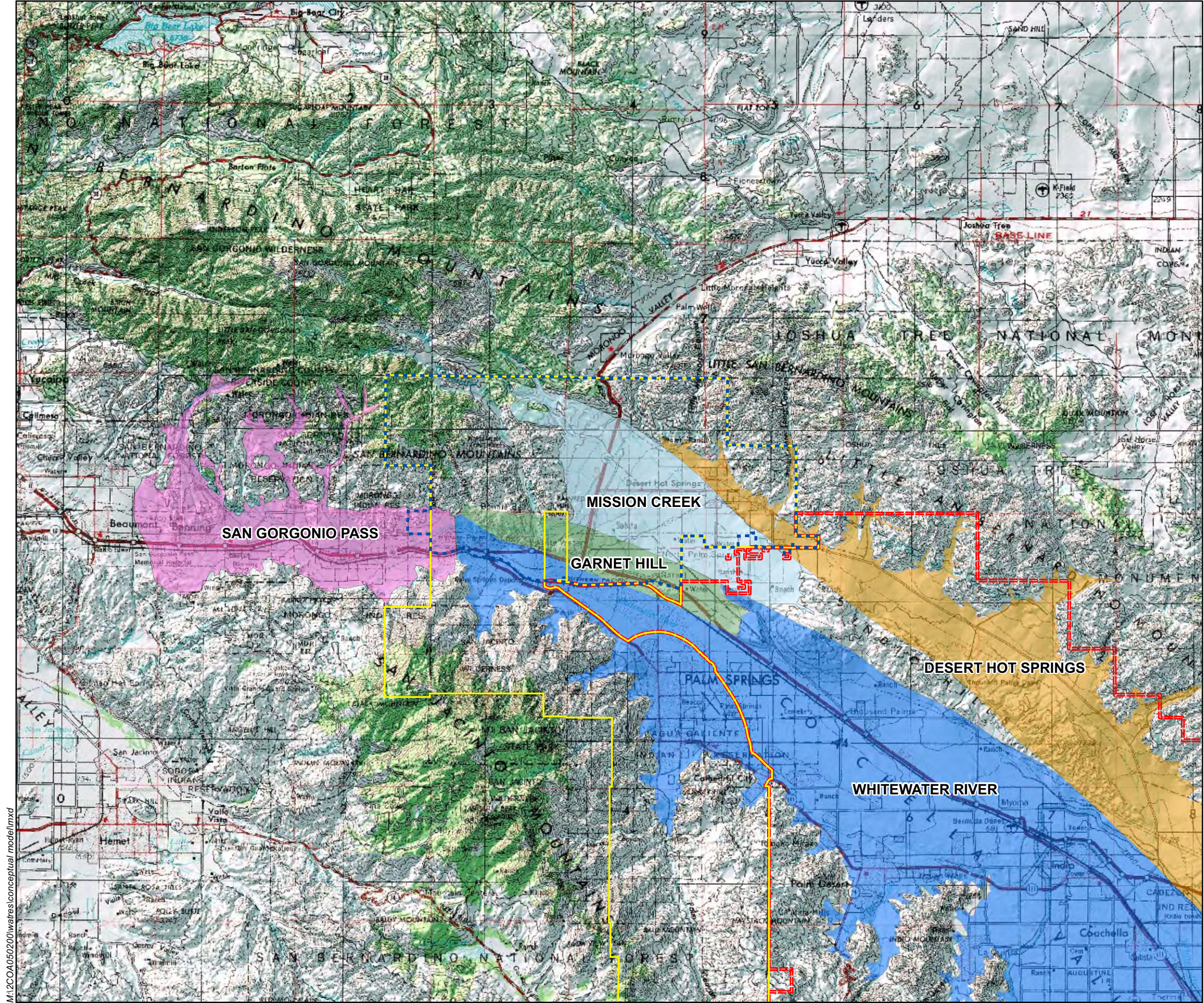


*Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California*



Legend

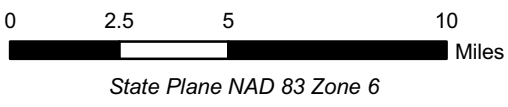
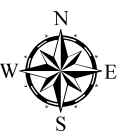
Water Districts

- COACHELLA VALLEY WATER DISTRICT
- DESERT WATER AGENCY
- MISSION SPRINGS WATER DISTRICT

Coachella Valley Groundwater Subbasins

- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER

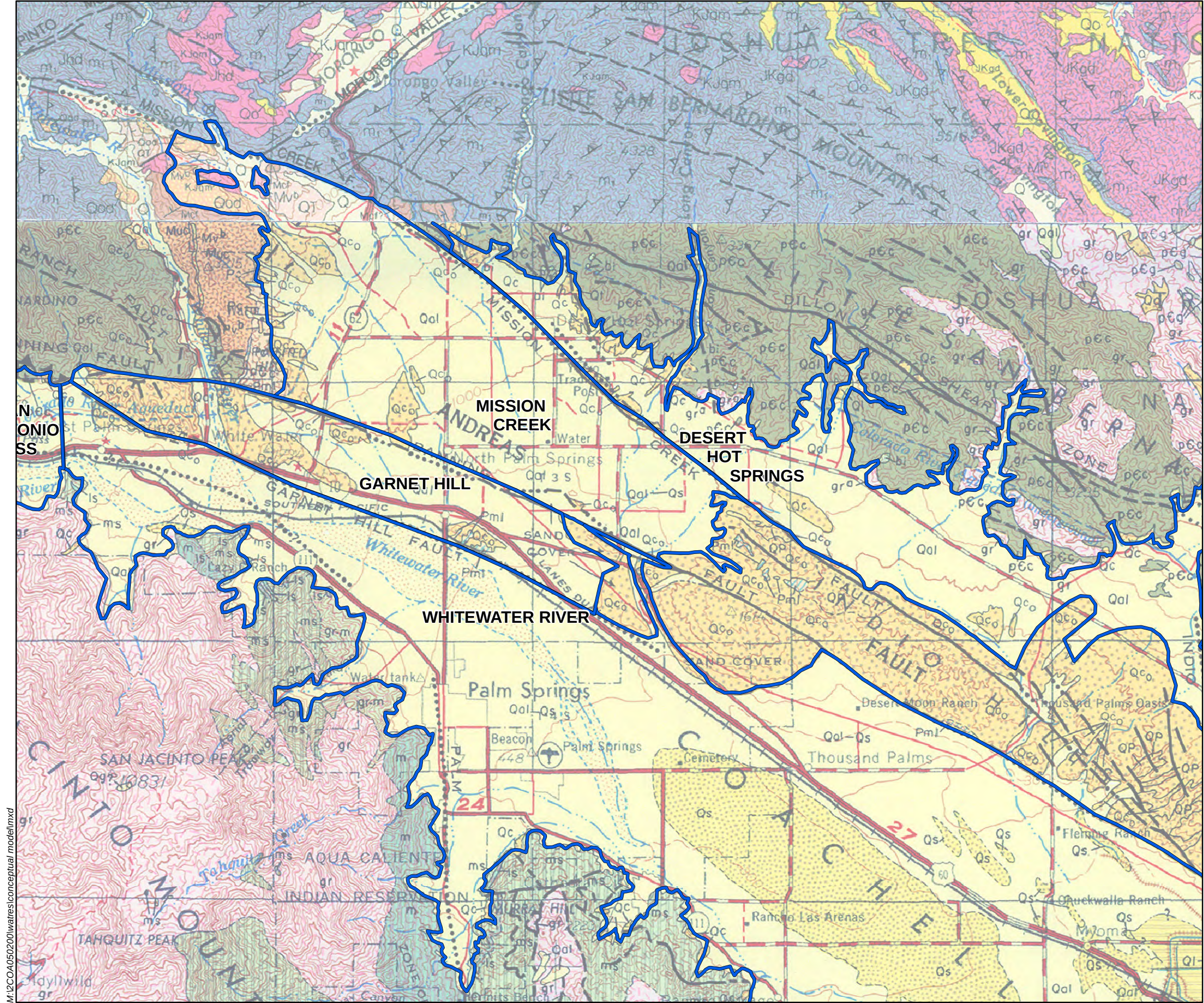
Source: Base map from USA Topos
District boundaries from CVWD, DWA & MSWD.



**Location of Mission Creek-
Garnet Hill Study Area**

M:\2COA\050200\waters\conceptual model.mxd

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California

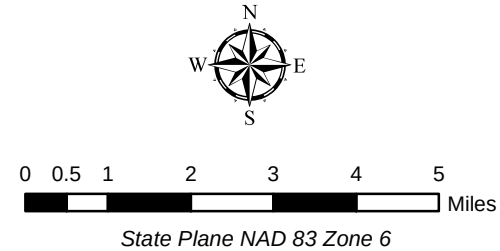


Legend

 Coachella Valley Groundwater Subbasins

See Figure 5 for Geologic Units Legend

Source: CDMG Santa Ana & San Bernardino
Scale:1:250,000 Geologic Maps, 1966.



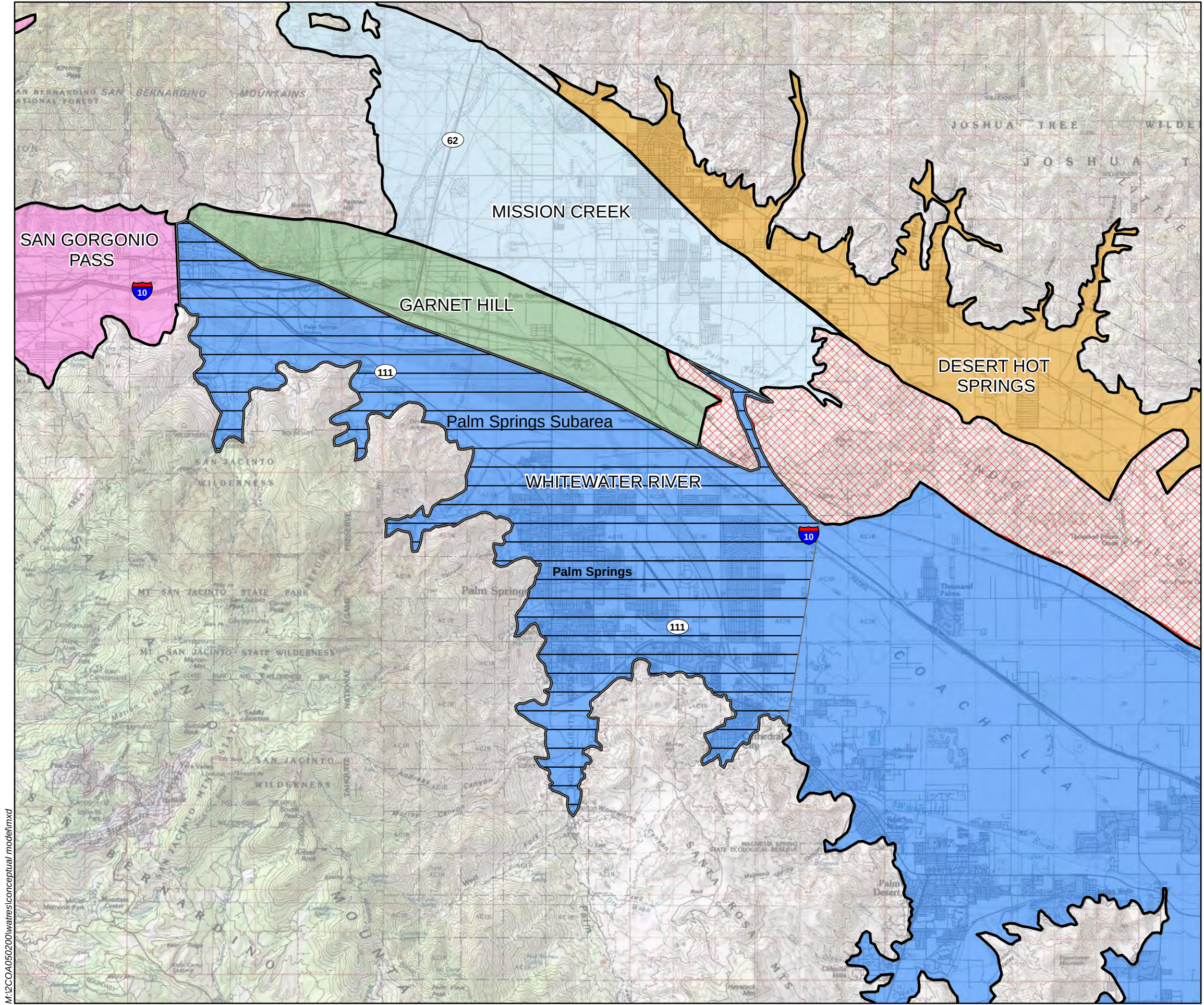
Regional Geologic Map



Source: CDMG Santa Ana 1:250,000 scale Geologic Map

Regional Geologic
Map Legend

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California



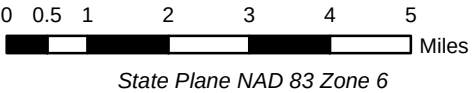
Legend

Coachella Valley Groundwater Subbasins

- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER
- Palm Springs Subarea
- Semi-waterbearing rocks

Topographic contours are in meters.

