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## Anejo de cálculo Hidrológico e Hidráulico

### 1. Datos de partida de las estaciones seleccionadas

Estación de Tuéjar

|    | Lluvia (mm) | Mes        |
|----|-------------|------------|
| 1  | 24.7        | Diciembre  |
| 2  | 43          | Septiembre |
| 3  | 79          | Mayo       |
| 4  | 51          | Agosto     |
| 5  | 91          | Julio      |
| 6  | 58          | Diciembre  |
| 7  | 50          | Junio      |
| 8  | 71          | Julio      |
| 9  | 175         | Noviembre  |
| 10 | 29          | Octubre    |
| 11 | 77          | Marzo      |
| 12 | 44          | Agosto     |
| 13 | 40          | Junio      |
| 14 | 40          | Mayo       |
| 15 | 36          | Mayo       |
| 16 | 42          | Diciembre  |
| 17 | 55          | Diciembre  |
| 18 | 34          | Octubre    |
| 19 | 70          | Junio      |
| 20 | 50          | Octubre    |
| 21 | 50          | Noviembre  |
| 22 | 28          | Octubre    |
| 23 | 50          | Enero      |
| 24 | 48          | Mayo       |
| 25 | 48          | Septiembre |
| 26 | 40          | Septiembre |
| 27 | 35          | Diciembre  |
| 28 | 80          | Diciembre  |
| 29 | 19          | Diciembre  |
| 30 | 24          | Mayo       |
| 31 | 52          | Junio      |
| 32 | 65          | Octubre    |
| 33 | 24          | Noviembre  |
| 34 | 30          | Noviembre  |
| 35 | 20          | Noviembre  |
| 36 | 35          | Septiembre |
| 37 | 45          | Julio      |
| 38 | 199         | Noviembre  |
| 39 | 58          | Abril      |
| 40 | 38          | Octubre    |
| 41 | 42          | Diciembre  |
| 42 | 27          | Enero      |
| 43 | 36          | Octubre    |
| 44 | 85          | Octubre    |
| 45 | 36          | Octubre    |
| 46 | 70          | Noviembre  |

Estación de Chelva Agraria

|    | Lluvia (mm) | Mes        |
|----|-------------|------------|
| 1  | 70.0        | Octubre    |
| 2  | 40.0        | Diciembre  |
| 3  | 39.0        | Noviembre  |
| 4  | 50.0        | Septiembre |
| 5  | 178.0       | Septiembre |
| 6  | 44.0        | Agosto     |
| 7  | 29.0        | Febrero    |
| 8  | 35.0        | Julio      |
| 9  | 76.5        | Diciembre  |
| 10 | 22.0        | Junio      |
| 11 | 72.0        | Septiembre |
| 12 | 42.6        | Febrero    |
| 13 | 90.0        | Junio      |
| 14 | 50.0        | Octubre    |
| 15 | 24.5        | Junio      |
| 16 | 48.4        | Noviembre  |
| 17 | 27.0        | Agosto     |
| 18 | 73.0        | Octubre    |
| 19 | 33.5        | Noviembre  |
| 20 | 213.5       | Noviembre  |
| 21 | 63.0        | Diciembre  |
| 22 | 46.0        | Agosto     |
| 23 | 41.0        | Abril      |
| 24 | 26.0        | Diciembre  |
| 25 | 37.8        | Noviembre  |
| 26 | 34.0        | Octubre    |
| 27 | 44.0        | Diciembre  |
| 28 | 44.0        | Agosto     |
| 29 | 52.0        | Junio      |
| 30 | 28.5        | Septiembre |
| 31 | 46.0        | Septiembre |
| 32 | 80.0        | Octubre    |
| 33 | 22.0        | Abril      |
| 34 | 80.0        | Junio      |
| 35 | 75.0        | Febrero    |
| 36 | 32.0        | Mayo       |
| 37 | 32.0        | Noviembre  |
| 38 | 57.5        | Abril      |
| 39 | 54.0        | Octubre    |
| 40 | 39.5        | Marzo      |
| 41 | 37.0        | Abril      |
| 42 | 90.0        | Julio      |

## 2. Análisis de independencia de los datos seleccionados

### Estación de Tuéjar

| Rachas Superiores a la Mediana |              | Rachas Inferiores a la Mediana |              |
|--------------------------------|--------------|--------------------------------|--------------|
| Longitud de Racha              | Nº de Rachas | Longitud de Racha              | Nº de Rachas |
| 1                              | 5            | -1                             | 4            |
| 2                              | 1            | -2                             | 3            |
| 3                              | 3            | -3                             | 0            |
| 4                              | 0            | -4                             | 2            |
| 5                              | 0            | -5                             | 1            |
| 6                              | 0            | -6                             | 0            |
| 7                              | 1            | -7                             | 0            |
| 8                              | 0            |                                |              |
| Total Rachas > Mediana         | 10           | Total Rachas < Mediana         | 10           |

|                           |       |
|---------------------------|-------|
| Mediana (valores lluvia)  | 44.5  |
| Nº Valores > mediana (n1) | 23    |
| Nº Valores < mediana (n2) | 23    |
| Media(R)                  | 24.0  |
| Varianza (R)              | 11.24 |
| Desv. Tipica ( $\sigma$ ) | 3.4   |
| Estadístico (Z)           | -1.19 |

|                                  |      |
|----------------------------------|------|
| Región Aceptación (5%) [V.A.]*   | 1.65 |
| Región Aceptación (2,5%) [V.A.]* | 1.96 |
| * [V.A.] - Valor Absoluto        |      |

### Estación Chelva Agraria

| Rachas Superiores a la Mediana |              | Rachas Inferiores a la Mediana |              |
|--------------------------------|--------------|--------------------------------|--------------|
| Longitud de Racha              | Nº de Rachas | Longitud de Racha              | Nº de Rachas |
| 1                              | 7            | -1                             | 7            |
| 2                              | 5            | -2                             | 3            |
| 3                              | 1            | -3                             | 1            |
| 4                              | 0            | -4                             | 0            |
| 5                              | 0            | -5                             | 0            |
| 6                              | 0            | -6                             | 1            |
| 7                              | 0            | -7                             | 0            |
| 8                              | 0            |                                |              |
| Total Rachas > Mediana         | 13           | Total Rachas < Mediana         | 12           |

|                           |       |
|---------------------------|-------|
| Mediana (valores lluvia)  | 44.0  |
| Nº Valores > mediana (n1) | 20    |
| Nº Valores < mediana (n2) | 22    |
| Media(n1yn2)              | 21.95 |
| Varianza (n1yn2)          | 10.2  |
| Desv. Tipica ( $\sigma$ ) | 3.2   |
| Estadístico (Z)           | 0.95  |

|                                  |      |
|----------------------------------|------|
| Región Aceptación (5%) [V.A.]*   | 1.65 |
| Región Aceptación (2,5%) [V.A.]* | 1.96 |
| * [V.A.] - Valor Absoluto        |      |

### 3. Análisis Hidromorfométrico de la cuenca vertiente a Calles

#### Distribución de pendientes según subcuencas

| Subcuenca | Pendiente del terreno | Superficie de terreno (Km2) | Porcentaje Relativo | Porcentaje Absoluto |
|-----------|-----------------------|-----------------------------|---------------------|---------------------|
| 1         | >=3%                  | 4.46                        | 48.00%              | 1.08%               |
|           | <3%                   | 4.83                        | 52.00%              | 1.17%               |
| 2         | >=3%                  | 24.54                       | 49.34%              | 5.94%               |
|           | <3%                   | 25.19                       | 50.66%              | 6.10%               |
| 3         | >=3%                  | 5.93                        | 39.34%              | 1.44%               |
|           | <3%                   | 9.15                        | 60.66%              | 2.21%               |
| 4         | >=3%                  | 10.44                       | 29.30%              | 2.53%               |
|           | <3%                   | 25.20                       | 70.70%              | 6.10%               |
| 5         | >=3%                  | 6.65                        | 63.12%              | 1.61%               |
|           | <3%                   | 3.89                        | 36.88%              | 0.94%               |
| 6         | >=3%                  | 12.07                       | 49.65%              | 2.92%               |
|           | <3%                   | 12.24                       | 50.35%              | 2.96%               |
| 7         | >=3%                  | 5.47                        | 42.30%              | 1.32%               |
|           | <3%                   | 7.46                        | 57.70%              | 1.81%               |
| 8         | >=3%                  | 12.09                       | 52.62%              | 2.93%               |
|           | <3%                   | 10.89                       | 47.38%              | 2.64%               |
| 9         | >=3%                  | 14.19                       | 44.86%              | 3.43%               |
|           | <3%                   | 17.44                       | 55.14%              | 4.22%               |
| 10        | >=3%                  | 12.51                       | 31.65%              | 3.03%               |
|           | <3%                   | 27.00                       | 68.35%              | 6.53%               |
| 11        | >=3%                  | 4.40                        | 26.90%              | 1.07%               |
|           | <3%                   | 11.96                       | 73.10%              | 2.90%               |
| 12        | >=3%                  | 5.50                        | 36.76%              | 1.33%               |
|           | <3%                   | 9.46                        | 63.24%              | 2.29%               |
| 13        | >=3%                  | 11.14                       | 48.46%              | 2.70%               |
|           | <3%                   | 11.84                       | 51.54%              | 2.87%               |
| 14        | >=3%                  | 11.67                       | 30.77%              | 2.82%               |
|           | <3%                   | 26.26                       | 69.23%              | 6.36%               |
| 15        | >=3%                  | 4.25                        | 31.58%              | 1.03%               |
|           | <3%                   | 9.20                        | 68.42%              | 2.23%               |
| 16        | >=3%                  | 5.11                        | 28.23%              | 1.24%               |
|           | <3%                   | 12.98                       | 71.77%              | 3.14%               |
| 17        | >=3%                  | 28.55                       | 75.57%              | 6.91%               |
|           | <3%                   | 9.23                        | 24.43%              | 2.23%               |
| Total     |                       | 413.17                      | Total               | 100.00%             |

