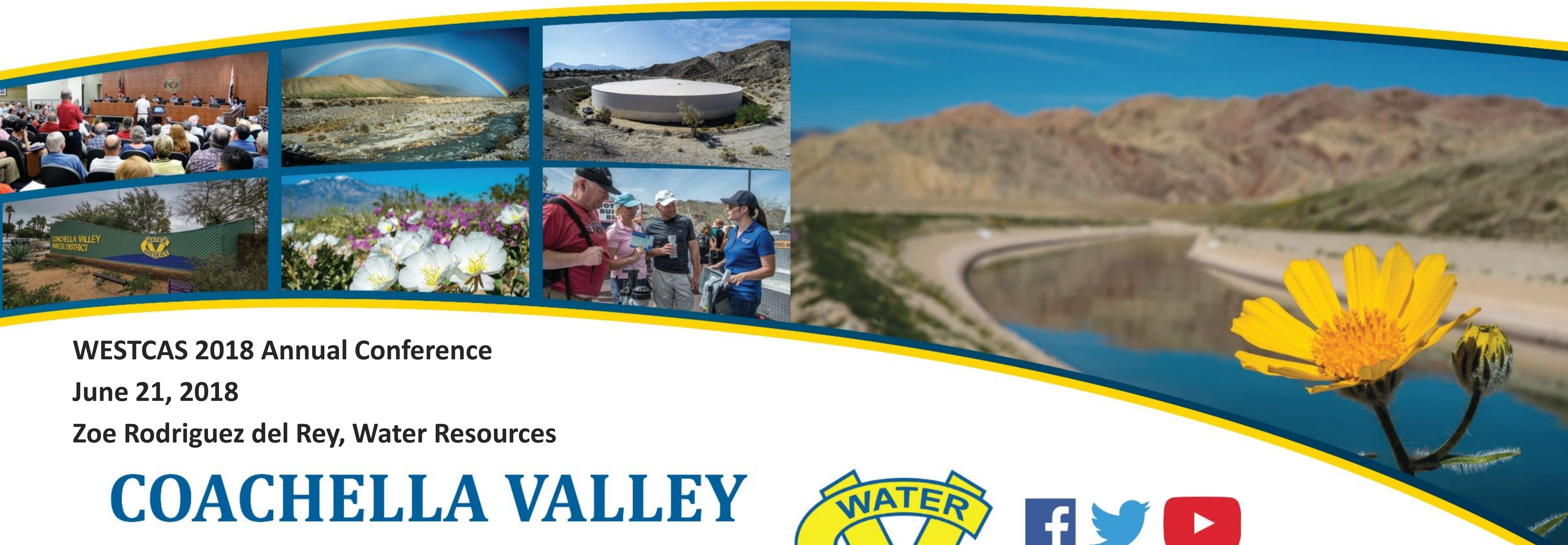
Groundwater Replenishment In The Coachella Valley, CA



WESTCAS 2018 Annual Conference

June 21, 2018

Zoe Rodriguez del Rey, Water Resources

COACHELLA VALLEY
WATER DISTRICT

www.cvwd.org

Coachella Valley

Indio

Mecca

Palm Springs

La Quinta

Thermal

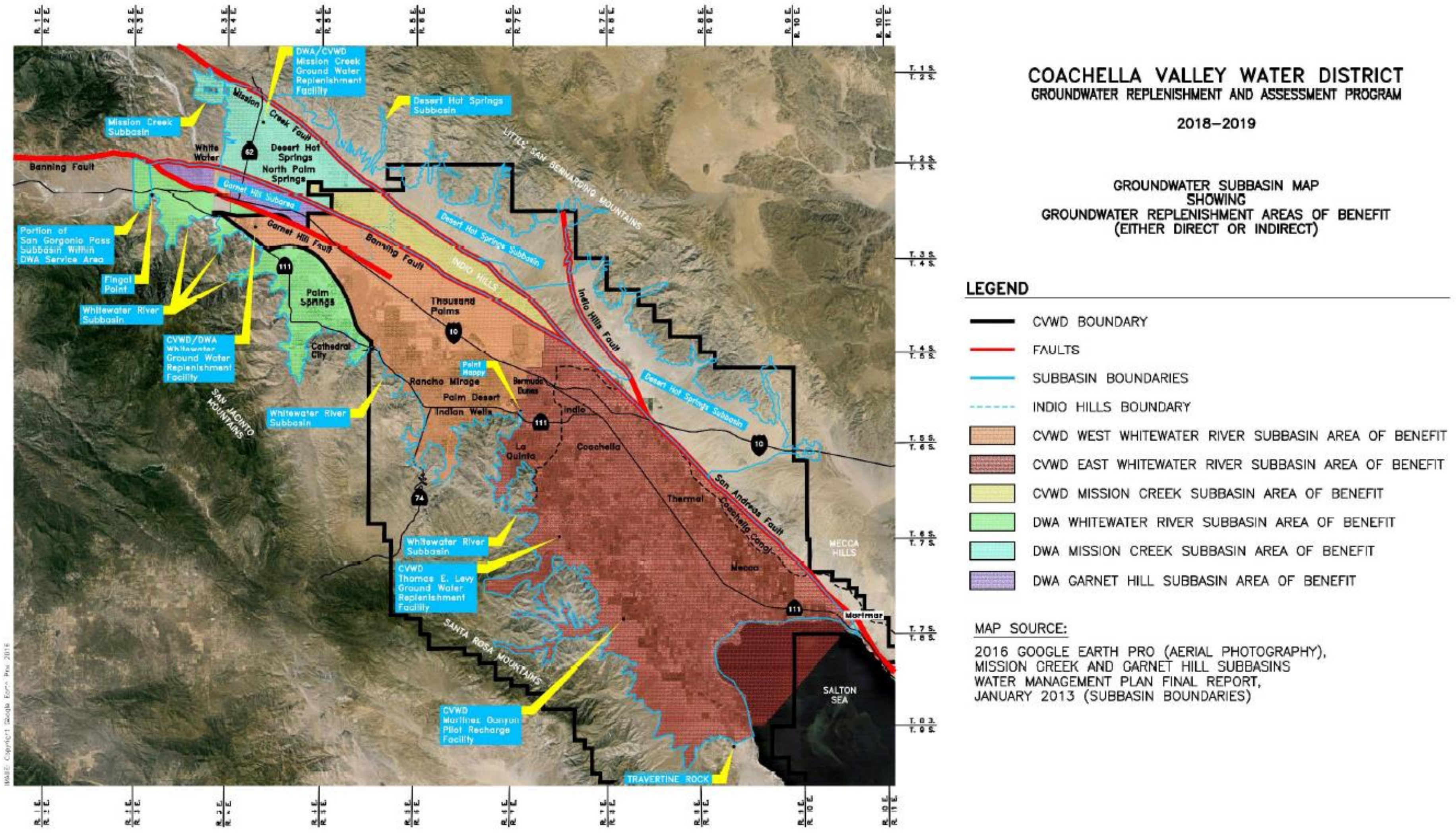
Coachella Valley Groundwater Replenishment and Assessment Programs

