

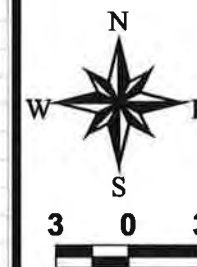
# County of San Diego Hydrology Manual



## Rainfall Isopluvials

### 100 Year Rainfall Event - 6 Hours

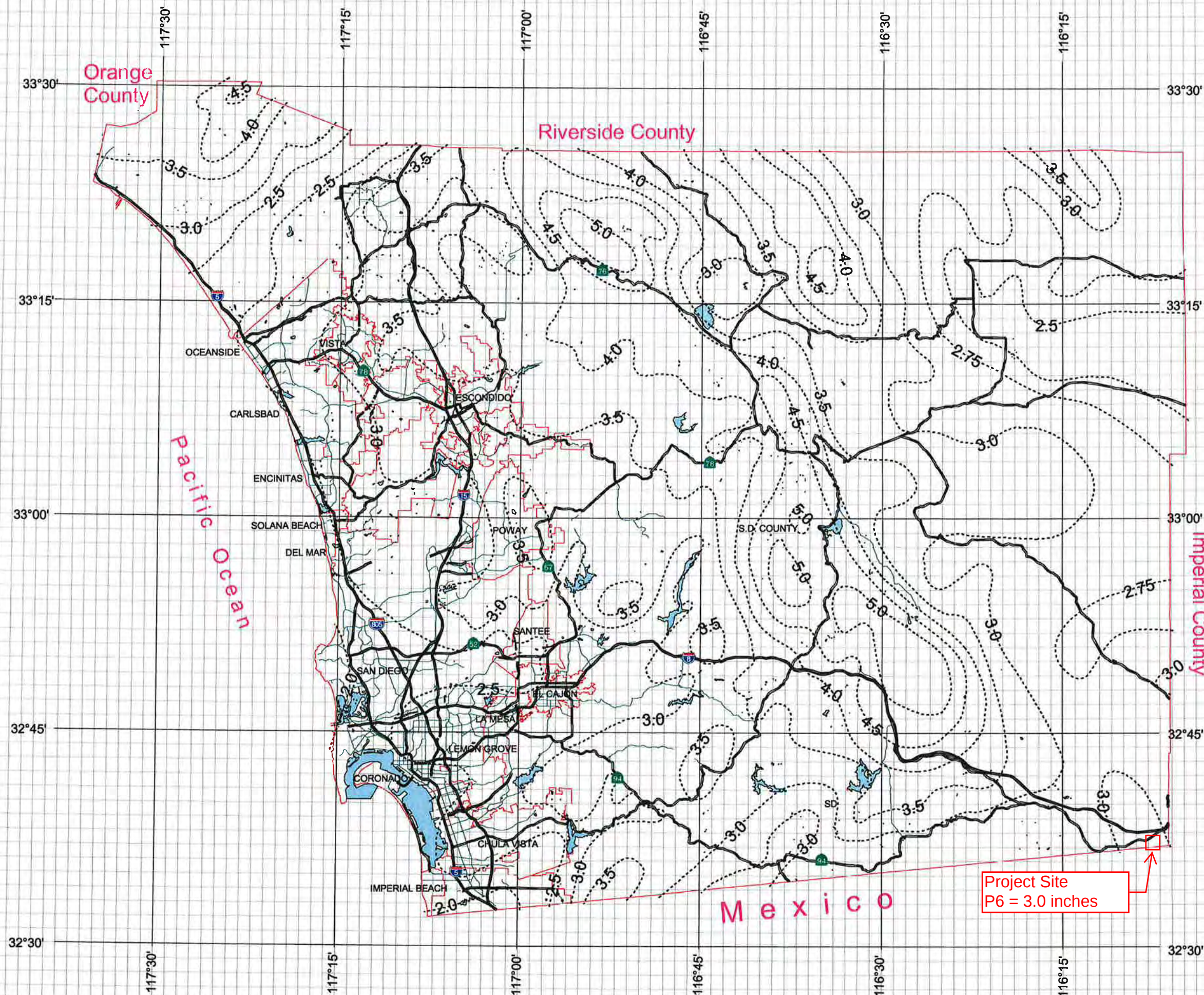
----- Isopluvial (inches)



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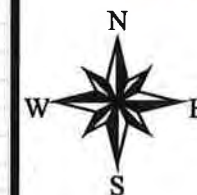
# County of San Diego Hydrology Manual



## Rainfall Isopluvials

### 100 Year Rainfall Event - 24 Hours

----- Isopluvial (inches)

