Aquifer Recharge and Beneficial Reuse

Multi-State Salinity Coalition
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PLANNING • ENGINEERING • PROJECT MANAGEMENT
MCi Moreno Cardenas Inc.
Leaders in Project Delivery & Performance

Topics

- El Paso Water Supply
- ASR Concepts
- Fred Hervey Water Reclamation Plant Background
- Injection Wells or Basins?
- Uses of Fred Hervey Water Reclamation Plant Effluent
- Future Plans

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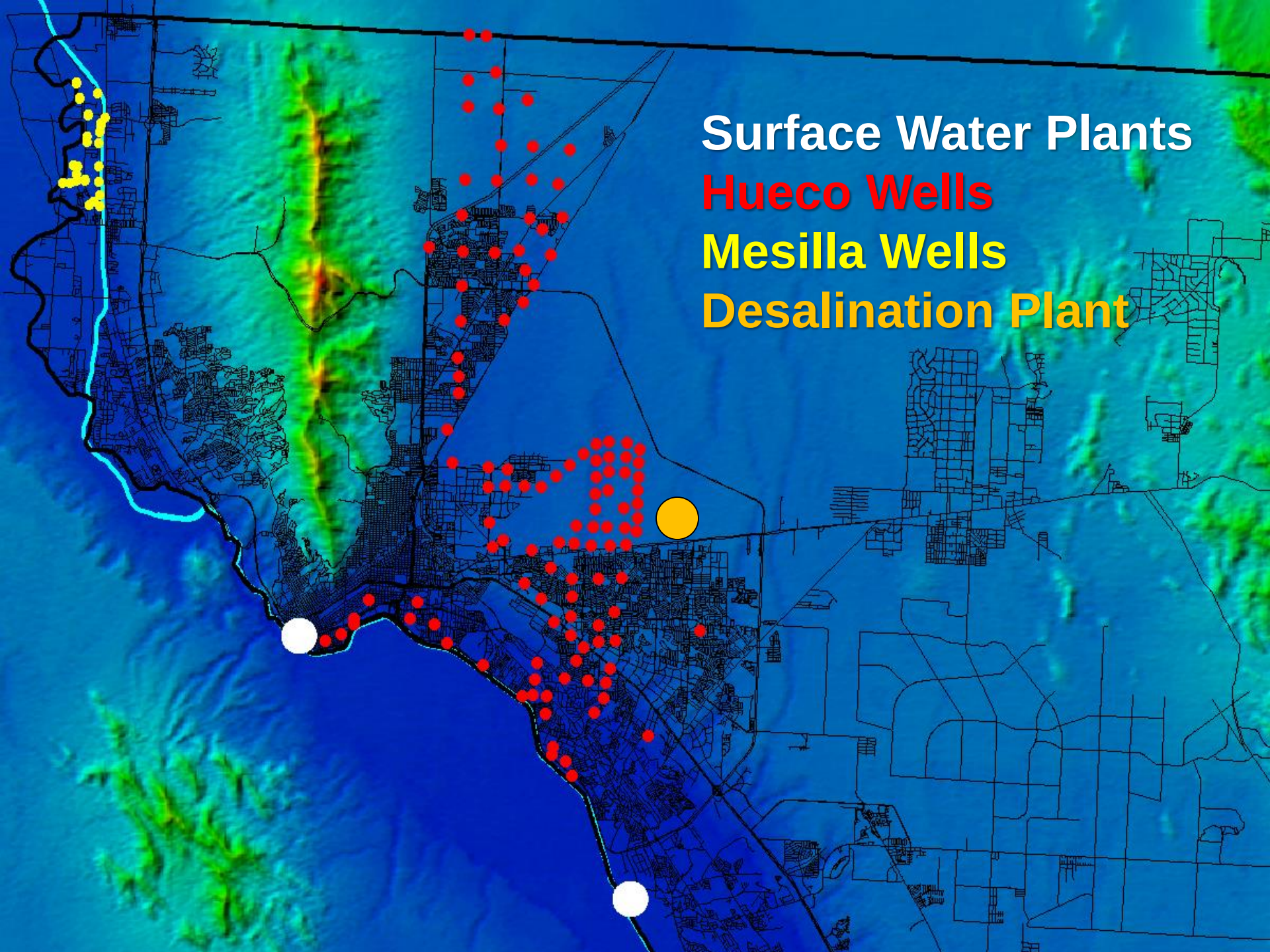
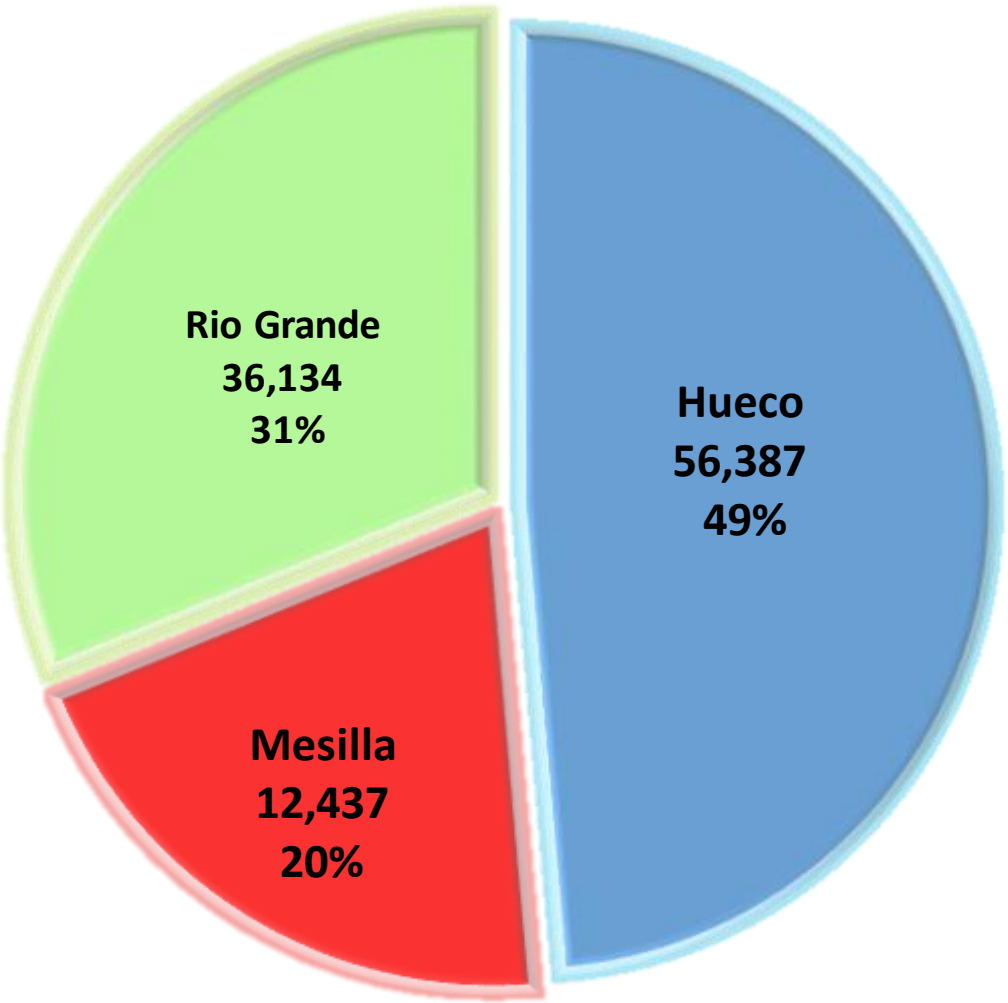
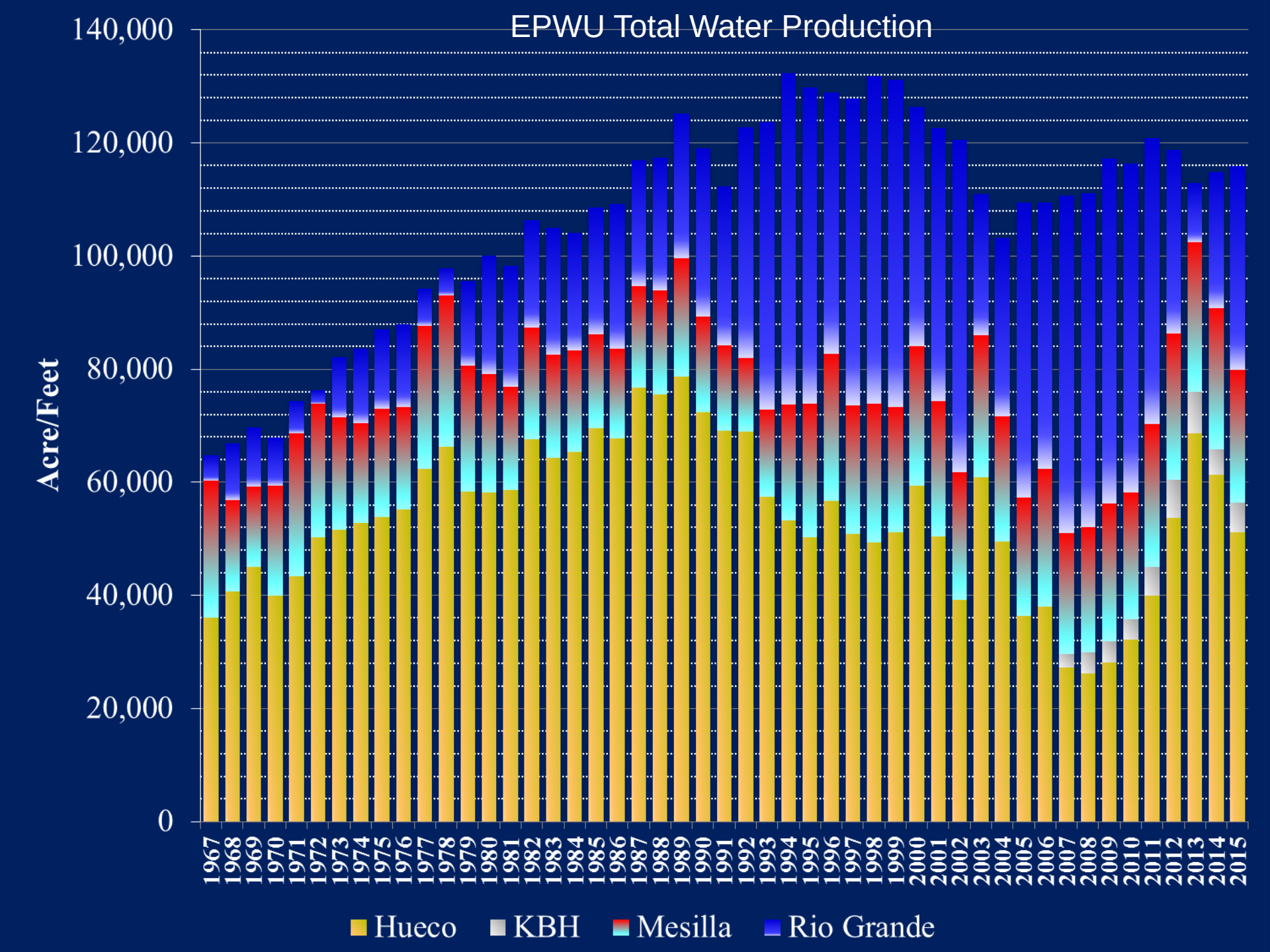