#### Distribución de pendientes en el total de la cuenca

| Superficie superior al 3% (Km2) | Superficie inferior al 3% (Km2) | Porcentaje superior al 3% | Porcentaje inferior al 3% |
|---------------------------------|---------------------------------|---------------------------|---------------------------|
| 178.959                         | 234.215                         | 43.31%                    | 56.69%                    |

### Distribución de usos del terreno en la cuenca

| Código de Uso | Tipo de Uso   | Area (Km2) | Porcentaje |
|---------------|---|------------|------------|
| 111           | Urbano Continuo                                     | 0.77       | 0.19%      |
| 131           | Extracción Minera                                   | 1.17       | 0.28%      |
| 211           | Cultivo Tierra Secano                               | 41.58      | 10.06%     |
| 212           | Cultivo Tierra Regadío                              | 1.86       | 0.45%      |
| 221           | Viñedo  | 1.27       | 0.31%      |
| 222           | Frutales Secano                                     | 0.20       | 0.05%      |
| 223           | Olivos  | 1.61       | 0.39%      |
| 241           | Cultivo Permanente Secano                           | 0.47       | 0.11%      |
| 242           | Mosaico Cultivos prados en secano                   | 61.48      | 14.88%     |
| 243           | Mosaico Agrícola con espacios de vegetación natural | 20.20      | 4.89%      |
| 311           | Perennifolias                                       | 2.55       | 0.62%      |
| 312           | Bosque Coníferas                                    | 80.39      | 19.46%     |
| 313           | Bosque Mixto  | 0.27       | 0.06%      |
| 321           | Pastizales Supraforestales                          | 0.30       | 0.07%      |
| 323           | Vegetación Esclerófito                              | 106.00     | 25.66%     |
| 324           | Matorral boscoso de transición                      | 92.14      | 22.30%     |
| 334           | Zonas Quemadas                                      | 0.93       | 0.23%      |
|               | <b>Total</b>  | 413.17     | 100.00%    |

## 4. Estudio Pluviométrico

### Resultados ANALEST “Estación de Chelva Agraria”

| Datos |          | Distribución Empírica |         |         | Función Gumbel |          |         | Función SQRT |          |         |
|-------|----------|-----------------------|---------|---------|----------------|----------|---------|--------------|----------|---------|
| ORDEN | PLUVIOM. | PROB. EMP.            | T       | -L-LF   | MOM            | T        | -L-LF   | MOM          | T        | -L-LF   |
| 1     | 213.5    | 0.9858                | 70.3333 | 4.2461  | 0.9976         | 422.5294 | 6.0451  | 0.9939       | 164.6384 | 5.1007  |
| 2     | 178      | 0.9621                | 26.3750 | 3.2532  | 0.9920         | 124.3041 | 4.8187  | 0.9866       | 74.7299  | 4.3072  |
| 3     | 90       | 0.9384                | 16.2308 | 2.7553  | 0.8446         | 6.4360   | 1.7787  | 0.8674       | 7.5429   | 1.9503  |
| 4     | 90       | 0.9147                | 11.7222 | 2.4172  | 0.8446         | 6.4360   | 1.7787  | 0.8674       | 7.5429   | 1.9503  |
| 5     | 80       | 0.8910                | 9.1739  | 2.1592  | 0.7878         | 4.7119   | 1.4332  | 0.8216       | 5.6050   | 1.6270  |
| 6     | 80       | 0.8673                | 7.5357  | 1.9493  | 0.7878         | 4.7119   | 1.4332  | 0.8216       | 5.6050   | 1.6270  |
| 7     | 76.5     | 0.8436                | 6.3939  | 1.7715  | 0.7640         | 4.2371   | 1.3123  | 0.8017       | 5.0440   | 1.5098  |
| 8     | 75       | 0.8199                | 5.5526  | 1.6166  | 0.7531         | 4.0507   | 1.2605  | 0.7925       | 4.8202   | 1.4588  |
| 9     | 73       | 0.7962                | 4.9070  | 1.4789  | 0.7380         | 3.8169   | 1.1914  | 0.7796       | 4.5364   | 1.3902  |
| 10    | 72       | 0.7725                | 4.3958  | 1.3544  | 0.7302         | 3.7060   | 1.1568  | 0.7728       | 4.4005   | 1.3556  |
| 11    | 70       | 0.7488                | 3.9811  | 1.2404  | 0.7139         | 3.4956   | 1.0877  | 0.7585       | 4.1404   | 1.2857  |
| 12    | 63       | 0.7251                | 3.6379  | 1.1350  | 0.6511         | 2.8658   | 0.8459  | 0.7009       | 3.3428   | 1.0343  |
| 13    | 57.5     | 0.7014                | 3.3492  | 1.0366  | 0.5951         | 2.4700   | 0.6559  | 0.6461       | 2.8259   | 0.8284  |
| 14    | 54       | 0.6777                | 3.1029  | 0.9441  | 0.5567         | 2.2560   | 0.5350  | 0.6065       | 2.5413   | 0.6930  |
| 15    | 52       | 0.6540                | 2.8904  | 0.8566  | 0.5339         | 2.1454   | 0.4659  | 0.5821       | 2.3927   | 0.6140  |
| 16    | 50       | 0.6303                | 2.7051  | 0.7733  | 0.5105         | 2.0427   | 0.3968  | 0.5563       | 2.2539   | 0.5337  |
| 17    | 50       | 0.6066                | 2.5422  | 0.6935  | 0.5105         | 2.0427   | 0.3968  | 0.5563       | 2.2539   | 0.5337  |
| 18    | 48.4     | 0.5829                | 2.3977  | 0.6168  | 0.4913         | 1.9659   | 0.3415  | 0.5348       | 2.1495   | 0.4685  |
| 19    | 46       | 0.5592                | 2.2688  | 0.5427  | 0.4620         | 1.8589   | 0.2586  | 0.5009       | 2.0035   | 0.3691  |
| 20    | 46       | 0.5355                | 2.1531  | 0.4709  | 0.4620         | 1.8589   | 0.2586  | 0.5009       | 2.0035   | 0.3691  |
| 21    | 44       | 0.5118                | 2.0485  | 0.4009  | 0.4372         | 1.7769   | 0.1895  | 0.4712       | 1.8912   | 0.2845  |
| 22    | 44       | 0.4882                | 1.9537  | 0.3325  | 0.4372         | 1.7769   | 0.1895  | 0.4712       | 1.8912   | 0.2845  |
| 23    | 44       | 0.4645                | 1.8673  | 0.2654  | 0.4372         | 1.7769   | 0.1895  | 0.4712       | 1.8912   | 0.2845  |
| 24    | 42.6     | 0.4408                | 1.7881  | 0.1994  | 0.4197         | 1.7231   | 0.1412  | 0.4498       | 1.8174   | 0.2244  |
| 25    | 41       | 0.4171                | 1.7154  | 0.1341  | 0.3994         | 1.6651   | 0.0859  | 0.4246       | 1.7378   | 0.1547  |
| 26    | 40       | 0.3934                | 1.6484  | 0.0693  | 0.3868         | 1.6307   | 0.0514  | 0.4085       | 1.6905   | 0.1105  |
| 27    | 39.5     | 0.3697                | 1.5865  | 0.0049  | 0.3804         | 1.6140   | 0.0341  | 0.4003       | 1.6676   | 0.0883  |
| 28    | 39       | 0.3460                | 1.5290  | -0.0596 | 0.3741         | 1.5976   | 0.0168  | 0.3921       | 1.6451   | 0.0659  |
| 29    | 37.8     | 0.3223                | 1.4755  | -0.1243 | 0.3588         | 1.5596   | -0.0246 | 0.3722       | 1.5929   | 0.0118  |
| 30    | 37       | 0.2986                | 1.4257  | -0.1896 | 0.3487         | 1.5353   | -0.0523 | 0.3588       | 1.5596   | -0.0246 |
| 31    | 35       | 0.2749                | 1.3791  | -0.2557 | 0.3233         | 1.4779   | -0.1214 | 0.3249       | 1.4812   | -0.1172 |
| 32    | 34       | 0.2512                | 1.3354  | -0.3232 | 0.3108         | 1.4509   | -0.1559 | 0.3077       | 1.4445   | -0.1643 |
| 33    | 33.5     | 0.2275                | 1.2945  | -0.3925 | 0.3045         | 1.4378   | -0.1732 | 0.2991       | 1.4268   | -0.1881 |
| 34    | 32       | 0.2038                | 1.2560  | -0.4641 | 0.2858         | 1.4002   | -0.2250 | 0.2733       | 1.3761   | -0.2602 |
| 35    | 32       | 0.1801                | 1.2197  | -0.5390 | 0.2858         | 1.4002   | -0.2250 | 0.2733       | 1.3761   | -0.2602 |
| 36    | 29       | 0.1564                | 1.1854  | -0.6181 | 0.2493         | 1.3321   | -0.3286 | 0.2221       | 1.2855   | -0.4086 |
| 37    | 28.5     | 0.1327                | 1.1530  | -0.7029 | 0.2433         | 1.3216   | -0.3459 | 0.2137       | 1.2717   | -0.4339 |
| 38    | 27       | 0.1090                | 1.1223  | -0.7959 | 0.2257         | 1.2915   | -0.3977 | 0.1888       | 1.2328   | -0.5109 |
| 39    | 26       | 0.0853                | 1.0933  | -0.9008 | 0.2142         | 1.2726   | -0.4323 | 0.1727       | 1.2087   | -0.5632 |
| 40    | 24.5     | 0.0616                | 1.0657  | -1.0249 | 0.1974         | 1.2459   | -0.4841 | 0.1492       | 1.1754   | -0.6431 |
| 41    | 22       | 0.0379                | 1.0394  | -1.1855 | 0.1705         | 1.2055   | -0.5705 | 0.1127       | 1.1271   | -0.7806 |
| 42    | 22       | 0.0142                | 1.0144  | -1.4477 | 0.1705         | 1.2055   | -0.5705 | 0.1127       | 1.1271   | -0.7806 |

