Groundwater Management Planning for the Eastern San Joaquin Basin

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Water Resource Coordinator
San Joaquin County

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Northeastern San Joaquin County Groundwater Banking Authority

"...This Groundwater Management Plan is the result of this inexorable collaborative effort, which was single-minded in its effort to reinforce local control and provide direction for the sustainable development of this vital resource for the future social, economic and environmental viability of San Joaquin County."

Northeastern San Joaquin County Groundwater Banking Authority
Executive Summary

- Background
- Purpose and Objectives
- Groundwater Management Area
- Agency Participation
- Plan Consistency
- Eastern San Joaquin County Hydrogeology
- Basin Management Objectives
- Groundwater Management Options
- Groundwater Contamination
- Groundwater Monitoring and Science Programs
- Financing Options
- Plan Governance
- Integrated Conjunctive Use Program
- Plan Implementation
- Future Activities

Northeastern San Joaquin County
Groundwater Banking Authority
Background

- **Groundwater Export Ordinance – June 2000**
- **Countywide Water Management Plan – Adopted 2002**
- **Eastern San Joaquin Basin Groundwater Management Plan** include requirements of AB 3030 & SB 1938
  - Basin Management Objectives
  - Expanded monitoring program
  - Update of Conjunctive Use Project Alternatives
Plan Review and Comments

- Plan Development Kickoff – April 2003
  - Regular monthly meetings – GBA CC & Planning Group
  - Ongoing review
- Draft Admin. Plan Release – April 2004
- Draft Plan Release & Board Acceptance – June 2004
  - 50 Plan copies (hard/CD) mailed plus website
- Comment Period – July through Sept. 2004
  - SEWD
  - Central Delta Water Agency
  - North San Joaquin Water Conservation District
  - City of Stockton
  - City of Manteca
  - San Joaquin Farm Bureau
  - EBMUD
- Final Plan Public Hearing – September 2004
Plan Purpose and Objectives

- Maintain Long-Term Sustainability of the Basin - Development of Management Objectives, Practices & Conjunctive Use Projects
- Prevent Further Saline Intrusion and Degradation of Groundwater Basin
- Development of Program to Monitor, Evaluate and Predict Basin Conditions
- Maintain Local Control of the Groundwater Basin
- Attainable Management Objectives to Retain State Funding Eligibility
- Voluntary Policies, Practices and Incentive Programs to Meet Management Objectives
- Financing Strategies for Plan Implementation
## Mission Values for Success

<table>
<thead>
<tr>
<th>Groundwater Management Plan Mission Values for Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be implemented in an equitable manner</td>
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<tr>
<td>Be affordable</td>
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<tr>
<td>Exhibit multiple benefits to local land owners and other participating agencies</td>
</tr>
<tr>
<td>Minimize adverse impacts to the environment</td>
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</table>
Groundwater Management Area

Northeastern San Joaquin County Groundwater Banking Authority

Figure 1-X

Source: California Spatial Information Library at http://www.gis.ca.gov/
Agency Participation

- **Local/Regional Participants & Agencies**
  - Calaveras County Water District
  - California Water Service Company
  - Central Delta Water Agency
  - Central San Joaquin Water Conservation District
  - City of Lathrop
  - City of Lodi
  - City of Manteca
  - City of Stockton
  - East Bay Municipal Utility District
  - Linden County Water District
  - North San Joaquin Water Conservation District
  - San Joaquin County Environmental Health
  - San Joaquin County Public Works
  - San Joaquin Farm Bureau Federation
  - South Delta Water Agency
  - South San Joaquin Irrigation District
  - Stanislaus County
  - Stockton Area Business Council, Inc.
  - Stockton East Water District
  - Woodbridge Irrigation District

- **State Participants & Agencies**
  - Department of Water Resources
  - Office of State Senator Charles Poochigan
  - Office of Assemblywoman Barbara Matthews

- **Federal Participants & Agencies**
  - Natural Resource Conservation Service
  - U.S. Geological Survey
  - U.S. Army Corps of Engineers

- **Other Participants & Agencies**
  - California Center for Collaborative Policy
  - Camp, Dresser, & McKee
  - Galt Economic Development Task Force
  - Schlumberger Water Services
  - The Great Valley Center
  - The Sierra Club

Northeastern San Joaquin County Groundwater Banking Authority
## Plan Consistency & Requirements

### Table ES-4 Components of a Groundwater Management Plan

<table>
<thead>
<tr>
<th>Plan Component</th>
<th>Recommended by AB 3030</th>
<th>Required by SB 1938</th>
<th>Plan Sections</th>
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<td>Control of saline water intrusion</td>
<td>X</td>
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<td>Management of wellhead protection and recharge areas</td>
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<td>4</td>
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<td>Regulation of contaminated groundwater</td>
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<td>The administration of a well abandonment</td>
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<td>Elimination of groundwater overdraft</td>
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<td>Replenishment of groundwater</td>
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<td>Operation of a conjunctive water management system</td>
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<td>Well construction standards</td>
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<td>Financing groundwater management projects</td>
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<td>The development of groundwater management partnerships</td>
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<td>Coordination of land use planning and groundwater management</td>
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<td>4</td>
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<td>Description of participation by interested parties</td>
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<td>Plan to involve agencies overlying the basin</td>
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<td>Basin Management Objectives</td>
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<td>Basin management entity and area map</td>
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Sources:
- California Department of Water Resources Division of Planning and Local Assistance
  - [http://www.dpla.water.ca.gov/cgi-bin/supply/gw/management/hg/ab3030/main.pl](http://www.dpla.water.ca.gov/cgi-bin/supply/gw/management/hg/ab3030/main.pl)
- California Department of Water Resources Draft 2003 Update Bulletin 118

Northeastern San Joaquin County
Groundwater Banking Authority
Groundwater Hydrogeology

- Extensive area of County with heads below MSL
- Groundwater heads as low as 60 feet below MSL
- Strong west to east gradient in Stockton area – reversing historical flow directions
Basin Management Objectives

- **Groundwater Level**: Maintain or enhance groundwater elevations to meet the long-term needs of groundwater users within the Basin Management Area.