Surface Water Plants
Hueco Wells
Mesilla Wells
Desalination Plant

TYPICAL TOTAL WATER PRODUCTION
(Acre-Feet)




EPWU Total Water Production
Acre/Feet
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
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1980
1981
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2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Hueco
KBH
Mesilla
Rio Grande

Aquifer Storage and Recovery

- El Paso Water Utilities uses highly-treated effluent for aquifer recharge
- Groundwater levels
- Improve water quality of the aquifer

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Aquifer Storage and Recovery

- Fred Hervey Water Reclamation Plant effluent is also used for turf irrigation and industrial cooling
- Since 1985, over 75,000 ac-ft of effluent has been recharged to the Hueco Bolson
- Only reclaimed water ASR program in Texas

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Fred Hervey Water Reclamation Plant

- First oxidation pond built in late 1950s
- Original plant built in 1985 (10 MGD)
- Expanded plant capacity (12 MGD)
- Plant located 20 miles from the Rio Grande, effluent discharge to the river not economical

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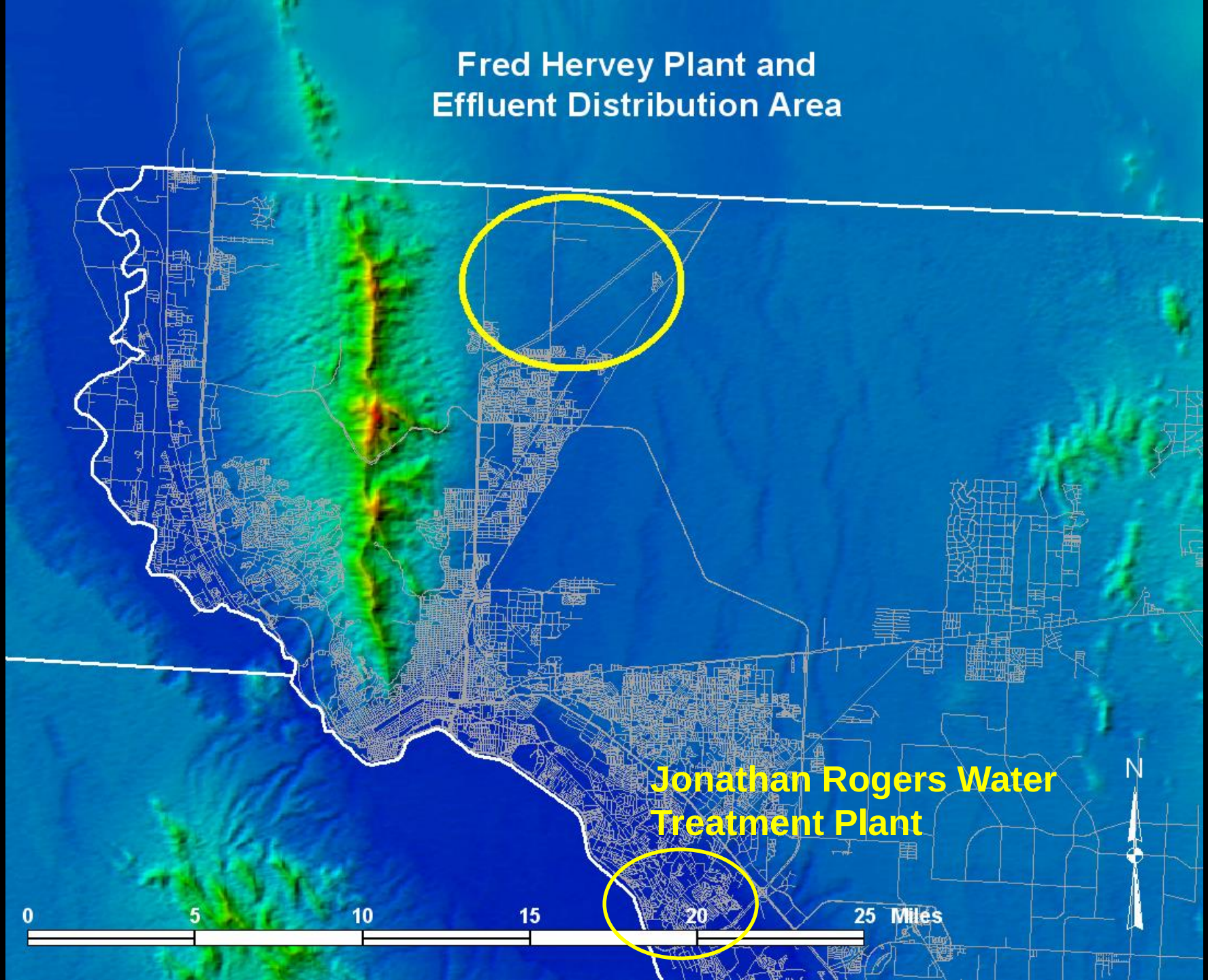
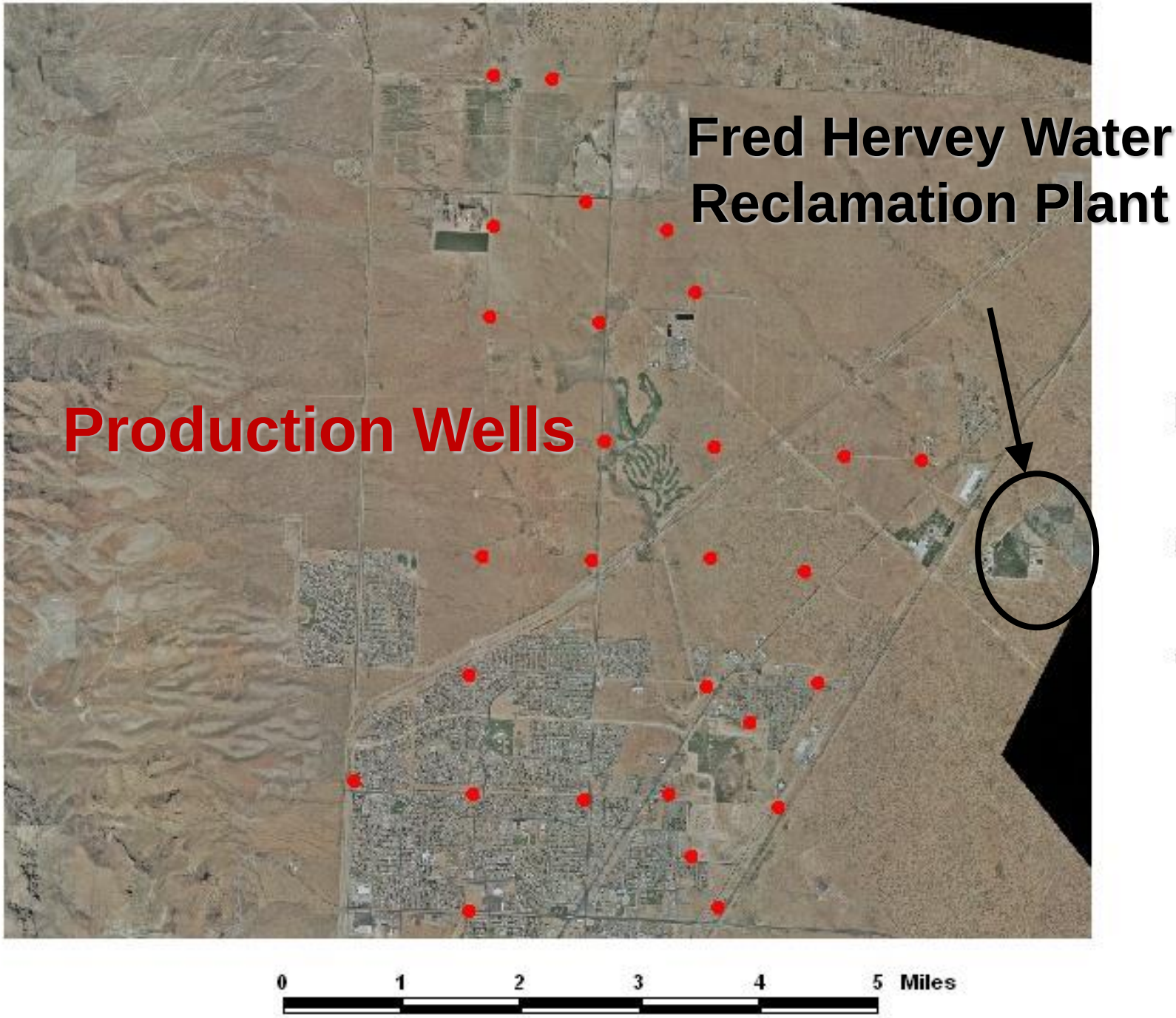
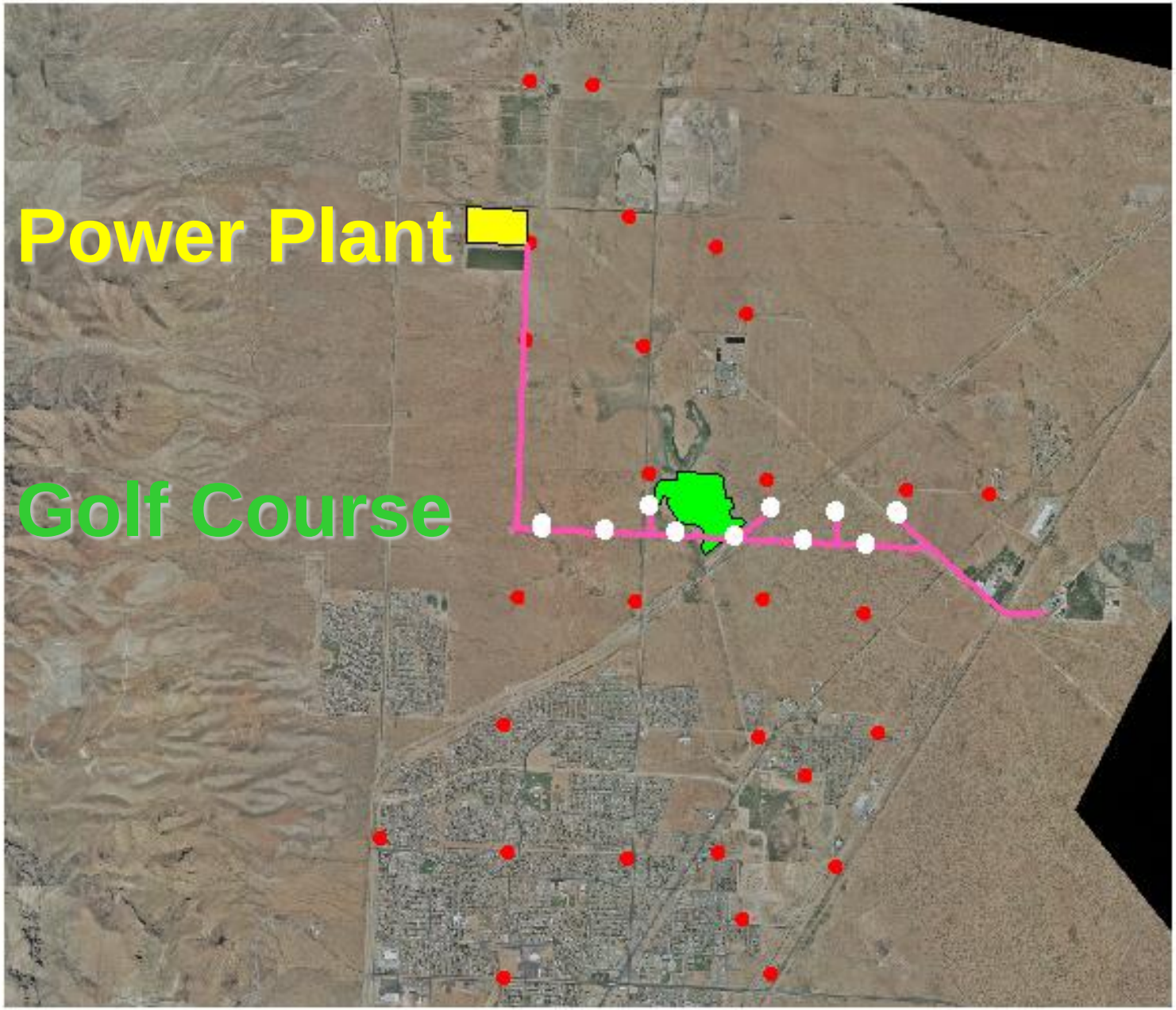

