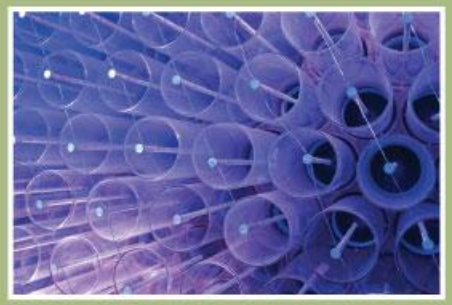
CALIFORNIA
AMERICAN WATER

Carmel River Operations: Post Desal

Presented to Carmel River Advisory Committee
August 4th, 2011



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Overview:

- Pumping, Treatment, and Storage infrastructure
- Current River Operations
- Higher demand year, lower demand recent year
- Post Desal Strategy – Challenges and Considerations
- Illustration of possible Post Desal Operations
- Dry year, average year, extremely wet year

CAW Infrastructure on the Carmel River

- Production Wells
- Treatment Plants
- Dams

Carmel River Wells

- **Russell Wells**
  - Considered surface water – treated at the CVFP
  - Use restricted by Conservation Agreement with NMFS.
- **Upper Carmel River Wells**
  - Pumped directly to the system after chlorination.
  - Use restricted by Conservation Agreement with NMFS.
  - Recent capacity – 4 MGD or 12 AFD
- **Lower Carmel River Wells**
  - Centrally Treated at the Begonia Iron Removal Plant. (not San Carlos)
  - Currently used year round.
  - Recent capacity – 12.7 MGD or 39 AFD

Carmel River Treatment Plants

- **Carmel Valley Filter Plant**
  - Surface Water Treatment Plant
  - Constructed 1940's – Renovated 1970's
  - 16 Horizontal Pressure Filters – original rated capacity of 32 AFD

- **Begonia Iron Removal Plant**
  - Iron and Manganese removal
  - Constructed 1975
  - 18 Horizontal Pressure Filters – rated capacity of 52 AFD
  - Currently operated 24/7

Carmel River Dams

- **San Clemente Dam**
  - Concrete arch dam – Constructed 1921
  - Deemed seismically unsound and unstable during PMF
  - Removal scheduled 2012-2015

