

File No. TM14-1519

Location Map

Carson Creek Unit 3

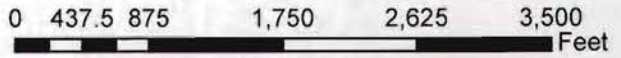


EXHIBIT A

POR. SECS. 23 & 26, T.9N., R.8E., M.D.M.
 CARSON CREEK
 J-130

117:57



1" equals 600'

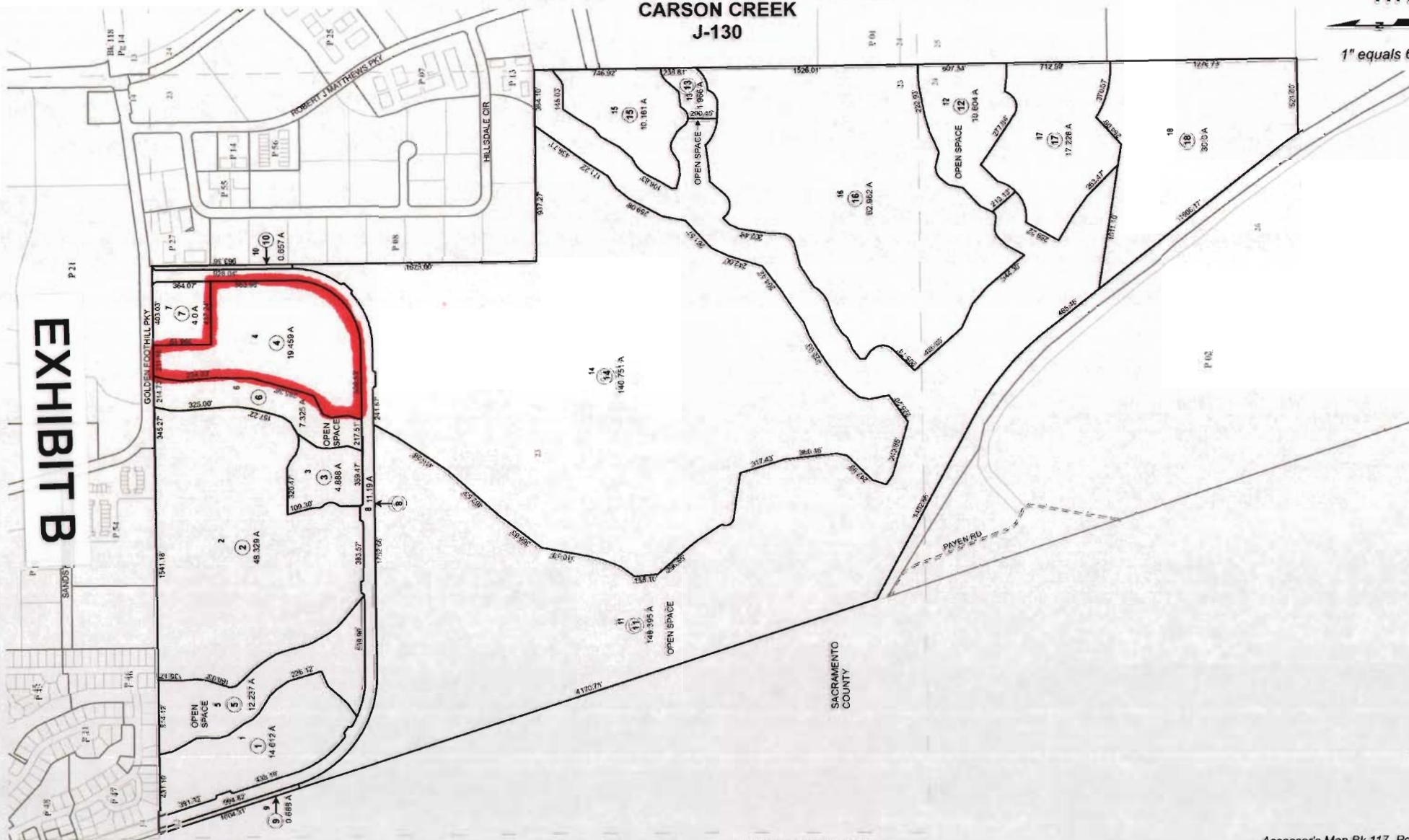
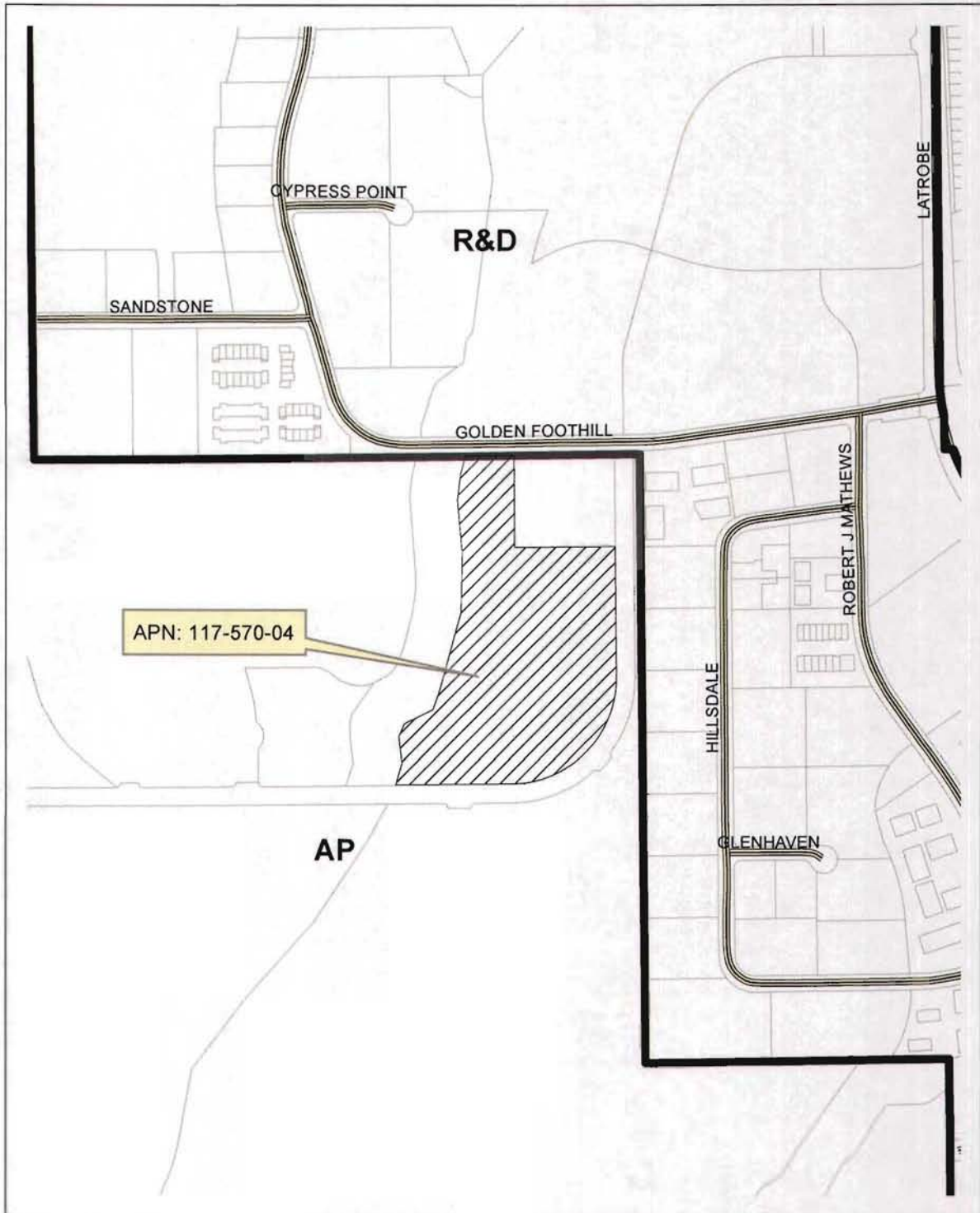


EXHIBIT B

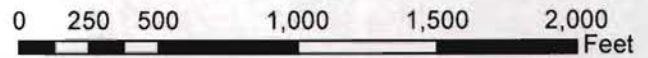
THIS MAP IS NOT A SURVEY. It is prepared by the El Dorado Co Assessor's Office for assessment purposes only. Area calculations and characteristics are not guaranteed. Users should verify areas, such as dimensions and acreage.

Acreages Are Estimates

Assessor's Map Pages 121-126 in 'Geo-Tax'
 Assessor's Block Number System in Biggs
 Assessor's Parcel Number System in Carls

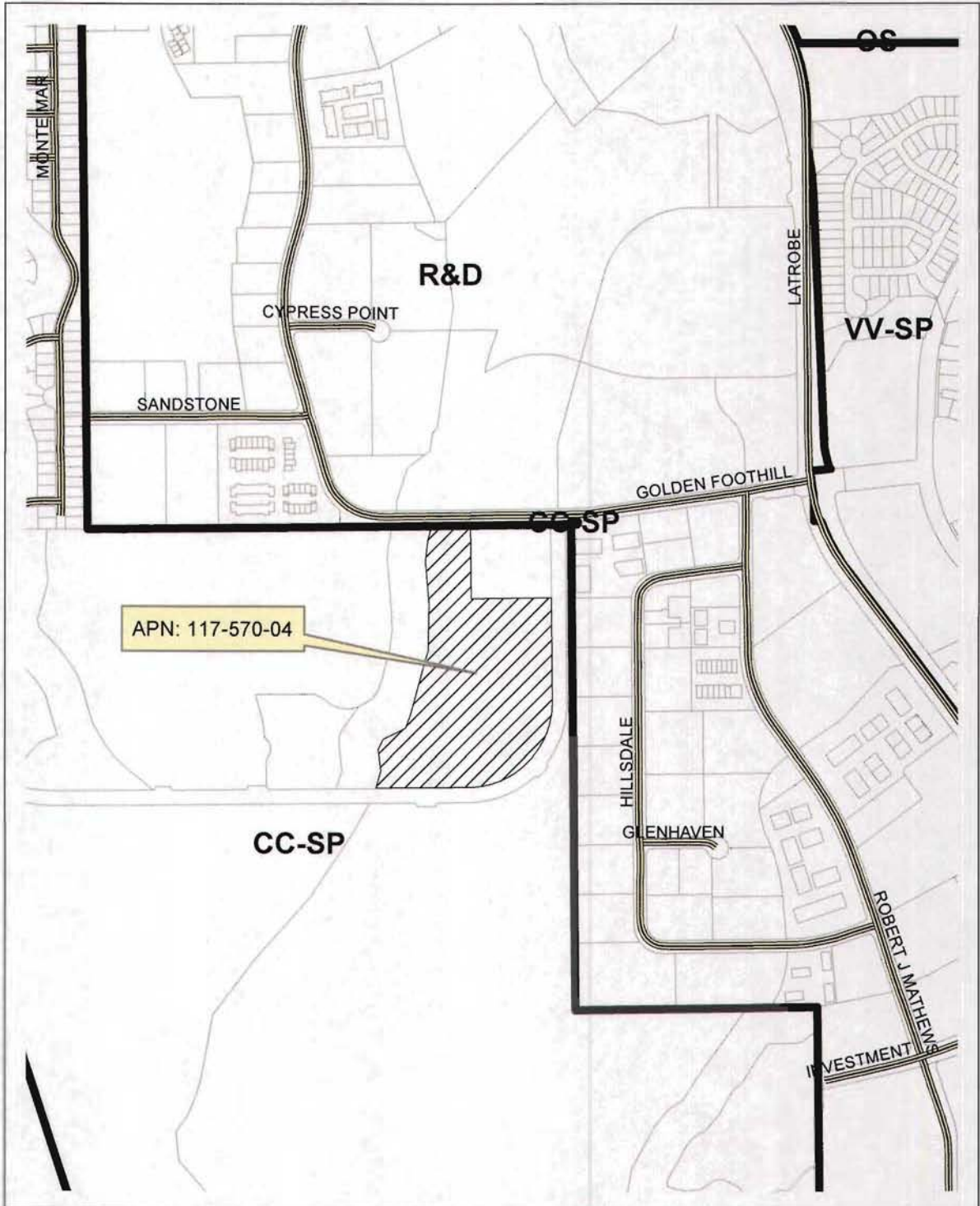


File No. TM14-1519
General Plan Map
 Carson Creek Unit 3



AP = Carson Creek Specific Plan

EXHIBIT C



File No. TM14-1519
Zoning Map
 Carson Creek Unit 3

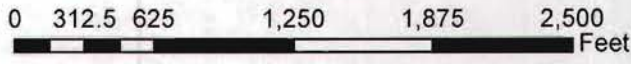
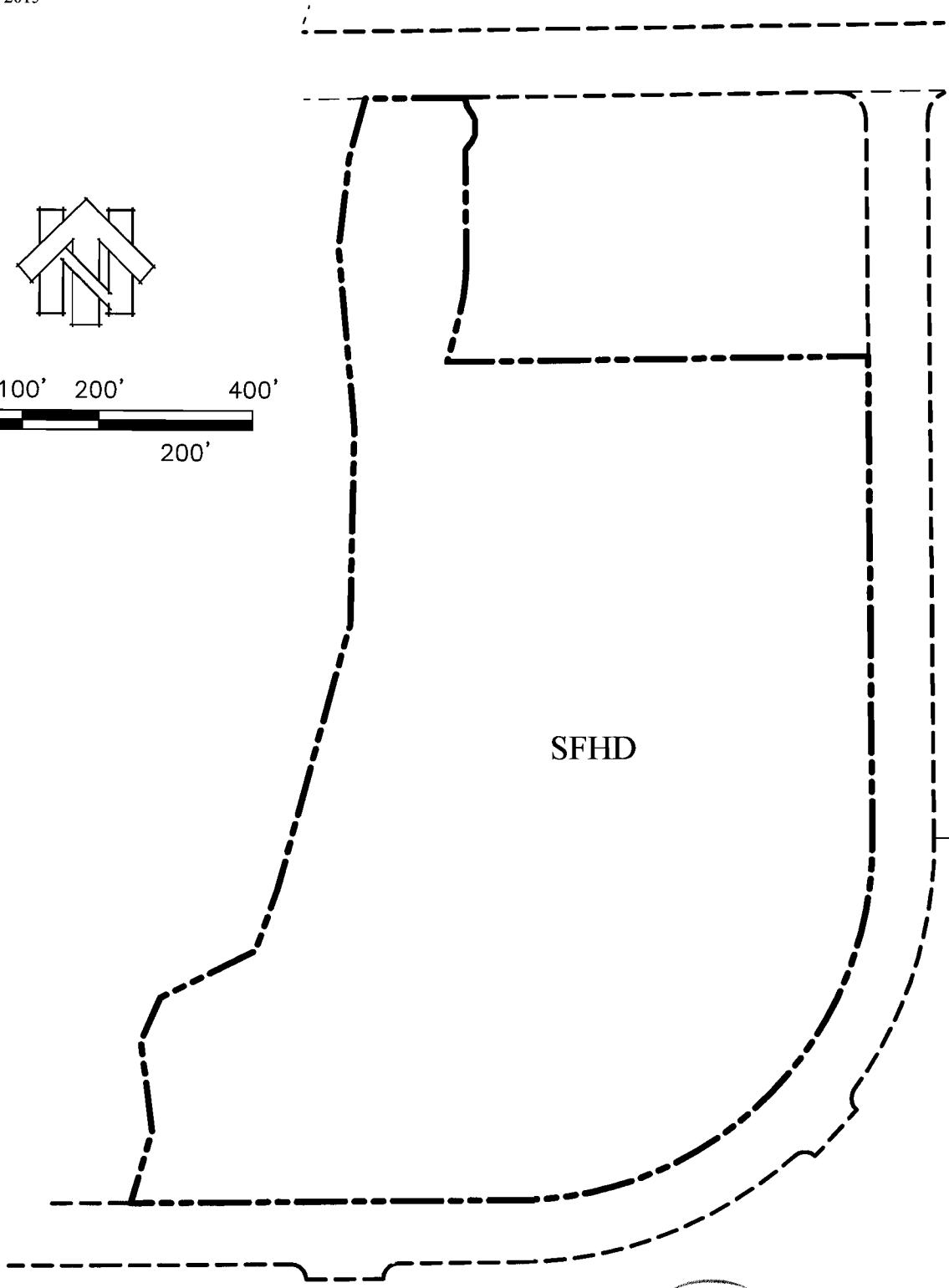
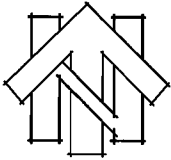