CVWD Areas of Benefit

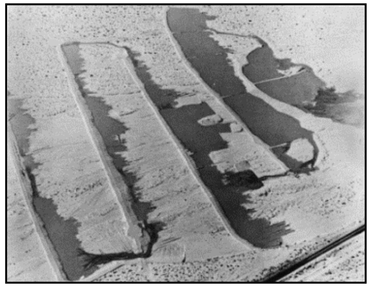
- West Whitewater River Subbasin – 1980
- Mission Creek Subbasin – 2003
- East Whitewater River Subbasin – 2005

DWA Areas of Benefit

- West Whitewater River Subbasin – 1978
- Mission Creek Subbasin – 2003
- Garnet Hill Subbasin – 2015



Coachella Valley
Groundwater Replenishment History



1918 – CVWD Formed

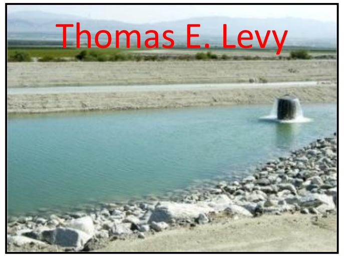
1949 – Supplemental Water Deliveries Begin

1973 – State Water Projects Begin

1984 – Whitewater Facility Expanded

1997 – Dike No. 4 Pilot Facility

2002 – Mission Creek Facility Operational



2009 – Thomas E. Levy Facility Operational

2018 – Construction on Palm Desert Facility Begins

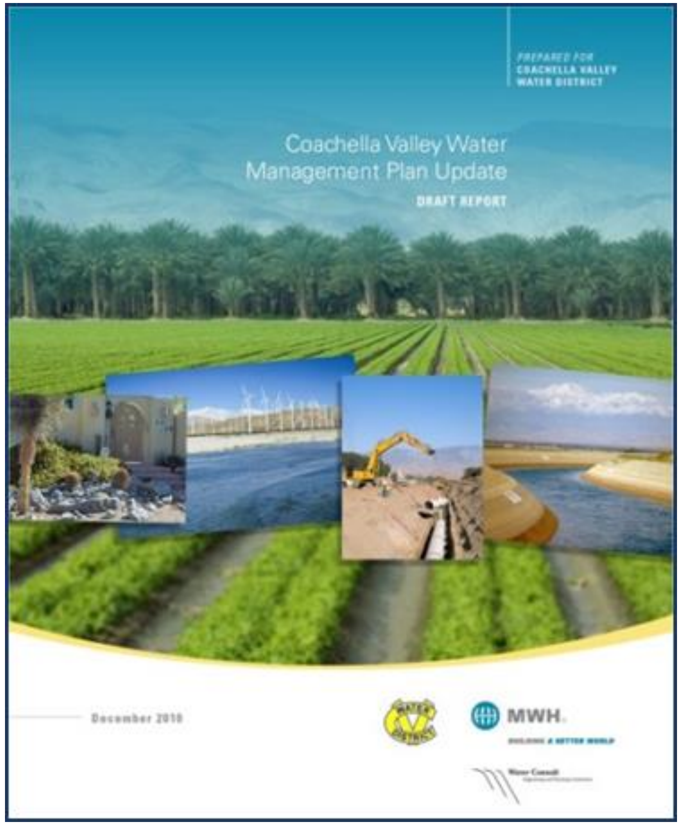
Coachella Valley
Water Management Plan

Objectives:

- Sustainable Groundwater Supply
- Maximize Conjunctive Use
- Minimize Economic and Environmental Impacts

Major Elements:

- Water Conservation
- Source Substitution
- Groundwater Replenishment
- Additional Water Supplies

