NAWS China Lake

Indian Wells Valley Groundwater Resources

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- Navy and Community have long history of proactive groundwater management.

- IWV Cooperative Groundwater Management Plan signed Sept. 1995. Signatories include:
  - NAWS China Lake
  - IWV Water District
  - City of Ridgecrest
  - Searles Valley Minerals Corporation
  - Inyokern Community Services District
  - IWV Airport District
  - Bureau of Land Management
  - Kern County Water Agency
  - Kern County
  - Eastern Kern County RCD
  - Quist Farms

IWV Cooperative Groundwater Management Plan

Purpose

- Set guidelines/management principles for production, distribution and use of groundwater.
- Continue to develop technical and analytical capabilities to better understand the nature/characteristics of the watershed and aquifer system.
- Apply guidelines towards sound management practices to extend the useful life of the resource.
- Coordination between local agencies and water producers to share info and implement management practices to maintain the life of the reservoir.

IWV Cooperative Groundwater Management Plan

Objectives and Guidelines

- Limit large scale pumping in specific areas
- Distribute new groundwater extractions to minimize effects on existing conditions and maximize long-term water supply.
- Development and implementation of water conservation and education programs.
- Encourage use of treated, reclaimed, recycled, gray and lower quality water where appropriate and economically feasible.
- Explore potential for additional types of water management programs
- Continue cooperative efforts to develop info and data to further define and understand groundwater resources in the valley
- Develop interagency management framework to implement and enforce objectives of cooperative plan.

Water Supply Issues

Historic Groundwater Extractions

Decade High	Extraction Total
1979	27,034 AF
1985	27,214 AF
1996	30,220 AF
2004	25,000 AF

