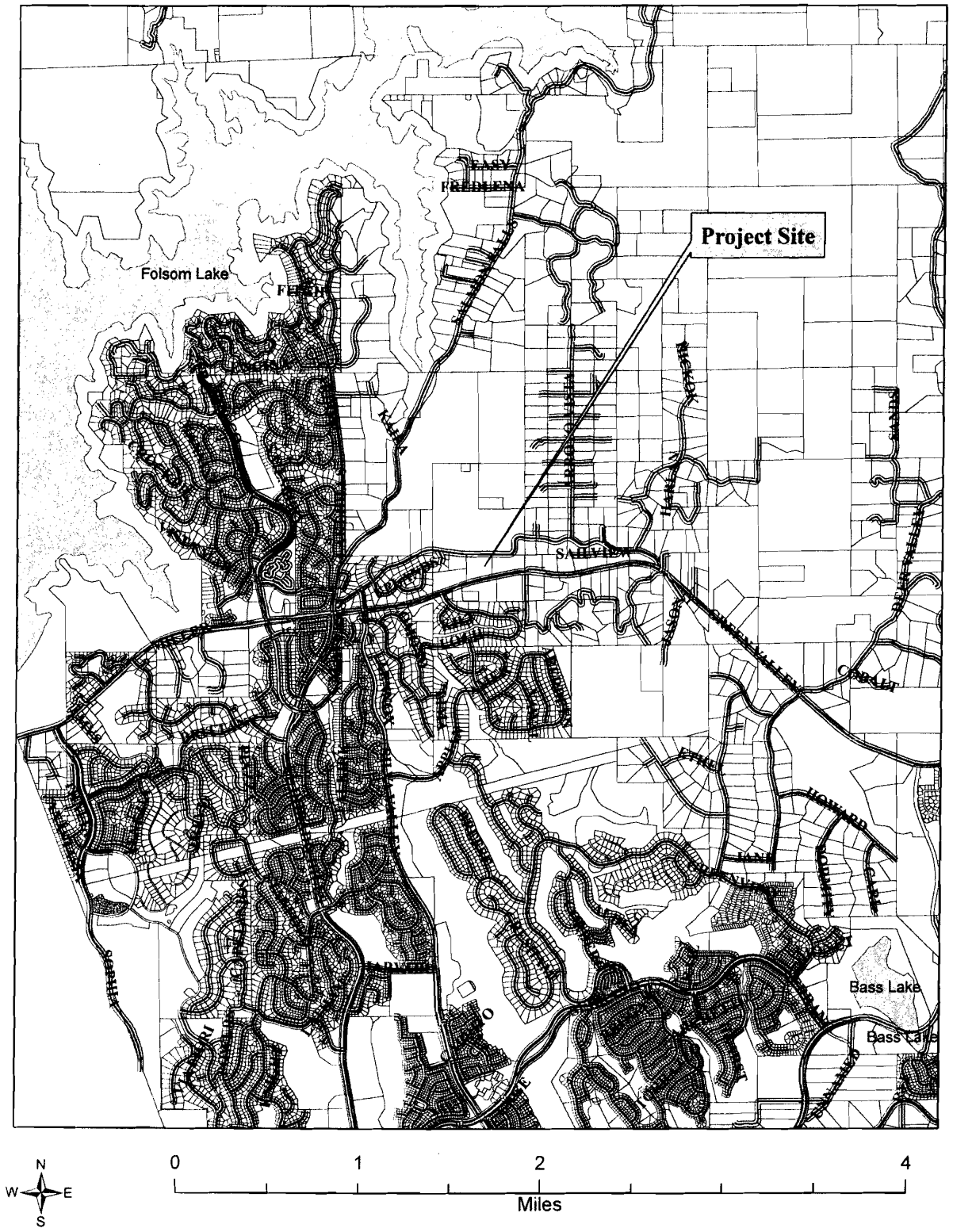
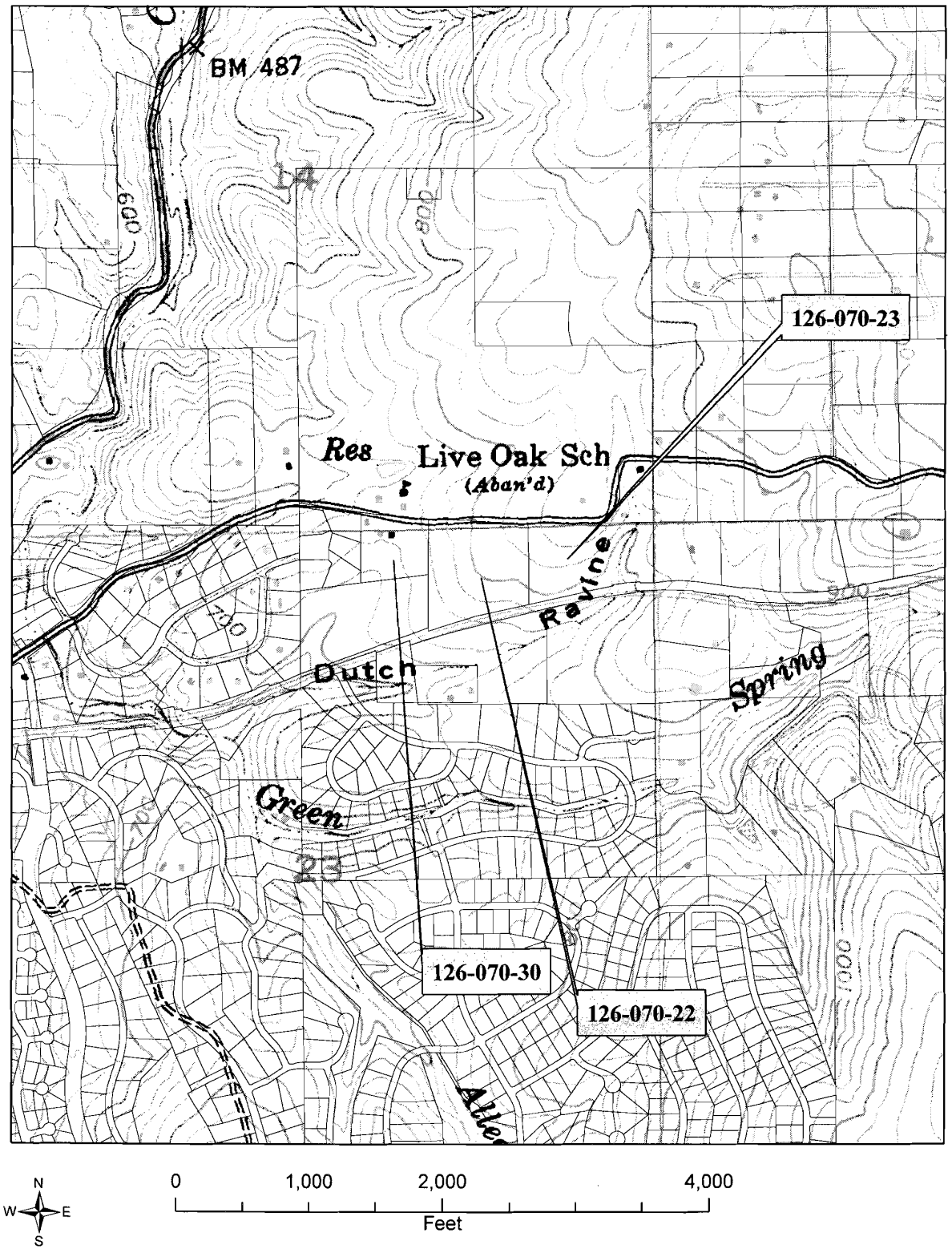
Location Map



File Numbers Z14-0002/PD14-0001/TM14-1515

Attachment 1

Clarksville U.S.G.S Quadrangle with El Dorado County Parcels Overlaid



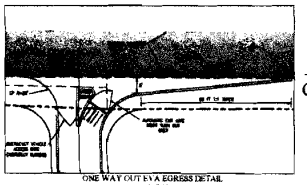
File Numbers Z14-0002/PD14-0001/TM14-1515

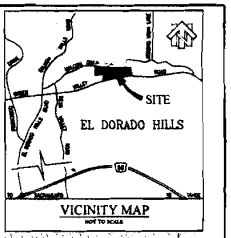
Attachment 2

Attachment 3

TENTATIVE MAP
WILSON ESTATES

COUNTY OF EL DORADO — AUGUST, 2014 — STATE OF CALIFORNIA


ONE WAY OUT EVA EGRESS DETAIL



VICINITY MAP

SCALE: 1"=60'

OWNERS OF RECORD
LISA VOGELSANG
CATHERINE RYAN
JULIE RYAN

1615 GREENWICH STREET
SAN FRANCISCO, CA 94123

APPLICANT
CTA ENGINEERING & SURVEYING
3233 MONIER CIRCLE
RANCHO CORDOVA, CA 95742

ENGINEER
cta Engineering & Surveying
Civil Engineering · Land Surveying · Land Planning

MAP SCALE
1" = 60'

CONTOUR INTERVAL
CONTOUR INTERVAL = 2 FEET

SOURCE OF TOPOGRAPHY
AERIAL PHOTOGRAPHY

SECTION, TOWNSHIP and RANGE
PORTION OF SECTIONS 13, 14 & 23, T.10N., R.8E., M.D.M.

ASSESSOR'S PARCEL NUMBERS
A.P.N. 126-070-22, 126-070-23, 126-070-30

GENERAL PLAN
HDR IN A COMMUNITY REGION

PRESENT ZONING
R1A

PROPOSED ZONING
R1A – PD/ OS-PD (ZONE BOUNDARY ESTABLISHED BY FINAL MAP)

TOTAL AREA
28.18 ACRES

TOTAL NUMBER OF PARCELS

RESIDENTIAL LOTS (1-28)	16.51 AC
PRIVATE ROAD LOT (LOT R)	1.45 AC
LETTERED LOT (B), LOT (C)	
OPEN SPACE, DRAINAGE & WATERLINE	9.41 AC | 33% OPEN SPACE
NEW CONNECTION (LOT A)	0.65 AC
MALCOLM DIXON ROADWAY DEDICATION	0.62 AC
GREEN VALLEY ROAD ROADWAY DEDICATION	0.54 AC
TOTAL AREA	28.18 AC

MINIMUM LOT AREA
20,004 SQUARE FEET

WATER SUPPLY and SEWAGE DISPOSAL
EL DORADO IRRIGATION DISTRICT

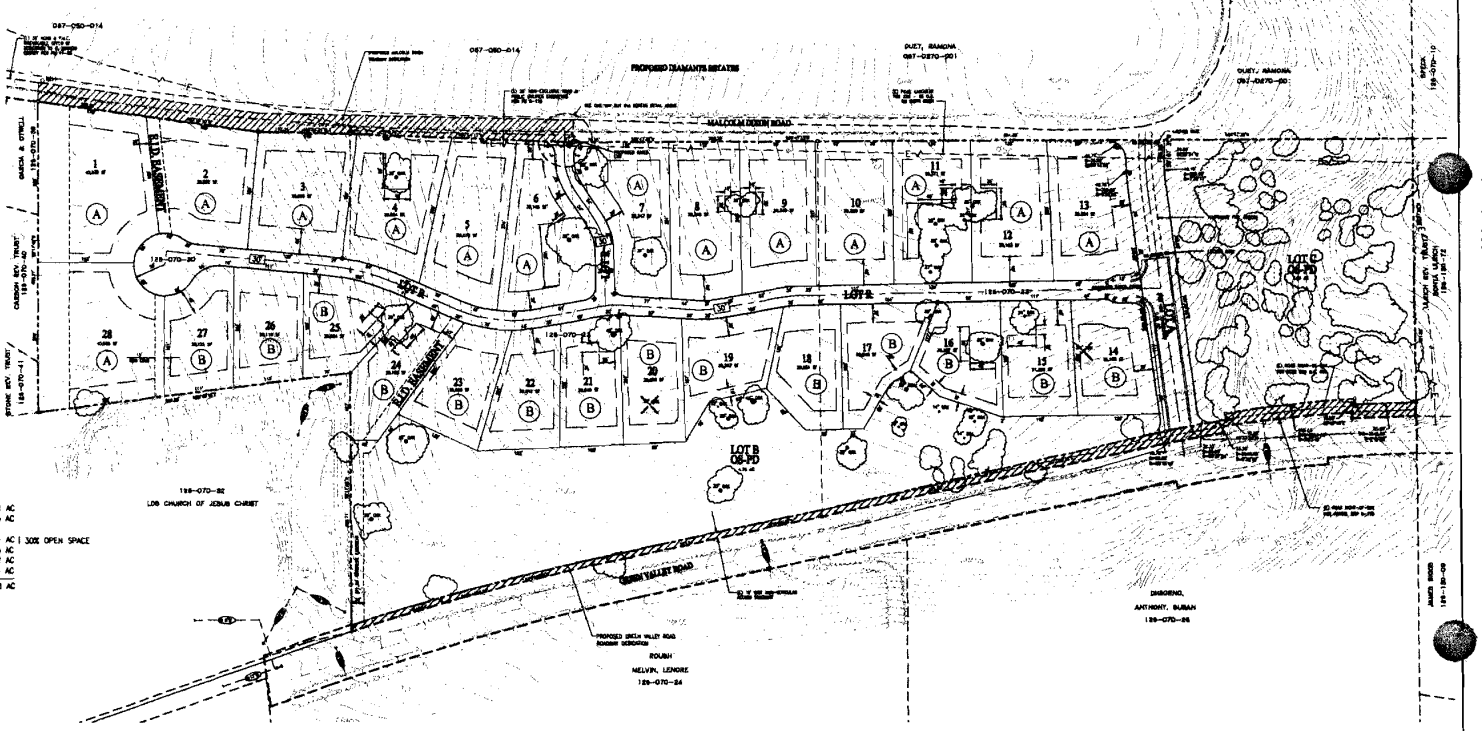
PROPOSED STRUCTURAL FIRE PROTECTION
EL DORADO HILLS COUNTY WATER DISTRICT (FIRE DEPARTMENT)

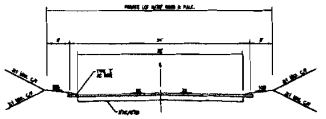
DATE OF PREPARATION
AUGUST, 2014

PHASING PLAN NOTICE
THE SUBDIVIDER MAY FILE MULTIPLE FINAL MAPS FOR THIS PROJECT. THE SUBDIVIDER SHALL NOT BE REQUIRED TO DEFINE THE NUMBER OR CONFIGURATION OF THE PROPOSED MULTIPLE FINAL MAPS. (PER THE SUBDIVISION MAP ACT, SECTION 66456.1)

ENGINEER'S CERTIFICATE
I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THE LAND DEVELOPMENT KNOWN AS WILSON ESTATES HAS BEEN DESIGNED IN ACCORDANCE WITH THE SPECIFICATIONS AND GUIDELINES ESTABLISHED BY THE COUNTY OF EL DORADO.

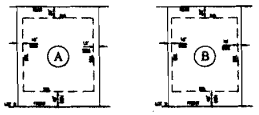
DAVID R. CROSARIOL, R.C.E. 34520 — DATE




TYPICAL ROAD SECTION


TEMPORARY FIRE ACCESS ROAD (GATED) ≤ 20%


NEW CONNECTION


MODIFIED R-1A SETBACKS UON — MODIFIED R-20,000 SETBACKS UON

TYPICAL BUILDING SETBACKS
ONE-FAMILY RESIDENTIAL
UNLESS OTHERWISE NOTED (UON) ON TENATIVE MAP

LEGEND:
- (P) FIRE HYDRANT
- (P) SUBDIVISION BOUNDARY
- (P) RIGHT OF WAY LINE
- (P) LOT LINE
- 50 (P) LOT R WIDTH

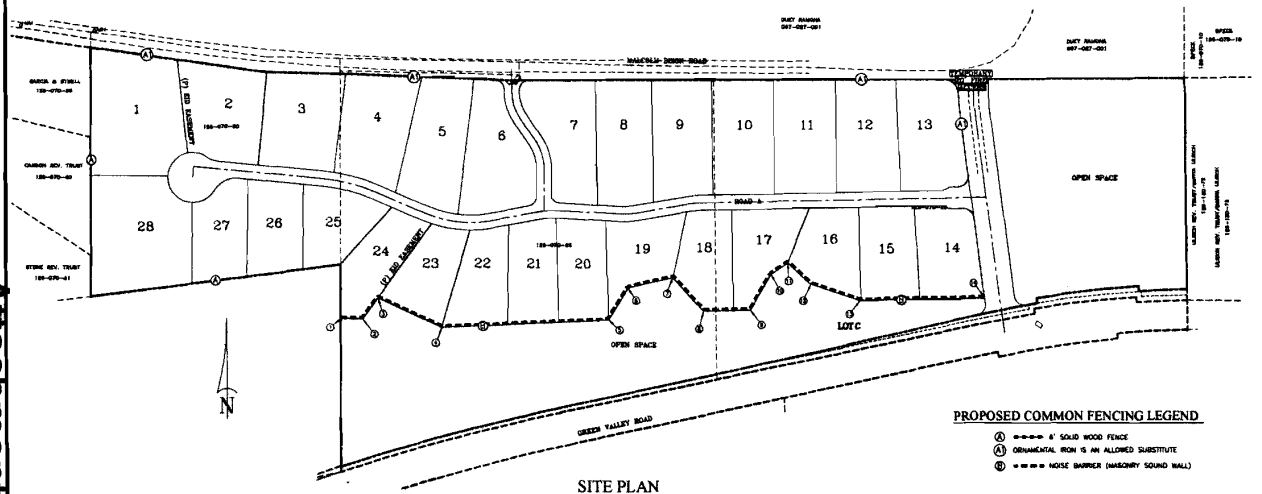
RECEIVED
PLANNING DEPARTMENT
14 AUG 19 PM 3:26

M:\06-047-002\PLANNING\TENTATIVE MAP\06-047-002-TM.dwg TENTATIVE MAP 8/18/2014 10:21:33 AM dmerlo

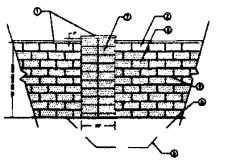
Attachment 4

WILSON ESTATES
FENCE EXHIBIT
COUNTY OF EL DORADO, CALIFORNIA
AUGUST, 2014

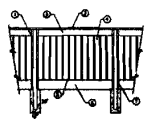
14 AUG 19 PM 3:26
RECEIVED
PLANNING DEPARTMENT



SITE PLAN
SCALE: 1"=100'

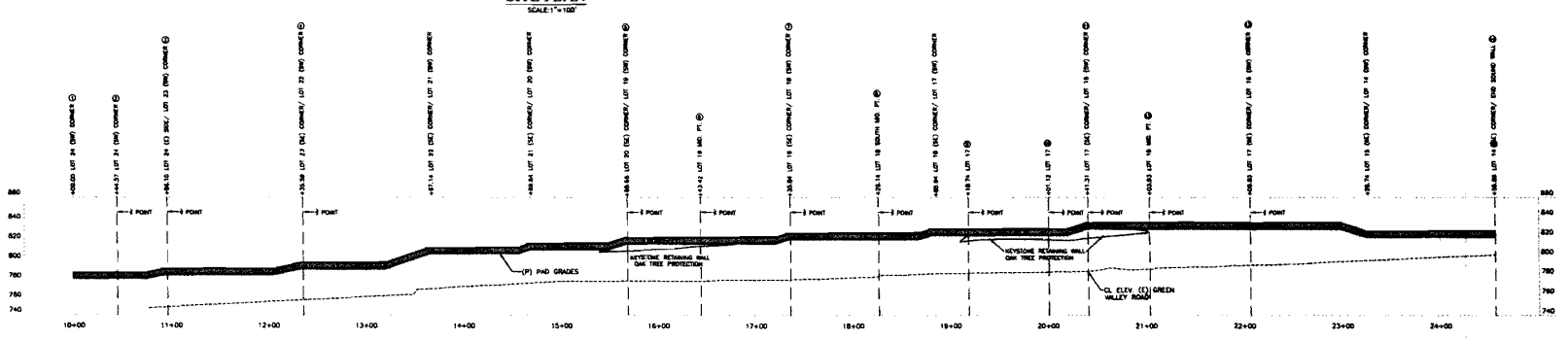


NOISE BARRIER DETAIL
(MASONRY SOUND WALL)
SCALE: 1"=4'



6' SOLID WOOD FENCE
SCALE: 1"=5'

PROPOSED COMMON FENCING LEGEND
- (A) 6' SOLID WOOD FENCE
- (A1) ORNAMENTAL IRON IS AN ALLOWED SUBSTITUTE
- (B) NOISE BARRIER (MASONRY SOUND WALL)



6' NOISE BARRIER (MASONRY SOUND WALL) PROFILE
SCALE: 1"=50' HORZ. & VERT

cta Engineering & Surveying
Civil Engineering • Land Surveying • Land Planning

M:\06-047-002\PLANNING\EXHIBITS\06-047-002 Wall Exhibit August 2014.dwg, Layout2-Layout1, 8/18/2014 10:20:46 AM, dmarks

WILSON ESTATES

AIR QUALITY IMPACT ANALYSIS AND GREENHOUSE GASES

Prepared by:

PMC®

2729 PROSPECT PARK DRIVE, SUITE 220
RANCHO CORDOVA, CA 95670

JULY 2011

Attachment 5

INTRODUCTION

This report documents the results of both an air quality impact analysis and greenhouse gas (GHG) impact analysis completed for the proposed Wilson Estates project, a 28-acre, 60-unit single-family residential development project proposed to be located along the south side of Malcolm Dixon Road in El Dorado Hills, California (the proposed project or project). The purpose of this impact analysis is to identify potential environmental impacts associated with both air quality and GHGs as required by the California Environmental Quality Act (CEQA).

The air quality impact analysis was prepared using methodologies and assumptions recommended within the rules and regulations of the El Dorado County Air Quality Management (EDCAQMD) (formerly identified as the El Dorado County Air Pollution Control District). Regional and local air quality conditions are presented, along with pertinent air quality standards and regulations. The GHG impact analysis was prepared by comparing proposed project consistency with measures recommended by the State of California and the County of El Dorado for reducing GHG emissions, including measures currently recommended by the El Dorado County Board of Supervisors Environmental Vision for El Dorado County, Resolution No. 29-2008.

AIR QUALITY SETTING

Air quality in a region is determined by its topography, meteorology, and existing air pollutant sources. These factors are discussed below, together with the current regulatory structure that applies to the Mountain Counties Air Basin (MCAB), in which the project site is located, pursuant to the regulatory authority of the EDCAQMD. The EDCAQMD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. Currently, the portion of the MCAB in which the project site is located (western El Dorado County) is designated as nonattainment for the state ozone and PM_{10} (particulate matter less than 10 microns in diameter) standards as well as for the federal ozone and $PM_{2.5}$ (particulate matter less than 2.5 microns in diameter) standards (CARB 2010a). These designations will be described in greater detail later in this analysis.

Topographic and Meteorological Influences on Air Quality

Ambient air quality is commonly characterized by climatological conditions, the meteorological influences on air quality, and the quantity and type of pollutants released. The air basin is subject to a combination of topographical and climatic factors that influence the potential for regional and local air pollutants. The following section describes pertinent characteristics of the air basin and provides an overview of the physical conditions affecting pollutant dispersion in the project area.

The MCAB lies along the northern Sierra Nevada range, close to or contiguous with the Nevada border, and covers an area of roughly 11,000 square miles. The western slope of El Dorado County, from Lake Tahoe on the east to the Sacramento County boundary on the west, lies within the MCAB. Elevations range from over 10,000 feet at the Sierra crest down to several hundred feet above sea level at the Sacramento County boundary. Throughout El Dorado County, the topography is highly variable and includes rugged mountain peaks and valleys with extreme slopes and differences in altitude in the Sierras, as well as rolling foothills to the west.

The general climate of the MCAB varies considerably with elevation and proximity to the Sierra ridge. The terrain features of the basin make it possible for various climates to exist in relatively close proximity. The pattern of mountains and hills causes a wide variation in rainfall, temperature, and localized winds throughout the basin. Temperature variations have an

important influence on basin wind flow, dispersion along mountain ridges, vertical mixing, and photochemistry. In the western foothills of the county, where the project site is located, winter temperatures usually dip below freezing only at night, and precipitation is mixed as rain or light snow. In the summer, temperatures can routinely exceed 100 degrees Fahrenheit at the project site.

From an air quality perspective, the topography and meteorology of the MCAB combine such that local conditions predominate in determining the effect of emissions in the basin. Regional airflows are affected by the mountains and hills, which direct surface airflows, cause shallow vertical mixing, and create areas of high pollutant concentrations by hindering dispersion. Inversion layers, where warm air overlays cooler air, frequently occur and trap pollutants close to the ground. During summer's longer daylight hours, stagnant air, high temperatures, and plentiful sunshine provide the conditions and energy for the photochemical reaction between reactive organic compounds (ROG) and oxides of nitrogen (NOx) that results in the formation of ozone (O_3). Because of its long formation time, ozone is a regional pollutant rather than a local hot-spot problem.

In the summer, the strong upwind valley air flowing into the basin from the Central Valley to the west of the project site is an effective transport medium for ozone precursors and ozone generated in the Bay Area and the Sacramento and San Joaquin valleys. These transported pollutants predominate as the cause of ozone in the MCAB and are largely responsible for the exceedances of the state and federal ozone ambient air quality standards in the MCAB (EDCAQMD 2002, Chapter 2, p. 2).

CRITERIA AIR POLLUTANTS OF CONCERN AND HEALTH EFFECTS

The most problematic pollutants in the project area include ozone and particulate matter. The health effects and major sources of these pollutants are described below. Toxic air pollutants are a separate class of pollutants and are discussed later in this analysis.

Ozone

Ground-level ozone, commonly referred to as smog, is greatest on warm, windless, sunny days. Ozone (O_3) is not emitted directly into the air but formed through a complex series of chemical reactions between reactive organic gases (ROG) and NOx. These reactions occur over time in the presence of sunlight. Ground-level ozone formation can occur in a matter of hours under ideal conditions. The time required for ozone formation allows the reacting compounds to spread over a large area, producing a regional pollution concern. Once formed, ozone can remain in the atmosphere for one or two days.

Ozone is also a public health concern because it is a respiratory irritant that increases susceptibility to respiratory infections and diseases, and because it can harm lung tissue at high concentrations. In addition, ozone can cause substantial damage to leaf tissues of crops and natural vegetation and can damage many natural and man-made materials by acting as a chemical oxidizing agent.

The principal sources of the ozone precursors (ROG and NOx) are the combustion of fuels and the evaporation of solvents, paints, and fuels.

Reactive Organic Gases

Reactive organic gases (ROG), also known as volatile organic compounds, are photochemically reactive hydrocarbons that are important for ozone formation. This definition excludes methane,

carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonates, methylene chloride, methyl chloroform, and various chlorofluorocarbons. There are no health standards for ROG separately. The main concern with ROG is its role in photochemical ozone formation. In addition, some compounds that make up ROG are also toxic. An example is benzene, which is a carcinogen.

The primary sources of ROG are mobile sources, solvents, farming operations and other area sources, and oil and gas production.

Nitrogen Oxides

Nitrogen oxides (NO_x) are a family of gaseous nitrogen compounds and are precursors to ozone formation. The major component of NO_x, nitrogen dioxide (NO_2), is a reddish-brown gas that is toxic at high concentrations. NO_x results primarily from the combustion of fossil fuels under high temperature and pressure.

Health effects associated with NO_x are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may lead to eye and mucous membrane aggravation, along with pulmonary dysfunction. NO_x can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates. Airborne NO_x can also impair visibility. NO_x is a major component of acid disposition in California. On-road and off-road motor vehicles and fuel combustion are the major sources of this air pollutant.

Particulate Matter

Particulate matter (PM) can be divided into several size fractions. Coarse particles are between 2.5 and 10 microns in diameter and arise primarily from natural processes, such as wind-blown dust or soil. Fine particles are less than 2.5 microns in diameter and are produced mostly from combustion or burning activities. Fuel burned in cars and trucks, power plants, factories, fireplaces, and woodstoves produces fine particles.

The level of fine particulate matter in the air is a public health concern because it can bypass the body's natural filtration system more easily than larger particles and can lodge deep in the lungs. The health effects vary depending on a variety of factors, including the type and size of particles. Research has demonstrated a correlation between high PM concentrations and increased mortality rates. Elevated PM concentrations can also aggravate chronic respiratory illnesses such as bronchitis and asthma.

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas that is formed by the incomplete combustion of fuels. Motor vehicle emissions are the dominant source of CO in the region. At high concentrations, CO reduces the oxygen-carrying capacity of the blood and can cause dizziness, headaches, unconsciousness, and even death. Carbon monoxide can also aggravate cardiovascular disease. Relatively low concentrations of CO can significantly affect the amount of oxygen in the bloodstream because CO binds to hemoglobin 220–245 times more strongly than oxygen.

CO emissions and ambient concentrations have decreased significantly in recent years. These improvements are due largely to the introduction of cleaner burning motor vehicles and motor vehicle fuels. CO is still a pollutant that must be closely monitored, however, due to its severe effect on human health.

Elevated CO concentrations are usually localized and are often the result of a combination of high traffic volumes and traffic congestion. Elevated carbon monoxide levels develop primarily during winter periods of light winds or calm conditions combined with the formation of ground-level temperature inversions. Wintertime CO concentrations are higher because of reduced dispersion of vehicle emissions and because CO emission rates from motor vehicles increase as temperature decreases.

Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless, irritating gas with a rotten egg smell formed primarily by the combustion of sulfur-containing fuels such as coal, fuel oil, and diesel fuels. Health effects include sore throats, coughing, and breathing problems. In addition, like nitrogen dioxide, sulfur dioxide changes in the atmosphere to acidic particles and sulfuric acid, which can injure both people and plants. It is rare in California to see levels of SO_2 high enough to cause these symptoms.

AMBIENT AIR QUALITY STANDARDS

Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants that represent safe levels which avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The federal and California ambient air quality standards for important pollutants are summarized in **Table 1**. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California standards are more stringent. This is particularly true for ozone and PM_{10}.

TABLE 1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour	–	0.09 ppm
	8-Hour	0.075 ppm	0.07 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35 ppm	20.0 ppm
Nitrogen Dioxide	Annual Average	0.053 ppm	0.03 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	Annual Average	0.03 ppm	–
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	75 ppb	0.25 ppm
PM_{10}	Annual Average	–	20 $\mu g/m^3$
	24-Hour	150 $\mu g/m^3$	50 $\mu g/m^3$

Pollutant	Averaging Time	Federal Primary Standard	State Standard
$PM_{2.5}$	Annual Average	15 $\mu g/m^3$	12 $\mu g/m^3$
	24-Hour	35 $\mu g/m^3$	–

Notes: ppm = parts per million; ppb = parts per billion; ug/m³ = micrograms per cubic meter
PM_{10} = particulate matter 10 microns or less; $PM_{2.5}$ = particulate matter 2.5 microns or less
Source: CARB 2010b

AMBIENT AIR QUALITY

Ambient air quality in the project area can be inferred from ambient air quality measurements conducted at nearby air quality monitoring stations. CARB maintains over 60 air quality monitoring stations throughout California.

The Folsom–Natoma Street air quality monitoring station, located approximately 6 miles west of the project site, is the closest station to the project site. The Folsom–Natoma Street air quality monitoring station monitors ambient concentrations of ozone and $PM_{2.5}$. Ambient emission concentrations will vary due to localized variations in emission sources and climate and should be considered "generally" representative of ambient concentrations within the project area.

Table 2 summarizes the published data since 2008 from the Folsom–Natoma Street air quality monitoring station for each year that the monitoring data is provided. As depicted in **Table 2**, exceedances of state and federal ozone standards declined during the last three years of available data.

TABLE 2
SUMMARY OF AMBIENT AIR QUALITY DATA

Pollutant Standards	2008	2009	2010
Ozone			
Max 1-hour concentration (ppm)	0.166	0.120	0.124
Max 8-hour concentration (ppm) (state/federal)	0.12/0.12	0.10/0.10	0.12/0.12
Number of days above state 1-hr standard	38	24	12
Number of days above state/federal 8-hour standard	65/50	47/35	26/19
Respirable Particulate Matter (PM_{10})			
Max 24-hour concentration (μg/m3) (state/federal)	–/–	–/–	–/–
Number of days above state/federal standard	–/–	–/–	–/–
Fine Particulate Matter (PM2.5)			
Max 24-hour concentration (μg/m3) (state/federal)	130.5/–	31.1/–	34.0/–
Number of days above state/federal standard	–/–	–/–	–/–

$\mu g/m^3$ = micrograms per cubic meter; ppm – parts per million
– Insufficient or no data currently available to determine the value
Source: CARB 2011

Attainment Status for Criteria Air Pollutants

The attainment status of the western El Dorado County portion of the Mountain Counties Air Basin is summarized in **Table 3**. An attainment designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A nonattainment designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation(s) was caused by an exceptional event, as defined in the criteria.

As depicted in **Table 3**, the western El Dorado County portion of the MCAB is currently designated nonattainment for the state ozone and PM_{10} standards as well as for the federal ozone and $PM_{2.5}$ standards. This portion of the air basin is designated either attainment or unclassified for the remaining federal and state ambient air quality standards.

TABLE 3
ATTAINMENT STATUS DESIGNATIONS

Pollutant	Designation/Classification	
	State	Federal
Ozone	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Unclassified	Nonattainment
CO	Unclassified	Unclassified/Attainment
NO_2	Attainment	Unclassified/Attainment
SO_2	Attainment	Unclassified

Source: CARB 2010a

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. Unlike criteria pollutants, no safe levels of exposure to TACs have been established. There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death. Potential sources of TACs in the county include all gas stations, auto body shops, and printing services.

Diesel exhaust is a TAC of growing concern in California. According to the *California Almanac of Emissions and Air Quality* (CARB 2006), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). The California Air Resources Board in 1998 identified diesel engine PM as a toxic air contaminant. Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. The exhaust from diesel engines contains hundreds of different gaseous and particulate components, many of which are toxic. Many of these compounds adhere to the particles, and because diesel particles are so small, they penetrate deep into the lungs. Diesel engine particulate has been identified as a human carcinogen.

Mobile sources, such as trucks, buses, automobiles, trains, ships, and farm equipment, are by far the largest source of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections.

Odors

Typically odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

REGULATORY AIR QUALITY SETTING

Federal Laws and Regulations

- The federal Clean Air Act (CAA) required by the U.S. Environmental Protection Agency (EPA) to establish national ambient air quality standards (NAAQS).

State Laws and Regulations

- The California Clean Air Act (CCAA), which was adopted in 1988, required CARB to establish California ambient air quality standards (CAAQS).

Local Laws, Regulations, and Policies

- The Sacramento Regional 8-Hour Ozone 2011 Reasonable Further Progress Plan and PM_{10} Implementation/Maintenance Plan and Re-Designation Request, prepared by the air districts in the greater Sacramento region in compliance with the requirements set forth in the CCAA, specifically addressed the nonattainment status for ozone and PM_{10}.
- The EDCAQMD has also adopted various rules and regulations pertaining to the control of emissions from area and stationary sources. All projects are subject to EDCAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the proposed project may include, but are not limited to:
  - Rule 101 – General Provisions
  - Rule 205 – Nuisances
  - Rule 207 – Particulate Matter
  - Rule 223 – Fugitive Dust General Requirements

- Rule 223-1 – Fugitive Dust Construction Requirements
- Rule 224 – Cutback Asphalt Paving Material

AIR QUALITY IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the application of the following CEQA Guidelines Appendix G thresholds of significance:

1. Conflict with or obstruct implementation of any applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 1 ***Conflict with or obstruct implementation of any applicable air quality plan.***

As stated above, the western portion of El Dorado County is designated as nonattainment for the state and federal ozone standards. The Sacramento Regional 8-Hour Ozone 2011 Reasonable Further Progress Plan (OAP) was developed by the air districts in the Sacramento region to bring the region into attainment. The region addressed in the OAP includes the Mountain Counties Air Basin portion of El Dorado County, and thus the project site. The OAP is the regional component of the State Implementation Plan (SIP), which is the State's plan for attaining the federal 8-hour ozone standard as required by the California Clean Air Act and the federal Clean Air Act. The SIP has been prepared to identify a detailed comprehensive strategy for reducing emissions to the level needed for attainment and show how the region would make expeditious progress toward meeting this goal. The SIP assumes annual increases in air pollutant emissions resulting from regional growth (including construction-generated emissions) anticipated according to local land use plans (e.g., general plans, regional transportation plans). The SIP also assumes the incremental increase in emissions will be partially offset through the implementation of stationary, area, and indirect source control measures contained within the SIP.

In addition to not attaining the federal or state ozone standards, the region does not attain the federal $PM_{2.5}$ standards or state PM_{10} standards. Reduction of particulate matter by all feasible means is necessary to attain these particulate matter standards. The purpose of the PM_{10} Implementation/Maintenance Plan and Re-Designation Request for Sacramento County (PM_{10} Plan) is to fulfill the requirements for the EPA to redesignate the Sacramento region from nonattainment to attainment of the PM_{10} ambient air quality standards by preparing the following plan elements and tasks:

- Document the extent of the PM_{10} problem in the Sacramento region.
- Determine the emission inventory sources contributing to the PM_{10} problem.
- Identify the appropriate control measures that achieved attainment of the PM_{10} NAAQS.
- Demonstrate maintenance of the PM_{10} NAAQS.
- Request formal redesignation to attainment of the PM_{10} NAAQS.

Particulate matter directly emitted from a project is generally regarded as having regional and localized impacts; however, PM_{10} and $PM_{2.5}$ are of greatest concern during construction (e.g., the site preparation phase) of a proposed project.

According to the EDCAQMD's Guide to Air Quality Assessment (2002), a project is conforming to the air quality plans if:

1. The project does not require a change in the existing land use designation (e.g., a general plan amendment or rezone), and projected emissions of ROG and NOx from the proposed project are equal to or less than the emissions anticipated for the site if developed under the existing land use designation.

