



DATE: February 19, 2010
TO: Mayor, City Council, City Manager
FROM: Scott Anderson, Engineering
RE: Update on Lower Penn Lake Management Plan – Responses to Comments

At the January 25, 2010 public hearing on the Lower Penn Lake Management Plan, Council requested that the public provide staff with comments on the plan by February 5, 2010. This memo includes responses to comments and includes as an attachment, copies of all written comments submitted. The public hearing on the Lower Penn Lake Management Plan was continued to March 1, 2010.

Responses to Comments submitted from the Penn Lake Watershed District Association, February 5, 2010

Characteristics of Lower Penn Lake – (Five comments)

1. The wording in question, “to augment the lake” was specifically added for clarification of the original intent of the well as part of the 1976 overall project. This information is considered important to the understanding of the intent of the well as it relates to the applicable laws and acceptable uses of groundwater at the time the well was constructed as opposed to now. The 1976 project proposed to “*Construct a well capable of maintaining the water level during periods of little or no precipitation.*”

The 1976 project specifically proposed a water pump system with aeration devices that would pump water from Lower Penn Lake to provide aeration. Additionally, a provision for in-lake re-circulation was identified as a means to provide aeration. This system was ultimately constructed.

No change to the plan language is made here.

2. Based on the comment received, the plan language has been amended to read, “Operation of the in-lake system appears to have been successful to date in preventing winter kill of the existing fish population.” [Page 4, first full paragraph].
3. Based on the comment received, the plan language has been amended as suggested to read, “The water quality of hypereutrophic lakes can fluctuate daily and seasonally and

experience anoxia (depletion of oxygen), fish kills, or even toxic conditions (blue-green algae blooms can sometimes become toxic and can cause rash or illness in animals and potentially people). [Page 4, second full paragraph].

4. Maintenance requirements for vegetative buffers do not have to be different from most other landscape or garden features. Buffers can be planted or maintained in a manner to address the issues raised in the comment. Plant height, type, and density are not prescribed, but can be tailored to a property owner's needs or desires.

No change to the plan language is made here.

5. The wildlife list included in the plan consists of populations that have been observed or reported over a lengthy period of time. Specifically, fox and bald eagle have been reported recently and may or may not return year after year. The wildlife population discussion is entirely based on reports from residents or the public or observations made by city or agency staff, so the phrase "and reports of" is appropriate.

No change to the plan language is made here.

Characteristics of Shallow Lakes – (Two comments)

1. The criterion of minimal connectivity to impervious surface and storm water runoff is listed as a characteristic of a healthy shallow lake (Page 6) – it has not been excluded.

No change to the plan language is made here.

Chlorophyll-a levels are a measure of algae concentrations. This is covered by the bullet "Frequent nuisance algal blooms" as a characteristic of a turbid shallow lake.

No change to the plan language is made here.

2. Based on the comment received, the plan language has been amended to read, "This plan, its strategies or alternatives and goals are intended to improve the quality of Lower Penn Lake such that it can achieve as many of the criteria of a stable, healthy shallow lake as possible to support the lake's attainable uses." [Page 6, last paragraph].

Lower Penn Lake Classifications and Goals – (Two comments)

1. The last two paragraphs are specific to Lower Penn Lake based on input received directly from DNR Division of Wildlife and DNR Division of Fisheries on the current state of the lake and future direction. It is appropriate to have this information here in a discussion of current lake classification and goals.

No change to the plan language is made here.

2. Appendix J was included in the January version of the plan that contained documentation provided by the DNR based on a 1996 data. As mentioned in the response above, the language in the plan reflects current opinion provided to the City from DNR Division of Fisheries.

The 1998 Lake Management Plan (Fisheries Plan) will also be included in Appendix J.