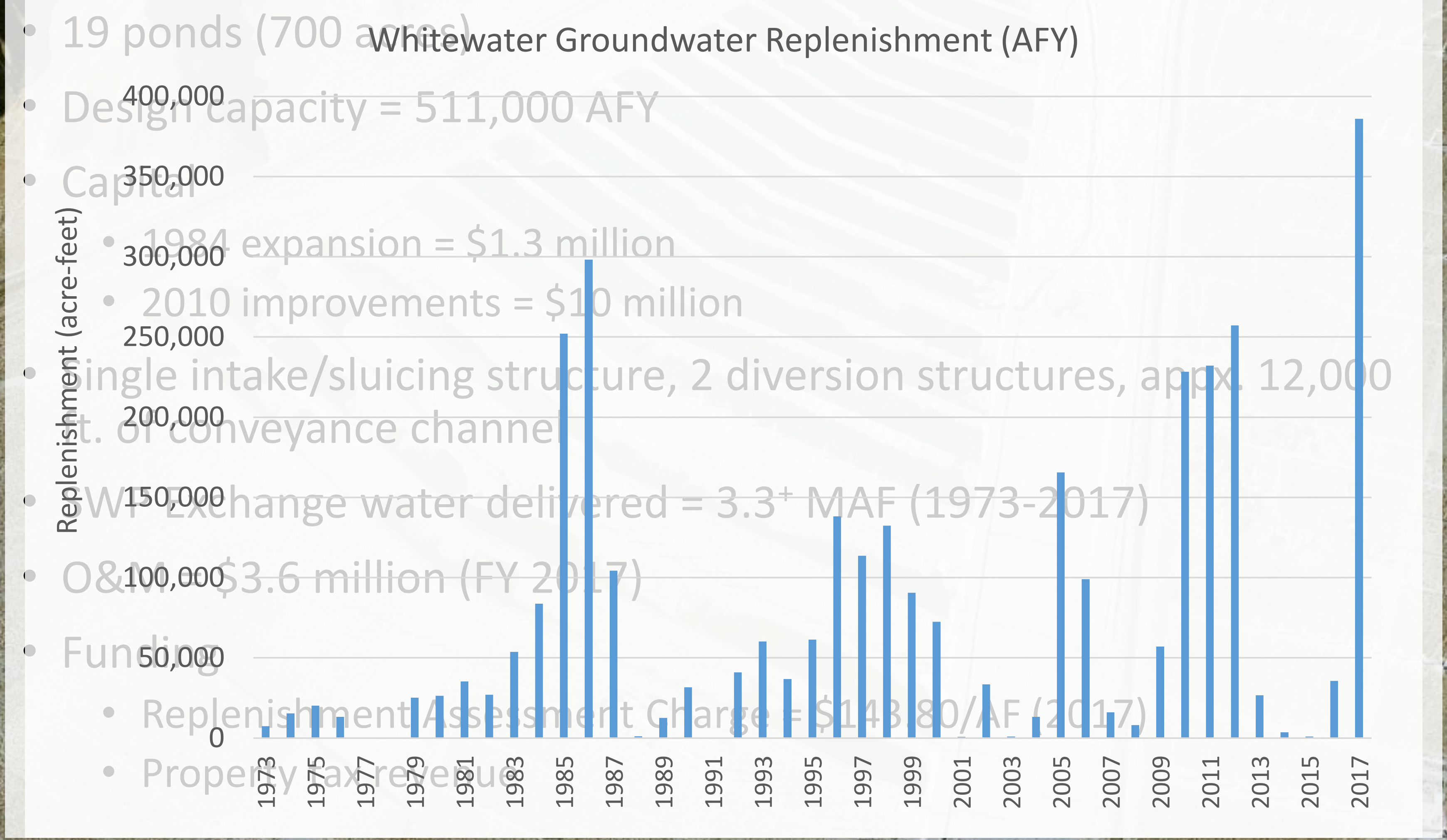


Replenishment Water Supplies

- Colorado River Water:
  - 384,000 AF (2018)
- State Water Project:
  - CVWD = 138,350 AF
  - DWA = 55,750 AF
  - Total = 194,100 AF
- MWD Advanced Delivery:
  - Balance (May 2018) = 222,215 AF

Whitewater Groundwater Replenishment Facility

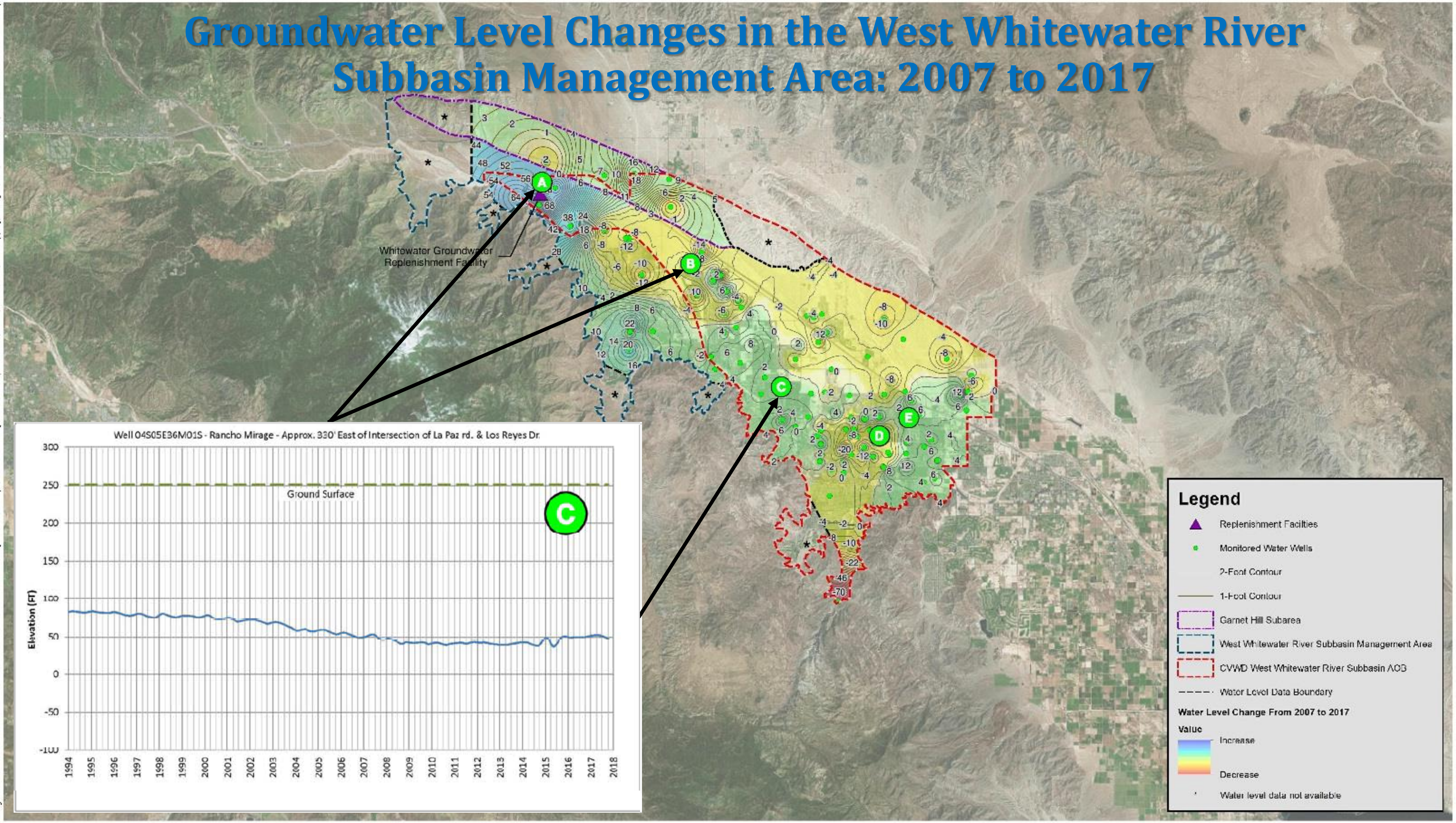
- 19 ponds (700 acres)
- Design capacity = 511,000 AFY
- Capital
  - 1984 expansion = $1.3 million
  - 2010 improvements = $10 million
- Single intake/sluicing structure, 2 diversion structures, appx. 12,000 ft. of conveyance channel
- SWP Exchange water delivered = 3.3+ MAF (1973-2017)
- O&M = $3.6 million (FY 2017)
- Funding
  - Replenishment Assessment Charge = $143.80/AF (2017)
  - Property tax revenue



Operation and Maintenance

- Delivery Procedure
  - Ramp-up in daily 50 cfs max increments
  - Sluice sediment into the Whitewater River channel
- Flow Range
  - 165-700 cfs
  - 165 cfs is minimum flow to operate the HPG
- Natural Runoff/Flood Procedures
  - Flows above 1,500 cfs enter the Whitewater River channel to protect the ponds
  - Real-time monitoring of USGS-National Water Information System (900 cfs alert)
- Maintenance
  - Remove accumulated fine sediments
  - Two-thirds of facility can remain open during regular maintenance