2. The project does not exceed the "project alone" significance criteria.

3. The lead agency for the project requires the project to implement any applicable emission reduction measures contained in and/or derived from the air quality plans.

4. The project complies with all applicable district rules and regulations.

As demonstrated in **Impact 2** below, adoption of the Wilson Estates project will not conflict with implementation of the applicable air quality plans, as emissions generated from project construction would not exceed the EDCAQMD thresholds of 82 pounds per day of ROG or 82 pounds per day of NOx (see **Table 5**). Furthermore, mitigation measures **MM AQ-1** and **MM AQ-2**, described in detail below, represent emission reduction measures consistent with the applicable air quality plans (i.e., OAP and PM_{10} Plan) as well as EDCAQMD rules and regulations. Therefore, since the proposed project does not require a change of existing land use designation, does not exceed any significance criteria, and is consistent with the OAP, PM_{10} Plan, and EDCAQMD rules and regulations, it is **less than significant.**

Impact 2 ***Violate any air quality standard or contribute substantially to an existing or projected air quality violation.***

Subsequent land use activities associated with implementation of the proposed project would introduce additional construction, mobile, and stationary sources of emissions, which would adversely affect regional air quality.

Short- and long-term operational emissions associated with the development potential of the proposed project were quantified using the URBEMIS 2007 land use emissions model (see **Appendix A** for model data outputs). Urbemis is software that uses the URBEMIS land use emissions inventory model to estimate greenhouse gas and criteria pollutant emissions under particular scenarios involving construction, area, and other sources. It has been designed specifically for California, though a version which applies to 49 states is in development. For the purposes of this analysis, Urbemis uses California-specific road and construction emissions factors. The URBEMIS 2007 model uses the California Air Resources Board's EMFAC2007 model for on-road vehicle emissions and the OFFROAD2007 model for off-road vehicle emissions. This assessment

includes quantification of net increases of ozone precursor pollutants (i.e., ROG and NOx) and airborne particulate matter (i.e., $PM_{2.5}$ and PM_{10}) attributable to the proposed project. These quantified emission projections are then compared with EDCAQMD significance thresholds established in EDCAQMD's *Guide to Air Quality Assessment* (2002).

CONSTRUCTION EMISSIONS

Construction-generated emissions are temporary and short term but have the potential to represent a significant air quality impact. The construction and development of the proposed project would result in the temporary generation of emissions resulting from site grading and excavation, paving, and motor vehicle exhaust associated with construction equipment and worker trips, as well as the movement of construction equipment, especially on unpaved surfaces. Emissions of airborne particulate matter are largely dependent on the amount of ground disturbance associated with site preparation activities.

As stated above, the EDCAQMD has adopted guidelines for determining potential adverse impacts to air quality in the region. The EDCAQMD guidelines state that construction activities are considered a potentially significant adverse impact if such activities generate total emissions in excess of EDCAQMD established thresholds. According to the *Guide to Air Quality Assessment* (EDCAQMD 2002, Chapter 4, p. 3), if identified ROG and NO_x emissions are under the construction emissions threshold of 82 pounds generated per day and thus considered less than significant, then emissions of CO and PM_{10} would also be considered less than significant.

Table 4 illustrates the construction-related criteria and precursor emissions that would result from implementation of the proposed project.

TABLE 4
CONSTRUCTION-RELATED CRITERIA POLLUTANT AND PRECURSOR EMISSIONS – UNMITIGATED
(POUNDS PER DAY & TONS PER YEAR)

Construction Activities	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_x)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)
Pounds per Day (Unmitigated)						
2012	3.78	29.73	24.63	0.01	141.55	30.66
2013	86.81	15.51	23.25	0.01	1.04	0.92
EDCAQMD Potentially Significant Impact Threshold	82 pounds/day	82 pounds/day	AAQS	–	AAQS	–
Exceed EDCAPC Threshold?	**Yes**	**No**	–	–	–	–

Refer to Appendix A for Model Data Outputs.

As demonstrated in **Table 4**, the proposed project would result in the exceedance of EDCAQMD thresholds for daily ROG emissions during construction activities in 2013, primarily associated with architectural coatings. Since the EDCAQMD deems construction emissions of CO and PM_{10} to be significant if ROG and NO_x are deemed so, these pollutants would be considered significant as well. Therefore, construction activities associated with the proposed project represent a **potentially significant** impact unless mitigation is applied. The following mitigation measures were formulated using methodologies recommended within the various guidelines of the EDCAQMD to control pollutant emissions.

Mitigation Measures

MM AQ-1: The proposed project shall be required to conform to all EDCAQMD Best Available Fugitive Dust Control Measures and Best Available Fugitive Dust Control Measures for High Wind Conditions as described in Appendix C-1 of the EDCAQMD *Guide to Air Quality Assessment* (2002). These dust suppression techniques are summarized below.

a. **During earth-moving activities (except construction cutting and filling areas, and mining operations):** Either maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the EDCAQMD; two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR

   For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.

b. **Earth-moving – construction fill areas:** Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the District; for areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM method 1557 or other equivalent method approved by the District, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content; two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.

c. **Disturbed surface areas (except completed grading areas):** Apply dust suppression in a sufficient quantity and frequency to maintain a stabilized surface; any areas which cannot be stabilized, as evidenced by wind-driven dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.

d. **Disturbed surface areas – completed grading areas:** Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas which are inaccessible due to excessive slope or other safety conditions; OR

   Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR

   Establish a vegetative ground cover within 21 days after active operations have ceased; ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR

   Utilize any combination of control actions above such that, in total, they apply to all inactive disturbed surface areas.

e. **Unpaved roads:** Water all roads used for any vehicular traffic at least once per every two hours of active operations; OR

Water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph; OR

Apply chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.

f. **Open storage piles:** Apply chemical stabilizers; OR

Apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust; OR

Install a three-sided enclosure with walls with no more than 50 percent porosity that extends, at a minimum, to the top of the pile.

g. **Track-out control:** Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and width of at least 20 feet; OR

Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.

During high wind conditions represented by gusts of over 25 miles per hour:

a. **During earth moving:** Cease all active operations; OR

Apply water to soil not more than 15 minutes prior to moving such soil.

b. **Disturbed surface areas:** On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR

Apply chemical stabilizers prior to a wind event; OR

Apply water to all unstabilized disturbed areas three times per day; if there is any evidence of wind-driven fugitive dust, watering frequency is increased to a minimum of four times per day.

c. **Unpaved roads**: Apply chemical stabilizers prior to a wind event; OR

Apply water twice per hour during active operation; OR

Stop all vehicular traffic.

d. **Open storage piles:** Apply water twice per hour; OR

Install temporary coverings.

e. **Paved road track-out:** Cover all haul vehicles; OR

Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for operation on both public and private roads.

Timing/Implementation: *During construction*

Enforcement/Monitoring: *El Dorado County Air Quality Management District*

MM AQ-2: All architectural coating activities associated construction of the proposed project shall be required to use interior and exterior coatings that contain less than 250 grams of volatile organic compounds (VOC) per liter of coating.

Timing/Implementation: *During construction*

Enforcement/Monitoring: *El Dorado County Air Quality Management District*

Implementation of these mitigation measures would reduce construction-related air pollutant emissions. **Table 5** illustrates the construction-related criteria and precursor emissions that would result from implementation of the proposed project after mitigation is applied.

TABLE 5
CONSTRUCTION-RELATED CRITERIA POLLUTANT AND PRECURSOR EMISSIONS – MITIGATED
(POUNDS PER DAY & TONS PER YEAR)

Construction Activities	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_x)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)
Pounds per Day (Mitigated)						
2012	3.78	29.73	24.63	0.01	80.72	17.95
2013	78.14	15.51	23.25	0.01	1.04	0.92
EDCAQMD Potentially Significant Impact Threshold	82 pounds/day	82 pounds/day	AAQS	–	AAQS	–
Exceed EDCAPC Threshold?	No	No	–	–	–	–

Refer to Appendix A for Model Data Outputs.

As shown in **Table 5**, mitigation measures **MM AQ-1** and **MM AQ-2** would reduce construction-generated emissions of ROG to a level below EDCAQMD significance thresholds. Emissions of PM_{10} and $PM_{2.5}$ would be substantially reduced as well. As previously stated, the EDCAQMD deems construction emissions of CO and PM_{10} to be less than significant if ROG and NO_x are deemed so. Therefore, construction-related air quality impacts associated with the proposed project are **less than significant.**

OPERATIONAL EMISSIONS

Implementation of the proposed project would result in increased regional emissions of PM_{10} and $PM_{2.5}$, as well as ROG, NO_x, and CO, due to increased use of motor vehicles, natural gas, maintenance equipment, and various consumer products, thereby increasing potential operational air quality impacts. Increases in operational air impacts with implementation of the proposed project would generally consist of two sources: stationary and mobile.

As stated above, the EDCAQMD has adopted guidelines for determining potential adverse impacts to air quality in the region. The EDCAQMD guidelines state that operational activities are considered a potentially significant adverse impact if such activities generate total emissions in excess of EDCAQMD established thresholds. According to the *Guide to Air Quality Assessment* (EDCAQMD 2002, Chapter 5, p. 2), if identified ROG and NO_x emissions are under the operation emissions threshold of 82 pounds generated per day and thus considered less than significant, then emissions of CO and PM_{10} would also be considered less than significant.

Table 6 illustrates the operations-related criteria and precursor emissions of an average year that would result from implementation of the proposed project.

TABLE 6
OPERATIONS-RELATED CRITERIA POLLUTANT AND PRECURSOR EMISSIONS
(POUNDS PER DAY & TONS PER YEAR)

Operational Activities	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_x)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)
Pounds per Day (Maximum)						
Proposed Project	20.28	12.43	141.30	0.21	18.07	10.02
EDCAQMD Potentially Significant Impact Threshold	82 pounds/day	82 pounds/day	AAQS	–	AAQS	–
Exceed EDCAPC Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Refer to Appendix A for Model Data Outputs. Emissions estimates are represented as an average between summer and winter season emission projections.

As shown in **Table 6**, project emissions would not exceed EDCAQMD significance thresholds for operational pollutants. Therefore, impacts resulting from project operations would be **less than significant.**

Impact 3 ***Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).***

The EDCAQMD's primary criterion for determining whether a project has significant cumulative impacts is whether the project is consistent with an approved plan in place for the pollutants emitted by the project (i.e., the Sacramento Regional 8-Hour Ozone 2011 Reasonable Further Progress Plan (OAP) and the PM_{10} Implementation/Maintenance Plan and Re-Designation Request for Sacramento County (PM_{10} Plan)). This criterion is applicable to both the construction

and operation phases of a project. According to the EDCAQMD's *Guide to Air Quality Assessment* (2002), a project is conforming to the air quality plans if:

1. The project does not require a change in the existing land use designation (e.g., a general plan amendment or rezone), and projected emissions of ROG and NO_x from the proposed project are equal to or less than the emissions anticipated for the site if developed under the existing land use designation.

2. The project does not exceed the "project alone" significance criteria.

3. The lead agency for the project requires the project to implement any applicable emission reduction measures contained in and/or derived from the air quality plans.

4. The project complies with all applicable district rules and regulations.

As demonstrated in **Impact 2** above, adoption of the Wilson Estates project will not conflict with implementation of the applicable air quality plans, as emissions generated from project construction would not exceed the EDCAQMD thresholds of 82 pounds per day of ROG or 82 pounds per day of NO_x (see **Table 5**). Furthermore, mitigation measures **MM AQ-1** and **MM AQ-2** represent emission reduction measures consistent with the applicable air quality plans (i.e., OAP and PM_{10} Plan) as well as EDCAQMD rules and regulations. Therefore, since the proposed project does not require a change of existing land use designation, does not exceed any significance criteria, and is consistent with the OAP, PM_{10} Plan, and EDCAQMD rules and regulations, it results in a **less than significant** cumulative impact.

Impact 4 ***Expose sensitive receptors to substantial pollutant concentrations.***

The proposed project could create a significant hazard to surrounding residents through exposure to substantial pollutant concentrations such as $PM_{2.5}$ during construction activities and/or other toxic air contaminants.

Sensitive land uses are generally defined as locations where people reside or where the presence of air emissions could adversely affect the use of the land. Typical sensitive receptors include residents, schoolchildren, hospital patients, and the elderly. Residential land uses currently surround the project site. Construction activities would involve the use of a variety of gasoline- or diesel-powered equipment that emits exhaust fumes. Surrounding residents would potentially be exposed to nuisance dust and heavy equipment emission odors (e.g., diesel exhaust) during construction. However, the duration of exposure would be short and exhaust from construction equipment dissipates rapidly. Furthermore, mitigation measure **MM AQ-1** would ensure fugitive dust (PM_{10} and $PM_{2.5}$) control measures are incorporated into the project plans to reduce the emission of fugitive dust during construction activities at the project site. Implementation of this mitigation measure would ensure sensitive receptors in the vicinity of the project site would not be exposed to substantial fugitive dust emissions.

Typically, substantial pollutant concentrations of CO are associated with mobile sources (e.g., vehicle idling time). Localized concentrations of CO are associated with congested roadways or signalized intersections operating at poor levels of service (LOS E or lower). High concentrations of CO may negatively affect local sensitive receptors (e.g., residents, schoolchildren, or hospital patients). Surrounding the project site are sensitive receptors consisting of existing residential uses and an existing roadway network of two-lane roadways with vehicle traffic controlled by stop signs. Traffic volumes in the project area are not large enough to trigger CO concentration issues. As previously described, the project would not result in significant generation of CO emissions. Therefore, the operation of the proposed project is not expected to result in impacts

to sensitive receptors. For those reasons, impacts to sensitive receptors are considered to be **less than significant.**

Impact 5 ***Create objectionable odors affecting a substantial number of people.***

Residential developments are not considered to be an emission source that would result in objectionable odors. Future construction activities could result in odorous emissions from diesel exhaust associated with construction equipment. However, because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, exposure of sensitive receptors to these emissions would be limited. In addition, the EDCAQMD has adopted a nuisance rule that addresses the exposure of nuisance discharges such as unpleasant odors. Rule 205 states that no person shall discharge from any source whatsoever such quantities of odors or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. Therefore, this impact is **less than significant.**

GREENHOUSE GAS SETTING

To fully understand global climate change, it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases (GHGs) that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

For most non-industrial development projects, motor vehicles make up the bulk of GHG emissions produced on an operational basis. The primary greenhouse gases emitted by motor vehicles include carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons (CARB 2004). Following are descriptions of the primary greenhouse gases attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

EFFECTS OF GLOBAL CLIMATE CHANGE

With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state—as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea level rise, and ecological shifts.

Many scientists believe that these changes are accelerating—locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California is anticipated to face intensifying climate changes in coming decades (CNRA 2009). Generally, research indicates that California should expect overall hotter and drier conditions with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased average temperatures, and accelerating sea level rise. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA 2009).

Climate change temperature projections identified in the 2009 California Climate Adaptation Strategy suggest the following (CNRA 2009):

- Average temperature increase is expected to be more pronounced in the summer than in the winter season.
- Inland areas are likely to experience more pronounced warming than coastal regions.
- Heat waves are expected to increase in frequency, with individual heat waves also showing a tendency toward becoming longer, and extending over a larger area, thus more likely to encompass multiple population centers in California at the same time.
- As GHGs remain in the atmosphere for decades, temperature changes over the next 30 to 40 years are already largely determined by past emissions. By 2050, temperatures are projected to increase by an additional 1.8 to 5.4 degrees Fahrenheit (an increase one to three times as large as that which occurred over the entire 20th century).
- By 2100, the models project temperature increases between 3.6 and 9 degrees Fahrenheit.

Precipitation levels are expected to change over the 21st century, though models differ in determining where and how much rain and snowfall patterns will change (CNRA 2009). Eleven out of 12 precipitation models run by the Scripps Institution of Oceanography suggest a small to significant (12–35 percent) overall decrease in precipitation levels by mid-century (CNRA 2009). In addition, higher temperatures increase evaporation and make for a generally drier climate, as higher temperatures hasten snowmelt and increase evaporation and make for a generally drier climate. Moreover, the 2009 California Climate Adaptation Strategy concludes that more precipitation will fall as rain rather than as snow, with important implications for water management in the state. California communities have largely depended on runoff from yearly established snowpack to provide the water supplies during the warmer, drier months of late spring, summer, and early autumn. With rainfall and meltwater running off earlier in the year, the state will face increasing challenges of storing the water for the dry season while protecting Californians downstream from floodwaters during the wet season.

There may be dramatic changes in average temperature and precipitation. In the next few decades, it is likely that the state will face a growing number of climate-change-related extreme events such as heat waves, wildfires, droughts, and floods. Because communities, infrastructure, and other assets are at risk, such events can cause significant damages and are already responsible for a large fraction of near-term climate-related impacts every year (CNRA 2009).

REGULATORY FRAMEWORK

The following federal, state, and local regulations, plans, programs, and guidelines are applicable to the proposed project:

State Laws and Regulations

Beginning in 2002, California has enacted the following acts, executive orders, and administrative practices to address climate change and greenhouse gas emissions:

- Assembly Bill (AB) 1493, codified at Health and Safety Code Sections 42823 and 43018.5

- Senate Bill (SB) 1771 – Greenhouse Gas Emission Reductions: Climate Change, codified at Health and Safety Code Section 42800 et seq. and Public Resources Code Section 25730 et seq.
- Executive Order S-3-05 (2005)
- AB 32, the Global Warming Solutions Act, codified at Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599
- SB 375, codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588, 14522.1, 14522.2, and 65080.01 as well as Public Resources Code Sections 21061.3, 21159.28, and Chapter 4.2
- SB 1368, codified at Public Utilities Code Chapter 3
- SB 1771, codified at Health and Safety Code Article 6 and Public Resources Code Chapter 8.5
- SB 527, codified at Health and Safety Code Sections 42400.4, 42801, 42810, 42821–42824, 42840–42843, 42860, 42870, 43021, 42410, 42801.1, 43023
- SB 1078, Public Utilities Code Sections 387, 390.1, 399.25 and Article 16
- Executive Order S-13-08 (2008)
- California Building Standards Code – Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, established in 1978 in response to a legislative mandate to reduce California's energy consumption
- Climate Change Scoping Plan – In October of 2008, CARB published its Climate Change Proposed Scoping Plan, which is the State's plan to achieve GHG reductions in California required by AB 32.

GREENHOUSE GAS IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the application of the following State CEQA Guidelines Appendix G thresholds of significance:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 1 ***Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.***

Implementation of the proposed project could contribute to increases of GHG emissions that are associated with global climate change, such as CO_2, N_2O, and CH_4. Changes to state law, the Global Warming Solutions Act of 2006, have established requirements to begin to deal with greenhouse gas emissions in California. One of the requirements in the law is for environmental documents to identify greenhouse gas emissions that are expected to occur as a result of the construction and operation of projects within the state.

The proposed project is under the jurisdiction of the EDCAQMD, which does not currently have an adopted threshold of significance for GHG emissions. Thresholds of significance illustrate the extent of an impact and are a basis from which to apply mitigation measures.

Short-Term Construction

In April 2011, the Sacramento Metropolitan Air Quality Management District (SMAQMD) updated its CEQA Guide to Air Quality Assessment to include guidance for assessing and mitigating construction-related GHG emissions. While the SMAQMD does not have a threshold of significance for GHG emissions either, SMAQMD recommends addressing the potential impacts of construction-generated GHG emissions by quantifying the finite mass emissions of GHGs that would be generated by project construction, and the input parameters and assumptions used to estimate these values, as well as a discussion of feasible mitigation necessary to reduce impacts. For the purposes of evaluating the proposed project's construction-related GHG impacts, emissions resulting from construction of the proposed project will be quantified and GHG emission reduction strategies will be identified. This methodology was considered appropriate by the EDCAQMD (Otani 2011).

During construction activities, GHGs would be emitted from the operation of construction equipment and from worker and building supply vendor vehicles. **Table 7** illustrates the construction-related carbon dioxide equivalent (CO_2e) emissions that would result from implementation of the proposed project. Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps over 21 times more heat per molecule than CO_2, and N_2O absorbs 310 times more heat per molecule than CO_2. Greenhouse gas emissions are presented in CO_2e, which weight each gas by its global warming potential. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

The resultant emissions of these activities were calculated using the CalEEMod model (see **Appendix B**. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for the use of government agencies, land use planners, and environmental professionals. As indicated, construction of the development allowed under the proposed project would generate total emissions of approximately 630 metric tons of CO_2e in the first year of construction.

TABLE 7
CONSTRUCTION-RELATED GHG EMISSIONS (AVERAGE YEAR)
(METRIC TONS PER YEAR)

Source	Carbon Dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)	Carbon Dioxide Equivalent (CO_2e)
Construction Activities				
Year 1	629	0.08	0.00	631
Year 2	521	0.06	0.00	522
Year 3 (if necessary)	81	0.01	0.00	82

Refer to Appendix B for Model Data Outputs.

The SMAQMD recommends the identification of GHG reduction strategies during construction activities. Therefore, without an attempt to mitigate construction-generated GHG emissions, development of the project would be **potentially significant**. The proposed project shall be subject to the following measures in effect at the time of construction as mandated in mitigation measure **MM GHG-1**.

Mitigation Measures

MM GHG-1: The proposed project shall be required to implement the following management practices during construction activities:

a) Perform 90-day low-NO_x tune-ups for off-road equipment operating during construction.

b) Limit allowable idling to 5 minutes for trucks and heavy equipment.

c) Construction operators shall use Tier 3-rated engines during site grading for all equipment exceeding 100 horsepower, if feasible.

d) Construction operators shall utilize equipment with engines equipped with diesel oxidation catalysts, if available.

e) Construction operators shall utilize diesel particulate filter and diesel oxidation catalyst on heavy equipment, where feasible.

Timing/Implementation: *During construction*

Enforcement/Monitoring: *El Dorado County Air Quality Management District*

Adherence to mitigation measure **MM GHG-1** would reduce construction-related GHG emissions. Therefore, the construction-related GHG impacts of the proposed project would be considered **less than significant**.

Long-Term Operation

As stated above, the EDCAQMD does not currently have an adopted threshold of significance for GHG emissions. In January 2009, the State of California, through the California Air Resources Board (CARB), published its interim greenhouse gas threshold. This interim GHG threshold has

been set at 1,600 metric tons of carbon dioxide equivalents ($MTCO_2e$) per year for residential projects such as the proposed land use. In other words, projects resulting in the generation of more than 1,600 $MTCO_2e$ per year would surpass the CARB interim GHG threshold and be considered a significant impact. For the purposes of evaluating the proposed project's GHG operational impacts, emissions resulting from project operations have been quantified and the quantified emissions are compared with the CARB interim GHG threshold. This methodology was considered appropriate by the EDCAQMD (Otani 2011).

Table 8 illustrates the operational-related CO_2e emissions projected to be generated annually after construction of the project. The resultant emissions of these activities were calculated using the CalEEMod model (see **Appendix B**.

TABLE 8
OPERATIONAL GREENHOUSE GAS EMISSIONS
(METRIC TONS PER YEAR)

Emission Type	CO_2e
Operations	
Area Source (landscaping, hearth)	144
Energy (electricity and natural gas)	237
Mobile (vehicles)	874
Waste	20
Water Conveyance	12
Total	1,287
California Air Resources Board Interim Greenhouse Gas Threshold	1,600
Threshold Exceeded?	No

Refer to Appendix B for Model Data Outputs.

As shown in **Table 8**, GHG emissions projected to result with development and operations of the proposed project would not exceed the CARB interim GHG threshold of 1,600 $MTCO_2e$ per year. Therefore, the project's impact is considered **less than significant.**

Impact 2 ***Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.***

El Dorado County does not have local policies or ordinances with the purpose of reducing GHG emissions with the exception of El Dorado County Board of Supervisors Environmental Vision for El Dorado County, Resolution No. 29-2008, which sets forth broad goals to address positive environmental changes. Some of the primary goals of Resolution No. 29-2008 are to promote carpooling, reduce vehicle miles traveled, and promote recycling and utilization of recycled products. There are no aspects of the proposed project that would inhibit these goals.

The County is subject to compliance with the Global Warming Solutions Act (AB 32), which set 2020 GHG emissions reduction goals into law. As identified in **Table 8**, the proposed project would not exceed CARB interim GHG significance thresholds that were established with the purpose of complying with AB 32. Also, adherence to mitigation measure **MM GHG-1** would reduce construction-related GHG emissions. Therefore, the proposed project would not conflict with AB 32, and this impact is **less than significant.**

REFERENCES

California Air Resources Board (CARB). 2004. *Climate Change Emissions Control Regulations.*

———. 2006. *The 2006 California Almanac of Emissions and Air Quality*. Sacramento, CA.

———. 2010a. *Area Designation Maps/State and National.* http://www.arb.ca.gov/desig/adm/adm.htm (accessed July 8, 2011).

———. 2010b. *Ambient Air Quality Standards.* http://www.arb.ca.gov/research/aaqs/aaqs2.pdf (accessed July 8, 2011).

———. 2011. *Air Quality Data Statistics.* http://www.arb.ca.gov/adam/index.html (accessed July 8, 2011).

California Natural Resources Agency (CNRA). 2009. *2009 California Climate Adaptation Strategy.*

El Dorado County Air Pollution Control District (EDCAQMD). 2002. *Guide to Air Quality Assessment.*

El Dorado County. 2008. *El Dorado County Board of Supervisors Environmental Vision for El Dorado County, Resolution No. 29-2008.* Adopted March 25, 2008.

Otani, Dennis. 2011. El Dorado County Air Quality Management District. Personal correspondence. July 8.

Sacramento Metropolitan Air Quality Management District (SMAQMD). 2008. *Sacramento Regional 8-Hour Ozone 2011 Reasonable Further Progress Plan.*

———. 2010. *PM_{10} Implementation/Maintenance Plan and Re-Designation Request for Sacramento County.*

———. 2011. *CEQA Guide to Air Quality Assessment.* April 2011.

APPENDICES

APPENDIX A

7/13/2011 8:47:37 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\AQ-GHG Models\Wilson Estates\Urbemis\Wilson Estates.urb924

Project Name: Wilson Estates

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

7/13/2011 8:47:37 AM

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2012 TOTALS (lbs/day unmitigated)	3.78	29.73	24.63	0.01	140.01	1.54	141.55	29.24	1.42	30.66
2012 TOTALS (lbs/day mitigated)	3.78	29.73	24.63	0.01	79.18	1.54	80.72	16.54	1.42	17.95
2013 TOTALS (lbs/day unmitigated)	86.81	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
2013 TOTALS (lbs/day mitigated)	78.14	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	4.33	0.78	3.00	0.00	0.01	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	7.45	8.42	82.77	0.05	9.59	1.86

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	11.78	9.20	85.77	0.05	9.60	1.87

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5

Time Slice 3/30/2012-5/11/2012 Active Days: 31	3.78	29.73	18.15	0.00	140.01	1.54	141.55	29.24	1.42	30.66
Fine Grading 03/30/2012-05/11/2012	3.78	29.73	18.15	0.00	140.01	1.54	141.55	29.24	1.42	30.66
Fine Grading Dust	0.00	0.00	0.00	0.00	140.00	0.00	140.00	29.24	0.00	29.24
Fine Grading Off Road Diesel	3.71	29.61	16.24	0.00	0.00	1.54	1.54	0.00	1.42	1.42
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.12	1.91	0.00	0.01	0.00	0.01	0.00	0.00	0.01
Time Slice 5/14/2012-6/11/2012 Active Days: 21	3.33	15.88	11.89	0.01	0.02	1.25	1.28	0.01	1.15	1.16
Asphalt 05/12/2012-06/11/2012	3.33	15.88	11.89	0.01	0.02	1.25	1.28	0.01	1.15	1.16
Paving Off-Gas	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.23	13.48	8.10	0.00	0.00	1.17	1.17	0.00	1.07	1.07
Paving On Road Diesel	0.15	2.21	0.74	0.00	0.01	0.08	0.09	0.00	0.07	0.08
Paving Worker Trips	0.12	0.19	3.05	0.00	0.01	0.01	0.02	0.00	0.00	0.01
Time Slice 6/12/2012-12/31/2012 Active Days: 145	3.73	16.60	24.63	0.01	0.05	1.10	1.15	0.02	1.01	1.02
Building 06/12/2012-02/22/2013	3.73	16.60	24.63	0.01	0.05	1.10	1.15	0.02	1.01	1.02
Building Off Road Diesel	3.14	14.81	10.52	0.00	0.00	1.04	1.04	0.00	0.95	0.95
Building Vendor Trips	0.08	0.98	0.92	0.00	0.01	0.04	0.04	0.00	0.03	0.04
Building Worker Trips	0.51	0.81	13.20	0.01	0.04	0.02	0.07	0.02	0.02	0.03
Time Slice 1/1/2013-2/22/2013 Active Days: 39	3.42	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
Building 06/12/2012-02/22/2013	3.42	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
Building Off Road Diesel	2.88	13.91	10.20	0.00	0.00	0.93	0.93	0.00	0.86	0.86
Building Vendor Trips	0.08	0.87	0.85	0.00	0.01	0.03	0.04	0.00	0.03	0.03
Building Worker Trips	0.46	0.74	12.20	0.01	0.04	0.02	0.07	0.02	0.02	0.03

Time Slice 2/25/2013-4/12/2013 Active Days: 35	86.81	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Coating 02/23/2013-04/12/2013	86.81	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Architectural Coating	86.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 3/30/2012 - 5/11/2012 - Fine Site Grading

Total Acres Disturbed: 28

Maximum Daily Acreage Disturbed: 7

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (106 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 5/12/2012 - 6/11/2012 - Paving

Acres to be Paved: 7

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 6/12/2012 - 2/22/2013 - Building Construction

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 2/23/2013 - 4/12/2013 - Architectural Coating

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
Time Slice 3/30/2012-5/11/2012 Active Days: 31	3.78	29.73	18.15	0.00	79.18	1.54	80.72	16.54	1.42	17.95
Fine Grading 03/30/2012-05/11/2012	3.78	29.73	18.15	0.00	79.18	1.54	80.72	16.54	1.42	17.95
Fine Grading Dust	0.00	0.00	0.00	0.00	79.17	0.00	79.17	16.53	0.00	16.53
Fine Grading Off Road Diesel	3.71	29.61	16.24	0.00	0.00	1.54	1.54	0.00	1.42	1.42
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.12	1.91	0.00	0.01	0.00	0.01	0.00	0.00	0.01

Time Slice 5/14/2012-6/11/2012 Active Days: 21	3.33	15.88	11.89	0.01	0.02	1.25	1.28	0.01	1.15	1.16
Asphalt 05/12/2012-06/11/2012	3.33	15.88	11.89	0.01	0.02	1.25	1.28	0.01	1.15	1.16
Paving Off-Gas	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.23	13.48	8.10	0.00	0.00	1.17	1.17	0.00	1.07	1.07
Paving On Road Diesel	0.15	2.21	0.74	0.00	0.01	0.08	0.09	0.00	0.07	0.08
Paving Worker Trips	0.12	0.19	3.05	0.00	0.01	0.01	0.02	0.00	0.00	0.01
Time Slice 6/12/2012-12/31/2012 Active Days: 145	3.73	16.60	24.63	0.01	0.05	1.10	1.15	0.02	1.01	1.02
Building 06/12/2012-02/22/2013	3.73	16.60	24.63	0.01	0.05	1.10	1.15	0.02	1.01	1.02
Building Off Road Diesel	3.14	14.81	10.52	0.00	0.00	1.04	1.04	0.00	0.95	0.95
Building Vendor Trips	0.08	0.98	0.92	0.00	0.01	0.04	0.04	0.00	0.03	0.04
Building Worker Trips	0.51	0.81	13.20	0.01	0.04	0.02	0.07	0.02	0.02	0.03
Time Slice 1/1/2013-2/22/2013 Active Days: 39	3.42	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
Building 06/12/2012-02/22/2013	3.42	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
Building Off Road Diesel	2.88	13.91	10.20	0.00	0.00	0.93	0.93	0.00	0.86	0.86
Building Vendor Trips	0.08	0.87	0.85	0.00	0.01	0.03	0.04	0.00	0.03	0.03
Building Worker Trips	0.46	0.74	12.20	0.01	0.04	0.02	0.07	0.02	0.02	0.03
Time Slice 2/25/2013-4/12/2013 Active Days: 35	78.14	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Coating 02/23/2013-04/12/2013	78.14	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Architectural Coating	78.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 3/30/2012 - 5/11/2012 - Fine Site Grading

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

The following mitigation measures apply to Phase: Architectural Coating 2/23/2013 - 4/12/2013 - Architectural Coating

For Residential Architectural Coating Measures, the Residential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Residential Architectural Coating Measures, the Residential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5
Natural Gas	0.06	0.75	0.32	0.00	0.00	0.00
Hearth - No Summer Emissions						
Landscape	0.48	0.03	2.68	0.00	0.01	0.01
Consumer Products	2.94					
Architectural Coatings	0.85					
TOTALS (lbs/day, unmitigated)	4.33	0.78	3.00	0.00	0.01	0.01

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25
Single family housing	7.45	8.42	82.77	0.05	9.59	1.86
TOTALS (lbs/day, unmitigated)	7.45	8.42	82.77	0.05	9.59	1.86

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Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2013 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	28.00	10.83	dwelling units	60.00	649.80	5,555.60
					649.80	5,555.60

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	32.5	0.9	98.8	0.3
Light Truck < 3750 lbs	24.5	2.4	89.4	8.2
Light Truck 3751-5750 lbs	19.7	1.0	98.5	0.5
Med Truck 5751-8500 lbs	9.2	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	68.0	32.0
Lite-Heavy Truck 10,001-14,000 lbs	1.2	0.0	41.7	58.3
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	6.4	54.7	45.3	0.0
School Bus	0.1	0.0	0.0	100.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motor Home	2.0	0.0	85.0	15.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: H:\AQ-GHG Models\Wilson Estates\Urbemis\Wilson Estates.urb924

Project Name: Wilson Estates

Project Location: Mountain Counties Air Basin

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

7/13/2011 8:47:49 AM

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2012 TOTALS (lbs/day unmitigated)	3.78	29.73	24.63	0.01	140.01	1.54	141.55	29.24	1.42	30.66
2012 TOTALS (lbs/day mitigated)	3.78	29.73	24.63	0.01	79.18	1.54	80.72	16.54	1.42	17.95
2013 TOTALS (lbs/day unmitigated)	86.81	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
2013 TOTALS (lbs/day mitigated)	78.14	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	20.47	3.02	105.20	0.33	16.95	16.31

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	8.32	12.64	91.63	0.05	9.59	1.86

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	28.79	15.66	196.83	0.38	26.54	18.17

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5

Time Slice 3/30/2012-5/11/2012 Active Days: 31	3.78	29.73	18.15	0.00	140.01	1.54	141.55	29.24	1.42	30.66
Fine Grading 03/30/2012-05/11/2012	3.78	29.73	18.15	0.00	140.01	1.54	141.55	29.24	1.42	30.66
Fine Grading Dust	0.00	0.00	0.00	0.00	140.00	0.00	140.00	29.24	0.00	29.24
Fine Grading Off Road Diesel	3.71	29.61	16.24	0.00	0.00	1.54	1.54	0.00	1.42	1.42
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.12	1.91	0.00	0.01	0.00	0.01	0.00	0.00	0.01
Time Slice 5/14/2012-6/11/2012 Active Days: 21	3.33	15.88	11.89	0.01	0.02	1.25	1.28	0.01	1.15	1.16
Asphalt 05/12/2012-06/11/2012	3.33	15.88	11.89	0.01	0.02	1.25	1.28	0.01	1.15	1.16
Paving Off-Gas	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.23	13.48	8.10	0.00	0.00	1.17	1.17	0.00	1.07	1.07
Paving On Road Diesel	0.15	2.21	0.74	0.00	0.01	0.08	0.09	0.00	0.07	0.08
Paving Worker Trips	0.12	0.19	3.05	0.00	0.01	0.01	0.02	0.00	0.00	0.01
Time Slice 6/12/2012-12/31/2012 Active Days: 145	3.73	16.60	24.63	0.01	0.05	1.10	1.15	0.02	1.01	1.02
Building 06/12/2012-02/22/2013	3.73	16.60	24.63	0.01	0.05	1.10	1.15	0.02	1.01	1.02
Building Off Road Diesel	3.14	14.81	10.52	0.00	0.00	1.04	1.04	0.00	0.95	0.95
Building Vendor Trips	0.08	0.98	0.92	0.00	0.01	0.04	0.04	0.00	0.03	0.04
Building Worker Trips	0.51	0.81	13.20	0.01	0.04	0.02	0.07	0.02	0.02	0.03
Time Slice 1/1/2013-2/22/2013 Active Days: 39	3.42	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
Building 06/12/2012-02/22/2013	3.42	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
Building Off Road Diesel	2.88	13.91	10.20	0.00	0.00	0.93	0.93	0.00	0.86	0.86
Building Vendor Trips	0.08	0.87	0.85	0.00	0.01	0.03	0.04	0.00	0.03	0.03
Building Worker Trips	0.46	0.74	12.20	0.01	0.04	0.02	0.07	0.02	0.02	0.03

Time Slice 2/25/2013-4/12/2013 Active Days: 35	86.81	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Coating 02/23/2013-04/12/2013	86.81	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Architectural Coating	86.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 3/30/2012 - 5/11/2012 - Fine Site Grading

Total Acres Disturbed: 28

Maximum Daily Acreage Disturbed: 7

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 5/12/2012 - 6/11/2012 - Paving

Acres to be Paved: 7

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 6/12/2012 - 2/22/2013 - Building Construction

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 2/23/2013 - 4/12/2013 - Architectural Coating

