

December 6, 2011

Dean Schwarz, Town Chair
Town of West Point
N 2114 Rausch Road
Lodi, WI 53555

David Ripp, Chair
Crystal, Fish and Mud Lakes Protection and Rehabilitation District
7220 Hwy 19
Waunakee, WI 53597

Dear Mr. Schwarz and Mr. Ripp:

I am the Chairman of the Town of West Point Plan Commission. After some discussion and skepticism regarding the feasibility and cost effectiveness of the proposed high capacity well that's intended to lower the water level in Crystal Lake, I was authorized on behalf of the Town of West Point to request information to review the issue from a technical standpoint. A copy of the e-mail information request dated October 24, 2011 is attached to this letter. I am a registered professional engineer, with a masters degree in Water Resources Management and extensive experience in groundwater hydrology and wells. I indicated that I would review the technical information and provided an independent perspective to the Town of West Point and the Crystal, Fish and Mud Lakes Protection and Rehabilitation District. I am doing this as an unpaid citizen volunteer, not in any official capacity as Chairman of the Town of West Point Plan Commission.

My October 24, 2011 information request to Foth and Associates (the engineering consultant for the project) indicated that I would briefly report my findings and technical perspectives in writing to the Town of West Point Town Board and to the Crystal, Fish, Mud Lake District within about a month. This letter is intended to provide that report. A copy of the October 24th e-mail was sent to David Padley, Secretary of the Lake District, and I have talked to Dave a number of times since.

Unfortunately, Foth and Associates has not responded to the October 24th request for information. From verbal information that I have been able to gather, however, there appears to be good reason for the skepticism expressed earlier regarding the feasibility of the high capacity well project. I have been told that an engineering report, feasibility report, cost effectiveness analysis or alternatives analysis was not prepared for the high capacity well project. The engineering consultant apparently proceeded with a presumption that construction and pumping a conventional high capacity well would be an effective and feasible alternative for lowering the water level of Crystal Lake. My personal opinion is that before proceeding there should have been significant geological and hydrological information available or developed to support that alternative. There should have been no presumption that the well alternative would work. I do not believe that a presumption for a high capacity well alternative was appropriate from a technical standpoint. In fact, the limited technical information this is available appears to support a conclusion that a

conventional high capacity well is not a feasible alternative. It appears that information available months ago should have raised significant questions about proceeding with a well.

There is an existing test well at the site. I'm told that the water level in the test well is significantly lower than the lake level. If that is true, it would indicate that the surface water in the lake and the groundwater in the geologic formation where the test well is developed are not well connected hydraulically. In my opinion, for a well project to be feasible and successful in lowering the lake level, the well pumping would have to induce large amounts of lake water to move directly to the well. The well would have to pump primarily induced lake water rather than deeper groundwater. Without a highly permeable formation with an excellent hydraulic connection between the well and the lake, the project could not be successful, in my opinion. In addition, the geologic formation where the high capacity well is developed would have to support a high rate of pumping. The pumping rate of the well would have to be sufficient to alter the water balance of the lake to lower the lake level. I'm told that the Lake District has recently received information from Johnson Screens, Inc. that indicates a much lower well capacity than had been anticipated. That sieve analyses information comes from boring samples that were collected several months ago.

I believe that as of this writing, a pipeline from Crystal Lake to a tributary of Roxbury Creek has already been or is nearly completed. Further, I'm told that the contract for well drilling has already been let and bids have been solicited for the pumping equipment and controls. I would advise the Lake District to not proceed at this point with drilling a well. I asked Foth and Associates for but did not receive information on the proposed well design. That may be a moot point. From the limited information that I'm aware of, I remain very skeptical about any water withdrawal project that involves a conventional vertical high capacity well. I believe that some sort of an intake or horizontal collection on or near the lake bed should be given serious consideration. A conventional vertical well should be considered, in my opinion, only if sufficient hydrologic and geologic information is available or is developed to support a feasibility analysis for that alternative.

Since the discharge pipeline has already been constructed and since the Lake District and funding agencies appear committed to a pumping project, I would suggest that the Lake District and their consultants step back and proceed as follows:

1. Develop a list of several conceptual alternatives for a pumping system to lower the lake level and pump water through the new pipeline to Roxbury Creek. The regulatory implications, cost and technical feasibility of each of the conceptual alternatives should be considered. Among those conceptual alternatives might be:
 - a. Pumping directly from the lake either with or without treatment prior to discharge;
 - b. Constructing a screened or slotted intake manifold directly on the lakebed and covering the intake structure with sand and gravel to filter out suspended solids.
 - c. Excavating a trench or trenches on the lakebed, placing screens on slotted pipes in the underwater trench and filling the trench with sand and gravel to act as a filter.
 - d. Excavating a trench on the lake shore immediately adjacent to the shoreline to induce the flow of lake water into the trench.
2. Evaluate the strengths and weaknesses of the conceptual alternatives. Consider the technical feasibility, costs, timing and regulatory constraints. Modify the conceptual alternatives as appropriate.
3. Discuss the strengths and weaknesses of each of the conceptual alternatives with stakeholders including, most importantly, the Department of Natural Resources

(DNR). The DNR will be a key partner in determining the regulatory implications and regulatory constraints as well as the technical feasibility of each of the conceptual alternatives. These discussions will need to involve program staff and supervisors from a number of DNR programs in the Central Office and the Region. These programs include groundwater, surface water standards, WPDES permitting, water quality monitoring, the water regulation program under Chap. 30, States, etc. Initial involvement by and continued support from the administration of the Department will be necessary. Since so many DNR programs need to be involved, I would suggest that the Lake District ask the DNR administration to appoint a point person as single point of contact for coordination and communication with the agency. The DNR should be appraised that time is of the essence. There are considerable time constraints from the funding agencies as well as a practical need to get the pumping started as soon as possible. DNR cooperation will be important in that regard. Other stakeholders should be consulted and should be part of the process. Given that the discharge pipeline has already been constructed at great expense and after considerable delay, I would not advise revisiting the question of the point of discharge for the pumped water.

