DOCUMENT E-3

INITIAL ADVISORY COMMITTEE INPUT ON CORPS MEASURES AND CONSIDERATION OF LOCALLY IDENTIFIED PROJECTS

April 20, 2009

***Note**: Separate Technical Committee documents have been sent to the Advisory Committee that are pertinent to certain measures/projects that will be discussed at the April 20th AC meeting. Please refer to these documents as you are reviewing this document. We have prepared a guide to the documents to help you orient to which documents you need to focus on for this discussion.*

The following table provides initial input from the Skagit Comprehensive Flood Hazard Management Plan (CFHMP) Advisory Committee (AC) on the Skagit GI measures. It additionally includes locally identified projects that the AC is considering for inclusion in the Comprehensive Flood Hazard Management Plan (CFHMP). The input was developed at a workshop the AC held on February 18, 2009 and at the regular AC meeting on March 16, 2009. The AC provided its thoughts on whether an individual measure should be further evaluated by the Army Corps, along with comments, suggestions and questions related to the measure. Additionally, the AC considered potential local projects, though they intend to consider these further at future meetings.

The purpose of this effort is for the AC to provide a local perspective on the Skagit GI measures for the Corps to consider as they begins their process of narrowing and lumping individual measures into a more focused and shorter list of alternatives. Additionally, the work of the AC will be used as one of the processes for determining which projects should be recommended in the CFHMP.

At this point the effort is not intended to be a detailed, final prioritization of measures. The AC will complete a more detailed evaluation in the spring of 2009 and pass its recommendations onto the FCZD Board of Supervisors for their consideration. While the decision of the Board of Supervisors will be the final work product related to impressions of the measures and various local projects, it is expected that the Army Corps will consider the results of this initial effort in their narrowing process.

In parallel with the AC evaluation of the measures and local projects, the AC is developing criteria for screening measures and projects. While these criteria have not been completed, they have been considered by the AC and were part of the process of commenting on the measures. It is anticipated that the AC criteria discussion notes will be considered by the Army Corps in narrowing the measures. The AC hopes to complete its work on selecting screening criteria in the spring of 2009 also.

Table 1 summarizes the AC's discussions of the measures. Table 2 includes three local projects identified by the Technical Committees and local sponsors. Where thorough discussions have not been completed, Technical Committee comments are included for reference. Attached are the criteria that the TCs used in their evaluation of the measure. For all other measures and projects, only the AC comments are included.

Green highlighted projects could be eligible for early action implementation. Yellow highlighted projects need additional analysis, development, design, and alternative packaging. Red highlighted projects should be abandoned, considering any caveats listed under comments. Blue highlighted comments or projects need additional AC review and comment.

Table 1 - Advisory Committee Input on Skagit GI Measures
WHOLE BASIN EFFECTS -Storage
(Range of Possible Additional Storage for Each Measure)

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #1—Upper Baker		
Recommend continued evaluation/project development. ▪ Meets all criteria ▪ Must be consistent with Baker Settlement Agreement ▪ Need more PSE involvement. This has limited ability to understand this project. PSE expressed willingness to actively participate when Upper and Lower Baker are being discussed. Contact – Mark Killgore ▪ Need to make sure WCM working for flood concerns ▪ Many environmental concerns. Understanding among Baker Settlement Committee is that Skagit GI must be complete and license reopened for this to go forward. Aquatics Research Group would be logical starting point. ▪ Maximize storage and modify operations to reduce flood flows (Measure #1C)	Need to continue Corps analysis and modify WCM Skagit GI Analysis Need PSE input What about increasing flood storage capacity by raising the dam?	tbd
Measure #2—Lower Baker		
Recommend continued evaluation/project development. ▪ Same comments as for Measure #1 ▪ Continues to demonstrate significant benefits during recent events. Dike Districts request that the Interim Protection Plan remain in effect until Corps Skagit GI study is completed. ▪ Maximize storage and modify operations to reduce flood flows (Measure #2C)	Same as for Measure #1	tbd
Measure #3—Ross		
Recommend continued evaluation/project development. ▪ Meets all criteria and could be improved with operational changes. ▪ Maximize storage and modify operations to reduce flood flows ▪ This is the only measure that would help the people above Concrete. ▪ This concept has been discussed for about 20 years. Serious concerns include – impacts to fish, need for FERC license amendment, financial costs, and normal flow issues. Revenue loss to SCL would be very large. Downdrafting the reservoir can't be done quickly in anticipation of flood. ▪ As proposed, project would have high impacts to Chinook and pink salmon. May be workable if consistent with Skagit Settlement Agreement and Skagit GI. Recent dam operations have resulted in tremendous gains for fish. Dewatering of redds was problem before.	Quantify hydropower loss Need Corps analysis to modify WCM Skagit GI Analysis Need Seattle City Light input	tbd