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
Time Slice 3/30/2012-5/11/2012 Active Days: 31	3.78	29.73	18.15	0.00	79.18	1.54	80.72	16.54	1.42	17.95
Fine Grading 03/30/2012-05/11/2012	3.78	29.73	18.15	0.00	79.18	1.54	80.72	16.54	1.42	17.95
Fine Grading Dust	0.00	0.00	0.00	0.00	79.17	0.00	79.17	16.53	0.00	16.53
Fine Grading Off Road Diesel	3.71	29.61	16.24	0.00	0.00	1.54	1.54	0.00	1.42	1.42
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.12	1.91	0.00	0.01	0.00	0.01	0.00	0.00	0.01

Time Slice 5/14/2012-6/11/2012 Active Days: 21	3.33	15.88	11.89	0.01	0.02	1.25	1.28	0.01	1.15	1.16
Asphalt 05/12/2012-06/11/2012	3.33	15.88	11.89	0.01	0.02	1.25	1.28	0.01	1.15	1.16
Paving Off-Gas	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.23	13.48	8.10	0.00	0.00	1.17	1.17	0.00	1.07	1.07
Paving On Road Diesel	0.15	2.21	0.74	0.00	0.01	0.08	0.09	0.00	0.07	0.08
Paving Worker Trips	0.12	0.19	3.05	0.00	0.01	0.01	0.02	0.00	0.00	0.01
Time Slice 6/12/2012-12/31/2012 Active Days: 145	3.73	16.60	24.63	0.01	0.05	1.10	1.15	0.02	1.01	1.02
Building 06/12/2012-02/22/2013	3.73	16.60	24.63	0.01	0.05	1.10	1.15	0.02	1.01	1.02
Building Off Road Diesel	3.14	14.81	10.52	0.00	0.00	1.04	1.04	0.00	0.95	0.95
Building Vendor Trips	0.08	0.98	0.92	0.00	0.01	0.04	0.04	0.00	0.03	0.04
Building Worker Trips	0.51	0.81	13.20	0.01	0.04	0.02	0.07	0.02	0.02	0.03
Time Slice 1/1/2013-2/22/2013 Active Days: 39	3.42	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
Building 06/12/2012-02/22/2013	3.42	15.51	23.25	0.01	0.05	0.99	1.04	0.02	0.90	0.92
Building Off Road Diesel	2.88	13.91	10.20	0.00	0.00	0.93	0.93	0.00	0.86	0.86
Building Vendor Trips	0.08	0.87	0.85	0.00	0.01	0.03	0.04	0.00	0.03	0.03
Building Worker Trips	0.46	0.74	12.20	0.01	0.04	0.02	0.07	0.02	0.02	0.03
Time Slice 2/25/2013-4/12/2013 Active Days: 35	78.14	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Coating 02/23/2013-04/12/2013	78.14	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Architectural Coating	78.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.09	1.43	0.00	0.01	0.00	0.01	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 3/30/2012 - 5/11/2012 - Fine Site Grading

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For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

The following mitigation measures apply to Phase: Architectural Coating 2/23/2013 - 4/12/2013 - Architectural Coating

For Residential Architectural Coating Measures, the Residential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Residential Architectural Coating Measures, the Residential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5
Natural Gas	0.06	0.75	0.32	0.00	0.00	0.00
Hearth	16.62	2.27	104.88	0.33	16.95	16.31
Landscaping - No Winter Emissions						
Consumer Products	2.94					
Architectural Coatings	0.85					
TOTALS (lbs/day, unmitigated)	20.47	3.02	105.20	0.33	16.95	16.31

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25
Single family housing	8.32	12.64	91.63	0.05	9.59	1.86
TOTALS (lbs/day, unmitigated)	8.32	12.64	91.63	0.05	9.59	1.86

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Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2013 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	28.00	10.83	dwelling units	60.00	649.80	5,555.60
					649.80	5,555.60

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	32.5	0.9	98.8	0.3
Light Truck < 3750 lbs	24.5	2.4	89.4	8.2
Light Truck 3751-5750 lbs	19.7	1.0	98.5	0.5
Med Truck 5751-8500 lbs	9.2	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	68.0	32.0
Lite-Heavy Truck 10,001-14,000 lbs	1.2	0.0	41.7	58.3
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	6.4	54.7	45.3	0.0
School Bus	0.1	0.0	0.0	100.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motor Home	2.0	0.0	85.0	15.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Operational Changes to Defaults

APPENDIX B

Wilson Estates - Greenhouse Gases

El Dorado County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Single Family Housing	60	Dwelling Unit

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Utility Company**	Pacific Gas & Electric Company
Climate Zone	2	**Precipitation Freq (Days)**	70		

1.3 User Entered Comments

Project Characteristics -

Land Use - Project Site - 28 Acres

Construction Phase - Project Has No Demolition Phase

Vehicle Trips - 10.83 Average Daily Trips Per Kimley-Horn and Associates, Inc., 2011

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2011											0.00	629.36	629.36	0.08	0.00	630.95
2012											0.00	521.14	521.14	0.06	0.00	522.44
2013											0.00	81.48	81.48	0.01	0.00	81.73
Total											0.00	1,231.98	1,231.98	0.15	0.00	1,235.12

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2011											0.00	629.36	629.36	0.08	0.00	630.95
2012											0.00	521.14	521.14	0.06	0.00	522.44
2013											0.00	81.48	81.48	0.01	0.00	81.73
Total											0.00	1,231.98	1,231.98	0.15	0.00	1,235.12

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											61.98	78.71	140.69	0.06	0.01	143.74
Energy											0.00	236.03	236.03	0.01	0.00	237.49
Mobile											0.00	873.03	873.03	0.06	0.00	874.29
Waste											8.73	0.00	8.73	0.52	0.00	19.56
Water											0.00	8.71	8.71	0.12	0.00	12.18
Total											**70.71**	**1,196.48**	**1,267.19**	**0.77**	**0.01**	**1,287.26**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											61.98	78.71	140.69	0.06	0.01	143.74
Energy											0.00	236.03	236.03	0.01	0.00	237.49
Mobile											0.00	873.03	873.03	0.06	0.00	874.29
Waste											8.73	0.00	8.73	0.52	0.00	19.56
Water											0.00	8.71	8.71	0.12	0.00	12.18
Total											**70.71**	**1,196.48**	**1,267.19**	**0.77**	**0.01**	**1,287.26**

3.0 Construction Detail

3.1 Mitigation Measures Construction

3.3 Site Preparation - 2011

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	72.53	72.53	0.01	0.00	72.72
Total											0.00	72.53	72.53	0.01	0.00	72.72

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	1.58	1.58	0.00	0.00	1.58
Total											0.00	1.58	1.58	0.00	0.00	1.58

3.3 Site Preparation - 2011

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	72.53	72.53	0.01	0.00	72.72
Total											**0.00**	**72.53**	**72.53**	**0.01**	**0.00**	**72.72**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	1.58	1.58	0.00	0.00	1.58
Total											**0.00**	**1.58**	**1.58**	**0.00**	**0.00**	**1.58**

3.4 Grading - 2011

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	221.54	221.54	0.02	0.00	222.05
Total											**0.00**	**221.54**	**221.54**	**0.02**	**0.00**	**222.05**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	3.94	3.94	0.00	0.00	3.95
Total											**0.00**	**3.94**	**3.94**	**0.00**	**0.00**	**3.95**

3.4 Grading - 2011

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	221.54	221.54	0.02	0.00	222.05
Total											**0.00**	**221.54**	**221.54**	**0.02**	**0.00**	**222.05**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	3.94	3.94	0.00	0.00	3.95
Total											**0.00**	**3.94**	**3.94**	**0.00**	**0.00**	**3.95**

3.5 Building Construction - 2011

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	302.33	302.33	0.04	0.00	303.19
Total											**0.00**	**302.33**	**302.33**	**0.04**	**0.00**	**303.19**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	11.55	11.55	0.00	0.00	11.56
Worker											0.00	15.89	15.89	0.00	0.00	15.91
Total											**0.00**	**27.44**	**27.44**	**0.00**	**0.00**	**27.47**

3.5 Building Construction - 2011

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	302.33	302.33	0.04	0.00	303.19
Total											0.00	302.33	302.33	0.04	0.00	303.19

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	11.55	11.55	0.00	0.00	11.56
Worker											0.00	15.89	15.89	0.00	0.00	15.91
Total											0.00	27.44	27.44	0.00	0.00	27.47

3.5 Building Construction - 2012

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	478.23	478.23	0.06	0.00	479.48
Total											**0.00**	**478.23**	**478.23**	**0.06**	**0.00**	**479.48**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	18.36	18.36	0.00	0.00	18.37
Worker											0.00	24.55	24.55	0.00	0.00	24.59
Total											**0.00**	**42.91**	**42.91**	**0.00**	**0.00**	**42.96**

3.5 Building Construction - 2012

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	478.23	478.23	0.06	0.00	479.48
Total											**0.00**	**478.23**	**478.23**	**0.06**	**0.00**	**479.48**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	18.36	18.36	0.00	0.00	18.37
Worker											0.00	24.55	24.55	0.00	0.00	24.59
Total											**0.00**	**42.91**	**42.91**	**0.00**	**0.00**	**42.96**

3.5 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	25.65	25.65	0.00	0.00	25.71
Total											**0.00**	**25.65**	**25.65**	**0.00**	**0.00**	**25.71**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.99	0.99	0.00	0.00	0.99
Worker											0.00	1.29	1.29	0.00	0.00	1.29
Total											**0.00**	**2.28**	**2.28**	**0.00**	**0.00**	**2.28**

3.5 Building Construction - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	25.65	25.65	0.00	0.00	25.71
Total											**0.00**	**25.65**	**25.65**	**0.00**	**0.00**	**25.71**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.99	0.99	0.00	0.00	0.99
Worker											0.00	1.29	1.29	0.00	0.00	1.29
Total											**0.00**	**2.28**	**2.28**	**0.00**	**0.00**	**2.28**

3.6 Paving - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	46.31	46.31	0.01	0.00	46.47
Paving											0.00	0.00	0.00	0.00	0.00	0.00
Total											**0.00**	**46.31**	**46.31**	**0.01**	**0.00**	**46.47**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	2.19	2.19	0.00	0.00	2.20
Total											**0.00**	**2.19**	**2.19**	**0.00**	**0.00**	**2.20**

3.6 Paving - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	46.31	46.31	0.01	0.00	46.47
Paving											0.00	0.00	0.00	0.00	0.00	0.00
Total											**0.00**	**46.31**	**46.31**	**0.01**	**0.00**	**46.47**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	2.19	2.19	0.00	0.00	2.20
Total											**0.00**	**2.19**	**2.19**	**0.00**	**0.00**	**2.20**

3.7 Architectural Coating - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	4.46	4.46	0.00	0.00	4.48
Total											**0.00**	**4.46**	**4.46**	**0.00**	**0.00**	**4.48**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	0.58	0.58	0.00	0.00	0.59
Total											**0.00**	**0.58**	**0.58**	**0.00**	**0.00**	**0.59**

3.7 Architectural Coating - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	4.46	4.46	0.00	0.00	4.48
Total											**0.00**	**4.46**	**4.46**	**0.00**	**0.00**	**4.48**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	0.58	0.58	0.00	0.00	0.59
Total											**0.00**	**0.58**	**0.58**	**0.00**	**0.00**	**0.59**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.00	873.03	873.03	0.06	0.00	874.29
Unmitigated											0.00	873.03	873.03	0.06	0.00	874.29
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	649.80	649.80	649.80	1,861,380	1,861,380
Total	649.80	649.80	649.80	1,861,380	1,861,380

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
Single Family Housing	10.80	7.30	7.50	42.60	21.00	36.40

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.00	119.64	119.64	0.01	0.00	120.39
Electricity Unmitigated											0.00	119.64	119.64	0.01	0.00	120.39
NaturalGas Mitigated											0.00	116.39	116.39	0.00	0.00	117.09
NaturalGas Unmitigated											0.00	116.39	116.39	0.00	0.00	117.09
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Single Family Housing	2.18098e+006											0.00	116.39	116.39	0.00	0.00	117.09
Total												0.00	116.39	116.39	0.00	0.00	117.09

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Single Family Housing	2.18098e+006											0.00	116.39	116.39	0.00	0.00	117.09
Total												0.00	116.39	116.39	0.00	0.00	117.09

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Single Family Housing	411275					119.64	0.01	0.00	120.39
Total						119.64	0.01	0.00	120.39

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Single Family Housing	411275					119.64	0.01	0.00	120.39
Total						**119.64**	**0.01**	**0.00**	**120.39**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											61.98	78.71	140.69	0.06	0.01	143.74
Unmitigated											61.98	78.71	140.69	0.06	0.01	143.74
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products											0.00	0.00	0.00	0.00	0.00	0.00
Hearth											61.98	77.98	139.95	0.06	0.01	142.98
Landscaping											0.00	0.74	0.74	0.00	0.00	0.75
Total											**61.98**	**78.72**	**140.69**	**0.06**	**0.01**	**143.73**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products											0.00	0.00	0.00	0.00	0.00	0.00
Hearth											61.98	77.98	139.95	0.06	0.01	142.98
Landscaping											0.00	0.74	0.74	0.00	0.00	0.75
Total											**61.98**	**78.72**	**140.69**	**0.06**	**0.01**	**143.73**

7.0 Water Detail

7.1 Mitigation Measures Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					8.71	0.12	0.00	12.18
Unmitigated					8.71	0.12	0.00	12.18
Total	NA	NA	NA	NA	NA	NA	NA	NA

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Single Family Housing	3.90924 / 2.46452					8.71	0.12	0.00	12.18
Total						8.71	0.12	0.00	12.18

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Single Family Housing	3.90924 / 2.46452					8.71	0.12	0.00	12.18
Total						**8.71**	**0.12**	**0.00**	**12.18**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					8.73	0.52	0.00	19.56
Unmitigated					8.73	0.52	0.00	19.56
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Single Family Housing	43					8.73	0.52	0.00	19.56
Total						**8.73**	**0.52**	**0.00**	**19.56**

Mitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Single Family Housing	43					8.73	0.52	0.00	19.56
Total						**8.73**	**0.52**	**0.00**	**19.56**

9.0 Vegetation

WILSON ESTATES

AIR QUALITY AND GREENHOUSE GAS EMISSIONS UPDATE

Prepared by:

PMC®

2729 PROSPECT PARK DRIVE, SUITE 220
RANCHO CORDOVA, CA 95670

OCTOBER 2012

Attachment 6

INTRODUCTION

This report documents the results of both an air quality impact analysis and greenhouse gas (GHG) impact analysis completed for the updated of the proposed Wilson Estates project.

CRITERIA AIR POLLUTANTS

CONSTRUCTION EMISSIONS

The El Dorado County Air Quality Management District (EDCAQMD) has adopted guidelines for determining potential adverse impacts to air quality in the region. The EDCAQMD guidelines state that construction activities are considered a potentially significant adverse impact if such activities generate total emissions in excess of EDCAQMD established thresholds. According to the *Guide to Air Quality Assessment* (EDCAQMD 2002, Chapter 4, p. 3), if identified ROG and NO_x emissions are under the construction emissions threshold of 82 pounds generated per day and thus considered less than significant, then emissions of CO and PM_{10} would also be considered less than significant.

Table 1 illustrates the construction-related criteria and precursor emissions that would result from implementation of the proposed project.

TABLE 1
CONSTRUCTION-RELATED CRITERIA POLLUTANT AND PRECURSOR EMISSIONS
(POUNDS PER DAY)

Construction Phases	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_x)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)
Summer Emissions - Pounds per Day (Unmitigated)						
Construction	79.29	65.70	37.06	0.07	11.38	6.41
Winter Emissions - Pounds per Day (Unmitigated)						
Construction	79.29	65.71	36.97	0.07	11.38	6.41
EDCAQMD Potentially Significant Impact Threshold	82 pounds/day	82 pounds/day	--	--	--	--
Exceed SMAQMD Threshold?	**No**	**No**	--	--	--	--

Source: CalEMod version 2011.1.1. Diesel-fueled construction equipment load factors reduced 33% to account for offroad emission overestimation (CARB 2010).

As demonstrated in **Table 1**, the proposed project would not result in the exceedance of EDCAQMD thresholds for daily emissions during construction activities.

OPERATIONAL EMISSIONS

EDCAQMD has adopted guidelines for determining potential adverse impacts to air quality in the region. The EDCAQMD guidelines state that operational activities are considered a potentially significant adverse impact if such activities generate total emissions in excess of EDCAQMD established thresholds. According to the *Guide to Air Quality Assessment* (EDCAQMD 2002, Chapter 5, p. 2), if identified ROG and NO_x emissions are under the operation emissions

threshold of 82 pounds generated per day and thus considered less than significant, then emissions of CO and PM_{10} would also be considered less than significant.

Table 2 illustrates the operations-related criteria and precursor emissions of an average year that would result from implementation of the proposed project.

TABLE 2
OPERATIONS-RELATED CRITERIA POLLUTANT AND PRECURSOR EMISSIONS
(POUNDS PER DAY & TONS PER YEAR)

Construction Phases	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_x)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)
Summer Emissions - Pounds per Day (Unmitigated)						
Project Buildout	32.67	5.44	74.65	0.08	10.45	5.79
Winter Emissions - Pounds per Day (Unmitigated)						
Project Buildout	32.85	5.83	74.32	0.08	10.45	5.79
SMAQMD Potentially Significant Impact Threshold	65 pounds/day	65 pounds/day	AAQS	–	AAQS	–
Exceed SMAQMD Threshold?	**No**	**No**	–	–	–	–

Source: CalEEMod version 2011.1.1.

As shown in **Table 2**, project emissions would not exceed EDCAQMD significance thresholds for operational pollutants.

GREENHOUSE GAS EMISSIONS

Thresholds of significance illustrate the extent of an impact and are a basis from which to apply mitigation measures. Significance thresholds for greenhouse gas emissions resulting from land use development projects have not been established in El Dorado County (the El Dorado County Air Quality Management District (EDCAQMD) has not yet established significance thresholds for GHG emissions from project operations). In April 2012, the San Luis Obispo County Air Pollution Control District (SLOAPCD) published its GHG threshold. Utilization of SLOAPCD's GHG threshold was considered reasonable and appropriate by EDCAQMD staff.

As shown in **Table 3**, the long-term operations of the proposed project would produce 939 metric tons of CO_2e annually, primarily from motor vehicles that travel to and from the site.

TABLE 3
OPERATIONAL GREENHOUSE GAS EMISSIONS – METRIC TONS PER YEAR (UNMITIGATED)

Source	CO_2	CH_4	N_2O	CO_2e
Construction Amortized over 30 Years	11	0	0	11
Area	115	0.05	0	117
Energy	193	0.01	0	194
Mobile	601	0.03	0	601

Source	CO_2	CH_4	N_2O	CO_2e
Solid Waste	7	0.42	0	16
Water	7	0.10	0	10
Total	**934**	**0.61**	**0**	**949**

Source: CalEMod version 2011.1.1. Diesel-fueled construction equipment load factors reduced 33% to account for offroad emission overestimation (CARB 2010). See ***Appendix A*** *for emission model outputs.*

As shown in **Table 3**, estimated GHG emissions resulting from both construction and operations of the currently entitled land use would equal 949 metric tons of CO_2e per year, which less the SLOAPCD GHG threshold of 1,150 metric tons of CO_2e per year.

Reference:

California Air Resources Board (CARB). 2010b. *Staff Report: Proposed Amendments to the Regulation for In-Use Off Road Diesel-Fueled Fleets and the OFFROAD Large Spark-Ignition Fleet Requirements.* October 2010.

Wilson Estates

El Dorado County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Single Family Housing	49	Dwelling Unit

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Utility Company**	Pacific Gas & Electric Company
Climate Zone	2	**Precipitation Freq (Days)**	70		

1.3 User Entered Comments

Off-road Equipment - Diesel-fueled construction equipment load factors reduced 33% to account for offroad emission overestimation.

Source - California Air Resources Board. 2010. "Staff Report: Proposed Amendments to the Regulation for In-Use Off Road Diesel-Fueled Fleets and the OFFROAD Large Spark-Ignition Fleet Requirements." October 2010.

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2013	1.85	3.06	2.17	0.00	0.08	0.20	0.28	0.03	0.20	0.23	0.00	329.33	329.33	0.04	0.00	330.11
Total	1.85	3.06	2.17	0.00	0.08	0.20	0.28	0.03	0.20	0.23	0.00	329.33	329.33	0.04	0.00	330.11

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.57	0.05	4.17	0.00		0.00	0.54		0.00	0.54	50.61	64.28	114.90	0.05	0.00	117.38
Energy	0.01	0.08	0.03	0.00		0.00	0.01		0.00	0.01	0.00	192.76	192.76	0.01	0.00	193.95
Mobile	0.65	0.83	5.52	0.01	0.63	0.03	0.65	0.01	0.02	0.03	0.00	600.59	600.59	0.03	0.00	601.29
Waste						0.00	0.00		0.00	0.00	7.10	0.00	7.10	0.42	0.00	15.92
Water						0.00	0.00		0.00	0.00	0.00	7.11	7.11	0.10	0.00	9.95
Total	4.23	0.96	9.72	0.01	0.63	0.03	1.20	0.01	0.02	0.58	57.71	864.74	922.46	0.61	0.00	938.49

3.0 Construction Detail

3.1 Mitigation Measures Construction

3.2 Grading - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.06	0.00	0.06	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.06	0.49	0.27	0.00		0.02	0.02		0.02	0.02	0.00	49.68	49.68	0.00	0.00	49.78
Total	0.06	0.49	0.27	0.00	0.06	0.02	0.08	0.03	0.02	0.05	0.00	49.68	49.68	0.00	0.00	49.78

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00	1.26
Total	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25	0.00	0.00	1.26

3.3 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.31	2.05	1.43	0.00		0.13	0.13		0.13	0.13	0.00	219.62	219.62	0.03	0.00	220.15
Total	0.31	2.05	1.43	0.00		0.13	0.13		0.13	0.13	0.00	219.62	219.62	0.03	0.00	220.15

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.84	8.84	0.00	0.00	8.85
Worker	0.01	0.01	0.09	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	11.28	11.28	0.00	0.00	11.30
Total	0.02	0.06	0.15	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	20.12	20.12	0.00	0.00	20.15

3.4 Paving - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.07	0.40	0.25	0.00		0.03	0.03		0.03	0.03	0.00	31.41	31.41	0.01	0.00	31.52
Paving	0.00					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.07	0.40	0.25	0.00		0.03	0.03		0.03	0.03	0.00	31.41	31.41	0.01	0.00	31.52

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19	2.19	0.00	0.00	2.20
Total	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19	2.19	0.00	0.00	2.20

3.5 Architectural Coating - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.38					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.01	0.05	0.03	0.00		0.00	0.00		0.00	0.00	0.00	4.46	4.46	0.00	0.00	4.48
Total	1.39	0.05	0.03	0.00		0.00	0.00		0.00	0.00	0.00	4.46	4.46	0.00	0.00	4.48

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.58	0.00	0.00	0.59
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.58	0.00	0.00	0.59

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.65	0.83	5.52	0.01	0.63	0.03	0.65	0.01	0.02	0.03	0.00	600.59	600.59	0.03	0.00	601.29
Unmitigated	0.65	0.83	5.52	0.01	0.63	0.03	0.65	0.01	0.02	0.03	0.00	600.59	600.59	0.03	0.00	601.29
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	468.93	493.92	429.73	1,337,455	1,337,455
Total	468.93	493.92	429.73	1,337,455	1,337,455

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
Single Family Housing	10.80	7.30	7.50	42.60	21.00	36.40

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	97.71	97.71	0.00	0.00	98.32
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	97.71	97.71	0.00	0.00	98.32
NaturalGas Mitigated	0.01	0.08	0.03	0.00		0.00	0.01		0.00	0.01	0.00	95.05	95.05	0.00	0.00	95.63
NaturalGas Unmitigated	0.01	0.08	0.03	0.00		0.00	0.01		0.00	0.01	0.00	95.05	95.05	0.00	0.00	95.63
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Single Family Housing	1.78113e+006	0.01	0.08	0.03	0.00		0.00	0.01		0.00	0.01	0.00	95.05	95.05	0.00	0.00	95.63
Total		0.01	0.08	0.03	0.00		0.00	0.01		0.00	0.01	0.00	95.05	95.05	0.00	0.00	95.63

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	lons/yr				MT/yr			
Single Family Housing	135875					97.71	0.00	0.00	98.32
Total						97.71	0.00	0.00	98.32

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lons/yr										MT/yr					
Mitigated	3.57	0.05	4.17	0.00		0.00	0.54		0.00	0.54	50.61	64.28	114.90	0.05	0.00	117.38
Unmitigated	3.57	0.05	4.17	0.00		0.00	0.54		0.00	0.54	50.61	64.28	114.90	0.05	0.00	117.38
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

SubCategory	tons/yr										MT/yr					
Architectural Coating	0.14					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.34					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	3.08	0.04	3.79	0.00		0.00	0.54		0.00	0.54	50.61	63.68	114.30	0.05	0.00	116.77
Landscaping	0.01	0.00	0.38	0.00		0.00	0.00		0.00	0.00	0.00	0.60	0.60	0.00	0.00	0.61
Total	3.57	0.04	4.17	0.00		0.00	0.54		0.00	0.54	50.61	64.28	114.90	0.05	0.00	117.38

7.0 Water Detail

7.1 Mitigation Measures Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					7.11	0.10	0.00	9.95
Unmitigated					7.11	0.10	0.00	9.95
Total	NA	NA	NA	NA	NA	NA	NA	NA

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	tons/yr				MT/yr			
Single Family Housing	3.1/2.55 / 2.01/2.69					7.11	0.10	0.00	9.95
Total						7.11	0.10	0.00	9.95

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					7.10	0.42	0.00	15.92
Unmitigated					7.10	0.42	0.00	15.92
Total	NA	NA	NA	NA	NA	NA	NA	NA

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Single Family Housing	35					7.10	0.42	0.00	15.92
Total						7.10	0.42	0.00	15.92

SPECIAL STATUS PLANT SURVEYS

Wilson Estates

El Dorado County,
California

August 2011

Prepared For:

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Attachment 7

INTRODUCTION

This report presents the results of a special status plant survey. The survey was conducted within the study area for the below described Wilson Estates property.

LOCATION

The 28-acre study area is located in Sections 14 and 23, Township 10 North, Range 8 East, MDB&M, El Dorado County, California. The parcel can be found at UTM 668,627.94 M N; 4,286,600.86 M E, Zone 10 North and is portrayed on the Clarksville 7.5-Minute Series Topographic Quadrangle. Figure 1 is a vicinity map, and Figure 2 is an exhibit displaying the study area.

GENERAL SITE CONDITIONS AND HABITATS

The study area is located in the foothills on moderately hilly terrain at a median elevation of approximately 800 feet. Malcolm Dixon Road and Green Valley Road mark the northern and southern boundaries, respectively, and residential developments are located directly to the west. A church abuts the site to the southwest while ranchettes occupy lands to the north and east. The study area is undeveloped and lacks any permanent habitable structures. The site was not graded, grazed, or disked at the time of field surveys.

The highest point of the study area is located near the northern central portion of the site along Malcolm Dixon Road. The immediately surrounding areas slope away to the west, south and north. Located on the east side of the study area, an intermittent reach of Dutch Ravine flows off-site to the south before turning west to merge with Green Spring Creek. Green Spring Creek is tributary to the navigable American River by way of New York Creek, the South Fork of the American River, and Folsom Reservoir, respectively.

The study area encompasses several habitat types including non-native annual grasslands, foothill oak savannah/woodland, and a small riparian woodland corridor associated with Dutch Ravine. The majority of the site supports oak savannah/woodland which is mainly composed of live oaks (*Quercus wislizenii*) and blue oaks (*Quercus douglasii*). The understory consists of dogtail (*Cynosurus echinatus*), wild oats (*Avena fatua*), rip-gut brome (*Bromus diandrus*), medusa head (*Taeniatherum caput-medusae*), and soft chess (*Bromus hordeaceus*). Interspersed between the oak woodlands/savannah are areas of non-native annual grasslands dominated by

yellow start-thistle (*Centaurea solstitialis*), Italian thistle (*Carduus pycnocephalus*), ripgut brome (*Bromus diandrus*), and medusa-head (*Taeniatherum caput-medusae*). Other observed species include wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), prickly lettuce (*Lactuca serriola*), and split-leaf geranium (*Geranium dissectum*). Dutch Ravine supports a riparian woodland corridor composed of Himalayan blackberry (*Rubus discolor*), narrow-leaf willow (*Salix exigua*), California buckeye (*Aesculus californica*), live oak (*Quercus wislizenii*), blue oaks (*Quercus douglasii*), blue elderberry (*Sambucus mexicana*), and foothill pine (*Pinus sabiniana*). Herbaceous species consist of tall flat sedge (*Cyperus eragrostis*), spiny-fruited buttercup (*Ranunculus muricatus*), perennial rye (*Lolium perenne*), water cress (*Rorippa nasturtium-aquaticum*), ripgut brome (*Bromus diandrus*), wild oats (*Avena fatua*), and curly dock (*Rumex crispus*).

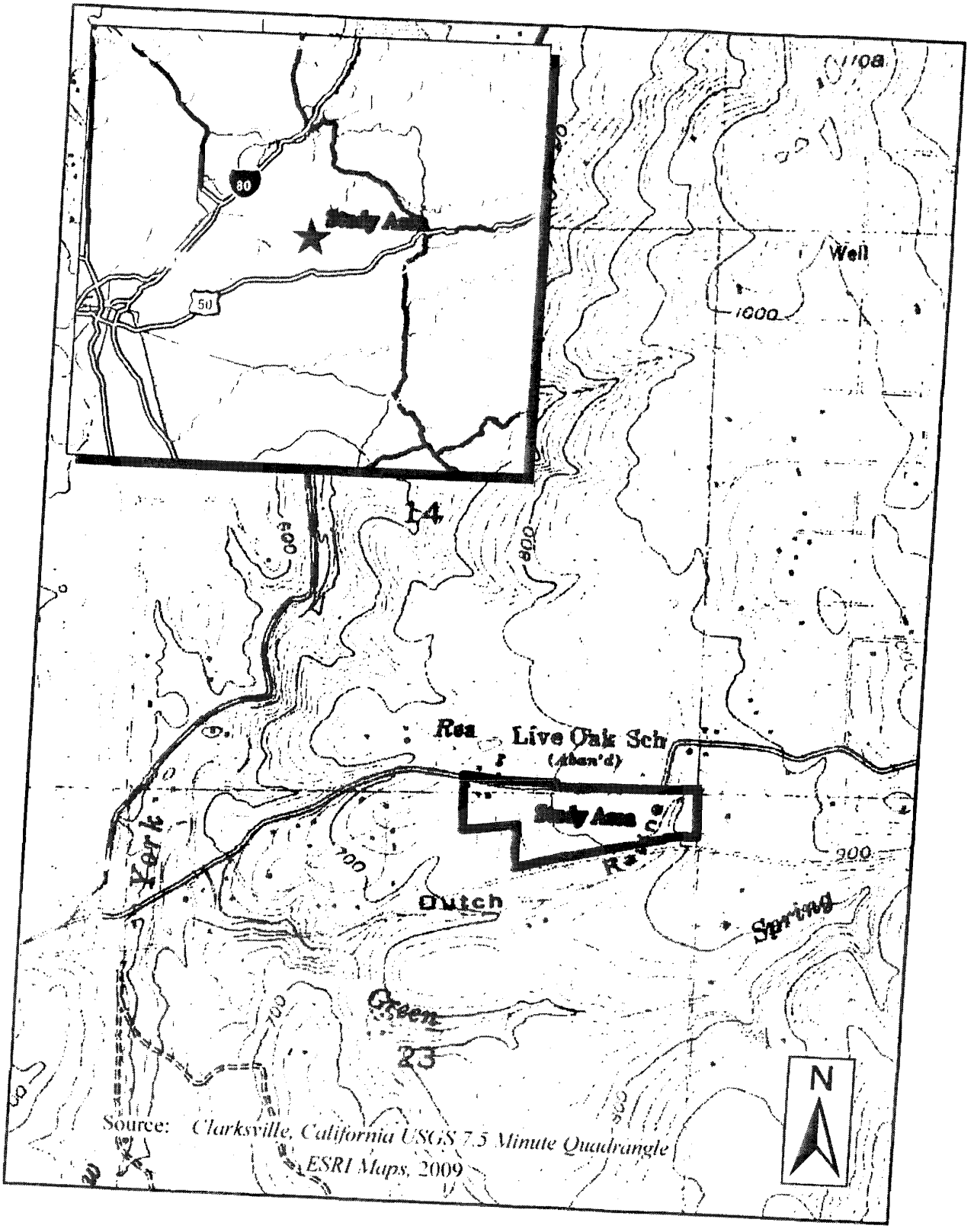
Soils

According to the April 1974, "**Soil Survey for El Dorado Area, California**" one soil map unit occurs within the study area. Auburn very rocky silt loam, 2 to 30% slopes (AxD), which is a well-drained, shallow ruptic-lithic xerochrept composed of 5 to 25% rock outcrops. The water holding capacity is 2 to 4 inches, and the depth to bedrock (and effective plant rooting range) varies between 20 to 26 inches. Contained within this unit are inclusions of Argonaut very rocky loam, Boomer very rocky loam, and Sobrante very rocky silt loam. Figure 3 is a soils map.

METHODOLOGY

Initially, a record search of the California Natural Diversity Database (CNDDB) was conducted for the Rocklin, Pilot Hill, Coloma, Folsom, Clarksville, Shingle Springs, Buffalo Creek, Folsom SE, and Latrobe, California 7.5-Minute USGS quadrangles to identify all documented sightings of special-status plant species in the vicinity of the study area. Special-status plant species include those officially listed by California or the federal government as endangered, threatened, or rare, as well as those proposed for formal state or federal listing as candidate species for listing as endangered, threatened, or rare. We also included those plant species considered to be rare, threatened, or endangered in California by the California Native Plant Society (CNPS); this includes species on Lists 1, 2 3, and 4 of the CNPS Ranking System:

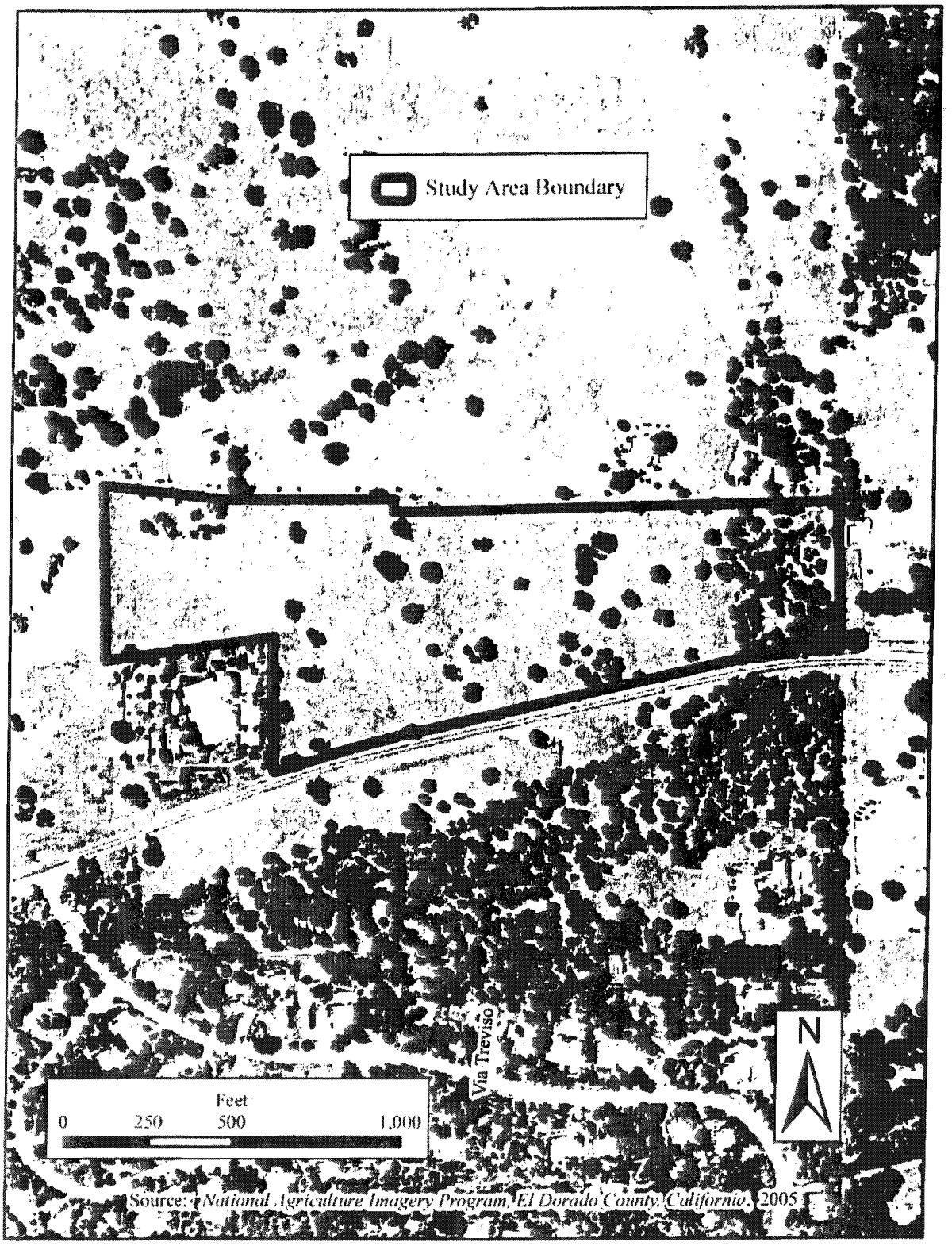
- List 1 A: Plants presumed extinct in California.
- List 1 B: Plants rare, threatened, or endangered in California and elsewhere.



