Groundwater Sustainability Plan Regulations

GSA Decisions and Responsibilities

Presented by the Center for Collaborative Policy using an approach and materials prepared by Davids Engineering as funded by the County of Colusa for Colusa SGMA Implementation

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Approach

- Governance is all about decision making
  - If important decisions will be made, then governance is important; otherwise, not so much
- What are the key decisions embedded in preparing Groundwater Management Plan (or Plans)?
- "Key decisions" are ones that could affect the availability and/or the cost of groundwater to overlying landowners
- Be thinking about: "How should GSA's be formed to make these key decisions (and many others) appropriately?"

Outline

- Final Groundwater Sustainability Plan (GSP) Regulations
  - Focus on Key Decisions embedded in GSP development
- Thoughts on Delineating Management Areas
- Questions & Answers, Discussion

- *NOTE: Approach and materials in this presentation were prepared by Davids Engineering as funded by the County of Colusa*

GSP Regulations

- Finalized on May 18, 2016
- California Code of Regulations, Title 23. Waters, Division 2, Department of Water Resources, Chapter 1.5, Groundwater Management, Subchapter 2. Groundwater Sustainability Plans
  - Article 1. Introductory Provisions
  - Article 2. Definitions
  - Article 3. Technical and Reporting Standards
  - Article 4. Procedures
  - Article 5. Plan Contents
  - Article 6. Department Evaluation and Assessment
  - Article 7. Annual Reports and Periodic Evaluation by the Agency
  - Article 8. Interagency Agreements
  - Article 9. Adjudicated Areas and Alternatives

Article 5. Plan Contents

- Subarticle 1. Administrative Information
- Subarticle 2. Basin Setting
- Subarticle 3. Sustainable Management Criteria
- Subarticle 4. Monitoring Networks
- Subarticle 5. Projects and Management Actions

Key Decisions Embedded in GSP Development

- **Subarticle 3. Sustainable Management Criteria**
  - Defining "Undesirable Results": do they exist now; will they potentially occur in the future?
  - Establishing "Minimum Thresholds" and "Measureable Objectives" for each Sustainability Indicator (groundwater levels, water quality, land subsidence, etc.)
- **Subarticle 5. Projects and Management Actions**
  - Identifying "Potential Projects and Management Actions" needed to achieve sustainable basin management

Key Decisions: Defining Undesirable Results

- For each Sustainability Indicator, do significant and unreasonable effects currently exist or could they develop in the future?

• Chronic Lowering of GW Levels	• Degraded Water Quality
• Reduction of GW Storage	• Land Subsidence
• Seawater Intrusion	• Depletions of Interconnected Surface Water

- Do not need to address Sustainability Indicators if the GSA can demonstrate that undesirable results are not present and are not likely to occur.

Key Decision: Establishing Minimum Thresholds and Measureable Objectives

- **Numeric, site-specific criteria for each Sustainability Indicator establishing a point at which, if exceeded, significant and unreasonable results may occur.**

• Chronic Lowering of GW Levels	• Degraded Water Quality
• Reduction of GW Storage	• Land Subsidence
• Seawater Intrusion	• Depletions of Interconnected Surface Water

- **Must be established to avoid causing undesirable results in adjoining basins**
- **Must evaluate effects on the interests of beneficial uses and users of groundwater or land uses and property interests**

Key Decision: Defining Projects and Management Actions

- Describe Projects and Management Actions needed to observe Minimum Thresholds and Measureable Objectives
- Describe circumstances under which Projects or Management Actions shall be implemented
- Describe required legal authority and permitting and regulatory process to implement projects
- Explain expected benefits, costs and how costs will be met

Key Decisions by Sustainability Indicator Matrix

Figure 1. Key Decisions Embedded in Preparation of Groundwater Sustainability Plans pursuant to the Sustainable Groundwater Management Act
Prepared by Davids Engineering
July 2016

Groundwater Sustainability Agency

Groundwater Sustainability Plan

Sustainability Goal:
Essentially: Operate the subbasin within sustainable yield, with no Undesirable Results over time.

