

Sunol Wastewater Feasibility Study

Project Alternatives Overview

- 1. No Project Alternative - status quo;** OWTS improvements and variances processed individually between property owner and County.
- 2. Onsite system upgrades with local management/maintenance district oversight.** Provides opportunity for customized OWTS standards for Sunol, adoption of general variances/waivers, public financing assistance, ongoing monitoring of Sinbad Creek water quality.
- 3. Community system for Kilcare Woods.** Location, type and size of system yet to be determined.
- 4. Combination of several cluster systems and onsite upgrades for Kilcare Woods.** Could be accomplished under Alternative 2, with cluster systems using undeveloped KWA lots; yet to be investigated.
- 5. Community system for Downtown Sunol.** Limited capacity system for high density areas of Sunol and problematic lots; STEP collection system with community treatment, dispersal and water reuse (irrigation) on County owned parcels. Conceptual plan (attachment) for 10,000 to 12,000 gpd capacity could serve commercial district, school, and 30 to 50 residences.
- 6. Combined community system for Kilcare Woods and Sunol.** Collection of sewage from Kilcare Woods and Downtown Sunol with either: (a) force main sewer to Pleasanton; or (b) standalone treatment plant and dispersal system at local site yet to be identified.
- 7. Community system for entire study area.** Same as Alternative 6, except also providing service to all properties along Kilcare Road between Kilcare and Sunol.
- 8. Hybrid approach including variations of the above.**

Graywater – Key Points Relevant to OWTS Usage
(Per California Plumbing Code, Chapter 15)
(Questa Engineering, Feb 2019 for ACDEH)

- a. Graywater systems are explicitly excluded from coverage under the State OWTS Policy under the definition of OWTS, which states: “..... OWTS do not include “graywater” systems pursuant to Health and Safety Code Section 17922.12.”
- b. Regulations for graywater systems are contained in California Plumbing Code, Chapter 15 (aka “Graywater Code”). The following are the stated Intent of the code:
 - 1. Conserve water by facilitating greater reuse of laundry, shower, lavatory and similar sources of discharge for irrigation and/or indoor use.
 - 2. Reduce the number of non-compliant gray water systems by making legal compliance easily achievable.
 - 3. Provide guidance for avoiding potentially unhealthful conditions.
 - 4. Provide an alternative way to relieve stress on a private sewage disposal system by diverting the graywater.
- c. Household graywater is defined as including water from laundry, showers, baths, and sinks – but it excludes water from toilets, kitchen sinks, or water used to wash diapers or similarly soiled or infectious garments.
- d. Graywater is required to have a diverter valve that allows the graywater to be diverted back to the house sewer drain or septic tank.
- e. Graywater may be dispersed on the property of origin (or adjacent easement) for: subsurface irrigation, disposal (e.g. leachfield), or mulch basin.
- f. Graywater is not allowed to be surface irrigated, or to pond or runoff the property, or discharge directly to a watercourse.
- g. There is no requirement in the code requiring graywater to be diverted back to the sewer or septic tank during the wet season, as long as the conditions under (f) above are not violated. This theoretically (and legally) allows graywater to be diverted to a disposal field year-round as long as it meets siting and operational standards.
- h. Most county health departments have assumed the policy of not allowing graywater systems to be credited as supplying any of the required disposal capacity for a house. However, the Graywater Code does not mandate this policy.

i. Key siting criteria for graywater systems:

- 3-ft separation to groundwater below disposal/irrigation lines (note: use of raised planter beds to meet vertical separation may be possible – but not explicitly addressed in Code)
- Percolation/soils testing at discretion of local authority
- Key setbacks for disposal/irrigation fields:
 - Building structures 5'
 - Property line 5'
 - Wells 100'
 - Streams and lakes 100' (may be reduced to 50', if "filtered"¹)
 - Domestic water line 0'