Source: *Clarksville, California USGS 7.5 Minute Quadrangle*
ESRI Maps, 2009

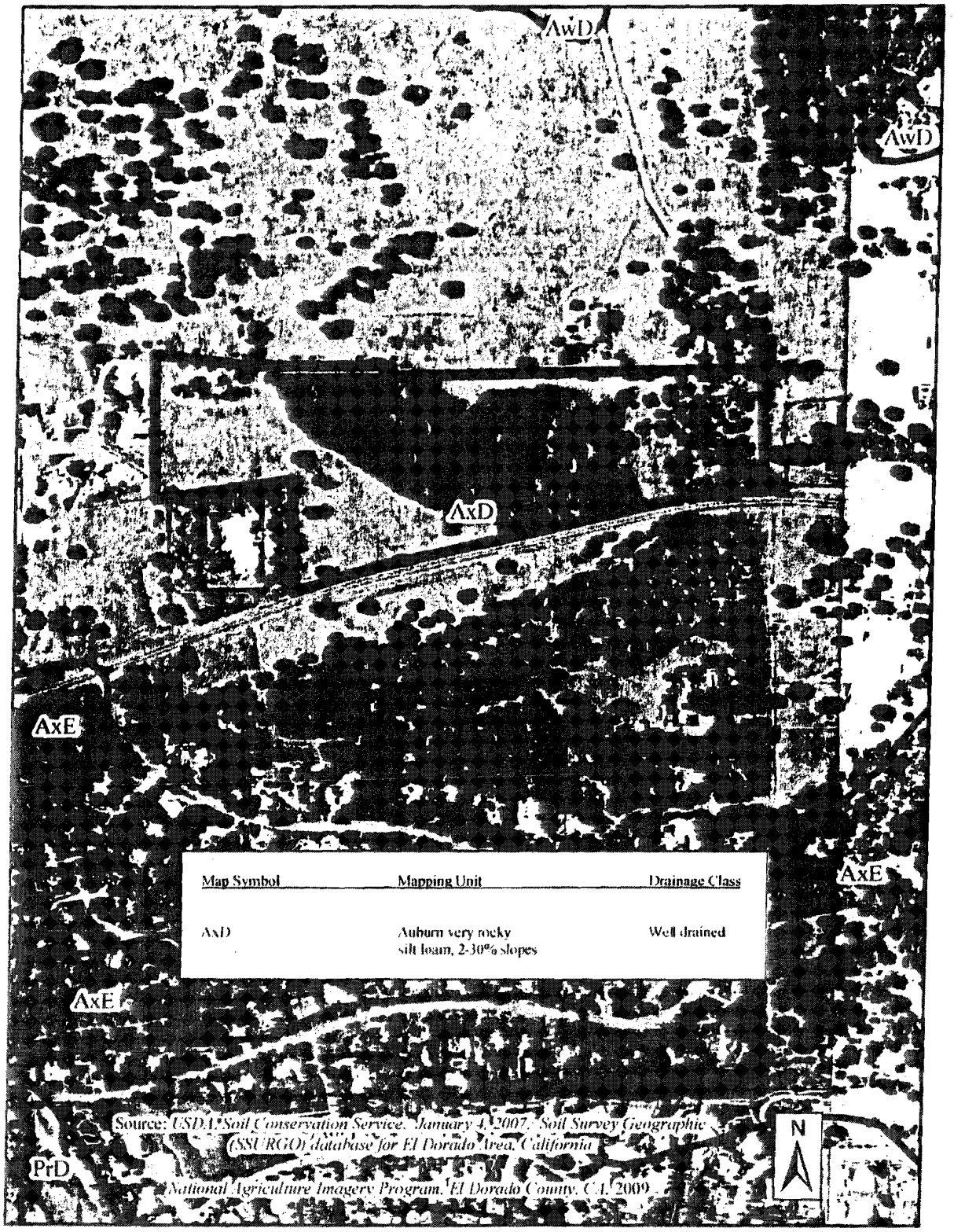
Wilson Estates
Special Status Plant Surveys
August 2011

Figure 1
Vicinity Map



Wilson Estates
Special Status Plant Surveys
August 2011

Figure 2
Study Area



Map Symbol	Mapping Unit	Drainage Class
AxD	Auburn very rocky silt loam, 2-30% slopes	Well drained

Wilson Estates
Special Status Plant Surveys
August 2011

Figure 3
Soils Map

- List 2: Plants rare, threatened, or endangered in California, but more common elsewhere.
- List 3: Plants about which the CNPS needs more information – a review list.
- List 4: Plants of limited distribution – a watch list.

The CNPS Threat Rank is an extension that is added onto the CNPS List. It ranges from .1 to.3 and indicates the level of endangerment to the species with .1 representing the most endangered and .3 being the least endangered.

Also included are taxa meeting the criteria for listing under Section 15380 of the California Environmental Quality Act (CEQA) Guidelines. (Note that all CNPS List 1 and 2 and some List 3 species may fall under Section 15380 of CEQA.) Appendix A contains a map displaying CNDDB elemental occurrences recorded in the vicinity of the study area. Table 1 provides a list of special-status plant species listed as occurring in the above target quadrangles that were evaluated including their listing status.

Multiple site visits were conducted to coincide with the blooming periods of special-status plant species listed by the CNDDB as occurring within the target quadrangles. Field surveys were performed by Matt Hirkala on June 27 and August 2, 2011. Several visits were made to known reference populations throughout the growing season to assess the local phenology of target species. It should be noted that the unusually late rains appear to have interrupted the phenology of many local species by delaying respective blooming periods. Meandering transects were performed throughout the study area parcel. Appendix B contains a list of plants observed within the study area.

RESULTS AND DISCUSSION

The CNDDB search recorded nineteen special-status plant species as occurring within the vicinity of the study area: Jepson's onion (*Allium jepsonii*), big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*), Stebbin's morning glory (*Calystegia stebbinsii*), Pine Hill ceanothus (*Ceanothus roderickii*), Red Hills soaproot (*Chlorogalum gradiflorum*), Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeeae*), Tuolumne button-celery (*Eryngium pinnatisectum*), Pine Hill flannelbush (*Fremontodenderon decumbens*), El Dorado bedstraw (*Galium californicum* ssp. *sierrae*), Bogg's Lake hedge-hyssop (*Gratiola heterosepala*), Bisbee Peak rush-rose (*Helianthemum suffrutescens*), Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*), legenere (*Legenere limosa*), pin cushion navarretia (*Navarretia myersii* ssp. *myersii*), slender

orcutt grass (*Orcuttia tenuis*), Sacramento orcutt grass (*Orcuttia viscida*), Layne's ragwort (*Packera layneae*), Sanford's arrowhead (*Sagittaria sanfordii*), and El Dorado mule ears (*Wyethia reticulata*). Based on a recorded sighting within the Clarksville quadrangle provided by the California Native Plant Society's database, we also included Hartweg's golden sunburst (*Pseudobahia bahiifolia*) in our list of special status plants even though the CNDDB search did not record any occurrences within the target quadrangles.

Brandegee's Clarkia

Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeeae*) is not listed under the federal or California Endangered Species Act; however, it is designated as a CNPS List 1B.2 plant. It favors chaparral and cismontane woodland and is often associated with roadcuts. Brandegee's clarkia is an annual herbaceous species, and it blooms from May to July.

Though the study area encompasses the appropriate habitat to support Brandegee's clarkia, no specimens were observed during the field surveys which were conducted during its blooming period.

Tuolumne Button-Celery

Tuolumne button-celery (*Eryngium pinnatisectum*) is a CNPS List 1B.2 species. It is a biennial or perennial herb, and it favors vernal pools or other wet depressions located in cismontane woodlands and lower montane coniferous forests. Tuolumne button-celery blooms from June to August and is found between approximately 230 to 3,000 feet.

The study area does not contain the necessary wetland habitat to support Tuolumne button-celery.

Bogg's Lake Hedge-Hyssop

Bogg's Lake hedge-hyssop (*Gratiola heterosepala*) is a California endangered species and a CNPS List 1B.2 plant. Though Bogg's Lake hedge-hyssop grows in vernal pools, it can also occur around the perimeter of lakes and ponds. It is found between 30 and 7,800 feet, favors clay soils, and blooms from April to August.

The study area does not contain the necessary wet habitat to support this species.

Table 1: Special-Status Species Plants and Habitat Associations

	Federal Status	State Status	CNPS Listing	Habitat Association	Blooming Period
Allium jepsonii (Jepson's onion)	None	None	CNPS-1B.2	Cismontane woodland or lower montane coniferous forests with serpentine soils or volcanic slopes.	May to August
Balsamorhiza macrolepis var. macrolepis (big-scale balsamroot)	None	None	CNPS-1B.2	Chaparral, cismontane woodland, and valley and foothill grasslands -- sometimes found on serpentine soils.	March to June
Calystegia stebbinsii (Stebbin's morning glory)	Endangered	Endangered	CNPS-1B.1	Open areas in foothill chaparral and cismontane woodland with serpentine or Gabbro soils.	April to July
Ceanothus roderickii (Pine Hill ceanothus)	Endangered	Rare	CNPS-1B.2	Foothill chaparral and cismontane woodland with serpentine or Gabbro soils.	May to June
Chlorogalum grandiflorum (Red Hills soaproot)	None	None	CNPS-1B.2	Foothill chaparral, cismontane woodland, and lower montane coniferous forest. Sometimes found on serpentine or Gabbro soils.	May to June
Clarkia biloba ssp. brandegeeae (Brandegee's clarkia)	None	None	CNPS-1B.2	Generally associated with chaparral and cismontane woodland, but may occur in foothill oak woodland and grassland.	May to July
Eryngium pinnatisectum (Tuolumne button-celery)	None	None	CNPS-1B.2	Vernal pools and wet depressions or areas with mesic soils within cismontane woodlands and lower montane coniferous forests.	June to August
Fremontodenderon decumbens (Pine Hill flannelbush)	Endangered	Rare	CNPS-1B.2	Foothill chaparral and cismontane woodland with rocky serpentine or Gabbro soils.	April to July
Galium californicum ssp. sierrae (El Dorado bedstraw)	Endangered	Rare	CNPS-1B.2	Foothill chaparral and cismontane woodland with Gabbro soils.	May to June
Gratiola heterosepala (Bogg's Lake hedge-hyssop)	None	Endangered	CNPS-1B.2	Vernal pools, seasonal wetlands, and margins of lakes ponds.	April to August
Helianthemum suffrutescens (Bisbee Peak rush rose)	None	None	CNPS-3.2	Open areas within chaparral -- sometimes found in serpentine, lone, or Gabbro soils.	April to June

Table 1: Special-Status Species Plants and Habitat Associations

Juncus leiospermus var. ahartii (Ahart's dwarf rush)	None	None	CNPS-1B.2	Edges of vernal pools and other seasonally flooded features.	March to May
Legenere limosa (legenere)	None	None	CNPS-1B.1	Vernal pools and seasonal wetlands.	April to June
Navarretia myersii ssp. myersii (Pin cushion navarretia)	None	None	CNPS-1B.1	Vernal pools and seasonal wetlands.	May
Orcuttia tenuis (slender orcutt grass)	Threatened	Endangered	CNPS-1B.1	Vernal pools and seasonal wetlands.	May to October
Orcuttia viscida (Sacramento orcutt grass)	Endangered	Endangered	CNPS-1B.1	Vernal pools and seasonal wetlands.	April to July
Packera layneae (Layne's ragwort)	Threatened	Rare	CNPS-1B.2	Chaparral and cismontane woodland with serpentine or Gabbro soils.	April to July
Pseudobahia bahiifolia (Hartweg's golden sunburst)	Endangered	Endangered	CNPS-1B.1	Cismontane woodland, valley and foothill grassland with clay soils.	March to April
Sagittaria sanfordii (Sanford's arrowhead)	None	None	CNPS-1B.2	Freshwater emergent marsh habitat -- also associated with drainages, canals, or irrigation ditches.	May to October
Wyethia reticulata (El Dorado Co. mule ears)	None	None	CNPS-1B.2	Foothill chaparral, cismontane woodland, and lower montane coniferous forest with Gabbro soils.	May to July

Ahart's Dwarf Rush

Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*) is a CNPS list 1B.2 species. It is an annual herb found between elevations of approximately 110 feet and 3,400 feet. It blooms from March to May and grows along the edges of seasonal wet habitats such as vernal pools and swales.

The study area does not contain the necessary wetland habitat to support this Ahart's dwarf rush.

Legenere

Legenere (*Legenere limosa*) is a CNPS list 1B.1 that is primarily associated with the bottoms of vernal pools between 0 to 2,900 feet. It is an annual herb and it blooms from April to June. Threatened by grazing and developments, many historic populations of legenere are believed to have been extirpated.

The study area does not contain the necessary wetland habitat to support this species.

Pin Cushion Navarretia

Pin cushion navarretia (*Navarretia myersii* ssp. *myersii*) is a CNPS list 1B.1 plant. It is an annual herb that prefers vernal pools and other seasonal wetlands between approximately 100 and 1,100 feet. Pin cushion navarretia typically blooms in May and is currently threatened by development.

The study area does not contain the necessary wetland habitat to support pin cushion navarretia.

Slender Orcutt Grass

Slender orcutt grass (*Orcuttia tenuis*) is a federally threatened and California endangered species as well as a CNPS list 1B.1 plant. It favors vernal pools and other seasonal wetland habitats between 115 and 5,800 feet. Slender orcutt grass is an annual herbaceous species, and its bloom period extends from May to October.

The study area does not contain the necessary wetland habitat to support this species.

Sacramento Orcutt Grass

Sacramento orcutt grass (*Orcuttia viscida*) is a federally endangered and California endangered species as well as a CNPS list 1B.1 plant. Like slender orcutt grass, this herbaceous annual also favors vernal pools and other seasonal wetland habitats, though it is typically found between 100 and 330 feet elevation. (The average elevation of the study area is approximately 800 feet.) Sacramento orcutt grass blooms from April to July and faces serious threats from agriculture, urbanization, and non-native species.

The study area lacks the necessary wetland habitat to support this species; the study area elevation is above the known range of Sacramento orcutt grass.

Sanford's Arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is listed as a 1B.2 plant by the CNPS. It generally occurs in shallow freshwater habitats associated with drainages, canals, and larger ditches that sustain inundation and/or slow moving water into early summer. It is a perennial rhizomatous emergent species, and it blooms from May to October.

The study area does not contain the necessary aquatic habitat to support Sanford's arrowhead.

Hartweg's Golden Sunburst

Hartweg's golden sunburst (*Pseudobahia bahiifolia*) is a federal and California endangered species and a CNPS list 1B.1 plant. It is an annual herbaceous species that is associated with grasslands and/or open woodlands and favors clay soils. Hartweg's golden sunburst is known to grow at elevations ranging from approximately 100 to 1,000 feet, and it typically blooms in March and April.

The study area does not contain the clay soils necessary to support Hartweg's golden sunburst.

Special Status Plants Requiring Gabbro and/or Serpentine Soils

The ten special-status species of plants listed below are associated with Gabbro and/or serpentine soils and are identified by the CNDDB as occurring within the target quadrangles. The mildly acidic Gabbro soils are derived from igneous rock and possess peculiar characteristics such as high concentrations of magnesium, iron, nickel, chromium, and cobalt and low amounts of calcium and plant nutrients such as phosphorus. Serpentine soils are also known for having

atypical characteristics such as a lack of the essential nutrients nitrogen, potassium, and phosphorus, a low calcium-magnesium ratio, and high concentrations of the heavy metals. The unusual soil chemistry has resulted in the evolution of a unique community of plants, many of which are only found in El Dorado County. Most of these plants have only been documented in chaparral or cismontane woodland associated with the Gabbro soils region around Pine Hill.

According to the **"Soil Survey of El Dorado Area, California"** no serpentine, gabbros, or clay soils are present within the study area. The majority of CNDDB occurrences for these species are located in western El Dorado County around the Pine Hill Preserve. The CNDDB occurrence map in Appendix A displays the location of the Gabbro soils (also known as the Rescue Series) and serpentine soils in relation to the study area.

Stebbin's Morning Glory

Stebbin's morning glory (*Calystegia stebbinsii*) is a federally endangered and California endangered species as well as a CNPS list 1B.1 plant. It is a perennial herb associated with open areas in foothill chaparral and cismontane woodland with Gabbro or serpentine soils. Stebbin's morning glory blooms from April to July and is found at elevations of approximately 600 to 2,400 feet.

The study area does not contain the necessary Gabbro or serpentine soils to support this species.

Pine Hill Ceanothus

Pine Hill ceanothus (*Ceanothus roderickii*) is listed as a federally endangered and California rare species; it is also a CNPS list 1B.2 plant. This low growing shrub prefers foothill chaparral and cismontane woodland with serpentine or Gabbro soils at elevations between approximately 850 to 2,100 feet.

The study area does not contain the necessary Gabbro or serpentine soils to support this species.

Pine Hill Flannelbush

Pine Hill flannelbush (*Fremontodon decumbens*) is listed as a federally endangered and California rare species; it is also a CNPS list 1B.2 plant. Pine Hill flannelbush is a sprawling, low-growing shrub endemic to Pine Hill and the immediate vicinity. The species favors foothill chaparral and cismontane woodland with rocky Gabbro or serpentine soils. It blooms from April to July.

The study area does not contain the necessary Gabbro or serpentine soils to support this species.

El Dorado Bedstraw

El Dorado bedstraw (*Galium californicum* ssp. *sierrae*) is listed as a federally endangered and California rare species; it is also a CNPS list 1B.2 plant. This low-growing perennial herb prefers foothill chaparral and cismontane woodland with Gabbro soils. El Dorado bedstraw blooms from May to June and is known only grow in the Gabbro region of western El Dorado County.

The study area does not contain the necessary Gabbro or serpentine soils to support this species.

Layne's Ragwort

Layne's ragwort (*Packera layneae*), which is also known as Layne's butterweed (*Senecio layneae*), is listed as a federally endangered and California rare species; it is also a CNPS list 1B.2 plant. Layne's ragwort is a non-woody perennial associated with open areas in chaparral and cismontane woodland. This member of the sunflower family blooms from April to July and grows on rocky Gabbro or serpentine soils. It can also be found in the Red Hills in Tuolumne County and near Brownsville in Yuba County.

The study area does not contain the necessary Gabbro or serpentine soils to support this species.

El Dorado Mule Ears

El Dorado mule ears (*Wyethia reticulata*) is listed as a 1B.2 plant by the CNPS. This perennial sunflower typically favors foothill chaparral, cismontane woodland, and lower montane coniferous forest with Gabbro or serpentine soils; however, it is known to grow clay soils as well.

The study area does not contain the necessary Gabbro, serpentine, or clay soils to support this species.

Red Hills Soaproot

Red Hills soaproot (*Chlorogalum gradiflorum*) is listed as a 1B.2 plant by the CNPS. Red Hills soaproot typically favors foothill chaparral, cismontane woodland, and lower montane coniferous

forest with Gabbro or serpentine soils; however, it is known to grow on other soil types as well. This perennial blooms from May to June and is found from approximately 800 to 3,300 feet.

Though the study area encompasses the appropriate habitat to support this species, no specimens were observed during the field surveys which were conducted during its blooming period.

Bisbee Peak Rush-Rose

Bisbee Peak rush-rose (*Helianthemum suffrutescens*) is listed as a 3.2 plant by the CNPS. This evergreen shrub grows in open areas within chaparral. Though Bisbee Peak rush-rose grows on the Gabbro and serpentine soils of the Pine Hill region, it is also found on other soils as well.

The study area does not contain the necessary chaparral habitat needed to support this species.

Jepson's Onion

Jepson's onion (*Allium jepsonii*) is classified as a List 1B.2 plant by the CNPS. It is a bulbiferous perennial herb that is usually associated with open areas within cismontane woodland or lower montane coniferous forest between 985 and 3,800 feet. Jepson's onion is typically found on serpentine soils of the Sierra Nevada, but it has been documented growing on the volcanic soils at Table Mountain as well. It blooms between May and August.

The study area does not contain the necessary soils required to support Jepson's onion.

Big-Scale Balsamroot

Big-scale balsamroot (*Balsamorhiza macrolepis var. macrolepis*) is classified as a List 1B.2 plant by the CNPS. It is a perennial herbaceous species that favors chaparral, cismontane woodland and valley and foothill grasslands between 295 and 4,600 feet. Big-scale balsamroot blooms from March through June and may be found on serpentine soils, though it is known to grow on other soil types as well.

Though the study area encompasses the appropriate habitat to support big-scale balsamroot, no specimens were observed during the field surveys which were conducted during its blooming period.

CONCLUSIONS

Field surveys were performed on June 27 and August 2, 2011; no special-status species plants were observed within the study area.

REFERENCES

California Department of Fish & Game (CDFG). 2011. Rarefind CDFG Natural Diversity Database. Commercial Version 3.1.0, Sacramento, California.

California Native Plant Society. 2001. CNPS Botanical Survey Guidelines, California Native Plant Society, Sacramento County, California. Available at: http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf

California Native Plant Society. 2001. Inventory of Rare and Endangered Plants of California (6th Edition), Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. California Native Plant Society, Sacramento County, California.

Gibson & Skordal, LLC. 2006. Jurisdictional Delineation and Special Status Species Evaluation, Carpenter Ranch Property, Sacramento County, California.

Hickman, J.C. 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley and Los Angeles, California.

Mason, H.L. 1957. A Flora of the Marshes of California. University of California Press, Berkeley and Los Angeles, California.

Munz, P.A. 1973. A California Flora and Supplement. University of California Press, Berkeley and Los Angeles, California.

U. S. Department of Agriculture, Soil Conservation Service. 1974. Soil Survey of El Dorado Area, California. U.S. Department of Agriculture, Soil Conservation Service. Davis, California.

JURISDICTIONAL DELINEATION AND SPECIAL STATUS SPECIES EVALUATION

WILSON ESTATES

GIBSON & SKORDAL, LLC
Wetland Consultants
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Sacramento, California 95825

Attachment 8

Z 11-0007
PD 11-0004/TM11-1504

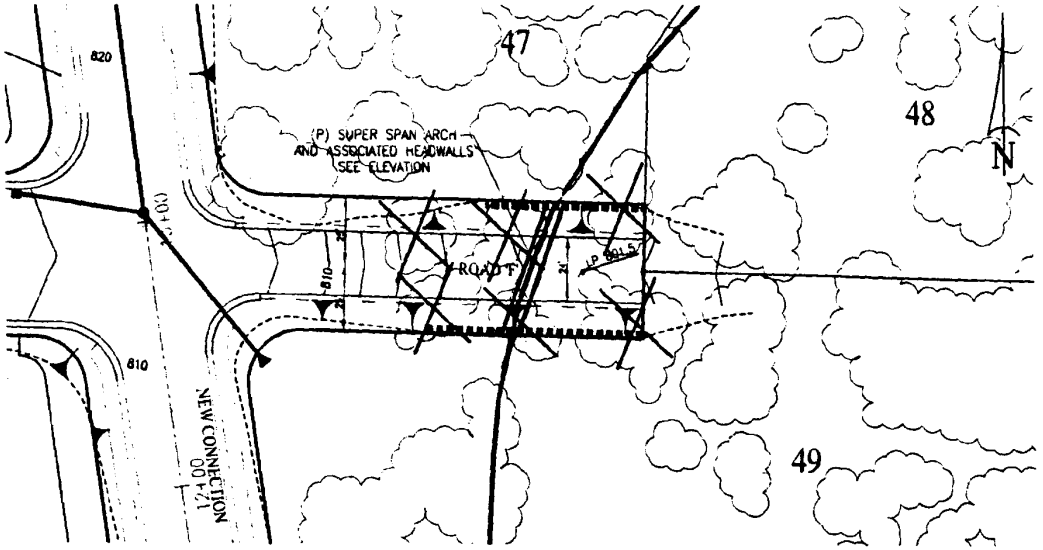
WILSON ESTATES

ROAD 'F' DRAIN CROSSING

(P) TOTAL AVOIDANCE OF US WATERS

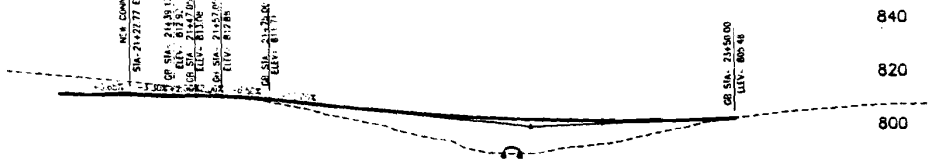
EL DORADO HILLS, CALIFORNIA

MAY, 2012



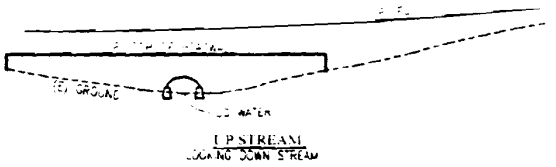
PLAN VIEW

SCALE: 1"=40'



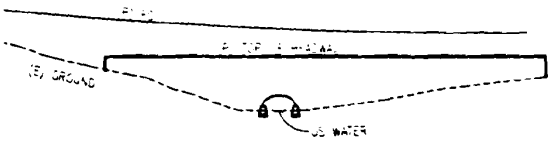
ROAD 'F' PROFILE

SCALE: 1"=40'



UPSTREAM

LOOKING DOWN STREAM



DOWNSTREAM

LOOKING UPSTREAM

ELEVATION

SCALE: 1"=20'

NOTES:

1. APPROXIMATE 6'x1'-9.5" STRUCTURAL PLATE ARCH OR EQUIVALENT
2. HEADWALLS APPROXIMATE AS SHOWN; POSSIBLE ANGLES IF TREES ARE AVOIDED.
3. NO IMPACT TO US WATER.
4. COE PERMIT (NOT REQUIRED)
5. 401 WATER QUALITY CERT. (NOT REQUIRED)
6. FISH AND GAME 1602 (MAY BE REQUIRED)

cta Engineering & Surveying

Civil Engineering Land Surveying Land Planning

3233 Mother Creek Rancho Cordova, CA 95742

M:\06-047-002\PLANNING\EXHIBITS\Roadway to -ots 47-48-49 dwg, Layout1 5/23/2012 4:05:04 PM rhuson

JURISDICTIONAL DELINEATION AND SPECIAL STATUS SPECIES EVALUATION

WILSON ESTATES

EL DORADO COUNTY, CALIFORNIA

January 2009

Prepared For:

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INTRODUCTION

This report presents the results of a special status species assessment and a delineation of waters of the United States, including wetlands, which may be regulated by the U. S. Army Corps of Engineers under the authority of Section 404 of the Federal Clean Water Act. The special status species assessment and delineation of waters of the United States were conducted within the study area for the below described Wilson Estates property.

LOCATION

The 28-acre study area is located in Sections 14 and 23, Township 10 North, Range 8 East, MDB&M, El Dorado County, California. The parcel can be found at UTM 668,627.94 M N; 4,286,600.86 M E, Zone 10 North and is portrayed on the Clarksville 7.5 Minute Series Quadrangle. Figure 1 is a locator map, and Figure 2 is a vicinity map.

To access the site from Sacramento, drive east on Highway 50 into El Dorado county and exit at El Dorado Hills Boulevard. Travel north on El Dorado Hills Boulevard until it intersects with Green Valley Road. Turn right onto Green Valley Road and travel for approximately 0.75 mile. The study area is situated on the north side of Green Valley Road.

METHODOLOGY

This delineation was performed in accordance with the 1987 **"Corps of Engineers Wetlands Delineation Manual,"**[1] the **"Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0),"**[2] and Sacramento District's **"Minimum Standards for Acceptance of Preliminary Wetlands Delineations"** dated November 30, 2001. Corps' regulations (33 CFR 328) were used to determine the presence of waters of the United States other than wetlands. The **"U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook, May 30, 2007"**[3] was consulted in evaluating the jurisdictional status of the various waterbodies existing within the study area.

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[1] Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station. Vicksburg, Miss.

[2] Wetlands Regulatory Assistance Program. September 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, Miss.

[3] U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook. May 30, 2007. U.S. Army Corps of Engineers & U.S. Environmental Protection Agency.

The **"National List of Plant Species That Occur in Wetlands: California (Region 0)"**[4] was used to determine the wetland indicator status of plants observed in the study area.

Field surveys were conducted on August 1, 2008, and January 14, 2009, within the study area to delineate water features, including wetlands that are potentially regulated under Section 404 of the Federal Clean Water Act. Data point locations were surveyed utilizing a Trimble ProXR GPS unit equipped with sub-meter accuracy. Due to poor satellite reception caused by tree canopy and hilly terrain, Dutch Ravine was mapped by surveying GPS points within the channel and digitizing these reaches with the assistance of a topographic overlay and aerial photography. The delineation map was prepared by digitizing and layering the GPS survey data over USGS aerial photography flown in 2002. Detailed data on vegetation, soils, and hydrology were taken in the field. Data sheets documenting the basis for determining which areas are wetland or upland are provided in Appendix A. Appendix B contains a delineation map of the study area.

The study area was assessed for the potential presence of special status species. Initially, a record search of the California Natural Diversity Database (CNDDB) was conducted for the Coloma, Shingle Springs, Clarksville, Pilot Hill, Latrobe, Folsom SE, Folsom, Buffalo Creek, and Rocklin 7.5 Minute USGS quadrangles to identify all documented sightings of special status species in the vicinity of the site. In addition to species identified in the CNDDB search, we included other special status species that may be present based on historic or predicted range data.

GENERAL SITE CONDITIONS AND HABITAT

Existing Field Conditions

The study area is located in the foothills on moderately hilly terrain at a median elevation of approximately 800 feet. Malcolm Dixon Road and Green Valley Road mark the northern and southern boundaries, respectively, and residential development is located to the west. An LDS church abuts the site to the southwest while ranchettes occupy lands to the north and east. The study area is undeveloped and lacks any permanent habitable structures. A reach of Dutch Ravine traverses the east end of the parcel from north to south. The site was not graded, grazed, or disked at the time of field surveys.

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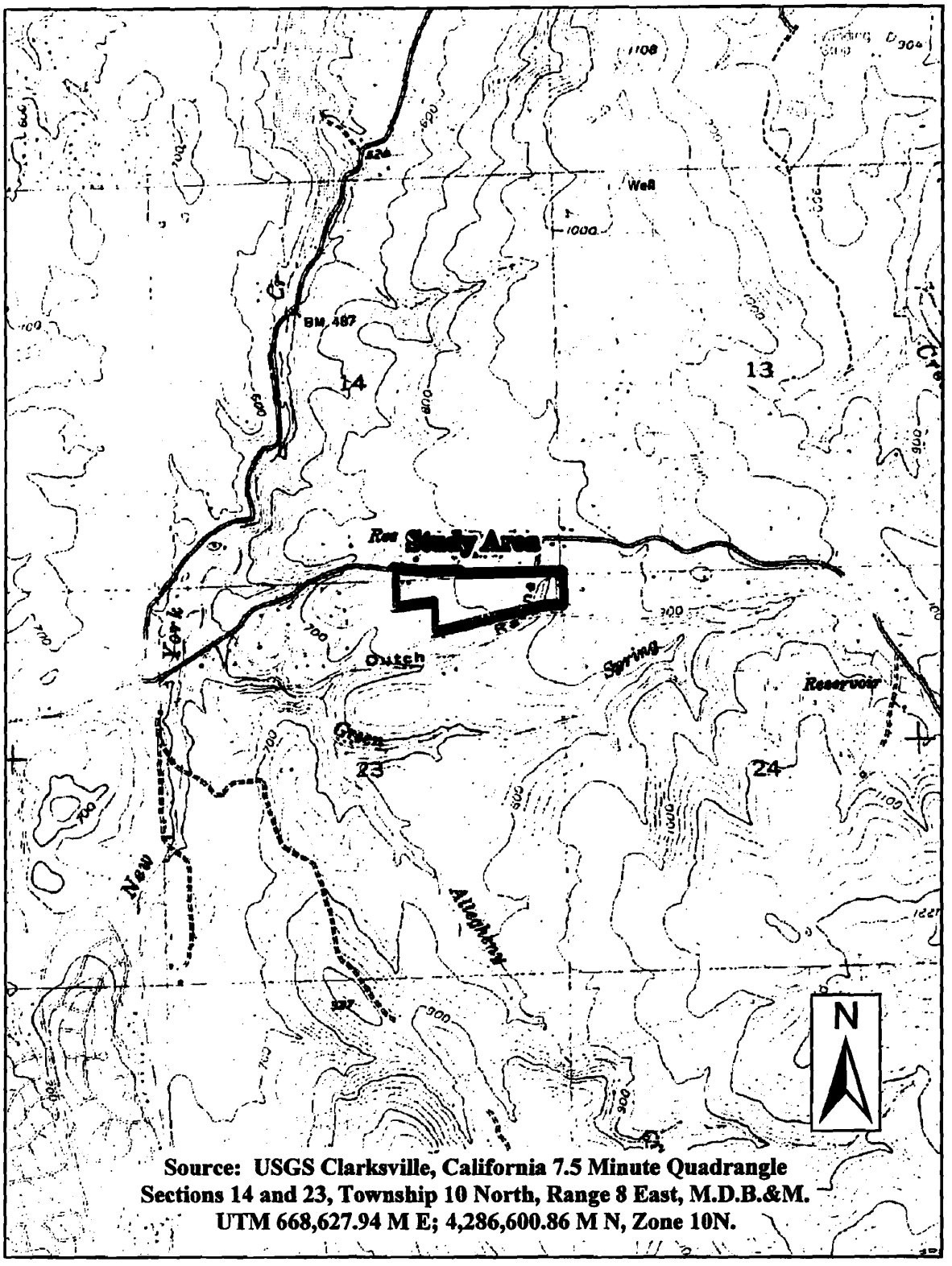
[4] Reed, P.B. 1988. National List of Plant Species That Occur In Wetlands: California (Region 0). Biological Report 88(26.10). May 1988. National Ecology Center, National Wetlands Inventory, U.S. Fish & Wildlife Service, St. Petersburg, Florida.

Source: USGS Sacramento, California 1:250,000 Quadrangle
Sections 14 and 23, Township 10 North, Range 8 East, M.D.B.&M.
UTM 668,627.94 M E; 4,286,600.86 M N, Zone 10N.

Wilson Estates
Jurisdictional Delineation & Special Status Species Assessment
January 2009

Figure 1
Locator Map



Source: USGS Clarksville, California 7.5 Minute Quadrangle
Sections 14 and 23, Township 10 North, Range 8 East, M.D.B.&M.
UTM 668,627.94 M E; 4,286,600.86 M N, Zone 10N.

Wilson Estates
Jurisdictional Delineation & Special Status Species Assessment
January 2009

Figure 2
Vicinity Map

Plant Communities

The site contains foothill non-native annual grasslands and foothill woodlands. The grassland component is dominated by wild oats (*Avena fatua*), rip-gut brome (*Bromus rigidus*), and soft chess (*Bromus mollis*). Other species include yellow star thistle (*Centaurea solstitialis*), filaree (*Erodium botrys*), rose clover (*Trifolium hirtum*), and goat grass (*Aegilops triuncialis*). Blue oak (*Quercus douglasii*), interior live oak (*Quercus wislizenii*), and foothill pine (*Pinus sabiniana*) are scattered throughout the majority of the site. The heaviest concentration of these species forms the foothill woodlands along the east side bordering Dutch Ravine.

Hydrology

The only mapped water feature within the study area is an intermittent reach of Dutch Ravine. Located on the east side of the study area, Dutch Ravine flows off-site to the south before turning west to merge with Green Spring Creek. Green Spring Creek is tributary to the navigable American River by way of New York Creek, the South Fork of the American River, and Folsom Reservoir, respectively.

Soils

According to the April 1974, "**Soil Survey for El Dorado Area, California**" one soil map unit occurs within the study area. Auburn very rocky silt loam, 2 to 30% slopes (AxD), which is a well-drained, shallow ruptic-lithic xerochrept composed of 5 to 25% rock outcrops. The water holding capacity is 2 to 4 inches, and the depth to bedrock (and effective plant rooting range) varies between 20 to 26 inches. Contained within this unit are inclusions of Argonaut very rocky loam, Boomer very rocky loam, and Sobrante very rocky silt loam.

The above soil map unit is not listed in the June 1991, "**Hydric Soils of the United States.**" Figure 3 is a soils map and Table 1 lists the map units present within the study area.

FINDINGS

Potential Wetlands and Waters of the United States

Approximately 0.0748 acre of Dutch Ravine was mapped within the study area. Appendix B provides a delineation map which displays the study area boundary, water features, and data

points, and Appendix C includes a list of plant species observed in the study area including their status as wetland indicator species.

Dutch Ravine

Approximately 0.0748 acre of Dutch Ravine was delineated within the study area. Dutch Ravine possesses an ordinary high water mark, a distinct bed and bank, and supports a riparian woodland corridor composed of Himalayan blackberry (*Rubus procerus*), willow (*Salix* sp.), California buckeye (*Aesculus californica*), blue oak, live oak, and foothill pine. Herbaceous species include ripgut brome, wild oats, and curly dock (*Rumex crispus*). No water was observed in Dutch Ravine during either field visit.

JURISDICTIONAL FINDINGS

The delineated areas shown on Appendix B represent those aquatic features that exhibit the requisite physical and/or biological characteristics to be considered wetlands or other potential waters of the United States (e.g. ponds, creeks, canals, etc.) subject to the Corps' jurisdiction pursuant to Section 404 of the Clean Water Act. Whether they are, in fact, jurisdictional depends on their relationship to traditional navigable waters. The Corps of Engineers jurisdiction under Section 404 of the Clean Water Act is defined in 33 CFR 328 and is further defined in "U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook" and its various appendices (the "Guidance"). Under the Guidance, waters of the United States that are potentially regulated pursuant to Section 404 of the Clean Water Act fall into one of the following categories.

I – Jurisdictional

A. Traditional navigable waters ("TNWs") and their adjacent (abutting and non-abutting) wetlands;

B. Non-navigable tributaries to TNWs that are relatively permanent waters (RPWs) and wetlands that directly abut such tributaries.

