March 15, 2002

RESPONSE TO ISRP COMMENTS

COLUMBIA CASCADE PROVINCE – OKANOGAN RIVER

PROJECT #29021: DEVELOP A PHYSICAL PROCESSES METHOD (PPM) TO SUPLEMENT HABITAT CONDITIONS ANALYSIS AND SUBBASIN PLANNING

1. ***"****The ISRP was not convinced that a highly sophisticated mathematical approach in combination with EDT is appropriate at this time."*

Response: We are not proposing a "…a highly sophisticated mathematical approach, nor are we proposing a complex direction for PPM. This proposal describes a straightforward process to review and integrate existing information in a focused manner that will:

a. Isolate the physical processes controlling the environment (cause and effect relationships will be targeted);
b. Produce a template and matrix of possible treatment options (mainly the civil and geomorphic side of the equation – the math and literature etc.) and make this available to EDT or other ecosystem analyses;
c. Provide a more quantitative method of measuring the *effects* of each treatment and/or suite of strategic actions (larger plans), and
d. Investigate, and possibly simulate, the interrelated nature of treatment actions across the ecosystem, subbasin, Province etc.

Having these four powerful features available to subbasin and watershed planners are powerful, in and of themselves, and with these in place, comes the ability to do two additional, and significant utilities. These are:

e. cost: benefit analysis, and
f. trade-off analysis.

These two outcome capabilities will dramatically improve the decision process for BPA, and for NPPC to justify the overarching subbasin planning approach. Regional recovery efforts that tie in the Federal BiOp, HCPs, ESA recovery planning, state-led watershed plans, local government and municipal needs and economies etc., will be strongly supported by PPM. All six attributes are required elements for standardized and feasible fish and wildlife recovery planning and are reasonably attainable in the proposal.

We have anticipated with some precision how this project can indeed provide benefit. Our overall process (sum of related projects) further illuminates that the Columbia Cascade Province is an appropriate development and proving ground. The emerging

Subbasin Plan (CC will likely be the first to fully engage), and the proposed EDT analysis, are but two examples of how the benefit of the PPM will provide immediate and expanded capability. In sum, a better plan and treatment projects will result.

The development of the Physical Process Method/Model is a simple and intuitive project to extend and integrate landform literature, approaches, models and matrices into the EDT Method. Extension and integration is an intuitive and common step in many modern and successful model and decision support processes and should be applied in this case.

2. *"The sub models are available…." "…users may be better off to leave them unlinked and use them as needed*"

Response: It is clear to many at the Bonneville Power Administration, The Northwest Power Planning Council, the Army Corps.of Engineers, (see attached letters of support), Subbasin Planners and EDT developers, that opportunities to examine the full range of physical process, (or even *scratch the surface* in a reliable way) information are lost in the shuffle (e.g, are truly not "available," in an honest appraisal). The information is complex, disparate and largely inaccessible in forms and formats that allow it to be incorporated into ecosystem analysis or decision-making processes. Simply "hoping" that analysts and planners will access this information has proven to be injudicious and costly.

We do agree with the ISRP statement that a host of sub models information currently exists, however, we fully intend this project to be oriented at <u>capturing</u> the existing knowledge and providing it as <u>a functional and accessible platform,</u> rather that simply hoping that scientists and planners will be aware its "out there" and that (or how) it can be used effectively. This is a key point of clarification.

3. *"A big Physical Process Model may gain little not available from individual models for discrete processes."*

The PPM is not a "big Model." In fact, we've described the PPM in the title and in the proposal more accurately as *a Method.* The effort and tasks have been developed to provide a functional "list" (albeit dynamically constructed, so it actually works!) of parameters that control the environment, and as a matrix that allows integration as a subroutine simply for ease and creating maximum functionality across complex ecosystem variables and attributes. We regard this as the non-Naïve approach.