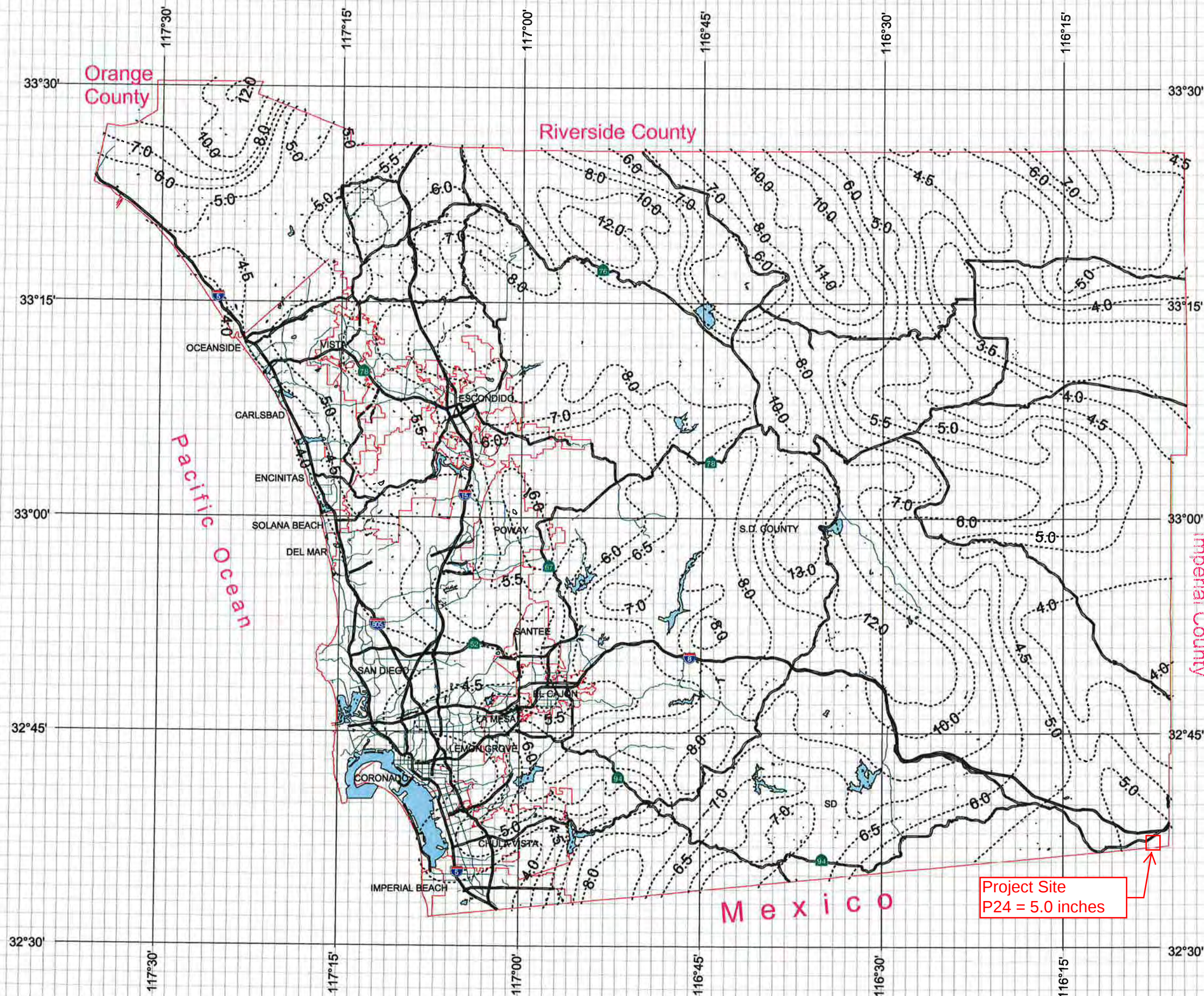


3 0 3 Miles

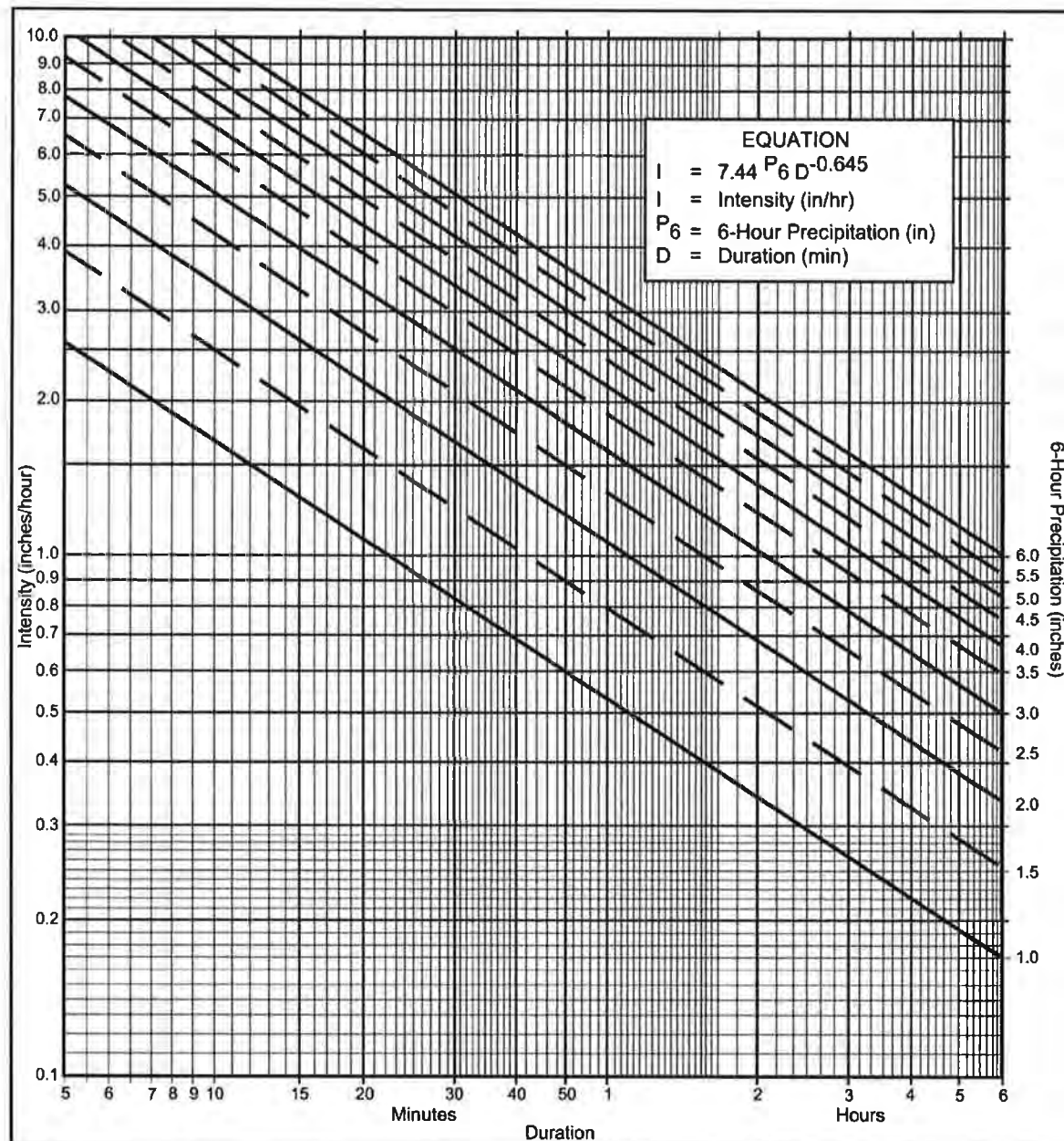
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#### Directions for Application:

- (1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).
- (2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).
- (3) Plot 6 hr precipitation on the right side of the chart.
- (4) Draw a line through the point parallel to the plotted lines.
- (5) This line is the intensity-duration curve for the location being analyzed.

#### Application Form:

- (a) Selected frequency 100 year
- (b)  $P_6 = \underline{3.0}$  in.,  $P_{24} = \underline{5.0}$ ,  $\frac{P_6}{P_{24}} = \underline{60} \%$ (2)
- (c) Adjusted  $P_6^{(2)} = \underline{\hspace{1cm}}$  in.
- (d)  $t_x = \underline{\hspace{1cm}}$  min.
- (e)  $I = \underline{\hspace{1cm}}$  in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

| P6       | 1    | 1.5  | 2    | 2.5  | 3    | 3.5  | 4     | 4.5   | 5     | 5.5   | 6     |
|----------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| Duration |      |      |      |      |      |      |       |       |       |       |       |
| 5        | 2.63 | 3.95 | 5.27 | 6.59 | 7.90 | 9.22 | 10.54 | 11.86 | 13.17 | 14.49 | 15.81 |
| 7        | 2.12 | 3.18 | 4.24 | 5.30 | 6.36 | 7.42 | 8.48  | 9.54  | 10.60 | 11.66 | 12.72 |
| 10       | 1.68 | 2.53 | 3.37 | 4.21 | 5.05 | 5.90 | 6.74  | 7.58  | 8.42  | 9.27  | 10.11 |
| 15       | 1.30 | 1.95 | 2.59 | 3.24 | 3.89 | 4.54 | 5.19  | 5.84  | 6.49  | 7.13  | 7.78  |
| 20       | 1.08 | 1.62 | 2.15 | 2.69 | 3.23 | 3.77 | 4.31  | 4.85  | 5.39  | 5.93  | 6.46  |
| 25       | 0.93 | 1.40 | 1.87 | 2.33 | 2.80 | 3.27 | 3.73  | 4.20  | 4.67  | 5.13  | 5.60  |
| 30       | 0.83 | 1.24 | 1.66 | 2.07 | 2.49 | 2.90 | 3.32  | 3.73  | 4.15  | 4.58  | 4.98  |
| 40       | 0.69 | 1.03 | 1.38 | 1.72 | 2.07 | 2.41 | 2.76  | 3.10  | 3.45  | 3.79  | 4.13  |
| 50       | 0.60 | 0.90 | 1.19 | 1.49 | 1.79 | 2.09 | 2.39  | 2.69  | 2.98  | 3.28  | 3.58  |
| 60       | 0.53 | 0.80 | 1.06 | 1.33 | 1.59 | 1.86 | 2.12  | 2.39  | 2.65  | 2.92  | 3.18  |
| 90       | 0.41 | 0.61 | 0.82 | 1.02 | 1.23 | 1.43 | 1.63  | 1.84  | 2.04  | 2.25  | 2.45  |
| 120      | 0.34 | 0.51 | 0.68 | 0.85 | 1.02 | 1.19 | 1.36  | 1.53  | 1.70  | 1.87  | 2.04  |
| 150      | 0.29 | 0.44 | 0.59 | 0.73 | 0.88 | 1.03 | 1.18  | 1.32  | 1.47  | 1.62  | 1.76  |
| 180      | 0.26 | 0.39 | 0.52 | 0.65 | 0.78 | 0.91 | 1.04  | 1.18  | 1.31  | 1.44  | 1.57  |
| 240      | 0.22 | 0.33 | 0.43 | 0.54 | 0.65 | 0.76 | 0.87  | 0.98  | 1.08  | 1.19  | 1.30  |
| 300      | 0.19 | 0.28 | 0.38 | 0.47 | 0.56 | 0.66 | 0.75  | 0.85  | 0.94  | 1.03  | 1.13  |
| 360      | 0.17 | 0.25 | 0.33 | 0.42 | 0.50 | 0.58 | 0.67  | 0.75  | 0.84  | 0.92  | 1.00  |