The following paragraph will also be added to this section:

“Prior to 1976, the lake was not managed for fishing. After completion of the 1976 project, including construction of the groundwater well, the lake was managed for fishing including annual stocking of fish (See Appendix J). It appears that the last year for fish stocking was 1997 and in 1998, DNR Fisheries identified in a report that the limiting factors of the lake included high phosphorus loading, poor water quality, and exfiltration. No additional fish surveys were needed since the aeration system reduced the chance of winterkill. [Page 8, fourth paragraph]

While the plan at that time recommended continual operation of the aeration system and water level augmentation, it is now understood that the recommendation is now in violation of State Statute relating to use of the groundwater well in excess of 10 million gallons per year and is no longer permissible.

In the event of a winterkill, DNR Fisheries recommended at that time re-stocking with “10 adult bluegills, 10 adult black crappies, and 10 adult largemouth bass as brood stock.” Implementation strategy F specifically includes a provision for determining details for fish re-stocking.

Implementation Strategies – (Two comments)

1. This section of the plan needs to be clear about the flexibility of the plan not only based on technical information, but on financial limitations as well. Current City budget does not have the level of funding needed to implement all parts of this plan. Further, some of the options indeed have limited benefit to the public as a whole while residents who live on or around the lake or who are users of the lake may experience greater benefit. Because of the large scope of the plan, it is imperative that funding sources and partners be identified along with appropriate contributions from those actually benefiting in the context of managing all of the City’s resources.”

No change to the plan language is made here.

2. The City will continue to make information available to the public as a whole through the City’s website, Bloomington Briefing, and other means. If members of the public have specific questions or would like to meet to discuss relevant issues, staff is available.

No change to the plan language is made here.

Lake Level and Groundwater Well

Because the use of the groundwater well has become a controversial and misunderstood issue, the plan attempts to provide clarification in this section. The City and Watershed District have undertaken efforts to analyze the affects of the well on the lake and the results are documented showing minimal impact to the plan goals. Further, use of the well must comply with State Law and the water use permit as issued by the DNR. Lastly, based on these efforts and input, the City does not support the use of groundwater as a significant component of this plan.

The strategy in the plan for the use of up to 10 million gallons per year is included in the Winter Aeration alternative to consist of:

- Use of the well up to 10 MGY IF the re-circulation system is inoperable.
- The option of the use of the well in the above condition provided it remains in a state of adequate operation without significant expense.
- The option of the use of the well will remain so long as information such as a fish survey and lake bottom survey indicate that it is a necessary component to continue to meet the plan goals and a long-term, more sustainable system is not in place.
- The well is not considered to be a long-term component of the management of Lower Penn Lake due to the reliance on the groundwater resource and minimal impact towards the goals of the plan.

The water balance work has been confirmed, and the information contained in the report is correct. Additional information provided by the watershed district regarding interpretation of the water balance conclusions has been added to this section:

If limited to the winter season only, a groundwater appropriation of 10 million gallons could add approximately 0.7 feet over roughly 22 days of pumping. If the well was reconfigured to pump over a longer period of time, exfiltration losses could likely be off-set over the course of 90 days by pumping 79 gallons per minute. No net increase in lake elevation would occur over the 90 days. [Page 5, fifth paragraph].

The use of 10 million gallons of groundwater per year has limited benefit in maintaining the water level as a means to improving the fishery at Lower Penn Lake as shown in the water balance. Use of the well will not “refresh oxygen levels” in the spring as stated in the comments. Groundwater has no oxygen in it at all. It is only through the stair-step structure that oxygen is introduced – the same thing that occurs when using the in-lake system.

Use of the well in the fall to “ensure that the lake has enough depth to support its fish population” is not feasible. As the water balance shows, the rate of loss through exfiltration would more than off-set the addition of 10 million gallons.

As noted in a number of documents (including the 1976 proposal, 1990 study, and recent water balance) a pumping rate of approximately 350 GPM was determined to be needed to counter the natural lake losses.

Additional paragraphs in this section pertaining to groundwater, DNR direction on use of the well, and shallow lakes are included to provide factual information and reinforce the direction of the plan. Some language deemed critical to the understanding of this plan is included in the plan body as well as the Appendix since the appendix may not always be available to readers of the plan.

No further change to the plan language is made here.

