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April 1, 2016

California Department of Water Resources
Attn: Lauren Bisnett, Public Affairs Office
P.O. Box 942836
Sacramento, California 94236

Re: Comments on Draft GSP Regulations

Dear Ms. Bisnett,

Thank you for the opportunity to comment on the draft Groundwater Sustainability Plan (GSP) regulations. The Union of Concerned Scientists is a non-governmental organization with scientific and technical staff that develops innovative, practical solutions to some of our planet's most pressing problems. The Union of Concerned Scientists was actively involved in supporting the Sustainable Groundwater Management Act (SGMA) legislation and has been deeply involved in analyzing and making recommendations on how the law can best be implemented. This has included producing a comprehensive technical report on SGMA implementation, *Measuring What Matters* (www.ucsusa.org/MeasuringWhatMatters), that was informed by discussions with a wide range of groundwater managers and stakeholders, and has been made available to Department of Water Resources (Department) staff. We have been encouraged that the Department has apparently taken a number of the recommendations from the report and from our comments, and appreciate the time that department staff have taken to understand the underlying science and analytics behind the reasoning for our recommendations.

The Union of Concerned Scientists has remained actively engaged in ensuring that the regulations that support SGMA deliver on its promise to improve our scientific understanding of the state's water system and increase the transparency of water management decisions. Our comments on the draft GSP regulations focus on three main areas:

- the maintenance of the sound technical approach to data reporting and standards;
- the deletion of the term "substantial compliance;" and
- the clarification of key concepts, including the sustainability goal and uncertainty.

We find that the draft regulations take a sound technical approach to data and reporting standards. In particular, for any statewide regulation to be effective, consistent measurement, monitoring, and reporting standards are needed. It will be critical to maintain the language in Section 352. 6 Data and Reporting Standards to ensure that both the state and local stakeholders can understand, use, and compare the data that is required by SGMA to be reported in GSPs.

However, in other respects, the regulations are far too permissive – potentially allowing plans that do not meet the procedural and performance-based standards included in the statute to be declared adequate. The danger of obstructing the requirements and intent of SGMA is most clear in the use of the term "substantial compliance." Finally, there are several areas of the draft regulations that require further clarification. First, the sustainability goal is central to the purpose and passage of SGMA, yet it is only briefly mentioned in the draft regulations. In addition, the draft regulations do not require minimum thresholds be set in initial GSPs to avoid depletions of interconnected surface water (as required in Water Code section 10721 (w)(6)) and, therefore, it is unclear how a basin with interconnected surface water could develop an adequate sustainability goal without this key piece of information. Secondly, while the concept of uncertainty is mentioned as an important aspect of understanding water budget components, the regulations do not describe how uncertainty should be characterized or applied in the process of setting minimum thresholds so as to reduce the risk of causing undesirable results inadvertently due to limited knowledge or information. We provide more detail about each of these points, and provide some suggestions to address them, below.

1. **Sound Technical Approach to Data Reporting Standards Should be Maintained**

We commend the Department's approach to data and reporting standards in the draft GSP regulations. In particular, we believe that the requirement that groundwater and surface models developed or utilized in the Plans consist of public domain open-source software is critical to ensure transparency and will help "to encourage the active involvement of diverse social, cultural, and economic elements of the population," as required in Water Code Section 10727.8.

We suggest the following amendment to ensure that the public has access to the data and assumptions used in these models during the public comment period (all language quoted directly from the draft regulations is italicized and changes are bolded and italicized throughout):

Section 352.6 Data and Reporting Standards

*(e)**(4) All data shall be submitted using a common format established in the BMP document that can be easily uploaded into a regional open-source model on the Department's website within 30 days of receipt of the Plan.***

While this requires a quick process for uploading data, the public comment period is only open for 60 days and the public will need to be able to see the modeling data to make informed technical comments. As alternatives, we would suggest lengthening the public comment period or making the comment period clock start when the modeling data becomes public.

2. **Delete "Substantial Compliance"**

This term affords a level of discretion over plan evaluation not envisioned in the statue. It is taken from contract law, and while it may be appropriate in some applications such as the contract language related to projects proposed by a GSP, it is not applicable to a GSP as a whole. We find that the Department retains a great deal of discretion throughout in determining what constitutes best available information and best available science. In addition, the Department has flexibility in accepting plans as "conditionally adequate" even if they have minor deficiencies but generally

comply with the terms of the Act and draft regulations. Therefore, this additional term is unnecessary and extremely problematic.