Further, the ISRP correctly characterizes that many existing models are "for discrete purposes." This statement actually supports the need to the PPM. The PPM will review these models and evaluate their potential for use in a strategic and integrated planning process. Where opportunities exist, access to previously "discrete" applications will be identified. There are many examples where attempting to "force" existing information together, creates error and false correlates.

To our discredit, the way the project has been designed may give a false impression of complexity because we've described, in a very detailed way, an approach designed to include systems engineers and decision-support experts. We've done this in order to avoid creating yet another 'black box, false-promises model.

4. *Some questions and concerns that arose in the course of review include: Where does EDT leaves off and PPM take over? What is the expected output of EDT in a specific real application and what is the expected output of PPM in the same illustration? Is EDT output input for PPM?*

Response: The ISRP poses some questions with regard to the soundness of using EDT in the Columbia Cascade Province. For clarification, the context within which the referenced statement is taken is specific and applicable only to future EDT development, not to its current validity as an ecosystem analysis and planning tool. Proposal #29021 only identifies a method to provide programmed features of civil engineering, geology and other earth sciences, for dynamic use in EDT. The sole intent of the proposed physical processes method is to facilitate a more precisely measurable linkage between the biological and physical world and provide a "library" of earth science and "treatment actions" information to EDT.

Currently, the EDT method is being reviewed on a timeline and in a manner that is complimentary with the initiation date for this project and for the EDT Columbia Cascade proposal #29037. This work has initiated a process for evaluating the Ecosystem Diagnosis and Treatment (EDT) model and assessing its applicability to the Columbia Basin Fish and Wildlife Program and the recovery of listed aquatic species pursuant to the Endangered Species Act. The outcome of the RAAC EDT validation process is focused on providing:

- Identification of possible EDT enhancements (PPM specifically identified in scoping discussions).
- Guidance for how EDT should be used within the context of Subbasin planning
- Other as appropriate

This illustrates the integrated and strategic manner in which the various project proponents have linked proposals. The EDT validation project, the Columbia Cascade EDT project and the PPM project are relentlessly complimentary.

Once again, the Columbia Cascade Provincial EDT Assessment Project will be led by members of the RAAC (coincidentally, and perhaps serendipitously in the case of the Columbia Cascade) and the PPM Principal Investigator and project manager are likewise participants.

One of the highest benefits of this proposal is that PPM/EDT will be applied as a course-scale analysis and planning tool, one of EDTs strongest capabilities. The RAAC

members will gain vital perspectives of how this approach can be further supported, and the RAAC EDT validation process will provide direct guidance to the Columbia Cascade EDT analysis.

NOTE: The EDT Validation project is being conducted under the auspices of the Regional Assessment Advisory Committee (RAAC). The RAAC was created by the Northwest Power Planning Council (Council) and consists of agency and private sector scientists with expertise in biological modeling. The RAAC is co-chaired by the Council and the National Marine Fisheries Service (NMFS). The Committee's charter directs that the RAAC "will advise the Council and the region on technical aspects of the biological assessment of subbasins." The Committee's primary function "is *to advise the Council on how to conduct subbasin assessments that are technically sound, and deliver outputs that are understandable and manageable by a non-technical audience.…"*

5. *The proposal should have contained a detailed monitoring and evaluation component. What real data will be collected and how will the project be evaluated (ground truthed)? How and when will one know that the project was a success or a failure?*

Response: The project proponents have a sophisticated and noteworthy experience with these types of development processes. Dr. Bill Roberds is a world-renowned leader who has over 30 years experience monitoring and evaluating the outcomes of decision-support systems development. The Yucca Mountain project provides one high profile example of Dr. Roberds capability. This project, to develop the decision-support system for disposal of the nations nuclear waste, is led by Dr. Roberds. Golder Associates Inc. developed the model for contaminant transport, fractured rock mechanics, risk assessment, and a host of other critical functions. Golder understandably developed a very comprehensive M&E program for this project and has been reauthorized by Congress to continue our 7th year of leadership and participation on this project (slight pause inserted here for effect!)