Intensity-Duration Design Chart - Template

FIGURE

3-1



**Table 3-1  
RUNOFF COEFFICIENTS FOR URBAN AREAS**

| Land Use                              |                                | Runoff Coefficient "C" |           |      |      |      |
|---------------------------------------|--------------------------------|------------------------|-----------|------|------|------|
| NRCS Elements                         | County Elements                | % IMPER.               | Soil Type |      |      |      |
|                                       |                                |                        | A         | B    | C    | D    |
| Undisturbed Natural Terrain (Natural) | Permanent Open Space           | 0*                     | 0.20      | 0.25 | 0.30 | 0.35 |
| Low Density Residential (LDR)         | Residential, 1.0 DU/A or less  | 10                     | 0.27      | 0.32 | 0.36 | 0.41 |
| Low Density Residential (LDR)         | Residential, 2.0 DU/A or less  | 20                     | 0.34      | 0.38 | 0.42 | 0.46 |
| Low Density Residential (LDR)         | Residential, 2.9 DU/A or less  | 25                     | 0.38      | 0.41 | 0.45 | 0.49 |
| Medium Density Residential (MDR)      | Residential, 4.3 DU/A or less  | 30                     | 0.41      | 0.45 | 0.48 | 0.52 |
| Medium Density Residential (MDR)      | Residential, 7.3 DU/A or less  | 40                     | 0.48      | 0.51 | 0.54 | 0.57 |
| Medium Density Residential (MDR)      | Residential, 10.9 DU/A or less | 45                     | 0.52      | 0.54 | 0.57 | 0.60 |
| Medium Density Residential (MDR)      | Residential, 14.5 DU/A or less | 50                     | 0.55      | 0.58 | 0.60 | 0.63 |
| High Density Residential (HDR)        | Residential, 24.0 DU/A or less | 65                     | 0.66      | 0.67 | 0.69 | 0.71 |
| High Density Residential (HDR)        | Residential, 43.0 DU/A or less | 80                     | 0.76      | 0.77 | 0.78 | 0.79 |
| Commercial/Industrial (N. Com)        | Neighborhood Commercial        | 80                     | 0.76      | 0.77 | 0.78 | 0.79 |
| Commercial/Industrial (G. Com)        | General Commercial             | 85                     | 0.80      | 0.80 | 0.81 | 0.82 |
| Commercial/Industrial (O.P. Com)      | Office Professional/Commercial | 90                     | 0.83      | 0.84 | 0.84 | 0.85 |
| Commercial/Industrial (Limited I.)    | Limited Industrial             | 90                     | 0.83      | 0.84 | 0.84 | 0.85 |
| Commercial/Industrial (General I.)    | General Industrial             | 95                     | 0.87      | 0.87 | 0.87 | 0.87 |

\*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient,  $C_p$ , for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).

DU/A = dwelling units per acre

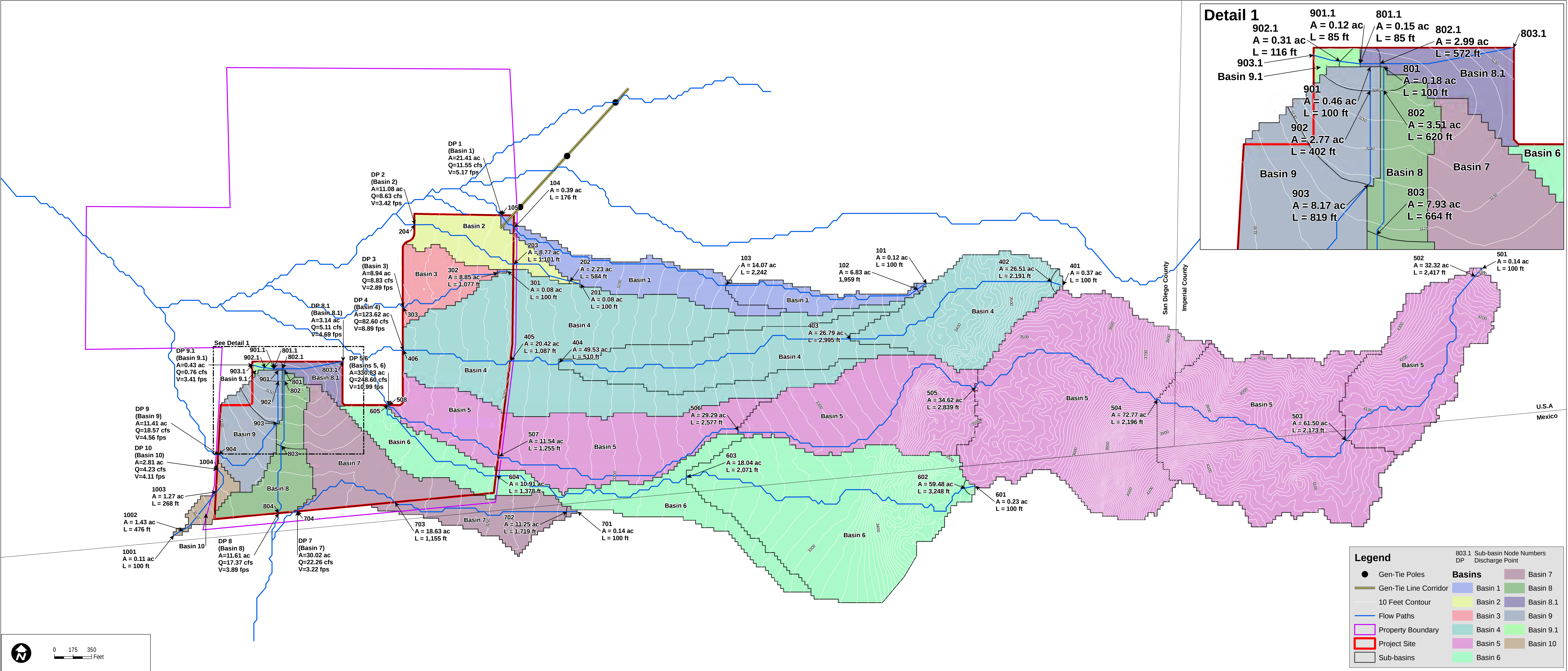
NRCS = National Resources Conservation Service



