Summary of Onsite Wastewater Treatment System (OWTS) Requirements

This document presents a summary of Key OWTS design parameters from the Local Area Management Plan (LAMP) and the County Code Chapter 7.38. It also includes some additional guidance for application of those requirements. Wherever there may be a conflict or lack of clarity, the provisions of Chapter 7.38 and the LAMP shall prevail.

This document includes information on:

- System Types and Allowable Uses
- Dispersal Area Application Rates, Design Flow and Dispersal Area Required
- Groundwater Separation
- Types of Enhanced Treatment Systems
- Design Flow for Non-Residential Uses

Table 3-1: Types of Systems, Requirements, and Building Allowances:

System Type	Conditions	Requirements	Building Allowed
New	Conventional: meets standards	Minimum Parcel size (7.38.045)	New residence; Possible ADU
	Enhanced Treatment for: reduced groundwater separation, fast or slow soil percolation	Minimum Parcel size Maintenance Contract Deed recordation	
Upgrade	Conventional, meets standards		ADU; Bedroom Addition; and/or >500 sf addition
	Enhanced Treatment for: • reduced groundwater or surface water separation, • fast or slow soil percolation • under pavement with traffic rated cover • reduced dispersal area • existing seepage pits	• Maintenance Contract • Deed recordation	
Repair: Replaces old or failing system	Conventional, meets standards as much as possible, improvement over old system and old system not causing impairment ; Low flow system may be approved.	• Meets conventional standards as much as possible • Must comply with Prohibitions (7.38.042)	One-time addition less than 500 sf
	Enhanced Treatment for: • reduced groundwater or surface water separation, • fast or slow soil percolation • under pavement with traffic rated cover • reduced dispersal area up to 50% • existing seepage pits	• Maintenance Contract • Deed recordation	
	• Low Flow System • Nonconforming Interim (deferred enhanced treatment)	• Water efficiency measures installed • Must comply with Prohibitions (7.38.042) • Must install enhanced treatment at time of property transfer • Deed Recordation • Annual Inspection	No Addition
Existing System	• Meets standards for water separation • Not failing, good pumper report • Not seepage pit	• Ongoing maintenance	If dispersal size adequate under new standards: • Bedroom Addition, ADU • >500 sf addition
	• Does not fully meet standards • Not failing, good pumper report	• Prestandard, before 1983 • Ongoing maintenance	One-time addition less than 500 sf
	Failing: surfacing effluent	Repair required	Depends on Repair

Note: Standards for conventional systems are specified in County Code Section 7.38.095-180; Additional requirements for enhanced treatment systems and conventional non-standard systems are specified in Sections 7.38.182-186.

Table 3-2: Dispersal System Application Rates

From State OWTS Policy Table 3. Some application rates may be doubled for enhanced treatment with effluent less than 30 mg/L BOD as noted in the following table.

Percolation Rate MPI	Application gal/sf/day	
	BOD=150 mg/L Conventional	BOD<=30 mg/L ET/Dosed
<1	--	1.60
1	1.20	1.60
5	1.20	1.60
10	0.80	1.60
15	0.73	1.46
20	0.66	1.32
25	0.59	1.18
30	0.53	1.06
35	0.48	0.96
40	0.42	0.84
45	0.37	0.74
50	0.31	0.62
55	0.26	0.52
60	0.20	0.40
90-120	--	0.20

Table 3-3: Design Flow per Bedroom

Number of Bedrooms	1	2	3	4	5	6	Per Additional Bedroom
Standard Design Flow (gpd)	250	300	375	450	525	600	75
Low Flow System (gpd) Repair Only, with Limitations*	150	200	250	300	350	400	50

*Low Flow Systems require water conservation devices, flow monitoring, deed recordation, annual fee, periodic inspection, and limits on remodels.