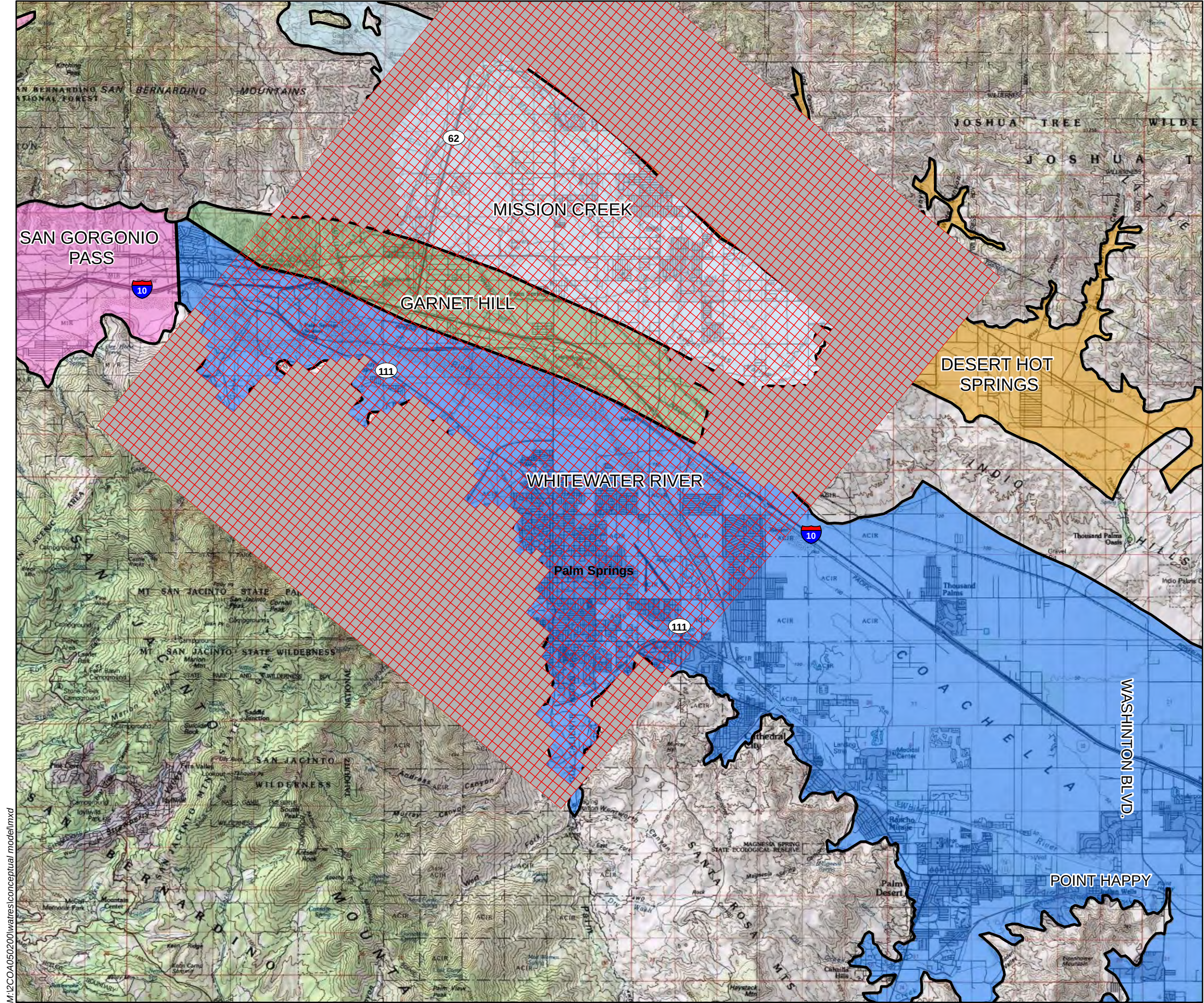
Source: Base map from USA Topo.
Groundwater subbasins from DWR, 2004a;
DWR, 2004b and DWR, 1964.



State Plane NAD 83 Zone 6

Groundwater Subbasins

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California

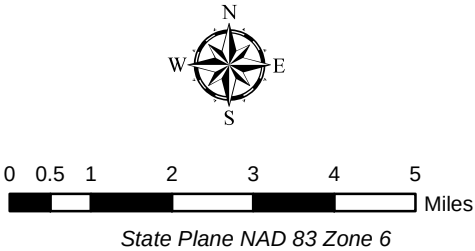


Legend

- Model Grid
- No Flow Cell
- Coachella Valley Groundwater Subbasins
 - DESERT HOT SPRINGS
 - GARNET HILL
 - MISSION CREEK
 - SAN GORGONIO PASS
 - WHITEWATER RIVER

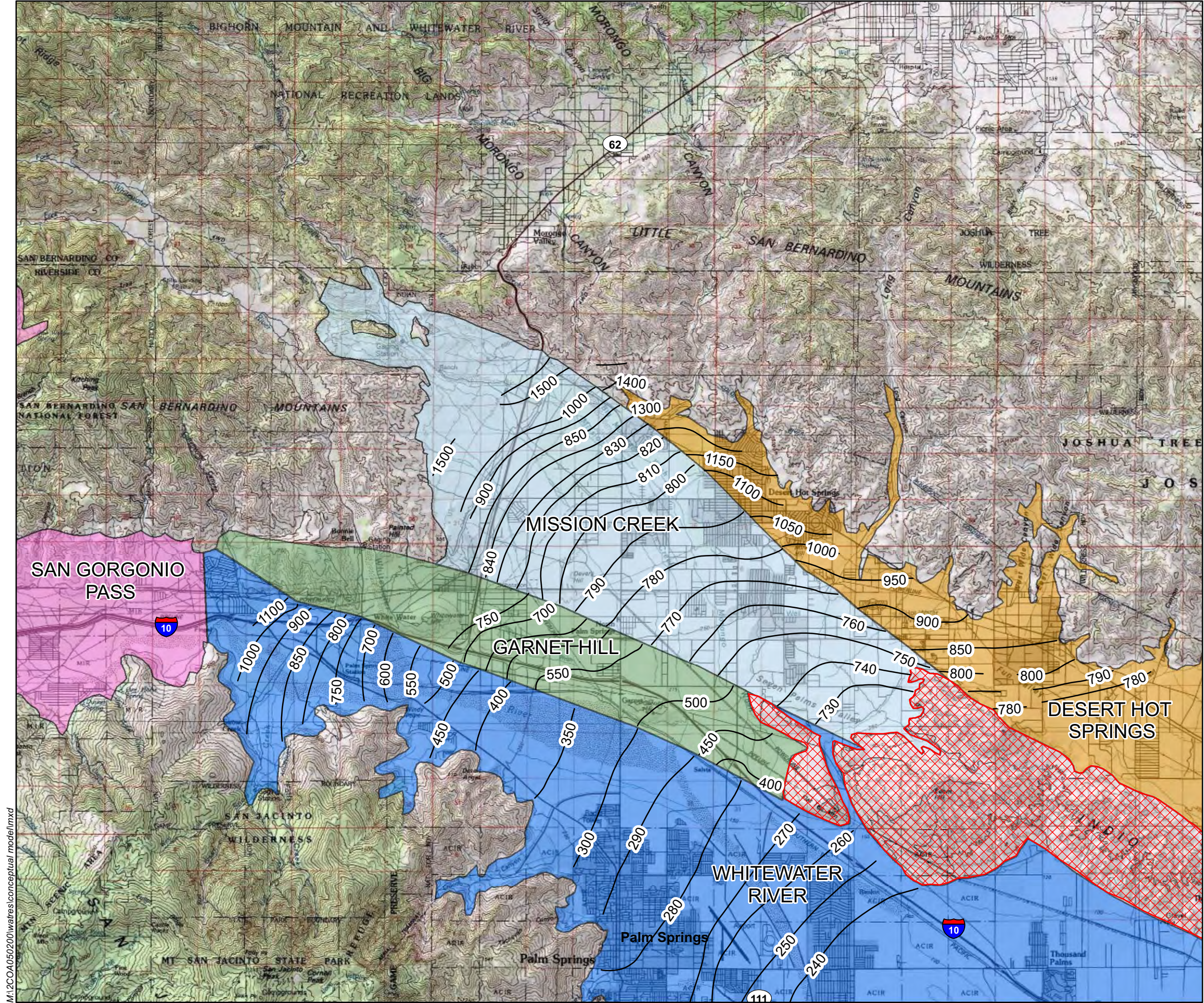
Topographic contours are in meters.

Source: Base map from USA Topo.
Groundwater subbasins from DWR, 2004a;
DWR, 2004b; and DWR, 1964.
Model grid based on Fogg et al., 2000.



Numerical Model Grid and
Groundwater Subbasins

*Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California*



Legend

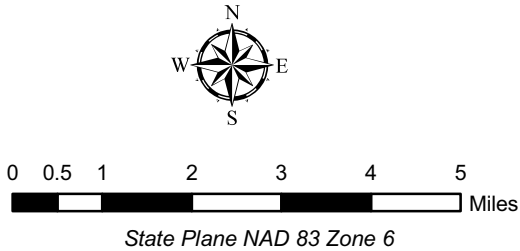
Groundwater Elevation Contour (feet msl)

Coachella Valley Groundwater Subbasins

- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER
- Semi-waterbearing rocks

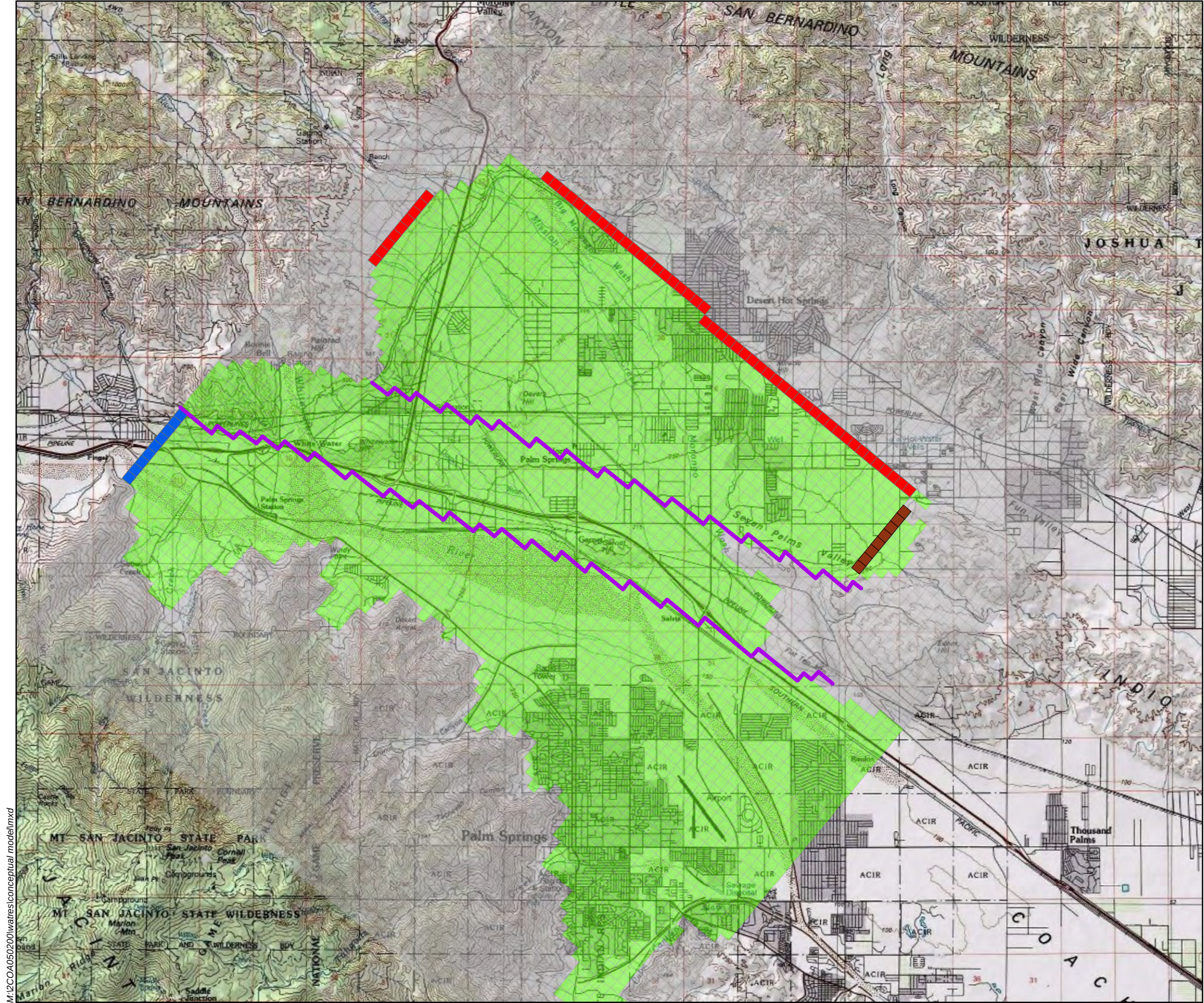
Source: Tyley, 1974.