- **Water Quality**: Maintain or enhance groundwater quality underlying the Basin to meet the long-term needs of groundwater users within the Basin Management Area.

- **Surface Water Quality**: Minimize impacts to surface water quality and flow due to continued Basin overdraft and planned conjunctive use.

- **Inelastic Land Subsidence**: Prevent inelastic land subsidence in Eastern San Joaquin County due to continued groundwater overdraft.
Basin Management

Management Objective #1: Groundwater Level Plan Elements

1. Increase use of available and new surface water supplies;
2. Implementation of local and regional conjunctive use programs;
3. Development of Basin Operations Criteria;
4. Development of urban and agricultural incentive-based conservation and demand management programs;
5. Development of local and outside revenue sources.
Groundwater Management Options

- Existing or new surface water supply elements
- New & improved Storage/conveyance elements
- Conjunctive use elements
  - In-lieu groundwater recharge
  - Direct recharge
  - ASR facilities
  - Direct use
  - Other options
Groundwater Contamination

- Coordinate with local, State, and Federal agencies to ensure underlying Basin is adequately protected against groundwater contamination and ensure all contaminated sites are documented and mitigated by responsible parties.

- Continue to manage efforts to combat saline intrusion.

- Strive to improve groundwater quality when technically and economically feasible. Authority actions that would degrade groundwater quality are not acceptable.

- Require recharge projects to identify and evaluate impacts to groundwater quality and the potential for mobilization of soil and source water contaminants.

- Consider current and future water quality standards in the planning and design of projects identified in Plan.
Monitoring & Science Programs

Groundwater Data Center

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Groundwater Reporting

WELL NO. 02N07E24J001
GROUNDWATER LEVEL READINGS

-100 -80 -60 -40 -20 0
WATER LEVEL (FEET)

YEAR

Spring Readings
Fall Readings

Northeastern San Joaquin County
Groundwater Banking Authority
USGS – Joint Salinity Study

- GBA, USGS and DWR joint project
- $2.5 million over next 5 years
- Source, areal extent and vertical distribution of high-chloride groundwater
- Sources, distribution and rates of groundwater recharge
Financing Options

- State Eligibility for GBA member agencies
- Sources:
  - Federal
  - State – AB 303, Prop # 50
  - Local
  - Regional Partnerships

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Basin Plan Governance

Management Structure
- Individual Interest-based
- Mutual Interest-based

Dispute Resolution

Mutual Interest-based Model

- County Board of Supervisors
- Public Input
- Groundwater Management Authority
- Water Districts
- Cities
- Partnerships
- Projects
- Funding

Northeastern San Joaquin County Groundwater Banking Authority
Integrated Conjunctive Use Program

East Basin Conjunctive Use Program

MORE WATER

SJC-FREEPORT

STANISLAUS River

CALAVERAS River

GILL CREEK BASINS

NSJWCD RECHARGE

SEWD FARMINGTON PROGRAM

STOCKTON ASR WELLS

CSJWCD IN-LIEU

OTHER PROJECTS

LODI ASR WELLS

EWA PROJECTS

OTHER SUPPLY PROJECTS

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Basin Modeling

DYNFLOW Finite Element Flow Model
- 3,520 Elements
- 1,860 Plan View Nodes
- 4 Layers, 5 Levels

- Typical 3-D groundwater model parameters
- Land use parameters
- River/stream parameters
- Irrigation parameters
Project Impacts & Coordination

- Evaluate increase in groundwater levels
Implementation & Next Steps

- Local and regional cooperation
- Increased data collection and analysis
  - Better characterize salinity problem
  - Groundwater monitoring – State of the Basin Report
- State and Federal funding
  - Major conjunctive use opportunities
- Implement management objectives
  - Operations Criteria discussions
  - Modeling effort
  - IRWMP effort
  - Integrated Conjunctive Use Programmatic EIR development
  - Local Control & Governance review
Future Activities

Governance Options

Groundwater Banking Authority

Groundwater Management Plan

Basin Management Objectives

Basin Operations Criteria

Groundwater Management Authority

Groundwater Management Ordinances

Groundwater Export Permitting Review

Northeastern San Joaquin County Groundwater Banking Authority
Draft Basin Operations Criteria

- Pre - 1960
- Fall 1986
- 75% Recovery
- 50% Recovery
- Drought Reserve
- Fall 1992
- Terminal Pool

Water District or Agency

Groundwater Contour

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Questions?
Acknowledgements

This Groundwater Management Plan (GMP) is a product of the commitment that the Groundwater Banking Authority (GBA) members together with many other interested agencies made to sustain and enhance the groundwater resources of the Eastern San Joaquin Basin. The GBA extends thanks to staff consultants from HDR Inc., Schlumberger Water Services and Camp Dresser & McKee Inc. in the preparation of materials, modeling information and technical review of the GMP. In addition, special thanks are given for grant funding, information and services provided by the California Department of Water Resources, the Center for Collaborative Policy and the U.S. Geological Survey.

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