EXHIBIT D

CARSON CREEK UNIT 3
ZONING MAP - PROPOSED
COUNTY OF EL DORADO
MAY, 2015



SFHD

EXHIBIT D1



Civil Engineering • Land Surveying • Land Planning
3233 Monier Circle, Rancho Cordova, CA 95742
T (916) 638-0919 • F (916) 638-2479 • www.ctaes.net

M:\05-063-010\PLANNING\EXHIBITS\05-063-010 ZONING MAP.dwg, Layout1, 5/19/2015 11:46:41 PM, rfursov

PRELIMINARY GRADING & DRAINAGE PLAN
CARSON CREEK - UNIT 3

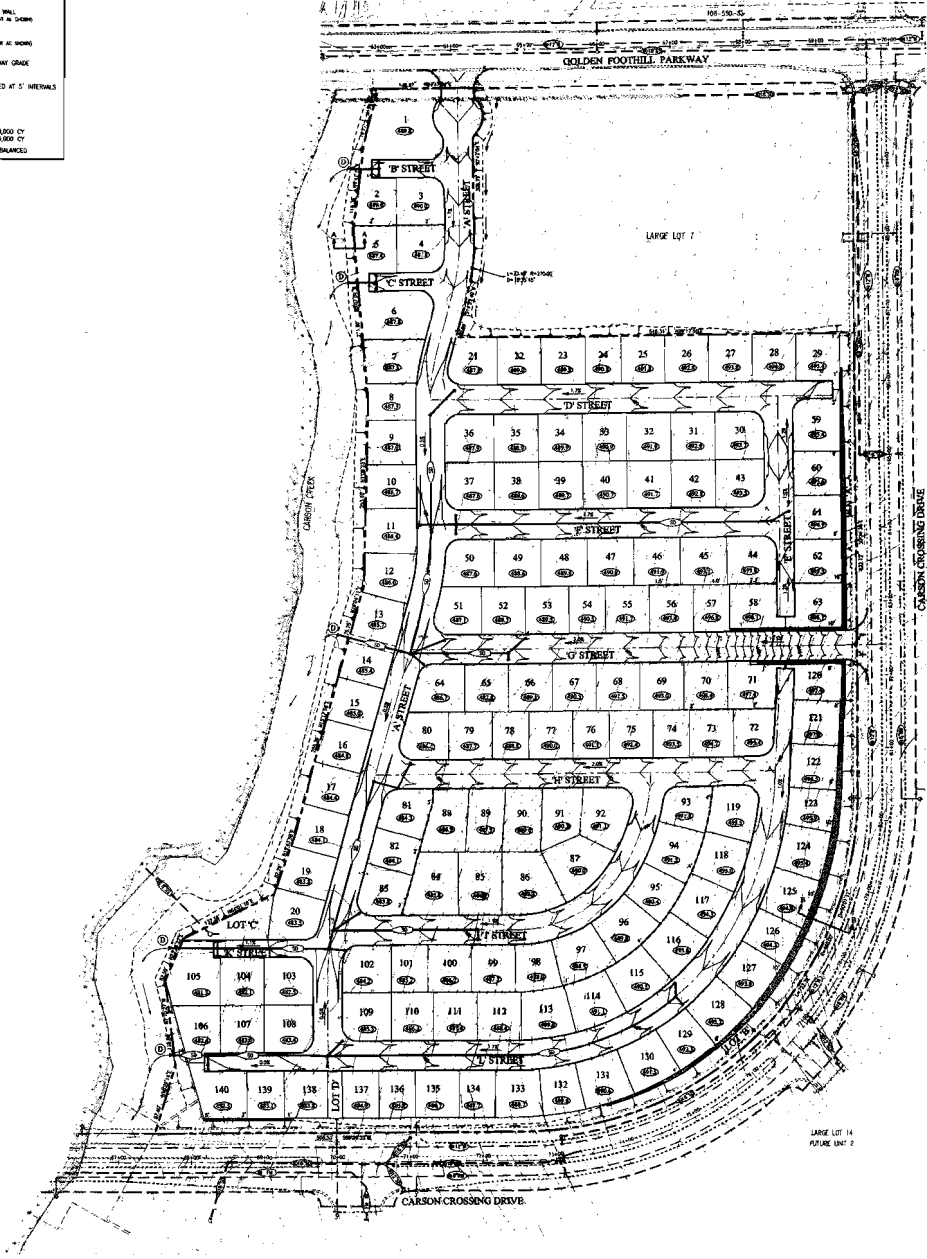
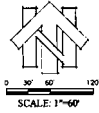
COUNTY OF EL DORADO SHEET 1 OF 1 STATE OF CALIFORNIA

LEGEND:

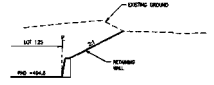
- ⊙ (P) DRAINAGE OUTFALL
- FIELD PALE TO STORM DRAIN SYSTEM
- DRAINAGE ALLEY (D/A)
- ROCKERY RETAINING WALL (APPROXIMATE WALL HEIGHT AS SHOWN)
- RETAINING WALL (APPROXIMATE WALL HEIGHT AS SHOWN)
- APPROXIMATE ROADWAY GRADE
- TO CONTAIN LABELED AT 5' INTERVALS

EARTHWORK

APPROXIMATE CUT: 110,000 CY
 APPROXIMATE FILL: 100,000 CY
 ASSUMES PROJECT EARTHWORK IS BALANCED



SECTION A
SCALE: 1"=10'

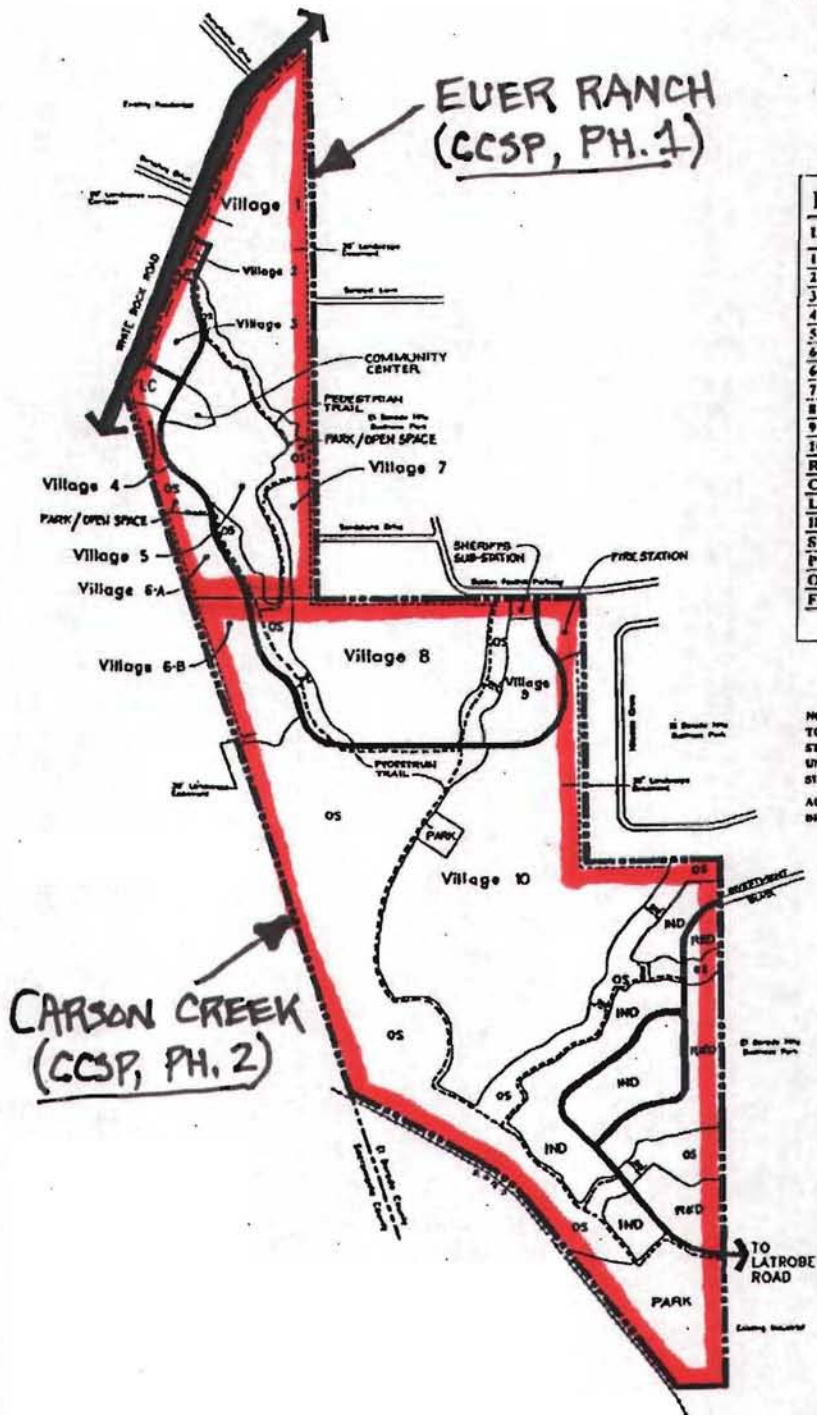


SECTION B
SCALE: 1"=10'

cta Engineering & Surveying
 Civil Engineering • Land Surveying • Land Planning
 228 Sierra Circle, Redlands, California, CA 91242
 (909) 408-1100 • FAX (909) 408-1101

EXHIBIT F

LAND USE PLAN



LAND USE CALCULATIONS			
LAND USE VILLAGES	ACRES	UNITS	D.U.A.
1	74.8	255	3.4
2	1.1	4	3.6
3	9.5	28	2.9
4	3.3	7	2.2
5	31.2	125	4.0
6-A	10.4	36	3.4
6-B	20.9	83	4.0
7	9.2	41	4.0
8	55.3	364	6.5
9	16.6	67	4.0
10	136.4	750	5.5
RESEARCH & DEVELOPMENT	34.4	0	
COMMUNITY CENTER	3.0	0	
LOCAL COMMERCIAL (LC)	4.6	0	
INDUSTRIAL (IND)	59.7	0	
SHERIFF SUB-STATION	1.2	0	
PARKS	37.0	0	
OPEN SPACE (OS)	198.9	0	
FIRE STATION	5.4	0	
TOTAL	712.8	1700	

NOTE: UNIT COUNT SHOWN HEREON MAY CHANGE FROM VILLAGE TO VILLAGE AND WILL BE FINALIZED AT THE TENTATIVE MAP STAGE. THE CHANGES ARE PERMITTED SO LONG AS THE TOTAL UNIT COUNT DOES NOT EXCEED THE MAXIMUM UNIT COUNT AS SHOWN ON THE SPECIFIC PLAN.

ACRES SHOWN HEREON ARE APPROXIMATE ONLY AND WILL BE FINALIZED AT TENTATIVE MAP STAGE.

Carson Creek Specific Plan

EXHIBIT G

FIGURE 4 LAND USE PLAN

TENTATIVE MAP
CARSON CREEK, UNIT 2
 PHASE TWO PORTION OF "CARSON CREEK SPECIFIC PLAN"
 LOT & PLAN DETAIL

COUNTY OF EL DORADO SHEET 2 OF 2 STATE OF CALIFORNIA
 OCTOBER, 2012 SCALE: 1"=100'



EL DORADO HILLS BUSINESS PARK
 APN 117-081-05

APN 117-210-21
 PARCEL 11
 PM 47-137

APN 117-210-33
 PARCEL 3
 PM 47-137

CARSON CREEK
 UNIT 1
 TM #04-1391

LEGEND:
 PROPOSED FIRE HYDRANT
 EXISTING WETLANDS
 PEDESTRIAN ROUTE OF TRAVEL
 OSA OPEN SPACE ACCESS

NOTE:
 OPEN SPACE ACCESS POINTS ARE FOR EMERGENCY EQUIPMENT ACCESS ONLY AND ARE NOT FINAL. THE FINAL DESIGN DETAILS FOR THESE ACCESS POINTS SHALL BE APPROVED BY THE EL DORADO HILLS FIRE DEPARTMENT PRIOR TO INSTALLATION.

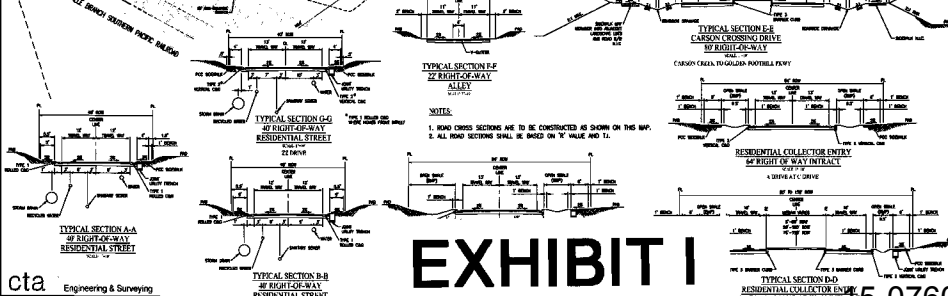


EXHIBIT I

DESIGN WAIVER REQUEST

For

Carson Creek Unit 3

APN 117-010-08

TM 14-1519

14 MAY 20 AM 10:55

RECEIVED
PLANNING DEPARTMENT

Design Waiver Request:

1. Construct the Lot R encroachment onto Golden Foothill Parkway to Standard Plan 103D without the 100' foot tapers.
2. Construct road encroachment (exit only) onto Carson Crossing Drive to Standard Plan 103D without the 100' tapers.
3. Reduce sidewalk widths to 4' for residential streets (sidewalk on one side).
4. Reduce residential street right of way widths (Lot R) from 50' to 40'.
5. Install local access stub streets $\leq 150'$ in length (Lot R width 24'; 21'-cf/cf)
6. Intersection off-set of K-Street and R-Street $< 150'$

Required Conditions:

This Design Waiver Request meets the required conditions set forth in Chapter 16.08.020 of the County Land Division Ordinance as follows.

