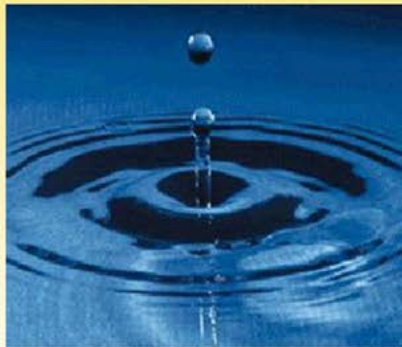


Appendix C STEPL Spreadsheet Results

The purpose of this appendix is to present screen captures of the US Environmental Protection Agency's Spreadsheet Tool for Estimating Pollutant Loads, version 4.0 (STEPL), illustrating all input values and output results derived in development of this TMDL project. STEPL spreadsheet tools, and user manuals can be downloaded from [http://it.tetrattech-ffx.com/steplweb/models\\$docs.htm](http://it.tetrattech-ffx.com/steplweb/models$docs.htm)

The Spreadsheet Tool for Estimating Pollutant Loads (STEPL)



Appendix C - STEPL Spreadsheet Results

Show optional input tables? Yes No Treat all the subwatersheds as parts of a single watershed Groundwater load calculation

State: County: Weather Station (for rain correction factors):

1. Input watershed land use area (ac) and precipitation (in)									Rain correction factors		
Watershed	Urban and Built Up	Cropland	Range Land	Woodland	User Defined	Feedlots	Feedlot Percent Paved	Total	Annual Rainfall	Rain Days	Avg. Rain/Event
Clear Creek-San Benito River	0	0	13205	21625	0	0	0-24%	34830	22.2	46	0.996
Hernandez Reservoir-San Benito River	0	178	8821	9888	0	0	0-24%	18887	21.3	46	0.956
James Creek-San Benito River	0	10	16330	12401	0	0	0-24%	28741	20	46	0.897
Rock Springs Creek-San Benito River	0	303	23080	6397	0	0	0-24%	29780	18.4	46	0.826
Sulphur Creek-San Benito River	0	461	20911	2802	0	0	0-24%	24174	16	46	0.718
Willow Creek	0	41	15962	2583	0	0	0-24%	18586	17.6	46	0.790
Stone Creek	0	5	8133	1922	0	0	0-24%	10060	17.9	46	0.803
Upper Tres Pinos Creek	0	81	20916	2243	0	0	0-24%	23240	18.2	46	0.817
Middle Tres Pinos Creek	0	19	22470	508	0	0	0-24%	22997	16.4	46	0.736
Pescadero Creek	87	672	13486	11420	0	0	0-24%	25665	17.8	46	0.799
Las Aguilas Creek	0	0	24509	220	0	0	0-24%	24729	18	46	0.808
Los Muertos Creek	0	42	18176	710	0	0	0-24%	18928	16.1	46	0.722
Paicines Reservoir-San Benito River	16	4354	26909	2610	0	0	0-24%	33889	15.2	46	0.682
Lower Tres Pinos Creek	231	2179	13973	1468	0	0	0-24%	17851	14.8	46	0.664
San Juan Canyon	927	6136	11360	5774	0	0	0-24%	24197	19.5	50	0.805
Bird Creek-San Benito River	3034	3779	17505	8424	0	0	0-24%	32742	17	50	0.702
Quien Sabe Creek	0	3172	29268	116	0	0	0-24%	32556	17.2	50	0.710
Santa Ana Creek	853	7084	24603	1177	0	0	0-24%	33717	15.7	50	0.648
Tequisquita Slough	1966	8966	12638	2393	0	0	0-24%	25963	17.8	50	0.735
Watsonville Slough	4178	5049	292	5952	0	0	0-24%	15471	23.1	58	0.822
Lower Pajaro River	963	11321	11680	9321	0	0	0-24%	33285	23.2	58	0.826
Arroyo De Las Viboras	0	327	14229	184	0	0	0-24%	14740	20.2	50	0.834
Salsipuedes Creek	1342	4019	2344	7993	0	0	0-24%	15698	26.2	58	0.932
Lower Pacheco Creek	192	4172	15796	1717	0	0	0-24%	21877	21.5	58	0.765
South Fork Pacheco Creek	0	0	11497	10	0	0	0-24%	11507	21.6	58	0.769
Lower Uvas Creek	1602	4142	13677	6269	0	0	0-24%	25690	24.4	58	0.868
Upper Pajaro River	1313	19596	13487	1070	0	0	0-24%	35466	19.4	58	0.690
Cornalitos Creek	1108	2594	178	13909	0	0	0-24%	17789	32.5	58	1.157
Upper Pacheco Creek	0	0	18094	222	0	0	0-24%	18316	20.3	58	0.722
Lower Llagas Creek	5442	5378	4721	4467	0	0	0-24%	20008	21	58	0.747
Cedar Creek	0	0	7890	4876	0	0	0-24%	12766	21.2	58	0.754
Upper Uvas Creek	201	316	15576	13491	0	0	0-24%	29584	32.7	57	1.184
Little Llagas Creek	5257	2216	5284	2636	0	0	0-24%	15393	21.2	57	0.768
Upper Llagas Creek	1232	505	14056	2713	0	0	0-24%	18506	28.8	57	1.043
Lower North Fork Pacheco Creek	0	0	24891	688	0	0	0-24%	25579	20	58	0.712
Upper North Fork Pacheco Creek	0	0	1372	15667	0	0	0-24%	17039	21.3	58	0.758