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures

WHOLE BASIN EFFECTS - Nonstructural

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #25— Nonstructural (Evacuation, Flood Warning, Floodproofing)		
Recommend inclusion in Corps alternatives and CFHMP ▪ No downside. ▪ Support good land use decisions. ▪ Need to review existing and potential land use regulations; including Shoreline Management Act ▪ May include proposed Measure 38 – interior drainage ▪ Includes flood proofing, flood warning, and evacuation systems	Needs to be coordinated with DEM Need information on specifics	tbd
Measure #27— Debris Management		
Recommend inclusion in Corps alternatives and CFHMP ▪ Need debris management program to keep LWD passing bridge structures ▪ Railroad bridge upstream from Highway 9 is particularly bad for trapping debris. Bridge needs to be removed. ▪ Ongoing maintenance needs to be coordinated better. ▪ LWD should be passed downstream rather than pulled out. In nonemergency situation, need to be more consistent about how LWD is handled. Can pieces be removed and replaced downstream? ▪ Standardized guidance may be needed so individual entities understand requirements for LWD to stay in the system. ▪ Corps views as local responsibility. Would look at bridge designs, bypass channels, etc. for debris passage.	Programmatic permits	tbd
Measure #23— Estuarine Restoration		
Recommend continued evaluation/project development. ▪ Prioritize projects that have a positive impact on flood control and improve interior drainage and outlet facilities. Example: New Stanwood outlet WCS at bayfront. ▪ Design should meet Salmon Recovery goals.	Need location and design	tbd

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures

UPPER BASIN

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #22— Cockreham Island Levee Removal		
Recommend continued evaluation/project development. • Emphasis on potential environmental benefits. Habitat restoration potential is good. Some concern about potential loss of main stem habitat. • As flood project, some concern that it impacts farm land with minimal flood control benefits. • County may need to address because of legal issues • Corps analysis concludes it doesn't pencil out for flood reduction, but environmental benefit could be good.	Need design info Impacts unknown Flood control benefits unknown	tbd
Measure #24— Riparian Restoration		
Recommend continued evaluation/project development. • Combine with flood projects - "combined" may be as mitigation • Not meant to threaten existing infrastructure. • Corps approach – what are best flood projects, then what are riparian restoration projects that are appropriate with those.	Impacts to critical infrastructure Design, and specific projects Existing list could be expanded	tbd
Measure #26— Hamilton Relocation		
Recommend inclusion in Corps alternatives and CFHMP • Meets criteria • Incorporate wetland and slough habitats where possible	Funding sources	tbd

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures
MIDDLE/LOWER BASIN - Small-Scale Storage

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #4— Nookachamps **Note comments from LUTC and D&D District TC requesting a revisit of this measure by the AC (See comments under Additional Comments and Ideas from Technical Committees)**		
Recommend dropping from further analysis by GI and CFHMP • Technical feasibility is poor because of overflow timing requirements and ability to get water back out of Nookachamps following overflow • Environmental concerns related to new hardened structures along the river • Concerns about upstream and downstream impacts • Any additional consideration would require new design. • Cost	n/a	n/a
Measure #5— Hart's Slough		
Recommend dropping from further analysis by GI and CFHMP • Recommend dropping for same reasons as Measure #4	n/a	

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures
MIDDLE/LOWER BASIN - Levees

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #9— Overtopping Levees		
Recommend continued evaluation/project development. • Overtopping would have happened very infrequently based on historical floods. Under Corps analysis it may happen more in the future. • Since overtopping happens anyway, need to direct flow to reduce damages. • Levees would need to be strengthened in areas designed for overtopping. • Concern if existing level of protection is reduced for adjacent areas. • Problems from Corps perspective – where would overtopping happen, and ability to quantify benefits. • Critical to have interior drainage addressed in conjunction with this measure (new measure #38). • Cost must include flowage easement – this is significant cost. • May fit more in CFHMP than GI	Locations Fish loss and up/downstream effects Flow paths and easements needed	tbd

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures

MIDDLE/LOWER BASIN - Levees

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #11— Raise All Levees		
Recommend dropping from further analysis by GI and CFHMP • Big concern if levees are raised to provide 100-year protection for rural areas. Moderate concern if levees raised to provide less than 100-year protection for rural areas • Does not meet environmental criteria		
Measure #12— Setback Levees with Excavation		
Recommend continued evaluation/project development. • Several setback levee measures are presented - #7, 8, 10, 11, 12, 13. While the Committee believes the concept of setback levees has merit, there are some concerns as well. Those are listed here for all setback levee measures, and comments specific to each measure are listed with the individual measure. • Farmland impacts must be addressed. Compensation should include future agricultural production (i.e. if farming is possible in setback area, need to compensate for inability to grow crops that must overwinter). • The concept of no net loss of farmland (potentially a criterion) is incompatible with setback levees, so this will have to be reconciled somehow for all setback levee options • Existing levee / rock armoring needs to be removed with minor excavation as needed to install effective fish habitat features. Needs to restore riverine processes. • Upstream/downstream impacts must be identified and addressed. • Cost is a big factor. • Excavation can't increase risk to levees	Need locations, design, and elevation Needs additional analysis. Incorporate habitat restoration	tbd
Measure #13— Setback Levees Entire System		
Recommend continued evaluation/project development. • See Measure #12 regarding general comments on setback levees, farm impacts, environmental design considerations, critical infrastructure protection, cost and impacts analysis. • Some preference for Measure # 12, because existing levee/rock armoring needs to be removed with minor excavation as needed to install effective fish habitat features	Cost	tbd

