Table 3-2: San Juan Hydraulic Model Flowrates

Condition	Node	Cross-Section	Storm Event Flowrate (cfs)					
			2-year EV	5-year EV	10-year EV	25-year EV	50-year EV	100-year EV
Existing	126	52124	525	2380	7145	14924	17828	20352
	127	45373	514	2314	6990	14964	17925	20460
	133T	2096	354	786	1875	2942	3500	3986
	133U	39524	515	2308	6914	14948	17911	20361
	133C	39298	583	2458	7172	15972	19143	21828
	134U	35120	582	2415	7148	16080	19284	22000
	134C	33352	610	2525	7275	16770	20118	22933
	137	27635	617	2501	7267	16869	20237	23080
	138	22946	625	2510	7270	16983	20380	23249
	139	19802	640	2531	7270	17013	20423	23299
Phased PA-1, -2, -3, -4	126	52124	520	2360	7144	14844	17748	20205
	127	45373	570	2449	7127	14878	17825	20317
	133T	2096	404	797	1654	2347	2683	2985
	133U	39524	573	2461	7109	14864	17812	20316
	133C	39298	653	2592	7252	15816	18990	21663
	134U	35120	658	2654	7271	15974	19187	21890
	134C	33352	695	2732	7419	16646	19978	22789
	137	27635	713	2733	7440	16747	20112	22943
	138	22946	711	2706	7439	16850	20231	23102
	139	19802	721	2753	7440	16878	20272	23154
Phased PA-1, -2, -3	126	52124	526	2347	7112	14844	17769	20242
	127	45373	558	2409	7165	14857	17810	20310
	133T	2096	403	797	1654	2347	2683	2985
	133U	39524	562	2537	7118	14837	17787	20290
	133C	39298	655	2621	7204	15765	18936	21609
	134U	35120	653	2654	7221	15923	19132	21833
	134C	33352	696	2705	7369	16597	19925	22734
	137	27635	704	2719	7390	16699	20057	22888
	138	22946	703	2702	7391	16802	20178	23044
	139	19802	707	2741	7391	16830	20217	23100
Ultimate w/Basins	126	52124	520	2359	7144	14844	17748	20204
	127	45373	560	2411	7140	14851	17782	20257
	133T	2096	403	797	1654	2347	2683	2985
	133U	39524	619	2542	7183	14836	17764	20237
	133C	39298	652	2670	7254	15717	18855	21486
	134U	35120	654	2701	7263	15857	19022	21682
	134C	33352	687	2748	7407	16514	19808	22574
	137	27635	699	2745	7426	16616	19929	22720
	138	22946	704	2751	7424	16709	20055	22882
	139	19802	710	2750	7424	16741	20088	22928

Table 3-3 and Table 3-4 show the minimum, maximum, and average hydraulic parameters for the two different flow regimes and two different flowrates (existing and proposed) for Gobernadora. The tables show that there are no significant changes between the existing and proposed condition hydraulics. The

results of the ultimate condition 100-year expected value floodplain hydraulic characteristics are very similar to the results of the 2013 Ranch Plan ROMP. The following conclusions can be drawn:

- Channel Depth: The fluctuation of computed depths suggests highly irregular bank heights, bed profile, and channel capacity, all of which indicate channel stability.
- Channel Area: In general, the variation of channel area varies marginally between adjacent cross sections, indicating that gradually varied geometry is present in the creek. The large spike in area near the downstream end of the reach is a result of backwater effects upstream of the culvert crossing at a Ranch access road.
- Top Width: The large fluctuations in top width further substantiate the variation in channel geometry and demonstrate the oscillation between incised channels, and shallow channels with access to a wider floodplain.
- Velocity: Average velocity varies significantly, which is reflective of the variability of channel cross-section shape and area. Velocities are moderate and occasionally high.
- Froude Number: The Froude number indicates that flow is mostly subcritical with a few areas of supercritical flow regime.