Fred Hervey Plant and
Effluent Distribution Area
Jonathan Rogers Water
Treatment Plant
N
0
5
10
15
20
25 Miles


Fred Hervey Water Reclamation Plant
Production Wells
N
0
1
2
3
4
5 Miles


Power Plant
Golf Course
N
0
1
2
3
4
5 Miles

Injection Well Summary

- 10 injection wells completed with galvanized casing and well screen in 1984
- Due to concerns about corrosion in well casing material, PVC was used to complete injection wells
- 2 PVC wells are in service

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AWWARF Research Foundation Study (2003)

- Comparison of alternative methods for recharge of a deep aquifer
- Spreading basin completed beneath the caliche at the surface
- Dry well completed in vadose zone below caliche and clays to speed transit to aquifer

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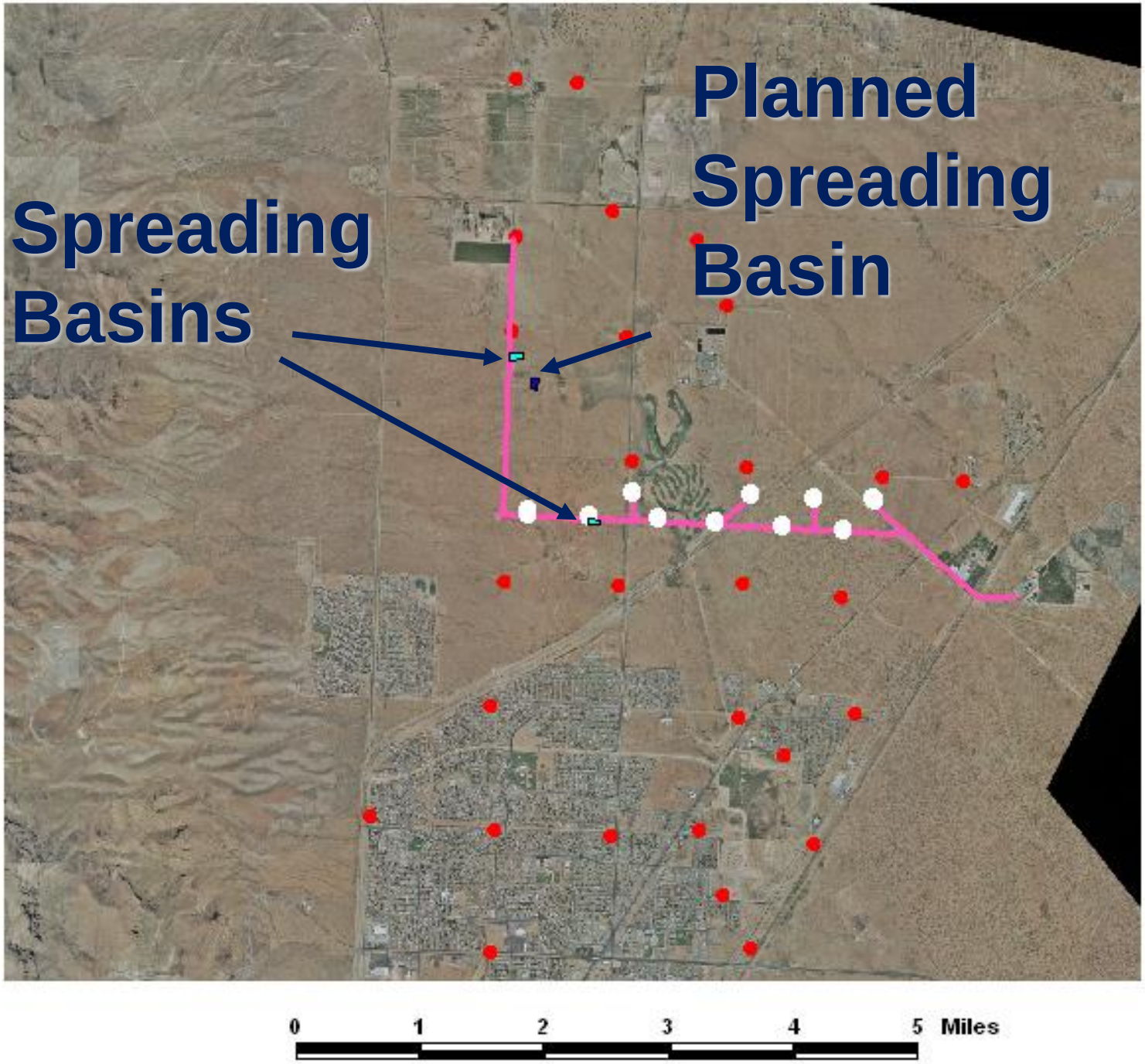
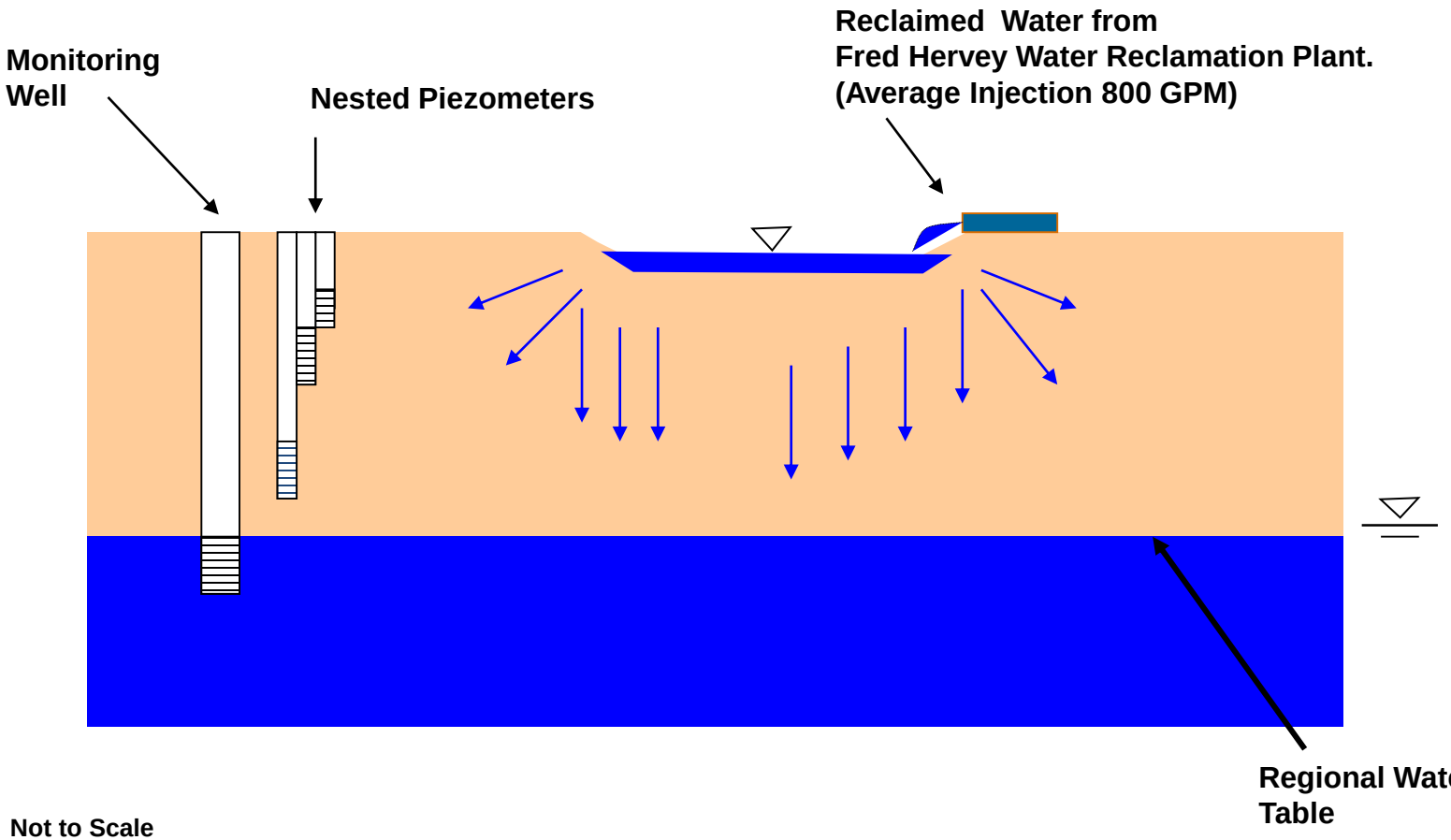

