## Appendix B - Hehe Creek

PEAK DISCHARGES FOR SELECTED FREQUENCIES

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Watershed Name: HEHE CR

### PEAK DISCHARGE CALCULATION BY PREDICTION EQUATION

Peak discharges for the ungaged watershed have been determined from a set of hydrologic prediction equations derived using generalized least squares. The models relate peak discharges to physical watershed characteristics such as area and precipitation. The equations take this form:

```
Q(T)=(10.0^C0(T))*(CHR1^C1(T))* . . . (CHRn^Cn(T))
--------------------------------------------------
   Q(T)  =  Peak Discharge for Return Period T
   Cx(T) =  Coefficient x for Return Period T
   CHR1  =  The First Watershed Characteristic
   CHRn  =  The nth Watershed Characteristic
--------------------------------------------------
   Note: * = multiplication, ^ = exponentiation
```

For this ungaged watershed, peak discharges were estimated using prediction equations for this flood region:

WESTERN INTERIOR WATERSHEDS - > 2875 FEET AND < 3125 FEET

WATERSHED ELEVATION = 2890 FEET

For western interior watersheds with mean elevations between 2875 and 3125 feet, peaks are calculated as a weighted average of peaks estimated by the prediction equation for interior watersheds above 3000 feet and the prediction equation for interior watersheds below 3000 feet - using this equation:

```
--------------------------------------------------------------
      Qw(T)=Ql(T)*(3125-E)/250 + Qh(T)*(E-2875)/250
--------------------------------------------------------------
Qw(T) = Weighted Average Peak Discharge for Return Period T
Ql(T) = Peak Discharge for Return Period T for Low Elevation
Qh(T) = Peak Discharge for Return Period T for High Elevation
E     = Mean Watershed Elevation
--------------------------------------------------------------
         Note: * = multiplication, / = division
```

Prediction Equation for Interior Watersheds < 3000 Feet

```
-----------------------------------------------------------------------
Q(T)=(10.0^C0(T))*(X1^C1(T))*(X2^C2(T)*(X3^C3(T))*(X4^C4(T))*(X5^C5(T))
-----------------------------------------------------------------------
    Q(T)    =  Peak Discharge for Return Period T
    Cx(T)   =  Coefficient x for Return Period T
    X1      =  Drainage area                       (square miles)
    X2      =  Mean watershed slope                (degrees)
    X3      =  2-year 24-hour precipitation intensity  (inches)
    X4      =
    X5      =
-----------------------------------------------------------------------
              Note: * = multiplication, ^ = exponentiation
```

Prediction Equation Coefficients

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| Return Period T | Coefficients C0(T) | C1(T) | C2(T) | C3(T) | C4(T) | C5(T) |
|---|---|---|---|---|---|---|
| 2 | 9.607E-01 | 9.004E-01 | 4.695E-01 | 8.481E-01 | | |
| 5 | 1.162E+00 | 9.042E-01 | 4.735E-01 | 7.355E-01 | | |
| 10 | 1.267E+00 | 9.064E-01 | 4.688E-01 | 6.937E-01 | | |
| 20 | 1.351E+00 | 9.081E-01 | 4.633E-01 | 6.651E-01 | | |
| 25 | 1.375E+00 | 9.086E-01 | 4.615E-01 | 6.578E-01 | | |
| 50 | 1.443E+00 | 9.101E-01 | 4.559E-01 | 6.390E-01 | | |
| 100 | 1.503E+00 | 9.114E-01 | 4.501E-01 | 6.252E-01 | | |
| 500 | 1.620E+00 | 9.141E-01 | 4.365E-01 | 6.059E-01 | | |

Required Watershed Characteristics

| | | |
|---|---|---|
| Drainage area | (square miles) | 1.860 |
| Mean watershed slope | (degrees) | 26.300 |
| 2-year 24-hour precipitation intensity | (inches) | 2.880 |

