

Phase 1 Report

Sunol Community

Wastewater

Feasibility Study

Prepared for:

Alameda County Department of Environmental Health
 1131 Harbor Bay Parkway, Suite 250
 Alameda, California 94502

Sunol Citizens' Advisory Council

By:

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April 2021

Scope of Study

- ❑ Compile and review information on existing OWTS
- ❑ Soil and site suitability evaluation
- ❑ Sinbad Creek water quality sampling
- ❑ Formulate range of alternatives for long-term OWTS management
- ❑ Develop conceptual plans and preliminary cost estimates for community wastewater alternatives

Impetus for the Study

- ❑ Growing concerns about the condition and function of many aging OWTS
- ❑ Physical constraints for OWTS, including small lots, steep slopes, proximity to creeks
- ❑ OWTS regulatory challenges for home remodeling and additions
- ❑ Designated and Potential “Areas of Concern”

Field & Background Studies

- ❑ County OWTS File Reviews

- ❑ Questionnaire Survey

- ❑ Individual Field Reviews

- ❑ Sinbad Creek water quality sampling
 - ❑ Questa Engineering (June 2017, March 2018)
 - ❑ Alameda Creek Alliance (February, May 2017)

Questionnaire Survey Results

- ❑ Typically 2 buildings, 3 to 4 bedrooms, 2 occupants
- ❑ Vast majority of OWTS 40+ years old
- ❑ < 20% have separate graywater system
- ❑ 2 to 5-yr septic tank pump-out frequency (75%)
- ❑ 50% have had OWTS inspection, mostly downtown area, few in Kilkare Woods
- ❑ Vast majority report no OWTS problems
- ❑ Problems noted: sluggish plumbing, roots, access risers, tank replacement, leachfield replacement

Field Reviews

Subarea	Existing Development		Setback Variances; Tank, Field					Recommended OWTS	Disposal Site Rating (A to E)	Upgrade Cost Rating (1 to 3)
	Bldg. Size (Bedrooms)	Lot Size (acres)	Property Lines	Building, driveway	Cut Banks	Drainage Ditches	Watercourse			
Downtown	3	5.08						Treatment or PD trenches	A	2
Downtown	2	0.14						Pump-up to standard trenches	A	2
Downtown	4	5.2	Tank, Field				Field	Treatment, w/subsurface drip	C	1
Lower Kilkare Rd	3	0.57	Field				Field	Treatment	C	2
Lower Kilkare Rd	4	1.2						Pump-up to standard trenches	A	2
Lower Kilkare Rd	3	0.44			Tank, Field	Field	Field	Treatment, w/subsurface drip	D	3
Kilkare West	1	0.14					Field***	Treatment, offsite adjacent PD trenches***	D	3
Kilkare West	1	0.12	Tank, Field	Field	Tank, Field			Off-site TBD	E	3
Kilkare West	3	0.72	Tank	Tank	Tank, Field		Tank, Field	Treatment w/subsurface drip	D	3
Kilkare West	2	0.35		Tank	Tank		Tank, Field	Treatment w/PD trenches	D	3
Kilkare West	2	0.11	Field	Tank, Field			Tank	Treatment, offsite adjacent PD trenches***	C	3
Kilkare West	2	0.12	Field	Tank, Field	Tank, Field	Tank, Field		Treatment w/subsurface drip	B	1
Kilkare East	2	0.38	Field	Tank	Tank, Field		Tank, Field	Treatment w/PD or subsurface drip	C	3
Kilkare East	3	0.3	Tank	Tank	Tank, Field		Field	Treatment w/subsurface drip	D	3

Table 6: Water Quality Objectives for Bacteria^a

Beneficial Use	Fecal Coliform (MPN/100ml)	Total Coliform (MPN/100ml)	Enterococcus (MPN/100ml)^g
Water Contact	geometric mean < 200	median < 240	geometric mean < 35
Recreation	90th percentile < 400	no sample > 10,000	no sample > 104
Shellfish Harvesting ^b	median < 14 90th percentile < 43	median < 70 90th percentile < 230 ^c	
Non-contact Water	mean < 2000		
Recreation ^d	90th percentile < 4000		
Municipal Supply:			
- Surface Water ^e	geometric mean < 20	geometric mean < 100	
- Groundwater		< 1.1 ^f	

**Table 7: U.S. EPA Bacteriological Criteria for Water Contact Recreation¹
(in colonies per 100 ML)**

	Fresh Water		Salt Water
	Enterococci	E. Coli	Enterococci
Steady State (all areas)	33	126	35
Maximum at:			
- designated beach	61	235	104
- moderately used area	89	298	124
- lightly used area	108	406	276
- infrequently used area	151	576	500

Sinbad Creek - Fecal Bacteria Exceedances

Sampling Reach	Exceedances Questa Sampling	Exceedances ACA Sampling	Total Exceedances	Percent Exceedance
Upstream Control	0 of 3 samples	0 of 10 samples	0 of 13 samples	0%
Kilkare Woods	1 of 15 samples	2 of 20 samples	3 of 35 samples	9%
Lower Kilkare Rd	1 of 9 samples	3 of 20 samples	4 of 29 samples	14%
Downtown Sunol	3 of 9 samples	4 of 10 samples	7 of 19 samples	37%