## Resultados ANALEST “Estación de Tuéjar”

| Datos |          | Distribución Empírica |         |         | Función Gumbel |          |         | Función SQRT |          |         |
|-------|----------|-----------------------|---------|---------|----------------|----------|---------|--------------|----------|---------|
| ORDEN | PLUVIOM. | PROB. EMP.            | T       | -L-LF   | MOM            | T        | -L-LF   | MOM          | T        | -L-LF   |
| 1     | 199      | 0.9870                | 77.0000 | 4.3373  | 0.9977         | 436.3941 | 6.0774  | 0.9941       | 170.8099 | 5.1376  |
| 2     | 175      | 0.9654                | 28.8750 | 3.3454  | 0.9943         | 176.8536 | 5.1725  | 0.9895       | 95.5313  | 4.5542  |
| 3     | 91       | 0.9437                | 17.7692 | 2.8486  | 0.8740         | 7.9396   | 2.0053  | 0.8899       | 9.0819   | 2.1485  |
| 4     | 85       | 0.9221                | 12.8333 | 2.5118  | 0.8447         | 6.4384   | 1.7791  | 0.8667       | 7.5018   | 1.9445  |
| 5     | 80       | 0.9004                | 10.0435 | 2.2549  | 0.8156         | 5.4234   | 1.5906  | 0.8433       | 6.3826   | 1.7696  |
| 6     | 79       | 0.8788                | 8.2500  | 2.0463  | 0.8093         | 5.2425   | 1.5528  | 0.8381       | 6.1782   | 1.7340  |
| 7     | 77       | 0.8571                | 7.0000  | 1.8698  | 0.7959         | 4.9007   | 1.4774  | 0.8272       | 5.7876   | 1.6624  |
| 8     | 71       | 0.8355                | 6.0789  | 1.7163  | 0.7511         | 4.0184   | 1.2512  | 0.7895       | 4.7504   | 1.4424  |
| 9     | 70       | 0.8139                | 5.3721  | 1.5800  | 0.7429         | 3.8900   | 1.2135  | 0.7824       | 4.5957   | 1.4049  |
| 10    | 70       | 0.7922                | 4.8125  | 1.4570  | 0.7429         | 3.8900   | 1.2135  | 0.7824       | 4.5957   | 1.4049  |
| 11    | 65       | 0.7706                | 4.3585  | 1.3446  | 0.6985         | 3.3169   | 1.0250  | 0.7431       | 3.8924   | 1.2142  |
| 12    | 58       | 0.7489                | 3.9828  | 1.2409  | 0.6268         | 2.6793   | 0.7611  | 0.6757       | 3.0832   | 0.9363  |
| 13    | 58       | 0.7273                | 3.6667  | 1.1443  | 0.6268         | 2.6793   | 0.7611  | 0.6757       | 3.0832   | 0.9363  |
| 14    | 55       | 0.7056                | 3.3971  | 1.0536  | 0.5927         | 2.4550   | 0.6479  | 0.6417       | 2.7913   | 0.8129  |
| 15    | 52       | 0.6840                | 3.1644  | 0.9681  | 0.5567         | 2.2557   | 0.5348  | 0.6045       | 2.5287   | 0.6866  |
| 16    | 51       | 0.6623                | 2.9615  | 0.8868  | 0.5443         | 2.1944   | 0.4971  | 0.5914       | 2.4473   | 0.6438  |
| 17    | 50       | 0.6407                | 2.7831  | 0.8092  | 0.5317         | 2.1354   | 0.4594  | 0.5779       | 2.3688   | 0.6007  |
| 18    | 50       | 0.6190                | 2.6250  | 0.7349  | 0.5317         | 2.1354   | 0.4594  | 0.5779       | 2.3688   | 0.6007  |
| 19    | 50       | 0.5974                | 2.4839  | 0.6633  | 0.5317         | 2.1354   | 0.4594  | 0.5779       | 2.3688   | 0.6007  |
| 20    | 50       | 0.5758                | 2.3571  | 0.5941  | 0.5317         | 2.1354   | 0.4594  | 0.5779       | 2.3688   | 0.6007  |
| 21    | 48       | 0.5541                | 2.2427  | 0.5270  | 0.5060         | 2.0245   | 0.3840  | 0.5496       | 2.2204   | 0.5133  |
| 22    | 48       | 0.5325                | 2.1389  | 0.4617  | 0.5060         | 2.0245   | 0.3840  | 0.5496       | 2.2204   | 0.5133  |
| 23    | 45       | 0.5108                | 2.0442  | 0.3979  | 0.4664         | 1.8741   | 0.2709  | 0.5044       | 2.0179   | 0.3794  |
| 24    | 44       | 0.4892                | 1.9576  | 0.3354  | 0.4529         | 1.8279   | 0.2332  | 0.4886       | 1.9556   | 0.3339  |
| 25    | 43       | 0.4675                | 1.8780  | 0.2741  | 0.4394         | 1.7837   | 0.1955  | 0.4725       | 1.8957   | 0.2880  |
| 26    | 42       | 0.4459                | 1.8047  | 0.2136  | 0.4257         | 1.7412   | 0.1578  | 0.4560       | 1.8381   | 0.2416  |
| 27    | 42       | 0.4242                | 1.7368  | 0.1538  | 0.4257         | 1.7412   | 0.1578  | 0.4560       | 1.8381   | 0.2416  |
| 28    | 40       | 0.4026                | 1.6739  | 0.0945  | 0.3981         | 1.6615   | 0.0824  | 0.4220       | 1.7300   | 0.1476  |
| 29    | 40       | 0.3810                | 1.6154  | 0.0355  | 0.3981         | 1.6615   | 0.0824  | 0.4220       | 1.7300   | 0.1476  |
| 30    | 40       | 0.3593                | 1.5608  | -0.0233 | 0.3981         | 1.6615   | 0.0824  | 0.4220       | 1.7300   | 0.1476  |
| 31    | 38       | 0.3377                | 1.5098  | -0.0822 | 0.3704         | 1.5884   | 0.0070  | 0.3868       | 1.6309   | 0.0515  |
| 32    | 36       | 0.3160                | 1.4620  | -0.1415 | 0.3427         | 1.5214   | -0.0685 | 0.3508       | 1.5402   | -0.0466 |
| 33    | 36       | 0.2944                | 1.4172  | -0.2012 | 0.3427         | 1.5214   | -0.0685 | 0.3508       | 1.5402   | -0.0466 |
| 34    | 36       | 0.2727                | 1.3750  | -0.2618 | 0.3427         | 1.5214   | -0.0685 | 0.3508       | 1.5402   | -0.0466 |
| 35    | 35       | 0.2511                | 1.3353  | -0.3235 | 0.3289         | 1.4901   | -0.1062 | 0.3324       | 1.4980   | -0.0965 |
| 36    | 35       | 0.2294                | 1.2978  | -0.3867 | 0.3289         | 1.4901   | -0.1062 | 0.3324       | 1.4980   | -0.0965 |
| 37    | 34       | 0.2078                | 1.2623  | -0.4519 | 0.3151         | 1.4602   | -0.1439 | 0.3140       | 1.4578   | -0.1469 |
| 38    | 30       | 0.1861                | 1.2287  | -0.5195 | 0.2611         | 1.3534   | -0.2947 | 0.2402       | 1.3161   | -0.3551 |
| 39    | 29       | 0.1645                | 1.1969  | -0.5905 | 0.2480         | 1.3298   | -0.3324 | 0.2220       | 1.2853   | -0.4089 |
| 40    | 28       | 0.1429                | 1.1667  | -0.6657 | 0.2351         | 1.3073   | -0.3701 | 0.2040       | 1.2563   | -0.4634 |
| 41    | 27       | 0.1212                | 1.1379  | -0.7468 | 0.2224         | 1.2859   | -0.4078 | 0.1864       | 1.2291   | -0.5187 |
| 42    | 24.7     | 0.0996                | 1.1106  | -0.8359 | 0.1940         | 1.2408   | -0.4945 | 0.1475       | 1.1731   | -0.6490 |
| 43    | 24       | 0.0779                | 1.0845  | -0.9369 | 0.1857         | 1.2281   | -0.5209 | 0.1363       | 1.1578   | -0.6896 |
| 44    | 24       | 0.0563                | 1.0596  | -1.0569 | 0.1857         | 1.2281   | -0.5209 | 0.1363       | 1.1578   | -0.6896 |
| 45    | 20       | 0.0346                | 1.0359  | -1.2128 | 0.1412         | 1.1644   | -0.6717 | 0.0791       | 1.0859   | -0.9311 |
| 46    | 19       | 0.0130                | 1.0132  | -1.4688 | 0.1310         | 1.1507   | -0.7094 | 0.0670       | 1.0718   | -0.9943 |