Appendix C - STEPL Spreadsheet Results

65	2. Input agricultural animals									
66	Watershed	Beef Cattle	Dairy Cattle	Swine (Hog)	Sheep	Horse	Chicken	Turkey	Duck	# of months manure applied
67	Clear Creek-San Benito River	0	0	0	0	0	0	0	0	0
68	Hernandez Reservoir-San Benito River	0	0	0	0	0	0	0	0	0
69	James Creek-San Benito River	0	0	0	0	0	0	0	0	0
70	Rock Springs Creek-San Benito River	123	18	13	16	4	0	0	0	0
71	Sulphur Creek-San Benito River	6	1	0	1	1	0	0	0	0
72	Willow Creek	0	0	0	0	0	0	0	0	0
73	Stone Creek	68	10	0	7	9	2	0	0	0
74	Upper Tres Pinos Creek	0	0	0	0	0	0	0	0	0
75	Middle Tres Pinos Creek	0	0	0	0	0	0	0	0	0
76	Pescadero Creek	0	0	0	0	0	0	0	0	0
77	Las Aguilas Creek	0	0	0	0	0	0	0	0	0
78	Los Muertos Creek	0	0	0	0	0	0	0	0	0
79	Paicines Reservoir-San Benito River	1980	285	3	202	264	66	0	0	0
80	Lower Tres Pinos Creek	841	121	1	86	112	28	0	3	0
81	San Juan Canyon	115	17	0	12	15	4	0	0	0
82	Bird Creek-San Benito River	647	93	1	66	86	22	0	2	0
83	Quien Sabe Creek	0	0	0	0	0	0	0	0	0
84	Santa Ana Creek	1789	258	2	182	238	59	0	5	0
85	Tequisquita Slough	2230	322	3	227	297	74	0	7	0
86	Watsonville Slough	225	0	0	117	682	0	0	10	0
87	Lower Pajaro River	581	23	5	84	405	69	1	5	0
88	Arroyo De Las Viboras	101	8	1	10	24	9	0	0	0
89	Salsipuedes Creek	0	0	0	0	0	0	0	0	0
90	Lower Pacheco Creek	2043	56	25	211	677	275	6	7	0
91	South Fork Pacheco Creek	0	0	0	0	0	0	0	0	0
92	Lower Uvas Creek	617	4	9	64	227	94	2	2	0
93	Upper Pajaro River	3625	196	35	373	1037	403	2	12	0
94	Corralitos Creek	27	0	0	14	78	0	0	1	0
95	Upper Pacheco Creek	0	0	0	0	0	0	0	0	0
96	Lower Llagas Creek	62	0	1	6	23	9	0	0	0
97	Cedar Creek	0	0	0	0	0	0	0	0	0
98	Upper Uvas Creek	115	1	2	12	42	18	0	0	0
99	Little Llagas Creek	992	6	14	103	365	152	3	3	0
100	Upper Llagas Creek	80	0	1	8	29	12	0	0	0
101	Lower North Fork Pacheco Creek	0	0	0	0	0	0	0	0	0
102	Upper North Fork Pacheco Creek	0	0	0	0	0	0	0	0	0