Goals

1. The goals are not listed any intended order nor are they prioritized. The goals are a comprehensive list developed through a public process to meet the interests of the public and City.

The implementation strategies are also not listed in any intended order or priority, but were identified and included as potential strategies that would meet one or more plan goal. Additionally, the strategies are intended to have benefit as stand-alone measures or in combination with some of the other strategies. Other strategies not listed in this plan may also be later identified as appropriate. Finally, feasibility analyses, budgetary considerations, and other approvals are needed.

2. Implementation Strategy R or Alternative R is included in the plan in an effort to disclose the potential removal of the well at some time in the future. As the management plan is implemented and evolves, the use of groundwater will likely become unnecessary at which time the well would have to be removed.
3. Additional goals requested to be added:
 - Repair the fishing pier – There is not a pressing issue or maintenance need for the fishing pier at this time. If repair work to the fishing pier is identified as being needed in the future it will be addressed at that time.
 - Lower the boat ramp – The need for this is not evident. The elevation of the boat ramp is not a limiting factor to boating on Lower Penn.
 - Re-enroll in the DNRs FIN Program – This is a DNR program designed to provide fishing opportunities in places where they may not normally exist. Due to the aeration, over-wintering of a fish population has eliminated the need to specifically stock fish for this purpose. Fishing can occur at the Lower Penn at any time. If a fish survey is conducted, that information could be used going forward in managing that population and potentially establishing a re-stocking plan or inclusion in other DNR programs.
 - Explore strategies for retarding exfiltration – This should not be explored as it is contrary to surface water management. Lower Penn likely serves a groundwater recharge basin and no benefit to the environment nor progress toward any of the plan goals will result in an effort of this type.

Specific comments relating to implementation strategy details:

Public Education – As stated above, the strategies are not listed in order of priority. The estimated cost has been revised as this is a part of the City’s existing program. Costs related to specific additions for Lower Penn Lake are not expected to be significant.

Remove accumulated sediment – No changes to the plan language here.

Winter aeration – The specific reference to well use for the 2009-2010 season has been removed. The 803 reference elevation was based on the intake elevation of the re-circulation system and was agreed on by the Lower Penn Lake Association back in September.

The “variable frequency drive” has been investigated and this alone is not a feasible approach to achieving any of the plan goals. More extensive equipment (pump and controls) modifications are necessary to significantly alter the existing flow rate for the groundwater well.

If the winter aeration alternative is approved as part of this plan, and the well is a component of aeration, an appropriate maintenance schedule will be developed for all equipment.

The cost estimate listed for this alternative is a general estimate that includes items such as power, labor, and parts. \$600-\$700 annually is only representative of the power costs to operate the re-circulator.

Water quality monitoring – No change to the plan language here.

Fish Inventory – No more details on specifics to an inventory are available at this time other than the details associated with the re-stocking plan identified in 1998. This has been added to Appendix J. More specifics would be expected as information such as the bathymetric survey and actual inventory is obtained.

It is not appropriate to compare the re-stocking of Penn Lake with the stocking of Smith Pond as Smith Pond is stocked for specific Fish in the Neighborhood programming by the DNR.

Rough fish removal – No change to the plan language here.

Alum treatment – Specific removal of sediment or reconstruction of the sediment ponds would not impact the effectiveness of an alum treatment.

No change to the plan language here.

Barley Straw Application – While fish populations likely have a dramatic impact on the water quality of Lower Penn Lake, barley straw could be used independently of fish removal or fish barrier construction.

No change to the plan language here.

Improving the well – The estimate obtained by the residents is not satisfactory to address other areas of the well that may be prone to maintenance, replacement, or improvement (pump/motor, screening, controls, etc.). The estimate for this item has been revised to include a price range \$5,000-\$50,000.

Conclusion

This plan is not required by the City, Watershed District, or DNR. This effort was pursued at the request of the public to address concerns expressed in 2007. Aside from the desire to operate the groundwater well to maintain the water elevation, other concerns were identified and are included as goals in this plan. As stated in the plan introduction, the overall intent of the management plan is to identify actions or strategies that can be implemented that address concerns and result in improvement to the Lake while maintaining balance with all the other resources in the City.