Figure 6. Sinbad Creek Bacteriological Sampling Results

Alameda Creek Alliance, E. coli Geometric Mean - May 2017

Questa Engineering, Fecal Coliform - 6/5/17 & 3/29/18

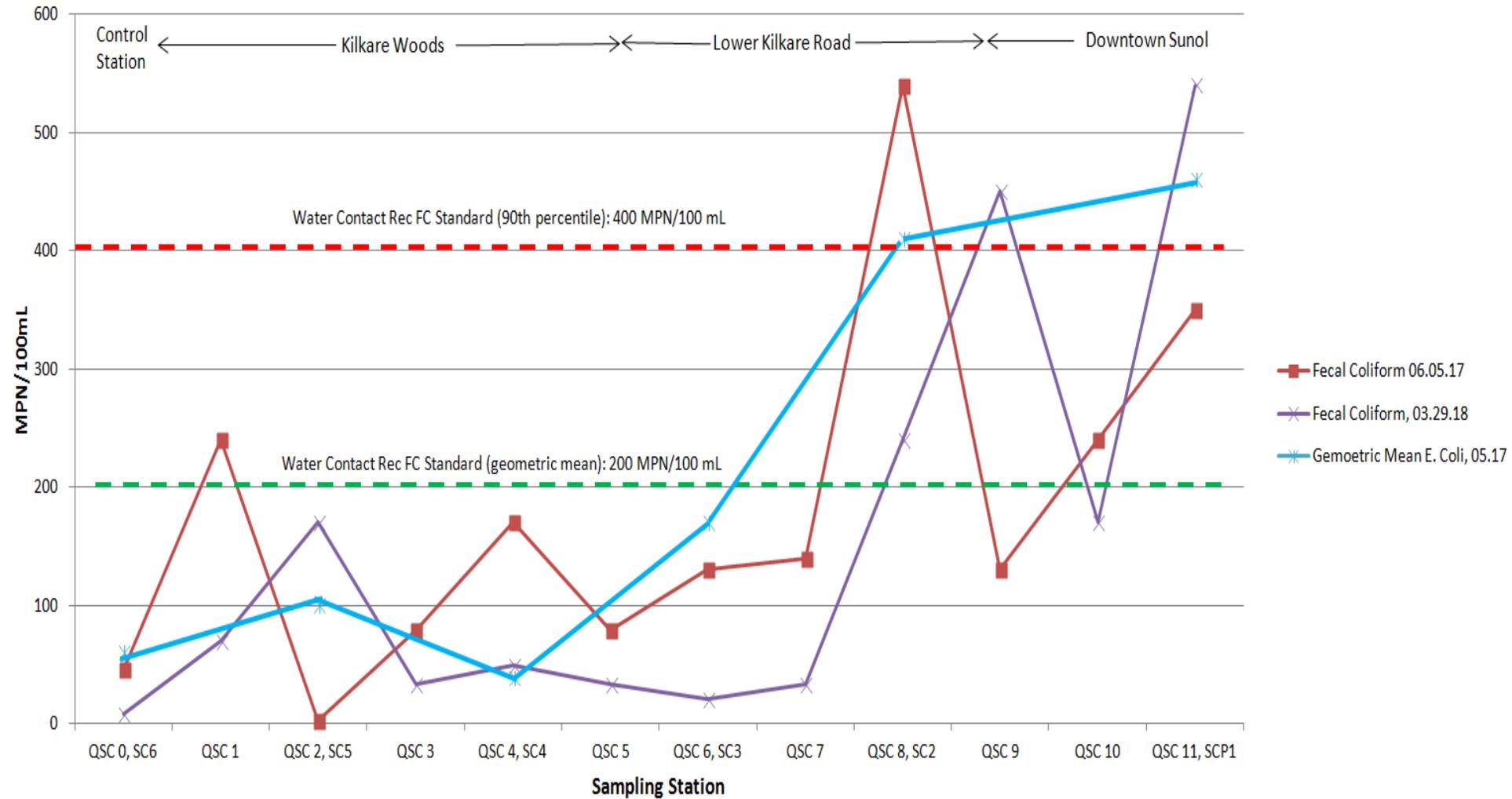
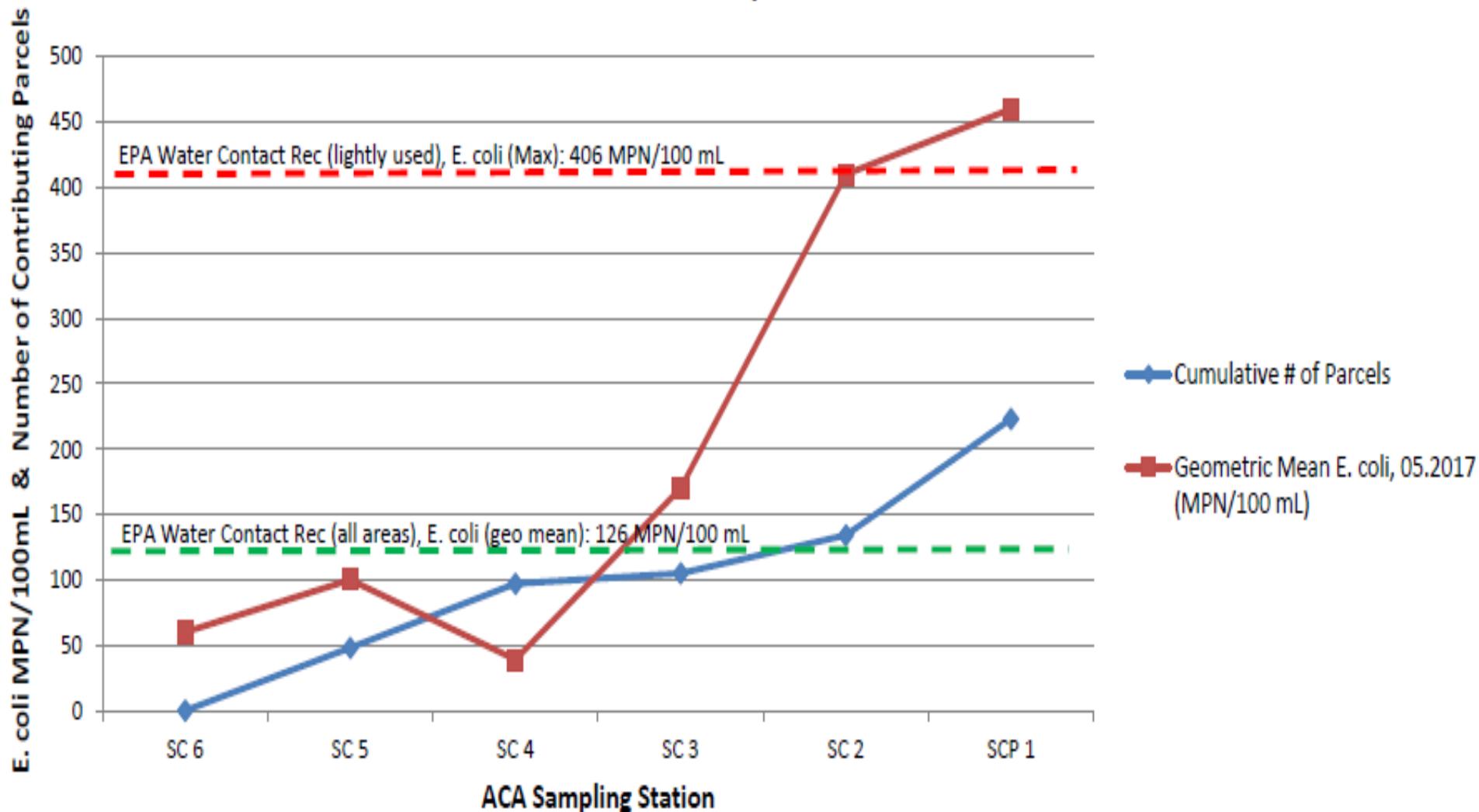


Figure 8. E. coli Trend vs. Cumulative Watershed Parcel Development

Alameda Creek Alliance Sampling Stations

Sinbad Creek - May 2017



Formulating Wastewater Alternatives

OWTS Options

- Status Quo – individual responsibility for OWTS
- Onsite Management District Approach – customized local standards; streamlined permitting; shared monitoring & maintenance; public financing opportunities

Community System Options

- Wastewater flow estimates for Sunol sub-areas
- Identify potential community wastewater sites
- Wastewater collection methods
- Wastewater treatment technologies
- Wastewater disposal site constraints & capacities

Wastewater Management Alternatives

- #1 No Project – Status Quo
- #2 OWTS Management Program
- #3 Kilkare Woods Community System
- #4 Downtown Sunol Community System
- #5 Downtown-Lower Kilkare Rd Community System
- #6 Sunol Community-wide Wastewater System
- #7 Sewer Connection to Pleasanton

