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MEMORANDUM

DATE: 1/20/03

TO: Chris Malan, FONR

FROM: Phil Williams and Julie Haas

RE: **Comments on recent revisions to the Napa River Enhanced Minimum Plan**
PWA Ref. #: 1628

On 11/29/02 we provided written comments on the City of St Helena's recommended alternative for flood control on the Napa River, referred to as the Enhanced Minimum Plan [EMP]. On 12/02 we met with the City's consultant team to discuss these comments. Subsequently we have received the following additional information:

- A letter from MIG to Bernard Krevet of FONR responding to the 11/29/02 comments
- A four page explanation of the plan formulation process from MKG
- A new report entitled "Geomorphic Design Report" from SH&G dated 1/06/03

In our previous review (attached) and in these comments it is our intent to assist the City in formulating and assessing a multi-objective flood control and river restoration project in accordance with the Living River Principles. [LRP]. We have expressed our opinion that the EMP has not been developed using the LRP, but we have outlined a rationale and methodology that could be used by the City to demonstrate why it considers the EMP to represent the most appropriate balancing of flood management and ecologic objectives, and why other alternatives were rejected. We believe that the City will need to follow a rigorous planning process in order to prepare an understandable EIR that will meet the approval of funding and regulatory agencies.

Our comments to date have focused more on the need for logic, rather than the technical adequacy of the EMP, although we have earlier raised some significant questions concerning key design assumptions affecting the intended benefits of the EMP.

In our review of these new documents we find the planning issues we have raised are acknowledged; some additional information has been developed that is helpful in assessing how the project might

perform, and how it might affect fish habitat; but a coherent planning methodology has not been presented. Instead, it is clear that the planning of this project is being carried out in two stages. First, the 'footprint' of the EMP has been identified based on flood control and land ownership costs –but not based on ecologic or geomorphic considerations. Second, within this footprint riparian enhancement is being designed. Such an approach that subordinates ecologic and geomorphic objectives is inconsistent with the LRP and specifically contradictory to the guidance given in 'Goals and Objectives for a "Living" Napa River System' 7/02/96 [see p8].

Our earlier comments relating to the technical adequacy of the design also remain largely unanswered. Instead new information and opinions are presented that increase our concern that the EMP as proposed has a significant risk of neither achieving its flood management goals nor the intended riparian habitat. Furthermore, we believe that if implemented as suggested in the new SHG report the EMP could result in large long term maintenance costs and liability for the City.

In addition to the concerns we had raised earlier, there are four significant issues that need to be resolved quickly, if they are not to emerge as major impediments to the project.

1. Geomorphic Stability

We are not satisfied with the new SHG report's response to our comments on the importance of understanding and predicting channel stability as it relates to future erosion hazards, habitat evolution and maintenance requirements. The report states: *It is apparent both from examination of the topographic profile measured in 2002 and field evidence that neither the Pope St bridge nor any artificial control holds the streambed grade in the project reach.* [p34].

We disagree. As of October 2002 a concreted rock sill was exposed on the bed at the Pope St Bridge. This conclusion of channel stability underlies the design assumptions for channel modifications upstream, and if wrong would have important and costly consequences. If the sill is presently preventing upstream channel incision and were to fail in a large flood, bank protection upstream would be undermined and fail. We find it surprising that this question has not been thoroughly analyzed at this stage in the design because it can be resolved easily with accurate field surveys. The 2002 survey cited and shown in figure 16 in the HSG report is inconsistent with the other downstream surveys we have seen, including the one used for HEC-RAS modeling shown in the same report in figure 20, and the channel profile shown in figure 2 of appendix B of the CDM report. This latter profile indicates at least 5ft of potential degradation.

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The report does acknowledge future uncertainty concerning possible aggradation as watershed conditions change. However, the potential affect this would have on increasing flood levels is not incorporated in the plan.