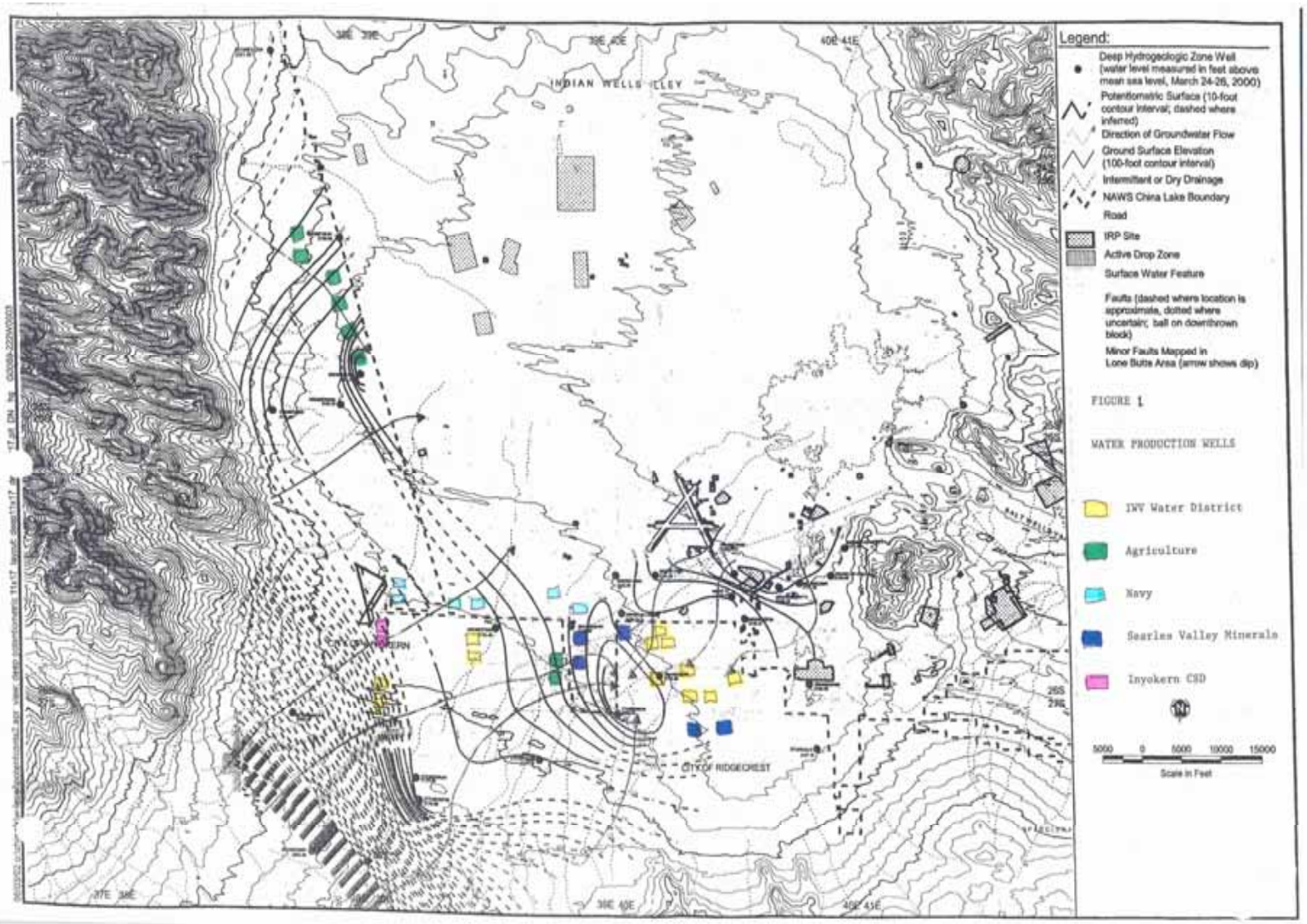
Water Supply Issues

Current Groundwater Extractions

- May 2005 – R/C Population: 26,493
- 2004 Groundwater Extraction: 25,000 AF/YR
- 2004 Groundwater Extraction Distribution:
  - IWVWD 9,000 AF
  - Agriculture 7,000 AF
  - NAWS CL 2,700 AF
  - SVMC 2,500 AF
  - Domestics 3,000 – 4,000 AF
  - Inyokern CSD 100 AF

Total 24,300 – 25,300 AF

Groundwater Extraction Locations



Water Supply Issues

Water Levels

Extraction Areas:

- Harvey Wellfield
  < 1.0 ft/YR decline
- Intermediate Wellfield
  < 1.0 ft/yr decline
- Ridgecrest Wellfield
  < 1.0 ft/yr decline
- Southwest Wellfield
  < 1.0 ft/yr decline
- Domestic Well Areas
  < 0.20 – 0.50 ft/yr decline
- East-Central/Northern Valley Areas
  0.00 – 0.20 ft/yr decline

Aquifer Conditions

Groundwater in Storage

- IWV Groundwater Basin Size: 385 sq mi
- Useable Groundwater-Basin Size: 110 sq mi
- 2,200,000 AF in storage within upper 200 feet of aquifer
- Recent deep wells indicate saturated sediments approx. 1500 feet thick (more than 5 times original estimate)
- Good aquifer characteristics throughout section

Aquifer Conditions

Water Quality in Extraction Areas

- Harvey Wellfield

  TDS decreases since 1970 (500+ppm – 400 ppm)

- Intermediate Wellfield

  TDS increases since 1970's (270 ppm – 290 ppm)

- Ridgecrest Wellfield

  TDS remains static since 1970's (350 ppm – 400 ppm)