II – Potentially jurisdictional depending on whether there is a significant nexus to TNWs

A. Non-navigable tributaries to TNWs that are not relatively permanent waters (Non-RPWs) and their adjacent wetlands (abutting and non-abutting)

Wilson Estates
Jurisdictional Delineation & Special Status Species Assessment
January 2009

Figure 3
Soils Map

Table 1: Study Area Soil Map Units

Map Symbol	Mapping Unit	Drainage Class
AxD	Auburn very rocky silt loam, 2-30% slopes	Well drained

B. Wetlands adjacent to, but not abutting, RPWs

III – Potentially jurisdictional depending on whether there is a commerce clause nexus

A. Interstate and intrastate waterbodies and their adjacent wetlands that are not direct or indirect tributaries to TNWs (isolated waterbodies)

B. Interstate and intrastate wetlands that are not adjacent to TNWs or tributaries to TNWs (isolated wetlands)

Appendix D contains two exhibits prepared by Gibson & Skordal, LLC to help visualize these categories of potential jurisdiction with respect to the jurisdictional standard for each category. The first exhibit is a color-coded map showing the various categories discussed above, and the second is a chart showing the sequential questions that must be addressed to determine the jurisdictional status of specific wetlands. Appendix E includes a map displaying the connection between study area water features and the navigable American River. Site photos are contained in Appendix F.

The only water feature within the study area is a reach of Dutch Ravine, which flows westward into Green Spring Creek, New York Creek, the South Fork of the American River, Folsom Reservoir, and the navigable American River, respectively. The American River has been determined to be a TNW by the Corps of Engineers from its mouth to Bradshaw Road (approximately river mile 12). It is also likely that the American River above that point including Folsom Reservoir may be considered navigable-in-fact and thus would be considered to be a TNW by the Corps. Dutch Ravine is intermittent and is a non-RPW. As such, it requires a significant nexus determination to be classified as jurisdictional.

Dutch Ravine is capable of filtering and conveying sediment derived from the surrounding uplands, and it also contributes base flow to Green Spring Creek, New York Creek, the South Fork of the American River, and downstream TNW(s) during periods of flow. It appears to support the food chain through the transfer of organic carbon and nutrients, and it may provide limited food sources for aquatic species in downstream drainages. Appendix E lists the distances in river miles and air miles between the American River and the reach of Dutch Ravine within the study area. Absent any metrics for determining significance, we are unable to make a judgment whether Dutch Ravine would have a significant nexus to either the American River or Folsom Reservoir.

CONCLUSIONS

Based on the above, we make the following conclusions:

- Dutch Ravine is a non-RPW and requires a significant nexus determination to ascertain its status as a jurisdictional water of the United States.

These conclusions represent the professional opinion of Gibson & Skordal, LLC. Ultimately, the Corps of Engineers and the Environmental Protection Agency are responsible for determining the extent and jurisdictional status of aquatic habitats within the study area.

SPECIAL STATUS SPECIES EVALUATION

This report summarizes our evaluation of the potential presence of special status species within the study area. The special status species evaluation considers those species identified as having relative scarcity and/or declining populations by the United States Fish & Wildlife Service (FWS) or California Department of Fish & Game (CDFG). Special status species include those formally listed as threatened or endangered, those proposed for formal listing, candidates for federal listing, and those classified as species of special concern by CDFG. We also included those species considered to be "special animals" or "fully protected" by the CDFG and those plant species considered to be rare, threatened, or endangered in California by the California Native Plant Society (CNPS).

A record search of the CNDDB was conducted to identify all documented sightings of special status species in the vicinity of the study area. In addition to species identified in the CNDDB search, we included other special status species that may occur in the study area based on historical range data. Appendix G contains a CNDDB elemental occurrence map.

Table 2 provides a list of special status species that were evaluated including their listing status, habitat associations, and whether potential habitats occur in the study area. The following is a detailed summary of special status species and their habitats as they relate to the study area.

American Badger

American badger (*Taxidea taxus*) is a listed CDFG species of special concern. This burrowing carnivorous mammal is solitary and very territorial preferring to feed on small mammals, lizards, snakes, insects, and carrion. It has no known natural enemies and inhabits dry, open fields, grasslands, and pastures.

The appropriate habitat is present to support this species.

Pallid Bat

Pallid bat (*Antrozous pallidus*) is a listed CDFG species of special concern. It favors roosting sites in crevices in rock outcrops, caves, abandoned mines, and human-made structures such as barns, attics, hollow trees, and sheds. Though pallid bats are gregarious, they tend to group in smaller colonies of 10 to 100 individuals. It is a nocturnal hunter and captures prey in flight, but unlike most American bats, the species has been observed foraging for flightless insects, which it

seizes after landing. The sole occurrence within the target quadrangles is based upon a specimen collected two miles northwest of Folsom in 1942.

The lack of recent sightings makes it unlikely that pallid bats occupy the study area.

Silver-Haired Bat

Silver-haired bat (*Lasionycteris noctivagans*) is a listed CDFG special animal. Primarily considered a coastal and montane forest species; the silver-haired bat roosts in abandoned woodpecker holes, under bark, and occasionally in rock crevices. This insectivore's favored foraging sites include open wooded areas near water features.

The site contains the appropriate roosting and foraging habitat for this species.

Cooper's Hawk

Cooper's hawk (*Accipiter cooperi*), which is also known as the blue darter or chicken hawk, is listed by CDFG as a species of special concern. This raptor is an ambush predator that prefers to forage in or near wooded locations for birds, domestic poultry, and small mammals. Unlike falcons which use their beaks, Cooper's hawks subdue prey by continuously squeezing with talon-equipped feet. It has been observed on occasion drowning captured prey in water. This species prefers tree nesting in wooded areas typically 10 to 60 feet above ground level.

The study area contains suitable foraging and nesting habitat for this species.

Tricolored Blackbird

Tricolored blackbirds (*Agelaius tricolor*) are listed by CDFG as a species of special concern due to declining populations in the region. They are colonial nesters preferring to nest in dense stands of cattails and/or bulrush, but they also commonly nest in blackberry thickets associated with drainages, ditches, and canals. The nearest recorded nesting colony location is approximately 3.2 miles to the southwest near Mormon Island Dam.

The study area contains suitable foraging and nesting habitat.

TABLE 2:
EVALUATION OF SPECIAL STATUS SPECIES HABITATS

	Federal Status	State Status	CNPS Listing	Habitat Association	Potential Habitat In Study Area
Antrozous pallidus (pallid bat)	None	Species of Special Concern		Roosts in rock outcrops, hollow trees, abandoned mines, barns, and attics.	The lack of recent sightings make it unlikely to occur in the study area.
Lasionycteris noctivagans (silver-haired bat)	None	CDFG-Special Animals		Roosts in abandoned woodpecker holes, under bark, and occasionally in rock crevices. It forages in open wooded areas near water features.	Roosting and foraging habitat is present.
Taxidea taxus (American badger)	None	Species of Special Concern		This species prefers dry open fields, grasslands, and pastures.	Foraging and burrowing habitat is present.
Accipiter cooperi (Cooper's hawk)	None	CDFG-Special Animals		Inhabits forested habitats, forest edge, and riparian habitat, may forage in adjacent grassland and fields.	Foraging and nesting habitat present.
Agelaius tricolor (tricolored blackbird)	None	Species of Special Concern		Colonial nester in cattails, bulrush, or blackberries associated with marsh habitats.	Nesting and foraging habitat is present.
Ammodramus savannarum (grasshopper sparrow)	None	Species of Special Concern		Favors native grasslands. Feeds on insects, particularly grasshoppers, which it forages from open ground.	Foraging and nesting habitat present.
Ardea alba (great egret)	None	CDFG-Special Animals		Rivers, streams, lakes, marsh and other aquatic habitats.	No
Ardea herodias (great blue heron)	None	CDFG-Special Animals		Rivers, streams, lakes, marsh and other aquatic habitats.	No
Athene cunicularia (burrowing owl)	None	Species of Special Concern		Nests in abandoned ground squirrel burrows associated with open grassland habitats.	No
Buteo Swainsoni (Swainson's hawk)	None	Threatened		Nests in tall cottonwoods, valley oaks or willows. Forages in fields, cropland, irrigated pasture, and grassland near large riparian corridors.	Marginal nesting and foraging habitat present; species unlikely present.
Elanus leucurus (white-tailed kite)	None	Fully Protected		Nests in riparian corridors along streams and rivers, and forages in nearby grasslands and fields.	Marginal nesting and foraging habitat present; species unlikely present.

TABLE 2:
EVALUATION OF SPECIAL STATUS SPECIES HABITATS

Haliaeetus leucocephalus (bald eagle)	Delisted	Endangered		Documented as wintering & nesting in El Dorado Co., they typically nest in oak woodland within 1 mile of lakes, rivers, or larger streams.	Foraging habitat present.
Laterallus jamaicensis coturniculus (California black rail)	None	Threatened		Nests and forages in salt, brackish, and fresh marshes with abundant vegetative cover.	No
Phalacrocorax auritus (double-crested cormorant)	None	CDFG-Special Animals		Nests in colonies on rocks, cliff, or in trees. It prefers open water habitats such as coastlines, ponds, rivers, lakes, estuaries, or lagoons.	No
Progne subis (purple martin)	None	Species of Special Concern		Prefers open areas near bodies of water or wetlands. It is a colonial nester which utilizes cavities in trees, cliff faces, buildings.	Foraging habitat present.
Actinemys marmorata marmorata (northwestern pond turtle)	None	Species of Special Concern		Ponds, rivers, streams, wetlands, and irrigation ditches with associated marsh habitat.	No
Phrynosoma coronatum (frontale population) (California horned lizard)	None	Species of Special Concern		Diverse habitat associations, but normally a low land species associated with sandy scrub habitat.	No
Rana draytonii (California red-legged frog)	Threatened	Species of Special Concern		Breeds in permanent to semi-permanent aquatic habitats including lakes, ponds, marshes, creeks, and other drainages.	No
Rana boyii (foothill yellow-legged frog)	None	Species of Special Concern		Prefers gravelly or sandy streams with open banks near woodlands.	No
Spea (=Scaphiopus) hammondii (western spadefoot toad)	None	Species of Special Concern		Breeds in vernal pools, seasonal wetlands and associated swales. Forages and hibernates in adjacent grasslands.	No
Andrena blennospermatis (solitary or ground nesting bee)	None	None		Forages in vernal pools for pollen from blennosperma (*Blennosperma nanum*), and nests in nearby uplands.	No
Banksula californica (Alabaster Cave harvestman)	None	None		Only known from Alabaster Cave in which has since been partially destroyed by historic mining. Presently, it is sealed with cement.	No
Branchinecta conservatio (Conservancy fairy shrimp)	Endangered	None		Vernal pools or other seasonal wetlands	No

TABLE 2:
EVALUATION OF SPECIAL STATUS SPECIES HABITATS

Branchinecta lynchi (vernal pool fairy shrimp)	Threatened	None		Vernal pools or other seasonal wetlands.	No
Branchinecta mesovallensis (midvalley fairy shrimp)	None	None		Vernal pools or other seasonal wetlands.	No
Desmocerus californicus dimorphus (valley elderberry longhorn beetle)	Threatened	None		Dependent upon elderberry plant (Sambucus mexicana) as primary host species	No, elderberries were not observed.
*Hydrochara ricksecker*i (Ricksecker's water scavenger beetle)	None	None		Ponds, lakes, streams, rivers, vernal pools, and other freshwater features.	No
Lepidurus packardi (vernal pool tadpole shrimp)	Endangered	None		Vernal pools or other seasonal wetlands.	No
Linderiella occidentalis (California linderiella)	None	None		Vernal pools or other seasonal wetlands.	No
Allium jepsonii (Jepson's onion)	None	None	CNPS-1B.2	Prefers cismontane woodland or lower montane coniferous forests associated with serpentine soils or volcanic slopes.	No
Balsamorhiza macrolepis var. *macrolepis* (big-scale balsamroot)	None	None	CNPS-1B.2	Prefers chaparral, cismontane woodland, and valley and foothill grasslands.	Yes
Calystegia stebbinsii (Stebbin's morning glory)	Endangered	Endangered	CNPS-1B.1	Foothill chaparral and cismontane woodland associated with Gabbro soils.	No
Ceanothus roderickii (Pine Hill ceanothus)	Endangered	Rare	CNPS-1B.2	Foothill chaparral and cismontane woodland associated with Gabbro soils.	No
Chlorogalum grandiflorum (Red Hills soaproot)	None	None	CNPS-1B.2	Foothill chaparral, cismontane woodland, and lower montane coniferous forest. Usually found in Gabbro soils, but is known to grow on other soil types as well.	Yes
Clarkia biloba ssp. *brandegeeae* (Brandegee's clarkia)	None	None	CNPS-1B.2	Generally associated with chaparral and cismontane woodland, but may occur in foothill oak woodland and grassland.	Yes

TABLE 2:
EVALUATION OF SPECIAL STATUS SPECIES HABITATS

Fremontodenderon decumbens (Pine Hill flannelbush)	Endangered	Rare	CNPS-1B.2	Foothill chaparral and cismontane woodland associated with Gabbro soils.	No
Galium californicum ssp. *sierrae* (El Dorado bedstraw)	Endangered	Rare	CNPS-1B.2	Foothill chaparral and cismontane woodland associated with Gabbro soils.	No
Gratiola heterosepala (Bogg's Lake hedge-hyssop)	None	Endangered	CNPS-1B.2	Vernal pools and margins of lakes/ponds.	No
Helianthemum suffrutescens (Bisbee Peak rush rose)	None	None	CNPS-3.2	Open areas within chaparral. Can grow on Gabbro soils as well as other soil types.	No
Legenere limosa (legenere)	None	None	CNPS-1B.1	Vernal pools or other seasonal wetlands.	No
Packera layneae (Layne's ragwort)	Threatened	Rare	CNPS-1B.2	Foothill chaparral and cismontane woodland associated with Gabbro soils.	No
Eryngium pinnatisectum (Tuolumne button-celery)	None	None	CNPS-1B.2	Cismontane woodlands, lower montane coniferous forests, and vernal pools.	No
Juncus leiospermus var. *ahartii* (Ahart's dwarf rush)	None	None	CNPS-1B.2	Margins of vernal pools.	No
Navarretia myersii ssp. *myersii* (Pin cushion navarretia)	None	None	CNPS-1B.1	Vernal pools and other seasonally flooded features.	No
Orcuttia tenuis (slender orcutt grass)	Threatened	Endangered	CNPS-1B.1	Vernal pools and other seasonally flooded features.	No
Orcuttia viscida (Sacramento orcutt grass)	Endangered	Endangered	CNPS-1B.1	Vernal pools and other seasonally flooded features.	No
Pseudobahia bahiifolia (Hartweg's golden sunburst)	Endangered	Endangered	CNPS-1B.1	Prefers grassland or open woodland with clay soils.	No
Sagittaria sanfordii (Sanford's arrowhead)	None	None	CNPS-1B.2	Emergent marsh habitat, typically associated with drainages, canals, or irrigation ditches.	No
Wyethia reticulata (El Dorado Co. mule ears)	None	None	CNPS-1B.2	Foothill chaparral and cismontane woodland associated with Gabbro soils.	No

Grasshopper Sparrow

The grasshopper sparrow (*Ammodramus savannarum*) is listed by CDFG as a species of special concern. This relatively small song bird favors open grasslands and feeds primarily on insects, particularly grasshoppers, which it forages from the ground. It builds on the ground well concealed cup-like nests composed of grass blades. It is also known to form loose breeding colonies.

The required nesting and foraging habitats are present within the study area.

Great Egret

The great egret (*Ardea alba*) is listed by CDFG as a special animal. This bird usually forages alone in shallow open water and wetlands for fish, amphibians, and aquatic invertebrates. The species has recovered from historic persecution by plume hunters, but destruction of wetlands, especially in the West where colonies are few and widely scattered, poses a current threat. Great egrets prefer breeding habitat in or near open waters and wetlands.

The required nesting and foraging habitat is not present.

Great Blue Heron

The great blue heron (*Ardea herodias*) is listed by CDFG as a special animal. This wading bird forages in wetlands and shallow open waters for fish, aquatic invertebrates, small mammals, and amphibians. It usually nests in rookeries that are situated in wetlands or near open waters.

The study area does not support the required nesting and foraging habitat for this species.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is a ground nesting raptor species that is afforded protection by CDFG as a species of special concern due to declining populations in the Great Central Valley of California. They typically inhabit open grasslands and nest in abandoned ground squirrel burrows, cavities associated with raised mounds, levees, or soft berm features. The closest recorded occurrence is approximately 4.8 miles south of the study area near the El Dorado-Sacramento County line.

The study area does not contain the necessary foraging and nesting habitat for burrowing owl.

Swainson's Hawk

Swainson's hawk (*Buteo swainsoni*) is a raptor species currently listed as threatened in California by the CDFG. Breeding pairs typically nest in tall cottonwoods, valley oaks, or willows associated with riparian corridors, grassland, irrigated pasture, and cropland with a high density of rodents. The Central Valley populations breed and nest in the late spring through early summer before migrating to Central and South America for the winter. The closest recorded occurrence is approximately 6.5 miles southwest of the study area north of Highway 16.

Marginal nesting and foraging habitats are present within the study area; however, it is unlikely that Swainson's hawks frequent the study area.

White-Tailed Kite

White-tailed kite (*Elanus leucurus*), also known as black-shouldered kite, is a CDFG fully protected species. This non-migrating bird typically attains a wingspan of approximately 40 inches and feeds primarily on insects, small mammals, reptiles, and amphibians, which it forages from open grasslands. It builds a platform-like nest of sticks in trees or shrubs and lays 3 to 5 eggs, but may brood a second clutch if prey is abundant. The kite's distinct style of hunting includes hovering before diving onto its target.

Marginal nesting and foraging habitats are present within the study area; however, it is unlikely that white-tailed kites frequent the study area.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is a state endangered raptor that typically nests within one mile of large bodies of water including lakes, streams, or rivers. They prey on fish, waterfowl, squirrels, rabbits, and muskrats, though bald eagles have been observed feeding on carrion. They are solitary nesters and may be monogamous. The closest recorded occurrence is approximately 2.7 miles to the south at Bass Lake.

The site contains the appropriate foraging habitat for this species.

California Black Rail

The California black rail (*Laterallus jamaicensis coturniculus*) is listed as threatened in California by the CDFG. It favors salt, brackish, and fresh marshes at low elevations where it forages for seeds, insects, and isopods. It is a solitary nester favoring the edges of wetlands with tall grass and open space. Its range is poorly understood due mainly to its secretive nature. The data search revealed a single occurrence within the Rocklin quadrangle on Clover Creek about two miles northwest of Loomis or approximately 12 miles northwest of the study area.

The site does not support the required nesting and foraging habitat to support this species.

Purple Martin

The purple martin (*Progne subis*) is a California species of special concern. This bird winters in South American and migrates to Mexico, the United States, and southern Canada to breed. It is a colonial nester and utilizes natural cavities such as hollow trees, cliffs, and abandon woodpecker dens. Purple martins also take advantage of created nesting sites such as bird houses or gourds. It feeds on winged insects which it catches on the fly, and it prefers open areas near lakes, ponds, marshes or other water features.

The site appears to provide foraging habitat for purple martins.

Double-Crested Cormorant

The double-crested cormorant (*Phalacrocorax auritus*) is listed by CDFG as a species of special concern. This diving aquatic bird is the most widespread cormorant in North America. It prefers open water habitats such as ponds, rivers, estuaries, lagoons, and open coastlines where is forages for fish, amphibians, and crustaceans. It constructs nests near water in colonies on cliffs, rocks, or in trees.

Based on the lack of suitable habitat, double-crested cormorants are not likely to occur within the project area.

Northwestern Pond Turtle

The northwestern pond turtle (*Actinemys marmorata marmorata*) is a California species of special concern. Its favored habitats include streams, large rivers and canals with slow-moving

water, aquatic vegetation, and open basking sites. Although the turtles must live near water, they can tolerate drought by burrowing into the muddy beds of dried drainages. This species feeds mainly on invertebrates such as insects and worms, but will also consume small fish, frogs, mammals and some plants. Northwestern pond turtle predators include raccoons, coyotes, raptors, weasels, large fish, and bullfrogs. This species breeds from mid to late spring in adjacent open grasslands or sandy banks.

The necessary habitat is not present for northwestern pond turtle.

California Red-Legged Frog

The California red-legged frog (*Rana draytonii*) is a federally threatened and a CDFG species of special concern. This species is the largest indigenous frog west of the Continental divide. Once harvested for food with an annual take of approximately 80,000 animals per year in the late 1800s and early 1900s, the red-legged frog began to decline. To bolster diminishing populations, the larger and much more aggressive bull frog (*Rana catesbiana*) was introduced from the eastern United States in 1886. Bull frogs, which are voracious feeders, extirpated the native frogs from much of its historic range. Habitat destruction associated with placer mining, drought, ranching, farming, and urbanization further reduced populations, and in June 1996, the frog was officially assigned protection under the Endangered Species Act. Presently, red-legged frogs are believed to occupy only about 10% of its original range. This species requires deeper (2' to 3') slow moving or still aquatic habitats with abundant emergent vegetation, but it is known also to forage and disperse in nearby uplands. The closest CNDDB occurrence is less than 2 miles northwest of the study area; a specimen was observed during surveys in 2005 in an unnamed drainage near Fitch Way on the east side of Folsom Reservoir.

The study area does not contain the appropriate habitat for this species.

Foothill Yellow-Legged Frog

The foothill yellow-legged frog (*Rana boyii*), which is found from the Umpqua Basin in Oregon to the Coastal Range and Sierra foothills of California, is a state species of special concern. It requires slow moving, gravelly or sandy bottomed streams with open, sunny banks for breeding and foraging. It has also been observed hunting for invertebrates in adjacent woodlands. The nearest occurrence is recorded approximately 11.5 miles to the northeast within a perennial reach of Indian Creek.

The study area does not contain the necessary habitat to support this species.

California Horned Lizard

The California horned lizard (*Phrynosoma coronatum*) is a California species of special concern. Several factors including commercial pet collecting (which was banned in 1981) and habitat destruction have resulted in the decline of the species. This lizard's ability to change color to match its background, and its low, flattened profile make it difficult to detect. When threatened, the horned lizard can shoot streams of blood from its eyes up to a distance of four feet. Ants compose about 50% of their diet, but it will consume other insects as well. Mature females produce clutches of 6 to 21 eggs from May to June, which hatch in August and September. It lives in several diverse habitats, but the California horned lizard typically prefers lowland sandy scrub habitats.

The study area does not contain the preferred scrub habitat most commonly associated with this species.

Western Spadefoot Toad

The western spadefoot toad (*Spea hamondii)* is a California species of special concern. It is a nocturnally active animal, and prefers to forage in grassland, scrub, and chaparral for a variety of insects, worms, and other invertebrates. This species breeds from January to May in vernal pools, pools in ephemeral stream courses, and other fish-free water features. Females commonly lay more than 500 eggs in one season. The tadpoles develop in 3 to 11 weeks, and must complete their metamorphosis before the temporary pools dry.

The required habitat is not present to support western spadefoot toads.

Solitary or Ground-Nesting Bee

The solitary bee (*Andrena blennospermatis*) is not a state or federal listed species; however, it has been assigned a State Ranking code of S2 meaning that 6 to 20 elemental occurrences or 1,000 to 3,000 individuals have been identified within the state. This ground nesting species collects pollen from the vernal pool flower, blennosperma (*Blennosperma nanum*), which it caches in several individual underground brood chambers. In each chamber the female deposits a solitary egg that will hatch and feed on the specially treated pollen ball. These bees forage in vernal pool habitat supporting blennosperma and burrow and nest in adjacent uplands.

The site's lack of vernal pools would greatly reduce the likelihood that this ground-nesting bee regularly occupies the parcel.

Alabaster Cave Harvestman

The Alabaster Cave harvestman (*Banksula californica*) was recorded by CNDDB as occurring within the vicinity of the study area. Though it maintains no special state or federal status, it has been assigned a State Ranking of SH meaning that all elemental occurrences are historical. *Banksula californica* is poorly understood and known only from specimens collected from Alabaster Cave around 1900. The Alabaster Cave in El Dorado County has since been partially destroyed by historic mining, and it is presently sealed with cement.

The site lacks the caves necessary to support these species.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is a federal threatened species that is dependent upon the elderberry plant (*Sambucus sp.*) as a primary host species. Elderberry shrubs are a common component of riparian areas throughout the Sacramento Valley region, and numerous occurrences of valley elderberry longhorn beetle have been recorded east of the study area with the closest located approximately 8 miles away.

No elderberry shrubs were observed during our site visits.

Ricksecker's Water Scavenger Beetle

This aquatic beetle (*Hydrochara rickseckeri*) is not a state or federal listed species; however, it has been assigned a State Ranking code of S1S2 meaning that <6 to 20 elemental occurrences or <1,000 to 3,000 individuals have been identified within the state. The habits of this poorly understood species have not been thoroughly documented. They are believed to be scavengers and metamorphose from a predacious larval stage. This species favors shallow, weedy freshwater habitats such as vernal pools, lakes, ponds, and slow moving streams. It is capable of flight, but its dispersal capabilities are not well understood.

The study area does not provide the required habitat to support this species.

Vernal Pool Branchiopods

The federally threatened vernal pool fairy shrimp *(Branchinecta lynchi)* and the federally endangered vernal pool tadpole shrimp (*Lepidurus packardi*) as well as the non-listed California linderiella (*Linderiella occidentalis*) and midvalley fairy shrimp (*Branchinecta mesovallensis*) has been documented by the CNDDB as occurring within the proximity of the study area. Due to the dearth of available distribution information, we also included the federally endangered Conservancy fairy shrimp (*Branchinecta conservatio*) in our special status species habitat assessment even though none are listed as occurring in any of the target quadrangles. These species exclusively inhabit vernal pools or other seasonally ponded wetlands that sustain inundation during the winter before drying in the late spring.

The site lacks the necessary habitat to support these species.

Special Status Plants Requiring Gabbro Soils

Several special status species plants associated with the mildly acidic Gabbro soils are identified on the CNDDB as occurring within the target quadrangles and include Stebbin's morning glory (*Calystegia stebbinsii*), Pine Hill flannelbush (*Fremontodon decumbens*), Pine Hill ceanothus (*Ceanothus roderickii*), El Dorado bedstraw (*Galium californicum sierrae*), Layne's ragwort (*Packera layneae*), and El Dorado mule ears (*Wyethia reticulata*). Gabbro soils are derived from igneous rock and possess peculiar characteristics such as high concentrations of magnesium, iron, nickel, chromium, and cobalt and low amounts of calcium and plant nutrients such as phosphorus. This unusual soil has resulted in the evolution of a unique community of plants, many of which are only found in El Dorado County.

Most of the above plants have only been documented in chaparral or cismontane woodland associated with the Gabbro soils region around Pine Hill. Though all have been observed within five miles of the study area, the appropriate soils (also known as the Rescue Series) are not present within the study area according to the April 1974, "**Soil Survey for El Dorado Area, California.**" It is unlikely any of the above species occur within the study area.

The CNDDB also lists the presence of two additional sensitive plant species associated with Gabbro soils. Bisbee Peak rush-rose (*Helianthemum suffrutescens*), and Red Hills soaproot (*Chlorogalum gradiflorum*) have been documented in the Gabbro region, but are known to grow on other soil types as well. Both occur in chaparral, but Red Hills soaproot is also found in

cismontane woodlands, and lower montane coniferous forest. Both species are documented by the CNDDB as occurring within 1.5 miles of the study area.

The appropriate habitat for Red Hills soaproot is present within the study area.

Plants Associated with Vernal Pools and Other Wet Habitats

Special status plant species identified by CNDDB as occurring in the general vicinity of the study area include dwarf pin cushion navarretia (*Navarretia myersii* ssp. *myersii*), legenere (*Legenere limosa*), slender orcutt grass (*Orcuttia tenuis*), Sacramento orcutt grass (*Orcuttia viscida*), Tuolumne button-celery (*Eryngium pinnatisectum*), Bogg's Lake hedge-hyssop (*Gratiola heterosepala*), Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*), and Sanford's arrowhead (*Sagittaria sanfordii*). Pincushion navarretia, Ahart's dwarf rush, slender orcutt grass, Sacramento orcutt grass, and legenere are strongly associated with vernal pools or other seasonal wetlands. Bogg's Lake hedge-hyssop is found in vernal pools, but it also favors other shallow water habitats such as lake margins and marshes. Tuolumne button-celery occurs in vernal pools, but it is also found in other habitats such as cismontane woodland and lower coniferous montane forests. Sanford's arrowhead generally occurs in or near standing or slow-moving drainages, canals, ditches, or ponds.

The appropriate habitat types for these species are not present within the study area.

Other Special Status Plant Species

Several other special status species plants, such as Jepson's onion (*Allium jepsonii*), big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*), Hartweg's golden sunburst (*Pseudobahia bahiifolia*), and Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeeae*) have been recorded as occurring within the target quadrangles. Jepson's onion grows in cismontane woodland and lower cismontane coniferous forests associated with serpentine soils or volcanic slopes. Big-scale balsamroot is found in valley or foothill grasslands or cismontane woodland habitats; it sometimes is found on serpentine soils. Hartweg's golden sunburst is a federal and California endangered species associated with grasslands and/or open forests with clay soils. Brandegee's clarkia is generally associated with chaparral and cismontane woodland, but is also documented in foothill oak woodland and grassland.

Habitat is present within the study area for all of the above species except Hartweg's golden sunburst and Jepson's onion.

SUMMARY OF SPECIAL STATUS SPECIES HABITAT ASSESSMENT

Based on the presence of suitable habitat the following species may occur within the study area: silver-haired bat, American badger, Cooper's hawk, tricolored blackbird, grasshopper sparrow, bald eagle, purple martin, big-scaled balsamroot, Red Hills soaproot, and Brandegee's clarkia.

If future development of the study area will occur during the raptor nesting season, which extends from February to September, we recommend that a pre-construction nesting survey be completed within two weeks of the start of work.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

August 23, 2011

SEP 6 2011

SEP 15 RECEIVED PLANNING DEPARTMENT

Regulatory Division SPK-2011-00646

Ms. Ann Wilson
4101 Greenview Drive
El Dorado Hills, California 95762

Dear Ms. Wilson:

We are responding to your June 24, 2011, request for a preliminary jurisdictional determination (JD), in accordance with our Regulatory Guidance Letter (RGL) 08-02, for the Wilson Estates site. The approximately 28-acre site is located on or near Section 14, Township 10 North, Range 8 East, Mount Diablo Meridian Survey, Latitude 38.7138281150738°, Longitude -121.06310440849°, El Dorado Hills, El Dorado County, California.

Based on available information, **we concur with the estimate of potential waters of the United States, as depicted on the January 2009, Jurisdictional Delineation, Wilson Estates Property drawing prepared by Gibson & Skordal, LLC** (enclosure 1). The approximately 0.0748 acre of wetlands or other water bodies present within the survey area may be jurisdictional waters of the United States. These waters may be regulated under Section 404 of the Clean Water Act.

A copy of our RGL 08-02 Preliminary Jurisdictional Determination Form for this site is enclosed (enclosure 2). Please sign and return a copy of the completed form to this office. Once we receive a copy of the form with your signature we can accept and process a Pre-Construction Notification or permit application for your proposed project.

You should not start any work in potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization. You may request an approved JD for this site at any time prior to starting work within waters. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the particular site identified in this request. A Notification of Appeal Process and Request for Appeal (RFA) form is enclosed to notify you of your options with this determination (enclosure 3). This determination may not be valid for the wetland conservation provisions of the Food Security Act

Attachment 9

of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey.*

Please refer to identification number SPK-2011-00646 in any correspondence concerning this project. If you have any questions, please contact Mr. Peck Ha at our California North Branch Office, Regulatory Division, Sacramento District, U.S. Army Corps of Engineers, 650 Capitol Mall, Suite 5-200, Sacramento, California 95814-4708, email *Peck.Ha@usace.army.mil*, or telephone 916-557-6617. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Nancy Arcady Haley
Chief, California North Branch

Enclosures

Copy Furnished without enclosures:
Mr. James Gibson, Gibson & Skordal, LLC, 2277 Fair Oaks Blvd, Suite 105, Sacramento, California 95825

Copies Furnished with enclosure 1:
Mr. Dan Radulescu, Storm Water and Water Quality Certification Unit, California Regional Water Quality Control Board, Central Valley Region, 11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Mr. Kent Smith, California Department of Fish and Game, Region 2, 1701 Nimbus Drive, Rancho Cordova, California 95670-4599
Ms. Kim Squires, Forest Foothill Branch, U.S. Fish and Wildlife Service, Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901
Mr. Jason Brush, Environmental Protection Agency, WRT-8, 75 Hawthorne Street, San Francisco, California 94105

PRELIMINARY JURISDICTIONAL DETERMINATION FORM
Sacramento District

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Regulatory Branch: **California North** File/ORM #: **SPK-2011-00646** PJD Date: **August 23, 2011**

State: **CA** City/County: **, El Dorado County**
Nearest Waterbody:

Location (Lat/Long): **38.7138281150738°, -121.06310440849°**

Size of Review Area: **28** acres

Name/Address Of Property Owner/ Potential Applicant: **Ann Wilson**
4101 Greenview Drive
El Dorado Hills, California 95762

Identify (Estimate) Amount of Waters in the Review Area
Non-Wetland Waters:
linear feet ft wide acre(s)
Stream Flow: **N/A**

Wetlands: **0.0748** acre(s) Cowardin Class: **N/A**

Name of any Water Bodies on the site identified as Section 10 Waters: Tidal: Non-Tidal:

☒ Office (Desk) Determination
☐ Field Determination:
Date(s) of Site Visit(s):

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply – checked items should be included in case file and, where checked and requested, appropriately reference sources below)

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **January 2009, Jurisdictional Delineation, Wilson Estates Property drawing prepared by Gibson & Skordal, LLC**
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Data sheets prepared by the Corps.
☐ Corps navigable waters' study.
☐ U.S. Geological Survey Hydrologic Atlas:
  ☐ USGS NHD data.
  ☐ USGS HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: **1:24K; CA-CLARKSVILLE**
☐ USDA Natural Resources Conservation Service Soil Survey.
☐ National wetlands inventory map(s).
☐ State/Local wetland inventory map(s).
☐ FEMA/FIRM maps.
☐ 100-year Floodplain Elevation (if known):
☒ Photographs: ☒ Aerial
  ☒ Other
☐ Previous determination(s). File no. and date of response letter:
☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:
1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Ann Wilson,	File No.: SPK-2011-00646	Date: August 23, 2011
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/inet/functions/cw/cecwo/reg* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II: REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Peck Ha Regulatory Project Manager U.S. Army Corps of Engineers 1325 J Street, Room 1480 Sacramento, California 95814-2922 Phone: 916-557-6617, FAX 916-557-6877 Email: Peck.Ha@usace.army.mil (Use this address for submittals to the **district** engineer)	If you only have questions regarding the appeal process you may also contact: Thomas J. Cavanaugh Administrative Appeal Review Officer U.S. Army Corps of Engineers 1455 Market Street San Francisco, California 94103-1399 Phone: 415-503-6574, FAX 415-503-6646) Email: Thomas.J.Cavanaugh@usace.army.mil (Use this address for submittals to the **division** engineer)

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

SPD version revised December17, 2010

PHASE I ARCHAEOLOGICAL STUDY
OF THE WILSON ESTATES PROJECT,
ASSESSORS PARCEL NO. 126:070:22, 23 AND 30,
BORDERING MALCOLM DIXON ROAD,
EL DORADO HILLS, EL DORADO COUNTY, CALIFORNIA 95762

JANUARY 2011

Prepared For:

Brian Veit

One Maritime Plaza, Suite 1103

San Francisco, CA 94111

CTA Engineering and Surveying

3233 Monier Circle,

Rancho Cordova, CA 95742

Prepared By:

Historic Resource Associates

2001 Sheffield Drive

El Dorado Hills, CA 95762

Attachment 10

Malcolm Dixon Road from the farm of Charles Dixon, and Dixon family members taught for many years at the school, until it finally closed its doors around 1950. The school, however, is not part of the current project.

X. RECOMMENDATIONS

During the course of grading activities within the perimeter of the Charles Dixon Farm Site, as defined by Figure 1, archaeological monitoring should occur. If previously unidentified or subsurface archaeological sites or features are discovered, work should stop at that location and the discovery should be examined for its potential significance and removed if deemed of scientific value, after which work can proceed once again.

In addition, an interpretive sign should be designed in consultation with the El Dorado County Historical Museum to commemorate the location of the Charles Dixon Farm and the Live Oak School. The sign should be mounted in an appropriate location near the site and along Malcolm Dixon Road.

XI. PROFESSIONAL QUALIFICATIONS

Dana E. Supernowicz, principal of Historic Resource Associates, earned his M.A. degree in History at California State University, Sacramento in 1983, with an emphasis in California and Western United States history. Supernowicz has over 30 years of experience working in the field of cultural resources management for federal and state agencies, as well as 25 years in private consulting. He had also served as president of the El Dorado County Historical Society, and is a member of the Society for California Archaeology, Oregon-California Trails Association, and the National Trust for Historic Preservation.

XII. REFERENCES

Secondary Sources

Ayers, James and Gregory Seymour. *Life on a 1930s Homestead: Historical Archaeological Investigations of the Brown Homestead on the Middle Agua Fria River, Yavapai County, Arizona*. SWCA Anthropological Research Paper Number 2, Tucson, AZ. 1993.