Table 3-5 and Table 3-6 show the minimum, maximum and average hydraulic parameters for the two different flow regimes and two different flowrates (existing and proposed) for San Juan Creek. The tables show that there are no significant changes between the existing and proposed condition analysis. The results of the ultimate condition 100-year expected value floodplain hydraulic characteristics are very similar to the results of the 2013 Ranch Plan ROMP. The following conclusions can be drawn:

- Channel Depth: The fluctuation of the computed maximum and hydraulic depths indicates that gradually varied conditions probably exist between adjacent cross sections.
- Channel Area: The variation of channel area varies marginally between adjacent cross sections, indicating that gradually varied geometry is present in the creek and that future channel adjustments to a more stable form may not necessarily occur.
- Top Width: The large fluctuations in top width further substantiate the variation in channel geometry between adjacent cross sections, and potential for large areas of flooding in some reaches.
- Velocity: Average velocity for the non-channelized reach of SJC is relatively low, although there are some areas where higher velocities occur, typically at bridges or in highly encroached reaches.
- Froude Number: The hydraulic water surface profile indicates that flow in the study reach is strongly subcritical through the comparison to critical depth, except at isolated cross sections. The spike in Froude number indicates a natural sandstone narrow area which accelerates the flow before expanding to wide floodplain area.

Detailed results including a comparison of results by cross section are included in Appendix I.3 and I.4 for all the storm events and hydraulics regime.

Table 3-3: Gobernadora HEC-RAS 100-year EV – Mixed Flow Regime Comparison

Parameter	Existing 100-year					Ultimate 100-year				
	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #
Minimum	0.9	0.98	293.4	47.8	0.1	0.1	0.8	172.7	41.9	0.1
Maximum	18.0	14.2	4631.9	973.4	1.1	17.1	16.5	3768.1	956.2	1.9
Average	5.9	5.3	966.3	453.9	0.5	5.2	5.1	762.1	419.3	0.6

Table 3-4: Gobernadora HEC-RAS 100-year EV – Subcritical Flow Regime Comparison

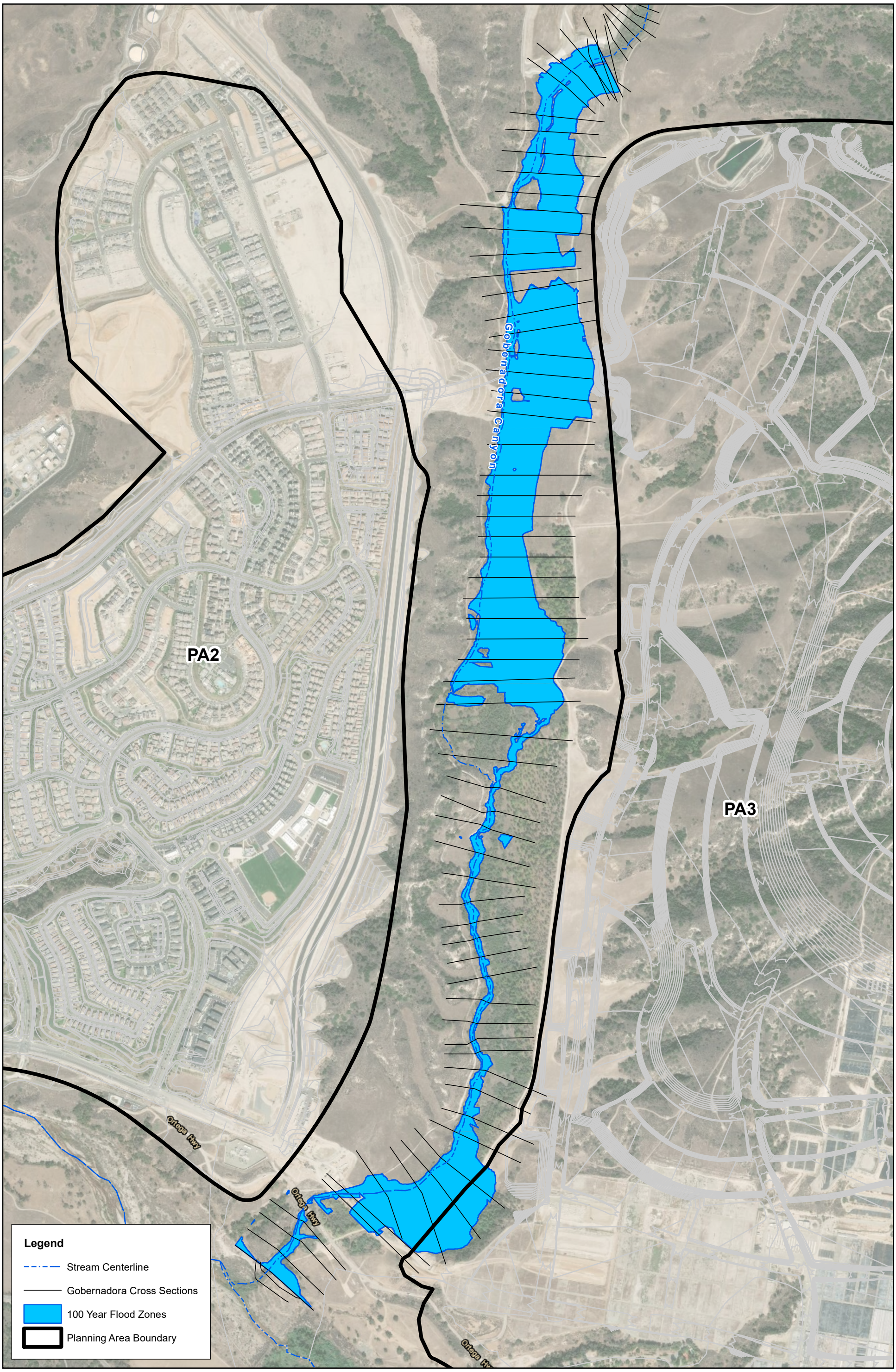
Parameter	Existing 100-year					Ultimate 100-year				
	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #
Minimum	0.9	1.0	293.4	47.8	0.1	0.1	0.8	223.9	41.9	0.1
Maximum	18.0	13.0	4631.9	973.4	1.0	17.1	12.7	3768.1	956.2	1.1
Average	5.9	5.2	970.9	455.3	0.5	5.2	4.9	767.0	420.1	0.5