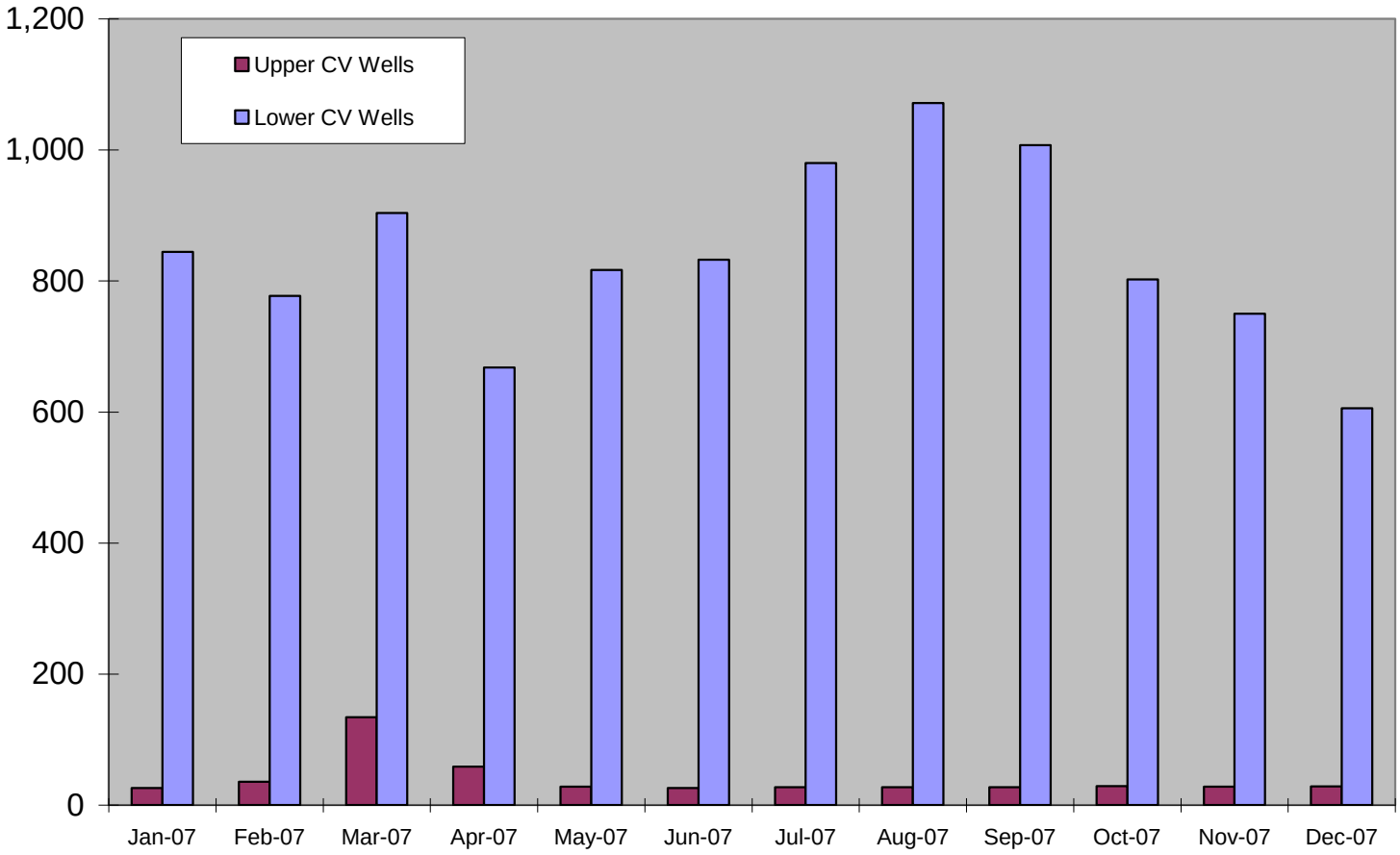
- **Los Padres Dam**
  - Earth and rockfill embankment dam – Constructed 1949
  - Original storage capacity of 3,032 AF has since declined with siltation
  - Downstream fish passage improvements scheduled for 2012

