



Tularosa Basin National Desalination Research Facility

Facility Study Results

Mike Hightower, Sandia National Laboratories
Tom Jennings, Bureau of Reclamation

Alamogordo City Commission
September 24, 2002

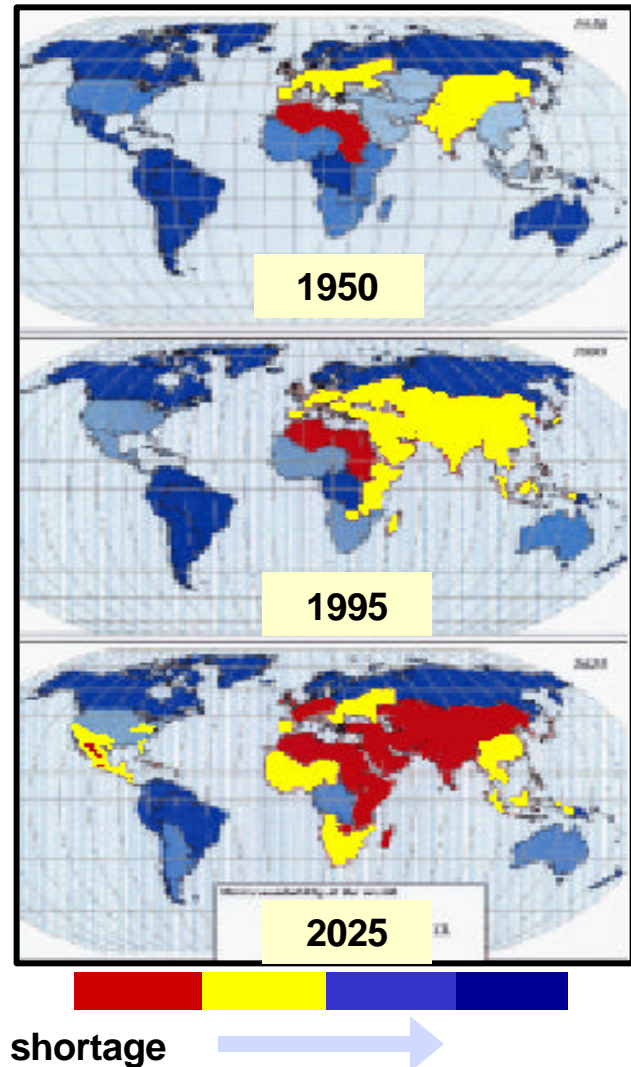


Over half the world's population will face severe water shortage in the next 50 years.

- In 1990, poor water supply and sanitation was the 2nd leading cause of death and disability worldwide.
- Over 50% of world's major rivers are dry or heavily polluted.
- By 2025, 20% more fresh water will be needed for irrigation and 40% more for cities to maintain current per capita water levels.
- **NONTRADITIONAL** water resources will need to be used to address these shortages.

“Water promises to be to the 21st century what oil was to the 20th century: the precious commodity that determines the wealth of nations.”