Now, that being said, the answer to the ISRP's question is this: We do not have a fully developed M&E plan for this project. We have committed task and budget allocations to do this and are aware of the requirement and importance of this phase of the PPM project.

We commit to development of a comprehensive M&E plan for this project and ask the ISRP for its understanding (this is another example of how the Upper Columbia has lacked infrastructure and overall capability for over 60 years!) and confidence that the project sponsors have long experience and full capability to fulfill the stated objectives, accomplish the overall goals, and report our results in a full and meaningful manner to the ISRP, NPPC and to BPA.

We further commit, as referenced in the proposal, to submit M&E results on an annual basis and provide all information about task objectives, findings, conceptual model structure etc. to all subbasins in the Columbia Basin for review and use.

The project will be termed a success for failure on whether we have attained the following objectives:

6. Isolated the physical processes controlling the environment (cause and effect relationships will be targeted);
7. Produced a template and matrix of possible treatment options (mainly the civil and geomorphic side of the equation – the math and literature etc.) and make this available to EDT or other ecosystem analyses;
8. Provided a more quantitative method of measuring the *effects* of each treatment and/or suite of strategic actions (larger plans), and
9. Investigated, and possibly stimulated, the interrelated nature of treatment actions across the ecosystem, subbasin, Province etc.
10. Enabled the ability of subbasin planners, CBFWA, NPPC and BPA to conduct cost: benefit analysis, and
11. Trade-off analysis.

We anticipate accomplishing these objectives in full or significantly, during the 2003-2005 project period.

The project will be ground truthed in the Columbia Cascade Province subbasin planning process and EDT assessment projects. Additionally, the Chehalis Basin habitat restoration project is currently "stranded" for reasons specifically addressed in the PPM proposal. The attached letter from the Chehalis Basin project manager aptly reiterates the need for accomplishing PPM project objectives.

> *ISRP Comment: The proponents need to demonstrate support from management agencies in the Columbia Cascade Province and/or letters from the Council indicating need for augmentation of EDT in the subbasin planning effort.*

Response: See attached letter from the Army Corps. of Engineers aptly capturing and reiterating the problem, in a real world example from the Chehalis Basin. Additionally, key staffs from BPA and NPPC, as well as those familiar with the issues at PNNL, and notably, the EDT developers themselves, are in full agreement as to the priority need for PPM.

> *ISRP Comment: A conceptual model of the system is needed. Without a conceptual model of the system, it is difficult to judge the qualifications of the proponents or the likelihood of success of the project.*

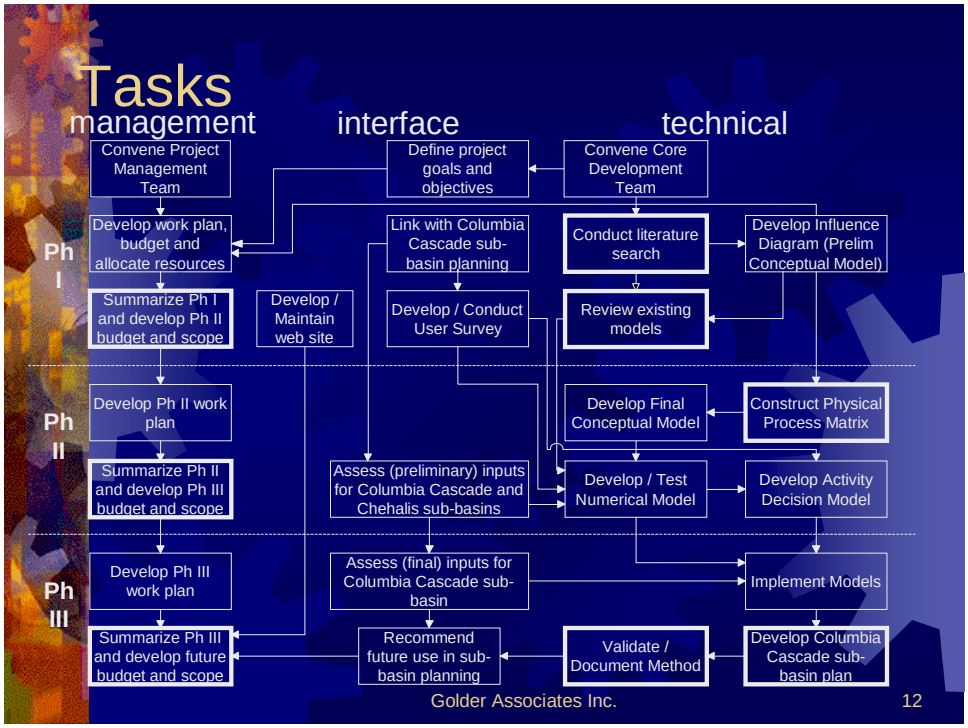
Response: The proposal identifies that the conceptual model development must be funded as part of the project. As has been stated on many different discussions relative to the Upper Columbia, the infrastructure for taking this significant a step (the process to develop a true "conceptual model" is a disciplined and specialized (formal) step in

