

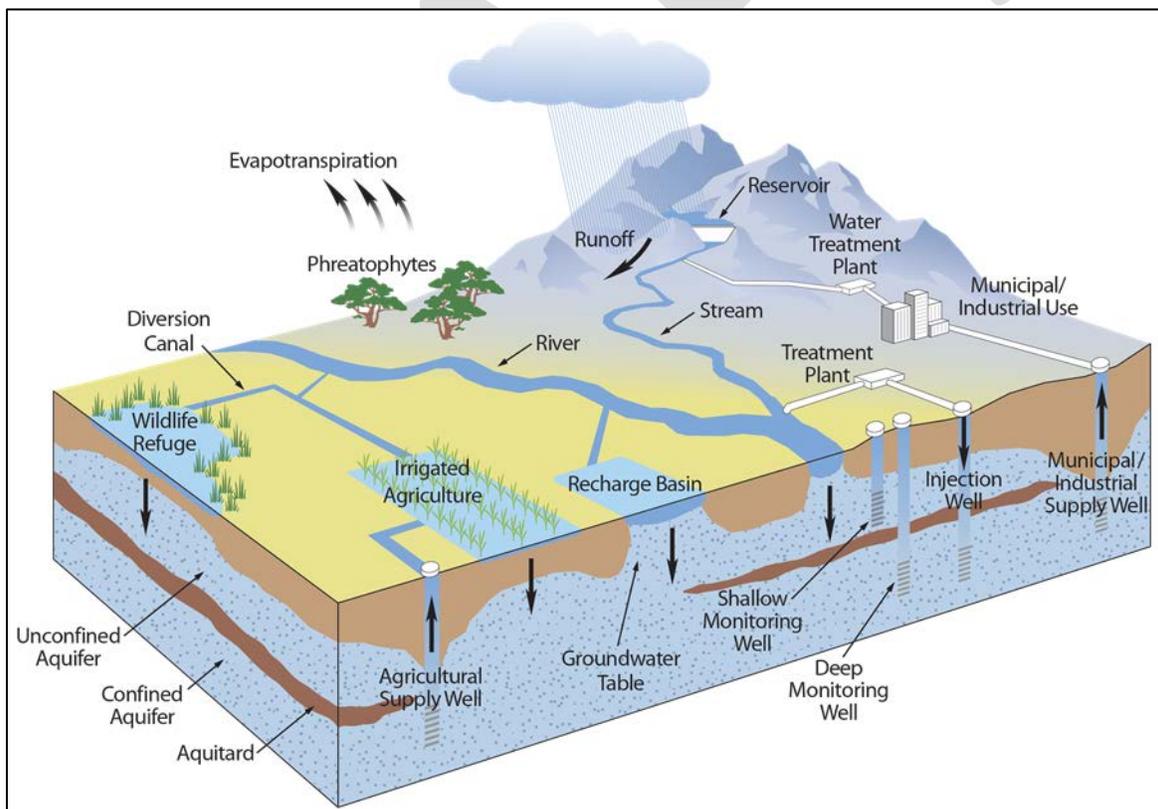
Topic 7: Water Budget and Coordination

*Department of Water Resources - Sustainable Groundwater Management Program
August 28, 2015*

1.0 PURPOSE AND DEFINITION

The purpose of this paper is to provide information to advance the discussion with stakeholders and the public as the Department of Water Resources (DWR) develops regulations as required in the Sustainable Groundwater Management Act (SGMA). DWR identified a series of ten topics related to the development of Groundwater Sustainability Plan (GSP) regulations that were deemed of special interest to further discuss with stakeholders and the public. This paper covers information specific to Topic 7: Water Budget and Coordination.

“Water budget” means an accounting of the total groundwater and surface water entering and leaving a basin including the changes in the amount of water stored.



