**Worksheet 11.** Computations of velocity using various methods (Rosgen and Silvey, 2005)**.**

## Bankfull VELOCITY / DISCHARGE Estimates

| Site | | Location | | Ref. Rch. Page # |
|---|---|---|---|---|
| Date | Stream Type | Party | | |

| INPUT VARIABLES | | | | OUTPUT VARIABLES | | | |
|---|---|---|---|---|---|---|---|
| Bankfull Cross-section AREA | | $A_{bkf}$ | (SqFt) | Bankfull Mean DEPTH $D_{bkf} = A_{bkf} / W_{bkf}$ | | $D_{bkf}$ | (Ft) |
| Bankfull WIDTH | | $W_{bkf}$ | (Ft) | Wetted Perimeter $\sim 2 * D_{bkf} + W_{bkf}$ | | $Wp_{bkf}$ | (Ft) |
| D84 @ Riffle | | Dia. | (mm) | D84 mm / 304.8 = | | D84 | (Ft) |
| Bankfull SLOPE (riffle) | | S | (Ft/Ft) | Hydraulic Radius $A_{bkf} / WP_{bkf}$ | | R | (Ft) |
| Gravitational Acceleration | | g | ($Ft/Sec^2$) | R (Ft) / D84 (Ft) | | | |
| Drainage AREA | | DA | (SqMi) | Shear Velocity: $u_* = \sqrt{gRS}$ | | $U_*$ | (Ft/Sec) |

| ESTIMATION METHODS | Bankfull VELOCITY | Bankfull DISCHARGE |
|---|---|---|
| 1. Friction Factor / Relative Roughness $u = \left[2.83 + 5.66 \log\left(R/D84\right)\right] u_*$ | Ft/Sec | CFS |
| 2. Roughness Coefficient: a) Manning's "n" from *friction factor / relative roughness.* (P188-189) | Ft/Sec | CFS |
| 2. Roughness Coefficient: b) Manning's "n" from Jarrett (USGS): $n = 0.039 S^{.38} R^{-.16}$ n = ____ $u = 1.4895 * R^{2/3} * S^{1/2} / n$ | Ft/Sec | CFS |
| 2. Roughness Coefficient: c) Manning's "n" from Stream Type n = ____ $u = 1.4895 * R^{2/3} * S^{1/2} / n$ | Ft/Sec | CFS |
| 3. Other Methods, i.e. Hydraulic Geometry; ( Darcy-Weisbach, Chezy C, etc.) | Ft/Sec | CFS |
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| 4. Continuity Equations: a) Regional Curves: $u = Q / A$ | Ft/Sec | CFS |
| 4. Continuity Equations: b) USGS Gage: $u = Q / A$ Return Period for Bankfull Q = ____ Yr. | Ft/Sec | CFS |