City of Santa Fe

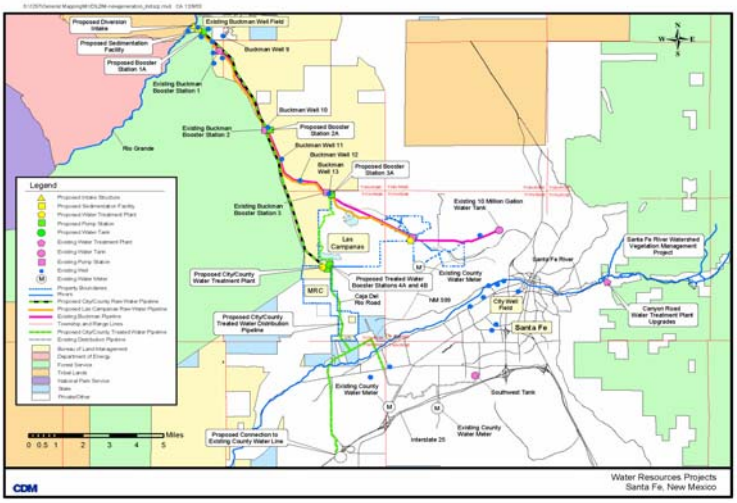
Sangre de Cristo Water Division
Water Supply Program

Jemez y Sangre
Presentation
December 13, 2004

Presentation Overview

- Current City Water Supply Sources
- Water Supply and Management Goals
- City Water Supply Priorities & Strategy
  - Buckman Direct Diversion Project
  - Long-Range Water Supply Plan
  - System Improvement Projects
  - Water Rights Enhancements
  - Funding

Current City Water Supply Sources

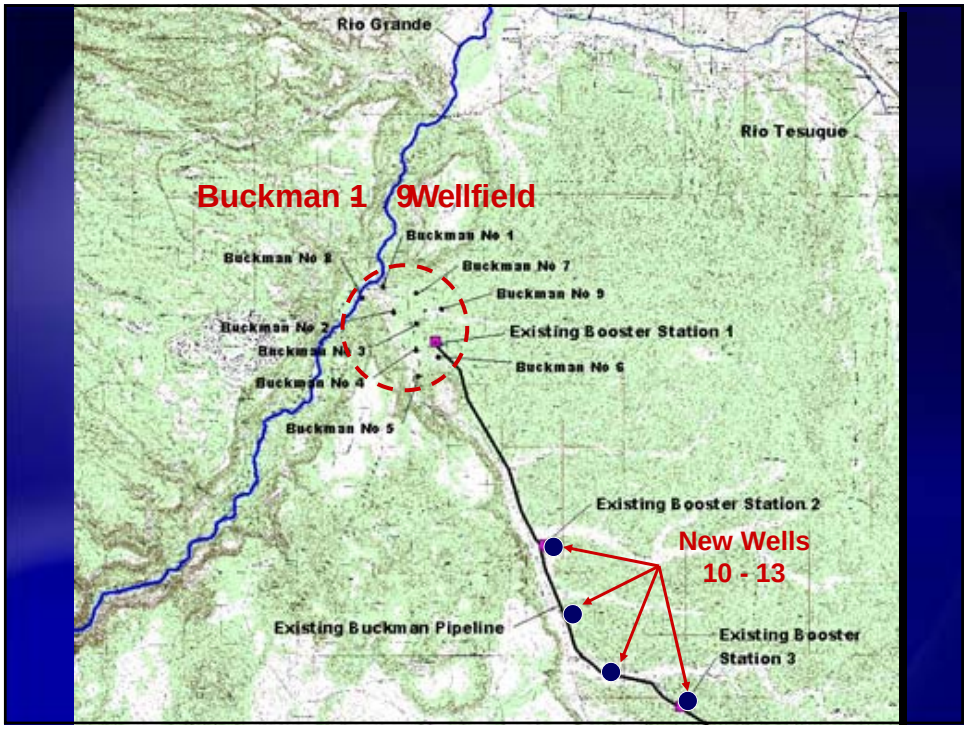


Canyon Road Water Treatment Plant and Reservoirs

- WTP Production = 3 mgd
  - Design capacity = 8 mgd
- Daily Inflow to Reservoirs = 0.456 mgd
- Reservoir Storage = 54.5%
  - Same date in 2002 = 27.1%
  - Will carry over about 30% for next year
- Total System Production = 6.17 mgd
  - Summer peak can reach 17 mgd

Supplemental Wells 10-13 Project

- Four new deep wells (approx. 2000')
  - Producing approximately 800 gpm (1.15mgd or 1290 AFY)
- Total Cost: $11.5 M
  - Booster station upgrades
- Currently using wells under emergency permit
- Supplemental well permit pending with Office of the State Engineer
  - Hearing has been appealed to court of law



