MEMORANDUM

Date: July 19, 2023
To: Chehalis Basin Board
From: Nat Kale, OCB Director
Re: Advancing LAND Alternative Infrastructure Elements, Structures Database, and Review of Local Jurisdiction Comprehensive Plans and Development Codes

Overview

This memorandum provides a summary of recommended next steps to refine several elements identified through the Local Actions Non-Dam Alternative (LAND) process and support the Board's upcoming comparative evaluation. OCB staff will request a Board decision to advance these next steps at the August 3 Board meeting.

At the June 1 Board meeting, Board members requested OCB staff develop more detailed scopes of work for Board approval that could be included in a future Request for Qualifications (RFQ) and a timeline for completing technical studies to advance the LAND Alternative and inform the Board's timeline for developing the long-term strategy. Board members also requested OCB staff develop recommendations on how to move forward any other tasks that would not be included in a future RFQ, and to clarify whether the work is meant to advance LAND, CFAR, or the Strategy as a whole.

Next steps are summarized in the following three sections:

- LAND Infrastructure Elements Alternatives Analysis
- Update Structures Database
- Review of Local Jurisdiction Comprehensive Plans and Development Codes

LAND Infrastructure Elements Alternatives Analysis

The LAND Alternative proposes a variety of programs, policies, and projects. The infrastructure elements of the LAND are the diversion channel near Mellen St., the conveyance improvements also near Mellen St., and the levees. Based on Board direction, Staff have developed the scope of work included as Appendix A to this memo to advance the work related to these major infrastructure elements. This scope would be included in a future RFQ and is divided into the following sections:

- Task 1: LAND Infrastructure Elements Alternatives Analysis
  - Subtask 1.1: Project Workplan and OCB, Steering Group, and Board Coordination
  - Subtask 1.2: Size and Location Refinement Analysis of Interrelated Structural Interventions

- Subtask 1.3: Desktop Review Geotechnical Risk Evaluation for the Diversion and Conveyance and Levee Options
- Subtask 1.4: Cultural Resources Consultation

Staff estimates that this work should be completed within **12-14 months** from the time a contractor is hired, to support a future comparative evaluation for Board decision-making on a long-term strategy. It is anticipated that the work will cost **approximately $400,000 to $600,000**, but the final amount will need to be determined once a final scope of work has been agreed upon with a consultant.

Completing this scope of work will create more accurate and precise estimates at a 10% design level of the cost, impacts, and benefits of the various LAND infrastructure alternatives. The work will be sufficient to inform the future comparative evaluation of packages of strategy elements, including benefit-cost analyses.

Staff recommendation: Staff recommends that the scope of work included in Appendix A in this memo be included in a future RFQ to complete an alternatives analysis of the major infrastructure elements of the LAND Alternative to further support the Chehalis Basin Board's decision-making process on the long-term integrated strategy.

Update Structures Database

The LAND Alternative and the Draft SEPA and NEPA Environmental Impact Statements for the proposed FRE rely on a database of structures created in 2017 for the mainstem of the Chehalis River. The Structures Database is a GIS layer containing spatial data (roofline delineation of each structure) and relevant information (e.g., land-use classification, finished floor elevation, assessed value, etc.) for structures in the floodplain.

Updated information, including information about structures along the Skookumchuck River, is needed to determine the actual scale of flooding impacts under the modeled late century 2080 flood extent. This information is important regardless of whether LAND, the FRE, or a combination of the two are advanced.

After discussion with Anchor QEA and Watershed Science and Engineering staff, the update to the structures database will likely be required for the Final EISs and potentially for the Skookumchuck dam evaluation. Therefore, this work does not to be completed through a separate RFQ process.

Staff recommendation: Staff recommends that Anchor QEA and Watershed Science and Engineering staff complete the update to the structure database, as this would already likely be required for the Final EISs and potentially for the Skookumchuck dam evaluation. The updated data can be used to refine and prioritize CFAR/Safe Structures costs and implementation

strategies and will be used in a future comparative evaluation to support Board decision making on a long-term strategy.

Review of Local Jurisdiction Comprehensive Plans and Development Codes

A review of local jurisdiction comprehensive plans and development codes is needed to provide technical and best practice information related to floodplain management and flood damage reduction. Local jurisdictions are beginning their State-mandated 10-year comprehensive plan update cycle now. Previously, development code and flood mapping audits have been completed by French & Associates, but implementation of those recommendations is incomplete or partial across jurisdictions. If recommendations have not been implemented, it is important to understand why, and if there are ways to reduce potential flood damage to existing and future development through comprehensive plan, mapping, and development code updates. This research can also provide local jurisdictions currently updating their comprehensive plans information to include in their decision-making.

