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Greetings all

I spent some time this weekend doing some cross checking on the preliminary numbers I came up with for the various flood mitigation options we have been discussing in our private sector work group. The orders of magnitude all remained about the same so I will quickly discuss them below.

My personal 1st choice and endorsed by our hydrologist would be the permanent lowering of Mendenhall Lake. It may be possible to lower it as much as eight feet which could provide as much as 3 billion gallons of water buffering. This would necessitate digging a channel downstream to an area close to the upper Mendenhall River bridge. This area is unfortunately a choke point which does cause some backing up of the flow. I remember when I removed the old bridge, I lamented that it was unfortunate that they didn't increase the span further when they replaced it. Little did we know. The Deepened channel would be a little over a mile long and likely result in at least 40,000 yds of material removed and likely much more. There are several 7-to-10-acre low value ponds in the area that could easily hold the dredging spoils if they were not to be marketed or there is also lots of upland room to stockpile them like was done when the area was being used as a borrow source. Hence the name "Dredge Lakes" One of the attractions of this option is that it is easily accessed from the east side and would have little impact on neighborhoods. I suspect much of the material could be used for fill for other mitigation projects as well as marketed.

A second option discussed is a levee system around Mendenhall Lake or even around the entire Dredge Lake area. The lake option would have approximately 2.5 miles of levee starting at the visitor center parking lot, following the shoreline to the outlet adjacent to the campground, skirting the campground, Brigadoon Subdivision and the borrow pit and continuing to the hillside by the Skaters cabin. This would follow the proposed trail route around the lake and entail a level control structure where the proposed pedestrian bridge would be sited. This would entail building a levee approximately 15' high and also require a flood gate across the West Glacier Spur Road. It would need approximately 220,000 yards of material for the levee. Presuming a lower lake level, this 1100-acre area could impound perhaps 5 billion gallons which is about a third of the basin release.

The levee around the entire Dredge Lake area would be approximately 3.5 miles long and since there is a gradient to the area it would be higher as it progressed further from the lake. I have estimated a little over 300,000 yards of material as there are natural terrain features positioned to serve as part of the levee system. This would bring the area to approximately 1800 acres and could likely impound around 8 billion gallons. Both of these levees would actually be quite easy to construct seeing as all the basic fill is on site and only armoring would need to be trucked in. Breaking them into phases awarded to multiple contractors could expedite the process allowing construction to be done in a couple months.

A 3rd option which I feel should be implemented as soon as possible is the construction of two overflow bypass channels which would alleviate the flow restriction caused by the sharp bend at Killowich and Meander drives. 3 different hydrologists also agree that this is likely one of the quickest and easiest to achieve measures. These channels would be approximately 1300 and 1800 feet long and I am estimating 100 feet wide which is comparable to the river width at these points and would average perhaps 6 to eight feet in depth. They would be constructed at ordinary high-water depth and robustly armored so as to not become a permanent channel diversion. Properly graded they would not be fish traps and could conceivably be actual enhancement projects. These channels could require 30-50 thousand yards of excavation each and could require 12 to 15 thousand yards of armor rock each. Done during low water flows, the actual work could be easily accomplished. Finding a spoil area would likely be the biggest challenge. Much of the material should be marketable as the area served as a



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borrow area years ago. I remember bailing out of the river and mining the gravel bars across from car body bend when I was quite young working for my father, and it was great borrow material.

Another option would be to construct a levee along the east side of the river from the Marion Drive area all the way down to the Riverbend School area. This would prevent the over topping that occurred this year presuming the release is no greater. While this would likely require no agency permits it would involve eminent domain action and access to the work area would be difficult. The levee would be approximately 3 miles long and presuming 6 feet high would require perhaps 40,000 yards of material including armoring. Another consideration is that we are hearing that there has been subsidence of some of the armor rock along this bank and as the river keeps trying to reach equilibrium, we should presume that access to allow rip rap repair will be needed also.

All of these options require that modeling be done sooner than later. Updated mapping is also probably necessary. As I related last week, the Southeast Alaska Watershed Coalition has recently received a grant to provide this. I hope we are already in discussions with them to accelerate the process. I have contacted industry experts who are current in the fields necessary to do this work who are ready to participate in your work group. I suspect that my participation will no longer be needed but please don't hesitate to reach out if I can be of further service. I think we all realize that this situation has the ability to put a death grip on our community with long term devastating results. As such we are all will to contribute what we can.

Thank you for your consideration,
Dave Hanna