Revised
Received
July 12 2012

DRAINAGE REPORT

WILSON ESTATES

July 2012

~~Prepared: June 2011~~

cta Engineering & Surveying

Civil Engineering ▪ Land Surveying ▪ Land Planning

Attachment 11

Z 11-0007
PD 11-0004/TM11-1504

WILSON ESTATES DRAINAGE STUDY SHED PARAMETERS - Tc's

SHED ID	SHEET FLOW TRAVEL TIME					SHALLOW CONCENTRATED FLOW				CHANNEL FLOW TIME						SUM Tc (min)	Shed Area (mi^2)	Ia	CN	Lag (min)	Shed Area (ac)	SHED ID
	L1 (ft)	n	P (in)	S1	Tc1 (min)	Unpaved Length (ft)	S2	V2 (ft/sec)	Tc2 (min)	Channel Length (ft)	S2	V2 (ft/sec)	Altitude index H (0.001ft)	Peak discharg e Q (cfs)	Tc3 (min)							
PRE-DEVELOPMENT																						
A	180	0.24	2.52	0.110	13.01	6550	0.030	2.79	39.06	1050	0.044	3.7	0.84	19.0	4.73	64.53	0.3531	0.36	84.65	38.7	226.0	A
	120	0.24	2.52	0.180	7.73																	
B*	300	0.16	2.52	0.060	16.06	300	0.116	5.50	0.91							16.99	0.0084	0.36	84.8	10.2	5.4	B
C	300	0.24	2.52	0.080	22.24	950	0.085	4.70	3.37							25.61	0.0099	0.35	85.2	15.4	6.4	C
D	300	0.24	2.52	0.065	24.17	1260	0.086	4.73	4.44							28.61	0.0181	0.38	84.0	17.2	11.6	D
POST-DEVELOPMENT																						
A1	180	0.24	2.52	0.110	13.01	6550	0.030	2.79	39.06	1050	0.044	3.7	0.84	18.8	4.73	64.53	0.35000	0.36	84.68	38.7	224.0	A1
	120	0.24	2.52	0.180	7.73																	
A2					10.00	100	0.07	5.38	0.31	120		10.0			0.20	11.3	0.00578	0.33	85.86	6.79	3.70	A2
						245	0.097	5.03	0.81													
B	210	0.24	2.52	0.094	16.40	355	0.030	3.52	1.68	322		10.0			0.54	18.6	0.00922	0.34	85.59	11.17	5.90	B
C	190	0.24	2.52	0.080	15.43	320	0.07	4.27	1.25							18.4	0.00813	0.34	85.65	11.07	5.20	C
						480	0.050	4.55	1.76													
D	260	0.24	2.52	0.086	19.27	120	0.07	4.24	0.47													
						345	0.04	4.07	1.41	100		10.0			0.17	22.4	0.01234	0.32	86.30	13.45	7.90	D
						260	0.06	3.95	1.10													

LEGEND

SHEET	PIPE
PAVED	CHANNEL
UNPAVED	HOUSE

NOTES:

* n value for shed B is adjusted to reflect road/gravel (0.011) and dense grass (0.24) combination for the roughness coefficient

WILSON ESTATES LAND USE SHED CHARACTERISTICS

PRE-CONSTRUCTION

SHED A	ac	CN	CNcomp
Woods/Grass fair	98	82	35.6
Range D fair	103.5	84	38.5
Impervious	24.5	98	10.6
	226		**84.65**
SHED B	**ac**	**CN**	**CNcomp**
Pasture D fair	5.1	84	79.3
Road	0.3	98	5.4
	5.40		**84.8**
SHED C	**ac**	**CN**	**CNcomp**
Pasture D fair	5.5	84	77.0
Road	0.5	98	8.2
	6.00		**85.2**
SHED D	**ac**	**CN**	**CNcomp**
Pasture D fair	11.6	84	**84.0**

POST-CONSTRUCTION

SHED A	ac	CN	CNcomp
Woods/Grass fair	98	82	35.9
Range D fair	97.7	84	36.6
Impervious	24.5	98	10.7
lots	3.6	84.6	1.4
GV Connector	0.200	98	0.1
0.35000	**224**		**84.68**
SHED A2	**ac**	**CN**	**CNcomp**
Open space good	0.62	80	13.4
Residential 1	2.52	84.6	57.6
GV Connector	0.56	98	14.8
0.00578	**3.7**		**85.86**
SHED B	**ac**	**CN**	**CNcomp**
Open Space good	0.66	80	9.0
Residential 1	4.55	84.6	65.6
Road	0.66	98	11.0
0.00917	**5.87**		**85.59**
SHED C	**ac**	**CN**	**CNcomp**
Open Space good	0.8	80	12.4
Residential 1	3.7	84.6	60.4
Road	0.68	98	12.9
0.00809	**5.18**		**85.65**
SHED D	**ac**	**CN**	**CNcomp**
Residential 1	6.9	84.6	73.9
Road	1	98	12.4
0.01234	**7.9**		**86.3**

Project: Wilson Estates Simulation Run: Existing 10

Start of Run: 06Jun2011, 01:00 Basin Model: Existing
End of Run: 07Jun2011, 01:01 Meteorologic Model: SCS 1 10y
Compute Time: 10May2012, 10:43:45 Control Specifications: 24H

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
A	0.3531	152.1	06Jun2011, 11:33	2.14
B	0.0084	7.3	06Jun2011, 11:03	2.17
C	0.0099	7.3	06Jun2011, 11:08	2.20
D	0.0181	12.0	06Jun2011, 11:10	2.10
Sink-A	0.3531	152.1	06Jun2011, 11:33	2.14
Sink-C	0.0099	7.3	06Jun2011, 11:08	2.20

Project: Wilson Estates Simulation Run: Proposed 2012 10

Start of Run: 06Jun2011, 01:00 Basin Model: Poposed 2012
End of Run: 07Jun2011, 01:01 Meteorologic Model: SCS 1 10y
Compute Time: 10May2012, 10:33:17 Control Specifications: 24H

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
A1	0.3500	151.0	06Jun2011, 11:33	2.14
A2	0.0057	6.0	06Jun2011, 11:00	2.27
B	0.0092	8.0	06Jun2011, 11:04	2.24
C	0.0081	7.1	06Jun2011, 11:04	2.24
D	0.0123	10.2	06Jun2011, 11:06	2.30
JA	0.3557	152.1	06Jun2011, 11:33	2.14
Sink-A	0.3557	152.1	06Jun2011, 11:33	2.14

Project: Wilson Estates Simulation Run: Existing 100

Start of Run: 06Jun2011, 01:00 Basin Model: Existing
End of Run: 07Jun2011, 01:01 Meteorologic Model: SCS 1 100y
Compute Time: 10May2012, 10:43:50 Control Specifications: 24H

Volume Units: IN

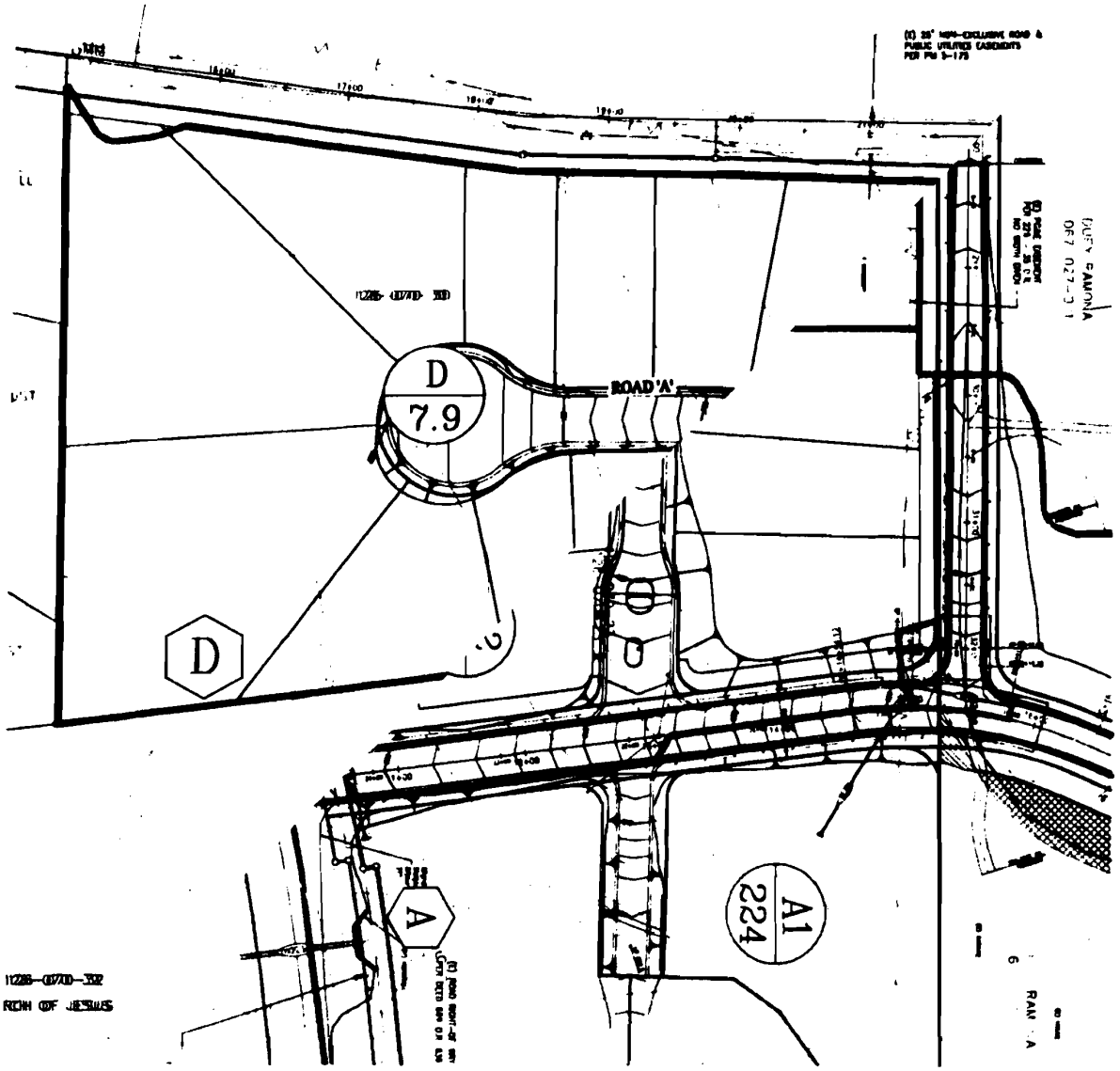
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
A	0.3531	256.2	06Jun2011, 11:33	3.52
B	0.0084	12.3	06Jun2011, 11:03	3.58
C	0.0099	12.2	06Jun2011, 11:08	3.61
D	0.0181	20.4	06Jun2011, 11:10	3.49
Sink-A	0.3531	256.2	06Jun2011, 11:33	3.52
Sink-C	0.0099	12.2	06Jun2011, 11:08	3.61

Project: Wilson Estates Simulation Run: Proposed 2012 100

Start of Run: 06Jun2011, 01:00 Basin Model: Poposed 2012
End of Run: 07Jun2011, 01:01 Meteorologic Model: SCS 1 100y
Compute Time: 10May2012, 10:33:24 Control Specifications: 24H

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
A1	0.3500	254.1	06Jun2011, 11:33	3.52
A2	0.0057	9.8	06Jun2011, 11:00	3.69
B	0.0092	13.3	06Jun2011, 11:04	3.65
C	0.0081	11.7	06Jun2011, 11:04	3.66
D	0.0123	16.7	06Jun2011, 11:06	3.72
JA	0.3557	256.0	06Jun2011, 11:32	3.53
Sink-A	0.3557	256.0	06Jun2011, 11:32	3.53


ROAD 'A'
D
7.9
D
A
A1
224

Environmental Noise Assessment

Wilson Estates

El Dorado Hills, California

BAC Job # 2011-043

Prepared For:

Ann Wilson

4101 Greenview Drive
El Dorado Hills, CA 96762

Prepared By:

Bollard Acoustical Consultants, Inc.

Paul Bollard, President

May 3, 2012

BOLLARD
Acoustical Consultants

Attachment 12

3551 Bankhead Road ▸ Loomis, CA 95650 ▸ Phone: (916) 663-0500 ▸ Fax: (916) 663-0501 ▸ BACNOISE.COM

Introduction

The proposed Wilson Estates (project) site is located within El Dorado County along Green Valley Road at the location shown on Figure 1. Due to the proximity of proposed residences to Green Valley Road, Bollard Acoustical Consultants, Inc. (BAC) was retained to prepare this noise study. Specifically, the purpose of this assessment is to quantify noise generated by Green Valley Road traffic as it affects the project site and to recommend appropriate noise mitigation measures where future traffic noise levels are predicted to exceed applicable El Dorado County Noise Element standards.

Noise Fundamentals and Terminology

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 thus 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. Table 1 shows common noise levels associated with various sources.

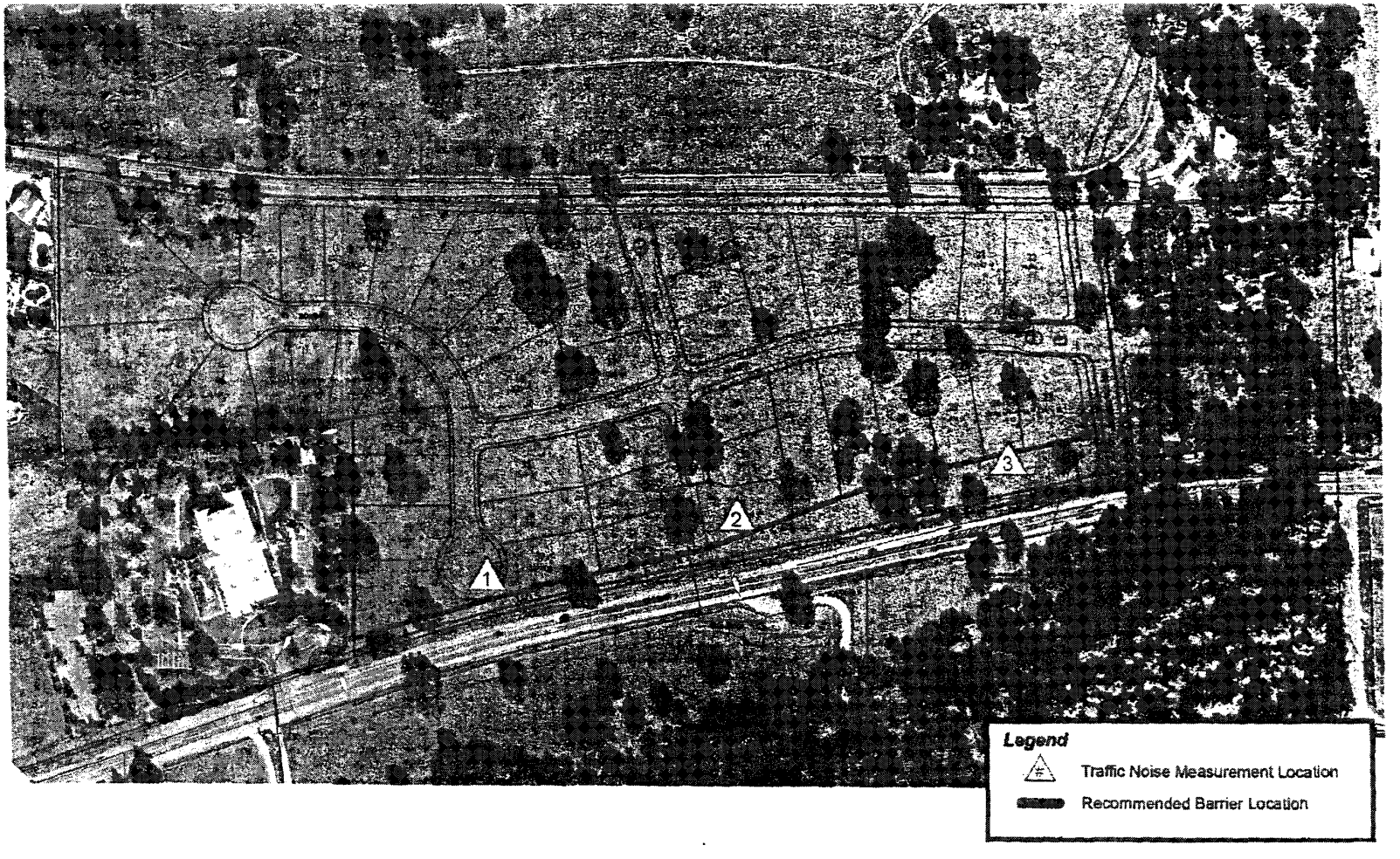
The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighing 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.

Figure 1

Wilson Estates - El Dorado County, California

Proposed Site Plan & Traffic Noise Calibration Locations



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.

Table 1
Typical A-Weighted Sound Levels of Common Noise Sources

Loudness Ratio	dBA	Description
128	130	Threshold of pain
64	120	Jet aircraft take-off at 100 feet
32	110	Riveting machine at operators position
16	100	Shotgun at 200 feet
8	90	Bulldozer at 50 feet
4	80	Diesel locomotive at 300 feet
2	70	Commercial jet aircraft interior during flight
1	60	Normal conversation speech at 5-10 feet
1/2	50	Open office background level
1/4	40	Background level within a residence
1/8	30	Soft whisper at 2 feet
1/16	20	Interior of recording studio

Criteria for Acceptable Noise Exposure

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.

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.

Future Traffic Noise Environment

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.

Traffic noise level measurements were completed using Larson-Davis Laboratories, Inc. (LDL) Model 820 sound level meters equipped with a G.R.A.S. Model 40AQ ½" microphone. The measurement instrumentation was calibrated in the field before use with an LDL Model CAL200 acoustical calibrator. The measurement system meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound measurement systems.

On July 7, 2011, Bollard Acoustical Consultants, Inc. staff completed a project site inspection and traffic noise level measurements (Green Valley Road). Counts of Green Valley Road traffic were completed during the noise level measurements to be used toward calibration of the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (FHWA RD-77-108). Measurements were completed at a height of 5 feet above the ground and approximately 10-15 feet above the existing roadway elevation. All three measurement sites were located approximately 100 feet from the centerline of Green Valley Road, in the vicinity of the closest proposed residential properties. The noise level measurement locations are illustrated on Figure 1.

The short-term traffic noise level measurements and traffic volume counts were used to calibrate the FHWA Model regarding the prediction of future traffic noise exposure on the project site. The noise level measurement results were compared to the FHWA Model results to determine any applicable noise modeling offsets/adjustments (calibration of the Model). For this project, the Model was found to over-predict traffic noise exposure on the project site due to acoustical shielding from the elevated site (topography) and above-average ground absorption (tall grasses). Under project conditions, acoustical shielding from project-area topography would remain, but ground absorption would be significantly reduced. To account for these conditions, a conservative Model adjustment of -2 dB was provided for the final traffic noise assessment. The complete calibration results are provided in the Appendix B.

With the applied FHWA Model offset, a future (2035) Green Valley Road traffic volume of 15,500 ADT (SACOG, October 2010), an assumed day/night traffic distribution of 83%/17%, an auto/medium truck/heavy truck traffic distribution of 98%/2%/0% (consistent with field observations), and an actual traffic speed of 50 MPH, future (2035) Green Valley Road traffic noise exposure at the project lots was calculated to be 60-63 dB L_{dn} depending on the lot. These are conservative estimates of future traffic noise exposure on the project site. The calculated traffic noise exceeds the applicable 60 dB L_{dn} exterior criterion. Table 2 provides Green Valley Road traffic noise contour distances and calculated future L_{dn} for various lots. The FHWA Model inputs and predicted future traffic noise levels at the project site are shown in

Appendix B and C, respectively. Recommended mitigation measures are discussed in the following section.

Table 2
Future Traffic Noise Levels and Contour Distances
Wilson Estates – El Dorado County

Lot Number	Distance (feet)[1]	L_{dn} (dB)
24	160	61
27	170	60
31	130	62
32	110	63
37	110	63
38	130	62

Notes: [1] Distance measured from centerline of roadway to approximate center of outdoor activity area (backyard).
Source: Bollard Acoustical Consultants, Inc.

It is estimated that future (2035) traffic noise exposure from Green Valley Road may be as high as 66 dB L_{dn} at second-floor building facades facing the roadway. These facades would not benefit from topographic shielding or significant ground absorption unlike ground-floor receivers, and would therefore experience incrementally higher noise exposure.

Assuming that standard residential construction would provide a minimum exterior-to-interior noise level reduction of 25 dB with windows and exterior doors closed, interior noise exposure from future (2035) Green Valley Road traffic may be as high as 38 dB L_{dn} and 41 dB L_{dn} within the closest first-floor and second-floor project rooms, respectively. Therefore, future traffic noise exposure within project dwellings would not be expected to exceed the applicable 45 dB L_{dn} limit. It is assumed that all project dwellings would be provided with appropriately designed mechanical systems so that windows and exterior doors may be closed when needed for noise insulation.

Traffic Noise Mitigation

Predicted future Green Valley Road traffic noise levels at the outdoor activity areas of the proposed project (63 dB L_{dn}) are expected to exceed the El Dorado County exterior traffic noise standard (60 dB L_{dn}). It is recommended that noise barriers measuring 6-feet in height relative to backyard elevations be constructed at the locations depicted in Figure 1. Based on the topography of the site plan, there is an elevation of 4 feet between the road and the house pad. At that height, such barriers would be expected to provide a 7 dB reduction in traffic noise levels. As a result, future traffic noise levels at the outdoor activity areas would be expected to comply with the El Dorado County exterior traffic noise standard. The barrier insertion loss calculations and graphs are shown in Appendix D and E, respectively.

At the southeastern-most lot in this development, the project engineer has stated that barrier construction would be problematic from a tree-preservation standpoint. As a result, alternative mitigation measures are recommended for this lot. The predicted future traffic noise level at this location is 61 dB Ldn, which only exceeds the County noise standard by 1 dB. Therefore, provided the primary outdoor activity area of this lot is positioned in an area which is either partially or completely shielded from view of Green Valley Road by the residence constructed on this property, by a wing-wall, or through the creation of a courtyard, the County's exterior noise standard will be satisfied.

Conclusions and Recommendations

Future Green Valley Road traffic noise levels at the outdoor activity areas (backyards) of the Wilson Estates project site are expected to exceed the exterior El Dorado County traffic noise level standard, although only by a small margin. As a means of achieving compliance with the exterior standard, a 6-foot high noise barrier is recommended at the location depicted in Figure 1. As a result, Green Valley Road traffic noise exposure at the outdoor activity areas (backyards) of the shielded lots would be expected to be less than 60 dB L_{dn}.

Barriers should be constructed of concrete or masonry block, or precast concrete. Wood is not recommended due to eventual warping and shrinking of materials which results in openings and cracks which compromise the barrier longevity. Other prefabricated barriers may be used. However, they should be reviewed by an acoustical consultant.

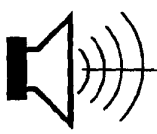
At the southeastern-most lot in this development, the project engineer has stated that barrier construction would be problematic from a tree-preservation standpoint. As a result, alternative mitigation measures are recommended for this lot. Provided the primary outdoor activity area of this lot is positioned in an area which is either partially or completely shielded from view of Green Valley Road by the residence constructed on this property, by a wing-wall, or through the creation of a courtyard, the County's exterior noise standard will be satisfied at this lot as well. This approach would result in compliance with the County's noise requirements without the need to potentially remove trees for the construction of a noise barrier at this lot.

These conclusions are based on the traffic data provided by Kimley-Horn and Associates, Inc. and noise reduction data for standard residential dwellings. 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.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	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.
RT_{60}	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.



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Appendix B-1

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Calibration Worksheet

Project Information:

Job Number: 2010-063
Project Name: Wilson Estates
Roadway Tested: Green Valley Road
Test Location: Site 1
Test Date: July 7, 2011

Weather Conditions:

Temperature (Fahrenheit): 91
Relative Humidity: 23%
Wind Speed and Direction: Calm
Cloud Cover: Clear

Sound Level Meter:

Sound Level Meter: LDL Model 820
Calibrator: LDL Model CAL200
Meter Calibrated: Immediately before
Meter Settings: A-weighted, slow response

Microphone:

Microphone Location: On project site
Distance to Centerline (feet): 100
Microphone Height: 5 feet above ground
Intervening Ground (Hard or Soft): **Soft**
Elevation Relative to Road (feet): 10

Roadway Condition:

Pavement Type Asphalt
Pavement Condition: Good
Number of Lanes: 2
Posted Maximum Speed (mph): 55

Test Parameters:

Test Time: 1:48 PM
Test Duration (minutes): 15
Observed Number Automobiles: 164
Observed Number Medium Trucks: 1
Observed Number Heavy Trucks: 1
Observed Average Speed (mph): 45

Model Calibration:

Measured Average Level (L_{eq}): 56.0
Level Predicted by FHWA Model: 60.5
Difference: ***4.5 dB***

Conclusions:

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Appendix B-2

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) Calibration Worksheet

Project Information:	Job Number:	2010-063
	Project Name:	Wilson Estates
	Roadway Tested:	Green Valley Road
	Test Location:	Site 2
	Test Date:	July 7, 2011
Weather Conditions:	Temperature (Fahrenheit):	91
	Relative Humidity:	23%
	Wind Speed and Direction:	Calm
	Cloud Cover:	Clear
Sound Level Meter:	Sound Level Meter:	LDL Model 820
	Calibrator:	LDL Model CAL200
	Meter Calibrated:	Immediately before
	Meter Settings:	A-weighted, slow response
Microphone:	Microphone Location:	On project site
	Distance to Centerline (feet):	100
	Microphone Height:	5 feet above ground
	Intervening Ground (Hard or Soft):	**Soft**
	Elevation Relative to Road (feet):	15
Roadway Condition:	Pavement Type	Asphalt
	Pavement Condition:	Good
	Number of Lanes:	2
	Posted Maximum Speed (mph):	55
Test Parameters:	Test Time:	1:48 PM
	Test Duration (minutes):	15
	Observed Number Automobiles:	164
	Observed Number Medium Trucks:	1
	Observed Number Heavy Trucks:	1
	Observed Average Speed (mph):	45
Model Calibration:	Measured Average Level (L_{eq}):	57.6
	Level Predicted by FHWA Model:	60.5
	Difference:	***2.9 dB***

Conclusions:

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Appendix B-3

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Calibration Worksheet

Project Information:	Job Number:	2010-063
	Project Name:	Wilson Estates
	Roadway Tested:	Green Valley Road
	Test Location:	Site 3
	Test Date:	July 7, 2011
Weather Conditions:	Temperature (Fahrenheit):	91
	Relative Humidity:	23%
	Wind Speed and Direction:	Calm
	Cloud Cover:	Clear
Sound Level Meter:	Sound Level Meter:	LDL Model 820
	Calibrator:	LDL Model CAL200
	Meter Calibrated:	Immediately before
	Meter Settings:	A-weighted, slow response
Microphone:	Microphone Location:	On project site
	Distance to Centerline (feet):	100
	Microphone Height:	5 feet above ground
	Intervening Ground (Hard or Soft):	**Soft**
	Elevation Relative to Road (feet):	15
Roadway Condition:	Pavement Type	Asphalt
	Pavement Condition:	Good
	Number of Lanes:	2
	Posted Maximum Speed (mph):	55
Test Parameters:	Test Time:	2:25 PM
	Test Duration (minutes):	15
	Observed Number Automobiles:	186
	Observed Number Medium Trucks:	5
	Observed Number Heavy Trucks:	4
	Observed Average Speed (mph):	45
Model Calibration:	Measured Average Level (L_{eq}):	60.7
	Level Predicted by FHWA Model:	62.4
	Difference:	***1.7 dB***

Conclusions:

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Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Prediction Worksheet

Project Information:

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road

Traffic Data:

Year:	2035
Average Daily Traffic Volume:	15,500
Percent Daytime Traffic:	83
Percent Nighttime Traffic:	17
Percent Medium Trucks (2 axle):	2
Percent Heavy Trucks (3+ axle):	0.1
Assumed Vehicle Speed (mph):	50
Intervening Ground Type (hard/soft):	**Soft**

Traffic Noise Levels:

				L_{dn}, dB			
Location:	Description	Distance	Offset (dB)	Autos	Medium Trucks	Heavy Trucks	Total
1	Lot 24 Backyard	160	-2	60	51	42	61
2	Lot 27 Backyard	170	-2	60	50	42	60
3	Lot 31 Backyard	130	-2	61	52	43	62
4	Lot 32 Backyard	110	-2	62	53	44	63
5	Lot 37 Backyard	110	-2	62	53	44	63
6	Lot 38 Backyard	130	-2	61	52	43	62

Traffic Noise Contours (No Calibration Offset):

L_{dn} Contour, dB	Distance from Centerline, (ft)
75	24
70	51
65	110
60	237

Notes: A conservative offset of -2 dB offset was applied based on the calibration results in Appendix B.

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Appendix D-1

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 24 Backyard

Noise Level Data:

Year: 2035
Auto L_{dn}, dB: 60
Medium Truck L_{dn}, dB: 51
Heavy Truck L_{dn}, dB: 42

Site Geometry:

Receiver Description: Lot 24 Backyard
Centerline to Barrier Distance (C_1): 130
Barrier to Receiver Distance (C_2): 30
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 10
Receiver Elevation[1]: 15
Base of Barrier Elevation: 10
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	L_{dn}, dB				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
16	6	53	44	36	**53**	Yes	Yes	Yes
17	7	52	43	35	**52**	Yes	Yes	Yes
18	8	51	42	34	**51**	Yes	Yes	Yes
19	9	50	41	33	**51**	Yes	Yes	Yes
20	10	49	40	32	**50**	Yes	Yes	Yes
21	11	49	40	32	**49**	Yes	Yes	Yes
22	12	48	39	31	**49**	Yes	Yes	Yes
23	13	47	38	30	**48**	Yes	Yes	Yes
24	14	47	38	29	**47**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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Appendix D-2

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 27 Backyard

Noise Level Data:

Year: 2035
Auto L_{dn}, dB: 60
Medium Truck L_{dn}, dB: 50
Heavy Truck L_{dn}, dB: 42

Site Geometry:

Receiver Description: Lot 27 Backyard
Centerline to Barrier Distance (C_1): 120
Barrier to Receiver Distance (C_2): 50
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 10
Receiver Elevation[1]: 15
Base of Barrier Elevation: 10
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	L_{dn}, dB				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
16	6	52	43	35	**52**	Yes	Yes	Yes
17	7	51	42	35	**51**	Yes	Yes	Yes
18	8	50	41	34	**51**	Yes	Yes	Yes
19	9	49	41	33	**50**	Yes	Yes	Yes
20	10	49	40	32	**50**	Yes	Yes	Yes
21	11	49	39	32	**49**	Yes	Yes	Yes
22	12	48	39	31	**48**	Yes	Yes	Yes
23	13	47	38	31	**48**	Yes	Yes	Yes
24	14	47	38	30	**47**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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Appendix D-3

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 31 Backyard

Noise Level Data:

Year: 2035
Auto L_{dn}, dB: 61
Medium Truck L_{dn}, dB: 52
Heavy Truck L_{dn}, dB: 43

Site Geometry:

Receiver Description: Lot 31 Backyard
Centerline to Barrier Distance (C_1): 90
Barrier to Receiver Distance (C_2): 40
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 10
Receiver Elevation[1]: 15
Base of Barrier Elevation: 10
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	L_{dn}, dB				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
16	6	53	44	37	**53**	Yes	Yes	Yes
17	7	52	43	36	**52**	Yes	Yes	Yes
18	8	51	42	35	**52**	Yes	Yes	Yes
19	9	51	42	34	**51**	Yes	Yes	Yes
20	10	50	41	33	**50**	Yes	Yes	Yes
21	11	49	40	33	**50**	Yes	Yes	Yes
22	12	49	40	32	**49**	Yes	Yes	Yes
23	13	48	39	31	**49**	Yes	Yes	Yes
24	14	48	39	31	**48**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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Appendix D-4

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 32 Backyard

Noise Level Data:

Year: 2035
Auto L_{dn}, dB: 62
Medium Truck L_{dn}, dB: 53
Heavy Truck L_{dn}, dB: 44

Site Geometry:

Receiver Description: Lot 32 Backyard
Centerline to Barrier Distance (C_1): 70
Barrier to Receiver Distance (C_2): 40
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 10
Receiver Elevation[1]: 15
Base of Barrier Elevation: 10
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	L_{dn}, dB				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
16	6	53	44	37	**54**	Yes	Yes	Yes
17	7	52	43	36	**53**	Yes	Yes	Yes
18	8	52	43	35	**52**	Yes	Yes	Yes
19	9	51	42	35	**52**	Yes	Yes	Yes
20	10	50	41	34	**51**	Yes	Yes	Yes
21	11	50	41	33	**50**	Yes	Yes	Yes
22	12	49	40	33	**50**	Yes	Yes	Yes
23	13	49	40	32	**49**	Yes	Yes	Yes
24	14	48	39	31	**49**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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Appendix D-5

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 37 Backyard

Noise Level Data:

Year: 2035
Auto L_{dn}, dB: 62
Medium Truck L_{dn}, dB: 53
Heavy Truck L_{dn}, dB: 44

Site Geometry:

Receiver Description: Lot 37 Backyard
Centerline to Barrier Distance (C_1): 70
Barrier to Receiver Distance (C_2): 40
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 10
Receiver Elevation[1]: 15
Base of Barrier Elevation: 10
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	L_{dn}, dB				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
16	6	53	44	37	**54**	Yes	Yes	Yes
17	7	52	43	36	**53**	Yes	Yes	Yes
18	8	52	43	35	**52**	Yes	Yes	Yes
19	9	51	42	35	**52**	Yes	Yes	Yes
20	10	50	41	34	**51**	Yes	Yes	Yes
21	11	50	41	33	**50**	Yes	Yes	Yes
22	12	49	40	33	**50**	Yes	Yes	Yes
23	13	49	40	32	**49**	Yes	Yes	Yes
24	14	48	39	31	**49**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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Appendix D-6

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 38 Backyard

Noise Level Data:

Year: 2035
Auto L_{dn}, dB: 61
Medium Truck L_{dn}, dB: 52
Heavy Truck L_{dn}, dB: 43

Site Geometry:

Receiver Description: Lot 38 Backyard
Centerline to Barrier Distance (C_1): 70
Barrier to Receiver Distance (C_2): 60
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 10
Receiver Elevation[1]: 15
Base of Barrier Elevation: 10
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	L_{dn}, dB: Autos	Medium Trucks	Heavy Trucks	Total	Barrier Breaks Line of Sight to... Autos?	Medium Trucks?	Heavy Trucks?
16	6	51	43	36	**52**	Yes	Yes	Yes
17	7	51	42	35	**51**	Yes	Yes	Yes
18	8	50	41	34	**51**	Yes	Yes	Yes
19	9	50	41	34	**50**	Yes	Yes	Yes
20	10	49	40	33	**50**	Yes	Yes	Yes
21	11	48	40	33	**49**	Yes	Yes	Yes
22	12	48	39	32	**49**	Yes	Yes	Yes
23	13	48	39	31	**48**	Yes	Yes	Yes
24	14	47	38	31	**48**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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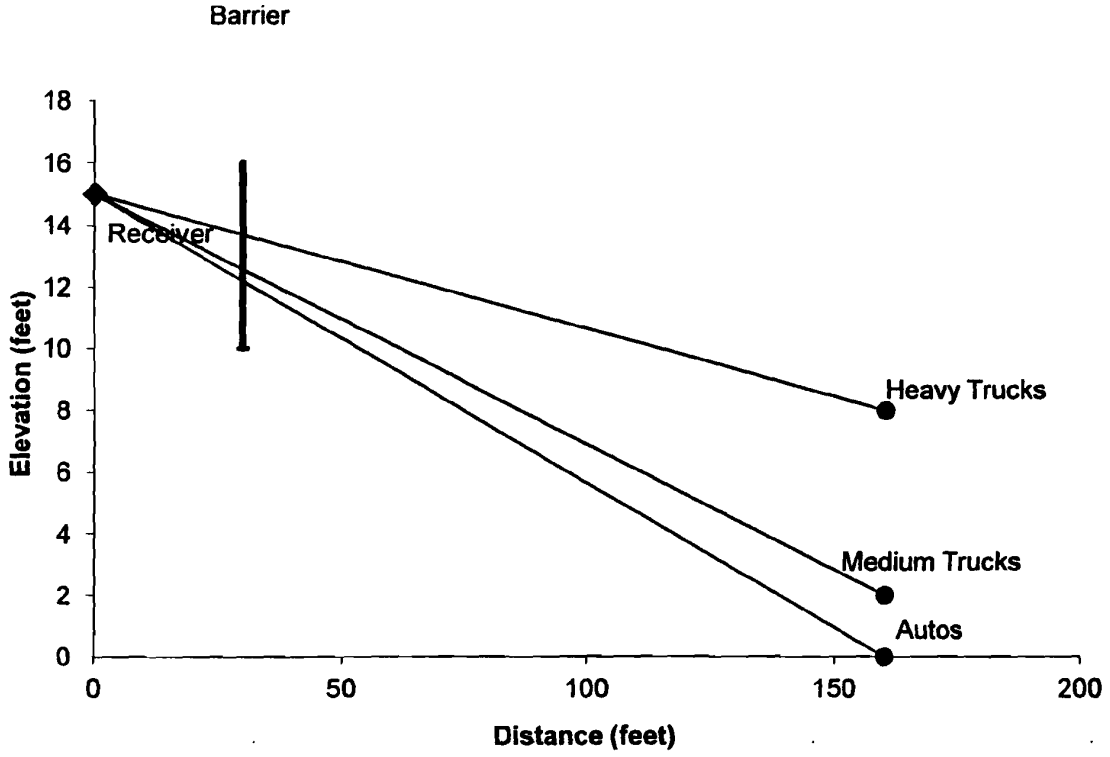
Appendix E-1

Barrier Insertion Graphic

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 24 Backyard



Centerline to Barrier Distance (C_1):	130
Barrier to Receiver Distance (C_2):	30
Automobile Elevation:	0
Medium Truck Elevation:	2
Heavy Truck Elevation:	8
Pad/Ground Elevation at Receiver:	10
Receiver Elevation[1]:	15
Base of Barrier Elevation:	10
Barrier Height[2]:	6