Groundwater Level Changes in the West Whitewater River Subbasin Management Area: 2007 to 2017



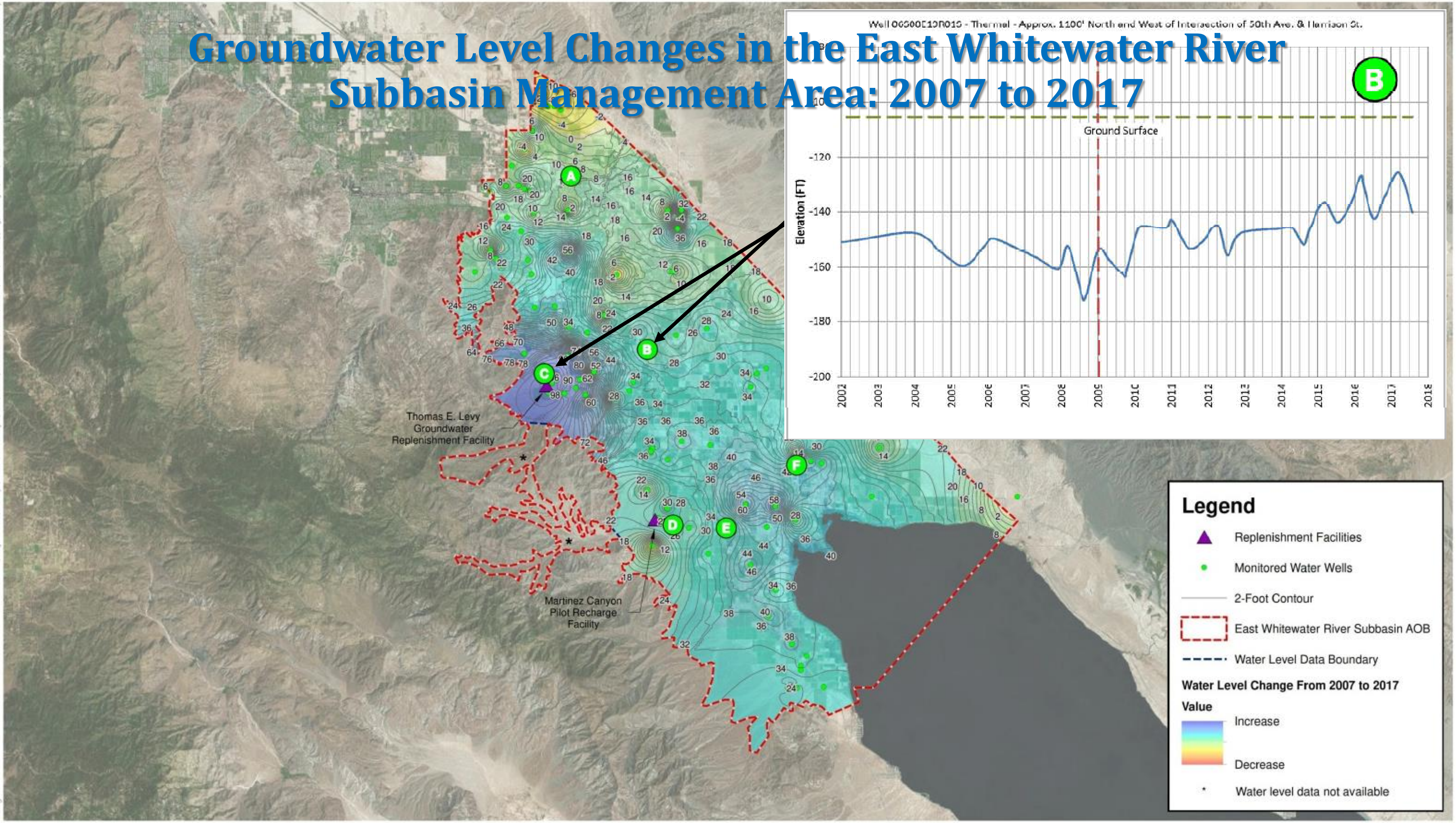
Prepared By:
KRIEGER & STEWART Engineering Consultants

Figure VI-2A
Groundwater Level Changes in
West Whitewater River Subbasin Management Area: 2007 to 2017

Thomas E. Levy
Groundwater Replenishment Facility

- 39 ponds (163 acres)
- Two 422K gallon reservoirs
- Pump station = 27,000 gpm capacity (1,500 HP, lift 160 ft)
- Design capacity = 40,000 AFY
- Capital (incl. land cost) = $60 million
- O&M = $3.4 million/yr. (FY 2017)
- QSA Mitigation Costs = $7.8 million (FY 2017)
- Colorado River water delivered = 325,000^{+} AF (1997-2017)
- Funding
  - Replenishment Assessment Charge = $66/AF (2017)
  - Property tax revenue

Groundwater Level Changes in the East Whitewater River Subbasin Management Area: 2007 to 2017



Prepared By:

KRIEGER & STEWART
Engineering Consultants

0 20,000 40,000
(IN FEET)