Alternative #1

No Project/Status Quo

- ❑ Individual property owners responsible for cost of permitting, maintenance and repair of OWTS
- ❑ Permitting by ACDEH
- ❑ Variances common needed, involving costly and lengthy process
- ❑ Situations triggering OWTS upgrades, repairs and replacement :
 - Abatement of failed system or complaint
 - In connection with building improvements
 - Condition of sale at time of property transfer
 - Voluntary by property owner as needed

Owts Upgrade-Repair Challenges

- ❑ Standard septic tank-leachfield options limited by small lots, steep slopes, stream and other setbacks
- ❑ Advanced treatment with pressure dosing leachfields/drip dispersal commonly needed
- ❑ Lengthy and costly variance approvals often required
- ❑ House additions and ADUs difficult to obtain

Alternative #1 – Estimated Numbers and Costs of OWTS Upgrades

OWTS Upgrade Category	Estimated Percentage of Total OWTS	Number of OWTS	Estimated Average Cost	Contingency 20%	Variance	Total Cost
Existing Code-Compliant OWTS	5%	12	0	0	0	0
Low Level of Upgrade	20%	49	\$18,000	\$3,600	\$5,000	\$26,600
Mid Level of Upgrade	25%	61	\$37,000	\$7,400	\$10,000	\$54,400
High Level of Upgrade	50%	121	\$64,000	\$12,800	\$15,000	\$91,800

Alternative #2

OWTS Management Program

- ❑ Adoption of customized local standards and procedures, such as:
 - Local geographic variances for streamlined approvals
 - Application of innovative technologies
 - Credit for greywater systems and high efficiency water conserving fixtures
 - Streamlined site reviews, design and permitting process
 - New site development, remodel and additions policies

