



September 4, 2009

David Dubey  
Chairman, Town of Mukwonago  
W320S8315 Beulah Rd.  
Mukwonago, WI 53149

Dear Chairman Dubey,

On September 2, 2009, the Waukesha County Department of Parks and Land Use (DPLU) facilitated a meeting of various professionals knowledgeable in issues associated with surface water runoff, groundwater and more specifically the flooding issues relating to the Country Bliss subdivision in the Town of Mukwonago. In attendance were Mike Hahn, Southeastern Wisconsin Regional Planning Commission; Gary Raasch, R.A. Smith National; Sean Sullivan, Ruekert & Mielke; Julie Burris, RSV Engineering; and with the Department of Parks and Land Use were Perry Lindquist, Land Resources Manager; Leif Hauge, Senior Civil Engineer; Steve Todd and Dave Egli, Environmental Health Sanitarians and myself.

In advance of the meeting, each attendee and other experts were asked to submit data relevant to Country Bliss. The submitted information, along with the data the County already had, was used to guide the discussions. The objectives of the meeting were to 1) review and discuss in detail all of the available technical information; 2) identify any additional key data that may be needed to make sound technical recommendations; and 3) try to reach agreement on recommending the best course of action to resolve the flooding problem.

After analyzing all the available data, we collectively agreed upon the following key points:

A Review of the Problem:

1. Even though the Country Bliss subdivision is located within a 200 acre internally drained watershed, we believe the flooding issues experienced over the past 2 years are primarily due to high water table not surface water runoff. Analysis of soil profiles and well monitoring data indicate this to be a long-term reoccurring condition.
2. Residential foundation drain tile and sump pump systems can help prevent flooding of individual basements during high groundwater conditions, and may even temporarily lower the nearby water table. However, the numerous sump pump discharges in the subdivision are apparently compounding the flooding problem in the lowest areas (the intersection of Memory Lane and Oak Tree Drive), where the discharge water has ponded due to saturation of the underlying soils and the lack of a surface outlet. Runoff from snow melt and heavy rains within the 200 acre internally drained watershed also add to the problem, but more so now because high groundwater conditions inhibit infiltration.

3. Groundwater flows into and out of this area are complex in nature. Water may originate from areas considerably beyond the subdivision or even the watershed boundary for surface water runoff. Extensive groundwater monitoring and site surveys may be needed to confirm the geographic limits of the contributing area. Even then, these boundaries may change over time due to long term weather patterns, groundwater levels, topography, underlying soils and glacial deposits, and other factors. It would be difficult to justify the high cost of such monitoring and surveying because of this and the fact that the additional knowledge may not affect the technical solutions available to resolve the flooding problem.
4. We believe grading, culvert placement or stormwater management practices in developments adjacent to Country Bliss do not have any significant impact on the flooding problem in Country Bliss. This includes, but is not limited to Stone Brook Hollow, Jericho Ridge and the culvert under Isabelle Drive near the Normandy Green subdivision, which has been removed.
5. There remains some question on the existence of an old drain tile that would have provided an outlet for the Country Bliss pond. To date, a review of air photos and considerable ground checking has found no evidence of a tile. It would be helpful, but not essential, to know if such a tile line exists. If the tile exists, homes being built in the estimated path of the tile line in Stone Brook Hollow or further downstream would need to take precautions to route the tile around their foundations. The presence of the tile from a Country Bliss solution standpoint is irrelevant because if the tile line passed through several properties, an appropriate easement was never recorded to preserve the flow path and ensure its maintenance.

#### A Review of Possible Solutions

1. We believe the possible solutions have been well documented in various reports and other documents. Our conclusion was that there are a large number of basement constructed below the historical high groundwater level. There generally is no good way to prevent basement flooding under these conditions beyond foundation drain tile and sump pump systems or filling and abandoning the basement. Therefore, the group primarily focused on the best way to provide an outlet for the ponded water in the road right-of-way.
2. As a whole, we prefer a gravity flow conveyance system to provide an outlet for the ponded water, extending all the way to the vicinity of Jericho Creek. This would minimize cost and risk of failure. However, the obstacles to this option have also been well documented, not the least of which are the high construction cost, obtaining the necessary drainage easements, and possible negative impacts on Jericho Creek that may need to be mitigated.
3. Our experience is that special utilities created for flooding issues are usually related to surface or storm water runoff, not groundwater. Legal and administrative issues may be encountered when creating a district to address a groundwater problem.
4. We believe any conveyance system that simply provides an outlet for water ponded on the surface would not eliminate the need for future sump pumping due to high groundwater. The level of pumping activity by individual homes will continue to depend on the location of the home on the landscape, basement depth and seasonal groundwater fluctuations. The monitoring wells installed in Country Bliss show a recession in groundwater levels going into the fall of 2008 which cannot be significantly attributed to the pumping that occurred.

Unfortunately, the basement flooding that is occurring here is not unique to Country Bliss or the Town of Mukwonago. It is a widespread problem. To date, there is no state code that prevents basements from being constructed below the seasonal high water table. County ordinance updates in 2005 were aimed to prevent basement flooding in the future by requiring detailed soil investigations for the planned location of basements, and basement floor elevations to be one foot above seasonal high groundwater indicators in the soil profile. In addition, the recently adopted Comprehensive Development Plan for Waukesha County identified, from a general planning level, soil map units with seasonally high groundwater attributes, and called for restricted development in those locations. Meanwhile, local communities are often faced with the no-win situation of dealing with existing problem areas.

The Department of Parks and Land Use convened this technical group to make sure all professionals that are currently actively involved in analyzing the Country Bliss issues had an opportunity to compare data, and openly discuss the matter in a spirit of providing the soundest technical feedback to you and the citizens involved. I hope you find this information helpful.

Sincerely,



Dale R. Shaver  
Director

cc. Gilbert Yerke, County Supervisor  
Perry Lindquist, DPLU - Land Resources Manager  
Leif Hauge, DPLU - Senior Civil Engineer  
Dave Egli, DPLU - Environmental Health Sanitarian  
Steve Todd, DPLU - Environmental Health Sanitarian  
Sean Sullivan, Ruekert & Mielke  
Gary Raasch, RA Smith National  
Julie Burris, RSV Engineering  
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