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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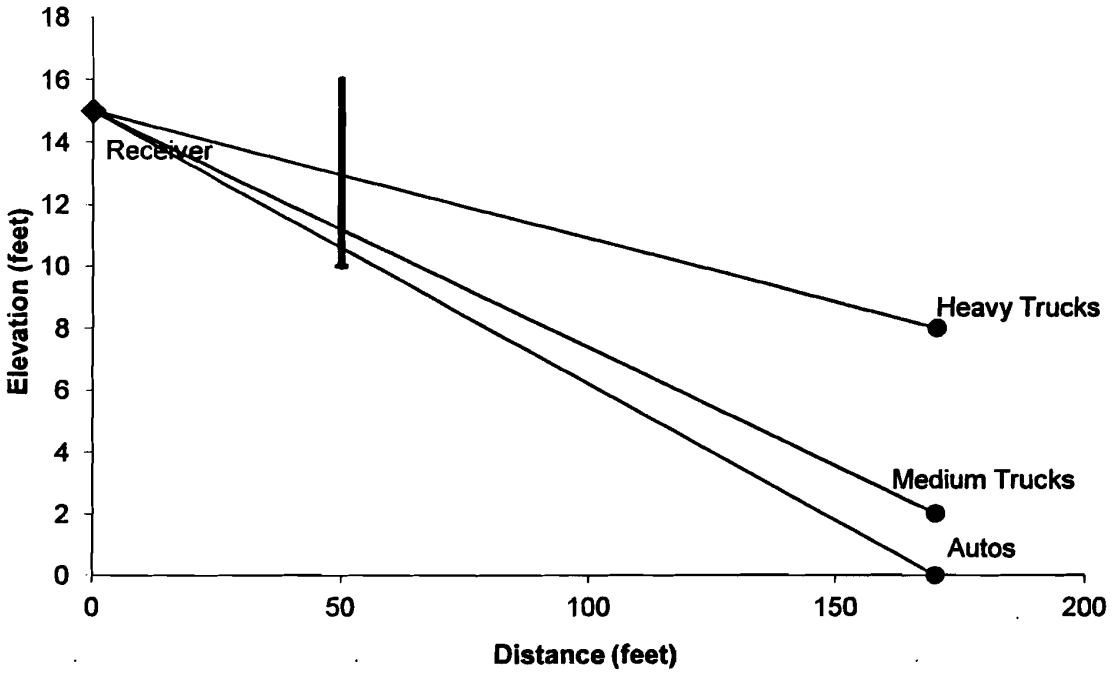
Appendix E-2

Barrier Insertion Graphic

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 27 Backyard

Barrier



Centerline to Barrier Distance (C_1):	120
Barrier to Receiver Distance (C_2):	50
Automobile Elevation:	0
Medium Truck Elevation:	2
Heavy Truck Elevation:	8
Pad/Ground Elevation at Receiver:	10
Receiver Elevation[1]:	15
Base of Barrier Elevation:	10
Barrier Height[2]:	6

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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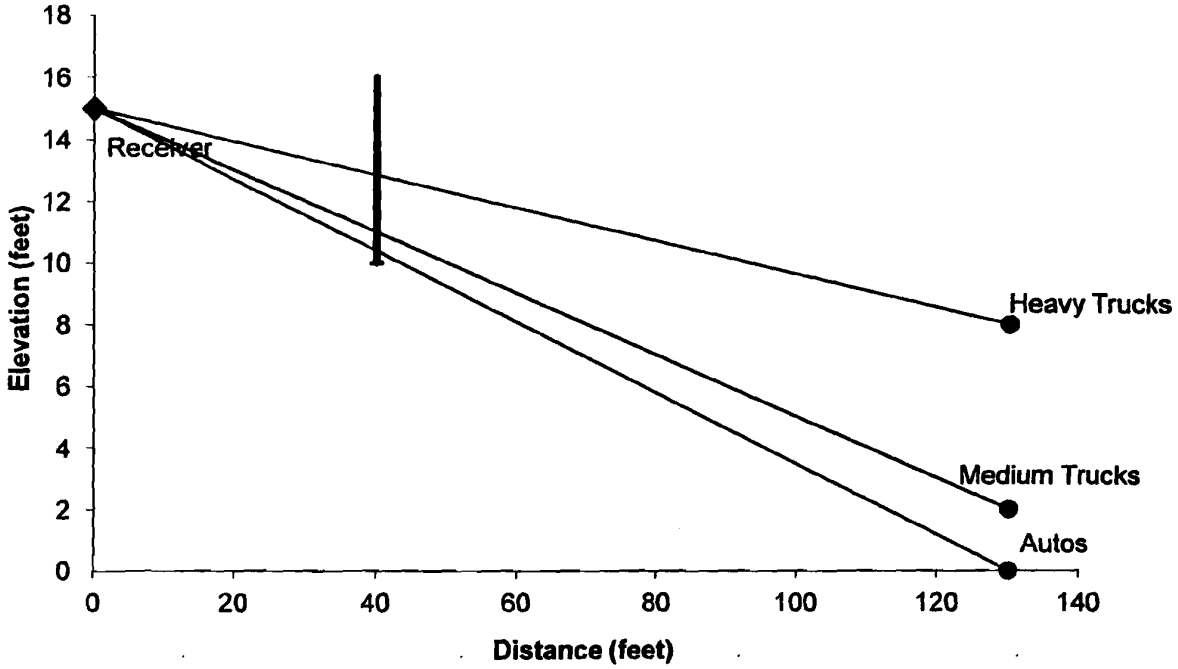
Appendix E-3

Barrier Insertion Graphic

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 31 Backyard

Barrier



Centerline to Barrier Distance (C_1):	90
Barrier to Receiver Distance (C_2):	40
Automobile Elevation:	0
Medium Truck Elevation:	2
Heavy Truck Elevation:	8
Pad/Ground Elevation at Receiver:	10
Receiver Elevation[1]:	15
Base of Barrier Elevation:	10
Barrier Height[2]:	6

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

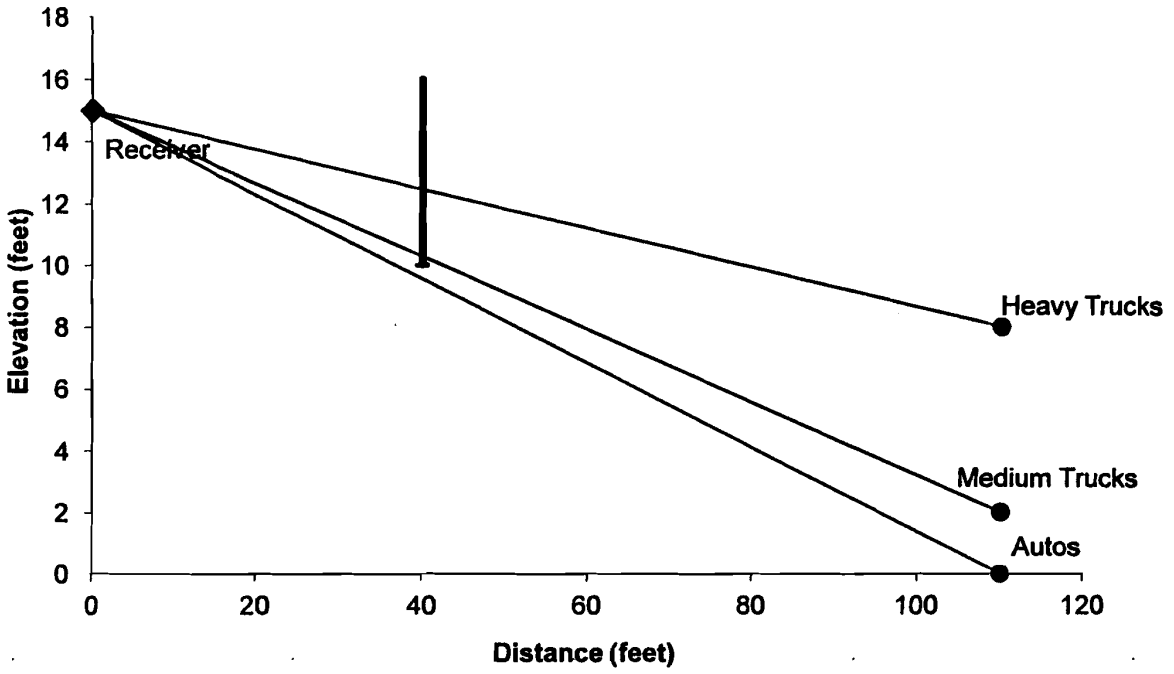
BOLLARD
Acoustical Consultants

Appendix E-4

Barrier Insertion Graphic

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 32 Backyard

Barrier



Centerline to Barrier Distance (C_1):	70
Barrier to Receiver Distance (C_2):	40
Automobile Elevation:	0
Medium Truck Elevation:	2
Heavy Truck Elevation:	8
Pad/Ground Elevation at Receiver:	10
Receiver Elevation[1]:	15
Base of Barrier Elevation:	10
Barrier Height[2]:	6

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

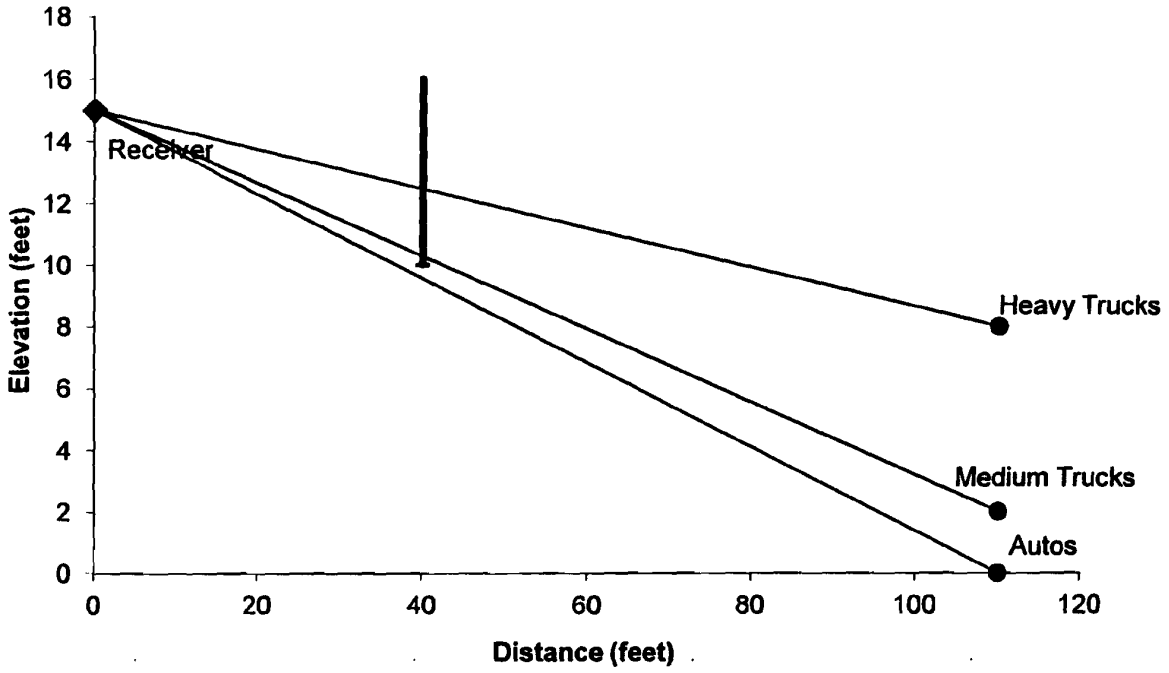
BOLLARD
Acoustical Consultants

Appendix E-5

Barrier Insertion Graphic

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 37 Backyard

Barrier



Centerline to Barrier Distance (C_1):	70
Barrier to Receiver Distance (C_2):	40
Automobile Elevation:	0
Medium Truck Elevation:	2
Heavy Truck Elevation:	8
Pad/Ground Elevation at Receiver:	10
Receiver Elevation[1]:	15
Base of Barrier Elevation:	10
Barrier Height[2]:	6

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

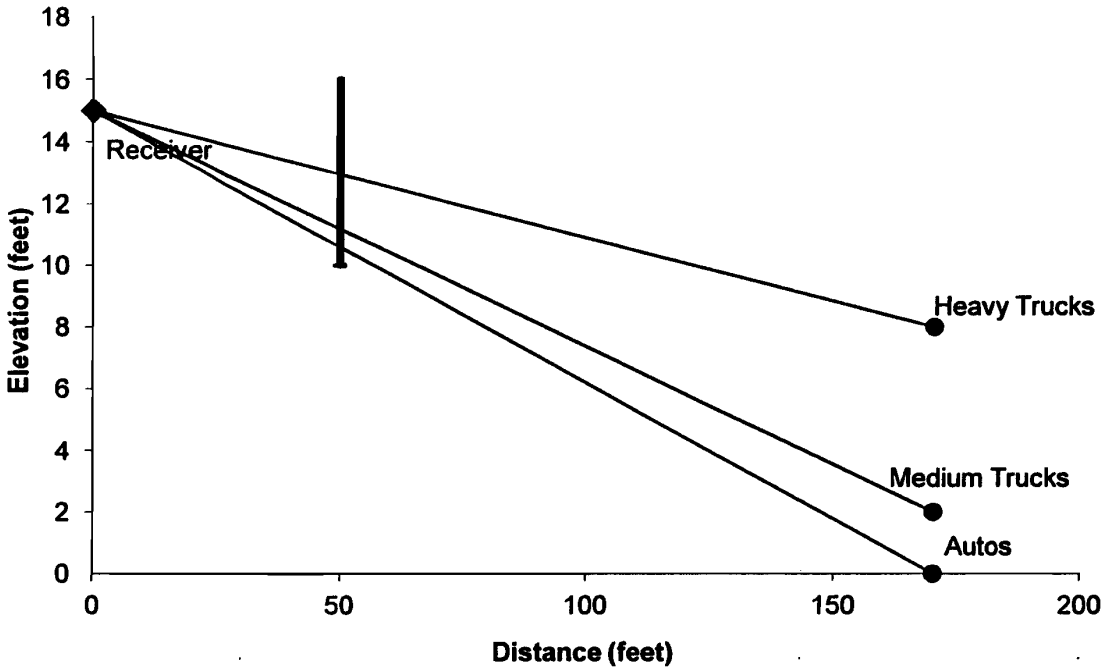
BOLLARD
Acoustical Consultants

Appendix E-6

Barrier Insertion Graphic

Job Number: 2011-043
Project Name: Wilson Estates
Roadway Name: Green Valley Road
Location(s): Lot 27 Backyard

Barrier



Centerline to Barrier Distance (C_1):	120
Barrier to Receiver Distance (C_2):	50
Automobile Elevation:	0
Medium Truck Elevation:	2
Heavy Truck Elevation:	8
Pad/Ground Elevation at Receiver:	10
Receiver Elevation[1]:	15
Base of Barrier Elevation:	10
Barrier Height[2]:	6

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

BOLLARD
Acoustical Consultants

BOLLARD ACOUSTICAL CONSULTANTS, INC.
Acoustics ▸ Vibration ▸ Noise Control Engineering

Memorandum

To: David Crosariol
CTA Engineering & Surveying
3233 Montier Circle
Rancho Cordova, CA. 95742

Date: May 20, 2014

From: Paul Bollard
Bollard Acoustical Consultants, Inc.
3551 Bankhead Road
Loomis, CA 95650

Subject: Revised Site Plan for Wilson Estates in El Dorado County, California.

Pursuant to your request, Bollard Acoustical Consultants, Inc. (BAC) has reviewed the site plan dated April, 2014 for the Wilson Estates Project.

After my review, I have determined that the sound barrier in the revised location will be adequate to meet the County's noise standards and the recommended mitigation in our noise analysis report dated May 3, 2012, is still applicable.

We note that, for aesthetic purposes, a wood fence is proposed for the noise barrier. We have reviewed the fence detail and concluded that it would provide the required degree of noise reduction to satisfy the County's noise standards. With exposure to the elements, it is important that the fence be properly maintained to prevent cracks and gaps which could degrade the acoustical properties of the barrier over time.

Please contact me at (916) 663-0500 or paulb@bacnoise.com if you have any comments or questions regarding this memorandum.

Sincerely,

Bollard Acoustical Consultants, Inc.

Paul Bollard
President

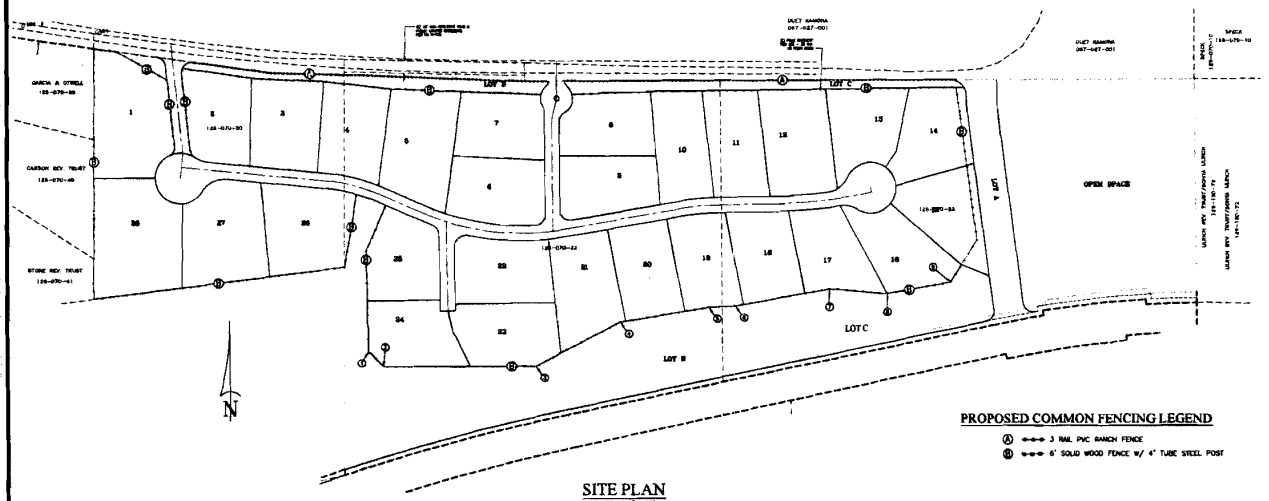
Attachment 13

WILSON ESTATES

FENCE EXHIBIT

COUNTY OF EL DORADO, CALIFORNIA

APRIL, 2014



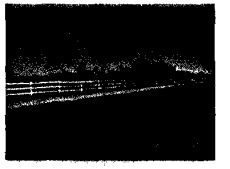
SITE PLAN

SCALE: 1"=100'

PROPOSED COMMON FENCING LEGEND

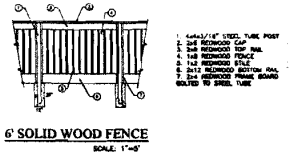
Ⓐ 3 RAIL PVC RANCH FENCE

Ⓑ 6' SOLID WOOD FENCE W/ 4" TUBE STEEL POST



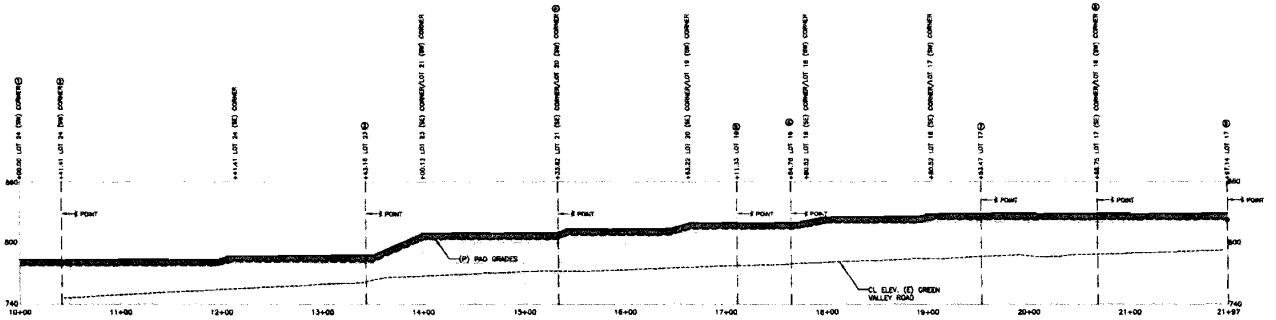
3 RAIL PVC RANCH FENCE

SCALE: NTS



6' SOLID WOOD FENCE

SCALE: 1"=5'



6' SOLID WOOD FENCE SOUND BARRIER PROFILE

SCALE: 1"=50' HORZ. & VERT.

cta Engineering & Surveying

Civil Engineering • Land Surveying • Land Planning

Wilson Estates

Wildland Fire Safe Plan

Prepared for:

Ann Wilson

Prepared by:

CDS Fire Prevention Planning
William F. Draper
Registered Professional Forester
#898
4645 Meadowlark Way
Placerville, CA 95667

September 2, 2011

Attachment 14

Wilson Estates

Approved by:

Brad Ballenger — 9/27/11

Brad Ballenger
Fire Marshal
El Dorado Hills Fire Department

Date

9/20/11

Chris Anthony, Battalion Chief
Fire Prevention
California Department of
Forestry and Fire Protection

Date

Prepared by:

William F. Draper — 9/27/11

William F. Draper
RPF 898

Date

CONTENTS

I. PURPOSE AND SCOPE

Communities are increasingly concerned about wildfire safety. Drought years coupled with flammable vegetation and annual periods of severe fire weather insure the potential for periodic wildfires.

The purpose of this plan is to assess the wildfire hazards and risks of the Wilson Estates subdivision, to identify measures to reduce these hazards and risks and protect the native vegetation. There are light fuel hazards and gentle topography associated with this proposed project both on and adjacent to the project.

The possibility of large fires occurring when the subdivision is complete will be greatly reduced. However, small wildfires in the open space areas and on the lots may occur due to the increase in public uses.

Incorporation of the fire hazard reduction measures into the design and maintenance of the future parcels will reduce the size and intensity of wildfires and help prevent catastrophic fire losses. State and County regulations provide the basic guidelines and requirements for fire safe mitigation measures and defensible space around dwellings. This plan builds on these basic rules and provides additional fire hazard reduction measures customized to the topography and vegetation of the development with special emphases on the interface of homes and wildland fuels.

The scope of the Wilson Estates Wildland Fire Safe Plan recognizes the extraordinary natural features of the area and designs wildfire safety measures which are meant to compliment and become part of the community design. The Plan contains measures for providing and maintaining defensible space around future homes and open space areas. Plan implementation measures must be maintained in order to assure adequate wildfire protection.

Homeowners who live in and adjacent to the wildfire environment must take primary responsibility along with the fire services for ensuring their homes have sufficient low ignitability and surrounding fuel reduction treatment. The fire services should become a community partner providing homeowners with technical assistance as well as fire response. For this to succeed it must be shared and implemented equally by homeowners and the fire services.

II. FIRE PLAN LIMITATIONS

The Wildland Fire Safe Plan for the Wilson Estates subdivision does not guarantee that wildfire will not threaten, damage or destroy natural resources, homes or endanger residents. However, the full implementation of the mitigation measures will greatly reduce the exposure of homes to potential loss from wildfire and provide defensible space for firefighters and residents as well as protect the native vegetation. Specific items are listed for homeowner's attention to aid in home wildfire safety.

III. WILSON ESTATES WILDLAND FIRE SAFE PLAN

1. PROJECT DESCRIPTION

The Wilson Estates subdivision is located along the south side of Malcolm Dixon Road in the El Dorado Hills area. The subdivision is approximately midway between Salmon Falls Road and Green Valley Road off of Malcolm Dixon Road. New roads will be built to serve this new development. These roads running through the subdivision are proposed to be 24' wide of travel surface. A new roadway will be constructed to connect Green Valley Road and Malcolm Dixon Road. This new connector road will be a part of the realignment of Malcolm Dixon Road. Lot F represents this new road. All roads will be constructed to El Dorado County Department of Transportation (DOT) standards or as approved on the tentative map. All new lots shall be served by El Dorado Irrigation District (EID) for domestic water supply, fire sprinklers and fire hydrants. This project consisting of 28.18 acres is planning to split parcels APN: 126-070-22, 23 and 30 into 58 residential lots. Each lot will be a minimum of 8,611 square feet in size. Lots 57 and 58 at the east end of the development will share a 20' driveway and be approximately 24,800 square feet each. Residential fire sprinklers shall be required by the California Residential Building Code unless otherwise amended. Fire hydrant location shall be determined after consultation with the Fire Department and meeting the standard established. The proposed fire hydrant locations are at the intersections of each cul-de-sac and at the driveway for lots 57 and 58.

Lots A, B and C consists of approximately 7.58 acres and is open space. The open space buffers this development from adjacent properties and Green Valley Road. A masonry sound wall is being proposed for all the lots on the south side of the subdivision. This would include lots 24, 25, 31, 32, 42-48, 50-56, and 58. Non-combustible fencing may be incorporated into the masonry wall at the cul-de-sacs and the ends. A minimal fuel hazard reduction zone along the non-combustible fencing will be required. A 10' zone will be needed in lots A, B and C where they border adjacent properties or roadways if not landscaped. Annual maintenance is essential for keeping fire safe conditions viable. A Community Service District (CSD), Lighting and Landscaping District (LLD) or Zone of Benefit/Home Owners Association shall be established and be responsible for the maintenance of this zone.

The El Dorado Hills Fire Protection Department provides all fire and emergency medical services to this project. The California Department of Forestry and Fire Protection (CAL FIRE) has wildland fire responsibility in this state responsibility area (SRA).

2. PROJECT VEGETATION (FUELS)

For wildfire planning purposes the vegetation is classified as follows:

(a) ground fuels- annual grasses and downed limbs (Brush)
(b) overstory- scattered blue oaks.

The property has terrain with gentle south facing slopes. Slopes are up to 10%. The tree canopy is open grown oaks. These trees typically have limbs and canopy reaching the ground creating ladder fuels. Ladder fuels will need to be eliminated. Limbing of trees is important to reduce their susceptibility from a ground fire. Tree spacing is a critical component to attaining the required fire safe clearances. A separation of the brush fuels and trees are essential for creating the defensible space around the residence. Specific guidelines for fuel hazard reduction are addressed in the mitigation measures.

3. PROBLEM STATEMENTS

A. The brush fuels on the slopes will ignite and have a rapid rate of spread.

Fire in the grass fuels on the slopes is the most serious wildfire problem for this project.

B. Risk of fire starts will increase with development.

The greatest risk from fire ignition will be along roads and on open space lots as human use on these areas increases.

C. Provisions must be made to maintain all fuel treatments.

The wildfire protection values of fuel reduction are rapidly lost if not maintained. Continued review of potential ladder fuels to maintain a fire safe environment is very important. Annual maintenance by June 1 of each year is necessary.

D. Typical home design and siting often does not recognize adequate wildfire mitigation measures.

A review of many wildfires has conclusively shown that most home losses occur when: (1) there is inadequate clearing of flammable vegetation around a house, (2) roofs are not fire resistant, (3) homes are sited in hazardous locations, (4) firebrand ignition points and heat traps are not adequately protected and (5) there is a lack of water for suppression.

4. GOALS

A. Modify the continuity of high hazard vegetation fuels.
B. Reduce the size and intensity of wildfires.
C. Ensure defensible space is provided around all structures.
D. Design fuel treatments to minimize tree removal.
E. Ensure fuel treatment measures are maintained.
F. Identify fire safe structural features.
G. Help homeowners protect their homes from wildfire.

5. WILDFIRE MITIGATION MEASURES

Wildfire mitigation measures are designed to accomplish the Goals by providing and maintaining defensible space and treating high hazard fuel areas. Fire hazard severity is reduced through these mitigation measures. The Wildland Fire Safe Plan places emphasis on defensible space around structures.

The residential construction materials, fire hydrant location and fuel treatments will be extremely important in the development of these new lots. Residential lots will have a 10' setback from the rear property line and only a 5' setback on the sides. Open space fuel treatment zones shall be at least 10' from all rear property lines of this development along the masonry and non-combustible fencing.

All residences shall be required to have NFPA 13D fire sprinkler systems unless the law is amended.

This subdivision is in a Moderate Fire Hazard Severity Zone. Wildland-Urban Interface Fire Areas Building Standards will be required in new construction. These standards address roofing, venting, eave enclosure, windows, exterior doors, siding, and decking.

Clearance along the road and around structures is very important and necessary. Branches on remaining trees shall be pruned up 10 feet as measured on the uphill side of the tree. Brush shall be removed. Grasses shall be kept mowed to a 4 inch stubble annually by June 1. Any tree crown canopy over the driveways shall be pruned at least 15 feet up from the driveway surface.

The fuel treatment zone in the open space areas shall continue along the perimeter and be at least 10 feet wide or to the property line. This zone is in addition to the clearances required by state law. The State required Fire Safe clearances (PRC 4291) shall be implemented around all structures. Clearances may be required at the time of construction.

More restrictive standards may be applied by approving El Dorado County Authorities. Approval of this plan does not by itself guarantee approval of this project. All provisions in this plan are subject to change and additional review until the project is filed and accepted by El Dorado County, Development Services.

Mitigation Measures:

- **Driveways shall be 12 feet wide. Driveways shall comply with the DOT weight standards.**
  - **a. Responsibility- homeowner**
- **All private driveway gates shall be inset on the driveway at least 30 feet from the road. Gate opening shall be 2 feet wider than the driveway unless exceptions are granted by the local Fire Department.**
  - **a. Responsibility- homeowner**
- **All homes shall have Class A listed roof covering.**
  - **a. Responsibility- homeowner**
- **Decks that are cantilevered over the natural slope shall be enclosed unless fire resistant.**
  - **a. Responsibility- homeowner (See Appendix C for guidelines)**
- **The houses shall be constructed with exterior wall sheathing that shall be rated noncombustible.**
  - **a. Responsibility-developer**
- **Windows and glass doors on the sides of the structure shall have tempered glass and fire resistant frames.**
  - **a. Responsibility-builder**
- **Rafter tails shall be enclosed with noncombustible material on the sides of the structure.**
  - **a. Responsibility-builder**
- **Gutters and downspouts shall be noncombustible.**
  - **a. Responsibility-builder**
- **Attic and floor vents shall be covered with ¼ inch, or less, noncombustible mesh and horizontal to the ground.**
  - **a. Responsibility-builder**

- **All lots shall have a 10 foot setback from the rear property line for buildings and accessory buildings and a 30 foot setback from the center of the road or as determined by Development Services.**
  a. Responsibility- builder

6. **OTHER FIRE SAFE REQUIREMENTS**

A. New roadway turn-around shall be constructed after consulting with El Dorado Hills Fire Department and DOT for specifications.

B. If applicable, each new builder or property owner prior to construction shall be required to contact El Dorado County Planning Services/Building Department to have the residential fire sprinklers plans approved. All fire sprinkler systems shall be designed and installed by a licensed contractor.

C. All road improvements shall be built to DOT standards or as approved with the Tentative Map.

D. 10' fuel treatment zone along the perimeter of this subdivision shall be installed and annually maintained by June 1 to the Fire Safe specifications. Sidewalks and landscaping is acceptable in this zone.

E. A Notice of Restriction shall be filed with the final parcel map which stipulates that a Wildland Fire Safe Plan has been prepared and wildfire mitigation measures must be implemented.

F. The project shall meet all the Public Resource Codes 4290 as amended (the 1991 SRA Fire Safe Regulations- Article 2 Access, Article 3 Signing, Article 4 Water, Article 5 Fuels), County and Fire Department ordinances.

G. The home/property owners are responsible for any future fire safe or building code changes adopted by the State or local authority.

H. Only wood, fire rated composite deck material or noncombustible decking shall be allowed.

I. All fencing adjacent to open space shall be noncombustible.

J. The developer shall establish a Community Service District (CSD), Lighting and Landscaping District (LLD) or Zone of Benefit/HOA responsible for maintaining the open space lot.

K. All vacant lots shall be treated to the standard established by the Weed Abatement Resolution of the Fire District.

L. The El Dorado Hills Fire Department shall review the Fire Safe Plan every 5 years to determine if additional Fire Safe measures need to be implemented.

7. **OPEN SPACE GUIDELINES**

A. Remove all dead trees within 100' of all property lines.

B. Remove all dead limbs from live trees that are within 10' of the ground.

C. Limb all trees within the open space lots at least 10' above the ground as measured on the uphill side of the tree.

D. Remove all dead limbs and trees laying on the ground within the open space lots.

E. Annually by June 1 cut or remove all grass and brush to a 4" stubble within 10' along the property lines adjacent to the residential lots and along streets.

F. Mature or multi stemmed oaks can present a serious wildfire problem if untreated. Treat the oaks as to the following specifications: (a) remove all dead limbs and stems and (b) cut off green stems at 10 feet above the ground as measured on the uphill side that arch over and are growing down towards the ground.

V. Appendix

APPENDIX A

WILSON ESTATES
FUEL TREATMENT SPECIFICATIONS
For
OAK WOODLAND
Within The Designated Fuel Treatment Areas

1. Leave all live trees where possible.

2. Remove all dead trees.

3. Remove all brush.

4. Prune all live trees of dead branches and green branches 10 feet from the ground as measured on the uphill side of the tree, except no more than 1/3 of the live crown is removed. All slash created by pruning must be disposed of by chipping or hauling off site.

5. Annually by June 1, reduce the grass or weeds to a 4 inch stubble in the open space by mowing, chemical treatment, disking or a combination of treatments.

6. Mature, multi stem Oak trees: remove all dead limbs and stems, cut off green stems at 10 feet above the ground as measured on the uphill side that arch over and are growing down towards the ground.

APPENDIX B

WILSON ESTATES
ENCLOSED DECK GUIDELINES

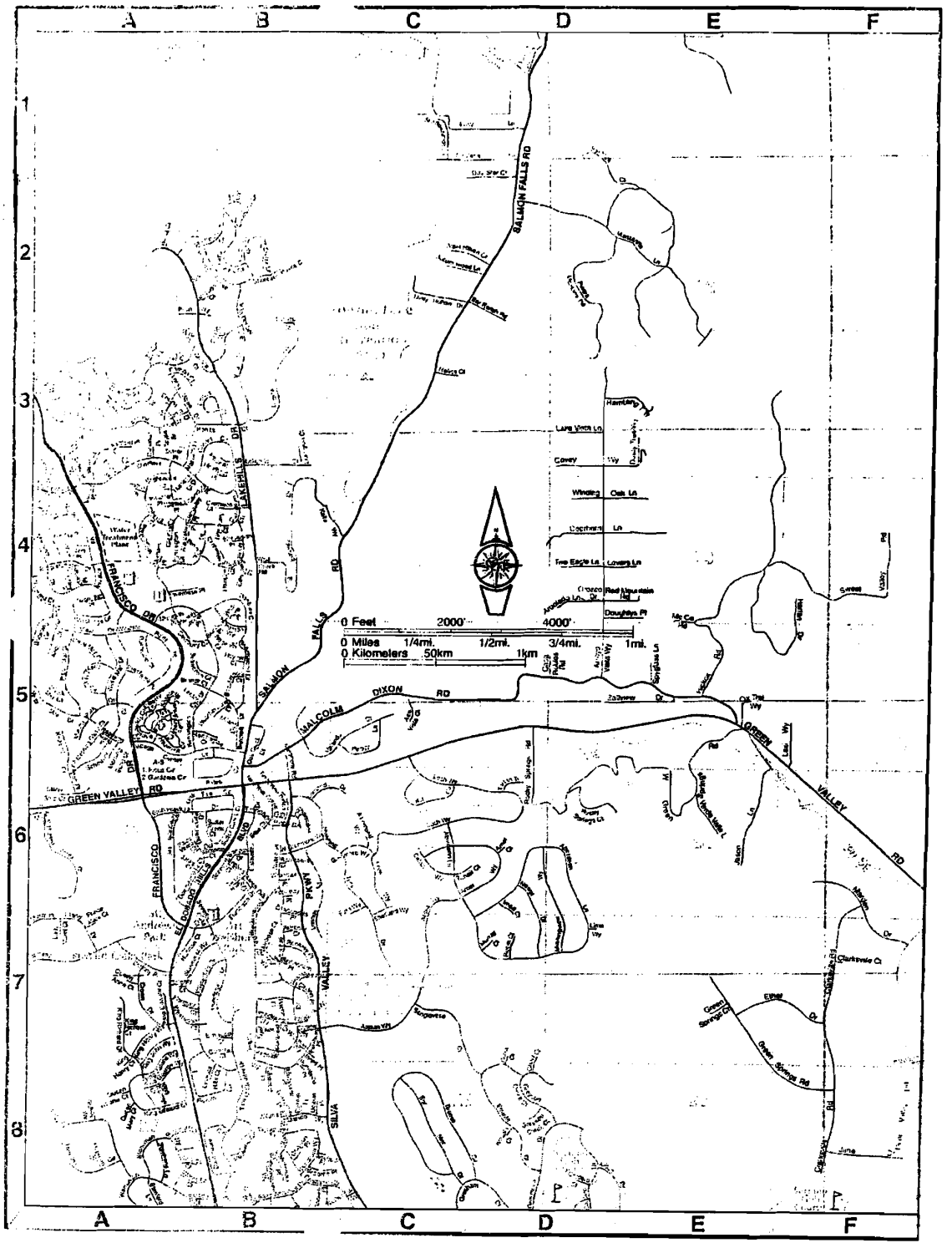
The purpose of enclosing the underside of decks that are cantilevered out over the natural slope is to help prevent heat traps and fire brands from a wildfire igniting the deck or fuels under the deck.