Alternative #2 - Cont'd

OWTS Management Program

- ❑ Community-based oversight, maintenance & environmental monitoring
- ❑ Facilitate development of cluster OWTS and off-site easements
- ❑ Obtaining and facilitating public financing to support:
 - OWTS management activities
 - Loans and grants to individual OWTS owners
 - Financing for construction of cluster systems

Alternative #2 – Estimated Numbers and Costs of OWTS Upgrades under Management District

OWTS Upgrade Category	Estimated Percentage of Total OWTS	Number of OWTS	Estimated Average Cost	Total Cost
Existing Code-Compliant OWTS	5%	12	0	0
Low Level of Upgrade	20%	49	\$18,000	\$900,000
Mid Level of Upgrade	25%	61	\$37,000	\$2,257,000
High Level of Upgrade	50%	121	\$64,000	\$7,744,000
Total	100%	244		\$10,901,000
Average Estimated Cost per Parcel (for 244 parcels)				\$44,676

Estimated Community Wastewater Flows

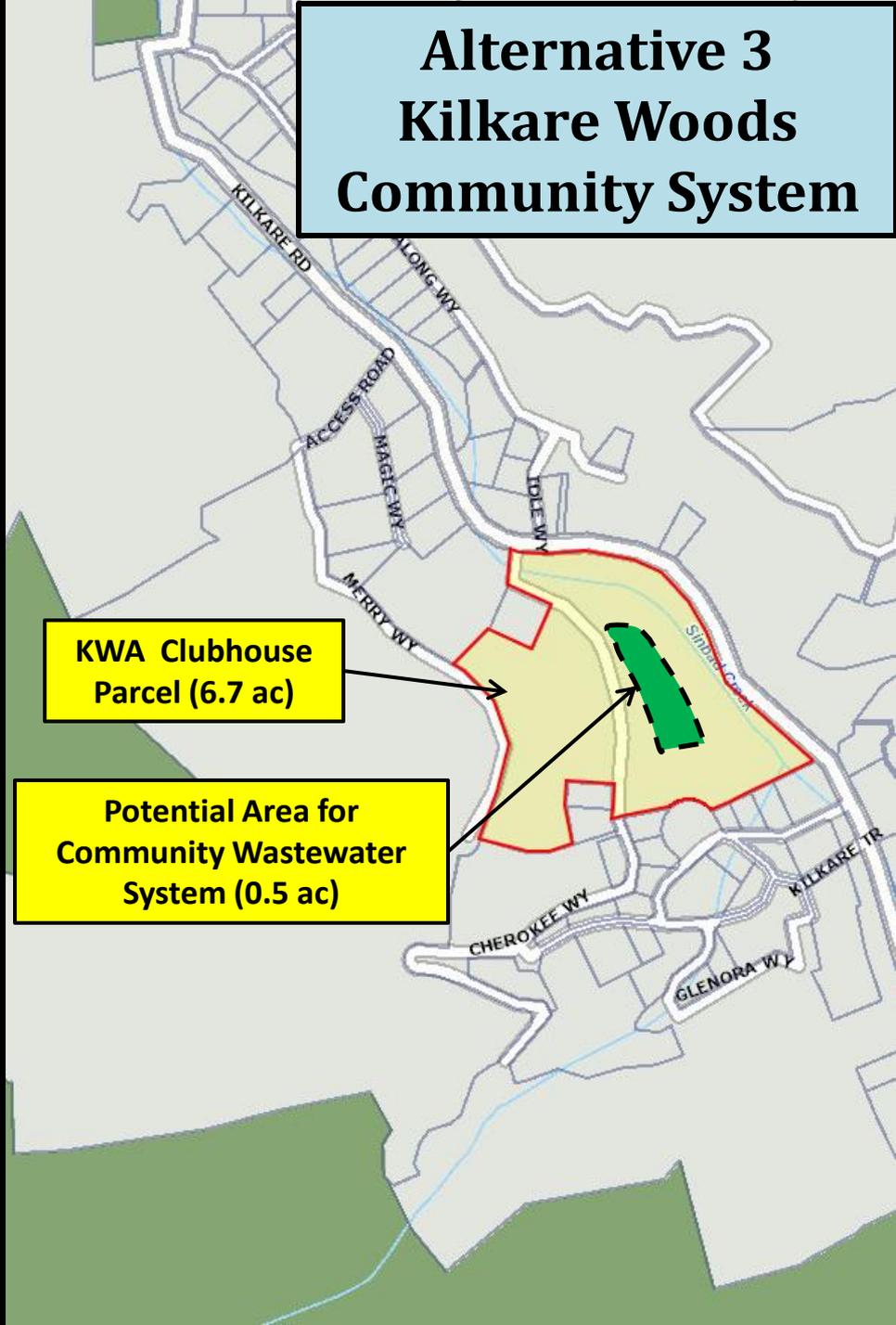
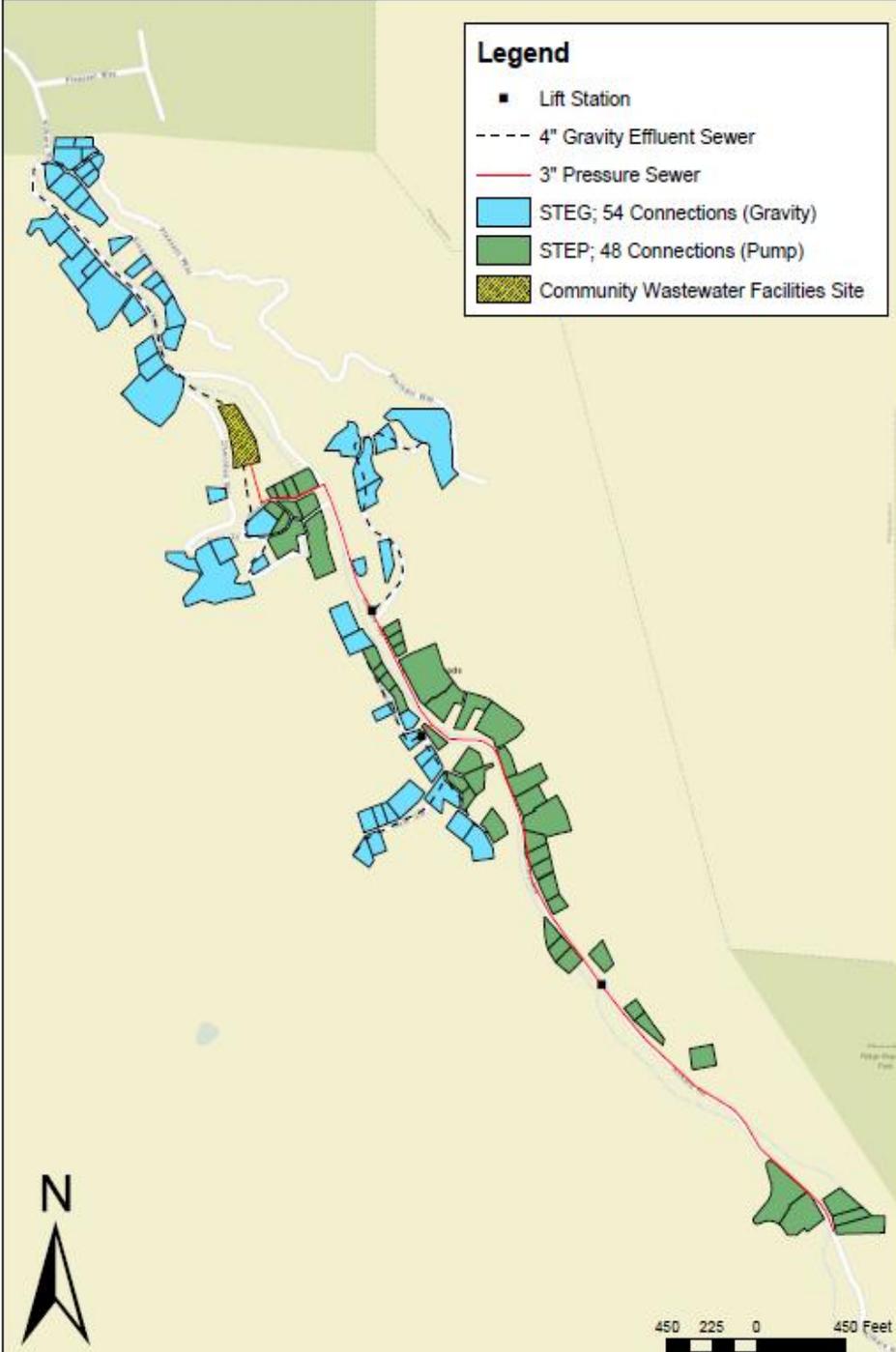
Land Use	# of Parcels	Unit Flow (gpd)*	Level of Residential Participation		
			100%	75%	50%
Downtown Sunol					
Residential	60	125	7,500	5,625	3,750
Multi-Family	3	500	1,500	1,500	1,500
Commercial & Industrial	8	-	4,500	4,500	4,500
School	1	1,500	1,500	1,500	1,500
Railroad (Restroom)	1	1,000	1,000	1,000	1,000
Downtown Sunol Sub-total			16,000	14,125	12,250
Lower Kilkare Road					
Residential	68	125	8,500	6,375	4,250
Commercial	1	500	500	500	500
Lower Kilkare Road Sub-total			9,000	6,875	4,750
Kilkare Woods					
Residential	102	125	12,750	9,625	6,375
KWA Clubhouse	1	50	50	50	50
Kilkare Woods Sub-total			12,800	9,675	6,425
Study Area Total			37,800	30,675	23,425