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures

MIDDLE/LOWER BASIN - Levees

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #8— Levee Setback 3-Bridge		
Recommend continued evaluation/project development. • See Measure #12 regarding general comments on setback levees, farm impacts, environmental design considerations, critical infrastructure protection, cost and impacts analysis. • Should be noted that this project is phased. 1st phase is levee setbacks. 2nd phase will be modifications to bridge(s) • Must be combined with other measures, especially downstream ***From City of Burlington:*** ▪ Clarify the three-bridge corridor project is in phases: 1. certified setback levee with existing bridges 2. setting back the bridges (like in 30 years)	Impact analysis Design, hydraulic and sediment transport impacts	tbd
Measure #7— Levee Setback below 3-Bridge (Main stem, S. & N. Fork)		
Recommend continued evaluation/project development. • See Measure #12 regarding general comments on setback levees, farm impacts, environmental design considerations, critical infrastructure protection, cost and impacts analysis. • Preferred over Measure #10, which does not include the south fork.	Locations, elevations, levee heights Design, hydraulic and sediment transport impacts	tbd
Measure #10— Levee Setback below 3-Bridge (Main stem & N. Fork)		
Recommend continued evaluation/project development. • See Measure #12 regarding general comments on setback levees, farm impacts, environmental design considerations, critical infrastructure protection, cost and impacts analysis. • Measure #7 is preferred because of opportunity to restore riverine functions to south fork.	Design, hydraulic and sediment transport impacts Analysis regarding levee heights	tbd
Measure #14— Improve Left Bank Levees		
Recommend dropping as stand-alone concept. May be needed in specific areas. ▪ Doesn't meet criteria as stand-alone. ▪ Improving all levees along one side will cause increased hazard on the opposite side. ▪ In reality, these would be in combination with other measures, including setback levees.	Location and elevation	

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures

MIDDLE/LOWER BASIN - Levees

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #15— Improve Right Bank Levees		
Recommend dropping as stand-alone concept. May be needed in specific areas. ▪ Doesn't meet criteria as stand-alone. ▪ Improving all levees along one side will cause increased hazard on the opposite side. ▪ In reality, these would be in combination with other measures, including setback levees.	Location and elevation	
Measure #16— Mount Vernon Floodwall		
Recommend continued evaluation/project development ▪ Major environmental concerns ▪ Existing levee/rock armoring needs to be removed with minor excavation as needed to install effective fish habitat features ▪ Needs to restore riverine processes. ▪ Concerned about cost-benefit if this project goes forward separately. ▪ Funding is not fully secured ▪ Project is redevelopment of downtown area. ▪ Want downtown Mt. Vernon to be elevated. LUTC did not believe analysis of this was appropriate to their role. ▪ EIS complete and public process ongoing		

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures
MIDDLE/LOWER BASIN - Levees

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #6a— Sterling Levee		
Recommend dropping from further analysis by GI and CFHMP • See Measure 6b		n/a
Measure #6b— Sterling Levee		
Recommend continued evaluation/project development. • Recommend a better design that combines Measures #6a and #6b. • Need more complete info from Burlington project. Believe Burlington project is similar to 6b with overtopping. • Concerns about any new hardened structures along the river • More study needed	Realign per proposal from City of Burlington Trigger flows	tbd

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures
SPOT ISSUES
Ring Dikes

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #28— Sedro-Woolley Ring Dike		
Recommend dropping from further analysis by GI and CFHMP • Project concept not technically feasible		n/a
Measure #29— Sedro-Woolley WWTP Ring Dike		
Recommend inclusion in Corps alternatives and CFHMP • Design needs to address any habitat issues		tbd
Measure #30— Sedro-Woolley Hospital Ring Dike		
Recommend inclusion in Corps alternatives and CFHMP • Must be coordinated with Burlington project. • Design must address any habitat issues • Must have plan in place to evacuate patients. Could increase risk if levee breaks on "pressure" side.		Tbd

Table 1 (cont.) - Advisory Committee Input on Skagit GI Measures

SPOT ISSUES

Ring Dikes

	Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #37— Anacortes WTP Ring Dike			
AC	**Recommend inclusion in Corps alternatives and CFHMP** • Need to update Corps measure with Anacortes plant upgrade design which includes flood protection for facility. Need to incorporate this design. • Levee upgrade to 100 year protection already underway • Would like more involvement from City of Anacortes	Anacortes design Update from Anacortes	tbd

Table 1 (cont.) – Advisory Committee Input on Skagit GI Measures

MIDDLE/LOWER BASIN - Bypass

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
1) **From the ETC - Bypass project requirements**: The ETC believes that a bypass may be a suitable flood risk reduction project if it: a) Has a wet channel with a minimum flow of water and adjacent riparian habitat, b) Is wide enough and has a channel forming flow regime so as to allow development of natural stream sinuosity (meandering) and habitat complexity at channel forming or designed flows, c) Includes a significant restoration component that may include off-channel habitat that could benefit multiple salmonid species such as chinook, chum and coho salmon. The required width of the "natural" riverine/riparian corridor would be based on what flows would be passed through the channel. The ETC believes there is opportunity for areas outside of that corridor, but within the bypass, to be used for farming or other uses – i.e. a wide bypass with habitat in the middle), and d) there is no significant damage to the estuarine receiving waters and its key species and habitats either through project construction or utilization, particularly areas currently designated for long-term resource protection.		