Appendix C - STEPL Spreadsheet Results

3. Input septic system and illegal direct wastewater discharge data						
	Watershed	No. of Septic Systems	Population per Septic System	Septic Failure Rate, %	Wastewater Direct Discharge, # of People	Direct Discharge Reduction, %
115						
116	Clear Creek-San Benito River	0	2.43	2	0	0
117	Hernandez Reservoir-San Benito River	0	2.43	2	0	0
118	James Creek-San Benito River	0	2.43	2	0	0
119	Rock Springs Creek-San Benito River	0	2.43	2	0	0
120	Sulphur Creek-San Benito River	0	2.43	2	0	0
121	Willow Creek	0	2.43	2	0	0
122	Stone Creek	0	2.43	2	0	0
123	Upper Tres Pinos Creek	0	2.43	2	0	0
124	Middle Tres Pinos Creek	0	2.43	2	0	0
125	Pescadero Creek	0	2.43	2	0	0
126	Las Aguilas Creek	0	2.43	2	0	0
127	Los Muertos Creek	0	2.43	2	0	0
128	Paicines Reservoir-San Benito River	0	2.43	2	0	0
129	Lower Tres Pinos Creek	0	2.43	2	0	0
130	San Juan Canyon	0	2.43	2	0	0
131	Bird Creek-San Benito River	100	3	2	0	0
132	Quien Sabe Creek	0	2.43	2	0	0
133	Santa Ana Creek	0	2.43	2	0	0
134	Tequisquita Slough	31	3	2	0	0
135	Watsonville Slough	70	2.5	2	0	0
136	Lower Pajaro River	125	2.5	2	0	0
137	Arroyo De Las Viboras	0	2.43	2	0	0
138	Salsipuedes Creek	0	2.5	2	0	0
139	Lower Pacheco Creek	0	2.43	2	0	0
140	South Fork Pacheco Creek	0	2.43	2	0	0
141	Lower Uvas Creek	0	2.43	2	0	0
142	Upper Pajaro River	0	2.43	2	0	0
143	Corralitos Creek	200	2.5	2	0	0
144	Upper Pacheco Creek	0	2.43	2	0	0
145	Lower Llagas Creek	150	2.77	2	0	0
146	Cedar Creek	0	2.43	2	0	0
147	Upper Uvas Creek	0	2.43	2	0	0
148	Little Llagas Creek	0	2.43	2	0	0
149	Upper Llagas Creek	150	2.77	2	0	0
150	Lower North Fork Pacheco Creek	0	2.43	2	0	0
151	Upper North Fork Pacheco Creek	0	2.43	2	0	0
152						

Appendix C - STEPL Spreadsheet Results

Optional Data Input:

5. Select average soil hydrologic group (SHG), SHG A = highest infiltration and SHG D = lowest infiltration

Watershed	SHG A	SHG B	SHG C	SHG D	SHG Selected	Soil N conc. %	Soil P conc. %	Soil BOD conc. %
Clear Creek-San Benito River					D	0.068	0.038	0.160
Hernandez Reservoir-San Benito River					D	0.068	0.038	0.160
James Creek-San Benito River					C	0.068	0.038	0.160
Rock Springs Creek-San Benito River					C	0.068	0.038	0.160
Sulphur Creek-San Benito River					C	0.068	0.038	0.160
Willow Creek					B	0.068	0.038	0.160
Stone Creek					B	0.068	0.038	0.160
Upper Tres Pinos Creek					C	0.068	0.038	0.160
Middle Tres Pinos Creek					D	0.068	0.038	0.160
Pescadero Creek					B	0.068	0.038	0.160
Las Aguilas Creek					C	0.068	0.038	0.160
Los Muertos Creek					C	0.068	0.038	0.160
Palcines Reservoir-San Benito River					C	0.068	0.038	0.160
Lower Tres Pinos Creek					C	0.068	0.038	0.160
San Juan Canyon					C	0.068	0.038	0.160
Bird Creek-San Benito River					B	0.068	0.038	0.160
Domin Sabre Creek					D	0.068	0.038	0.160
Santa Ana Creek					C	0.068	0.038	0.160
Tequisquits Slough					D	0.068	0.038	0.160
Watsonville Slough					D	0.068	0.038	0.160
Lower Pajaro River					C	0.068	0.038	0.160
Arroyo De Las Viboras					C	0.068	0.038	0.160
Salipuedes Creek					B	0.068	0.038	0.160
Lower Pacheco Creek					C	0.068	0.038	0.160
South Fork Pacheco Creek					C	0.068	0.038	0.160
Lower Uvas Creek					C	0.068	0.038	0.160
Upper Pajaro River					D	0.068	0.038	0.160
Corralitos Creek					B	0.068	0.038	0.160
Upper Pacheco Creek					C	0.068	0.038	0.160
Lower Llagas Creek					D	0.068	0.038	0.160
Cedar Creek					D	0.068	0.038	0.160
Upper Uvas Creek					C	0.068	0.038	0.160
Little Llagas Creek					D	0.068	0.038	0.160
Upper Llagas Creek					C	0.068	0.038	0.160
Lower North Fork Pacheco Creek					D	0.068	0.038	0.160
Upper North Fork Pacheco Creek					D	0.068	0.038	0.160