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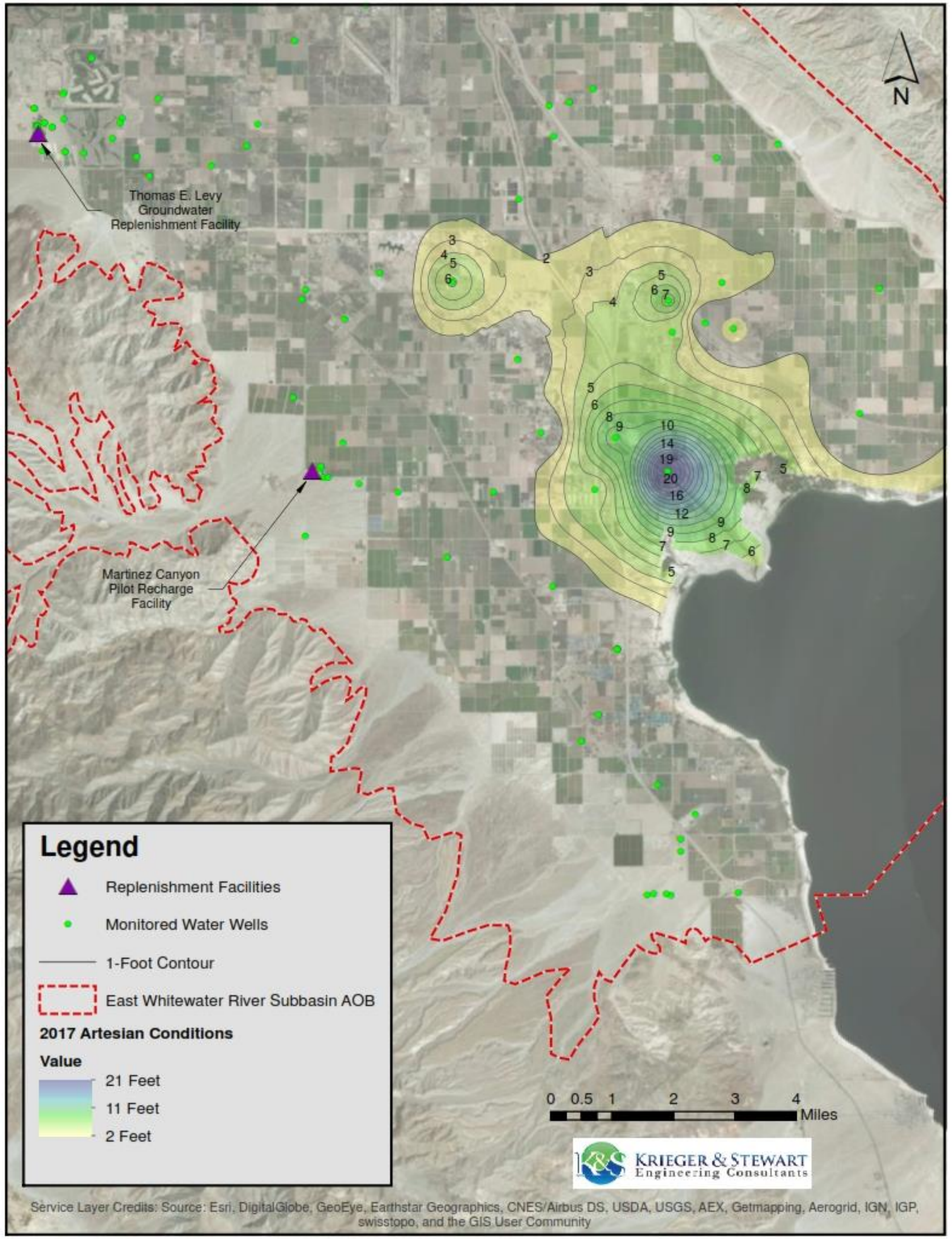
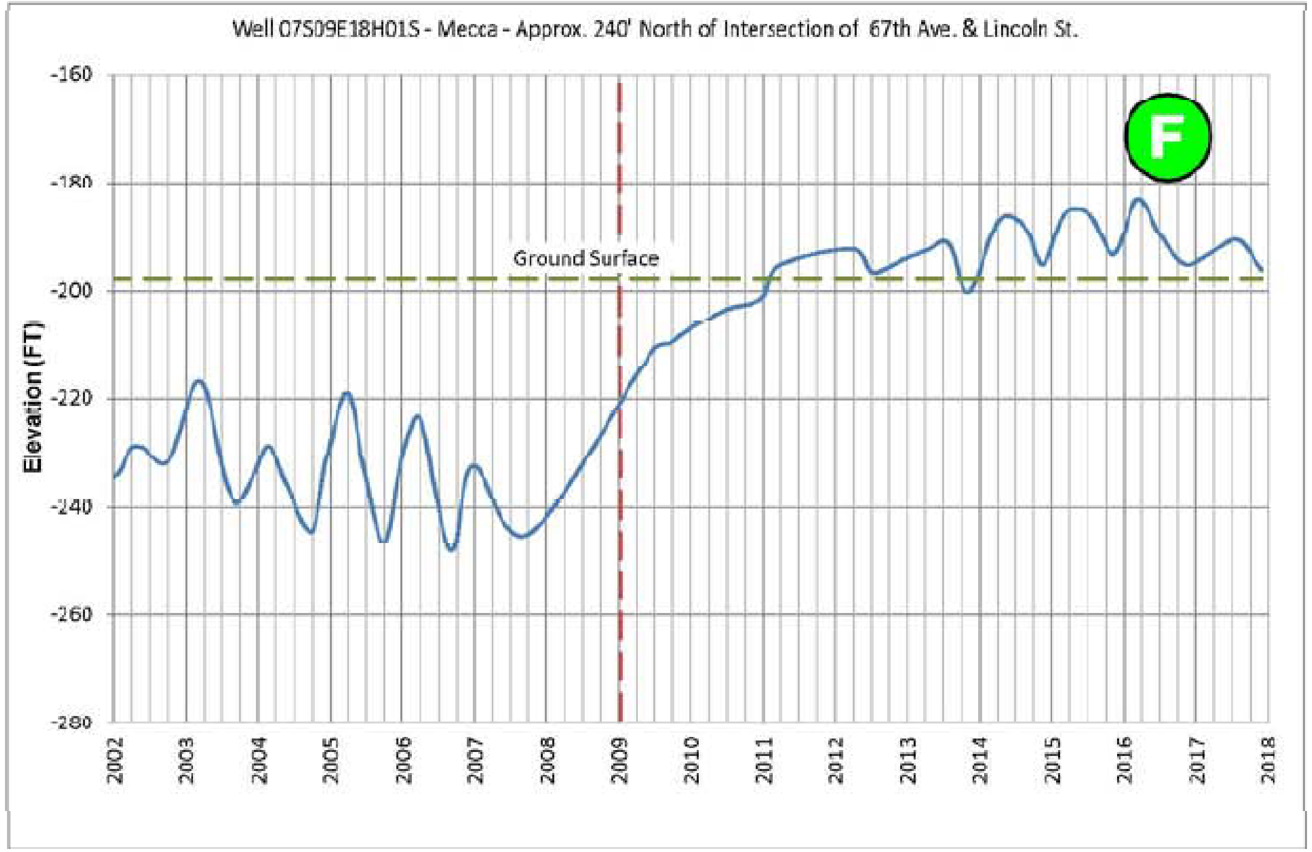
Figure VII-2A
Groundwater Level Changes in
East Whitewater River Subbasin Area of Benefit: 2007 to 2017

Artesian Conditions (2017)