Table 1 (cont.) – Advisory Committee Input on Skagit GI Measures

MIDDLE/LOWER BASIN - Bypass

Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #17— Swinomish Bypass – Note: AC wants to consider forming a joint subcommittee to determine: • **What would be an acceptable design for the Swinomish bypass?** • **Under what circumstances would this bypass be acceptable?** • **Would the bypass channel be wet, dry, farmland, or is there a hybrid approach?** • **What would the design features be?** • **What could the different interests live with?**		
Recommend continued evaluation/project development. ▪ Different generation of Avon bypass project ▪ Skepticism that it will ever get built because of cost ▪ Only project that would actually stop flooding in lower valley, although stopping flooding may not be best thing for farming in lower valley ▪ Skepticism that cost would be prohibitive – don't have enough information to make this determination ▪ Would have to be done in a way that would have substantial fish and wildlife benefits ▪ What is level of knowledge about possible fish benefits? ▪ Design dictates a lot – which of the following is it? o Dry bypass o Wet bypass o Grass weir o Hybrid ▪ If it's to stay on the list, project needs better definition ▪ Salmon money could be possible if wet channel design ▪ Could decide through the following: 1. If only wet acceptable for environmental interests 2. If only dry acceptable to farming community 3. Then not worth pursuing ▪ Expense of operation is extremely high. o Would have to create new dike district o Conflicts with existing infrastructure – pipelines o Annual maintenance needs and requirements ▪ Under what circumstances could people support – possible TC assignment ▪ Measure 38 could interact with this one – possible outlet for interior drainage ▪ Real estate would have to be purchased by County ▪ Concern about dropping this project off before we have more conclusions from the hydrology – may or may not need this project based on that.		

Table 1 (cont) – Advisory Committee Input on Skagit GI Measures

MIDDLE/LOWER BASIN - Bypass

Measure #18— Fir Island Bypass– See notes above under Measure #17			
AC	**Recommend continued evaluation/project development.** ▪ Note that DDD prefers setback levees to bypass in this area ▪ Environmental perspective – bypass has potential for big ecosystem restoration because of fish access to center of bay. Could be biggest restoration project potential in Puget Sound ▪ General question – will dike and drainage districts assume ownership and maintenance for new projects in their service area? ▪ Although this (and other bypass projects) is shown as straight channel, in fact it would not be. ▪ Wet, dry, or grass channel? ▪ Possible funding through salmon money is good reason to keep it on the list ▪ Connects to measure #38 (interior drainage) too ▪ Concern about south fork closing off. May not be hydrologically sustainable to distribute flow among three channels.		
Measure #19— Samish Bypass– See comments under measure #17. To be discussed in greater detail at April 20th AC meeting			
DD	Red – As presented. Yellow - If frequency is greater than 75 year event and low velocity flows. Design needs to focus on existing low areas and include interior drainage and outfall structure.	Flow, velocity, use frequency, flow pathwa	Lower basin measures
ENV	Yellow – Same as # 17, acceptable range of flows (when initiated and how much); design needs to include "significant" restoration	Biggest issues are: fish stocks and sedimentati on	Yes
LU	Red		
AC	**Recommend continued evaluation/project development?**		
Measure #20— Mount Vernon Bypass– See comments under measure #17 - To be discussed in greater detail at April 20th AC meeting			
DD	Red – As presented.		
ENV	Yellow – Same as #18, acceptable range of flows (when initiated and how much); design needs to include "significant" restoration	Year round flow impact to low flows	Yes
LU	Red		
AC	**Recommend continued evaluation/project development?**		

AC = Advisory Committee; DD = Drainage District Technical Committee; ENV = Environmental Technical Committee; LU = Land Use Technical Committee

Table 1 (cont.) – Advisory Committee Input on Skagit GI Measures

SPOT ISSUES – Ring Dikes

Committee	Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #31— Burlington Ring Dike			
AC	**Recommend dropping from further analysis by GI and CFHMP** ▪ Burlington does not want; prefer levee certification project below		
Measure #32— North Mount Vernon Ring Dike			
AC	**Recommend continued evaluation/project development** ▪ City of Mt. Vernon does not support this configuration – would probably like it to be further west. ▪ Difficult for AC to support without support and participation from Mt. Vernon. ▪ Expression that this is important project to protect freeway, railroad, and connect to downtown Mt. Vernon project ▪ Suggest support, but must connect on both ends ▪ Supported by DD17 to preserve farmland and protect critical infrastructure ▪ Need updated configuration – actual map with lines on it ▪ Needs to be linked with other project – AC wants to see how this connects to other projects		
Measure #33— West Mount Vernon Ring Dike			
AC	**Recommend dropping from further analysis by GI and CFHMP** ▪ MV does not like this concept		