The Community Flood Assistance & Resilience Program (CFAR) currently has an RFQ out to replace the floodplain management and land use technical assistance work previously completed by French & Associates.

Staff recommendation: Staff recommends that the new consultant hired to support the CFAR program include a review of local jurisdiction comprehensive plans and development codes as part of their scope. While not originally specified in the RFQ as a desired task, the new consultant is likely to have this expertise. If they do not, the Board can consider issuing a new, separate RFQ to advance this work.

Next Steps

At the August 3 Board meeting, following Board discussion, Staff will request a Board decision to advance the tasks as described in this memo.

Appendix A: LAND Alternatives Analysis RFQ Scope of Work

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SCOPE OF WORK

Under the direction of OCB, the CONSULTANT will complete an alternatives analysis of the major infrastructure elements of the LAND Alternative to further support the Chehalis Basin Board's decision-making process on the long-term integrated strategy. This is anticipated to include the areas of work as described below.

OCB and a Steering Group will provide guidance on the analyses in this scope of work, consistent with the direction set by the Chehalis Basin Board. In October 2021, the Chehalis Basin Board established Planning Assumptions and Outcomes to guide the development of the LAND Alternative, and these will continue to inform the evaluation of technical feasibility of LAND Alternative components.

To advance this tasking, the CONSULTANT will have access to all relevant data from the LAND projects, including existing hydraulic modeling data, technical reports, cost estimates, and preliminary conceptual designs created in the development of the LAND Alternative, and other supporting materials related to the LAND Alternative.

Task 1: Alternatives Analysis

Subtask 1.1: Project Workplan and OCB, Steering Group, and Board Coordination

The CONSULTANT will develop a Draft Project Workplan for OCB review and approval. This Workplan will describe the CONSULTANT's proposed approach for completing the work described in Subtasks 1.2 through 1.4 below and outline a schedule for the analysis and engagement with the Steering Group. Based on input from OCB and the Steering Group, the CONSULTANT will revise and finalize the Workplan.

The CONSULTANT will regularly coordinate with OCB and the Steering Group about the progress of the analyses and will proactively identify any issues, questions, and possible solutions for resolution. The CONSULTANT should assume participation in monthly meetings (approximately 2-3 hours each) with the Steering Group as well as associated planning meetings every other week with OCB during the project (approximately 1 hour each). The CONSULTANT will prepare agendas, co-facilitate, and prepare summaries of decisions and action items from Steering Group meetings and brief follow-up summaries from planning meetings with OCB. A final schedule for this work has not been determined, but for the purposes of this RFQ please assume two months of preliminary work with OCB and up to 1 year of Steering Group meetings (14 months total). Assume up to four of the Steering Group meetings to be held in-person in the Chehalis-Centralia area. In addition, the CONSULTANT will need to coordinate with OCB and a technical consultant that will support a future comparative evaluation and benefit cost analyses to support Board decision-making on a long-term strategy. For the purposes of this RFQ, assume four months of weekly 1-hour meetings.

The CONSULTANT will also provide briefings to the Chehalis Basin Board on the project. These are anticipated to occur at a minimum at the following milestones, some of which may be presented concurrently:

- Final Levee Feasibility Analysis
- Final Size and Location Refinement Analysis of Interrelated Structural Interventions
- Final High-Level Geotechnical Risk Evaluation
- Final Cultural Resources Consultation Memo

Assume one Board meeting will be attended in person and two will be attended virtually. They are full day meetings (seven hours) held on the first Thursday of the month at locations within the Chehalis River Basin. For the purposes of this RFQ, please assume three (3) total Board presentations.