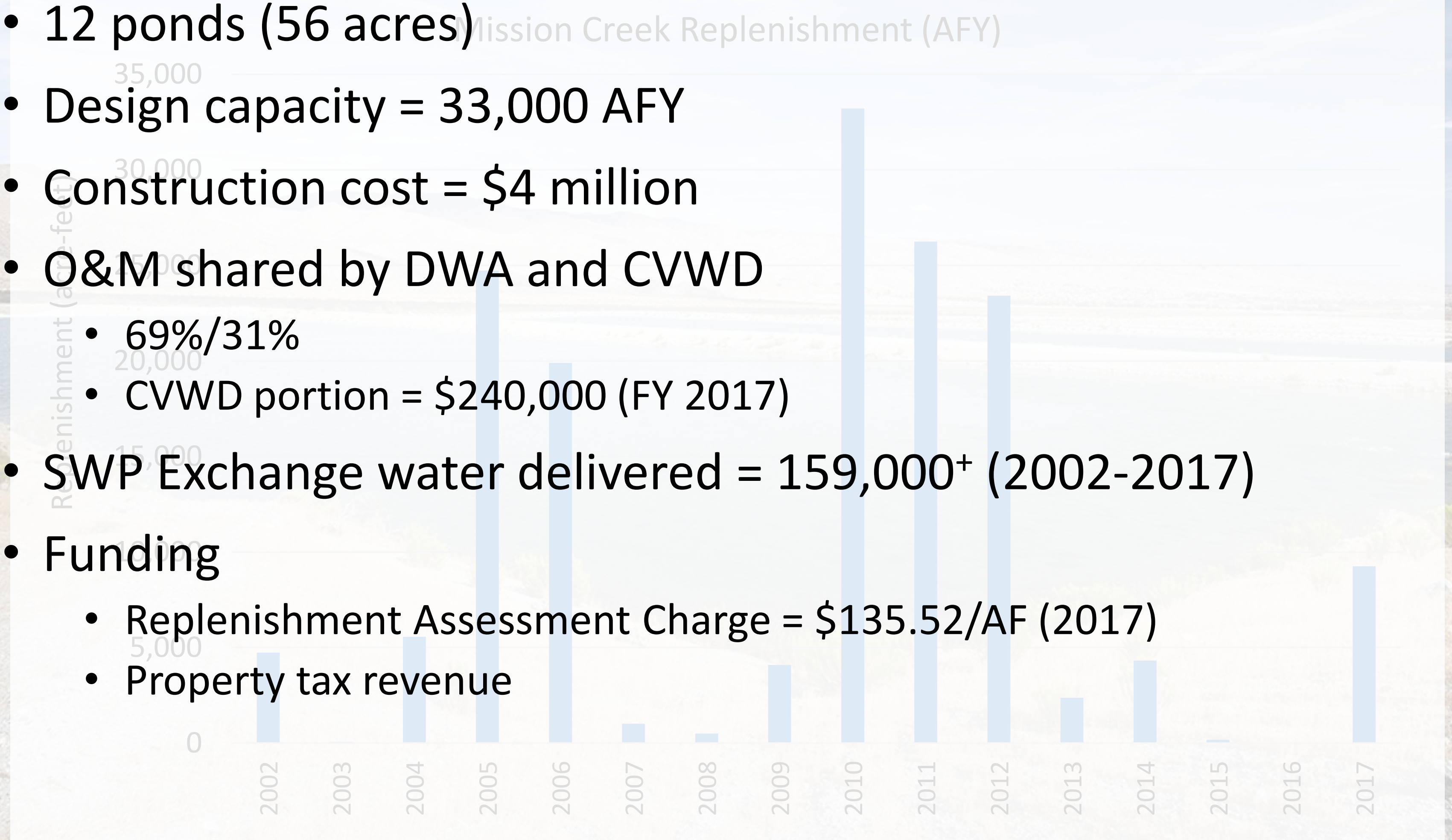


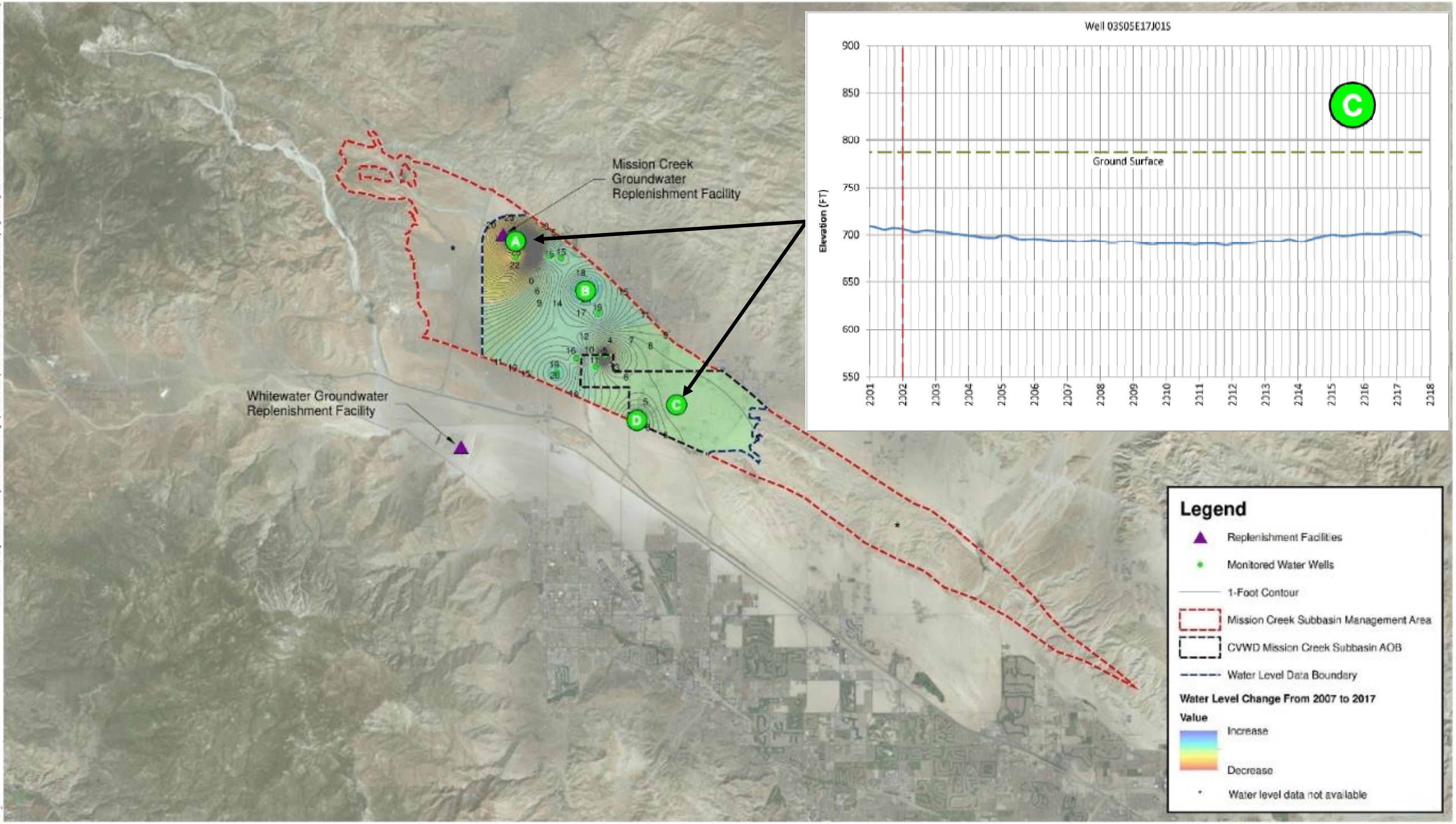


Replenishment Pond Maintenance

Mission Creek
Groundwater Replenishment Facility

- 12 ponds (56 acres)
- Design capacity = 33,000 AFY
- Construction cost = $4 million
- O&M shared by DWA and CVWD
  - 69%/31%
  - CVWD portion = $240,000 (FY 2017)
- SWP Exchange water delivered = 159,000+ (2002-2017)