Table 1 (cont.) – Advisory Committee Input on Skagit GI Measures

SPOT ISSUES – Ring Dikes

Committee	Comments (Focused on Criteria)	Missing Info.	Linkage with Other Measures
Measure #34— East Mount Vernon Ring Dike			
AC	**Recommend continued evaluation/project development** ▪ Support from WSDOT and MV ▪ No environmental benefit. Would need to combine with mitigation projects. Would not support as standalone as this would have environmental impact. ▪ May impact restoration project on opposite bank. ▪ What is linkage to other projects? ▪ Is there another project that would achieve similar outcome with less environmental impact? ▪ Problems – doesn't really connect into high ground. Levee setback in DD3 is probably a better project. ▪ MV wants 100 year flood protection for everything within City limits. What the specific project is will be fleshed out for each area.		
Measure #35— La Conner Connector Dike			
AC	**Recommend continued evaluation/project development** ▪ Environmental concerns may focus on Sullivan Slough ▪ La Conner needs this project no matter what else is done. Environmental restoration would be part of the project ▪ Suggest rename from La Conner Ring Dike to La Conner Connector Dike		
Measure #36— Clear Lake Ring Dike			
AC	**Recommend continued evaluation/project development** ▪ Part of 1979 Corps project. Protects downtown Clear Lake from river coming over Highway 9. Most important is that Beaver Lake area still rising after water going down in this area. Flows up East Nookachamps Creek and down Beaver Creek. Very important project ▪ Needs good environmental analysis – fish use this area as a refuge during high flows		

Table 2 – Locally Developed Projects for April 20th Meeting

Comments (Focused on Criteria)	Missing Info.
Measure #31A— Burlington Levee Certification Project	
Recommend continued evaluation/project development. Need more project information • Burlington project (from MF) not ring dike. Certify existing levee segments. • What is Plan B? Only project being considered by Burlington • Need to keep in mind that cities are doing reasonable thing to try to get lower flood levels on FEMA maps. Only way to do this is through levee certification. Also provide greater protection against flooding. • Flaws in data that may indicate this project not needed? Skepticism that flow through railroad bridge limited to 170,000 cfs. If you assume more water can get through, then problem is not as severe for Burlington. Trouble is then you have to get rid of the water somehow. Historically you would only have had that happen once in the last 87 years. Some belief that don't need to certify levees, just need to make a way for more water to pass through that bridge corridor. Railroad bridge is a safety hazard – desire to pressure BNSF to remove bridge. **From ETC - Response**: The project is ill defined, but appears to include levee setbacks and extensions. All setbacks should meet ETC project selection/screening criteria including the removal of hardened bank, old levees and restoration components. There should be no new hardened levees along the river. **From LUTC – Response:** The City of Burlington and Dike District #12 has issued a draft environmental impact statement on this measure with some project details. The City and District are now considering how best to respond to comments received during the public comment period. Revised site plans (see attached pdf documents #1 and #2) showing levee location and flood inundation areas were provided to the LUTC by Margaret Fleek, Planning Director, City of Burlington. Chal Martin, P.E., Public Works Director/Engineer for the City of Burlington, will provide additional information and respond to any questions pertaining to this measure at the next Dike and Drainage Technical Committee Meeting and at the 4/20/09 AC meeting. **From D&D District TC – Response:** Burlington's AC presentation to include "09 04 09 Basic Comparison ….PPT.	

Table 2 (cont.) – Locally Developed Projects for April 20th Meeting

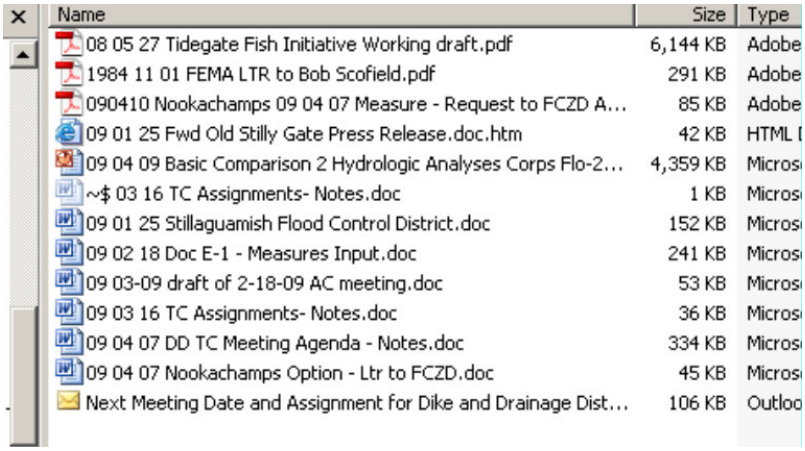
Comments (Focused on Criteria)	Missing Info.