Subtask 1.2: Size and Location Refinement Analysis of Interrelated Structural Interventions

The LAND Alternative identified several potential locations for new or expanded levees to protect against the late-century (2080) 100-year flood within or near urbanized areas in the Chehalis Basin. The potential levee alignments were highly conceptual (for preliminary hydraulic modeling purposes only) and have not been analyzed in depth for feasibility or potential community impact. Potential levees previously identified and included in existing hydraulic models are as follows:

- New ring levee in Adna around the new high school and commercial area
- New levee on the north bank of the Newaukum River east of I-5
- New and expanded levees on the north and south sides of the Skookumchuck River within Centralia
- New levee on the north bank of the Chehalis River from north of Fort Borst Park downstream to Galvin Road
- New levees on the north and south sides of China Creek from I-5 to the railroad tracks east of N. Railroad Ave
- New levee on the east side of I-5 from China Creek south to Salzer Creek then east along the north side of Salzer Creek until tying into high ground near Kresky Ave.
- Expand and raise the existing levee to provide flood protection to the Chehalis-Centralia Airport area

In addition to the potential locations for new and expanded levees, the LAND Alternative currently includes a proposed diversion and conveyance option that would require modifications to the floodplain to remove pinch points near the existing Mellen Street Bridge on the Chehalis River to increase conveyance during flood events. The current conceptual design of the diversion and conveyance option includes the following, and are included in existing hydraulic models:

- Constructing a new 700-foot wide, one-mile-long flow diversion by excavating approximately 1.3 million cubic yards of soil west of existing Mellen Street.
- Removing the existing Mellen Street Bridge and reconstructing it about 2,000 feet to the south, to connect Military Road west of the Chehalis River and I-5.

- Removing about 1.3 million cubic yards of soil along the right (east) bank of the Chehalis River, immediately upstream from the existing Mellen Street Bridge and for approximately 3,000 feet downstream of the existing Bridge to increase the ability of floodwaters to flow through this constricted area.

In coordination with OCB and the Steering Group, the CONSULTANT will refine the levee and diversion and conveyance concepts to a 10% level of design. For the purposes of this RFQ, 10% design level includes the following elements:

- Hydraulic modeling, with inundation mapping, hydraulic profiles, summary tables at pertinent locations. [Note: OCB will provide CONSULTANT with existing RiverFlow2D hydraulic model and results for their use.]
- AutoCAD drawings illustrating Plan, Profile and Section for the proposed levees and conveyance channel.
- Cost Estimates.
- Technical Memorandum summarizing modeling methodology and results.

Note that the size and scope of diversion and conveyance improvements will influence the required height and footprint of the levee options. The alternatives analysis will therefore need to evaluate a range of options including various combinations for these elements.

In coordination with OCB and the Steering Group, the CONSULTANT will conduct additional hydraulic modeling and design analysis to determine the size and locations of the diversion and conveyance and levee elements to achieve flood damage reduction, increase future implementation feasibility, and minimize impacts upstream and downstream. This analysis will include:

- Assess and refine the alignment, height, and footprint of levees to minimize impact to adjacent properties and uses.
- Assess the location and design of the diversion channel and extent of other conveyance improvements in relation to the location, size, and scale of the levee options, i.e., the size and scope of conveyance improvements will directly influence the size and scope of the levee options.
- Identify other locations, if applicable, where floodwalls, berms, or levees should be considered.
- Identify potential impacts to existing and proposed development including traffic impacts, stormwater impacts, viewshed impacts, neighborhood connectivity impacts, etc.
- Identify all properties that would need to be acquired, or for which easements would be required, to construct and maintain the proposed diversion and conveyance improvements and levees.
- Identify all streams, creeks, ditches, and stormwater systems that would be bisected by the proposed levees and whether these can be rerouted to other suitable locations or would require pump stations.

- Identify potential constructability and permitting issues or other aspects of the diversion and conveyance and levee locations and design that will be necessary to determine feasibility of each structure (e.g., wetlands and Waters of the State)
- Identify all traffic and utility improvements (e.g., bridges, reroutes, new easements or rights of way, etc.) that would be required as a result of the proposed conveyance and diversion features at a sufficient level to allow cost estimates of the proposed improvements.
- Identify major impacts to streams, wetlands, and other habitats and permitting/mitigation needs.
- Complete hydraulic modelling, using the existing RiverFlow2D hydraulic model, of different combinations and conceptual designs (10% design) of the diversion and conveyance and levee options. Results of the modeling should be evaluated for changes in values such as water surface elevations, inundation areas, flooding duration, and timing of flooding compared to the existing condition. Hydraulic model results (tabulated data, flooding extents, etc.) from the various alternatives evaluated will be used for creation of figures, tables, and documentation of findings in the draft and final report. For the purposes of this RFQ, assume modeling for up to 6 different scenarios (to be confirmed through the Hydraulic Modeling Work Plan), using three different flow events (e.g., 10-, 20-, and 100-year flows for future climate conditions using existing and available models).
- Based on the hydraulic modeling, identify upstream and downstream hydraulic impacts of proposed alternatives, including mapping the extent and magnitude of water level increases and an evaluation of any changes in timing of downstream flooding.
- Consider and, if applicable, describe how the diversion and conveyance and levee options would impact I-5 and other major transportation routes during major flood events, and coordinate with WSDOT, as needed to understand WSDOT's perspective. [Note: OCB will work in coordination with the CONSULTANT to facilitate engagement with WSDOT, as needed, throughout the course of the contract.]
- Develop capital and operating cost estimates for the diversion and conveyance and levee options to a sufficient detail to allow a rigorous QA/QC review of what was included/considered and what assumptions were made.