Appendix C

Tables 3-3a, 3-3b, 3-3c: Dispersal Area size calculations based on percolation rate, flow, and treatment:

Required Conventional Infiltration Area (Square feet)

Bedrooms:		1	2	3	4	5	Additional
	Flow gpd:	250	300	375	450	525	75
Perc MPI	App Rate						
<1	--	--	--	--	--	--	--
1	1.2	208	250	313	375	438	63
5	1.2	208	250	313	375	438	63
10	0.8	313	375	469	563	656	94
15	0.73	342	411	514	616	719	103
20	0.66	379	455	568	682	795	114
25	0.59	424	508	636	763	890	127
30	0.53	472	566	708	849	991	142
35	0.48	521	625	781	938	1094	156
40	0.42	595	714	893	1071	1250	179
45	0.37	676	811	1014	1216	1419	203
50	0.31	806	968	1210	1452	1694	242
55	0.26	962	1154	1442	1731	2019	288
60	0.2	1250	1500	1875	2250	2625	375
60-120	--	--	--	--	--	--	--

Enhanced Treatment (BOD <30 mg/L) Infiltration Area (Square Feet)

Bedrooms:		1	2	3	4	5	Additional
	Flow gpd:	250	300	375	450	525	75
Perc MPI	App Rate						
<1	1.6	156	188	234	281	328	47
1	1.6	156	188	234	281	328	47
5	1.6	156	188	234	281	328	47
10	1.6	156	188	234	281	328	47
15	1.46	171	205	257	308	360	51
20	1.32	189	227	284	341	398	57
25	1.18	212	254	318	381	445	64
30	1.06	236	283	354	425	495	71
35	0.96	260	313	391	469	547	78
40	0.84	298	357	446	536	625	89
45	0.74	338	405	507	608	709	101
50	0.62	403	484	605	726	847	121
55	0.52	481	577	721	865	1010	144
60	0.4	625	750	938	1125	1313	188
90-120	0.2	1250	1500	1875	2250	2625	375

Linear feet of Standard Trench by Number of Bedrooms
(4 square feet of infiltration surface per linear foot)

	Bedrooms	1	2	3	4	5	Additional
	Flow g/d	250	300	375	450	525	75
Perc	App Rate						
<1	--	--	--	--	--	--	--
1	1.2	52	63	78	94	109	16
5	1.2	52	63	78	94	109	16
10	0.8	78	94	117	141	164	23
15	0.73	86	103	128	154	180	26
20	0.66	95	114	142	170	199	28
25	0.59	106	127	159	191	222	32
30	0.53	118	142	177	212	248	35
35	0.48	130	156	195	234	273	39
40	0.42	149	179	223	268	313	45
45	0.37	169	203	253	304	355	51
50	0.31	202	242	302	363	423	60
55	0.26	240	288	361	433	505	72
60	0.2	313	375	469	563	656	94
90-120	--	--	--	--	--	--	--

Linear Feet of Standard Trench with Enhanced Treatment (<30mg/L)
(4 square feet of infiltration surface per linear foot)

	Bedrooms	1	2	3	4	5	Additional
	Flow g/d	250	300	375	450	525	75
Perc	App Rate						
<1	1.6	39	47	59	70	82	12
1	1.6	39	47	59	70	82	12
5	1.6	39	47	59	70	82	12
10	1.6	39	47	59	70	82	12
15	1.46	43	51	64	77	90	13
20	1.32	47	57	71	85	99	14
25	1.18	53	64	79	95	111	16
30	1.06	59	71	88	106	124	18
35	0.96	65	78	98	117	137	20
40	0.84	74	89	112	134	156	22
45	0.74	84	101	127	152	177	25
50	0.62	101	121	151	181	212	30
55	0.52	120	144	180	216	252	36
60	0.4	156	188	234	281	328	47
90-120	0.2	313	375	469	563	656	94

Low Flow System Infiltration Area (Square feet)
Only for Repairs with water conservation and other limitations

Bedrooms:		1	2	3	4	5	Additional
	Flow gpd:	150	200	250	300	350	50
Perc MPI	App Rate						
<1	--	--	--	--	--	--	--
1	1.2	125	167	208	250	292	42
5	1.2	125	167	208	250	292	42
10	0.8	188	250	313	375	438	63
15	0.73	205	274	342	411	479	68
20	0.66	227	303	379	455	530	76
25	0.59	254	339	424	508	593	85
30	0.53	283	377	472	566	660	94
35	0.48	313	417	521	625	729	104
40	0.42	357	476	595	714	833	119
45	0.37	405	541	676	811	946	135
50	0.31	484	645	806	968	1129	161
55	0.26	577	769	962	1154	1346	192
60	0.2	750	1000	1250	1500	1750	250
60-120	--	--	--	--	--	--	--

Legacy (2017) System Infiltration Area (Square Feet)

