

# Woodacre Flats Wastewater Feasibility Study

## Summary

### Community Meeting – May 10, 2011

#### INTRODUCTION

In February 2010 the County of Marin contracted with Questa Engineering Corporation to conduct a wastewater feasibility study for the community of Woodacre, focusing specifically on the Woodacre Flats study area, encompassing approximately 150 developed parcels, largely single family residences with a small number of commercial occupancies. The purpose of the study was to identify, evaluate and compare various alternatives for improving wastewater treatment and disposal in the community, including options ranging from onsite septic system upgrades to community sewerage facilities.

The Woodacre Flats study area includes primarily low-lying properties along the following streets: Redwood Drive, Railroad Avenue, Central Avenue and Taylor Avenue. This encompasses the area of Woodacre believed to be in most need of wastewater improvements, as well as the portion of the community that has expressed the greatest amount of interest in studying possible sewerage alternatives. For the purposes of the feasibility analysis, the study assumed that service would be provided to only existing developed properties. Assuming that participation in a community wastewater project would be voluntary, the study considered service to all 150 developed parcels as well as service to 75% of the developed properties (112 parcels) for cost comparison.

#### EXISTING WASTEWATER DISPOSAL PRACTICES

Voluntary (confidential) septic system inspections conducted in 2004-2005 as part of a County-wide outreach effort (“Septic Matters Program”) found roughly two-thirds of the systems inspected in Woodacre to have marginal to unacceptable operating conditions due to many of the following conditions and factors:

- System age, pre-dating modern standards and codes
- Small systems, undersized for current uses
- Additional living units, placing increased demand on sewage disposal systems
- Small parcel size with high intensity of development and limited area for sewage disposal
- Restricted access to yard areas for system maintenance and repair
- Unpermitted repairs and greywater systems
- Shallow depth to groundwater, including seasonal saturation at or near ground surface
- Shallow soils and marginal soil permeability
- Close proximity to streams and local drainages

File and field reviews conducted as part of the current wastewater feasibility study revealed information consistent with the above findings. Water quality sampling of Woodacre Creek and local storm drains in recent years has shown elevated levels of coliform bacteria, nitrate, ammonia and surfactants, in some cases exceeding receiving water quality standards. These influences on water quality are believed to be at least partly due to the high density of older septic systems combined with the difficult drainage and soil conditions in Woodacre, especially in the Flats.

#### ESTIMATED WASTEWATER FLOWS

Based on review of data from other small community wastewater systems, the following unit wastewater flows, in gallons per day (gpd) per single family residence were determined to be appropriate for the area:

- Average Daily Flow: 175 gpd/parcel (for assessing storage and disposal requirements)
- Peak Daily Flow: 210 gpd/parcel (for assessing treatment requirements)

The overall estimated wastewater flows generated from service to 150 parcels in the study area are:

- Average Dry Weather Flow: 26,250 gpd
- Average Wet Weather Flow: 28,875 gpd (w/10% infiltration/inflow factor)
- Peak Dry Weather Flow: 31,500 gpd
- Peak Wet Weather Flow: 34,650 gpd (w/10% infiltration/inflow factor)

## PROJECT ALTERNATIVES

Project alternatives formulated in consultation with Marin County EHS and RWQCB staff and evaluated in this study were as follows:

- **Alternative 1 - No Project.** This would involve maintaining the status quo, where individual property owners would be responsible for maintaining and upgrading their own onsite systems, and abatement of septic system failures as directed by Marin County EHS and/or the San Francisco Bay Regional Water Quality Control Board (RWQCB).
- **Alternative 2 - Onsite Wastewater Management Program.** This alternative considers the upgrade of onsite systems in conjunction with the formation of a local septic system maintenance and inspection program, operated under the authority of a wastewater maintenance district (e.g., County Service Area). Financing of individual septic system improvements would be accomplished with grant assistance to bring all currently developed properties into conformance with minimum acceptable “repair” standards.
- **Alternative 3A, 3B and 3C - Community Leachfield.** This would provide for the construction of a central wastewater collection system for the service area, leading to a community leachfield system located on a nearby wooded knoll along the Fire Road ridgeline northeast of Woodacre on property which is part of the Dickson Ranch. Three community leachfield options were evaluated:
  - **3A** - primary (septic tank) treatment with a shallow pressure distribution leachfield, with 100% capacity and no reserve area.
  - **3B** - secondary treatment (AdvanTex filter) with a shallow pressure distribution leachfield, 100% capacity plus 100% reserve area.
  - **3C** - secondary treatment (AdvanTex) with a subsurface drip dispersal leachfield, 200% capacity installed.
- **Alternative 4 – Water Recycling System at San Geronimo Golf Course.** This alternative would provide for collection, treatment, and recycling of wastewater for turf irrigation at the San Geronimo Golf Course. This would entail the construction of a central wastewater collection system, a wastewater transmission line (force main) to the San Geronimo Golf Course, a tertiary treatment plant located in golf course maintenance area, a holding pond on the golf course (near green #2) for winter storage of recycled water, and seasonal reuse of the recycled water for spray irrigation of the golf course turf grass. The wastewater would be treated to meet California State requirements for

