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MEMORANDUM

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*J.R. J. Oestrom -*  
*H. Engbretsen*  
*H. Hodge*  
*2/24/73*  
*[Signature]*

TO: Don Tilson, Paul Gregory, File S-349.001

FROM: G. R. Meigs

RE: Supplemental Questions Relative to Vancouver Lake Reclamation

DATE: April 20, 1973

ITEM NO. 1 SEDIMENTATION IN THE COLUMBIA RIVER

Don called on the 12th of March to report that the Burlington-Northern Railroad had been in touch with him to say that they had tried dredging the Columbia River Slough a few years ago. Burlington-Northern reports they had to stop because the sediment flowed into their excavation about as fast as they dredged it. Don wondered if we knew anything about it or could I check into it.

With regard to the entrance channel from the 15-foot minimum depth level to the high water shoreline, we have always felt that sedimentation was going to be a problem, but we have never known how serious it might be. Early in the study phases, I discussed the situation with two different representatives of the Army Corps of Engineers. One man was a designer and he felt that a structure could be installed either as a sand deflector or as a pile dike which would effectively control the deposition in the excavated channel. Another representative, a man involved with the Columbia River dredging operations, said that no matter what was designed there was always going to be dredging and that in his opinion structural measures weren't very effective. I think we all have to acknowledge that maintenance dredging will be needed in the future after the channel is constructed. I have suggested that the channel be constructed and that the maintenance problems in the post-construction period be carefully analyzed in order to determine whether the cost of a structural attempt would result in reasonable annual maintenance charges.

ITEM NO. 2 C. C. BARNARD'S "CONSTANT LEVEL" PROPOSAL

On March 9, Mr. Charles C. Barnard wrote to the Clark County Commissioners suggesting a program to deepen the lake by raising the surface of the water rather than by dredging out the bottom. Barnard's letterhead is "Consulting Engineer-Civil", but he writes as a citizen.

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The whole theme of Mr. Barnard's proposal is that what is needed in the lake is additional depth and that means to arrive at this depth are of first importance. He does not seem to give much consideration to the problem of removing or reducing the degradation in water quality that is caused by the bottom materials that enter the algal cycle in warm weather.

His first proposal is to run a levy across the north end of the lake from high ground over to the proposed Army project. A control structure at the outlet into Lake River would be required. This is a real restraint on planning as it requires the implementation of the diking program, and we have always felt that the two projects, that is Lake Reclamation and Diking, should be separated from each other. Mr. Barnard also proposes a constant level of about 12 feet above extreme low water. This suggestion would tend to increase the cost of the project inasmuch as more flushing water flow will be required than for a shallower depth. Mr. Barnard also feels that the increased depth is desirable so as to eliminate wave action on the bottom. Wave action, however, is needed for purposes of mixing and re-aeration. Without mixing, the amount of flushing water increases, and so Mr. Barnard's suggestion compounds the flushing water requirement.

The flushing water under the Barnard scheme would be provided by pumps operating with Columbia River water. He assumes that these pumps would be needed year around, but it is my opinion at the present time that pumping would only be required during the warm weather months. This is during a time when there is a surplus of electrical energy in the northwest and it might be possible to get a power rate that is quite attractive. On the other hand, in the future this surplus of energy may not exist.

Mr. Barnard also suggests constructing baffles in Burnt Bridge Creek to collect sediment. This would be fine if the additional expense can be borne, but the lake might as well be used as a settling pond, because regardless of the location of the sedimentation there will be dredging costs. Mr. Barnard also goes on to suggest fill along the east bank of the lake, and, of course, this was an element of the selected alternative. Barnard also suggests moving the proposed dike in the park area to the west, and we think this is beyond the scope of the lake reclamation plan and rather is a part of the County's park plan.

Barnard thinks that leaving the bottom of the lake as it is without removing the polluted muds will not be asking for trouble inasmuch as he thinks that the bottom sediments will compact and tend to purify. We doubt very much that the sediments will compact significantly in our own era. It is my opinion that the materials

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on the bottom of the lake would only tend to purify if they were allowed to enter into the algal cycle and the algae were washed out while in bloom. This would take the nutrients out of the lake, for otherwise they would re-enter the sediments when the algae died. Considering the depth of water that Mr. Barnard is proposing, I am somewhat skeptical of his claim that nature will take care of the situation for us.

The real advantage of Barnard's proposal is that it develops a fixed level lake surface. I have not had the time to see what an additional 10 feet of depth would do to the surface area, but I imagine it would make a significant increase which in turn would significantly increase the amount of water needed for flushing. A fixed level lake, however, would certainly simplify the recreational development costs since the shore line would be in a stable location rather than moving back and forth as the lake's level rises and falls.

A qualitative evaluation of Barnard's proposal could be best made by Washington State University, and perhaps their reply to Don will bring more numerical information to light.

GRM:jb