6. Reference runoff curve number (may be modified)

SHG	A	B	C	D
Urban	83	89	92	93
Cropland	67	78	85	89
Rangeland	49	69	79	84
Forest	39	60	73	79
User Defined	50	70	80	85

6a. Detailed urban reference runoff curve number (may be modified)

Urban/SH	A	B	C	D
Commercial	89	92	94	95
Industrial	81	88	91	93
Institutional	81	88	91	93
Transportation	98	98	98	98
Multi-Family	77	85	90	92
Single-Family	57	72	81	86
Urban-Cultivated	67	78	85	89
Vacant-Developed	77	85	90	92
Open Space	49	69	79	84

7. Nutrient concentration in runoff (mg/l)

Land use	N	P	BOD
1. L-Cropland	11.4	0.64	4
1a. w/ manure	8.1	2	12.3
2. M-Cropland	11.4	0.64	6.1
2a. w/ manure	12.2	3	18.5
3. H-Cropland	11.4	0.64	9.2
3a. w/ manure	18.3	4	24.6
4. Rangeland	0.25	0.21	13
5. Forest	0.2	0.1	0.5
6. User Defined	0	0	0

7a. Nutrient concentration in shallow groundwater (mg/l) (may be modified)

Land use	N	P	BOD
Urban	1.8	0.04	0
Cropland	5.93	0.04	0
Rangeland	0.14	0.04	0
Forest	0.14	0.04	0
Feedlot	6	0.07	0
User-Defined	0	0	0

Appendix C - STEPL Spreadsheet Results

286	8. Input or modify urban land use distribution											
287	Watershed	Urban Area (ac.)	Commercial %	Industrial %	Institutional %	Transportation %	Multi-Family %	Single-Family %	Urban-Cultivate	Vacant (developed)	Open Space %	Total % Area
288	Clear Creek-San Benito River	0	15	10	10	10	10	30	5	5	5	100
289	Hernandez Reservoir-San Benito River	0	15	10	10	10	10	30	5	5	5	100
290	James Creek-San Benito River	0	15	10	10	10	10	30	5	5	5	100
291	Rock Springs Creek-San Benito River	0	15	10	10	10	10	30	5	5	5	100
292	Sulphur Creek-San Benito River	0	15	10	10	10	10	30	5	5	5	100
293	Willow Creek	0	15	10	10	10	10	30	5	5	5	100
294	Stone Creek	0	15	10	10	10	10	30	5	5	5	100
295	Upper Tres Pinos Creek	0	15	10	10	10	10	30	5	5	5	100
296	Middle Tres Pinos Creek	0	15	10	10	10	10	30	5	5	5	100
297	Pescadero Creek	87	15	10	10	10	10	30	5	5	5	100
298	Los Aguilas Creek	0	15	10	10	10	10	30	5	5	5	100
299	Los Muertos Creek	0	15	10	10	10	10	30	5	5	5	100
300	Paicines Reservoir-San Benito River	16	15	10	10	10	10	30	5	5	5	100
301	Lower Tres Pinos Creek	231	15	10	10	10	10	30	5	5	5	100
302	San Juan Canyon	927	15	10	10	10	10	30	5	5	5	100
303	Bird Creek-San Benito River	3034	15	10	10	10	10	30	5	5	5	100
304	Quien Sabe Creek	0	15	10	10	10	10	30	5	5	5	100
305	Santa Ana Creek	853	15	10	10	10	10	30	5	5	5	100
306	Tequisquita Slough	1966	15	10	10	10	10	30	5	5	5	100
307	Watsonville Slough	4178	15	10	10	10	10	30	5	5	5	100
308	Lower Pajaro River	963	15	10	10	10	10	30	5	5	5	100
309	Arroyo De Las Yiboras	0	15	10	10	10	10	30	5	5	5	100
310	Salzipuedes Creek	1342	15	10	10	10	10	30	5	5	5	100
311	Lower Pacheco Creek	192	15	10	10	10	10	30	5	5	5	100
312	South Fork Pacheco Creek	0	15	10	10	10	10	30	5	5	5	100
313	Lower Uvas Creek	1602	15	10	10	10	10	30	5	5	5	100
314	Upper Pajaro River	1313	15	10	10	10	10	30	5	5	5	100
315	Corralitos Creek	1108	15	10	10	10	10	30	5	5	5	100
316	Upper Pacheco Creek	0	15	10	10	10	10	30	5	5	5	100
317	Lower Llagas Creek	5442	15	10	10	10	10	30	5	5	5	100
318	Cedar Creek	0	15	10	10	10	10	30	5	5	5	100
319	Upper Uvas Creek	201	15	10	10	10	10	30	5	5	5	100
320	Little Llagas Creek	5257	15	10	10	10	10	30	5	5	5	100
321	Upper Llagas Creek	1232	15	10	10	10	10	30	5	5	5	100
322	Lower North Fork Pacheco Creek	0	15	10	10	10	10	30	5	5	5	100
323	Upper North Fork Pacheco Creek	0	15	10	10	10	10	30	5	5	5	100