Key Decisions Determinations that must be made during GSP development per Final GSP Regulations.	Sustainability Indicators					
	#1 - Chronic Lowering of Groundwater Levels	#2 - Reduction of Groundwater Storage	#3 - Seawater Intrusion	#4 - Degraded Water Quality	#5 - Land Subsidence	#6 - Depletions of Interconnected Surface Water
Undesirable Results (§ 354.26) For each Sustainability Indicator, do significant and unreasonable effects currently exist or could they develop in the future?			Not Applicable			
Minimum Threshold (§ 354.28) Numeric, site-specific criteria for each Sustainability Indicator establishing a point at which, if exceeded, significant and unreasonable results may occur.			Not Applicable			
Measureable Objective and 5-Year Interim Milestones (§ 354.44) Numeric, site-specific criteria for each Sustainability Indicator describing prudent operational limits with "reasonable margin of operational flexibility" factored in.			Not Applicable			
Projects and Management Actions (§ 354.44) Descriptions of projects and management actions the GSA has determined will achieve the sustainability goal for the basin.			Not Applicable			

Pre-existing Undesirable Results

- GSPs may, but are not required to, address undesirable results that occurred before, and have not been corrected by, January 1, 2015 (per authorizing legislation; not expressed in GSP regs)

Sustainability Indicator #3: Seawater Intrusion

- Physically impossible; therefore, exempt

Sustainability Indicator #2: Reduction of Groundwater Storage

- Minimum Threshold: "…a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results." § 354.28 (c) (2)
- Potential Undesirable Results:
  - Reduced water supply reliability (reduced drought reserves)

Sustainability Indicator #4: Degraded Water Quality

- Minimum Threshold: "…degradation of water quality…that may lead to undesirable results." § 354.28 (c) (4)
- Potential Undesirable Results:
  - Unsuitable quality for beneficial uses
    - Agriculture
    - Drinking water
    - Stock water
    - Environmental uses
  - Reduced crop yields
  - Increased water treatment costs
  - Inability to comply with regulatory standards
    - Drinking water regs
    - Basin Water Quality Control Plan

Sustainability Indicator #5: Land Subsidence

- Minimum Threshold: "…the rate and extent of subsidence that substantially interferes with land surface uses and may lead to undesirable results." § 354.28 (c) (5)
- Potential Undesirable Results:
  - Permanent loss of aquifer storage capacity
  - Damage to foundations, roads, bridges, other infrastructure
  - Change in surface topography that reduces conveyance capacities of canals, natural channels, floodplains
  - Other effects

Sustainability Indicator #6
Depletions of Interconnected Surface Water

- Minimum Threshold: "…the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of surface water and may lead to undesirable results."
- Potential Undesirable Results:
  - Reduced water availability to "Groundwater Dependent Ecosystems" (GDE's) – TNC leading this
  - Reduced water availability to legal users of surface water

Sustainability Indicator #6
Depletions of Interconnected Surface Water

- Unofficial DWR Stance
  - Anticipating that effects on both Groundwater Dependent Ecosystems and streamflow depletion may become significant issues in the Sacramento Valley
  - Let local agencies define the challenges, recognizing that some local agencies might be from outside the Sacramento Valley
  - Working on technical tools to assist local agencies
    - C2VSim Model Update (fine grid)
    - Best Management Practices (BMPs) for local agencies to consider adopting for monitoring and analyzing effects of declining groundwater elevations

Sustainability Indicator #6
Depletions of Interconnected Surface Water

Crystal Ball:

- Potential effects of declining groundwater levels on GDE's and streamflow widely recognized, but physical relationships poorly understood
- Will definitely need to be addressed in GSP
  - TNC developing tools to assist in GSP preparation
- With respect to Sacramento River, potential effects are cumulative among subbasins
- Highly uncertain whether land subsidence will or may pose operational limitations

Sustainability Indicator #1
Chronic Lowering of Groundwater Levels

- Minimum Threshold: "…the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results."
- Potential Undesirable Results:
  - Well stranding
  - Increased well construction costs
  - Increased groundwater pumping costs
  - Inelastic land subsidence
  - Streamflow depletion
  - Impacts to Groundwater Dependent Ecosystems
  - Induced water quality degradation
  - Others?

Sustainability Indicators Summary "Risk Assessment"

- Will or may be able to remove from consideration:
  - Seawater Intrusion (#3)
- Will need to address but unlikely to pose operational constraints, at least in near term:
  - To Be Determined
- "Wildcards" with known, significant potential for undesirable effects but highly uncertain operational implications:
  - To Be Determined
- Significant risk of imposing operational constraints:
  - To Be Determined

Thoughts on Management Areas

Management Areas Described Differently in the Regs

- "…an area within a basin for which the Plan may identify different minimum thresholds, measureable objectives, monitoring or projects and management actions based on water use sector, water source type, geology, aquifer characteristics, or other factors." § 351 (r)
- "Each Agency may define one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the plan."

Potential Themes for Delineating Management Areas

- Similar institutional factors
- Physical connectedness
  - Upslope-downslope groundwater flow
- Shared groundwater challenges and similar likelihood that potential projects or management actions will be needed
  - Areas where Measureable Objectives may not be met
- Relative benefit from GW use

Note: Delineation of Management Areas does not preclude coordinated actions across Management Area boundaries.

Discussion