Topographic contours are in meters.



**Contours of Measured
Groundwater Elevations
in 1936**

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California



Legend

Horizontal Flow Barrier

Specified Flux

Drain

Specified Head

Model Grid

Cell Type

Active

No Flow

Topographic contours are in meters.

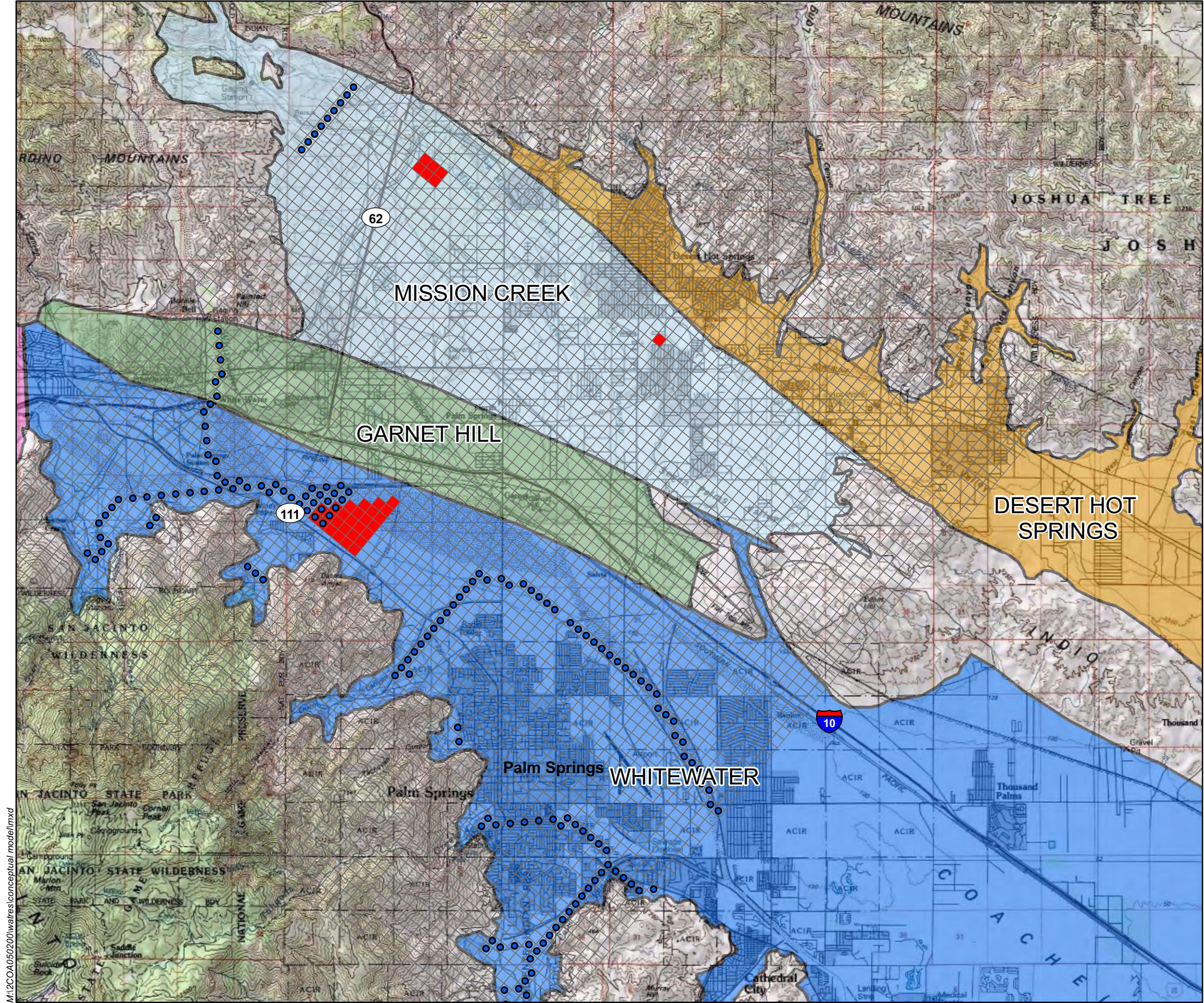


0 0.5 1 2 3 4 5
Miles

State Plane NAD 83 Zone 6

Model Mesh and Boundaries

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California



Legend

• Natural Recharge

Artificial_Recharge

Model Grid

Coachella Valley Groundwater Subbasins

DESERT HOT SPRINGS

GARNET HILL

MISSION CREEK

SAN GORGONIO PASS

WHITEWATER RIVER

Topographic contours are in meters.

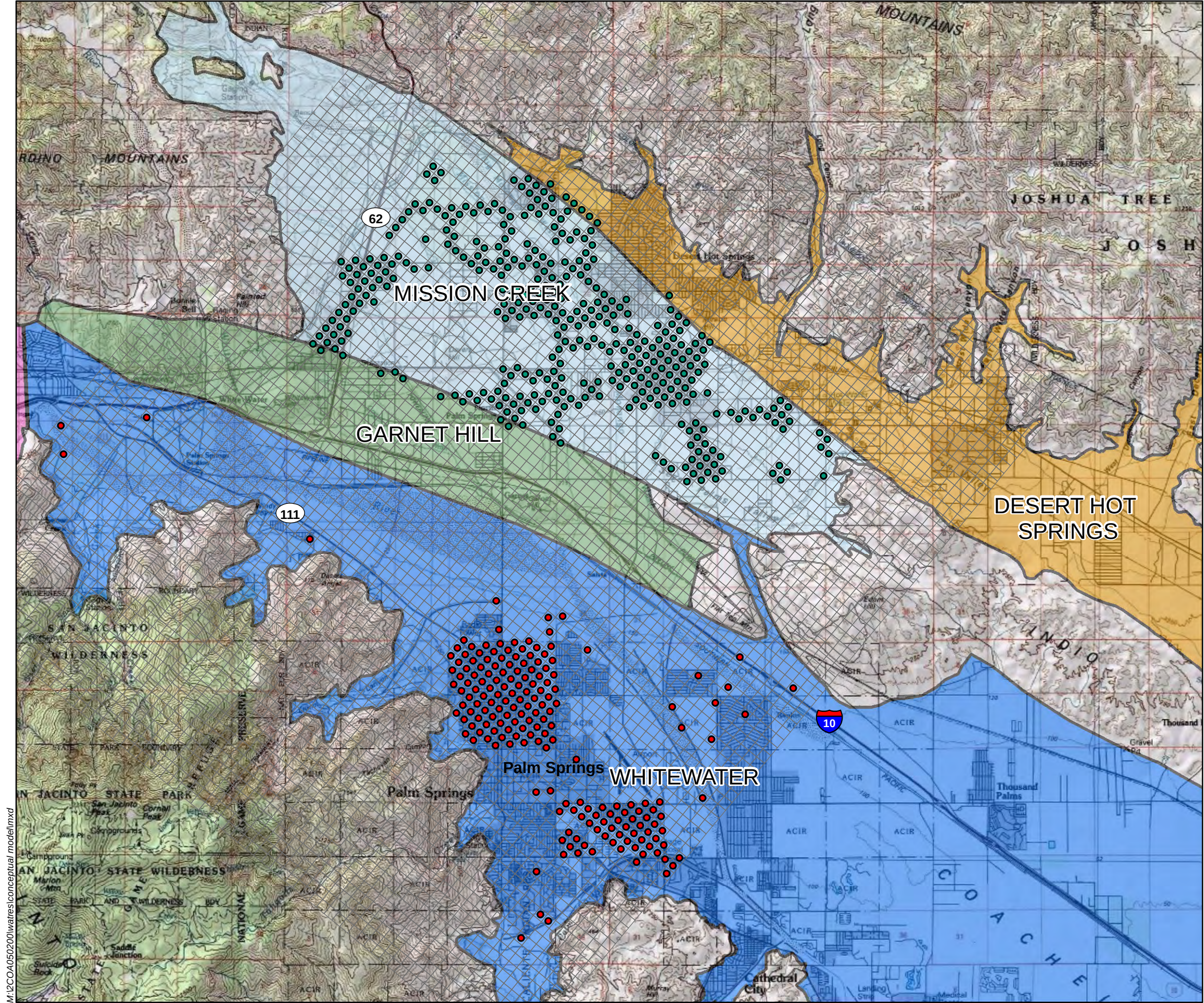


0 0.5 1 2 3 4 5 Miles

State Plane NAD 83 Zone 6

Location of Natural
and Artificial Recharge
Cells 1936-2009

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California



Legend

- Mission Creek/Garnet Hill Return Flows
- Whitewater Return Flow

Model Grid

Coachella Valley Groundwater Subbasins

- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER

Topographic contours are in meters.