- A. There are special conditions or circumstances peculiar to the property proposed to be subdivided which would justify the waiver.

Findings:

- DWR 1: The project is gated and the taper is not necessary
- DWR 2: The provision of tapers at encroachments onto Carson Crossing Drive would unnecessarily interfere with roadside ditches. In addition, the project Settlement Agreement states that the project will minimize impervious surfaces such as roadway pavement to the maximum extent practicable.
- DWR 3: The reduced sidewalk width is adequate to serve the pedestrians using it.
- DWR 4: The reduced right of way width (Lot R) is adequate to accommodate the proposed roadway.
- DWR 5: The access stubs coupled with the small lots allow better utilization of the property
- DWR 6: The access stub coupled with the small lots and the age restricted neighborhood is more characteristically a driveway than a road.

- B. Strict application of the design or improvement requirements of this chapter would cause extraordinary and unnecessary hardship in developing the property.

Findings:

- DWR 1: The strict application of the design standard unnecessarily interferes with the gate geometry.
- DWR 2: The strict application of the design standard (for an exit only) results in unnecessary impacts to roadside ditches.
- DWR 3: The increased sidewalk width would unnecessarily increase impervious area.
- DWR 4: Additional right of way width would unnecessarily decrease the amount of available land for the small age restricted lots
- DWR 5: The proposed stub allows for use of the land that is irregularly shaped by the creek bend
- DWR 6: The proposed stub and its location make use of the land that is irregularly shaped by the creek bend

- C. The waiver would not be injurious to adjacent properties or detrimental to the health, safety, convenience and welfare of the public.

Findings:

- DWR 1: The design waiver proposes improvements consistent with the County standards and therefore would not be injurious to adjacent properties or detrimental to the health, safety, convenience or welfare of the public. The existing road section provides adequate area for acceleration and deceleration to accommodate turning movements.
- DWR 2: The 18' roadway section provides adequate area for acceleration (exit only)

EXHIBIT J TM 14-1519

- DWR 3: The reduced sidewalk width would not be injurious to adjacent properties or detrimental to the health, safety, convenience and welfare of the public.
 - DWR 4: The reduction in right of way width for the residential streets would not be injurious to adjacent properties or detrimental to the health, safety, convenience and welfare of the public.
 - DWR 5: The proposed stub streets are more characteristic of driveways and would not be injurious to adjacent properties or detrimental to the health, safety, convenience and welfare of the public.
 - DWR 6: The proposed stub street is more characteristic of a driveway and would not be injurious to adjacent properties or detrimental to the health, safety, convenience and welfare of the public.
- D. The waiver would not have the effect of nullifying the objectives of this article or any other law or ordinance applicable to the subdivision.

Findings:

- DWR 1, 2, 3, 4, 5, & 6: The proposed improvements meet existing County standards , the requirements of the Carson Creek Specific Plan, and are consistent with the policies of the 2004 General Plan, and therefore would not have the effect of nullifying the objectives of Article II of Chapter 16 of the County Code or other ordinance.

Recommendation:

Approve the Design Waiver Request as it meets the required conditions set forth in Chapter 16.08.020 of the County Land Division Ordinance.



AECOM
2101 Webster Street
Suite 1900
Oakland, CA 94612
www.aecom.com

510 622 6600 tel
510 834 5220 fax

Technical Memorandum

To	Don Barnett, Lennar Homes	Pages	6
Subject	Carson Creek Trip Generation Comparison – Technical Memorandum		
From	Jeffrey Chan, PTP Amanda Leahy, AICP		
Date	February 20, 2015		

This memorandum has been prepared to compare the trip generation estimates associated with the proposed revisions to the approved land uses for the Carson Creek Unit 3 development (hereafter referred to as the "Proposed Project") with those as studied and documented in the *Carson Creek Unit 2 Transportation Impact Study*, completed by AECOM in 2010 (hereafter referred to as the "2010 Study"), and those as studied and documented in the *Carson Creek Unit 2 – Revised Project Description Memorandum*, completed by AECOM in 2012 for the changes to Carson Creek Unit 2 approved land uses (hereafter referred to as the "2012 Study").

The comparison of the trip generation as documented in this memorandum will assist in the determination of any potential changes to intersection or roadway operating conditions as documented in the 2010 Study or the 2012 Study.

Project Description

The project description for the Proposed Project, as well as those for the 2010 Study and 2012 Study, are as follows:

2010 Study

The 2010 Study documented the technical analysis results for the initial land uses (approved land uses) for both the Carson Creek Unit 2 (CCU2) and Carson Creek Unit 3 (CCU3) parcels. The CCU2 parcel consists of 136 units of attached senior housing and 488 units of detached senior housing, and the CCU3 parcel consists of 304 units of attached senior housing.

2012 Study

The 2012 Study documented the projected changes in the resulting trip generation due to the proposed revision to the land uses of the CCU2 parcel land uses. In lieu of the 136 units of attached senior housing and 488 units of detached senior housing, a total of 634 units of detached senior housing were proposed.

Proposed Project

The current proposal will further revise the land use of the CCU3 parcel. In lieu of the 304 units of attached senior housing, 140 units of detached senior housing are proposed.

Table 1 below summarizes the project descriptions of the CCU2 and CCU3 parcels for the different studies:

Table 1: Project Description for CCU2 and CCU3 Parcels

	CCU2 Parcel	CCU3 Parcel
2010 Study	136 Units Attached Senior Housing 488 Units Detached Senior Housing	304 Units Attached Senior Housing
2012 Study	634 Units Detached Senior Housing	304 Units Attached Senior Housing
Proposed Project	634 Units Detached Senior Housing	140 Units Detached Senior Housing

As discussed earlier, the Proposed Project consists of 634 units of detached senior housing on the CCU2 parcel located south of Carson Crossing Drive and 140 units of detached senior housing on the CCU3 parcel located north of Carson Crossing Drive. As evaluated in the 2012 Study, the CCU3 parcel was previously referred to as "CCU2 – North", consisted of 304 units of attached senior housing.

Other than the proposed changes to the CCU3 land uses, all other land use assumptions are the same as those evaluated in the 2012 Study. Specifically, a community center, which would be located within the Carson Creek Unit 1 (CCU1) development and a public park, which would be located within the CCU2 development, remain unchanged. These facilities would be accessible to all Carson Creek residents.

Trip Generation

2010 and 2012 Study Trip Generation

Trip generation estimates for the 2010 Study and 2012 Study were calculated using surveyed data as documented in Institute of Transportation Engineer's (ITE's) *Trip Generation Manual, Seventh Edition* (Transportation Research Board, 2003) for attached senior housing (ITE Land Use Code 252) and detached senior housing (ITE Land Use Code 251). Trip generation rates and totals (as approved and as documented in the 2010 Study and the 2012 Study) for CCU3 are summarized in **Table 2**.

For both the 2010 Study and the 2012 Study, the trip generation rates were reduced by 15% to account for internal trips within the Carson Creek development. This trip generation rate is consistent with the internalization assumption for trip generation for the project as analyzed in the Environmental Impact Report and other studies. All trips to the community center and the public park are assumed to be internal to the overall Carson Creek project and therefore would not add any trips to roadways or intersections outside of the Proposed Project.

Table 2 – Carson Creek External Vehicle-Trip Generation, 2010 and 2012 Study

Land Use	Size / Unit	Daily Rate	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
2012 Study								
CCU3								
Attached Senior Housing Trip Rate	304 DU	2.96	0.03	0.03	0.06	0.06	0.03	0.09
Attached Senior Housing Trips	Trips	900	9	9	18	18	9	27
CCU2								
Detached Senior Housing Trip Rate	634 DU	3.15	0.06	0.11	0.17	0.13	0.09	0.22
Detached Senior Housing Trips	Trips	1,997	38	70	108	82	57	139
Total 2012 Study Trips		2,897	47	79	126	100	66	166
2010 Study								
CCU3								
Attached Senior Housing Trip Rate	304 DU	2.96	0.03	0.03	0.06	0.06	0.03	0.09
Attached Senior Housing Trips	Trips	900	9	9	18	18	9	27
CCU2								
Attached Senior Housing Trip Rate	136 DU	2.96	0.03	0.03	0.06	0.06	0.03	0.09
Attached Senior Housing Trips	Trips	403	4	4	8	9	4	13
Detached Senior Housing Trip Rate	488 DU	3.15	0.06	0.11	0.17	0.13	0.09	0.22
Detached Senior Housing Trips	Trips	1,537	29	54	83	63	44	107
Total 2010 Study Trips	Trips	2,839	42	67	109	90	57	147
Change in Trip Generation (2010 Study to 2012 Study)	Trips	+58	+5	+12	+17	+10	+9	+19

Source: AECOM, 2010, 2012, 2015

Notes:

- Community Center and Public Park trips are internal trips and have been accounted for in the 15% internal trip reduction.

As shown in Table 2, as analyzed in the 2012 Study, the CCU3 development (340 units of attached senior housing) would generate approximately 18 weekday AM peak hour net external vehicle-trips (9 inbound, 9 outbound) and 27 weekday PM peak hour net external vehicle-trips (18 inbound, 9 outbound). The CCU2 development (634 units of detached senior housing) would generate approximately 108 weekday AM peak hour net external vehicle-trips (38 inbound, 70 outbound) and 139 weekday PM peak hour net external vehicle-trips (82 inbound, 57 outbound). Overall, the

development would generate 2,897 net daily external vehicle trips, with 126 weekday AM peak hour net external vehicle-trips (47 inbound, 79 outbound) and 166 weekday PM peak hour net external vehicle-trips (100 inbound, 66 outbound).

The project, as defined and evaluated in the 2010 Study and 2012 Study, would not materially degrade intersection operations (LOS) at any of the study intersections or study roadway segments under Existing or Cumulative Conditions. It is important to note that the 2012 Study re-evaluated intersection LOS and roadway segment LOS (i.e., full analyses completed) at all study intersections and roadway segment that had been analyzed in the 2010 Study, and presented any resulting changes in LOS and average delay at each location due to the increase in trip generation. The resulting change in projected trip generation is presented in the last row of **Table 2** above.

As calculated and documented in the 2012 Study, the change in the project trip generation resulting from the change of the land use from the 2010 Study to the 2012 Study would be an increase of 58 net daily external vehicle trips, with an increase of 17 weekday AM peak hour net external trips (5 inbound, 12 outbound) and an increase of 19 weekday PM peak hour net external trips (10 inbound, 9 outbound).

Despite the increases in daily, weekday AM peak hour and weekday PM peak hour net external vehicle trips resulting from the change in land uses, at all study intersections the LOS were projected to remain unchanged, and their corresponding average delays were projected to increase nominally (the greatest increase in average delay was projected to be by 2.0 seconds), for both the weekday AM and PM peak hours. At all roadway segments the LOS and the average delays were projected to remain unchanged, for both the weekday AM and PM peak hours. The details of the analyses and results are contained in **Table 4** through **Table 7** of the 2010 Study.

Proposed Project

The Proposed Project consists of 140 units of detached senior housing on the CCU3 parcel located north of Carson Crossing Drive, and 634 units of detached senior housing on the CCU2 parcel located south of Carson Crossing Drive.

To maintain consistency and to facilitate trip generation comparison, trip generation rate from the Institute of Transportation Engineer's (ITE's) *Trip Generation Manual, Seventh Edition* (Transportation Research Board, 2003) for detached senior housing (ITE Land Use Code 251) was used. Consistent with both the 2010 Study and the 2012 Study (both approved), the trip generation rate were reduced by 15% to account for internal trips within the Carson Creek development and were utilized in the calculation of projected trip generation of the Proposed Project. The ITE trip generation rates, as well as the projected trip generation totals for the Proposed Project are summarized in **Table 3**.

As shown in **Table 3**, the Proposed Project's 140 units of detached senior housing on the CCU3 parcel is projected to generate a total of 441 daily external vehicle trips, with 24 weekday AM peak hour net external vehicle trips (9 inbound, 15 outbound) and 31 weekday PM peak hour net external vehicle trips (18 inbound, 13 outbound). Overall, the development would generate 2,438 net daily external vehicle trips, with 132 weekday AM peak hour net external vehicle-trips (47 inbound, 85 outbound) and 170 weekday PM peak hour net external vehicle-trips (100 inbound, 70 outbound).

Table 3 – Carson Creek External Vehicle-Trip Generation, Proposed Project

Land Use	Size / Unit	Daily Rate	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
CCU3								
Detached Senior Housing <i>Trip Rate</i>	140 DU	3.15	0.06	0.11	0.17	0.13	0.09	0.22
Detached Senior Housing <i>Trips</i>	Trips	441	9	15	24	18	13	31
CCU2								
Detached Senior Housing <i>Trip Rate</i>	634 DU	3.15	0.06	0.11	0.17	0.13	0.09	0.22
Detached Senior Housing <i>Trips</i>	Trips	1,997	38	70	108	82	57	139
Total Proposed Project Trips	Trips	2,438	47	85	132	100	70	170

Source: AECOM, 2010, 2012, 2015

Notes:

- Community Center and Public Park trips are internal trips and have been accounted for in the 15% internal trip reduction for both ITE Rate and Modified ITE Rate estimates.

A comparison between the projected trip generation resulting from the Proposed Project with those of the 2010 Study and 2012 Study is shown in Table 4.

Table 4 – Carson Creek External Vehicle-Trip Generation Comparison

Scenario / Location	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Proposed Project	2,438	47	85	132	100	70	170
2012 Study	2,897	47	79	126	100	66	166
2010 Study	2,839	42	67	109	90	57	147
Change in Trip Generation (2012 Study to Proposed Project)	-459	0	+6	+6	0	+4	+4

Source: AECOM, 2010, 2012, 2015

Notes:

- The trip totals represent the total trips generated by proposed land uses on the CCU2 and the CCU3 developments.

As shown in Table 4, the Proposed Project, including development on CCU2 and CCU3, is projected to generate 459 fewer net daily external vehicle-trips compared to the 2012 Study, but is projected to generate 6 more weekday AM peak hour net external trips (0 inbound, 6 outbound) and 4 more weekday PM peak hour net external trips (0 inbound, 4 outbound).

This increase in both the AM peak hour net external vehicle trips (6 total trips) and the PM peak hour net external vehicle trips (4 total trips) is fewer than those resulting from the change in project description from the 2010 Study to the 2012 Study (17 total trips and 19 total trips, respectively). Since the assessment of the intersection LOS and roadway segment LOS due to the increase in projected trip generation from the 2010 Study and 2012 Study concluded that both the intersection LOS and roadway segment LOS and their associated average delays would not be substantially affected by the increase in trip generation, this additional, fewer increase in the projected trip generation from the 2012 Study to that for the Proposed Project would not be expected to result in substantial changes to the intersection LOS and roadway segment LOS as re-evaluated in the 2012 Study.

