

## Watershed Advisory Committee & Technical Advisory Team Meetings

7 March 2017 – 3:00 p.m. & 6:00 p.m.

### Minutes

First of note, the minutes for the Watershed Advisory Committee (WAC) and Technical Advisory Team (TAT) are combined for these initial meetings. This is due to the meetings containing so much of the same information. The WAC meeting was held first and the same presentation made there (along w/ comments received during WAC meeting) were shared at the TAT meeting. WAC meeting minutes are below in red. Additional TAT input is shown in blue.

- 1. Introductions** – Introductions of all attending the meeting were made. A sign in sheet was passed around and is included as an attachment to these minutes.
- 2. Water Quality Challenges** – FYRA's Dr. John Holz gave a brief review of the water quality characteristics of Lake Mitchell, as detailed in the attached .pdf of the power point presented. A general discussion of the severity of the challenges facing Lake Mitchell due to historic and recent sampling data was given by Dr. Holz.
- 3. Watershed Characteristics** – The watershed characteristics of size, ratios, slopes, soil types, etc. were given in the presentation. Of note is the extremely high watershed to lake ratio, which FYRA's Mike Sotak explained is a large contributor to water quality challenges in all lakes. Rules of thumbs indicate that a ratio of 40:1-80:1 are normal goals and Lake Mitchell has a 524:1 watershed to lake ratio.
- 4. External Nutrient Loads** – Dr. Holz explained the usual external sources of nutrients that enter the lake and how they differ from internal loading. Details on both loadings and estimates of % contribution were given in the attached presentation. Of note is that even if 100% of the external loading was eliminated, the internal loading is still high enough to cause water quality concerns in Lake Mitchell. Partitioning the sources allows a range of alternatives to be developed that can address nutrient loading at the source, and therefore is important to developing a solution.
- 5. 7 Steps of Successful Lake Management** – FYRA Engineering uses a 7-step approach and the value of each step was presented in the attached presentation. Discussion was held that skipping to Step 6 (Implementation of Practices) is often done without the prior steps and such a practice is often responsible for a lack of measurable outcome of action steps taken.
- 6. Project Tasks: Phase I** – FYRA's responsibilities in the contracted Phase I services was reviewed.



**7. Community Based Planning** – A description of the overall process for the CBP process was given and the goals for each phase of the process were discussed. As part of Phase I services, the identification/introduction of the problem, brainstorming of potential solutions and some initial background on the theory behind the development of goals to be established by the WAC and technical support of the TAT were all reviewed. The outcome of that discussion is in the minutes below.

## 8. Committee Activities for Today

- a. Develop a ranked list of concerns and issues** – A list of concerns and issues was developed, but not ranked since a lot of discussion about each one was conducted and ranking can be performed later. The list is as follows;

### Issues and Concerns

Storm sewer drains

Tree biomass

Algal Blooms

Septic systems dumping into the lake? The TAT clarified that all homes around Lake Mitchell are on sewer. None use septic tanks.

Cattle in headwaters

Maintaining good relations with landowners

Community Education

Watershed practices

Fish habitat/fishery – fishery is okay now....generally

Fish kills – a little each year, but varies in magnitude each year

Watercraft use...some no-wake probably acceptable (map exists)...there are less speedboats now

Post-project weed growth/vegetation management

Bubblers used for swimming (in canal)

- b. Develop project goals and objectives** – First, the categories for project goals and concerns were developed. Three categories included the items below along with some thoughts on what should go into the actual goal;

Algal Blooms – the number and severity of algal blooms, and the times when they are present was discussed. The heaviest use days of the lake are the Memorial Day, Independence Day and Labor Day weekends. Swimming from July through August. The possibility of limiting blooms around those times would be a plus. There is also a triathlon on June 11 of this year.

Right now, there are two significant blooms in July and August. There is also a late bloom in September/October each year, which doesn't hamper lake use as much.