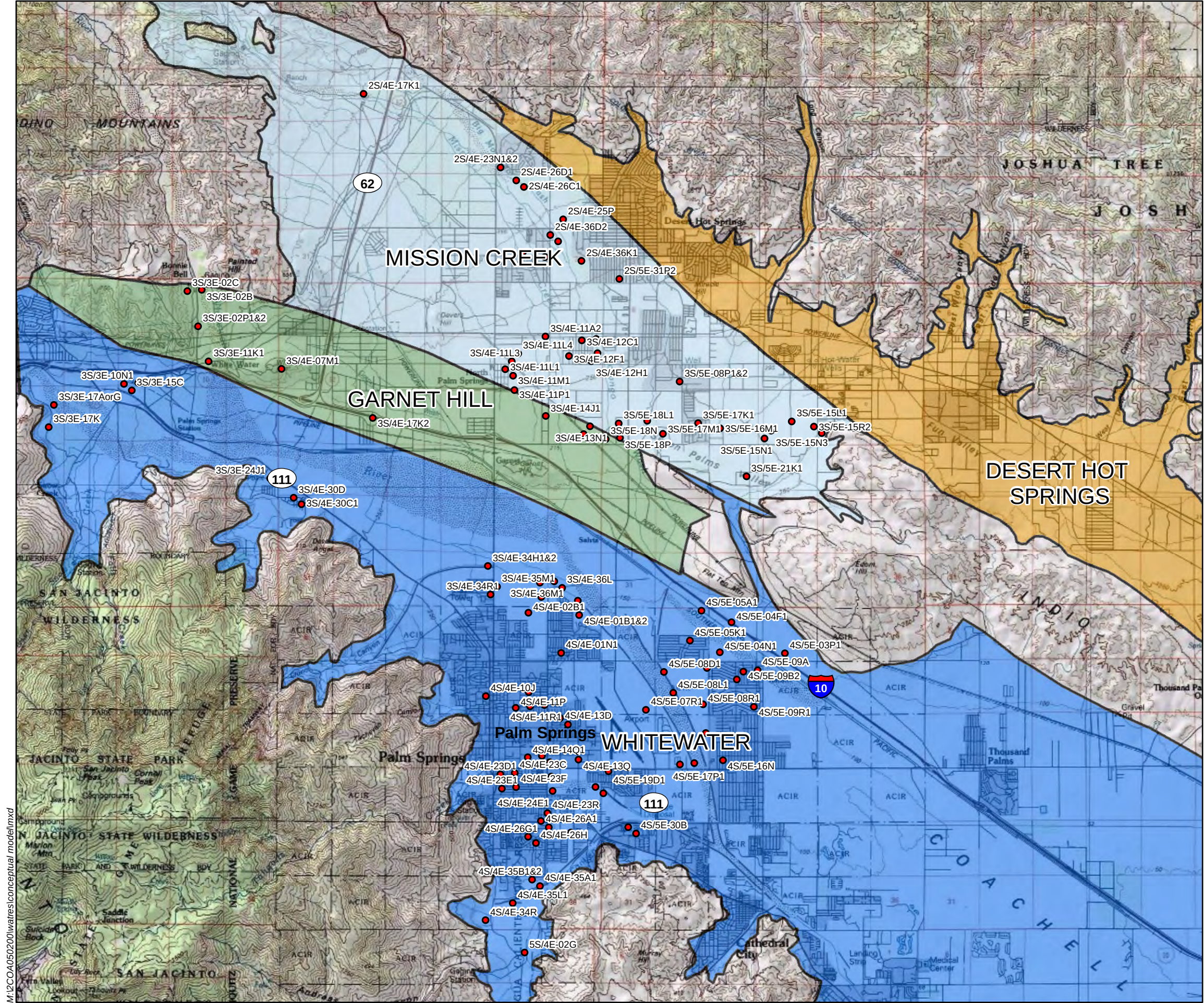


0 0.5 1 2 3 4 5 Miles

State Plane NAD 83 Zone 6

Location of Return Flow
Cells 1936-2009

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California



Legend

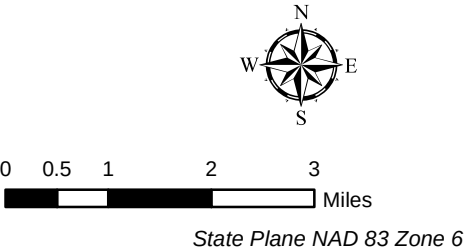
• Production Wells

Coachella Valley Groundwater Subbasins

- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER

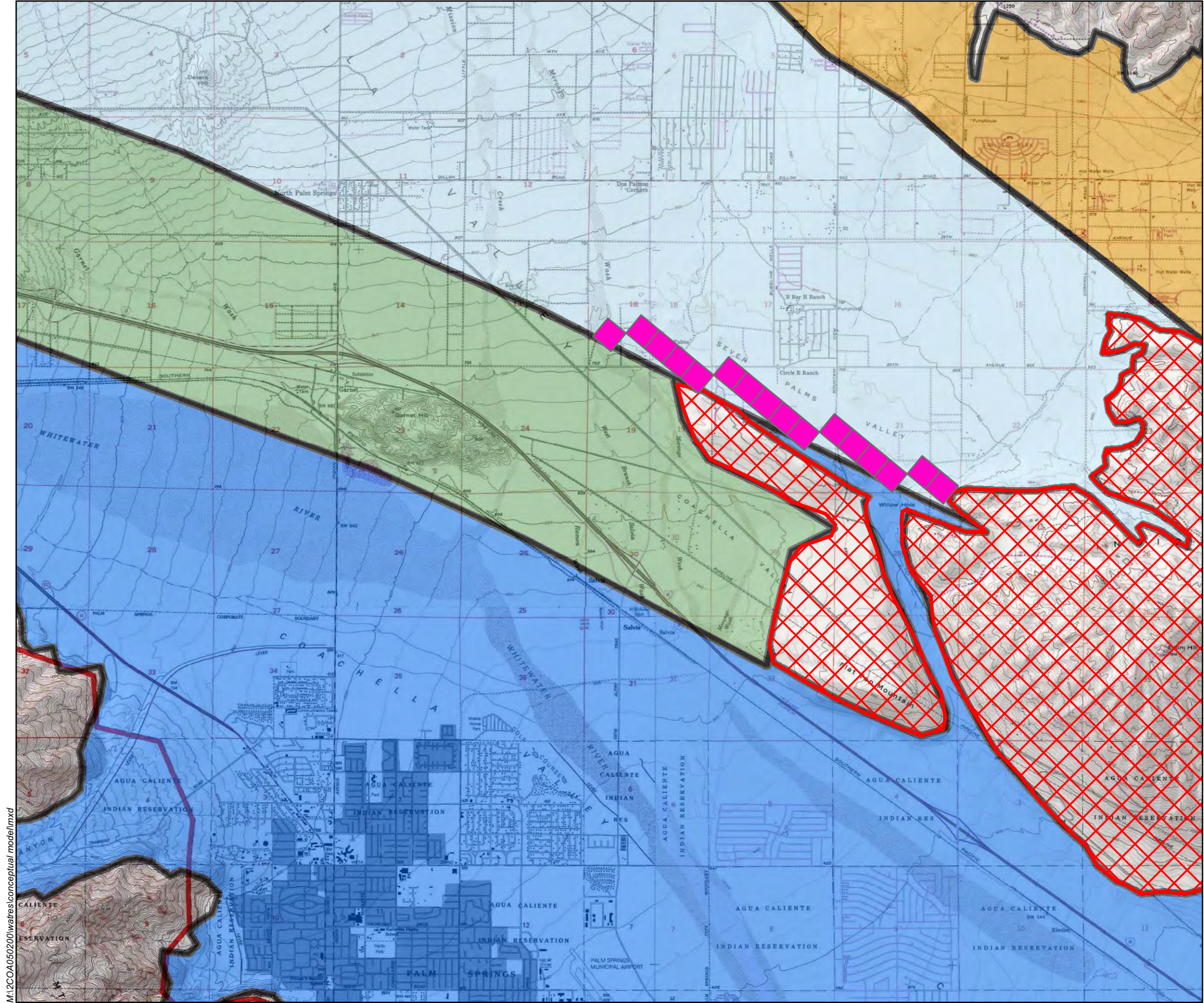
Source: Base map from USA Topo.
Groundwater subbasins from DWR, 2004a;
DWR, 2004b; and DWR, 1964.
Well locations from Psomas, 2010
(see Appendix A and D).

Topographic contours are in meters.



Location of Wells with
Production Information
1936-2009

*Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California*

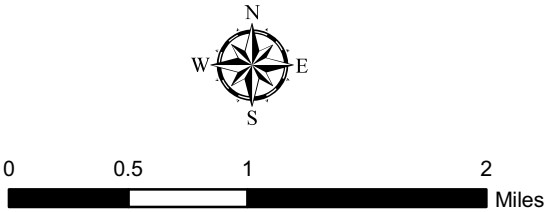


Legend

- Phreatophytes
- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER
- Semi-waterbearing Rocks

Source: Base map from USA Topo.
Groundwater subbasins from DWR, 2004a;
DWR, 2004b; and DWR, 1964.
Model grid based on Fogg et al., 2000.
Phreatophyte locations derived from Mayer, 2007.

Topographic contours are in meters.



State Plane NAD 83 Zone 6
**Location of Model Cells
with Discharge Associated
with Phreatophytes**