***gpd stands for gallons per day**

Alternative 3 Kilkare Woods Community System

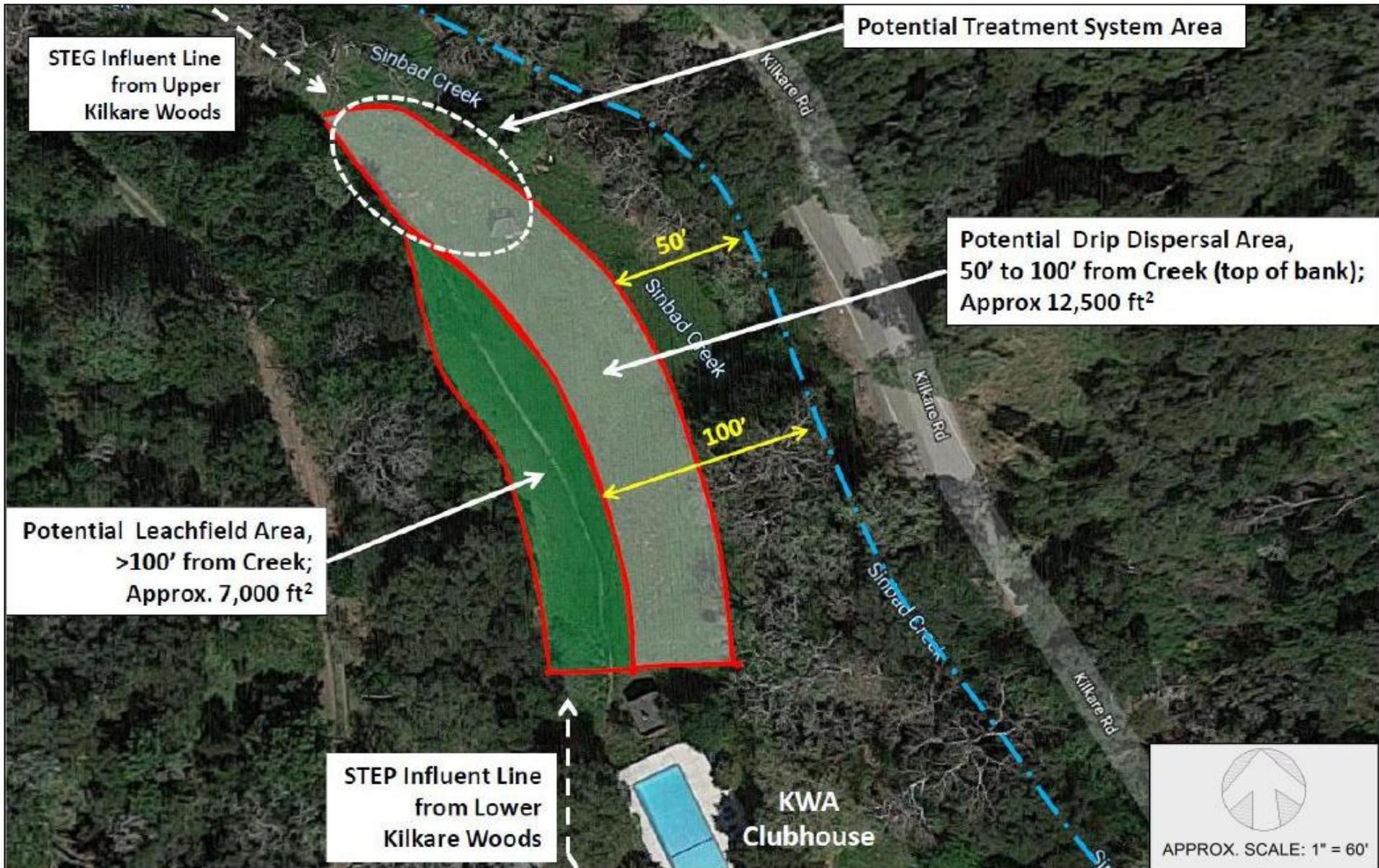
Legend

- Lift Station
- - - 4" Gravity Effluent Sewer
- 3" Pressure Sewer
- STEG; 54 Connections (Gravity)
- STEP; 48 Connections (Pump)
- Community Wastewater Facilities Site



**KWA Clubhouse
Parcel (6.7 ac)**

**Potential Area for
Community Wastewater
System (0.5 ac)**



PHASE 1 – SUNOL
WASTEWATER FEASIBILITY STUDY

SUNOL, CALIFORNIA
ALAMEDA COUNTY



KWA WASTEWATER FACILITIES
SITE ALTERNATIVE 3

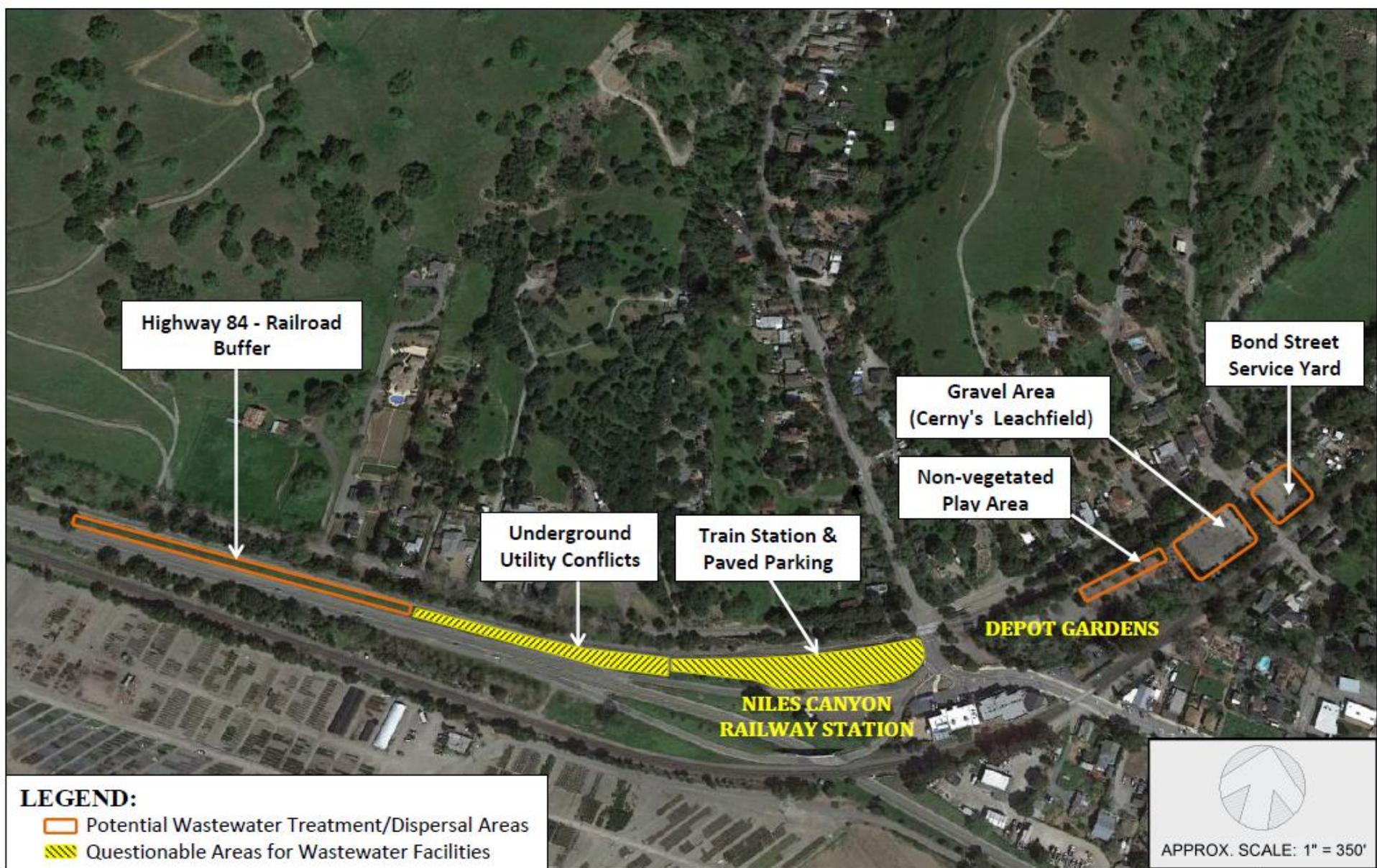
FIGURE
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Preliminary Cost Estimate

Kilkare Woods - Alternative 3 (A, B & C)

Item	Level of Residential Participation		
	3A - 100%	3B - 75%	3C - 50%
Total Parcels (ESDs)*	103	78	52
Public Facilities Cost	\$2,476,000	\$2,280,800	\$2,070,400
On-lot Facilities Cost	\$1,876,200	\$1,421,400	\$951,600
Total Estimated Cost	\$4,352,200	\$3,702,200	\$3,022,000
Estimated Cost per Parcel (ESD)	\$42,254	\$47,464	\$58,115
Approximate Homeowner Cost for On-lot Work	\$5,000	\$5,000	\$5,000
Net Cost to Assessment per Parcel (ESD)	\$37,254	\$42,464	\$53,115
Annual Cost per Parcel (assume 20-years at 3%)	\$2,504	\$2,854	\$3,570

***“ESD” stands for equivalent single family dwelling**



LEGEND:

- Potential Wastewater Treatment/Dispersal Areas
- Questionable Areas for Wastewater Facilities

