# APPENDIX D
# 4Q3 CALCULATIONS AND
# LAPLATA RIVER AREA-WEIGHTING

Log-Pearson Type III Statistics
SWSTAT 4.1
(based on USGS Program A193)

Notice -- Use of Log-Pearson Type III or Pearson-Type III distributions are for preliminary computations. User is responsible for assessment and interpretation.

09365000 San Juan River at Farmington
April 1 - start of season
March 31 - end of season
1966 - 2002 - time period
4-day low - parameter
37 - non-zero values
0 - zero values
0 - negative values (ignored)

| | | | | |
|---|---|---|---|---|
| 1132.500 | 390.750 | 289.750 | 452.500 | 914.750 |
| 458.000 | 422.500 | 349.500 | 1250.000 | 361.500 |
| 732.000 | 278.500 | 308.750 | 298.000 | 422.250 |
| 525.000 | 458.750 | 967.500 | 834.500 | 1165.000 |
| 826.750 | 1317.500 | 747.500 | 635.250 | 549.250 |
| 332.250 | 481.750 | 613.250 | 711.250 | 608.750 |
| 582.750 | 421.250 | 1030.750 | 433.750 | 735.750 |
| 515.250 | 551.500 | | | |

The following 7 statistics are based on non-zero values:

| | |
|---|---|
| Mean (logs) | 2.754 |
| Variance (logs) | 0.036 |
| Standard Deviation (logs) | 0.190 |
| Skewness (logs) | 0.255 |
| Standard Error of Skewness (logs) | 0.388 |
| Serial Correlation Coefficient (logs) | 0.161 |
| Coefficient of Variation (logs) | 0.069 |

| Non-exceedance Probability | Recurrence Interval | Parameter Value |
|---|---|---|
| 0.0100 | 100.00 | 222.761 |
| 0.0200 | 50.00 | 245.596 |
| 0.0500 | 20.00 | 285.684 |
| 0.1000 | 10.00 | 328.368 |
| 0.2000 | 5.00 | 391.133 |
| 0.3333 | 3.00 | 462.937 |
| 0.5000 | 2.00 | 557.387 |
| 0.8000 | 1.25 | 815.506 |
| 0.9000 | 1.11 | 1005.725 |
| 0.9600 | 1.04 | 1268.131 |
| 0.9800 | 1.02 | 1479.788 |
| 0.9900 | 1.01 | 1705.470 |

Calculated 4Q3

7 statistics were added as attributes to data set 101:

MEANND SDND SKWND NUMZRO NONZRO LDIST
L04003

Log-Pearson Type III Statistics
SWSTAT 4.1
(based on USGS Program A193)

Notice -- Use of Log-Pearson Type III or Pearson-Type III distributions are for preliminary computations. User is responsible for assessment and interpretation.

09368000 San Juan River at Shiprock
April 1 - start of season
March 31 - end of season
1966 - 2002 - time period
4-day low - parameter
37 - non-zero values
0 - zero values
0 - negative values (ignored)

| | | | | |
|---|---|---|---|---|
| 1035.000 | 239.500 | 110.250 | 479.500 | 928.250 |
| 298.000 | 313.500 | 78.500 | 1225.000 | 142.250 |
| 645.250 | 254.500 | 79.000 | 118.250 | 279.500 |
| 586.250 | 340.250 | 1010.000 | 739.500 | 909.250 |
| 923.750 | 1452.500 | 761.250 | 573.750 | 257.750 |
| 124.250 | 270.250 | 341.250 | 475.750 | 292.500 |
| 515.000 | 146.250 | 716.750 | 376.250 | 739.750 |
| 246.750 | 362.250 | | | |

The following 7 statistics are based on non-zero values:

| | |
|---|---|
| Mean (logs) | 2.580 |
| Variance (logs) | 0.116 |
| Standard Deviation (logs) | 0.341 |
| Skewness (logs) | -0.328 |
| Standard Error of Skewness (logs) | 0.388 |
| Serial Correlation Coefficient (logs) | 0.126 |
| Coefficient of Variation (logs) | 0.132 |

| Non-exceedance Probability | Recurrence Interval | Parameter Value |
|---|---|---|
| 0.0100 | 100.00 | 50.838 |
| 0.0200 | 50.00 | 66.345 |
| 0.0500 | 20.00 | 97.642 |
| 0.1000 | 10.00 | 135.891 |
| 0.2000 | 5.00 | 199.575 |
| 0.3333 | 3.00 | 280.382 |
| 0.5000 | 2.00 | 396.974 |
| 0.8000 | 1.25 | 743.066 |
| 0.9000 | 1.11 | 1007.322 |
| 0.9600 | 1.04 | 1369.594 |
| 0.9800 | 1.02 | 1654.857 |
| 0.9900 | 1.01 | 1949.938 |

Calculated 4Q3

7 statistics were added as attributes to data set 101:

MEANND SDND SKWND NUMZRO NONZRO LDIST
L04003

Log-Pearson Type III Statistics
SWSTAT 4.1
(based on USGS Program A193)

Notice -- Use of Log-Pearson Type III or Pearson-Type III distributions are for preliminary computations. User is responsible for assessment and interpretation.