Appendix C - STEPL Spreadsheet Results

1	Total Load	This is the summary of annual nutrient ar			
103					
104	1. Total load by subwatershed(s)				
	Watershed	N Load (no BMP)	P Load (no BMP)	BOD Load (no BMP)	Sediment Load (no BMP)
105					
106		lb/year	lb/year	lb/year	t/year
107	W1	19313.6	11604.9	325574.8	2202.0
108	W2	15689.7	7109.0	203073.0	1552.3
109	W3	16615.1	9736.5	270113.6	2570.7
110	W4	24812.9	11978.8	331768.6	3723.8
111	W5	22397.1	9719.2	241084.8	3478.9
112	W6	12698.5	6695.6	145723.9	2429.7
113	W7	6410.3	3489.6	76392.8	1233.0
114	W8	17435.1	9956.4	291894.7	3191.4
115	W9	16222.1	10342.6	328765.2	3356.8
116	W10	25600.3	7831.2	134556.3	2634.9
117	W11	17753.1	11096.1	334009.2	3642.3
118	W12	13075.0	7661.2	207731.6	2738.4
119	W13	86775.5	18611.3	318368.5	7258.4
120	W14	43292.5	9457.0	160625.0	3723.7
121	W15	146067.1	19161.5	247003.8	6391.3
122	W16	90814.2	15156.1	205392.1	5689.0
123	W17	83089.8	20011.4	470184.8	6702.5
124	W18	131947.4	22765.1	325437.0	8982.4
125	W19	205065.4	26291.0	327143.3	8737.3
126	W20	167708.4	14594.8	154098.1	2750.4
127	W21	293026.6	26565.5	329660.2	5802.1
128	W22	18289.1	7605.8	224189.8	2358.0
129	W23	124894.5	9863.6	97142.1	2078.1
130	W24	117935.3	21973.0	315317.6	8874.6
131	W25	11800.9	7225.9	186368.2	2768.0
132	W26	146596.7	24277.5	367341.5	8582.0
133	W27	441210.4	49576.6	459733.1	16687.3
134	W28	114847.6	9558.5	70718.6	1369.8
135	W29	18011.7	10932.0	266230.2	4360.0
136	W30	177779.7	23851.0	273914.0	8277.4
137	W31	9755.0	6002.1	157068.2	1987.5
138	W32	44351.8	18632.6	516300.4	4410.1
139	W33	98191.5	14550.3	237953.4	4565.8
140	W34	48257.3	14729.3	405759.2	4227.5
141	W35	25321.8	16045.9	444181.0	6004.7
142	W36	5707.1	2915.7	35880.0	378.3

254	2. Total load by land uses (with BMP)				
	Sources	N Load (lb/yr)	P Load (lb/yr)	BOD Load (lb/yr)	Sediment Load (t/yr)
255					
256	Urban	182,542	21,565	544,347	3,196
257	Cropland	1,869,231	204,350	1,051,823	72,706
258	Grazing Land	377,410	249,930	7,778,577	87,727
259	Woodland	44,199	22,434	109,661	2,091
260	Feedlots	0	0	0	0
261	User Defined	0	0	0	0
262	Septic	566	222	2,311	0
263	Gully	0	0	0	0
264	Streambank	0	0	0	0
265	Groundwater	384,812	19,074	0	0
266	Total	2,858,760	517,575	9,486,719	165,720
267					
268					
269					
270					
271					
272					
273					
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275					
276					
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278					
279					