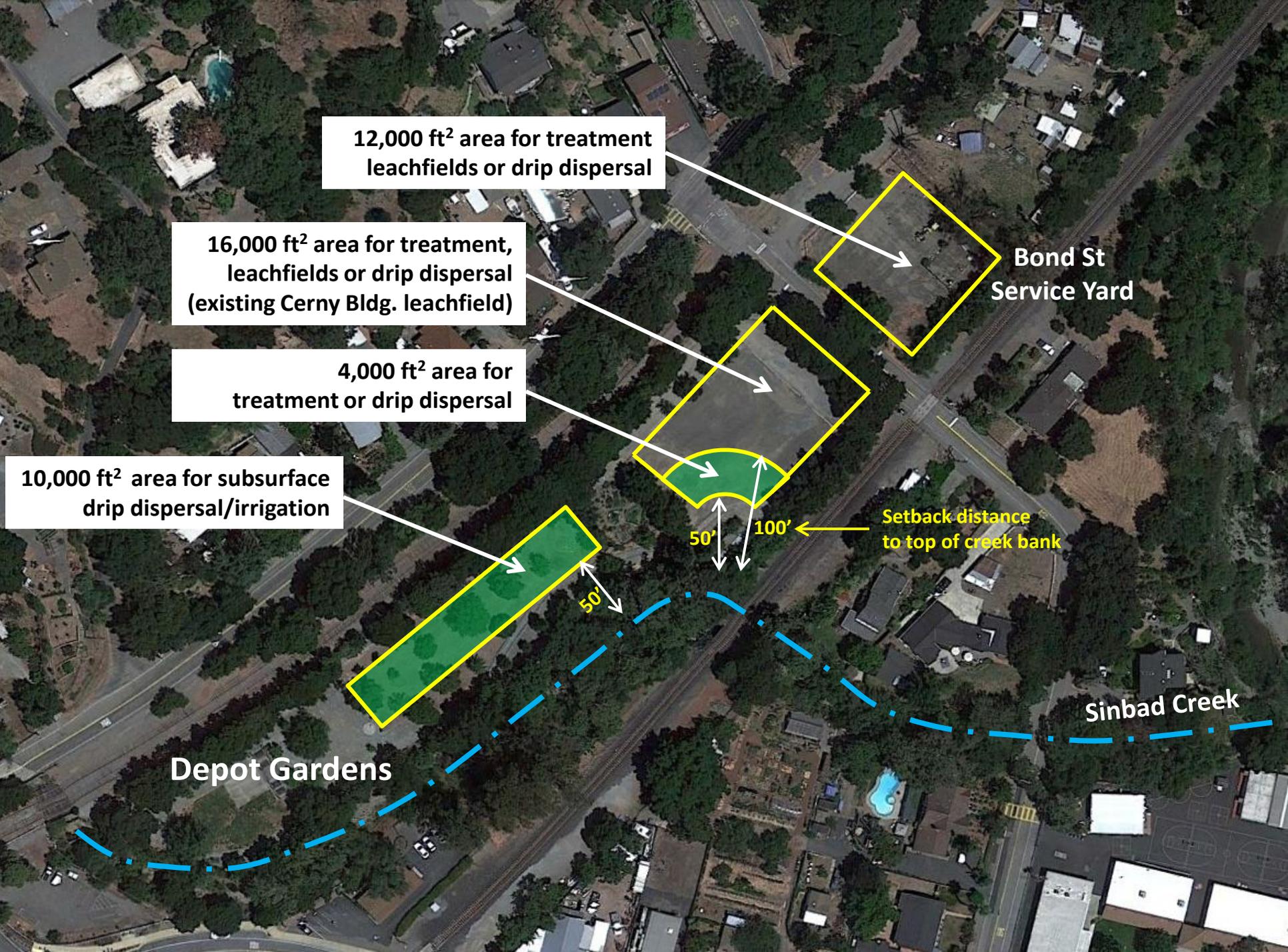
**PHASE 1 – SUNOL
WASTEWATER FEASIBILITY STUDY**

SUNOL, CALIFORNIA
ALAMEDA COUNTY



**POTENTIAL WASTEWATER SITES
ON COUNTY-OWNED PARCELS
IN DOWNTOWN SUNOL**

**FIGURE
11**



12,000 ft² area for treatment leachfields or drip dispersal

16,000 ft² area for treatment, leachfields or drip dispersal (existing Cerny Bldg. leachfield)

4,000 ft² area for treatment or drip dispersal

10,000 ft² area for subsurface drip dispersal/irrigation

Bond St Service Yard

Setback distance to top of creek bank

Sinbad Creek

Depot Gardens

50'

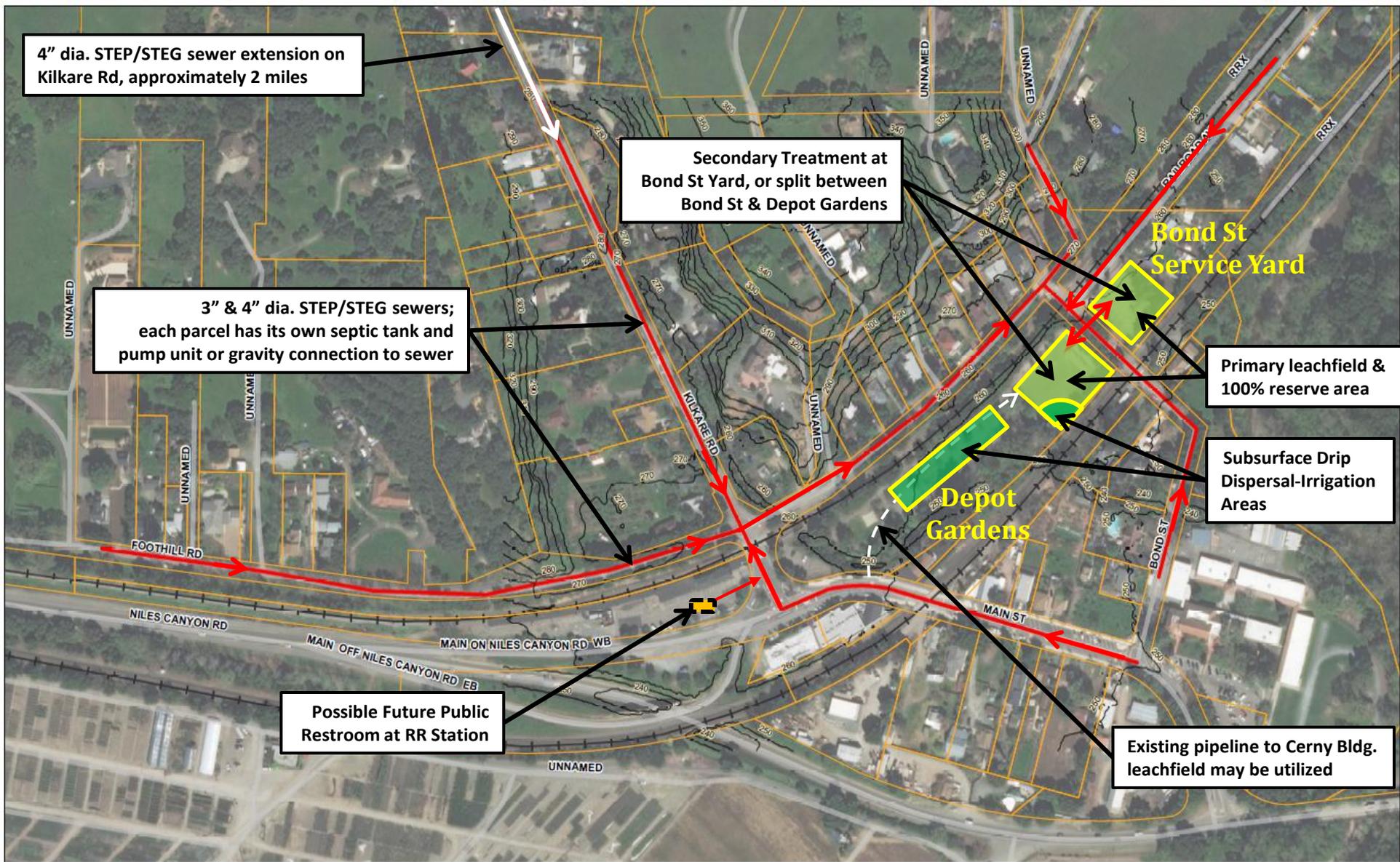
100'