Supplemental Wells 10-13 Project

Water Supply and Management Goals

- Long-term reliable and safe drinking water supply
- Provide drought protection
- Efficient & balanced use of regional resources

Water Supply Priorities

- Near-term drought protection
  - Buckman Direct Diversion
    2008
    - Needed to meet demand through 2010
- Long-Range supply projects
  2010
  - Needed to meet demand beyond 2010
- Water system improvement projects
  Ongoing
  - Needed to maximize treatment capacity of WTP
- Water rights enhancements
  Ongoing

Buckman Direct Diversion

- Meets City's near-term drought protection needs and normal demand through 2010
- Allows City to "rest" the Buckman well field
- Uses primarily San Juan Chama Project water
- Expected on-line in early 2008
- Joint regional project:
  - City of Santa Fe
  - County of Santa Fe
  - Las Campanas

Buckman Direct Diversion

- Major Project Components
  - Surface diversion structure
  - Sediment removal facility
  - Pipelines, pump stations, surge facilities
  - Water treatment plant
  - Introduction into distribution systems

Buckman Direct Diversion

- Facility Capacity
  - City of Santa Fe: 5,230 AFY
  - County of Santa Fe: 1,700 AFY
  - Las Campanas: <u>1,800 AFY</u>
    - Total 8,730 AFY (12 cfs)
    - Peaking capacity (net) of 28 cfs

Buckman Direct Diversion

Critical Path Milestones

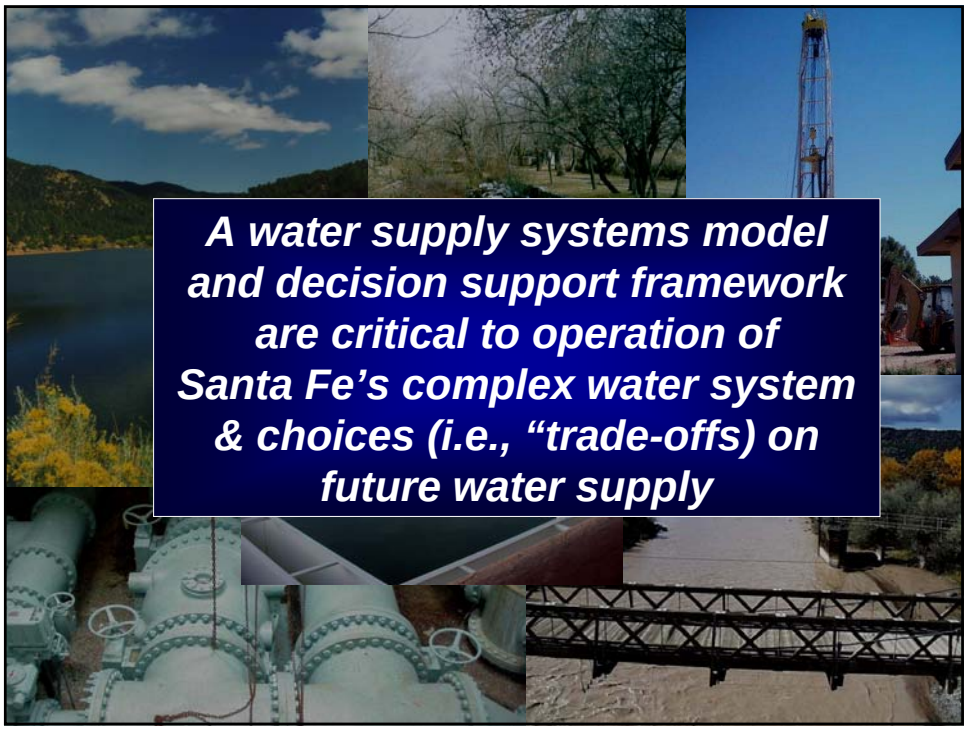
Draft NEPA EIS for public review	December 2004
Complete NEPA EIS	Dec 2005
Contract Owner's Agent for Alt. Project Delivery Method	Fall 2004
County Cost sharing Agreements	Fall 2004
Begin design/build	June 2005
On line	Early 2008

Estimated Itemized Total Cost of the Project (Escalated)