Prediction Equation for Interior Watersheds > 3000 Feet

Q(T)=(10.0^C0(T))*(X1^C1(T))*(X2^C2(T)*(X3^C3(T))*(X4^C4(T))*(X5^C5(T))

| | | | |
|---|---|---|---|
| Q(T) | = | Peak Discharge for Return Period T | |
| Cx(T) | = | Coefficient x for Return Period T | |
| X1 | = | Drainage area | (square miles) |
| X2 | = | Mean watershed slope | (degrees) |
| X3 | = | 2-year 24-hour precipitation intensity | (inches) |
| X4 | = | Mean minimum January temperature | (degrees F) |
| X5 | = | Mean maximum January temperature | (degrees F) |

Note: * = multiplication, ^ = exponentiation

Prediction Equation Coefficients

| Return Period T | Coefficients C0(T) | C1(T) | C2(T) | C3(T) | C4(T) | C5(T) |
|---|---|---|---|---|---|---|
| 2 | -2.506E+00 | 1.021E+00 | 8.124E-01 | 2.050E+00 | 3.541E+00 | -1.867E+00 |
| 5 | -2.107E+00 | 1.020E+00 | 9.022E-01 | 1.649E+00 | 3.611E+00 | -2.017E+00 |
| 10 | -1.811E+00 | 1.021E+00 | 9.506E-01 | 1.471E+00 | 3.620E+00 | -2.137E+00 |
| 20 | -1.551E+00 | 1.021E+00 | 9.844E-01 | 1.352E+00 | 3.623E+00 | -2.246E+00 |
| 25 | -1.475E+00 | 1.021E+00 | 9.930E-01 | 1.321E+00 | 3.624E+00 | -2.278E+00 |
| 50 | -1.260E+00 | 1.022E+00 | 1.014E+00 | 1.243E+00 | 3.624E+00 | -2.366E+00 |
| 100 | -1.071E+00 | 1.022E+00 | 1.030E+00 | 1.182E+00 | 3.621E+00 | -2.440E+00 |
| 500 | -7.047E-01 | 1.023E+00 | 1.053E+00 | 1.079E+00 | 3.601E+00 | -2.566E+00 |

Required Watershed Characteristics

| | | |
|---|---|---|
| Drainage area | (square miles) | 1.860 |
| Mean watershed slope | (degrees) | 26.300 |
| 2-year 24-hour precipitation intensity | (inches) | 2.880 |
| Mean minimum January temperature | (degrees F) | 32.500 |
| Mean maximum January temperature | (degrees F) | 45.300 |

PEAK DISCHARGE ESTIMATES BASED ON PREDICTION EQUATIONS

| Return | Weighted | < 3000 ft | > 3000 ft |
|---|---|---|---|

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| Period | Peak | 95% Confidenc | | Peak | 95% Confidenc | | Peak | 95% Confidenc | |
|---|---|---|---|---|---|---|---|---|---|
| | Flow | Lower Limit | Upper Limit | Flow | Lower Limit | Upper Limit | Flow | Lower Limit | Upper Limit |
| years | cfs | cfs | cfs | cfs | cfs | cfs | cfs | cfs | cfs |
| 2 | 178 | 93.9 | 339 | 182 | 96.4 | 343 | 133 | 62.4 | 285 |
| 5 | 258 | 137 | 485 | 261 | 139 | 490 | 211 | 108 | 413 |
| 10 | 310 | 163 | 588 | 313 | 165 | 593 | 265 | 139 | 506 |
| 20 | 360 | 187 | 692 | 362 | 188 | 698 | 317 | 166 | 606 |
| 25 | 375 | 194 | 726 | 378 | 195 | 732 | 334 | 175 | 640 |
| 50 | 424 | 215 | 834 | 426 | 216 | 840 | 387 | 199 | 751 |
| 100 | 471 | 234 | 948 | 473 | 235 | 953 | 441 | 222 | 873 |
| 500 | 581 | 274 | 1230 | 582 | 274 | 1240 | 570 | 269 | 1210 |