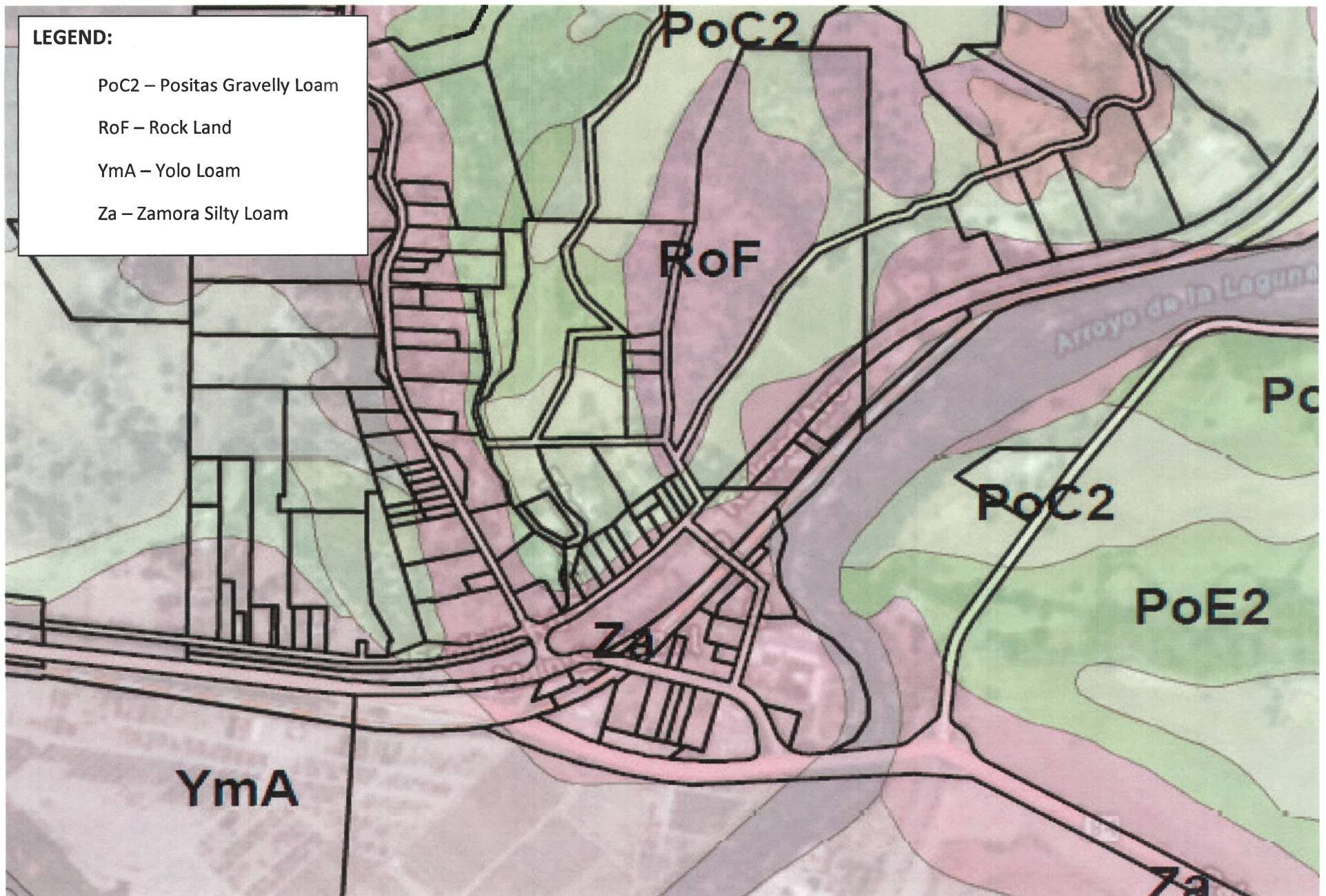
j. Graywater code gives the following criteria for graywater flow estimation and system sizing:

- Per capita usage:
 - Bathing - 25 gpd/capita
 - Laundry – 15 gpd/capita
 - Total - 40 gpd/capita
- Per bedroom calculations: (2) persons for first bedroom, (1) person/bedroom for additional bedrooms.
- Flows for 3-bedroom house w/full graywater system would be (Alameda County):
 - Standard OWTS design flow: $(3) \times 120/\text{bedroom} = 360 \text{ gpd}$
 - Diverted graywater: $2+1+1 = 4 \text{ persons} @ 40 \text{ gpd/person} = 160 \text{ gpd}$
 - Reduced OWTS design flow: 200 gpd
- Graywater code provides guidelines for system sizing, but allows broad latitude for locally adopted standards. Disposal (leachfield) designed per the Code would be very shallow and relatively short
 - Application rates (per CPC) range from 0.8 gpd/ft² for clay soils, up to 2.5 gpd/ft² for sandy loam, and 4.0 gpd/ft² for sand.
 - Design based on bottom area, 12 to 24-inch width
 - Depth of drain rock: 3" below pipe; 2" over pipe (gravel substitute material is allowed)
 - Soil cover over drain rock – 10"