Responses to Comments submitted via email, February 5, 2010

Why do we need a Lake Management Plan?

The lake management plan is not required. The plan is an effort to address the public's concerns about the lake in response to the change in the use of the well in compliance with State Law.

The addition of groundwater to Lower Penn Lake was initiated in 1976 to address frequent low water levels. At that time, State Law allowed groundwater to be used in this manner. Since 1994, State Statute prohibits the use of groundwater in excess of 10 MGY for the purpose of augmenting surface water bodies.

The well has not provided balance to Lower Penn Lake, but rather only served as a means to maintain an artificial water level.

Is this a Drought Issue? Or is more than that?

Seven out of the last nine years have seen below average precipitation. Abnormally dry conditions over these years have contributed to lower levels on waterbodies all throughout the metro area and much of the State. Additionally, water level fluctuation is more pronounced when there is a longer than average time between rain events. The shallow topography of the bottom of Lower Penn Lake also contributes to the visual impact of lower than normal surface water levels.

It is a correct observation that when the groundwater well was utilized to its full extent under the old permit (up to 200 MGY), the level of Lower Penn Lake was able to be maintained even in the absence of rainfall. In light of the State Law limiting the use of the groundwater well to 10 MGY, the option of utilizing groundwater simply to maintain the water level is not feasible.

Shallow Lake Issues

As noted above, Lower Penn Lake is shallow, and this, plus the gentle slope of the lake bottom, results in the large mudflat areas in dry times. Additionally, there is and historically has been flow out of Lower Penn to the shallow groundwater table. Without normal precipitation, this loss is not compensated for.

The Fishery?

The current plan includes efforts to get an accurate account of the fish population of Lower Penn Lake.

10/4/90 Letter From State Senator William Belanger

While the Senator supported the use of groundwater at Lower Penn Lake at that time, it was still permissible under State Law. Since 1994, the use of groundwater to augment surface waters is prohibited.

DNR Letter to City of Bloomington Stating They Would Consider Renewing the Pump Permit

Many options were explored with the public as well as DNR and Watershed District staff relating to Lower Penn Lake and the groundwater well.

Specifically “Option 3” (working with DNR Fish and Wildlife staff) was explored and took place. The results of those efforts are reflected in the current plan. Neither DNR Fisheries nor DNR Wildlife supports the use of the well for either the existing fish or wildlife populations.

The real reason the DNR has issued permits for the pump

Initially there was indication that using groundwater in excess of 10 MGY would be permissible if that use was shown to be necessary as part of a lake management plan. Through this process, it was found that not only was that incorrect, but also that use of groundwater was not needed to meet the goals of the plan – including the goal of enhancing the current fishery.

Through the process of developing this plan, it became clear the groundwater well was initially intended to augment, raise, or maintain the level of the lake. Fish were then stocked and the lake was artificially managed in this manner. Once it was discovered that the well was being operated outside the limits of State Statute, the DNR notified the City of the need to address it.

DNR Rep Thinks the Residents are Dishonest

DNR fish and Wildlife staff have advised that use of the groundwater well is not a necessary component of maintaining the fishery or wildlife around Lower Penn Lake. DNR Waters is simply following state statute with respect to the use of groundwater to augment surface water bodies.

The Pump Is The Cheapest Solution

The use of the groundwater well is not the cheapest solution in addressing the issues identified by the public as concerns with the lake. Use of the well only serves to address lake levels at the expense of a groundwater resource and is not capable of significantly impacting any of the goals stated in the plan.

Who Really Cares About Lower Penn Lake?

It is the intent of the plan to balance the desires of the public with existing rules, laws, and guidance to develop a management approach that results in improvement to Lower Penn Lake and protection of all the currently attainable uses.

Two additional separate comment letters received February, 5, 2010 forwarded to the City Council for Consideration.