A complete re-evaluation and reassessment of the intersection LOS and roadway segment LOS were not conducted as part of this trip generation comparison for the change in project description from that of the 2012 Study to that for the Proposed Project and it is concluded by inference that the nominal increase in the project trip generation would not result in substantial changes to the intersection LOS and roadway segment LOS as documented in the 2012 Study.

Given that the 2012 Study found that sufficient capacity would exist on transportation facilities in the study area to accommodate the projected increase in traffic, any fluctuations in delay or increase in density are expected to be minimal and the overall effects of the revised project description according to the Proposed Project are expected to be negligible. Therefore, the minimal incremental increase in traffic volumes generated by the Proposed Project during the weekday AM and PM peak hours would not be expected to degrade level of service at nearby intersections or on adjacent roadway segments or result in new impacts under the analysis scenarios previously considered in both the 2010 Study and the 2012 Study.

Environmental Noise Assessment

Carson Creek Unit 2

El Dorado County, California

BAC Job # 2007-026

Prepared For:

Lennar Communities

1075 Creekside Ridge Drive, Suite 110
Roseville, California 95678

Prepared By:

Bollard Acoustical Consultants, Inc.

Paul Bollard, President

January 21, 2009



INTRODUCTION

The Carson Creek Unit 2 Residential Development Project (Project) site is located in western El Dorado County in the southern portion of El Dorado Hills, California, approximately two miles south of US Highway 50, southwest of the intersection of Latrobe Road and Golden Foothill Parkway. This noise analysis was prepared to evaluate the potential noise impacts upon future residential uses developed within Carson Creek Unit #2 pursuant to project EIR Noise Mitigation Measures 4.7-2, 4.7-3, and 4.7-4, as well as to specifically address project Condition of Approval #31. Those mitigation measures and Conditions are reproduced below:

Mitigation Measure 4.7.2 (Traffic):

Where the development of a project could result in the exposure of noise-sensitive land uses to existing or projected future traffic noise levels in excess of the applicable County noise standards, the County shall require an acoustical analysis to be performed prior to the approval of such projects.

Mitigation Measure 4.7.3 (Railroad):

Where the development of a project could result in the exposure of noise-sensitive land uses to projected future railroad noise levels in excess of the applicable County noise standards, the County shall require an acoustical analysis to be performed prior to the approval of such projects.

Mitigation Measure 4.7.4 (Stationary Noise Sources):

Where the development of a project could result in the exposure of on-site noise-sensitive land uses to projected on-site or off-site stationary noise levels in excess of the applicable county noise standards, the county shall require an acoustical analysis to be performed prior to the approval of such projects.

Condition of Approval #31

Where the development of a project could result in the exposure of on-site noise-sensitive land uses to projected on-site or off-site stationary noise source levels in excess of the applicable County noise standards the County shall require an acoustical analysis to be performed prior to the approval of such projects. Where acoustical analysis determines that stationary source noise levels would exceed the applicable County noise standards at proposed on-site noise sensitive land uses, the County shall require the implementation of noise attenuation measures, such as setbacks, sound barrier walls, or noise berms, as necessary to reduce stationary source noise levels at proposed noise sensitive uses to conform with the applicable County Standards.

In response to these mitigation measures and conditions, Bollard Acoustical Consultants, Inc. (BAC) has prepared this analysis to specifically address noise impacts upon the project from traffic, railroad, and stationary noise sources. Figure 1 shows the project site plan, the location of the Business Park Lift Station #3, and the Folsom Excursion railroad tracks.

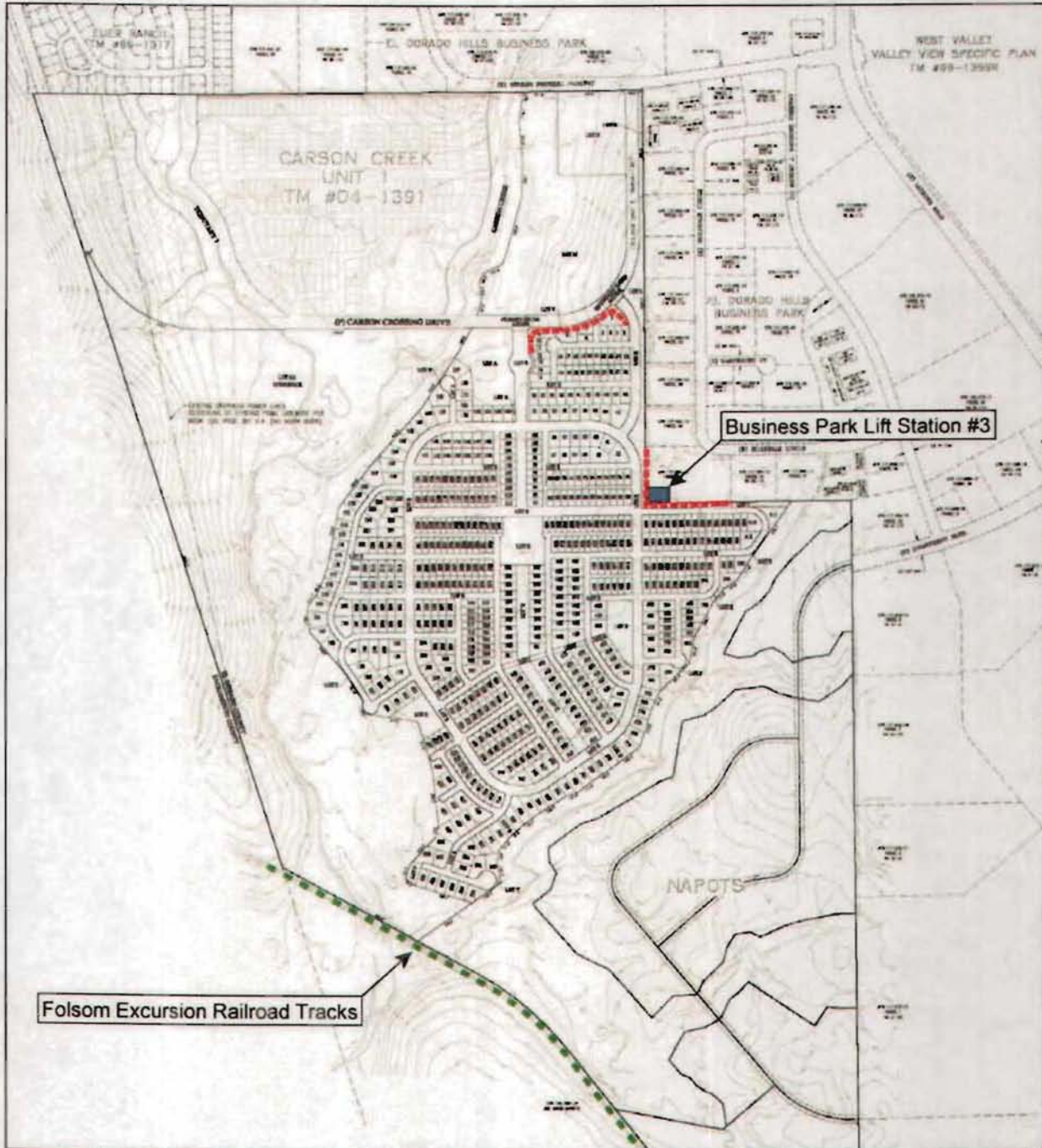
NOISE FUNDAMENTALS AND TERMINOLOGY

Background on Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz).

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness. Appendix A contains definitions of Acoustical Terminology. Figure 2 shows common noise levels associated with various sources.

Figure 1
Carson Creek Unit 2 – El Dorado County, California
Proposed Project Site Plan



--- : Noise Barrier Location



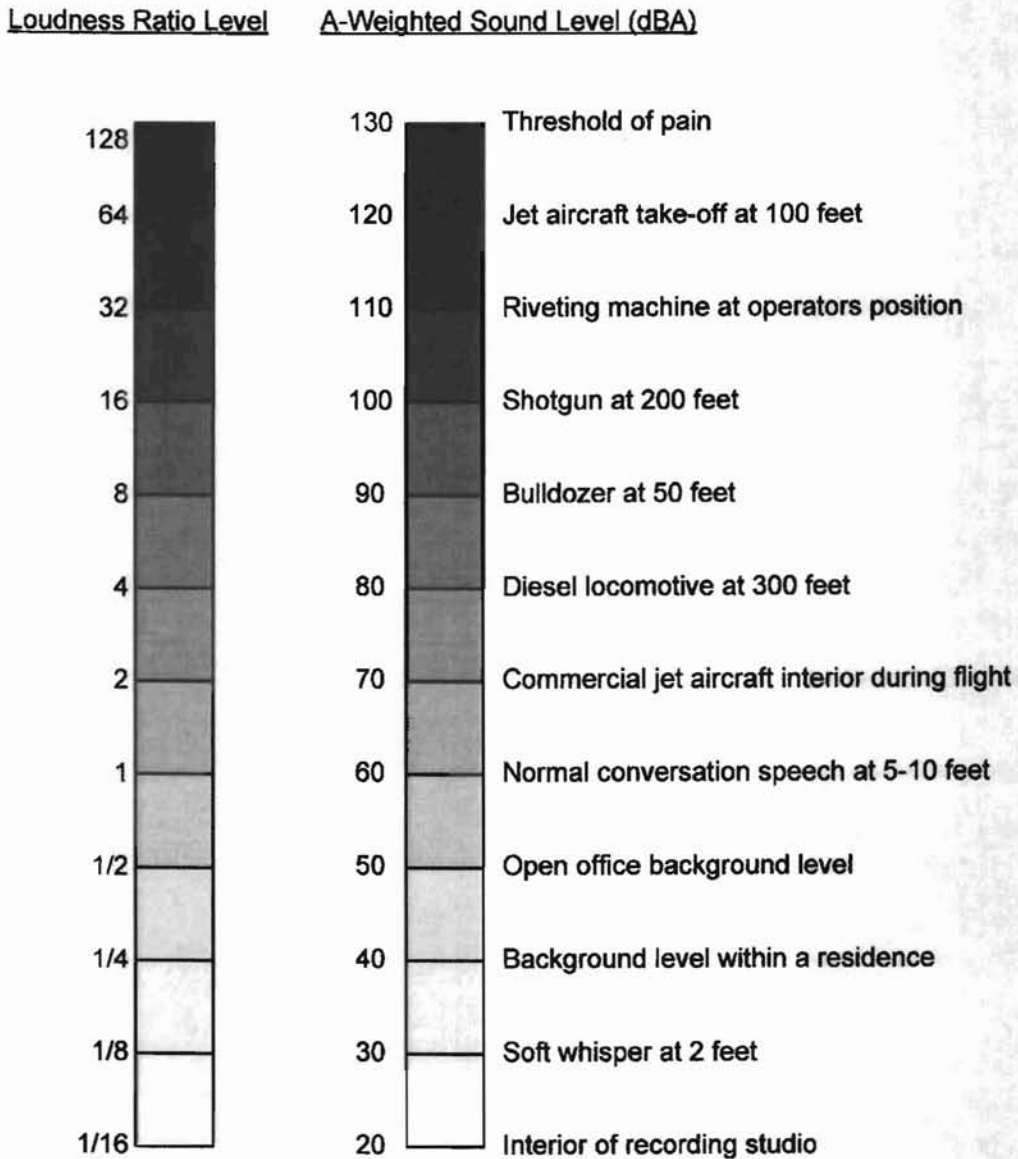
Effects of Noise on People

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels in decibels.

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}) over a given time period (usually one hour). The L_{eq} is the foundation of the Day-Night Average Level noise descriptor, L_{dn} , and shows very good correlation with community response to noise.

The Day-Night Average Level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. L_{dn} -based noise standards are commonly used to assess noise impacts associated with traffic, railroad and aircraft noise sources.

Figure 2
Typical A-Weighted Sound Levels of Common Noise Sources



CRITERIA FOR ACCEPTABLE NOISE EXPOSURE

El Dorado County Noise Standards

The Noise Element of the El Dorado County General Plan contains policies to ensure that County residents are not subjected to noise beyond acceptable levels. The current General Plan was adopted on July 19, 2004. The Carson Creek Specific Plan was approved while the previous General Plan (January 23, 1996) was in effect. Therefore the Project must abide by the standards set forth in the 1996 Noise Element. It is important to note that even though the General Plan was updated, both versions of the Noise Element contain the same standards.

Policy 6.5.1.1 of the County Noise Element requires an acoustical analysis for new residential developments located in potentially noise-impacted areas.

Policy 6.5.1.8 of the County Noise Element establishes 45 and 60 dB L_{dn} as being acceptable interior and exterior noise levels, respectively, for new residential uses affected by transportation (traffic, railroad) noise sources. Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn} or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 dB L_{dn} may be allowed provided that available exterior noise reduction measures have been implemented and interior noise levels are in compliance with the 45 dB L_{dn} standard.

Policy 6.5.1.7 of the County Noise Element provides performance standards for residential uses affected by non-transportation noise sources such as the adjacent business park activities and lift station operations. Those standards are provided below in Table 1 [Table 6-2 of the General Plan].

**Table 1
Exterior Noise Level Performance Standards
Non-Transportation (Stationary) Noise Sources Affecting Residential Uses**

Noise Level Descriptor	Daytime	Evening	Night
	7 a.m. - 7 p.m.	7 p.m. - 10 p.m.	10 p.m. - 7 a.m.
Hourly L_{eq} , dB	55	50	45
Maximum level, dB	70	60	55

Source: El Dorado County General Plan, 1996

NOISE IMPACTS ASSOCIATED WITH FUTURE RAILROAD OPERATIONS

Currently there are no railroad operations on the railroad tracks located southwest of the Carson Creek Unit #2 development. However, excursion trains between Folsom and Latrobe have been proposed and studied in the past. In a 1998 noise analysis prepared by Bollard Acoustical Consulting, the Folsom Excursion Rail Project proposed the operation of five round trips per weekend day between Folsom and Latrobe using steam (summer) and diesel (spring, fall, winter) locomotives with two to three passenger cars. The sightseeing trains would operate at speeds between 10 and 20 mph in the City of Folsom, up to 30 mph between Scott Road and Latrobe. All excursion train operations would occur during daytime hours, with no activities during nighttime or early morning hours.

That study concluded that, due to the relatively brief period of time required for the passage of the excursion trains, and an even more transient usage of warning horns near grade crossings, the percentage of the weekend day during which the train noise generation would occur in a particular area would be small. Furthermore, because excursion train usage was proposed only during daytime hours, the potential for sleep disturbance at the project site associated with excursion trains is considered to be minimal.

Based on information contained in that earlier analysis, it was concluded that the distance to the 60 dB L_{dn} contours for the excursion trains would be approximately 50 feet from the tracks in areas where warning horns are not used, and 200 feet from the tracks where warning horns are used. Because the Carson Creek Unit #2 project site is located well beyond 200 feet from the railroad tracks in question, no exceedance of the County's noise standards are anticipated, and no additional noise mitigation measures would be required for this project.