FIGURE 12
STEADY-STATE CALIBRATION: OBSERVED VS. COMPUTED GROUNDWATER ELEVATIONS

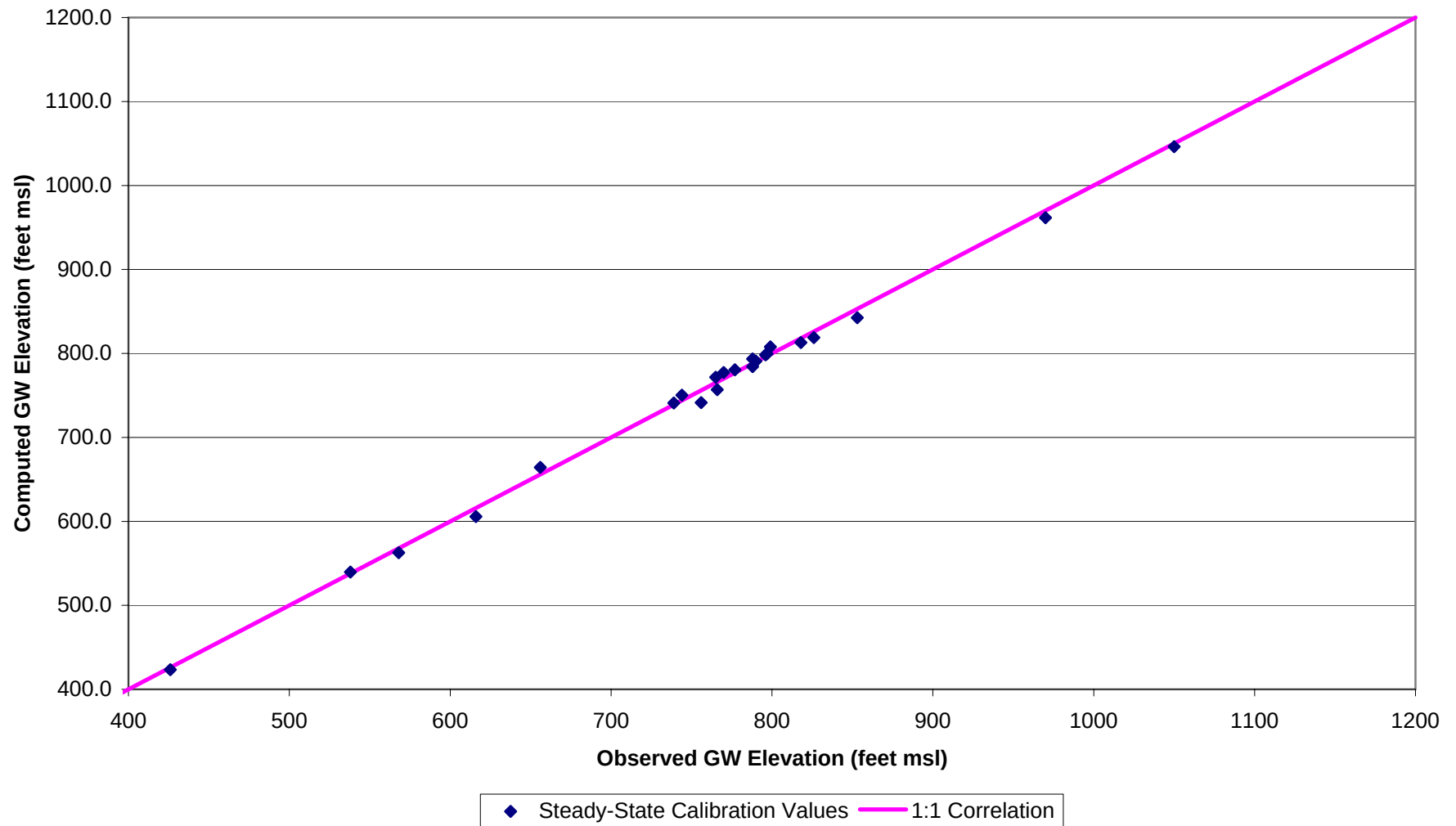
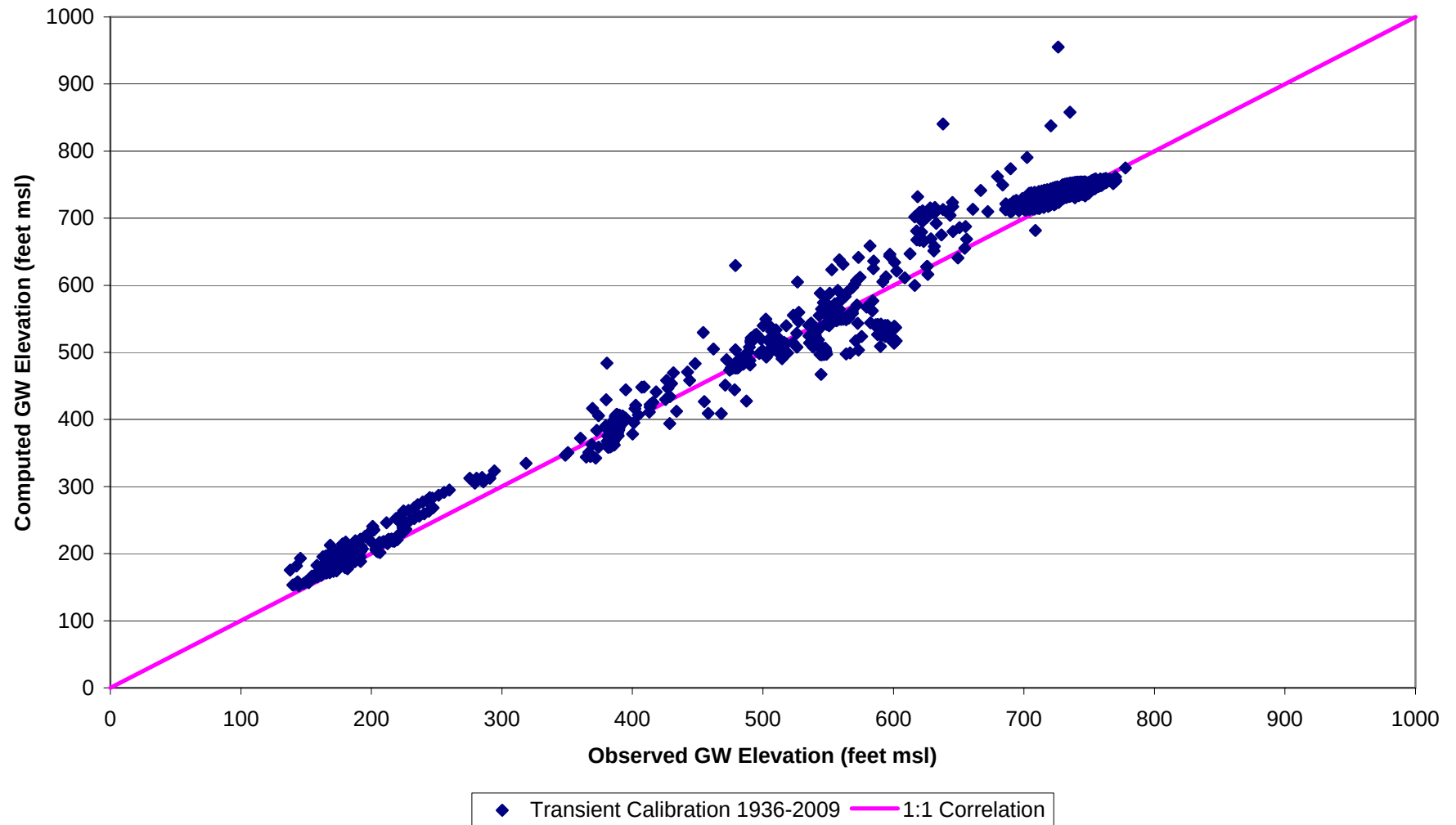
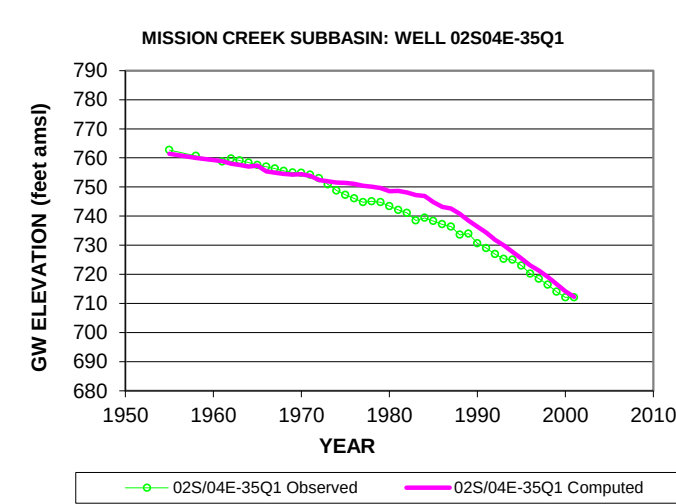
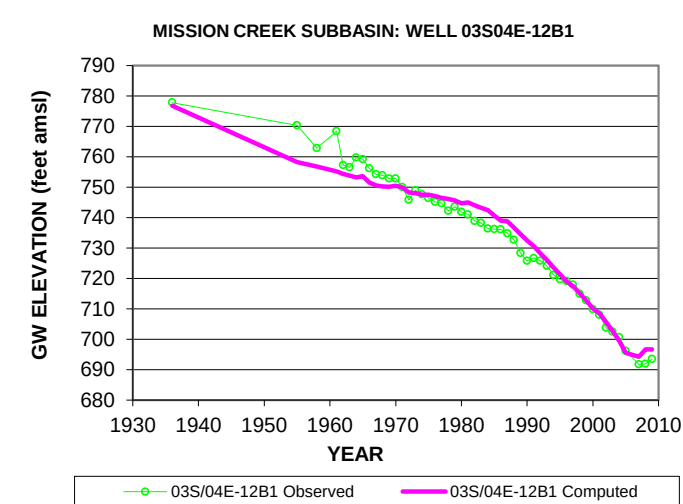
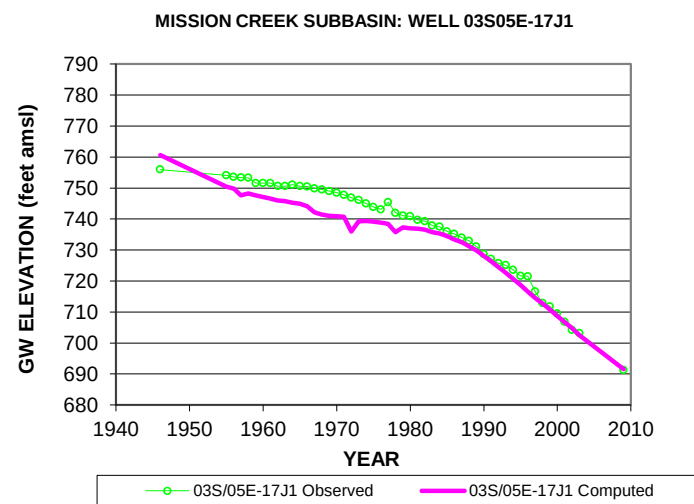
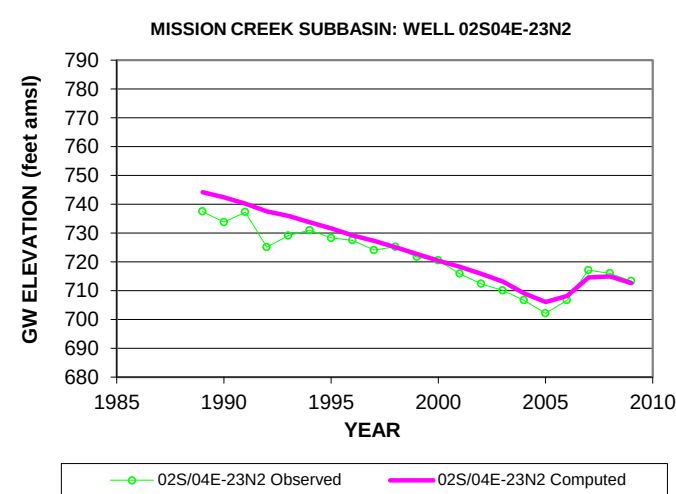
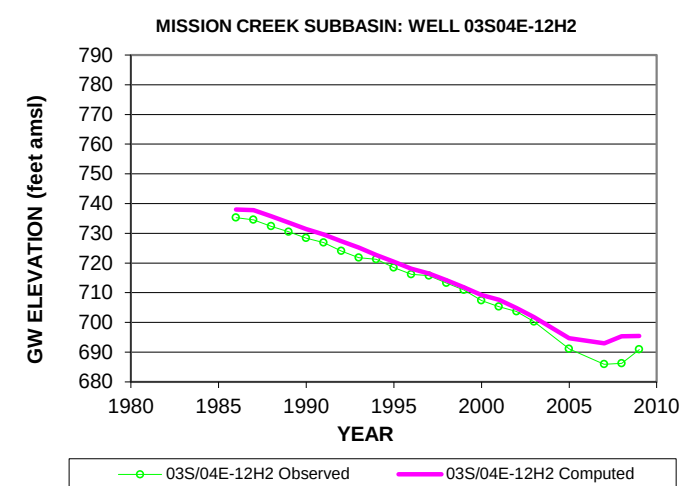
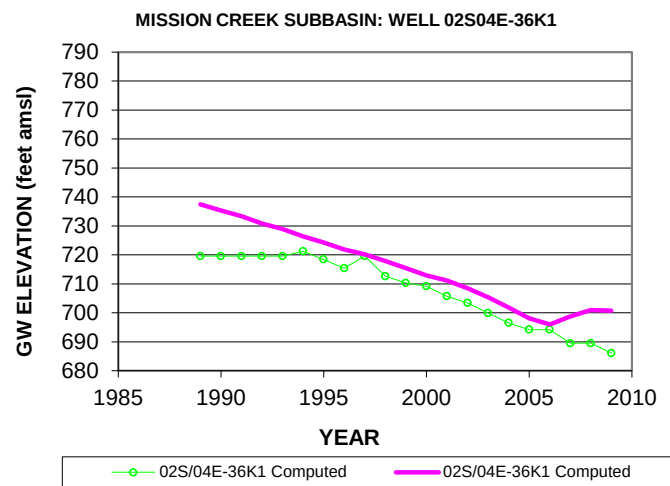
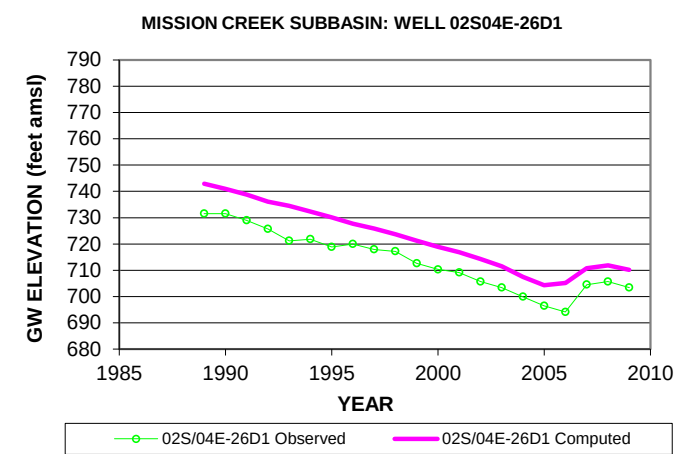
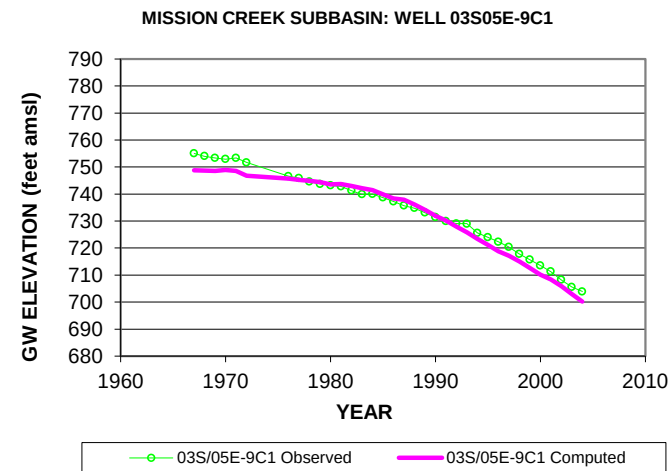
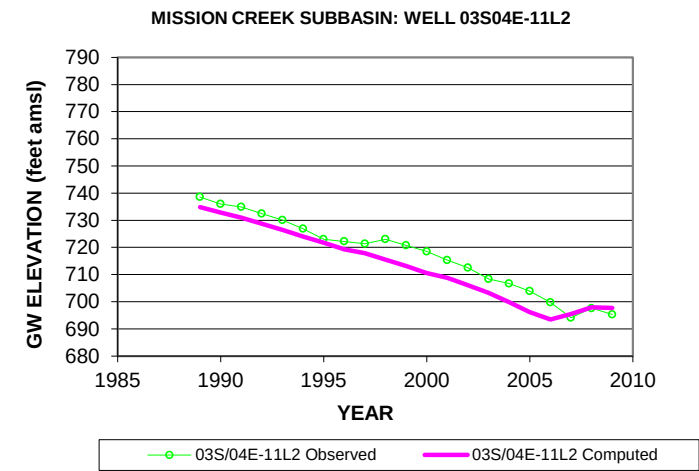


