DEPLETION OF INTERCONNECTED SURFACE WATER: SIGNIFICANT AND UNREASONABLE STATEMENT, MINIMUM THRESHOLDS, AND UNDESIRABLE RESULTS

Presented to Santa Margarita Groundwater Agency By Chelsea Neill 9/24/2020





- Review proposed Significant and Unreasonable Statement
- Review Minimum Thresholds
- •Provide direction for developing Undesirable Results

SIGNIFICANT AND UNREASONABLE DEPLETION OF INTERCONNECTED SURFACE WATER



The statement was revised based on feedback from the last board meeting. Are the Directors happy with this statement?

APPROACH FOR MINIMUM THRESHOLDS



The proposed approaches to establishing minimum thresholds:

- 1. Absolute minimum of the historic record
- 2. Average of the 5 lowest groundwater levels.

The historic record at SLVWD Quail MW-A has been quite consistent. The absolute minimum is less than 1 ft lower than the average of the 5 lowest measurements.

At SV4-MW there has been more variation in the record. The absolute minimum is approximately 12 ft lower than the average of the 5 lower measurements. The absolute minimum was recorded 2009. This point was the only measurement over a 7-year span and was approximately 11 feet lower than any other recorded point. The average of the 5 lowest groundwater levels is approximately 1 ft higher than the second lowest recorded groundwater level in 1999.



Please note the scales on the hydrographs do not match.

We can use the model to estimate the historical groundwater levels and evaluate the proposed minimum thresholds. At SLVWD Quail MW-A we see that the historical groundwater level has been very consistent over time. The model shows that the minimum level during the recent drought is very close to the minimum in the model simulated levels around 1991.



Please note the scales on the hydrographs do not match.

At SV4-MW the model suggests that the groundwater levels were relatively consistent during the 7-year period with only one data point, suggesting that the lowest point in 2009 may be an error. Using the average of the 5 lowest groundwater levels minimizes the impact this point may have on establishing the minimum threshold.



APPROACH FOR UNDESIRABLE RESULT



The monitoring wells are currently monitored by hand measurements at varying intervals. SLVWD Quail MW-A is measured roughly monthly and SV4 MW is monitored roughly every 6 months. SV4 MW was recently equipped with a logger, and SLVWD Quail MW-A might be equipped with a logger as part of the awarded grant funds. The loggers will measure groundwater levels continuously. As a result we will have a record of daily groundwater level. Here I have created a synthetic record of daily groundwater levels as an example.

The proposed approaches for undesirable result are:

- 1. The average monthly groundwater level. This option provides more flexibility, where groundwater levels could fall below the minimum threshold for short periods during the month, as long as the monthly average was above the minimum threshold.
- 2. The minimum monthly groundwater. This option provides less flexibility and would use the lowest recorded groundwater level during the month.

Which approach do you prefer?

1. Average monthly groundwater level

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2. Minimum monthly groundwater level

QUESTIONS AND COMMENTS