2.0 BACKGROUND

In 2014, legislation was passed that provides a statewide framework for sustainable groundwater management in California (Senate Bill [SB] 1168, Assembly Bill [AB] 1739, and SB 1319). This legislation, referred to as the SGMA, is intended to support local groundwater management through technical assistance and oversight of Groundwater Sustainability Agencies (GSAs) and the implementation of their GSPs.

SGMA requires GSAs to develop monitoring, management, and reporting of those data necessary to support sustainable groundwater management including: (1) sufficient land and water resource data to establish an accounting of the short- and long-term trends of the basin's water balance; (2) measures of basin sustainability; and (3) those data necessary to resolve disputes regarding sustainable yield, beneficial uses, and water rights.

Implementation of SGMA also provides for state agency oversight if GSAs do not implement their GSPs. To avoid intervention by the State Water Resources Control Board (SWRCB), SGMA requires GSAs to establish sustainability goals, accurately track the effectiveness of management actions to achieve the sustainability goals, and to manage the basin within its sustainable yield without causing undesirable results.

By June 1, 2016, DWR is required to adopt emergency regulations for evaluating GSPs, the implementation of GSPs, and coordination agreements. The emergency regulations will identify the necessary GSP components related to the collection, analysis, and reporting of water budget information that will assist local agencies in developing and implementing GSPs and coordination agreements.

Establishing GSA consistency in collection, analysis, and reporting of data components related to water budget accounting will be critical for effective statewide evaluation of GSP development and implementation. However, standard requirements for water accounting and reporting also need to consider basin-to-basin variability and the potential need for flexibility in the degree and range of water budget data and methods that will be required based the specific aquifer conditions and sustainability goals of each basin.

This document presents preliminary draft information to promote discussion and is subject to revision. Furthermore, because this discussion paper addresses a variety of issues raised by individuals and entities outside of DWR, inclusion of the issues in this document does not constitute an endorsement of any particular issue. DWR invites comment and input on the preliminary draft information and questions presented in this document. Comments should be submitted to sgmps@water.ca.gov.

3.0 SELECT CALIFORNIA WATER CODE SECTIONS

3.1 Water Code Sections Related To Water Budget Coordination

The following California Water Code (Water Code) Sections (§) are related to aspects of the SGMA that refer to water budget components, coordination, and reporting.

§ 10721 Definitions

- (e) *“De minimis extractor” means a person who extracts, for domestic purposes, two acre-feet or less per year.*
- (t) *“Sustainability goal” means the existence and implementation of one or more groundwater sustainability plans that achieve sustainable groundwater management by identifying and causing the implementation of measures targeted to ensure that the applicable basin is operated within its sustainable yield.*
- (u) *“Sustainable groundwater management” means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.*
- (v) *“Sustainable yield” means the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result.*
- (w) *“Undesirable result” means one or more of the following effects caused by groundwater conditions occurring throughout the basin:*
 - (1) *Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.*
 - (2) *Significant and unreasonable reduction of groundwater storage.*
 - (3) *Significant and unreasonable seawater intrusion.*
 - (4) *Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.*
 - (5) *Significant and unreasonable land subsidence that substantially interferes with surface land uses.*
 - (6) *Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.*
- (x) *“Water Budget” means an accounting of the total groundwater and surface water entering and leaving a basin including the changes in the amount of water stored.*
- (y) *“Water year” means the period from October 1 through the following September 30, inclusive.*

§ 10720.8(f) Adjudicated Basin Reporting Requirements

(3) By April 1, 2016, and annually thereafter, [an adjudicated basin shall] submit to the department a report containing the following information to the extent available for the portion of the basin subject to the adjudication:

- (A) Groundwater elevation data unless otherwise submitted pursuant to Section 10932.
- (B) Annual aggregated data identifying groundwater extraction for the preceding water year.
- (C) Surface water supply used for or available for use for groundwater recharge or in-lieu use.
- (D) **Total water use.**
- (E) Change in groundwater storage.
- (F) The annual report submitted to the court.