50'

Preliminary Cost Estimate

Downtown Sunol - Alternative 4 (A, B & C)

Item	Level of Residential Participation		
	4A - 100%	4B - 75%	4C - 50%
Total Parcels	73	58	43
Residential Parcels	60	45	30
Multi-family and Non-residential Parcels	13	13	13
Multi-family and Non-residential ESDs	39	39	39
Total Estimated ESDs	99	84	69
Public Facilities Cost	\$2,133,600	\$1,960,800	\$1,768,000
On-lot Facilities Cost	\$1,705,800	\$1,372,800	\$1,039,800
Total Estimated Cost	\$3,839,400	\$3,333,600	\$2,807,800
Estimated Cost per Residence (ESD)	\$38,782	\$39,686	\$40,693
Approximate Homeowner Cost for On-lot Work	\$5,000	\$5,000	\$5,000
Net Cost to Assessment per Parcel (ESD)	\$33,782	\$34,686	\$35,693
Estimated Annual Cost per Parcel (ESD) (assume 20 years at 3% interest)	\$2,270	\$2,331	\$2,400

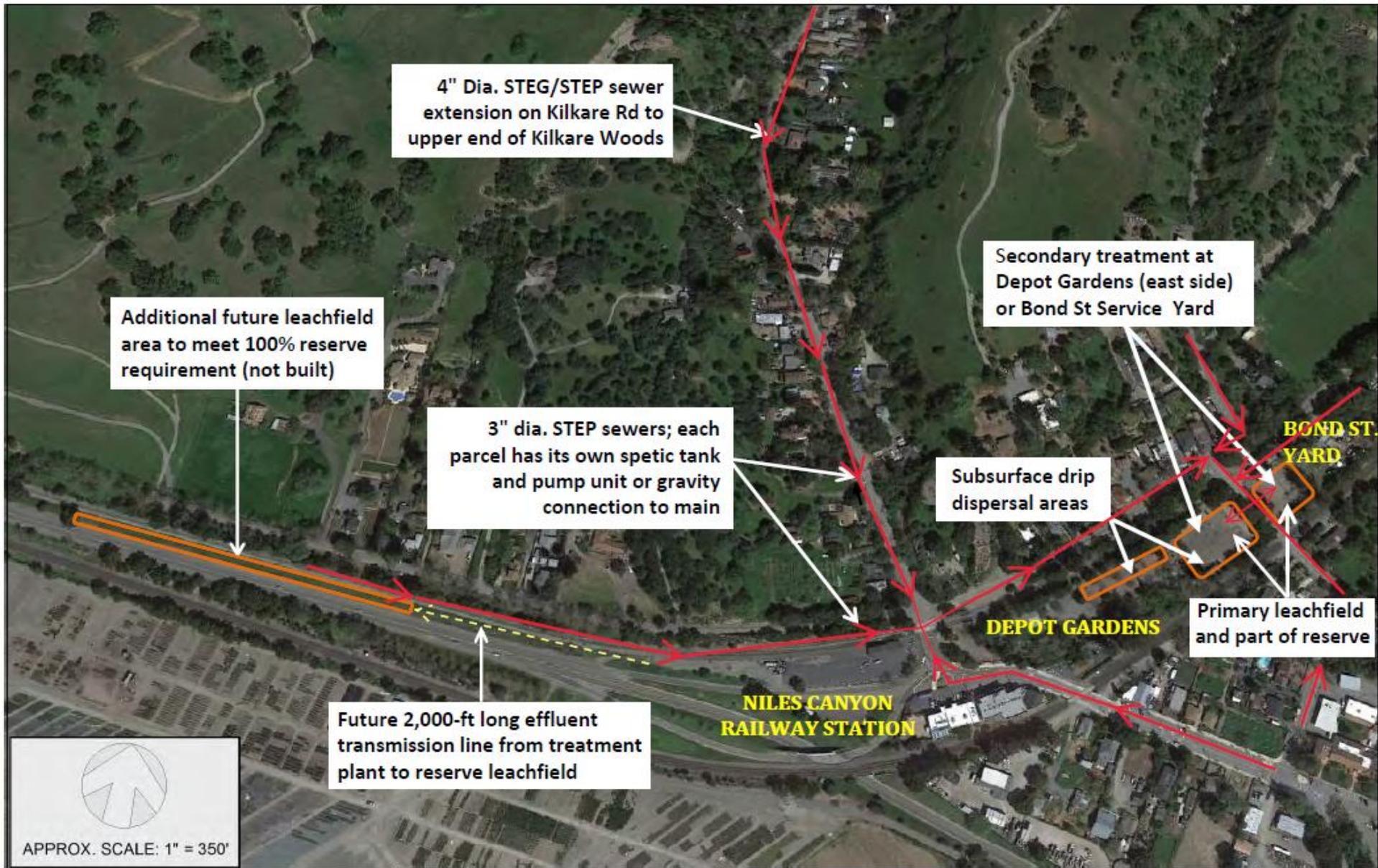


Alternative #5 Downtown Sunol & Lower Kilkare Road Community Wastewater System

Preliminary Cost Estimate

Downtown & Lower Kilkare Rd - Alternative 5 (A, B & C)

Item	Level of Residential Participation		
	5A - 100%	5B - 75%	5C - 50%
Total Parcels	142	110	78
Residential Parcels	128	96	64
Multi-family and Non-residential Parcels	14	14	14
Multi-family and Non-residential ESDs	42	42	42
Total Estimated ESDs	170	138	106
Public Facilities Cost	\$4,378,400	\$4,050,400	\$3,660,800
On-lot Facilities Cost	\$3,024,000	\$2,379,000	\$1,725,000
Total Estimated Cost	\$7,402,400	\$6,429,400	\$5,385,800
Estimated Cost per Residence (ESD)	\$43,544	\$46,590	\$50,809
Approximate Homeowner Cost for On-lot Work	\$5,000	\$5,000	\$5,000
Net Cost to Assessment per Parcel (ESD)	\$38,544	\$41,590	\$45,809
Estimated Annual Cost per Parcel (ESD) (assume 20 years at 3% interest)	\$2,590	\$2,796	\$3,080