4. Select and develop a water intake project from among the conceptual alternatives based upon technical feasibility, costs, timing, regulatory constraints and stakeholder feedback.
5. Obtain necessary permits. DNR as well as other stakeholders will be important partners and need to support the timeliness of the regulatory decisions.
6. Construct and operate the project.
7. Consider emergency pumping. The Lake District should explore with DNR whether some sort of permitted pumping could begin on an emergency basis while the longer term alternative is being selected and constructed.

I hope that this independent perspective and review has been helpful. I intend to come to the West Point Town Board meeting on Thursday, December 8th to answer any questions regarding this letter. I believe this will be discussed under the agenda topic entitled "correspondence." If the Lake District would like me to attend a meeting to answer any questions from the Lake District Board, please let me know. Please share copies of this letter with the West Point Town Board, Town of West Point Plan Commission and Lake District Board.

Sincerely,

Kevin Kessler, Chairman
Town of West Point Plan Commission
lakelodi@charter.net
608-712-7099

E-MAIL MESSAGE SENT 10-24-11

----- Begin message -----

Subject: Request for Crystal Lake Well Information

Date: 10/24/11 5:03:20 PM

From: "Kevin Kessler"

To: Greg.Bolin@Foth.com

Cc: "David Padley" , "Town Chair West Point"

To: Greg Bolin, Foth and Associates Greg.Bolin@Foth.com

CC: David Padley ddpadley2001@yahoo.com

From: Kevin Kessler, Town of West Point lakelodi@charter.net

Dear Mr. Bolin:

This is to confirm our telephone conversation last week. I'm sorry that I couldn't send this confirmation earlier, but an unexpected medical emergency prevented that.

I am the Chairman of the Town of West Point Plan Commission. After some discussion regarding the feasibility and cost effectiveness of the proposed high capacity well that's intended to lower the water level in Crystal Lake, I have been appointed by the Town of West Point to review that issue from a technical standpoint. I am a registered professional engineer with a B.S. degree in Civil/Environmental Engineering and an M.S. degree in Water Resources Management. During my 37-year career with the Department of Natural Resources I served as Chief of the Private Water Supply program and Chief of the Groundwater Management program prior to my retirement.

I'd particularly be interested in any feasibility report, engineering analysis or cost effectiveness analysis that documents whether the proposed well installation and pumping project will be cost effective in comparison to other alternatives including direct pumping from the lake with treatment and conducting no pumping at all. Such an analysis would need to document the capital costs of the project as well as the long term operational costs. During our telephone conversation, you indicated that no such analyses or reports were available. In my view, one of the major factors in determining whether this proposed project is cost effective is the vertical transmissivity of the lake bed and the vertical vs. the horizontal transmissivity of the shallow geological formations between the lake bed and the cone of depression. If the well were to draw a large portion of groundwater rather than induced lake water, the cost effectiveness would seem to be in question.

Given that there was apparently no feasibility or cost effectiveness study, I would like to review the hydrological and geological information that you have for the site including soil and bedrock borings and well logs. I'd like to see the proposed well design and be able to comment on whether the proposed well design will maximize lake water withdrawal. I'd think that it would also be important to be able to determine the effectiveness of the pumping once the well has been constructed and pumping has begun. We all know that the lake levels in Crystal Lake do fluctuate so a lowering of the lake level doesn't tell us what portion of the lowering could be attributed to pumping. I understand that there are two piezometers planned for installation very close to the proposed high capacity wells. It would seem to me that two such piezometers being located so close to the pumped well might be

quite ineffective in defining the cone of depression, the groundwater / surface water hydrology and interaction, and the relative contribution of surface water vs. groundwater to the pumped well. Certainly these questions could be studied to death for years. I understand the suggested approach is more along the lines of just trying and seeing what happens. It seems to me, however, that there ought to be an appropriate balance between "study" and "do" so that the cost effectiveness of the project can be judged even if it's after the fact.

My motivation for asking for this information isn't to be a naysayer or an obstructionist or to hold up the timing of the project. The people around Crystal Lake have suffered enough. Rather, I'd like to be able to add an outside perspective and advise you, your client (the Crystal, Fish and Mud Lake District), the Town of West Point and any other interested parties on how to maximize your chances for success.

During our telephone conversation, you asked me to document my request for information on the geological formations and the well design so that you could request your client's permission to share the information. In my view, much might be gained by a face-to-face technical discussion on this topic among representatives of the Lake District, Foth Associates, the Wisconsin Geological and Natural History Survey, the Department of Natural Resources, the two involved towns, and the two involved counties. Please let me know whether you can share geological and soils information and details of the proposed well design. Also let me know what your reaction is to scheduling a meeting. I believe the Town of West Point Town Hall could be available for such a meeting should you and your client wish to proceed. In any event, I would intend to briefly report my findings and technical perspectives in writing to the Town of West Point Town Board and to the Crystal, Fish, Mud Lake District within about a month.

Sincerely,
Kevin Kessler