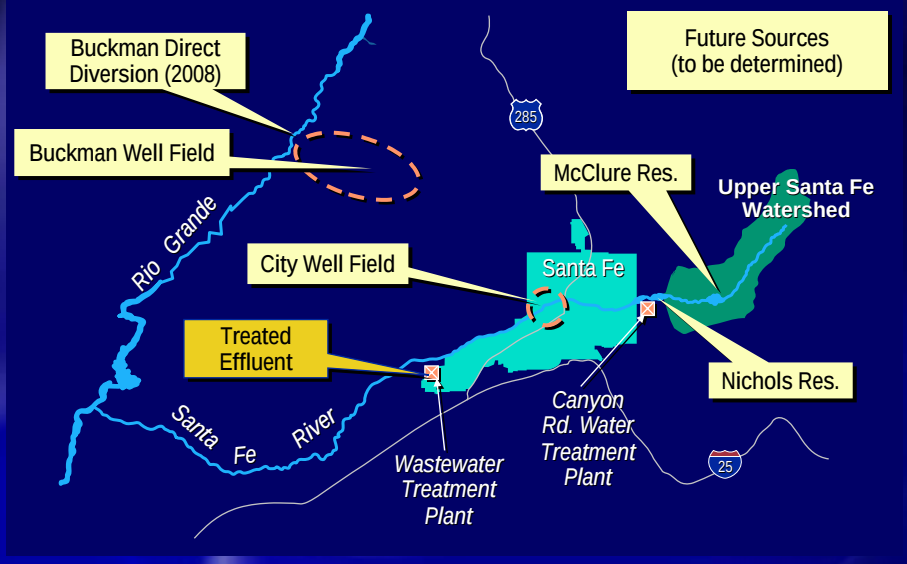
Eng. Feasibility	=	**$0.77M**
NEPA (EIS) (USFS, BLM)	=	**$0.61M**
Prelim. Engineering	=	**$0.31M**
Design, Legal, Admin (~ 12% of Const.)	=	**$8.83M**
Easement & ROW Acquisition	=	**$0.05M**
Construction	=	**$81.57M**
Eng. During Const (~ 8% of Const.)	=	**$7.09M**
TOTAL COST	=	**$99.23M**

Long-Range Water Supply Program

- **Purpose**
  - **To identify projects (diversify portfolio) important to meeting demand in 2010 and beyond**
    - **These projects would be in addition to the Buckman Direct Diversion**
    - **Facility/supply-based plan – NOT demand mngt.**
  - **To develop an operations system simulation model (STELLA)**
  - **Comprehensive public outreach and education program**



Complex System of Infrastructure and Constraints



Example Santa Fe Operational Model Decisions

- What should trigger Stage 2, 3, and 4 drought restrictions?
- Should we shut down the CRWTP each fall/when?
- Can we sustainably use existing supplies while meeting demands?
- How does corrosivity, water quality, and administrative constraints affect blending scenarios?
- What would we do in the event of a major component failure or continued drought?

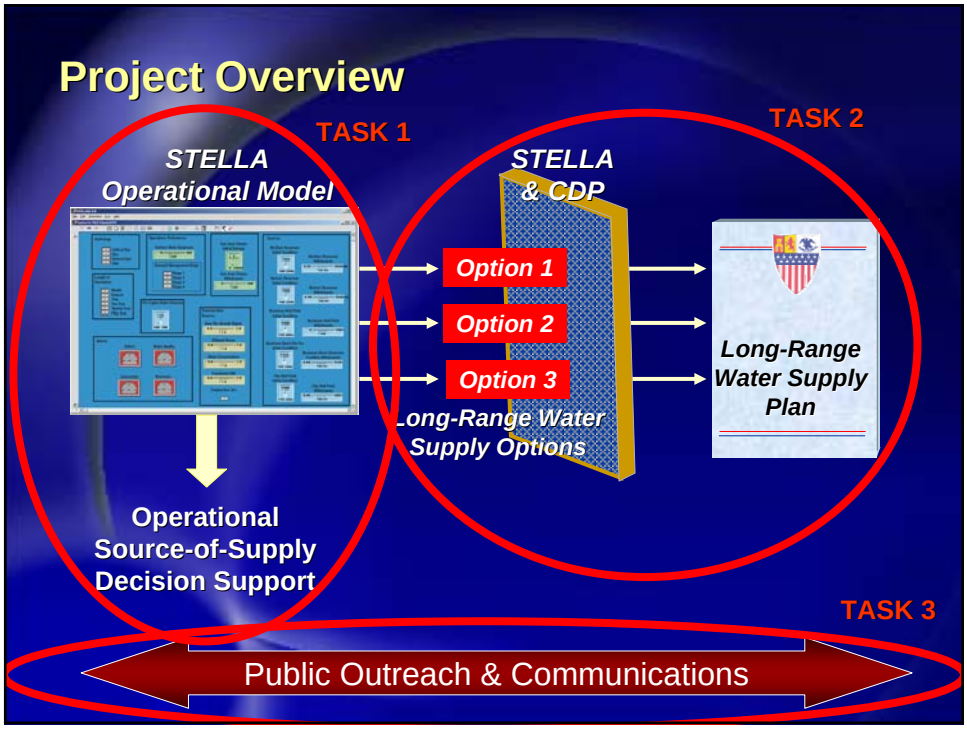
Example Long Range Planning Decisions

- What is the appropriate balance between reliability & costs?
- Does the community support this alternative?
- How would additional SJC / Rio Grande rights support our long-range demands?
- How do new distant sources compare to return flow credits and increased Rio Grande diversions?