We suggest the following amendments:

§ 355.4. Criteria for Plan Evaluation

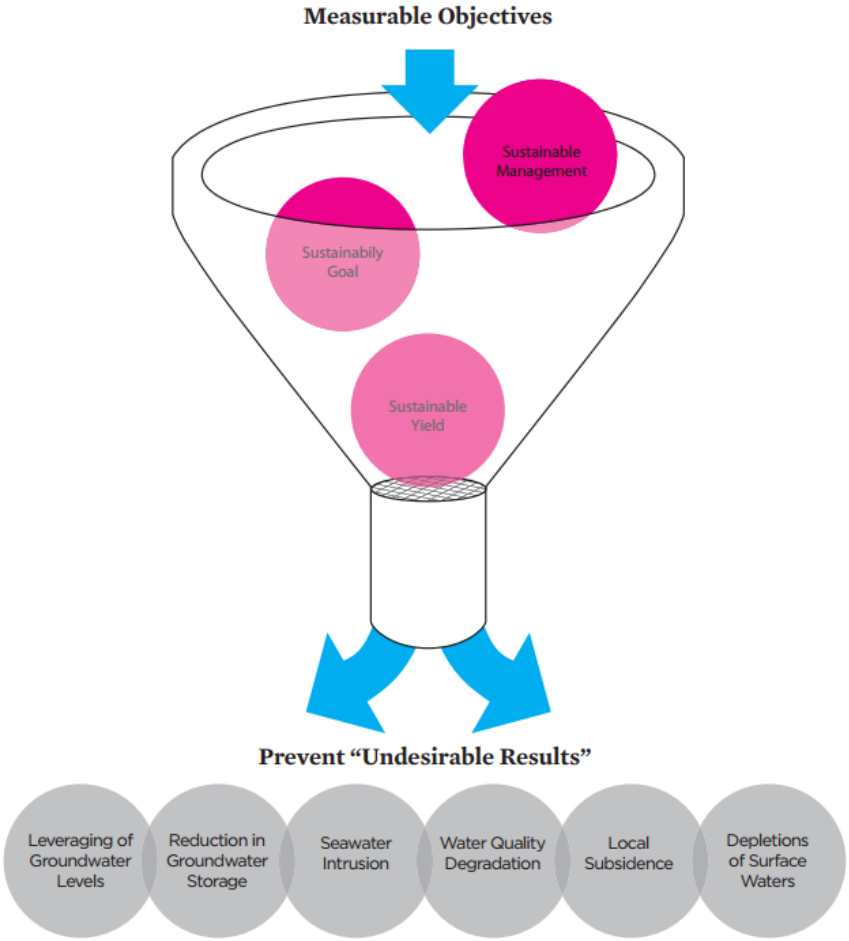
The Department shall evaluate a Plan to determine whether the Plan has the overall effect of achieving the sustainability goal for the basin, complies with the Act, and is in ~~substantial~~ compliance with this Subchapter. ~~Substantial compliance means that the Agency has attempted to comply with these regulations in good faith, that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to permit evaluation of the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal or of the Department to evaluate the likelihood of the Plan to attain that goal.~~

3. Clarification of the Following Key Concepts Needed:

a. Sustainability Goal

Before SGMA, there were nearly 120 local groundwater management plans in place; yet, these plans were voluntary, unenforceable by the state, and were found to be ineffective by numerous reviews (RMC Water and Environment 2014; Nelson 2011). SGMA made several key changes to the past planning requirements – most notably SGMA requires that plans manage to achieve a sustainability goal. The sustainability goal requires setting a sustainable yield that will avoid undesirable results such as chronic lowering of groundwater levels, reduction of groundwater storage, and seawater intrusion (see Figure 1 reprinted from Christian-Smith and Abhold 2015). Therefore, the concept of sustainability and the achievement of sustainable management are central to SGMA and should be a critical part of GSPs and their evaluation. In addition, one of the broadest authorities given to the Department is in relation to ensuring that the sustainability goal of one basin does not adversely affect the ability of another basin to achieve sustainability (Water Code Section 10733 (c)).

FIGURE 1. Groundwater Sustainability in SGMA



Measurable objectives define the sustainability goal, sustainable management, and sustainable yield, which are intended to prevent undesirable results, such as seawater intrusion and land subsidence. Many undesirable results are interconnected and are therefore displayed as overlapping circles.

SOURCE: DWR 2015.

Currently, we find the draft regulations provide little direction in terms of defining sustainability or in terms of evaluating the sustainability goals set in the GSPs. In order to address these deficiencies we offer the following amendments:

Section 354.24 Sustainability Goal

(a) Sustainable yield shall be consistent with the water budget information required in Section 354.18.

(b) Sustainable yield shall be defined as the allowable amount of groundwater extraction that avoids crossing minimum thresholds for all critical parameters and shall be expressed in acre-feet per year.

(c) Sustainable yield shall also be expressed in relation to water supply by using a contour map that translates the allowable amount of groundwater extraction and estimated water supply into a range of groundwater elevations across the basin.

Section 355.4. Criteria for Plan Evaluation

(*b) The Department shall evaluate a* ***Plan's stated sustainability goal to ensure that they are appropriate, adequate, and will not jeopardize the achievement of sustainable groundwater management statewide. When evaluating the sustainability goal, the Department shall consider the following:***

(1) Whether the assumptions and findings used to set the sustainability goal and sustainable yield, including the water budget and minimum thresholds, are accurate and reasonable.

(2) Whether the sustainability goal and sustainable yield adequately incorporate uncertainty in both water budget components and proposed minimum thresholds.