§ 10727.2 Required GSP Elements

A groundwater sustainability plan shall include all of the following:

(a) A description of the physical setting and characteristics of the aquifer system underlying the basin that includes the following:

- (1) Historical data, to the extent available.
- (2) Groundwater levels, groundwater quality, subsidence, and groundwater-surface water interaction.
- (3) **A general discussion of historical and projected water demands and supplies.**
- (4) A map that details the area of the basin and the boundaries of the groundwater sustainability agencies that overlie the basin that have or are developing groundwater sustainability plans.
- (5) A map identifying existing and potential recharge areas for the basin. The map or maps shall identify the existing recharge areas that substantially contribute to the replenishment of the groundwater basin. The map or maps shall be provided to the appropriate local planning agencies after adoption of the groundwater sustainability plan.

(b) (1) Measurable objectives, as well as interim milestones in increments of five years, to achieve the sustainability goal in the basin within 20 years of the implementation of the plan.

(2) **A description of how the plan helps meet each objective and how each objective is intended to achieve the sustainability goal for the basin for long-term beneficial uses of groundwater.**

(c) A planning and implementation horizon.

(d) Components relating to the following, as applicable to the basin:

- (1) The monitoring and management of groundwater levels within the basin.
- (2) The monitoring and management of groundwater quality, groundwater quality degradation, inelastic land surface subsidence, and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin.
- (3) Mitigation of overdraft.

(4) How recharge areas identified in the plan substantially contribute to the replenishment of the basin.

(5) A description of surface water supply used or available for use for groundwater recharge or in-lieu use.

(e) A summary of the type of monitoring sites, type of measurements, and the frequency of monitoring for each location monitoring groundwater levels, groundwater quality, subsidence, streamflow, precipitation, evaporation, and tidal influence. The plan shall include a summary of monitoring information such as well depth, screened intervals, and aquifer zones monitored, and a summary of the type of well relied on for the information, including public, irrigation, domestic, industrial, and monitoring wells.

(f) Monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin. The monitoring protocols shall be designed to generate information that promotes efficient and effective groundwater management.

(g) A description of the consideration given to the applicable county and city general plans and a description of the various adopted water resources-related plans and programs within the basin and an assessment of how the groundwater sustainability plan may affect those plans.

§10727.6 Requirements for Coordinated Plans, When Multiple Plans Cover a Basin

Groundwater sustainability agencies intending to develop and implement multiple groundwater sustainability plans pursuant to paragraph (3) of subdivision (b) of Section 10727 shall coordinate with other agencies preparing a groundwater sustainability plan within the basin to **ensure that the plans utilize the same data and methodologies** for the following assumptions in developing the plan:

- (a) Groundwater elevation data.
- (b) Groundwater extraction data.
- (c) Surface water supply.
- (d) Total water use.
- (e) Change in groundwater storage.
- (f) **Water budget.**
- (g) Sustainable yield.

§10728 Annual Reporting by GSAs to Department

On the April 1 following the adoption of a groundwater sustainability plan and annually thereafter, a groundwater sustainability agency shall submit a report to the department containing the following information about the basin managed in the groundwater sustainability plan:

- (a) Groundwater elevation data.
- (b) Annual aggregated data identifying groundwater extraction for the preceding water year.
- (c) Surface water supply used for or available for use for groundwater recharge or in-lieu use.
- (d) **Total water use.**
- (e) Change in groundwater storage.

§ 10733 Department Review of Plans

- (a) **The department shall periodically review the groundwater sustainability plans developed by groundwater sustainability agencies pursuant to this part to evaluate whether a plan conforms with Sections 10727.2 and 10727.4 and is likely to achieve the sustainability goal for the basin covered by the groundwater sustainability plan.**
- (b) If a groundwater sustainability agency develops multiple groundwater sustainability plans for a basin, the department shall evaluate whether the plans conform with Sections 10727.2, 10727.4, and 10727.6 and are together likely to achieve the sustainability goal for the basin covered by the groundwater sustainability plans.
- (c) **The department shall evaluate whether a groundwater sustainability plan adversely affects the ability of an adjacent basin to implement their groundwater sustainability plan or impedes achievement of sustainability goals in an adjacent basin.**

