Hydrologic Evaluation of the Settlement of CID Water Rights Adjudication Law Suit

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Under the Direction of
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Reviewed by
CID/USBOR and PVACD
Key Hydrologic Elements

• Retire 6,000 acres of irrigation rights within the CID and 11,000 acres within the PVACD
• Pump only as needed, up to 35,000 AFY, but not more than 100,000 AF during each 5-year accounting period to augment Pecos River flow
• Use CID water allocated to ISC lands for reallocation to CID farmers and for state line delivery
Augmentation Pumping Schedule

Roswell Artesian Groundwater Basin

Augmentation Pumping

Pecos River Supply

Total CID Supply

Carlsbad Area

State Line Delivery

NM
TX

50 KAF on March 1
60 KAF on May 1
65 KAF on June 1
75 KAF on July 15
90 KAF on Sept. 1
Use of CID Water Allocated to ISC Lands

Determine Cumulative State Line Delivery Credit

- State Line Delivery Credit Less than 50,000 AF
  - Reallocate to CID Farmers Until 50,000 AF Then Release to State Line

- State Line Delivery Credit Equal to or Greater than 50,000 AF, but Less than 115,000 AF
  - Reallocate To CID Farmers Until 90,000 AF Then Release to State Line

- State Line Delivery Credit Equal to or Greater than 115,000 AF
  - Reallocate to CID Farmers Until a FDR of 3.697 AF Per Acre Then Either Store or Lease
Impact Analysis

1. Model Development
Pecos River
RiverWare Model

Santa Rosa Reservoir

Roswell Artesian Basin Groundwater Model

Carlsbad Area Groundwater Model

Brantley Reservoir

Red Bluff Accounting Model

NM / TX State Line
Impact Analysis

2. Model Testing
Cumulative Inflow to Brantley Reservoir

- Observed data
- Simulated data

Cumulative Inflow to Brantley (1000 acre-ft)

Date:
- 1/1/1989
- 1/1/1990
- 1/1/1991
- 1/1/1992
- 1/1/1993
- 1/1/1994
- 1/1/1995
- 1/1/1996
- 1/1/1997
- 1/1/1998
- 1/1/1999
Annual Baseflow Gain between Acme and Artesia

![Graph showing annual baseflow gain between Acme and Artesia with observed and simulated data.]
Simulated Versus Observed Water Levels – Roswell Basin
(1906-1998 data from 41 wells)

73% simulated water levels fall within +/- 20 ft observed water levels
Baseflow Gain to the Upper (Carlsbad Springs) Reach
Baseflow Gain to the Lower Reach (Carlsbad to Malaga)
Simulated Versus Observed Water Levels
(Carlsbad Model, 1940-2000 data from 149 wells)

79% simulated water levels fall within +/- 20 ft of observed water levels
Impact Analysis

3. Operational Assumptions
Operational Assumptions

• Future hydrologic conditions are assumed to be represented by the hydrologic conditions during the period 1967-1996

• Impact is measured as the difference between a “baseline” scenario and the “settlement” scenario
Impact Analysis

4. Results
Augmentation Pumping from the RAB

Augmentation Pumping from PVACD (Annual Volume at Well Head, AF)

Average = 12,000 af/yr
CID Supply As Of March 1

CID Surface Water Supply - March 1

Total Supply Deliverable at Avalon (Acre-feet)

Year

- Augmentation from PVACD Wells
- Pecos River Native Flow
CID Farm Deliveries

Comparison of Actual CID Deliveries (from Avalon)
Initial Condition = January 1, 2000

Total Deliveries to CID from Avalon (Feet per Irrigated Acre)

Baseline Average = 2.51 feet per acre
Settlement Average = 2.95 feet per acre
Flows at Stateline

Comparison of Stateline Deliveries
Initial Condition = January 1, 2000

- Baseline: Average = 69,685 af/yr
- Settlement: Average = 79,500 af/yr
Compact Delivery Departures: Cumulative

Cumulative Compact Departure from Obligation
Initial Condition = January 1, 2000

Baseline
Settlement

Average Departure = (-2,950 af/yr)
Average Departure = 6,430 af/yr

Year
Total Departure (Thousands of Acre-Feet)

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
**Average Annual Water Budget**

- **Sumner Reservoir**
  - Additional Base Inflow: 2,100 AFY
  - Augmentation Pumping: 10,200 AFY

- **Brantley & Avalon Reservoirs**
  - 12,500 AFY
  - Conservation Spills: 2,100 AFY
  - ISC’s CID Water Rights: 2,300 AFY
  - State Line Flows: 9,680 AFY

- **Carlsbad Irrigation District**
  - 5,500 AFY
  - CID Return Flow

- **8,100 AFY**
Conclusions

Implementation of the Proposed Settlement Agreement Would:

1. Provide for a comfortable level of state line delivery credit and significantly reduce and probably avoid the occurrence of net shortfalls

2. Increase CID farm deliveries by about 0.5 AF/acre

3. Significantly reduce and probably avoid the need for a priority call on the Pecos River