# **APPENDIX D**

*Figures 5 and 6*







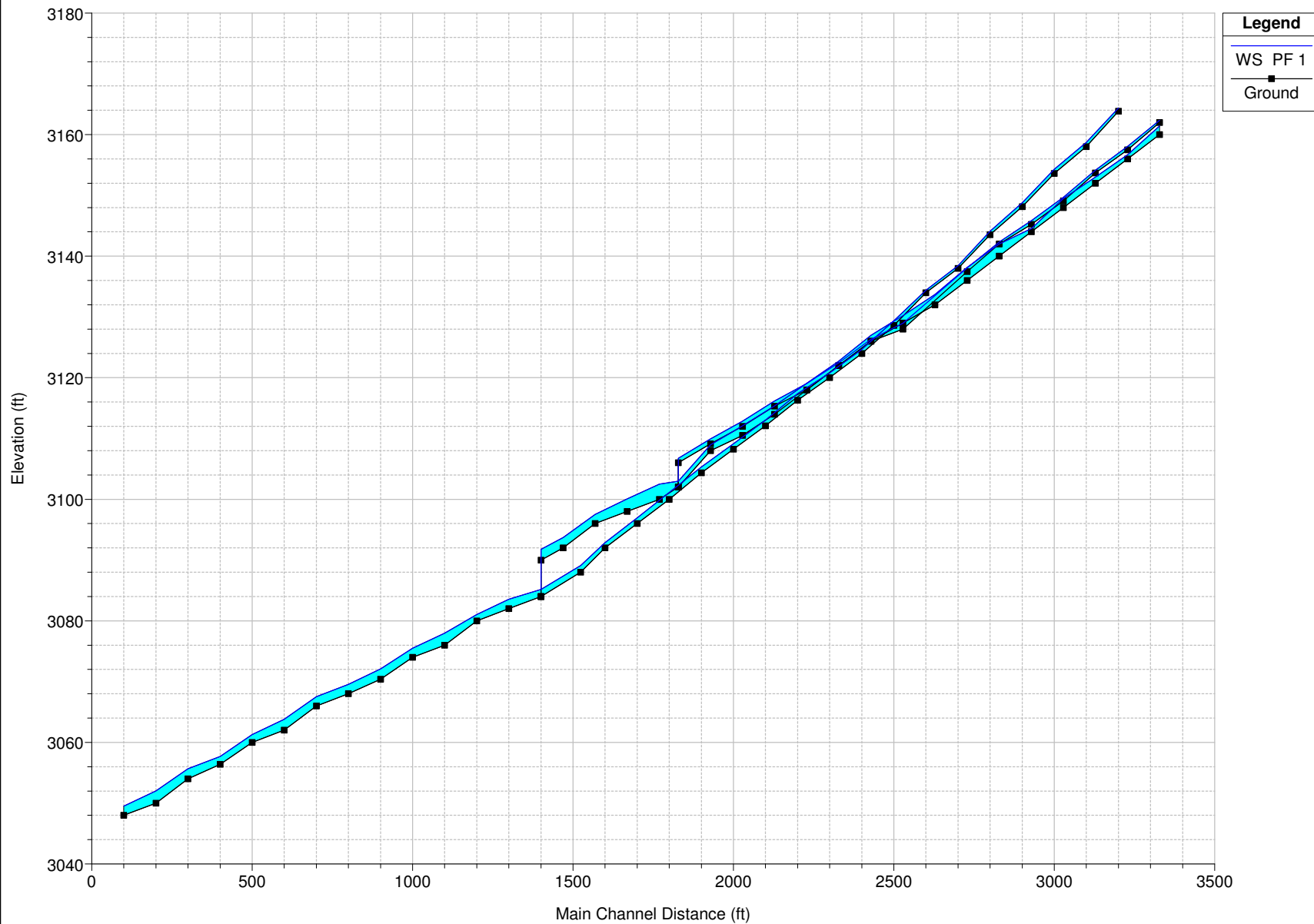




# **APPENDIX E**

## ***HEC-RAS Results***





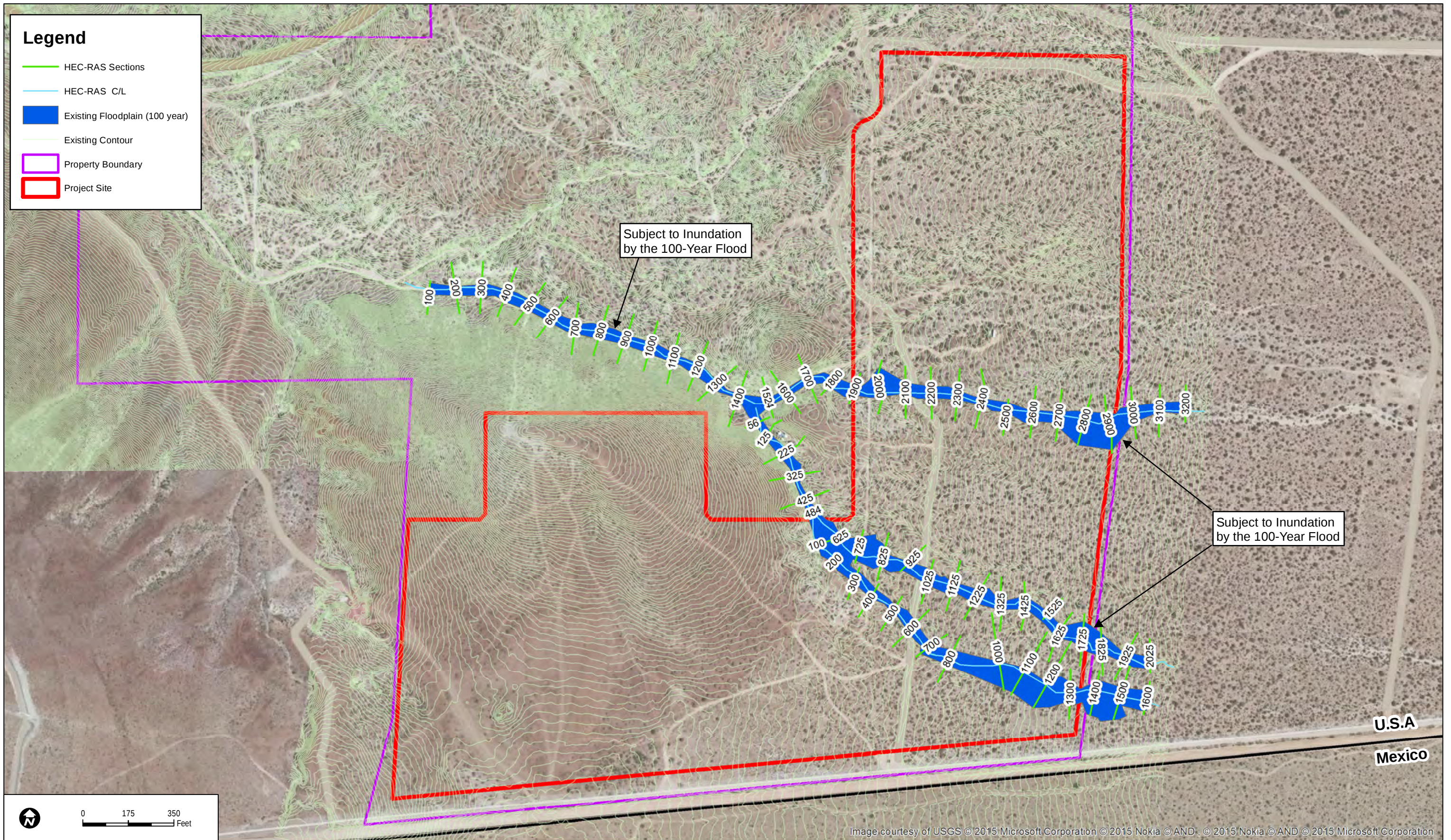


## HEC-RAS Plan: ExistingCond Profile: PF 1

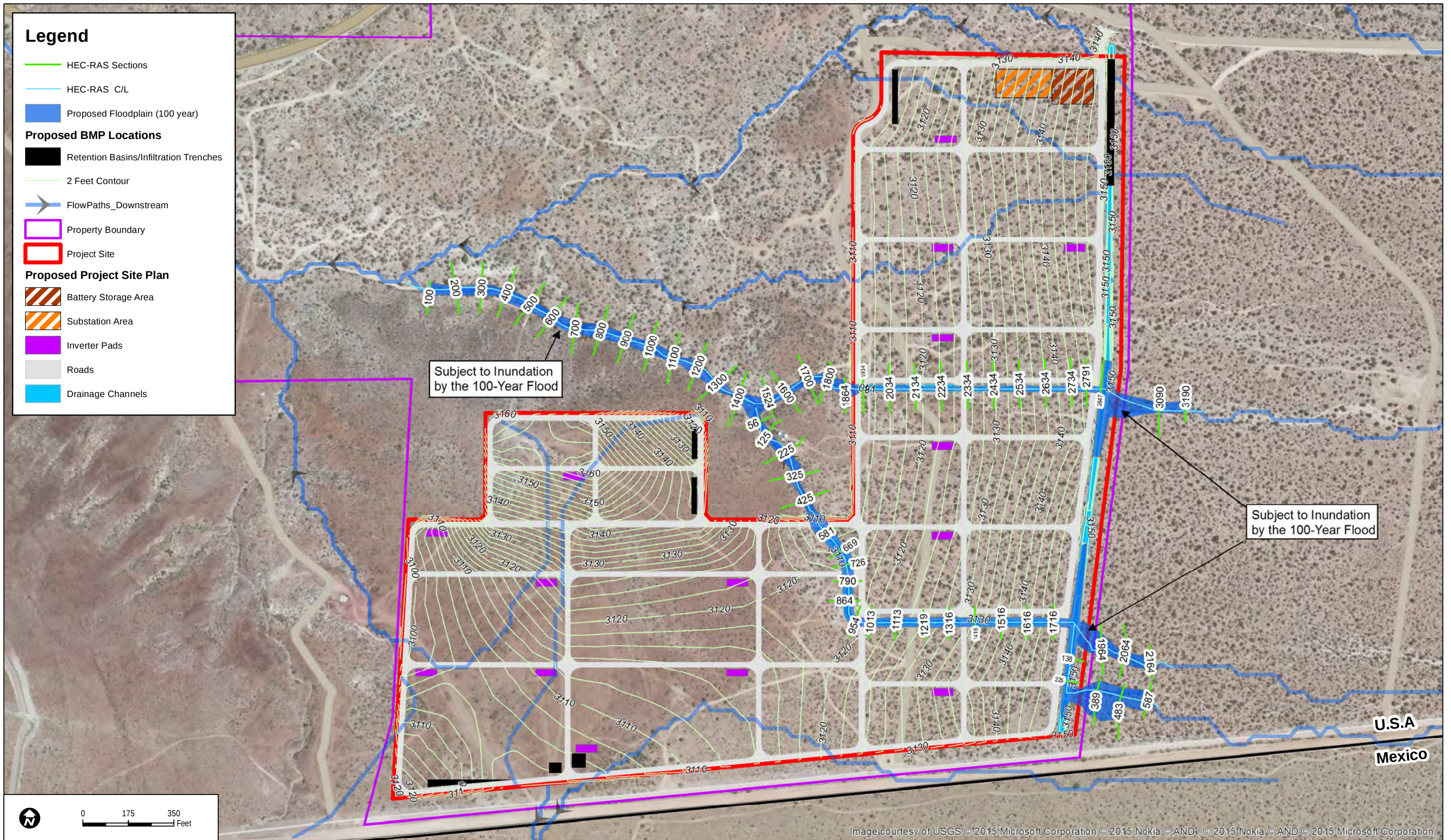
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|-------|-----------|---------|---------|-----------|-----------|-----------|-----------|------------|----------|-----------|-----------|--------------|
|       |           |         | (cfs)   | (ft)      | (ft)      | (ft)      | (ft)      | (ft/ft)    | (ft/s)   | (sq ft)   | (ft)      |              |
| 4     | 3200      | PF 1    | 74.00   | 3163.85   | 3164.38   | 3164.38   | 3164.56   | 0.042060   | 3.91     | 23.84     | 67.19     | 1.14         |
| 4     | 3100      | PF 1    | 74.00   | 3158.02   | 3158.71   | 3158.87   | 3159.24   | 0.068255   | 5.82     | 12.71     | 27.29     | 1.50         |
| 4     | 3000      | PF 1    | 74.00   | 3153.60   | 3154.32   | 3154.32   | 3154.49   | 0.033672   | 3.36     | 22.01     | 63.52     | 1.01         |
| 4     | 2900      | PF 1    | 83.00   | 3148.15   | 3148.79   | 3148.93   | 3149.26   | 0.084457   | 5.53     | 15.02     | 40.98     | 1.61         |
| 4     | 2800      | PF 1    | 83.00   | 3143.54   | 3144.11   | 3144.15   | 3144.37   | 0.044017   | 4.13     | 20.20     | 129.81    | 1.17         |
| 4     | 2700      | PF 1    | 83.00   | 3138.00   | 3138.42   | 3138.53   | 3138.79   | 0.072873   | 4.83     | 17.18     | 51.33     | 1.47         |
| 4     | 2600      | PF 1    | 83.00   | 3134.00   | 3134.40   | 3134.40   | 3134.58   | 0.032643   | 3.43     | 24.17     | 66.00     | 1.00         |
| 4     | 2500      | PF 1    | 83.00   | 3128.61   | 3129.36   | 3129.51   | 3129.88   | 0.072413   | 5.79     | 14.35     | 32.54     | 1.54         |
| 4     | 2400      | PF 1    | 83.00   | 3124.00   | 3124.69   | 3124.72   | 3124.99   | 0.034366   | 4.44     | 18.68     | 36.00     | 1.09         |
| 4     | 2300      | PF 1    | 83.00   | 3120.00   | 3120.79   | 3120.86   | 3121.18   | 0.042459   | 5.03     | 16.51     | 30.96     | 1.21         |
| 4     | 2200      | PF 1    | 83.00   | 3116.29   | 3117.37   | 3117.37   | 3117.68   | 0.028988   | 4.46     | 18.59     | 31.25     | 1.02         |
| 4     | 2100      | PF 1    | 83.00   | 3112.07   | 3113.03   | 3113.18   | 3113.51   | 0.064238   | 5.58     | 14.88     | 32.54     | 1.45         |
| 4     | 2000      | PF 1    | 83.00   | 3108.24   | 3109.11   | 3109.10   | 3109.26   | 0.031839   | 3.11     | 26.71     | 83.14     | 0.97         |
| 4     | 1900      | PF 1    | 83.00   | 3104.34   | 3105.33   | 3105.37   | 3105.64   | 0.037236   | 4.46     | 18.61     | 37.87     | 1.12         |
| 4     | 1800      | PF 1    | 83.00   | 3100.00   | 3101.13   | 3101.26   | 3101.75   | 0.040078   | 6.36     | 13.04     | 16.17     | 1.25         |
| 4     | 1700      | PF 1    | 83.00   | 3096.00   | 3096.96   | 3097.11   | 3097.60   | 0.043014   | 6.42     | 12.92     | 16.68     | 1.29         |
| 4     | 1600      | PF 1    | 83.00   | 3092.00   | 3092.86   | 3092.97   | 3093.38   | 0.040809   | 5.79     | 14.34     | 20.99     | 1.23         |