Current River Operations

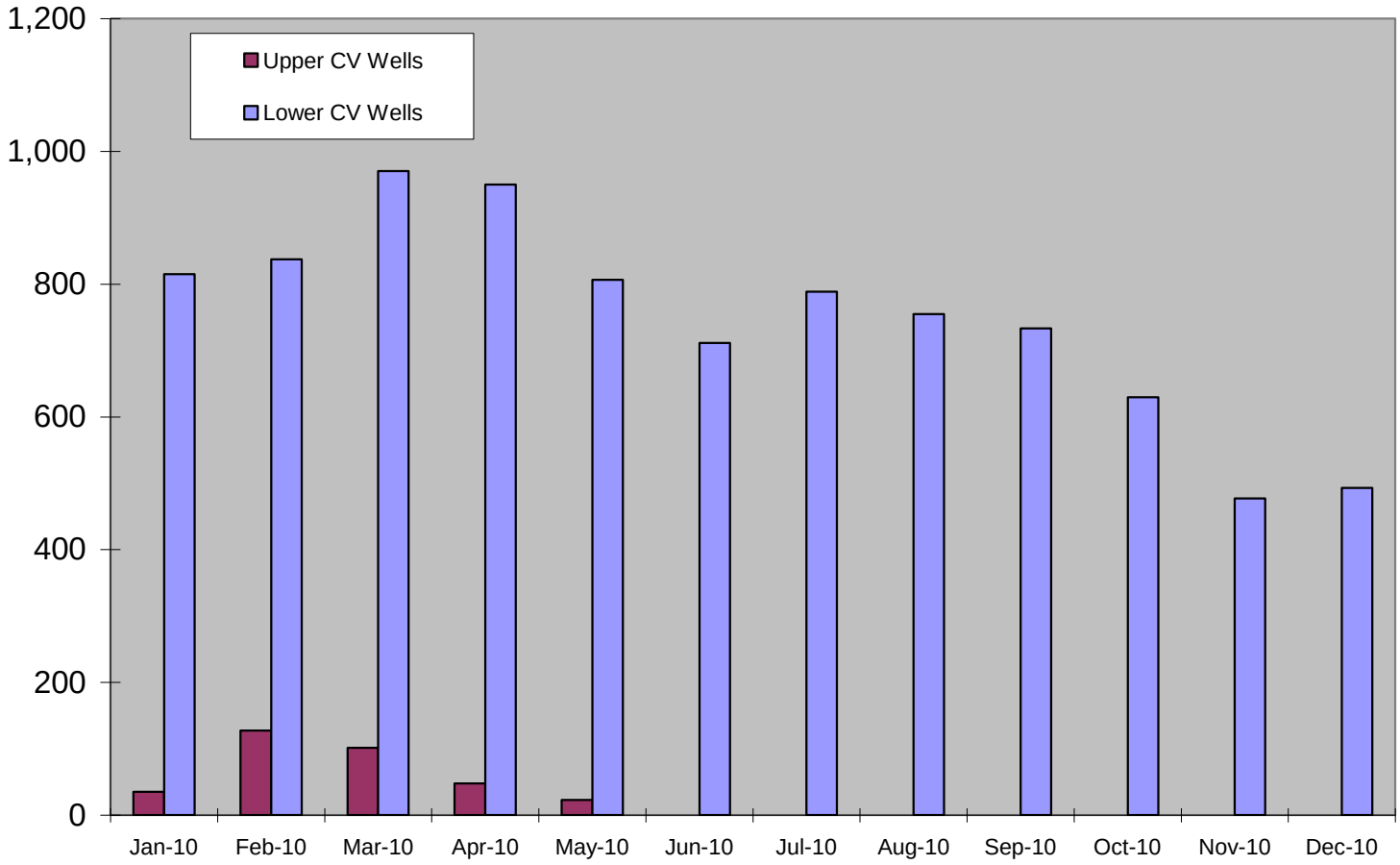
- **Two scenarios presented to illustrate current operations**
  - Higher demand year (2007)
  - Lower demand year (2010)

- **Scenarios illustrate:**
  - Current summer/winter pumping
  - Mix of Upper and Lower Carmel Valley Wells
  - ASR Diversions

2007 - Carmel River Pumping (AF)
System Production = 14,640 AF, ASR = 12 AF



2010 - Carmel River Pumping (AF)
System Production = 12,170 AF, ASR = 1,047 AF



Carmel River Strategy – Post Desal:

- Diversions within CAW's Carmel River water rights.
- Minimize pumping during the summer months.
- Maximize jointly held ASR water rights.

Challenges and Considerations:

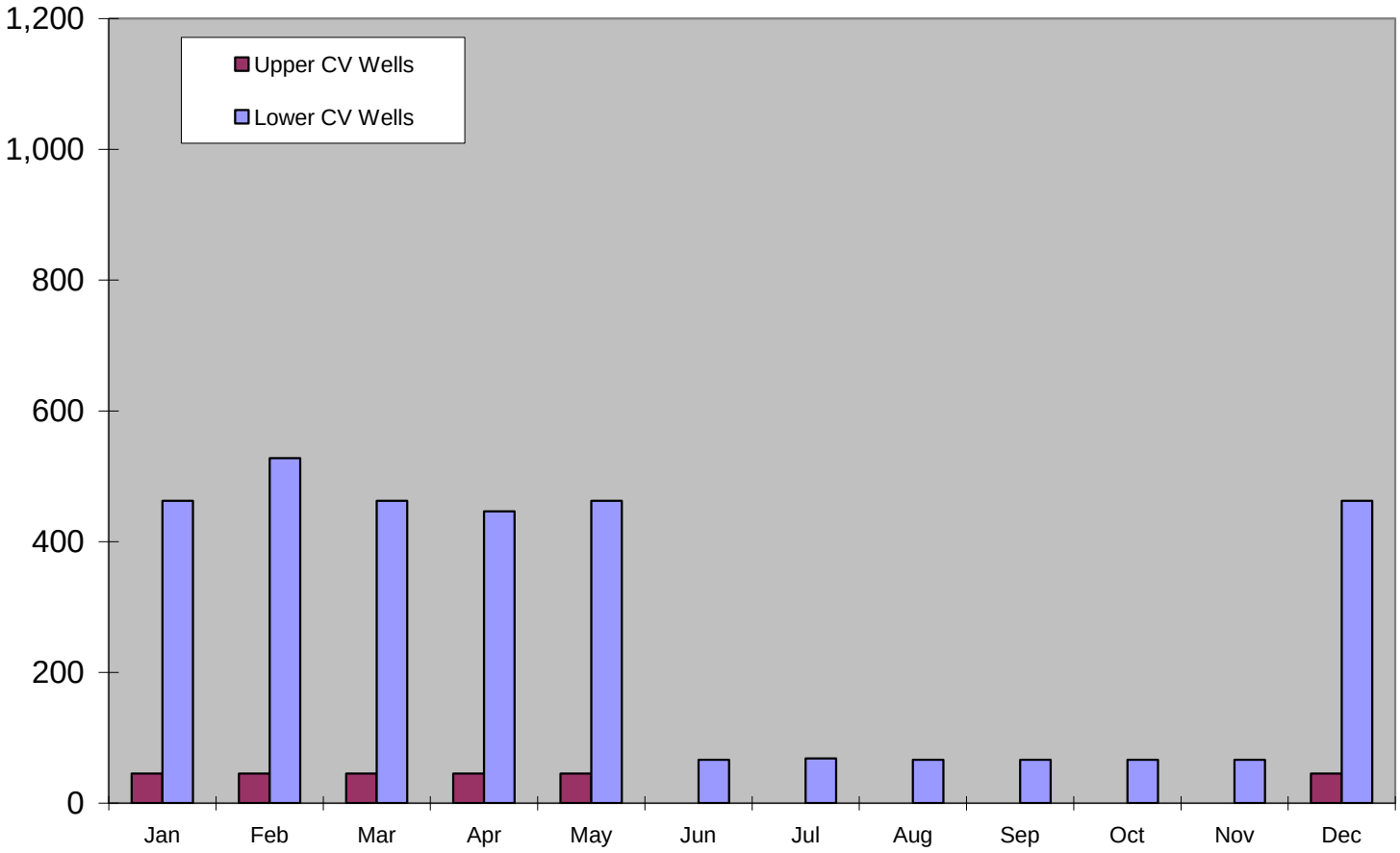
- Water budgeting / water accounting.
- Impact on BIRP of significantly reduced summer usage.
- Maintaining wells in stand-by during summer months.