Table 3-5: San Juan Creek HEC-RAS 100-year EV – Mixed Flow Regime Comparison

Parameter	Existing 100-year					Phase No PA-4&5 100-year					Phase No PA5 100-year					Ultimate 100-year				
	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #
Minimum	4.3	1.7	936.8	89.8	0.1	6.2	1.7	1047.7	89.8	0.1	4.6	1.7	946.4	89.8	0.1	4.6	1.7	944.5	89.8	0.1
Maximum	27.6	25.7	11736.5	1538.9	2.2	27.6	19.7	11708.7	1538.9	1.0	27.6	25.7	11710.6	1538.9	2.1	27.6	25.7	11691.4	1538.9	2.1
Average	13.8	7.5	4017.4	546.4	0.5	13.9	7.5	3923.7	530.6	0.4	13.9	7.6	3914.0	530.5	0.5	13.8	7.6	3898.6	529.4	0.5

Table 3-6: San Juan Creek HEC-RAS 100-year EV – Subcritical Flow Regime Comparison

Parameter	Existing 100-year					Phase No PA-4&5 100-year					Phase No PA5 100-year					Ultimate 100-year				
	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #	Flow Depth (ft)	Velocity (ft/s)	Flow area (Sq. ft)	Top Width (ft)	Froude #
Minimum	6.2	1.7	1047.7	89.8	0.1	6.2	1.7	1047.7	89.8	0.1	6.2	1.7	1047.7	89.8	0.1	6.2	1.7	1047.7	89.8	0.1
Maximum	27.6	19.7	11736.5	1538.9	1.0	27.6	19.7	11708.7	1538.9	1.0	27.6	19.7	11710.6	1538.9	1.0	27.6	25.7	11691.4	1538.9	2.1
Average	13.8	7.4	4028.2	546.6	0.4	13.9	7.5	3923.7	530.6	0.4	13.9	7.5	3924.7	530.8	0.4	13.8	7.6	3898.6	529.4	0.5