End Product: A Living "Tool" that The City Can Use as a Decision Framework

- Build on "Coarse Screening" results
- Tools and skills for City's ongoing use
- Institutionalized decision framework – document decisions and rationales
- Repeatable methodology:
  - Objectives and "weighting" of preferences
  - Building-block approach to new supplies
  - Transparent, understandable evaluation method

Project Task	Major Components & Activities
Task 1: Water Systems Simulation Model	◆ Construct model ◆ Extend model for long-range options ◆ Documentation & training
Task 2: Prepare Long-Range Water Supply Plan	◆ Refine objectives & performance measures ◆ Build on results of "Coarse Screening" ◆ Create and evaluate alternatives ◆ Implementation & funding strategies ◆ PUC updates & Council study sessions ◆ Report
Task 3: Public Outreach & Communications	◆ Public communication planning meeting ◆ Public Agency Meeting ◆ Public Communication Program ◆ Public meetings (3) and Fact Sheets



Systems Simulation Model

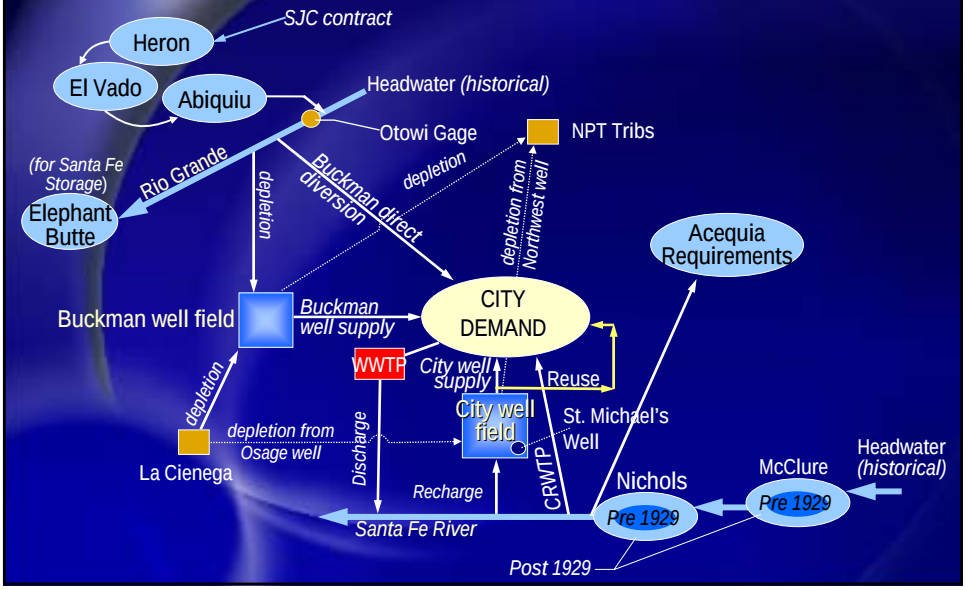
- Two main purposes:
  - Operational decision support
  - Long-Range Planning decision support
- Operational model used for determining when City should move from drought stages and for short term source of supply planning
- Long Range model used for determining which alternative supplies should be developed and when based on reliability, cost, water quality, environmental, and other factors

Systems Simulation Model Benefits

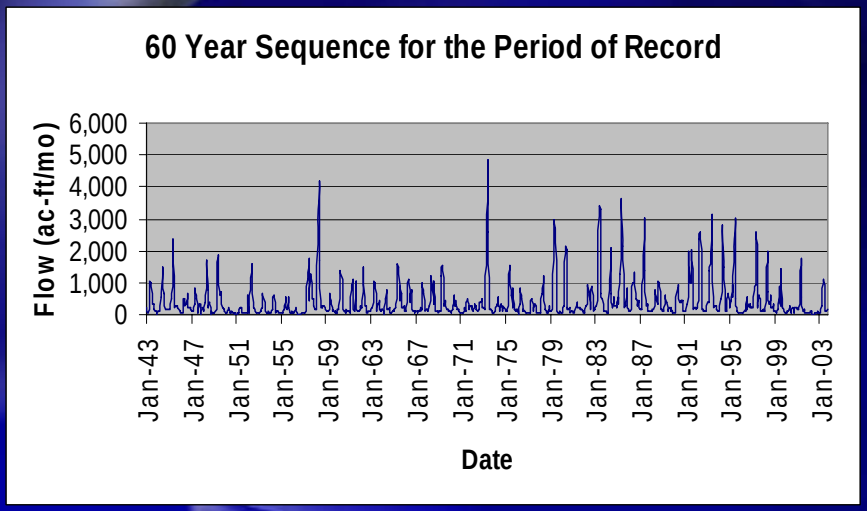
- Run by management panels, easy to use
- Easy to update using spreadsheets and databases that are linked to model
- Fast run time, seconds for most simulations
- Helps identify trade offs for decision making
- Helps develop scenarios for the future
- Helps decision makers document "why" and "how" decisions were made