NOISE IMPACTS ASSOCIATED WITH FUTURE TRAFFIC NOISE EXPOSURE

Traffic Noise Prediction Methodology

The Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108) with the Calveno vehicle noise emission curves was used to predict traffic noise levels at the Project site. The FHWA Model is the traffic noise prediction model preferred by the Federal Highway Administration and the State of California Department of Transportation (Caltrans) for use in traffic noise assessment.

ENVIRONMENTAL NOISE ANALYSIS

Predicted Future Traffic Noise Levels at the Project Site

The Carson Creek Unit 2 Project management is uncertain as to what the future average daily traffic (ADT) volumes will be on Carson Crossing Drive. Therefore, Bollard Acoustical Consultants, Inc. (BAC) utilized the FHWA Model with ADT volumes ranging from 8,000 to 21,000 to predict future traffic noise levels along Carson Crossing Drive. The FHWA Model inputs and predicted future traffic noise levels at the project site are shown in the Appendices. The predicted future traffic noise levels for Carson Crossing Drive are provided in Table 2.

**Table 2
Predicted Carson Crossing Drive Future Traffic Noise Levels
Carson Creek Unit 2 – El Dorado County**

ADT	Predicted L_{dn} @ 60 Feet, dB	Distance to Contours, Feet		
		70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}
8,000	65	29	63	135
9,000	66	32	68	146
10,000	66	34	73	157
11,000	67	36	78	167
12,000	67	38	82	177
13,000	67	40	87	187
14,000	68	42	91	197
15,000	68	44	96	206
16,000	68	46	100	215
17,000	69	48	104	224
18,000	69	50	108	232
19,000	69	52	112	241
20,000	69	54	116	249
21,000	69	55	120	258

Notes:

- FHWA Model input data are provided in the appendices.
- Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
- Source: FHWA-RD-77-108 with inputs from Bollard Acoustical Consultants, Inc.

ENVIRONMENTAL NOISE ANALYSIS

The Table 2 data indicate that future Carson Crossing Drive traffic noise levels are predicted to exceed the 60 dB L_{dn} exterior noise level standard applied by El Dorado County to the outdoor activity areas of new residential developments for the entire range of future ADT's. Specifically, future traffic noise levels in the backyards of the lots closest to Carson Crossing Drive are predicted to be approximately between 65 dB L_{dn} and 70 dB L_{dn} depending upon the actual future ADT volumes for that roadway. Therefore, noise mitigation measures would be required along Carson Crossing Drive in order to ensure compliance with the County's exterior standard.

Exterior Traffic Noise Mitigation

As discussed above, the entire range of possible future traffic noise levels from Table 2 are predicted to exceed the County's 60 dB L_{dn} exterior noise level standard. Therefore, Bollard Acoustical Consultants, Inc. performed a detailed barrier analysis to determine what the predicted future noise levels would be at the nearest outdoor activity areas with the various ADT volumes in conjunction with barriers of various heights. The results of the barrier analysis are presented on Table 3.

Table 3
Carson Crossing Drive Future Traffic Noise Levels With Varying ADT & Wall Heights
Carson Creek Unit 2 Residential Development – El Dorado County

ADT	Predicted L_{dn} (dB)	W/ 6' Wall	W/ 7' Wall	W/ 8' Wall
8,000	65	59	58	56
9,000	66	60	58	57
10,000	66	60	59	57
11,000	67	60	59	58
12,000	67	61	59	58
13,000	67	61	60	58
14,000	68	62	60	59
15,000	68	62	60	59
16,000	68	62	61	59
17,000	69	62	61	59
18,000	69	63	61	60
19,000	69	63	61	60
20,000	69	63	62	60
21,000	69	63	62	60

Notes:

- FHWA Model input data and results are provided in the Appendix.
- Predicted levels shown represent levels at outdoor activity areas which are 60 feet from the centerline of Carson Crossing Drive.
- Source: FHWA-RD-77-108 with inputs from Bollard Acoustical Consultants, Inc.

The results of the barrier analyses shown in Table 3 indicate that in order to ensure that Carson Crossing Drive traffic noise levels comply with the County's 60 dB L_{dn} exterior noise level standard at the nearest proposed residential outdoor activity areas, a noise barrier up to 8 feet in height (relative to the residential pad elevations), would be required at the residential property lines adjacent to the roadway.

Interior Traffic Noise Mitigation

According to Table 2, the worst-case exposure of any residence in the Carson Creek development to future traffic noise would occur at the residences along Carson Crossing Drive. The predicted future traffic noise levels at the first-floor facades of these residences would range from approximately 65-70 dB L_{dn} , without considering the shielding affects of property line noise barriers. Due to reduced ground absorption of sound at elevated locations, traffic noise levels are expected to be approximately 2 dB higher at second floor facades (67-72 dB L_{dn}). Therefore, given future worst-case exterior noise levels between 67-72 dB L_{dn} , a building facade noise reduction of 22-27 dB would be required to achieve an interior noise level of 45 dB L_{dn} .

Standard residential construction (wood siding, STC-27 windows, door weatherstripping, exterior wall insulation, composition plywood roof), results in an exterior to interior noise reduction of approximately 25 dB with windows closed, and approximately 15 dB with windows open. Therefore if the future ADT volumes do not exceed 16,000 vehicles per day, standard residential building construction would be sufficient for first and second floor building facades of residences that face Carson Crossing Drive. However, if future ADT volumes range from 16,000 to 21,000 vehicles per day then all windows that face Carson Crossing Drive would need to be upgraded to an STC-29 rating which would be required to provide approximately 26 dB of exterior to interior noise reduction. Under the worst-case scenario, if future ADT volumes range from 21,000 to 22,000 vehicles per day then windows with an STC-30 rating would be required at all first row facades that face Carson Crossing Drive in order to provide approximately 27 dB of exterior to interior noise reduction. The window upgrades discussed above would only be required for the windows that will have a direct view of Carson Crossing Drive.

NOISE IMPACTS ASSOCIATED WITH THE BUSINESS PARK

To generally quantify ambient noise levels associated with the adjacent business park uses (except DST, which was quantified through a separate noise survey described below), an ambient noise survey was conducted at the locations shown on Figure 3 on February, 27, 2007. The measurement results, as summarized in Table 4, are assumed to be representative of typical operations at the neighboring commercial/light industrial uses, and are used for subsequent comparison to the County's hourly noise exposure criteria to determine compatibility.

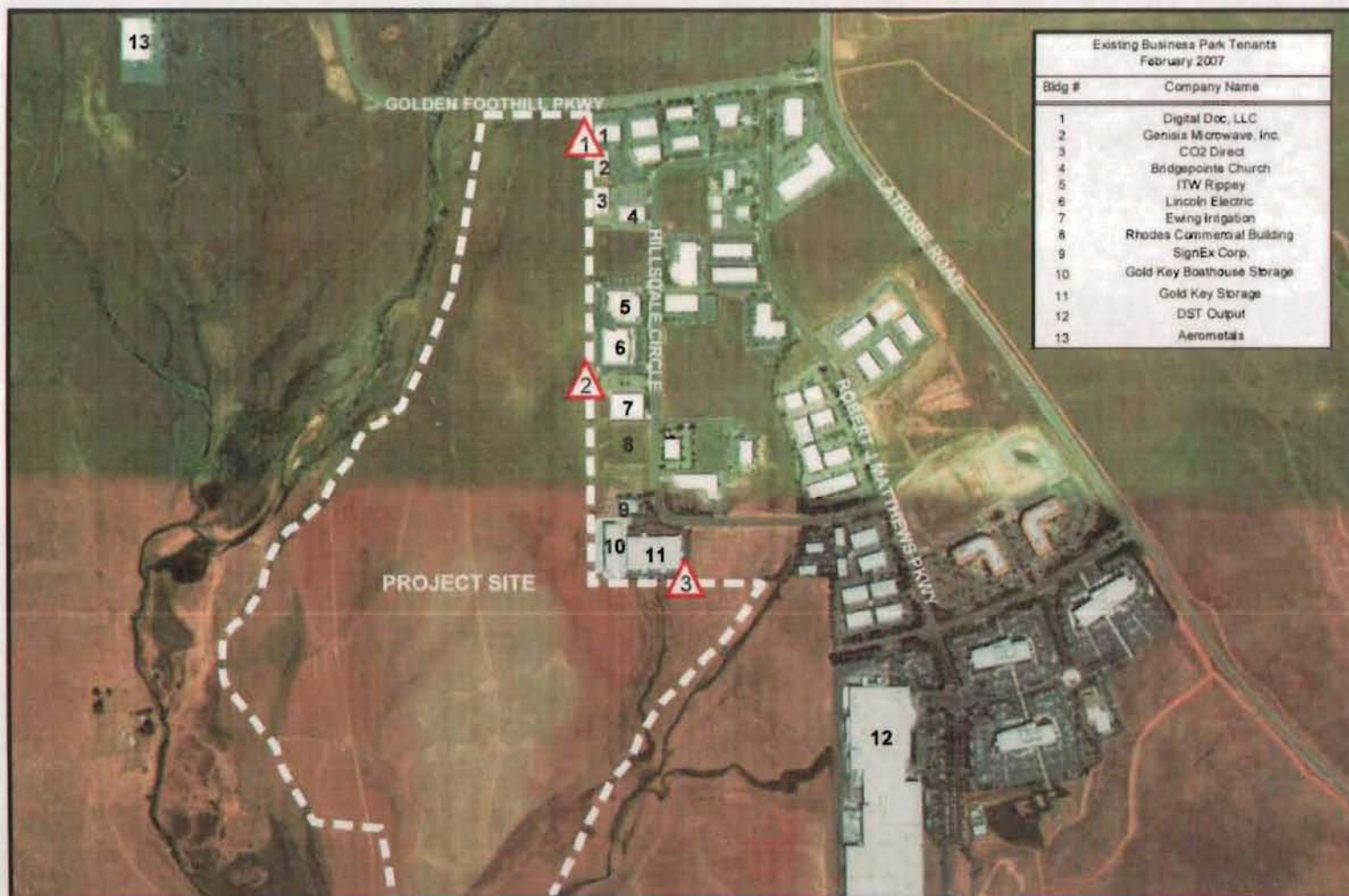
Noise measurement equipment used for this project included Larson-Davis Laboratories (LDL) Model 820 precision integrating sound level meters equipped with LDL Model 2560 ½" microphones. The systems were calibrated in the field before use using an LDL Model CAL200 acoustical calibrator. The measurement microphones were placed on tripods approximately 5 feet above the ground (assumed project building pad elevations).

**Table 4
Summary of Ambient Noise Level Measurements
Carson Creek Unit 2 Project Site and Vicinity – February 27, 2007**

Site	Location	Time	Measured Sound Level, dB	
			Average (L_{eq})	Maximum (L_{max})
1	Western property line, between Buildings 1 & 2	2:30 pm	45	59
2	Western property line, between Buildings 6 & 7	2:05 pm	44	54
3	Southeast corner of Building 11	3:00 pm	53	67


Source: Bollard Acoustical Consultants, Inc.
Noise measurement locations are identified on Figure 3.

Figure 3
Carson Creek Unit 2 – El Dorado County, California
Adjacent Land Uses & Short-term Noise Measurement Locations



Existing Business Park Tenants February 2007	
Bldg #	Company Name
1	Digital Doc, LLC
2	Genisa Microwave, Inc.
3	CO2 Direct
4	Bridgepointe Church
5	ITW Rippey
6	Lincoln Electric
7	Ewing Irrigation
8	Rhodes Commercial Building
9	SignEx Corp.
10	Gold Key Boathouse Storage
11	Gold Key Storage
12	DST Output
13	Aerometals



 : Short-Term Noise Measurement Site

ENVIRONMENTAL NOISE ANALYSIS

As shown in Table 4, existing operations at the adjacent commercial/light industrial facilities to north and east are all in compliance with the County's daytime noise level standards of 55 dB L_{eq} and 75 dB L_{max} . However, several noise producing activities were identified that, although not present during the ambient noise surveys, could exceed the County's standards. The primary noise sources associated with the adjacent commercial site which may be potentially significant at the proposed Carson Creek residential development include loading dock activities at Building 5, forklift operations at Building 7, boat storage and removal at the indoor boat storage facility at Building 10, and industrial operations at Building 12. These buildings are identified on Figure 3. A separate discussion of potential impacts and mitigation measures for each of these uses, as well as DST, follows:

Loading Dock Operations (Building 5 - ITW Rippey)

Building 5 (see Figure 3) was observed to have a dual bay loading dock, though it was not in use during the ambient noise survey. To determine typical loading dock noise levels, Bollard Acoustical Consultants used noise level measurements from a similar facility. Assuming one semi-tractor trailer truck delivery were to occur at this site per hour, the approximate noise levels would be 45 dB L_{eq} and 75 dB L_{max} at a reference distance of 50 feet.

Based upon noise levels of 45 dB L_{eq} and 75 dB L_{max} , respectively, loading dock noise levels were predicted at Lot "M", which may contain future residential uses. The nearest proposed residential property line would be located approximately 100 feet west of the loading dock area. Table 5 shows the predicted loading dock noise levels at this distance.

Table 5
Predicted Building 5 Loading Dock Operation Noise Levels
At the Nearest Carson Creek Unit 2 Property Line (Lot M)

Location	Distance	L_{eq} , dB	L_{max} , dB
Lot M	100 feet	39	69

Note: Predicted levels are based on noise levels of 45 dB L_{eq} and 75 dB L_{max} at a distance of 50 feet, with a sound attenuation rate of 6 dB per doubling of distance from the source.

As seen in Table 5, the Building 5 loading dock operation noise levels at the nearest property line of the Carson Creek Unit 2 development would be in compliance with the County's daytime noise level criteria presented in Table 1. As a result, no further mitigation measures are warranted for this aspect of the project provided loading dock activities are limited to daytime hours. It is worth noting however, that building 5 would not affect the tentative map for Unit 2 at this time.

Forklift Operations (Building 7 - Ewing Irrigation)

During BAC site inspections, Building 7 was observed to employ the use of a forklift. To determine typical forklift noise levels, Bollard Acoustical Consultants consulted file data from previous projects. The file data indicate that typical forklift operations are expected to produce noise levels of approximately 60 dB L_{eq} and 75 dB L_{max} at a reference distance of 50 feet.

Based upon noise levels of 60 dB L_{eq} and 75 dB L_{max} at a reference distance of 50 feet, forklift operation noise levels were predicted at the portion of the Carson Creek Unit 2 project site nearest to Building 7. The nearest potential residential locations (Lots 1, 2, 25, 26) would be approximately 85 feet west of Building 7. Table 6 shows the predicted forklift noise levels at this distance.