Fortune Magazine, May 15, 2000



Current Desalination Trends

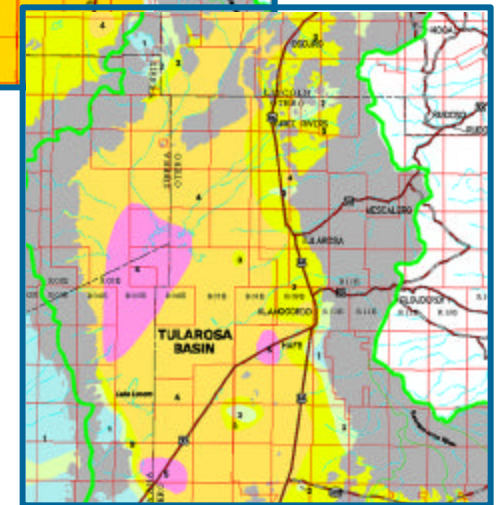
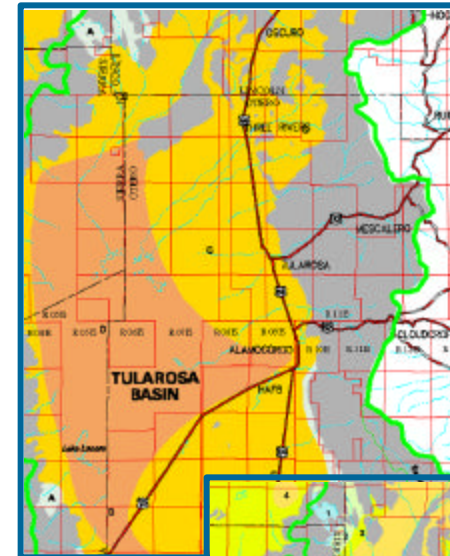
- **12,500 desalination plants in the world**
 - Supply 5.5 billion gallons per day (BGD) 1% of world's drinking water
 - Reverse osmosis and distillation are most common systems
 - Primary applications are for sea water
 - constant supply and easy disposal
- **\$10B investment expected in next 5 years to increase desalination by 1.5 BGD**
- **\$70B investment expected in next 20 years to increase desalination by 10 BGD (note: 1% increase in drinking water)**
- **Even at this level of investment, desalination will not significantly increase drinking water supplies in 2020**



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Study Objectives

- The BOR and Sandia received congressional funding in FY02 to:
 - Identify desalination research opportunities for a Tularosa Basin facility
 - Identify a regional, national, and international role that would complement other “national water research centers”
- Develop a preliminary facility design and operation and management plans
- Complete draft study by July 2002
- Develop facility design/build plan for FY03 start of construction



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Study Roles and Responsibilities

- **Sandia and Bureau of Reclamation/Denver managed the study and coordinated all technical support**
 - Consultant – Livingston and Associates, Alamogordo
 - NMWRRRI – meeting coordination, web access of all public information, public outreach, etc.
 - USGS – resource availability support
- **Established an executive committee of regional and national desalination and water resource experts to guide in facility vision and conceptual design**