Potential Measure #38 - Need interior drainage projects to handle excess flows – From Dike and Drainage District Technical Committee – Needs better definition from Dike and Drainage District

- Need to identify locations to direct overland flow to discharge via control structures into Samish, Padilla and Skagit bays.
- Everything needs to be engineered from the bottom to upstream.
- Drainage or flood damage reduction? Flood damage reduction. Idea is reduce velocity of water coming onto and off the floodplain. And reduce water surface elevation. Increase capacity of drainage system. Also reinforcing the downstream face of road embankments to reduce erosion.

From D&D District TC – Response: Response:

A) See list of documents provided (email attachment).



Name	Size	Type
08 05 27 Tidegate Fish Initiative Working draft.pdf	6,144 KB	Adobe
1984 11 01 FEMA LTR to Bob Scofield.pdf	291 KB	Adobe
090410 Nookachamps 09 04 07 Measure - Request to FCZD A...	85 KB	Adobe
09 01 25 Fwd Old Stilly Gate Press Release.doc.htm	42 KB	HTML
09 04 09 Basic Comparison 2 Hydrologic Analyses Corps Flo-2...	4,359 KB	Micros
~$ 03 16 TC Assignments- Notes.doc	1 KB	Micros
09 01 25 Stillaguamish Flood Control District.doc	152 KB	Micros
09 02 18 Doc E-1 - Measures Input.doc	241 KB	Micros
09 03-09 draft of 2-18-09 AC meeting.doc	53 KB	Micros
09 03 16 TC Assignments- Notes.doc	36 KB	Micros
09 04 07 DD TC Meeting Agenda - Notes.doc	334 KB	Micros
09 04 07 Nookachamps Option - Ltr to FCZD.doc	45 KB	Micros
Next Meeting Date and Assignment for Dike and Drainage Dist...	106 KB	Outloo

B) Members also mentioned other studies that include:
LBS Drainage Study dated 1984
Evaluation Areas Report completed by Tetra Tech for the County / Corps – 2002
HDR report dated 2008 (no other information on this report provided)

C) Group continues to request additional modeling (where does the water go and how much) before the this question can be answered.

D) Site visit planned for April 23rd. Trip summary attached.

Table 2 (cont.) – Locally Developed Projects for April 20th Meeting

Comments (Focused on Criteria)	Missing Info.
Potential Measure #38 (cont.) - Need interior drainage projects to handle excess flows – From Dike and Drainage District Technical Committee – Needs better definition from Dike and Drainage District	
From ETC - Response: Since there are no specific projects being proposed at this time the ETC will only offer a general response comment. Any changes to existing drainage infrastructure should minimize the stranding of fish; include consideration for safe collection and passage of fish to waterways/bay; and for restoration of fish habitat. **From LUTC – Response:** The LUTC acknowledges that this is an important concept for any flood reduction measure that results in flood water exiting its natural watercourse. Once these overtopping or spillage sites are located, detailed provisions for the expedited conveyance and removal of that water back to a natural watercourse or bay will be necessary. The urban areas should not be used as spillage or drainage pathways.	

Table 2 (cont.) – Locally Developed Projects for April 20th Meeting

Comments (Focused on Criteria)	Missing Info.
Potential Project - Habitat restoration projects in Upper basin tributaries – From Environmental Technical Committee – Needs better definition from Environmental Technical Committee	
• Habitat restoration projects in Upper basin tributaries could be evaluated for habitat restoration projects with flood damage reduction potential. • Benefits include reduction in sedimentation and LWD (mass wasting) and increased off channel flood water attenuation (storage). • Possible locations include Hansen, Coal, Wiseman, Jones creeks etc. • Sources of information include the Chinook Recovery Plan and the Skagit Watershed Council strategy document and "Three year list." **From ETC - Response**: There are no new specific habitat restoration projects being proposed at this time. Rather the ETC recommendation was to consider future restoration of the upper river tributaries (primarily the north side; e.g., Hansen Creek) if needed for mitigation or as stand-alone restoration projects. Restoring these tributary natural processes should have multiple benefits including increased flood storage and reduced sedimentation. It is acknowledged that flood risk reduction from any individual upper tributary restoration project is probably minimal. **From LUTC – Response:** The LUTC does not have any information/comments related to this task at this time. **From D&D District TC – Response:** The D&D District TC does not have any information/comments related to this task at this time.	
Emergency Overflow Spillway – New From Larry Kunzler	
Description Widen the 3 bridge corridor 500 feet (or more) and install an emergency overflow spillway (not to be confused with an overflow levee) in the Avon area. This spillway would only be activated when flows reach 145,000 cfs at the Mt. Vernon gage. In the last 82 years, the spillway would only have had to be used once and possibly twice (1990 and 1995). The floodwaters would then flow naturally towards Padilla Bay, which is where they are going to flow anyway during a major flood event. It's not like we would be spilling the entire flow of the river. During the 1990 flood event, the spillway would only have been spilling water for a period of 11 hours for an average of 5,100 cfs per hour. We would have to make sure that the water did not cross Highway 20 by either installing a berm on the south side of the highway or by raising the highway. Granted, during a 100-year event the spillway could be spilling as much as 30-50,000 cfs but what is the alternative? To have the water flow through the City of Burlington or be forced into the Samish River Basin?	