§ 10733.2 Plan Review and Implementation

- (a) (1) By June 1, 2016, the department shall adopt regulations for evaluating groundwater sustainability plans, the implementation of groundwater sustainability plans, and coordination agreements pursuant to this chapter.
(2) **The regulations shall identify the necessary plan components specified in Sections 10727.2, 10727.4, and 10727.6 and other information that will assist local agencies in developing and implementing groundwater sustainability plans and coordination agreements.**
- (b) (1) The department may update the regulations, including to incorporate the best management practices identified pursuant to Section 10729.
(2) **The regulations adopted pursuant to paragraph (1) of subdivision (a) shall identify appropriate methodologies and assumptions for baseline conditions concerning hydrology, water demand, regulatory restrictions that affect the availability of surface water, and unreliability of, or reductions in, surface water deliveries to the agency or water users in the basin, and the impact of those conditions on achieving sustainability. The baseline for measuring**

unreliability and reductions shall include the historic average reliability and deliveries of surface water to the agency or water users in the basin.

§ 10733.4 Submittal of Plans to Department for Evaluation

(a) Upon adoption of a groundwater sustainability plan, a groundwater sustainability agency shall submit the groundwater sustainability plan to the department for review pursuant to this chapter.

(b) If groundwater sustainability agencies develop multiple groundwater sustainability plans for a basin, the submission required by subdivision (a) shall not occur until the entire basin is covered by groundwater sustainability plans. When the entire basin is covered by groundwater sustainability plans, the groundwater sustainability agencies shall jointly submit to the department all of the following:

(1) The groundwater sustainability plans.

(2) An explanation of how the groundwater sustainability plans implemented together satisfy Sections 10727.2, 10727.4, and 10727.6 for the entire basin.

(3) A copy of the coordination agreement between the groundwater sustainability agencies to ensure the coordinated implementation of the groundwater sustainability plans for the entire basin.

§ 5203 Groundwater Reporting for Probationary Basins

Each report shall be prepared on a form provided by the board. The report shall include all of the following information:

(a) The name and address of the person who extracted groundwater and of the person filing the report.

(b) The name of the basin from which groundwater was extracted.

(c) The place of groundwater extraction. The location of the groundwater extraction facilities shall be depicted on a specific United States Geological Survey topographic map or shall be identified using the California Coordinate System or a latitude and longitude measurement. If assigned, the public land description to the nearest 40-acre subdivision and the assessor's parcel number shall be provided.

(d) The capacity of the groundwater extraction facilities.

(e) Monthly records of groundwater extractions. The measurements of the extractions shall be made by a methodology, water-measuring device, or combination thereof satisfactory to the board.

(f) The purpose of use.

(g) A general description of the area in which the water was used. The location of the place of use shall be depicted on a specific United States Geological Survey topographic map or on any other maps with identifiable landmarks.

(h) As near as is known, the year in which the groundwater extraction was commenced.

(i) Any information required pursuant to paragraph (3) of subdivision (c) of Section 10735.2.

- (j) *Any other information that the board may require by regulation and that is reasonably necessary for purposes of this division or Part 2.74 (commencing with Section 10720) of Division 6.*

4.0 SUMMARY OF TOPIC ISSUES AND CHALLENGES

As part of the SGMA outreach effort, DWR continues to meet with various organizations and individual experts to receive input on issues and challenges associated with implementing SGMA requirements for monitoring, reporting, and analysis of basin budgets. In addition, there is interest in receiving input regarding the issues and challenges associated with implementing a standard method for the collection and analysis of water budgets that will facilitate effective assessment of GSP water supply forecasting, surface water-groundwater interaction, and sustainable management.

As previously mentioned, GSA consistency in collection, analysis, and reporting of data related to water budget accounting will be critical for effective statewide evaluation of GSP development and implementation. However, standard requirements for water accounting and reporting need also consider basin-to-basin variability and the potential need for flexibility in the degree and range of water budget data and methods that will be required, based the specific aquifer conditions and sustainability goals of each basin.