| 4     | 1524      | PF 1    | 83.00   | 3088.00   | 3089.08   | 3089.31   | 3089.87   | 0.051820   | 7.11     | 11.68     | 14.84     | 1.41         |
| 5     | 2025      | PF 1    | 193.00  | 3160.00   | 3161.42   | 3161.42   | 3161.80   | 0.025930   | 4.94     | 39.08     | 52.00     | 1.00         |
| 5     | 1925      | PF 1    | 193.00  | 3156.00   | 3156.70   | 3156.95   | 3157.54   | 0.079782   | 7.38     | 26.14     | 44.20     | 1.69         |
| 5     | 1825      | PF 1    | 193.00  | 3152.00   | 3153.01   | 3153.01   | 3153.24   | 0.031490   | 3.85     | 50.07     | 111.91    | 1.02         |
| 5     | 1725      | PF 1    | 193.00  | 3148.00   | 3149.49   | 3149.59   | 3150.11   | 0.030768   | 6.30     | 30.77     | 67.55     | 1.14         |
| 5     | 1625      | PF 1    | 193.00  | 3144.00   | 3144.53   | 3144.74   | 3145.26   | 0.086941   | 6.85     | 28.19     | 56.96     | 1.71         |
| 5     | 1525      | PF 1    | 193.00  | 3140.00   | 3141.98   | 3141.98   | 3142.60   | 0.022230   | 6.30     | 30.63     | 24.62     | 1.00         |
| 5     | 1425      | PF 1    | 193.00  | 3136.00   | 3138.16   | 3138.36   | 3138.85   | 0.076130   | 6.68     | 28.90     | 53.96     | 1.61         |
| 5     | 1325      | PF 1    | 193.00  | 3132.00   | 3133.69   | 3133.78   | 3134.39   | 0.029294   | 6.69     | 28.88     | 27.12     | 1.13         |
| 5     | 1225      | PF 1    | 193.00  | 3128.99   | 3130.22   | 3130.37   | 3130.81   | 0.043850   | 6.15     | 31.39     | 44.55     | 1.29         |
| 5     | 1125      | PF 1    | 193.00  | 3126.00   | 3126.96   | 3126.99   | 3127.34   | 0.027227   | 4.92     | 40.23     | 139.99    | 1.02         |
| 5     | 1025      | PF 1    | 193.00  | 3122.00   | 3122.74   | 3122.92   | 3123.35   | 0.062730   | 6.26     | 30.82     | 55.78     | 1.48         |
| 5     | 925       | PF 1    | 193.00  | 3118.00   | 3119.07   | 3119.10   | 3119.53   | 0.025293   | 5.48     | 36.78     | 47.74     | 1.02         |
| 5     | 825       | PF 1    | 193.00  | 3114.00   | 3115.36   | 3115.48   | 3115.83   | 0.059013   | 5.53     | 34.93     | 72.79     | 1.41         |
| 5     | 725       | PF 1    | 193.00  | 3110.50   | 3112.08   | 3112.20   | 3112.55   | 0.020878   | 5.56     | 39.95     | 109.66    | 0.95         |
| 5     | 625       | PF 1    | 193.00  | 3108.00   | 3108.98   | 3109.15   | 3109.67   | 0.041228   | 7.43     | 33.03     | 43.19     | 1.32         |
| 6     | 1600      | PF 1    | 60.00   | 3162.00   | 3162.34   | 3162.34   | 3162.48   | 0.035654   | 3.02     | 19.86     | 70.21     | 1.00         |
| 6     | 1500      | PF 1    | 60.00   | 3157.50   | 3158.07   | 3158.09   | 3158.20   | 0.052296   | 2.97     | 20.23     | 98.84     | 1.15         |
| 6     | 1400      | PF 1    | 60.00   | 3153.69   | 3154.12   | 3154.12   | 3154.23   | 0.038349   | 2.64     | 22.70     | 103.68    | 1.00         |
| 6     | 1300      | PF 1    | 60.00   | 3149.08   | 3149.67   | 3149.72   | 3149.92   | 0.048489   | 4.01     | 14.97     | 43.60     | 1.21         |
| 6     | 1200      | PF 1    | 60.00   | 3145.22   | 3145.84   | 3145.84   | 3145.98   | 0.036443   | 2.92     | 20.52     | 77.49     | 1.00         |

