BF 13545 Hwy 22 Over Elbow River
Hydrotechnical Summary

Channel Capacity :

S = 0.0055
B = 40 m, h = 2 m, T_h = 60 m
Use AT equation

At Bank Height : Y = 2 m, V = 2.4 m/s, Q = 250 cms
At Channel Capacity : Y = 3 m, V = 3.3 m/s, Q = 550 cms

Historical Highwater Data :

HW has been observed in 1953 (Y = 1.5m), May 1967 (Y = 1.5m), May 1990 (Y = 1.5m), June 1995 (Y ~ 2.5m), and June 2005 (Y ~ 3m, note one report of HW to girders, but not consistent with other observations), and June 2013 (spur erosion, Y ~ 3m). A 1987 BIM report notes a HWM with Y = 2.0m. A washout occurred in 1945.

WSC gauge 05BJ006 (DA = 437km^2, 1967 – Now) reports Q = 180cms in June 1995 (rating curve suggests Y = 1.8m), with Q = 160cms (May 1967) and Q = 130cms (May 1990). Gauge 05BJ004 (DA = 790km^2, 1935 – Now) reports Q = 380cms (June 1995, stage rise = 2.5m, gauged at Q = 177cms and stage rise = 1.7m), and Q = 285cms in May 1967. Gauge 05BJ010 (DA = 1180km^2, 1979 – Now, 1995 missing) reports Q = 160cms in May 1990. Gauge 05BJ005 (DA = 1220km^2, 1934 – 1977, u/s of dam) reports Q = 270cms in May 1967. Gauge 05BJ001 (DA = 1230km^2, 1908 – Now, d/s of dam built in 1932) reports Q = 460cms (June 1923, gauged at Q = 413cms, stage rise = 3m), Q = 440cms (June 1929), and Q = 330cms (June 1932). The storm database indicates that the largest storm was in June 1929 with about 145mm, followed by June 1932 with about 115mm.

Basin Runoff Potential :

d = 70mm, T_p = 20 hrs, q = 1.0 cms/km^2.
Gross DA = 870 km^2.
Q_p = 870 cms.

Conclusion :

The channel capacity estimate is consistent with historic observations and is within the basin runoff potential.

Recommended parameters : Y = 3 m, V = 3.3 m/s, Q = 550 cms.