Illustration of Possible Post Desal Operations

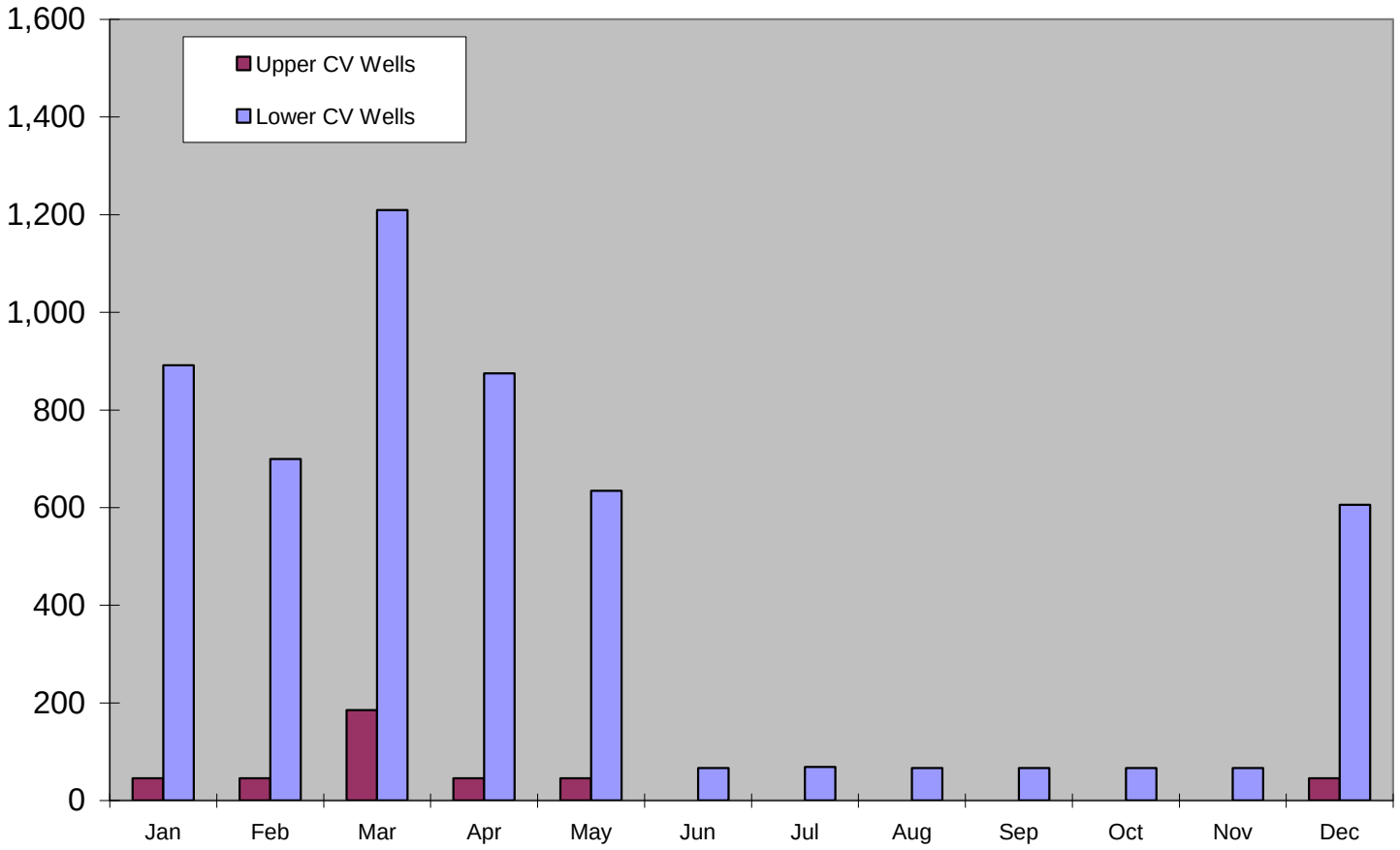
- **Three scenarios developed following the post-desal strategy, dry year, average year, extremely wet year.**

- **Data contains many assumptions and simplifications, for example:**
  - Summer maintenance flow through BIRP of 2.2 AFD (500 gpm).
  - Winter maintenance flow of 1.5 AFD (340 gpm) from UCV wells.
  - During injection days, assumed maximum rate of 28.6 AFD (6,500 gpm = 20808A + 20808C permits).
  - Best case scenario – no consideration given to equipment failures, down time, etc.
  - No discounting for reliability - Largest well out of service.
  - Actual operations and hydrologic conditions can vary.