HEC-RAS Plan: ExistingCond Profile: PF 1 (Continued)

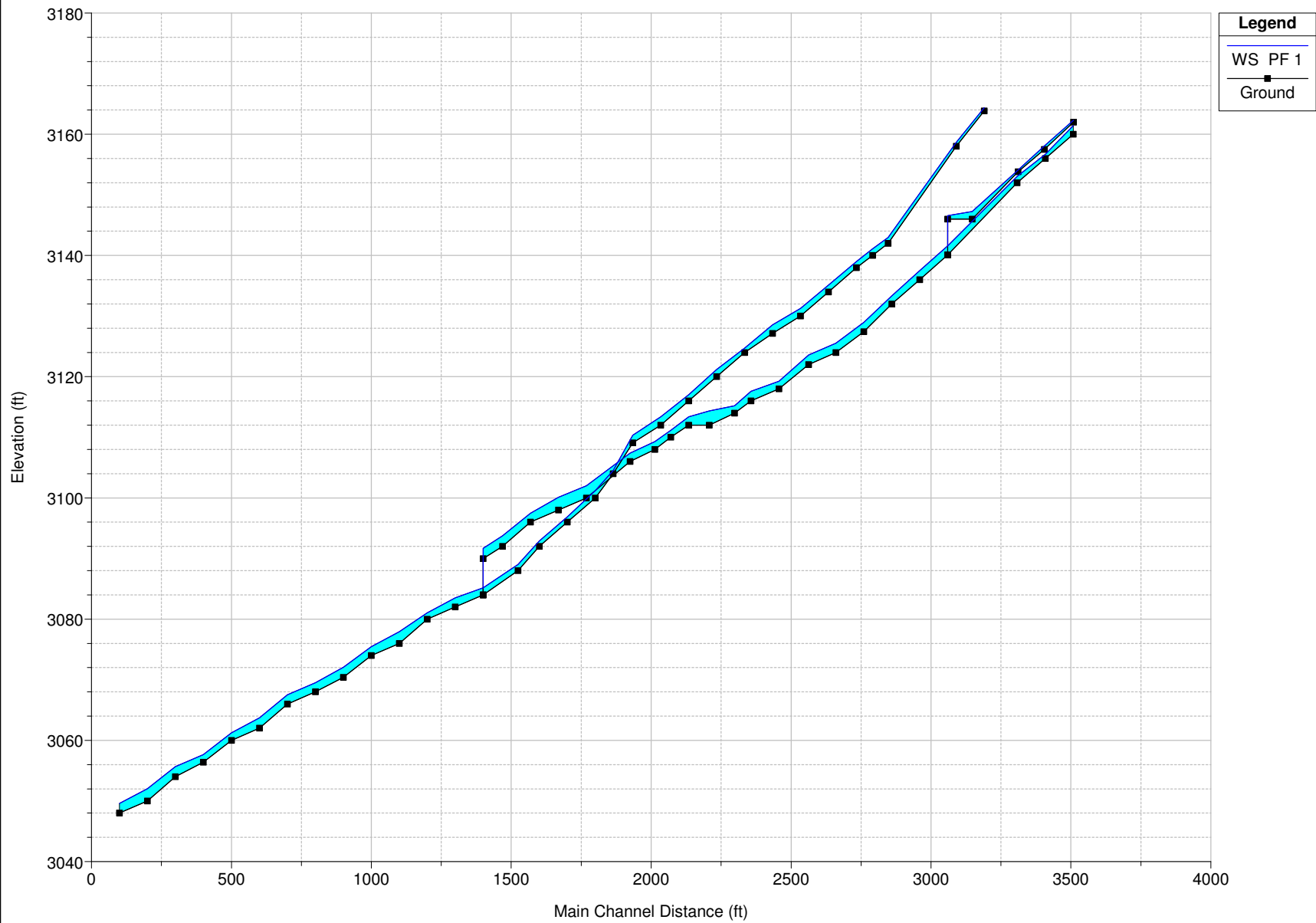
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|-------|-----------|---------|---------|-----------|-----------|-----------|-----------|------------|----------|-----------|-----------|--------------|
|       |           |         | (cfs)   | (ft)      | (ft)      | (ft)      | (ft)      | (ft/ft)    | (ft/s)   | (sq ft)   | (ft)      |              |
| 6     | 1100      | PF 1    | 60.00   | 3142.00   | 3142.32   | 3142.32   | 3142.42   | 0.034642   | 2.55     | 23.51     | 104.79    | 0.95         |
| 6     | 1000      | PF 1    | 60.00   | 3137.47   | 3138.07   | 3138.08   | 3138.16   | 0.053627   | 2.48     | 24.19     | 156.16    | 1.11         |
| 6     | 800       | PF 1    | 60.00   | 3128.00   | 3128.95   | 3128.88   | 3129.11   | 0.020176   | 3.20     | 18.74     | 39.52     | 0.82         |
| 6     | 700       | PF 1    | 60.00   | 3126.00   | 3126.34   | 3126.34   | 3126.48   | 0.035643   | 2.94     | 20.39     | 75.00     | 0.99         |
| 6     | 600       | PF 1    | 60.00   | 3122.00   | 3122.45   | 3122.48   | 3122.71   | 0.039652   | 4.04     | 14.84     | 36.70     | 1.12         |
| 6     | 500       | PF 1    | 60.00   | 3118.00   | 3119.05   | 3119.02   | 3119.31   | 0.025759   | 4.08     | 14.74     | 26.71     | 0.95         |
| 6     | 400       | PF 1    | 60.00   | 3115.32   | 3116.16   | 3116.16   | 3116.34   | 0.034029   | 3.45     | 17.39     | 48.65     | 1.02         |
| 6     | 300       | PF 1    | 60.00   | 3112.00   | 3112.85   | 3112.89   | 3113.13   | 0.038476   | 4.27     | 14.04     | 31.23     | 1.12         |
| 6     | 200       | PF 1    | 60.00   | 3109.15   | 3109.93   | 3109.93   | 3110.15   | 0.032836   | 3.78     | 15.88     | 37.63     | 1.02         |
| 6     | 100       | PF 1    | 60.00   | 3106.00   | 3106.73   | 3106.73   | 3106.99   | 0.030338   | 4.13     | 14.54     | 28.44     | 1.02         |
| 5-2   | 484       | PF 1    | 249.00  | 3102.00   | 3103.00   | 3103.36   | 3104.21   | 0.068623   | 8.86     | 28.11     | 32.13     | 1.67         |
| 5-2   | 425       | PF 1    | 249.00  | 3100.00   | 3102.47   | 3102.47   | 3103.18   | 0.021913   | 6.76     | 36.85     | 26.47     | 1.01         |
| 5-2   | 325       | PF 1    | 249.00  | 3098.00   | 3100.05   | 3100.11   | 3100.79   | 0.026150   | 6.92     | 35.98     | 28.88     | 1.08         |
| 5-2   | 225       | PF 1    | 249.00  | 3096.00   | 3097.53   | 3097.57   | 3098.05   | 0.027452   | 5.76     | 43.25     | 47.51     | 1.06         |
| 5-2   | 125       | PF 1    | 249.00  | 3092.00   | 3093.72   | 3093.90   | 3094.46   | 0.047933   | 6.90     | 36.09     | 45.89     | 1.37         |
| 5-2   | 56        | PF 1    | 249.00  | 3090.00   | 3091.75   | 3091.75   | 3092.35   | 0.022579   | 6.25     | 39.81     | 33.25     | 1.01         |
| 4-2   | 1400      | PF 1    | 320.00  | 3084.00   | 3085.18   | 3086.47   | 3091.76   | 0.379163   | 20.58    | 15.55     | 17.92     | 3.89         |
| 4-2   | 1300      | PF 1    | 320.00  | 3082.00   | 3083.55   | 3083.55   | 3084.18   | 0.022401   | 6.38     | 50.13     | 40.43     | 1.01         |
| 4-2   | 1200      | PF 1    | 320.00  | 3080.00   | 3081.04   | 3081.11   | 3081.64   | 0.028732   | 6.21     | 51.55     | 52.30     | 1.10         |
| 4-2   | 1100      | PF 1    | 320.00  | 3076.00   | 3077.96   | 3078.09   | 3078.72   | 0.029650   | 6.98     | 45.83     | 39.94     | 1.15         |
| 4-2   | 1000      | PF 1    | 320.00  | 3074.00   | 3075.50   | 3075.50   | 3076.08   | 0.022872   | 6.10     | 52.42     | 45.95     | 1.01         |
| 4-2   | 900       | PF 1    | 320.00  | 3070.39   | 3072.08   | 3072.31   | 3073.01   | 0.042133   | 7.71     | 41.50     | 40.64     | 1.34         |
| 4-2   | 800       | PF 1    | 320.00  | 3068.00   | 3069.55   | 3069.37   | 3069.95   | 0.014818   | 5.10     | 62.80     | 52.23     | 0.82         |
| 4-2   | 700       | PF 1    | 320.00  | 3066.00   | 3067.52   | 3067.52   | 3068.13   | 0.022682   | 6.28     | 50.97     | 42.48     | 1.01         |
| 4-2   | 600       | PF 1    | 320.00  | 3062.00   | 3063.81   | 3064.14   | 3064.97   | 0.045415   | 8.62     | 37.10     | 32.36     | 1.42         |
| 4-2   | 500       | PF 1    | 320.00  | 3060.00   | 3061.28   | 3061.28   | 3061.83   | 0.023298   | 5.96     | 53.70     | 49.62     | 1.01         |
| 4-2   | 400       | PF 1    | 320.00  | 3056.41   | 3057.70   | 3057.94   | 3058.54   | 0.048774   | 7.35     | 43.51     | 51.18     | 1.41         |
| 4-2   | 300       | PF 1    | 320.00  | 3054.00   | 3055.67   | 3055.67   | 3056.32   | 0.022088   | 6.47     | 49.45     | 38.57     | 1.01         |
| 4-2   | 200       | PF 1    | 320.00  | 3050.00   | 3052.04   | 3052.40   | 3053.24   | 0.043899   | 8.80     | 36.36     | 29.86     | 1.41         |
| 4-2   | 100       | PF 1    | 320.00  | 3048.00   | 3049.52   | 3049.59   | 3050.20   | 0.025453   | 6.68     | 49.00     | 45.13     | 1.07         |