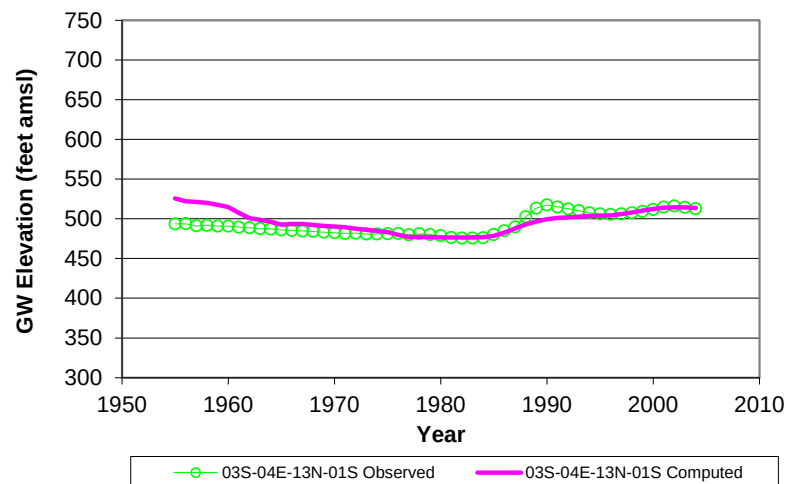
FIGURE 13
TRANSIENT CALIBRATION: OBSERVED VS COMPUTED GROUNDWATER ELEVATIONS



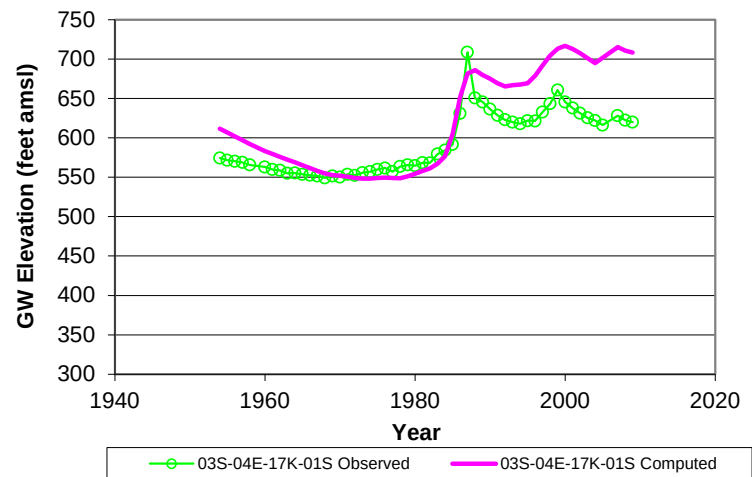


MISSION CREEK SUBBASIN HYDROGRAPHS
TRANSIENT MODEL RESULTS
FIGURE 14

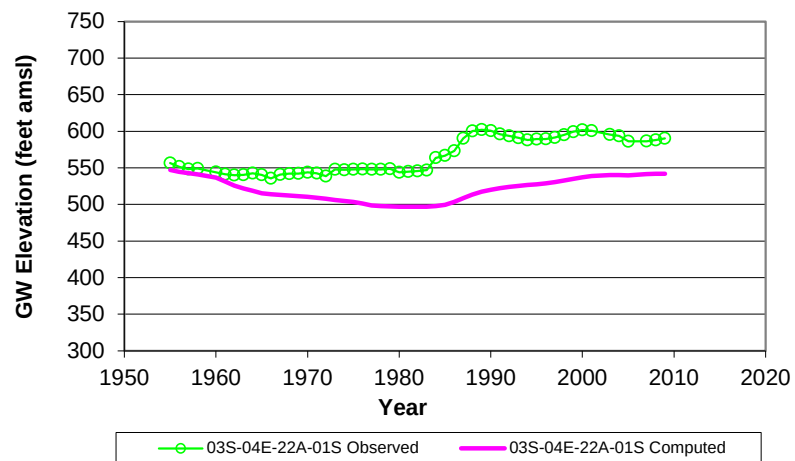
GARNET HILL SUBBASIN: 03S04E-13N1



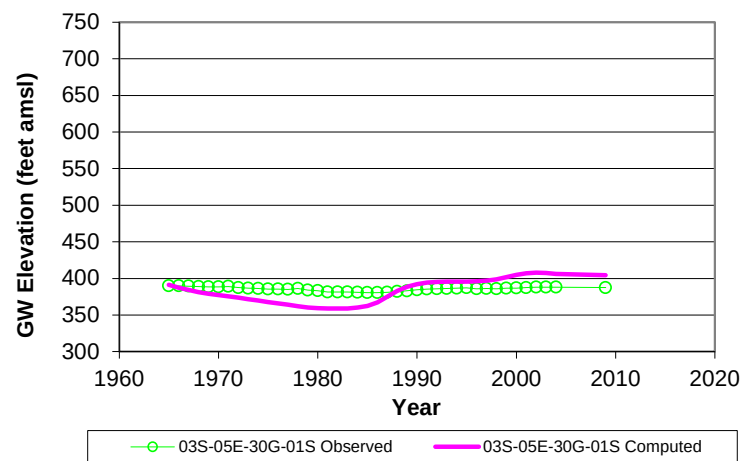
GARNET HILL SUBBASIN: WELL 03S04E-17K1



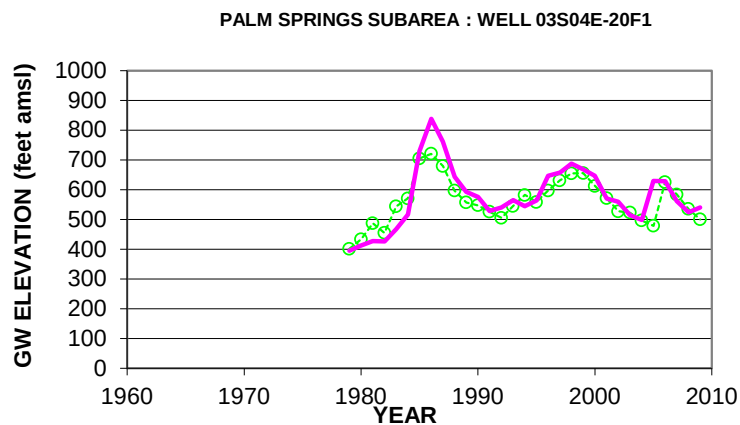
GARNET HILL SUBBASIN: WELL 03S04E-22A1



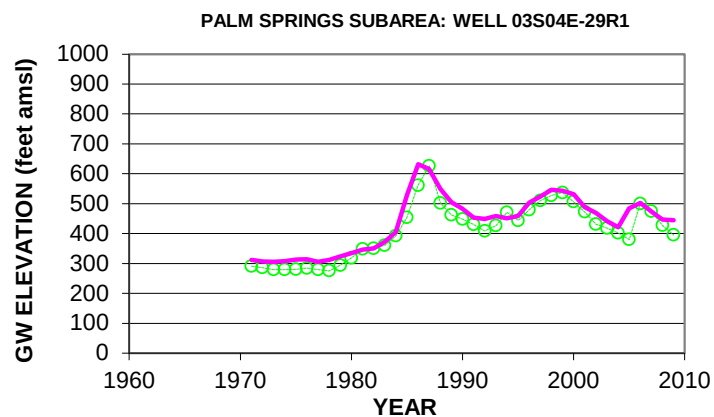
GARNET HILL SUBBASIN: WELL 03S05E-30G1



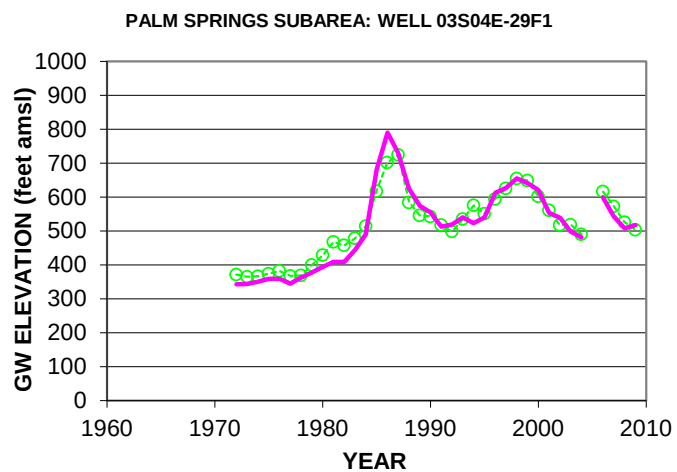
GARNET HILL SUBBASIN HYDROGRAPHS
TRANSIENT MODEL RESULTS
FIGURE 15



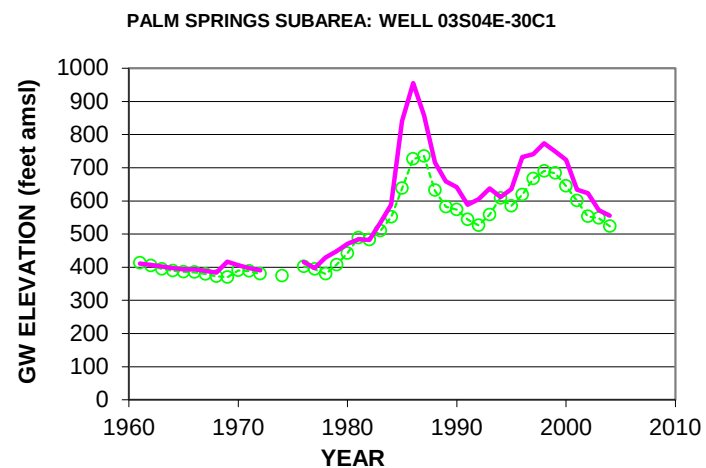
--○-- 03S/04E-20F-01S Observed — 03S/04E-20F-01S Computed



--○-- 03S/04E-29R1 Observed — 03S/04E-29R1 Computed



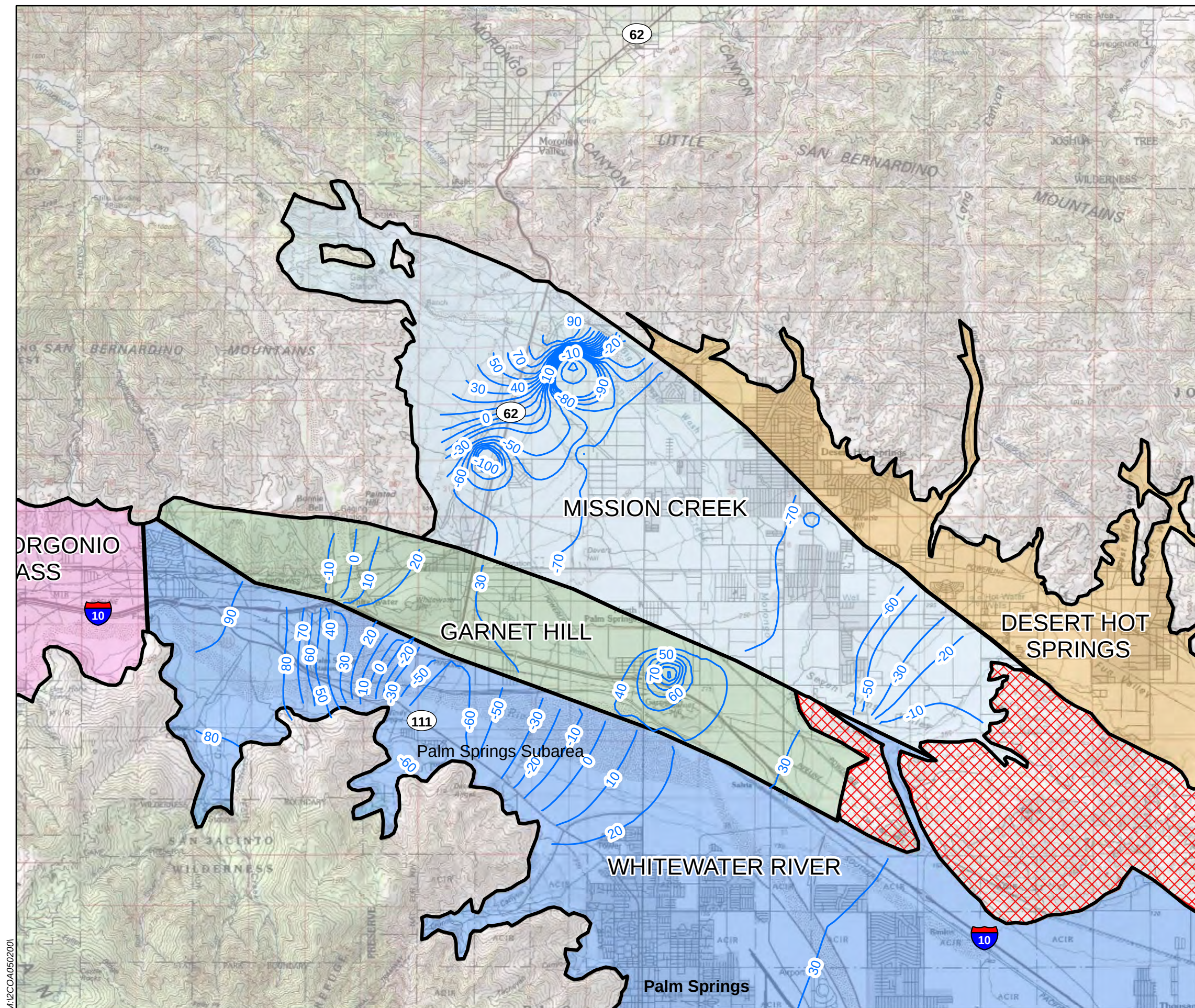
--○-- 03S/04E-29F-01 Observed — 03S/04E-29F-01 Computed