tertiary recycled water (unrestricted uses), and would be integrated into the existing golf course irrigation system to reduce the amount of raw water currently supplied from MMWD.

### ESTIMATED PROJECT COSTS

**Table 1** presents a summary of estimated capital costs and annual operation and maintenance (O&M) costs for various project alternatives to serve all 150 existing developed parcels in the Woodacre Flats study area along with the cost estimates for service to 75% of the properties in the area (112 parcels).

**Table 1: Summary of Estimated Project Costs**

Alternative	100% Participation (150 parcels)				75% Participation (112 parcels)			
	Capital Costs (\$)		Annual O&M Costs (\$)		Capital Costs (\$)		Annual O&M Costs (\$)	
	Total	Per Parcel	Total	Per Parcel	Total	Per Parcel	Total	Per Parcel
<b>1 No Project</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>2 Onsite Upgrades &amp; Mgt Program</b>	8,374,860	55,832	141,295	942	6,227,130	55,600	107,206	975
<b>3A Fire Road Primary Treatment – PD Leachfield</b>	5,330,130	35,534	110,000	733	4,563,000	40,741	90,970	812
<b>3B Fire Road Secondary Treatment – PD Leachfield</b>	5,996,610	39,777	132,770	885	5,083,260	45,386	112,420	1,004
<b>3C Fire Road Secondary Treatment – Drip Dispersal</b>	6,079,710	40,531	149,930	1,000	5,127,720	45,783	129,580	1,157
<b>4 Golf Course Water Recycling</b>	6,765,330	45,102	166,870	1,112	6,141,720	54,837	135,410	1,209

## COMPARATIVE SUMMARY AND APPARENT BEST ALTERNATIVE(S)

A comparative analysis was made of the various alternatives for the Woodacre Flats study area considering such factors as regulatory compliance, environmental impacts, reliability and flexibility, resource utilization, land use, and costs. Some of the factors are represented by objective data (e.g., cost), while others required exercise of professional judgment and more subjective information. The numerical ranking of alternatives is presented in **Table 2**. Based on the comparative analysis two alternatives were ranked roughly the equal, although the strengths and weaknesses vary between the two. The two alternatives identified as the apparent best alternatives are:

- **Alternative 3B – Fire Road Community Leachfield**, including secondary treatment and shallow pressure distribution leaching trenches.
- **Alternative 4 – Golf Course Water Recycling System**, including tertiary (Title 22) treatment, winter holding pond and seasonal turf irrigation at San Geronimo Golf Course.

**Table 2: Numerical Rating of Alternatives\***

COST FACTOR	1 No Project	2 Onsite Upgrades & Mgt. Program	3A Fire Road Community Leachfield Primary Treatment PD Disposal	3B Fire Road Community Leachfield Secondary Treatment PD Disposal	3C Fire Road Community Leachfield Secondary Treatment Drip Disposal	4 Golf Course Water Recycling Tertiary Treatment Storage Pond Spray Irrigation
Regulatory Compliance	1	2	3	5	5	6
Environmental Impacts	1	2	3	5	5	6
Reliability & Flexibility	1	2	3	5	5	6
Resource Utilization	6	5	4	3	3	1 + 1
Land Use	2	1	5	4	4	6
Present Worth Cost	2	4	12	10	8	6
<b>TOTAL</b>	<b>13</b>	<b>16</b>	<b>30</b>	<b>32</b>	<b>30</b>	<b>32</b>
<b>RANKING</b>	<b>6</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>1</b>

\*Maximum point score = 6 for all factors except for Present Worth Cost, where it is 12 points

