

- 1) Task 2 alternatives analyses
 - a) Effectiveness of the 1998 storm water diversion study done by the Waushara County Land conservation department. Need to also consider the feasibility of a silver lake weir or pump station on the highway 73 west landing.
 - b) Locate the weir or pump station at Hwy 73 west landing. Dave W (Town of Marion) suggested this landing could be closed to provide the access, land, and culverts for this placement.
- 2) Multiple paths to divert storm and surface water runoff may be an option.
 - a) Ditching and culverts on 21/73 to flow toward a natural low point which exists around Horseless carriage business (recommended by SLSD, Pat)
 - b) Boring a culvert under 21/73 at or around point to connect drainage ditches on the north side of 21/73 to the low point at Horseless Carriage business (south side)
 - c) Running culverts or ditches through farmland area to get to WWTP outflow
 - d) This may need to be considered in addition to the proposed wetland route from the 1998 LCD study
- 3) Do we have an estimate of how much water a pump station would move? Silver lake is 15.4 inches over OHWM. 1 inch equates to 20M Gals, so we have approximately 300M gals of excess water?
 - a) I assume the water flow estimates are part of a detailed engineering study, once the feasibility paths are determined
 - b) Will the feasibility study contain engineering plan cost estimates for the proposed options?
 - c) Will the options have a rough order of magnitude of construction costs?
- 4) Option for modifying the Irogami Lake weir
 - a) Modifying this weir will keep Irogami from contributing water to Silver Lake
 - b) This option cannot be the sole solution.
 - c) A feasible option here, is the 2 foot weir into a 2 ft versus 18 inch culvert to manage Irogami's OHWM. As stated in the proposal if both Irogami and Silver are at OHWM, no water should be flowing in the culvert on highway 21.
- 5) The option of modifying the highway 21 culvert.
 - a) It has been stated in the past, modifying that culvert, ie keeping Irogami lake levels higher would require 100% agreement of the property owners on Irogami.
 - b) Normally Irogami is a tad higher then Silver Lake. The culvert is set so if both lakes are at or below OHWM, nothing will flow.
 - c) I observed only a 2 week period this summer where water was not flowing out of Silver Into Irogami via the highway 21 culvert.
 - d) In a normal season, spring time normally has water flowing from Irogami into Silver. The past 5 years have been anything but normal.
- 6) EMAIL correspondence
- 7) **Mark's response to Rich D and Don M.**
 - a) I would add, to Rich's comments if the feasibility study results in 3 proposals, say, Option A, B, and C,
 - i) The study needs a rough order of magnitude of construction costs, realizing a detailed engineering study of selected option A would produce an estimate of construction costs.
 - ii) The rough order of magnitude needs to be considered in selecting an option to move forward to a detailed engineering study.
 - iii) For example if the detailed engineering study runs 225K but the selected Option results in a \$22M construction costs, then this might not have been the best proposal to select. And

another engineering study and spend would be required on Alternatives B and C. A range of construction costs for the proposals would be adequate to evaluate the proposals to move forward with into the detailed engineering study phase.

- 8) **On Nov 13, 2018, at 10:41 AM, Richard DeLisle** <rconstructive@yahoo.com> wrote:
- a) I have reviewed the proposal. The only comment I have is that this project is being done in three phases. Phase 1 is evaluating the data and developing a plan. Phase 2 is the detailed engineering design plans, cost, funding and more as outlined in the proposal. (on page 2). Phase 3 is the final construction of the project and management.
 - b) We have the cost for phase 1 in this proposal. To move forward I believe you should have the cost estimate for phase 2. Stantec should be able to provide a rough estimate for Phase 2, even with the many options. Phase 3 cost will depend on what is selected in Phase 1.
 - c) My concern is moving ahead with Phase 1 and you cannot move ahead on Phase 2 or 3. If you have an estimate on Phase 2, Then you can decide on Phase 1. This might take some time to prepare, but it might be better than wasting money on reviewing all the data.
 - d) Last week I had the county shoot the elevation of Bughs Lake. We are 1 1/4" below the 1993 record high.
- 9) **Aaron V (Stantec) response to all our questions.** Don, Here's a little more information about cost and phasing that may help in answering some questions about the Stantec study proposal.
- a) This first study would include developing conceptual cost estimates for several different alternatives, including estimates of construction cost and engineering costs.
 - b) As part of the initial planning study, we will look at cost data such as total construction costs and unit pricing from similar projects (such as pipeline / sewer projects, pump stations, grading/ditching, etc.) to estimate ballpark cost estimates for various alternatives.
 - c) I can't give you any sort of firm or committed cost estimates for future phases of the project yet, without doing the initial planning. But here are a few comments:
 - d) The 1984 study included cost estimates for several different alternatives, many of them around the \$300,000 range in 1985 dollars.
 - i) If you update that 1985 cost estimate to 2018 dollars with inflation, that equates to costs of around \$750,000 to \$800,000.
 - ii) My initial feeling is that is probably lower than what the current alternatives would cost.
 - e) I had preliminary discussion with our pump station engineer and he said the construction cost of a high-capacity pump station that may be needed to draw down Silver Lake could be a million dollars or more. So if you coupled a high-capacity drainage pump station with a long force main or sewer, that could run a couple million dollars.
 - f) Engineering, permitting, environmental, surveying costs typically run anywhere from 10% to 30% of construction cost. It's difficult to refine this more until we know more about what will be designed.
 - g) Depending upon the alternative we decide looks most promising, and the features/obstacles/constraints of that alternative, we may need to do another preliminary engineering phase before we do final design/construction documents, or we may be able to move right into final design/construction documents.
 - h) It's difficult to estimate land acquisition or easement costs yet; that is not included in any of the above estimates.

- 10) My very initial, gut feeling is that we may end up with an alternative with a construction cost of a couple million dollars. One big unknown is what alternatives will work to manage the situation in Bughs Lake area.
- a) I certainly hope we don't end up with the only feasible options costing tens of millions of dollars, but the first study will help narrow in on what feasibly can be done.
 - b) I will keep you updated through the planning process. For example, if as we start to look at feasible options and unit costs and the cost estimates start to trend a lot higher than what we've guessed so far, I will keep you informed so you can decide how to proceed
 - c) **Aaron Volkening, P.E.**
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