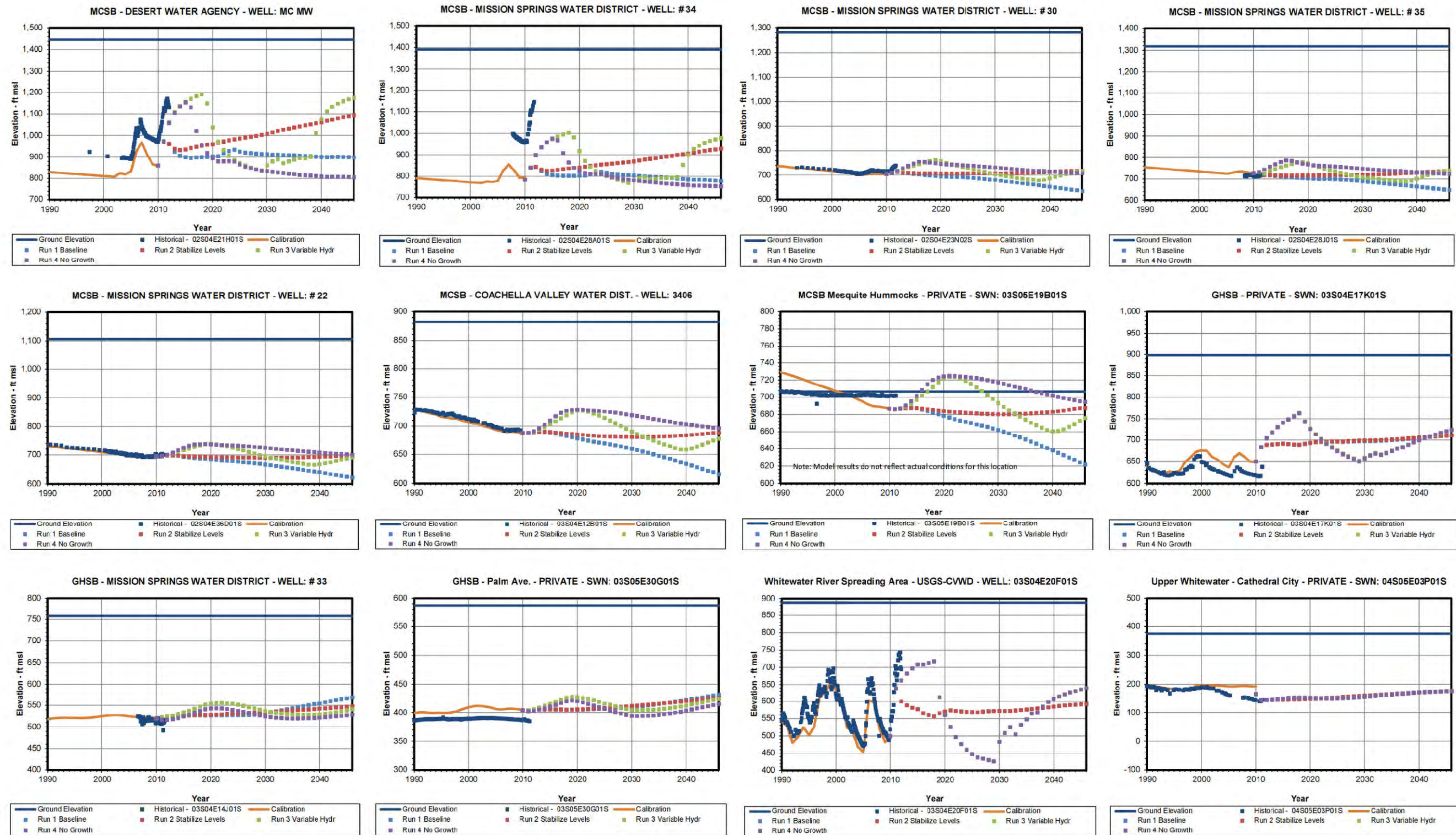


--○-- 03S/04E-30C1 Observed — 03S/04E-30C1 Computed

**PALM SPRINGS SUBAREA HYDROGRAPHS
TRANSIENT MODEL RESULTS
FIGURE 16**

Water Management Plan **Mission Creek and Garnet Hill Subbasins** **Desert Hot Springs, California**





**Well Hydrographs for
Mission Creek and
Garnet Hill Subbasins
Model Run Nos. 1, 2, 3, & 4**

Figure 19
Cumulative Change in Storage - Mission Creek Subbasin

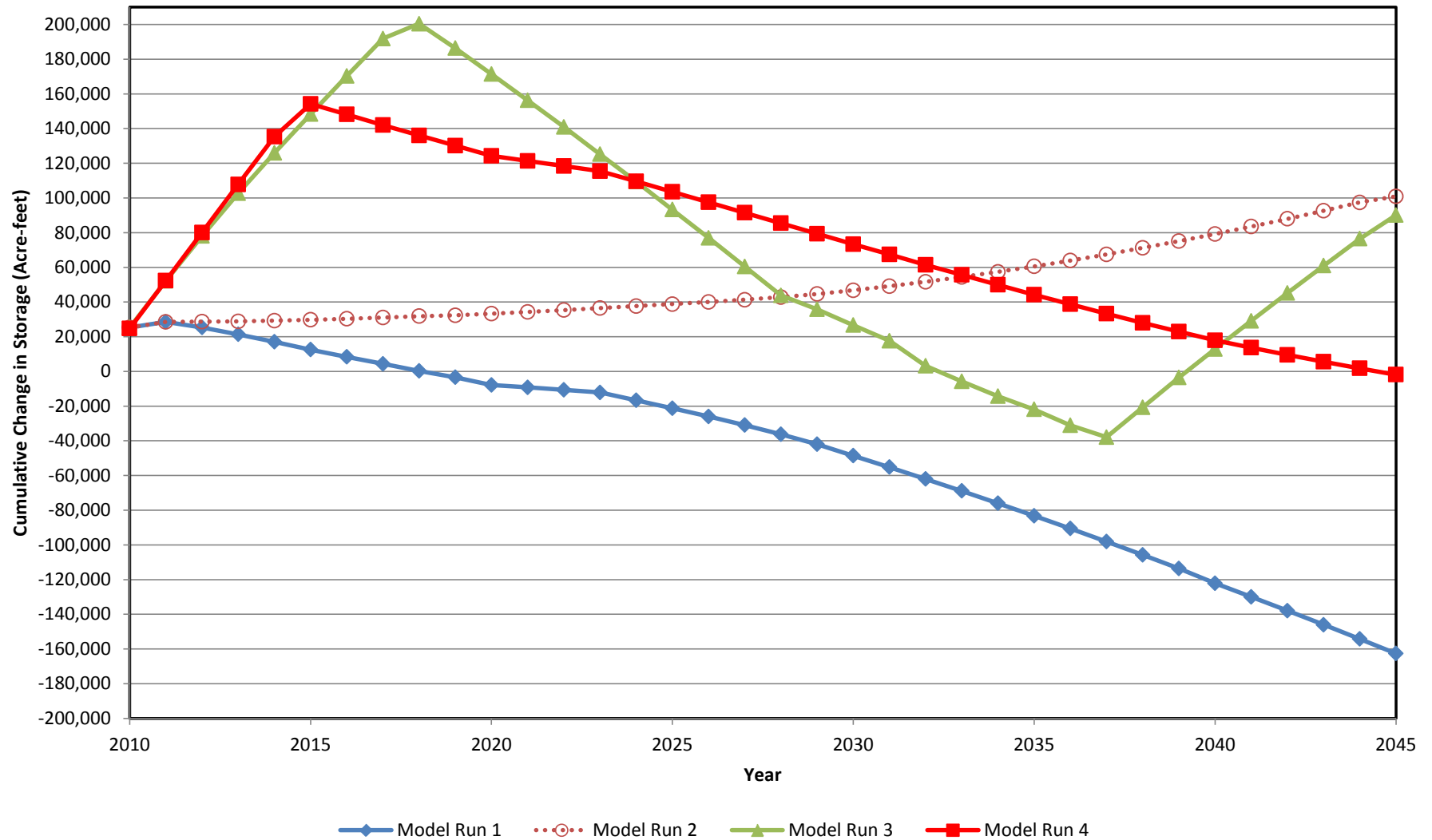
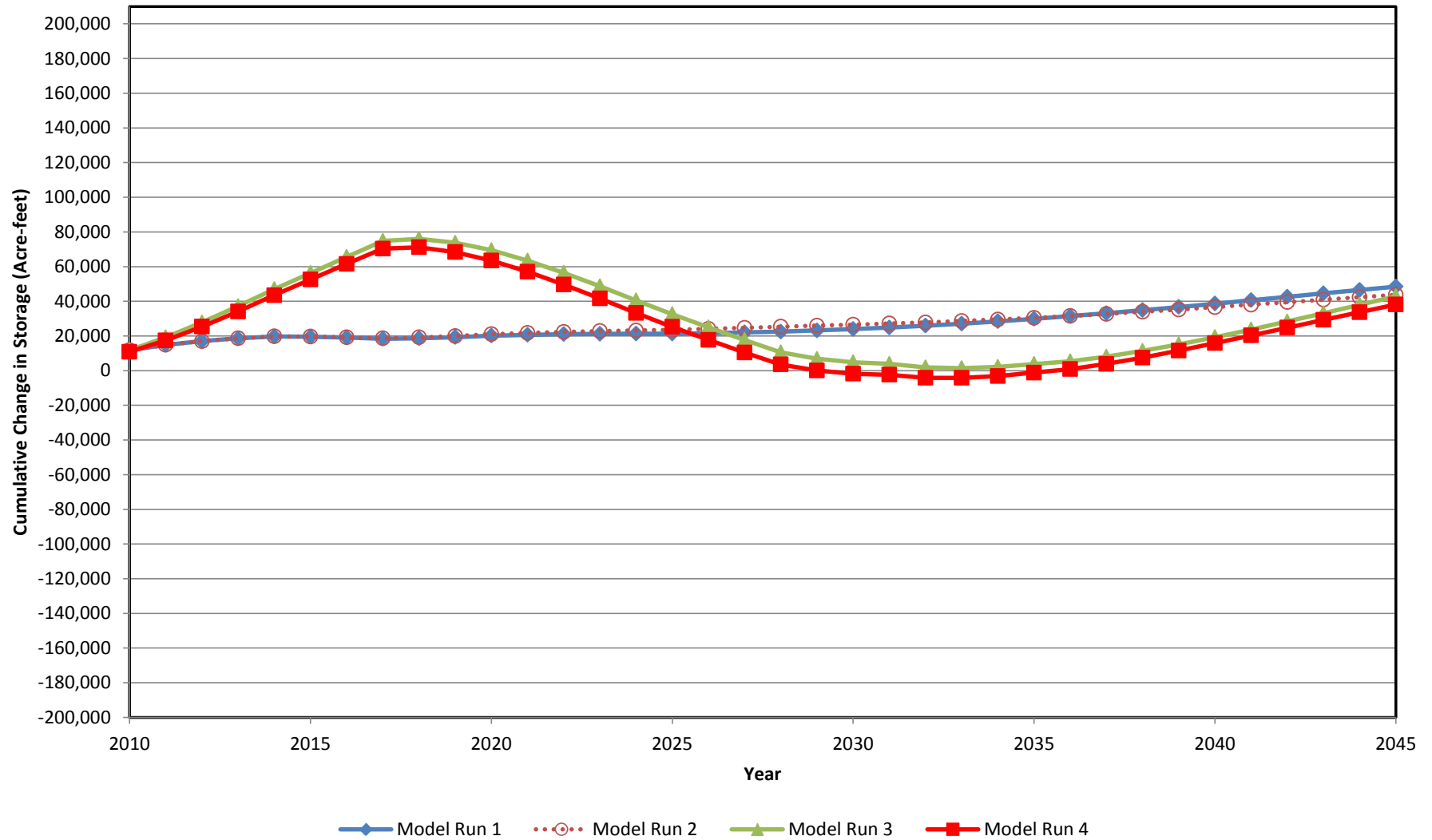
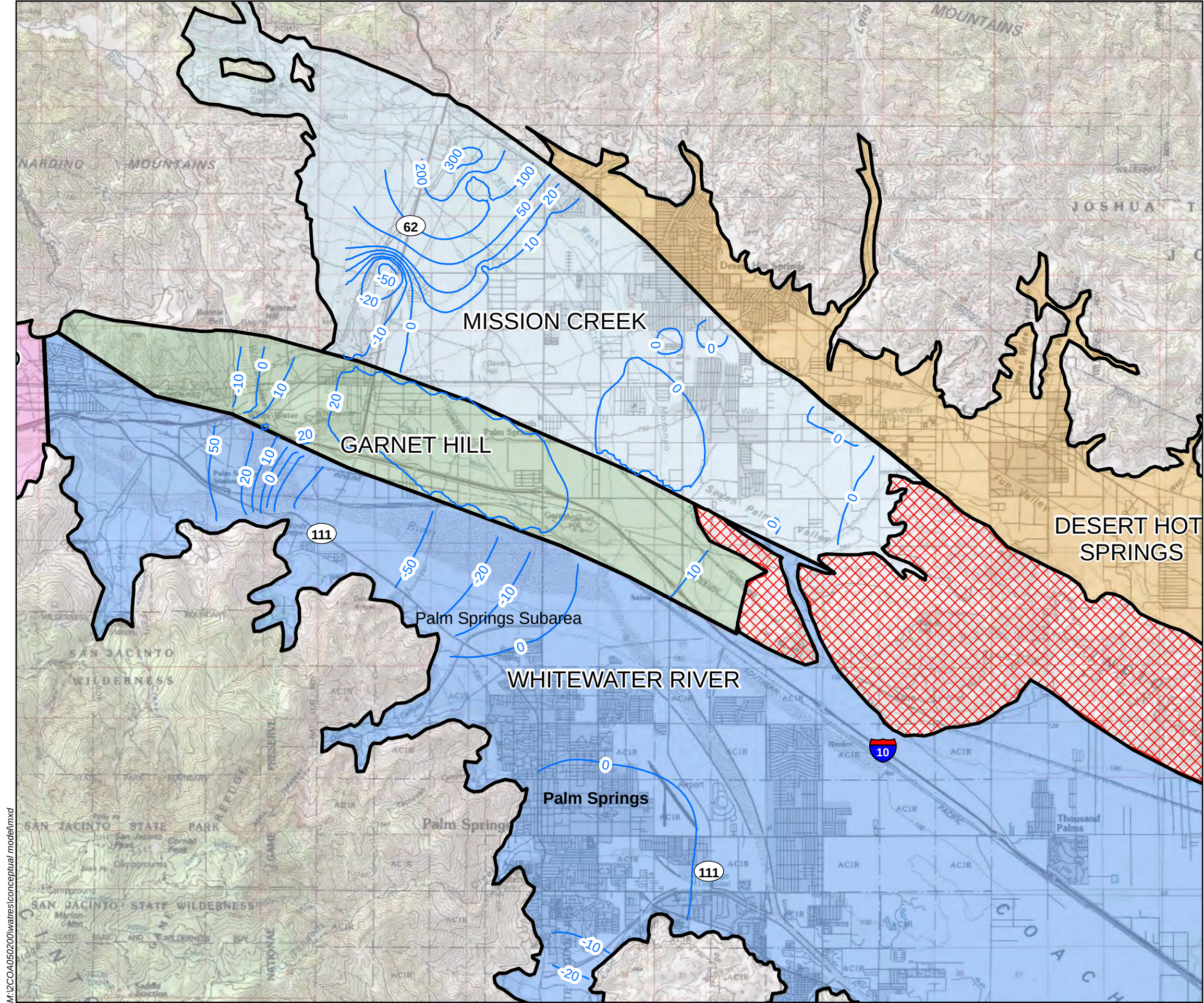