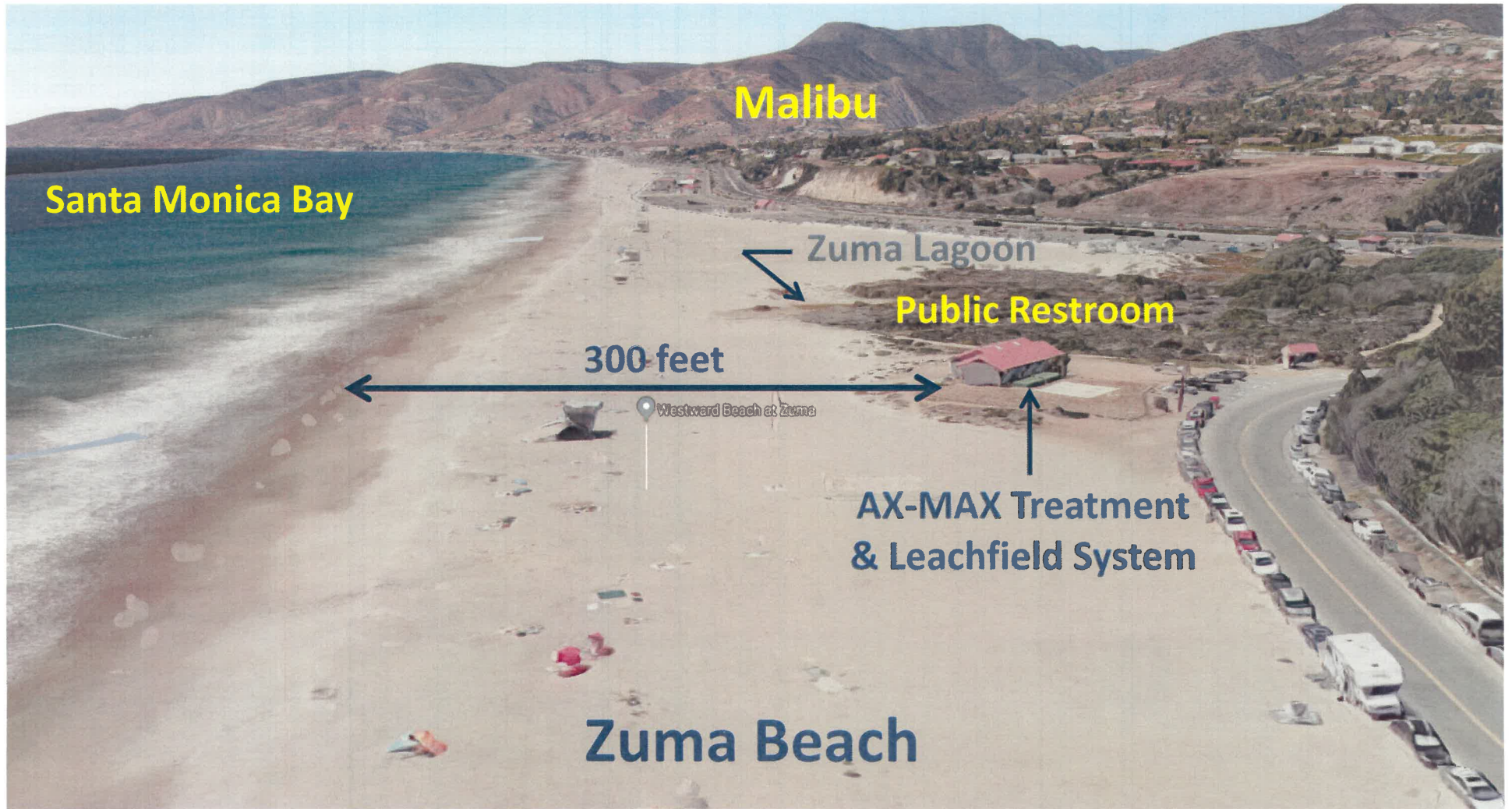
For 18" wide x 18" deep trench in sandy loam soils, total trench length for 160 gpd = 43'

- Preliminary analysis of 3-bedroom OWTS replacement project for existing lot in Kilcare Woods shows approximately 25% to 30% savings for (a) Reduced OWTS w/graywater system vs (b) full capacity OWTS no graywater.