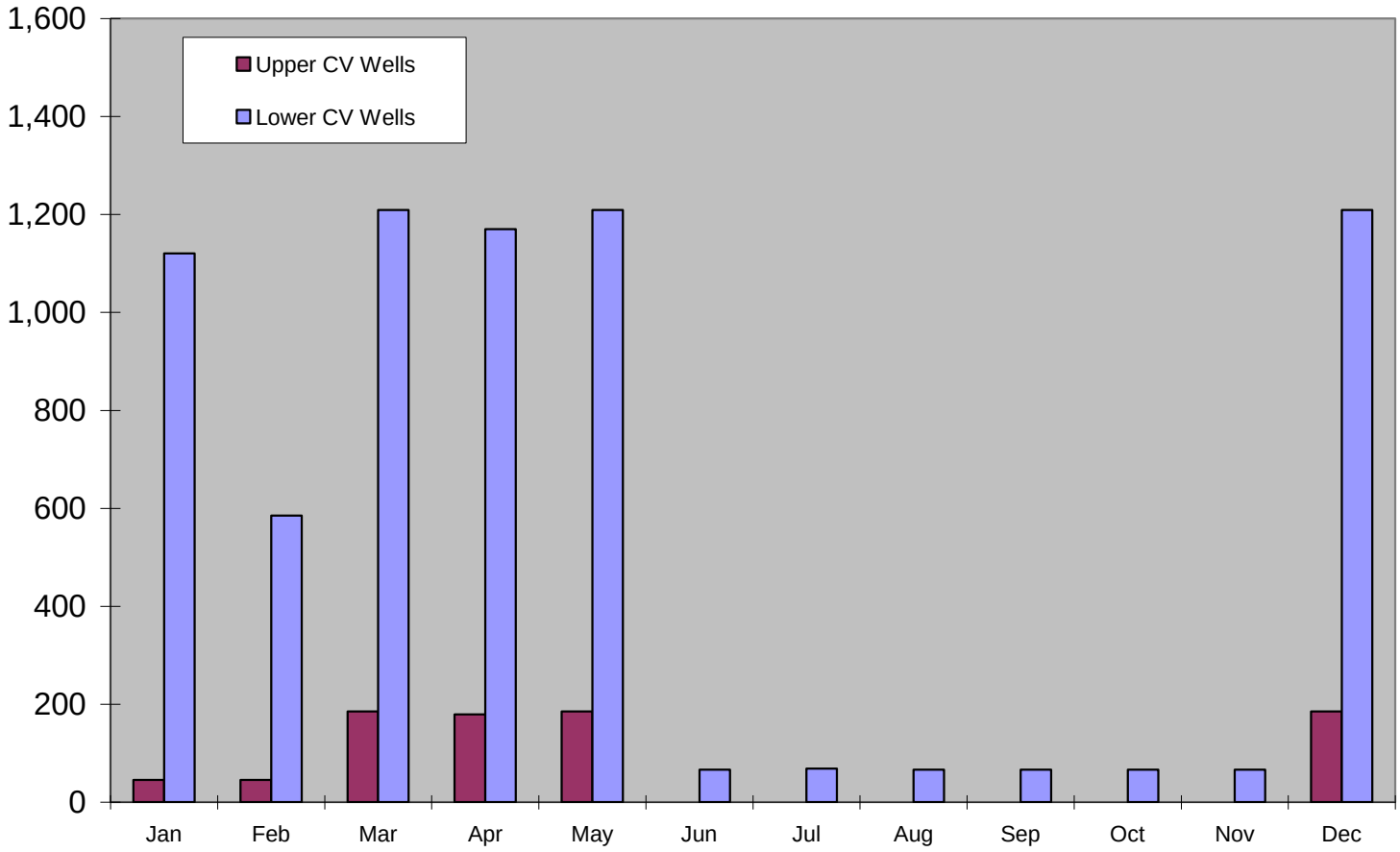
Dry Year - Carmel River Pumping Post Desal (AF)
ASR = 114 AF



Average Year - Carmel River Pumping Post Desal (AF)
ASR = 2,345 AF



Extremely Wet Year - Carmel River Pumping Post Desal (AF)
ASR = 4,347 AF



Questions?