Table 2 (cont.) – Locally Developed Projects for April 20th Meeting

	Comments (Focused on Criteria)	Missing Info.
Emergency Overflow Spillway – New From Larry Kunzler (cont)		

There would be many benefits to the spillway approach:

- It would allow the flood waters to pass the City of Burlington and spill onto the floodplain in a safe manner before it reaches the City of Mt. Vernon thus saving the Urban areas from catastrophic flooding and cutting the cost of the current proposals drastically (i.e. the Mt. Vernon floodwall wouldn't have to be anywhere near as high as is currently being proposed).
- By allowing the farmland to be subject to flooding (once in the past 82 years) it would preserve the farmland from urban encroachment. Fir Island and Samish River flooding would be drastically lowered.
- By designating the area as a floodway it would prohibit further development in the natural corridor where under current conditions the floodwaters are going to go anyway thus decreasing future damages. Further, it would keep the floodway designation out of the Urban areas which under current conditions in all likelihood it will be placed.
- Out of all the projects looked at, this could be the most affordable; provide the most benefits, meet the three E's, perhaps even be acceptable to the majority of the voters who should have the final say in any proposed project. Admittedly, the people living in this floodway corridor would object, but what they must realize is that if we do nothing, which is what we have done for the last 100 years, during any catastrophic levee failure or even if the levees hold under current conditions the water will end up in that corridor as they have in so many floods in the past.
- What about the fish you ask? Wouldn't providing an emergency overflow spillway put fish out onto the floodplain? The simple answer is yes. Once in the last 82 years we would have impacted some fish. In the last 82 years, there have been many levee failures. The most recent on Fir Island in 1990. How many fish were impacted by the levee failures? If there were no levees, how many fish are stranded on the floodplain? The fish issue like any other adverse impact can be mitigated if given a chance.

Table 2 (cont.) – Locally Developed Projects for April 20th Meeting

Comments (Focused on Criteria)	Missing Info.

Additional Comments and Ideas from Technical Committees

Environmental Technical Committee:

1) The ETC respectively recommends that a review of the research of hydrologic effects of forest practices on flooding be addressed in the Skagit GI environmental baseline reports and the updated CFHMP. Published research suggests the impact of current forestry practices is scale-dependent and not detectable downstream during major flood events.
2) A collaborative, multi-agency effort is underway to link climate and hydrology models to produce an inundation map using the best predictions of climate change. Ideally this information should be incorporated into the Skagit GI and updated CFHMP when available.

Land Use Technical Committee

Identify any additional local projects to include in measures screening.

Response:

1. LUTC requests that the Nookachamps Flood Reduction Project (Skagit GI Measure #4) be redesigned to meet environmental concerns and further studied as a possible Skagit GI and CFHMP project. See attached supporting pdf documents #3 and #4.
2. LUTC notes that earlier flood reduction studies (see site plan pdf attachment #5) had considered additional overtopping/spillage locations than that currently being proposed in Skagit GI measure #9. The Skagit GI and CFHMP should further study these additional locations or provide rationale for their elimination.
3. LUTC forwards proposal from WSDOT (see site plan pdf document #6) to extend Mount Vernon flood wall project (Skagit GI measure #16) to include protection of Interstate 5 and BNSF railway south of Mount Vernon.

Dike and Drainage District Technical Committee

Burlington Nookachamps letter requested by DD TC.

Criteria Used by Technical Committees in their original consideration of Measures (NOTE: For this Document E-1 these are only applicable to Measures #19 and #20, page 12)

Dike and Drainage District Technical Committee Screening Criteria

First Tier – Fatal Flaw criteria

1. Does the project maintain or improve Public Safety and critical infrastructure protection when compared to existing flood risk?
    a. Reduce the potential for levee failures?
    b. Increase conveyance efficiency of the existing levee system?
    c. Reduce risk of catastrophic failure due to inadequate interior drainage?
2. Can the project be implemented without increasing the flood risk up and downstream of the project area? If no, can the increased risk be mitigated?
3. Can the project maintenance and operations be sustained locally?
4. "Will the project reduce risk to soils and drainage in agricultural resource lands."

Key point: Projects need to be designed from bay-front up to address interior drainage and downstream impacts.