Draft System Schematic for STELLA

Santa Fe Water Supply System: Infrastructure and Flows

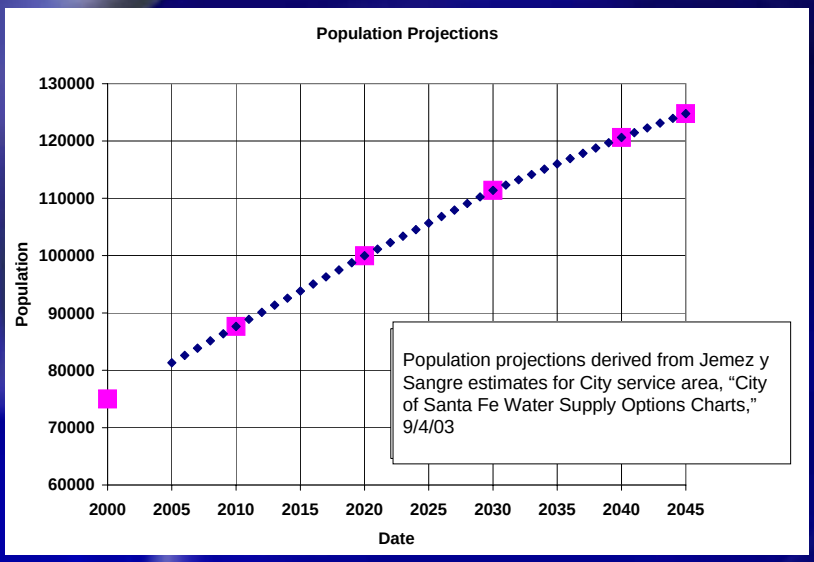


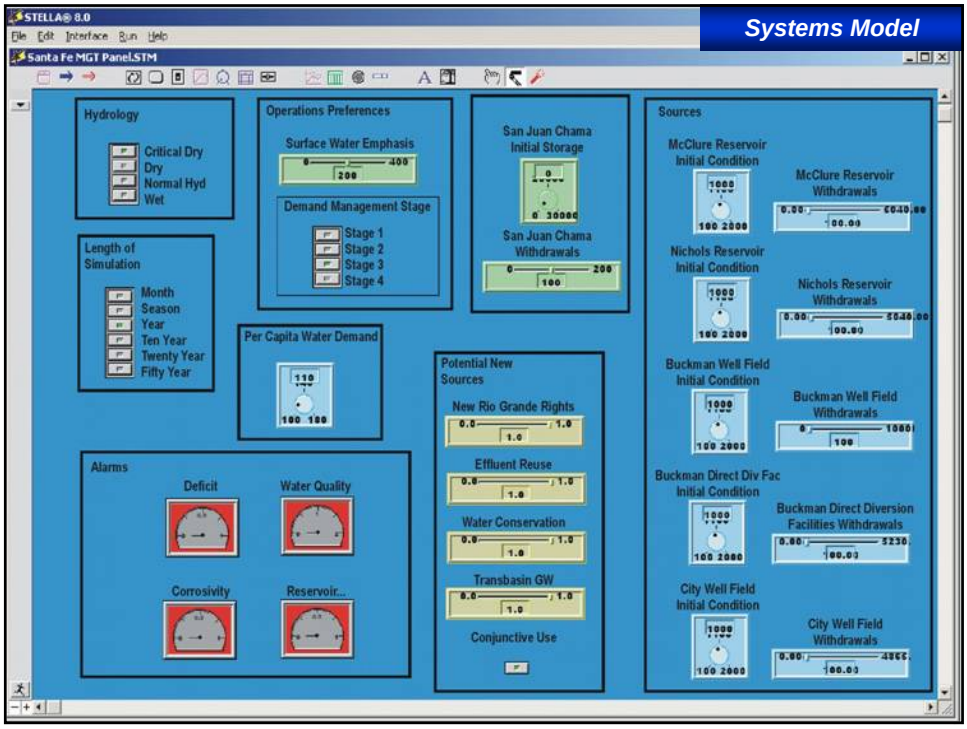
Flows into McClure Reservoir

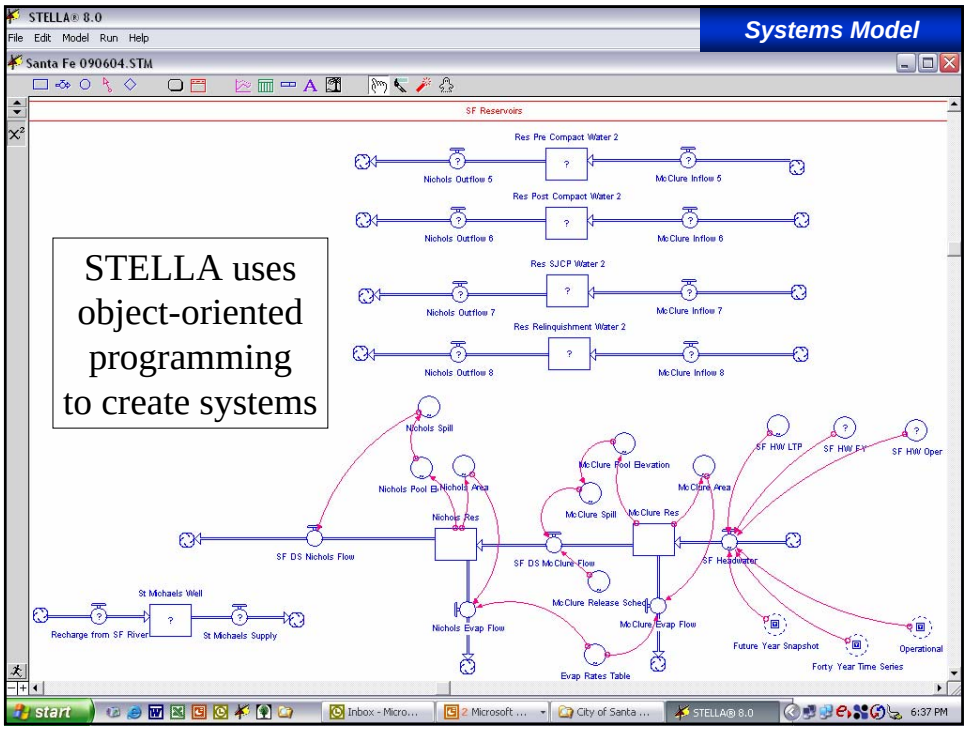


Source: USGS Stream Gage Data provided by the City of Santa Fe

Population Projections



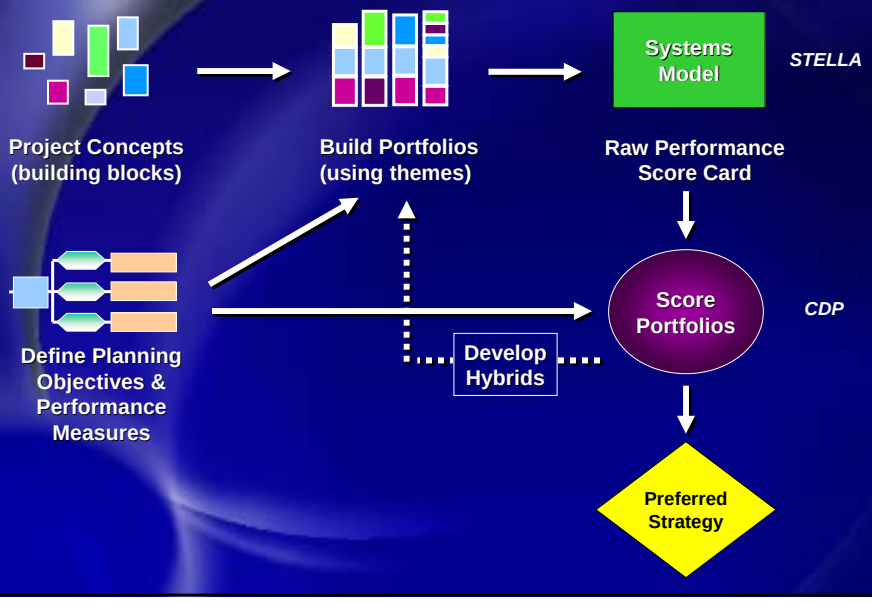

Systems Model
STELLA® 8.0
File Edit Interface Run Help
Santa Fe MGT Panel.STM
Hydrology
Critical Dry
Dry
Normal Hyd
Wet
Operations Preferences
Surface Water Emphasis
Demand Management Stage
Stage 1
Stage 2
Stage 3
Stage 4
San Juan Chama Initial Storage
San Juan Chama Withdrawals
Sources
McClure Reservoir Initial Condition
McClure Reservoir Withdrawals
Nichols Reservoir Initial Condition
Nichols Reservoir Withdrawals
Buckman Well Field Initial Condition
Buckman Well Field Withdrawals
Buckman Direct Div Fac Initial Condition