- Funding
  - Replenishment Assessment Charge = $135.52/AF (2017)
  - Property tax revenue





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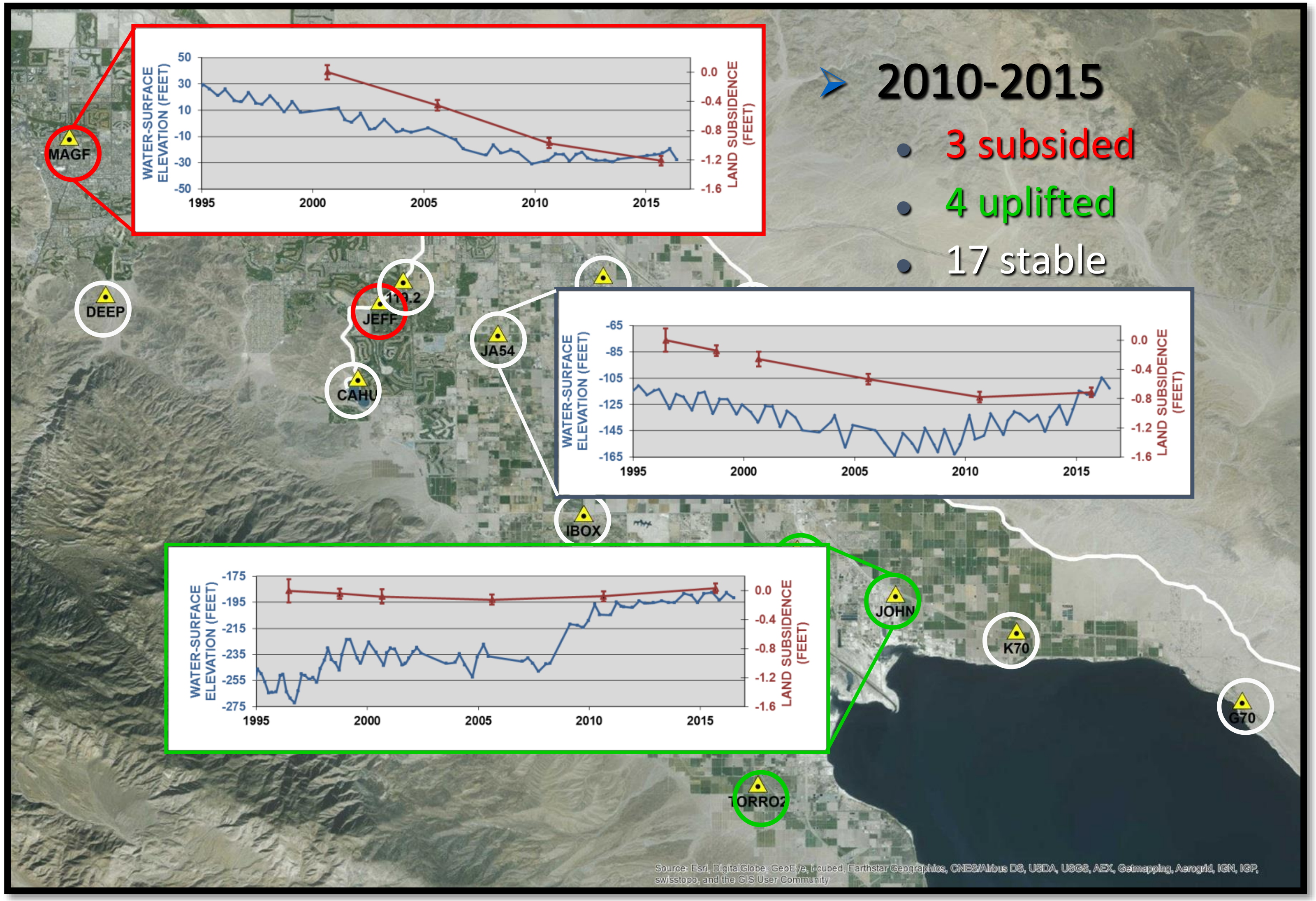
Engineering Consultants

0 15,000 30,000
(IN FEET)

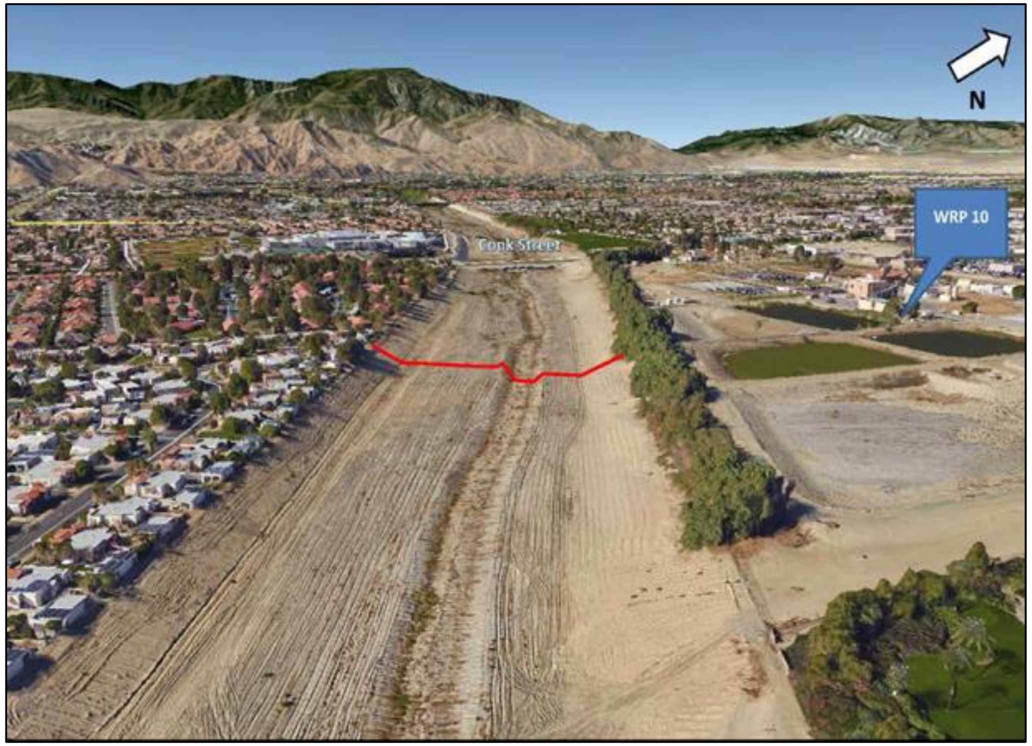
Figure V-2A
Groundwater Level Changes in
Mission Creek Subbasin Management Area: 2007 to 2017