HEC-RAS Plan: PropCond. Profile: PF 1

| 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 |
|-------|-----------|------|---------|---------|-----------|-----------|-----------|-----------|------------|----------|-----------|-----------|--------------|
|       |           |      |         | (cfs)   | (ft)      | (ft)      | (ft)      | (ft)      | (ft/ft)    | (ft/s)   | (sq ft)   | (ft)      |              |
| 4     | 3190      | 3200 | PF 1    | 74.00   | 3163.85   | 3164.36   | 3164.36   | 3164.53   | 0.033222   | 3.29     | 22.50     | 66.46     | 1.00         |
| 4     | 3090      | 3100 | PF 1    | 74.00   | 3158.02   | 3158.67   | 3158.87   | 3159.31   | 0.091247   | 6.46     | 11.46     | 26.21     | 1.72         |
| 4     | 2847      |      | PF 1    | 83.00   | 3142.00   | 3142.95   | 3143.24   | 3143.92   | 0.047827   | 7.90     | 10.50     | 12.93     | 1.55         |
| 4     | 2791      |      | PF 1    | 83.00   | 3140.00   | 3141.10   | 3141.24   | 3141.79   | 0.029053   | 6.68     | 12.42     | 13.48     | 1.23         |
| 4     | 2734      |      | PF 1    | 83.00   | 3138.00   | 3139.00   | 3139.23   | 3139.85   | 0.039893   | 7.41     | 11.19     | 13.22     | 1.42         |
| 4     | 2634      |      | PF 1    | 83.00   | 3134.00   | 3135.13   | 3135.36   | 3136.00   | 0.037114   | 7.49     | 11.07     | 12.10     | 1.38         |
| 4     | 2534      |      | PF 1    | 83.00   | 3130.00   | 3131.25   | 3131.52   | 3132.21   | 0.038474   | 7.86     | 10.56     | 10.93     | 1.41         |
| 4     | 2434      |      | PF 1    | 83.00   | 3127.13   | 3128.58   | 3128.64   | 3129.08   | 0.023927   | 5.72     | 14.52     | 17.48     | 1.11         |
| 4     | 2334      |      | PF 1    | 83.00   | 3124.00   | 3124.70   | 3124.92   | 3125.39   | 0.063705   | 6.64     | 12.50     | 25.55     | 1.67         |
| 4     | 2234      |      | PF 1    | 83.00   | 3120.00   | 3121.18   | 3121.25   | 3121.78   | 0.023011   | 6.18     | 13.43     | 13.72     | 1.10         |
| 4     | 2134      |      | PF 1    | 83.00   | 3116.00   | 3117.00   | 3117.38   | 3118.22   | 0.059221   | 8.85     | 9.38      | 11.36     | 1.72         |
| 4     | 2034      |      | PF 1    | 83.00   | 3112.00   | 3113.39   | 3113.55   | 3114.16   | 0.027907   | 7.04     | 11.79     | 11.26     | 1.21         |
| 4     | 1934      |      | PF 1    | 83.00   | 3109.08   | 3110.32   | 3110.51   | 3111.09   | 0.033712   | 7.01     | 11.83     | 13.36     | 1.31         |
| 4     | 1864      |      | PF 1    | 83.00   | 3104.00   | 3104.51   | 3104.90   | 3106.11   | 0.221507   | 10.16    | 8.17      | 22.50     | 2.97         |
| 4     | 1800      | 1800 | PF 1    | 83.00   | 3100.00   | 3101.22   | 3101.27   | 3101.72   | 0.029567   | 5.70     | 14.56     | 16.93     | 1.08         |
| 4     | 1700      | 1700 | PF 1    | 83.00   | 3096.00   | 3096.89   | 3097.11   | 3097.67   | 0.057729   | 7.11     | 11.68     | 16.18     | 1.47         |
| 4     | 1600      | 1600 | PF 1    | 83.00   | 3092.00   | 3092.91   | 3092.97   | 3093.36   | 0.032081   | 5.33     | 15.56     | 21.48     | 1.10         |
| 4     | 1524      | 1524 | PF 1    | 83.00   | 3088.00   | 3089.02   | 3089.31   | 3089.94   | 0.065019   | 7.72     | 10.75     | 14.30     | 1.57         |
| 5     | 2164      | 2025 | PF 1    | 193.00  | 3160.00   | 3161.41   | 3161.41   | 3161.80   | 0.026143   | 4.96     | 38.94     | 51.86     | 1.01         |
| 5     | 2064      | 1925 | PF 1    | 193.00  | 3156.00   | 3156.70   | 3156.96   | 3157.54   | 0.078803   | 7.35     | 26.25     | 44.24     | 1.68         |
| 5     | 1964      | 1825 | PF 1    | 193.00  | 3152.00   | 3153.03   | 3153.03   | 3153.25   | 0.030264   | 3.88     | 52.50     | 113.90    | 1.00         |
| 6     | 587       | 1600 | PF 1    | 56.00   | 3162.00   | 3162.32   | 3162.32   | 3162.46   | 0.036047   | 2.97     | 18.89     | 69.27     | 1.00         |
| 6     | 483       | 1500 | PF 1    | 56.00   | 3157.50   | 3158.06   | 3158.13   | 3158.30   | 0.044636   | 4.51     | 19.87     | 98.51     | 1.20         |
| 6     | 389       | 1400 | PF 1    | 56.00   | 3153.82   | 3154.11   | 3154.11   | 3154.22   | 0.071816   | 2.78     | 21.67     | 102.69    | 1.28         |
| 6     | 225       |      | PF 1    | 56.00   | 3146.00   | 3147.24   | 3146.64   | 3147.31   | 0.002204   | 2.14     | 26.27     | 23.70     | 0.35         |
| 6     | 138       |      | PF 1    | 56.00   | 3146.00   | 3146.57   | 3146.57   | 3146.85   | 0.022011   | 4.21     | 13.34     | 24.52     | 1.00         |
| 5-2   | 1716      |      | PF 1    | 243.00  | 3140.08   | 3141.60   | 3142.14   | 3143.36   | 0.049456   | 10.66    | 22.80     | 18.30     | 1.68         |
| 5-2   | 1616      |      | PF 1    | 243.00  | 3136.00   | 3137.50   | 3137.91   | 3138.91   | 0.038466   | 9.55     | 25.43     | 19.99     | 1.49         |
| 5-2   | 1516      |      | PF 1    | 243.00  | 3132.00   | 3133.33   | 3133.77   | 3134.80   | 0.044149   | 9.70     | 25.04     | 21.44     | 1.58         |
| 5-2   | 1416      |      | PF 1    | 243.00  | 3127.44   | 3128.98   | 3129.40   | 3130.40   | 0.043720   | 9.57     | 25.39     | 22.08     | 1.57         |
| 5-2   | 1316      |      | PF 1    | 243.00  | 3124.00   | 3125.51   | 3125.81   | 3126.68   | 0.030891   | 8.69     | 27.96     | 21.53     | 1.34         |
| 5-2   | 1219      |      | PF 1    | 243.00  | 3122.00   | 3123.57   | 3123.61   | 3124.32   | 0.017971   | 6.92     | 35.13     | 25.48     | 1.04         |
| 5-2   | 1113      |      | PF 1    | 243.00  | 3118.00   | 3119.23   | 3119.79   | 3121.03   | 0.059705   | 10.76    | 22.58     | 20.78     | 1.82         |
| 5-2   | 1013      |      | PF 1    | 243.00  | 3116.00   | 3117.57   | 3117.57   | 3118.27   | 0.016868   | 6.72     | 36.18     | 26.17     | 1.01         |
| 5-2   | 954       |      | PF 1    | 243.00  | 3114.00   | 3115.18   | 3115.62   | 3116.62   | 0.048470   | 9.61     | 25.30     | 23.72     | 1.64         |
| 5-2   | 864       |      | PF 1    | 243.00  | 3112.00   | 3114.36   | 3113.64   | 3114.67   | 0.004693   | 4.44     | 54.71     | 27.88     | 0.56         |
| 5-2   | 790       |      | PF 1    | 243.00  | 3112.00   | 3113.40   | 3113.40   | 3114.04   | 0.017099   | 6.41     | 37.91     | 29.90     | 1.00         |
| 5-2   | 726       |      | PF 1    | 243.00  | 3110.00   | 3111.15   | 3111.49   | 3112.35   | 0.041566   | 8.81     | 27.59     | 26.34     | 1.52         |
| 5-2   | 669       |      | PF 1    | 243.00  | 3108.00   | 3109.30   | 3109.53   | 3110.30   | 0.029806   | 8.01     | 30.34     | 25.96     | 1.31         |
| 5-2   | 581       |      | PF 1    | 243.00  | 3106.00   | 3107.37   | 3107.43   | 3108.09   | 0.019927   | 6.81     | 35.67     | 28.79     | 1.08         |
| 5-2   | 425       |      | PF 1    | 243.00  | 3100.00   | 3102.01   | 3102.42   | 3103.41   | 0.048427   | 9.49     | 25.66     | 21.58     | 1.48         |
| 5-2   | 325       |      | PF 1    | 243.00  | 3098.00   | 3100.11   | 3100.11   | 3100.75   | 0.022480   | 6.45     | 37.67     | 29.57     | 1.01         |

