

NWP Regional General Condition 5. Bank Stabilization:

As required by NWP Regional General Condition 5, please submit the following information:

a) The cause of the erosion and the distance of any existing structures from the area(s) being stabilized.

The banks of the Lower Satsop River are eroding in many places as part of the natural channel migration process. As the banks erode sediment is deposited along the opposite side, typically this process occurs gradually, however, it can also happen rapidly during floods or high-water events. Some of the factors that affect rates of bank erosion include soil composition, bank slope, land cover, and stream power. The characteristics of the banks at proposed project locations include a slope close to vertical with highly erodible silty clay loam soils, and insufficient riparian vegetation to provide needed soil cohesion on the outside bend of river meanders where stream power is concentrated.

The Port of Grays Harbor's water supply well is located approximately 10 feet from the downstream area where bank stabilization is required. The well is the only source of potable water to the Satsop Business Park. Keys Road is located approximately 240 feet from the upstream meander bend and 140 feet from the downstream meander bend.

b) The type and length of existing bank stabilization within 300 feet of the proposed project.

The proposed project will replace approximately 330 feet of rip rap placed at the toe of the bank with a timber revetment structure of the same length

c) A description of current conditions and expected post-project conditions in the waterbody.

Current conditions within the project reach are rates of erosion of up to 92 feet per year. Over the past two years areas with the worst erosion have receded 250 feet, with the greatest loss occurring during the November 2018 storm. Post project conditions are anticipated to reduce erosion and channel migration rates along the meanders that currently pose a threat to Keys Road and the Port of Grays Harbor well. Additional post project conditions will include higher quality habitat for aquatic species around the installed ELJ structures which will create habitat by scouring pools, sorting sediment for spawning, providing velocity refuge and supporting the production of allochthonous organic matter in the ELJs which support benthic macroinvertebrate productivity.

d) A statement describing how the project incorporates elements avoiding and minimizing adverse environmental effects to the aquatic environment and nearshore riparian area, including vegetation impacts in the waterbody.

The proposed project design has avoided and minimized adverse environmental effects to the aquatic environment and riparian zone through analysis of channel migration and erosion to focus bank stabilization actions in the most effective areas. The proposed project will use bioengineered ELJ structures to reduce stream power and stabilize banks. Rock, steel cable, steel chain and steel pin use will be minimized and only used where necessary to provide ballast and connect key wood to the supporting piles. Disturbance to existing riparian vegetation will be minimized by utilizing existing access routes and

Lower Satsop Keys Road Flood Protection project, Grays Harbor County, WA

Lat: 46.982143 Long: -123.482279, Township 17N, Range 6W, Section 6

designating temporary access routes and staging areas on unvegetated gravel bars. Bank stabilization locations have avoided wetland inlets to the maximum extent possible. Post project conditions will be similar to pre-project conditions with reduced erosion rates at meanders near Keys Road.

In addition to a. through d., the results from any relevant geotechnical investigations can be submitted if it describes current or expected conditions in the waterbody.

NWP 13: Bank Stabilization – Waiver:

Per NWP 13, for new bank stabilization projects, the discharge may not exceed 500 feet in length or an average of one cubic yard per running foot, as measured along the length of the treated bank, below the plane of the ordinary high water mark or the high tide line, unless the district engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects. Please provide information to support that the proposed bank stabilization is the minimum required to complete the work. Information that may assist in waiver justification includes but is not limited to:

- a) Site specific bank stabilization requirements
- b) Previous bank stabilization efforts (successes/failures)
- c) Reference sites

Bank stabilization is required to prevent damage to the Port of Grays Harbor's well and Keys Road. The proposed project will replace approximately 330 feet of failing rip rap placed at the toe of the bank with a bioengineered ELJ/ timber revetment structure of the same length. The rip rap in place is currently failing likely from the erosive power of the stream. This would not exceed the 500 feet length criterion. The timber revetment structure would have a high porosity and would not exceed the one cubic yard per running foot criterion, it would not move the top or toe of the bank further in to the stream or result in a loss of aquatic lands in excess of one cubic yard per linear foot of bank. Fish and other aquatic species would be able to use the interstitial and void spaces of the structure for refuge.