

**From:** Nanette Gilles  
**To:** Eddie Grant  
**Date:** Thu, May 6, 2004 9:45 AM  
**Subject:** Hydrology Discussion Topics

Eddie - Goutam has provided the attached list of discussion topics for next week's site visit. He wants to emphasize that these are not draft RAIs, but these are issues for discussion during the site visit. Some topics may be resolved during the site visit and others may evolve into RAIs.

Nan

**CC:** Goutam Bagchi; Vail, Lance W  
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**Subject:** Hydrology Discussion Topics  
**Creation Date:** Thu, May 6, 2004 9:45 AM  
**From:** Nanette Gilles

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## Clinton Hydrology Site Visit Topics

- 2.4.1-1 Confirm important lake parameters (key elevations, storages, etc)
- 2.4.1-2 Review USGS topographic maps of upstream contributing areas and stream/creek system. Discuss seasons and landuse that are most likely to result in extreme sediment/ bedload movements. Provide reference to demonstrate that there are no upstream or downstream dams.
- 2.4.1-3 Review basis for data presented in Table 2.4-2 (particularly evaporation estimates)
- 2.4.1-4 Confirm basis of basis for statement that "There are no known surface water users of Sangamon River within 50 river miles downstream from the plant site." Are there hydraulic continuity issues with downstream groundwater issues?
- 2.4.1-5 Review statistics of historical discharge data at the Rowell gauge. We independently obtained streamflow data for this gauge (1943-2000) and computed the same numbers -- there are some disagreements -- we'll need to look at these calculations as performed by the applicant to resolve the disagreements.
- 2.4.1-6 Discuss the calculation of ratio of catchment area at the Rowell gauge to that at the dam site. Application uses a value close to 1.13. We independently estimated it to approximately equal 1.145 using topographic maps. We need to resolve these disagreements.
- 2.4.2-1 HMR 33 is obsolete. PMP discussion should reflect HMR 51 and 52 instead.
- 2.4.2-2 Review PMP calculations. PMP for Clinton Dam was obtained using HMR 33 in the application -- we used HMR 51, HMR 52, and ANSI/ANS-2.8-1992 procedure to independently estimate PMP for the site. The applicant needs to redo calculations or justify not using the current standard.
- 2.4.2-3 Discuss flood frequency estimations. We independently obtained instantaneous flood data for the Rowell gauge and fitted log-Pearson type III distributions to flood data for pre- and post-dam periods following the procedure of WRC Bulletin 17B, and obtained the flood magnitudes corresponding to the same return periods as that in the application -- there is some disagreement between these estimates and those in the application -- we'll need to look at those calculations to resolve these disagreements.
- 2.4.3-1 Describe status of SPRAT computer program and software QA, if any.
- 2.4.3-2 Review independent bounding PMF calculation performed and discuss applicant's options. The bounding calculation (using the current PMP) shows adequate margins in the site's proposed design elevation.

- 2.4.3-3 If applicant wants to lower the PMF elevation by revisiting the analysis, we'll need to review precipitation losses, synthetic UH, lag effects.
- 2.4.3-4 Review coincident wave calculation and basis of 40 mph design wind.
- 2.4.4-1 Discuss due diligence.
- 2.4.5-1 Discuss due diligence. Review seiche calculations.
- 2.4.6-1 No issues.
- 2.4.7-1 Discuss ice sheet collision impacts on intake structure.
- 2.4.7-2 Review ice sheet thickness calculation.
- 2.4.7-3 Describe relationship (location and depth) of ESP intake relative to current intake.
- 2.4.7-4 All the discussion is limited to sheet ice. Why no mention of frazil or anchor ice.
- 2.4.7-5 Discuss impacts to ice formation, if current unit were no longer operating.
- 2.4.7-6 Discuss whether it is credible that ice dams could form around the lake discharge structure, particularly if the original unit were no longer in operation.
- 2.4.7-7 Discuss a definition (site characteristic) of frazil and anchor formation.
- 2.4.8-1 How were the velocities computed for over the crest and toe of the submerged UHS dam if the main dam breached?
- 2.4.8-2 Discuss nature of lake drawdown calculation. Are drawdown and induced evaporation fully coupled in the calculations.
- 2.4.8-3 Discuss behavior of discharge flume, if only ESP unit were in operation.
- 2.4.8-4 Discuss estimation of UHS capacity loss due to sediment/debris loads during extreme events. Also, discuss issues related to silting in the UHS part of the lake.
- 2.4.9-1 Describe due diligence on channel diversions.
- 2.4.10-1 40 mph was mentioned earlier with PMF – now it is 48 mph. Discuss the difference. Both breaking and non-breaking waves will be considered, is this not a design assumption for the COL applicant?
- 2.4.11-1 Discuss interannual and intrannual variability in water losses from evaporation and cooling towers. Discuss the climatic conditions used to determine quantity of water needed in the last paragraph of this section.
- 2.4.11-2 Review calculations, data, and methods utilized in the drawdown analysis.

2.4.11-3 Provide list of names and agencies discussed regarding future controls upstream (and downstream) from lake. In Section 2.4.11.6 there are statements on the supply capability of the watershed. What is the basis for this? There appears to be a COL interface to keep the UHS pool to be dredged.

2.4.12-1 Is applicant deferring this issue to COL or is this the 'analysis'? There is no basis provided for the statements in this section.

2.4.13-1 Review figures in section. Many figures were unreadable.

3.2.1-1 Review LAKET model. Is documentation available? Is it under any software QA? Is the source code and input's available. Describe representation of various heat exchange mechanisms.

3.2.2-1 Review schematics of UHS layout and describe operation (direction of water circulation).

3.2.2-2 Describe the thermal load capacity calculations. What is the margin for thermal capacity?