## Paul Pickett

Please see attached document.

## Performance-based approach methods document for site-specific natural conditions criteria

Public Comment Paul J. Pickett, P.E. May 21, 2025

My comments are based on a career of over 30 years as an Environmental Engineer at Department of Ecology. Most of that time I worked in EAP conducting TMDL studies, that typically included assessment of natural conditions.

## **Comments**

- 1. Step 1: Some discussion is needed regarding the seasonal variation in conditions and whether certain seasons represent critical conditions for the parameter of interest. In other words, the temporal boundaries and domain should also be considered.
- 2. Table 1 comments
  - a. Water Quality Observations, Marine Water: Natural Conditions could include data from reference areas with little human impact
  - b. Water Quality Observations, Fresh Water: Natural Conditions could include data from reference areas with little human impact. Also, modeling of the quality of freshwater inputs may need to be done to determine natural conditions for that input.
  - c. Hydrodynamics: Natural conditions should consider hydrodynamics absent changes from human activities, such as dredging, dredge disposal, bridges, infill of estuary areas, etc.
  - d. Other Observational Data: Natural Conditions could include data from reference areas with little human impact. These data should include nutrient flux between the sediment to the water column. Better yet, a separate row for sediment conditions should be added.
  - e. Freshwater Nutrient Inputs: it's not clear why this is a separate line it seems to already be addressed in the second row.
  - f. Point-Source Marine Discharges: Natural conditions should be no point source discharge. The statement "point source discharges reflective of no anthropogenic influence" makes little sense. If you are referring to stormwater runoff from a natural watershed absent urbanization and a conveyance system, you should specify that.
  - g. Meteorology: Mention should be made of microclimates and thermal refugia
  - h. Hydrology: Natural Conditions should specify flow regimes absent human impacts, with may require modeling or other analyses to determine changes in freshwater inflow volumes.
  - i. Oceanic Boundary Conditions: are boundary conditions always the open ocean? Some discussion should be made of marine boundary conditions that may not be natural due to human impacts outside the analysis domain. Budd Inlet TMDL is a good example.
  - j. Morphology: see comments about Hydrodynamics. These two items should be combined, since they address fundamentally the same issue.
- 3. Step 6: some discussion is needed regarding the potential need to use modeling of sources, such as sediment or freshwater inputs, as inputs to the marine model. The marine model may need more than just data collected by field measurements or lab sampling. In fact, the concept of

"input data" should be expanded to include modeling and other analyses used to develop model inputs.

- 4. Step 8:
  - a. "All human-caused impacts must be accounted for and removed using all existing, readily available, and credible information to develop the natural conditions scenarios." This statement somewhat contradicts the following statement "by removing all anthropogenic sources from the model simulation for those sources where it is feasible and practicable to model, and then estimating and removing the remaining anthropogenic sources where it is not feasible or practicable to model where existing and credible data are readily available". Some discussion should be included about the need to fully document the potential human impacts, the methods of addressing impacts, and any impacts that are infeasible to address, such as due to project scope.