- Southwest Wellfield

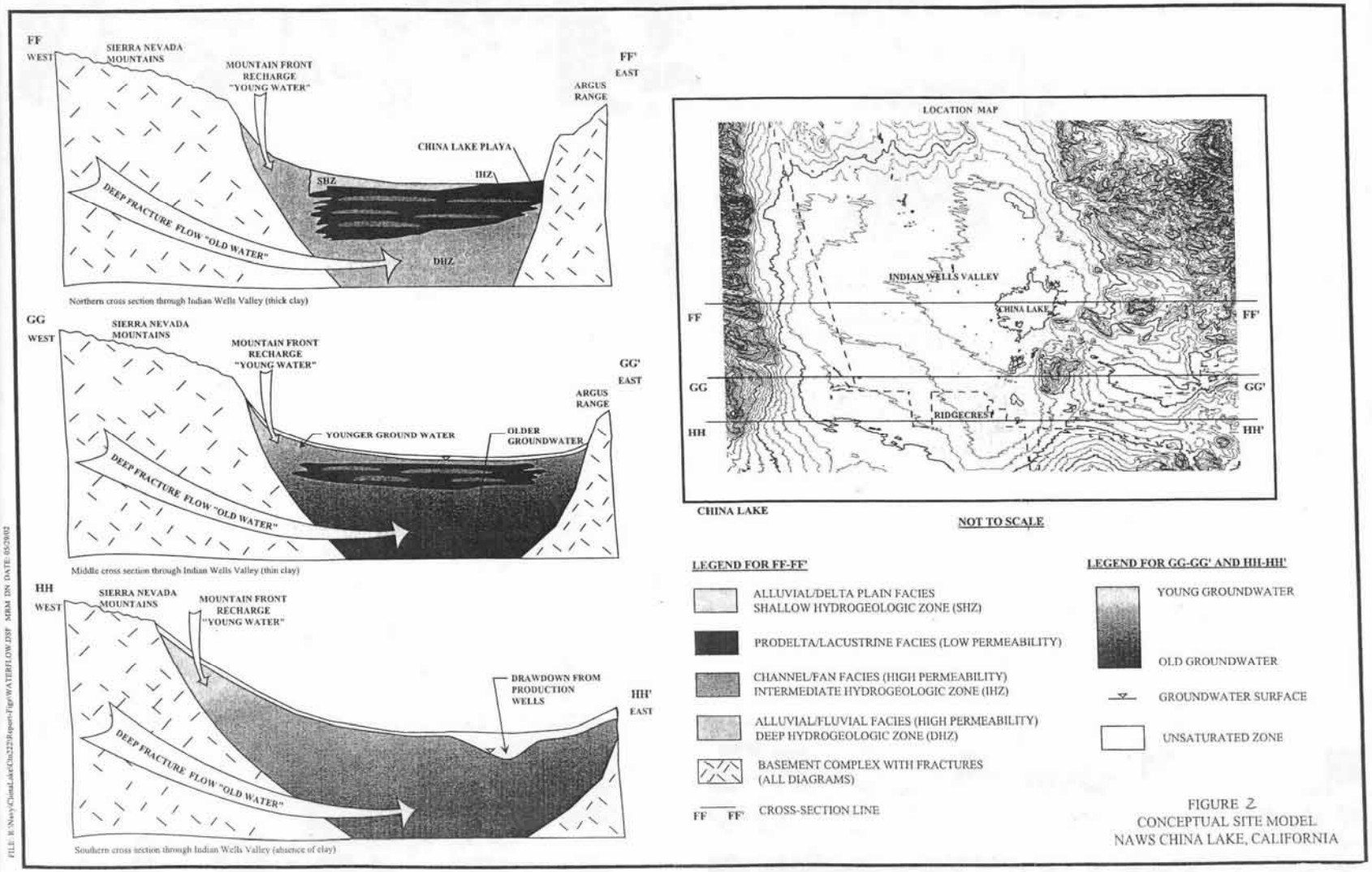
  TDS increases since 1970's (330 ppm – 340 ppm)

Aquifer Conditions

<u>Water Recharge</u>

- Recharge estimates range from 8,000 – 40,000 AF/YR
- Pleistocene water in basin (15,000 – 40,000 years old)
- High quality water in basin (TDS < 500 ppm)
- Recharge from:
  - Adjacent watersheds
  - Perennial streams in adjacent canyons
  - West to east groundwater movement

Groundwater Recharge



Conclusions

1. Based on recent drilling – more groundwater in storage than estimated by USGS. Current estimate: 4M-8M AF.
2. Useable life of basin water resources is 100's of years at current extraction rate (USBR).
3. Water levels in major extraction areas declining up to 1.0 foot/yr. Slight increase in extraction to support population increase is not expected to result in dramatic water level declines.
4. Groundwater quality has improved in one wellfield, slightly degraded in two wellfields and remains constant in another. All wellfields show excellent water quality parameters and no technical reason to expect change with an increase in extraction.