In addition, we find that the draft regulations treat undesirable results inconsistently by not requiring minimum thresholds be set in the first GSP for depletions of interconnected surface water. This is inadequate since the sustainability goal of the basin must be set so as to avoid all undesirable results, not some. Thus, delaying the consideration of one undesirable result invalidates any GSP with interconnected surface water from developing a credible sustainability goal in its initial GSP.

We suggest the following amendments to ensure that depletions of interconnected surface waters are treated in a consistent and legally and scientifically defensible manner:

Section 352.6 Data and Reporting Standards

*(e)(4) All water demands by water source type and water use sector****, including water demands for interconnected surface waters and groundwater dependent ecosystems.***

Section 354.28. Minimum Thresholds ***and Undesirable Results***

(6)(A) The location, quantity, and timing of depletions of interconnected surface water. If sufficient data to quantify depletions of interconnected surface water is not available, ***the Plan shall set a conservative minimum threshold following methods described in the BMP manual.***

*(B) A description of the groundwater-surface water model used to quantify surface water depletion. If a groundwater-surface water model is not used to estimate surface water depletion, the Plan shall identify and describe an equally effective method or tool to accomplish this requirement****, or identify provisions for developing a groundwater-surface water model capable of quantifying surface water depletion no later than the first five-year assessment***.

b. **Uncertainty**

Uncertainty is inherent in any long-term planning process. Uncertainties may be known (such as inaccuracies associated with different measurement techniques), or unknown (such as future land uses or changes in precipitation). Uncertainty means that the beneficial effects of an action may be lower (or higher) than expected, which in turn may (or may not) require further action and additional time.

Although we often cannot accurately project future conditions, outcomes can be bracketed (best- and worst-case scenarios) and risks need to be identified and managed. In areas of a basin that are particularly sensitive (for instance, where there are groundwater dependent ecosystems), or where a large degree of uncertainty exists (for instance, little information about groundwater extraction), conservative minimum thresholds should be set that reflect that uncertainty.

The draft regulations refer to uncertainty above in the water budget section (354.18), but they do not define the term or describe how it should be used. In order to ensure that the certainty of data and information appropriately informs management, we offer the following amendments:

Section 354.18. Water Budget

*(b)(3)**(D) Identify Uncertainty: Uncertainty associated with estimates of water demand will be identified by quantifying the margin of error in measurement technique or propagating error through a hydrogeologic conceptual model. Uncertainty associated with estimates of surface water supply will be identified by quantifying the range of historic and projected surface water supply availability.***

Section 354.28. Minimum Thresholds and Undesirable Results

Each Agency shall establish minimum thresholds for each critical parameter based on the conditions under which the Agency determines that those critical parameters are significant and unreasonable, as described in Section 354.26. The minimum threshold refers to the point at which conditions for a given critical parameter are significant and unreasonable. ***Minimum thresholds must be set so as to avoid causing undesirable results. Therefore, where there are data gaps or high levels of uncertainty, minimum thresholds will take a conservative approach.***

(a) Minimum thresholds shall be numeric values that define conditions that, if exceeded, could lead to undesirable results. The description of minimum thresholds shall include the following:

(1) The information and criteria relied upon in establishing minimum thresholds for each critical parameter. The justification for the minimum threshold shall be supported by information from the hydrogeologic conceptual model, basin conditions, water budget, ***the level of uncertainty around water budget components, and other data or models as appropriate.***

(2) An estimate of the maximum amount of groundwater extraction in acre-feet per year that could occur without crossing each minimum threshold, incorporating the uncertainty in water budget components.

(*3) A description of the interrelationship between critical parameters that explains how the minimum threshold for each critical parameter will not cause undesirable results for any*

other critical parameter. ***This description will include estimates of the maximum amount of groundwater extraction for all critical parameters as described in Section 354.28 (a) (2), and describe how a maximum allowable amount of groundwater extraction was chosen for the basin, as a whole, that does not cross any minimum thresholds.***

Finally, the draft regulations currently require GSPs that cross a minimum threshold to implement a contingency plan. While we find the concept of a contingency plan to be sound and a sign of good management, a contingency plan should be triggered well before a minimum threshold is crossed. It would be useful to suggest a standard approach as in the Safe Drinking Water Act, which requires action at 85% of the maximum contaminant level. Here, we suggest an approach to triggering a contingency plan that relies on the level of uncertainty.

We suggest the following amendment:

§ 354.44. Projects and Management Actions

(b)(3) The Plan shall describe emergency contingency projects or actions that will be implemented in the event that groundwater conditions in the basin ***are nearing a*** *minimum threshold or that undesirable results have occurred or are imminent.* ***Basins that have a high level of uncertainty associated with their water budget components will implement contingency plans when they are within one standard deviation of the minimum threshold.*** *Emergency contingency projects or actions shall be designed to achieve immediate results such that the Agency is able to demonstrate that the emergency has been abated by or before the next annual report.*

Thank you again for the opportunity to comment. We would be happy to provide additional information, upon request.

Sincerely,

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