Buckman Direct Diversion Facilities Withdrawals
City Well Field Initial Condition
City Well Field Withdrawals
Length of Simulation
Month
Season
Year
Ten Year
Twenty Year
Fifty Year
Per Capita Water Demand
Potential New Sources
New Rio Grande Rights
Effluent Reuse
Water Conservation
Transbasin GW
Conjunctive Use
Alarms
Deficit
Water Quality
Corrosivity
Reservoir...


Systems Model
STELLA® 8.0
File Edit Model Run Help
Santa Fe 090604.STM
SF Reservoirs
Res Pre Compact Water 2
Nichols Outflow 5
McClure Inflow 5
Res Post Compact Water 2
Nichols Outflow 6
McClure Inflow 6
Res SJCP Water 2
Nichols Outflow 7
McClure Inflow 7
Res Relinquishment Water 2
Nichols Outflow 8
McClure Inflow 8
STELLA uses object-oriented programming to create systems
Nichols Spill
Nichols Pool Elevation
Nichols Area
Nichols Res
McClure Pool Elevation
McClure Area
McClure Spill
McClure Res
SF HW LTP
SF HW FY
SF HW Oper
SF DS Nichols Flow
SF DS McClure Flow
SF Headwater
McClure Release Sched
St Michaels Well
Recharge from SF River
St Michaels Supply
Nichols Evap Flow
McClure Evap Flow
Future Year Snapshot
Operational
Forty Year Time Series
Evap Rates Table
start
Inbox - Micro...
2 Microsoft ...
City of Santa ...
STELLA® 8.0
6:37 PM

Water Management Objectives from Coarse Screening

- Cost factor 30%
- Sustainability and reliability factor 20%
- Technical implementability factor 15%
- Environmental concerns factor 15%
- Institutional factor 10%
- Expediency factor 10%

Overview of Process for Long-Range Plan



Coarse Screening Options: Surface Diversions

SW1. Diversion at San Ildefonso Pueblo
SW2. Diversion at Caja del Rio
SW3. Diversion at Cochiti
SW4. Diversion at Peña Blanca
SW5. Diversion at Abiquiu
SW6. Expand Use of Buckman Diversion

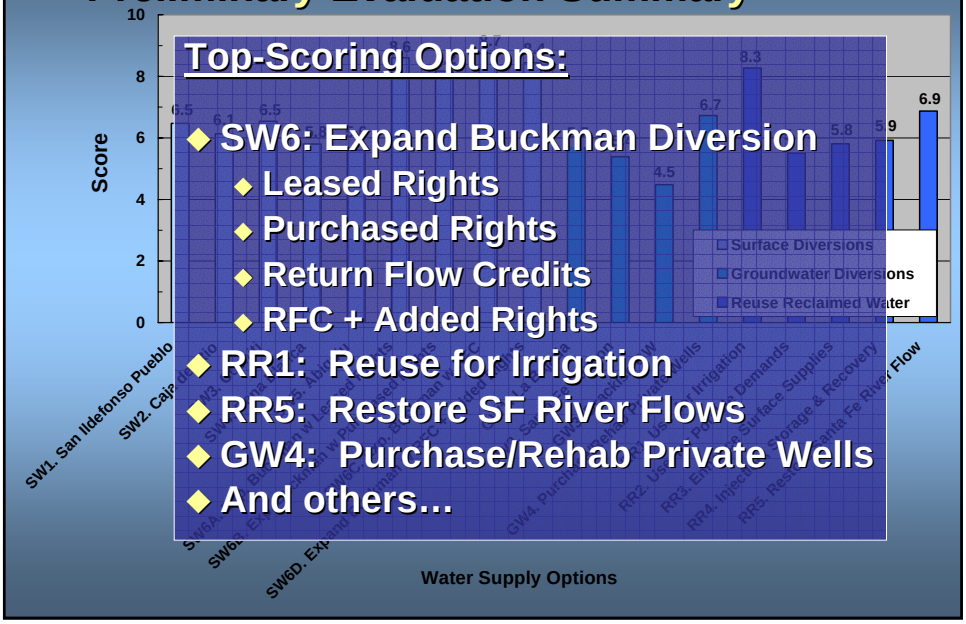
Coarse Screening Options: Groundwater Diversions