**Table 6
Predicted Forklift Noise Levels from Building 7 at the Nearest Carson Creek Unit 2
Residences (Lots 1, 2, 25, 26)**

Location	Distance	L_{eq} , dB	L_{max} , dB
Lots 1, 2, 25, 26	85 feet	55	70

Notes: Predicted levels are based on noise levels of 60 dB L_{eq} and 75 dB L_{max} at a distance of 50 feet, with a sound attenuation rate of 6 dB per doubling of distance from the source.

As seen in Table 6, the predicted Building 7 forklift operation noise levels at the nearest residential uses within the proposed Carson Creek Unit 2 development would be in compliance with the County's daytime noise level criteria presented in Table 1. As a result, no further mitigation measures are warranted for this aspect of the project provided forklift operations are limited to daytime hours.

If forklift activities were to occur during evening or nighttime hours, the outdoor activity areas of residential uses constructed near this use should be setback from the property line and/or shielded by intervening residential structures to reduce the levels shown in Table 6 to a state of compliance with the applicable El Dorado County standards.

Boat Storage Operations (Building 10 - Gold Key Boathouse Storage)

Proposed project residences will border the existing Gold Key Storage Facility. The facility is designed to store three levels of boats with their trailers. Boats are moved in and out of the storage building with the use of a large fork lift. In order to quantify the noise generated by the boat storage and removal process, Bollard Acoustical Consultants, Inc. Utilized previously collected reference noise level data for this facility. That data indicates that the boat fork lift generated noise levels of 70 dB L_{eq} and 81 dB L_{max} at a distance of 50 feet. The measurement was 13 minutes in duration and was representative of typical operations. Based on this operational information the boat storage noise levels were calculated at the nearest proposed residences to the west. The predicted boat storage noise levels are presented in Table 7.

**Table 7
Predicted Building 10 Boat Storage Operation Noise Levels
At the Nearest Residential Property Line**

Location	Distance	L_{eq} , dB	L_{max} , dB
Residences to the west	75 feet	60	78

Notes: Predicted levels are based on noise levels of 70 dB L_{eq} and 81 dB L_{max} at a distance of 50 feet (13 minute duration), with a sound attenuation rate of 6 dB per doubling of distance from the source.

The predicted noise levels shown in Table 7 exceed the County's daytime average daytime and maximum standards by 5 and 3 dB, respectively. In order to achieve compliance with the El Dorado County 55 dB L_{eq} and 70 dB L_{max} daytime noise level standards, a solid noise barrier would be required along the boundary of the residential back yards located nearest to this use. The results of the barrier analysis indicate that a 6-foot tall noise barrier at those locations would reduce boat storage operation noise levels by approximately 6 dB to a state of compliance with the El Dorado County daytime noise level standards. Activities at this site are limited to daytime hours (7 am to 7 pm). It should be noted, however, that the lift station that is in existence at the corner of this building generates higher noise levels, which would require noise mitigation in excess of 6 feet (see next section). If that lift station is removed or abandoned in the future, however, then a 6 foot tall barrier would be adequate to shield the Carson Creek Unit #2 project site receivers from this use.

Lift Station Noise Generation and Potential Noise Impacts

To quantify noise levels associated with the existing Business Park #3 Lift Station (seen in Figure 1), BAC conducted short-term noise level measurements of the existing lift station operations between the hours of 8 a.m. and 10 a.m. on June 14, 2007. At the time of the noise level measurements, BAC identified the emergency generator as the dominant noise producing component at the lift station facility. The emergency generator is housed in a roofed masonry enclosure with two louvered panels for air intake and air exhaust, and an exit port for engine exhaust, a standard door, and a roll up door. Accordingly, sound pressure level (SPL) measurements of the emergency generator were conducted at each side of the generator enclosure, and the levels were noted as being constant. Pump equipment was operating during the noise level measurements; however, it is located in an underground enclosure and pump noise was not audible over the generator noise. The lift station emergency generator noise level measurement results are summarized in Table 8.

**Table 8
Lift Station Noise Level Measurements
Carson Creek Unit 2 – El Dorado County, California**

Location	Distance (Feet)	SPL (dB)*
Northern Facade	20	83
Eastern Facade	20	89
Southern Facade	20	74
Western Facade	20	78

Source: Bollard Acoustical Consultants, Inc.

* Emergency generator was dominant noise source at lift station.

As the Table 8 data indicate, the highest noise levels measured were on the eastern facade, which was where the generator exhaust ports were located. No significant change in the overall equipment noise level was measured with the generator under load (i.e., with pump).

ENVIRONMENTAL NOISE ANALYSIS

Based on the measured noise levels contained in Table 8 and a spherical spreading loss offset (-6 dB per doubling of distance from the noise source), unmitigated worst-case emergency generator noise levels were predicted to be approximately 68 and 72 dB at the proposed residences that will be located just south and west of the lift station, respectively. Project management indicated that during weekly and monthly testing of the lift station equipment, the generator would be operated for no more than 6 and 12 minutes, respectively, during any given hour. Based on this operational information and the measured noise level data contained in Table 8, worst-case (12 minutes out of the hour) generator noise levels were calculated at the proposed residences to the west and south of the lift station. The predicted hourly (L_{eq}) lift station/generator noise levels are presented in Table 9.

Table 9
Predicted Lift Station Hourly Noise Levels at Nearest Residences
Carson Creek Unit 2 – El Dorado County, California

Location	Distance (Feet)	L_{eq} (dB)
Nearest residences to the south	40	61
Nearest residences to the west	40	65

Source: Bollard Acoustical Consultants, Inc.

Noise during emergency operation of the lift station generator would be exempt under the County's standards. However, noise during routine maintenance and testing of the generator would be required to comply. Therefore, the predicted lift station generator noise levels presented in Table 9 were compared to the County's daytime noise exposure standard. Unmitigated lift station generator noise levels are predicted to exceed the established 55 dB Hourly L_{eq} (daytime) limit. Specifically, predicted lift station generator noise levels exceed the County standard by approximately 6 and 10 dB at the proposed residences to the south and west, respectively. Therefore, noise mitigation for the lift station generator would be required.

In order to ensure that the emergency generator noise levels at the nearest residential property lines do not exceed the County's 55 dB L_{eq} daytime noise level criterion, either acoustic retrofits and upgrades to the emergency generator building would be required or a solid noise barrier would be required along the southern and western property lines of the generator site. An 8-foot tall solid barrier (relative to the pad elevation of the lift station building) is estimated to be sufficient to reduce noise levels during routine maintenance testing to acceptable levels. Upgrades to the generator building would be more complicated, and would require the use of acoustically absorptive materials at the interior of the generator building, silencers at both cooling air inlet and exhaust ports, and upgraded doors. Such upgrades require an analysis of specific lift station design plans, which should be undertaken when such plans are available.

ENVIRONMENTAL NOISE ANALYSIS

It is possible that the current location of the Business Park Lift Station #3 will be abandoned at some point with this project. If the lift station is abandoned, no further mitigation measures would be warranted for this source.

Industrial Operations (Building 12 - DST)

During the initial project site inspection it was noted that the rooftop mechanical equipment located atop Building 12, DST, was clearly audible (a photograph of this mechanical equipment can be seen in Appendix B). In order to quantify the noise generation of the DST equipment at the project site, noise measurements were taken at 13 locations throughout the project site on April 4, 2007. The measurement sites were spaced approximately 500 feet apart and were utilized to develop the 45 dB, 50 dB, and 55 dB noise level contours. The noise measurement locations and predicted contours can be seen in Figure 4. The results of the noise level measurements can be seen below in Table 10.

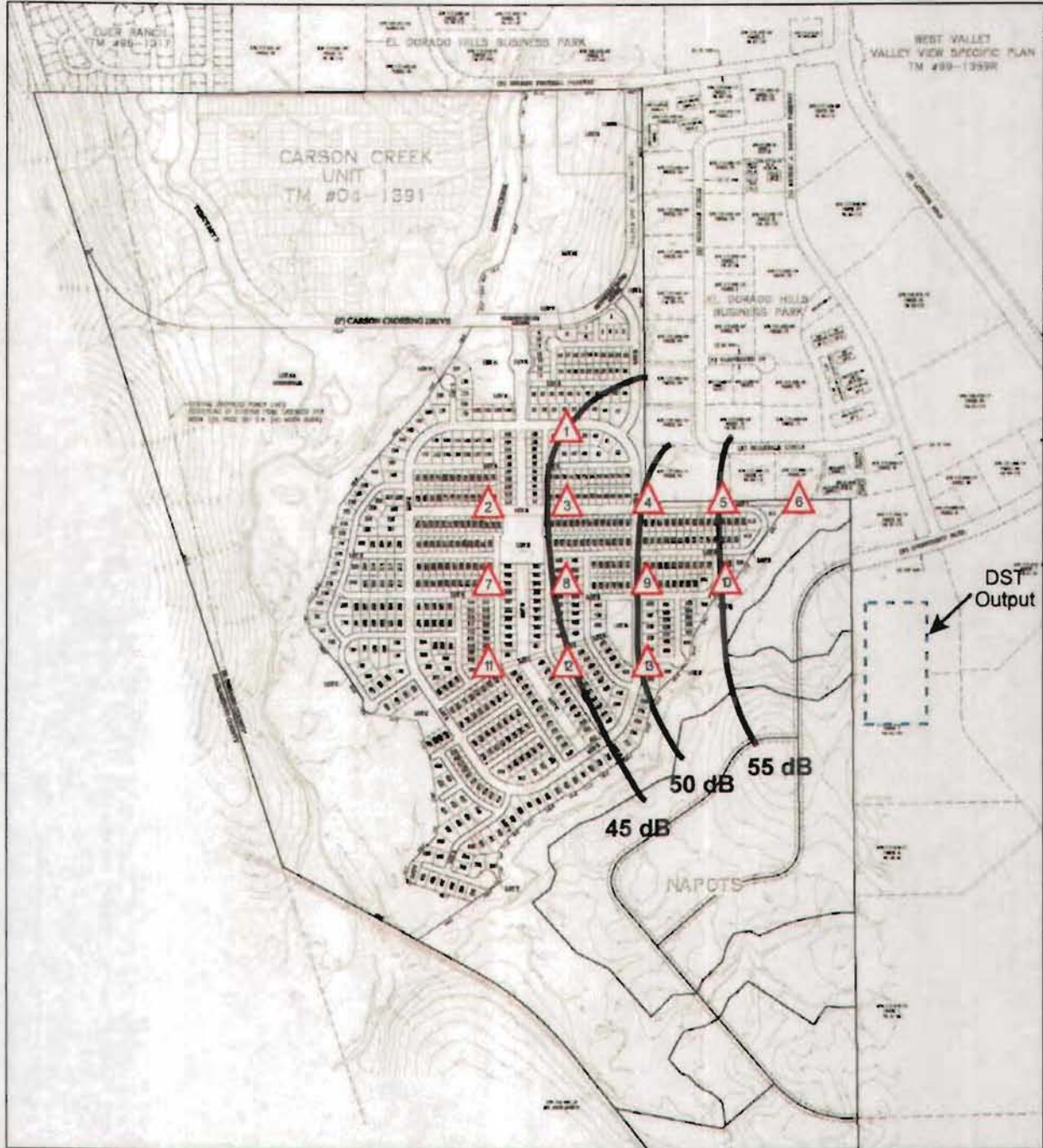
In addition to the sound pressure level measurements conducted for DST, 1/3 octave band frequency noise level measurements were also conducted to determine whether or not the noise emitting from the rooftop mechanical equipment contained pure tones. The measurements were taken at the 3 locations shown on Figure 5 on March 23, 2007. The results of the measurements, which are provided in Appendix C, indicate that the DST noise output does not contain pure tones.


Table 10
Summary of DST Output Noise Level Measurements
Carson Creek Unit 2 Project Site – April 4, 2007

Site	L_{eq}	L_{max}
1	44	55
2	45	55
3	47	52
4	53	55
5	55	61
6	54	60
7	43	52
8	42	53
9	46	50
10	55	57
11	42	54
12	44	48
13	49	53

Source: Bollard Acoustical Consultants. Noise measurement locations are shown on Figure 4.

Figure 4
Carson Creek Unit 2 – El Dorado County, California
DST Output Noise Measurement Sites and Noise Level Contours



 : Noise Measurement Site

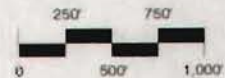
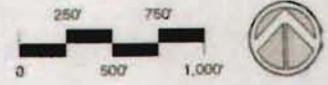


Figure 5
Carson Creek Unit 2 – El Dorado County, California
DST Output Frequency Analysis Noise Measurement Sites



: Noise Measurement Site



ENVIRONMENTAL NOISE ANALYSIS

Because operations at DST occur 24-hours per day, the appropriate standard to apply to this use would be the County's 45 dB L_{eq} nighttime standard. As can be seen from Figure 4, the 45 dB L_{eq} standard extends well into the Carson Creek Unit 2 project site. As a result, substantial noise mitigation measures would be required prior to the development of residences within that noise contour.

It is BAC's believe that there are only two options for ensuring that noise from DST satisfies the County noise level limits at future residential uses with the Carson Creek Unit 2 development. The first, and most efficient option would be to work with DST to develop industrial noise control measures which could be implemented at the source of the noise (i.e. acoustical silencers, partial enclosures of the noise-generating equipment, procurement of quieter equipment, etc.) to dramatically shrink the size of the 45 dB L_{eq} contour to the area where no residences are proposed, or even to the DST property line.

The second options is to restrict all residential development to locations outside of the 45 dB L_{eq} noise contour shown on Figure 4 until such time as the industrial noise control options cited above can be implemented or other mitigation has been determined.

It should be noted that, due to the elevated position of the industrial equipment responsible for the major noise generation of the DST facility, the use of noise barrier on the Carson Creek Unit 2 project site to shield this noise source would be very limited in effectiveness and are not recommended.

Aerometals Helicopter Noise Levels

The Aerometals facility is located just north of the proposed Carson Creek Unit 1 residential development. The company manufactures helicopter parts for the McDonnell Douglas MD-500 helicopter. The MD-500 is a four passenger helicopter and is flown an average of 21 flights a year. The helicopter operations at the Aerometals facility have been identified as a potentially significant noise source at the proposed residences.

The Special Use Permit S98-00117R (Aerometals Facilities Expansion) dated December 28, 2006 was conditionally approved by the County and required that disclosure be given to potential buyers of the neighboring properties. In addition, a cinder block sound wall was required that separates the Business Park from the residential area. The special use permit went on to say that the helicopter has been in operation for over eight years, and the County has not received any complaints in the vicinity according to the El Dorado Hills Area Planning Committee.

Although this issue has previously been addressed, it is recommended that similar disclosure statements be provided for the residences of the Carson Creek Unit 2 as were provided to the existing residences to the west of the Aerometals facility.

CONCLUSIONS

A portion of the Carson Creek Unit 2 development will be exposed to noise generated by future traffic and operations at the nearby business park to the east which exceeds, or has the potential under certain conditions to exceed, El Dorado County Noise Element standards. The following noise mitigation measures should be utilized to achieve compliance with those noise standards:

General Recommendations

1. Air conditioning should be included in all residences constructed in the Carson Creek Unit 2 development to allow occupants to close doors and windows as desired to achieve additional acoustic isolation from the commercial noise source in the project vicinity.
2. Disclosure statements should be provided to all future residents of the development notifying them of the presence of the nearby business park and the potential for periodic elevated noise levels associated with it's operations.