## 5. Cálculo Hidrológico

### Caudal generado mediante el Método Racional Modificado

|                      |       |
|----------------------|-------|
| P(24) [mm] T=10 años | 99.73 |
|----------------------|-------|

| Subcuencas | Area (km2) | Longitud Principal (Km) | Cota Max | Cota Min | Pend. Rec. Princip. | Tiemp. Concentr. "tc" [h] | Coef. Unif. Temp. "K" | Fact. Red. Areal "Ka" | Umbral Esc. Corregido "Po" (mm) | Coef. Escorr. "C(T)" | "I(h)T" [mm/h] | Fint(a) | "I(tc)T" [mm/h] | Caudal Subcuencas [m3/s] | Tiempo Lag (min) |
|------------|------------|-------------------------|----------|----------|---------------------|---------------------------|-----------------------|-----------------------|---------------------------------|----------------------|----------------|---------|-----------------|--------------------------|------------------|
| 1          | 9.3        | 8.6                     | 1037.3   | 330.0    | 0.0826              | 2.5                       | 1.18                  | 0.94                  | 35                              | 0.229                | 3.89           | 6.208   | 24.1            | 16.87                    | 89               |
| 2          | 49.7       | 21.6                    | 1542.9   | 775.0    | 0.0355              | 5.9                       | 1.39                  | 0.89                  | 50                              | 0.118                | 3.69           | 3.408   | 12.6            | 28.59                    | 211              |
| 3          | 15.1       | 9.0                     | 1209.6   | 775.0    | 0.0481              | 2.8                       | 1.21                  | 0.92                  | 42                              | 0.169                | 3.83           | 5.635   | 21.6            | 18.46                    | 103              |
| 4          | 35.7       | 15.8                    | 1675.0   | 1204.0   | 0.0298              | 4.8                       | 1.34                  | 0.90                  | 45                              | 0.144                | 3.73           | 3.944   | 14.7            | 27.94                    | 172              |
| 5          | 10.5       | 6.6                     | 1025.3   | 390.0    | 0.0966              | 2.0                       | 1.14                  | 0.93                  | 35                              | 0.227                | 3.87           | 7.219   | 28.0            | 21.26                    | 70               |
| 6          | 24.3       | 13.6                    | 829.5    | 390.0    | 0.0324              | 4.2                       | 1.30                  | 0.91                  | 42                              | 0.169                | 3.77           | 4.336   | 16.4            | 24.25                    | 150              |
| 7          | 12.9       | 10.0                    | 988.4    | 554.0    | 0.0433              | 3.1                       | 1.23                  | 0.93                  | 50                              | 0.127                | 3.85           | 5.270   | 20.3            | 11.39                    | 113              |
| 8          | 23.0       | 12.4                    | 1030.6   | 554.0    | 0.0383              | 3.8                       | 1.27                  | 0.91                  | 56                              | 0.097                | 3.78           | 4.640   | 17.5            | 13.88                    | 136              |
| 9          | 31.6       | 11.9                    | 991.9    | 647.0    | 0.0290              | 3.9                       | 1.28                  | 0.90                  | 73                              | 0.038                | 3.74           | 4.573   | 17.1            | 7.27                     | 139              |
| 10         | 39.5       | 21.3                    | 1159.7   | 647.0    | 0.0241              | 6.2                       | 1.41                  | 0.89                  | 61                              | 0.071                | 3.71           | 3.259   | 12.1            | 13.39                    | 224              |
| 11         | 16.4       | 8.0                     | 1456.4   | 968.0    | 0.0613              | 2.5                       | 1.18                  | 0.92                  | 49                              | 0.131                | 3.82           | 6.200   | 23.7            | 16.72                    | 89               |
| 12         | 15.0       | 11.1                    | 1517.6   | 968.0    | 0.0493              | 3.3                       | 1.24                  | 0.92                  | 46                              | 0.146                | 3.83           | 5.076   | 19.4            | 14.67                    | 120              |
| 13         | 23.0       | 10.7                    | 1361.7   | 787.0    | 0.0538              | 3.2                       | 1.23                  | 0.91                  | 55                              | 0.101                | 3.78           | 5.250   | 19.8            | 15.72                    | 114              |
| 14         | 37.9       | 15.6                    | 1489.3   | 787.0    | 0.0451              | 4.4                       | 1.31                  | 0.89                  | 48                              | 0.131                | 3.72           | 4.209   | 15.7            | 28.32                    | 157              |
| 15         | 13.4       | 7.8                     | 1496.3   | 1039.0   | 0.0590              | 2.4                       | 1.18                  | 0.92                  | 46                              | 0.146                | 3.84           | 6.254   | 24.0            | 15.50                    | 88               |
| 16         | 18.1       | 7.5                     | 1519.8   | 1039.0   | 0.0641              | 2.3                       | 1.17                  | 0.92                  | 41                              | 0.178                | 3.81           | 6.424   | 24.5            | 25.62                    | 84               |
| 17         | 37.8       | 18.6                    | 1098.1   | 330.0    | 0.0414              | 5.1                       | 1.35                  | 0.89                  | 53                              | 0.104                | 3.72           | 3.782   | 14.1            | 20.71                    | 182              |
| Cuenca     | 413.250    | 49.640                  | 1518     | 330.000  | 0.024               | 11.857                    | 1.611                 | 0.826                 | 51                              | 0.096                | 3.431          | 2.007   | 6.886           | 121.707                  | QT=10(100)       |

NOTA\* → Los parámetros de las subcuencas son los utilizados para la definición del modelo en HEC-HMS



## Caudal generado para cuencas del Levante según tipo de suelo

|       |                             | Región 822 |         |        |         |
|-------|-----------------------------|------------|---------|--------|---------|
|       |                             | Qt(T=10)   | Fi      | Lambda | Qt      |
| T=50  | Suelo C                     | 169.9      | 11.1378 | 0.7401 | 498.20  |
|       | Suelo B                     | 42.3       | 11.1378 | 0.7401 | 178.05  |
|       | Suelo Distr. Por Subcuencas | 121.2      | 11.1378 | 0.7401 | 388.05  |
| T=100 | Suelo C                     | 169.9      | 51.6297 | 0.6065 | 1162.90 |
|       | Suelo B                     | 42.3       | 51.6297 | 0.6065 | 500.43  |
|       | Suelo Distr. Por Subcuencas | 121.2      | 51.6297 | 0.6065 | 947.58  |
| T=200 | Suelo C                     | 169.9      | 85.5765 | 0.5982 | 1847.08 |
|       | Suelo B                     | 42.3       | 85.5765 | 0.5982 | 804.07  |
|       | Suelo Distr. Por Subcuencas | 121.2      | 85.5765 | 0.5982 | 1509.30 |