Land Use Technical Committee Criteria Recommendations

LUTC recommended the original Option #2 from Document C (AC Meeting 12/15/08)

OPTION 2: THEMES FROM THE TECHNICAL COMMITTEES

1. Critical infrastructure protection
2. Other existing infrastructure protection
3. Minimal known land use conflicts
4. Minimal known regulatory conflicts
5. Could be designed to benefit multiple objectives
6. Degree of environmental impact/mitigation and could it be designed for ecoysystem benefits
7. Timeliness of implementation
8. Cost
    - Capital
    - Land acquisition
    - Maintenance
    - Cost-benefit
9. Perceived community acceptance
    - Shared burden
    - Impacts to privately-owned land

Environmental Technical Committee "Fatal Flaw" Screening results 1/26/2009

Criteria Applied:

1. Does the project demonstrate a significant net gain in natural riverine processes? In particular, does the project:
    a. Improve natural flood water conveyance?; and
    b. Preserve or improve channel migration, and floodplain processes and reduce bank hardening?; and
    c. Improve / restore riparian processes?
2. Does the project improve or preserve estuarine, near shore and marine processes, habitats, and resources?
3. Does the project demonstrate improvements to flood related Water Quality and contamination problems?
4. Can the project work in synergy with other planned actions i.e. up and downstream effects need to be evaluated and addressed?

Key point: No new bank armoring; existing bank armoring needs to be removed with minor excavation as needed to install effective fish habitat features.

Comments from the City of Mount Vernon about the USACE Skagit GI Measures that have a direct and significant impact on the City of Mount Vernon

Measure 16 – Mount Vernon Floodwall

Part of the GI Measures slide show mentions four "Potential Disadvantages" to the MV Floodwall.

The City has some level of concern with all four of the potential disadvantages comments.

- ***Does not provide significant flood protection as a standalone project*** – The floodwall will provide significant flood protection to downtown Mount Vernon. The City can show that this is the case with both the ACE GI Hydrology model and the Cities own modeling.
- ***Impacts to commercial structures (i.e. parking) –*** The Downtown and Waterfront Master Plan, which the flood wall is a key part of, calls for the replacement of all parking plus more in the downtown area. A parking structure will be built between the transportation hub and the waterfront. No long term affect on commercial business. The retail business will be replaced and additional upscale residential condos will allow local residents the full enjoyment of the Skagit River.
- ***Restricts public access to the river –*** The City will remove the existing parking revetment which is currently a restriction to public access to the river. The City intends to increase the density of downtown, building on and enhancing existing retail activity along First Street to create a vibrant, attractive and safe waterfront and downtown, with enhanced public access to the shoreline and river, new and improved public amenities, and mixed-use redevelopment that will generate new jobs and create housing that preserves the character of downtown Mount Vernon. It is a place where people come to live, work, and play, enjoying the riverfront promenade, boutique shopping, fine dining, and entertainment of all sorts. Its public spaces are enlivened to include a farmer's market and live music. People will come for its fairs, festivals, and riverfront setting.
- ***Need to determine if impacts to historic buildings –*** The City has completed the NEPA process and consultation with the tribes. As part of the NEPA process the City has a firm inventory of all the significant buildings within the area of impact. Of all the buildings in the area of impact only one was found to be of historic significance, the Eddy Laughlin building. The City mitigated the impacts of demolishing the building by working with the Skagit County Historical Museum and an architectural salvage company to save those building elements which have some value before we raze the building. The City of Mount Vernon inventoried the historic buildings within the entire downtown area. The City has all of the concerns addressed in a Memorandum of Understanding between the City, Washington State Historic Preservation Officer (SHPO), and the Skagit County Historical Museum.

On an additional note related to the floodwall and Skagit GI hydraulic model. It has come to the City's attention that the historic sandbag wall is not included in the existing conditions hydraulic model. The City has historically constructed flood protection along Main Street during every major flood event. In addition the City has recently purchased a mobile flood fence and constructed a concrete footing to further assure that the flood fighting operation in downtown Mount Vernon is facilitated. The City's concern is that if a 4-foot flood or sandbag wall is not included in the existing conditions hydraulic model but the proposed 4-foot Mount Vernon Flood Wall is added to the future conditions (measures) hydraulic model then the future conditions model may indicate changes in upstream and/or downstream conditions that, in reality, do not exist.

It is completely understandable that modeling protocols need to be followed. However, the decision makers and public still needs to understand what the actual impacts of the Mount Vernon Flood Wall will be. If the ACE modeling protocols require only permanent structures can be placed within the existing hydraulic model then this should be noted in any report. Any hydraulic report or modeling results associated with the change in conditions related to the floodwall should be fully explained to include the fact that upstream and downstream impacts may be insignificant or none at all due to the fact that the historic City of Mount Vernon sandbag wall was not included in the existing conditions hydraulic model.

Measure 20 – Mount Vernon Bypass

The bypass has some very good advantages and could provide substantial flood protection especially in conjunction with the floodwall.

One concern worth mentioning is low flow design. The City of Mount Vernon is working extremely hard to create a waterfront and downtown environment that enhances the public access to the shoreline and Skagit River. Many of the envisioned uses, like the farmers market, live music, fairs, and riverfront festivals, would take place during the traditional low flow season. The City would like to see a design that keeps the maximum amount of the river's low flows along Mount Vernon's historic downtown waterfront area.

The City appreciates all of the USACE's hard work and dedication. We look forward to an ongoing relationship and future successes.

Take care,

Blaine Chesterfield

Engineering Manager
Program Coordination Division
Public Works
City of Mount Vernon