The following represents DWR-identified technical challenges and considerations developed, in part, based on initial stakeholder comments related to implementing intra- and inter-basin coordinating agreements between GSAs.

Issues and Questions

1. SGMA requires the GSAs to report, and the Department to evaluate, whether a GSP is likely to achieve the sustainability goal for the basin.
 - a. Given there is a wide variability in a GSA's capacity, tools, and resources, how would you suggest identifying a standardized approach to the methods and data requirements for analysis of groundwater basin water balance information?
 - b. What types of water budget information are needed in order for the GSA to assess if the proposed basin management practices are likely to achieve the sustainability goal for the basin?
 - c. What water supply forecasting methods are needed to evaluate if the proposed water budget and management practices will achieve the sustainability goal for the basin?
 - d. The SGMA legislation allows DWR to specify additional information needed to assess the sustainability of GSPs. What level of annual reporting of water budget data is needed in order for DWR to evaluate if the proposed basin management practices are likely to achieve the upcoming sustainability milestones for the basin? Annual reporting requirements specified explicitly in the Water Code include:

- i. Groundwater elevation data.
 - ii. Aggregated groundwater extraction for the preceding water year.
 - iii. Surface water supply for groundwater recharge or in-lieu use.
 - iv. Total water use.
 - v. Change in groundwater storage
2. SGMA requires annual aggregated reporting of groundwater extraction data. The appropriate methods and levels of water budget data collection, management, and reporting could vary depending on existing basin conditions and future sustainability goals.
 - a. In order for DWR to accurately assess GSA progress in reaching sustainability goals and milestones, and for the GSAs to apply focused water management measures, would it be helpful for GSAs to categorize and report water budget data by basin sub-areas relating to water demand, supply reliability, or land use?
 - b. Should water budget accounting and reporting include a tiered set of minimum requirements and standards for data collection, reporting, and methods, based on the occurrence and level of undesirable results within the basin or a subset of areas within the basin? For example, are the same level of requirements for water budget data, reporting, and methods needed for basins without undesirable results, versus basins experiencing one or more undesirable results? Are the same levels of reporting requirements needed for all areas within a basin?
3. SGMA requires GSAs to collect, manage, analyze, and report a wide range of water budget data and land use information. Some portion of these data will be shared with GSAs in hydrologically-connected basins through coordination agreements and with State agencies through GSPs and annual reports.
 - a. What challenges will GSAs face in sharing and reporting of water budget data sufficient for assessing sustainable water management?
 - b. Are GSP data collection and management protocols and standards needed in order to assure a consistent level and type of data collection and data compatibility?
 - c. Is it appropriate to have a tiered level of data collection and management standards, based on the occurrence and level of undesirable results in the basin?
4. SGMA requires GSAs to forecast and monitor the effectiveness of various management strategies under changing growth, land use, water supply, and climate scenarios, and to analyze the potential impacts to surface water habitat and flow due to groundwater extraction. In aggressively-managed basins, models are one of the few ways to systematically evaluate and forecast these scenarios. However, in groundwater basins where groundwater demand is not causing significant undesirable results and projections for growth are limited, other less-complicated approaches to forecasting future water supply scenarios may be appropriate.

- a. Should groundwater models be required for budget forecasting in aggressively managed basins currently experiencing significant undesirable results?
 - b. If groundwater models aren't used for budget forecasting in aggressively managed basins experiencing undesirable results, what other approaches to water supply forecasting may be appropriate?
5. DWR is responsible for assessing and reporting local sustainable water management efforts and integrating the results of these efforts into a broader statewide evaluation of how implementation of California's resource management strategies are meeting the goals and objectives of the California Water Action Plan.
- a. How should DWR make use of locally-developed water budget information within its own resource planning activities like the California Water Plan and the California Water Action Plan?
 - b. Should the locally-developed information roll up into a statewide assessment of water budgets?