systems development. This again highlights the reason we have chosen those with advanced degrees, notable publication history, and expertise to manage and design the process for developing PPM.

We must ask the ISRP to carefully reexamine the qualifications of the PPM team as provided in the proposal. The projects proponents education, experience and professional accomplishments, demonstrate the highest level of capability and experience necessary to accomplish the objectives set forth in this proposal.

Also, the development of this project and team is a direct outgrowth of a general review of model development history in the Columbia Basin. The proponents recognized that many unsuccessful projects had a common theme: biologists and biometricians have developed many models. Many have failed. Most lacked the fundamental associated with the "science" of decision and risk analysis; many lacked approaches and design standards necessary for a successful systems model. This project seeks to provide a higher level of technical rigor into the development of fish and wildlife models and methods, and to introduce a higher level of decision support and risk analysis "science" into the process. The ability to then conduct cost:benetit, trade-off analysis, and provide and thus, provide subbasin planners, CBFWA, NPPC and BPA to compare plans and assess the nature of out-of-basin effects, is without dispute, a vital and necessary component of the Northwest Power Planning Council's Fish and Wildlife program vision..

Below is an overall conceptual model for how the PPM project will proceed.



Summary: Without strong and complete linkages to the physical environment, the integrity and accountability of individual project proposals and the eventual subbasin plans themselves, will remain in question. How will BPA, Council, or planners know if actions/plan has accessed and reviewed all, (or even the major works) of the pertinent and available informatory. Indeed, how will any of us know if the proposed actions on the landscape will it work are the most correct/cost effective actions? Will BPA require earth science engineers to re-examine or review the proposed actions (sediment and channel forming processes is a great example), or would we all be better served if these are investigated in a disciplined and complete manner? This very issue has emerged again and again on the regional level, at NPPC/BPA, and in the SRFB process where PPM is also being prescribed.

Therefore, we remain unconvinced that the mere existence of ubiquitous land form and physical models will allow subbasin planners to make decisions in a adequately informed, integrated and successful way. And, that as practical tools, existing models and information represent nothing more than disaggregated and mostly impenetrable capabilities for salmon habitat and watershed planners. It is our contention that useful knowledge about land forming processes is currently decoupled from subbasin planning and habitat conditions analysis and that the "forcing" (smart people working hard to link and access the "science" between the physical and biological worlds) approach currently employed has a higher than desirable potential for false or inconsistent results. PPM is simply proposed to unite the biological and physical for use in a functional and true ecosystem-based approach.

Attachment 1. Letter from L. Morris (Army Corp of Engineers) to K. Wolf (Golder Associates) RE: Project Number 29021, March 2, 2002.