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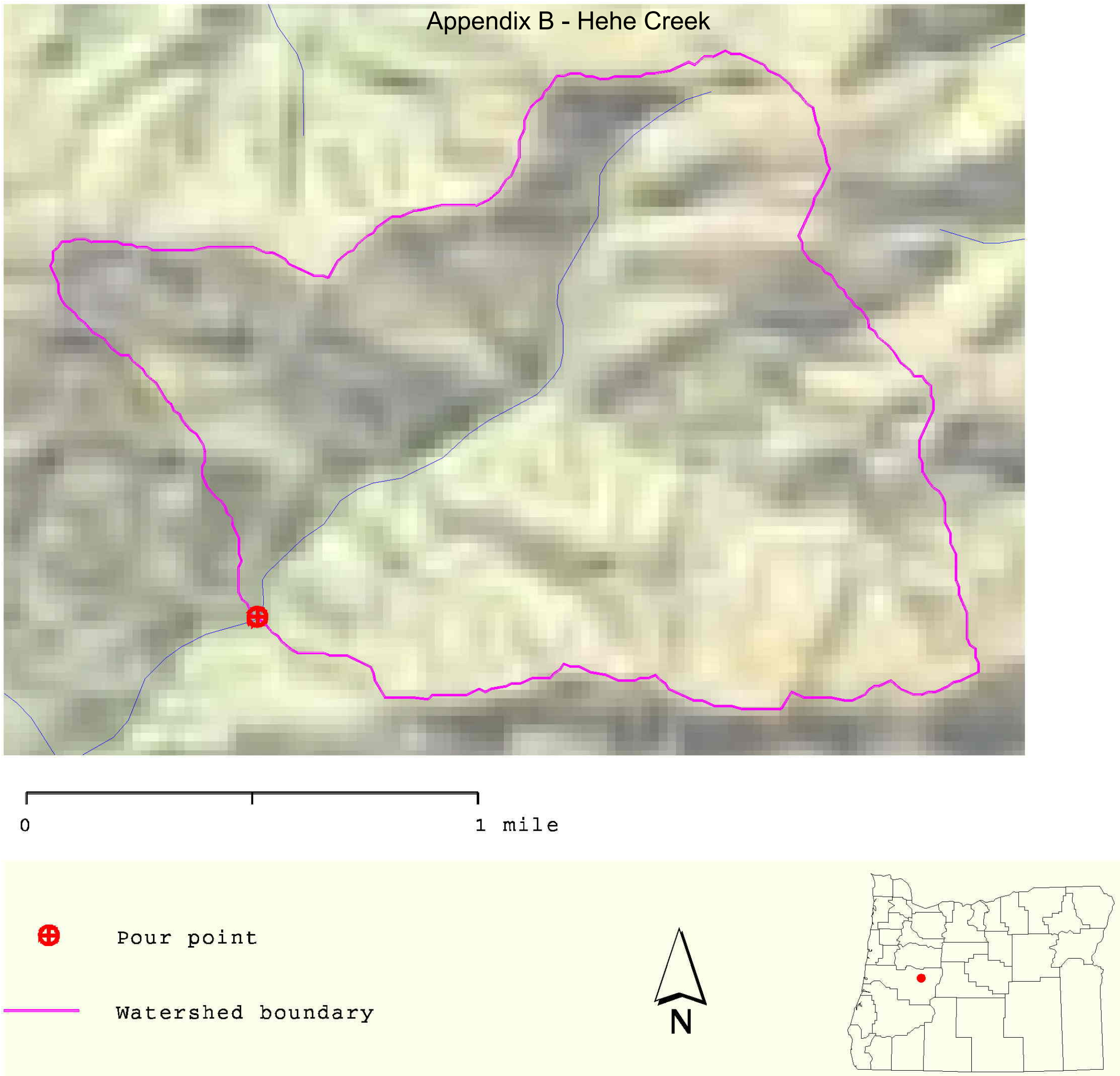


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