Tularosa Basin National Desalination Research Facility

Executive Committee

NM WRI
NM State Engineer
USGS/NM

City of Alamogordo
City of El Paso
City of Phoenix
City of Tucson

USBR/Denver
USBR/Yuma
USBR/El Paso
USBR/Alb

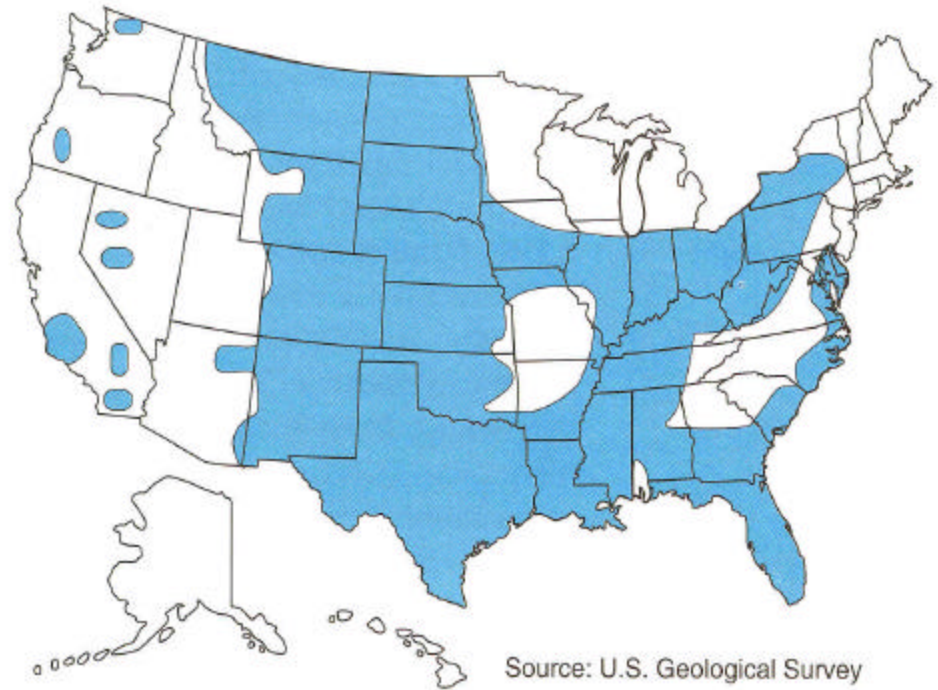
Sandia Labs
Livingston & Associates



Major Desalination Need: Technologies to Address Inland Issues

- **Inland desalination is a major concern**
 - Energy production, river quality, potable water
- **Issues include brine disposal, saline water variability, energy use, process scale**
- **Desalination costs need to be reduced by a factor of 3-5 to be more widely used**
- **Needs and applications are international in scope, including Mexico border region**

US Saline Aquifers



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Mission

- **Focus on inland brackish ground water desalination research**
 - evaluate technologies that address environmental issues of concentrate disposal or eliminate concentrate
 - evaluate pretreatment technologies needed for process efficiencies for inland waters, varying water chemistries, varying water contaminants, and produced water
 - cost-effective use of smaller-scale applications
 - application of renewable energy to desalination and concentrate reuse processes
- **This focus complements other national water treatment research centers**



INTERNATIONAL SPACE HALL OF FAME - SPACE CENTER



Photo by: Jim Matthews

LINCOLN NATIONAL FOREST



Photos by: Jim Matthews & Michael Charske



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Facility Study Status

- Executive committee has been meeting since January, toured Tularosa Basin sites and pilot desal operations
- Consultant toured BOR Yuma Facility for background information and research facility design lessons learned
- Feasibility study information; background and concepts, meeting minutes, and presentations are available on WRRI web site @ wrrri.nmsu.edu
- Study Report with suggested facility design, location, site plans, and organizational and management structures is available on WRRI web site
- Continuing with environmental and cultural investigations, well permitting, design/build planning, to help accelerate facility construction and operation.



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Design Highlights

- **3 primary site locations identified with easy access, good visibility, water availability**
- **20-30 acre sites with areas for concentrate reuse and beneficial use research, renewable energy desalination research, and ~13,000 square foot desalination research facility**
- **Desalination facility: 6 test bays for pilot system testing at 30 gpm, control room, water lab, research offices, resource/education room, conference room, operations viewing and tour areas, passive solar building**
- **Shop and chemical storage areas and exterior pads for large scale and renewable energy applications**

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Executive Committee Preferred Site

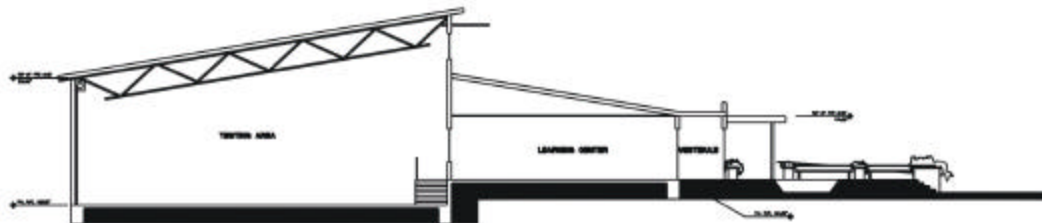
City of Alamogordo, N.M.
La Velle Road Area