## 6. Cálculo Hidráulico

### Resultados de los perfiles analizados para diferentes caudales de retorno

| Reach  | River Sta | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|--------|-----------|---------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Tuejar | 890.0001  | PF 1    | 550.00            | 349.33           | 352.80           | 351.93           | 353.29           | 0.004359            | 4.26              | 205.74            | 98.76            | 0.74         |
| Tuejar | 880       | PF 1    | 550.00            | 349.20           | 352.22           | 352.22           | 353.18           | 0.009323            | 5.48              | 148.57            | 78.12            | 1.04         |
| Tuejar | 869.9999  | PF 1    | 550.00            | 349.20           | 351.75           | 352.01           | 353.03           | 0.013762            | 6.07              | 129.95            | 75.75            | 1.24         |
| Tuejar | 860.0001  | PF 1    | 550.00            | 349.18           | 351.40           | 351.80           | 352.86           | 0.019125            | 6.55              | 122.33            | 81.10            | 1.43         |
| Tuejar | 850       | PF 1    | 550.00            | 349.20           | 351.92           | 351.61           | 352.57           | 0.006913            | 4.48              | 173.19            | 83.42            | 0.89         |
| Tuejar | 840       | PF 1    | 550.00            | 348.90           | 351.72           | 351.61           | 352.49           | 0.008100            | 4.89              | 164.67            | 84.67            | 0.96         |
| Tuejar | 830       | PF 1    | 550.00            | 348.82           | 351.78           | 351.42           | 352.37           | 0.005780            | 4.29              | 185.92            | 85.44            | 0.82         |
| Tuejar | 820.0001  | PF 1    | 550.00            | 348.51           | 351.70           | 351.34           | 352.30           | 0.005925            | 4.30              | 180.32            | 82.31            | 0.83         |
| Tuejar | 810       | PF 1    | 550.00            | 348.45           | 351.51           | 351.32           | 352.23           | 0.007299            | 4.59              | 166.89            | 81.33            | 0.91         |
| Tuejar | 800       | PF 1    | 550.00            | 347.90           | 351.54           | 351.10           | 352.14           | 0.004549            | 4.13              | 184.40            | 78.04            | 0.73         |
| Tuejar | 790       | PF 1    | 550.00            | 347.90           | 351.52           | 351.02           | 352.09           | 0.004135            | 4.03              | 191.04            | 78.54            | 0.71         |
| Tuejar | 780       | PF 1    | 550.00            | 347.65           | 351.46           | 350.95           | 352.05           | 0.004171            | 4.08              | 188.58            | 76.83            | 0.71         |
| Tuejar | 770.0001  | PF 1    | 550.00            | 347.59           | 351.31           | 351.01           | 351.99           | 0.004893            | 4.54              | 182.73            | 80.74            | 0.78         |
| Tuejar | 760       | PF 1    | 550.00            | 347.51           | 351.06           | 350.90           | 351.91           | 0.007553            | 4.95              | 153.94            | 72.35            | 0.93         |
| Tuejar | 750.0001  | PF 1    | 550.00            | 347.52           | 351.08           | 350.85           | 351.81           | 0.005872            | 4.57              | 172.07            | 81.20            | 0.83         |
| Tuejar | 740.0001  | PF 1    | 550.00            | 347.43           | 351.15           | 350.66           | 351.72           | 0.004139            | 4.05              | 193.43            | 81.33            | 0.71         |
| Tuejar | 730       | PF 1    | 550.00            | 347.33           | 351.20           | 350.45           | 351.65           | 0.002883            | 3.50              | 216.86            | 85.11            | 0.60         |
| Tuejar | 720       | PF 1    | 550.00            | 347.19           | 351.18           | 350.42           | 351.61           | 0.002867            | 3.52              | 221.84            | 86.80            | 0.60         |
| Tuejar | 709.9999  | PF 1    | 550.00            | 347.12           | 350.84           | 350.54           | 351.55           | 0.004833            | 4.42              | 177.05            | 77.95            | 0.77         |
| Tuejar | 700.0001  | PF 1    | 550.00            | 346.93           | 350.82           | 350.48           | 351.49           | 0.004808            | 4.29              | 178.19            | 79.10            | 0.76         |
| Tuejar | 690       | PF 1    | 550.00            | 346.87           | 350.80           | 350.43           | 351.44           | 0.004311            | 4.19              | 187.26            | 87.65            | 0.72         |
| Tuejar | 680       | PF 1    | 550.00            | 346.78           | 350.45           | 350.45           | 351.36           | 0.007399            | 4.97              | 160.53            | 88.81            | 0.92         |
| Tuejar | 669.9999  | PF 1    | 550.00            | 346.72           | 350.45           | 350.25           | 351.14           | 0.004783            | 4.39              | 187.43            | 92.11            | 0.76         |
| Tuejar | 660       | PF 1    | 550.00            | 346.60           | 350.42           | 350.18           | 351.08           | 0.004514            | 4.25              | 191.93            | 94.65            | 0.73         |
| Tuejar | 650       | PF 1    | 550.00            | 346.51           | 350.50           | 350.02           | 350.99           | 0.003449            | 3.80              | 220.24            | 101.92           | 0.63         |
| Tuejar | 640.0001  | PF 1    | 550.00            | 346.41           | 350.10           | 350.10           | 350.92           | 0.006433            | 5.17              | 179.89            | 96.28            | 0.88         |
| Tuejar | 630       | PF 1    | 550.00            | 346.27           | 350.15           | 349.95           | 350.79           | 0.004809            | 4.30              | 193.24            | 98.03            | 0.74         |
| Tuejar | 619.9999  | PF 1    | 550.00            | 346.20           | 349.90           | 349.90           | 350.72           | 0.006292            | 4.78              | 175.00            | 96.55            | 0.84         |
| Tuejar | 609.9999  | PF 1    | 550.00            | 346.08           | 349.74           | 349.84           | 350.65           | 0.006964            | 4.96              | 168.56            | 98.41            | 0.87         |
| Tuejar | 600.0001  | PF 1    | 550.00            | 346.04           | 349.90           | 349.63           | 350.47           | 0.004332            | 4.09              | 208.11            | 106.03           | 0.70         |
| Tuejar | 590       | PF 1    | 550.00            | 345.93           | 349.88           | 349.61           | 350.42           | 0.003814            | 4.07              | 219.53            | 111.93           | 0.68         |
| Tuejar | 580.0001  | PF 1    | 550.00            | 345.99           | 349.87           | 349.54           | 350.37           | 0.003755            | 3.85              | 223.00            | 113.47           | 0.65         |
| Tuejar | 570.0001  | PF 1    | 550.00            | 345.92           | 349.90           | 349.38           | 350.31           | 0.002891            | 3.52              | 242.03            | 112.42           | 0.58         |
| Tuejar | 559.9999  | PF 1    | 550.00            | 345.84           | 349.87           | 349.32           | 350.28           | 0.002787            | 3.49              | 241.53            | 108.18           | 0.57         |
| Tuejar | 550.0001  | PF 1    | 550.00            | 345.60           | 349.83           | 349.17           | 350.25           | 0.002633            | 3.48              | 261.24            | 143.23           | 0.55         |
| Tuejar | 539.9999  | PF 1    | 550.00            | 345.66           | 349.79           | 349.09           | 350.21           | 0.002657            | 3.50              | 267.06            | 160.22           | 0.56         |

Resultados cauce corregido  
para "T = 100 años"