Bedrooms:		1	2	3	4	5	Additional
	Flow gpd:	215	270	325	375	430	55
Perc MPI	App Rate						
<1	0.43	500	625	750	875	1000	125
1	0.43	500	625	750	875	1000	125
5	0.43	500	625	750	875	1000	125
10	0.36	600	750	900	1050	1200	150
15	0.36	600	750	900	1050	1200	150
20	0.36	600	750	900	1050	1200	150
25	0.36	600	750	900	1050	1200	150
30	0.36	600	750	900	1050	1200	150
35	0.24	900	1125	1350	1575	1800	225
40	0.24	900	1125	1350	1575	1800	225
45	0.24	900	1125	1350	1575	1800	225
50	0.24	900	1125	1350	1575	1800	225
55	0.24	900	1125	1350	1575	1800	225
60	0.24	900	1125	1350	1575	1800	225
60-120	0.1	2150	2700	3250	3750	4300	550

Table 3-1: Groundwater Separation Based on Stream Setback, Treatment, and Soil Percolation (MPI)

Horizontal Setback to Stream	25-50 Feet	50 - 100 Feet	> 100 Feet
Conventional Systems:			
New System on undeveloped parcel	Not Permitted	Not Permitted	<1 MPI – Not Permitted 1-5 MPI Not permitted in nitrate concern area 1-5 MPI =20 feet outside nitrate concern area 5-29.9 MPI = 8 feet 30-60 MPI = 5 feet >60 MPI – Not Permitted
Upgrade System, increase in flow by ADU, bedroom addition or major remodel	Not Permitted	Not Permitted	<1 MPI – Not Permitted 1-5 MPI Not permitted in nitrate concern area 1-5 MPI = 20 feet outside nitrate concern area 5-29.9 MPI = 8 feet 30-60 MPI = 5 feet >60 MPI – Not Permitted
Repaired System, no increase in flow	Not Permitted	<1 MPI – Not Permitted 1-5 MPI Not permitted in nitrate concern area 1-5 MPI – 20 feet outside nitrate concern area 5-29.9 MPI = 5 feet 30-60 MPI = 5 feet >60 MPI – Not Permitted	<1 MPI – Not Permitted 1-5 MPI Not permitted in nitrate concern area 1-5 MPI = 8 feet outside nitrate concern area 5-29.9 MPI = 5 feet 30-60 MPI = 5 feet >60 MPI – Not Permitted
Greywater Sump	5 feet	5 feet	3 feet

Enhanced Treatment System [a,b] (BOD, TSS, TN <30 mg/L;-Fecal coliform/E.coli Reduction to 200 MPN/100 ml)			
New System on undeveloped parcel	Not Permitted	Not Permitted	2 feet
Upgrade System, increase in flow by ADU, bedroom addition or major remodel	Not Permitted	2 feet	2 feet
Repaired System, no increase in flow	4 feet	2 feet	2 feet
Seepage Pit-Repair/Upgrade Only	Not Permitted	Not Permitted	10 feet

[a] Enhanced treatment with nitrogen reduction is required for all new, repaired, and replacement OWTS with soils that percolate faster than 5 MPI in nitrate concern areas (see Figure 3-1, Sec.3.2.6)

[b] Groundwater separation less than 2 ft can only be approved by Regional Water Board