Recommendations for Future Attached or Detached Units Developed on Lots M & N

3. The design of the multi-family residential sites to the north of Carson Crossing Drive (Lots M & N) should be set back as far as practical from the business park property line and the common outdoor activity areas should be shielded from the adjacent business park by intervening residential buildings. As an alternative, solid noise barriers could be considered between any proposed common outdoor activity areas and the business park property line, but the heights of such barriers cannot be determined until detailed site plans are available.

Recommendations for Residences Located Nearest to the Boat Storage Facility and Lift Station

4. Acoustic retrofits and upgrades to the emergency generator building or a solid noise barrier would be required along the southern and western property lines of the generator site. An 8-foot tall solid barrier (relative to the pad elevation of the lift station building) is estimated to be sufficient to reduce noise levels during routine maintenance testing to acceptable levels. Upgrades to the generator building would be more complicated, and would require the use of acoustically absorptive materials at the interior of the generator building, silencers at both cooling air inlet and exhaust ports, and upgraded doors. If the lift station is abandoned, then a 6-foot tall barrier would be required at the nearest residences to provide shielding from the boat storage facility.

Recommendations for Residences Proposed Within 45 dB L_{eq} Contour of DST Company

5. Work with DST to develop industrial noise control measures which could be implemented at the source of the noise (i.e. acoustical silencers, partial enclosures of the noise-generating equipment, procurement of quieter equipment, etc.) to dramatically shrink the size of the 45 dB L_{eq} contour to the area where no residences are proposed, or even to the DST property line.
6. Until noise control measures described above in item #1 or any other mitigation measures can be implemented and verified as being effective, development of residential uses on the Carson Creek Unit 2 project site should be limited to areas beyond the 45 dB L_{eq} contour shown on Figure 4.

Recommendations for Residences Proposed Adjacent to Carson Crossing Drive

7. An 8-foot tall solid noise barrier should be provided at the locations shown in Figure 1 to reduce noise levels in future backyard areas to 60 dB L_{dn} or less.
8. To ensure compliance with the County's 45 dB L_{dn} interior noise level standard, it is recommended that all second-floor bedroom windows of the residences constructed adjacent to Carson Crossing Drive from which that roadway would be visible have a minimum STC rating of 30.

These conclusions are based on: the site plan shown in Figure 1, Bollard Acoustical Consultants, Inc. site observations, noise level measurement data, and assumptions contained in this analysis. Changes to the site plan or deviations from the assumptions cited herein could cause future noise levels to differ from those predicted in this analysis. Bollard Acoustical Consultants, Inc. is not responsible for degradation in acoustic performance of the residential construction due to poor construction practices, failure to comply with applicable building code requirements, or for failure to adhere to the minimum building practices cited in this report.

Appendix A Acoustical Terminology

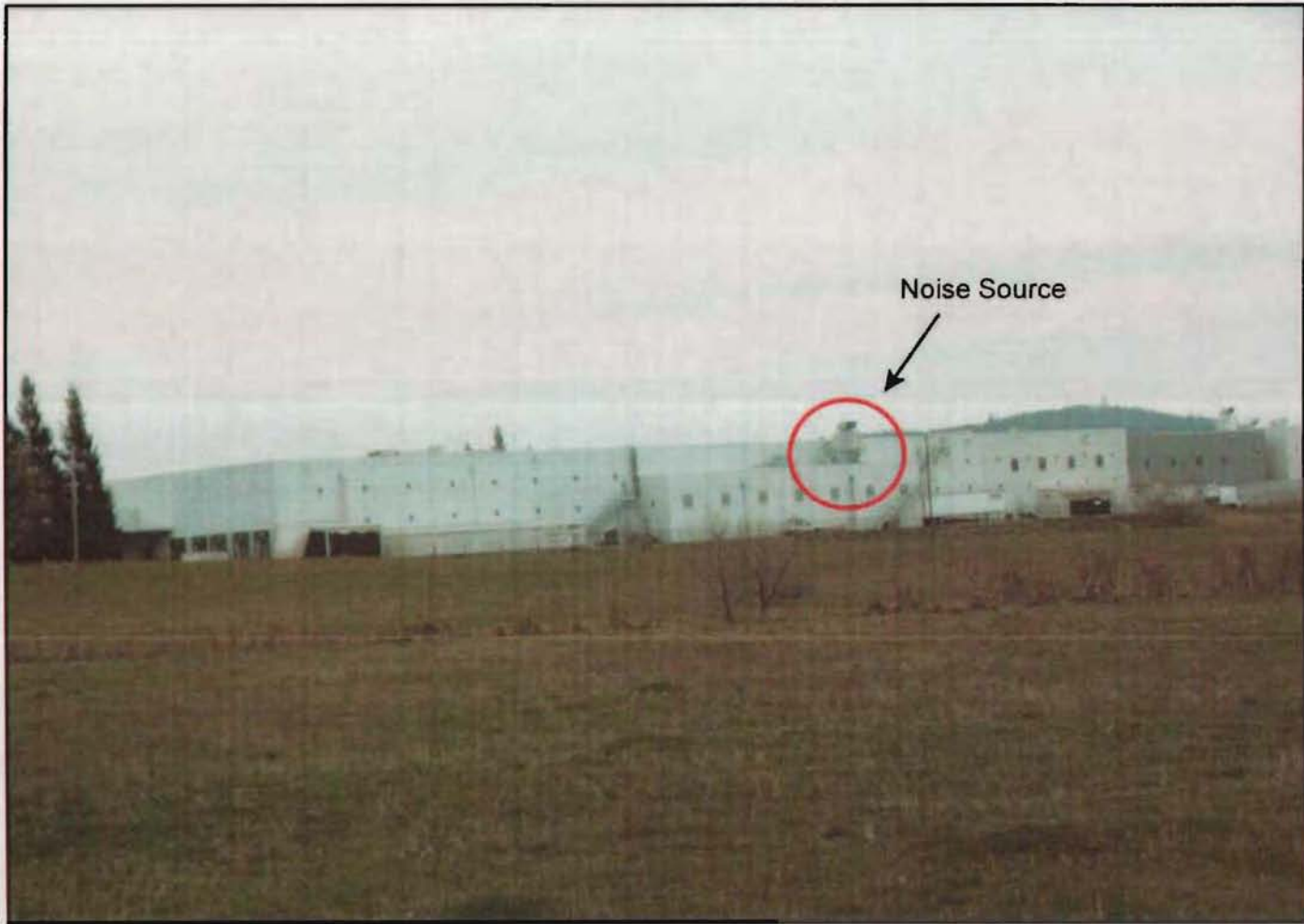
Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
Loudness	A subjective term for the sensation of the magnitude of sound.
Masking	The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
RT₆₀	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy of the event into a 1-s time period.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.



BOLLARD

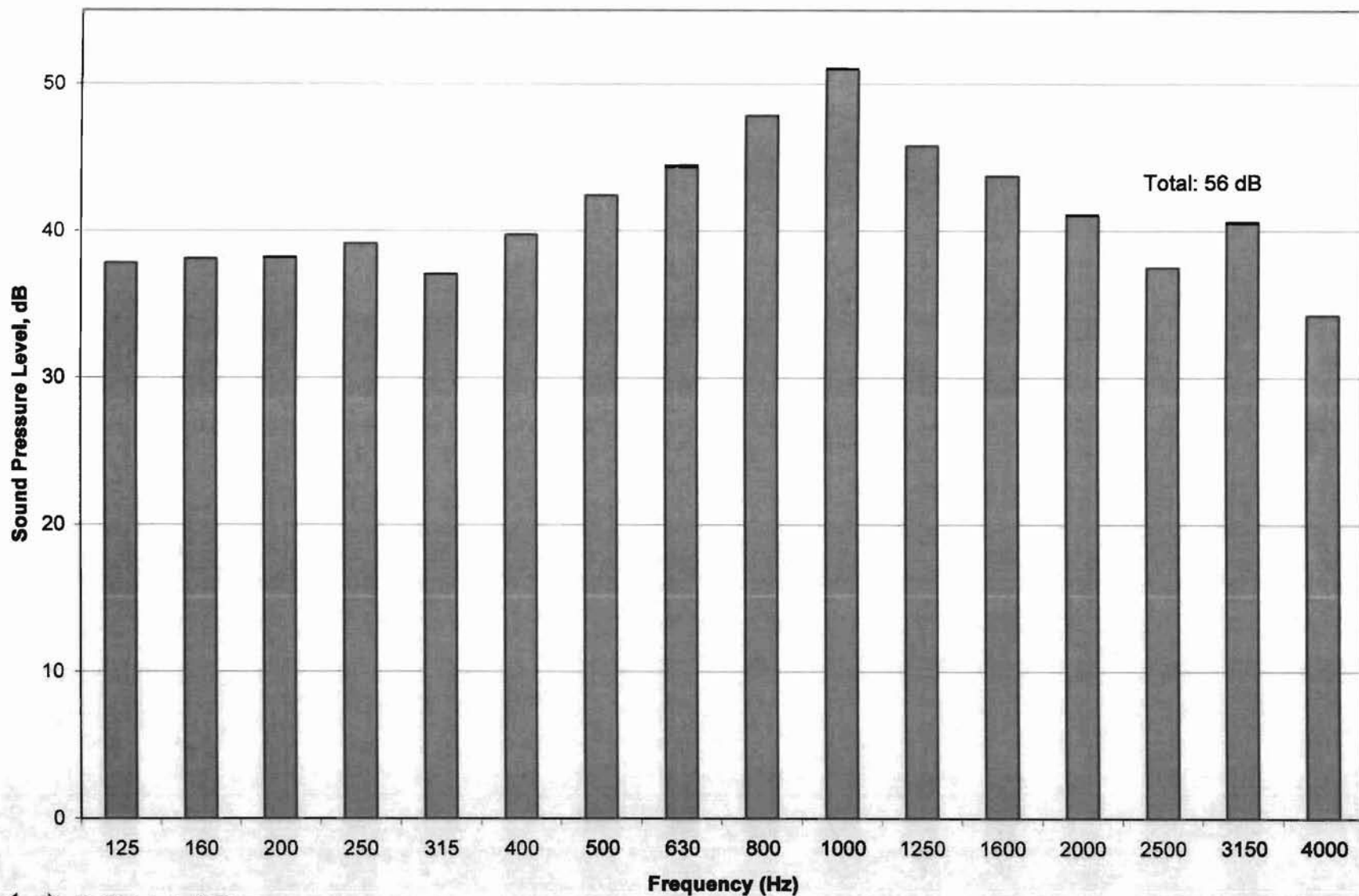
Acoustical Consultants

Appendix B
Carson Creek Unit 2 – El Dorado County, California
DST Output Photograph