| Reach  | River Sta | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|--------|-----------|---------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Tuejar | 539.9999  | PF 1    | 550.00            | 345.66           | 349.79           | 349.09           | 350.21           | 0.002657            | 3.50              | 267.06            | 160.22           | 0.56         |
| Tuejar | 530.0001  | PF 1    | 550.00            | 345.57           | 349.78           | 349.23           | 350.18           | 0.002575            | 3.40              | 252.89            | 157.34           | 0.57         |
| Tuejar | 520       | PF 1    | 550.00            | 345.51           | 349.64           | 349.26           | 350.14           | 0.003369            | 3.81              | 226.21            | 134.00           | 0.64         |
| Tuejar | 510       | PF 1    | 550.00            | 345.49           | 349.37           | 349.37           | 350.15           | 0.005122            | 4.65              | 190.48            | 111.25           | 0.78         |
| Tuejar | 500       | PF 1    | 550.00            | 345.53           | 349.28           | 349.06           | 349.84           | 0.004134            | 4.06              | 213.27            | 113.97           | 0.69         |
| Tuejar | 489.9999  | PF 1    | 550.00            | 345.44           | 349.35           | 348.88           | 349.76           | 0.003095            | 3.58              | 241.35            | 112.99           | 0.59         |
| Tuejar | 480       | PF 1    | 550.00            | 345.45           | 349.34           | 348.79           | 349.72           | 0.002919            | 3.43              | 247.44            | 110.88           | 0.57         |
| Tuejar | 470       | PF 1    | 550.00            | 345.45           | 349.31           | 348.78           | 349.69           | 0.003000            | 3.47              | 247.44            | 114.78           | 0.58         |
| Tuejar | 460       | PF 1    | 550.00            | 345.44           | 349.23           | 348.81           | 349.65           | 0.003546            | 3.70              | 235.84            | 115.68           | 0.63         |
| Tuejar | 450       | PF 1    | 550.00            | 345.41           | 349.19           | 348.72           | 349.62           | 0.003449            | 3.70              | 235.21            | 112.58           | 0.62         |
| Tuejar | 440.0001  | PF 1    | 550.00            | 345.28           | 349.14           | 348.71           | 349.58           | 0.003556            | 3.79              | 231.16            | 111.54           | 0.64         |
| Tuejar | 430       | PF 1    | 550.00            | 345.25           | 349.00           | 348.77           | 349.53           | 0.004310            | 4.05              | 217.63            | 115.08           | 0.68         |
| Tuejar | 420       | PF 1    | 550.00            | 345.20           | 349.08           | 348.58           | 349.45           | 0.002850            | 3.52              | 257.68            | 124.84           | 0.59         |
| Tuejar | 410       | PF 1    | 550.00            | 345.19           | 348.69           | 348.69           | 349.38           | 0.005850            | 4.62              | 196.68            | 123.59           | 0.82         |
| Tuejar | 400       | PF 1    | 550.00            | 345.07           | 348.74           | 348.52           | 349.28           | 0.004063            | 4.12              | 221.97            | 122.96           | 0.70         |
| Tuejar | 390.0001  | PF 1    | 550.00            | 345.04           | 348.74           | 348.45           | 349.22           | 0.003788            | 3.97              | 234.59            | 126.68           | 0.67         |
| Tuejar | 380       | PF 1    | 550.00            | 344.99           | 348.45           | 348.45           | 349.15           | 0.005839            | 4.78              | 200.60            | 125.66           | 0.84         |
| Tuejar | 370       | PF 1    | 550.00            | 344.88           | 348.41           | 348.36           | 349.03           | 0.005183            | 4.63              | 216.75            | 134.62           | 0.80         |
| Tuejar | 360       | PF 1    | 550.00            | 344.86           | 348.35           | 348.33           | 348.98           | 0.005046            | 4.58              | 218.24            | 139.83           | 0.79         |
| Tuejar | 350       | PF 1    | 550.00            | 344.86           | 348.50           | 348.17           | 348.86           | 0.003261            | 3.66              | 269.35            | 152.84           | 0.64         |
| Tuejar | 340       | PF 1    | 550.00            | 344.80           | 348.48           | 348.10           | 348.82           | 0.002902            | 3.47              | 281.87            | 159.21           | 0.60         |
| Tuejar | 330.0001  | PF 1    | 550.00            | 344.73           | 348.38           | 348.14           | 348.79           | 0.003032            | 3.65              | 273.54            | 166.97           | 0.62         |
| Tuejar | 320.0001  | PF 1    | 550.00            | 344.69           | 348.14           | 348.14           | 348.73           | 0.004656            | 4.27              | 232.91            | 167.45           | 0.75         |
| Tuejar | 310       | PF 1    | 550.00            | 344.61           | 348.02           | 347.91           | 348.54           | 0.004372            | 4.07              | 239.55            | 167.02           | 0.73         |
| Tuejar | 300       | PF 1    | 550.00            | 344.57           | 348.10           | 347.69           | 348.46           | 0.002906            | 3.40              | 270.12            | 151.83           | 0.60         |
| Tuejar | 290       | PF 1    | 550.00            | 344.57           | 347.87           | 347.74           | 348.40           | 0.004241            | 3.98              | 228.57            | 144.66           | 0.72         |
| Tuejar | 280       | PF 1    | 550.00            | 344.41           | 347.89           | 347.66           | 348.34           | 0.003592            | 3.67              | 253.52            | 169.53           | 0.66         |
| Tuejar | 270       | PF 1    | 550.00            | 344.06           | 347.89           | 347.62           | 348.29           | 0.002823            | 3.48              | 273.87            | 172.39           | 0.59         |
| Tuejar | 260       | PF 1    | 550.00            | 344.06           | 347.90           | 347.57           | 348.25           | 0.002684            | 3.36              | 287.75            | 172.15           | 0.57         |
| Tuejar | 250       | PF 1    | 550.00            | 344.06           | 347.92           | 347.48           | 348.21           | 0.002217            | 3.13              | 313.88            | 175.49           | 0.53         |
| Tuejar | 240       | PF 1    | 550.00            | 344.06           | 347.90           | 347.48           | 348.18           | 0.002381            | 3.18              | 309.07            | 174.59           | 0.54         |
| Tuejar | 230       | PF 1    | 550.00            | 344.06           | 347.87           | 347.45           | 348.16           | 0.002327            | 3.18              | 310.14            | 174.44           | 0.54         |
| Tuejar | 220       | PF 1    | 550.00            | 344.06           | 347.85           | 347.35           | 348.14           | 0.002431            | 3.16              | 301.45            | 166.64           | 0.54         |
| Tuejar | 210       | PF 1    | 550.00            | 343.96           | 347.83           | 347.27           | 348.11           | 0.002281            | 3.12              | 305.55            | 161.89           | 0.53         |
| Tuejar | 200       | PF 1    | 550.00            | 343.91           | 347.60           | 347.32           | 348.06           | 0.003556            | 3.85              | 244.66            | 141.52           | 0.66         |
| Tuejar | 190.0001  | PF 1    | 550.00            | 343.74           | 347.46           | 347.31           | 348.02           | 0.004305            | 4.12              | 222.56            | 132.25           | 0.72         |
| Tuejar | 180       | PF 1    | 550.00            | 343.73           | 347.43           | 347.28           | 347.97           | 0.004244            | 4.08              | 225.66            | 134.17           | 0.72         |
| Tuejar | 170       | PF 1    | 550.00            | 343.73           | 347.46           | 347.22           | 347.90           | 0.003449            | 3.75              | 251.41            | 148.78           | 0.65         |
| Tuejar | 160       | PF 1    | 550.00            | 343.73           | 347.51           | 346.93           | 347.83           | 0.002847            | 3.31              | 266.11            | 130.36           | 0.59         |
| Tuejar | 150       | PF 1    | 550.00            | 343.73           | 347.41           | 346.96           | 347.80           | 0.003151            | 3.54              | 249.98            | 125.12           | 0.62         |
| Tuejar | 140       | PF 1    | 550.00            | 343.73           | 347.39           | 346.91           | 347.76           | 0.003290            | 3.52              | 252.10            | 126.95           | 0.63         |
| Tuejar | 130       | PF 1    | 550.00            | 343.73           | 347.10           | 347.00           | 347.70           | 0.004661            | 4.30              | 214.65            | 125.68           | 0.76         |
| Tuejar | 120.0001  | PF 1    | 550.00            | 343.73           | 347.19           | 346.78           | 347.60           | 0.003464            | 3.71              | 241.44            | 121.09           | 0.65         |
| Tuejar | 110       | PF 1    | 550.00            | 343.73           | 347.19           | 346.68           | 347.56           | 0.003128            | 3.55              | 250.45            | 122.96           | 0.62         |
| Tuejar | 100       | PF 1    | 550.00            | 343.30           | 346.68           | 346.68           | 347.47           | 0.006349            | 4.84              | 179.53            | 102.28           | 0.87         |
| Tuejar | 90.00003  | PF 1    | 550.00            | 343.22           | 346.71           | 346.59           | 347.37           | 0.005475            | 4.49              | 194.57            | 107.88           | 0.80         |
| Tuejar | 80.00006  | PF 1    | 550.00            | 343.20           | 346.68           | 346.55           | 347.31           | 0.005192            | 4.39              | 199.86            | 109.99           | 0.79         |
| Tuejar | 70.00005  | PF 1    | 550.00            | 343.20           | 346.73           | 346.41           | 347.22           | 0.003893            | 3.97              | 223.53            | 113.24           | 0.69         |
| Tuejar | 59.99999  | PF 1    | 550.00            | 343.19           | 346.90           | 346.36           | 347.11           | 0.001982            | 2.91              | 352.46            | 200.23           | 0.49         |
| Tuejar | 50.00007  | PF 1    | 550.00            | 343.15           | 346.35           | 346.35           | 347.03           | 0.006824            | 4.69              | 192.15            | 119.93           | 0.88         |
| Tuejar | 40.00004  | PF 1    | 550.00            | 342.86           | 346.41           | 346.05           | 346.75           | 0.003177            | 3.48              | 275.43            | 155.66           | 0.62         |
| Tuejar | 30.00001  | PF 1    | 550.00            | 342.80           | 346.26           | 346.03           | 346.70           | 0.003980            | 3.88              | 246.92            | 145.83           | 0.69         |
| Tuejar | 20.00002  | PF 1    | 550.00            | 342.79           | 345.95           | 345.95           | 346.63           | 0.006288            | 4.64              | 202.56            | 132.95           | 0.86         |
| Tuejar | 9.999994  | PF 1    | 550.00            | 342.79           | 345.76           | 345.85           | 346.55           | 0.007944            | 4.97              | 183.63            | 124.35           | 0.96         |