¹ "filtered" is not specified in Code; there are commercial products available, but also other open source sand and gravel filter designs.

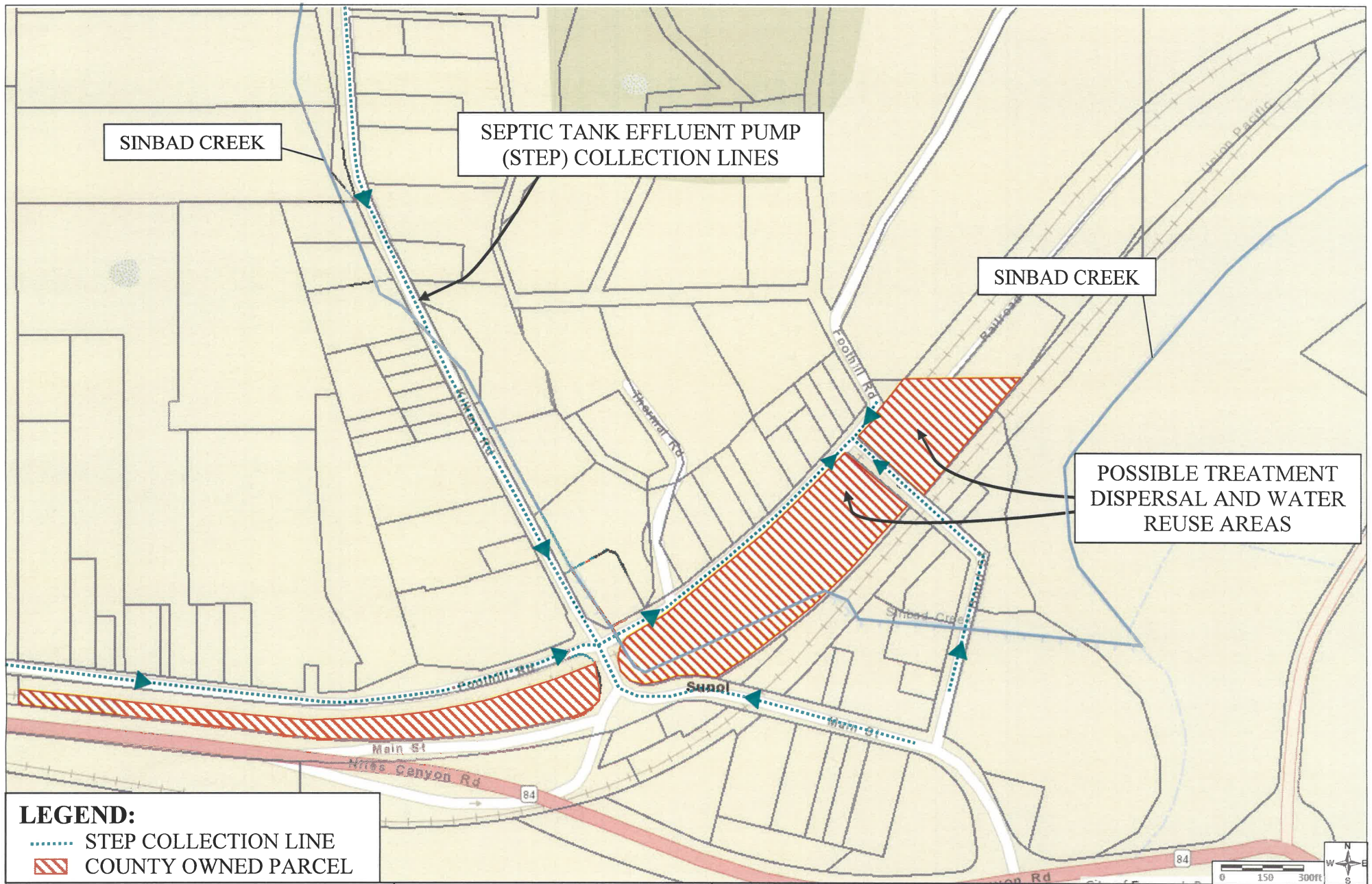


DOWNTOWN SUNOL SOILS





Zuma Beach Restroom Wastewater System



DATE: 3/12/2019
 PROJECT: Alameda County LAMP
 PROJECT NO.: 1500042
 DRAWN: MV
 APPROVED: NH



DOWNTOWN SUNOL COMMUNITY WASTEWATER SYSTEM ALTERNATIVE (CONCEPTUAL)

FIGURE
DTS