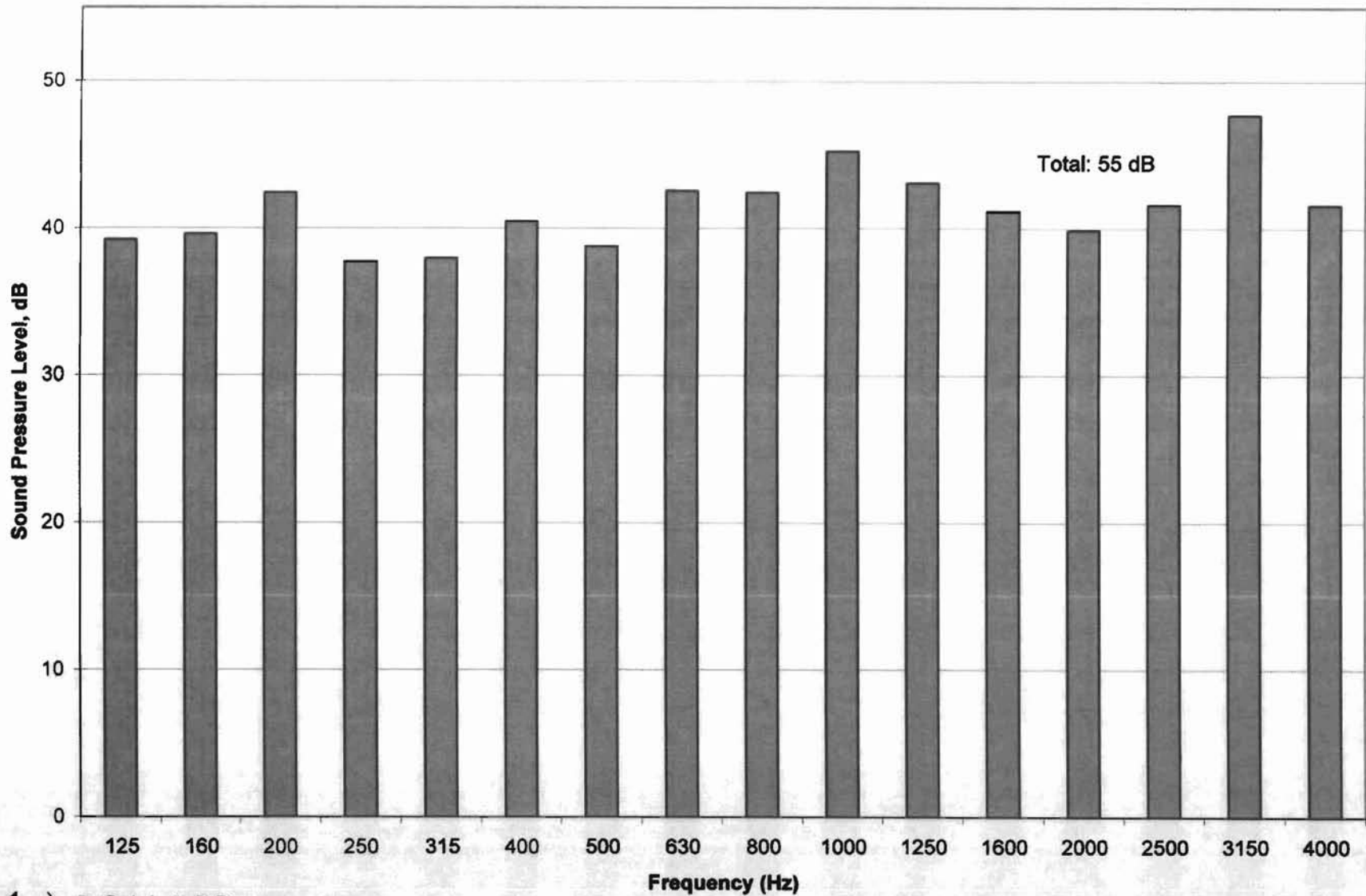


Note: Photograph taken from south-east corner of Gold Key Storage Facility

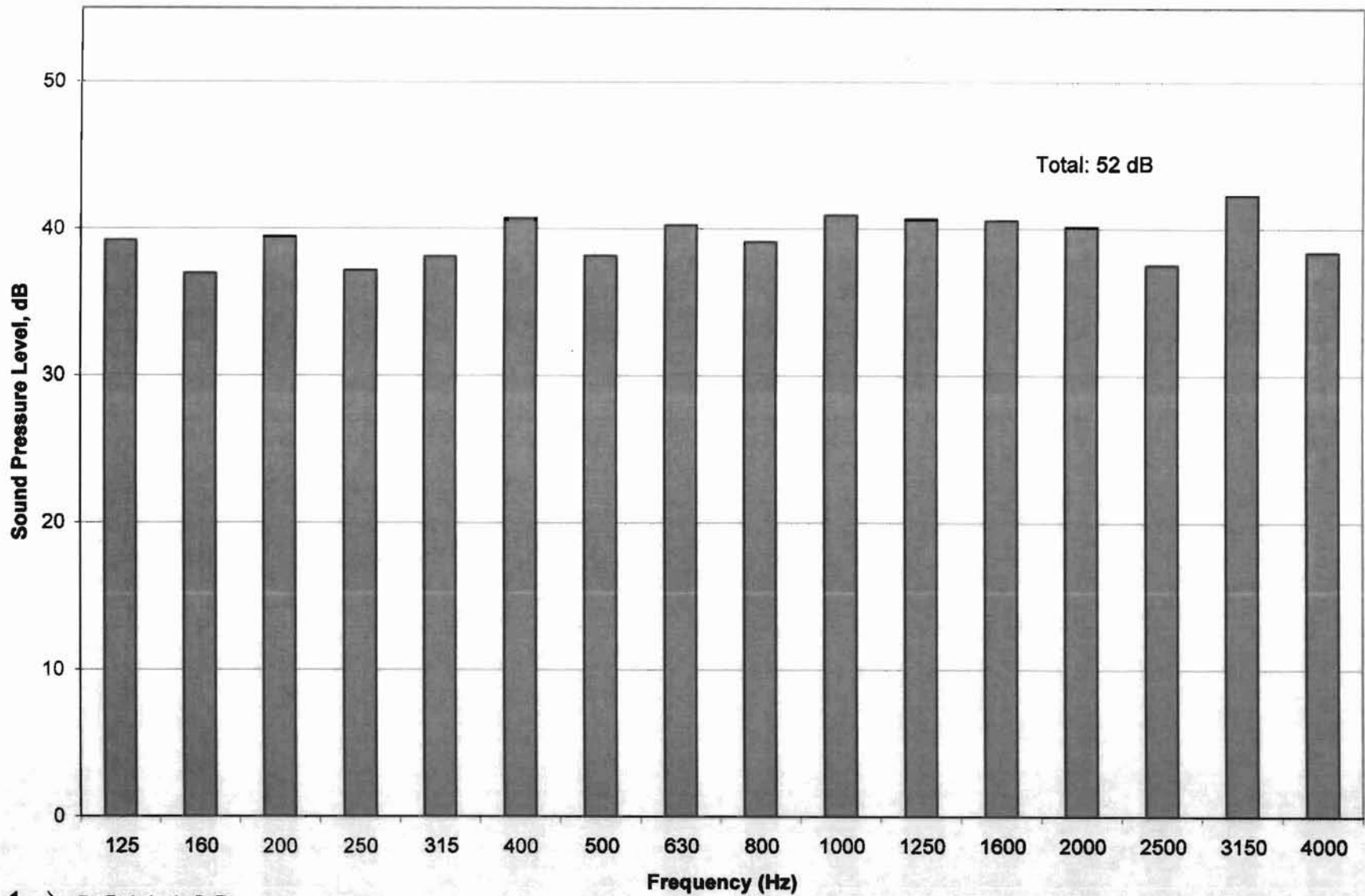
Appendix C-1
Carson Creek Unit 2 - Condition 31 - El Dorado County, California
Frequency Analysis of DST Output Noise Exposure at Site 1



Appendix C-2
Carson Creek Unit 2 - Condition 31 - El Dorado County, California
Frequency Analysis of DST Output Noise Exposure at Site 2



Appendix C-3
Carson Creek Unit 2 - Condition 31 - El Dorado County, California
Frequency Analysis of DST Output Noise Exposure at Site 3



State Water Resource Control Board Compliance

Carson Creek Unit 3

TM 14-1519

SWRCB requires all MS4 Permittees to comply with storm water discharge permit requirements for long term post construction practices that protect water quality and control runoff flow. As a minimum all discretionary projects shall incorporate, either a volumetric or flow based treatment control design standard, or both, as identified below to mitigate (infiltrate, filter or treat) storm water runoff:

Volumetric Treatment Control BMP

1. The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No.23/ASCE Manual of Practice No.87,(1998); or
2. The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook; or
3. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

Flow Based Treatment Control BMP

1. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the area; or
2. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

The project as designed has limited opportunity to mitigate storm water runoff from the project with volumetric treatment control BMPs. Post-Construction Water Balance Calculator (SMART) was used to determine if the project archives the minimum requirements and mitigates project-related impacts in runoff volume.

Project Description

Carson Creek Unit 3 is 140 units single-family residential subdivision with average housing footprints (rooftops) of 1400 sf. The front and back yards will be improved with predetermined amount of flat work and landscaping.

Based on location of the project it is estimated that the project 85 percentile average 24 hr event for the area is 1.24 in. See attached Post-Construction Water Balance Calculator. The existing and composite post-construction CN is 84 and 93. The pre-construction and post-construction Runoff Volumes are 18,482cf and 36,073cf.



EXHIBIT M

Since the project has limited areas for structural controls we would recommend breaking the project into several sub-water sheds and incorporating bio-swales into the design as shown on the revised grading and drainage plan.

For the water quality treatment purposes, the flow rate to be treated is defined as the Water Quality Flow and to be used for filtering types of treatment control devices. The value of rainfall intensity was used in Rational Method Formula to generate runoff from areas, which would flow to the filtering treatment devices is 0.16 in/hr (for elevations below 1000 feet).

We have modeled bio swales with a trapezoidal channel x-section of various bottom width and 3:1 side slopes. Contact time is 5 min; C=1, n=0.25. Runoff Coefficient was derived from composite curve number (CN_{comp}) and time of concentration for corresponding sheds. Based on EDC guidance, below is a summary of typ. vegetative swale characteristics recommended for reduction of post-construction run-off requirements.

Bio Swale Characteristics for Water Quality Flow								
SHED	WQF (cfs)	C	I (in/hr)	A (ac)	S (%)	Bottom Width	V (f/s)	Swale L (lf)
A	0.75	1	0.16	4.7	2	4	0.37	111
B	0.89	1	0.16	5.6	2	4	0.39	117
C	1.23	1	0.16	7.7	2	5	0.42	126
D	0.07	1	0.16	0.46	2	1	0.22	100 (66)
E	0.09	1	0.16	0.56	2	1	0.23	100 (69)

Other Treatment Control BMPs may be incorporated into final design of the project to mitigate increases in the run-off.

1. Incorporation within the site's plan or design, land use planning measures to minimize water quality impacts, including stream buffers and restoration activities.
2. Reduction of the site's imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the storm water conveyance system and minimizing clearing and grading.
3. When landscaping is required or proposed, provision of runoff storage measures dispersed uniformly throughout the site's landscape with the use of a variety of detention, retention, and runoff practices.
4. Implementation of on-site hydrologically functioning landscape design and management practices.
5. Minimize project's impervious footprint and conserve natural areas. Minimize directly connected impervious areas.
6. Where landscaping is proposed in or adjacent to parking areas, to the extent feasible, incorporate landscaped areas into a site drainage design that minimizes runoff.

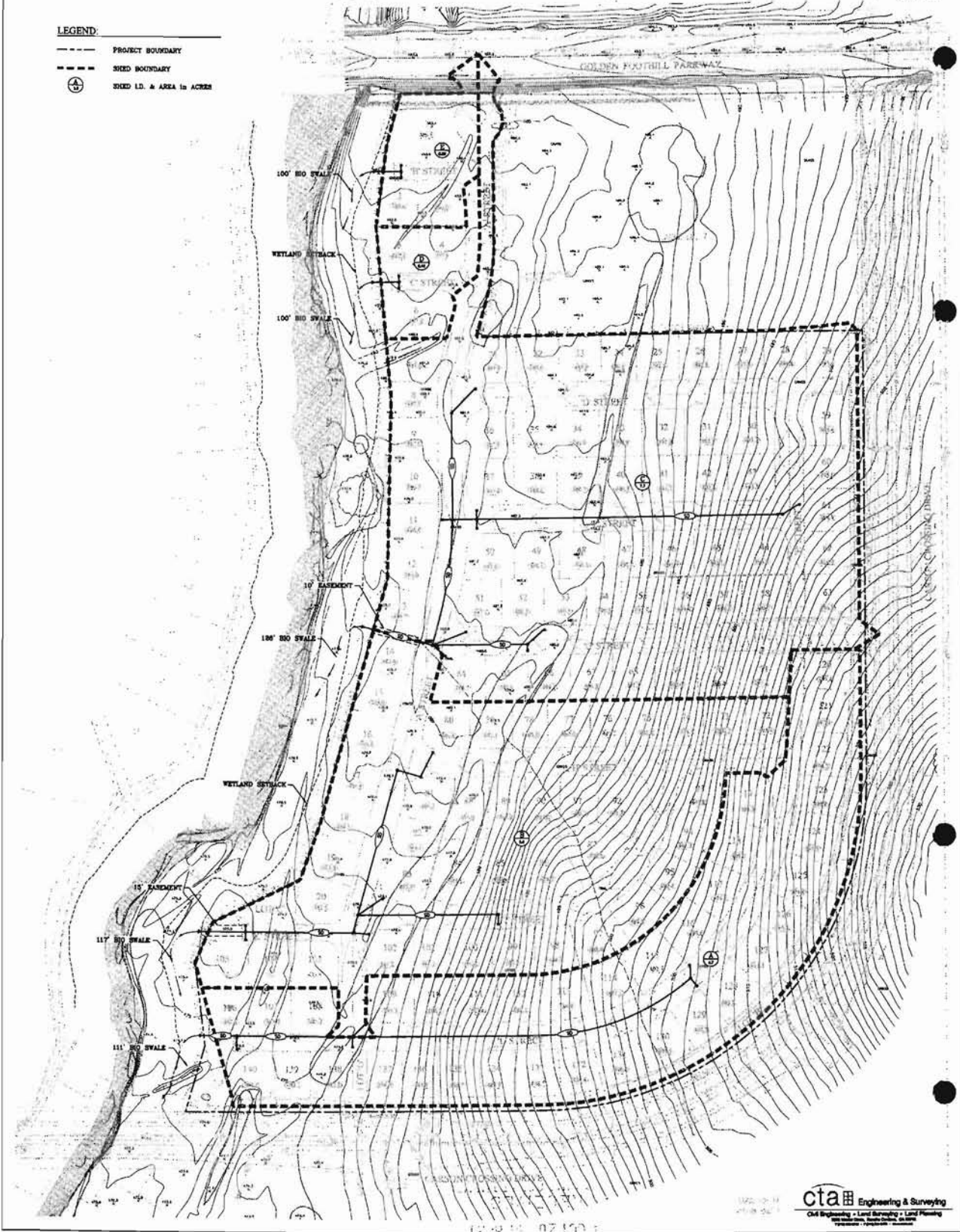
The final water quality methods and details will be worked out at improvement plans stage and might change based on the final design.

A	B	C	D	E	F	G	H	I	J	K	L	M	N		
Post-Construction Water Balance Calculator															
1															
2															
3	User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you.				(Step 1a) If you know the 85th percentile storm event for your location enter it in the box below		(Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left.				EL_DORADO				
4							(Step 1c) If you would like a more precise value select the location closest to your site. If you do not recognize any of these locations, leave this drop-down menu at location. The average value for the County will be used.				LOCATION				
5	Project Information						Runoff Calculations								
6	Project Name:		Carson Creek Unit 3				(Step 2) Indicate the Soil Type (dropdown menu to right):		Group D Soils		Very low infiltration. Clay loam, silty clay loam, sandy clay, silty clay, or clay. Infiltration rate 0 to 0.08 inch/hr when wet.				
7	Waste Discharge Identification (WDID):		Optional				(Step 3) Indicate the existing dominant non-built land Use Type (dropdown menu to right):		Pasture/Grassland/Range: 50% to 75% ground cover & not heavily grazed						
8	Date:		14-Oct-14				(Step 4) Indicate the proposed dominant non-built land Use Type (dropdown menu to right):		A mix of lawn, grass, pasture and trees covering more than 75% of the open space						
9	Sub Drainage Area Name (from map):		Optional						Complete Either						
10									Bq Ft		Acres		Acres		
11	Existing Runoff Curve Number		94				(Step 5) Total Project Site Area:		19.00		19.00				
12	Proposed Development Runoff Curve Number		93				(Step 6) Sub-watershed Area:		19.00		19.00				
13	Design Storm						Percent of total project:						100%		
14	Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)" for your area.		1.24		in										
15	The Amount of rainfall needed for runoff to occur (Existing runoff curve number - P from existing RCN (in)"		0.38		in		(Step 7) Sub-watershed Conditions		Complete Either		Calculated Acres				
16	P used for calculations (in) (the greater of the above two criteria)		1.24		in		Sub-watershed Area (acres)		Bq Ft		Acres		19.00		
17	*Available at www.calmapshandbooks.com						Existing Rooftop Impervious Coverage		0		0.00				
18							Existing Non-Rooftop Impervious Coverage		0		0.00				
19							Proposed Rooftop Impervious Coverage		4.8		4.80				
20							Proposed Non-Rooftop Impervious Coverage		7.1		7.10				
21															
22															
23															
24															
25	Pre-Project Runoff Volume (cu ft)		18,462		Cu.Ft.		Downspout Disconnection		9.00		0				
26	Project-Related Runoff Volume Increase w/o credits (cu ft)		26,073		Cu.Ft.		Impervious Area Disconnection		0.00		0				
27							Green Roof		0.00		0				
28							Stream Buffer		0.00		0				
29							Vegetated Swales		11.60		606,296				
30	Project-Related Volume Increase with Credits (cu ft)		0		Cu.Ft.		Subtotal		12.30		635,788				
31							Subtotal Runoff Volume Reduction Credits		28,643 Cu. Ft.						
32															
33	You have achieved your minimum requirements						(Step 8) Impervious Volume Reduction Credits		Volume (cubic feet)						
34							Rain Barrels/Cisterns		0 Cu. Ft.						
35							Soil Quality		0 Cu. Ft.						
36							Subtotal Runoff Volume Reduction		0 Cu. Ft.						
37							Total Runoff Volume Reduction Credit		28,643 Cu. Ft.						
38															
39															
40															

CARSON CREEK UNIT 3
SHED MAP
 EL DORADO HILLS, CALIFORNIA
 SCALE: 1"=40' OCTOBER, 2014



- LEGEND:**
- PROJECT BOUNDARY
 - - - SIZED BOUNDARY
 - ⊕ SIZED I.D. & AREA in ACRES



cta Engineering & Surveying
 Civil Engineering • Land Surveying • Land Planning
 15020-14
 916-938-5212