09367500 LaPlata near Farmington
April 1 - start of season
March 31 - end of season
1939 - 2002 - time period
4-day low - parameter
30 - non-zero values
34 - zero values
0 - negative values (ignored)

| | | | | |
|---|---|---|---|---|
| 0.500 | 2.000 | 0.075 | 0.100 | 0.143 |
| 0.725 | 0.100 | 0.025 | 0.100 | 0.010 |
| 0.425 | 0.010 | 0.070 | 0.188 | 0.278 |
| 0.458 | 1.475 | 0.115 | 1.565 | 1.075 |
| 1.375 | 0.153 | 0.558 | 0.042 | 0.275 |
| 1.250 | 0.370 | 0.418 | 0.095 | 0.160 |

The following 7 statistics are based on non-zero values:

| | |
|---|---|
| Mean (logs) | -0.660 |
| Variance (logs) | 0.380 |
| Standard Deviation (logs) | 0.616 |
| Skewness (logs) | -0.430 |
| Standard Error of Skewness (logs) | 0.427 |
| Serial Correlation Coefficient (logs) | 0.141 |
| Coefficient of Variation (logs) | -0.934 |

| Non-Exceedance Probability | Recurrence Interval | Parameter Value | Adjusted Non-Exceedance Probability | Adjusted Parameter Value |
|---|---|---|---|---|
| 0.0100 | 100.00 | 0.005 | 0.5359 | 0.000 |
| 0.0200 | 50.00 | 0.009 | 0.5406 | 0.000 |
| 0.0500 | 20.00 | 0.018 | 0.5547 | 0.000 |
| 0.1000 | 10.00 | 0.034 | 0.5781 | 0.000 |
| 0.2000 | 5.00 | 0.069 | 0.6250 | 0.000 |
| 0.3333 | 3.00 | 0.129 | 0.6875 | 0.000 |
| 0.5000 | 2.00 | 0.242 | 0.7656 | 0.000 |
| 0.8000 | 1.25 | 0.736 | 0.9063 | 0.313 |
| 0.9000 | 1.11 | 1.247 | 0.9531 | 0.698 |
| 0.9600 | 1.04 | 2.101 | 0.9812 | 1.405 |
| 0.9800 | 1.02 | 2.880 | 0.9906 | 2.038 |
| 0.9900 | 1.01 | 3.773 | 0.9953 | 2.808 |

Calculated 4Q3

Note -- Adjusted parameter values include zero values and correspond with non-exceedance probabilities in column 1 and recurrence interval in column 2. Parameter values in column 3 are based on non-zero values.

Log-Pearson Type III Statistics
SWSTAT 4.1
(based on USGS Program A193)

Notice -- Use of Log-Pearson Type III or Pearson-Type III distributions are for preliminary computations. User is responsible for assessment and interpretation.

09364500 Animas River at Farmington, NM
April 1 - start of season
March 31 - end of season
1967 - 2002 - time period
4-day low - parameter
35 - non-zero values
1 - zero values
0 - negative values (ignored)

| | | | | |
|---|---|---|---|---|
| 111.500 | 111.250 | 95.000 | 156.500 | 190.250 |
| 92.750 | 6.000 | 201.250 | 7.850 | 189.000 |
| 94.000 | 10.900 | 20.750 | 132.750 | 162.500 |
| 147.000 | 303.250 | 272.750 | 258.500 | 231.500 |
| 379.250 | 226.000 | 261.250 | 99.250 | 82.500 |
| 169.750 | 187.250 | 241.250 | 122.000 | 142.250 |
| 211.250 | 225.500 | 202.250 | 14.375 | 84.750 |

The following 7 statistics are based on non-zero values:

| | |
|---|---|
| Mean (logs) | 2.050 |
| Variance (logs) | 0.209 |
| Standard Deviation (logs) | 0.457 |
| Skewness (logs) | -1.675 |
| Standard Error of Skewness (logs) | 0.398 |
| Serial Correlation Coefficient (logs) | 0.153 |
| Coefficient of Variation (logs) | 0.223 |

| Non-Exceedance Probability | Recurrence Interval | Parameter Value | Adjusted Non-Exceedance Probability | Adjusted Parameter Value |
|---|---|---|---|---|
| 0.0100 | 100.00 | 3.030 | 0.0375 | 0.000 |
| 0.0200 | 50.00 | 5.846 | 0.0472 | 0.000 |
| 0.0500 | 20.00 | 14.101 | 0.0764 | 6.603 |
| 0.1000 | 10.00 | 27.798 | 0.1250 | 19.607 |
| 0.2000 | 5.00 | 55.783 | 0.2222 | 47.573 |
| 0.3333 | 3.00 | 94.163 | 0.3518 | 88.790 |
| 0.5000 | 2.00 | 148.212 | 0.5139 | 143.054 |
| 0.8000 | 1.25 | 263.334 | 0.8056 | 260.709 |
| 0.9000 | 1.11 | 313.387 | 0.9028 | 311.832 |
| 0.9600 | 1.04 | 351.634 | 0.9611 | 350.803 |
| 0.9800 | 1.02 | 368.074 | 0.9806 | 367.562 |
| 0.9900 | 1.01 | 378.225 | 0.9903 | 377.931 |

Calculated 4Q3

Note -- Adjusted parameter values include zero values and correspond with non-exceedance probabilities in column 1 and recurrence interval in column 2. Parameter values in column 3 are based on non-zero values.

# 4Q3 derivations for portions of gaged SJR Basin streams

4Q3 ungaged = Qt(u) = Qt(g) X (Au/Ag)^0.566 Reference: USGS 1993
where
4Q3 = 4-day, 3-year, low flow frequency (cfs)
Qt(g) = 4Q3 at the gaged site (cfs)
Au = drainage area at the ungaged site (mi2)
Ag = drainage area at the gaged site (mi2)
Qt(u) = area weighted 4Q3 at the ungaged site (cfs)

| **Parameter** | **La Plata River (gaged portion)** | **La Plata River (ungaged portion)** |
|---|---|---|
| Ag (mi2) | 583 | |
| Au (mi2) | | 434 |
| Qt(g) (cfs) | 0.13 | |
| Qt(u) = 4Q3 ungaged (cfs) | | 0.11 |
| 4Q3 ungaged (mgd) | | **0.071** |