

BANK EROSION POTENTIAL INDEX (BEPI) WORKSHEET

Applicants and Department staff shall use this worksheet to calculate erosion intensity pursuant to ss. NR 328.38(2)

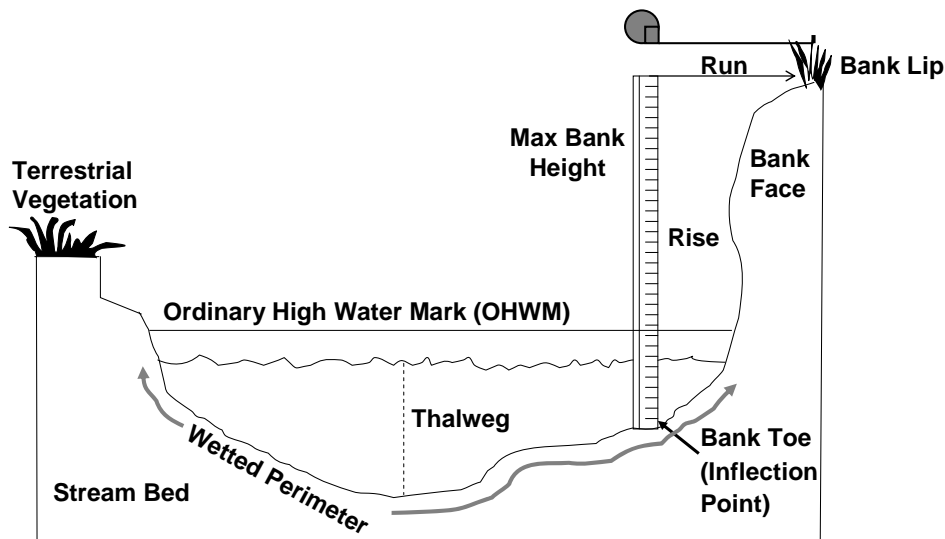
Name			Contact Person		
Mailing Address			Email Address		
City	State	Zip Code	Phone Number ()	Fax Number ()	

STREAMBANK VARIABLES	DESCRIPTIVE CATEGORIES Erosion Intensity Value is Located in Parenthesis at Bottom of Each Category Box.						SCORE
Bank Materials – predominance of bank materials at toe (between bed and ¹ OHWM on bank face).	Bedrock Outcrop Stop assessment BEPI=0	Cobble >3 inches (-10 points)	Silt/Clay (0 points)	Gravel <3 inches (5 points)	Sandy Gravel (7 points)	Non plastic sands and silts (10 points)	
Hydraulic Influence of Upstream Structures – distance (number of channel widths) to bridges, culverts, or dams. <u>Calculation:</u> Number of Channel Widths= Stream Distance to Structure <i>Divided by</i> the Average Channel Width	10+ channel widths (1 point)		5.1-10 channel widths (2 points)	2.1-5 channel widths (3 points)	0-2 channel widths (4 points)		
² Max Bank Height (feet) Divided by the OHWM Height (feet) <u>Calculation:</u> Max Bank Height / OHWM Height	1 – 1.19 Very Low or Low (2 points)	1.2 – 1.5 Medium (5 points)	1.6 – 2.0 High (7 points)	2.1 – 2.8 Very High (8 points)	>2.8 Extreme (10 points)		
³ Bank Slope (degrees) - measure rise/run and translate into angle degree <u>Calculation:</u> Bank Slope= Inverse Tangent (Rise/Run)	0 – 20 Very Low (1 point)	21 – 60 Low (3 points)	61 – 80 Moderate (5 points)	81 – 90 Vertical (7 points)	91+ Undercut (10 points)		
⁴ Stratification/ Bank Layering – type of soil layering occurring on the bank face.	No stratification (0 points)	No stratification, seepage present (3 points)	Stratified above OHWM (4 points)	Stratified above OHWM with seepage present, or stratified below OHWM (7 points)	Stratified below OHWM with visual seepage (10 points)		
⁵ Bank Vegetation – abundance of the vegetation, roots, and tree-falls occurring between the OHWM and the bank lip.	Rock outcrop bank– unable to support vegetation. (-7 points)	Dense vegetation <30% bare soil visible (-4 points)	Clumps of vegetation 30-59% bare soil visible (0 points)	Sparse vegetation 60-90% bare soil visible (4 points)	Vegetation absent >90% bare soil visible (7 points)		
⁶ Thalweg Location - deepest part of the channel and the location of stream current.	Located across the stream, against opposite bank (0 points)	Flowing down the center of the stream channel (2 points)		Immediately adjacent to bank proposed for erosion control (8 points)			
BEPI SCORE							

*****When the Department or applicants assess erosion at the bank stabilization site they shall apply methods outlined in the BEPI Worksheet above to calculate a bank erosion potential index (BEPI) score. For each continuous treatment site of 300 feet or less, applicants shall submit at least one BEPI assessment. For continuous treatments greater than 300 feet applicants shall conduct and submit BEPI assessments at 150 foot intervals along the treatment site.**

Note: The BEPI Worksheet is adapted from Rosgen, David L. "A Practical Method of Computing Streambank Erosion Rate", Wildland Hydrology Inc., Pagosa Springs, CO, 10 pp.

1. Ordinary High Water Mark (OHWM) means the point on the bank or shore up to which the presence and action of water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation or other easily recognizable characteristics. If bank material is composed of bedrock outcrop, stop with the BEPI assessment at this point; the reported total BEPI score is assumed equal to 0.
2. Maximum bank height means the vertical measure (feet) from the bank toe to the top of the bank lip, irrespective of changes in the water level. Bank toe is the inflection or bending point between the bank face and stream bed.
3. To measure the bank slope (degrees), the rise and run must be measured from the bank toe to the top of the bank lip. With your measure tape or stick, place the end firmly on the bank toe, parallel to the bank face and measure up to the bank lip to find the rise or max bank height. Subsequently, measure the run from the bank toe to the bank lip. From these measures, one should be able to calculate the bank slope with the formula 'bank slope= inverse tangent (rise/run)'. Additionally, a BEPI Calculator will be available soon on the Department's website. This website will automatically calculate the bank slope and BEPI score after inputting fields for bank materials, structures upstream, OHWM height, max bank height, distance to bank face, bank layering/stratification, bank vegetation, and thalweg location.



4. Stratification or bank layering means soils consisting of alternating layers of varying soils or textures.
5. Bank vegetation is the type and abundance of vegetation occurring between the ordinary high water mark (OHWM) and the bank lip. To assess the abundance of vegetation on the targeted bank, apply a 10 foot wide window of assessment from the OHWM to the top of the bank. The following percentages are assigned for the categories: bare soil visible over less than 30% of the surface area=dense vegetation; bare soil visible across 30-59% of the surface area= clumps of vegetation; bare soil visible across 60-90% of the surface area = vegetation sparse; bare soil visible across > 90% of the surface area = vegetation absent. Root wads, tree falls, and snags on the bank are considered in this assessment, because of their influence on thalweg, sediment transport, scour, and bank protection. After assessing the percentage of bare soil in the 'box', record its associated point value.

6. Thalweg means the deepest part of the channel or the location of fastest current. To find the thalweg, the channel must be divided into thirds. The applicant needs to perform one or a mixture of tests for the three segments in determining its location. The following tests are suggested: float an object such as an orange peel down the stream to find the segment of fastest current, find the segment with the bubble line visible at the water's surface, or find the deepest part of the channel, if safe. After locating the thalweg, record its proximity to the tested bank, adjacent (closest), center, or opposite (furthest) and record its associated point value.