GW1. New well field at La Bajada
GW2. New well field at Santa Fe Canyon
GW3. Treatment of brackish groundwater
GW4. Purchase and rehabilitate private wells

Coarse Screening Options: Reuse Reclaimed Water

RR1. Replace irrigation water
RR2. Use for potable demands
RR3. Enhance surface supplies
RR4. Injection, storage & recovery
RR5. Restore Santa Fe River flow

Coarse Screening Preliminary Evaluation Summary



Top-Scoring Options:

- SW6: Expand Buckman Diversion
  - Leased Rights
  - Purchased Rights
  - Return Flow Credits
  - RFC + Added Rights
- RR1: Reuse for Irrigation
- RR5: Restore SF River Flows
- GW4: Purchase/Rehab Private Wells
- And others…

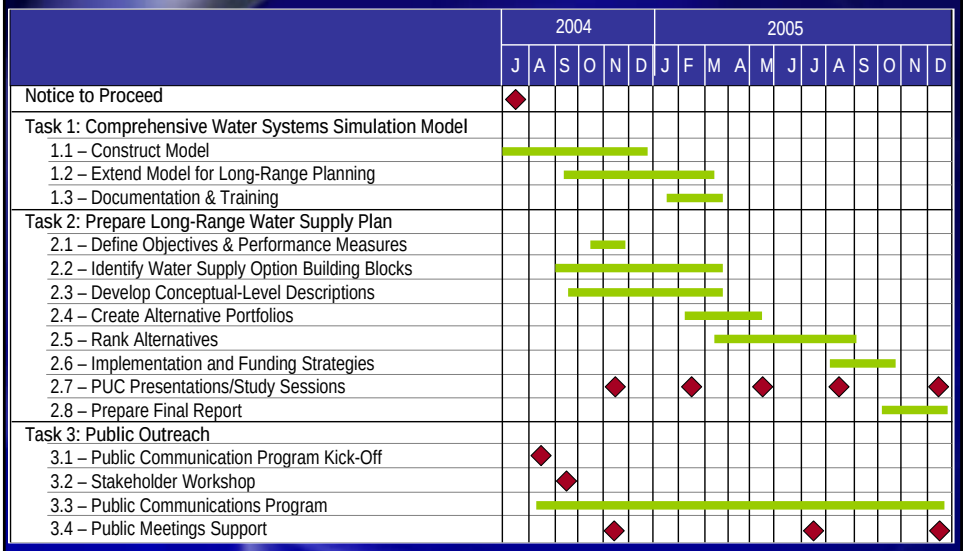
Public Outreach and Communications Components

- Public Communications Program Plan
- Public Agency Meeting (9/20/04)
- Public Meetings & Approximate Timing:
  - #1: November 9, 2004 – LRWSP Goals and Water Management Objectives
  - #2: Mid-2005 – Alternatives development
  - #3: Late 2005 – Long-Range Plan recommendations
- Three LRWSP project "fact sheets"

Project Communications

- LRWSP Email distribution list – let us know if you're interested
- Public Meetings with Pre Meeting "Open House" at Public Meetings #2 and #3
- Fact sheets and other materials to be posted to City's web site: www.santafenm.gov
- City of Santa Fe Water Resources Projects Coordinators:
  - Rick Carpenter: 955-4206 or rrcarpenter@santafenm.gov
  - Claudia Borchert: 955-4203 or ciborchert@santafenm.gov

Overall LRWSP Schedule



System Improvement Projects

- Upgrade Water Treatment Plant
  - Filter (air scour) rehabilitation and instrumentation
  - Thickener redundancy
  - Density meter for clarifier auto blowdown
  - Re pipe floor drain and city sewer line extension
- Tanks & Storage
  - Hospital tank rehabilitation

Water Rights Enhancements

- On-going
  - Initiating long-term lease (50 yrs) of San-Juan Chama Project water (Jicarilla Nation)
    - 3,000 AFY (used for offsets, exchange, ESA, diversion)
  - Engaged in discussions with entities for purchase of water rights for transfer into City Well Field
  - Engaged in discussions with entities for purchase of offsetting water rights for tributaries
  - Pursue purchase/lease of Middle Rio Grande water rights
  - Reservoir Storage Capacity
    - Pursue storage agreements (City of Albuquerque, MRGCD, BoR)

Grants, Loans, and Funding Plan

- Grants:
  - $2M State 2003 for BDD
  - $1.6M State 2003 for WTP Upgrades
  - $3.4M State 2004 for BDD
  - $2M State 2004 for WTP Upgrades
  - $0.5M State 2004 for Well Purge/Reuse
- Loans:
  - $7M State 2004 for BDD (2% over 20 yrs)
- Funding Plan – IUG evaluating bonding, taxation, rate increases/restructuring

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