

## **Preliminary Identification of the Preliminary Ordinary High Water Mark in Lower Sycamore Creek**

The ordinary high water mark (OHWM) as defined by the by the U. S. Army Corps of Engineers is fairly subjective in most cases and particularly in the case of Sycamore Creek, which is urban and of such a capacity that it overflows in this reach under flows that represent less than 10-year storm events.

U.S. Army Corps of Engineers guidelines<sup>1</sup> indicate that one of the ways to approach the OHWM determination is via review of gauging records for the subject creek or river. The guidelines suggest that the use of about a 5-year runoff event will approximate the OHWM. In this case, Sycamore Creek has limited gauging data (2 -3 years). However, depth-duration rainfall data in the watershed extends over a 53 year period. The use of recent discharge gauging and long-term depth-duration rainfall analysis allow a fairly accurate correlation of the flow rate in Sycamore Creek that conservatively represents a 5-year discharge rate. That is, a 5-year precipitation in a nearby watershed was noted on February 26, 2010 and the peak runoff on the same storm was noted and accepted as the 5-year runoff. The analysis is conservative because:

- A major portion of the watershed tributary to Sycamore Creek was recently burned in the Tea Fire. The burning of the watershed typically increases the amount of debris and peak runoff discharge for several years afterwards.
- The storm period used for the analysis was near the end of the rain season, after the watershed had been significantly saturated. This would result in more than typical runoff from soil.

Finally, the estimated 5-year flow rate (183 cubic feet per second) was entered into the pre-project condition HEC-RAS<sup>2</sup> model for the project area. The results of this analysis represent the 5-year flood elevation in the project reach or as stated above, the approximate OHWM.

The water surface profile between US101 and Punta Gorda Street is shown in Figure A. The water surface elevations and other pertinent data are shown in Table 1. This data should be used in coordination with an appropriate field review of the subject creek reach.

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<sup>1</sup> Lichvar, Robert W. and McColley, Shawn M.; A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, A delineation Manual; U.S. Army Corps of Engineers; August 2008; p43.

<sup>2</sup> HEC-RAS – Hydrologic Engineering Center – River Analysis System – a water surface profile computer program published by the U.S. Army Corps of Engineers.