*Resultados cauce Corregido  
para "T = 100 años"*

| Reach  | River Sta | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|--------|-----------|---------|-------------------|------------------|------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| Tuejar | 890.0001  | PF 1    | 550.00            | 349.14           | 352.69           | 351.99           | 353.27           | 0.004077            | 3.99              | 199.64            | 96.17            | 0.70         |
| Tuejar | 880       | PF 1    | 550.00            | 349.20           | 352.22           | 352.22           | 353.18           | 0.009323            | 5.48              | 148.57            | 78.12            | 1.04         |
| Tuejar | 869.9999  | PF 1    | 550.00            | 349.20           | 351.75           | 352.01           | 353.03           | 0.013762            | 6.07              | 129.95            | 75.75            | 1.24         |
| Tuejar | 860.0001  | PF 1    | 550.00            | 349.18           | 351.40           | 351.80           | 352.86           | 0.019125            | 6.55              | 122.33            | 81.10            | 1.43         |
| Tuejar | 850       | PF 1    | 550.00            | 349.20           | 351.92           | 351.61           | 352.57           | 0.006910            | 4.48              | 173.21            | 83.42            | 0.88         |
| Tuejar | 840       | PF 1    | 550.00            | 348.90           | 351.73           | 351.61           | 352.49           | 0.008055            | 4.88              | 164.97            | 84.68            | 0.96         |
| Tuejar | 830       | PF 1    | 550.00            | 348.82           | 351.79           | 351.42           | 352.37           | 0.005755            | 4.28              | 186.18            | 85.45            | 0.82         |
| Tuejar | 820.0001  | PF 1    | 550.00            | 348.51           | 351.70           | 351.34           | 352.31           | 0.005892            | 4.29              | 180.64            | 82.33            | 0.82         |
| Tuejar | 810       | PF 1    | 550.00            | 348.45           | 351.52           | 351.32           | 352.23           | 0.007197            | 4.57              | 167.65            | 81.38            | 0.90         |
| Tuejar | 800       | PF 1    | 550.00            | 347.90           | 351.55           | 351.10           | 352.15           | 0.004501            | 4.11              | 185.07            | 78.12            | 0.73         |
| Tuejar | 790       | PF 1    | 550.00            | 347.90           | 351.53           | 351.02           | 352.09           | 0.004090            | 4.02              | 191.74            | 78.56            | 0.70         |
| Tuejar | 780       | PF 1    | 550.00            | 347.65           | 351.47           | 350.95           | 352.05           | 0.004121            | 4.06              | 189.34            | 76.88            | 0.71         |
| Tuejar | 770.0001  | PF 1    | 550.00            | 347.59           | 351.32           | 351.01           | 352.00           | 0.004782            | 4.50              | 184.21            | 80.86            | 0.77         |
| Tuejar | 760       | PF 1    | 550.00            | 347.51           | 350.90           | 350.90           | 351.90           | 0.009424            | 5.33              | 142.80            | 70.18            | 1.03         |
| Tuejar | 750.0001  | PF 1    | 550.00            | 347.52           | 350.71           | 350.85           | 351.80           | 0.010110            | 5.51              | 142.59            | 78.01            | 1.07         |
| Tuejar | 740.0001  | PF 1    | 550.00            | 347.43           | 350.36           | 350.66           | 351.66           | 0.013069            | 6.01              | 130.74            | 77.18            | 1.21         |
| Tuejar | 730       | PF 1    | 550.00            | 347.33           | 350.69           | 350.45           | 351.39           | 0.005441            | 4.33              | 174.43            | 82.04            | 0.80         |
| Tuejar | 720       | PF 1    | 550.00            | 347.19           | 350.52           | 350.42           | 351.32           | 0.006818            | 4.72              | 165.06            | 83.50            | 0.89         |
| Tuejar | 709.9999  | PF 1    | 550.00            | 347.09           | 350.65           | 350.10           | 351.20           | 0.003607            | 3.55              | 187.39            | 77.81            | 0.64         |
| Tuejar | 700.0001  | PF 1    | 550.00            | 346.99           | 350.50           | 350.16           | 351.15           | 0.004528            | 4.10              | 181.76            | 80.36            | 0.74         |
| Tuejar | 690       | PF 1    | 550.00            | 346.86           | 350.60           | 349.94           | 351.05           | 0.003080            | 3.21              | 208.94            | 89.68            | 0.59         |
| Tuejar | 680       | PF 1    | 550.00            | 346.72           | 350.04           | 350.04           | 350.96           | 0.007671            | 4.58              | 150.43            | 86.79            | 0.92         |
| Tuejar | 669.9999  | PF 1    | 550.00            | 346.72           | 350.18           | 349.85           | 350.79           | 0.004317            | 3.81              | 186.59            | 91.75            | 0.71         |
| Tuejar | 660       | PF 1    | 550.00            | 346.60           | 350.03           | 349.78           | 350.73           | 0.004791            | 4.08              | 176.74            | 91.85            | 0.75         |
| Tuejar | 650       | PF 1    | 550.00            | 346.49           | 350.14           | 349.66           | 350.63           | 0.003567            | 3.41              | 204.05            | 94.79            | 0.63         |
| Tuejar | 640.0001  | PF 1    | 550.00            | 346.41           | 350.06           | 349.60           | 350.59           | 0.003281            | 3.56              | 204.44            | 96.04            | 0.63         |
| Tuejar | 630       | PF 1    | 550.00            | 346.27           | 350.03           | 349.56           | 350.55           | 0.003362            | 3.57              | 205.75            | 96.62            | 0.62         |
| Tuejar | 619.9999  | PF 1    | 550.00            | 346.20           | 349.61           | 349.61           | 350.48           | 0.005761            | 4.51              | 165.79            | 95.31            | 0.83         |
| Tuejar | 609.9999  | PF 1    | 550.00            | 346.08           | 349.58           | 349.53           | 350.39           | 0.005371            | 4.36              | 170.89            | 97.61            | 0.80         |
| Tuejar | 600.0001  | PF 1    | 550.00            | 346.02           | 349.72           | 349.36           | 350.26           | 0.003725            | 3.71              | 206.58            | 103.39           | 0.65         |
| Tuejar | 590       | PF 1    | 550.00            | 345.93           | 349.75           | 349.27           | 350.21           | 0.002962            | 3.38              | 225.18            | 111.48           | 0.59         |
| Tuejar | 580.0001  | PF 1    | 550.00            | 345.86           | 349.75           | 349.15           | 350.16           | 0.002528            | 3.19              | 237.15            | 112.85           | 0.55         |
| Tuejar | 570.0001  | PF 1    | 550.00            | 345.82           | 349.73           | 349.14           | 350.14           | 0.002645            | 3.25              | 238.51            | 111.54           | 0.56         |
| Tuejar | 559.9999  | PF 1    | 550.00            | 345.78           | 349.70           | 349.11           | 350.11           | 0.002652            | 3.26              | 235.63            | 107.65           | 0.56         |
| Tuejar | 550.0001  | PF 1    | 550.00            | 345.74           | 349.71           | 348.99           | 350.07           | 0.002273            | 3.07              | 254.37            | 125.11           | 0.52         |
| Tuejar | 539.9999  | PF 1    | 550.00            | 345.70           | 349.69           | 349.00           | 350.05           | 0.002254            | 3.10              | 256.22            | 148.27           | 0.52         |

