From: John Kessler
To: Docket Optical System
Date: 9/23/2008 10:52 AM
Subject: Fwd: RE: Sentinel - Prelim. GW Modeling Results
Attachments: Executive Summary of Basin Response Analysis.doc

Please docket this email message and the attachment as all one document to Sentinel (07-AFC-3) and include in the file name: "Applicant's statement re. GW recharge lead time".

thank you,

John

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>>> <MICHAEL.CARROLL@LW.com> 9/22/2008 4:34 PM >>>
Hello Everyone.

Thank you for the heads up, John. While it is not possible for us to respond to the latest staff analysis with any specificity until we see the underlying parameters and assumptions, a two-year lead time on recharge is much earlier than we believe is necessary to avoid impacts to the mesquite hummocks based on the analysis that we have completed. The results of our analysis were provided last week with the requested Willow Hole coordinates, and an Executive Summary of the results of our analysis is attached to this message. Based on our analysis, we continue to believe that a one-year lead time on recharge is more than adequate, even under conservative assumptions, to ensure no impact to the mesquite hummocks. As a practical matter, it is not possible for recharge to occur two years in advance of pumping since it would have to be underway already in order to meet that schedule. We understand that the staff's approach to this matter has been to use theoretical worst-case assumptions. We look forward to receiving the complete analysis (hopefully soon) so that we can engage in a constructive discussion of conservative, yet somewhat more realistic, assumptions that would be appropriate for the analysis. We are also working on a proposed condition of certification to implement measures intended to protect the mesquite hummocks (as well as local wells), which we hope to be able to share with you in the next couple of days.

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-----Original Message-----
From: John Kessler [mailto:Jkessler@energy.state.ca.us]
Sent: Friday, September 19, 2008 4:27 PM
To: Mark Turner; Jon_Avery@fws.gov; Carroll, Michael (OC); Dale Shileikis; Kathy Rushmore
Cc: Heather Blair; Christopher Dennis; Caryn Holmes; Paul Marshall;

Executive Summary of Basin Response to Recharge

In response to a question about the response of the Mission Creek Groundwater Sub-basin to recharge of water, URS performed an analysis of response time from the area of the sub-basin under the DWA percolation ponds to the nearest modeled Mesquite Hummocks area within the Willow Hole Conservation Area. An amount of water was introduced in the first month at the groundwater table below the DWA percolation ponds and, using the model previously developed for CPV Sentinel groundwater analysis, cases were run on monthly intervals to determine the first instance of groundwater level increase by as little as 0.001 feet at the Mesquite Hummocks observation point #1. To conservatively bound the results, transmissivity values of Tyley and 2X Tyley were performed for both Anisotripic ratios of 1 and 2. In addition, the time for the water to percolate was estimated based on the percolation rate of four feet per day and a distance from surface to groundwater of 450 feet to yield a 3.74 month percolation duration. The results of the analysis are summarized below:

	T = Tyley, A = 2	T = Tyley, A = 1	T = 2 Tyley, A =2	T = 2 Tyley, A = 1
Months to MH	4	8	1.5	3
Percolation, mo.	3.75	3.75	3.75	3.75
Total Duration, mo.	7.75	11.75	5.25	6.75

Pumping would commence in month 12 of this analysis, after the first impact of early recharge is registered at the Mesquite Hummocks. Furthermore, the effect of pumping at the Mesquite Hummocks would not be instant but would be similarly delayed, yielding even more margin against a potential negative impact.

URS did not run cases for T = ½ Tyley, because as previously reported, URS considers T = Tyley and T = 2 X Tyley to bound the expected results. As noted in the Data Response submittal to the CEC on July 9, 2008, URS considers half-Tyley to be an overly conservative sub-basin parameter. Below is the relevant text of the July 9, 2008 submittal on this point:

URS' selection of Tyley's T distribution for the CPV groundwater flow model was based on review of all data available at the time of modeling. This assessment of Tyley's T distribution continues to support that this distribution is reasonable with respect to basin geology and depositional trends. Post-Tyley data and project specific drilling indicate that not only is Tyley's T distribution reasonable but that it is somewhat conservative in that actual T values, at least in the project-specific pumping and recharge areas (i.e., upper Mission Creek Subbasin), are considerably higher (by a factor of approximately 2 or more). In fact, the results of the CPV Test Well Program constant-rate pumping and recovery tests include T values ranging from 395,000 to 448,000 gpd/ft with a geometric mean of 423,573 gpd/ft. Tyley's T value in this area of the basin was 50,000 gpd/ft, or about 8 times lower that that derived from the PW-1 aquifer test. URS believes that use of Tyley's T values in the CPV is conservative and produces an impact that may be greater than what would actually occur. Moreover, the conservative T values from Tyley add to the conservatism from the input values for pumping and recharge to create scenarios that are exceptionally conservative for an evaluation of potential project-specific impacts to the basin. Accordingly, URS believes that running Tyley's T distribution at one half misrepresents natural conditions whereby the results systematically over-predict impacts to nearby wells. URS believes that use of T distributions equal to Tyley's is quite conservative and that T values equal to two times Tyley may more accurately represent natural conditions in the basin.

In summary, by recharging the sub-basin at least 12 months prior to CPV Sentinel pumping, the area of Mesquite Hummocks in the Willow Creek Conservation Area will experience a beneficial water level increase and avoid impacts from the project.

Robert Worl; John Fio
Subject: Sentinel - Prelim. GW Modeling Results

Hello All:

Staff has received some initial and preliminary results from our GW modeling to determine what lead time for recharge is necessary to avoid a project-related negative change in the water table at the location of the mesquite hummocks. Our preliminary results indicate that recharge needs to precede project pumping by at least 2 years. We can fill you in with our assumptions and methods later, but wanted to get these results to you at our earliest opportunity.

Thank you,

John

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