Table 3-5: Types of Enhanced Treatment Systems and Approved Applications

Level of Treatment and Treatment Technology[a]	Reduced Dispersal Applica-tion Area	Minimum Groundwater Separation (ft)	Minimum Waterbody setback (ft)	Fast Perc <5 MPI[b]	Slow Perc >60 MPI	Seepage Pits
BOD and TSS Reduction Reduce BOD and TSS to <30 mg/L Intermittent Sand Filter Currently approved proprietary systems that Meet NSF/ANSI 40[c] Certification include: OSI Advantex Biomicrobics FAST AquaKlear Bord Na Mona Multi-Flo Aerobic Trmt MicroSepTec HOOT Acqualogic	Yes, per Table 7.38.150. B.3	See Table 3-4 Groundwater Separation based on Soil Percolation and Water Feature Setback	See Table 3-4 Groundwater Separation based on Soil Percolation and Water Feature Setback OR >50 -feet for Repairs and Upgrades only	Not Permitted See next row for BOD and TSS Reduction with Nitrogen Reduction	Repairs and Upgrades Only	Not Permitted See next row for BOD and TSS Reduction with Nitrogen Reduction
BOD and TSS Reduction with Nitrogen Reduction Reduce Total Nitrogen by 50% Recirculating Sand Filter Trickling Filter Currently approved proprietary systems That Meet NSF/ANSI 245a Certification, include: OSI Advantex Multi-Flo Aerobic Trmt MicroSepTec	Yes, per Table 7.38.150. B.3	See Table 3-4 Groundwater Separation based on Soil Percolation and Water Feature Setback	See Table 3-4 Groundwater Separation based on Soil Percolation and Water Feature Setback	Required[b]	NA	Required with min. 10-ft Separation to Groundwater
Pathogen Reduction Reduce Pathogens by 99%: Recirculating Sand filter Ultraviolet Light Chlorine disinfection	NA	Required with groundwater separation of 2-5 feet. See Table 3-4 of the Santa Cruz LAMP	25-50 feet for Repairs Only 50-100 ft for upgrades	Depends on stream, GW separation See Table 3-4	NA	Required with minimum Separation to Groundwater of 10 ft.

[a] Specific types of systems that are currently approved for use in Santa Cruz County are listed. Additional systems that meet the requirements may be added in the future.

[b] Nitrogen reduction may be waived outside of nitrogen concern areas.

[c] NSF/ANSI 40 is a standard for residential wastewater treatment systems with rated capacities between 400 and 1,500 gallons (1,514 and 5,678 liters) per day. Class I systems must achieve a 30-day average effluent quality of 25 mg/L CBOD5 and 30 mg/L TSS or less, and pH 6.0-9.0 spanning six months of testing.

Table 3-6: Design Flows for Non-Residential Uses

OWTS serving non-residential uses are subject to the same design and installation requirements as residential OWTS. Design flows should be determined by the designer based on historic or proposed water usage, according to the following table. [U.S. Environmental Protection Agency. *Onsite Wastewater Treatment Systems Manual Revised 2002, Chapter 3: Establishing Treatment System Performance Requirements]*

Type of Business or Facility	Design Flow (gallons per day)
Assisted Living/Residential Care Home	
- Per resident bed space, ambulatory residents	100
- Per resident bed space, non-ambulatory residents	125
- Live-in caregiver	75
- Per employee (day use)	15
Camps (per person)	
- Day use	10
- Overnight use, with flush toilets, no showers	25
- Overnight use, with flush toilets and showers	35
Churches and assembly halls (per seat)	
- Without kitchen	5
- With kitchen	15
Country clubs	
- Per resident member or caretaker	75
- Per guest	25
- Per employee	15
Day care (per patron, employee)	15
Detention center	
- Per resident bed space	100
- Per employee	15
Factories and industrial buildings (toilet waste only)	
- Without showers (per employee)	15
- With showers (per employee)	35
Hotels or motels	
- Per guest	50
- Per employee	15
- Additional for restaurant, spa or other facilities	Case-by-case
Laundromat, with self-service washing machines	
- Per machine, or	500
- Per customer	50
Mobile home parks (per space)	250
Multiunit residential housing	
- Apartments, per bedroom	150
- Boarding house and farm labor housing, per bed	50
Office and stores (per employee)	15
Parks with picnic areas (per person)	
- With flush toilets	5
- With flush toilets and showers	10
Recreational vehicle parks	
- Without individual sewer hook-ups (per space)	50
- With individual sewer hook ups (per space	100
Restaurants and Food Service	
- Toilet and kitchen wastes (per patron)	10
- Kitchen wastes only (per meal served)	5
- Addition for bars (per patron)	2

- Per employee	15
Type of Business or Facility	**Design Flow (gallons per day)**
Service Station	
- per vehicle served	10
- per employee	15
Schools, boarding	
- student and live-in staff (per person)	75
- daily staff (per person)	15
Schools, day	
- without cafeteria or showers (per student)	15
- with cafeteria (per student)	20
- with cafeteria and showers (per student)	25
- staff (per person)	15
Swimming pools	
- per patron	10
- per employee	15
Theaters	
- per seat	5
- per employee	15
Wineries (sanitary waste only)	
- tasting room, per visitor	2.5
- per employee	15
- special events	Case-by-case

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