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Michael Baker INTERNATIONAL

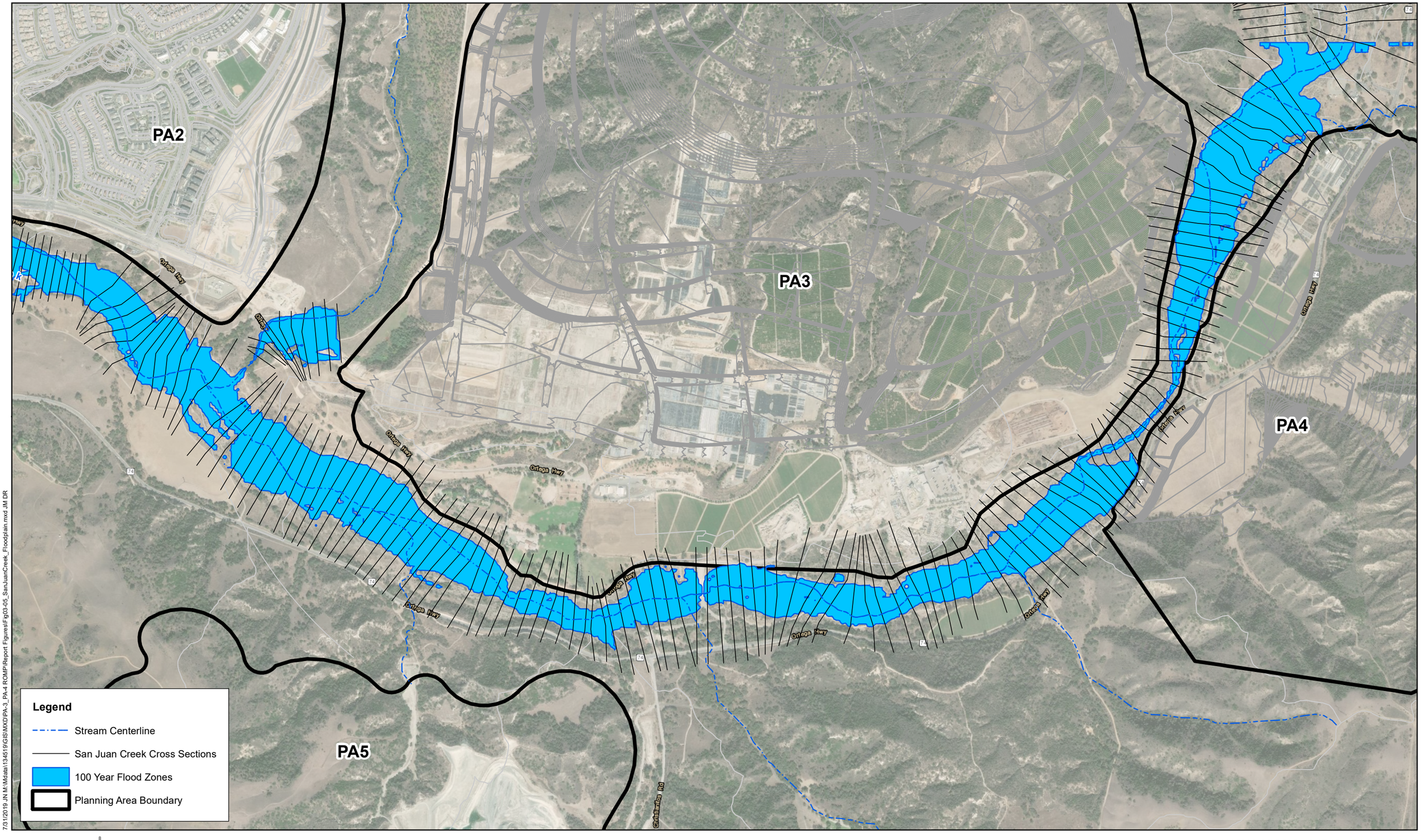
0 1,000 2,000 Feet

Source: PACE, Huitt-Zollars, Geosyntec, ESRI Online

RANCHO MISSION VIEJO - PA3&4 ROMP

Gobernadora Floodplain

Figure 3-4



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Michael Baker INTERNATIONAL

0 1,000 2,000 Feet

Source: PACE, Huitt-Zollars, Geosyntec, ESRI Online

RANCHO MISSION VIEJO - PA3&4 ROMP

Proposed San Juan Creek Floodplain

Figure 3-5