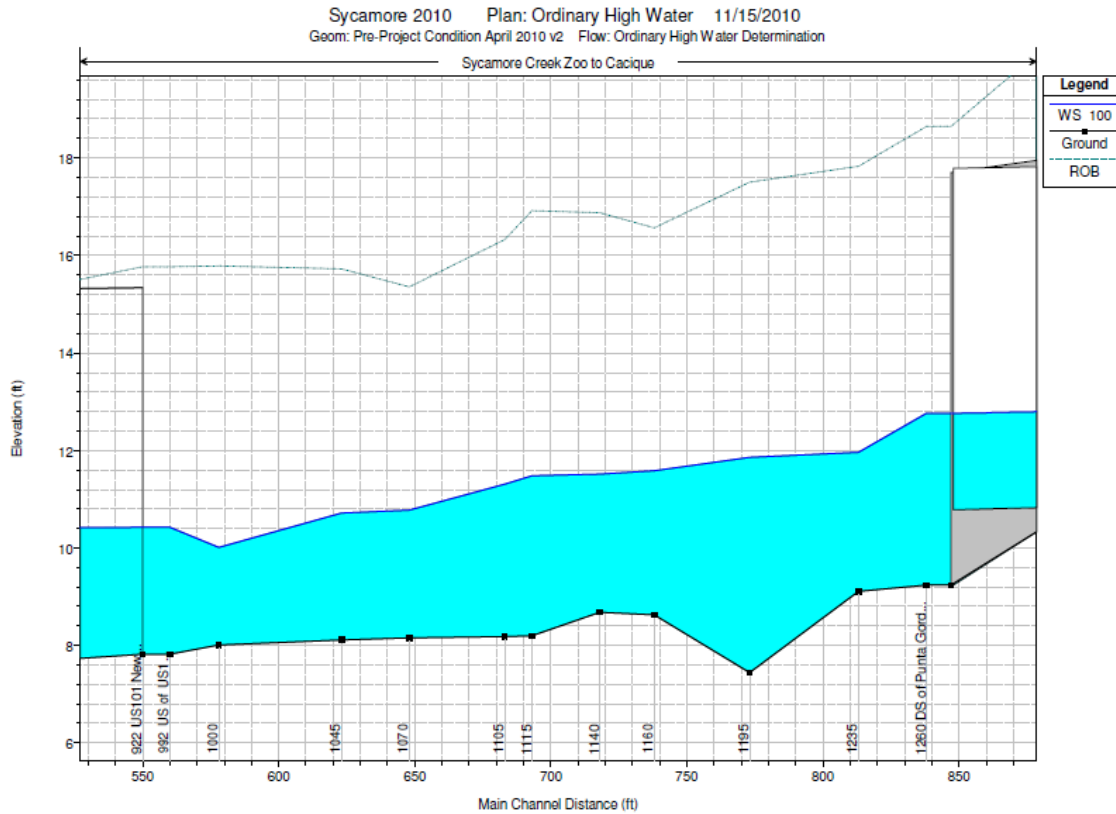
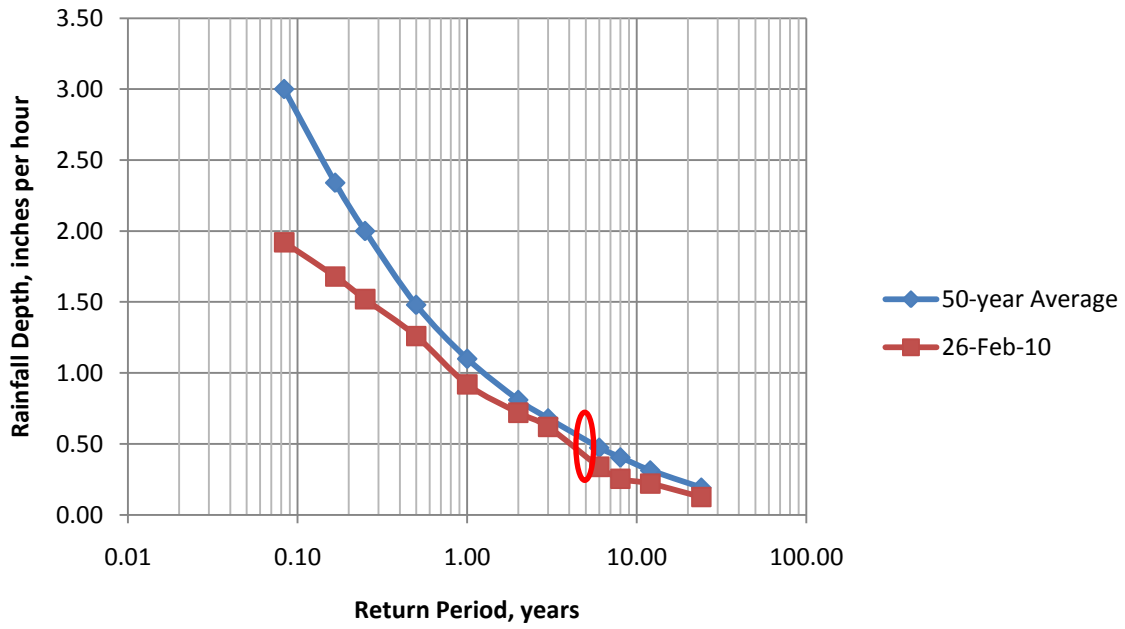


Figure A - 5-Year Water Surface Profile for a Portion of Lower Sycamore Creek

Table 1 - HEC-RAS Results for the 5-year Discharge

River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
1287	Culvert					
1260	183	9.24	12.76	2.84	64.41	23.94
1235	183	9.11	11.97	7.13	25.68	16.28
1195	183	7.44	11.86	3.87	47.28	18.25
1160	183	8.63	11.59	4.75	38.49	18.10
1140	183	8.68	11.51	4.51	40.55	18.17
1115	183	8.20	11.48	3.89	47.01	19.59
1105	183	8.18	11.31	4.77	38.35	17.57
1070	183	8.16	10.78	6.27	29.19	14.54
1045	183	8.11	10.71	5.20	35.19	16.54
1000	183	8.01	10.01	6.65	27.53	15.16
992	183	7.82	10.43	2.06	88.88	54.92
922	Bridge					

### Tunnel Trail Gage, Site 250



### Sycamore Creek Stream Gage (near 5 Points)