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BUILDING FRONT ELEVATION



BUILDING SECTION

NO.	DATE	DESCRIPTION	BY	CHK
1		CONCEPTUAL SUBMITAL	LOA	TRC
2				
3				
4				
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7				
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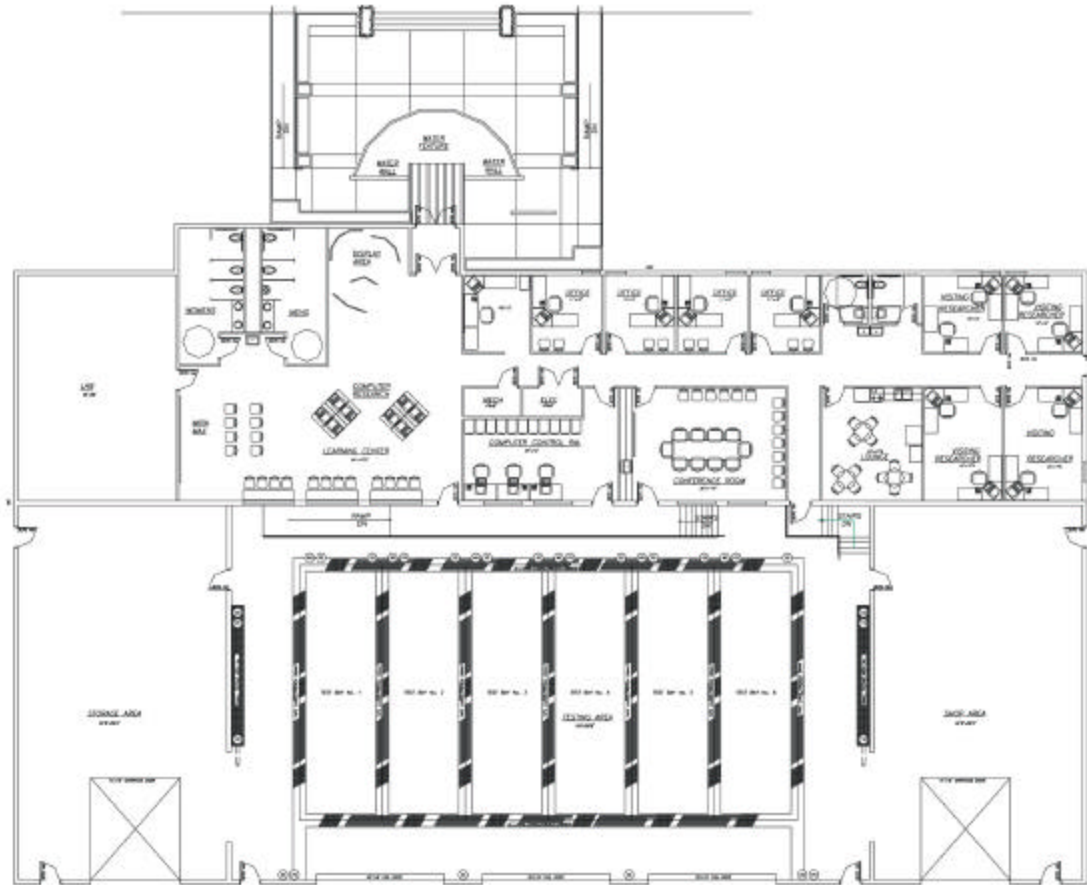


DESIGNER	DATE
DRAWN	DATE
CHECKED	DATE
APPROVED	DATE

DESALINATION RESEARCH FACILITY

RECOMMENDED FLOOR PLAN FIGURE 7			
DATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
NOV 14 2007		7	10

Tularosa Basin National Desalination Research Facility



BUILDING FLOOR PLAN
 1/8" = 1'-0"
 SCALE: 1/8" = 1'-0"

NO.	DESCRIPTION	DATE	BY	CHKD	APPD
1	CONCEPT SUBMITTAL	11/22/10	EB		
2	REVISION				

PROJECT NUMBER:
 SUBJECT: MEMPHIS
 DATE: ESTERSON
 TYPICAL: STANLEY

DESALINATION RESEARCH FACILITY

RECOMMENDED FLOOR PLAN
FIGURE 7

DATE: 10/1/10	PROJECT NO.:	SHEET NO.:	TOTAL SHEETS:
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