Decrease public health warnings – reduce the number of days the lake was either closed or public notice was issued for poor water quality. In notices, it would be beneficial to discriminate coliform vs. algal toxins to the community

Clarity – Black Hills Lakes, Cocharane, Pickrell, Wabay, Blue Dog, Hansen Lake were all listed as potentially acceptable water quality lakes that we could establish goals from. Lakes with poor water quality include Lake Vermillion and Lake Byron. The TAT team reviewed these lakes listed for pool and reasonable water quality and generally agreed. Some additional thought will be given for additional lakes to use that might have a history of water quality sampling data, which could be useful.

Some potential tools to help reach these goals include;

### Practices

Upstream structures

Farming practices

Forebay(s)

Remove trees from shoreline (create vegetation management program?)

Dredging

Watershed Wetlands

Dam modification

Nathan Powell clarified at the TAT meeting that low/no-Phosphorus regulations are already in place for Lake Mitchell. He will make those regulations available.

The TAT also discussed what lands might be available for various projects. Jeff Vander Wilt from NRCS discussed where conservation practices have been successful in the past, and Steve Donovan (Ducks Unlimited) discussed the potential effectiveness of wetlands and that this watershed has many areas well-suited for wetlands.

Becky Pirz from POET discussed water intake and use for their use. She discussed some challenges in water quality with the water and general discussions were made about how that use could possibly improve the reservoir.

- 9. Next Steps** – The next steps for FYRA include the collection of data to help build a water/nutrient mass balance model as accurately as possible. Additional lake level data was sent immediately after the meeting which will help with the water mass balance model. To further improve the resolution of the data and log when the reservoir is higher than normal pool, a piezometer and data logger were suggested by FYRA and a plan to build one was sent to Public Works immediately after the meeting.

FYRA will also work w/ the TAT to establish any available "low-hanging fruit" for watershed practices. Some, like low/no-P fertilizer have already begun.



The WAC will look for public opportunities to spread the message about the action being taken at Lake Mitchell so that we can begin to build consensus for future efforts.

Paula Mazzer from Dakota Wesleyan University and Julie Olson from Mitchell Senior High School expressed interest in getting students involved. Whether water quality sampling, or gathering other information, there is probably a role beneficial to the students and the lake project.

Questions asked during the presentation were;

What is the pH value? The 1997 TMDL reports and average pH of 8.3 near the surface and 8.0 near the bottom of Lake Mitchell. The question was asked in the context of the potential use of one management approach (alum application to lower phosphorus in the lake). Alum can be ineffective in very high or very low pH environments. The pH of Lake Mitchell is well within the range where alum is safe and effective.

How deep were sediment cores? The cores were 10 cm in depth. The highest concentrations of available phosphorus is found in the upper 4-7 cm of lake sediments. 10 cm cores were collected to capture that zone.

How deep does the bottom sediment contribute? 4-7 cm

Did you look at DNR's measurements from this summer to see how it correlates with the numbers we are being shown? No, we have not obtained or analyzed that data set.

Lake Mitchell soils are high in P...does that contribute? The watershed soils can contribute P to the lake from erosion and deposition into the lake. Soil particles (especially clays) have P attached. The lakebed sediments (soils) contribute P to the water column during internal loading events. These events are a combination of the chemical release of P from iron in the sediments and from P dissolving from organic matter in the sediments.

Did levels of P vary in cores? P in the sediment core samples were similar among the four sampling locations.

Did you test sediment in Firesteel Creek? No, sediment cores were only collected in the lake. One of the coring locations in the upper end of the lake was near the creek inflow.

Is there any test that can help to identify the source of the P? There is a test, but it can be expensive and inconclusive at times. The result of the phosphorus entering the lake and contributing to algae blooms is the same regardless of the source. Given what we're being told, is this project even affordable? That question is the main purpose of Phase I of this effort. We are building the data to be able to answer that question. The challenges are certainly significant. Given that people live on and recreate in the lake today would indicate that any improvement would be a plus, but whether or



not a solution can be developed where the benefits of achieving the goals for the project that are established is achievable for a reasonable budget is the main task at hand.

What is the remaining life of the dam? (spillway rehabilitated in 2000) Information is being obtained about the condition of the dam and from that info, this question will be answered along with any additional studies needed.