HEC-RAS Plan: PropCond. Profile: PF 1 (Continued)

| 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 |
|-------|-----------|---------|---------|-----------|-----------|-----------|-----------|------------|----------|-----------|-----------|--------------|
|       |           |         | (cfs)   | (ft)      | (ft)      | (ft)      | (ft)      | (ft/ft)    | (ft/s)   | (sq ft)   | (ft)      |              |
| 5-2   | 225       | PF 1    | 243.00  | 3096.00   | 3097.46   | 3097.55   | 3098.04   | 0.032902   | 6.11     | 39.76     | 45.90     | 1.16         |
| 5-2   | 125       | PF 1    | 243.00  | 3092.00   | 3093.76   | 3093.89   | 3094.41   | 0.040134   | 6.47     | 37.58     | 46.42     | 1.26         |
| 5-2   | 56        | PF 1    | 243.00  | 3090.00   | 3091.69   | 3091.71   | 3092.33   | 0.023413   | 6.46     | 37.80     | 32.50     | 1.03         |
| 4-2   | 1400      | PF 1    | 313.00  | 3084.00   | 3085.16   | 3086.45   | 3091.74   | 0.384674   | 20.58    | 15.21     | 17.72     | 3.91         |
| 4-2   | 1300      | PF 1    | 313.00  | 3082.00   | 3083.50   | 3083.52   | 3084.17   | 0.022321   | 6.58     | 48.33     | 40.00     | 1.02         |
| 4-2   | 1200      | PF 1    | 313.00  | 3080.00   | 3081.03   | 3081.09   | 3081.62   | 0.028694   | 6.17     | 50.77     | 52.22     | 1.10         |
| 4-2   | 1100      | PF 1    | 313.00  | 3076.00   | 3077.92   | 3078.08   | 3078.72   | 0.028992   | 7.17     | 44.35     | 39.37     | 1.15         |
| 4-2   | 1000      | PF 1    | 313.00  | 3074.00   | 3075.47   | 3075.48   | 3076.05   | 0.023570   | 6.13     | 51.07     | 45.51     | 1.02         |
| 4-2   | 900       | PF 1    | 313.00  | 3070.39   | 3072.06   | 3072.28   | 3073.00   | 0.039994   | 7.76     | 40.60     | 40.46     | 1.32         |
| 4-2   | 800       | PF 1    | 313.00  | 3068.00   | 3069.52   | 3069.36   | 3069.93   | 0.015402   | 5.13     | 61.00     | 51.68     | 0.83         |
| 4-2   | 700       | PF 1    | 313.00  | 3066.00   | 3067.51   | 3067.51   | 3068.15   | 0.020251   | 6.48     | 50.58     | 42.36     | 0.98         |
| 4-2   | 600       | PF 1    | 313.00  | 3062.00   | 3063.73   | 3064.10   | 3065.04   | 0.050459   | 9.20     | 34.45     | 31.36     | 1.50         |
| 4-2   | 500       | PF 1    | 313.00  | 3060.00   | 3061.26   | 3061.26   | 3061.83   | 0.021308   | 6.08     | 52.89     | 49.48     | 0.98         |
| 4-2   | 400       | PF 1    | 313.00  | 3056.41   | 3057.66   | 3057.92   | 3058.56   | 0.055019   | 7.62     | 41.08     | 50.14     | 1.48         |
| 4-2   | 300       | PF 1    | 313.00  | 3054.00   | 3055.65   | 3055.65   | 3056.29   | 0.022310   | 6.45     | 48.51     | 38.29     | 1.01         |
| 4-2   | 200       | PF 1    | 313.00  | 3050.00   | 3052.01   | 3052.34   | 3053.22   | 0.043295   | 8.83     | 35.46     | 29.39     | 1.40         |
| 4-2   | 100       | PF 1    | 313.00  | 3048.00   | 3049.57   | 3049.58   | 3050.14   | 0.022991   | 6.06     | 51.67     | 46.13     | 1.01         |