Spreading Basins
Planned Spreading Basin
N
0
1
2
3
4
5 Miles

AWWARF Study Infiltration Basin



Initial Start-Up of Recharge Basin

Study Results

- Dry well was ineffective although is less land intrusive compared to the basins
- Spreading basin was capable of maintaining a high recharge rate
- Basins are a cost effective alternative to dry wells or injection wells

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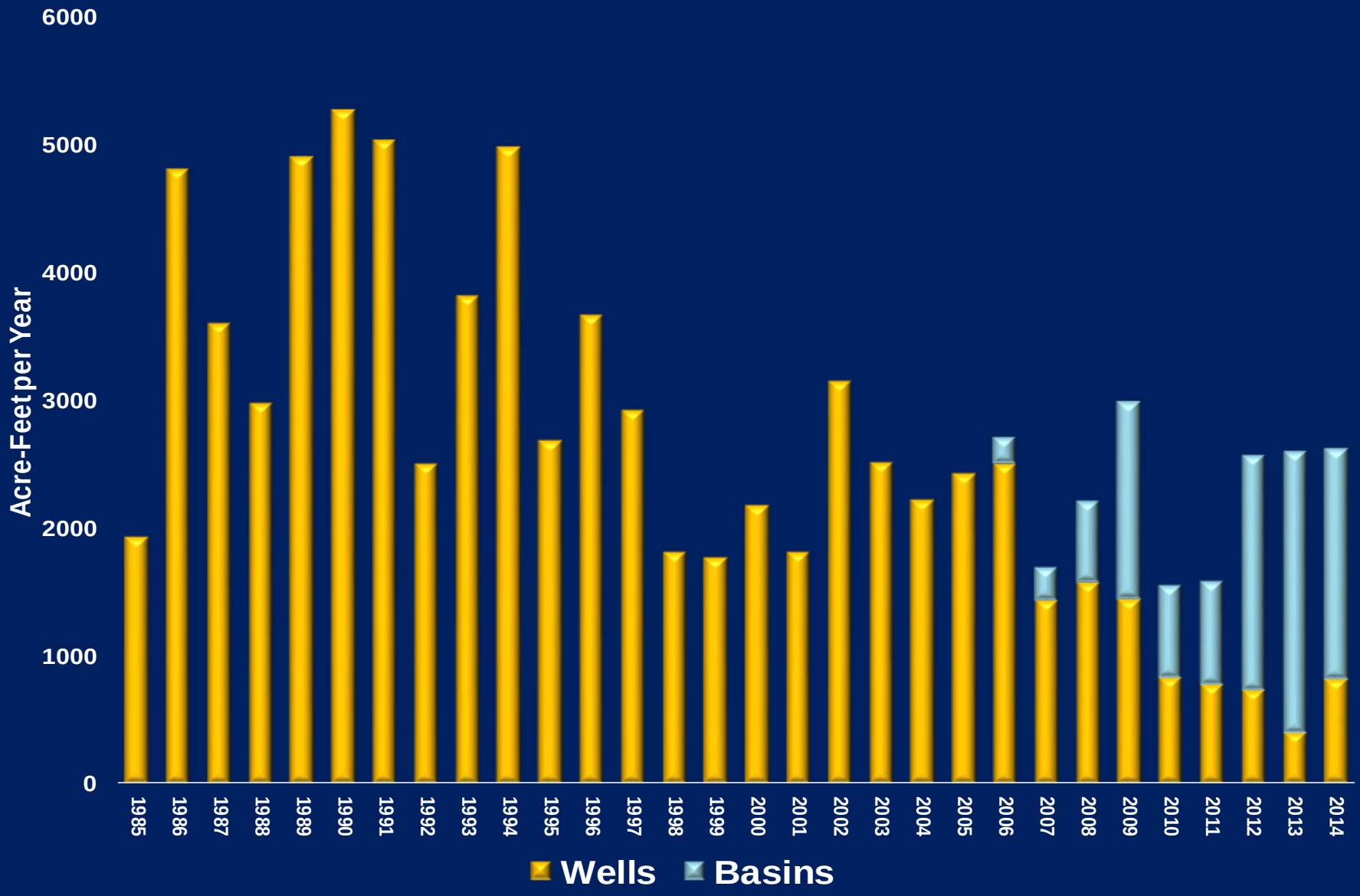
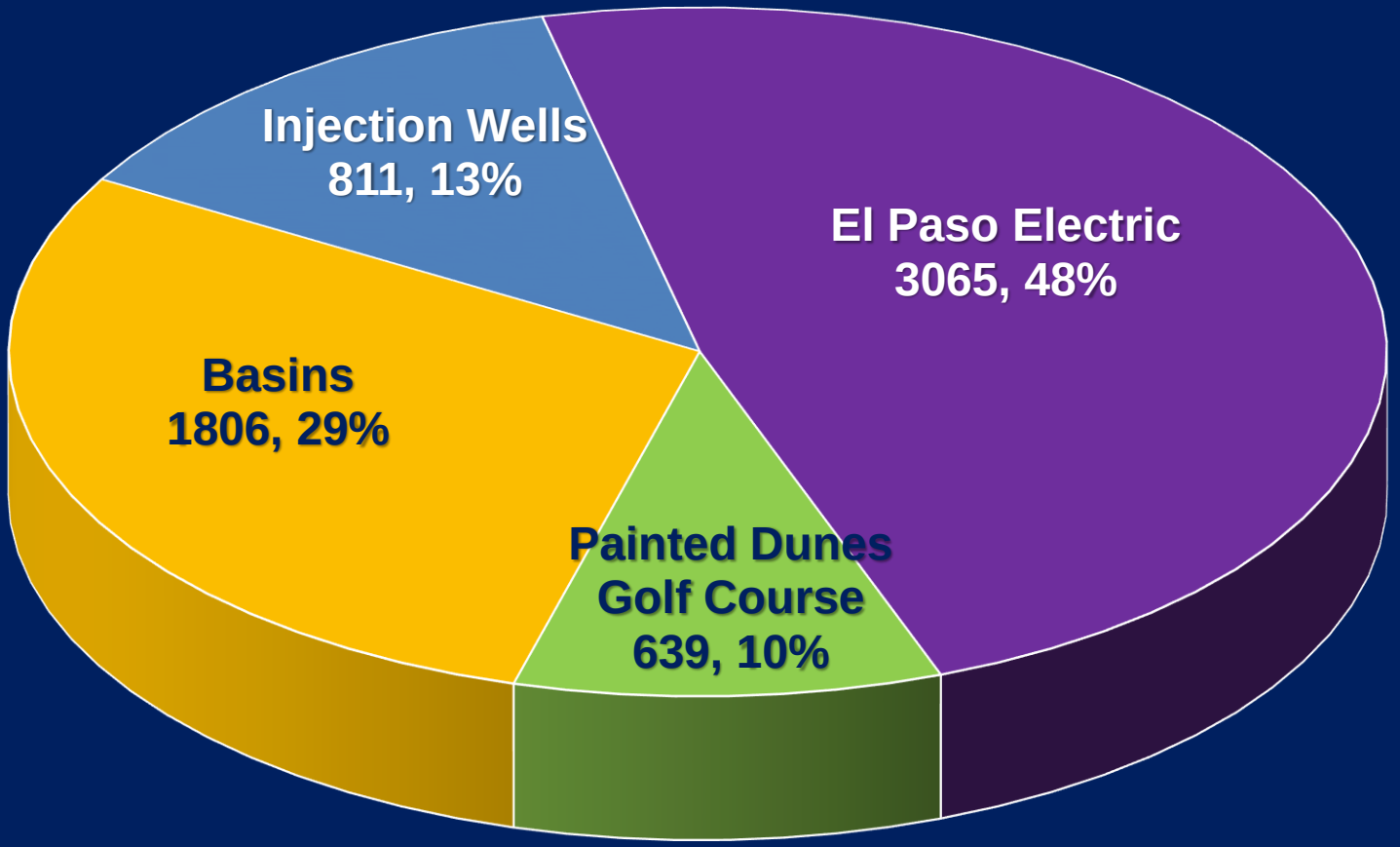
Fred Hervey Reclaimed Water Recharge (Past 20 Years)



Typical Fred Hervey Effluent Distribution by Use (acre-feet)



Future Expansion Plans

- Additional spreading basins are currently permitted by TCEQ
- Surface water recharge from Rio Grande (Jonathan Rogers Water Treatment Plant)
  - Water rights for 70,000 AF/year
  - Maximum annual diversion – 60,000 AF/year
  - Early irrigation season supply vs. demand challenge
- Infiltration via enhanced arroyo concepts
- Aquifer Recharge Master Plan

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