs to encourage individual water users to minimize their water demands are  
2       actively pursued throughout the Watershed, using pricing incentives, rebates,  
3       demonstration gardens, etc. In the Upper Watershed there is a potential conflict  
4       between demand reduction and salinity control because when sewer flows  
5       decrease their TDS concentrations increase, so there is a balancing act to minimize  
6       demands but not to the extent that downstream basins are penalized with too-high  
7       salt content.
- 8       • Wastewater is reused in the Watershed other than via the redirection of the  
9       wastewater flowing down the River. There is potential conflict between recycling  
10      and salinity control so extraordinary measures are taken to assure the Regional  
11      Board and neighboring water users that any adverse effects are being avoided or  
12      mitigated. For instance, to enable recycling of wastewater in the Chino Basin the  
13      entities there must maintain hydraulic control of the groundwater in order to prevent  
14      salinity impacts on the River where it flows into Orange County.
- 15     • SAWPA coordinates a program for eradication of *Arundo donax*, a non-native  
16     species of reed that has invaded many waterways in California. It displaces native  
17     vegetation, resulting in undesirable alterations of natural habitat, and it also  
18     consumes about three times as much water as the native vegetation. By the early  
19     1990's there were about 10,000 acres of *Arundo* in the Watershed. In 1997 a  
20     consortium of local, state and federal agencies launched a long term eradication  
21     program. Because *Arundo* spreads rapidly downstream as roots and rhizomes break  
22     off during high streamflows the eradication began in the uppermost reaches of  
23     affected streams. Each location requires multiyear treatment. So far about 3000  
24     acres of *Arundo* have been eradicated.

25       20.     Going forward, SAWPA, its Member Agencies and other stakeholders  
26     expect to build on the past successes and are reaching out to a broader base of participants  
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1 in order to incorporate in IRWM more environmental and recreational aspects such as  
2 wetlands, trails, and open space.

3 21. The State is already heavily invested in implementation of IRWM in the  
4 Santa Ana. \$235 million that was allocated pursuant to Proposition 13 generated, with local  
5 matches, over \$500 million to construct 23 projects, of which 19 are complete. Another  
6 \$25 million is being sought pursuant to Proposition 50.

7 THE APPLICATIONS.

8 22. Today Integrated Regional Water Management is seen by some as a new  
9 concept, but early in its work, in June 1968, the Porter-Cologne Study Project adopted as  
10 one of its guiding principles that “legislative intent in establishing the State Water  
11 Resources Control Board was to achieve a better integration of the quantity and quality  
12 aspects of overall water resources management”. The Applications and Petition before you  
13 offer a clear opportunity for you to act in furtherance of that intent. The Applications all  
14 contemplate projects that will further the cause of IRWM in the Santa Ana River Watershed  
15 by enabling more efficient use of available local water and reducing the need to reach out  
16 hundreds of miles for imported water of (apparently) increasingly dubious reliability. Your  
17 approval of Applications 31165, 31369, 31370, and 31371 would enable the capture of  
18 more natural local precipitation runoff, with its low TDS, for groundwater storage and first  
19 use in the Upper Watershed. Approval of Application 31174 would confirm the ability to  
20 capture water in the Lower Watershed that would otherwise be lost to the ocean. Approval  
21 of Application 31372 and Petition WW-0045 would help to enable direct recycling of  
22 wastewater.

23 23. The Applications and Petition present a clear opportunity for you to  
24 incorporate water quality considerations into your water right decision making, as  
25 contemplated at the time the State Board was created. Your approval of these Applications  
26 and Petitions will demonstrate your willingness to exercise your discretion to use your  
27 water right authorities to support IRWM in furtherance of Water Code Section 1256, which  
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1 directs you to "...give consideration to any general or co-ordinated plan looking toward the  
2 control, protection, development, utilization, and conservation of the waters of the State.."

3 24. If you make it your policy to support and reward IRWM efforts such as  
4 those in the Santa Ana River watershed, you may well encourage stakeholders in other  
5 regions to follow suit, and at the same time make your job easier.

6 Executed under the penalty of perjury under the laws of the State of California in  
7 El Maccero, California on April 11, 2007.

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10 Bill B. Dundy

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