2. Potential for significant deposition in the restored floodplain terrace reach

Analysis presented in the new report [figs 20 through 22] indicates there is a substantial risk that the EMP will induce significant amounts of sedimentation in the channel in the restored reach during major flood events. Deposition of boulders, gravels, and sands can reduce flood conveyance or result in ecologically disruptive or expensive maintenance requirements. The Pope St Bridge acts as a major hydraulic constriction during flood events, backing up water upstream in a backwater pool. Floodwaters entering this pool slow down and the shear stress forces that convey sediment drop significantly, causing the coarser bed material to deposit in the channel. The restored terraces are located at the upper endof this backwater pool that extends upstream from the Pope St Bridge [see fig 20]. We suspect that these backwater effects are underestimated in this study because it appears that debris obstruction on bridge piers has not been considered in the hydraulic analysis. Even ignoring debris affects, the analysis of average shear stress [fig 21] shows reductions in the terraced reach to about one fifth of upstream values. With this expected high rate of deposition it is not clear whether the flood conveyance or ecologic benefits assumed for the terraces are sustainable in the long term.

3. Adaptive management not integrated with planning and design

Although the new SHG report includes a discussion of an adaptive management plan [p59], what is described is a monitoring plan –not an integrated management plan. Because the EMP has not been developed based on a logical planning process that articulates objectives and measurable indicators of achievement of objectives, it is not possible to design a properly formulated adaptive management plan for this project. Instead what appears to be proposed is an expensive and complex annual decision making process, whose participants would become the de facto river managers and whose decisions would significantly affect flood hazards and the ecologic health of the river. This process does not constitute an adaptive management plan in part because there are no identified and agreed on benchmarks or thresholds that would initiate management actions.

Approaching river management in this way not only loses the opportunity for creating a resilient design that minimizes the need for maintenance intervention; it may also burden the City with indefinite, unrealistic and expensive maintenance responsibilities.

Instead a true adaptive management plan needs to be developed as an integral part of the design process using an explicit logical planning methodology, as we have recommended. Key design criteria such as

levels of acceptable sedimentation, roughness and channel obstruction would be built into the initial grading design. By anticipating the major management actions a realistic assessment can be made of maintenance costs, the need for ecologic disturbance or the need for remedial actions.

4. Design criteria for floodplain terraces unresolved

In October 2002 SHG produced a report intended to answer two unresolved issues, described in the CDM report: 1) Collect data to determine if the soils and hydrology are compatible with the assumption that terraces will develop as a complex of riparian, upland and wetlands; and 2) Conduct a geomorphic analysis to confirm the assumption that the 2-year water surface elevation used as the terrace design elevation correctly approximates the dominant discharge of the river; and, address questions raised by the resource agencies and FONR on the impacts to the geomorphology including, impacts to sediment transport, stream bank stability and overall potential for channel migration of the river.

We are surprised to find that the second issue still has not been resolved. The first issue was addressed to the extent possible given inconclusive geomorphic and hydrologic evidence regarding dominant discharge (issue #2).

SHG did not recommend revised terrace design elevations based on their geomorphic analysis, despite their findings that the dominant discharge ("bankfull") elevation is 10-15 feet lower than that estimated by MBK for the 2-year event. This issue continues to be unresolved in the revised SHG report, dated January 6, 2003 which states: *Field evidence and stream flow records collected at (the USGS Zinfandel gage) indicate that flood plain formation is occurring at a flow of about 500cfs, well below the modeled 1.5-year flood of 4,500cfs (Figure 10)…The modeled 1.5-year flood is about 8 feet deep at the gage, over twice the observed depth of field measured bankfull indicators.* No recommendation has yet been made on how to reconcile this difference and SHG's estimates of dominant discharge have apparently not been incorporated at all into the design, as represented on p 35 and illustrated in fig 19b (January 2003). We also note there are discrepancies between the text description and the illustration, which shows overflow terraces at elevations higher than the 2-year flood level, described in the text.

The January 2003 report predicts four plant communities will be supported with the EMP, thus addressing the first unresolved issue. However, a disconnect between the geomorphic analysis and the EMP design leads to some doubts about how the alder species, a so-called "bankfull indicator" species will be supported at a level up to 15 feet higher than the assessed bankfull level.

PWA has commented on the inadequacy of the analysis to address the "additional geomorphic concerns raised by the resource agencies and FONR" under items 1, 2, and 3 above. These unaddressed issues include impacts to sediment transport, stream bank stability and overall potential for channel migration of the river. We understand DFG and NMFS have raised specific concerns over the connectivity of the

overflow channels to the river during low flows, fish stranding and artificially high velocities in the overflow channels. These issues cannot be adequately addressed unless consistent bankfull and overflow channel design elevations are selected based on a consistent geomorphic rationale.