Coachella Valley Land Subsidence Studies

Land Surface Elevation Surveys



Preliminary and Subject to Revision – Michelle Sneed (USGS) March 28, 2017 Presentation



Palm Desert Groundwater Replenishment Project

Phase I

- Repurposing of Wastewater Reclamation Plant 10 percolation ponds
- Five ponds (20 acres)
- Design capacity = 10,000 AFY

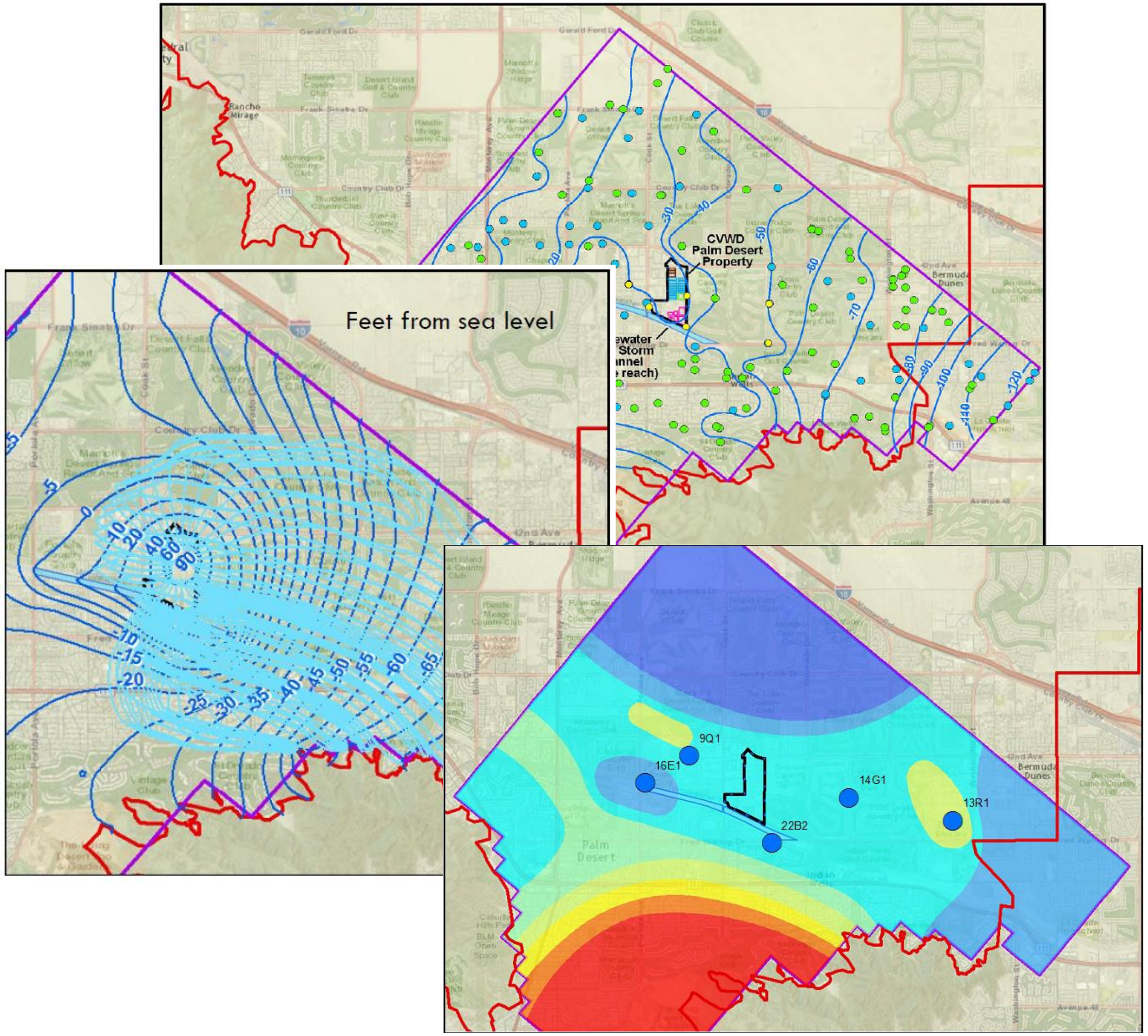
Phase II

- Replenishment ponds within the Whitewater River Storm Channel
- 3 Ponds (25 acres)
- Design capacity = 15,000 AFY

Estimated Construction Cost = ~$10 million

Key Project Elements

- Review existing hydrogeologic conditions
- Evaluate replenishment feasibility
- Develop local groundwater model to evaluate replenishment scenarios
  - Groundwater storage change
  - Water quality change
- Assess regulatory permitting
- Develop conceptual design/operational criteria



Project Summary

- Cost effective groundwater replenishment
- Aquifer has capacity without excessive mounding
- Groundwater gradient/flow equilibrium in ~5 years
- Groundwater levels in model area increase/stabilize at equilibrium
  - 25,000 AFY additional storage
  - Up gradient benefit – less subsurface flow into model area
  - Down gradient benefit – increased subsurface flow from model area
- Expected water quality changes support beneficial use
  - Safer groundwater (reduces long-term nitrate and Cr6 levels)
  - Salinity (aesthetic) increases within consumer acceptance range
- Permitting: updated WRP 10 permit; applied for 404, 401, and Streambed Alteration permits

Thank you!

Visit us at www.cvwd.org for more information on tours, presentations, newsletters and more!

Call us at (760) 398-2651
or email us at publicinfo@cvwd.org.

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