PHASE 1 – SUNOL
WASTEWATER FEASIBILITY STUDY

SUNOL, CALIFORNIA
ALAMEDA COUNTY



ALTERNATIVE 6
SUNOL COMMUNITY-WIDE
WASTEWATER SYSTEM

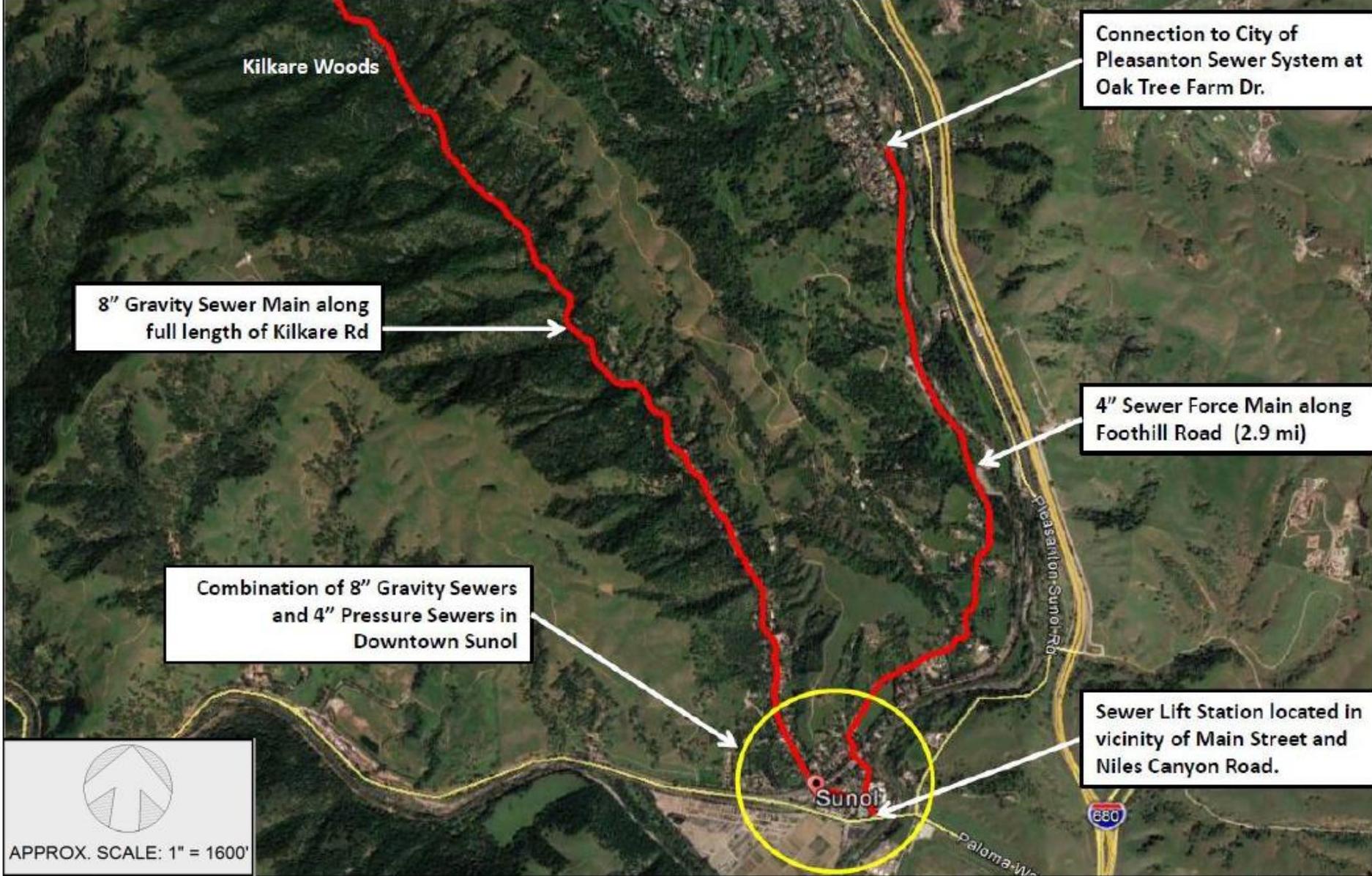
FIGURE

18

Preliminary Cost Estimate

Sunol Community-wide - Alternative 6 (A, B & C)

Item	Level of Residential Participation		
	6A - 100%	6B - 75%	6C - 50%
Total Parcels	245	187	130
Residential Parcels	231	174	116
Multi-family and Non-residential Parcels	14	14	14
Multi-family and Non-residential ESDs	42	42	42
Total Estimated ESDs	273	216	158
Public Facilities Cost	\$7,188,000	\$6,572,000	\$5,837,600
On-lot Facilities Cost	\$4,837,800	\$3,732,900	\$2,610,600
Total Estimated Cost	\$12,025,800	\$10,304,900	\$8,448,200
Estimated Cost per Residence (ESD)	\$44,051	\$47,708	\$53,470
Approximate Homeowner Cost for On-lot Work	\$5,000	\$5,000	\$5,000
Net Cost to Assessment per Parcel (ESD)	\$39,051	\$42,708	\$48,470
Estimated Annual Cost per Parcel (ESD) (assume 20 years at 3% interest)	\$2,625	\$2,870	\$3,258




 APPROX. SCALE: 1" = 1600'

**PHASE 1 – SUNOL
 WASTEWATER FEASIBILITY STUDY**

 SUNOL, CALIFORNIA
 ALAMEDA COUNTY



**ALTERNATIVE #7
 SEWER CONNECTION
 TO PLEASANTON**

FIGURE
18

Preliminary Cost Estimate

Sewer Connection to Pleasanton – Alternative 7

Item	Estimated Cost
Public sewer facilities cost:	\$ 16,177,600
On-lot facilities connection cost:	\$ 3,119,400
Total estimated construction cost:	\$ 19,297,000
Construction cost per residence (273 ESDs):	\$ 70,945
City of Pleasanton connection fee per residence:	\$ 14,885
Total estimated cost per connection:	\$ 85,830
Up-front homeowner costs for connection:	\$ 27,000
Net Cost to Assessment per Parcel (ESD):	\$ 58,830
Estimated Annual Cost per Parcel (ESD): (assume 20 years at 3% interest)	\$ 3,934

Preliminary Cost Summary

Alternative	# Parcels Served	Estimated Project Cost	Estimated Cost per ESD	Estimated Amortized Cost
#1 – No Project, Status Quo	244	N/A	\$27,000 to \$92,000+	N/A
#2 – Onsite Management District	244	\$10,883,000	\$18,000 to \$64,000	Possible Financing
#3 – Kilkare Woods System	103	\$4,352,200	\$42,254	\$2,504
#4 – Downtown Sunol System	73	\$3,839,400	\$ 38,782	\$2,270
#5 – Downtown & Lower Kilkare Rd	142	\$7,402,400	\$43,544	\$2,590
#6 – Sunol Community-wide System	245	\$ 12,025,800	\$44,051	\$2,625
# 7 – Sewer Connection to Pleasanton	245	\$ 19,297,000	\$ 85,830	\$ 3,934

Next Steps

- Review and discuss** information in the report
- Community surveys** on level of interest, preferences, additional information needs, etc.
- Talk to or visit other similar communities**
- Define potential service areas**
- Define scope of additional studies**
- Funding sources**
- Phase 2 Feasibility Study**, if warranted



It's Your Choice

A Guidebook for Local Officials on Small Community Wastewater Management Options

