Agricultural Drainage

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Classes of Subsurface Drainage Designs

- Steady-state
  - Humid regions
  - Control steady water table
- Non-steady state
  - Arid, Irrigated
  - Drop water table after irrigation/rainfall
- Interceptor
  - Protect cropland from source of high groundwater
Primary Functions of Agricultural Drains

• Control of water table – root zone aeration
  – EBID
  – Drainage density of 20 f/acre

• Removal of salt from root zone
  – HCCRD
  – Drainage density of 22 f/acre plus field systems
Yield effects of Salinity
Drain Installation – Then & Now

Ca. 1900

Ca. 2000
The local drainage systems

- Open ditch
- Installed in 1920s-1930s
- Functions:
  - Water table control
  - Salt removal
  - Storm water conveyance
  - Operational spill return
Drain flows between the states
Long-Term Salt Balance

- **Mass Balance**: $Q_{in} TDS_{in} - Q_{out} TDS_{out}$
- **Elephant Butte to El Paso (Courchesne Bridge)**
  - 90,640 acres of EBID + 10,000 acres of EPCWID
- **Courchesne Bridge to Fort Quitman**
  - 59,000 acres of EPCWID + 18,000 acres of HCCRD
  - Mexico (???)
Salt Balance, Elephant Butte to El Paso
Salt Balance, El Paso to Fort Quitman
The Future

Legal Considerations

– Possible changes in water quality regulations
– Urbanization and municipal use of Project Water
– Changes in Project operation

• Environmental Considerations
  – Drains as habitat
  – Restoration efforts on drains
  – Illegal dumping in drains
Picacho Drain Bosque Park

- City of Las Cruces, EBID, and Southwest Environment Center
- NM Fish and Game land
- Picacho Drain right-of-way
- No increased depletion due to habitat restoration
  - Offset open water evaporation with removal of large, dense canopy salt cedar
- Drain function is paramount
Picacho Drain