

Date: Fri, 12 Sep 2008 09:52:36 -0500

To: Stuart Arkley <Stuart.Arkley@dnr.state.mn.us>

From: John Coleman <jcolema1@wisc.edu>

Subject: Re3: RS22 Appen.B and pump-test analysis in RS10A

Cc: Nancy Schuldt <nancyschuldt@fdrez.com>, Ann McCammon_Soltis <amsoltis@glifwc.org>, "Ahlness, Jon K MVP" <jon.k.ahlness@usace.army.mil>

Bcc:

X-Attachments: W:\mail\coleman5\attach\CC_JRK_RS10a Comments.doc;

In-Reply-To: <48C947E4.4A83.0060.0@dnr.state.mn.us>

References: <0K71006I8STU1P20@smtpauth1.wiscmail.wisc.edu>

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Stuart,

Thanks for forwarding your consultants' comments on RS10a. I'm glad to see that their comments and mine identify the same weaknesses. As I mentioned in my comments related to RS22 Appen.B and RS10A, the relationship between the bedrock and surficial aquifer is a critical piece of information for, among other things, predicting drawdown impacts to surface water bodies and wetlands on and off the site. Both these RS documents are not very useful because the models and tests they report are poorly designed. Conclusions, independent or not, are on a weak foundation when based on poorly designed studies. As I stated in my RS22, Appen.B comments, this site needs a pump-test that actually produces useful information concerning the connectedness of the bedrock and surficial aquifers. Is there some other source of information for this important parameter?

The subjects of the meetings on the 23rd and the 29-30th depend heavily on concepts and assumptions based in these two RS documents. The basic hydrology of the site underlies much of RS74 and the Water Resources chapter. I assume there will be an opportunity for staff to discuss the implications of these two studies and how to incorporate uncertainty given the weaknesses in the hydrologic characterizations.

john

At 04:31 PM 9/11/2008, you wrote:

John,

I have forwarded your comments to DNR and contractor staff and have asked that they consider your comments when drafting the DEIS chapters. I do not know specifically how our reviewers dealt with the issues that you raise when they assessed the data, but both DNR and contractor staff will apply independent judgment to the data rather than relying on the conclusions of the report.

Stuart

>>> John Coleman <jcolema1@wisc.edu> 9/10/2008 4:17 PM >>>

In my earlier email concerning the RS22 Appen.B Modflow modeling I stated that no pump-test had been conducted to determine the connectedness of the wetland and bedrock hydrology. I was mistaken. I did finally find such a pump test in RS10A.

However, I strongly disagree with the conclusion in that pump test report. The pump-test was poorly designed, with no pre-established background wells to compare the drawdown monitoring

wells to; there were too few drawdown monitoring wells in both the bedrock and in the wetlands; and the pumping of only 20-22 gpm did not impose an adequate stress on the system. Furthermore, 2 of the 5 wells in the wetlands showed unexplained erratic behavior before the pump-test.

In any case, 4 of the 5 wetland wells monitoring for drawdown showed noticeable drops in water level during the pump-test. Given the poor test design it is impossible to attribute the drops in water level in 3 of these wells to any particular cause but neither can pump-test induced drawdown be ruled out. The pump-test data certainly do not support the claim made in the report that "significant and widespread drawdown of the water table within these deposits is not anticipated." The report attributes the drops in water level in those three wells to other causes but is unable to identify what those causes might be and in no way rules out pump-test induced drawdown. The report goes on to then use the lack of understanding of what caused the drop in the water levels in these three wells to somehow argue that there is no drawdown in the three wells. This is fuzzy logic at best.

The response of wetland well 20P clearly indicates that moderate pumping (20 gpm) of well P2 in the bedrock aquifer at a depth of 302 feet is capable of inducing significant drawdown very close to the wetland surface (20P is screened at a 7.5 foot depth). Whether the drawdown would extend to the very surface can not be answered with the available data but the drop in the two shallowest wells (screened at 2.4 to 3 feet) that parallels the drop in 20P suggests that it could.

Although the pump-test was poorly designed and the results are ambiguous, if any conclusion could be made it would be the opposite of that stated in the report. It appears that the pump-test provides no evidence to support the report's conclusion that "significant and widespread drawdown of the water table within these deposits is not anticipated." and in fact the pump-test provides some evidence for exactly the opposite conclusion.

I believe that the relationship between the bedrock and surficial aquifer must be further explored with a well designed pump-test which incorporates adequate temporal and spatial control for variation in water levels (i.e. monitoring of wells for longer periods before and after the test, and the placement of wells away from the pump test for comparison with impacted wells). A well designed pump-test must also incorporate a larger number of test monitoring wells in both the bedrock and wetland soils and induce a larger stress on the hydraulic system.

Thank you for passing these comments on to the appropriate staff.
john