Based on the Project Workplan and input from the Steering Group, the CONSULTANT will prepare a Draft and Final Size and Location Refinement Analysis Report for OCB review and approval. This technical analysis will be conducted within the anticipated project timeframe of 14 months, through an iterative process that engages the Steering Group in understanding how key changes in the LAND structural components and modeling assumptions interact to optimize project outcomes. For the purposes of this RFQ, the CONSULTANT should assume at least three alternatives are identified in the final report that differently balance potential impacts, flood damage reduction, and future implementation feasibility.

Note that all community outreach and engagement associated with the refined LAND Alternative concepts will be conducted by OCB in consultation with the CONSULTANT.

Subtask 1.3: Desktop Review Geotechnical Risk Evaluation for the Diversion and Conveyance and Levee Options

In coordination with OCB and the Steering Group, the CONSULTANT will conduct a 10% design geotechnical risk evaluation of the proposed diversion and conveyance and levee options in the conceptual design refinements discussed in Subtask 1.2 to identify potential issues, such as soils or other geotechnical conditions that would prevent the diversion and conveyance and levee options from being constructed as conceptualized in subtask 1.2. Using published geology maps, the CONSULTANT would identify the key geotechnical factors that will govern a successful project, risks associated with different diversion and conveyance and levee types, mitigation strategies to address the geotechnical risks identified, and development of a "model" geotechnical sampling and analysis program that would be included in subsequent (design level) scope requests. Another consideration for the analysis is the composition of the levee embankment and source materials, e.g., what are the cost drivers to haul this material and build? What is the foundation preparation and mitigation needed to construct?

This study would focus only on major issues that would prevent the option from being feasible. The CONSULTANT will identify construction methods that would be required to address those issues as well as identify the approximate cost, time, and permitting needed for mitigation.

Based on the Project Workplan and input from the Steering Group, the CONSULTANT will prepare a Draft and Final Desktop Review Geotechnical Risk Evaluation Report for OCB review and approval.

Subtask 1.4: Cultural Resources Consultation

The proposed diversion and conveyance and levee concepts would require ground disturbance in or near areas with known cultural resources. The CONSULTANT will support an initial cultural resources review for the proposed diversion, conveyance, and levee concepts to further characterize cultural resources issues. Under the direction of OCB, the CONSULTANT will assist with the cultural resources consultation, consistent with the Governor's Executive Order 21-02. Activities are expected to include:

- Coordination with OCB, the Confederated Tribes of the Chehalis Reservation (Chehalis Tribe), the Quinault Indian Nation, the State Department of Archeology and Historic Preservation (DAHP), and the U.S. Army Corps of Engineers (USACE) to develop an understanding of cultural resources, as well as input on the approach for the desktop review. Coordination with other interested tribes (e.g., Cowlitz Indian Tribe and Nisqually Indian Tribe) may also be necessary pending input from DAHP and USACE.
- A desktop review of proposed diversion, conveyance, and levee project locations, including identification of known cultural resource locations within the potential project boundaries.
- Preparation of a draft and final written Technical Memorandum summarizing the results of cultural resources desktop review, including any further actions recommended to protect cultural resources should the project concepts advance to the design stage.

This task is intended to provide additional clarity and expectations of any future project related to cultural resources, especially if projects identified in LAND are of particular concern to affected tribal entities due to potential issues with the infrastructure elements.

Based on input from the Steering Group and in coordination with the parties listed in this task, the CONSULTANT will prepare a Draft and Final Cultural Resources Consultation Memo for OCB review and approval.