Figure 20
Cumulative Change in Storage - Garnet Hill Subbasin



Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California



Legend

Groundwater Elevation Change (in feet)

Coachella Valley Groundwater Subbasins

- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER
- Semi-waterbearing rocks

Topographic contours are in meters.

Source: Base map from USA Topo.
Groundwater subbasins from DWR, 2004a;
DWR, 2004b and DWR, 1964.

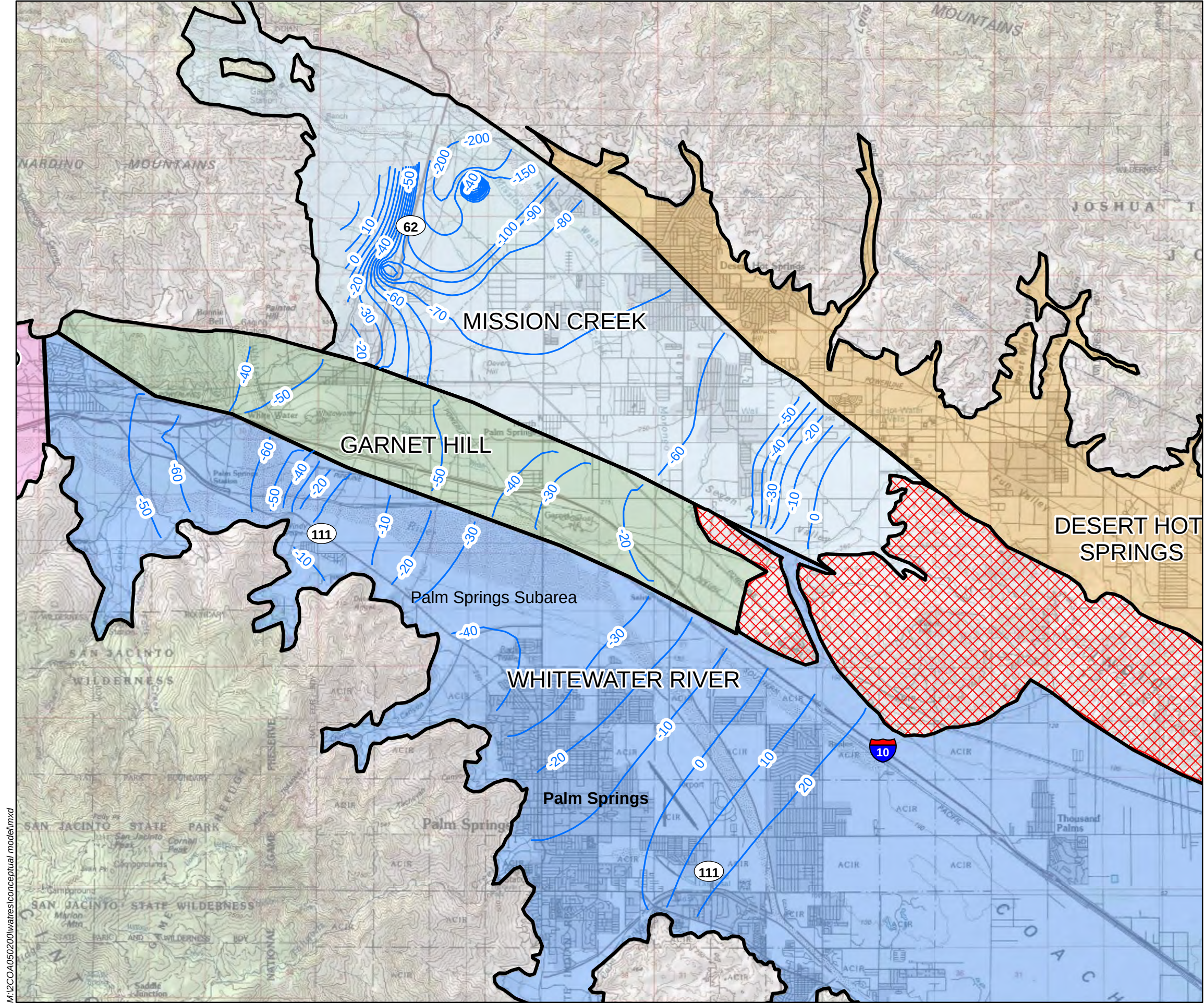


0 0.5 1 2 3 4 5 Miles

State Plane NAD 83 Zone 6

**Overall Change in
Groundwater Levels
for Model Run #2
(2010-2045)**

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California



Legend

Groundwater Elevation Change (in feet)

Coachella Valley Groundwater Subbasins

- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER
- Semi-waterbearing rocks

Topographic contours are in meters.

Source: Base map from USA Topo.
Groundwater subbasins from DWR, 2004a;
DWR, 2004b and DWR, 1964.

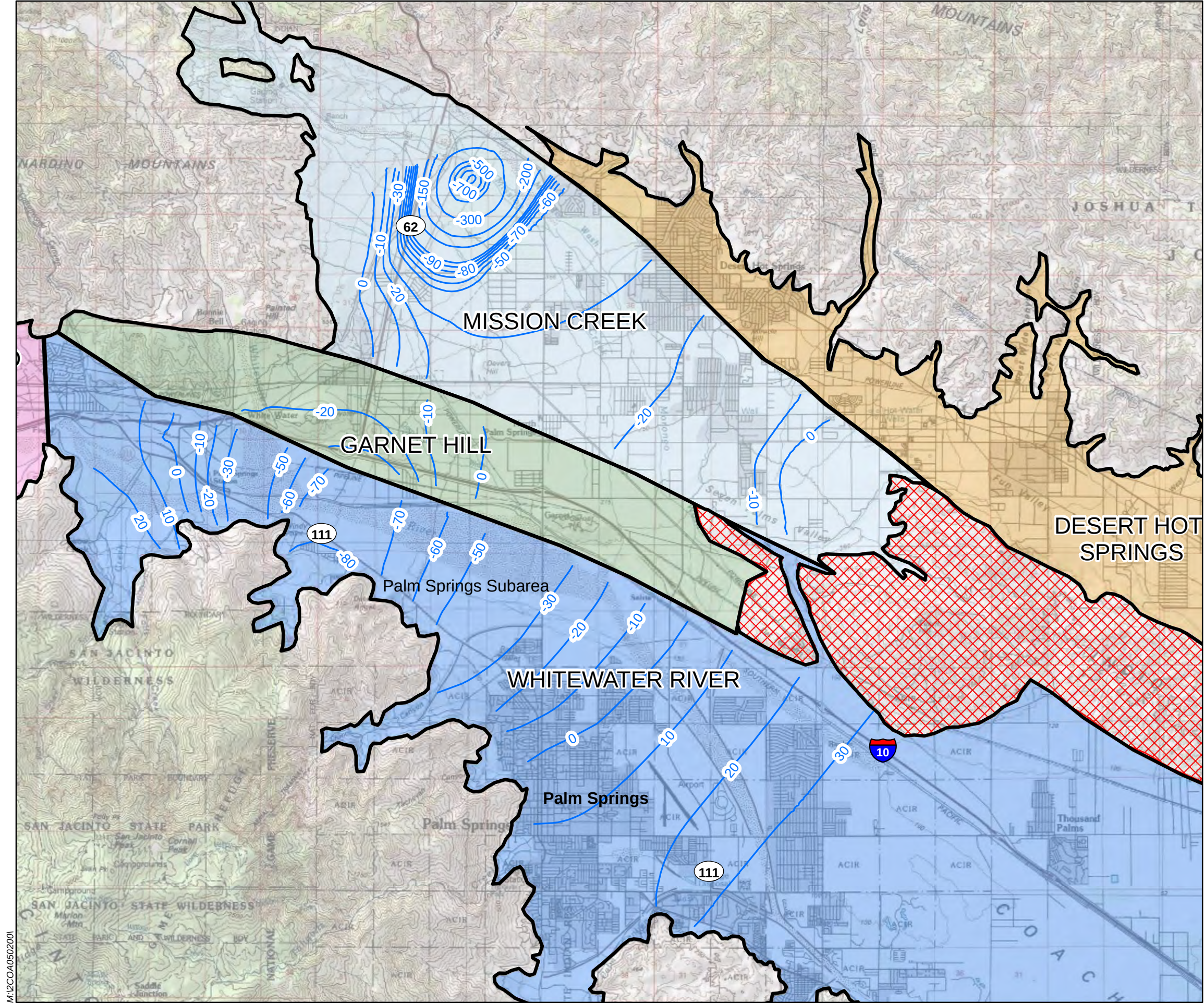


0 0.5 1 2 3 4 5 Miles

State Plane NAD 83 Zone 6

**Overall Change in
Groundwater Levels
for Model Run #3
(2018-2038)**

Water Management Plan
Mission Creek and Garnet Hill Subbasins
Desert Hot Springs, California



Legend

Groundwater Elevation Change (in feet)

Coachella Valley Groundwater Subbasins

- DESERT HOT SPRINGS
- GARNET HILL
- MISSION CREEK
- SAN GORGONIO PASS
- WHITEWATER RIVER
- Semi-waterbearing rocks

Topographic contours are in meters.

Source: Base map from USA Topo.
Groundwater subbasins from DWR, 2004a;
DWR, 2004b and DWR, 1964.



0 0.5 1 2 3 4 5 Miles

State Plane NAD 83 Zone 6

**Overall Change in
Groundwater Levels
for Model Run #4
(2015-2045)**