|        |          |      |        |        |        |        |        |          |      |        |        |      |
|--------|----------|------|--------|--------|--------|--------|--------|----------|------|--------|--------|------|
| Tuejar | 530.0001 | PF 1 | 550.00 | 345.65 | 349.66 | 348.96 | 350.02 | 0.002191 | 3.02 | 253.06 | 129.92 | 0.51 |
| Tuejar | 520      | PF 1 | 550.00 | 345.61 | 349.58 | 348.98 | 350.00 | 0.002495 | 3.24 | 236.56 | 106.46 | 0.54 |
| Tuejar | 510      | PF 1 | 550.00 | 345.57 | 349.12 | 349.12 | 349.92 | 0.005271 | 4.32 | 175.60 | 109.91 | 0.77 |
| Tuejar | 500      | PF 1 | 550.00 | 345.53 | 349.15 | 348.63 | 349.58 | 0.002853 | 3.24 | 227.49 | 113.62 | 0.57 |
| Tuejar | 489.9999 | PF 1 | 550.00 | 345.48 | 349.09 | 348.67 | 349.55 | 0.003202 | 3.45 | 225.52 | 112.13 | 0.61 |
| Tuejar | 480      | PF 1 | 550.00 | 345.45 | 349.15 | 348.49 | 349.48 | 0.003205 | 2.94 | 243.48 | 110.37 | 0.52 |
| Tuejar | 470      | PF 1 | 550.00 | 345.38 | 348.95 | 348.58 | 349.43 | 0.003563 | 3.56 | 219.61 | 113.16 | 0.63 |
| Tuejar | 460      | PF 1 | 550.00 | 345.29 | 348.86 | 348.57 | 349.39 | 0.003858 | 3.68 | 211.96 | 114.34 | 0.66 |
| Tuejar | 450      | PF 1 | 550.00 | 345.20 | 348.85 | 348.46 | 349.34 | 0.003493 | 3.56 | 215.28 | 110.08 | 0.63 |
| Tuejar | 440.0001 | PF 1 | 550.00 | 345.12 | 348.80 | 348.43 | 349.31 | 0.003467 | 3.57 | 213.23 | 110.16 | 0.63 |
| Tuejar | 430      | PF 1 | 550.00 | 345.04 | 348.64 | 348.46 | 349.26 | 0.004248 | 3.89 | 198.38 | 114.14 | 0.69 |
| Tuejar | 420      | PF 1 | 550.00 | 344.96 | 348.72 | 348.32 | 349.18 | 0.003060 | 3.45 | 232.29 | 122.10 | 0.60 |
| Tuejar | 410      | PF 1 | 550.00 | 344.88 | 348.34 | 348.34 | 349.10 | 0.005616 | 4.26 | 177.67 | 120.71 | 0.79 |
| Tuejar | 400      | PF 1 | 550.00 | 344.80 | 348.43 | 348.18 | 348.98 | 0.003905 | 3.73 | 210.21 | 120.43 | 0.66 |
| Tuejar | 390.0001 | PF 1 | 550.00 | 344.72 | 348.42 | 348.12 | 348.93 | 0.003512 | 3.59 | 220.41 | 125.11 | 0.63 |
| Tuejar | 380      | PF 1 | 550.00 | 344.64 | 348.16 | 348.08 | 348.87 | 0.005205 | 4.16 | 186.22 | 120.78 | 0.76 |
| Tuejar | 370      | PF 1 | 550.00 | 344.56 | 348.16 | 348.03 | 348.80 | 0.004584 | 4.02 | 202.68 | 131.66 | 0.72 |
| Tuejar | 360      | PF 1 | 550.00 | 344.48 | 348.13 | 347.96 | 348.75 | 0.004291 | 3.96 | 207.60 | 138.64 | 0.70 |
| Tuejar | 350      | PF 1 | 550.00 | 344.40 | 348.26 | 347.86 | 348.64 | 0.002615 | 3.22 | 261.65 | 151.62 | 0.55 |
| Tuejar | 340      | PF 1 | 550.00 | 344.32 | 348.25 | 347.81 | 348.61 | 0.002394 | 3.12 | 272.64 | 155.95 | 0.53 |
| Tuejar | 330.0001 | PF 1 | 550.00 | 344.24 | 348.18 | 347.74 | 348.58 | 0.002530 | 3.21 | 262.73 | 166.26 | 0.54 |
| Tuejar | 320.0001 | PF 1 | 550.00 | 344.16 | 347.90 | 347.70 | 348.53 | 0.003992 | 3.91 | 216.78 | 165.23 | 0.68 |
| Tuejar | 310      | PF 1 | 550.00 | 344.08 | 348.01 | 347.62 | 348.43 | 0.002779 | 3.36 | 261.24 | 166.99 | 0.57 |
| Tuejar | 300      | PF 1 | 550.00 | 344.00 | 348.05 | 347.45 | 348.38 | 0.002118 | 3.02 | 283.98 | 150.22 | 0.50 |
| Tuejar | 290      | PF 1 | 550.00 | 343.92 | 347.92 | 347.55 | 348.34 | 0.002681 | 3.36 | 253.75 | 144.98 | 0.57 |
| Tuejar | 280      | PF 1 | 550.00 | 343.84 | 347.95 | 347.14 | 348.29 | 0.001995 | 2.98 | 286.86 | 169.85 | 0.50 |
| Tuejar | 270      | PF 1 | 550.00 | 343.80 | 347.96 | 347.35 | 348.26 | 0.001772 | 2.83 | 305.42 | 172.95 | 0.47 |
| Tuejar | 260      | PF 1 | 550.00 | 343.76 | 347.96 | 347.37 | 348.24 | 0.001748 | 2.81 | 317.58 | 173.06 | 0.46 |
| Tuejar | 250      | PF 1 | 550.00 | 343.73 | 347.97 | 347.32 | 348.21 | 0.001582 | 2.67 | 340.23 | 175.78 | 0.43 |
| Tuejar | 240      | PF 1 | 550.00 | 344.06 | 347.90 | 347.48 | 348.18 | 0.002381 | 3.18 | 309.07 | 174.59 | 0.54 |
| Tuejar | 230      | PF 1 | 550.00 | 344.06 | 347.87 | 347.45 | 348.16 | 0.002327 | 3.18 | 310.14 | 174.44 | 0.54 |
| Tuejar | 220      | PF 1 | 550.00 | 344.06 | 347.85 | 347.35 | 348.14 | 0.002431 | 3.16 | 301.45 | 166.64 | 0.54 |
| Tuejar | 210      | PF 1 | 550.00 | 343.96 | 347.83 | 347.27 | 348.11 | 0.002281 | 3.12 | 305.55 | 161.89 | 0.53 |
| Tuejar | 200      | PF 1 | 550.00 | 343.91 | 347.60 | 347.32 | 348.06 | 0.003556 | 3.85 | 244.66 | 141.52 | 0.66 |
| Tuejar | 190.0001 | PF 1 | 550.00 | 343.74 | 347.46 | 347.31 | 348.02 | 0.004305 | 4.12 | 222.56 | 132.25 | 0.72 |
| Tuejar | 180      | PF 1 | 550.00 | 343.73 | 347.43 | 347.28 | 347.97 | 0.004244 | 4.08 | 225.66 | 134.17 | 0.72 |

*Resultados cauce con ensanche  
para "T = 100 años"*

| Reach  | River Sta | Profile | Q Total             | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area         | Top Width | Froude # Chl |
|--------|-----------|---------|---------------------|-----------|-----------|-----------|-----------|------------|----------|-------------------|-----------|--------------|
|        |           |         | (m <sup>3</sup> /s) | (m)       | (m)       | (m)       | (m)       | (m/m)      | (m/s)    | (m <sup>2</sup> ) | (m)       |              |
| Tuejar | 170       | PF 1    | 550.00              | 343.73    | 347.46    | 347.22    | 347.90    | 0.003449   | 3.75     | 251.41            | 148.78    | 0.65         |
| Tuejar | 160       | PF 1    | 550.00              | 343.73    | 347.51    | 346.93    | 347.83    | 0.002847   | 3.31     | 266.11            | 130.36    | 0.59         |
| Tuejar | 150       | PF 1    | 550.00              | 343.73    | 347.41    | 346.96    | 347.80    | 0.003151   | 3.54     | 249.98            | 125.12    | 0.62         |
| Tuejar | 140       | PF 1    | 550.00              | 343.73    | 347.39    | 346.91    | 347.76    | 0.003290   | 3.52     | 252.10            | 126.95    | 0.63         |
| Tuejar | 130       | PF 1    | 550.00              | 343.73    | 347.10    | 347.00    | 347.70    | 0.004661   | 4.30     | 214.65            | 125.68    | 0.76         |
| Tuejar | 120.0001  | PF 1    | 550.00              | 343.73    | 347.19    | 346.78    | 347.60    | 0.003464   | 3.71     | 241.44            | 121.09    | 0.65         |
| Tuejar | 110       | PF 1    | 550.00              | 343.73    | 347.19    | 346.68    | 347.56    | 0.003128   | 3.55     | 250.45            | 122.96    | 0.62         |
| Tuejar | 100       | PF 1    | 550.00              | 343.30    | 346.68    | 346.68    | 347.47    | 0.006349   | 4.84     | 179.53            | 102.28    | 0.87         |
| Tuejar | 90.00003  | PF 1    | 550.00              | 343.22    | 346.71    | 346.59    | 347.37    | 0.005475   | 4.49     | 194.57            | 107.88    | 0.80         |
| Tuejar | 80.00006  | PF 1    | 550.00              | 343.20    | 346.68    | 346.55    | 347.31    | 0.005192   | 4.39     | 199.86            | 109.99    | 0.79         |
| Tuejar | 70.00005  | PF 1    | 550.00              | 343.20    | 346.73    | 346.41    | 347.22    | 0.003893   | 3.97     | 223.53            | 113.24    | 0.69         |
| Tuejar | 59.99999  | PF 1    | 550.00              | 343.19    | 346.90    | 346.36    | 347.11    | 0.001982   | 2.91     | 352.46            | 200.23    | 0.49         |
| Tuejar | 50.00007  | PF 1    | 550.00              | 343.15    | 346.35    | 346.35    | 347.03    | 0.006824   | 4.69     | 192.15            | 119.93    | 0.88         |
| Tuejar | 40.00004  | PF 1    | 550.00              | 342.86    | 346.41    | 346.05    | 346.75    | 0.003177   | 3.48     | 275.43            | 155.66    | 0.62         |
| Tuejar | 30.00001  | PF 1    | 550.00              | 342.80    | 346.26    | 346.03    | 346.70    | 0.003980   | 3.88     | 246.92            | 145.83    | 0.69         |
| Tuejar | 20.00002  | PF 1    | 550.00              | 342.79    | 345.95    | 345.95    | 346.63    | 0.006288   | 4.64     | 202.56            | 132.95    | 0.86         |
| Tuejar | 9.999994  | PF 1    | 550.00              | 342.79    | 345.76    | 345.85    | 346.55    | 0.007944   | 4.97     | 183.63            | 124.35    | 0.96         |

*Resultados cauce con ensanche  
para "T = 100 años"*