1. Does not apply to decks that are constructed using fire resistant materials such as concrete, steel, stucco etc.

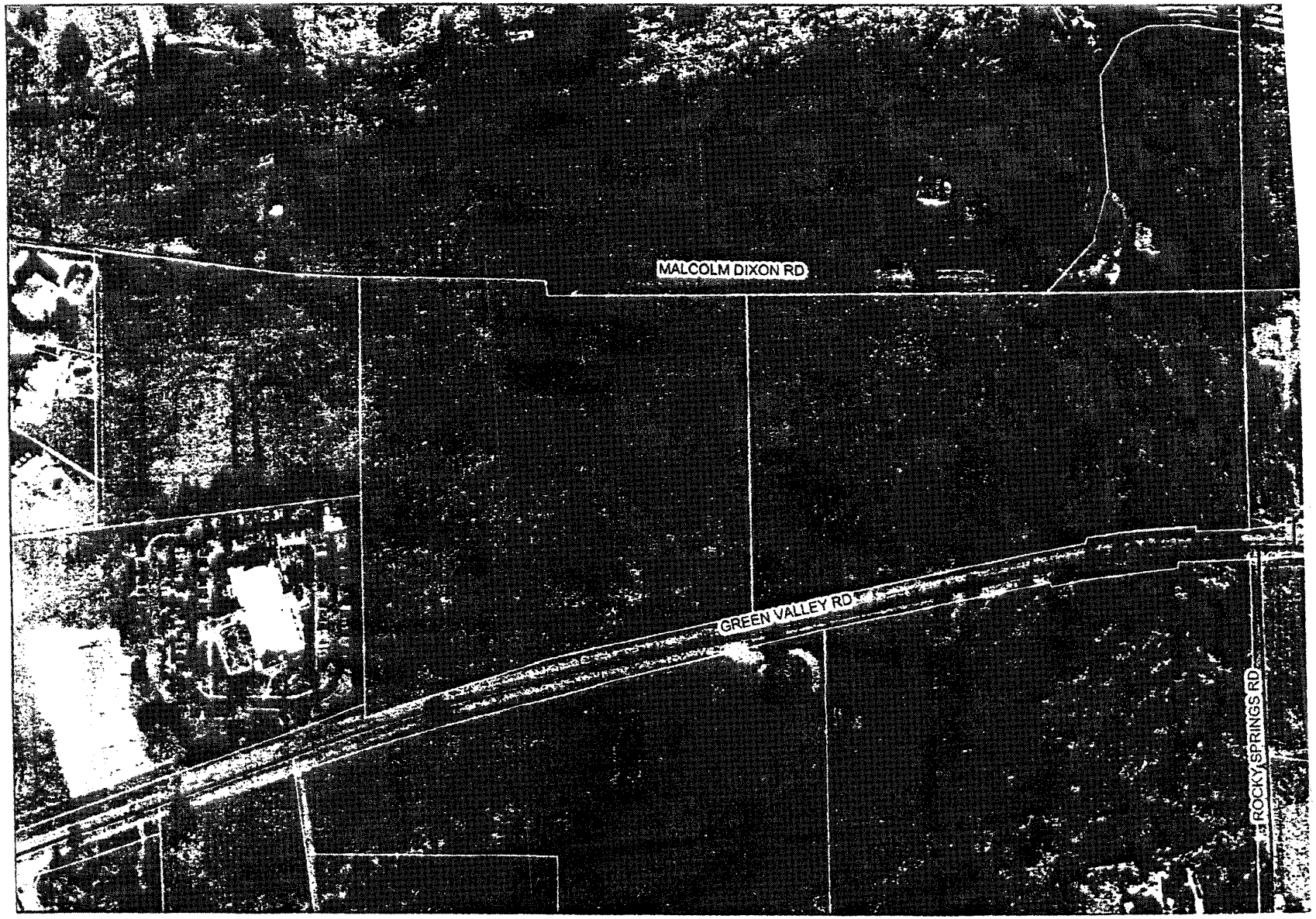
2. Any deck shall not include combustible composite deck material.

3. This applies to decks one story or less above natural slopes.

4. Combustible material must not be stored under the deck.


A
B
C
D
E
F
1
2
3
4
5
6
7
8
See Page
SALMON FALLS RD
FRANCISCO DR
SALMON FALLS RD
DIXON RD
MALCOLM
GREEN VALLEY RD
FRANCISCO
PKWY
VALLEY
SILVA
GREEN VALLEY RD
0 Feet 2000' 4000'
0 Miles 1/4mi. 1/2mi. 3/4mi. 1mi.
0 Kilometers 50km 1km

APN 126-070- 30 & 22 & 23



Wilson Estates

Amendment A

Wildland Fire Safe Plan

Prepared by:

CDS Fire Prevention Planning
William F. Draper
Registered Professional Forester
#898
4645 Meadowlark Way
Placerville, CA 95667

May 28, 2014

Attachment 15

Wilson Estates

Approved by:

6/25/14

Michael Lilienthal, DC
Fire Marshal
El Dorado Hills Fire Department

Date

6/26/14

Darin McFarlin, FC
Fire Prevention
California Department of
Forestry and Fire Protection

Date

Prepared by:

6-26-14

William F. Draper
RPF #898

Date

Amendment A

Wilson Estates

All provisions in the original Wildland Fire Plan shall remain in effect. This amendment is for the reduction in the number of lots being created, change in access and the amount of open space being left undeveloped.

The original Wildland Fire Safe Plan approved in September, 2011 was for a 58 lot subdivision on 28.18 acres. The current map is scaled back to 28 residential lots. There is still to be open space along Green Valley Road and now also at the east end of the development. The primary access is still to be off of Malcolm Dixon Road and will be gated. The second access is also gated and being designed to be an emergency evacuation access road (eva). The gates in this development shall have an opticon type opener as specified by El Dorado Hills Fire Department. The gates shall also have a knox lock box. In the case of a power failure, the gates shall lock open.

The turn-around at lots 23 and 24 shall be a modified "T" and incorporated into the 2 driveways at the end of the roadway.

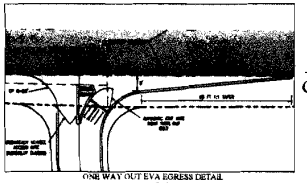
Any trails within the open space and all open space adjacent to the lots and roadways shall have a fuel hazard reduction zone (FHRZ). The FHRZ adjacent to any trail shall be 10' on both sides of the trail. It shall also be 10' adjacent to the roadway. The FHRZ adjacent to the lots shall be 30' from the rear of the each lot or to the subdivision property line, whichever is less.

The fuels within the fuel hazard reduction zones shall be cut to a 4" stubble. This must be done annually and maintained throughout the declared fire season.

TENTATIVE MAP

WILSON ESTATES

COUNTY OF EL DORADO AUGUST, 2014 STATE OF CALIFORNIA


ONE WAY OUT EVA EGRESS DETAIL

VICINITY MAP

SCALE: 1"=60'

OWNERS OF RECORD
LISA VOGELSANG
CATHERINE RYAN
JULIE RYAN

1615 GREENWICH STREET
SAN FRANCISCO, CA 94123

APPLICANT
CTA ENGINEERING & SURVEYING
3233 MONIER CIRCLE
RANCHO CORDOVA, CA 95742

ENGINEER
cta Engineering & Surveying
Civil Engineering · Land Surveying · Land Planning

MAP SCALE
1" = 60'

CONTOUR INTERVAL
CONTOUR INTERVAL = 2 FEET

SOURCE OF TOPOGRAPHY
AERIAL PHOTOGRAPHY

SECTION, TOWNSHIP and RANGE
PORTION OF SECTIONS 13, 14 & 23, T.10N., R.8E., M.D.M.

ASSESSOR'S PARCEL NUMBERS
A.P.N. 126-070-22, 126-070-23, 126-070-30

GENERAL PLAN
HDR IN A COMMUNITY REGION

PRESENT ZONING
R1A

PROPOSED ZONING
R1A – PD/ 05-PD (ZONE BOUNDARY ESTABLISHED BY FINAL MAP)

TOTAL AREA
28.18 ACRES

TOTAL NUMBER OF PARCELS

RESIDENTIAL LOTS (1-28)	16.51 AC	
PRIVATE ROAD LOT (LOT R)	1.43 AC	
LETTERED LOT (B), LOT (C)		
OPEN SPACE, DRAINAGE & WATERLINE	8.41 AC	30% OPEN SPACE
NEW CONNECTION (LOT A)	0.65 AC	
MALCOLM DIXON ROADWAY DEDICATION	0.82 AC	
GREEN VALLEY ROAD ROADWAY DEDICATION	0.54 AC	
TOTAL AREA	28.18 AC	

MINIMUM LOT AREA
20,004 SQUARE FEET

WATER SUPPLY and SEWAGE DISPOSAL
EL DORADO IRRIGATION DISTRICT

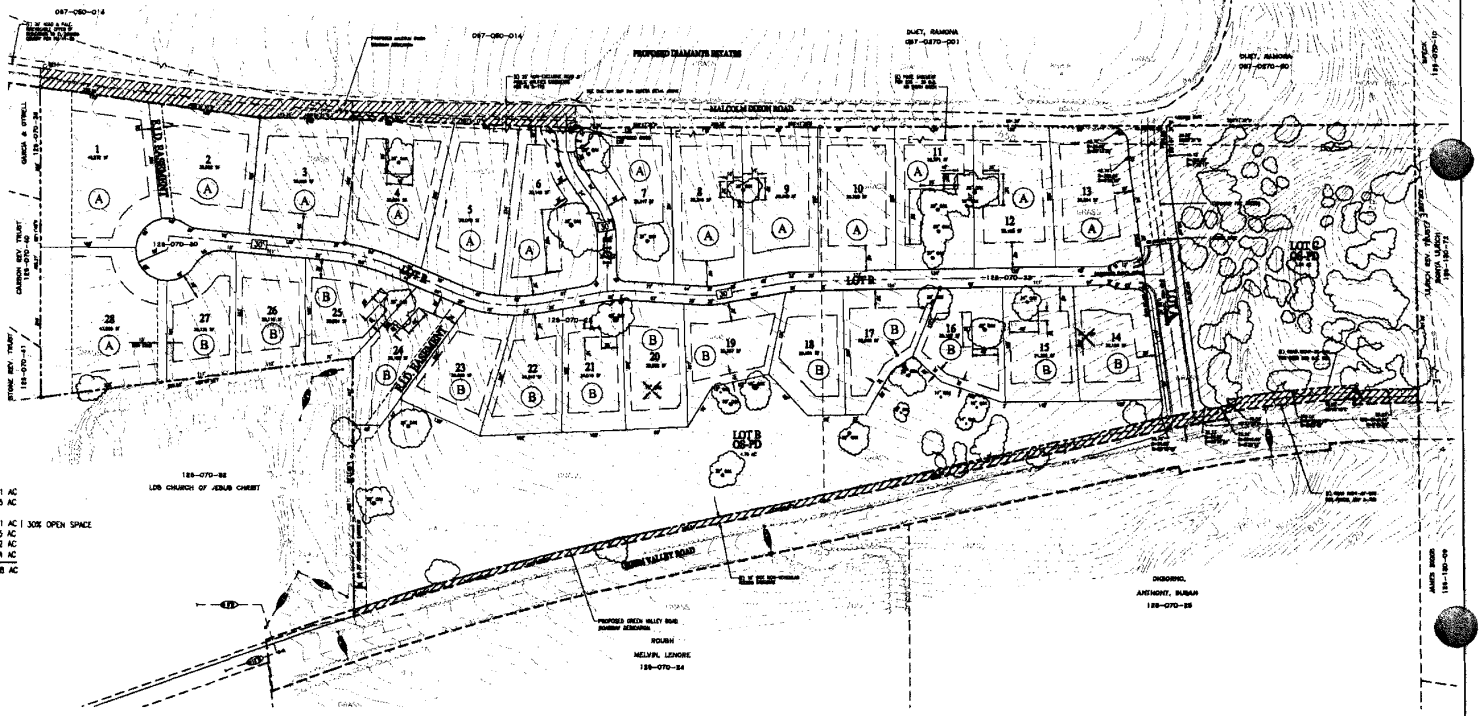
PROPOSED STRUCTURAL FIRE PROTECTION
EL DORADO HILLS COUNTY WATER DISTRICT (FIRE DEPARTMENT)

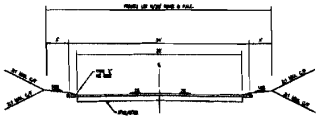
DATE OF PREPARATION
AUGUST, 2014

PHASING PLAN NOTICE
THE SUBDIVIDER MAY FILE MULTIPLE FINAL MAPS FOR THIS PROJECT. THE SUBDIVIDER SHALL NOT BE REQUIRED TO DEFINE THE NUMBER OR CONFIGURATION OF THE PROPOSED MULTIPLE FINAL MAPS. (PER THE SUBDIVISION MAP ACT, SECTION 66456.1)

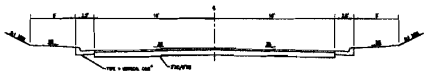
ENGINEER'S CERTIFICATE
I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THE LAND DEVELOPMENT KNOWN AS WILSON ESTATES HAS BEEN DESIGNED IN ACCORDANCE WITH THE SPECIFICATIONS AND GUIDELINES ESTABLISHED BY THE COUNTY OF EL DORADO.

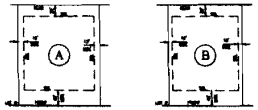
DAVID R. CROSARIOL R.C.E. 34520 DATE




TYPICAL ROAD SECTION


TEMPORARY FIRE ACCESS ROAD (GATED) ≤ 20%


NEW CONNECTION


MODIFIED R-1A SETBACKS UON MODIFIED R-20,000 SETBACKS UON

TYPICAL BUILDING SETBACKS
ONE-FAMILY RESIDENTIAL
UNLESS OTHERWISE NOTED (UON) ON TENATIVE MAP

LEGEND:
- (P) FIRE HYDRANT
- (P) SUBDIVISION BOUNDARY
- (P) RIGHT OF WAY LINE
- (P) LOT LINE
- (P) LOT R WIDTH

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Traffic Impact Analysis

Wilson Estates (WO#38)
El Dorado Hills, California

FINAL
March 3, 2011

Prepared for:

El Dorado County, California

Prepared by:

Kimley-Horn and Associates, Inc.
11919 Foundation Place, Suite 200
Gold River, California 95670

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Attachment 16

EXECUTIVE SUMMARY

This report documents the results of a traffic impact analysis completed for Wilson Estates, a 28-acre, 60-unit single-family residential development project proposed to be located along the south side of Malcolm Dixon Road in El Dorado Hills, California (the "proposed project" or "project"). The purpose of this impact analysis is to identify potential environmental impacts to transportation facilities as required by the California Environmental Quality Act (CEQA). This study was performed in accordance with the El Dorado County Department of Transportation's *Traffic Impact Study Protocols and Procedures*, and the scope of work provided by a representative of the County.

The 28-acre project site is proposed to be developed with up to 60 single-family detached dwelling units. Primary access to the site will be provided via two (2) full access driveways along Malcolm Dixon Road. The proposed project is also assumed to include the construction of a new access road connecting Malcolm Dixon Road and Green Valley Road through the eastern portions of the site. The following intersections are included in this evaluation:

1. *Malcolm Dixon Road at Western Project Site Access Driveway (Project Only)*
2. *Malcolm Dixon Road at Eastern Project Site Access Driveway (Project Only)*
3. *Green Valley Road at Site Access Road (Project Only)*
4. Salmon Falls Road at Malcolm Dixon Road
5. Green Valley Road at Silva Valley Parkway/Allegheny Road
6. Green Valley Road at El Dorado Hills Boulevard/Salmon Falls Road
7. El Dorado Hills Boulevard at Francisco Drive
8. Green Valley Road at Francisco Drive
9. El Dorado Hills Boulevard at Serrano Parkway
10. El Dorado Hills Boulevard at US-50 Westbound Ramps
11. El Dorado Hills Boulevard at US-50 Eastbound Ramps

Based on the County's requirements, this LOS analysis was conducted for the above facilities for the following scenarios:

A. Existing (2010) Conditions
B. Existing (2010) plus Proposed Project Conditions
C. Existing plus Approved Projects (2015) Conditions
D. Existing plus Approved Projects (2015) plus Proposed Project Conditions

Significant findings of this study include:

- The proposed project is expected to generate 650 total daily trips, including 52 AM peak-hour trips and 66 PM peak-hour trips.
- The proposed project is consistent with the zoning density and the 2004 General Plan land use designation for the site. Furthermore, the proposed project trip generation is not projected to exceed 2025 thresholds assumed in the County's 2004 *General Plan* trip generation. Therefore, cumulative (year 2025) analyses are not required.
- As defined by the County, the addition of the proposed project to the Existing (2010) and Existing plus Approved Projects (2015) scenarios significantly worsens conditions at three (3) study intersections. However, these impacts can be mitigated to be ***less than significant.***
- The combination of the volume of eastbound left-turns onto the project site access roadway with the proportion of this movement to the approach volumes suggests the need to consider an exclusive eastbound left-turn lane along Green Valley Road. Considering the high speed, rural nature of Green Valley Road through the project area, an exclusive eastbound left-turn lane should be considered as a means by which to enhance safety at the project site access roadway intersection. Said left-turn lane should be designed with appropriate storage and deceleration distances consistent with the County's applicable design standards.

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INTRODUCTION

This report documents the results of a traffic impact analysis completed for Wilson Estates, a 28-acre, 60-unit single-family residential development project proposed to be located along the south side of Malcolm Dixon Road in El Dorado Hills, California (the "proposed project" or "project"). The purpose of this impact analysis is to identify potential environmental impacts to transportation facilities as required by the California Environmental Quality Act (CEQA). This study was performed in accordance with the El Dorado County Department of Transportation's *Traffic Impact Study Protocols and Procedures*, and the scope of work provided by a representative of the County[1].

The remaining sections of this report document the proposed project, analysis methodologies, impacts and mitigation, and general study conclusions.

PROJECT DESCRIPTION

The 28-acre project site is proposed to be developed with up to 60 single-family detached dwelling units. Primary access to the site will be provided via two (2) full access driveways along Malcolm Dixon Road. The proposed project is also assumed to include (either as part of the project or to have been previously constructed by others) the construction of a new access road connecting Malcolm Dixon Road and Green Valley Road through the eastern portions of the site.

The project location is shown in Figure 1, and the proposed project site plan is shown in Figure 2. The following intersections are included in this evaluation:

1. *Malcolm Dixon Road at Western Project Site Access Driveway (Project Only)*
2. *Malcolm Dixon Road at Eastern Project Site Access Driveway (Project Only)*
3. *Green Valley Road at Site Access Road (Project Only)*
4. Salmon Falls Road at Malcolm Dixon Road
5. Green Valley Road at Silva Valley Parkway/Allegheny Road
6. Green Valley Road at El Dorado Hills Boulevard/Salmon Falls Road
7. El Dorado Hills Boulevard at Francisco Drive
8. Green Valley Road at Francisco Drive
9. El Dorado Hills Boulevard at Serrano Parkway
10. El Dorado Hills Boulevard at US-50 Westbound Ramps
11. El Dorado Hills Boulevard at US-50 Eastbound Ramps

Figure 3 illustrates the study facilities, existing traffic control, and existing lane configurations.

PROJECT AREA ROADWAYS

The following are descriptions of the primary roadways in the vicinity of the project.

US Route 50 (US-50) is an east-west freeway located south of the project site. Generally, US-50 serves all of El Dorado County's major population centers and provides connections to Sacramento County to the west and the State of Nevada to the east. Primary access to the project site from US-50 is provided at the El Dorado Hills Boulevard/Latrobe Road interchange (supplemental access via Silva Valley Parkway interchange in 2015). Within the general project area, US-50 currently serves approximately 95,000 vehicles per day[2] (vpd) with three travel lanes in each direction, west of El Dorado Hills Boulevard/Latrobe Road.

[1] Memorandum from Abhi Parikh, Dowling Associates, Inc., to Eileen Crawford, El Dorado County DOT, November 9, 2010.
[2] Caltrans Traffic and Vehicle Data Systems Unit, http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2009all/2009TrafficVolumes.htm

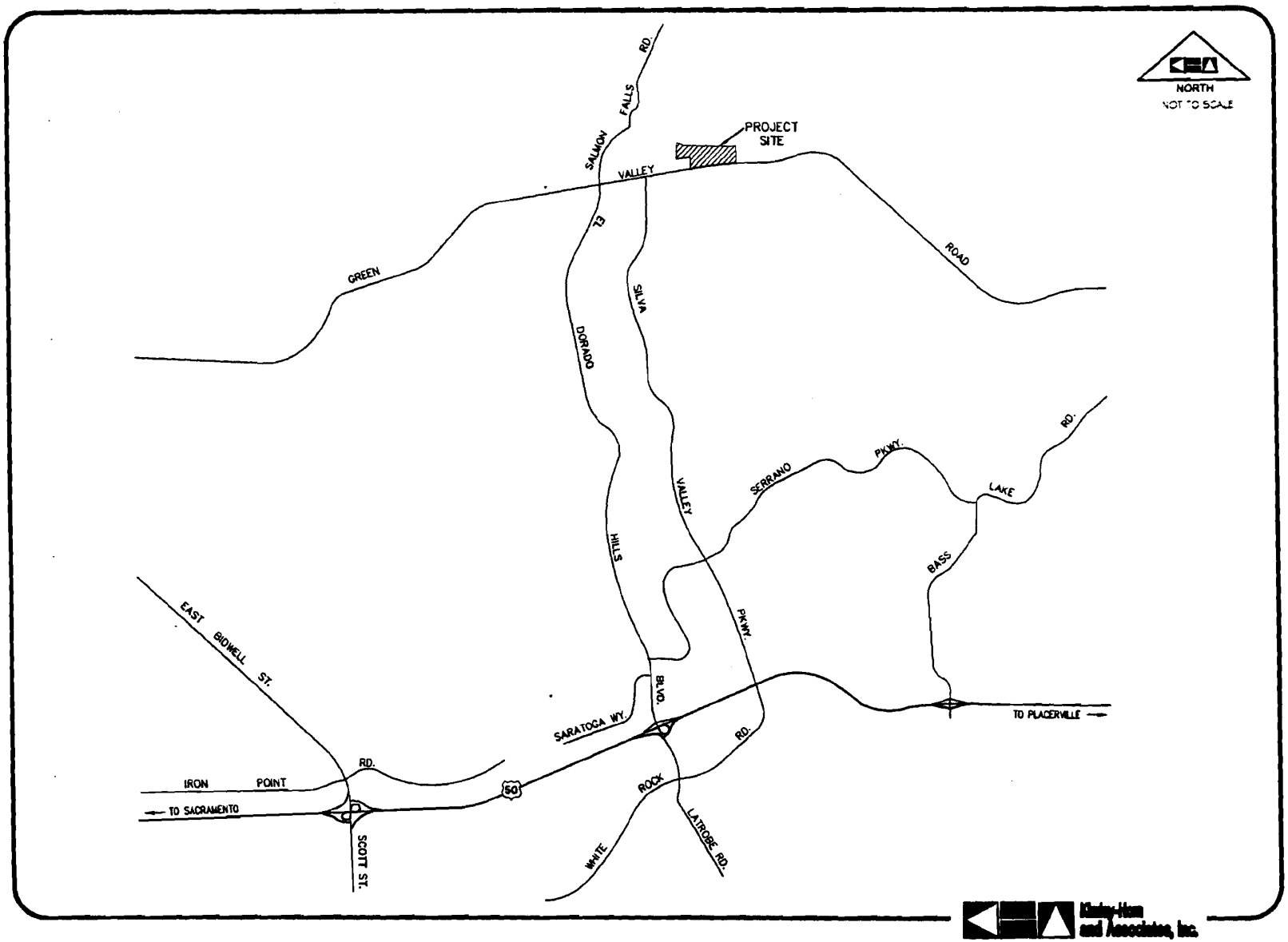
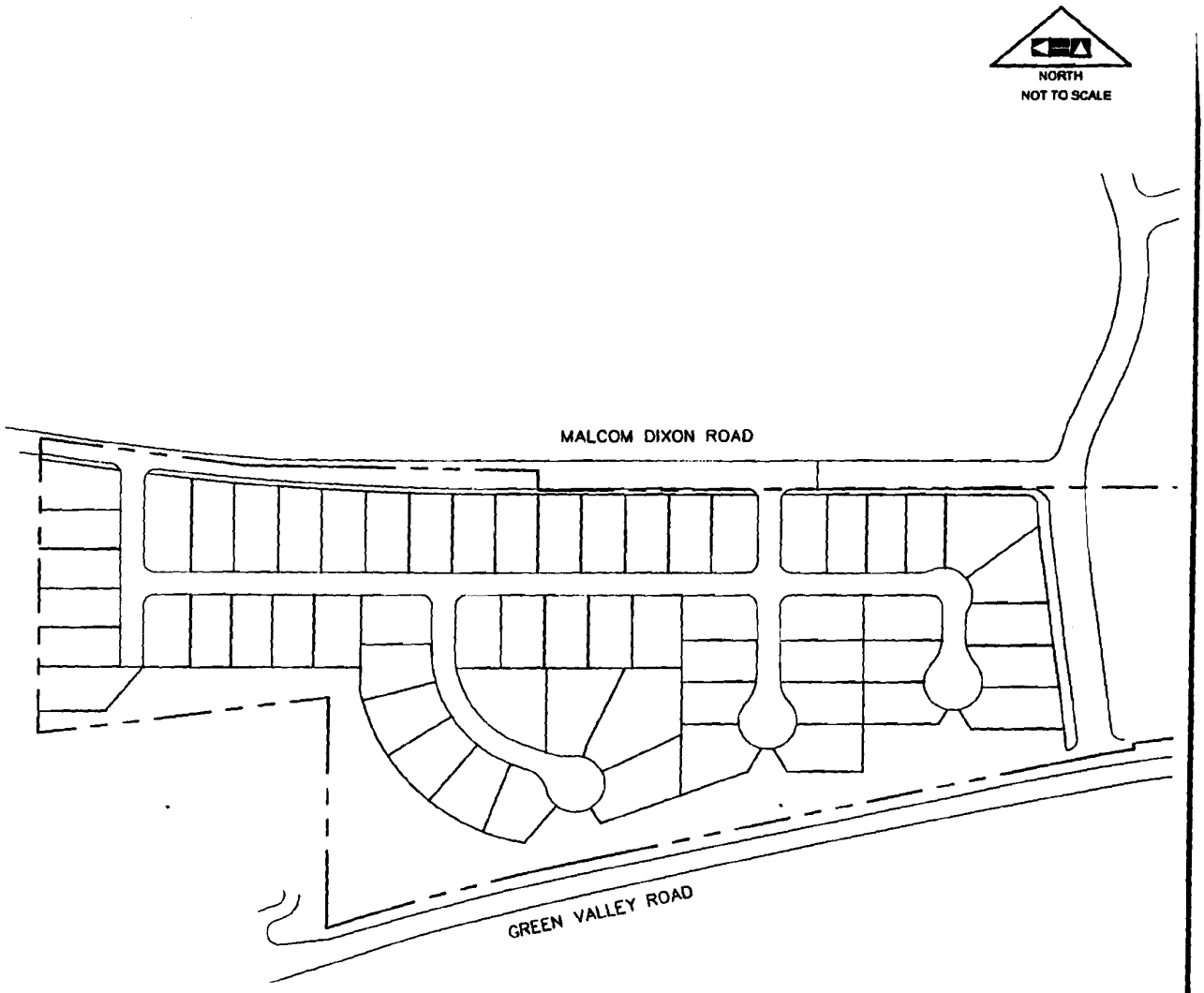


FIGURE 1

PROJECT VICINITY MAP

WILSON ESTATES

EL DORADO HILLS, CA



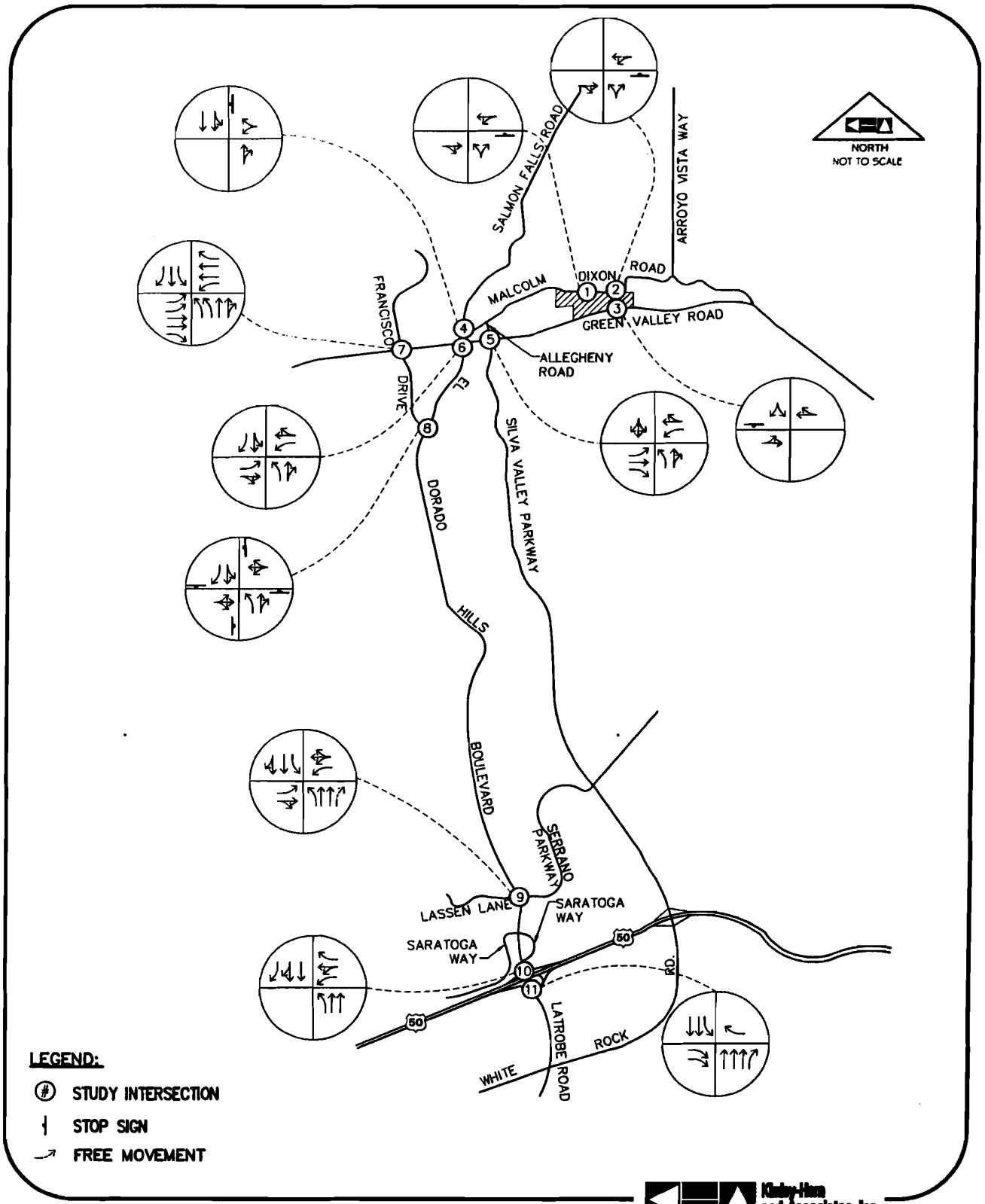
SOURCE: CTA ENGINEERING & SURVEYING, OCTOBER 2010

Kimley-Horn and Associates, Inc.

FIGURE 2

PROPOSED PROJECT SITE PLAN

WILSON ESTATES
EL DORADO HILLS, CA



Kimley-Horn and Associates, Inc.

FIGURE 3

STUDY INTERSECTIONS, TRAFFIC CONTROL AND LANE GEOMETRIES

WILSON ESTATES
EL DORADO HILLS, CA

Green Valley Road is an east-west arterial roadway that connects Placerville with western portions of El Dorado County and eastern Sacramento County, south of Folsom Lake. Through the project area, Green Valley Road provides one travel lane in each direction and serves approximately 13,000 vehicles per day[3].

Salmon Falls Road is a north-south arterial roadway that serves as a primary connection for areas located along the eastern border of Folsom Lake, and provides a connect to SR-49 to the north. Through the project area, this roadway serves approximately 7,300 vpd[3] with one travel lane in each direction. South of Green Valley Road, Salmon Falls Road becomes El Dorado Hills Boulevard. **El Dorado Hills Boulevard** provides a primary connection to US-50 for western El Dorado County. Just north of US-50 this roadway carries approximately 31,000 vpd[3] with two travel lanes in each direction.

Silva Valley Parkway is a north-south collector roadway that connects Green Valley Road with Serrano Parkway and eventually US-50. Silva Valley Parkway provides one travel lane in each direction and serves approximately 6,200 vpd[3] just south of Green Valley Road. A new US-50 interchange with Silva Valley parkway is assumed to be in place for Existing plus Approved Projects (2015) Conditions.

Malcolm Dixon Road is an east-west local roadway that connects Salmon Falls Road with Green Valley Road. Malcolm Dixon Road is a low-speed, two-lane roadway that primarily provides local residential access.

Allegheny Road is a north-south, minor roadway that provides a short, direct connection between Malcolm Dixon Road and Green Valley Road. Allegheny Road becomes Silva Valley Parkway south of Green Valley Road.

ASSESSMENT OF PROPOSED PROJECT

Proposed Project Trip Generation

The number of trips anticipated to be generated by the proposed project were derived using data included in *Trip Generation, 8th Edition,* published by the Institute of Transportation Engineers (ITE). The anticipated trip generation for this project, is shown in Table 1.

Table 1 – Proposed Project Trip Generation

Land Use (ITE Code)	Size (# Units)	Daily Trips	AM Peak Hour					PM Peak Hour				
			Total Trips	In %	In Trips	Out %	Out Trips	Total Trips	In %	In Trips	Out %	Out Trips
Single-Family Detached Housing (210)	60	650	52	25%	13	75%	39	66	63%	42	37%	25
Net New External Trips		650	52		13		39	66		42		25

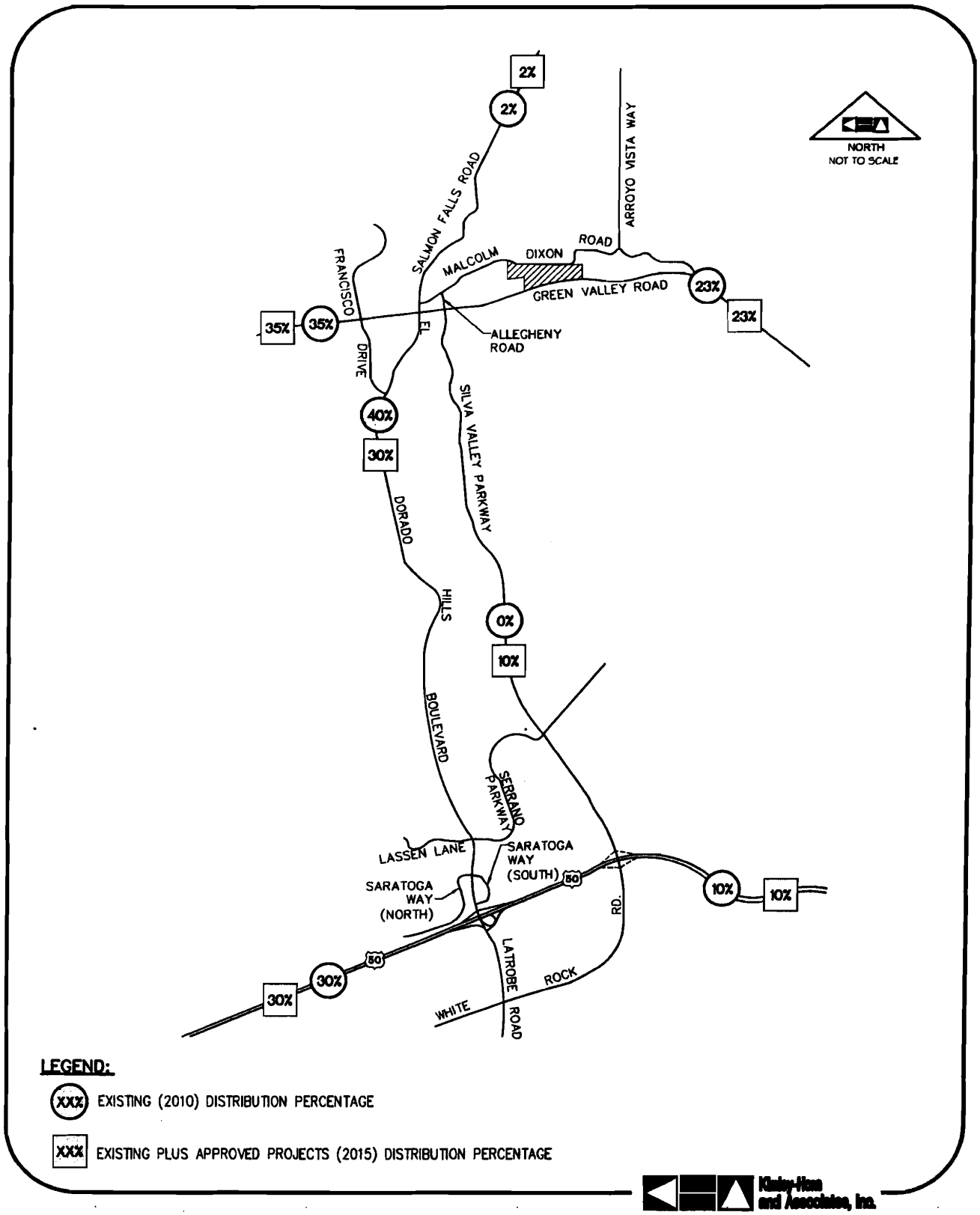
Source: *Trip Generation, 8th Edition*, ITE.

As shown in Table 1, the proposed project is estimated to generate 650 total new daily trips, with 52 new trips occurring during the AM peak-hour, and 66 new trips occurring during the PM peak-hour.

Proposed Project Trip Distribution

The distribution of project traffic was based on information approved and provided by a representative of the County[1]. The project trip distribution percentages are illustrated in Figure 4. The resulting AM and PM peak-hour traffic volumes attributed to the proposed project are illustrated in Figure 5 and Figure 6.

[3] El Dorado County Department of Transportation, 2009.



Kimley-Horn and Associates, Inc.

FIGURE 4

PROPOSED PROJECT TRIP DISTRIBUTION

WILSON ESTATES
EL DORADO HILLS, CA

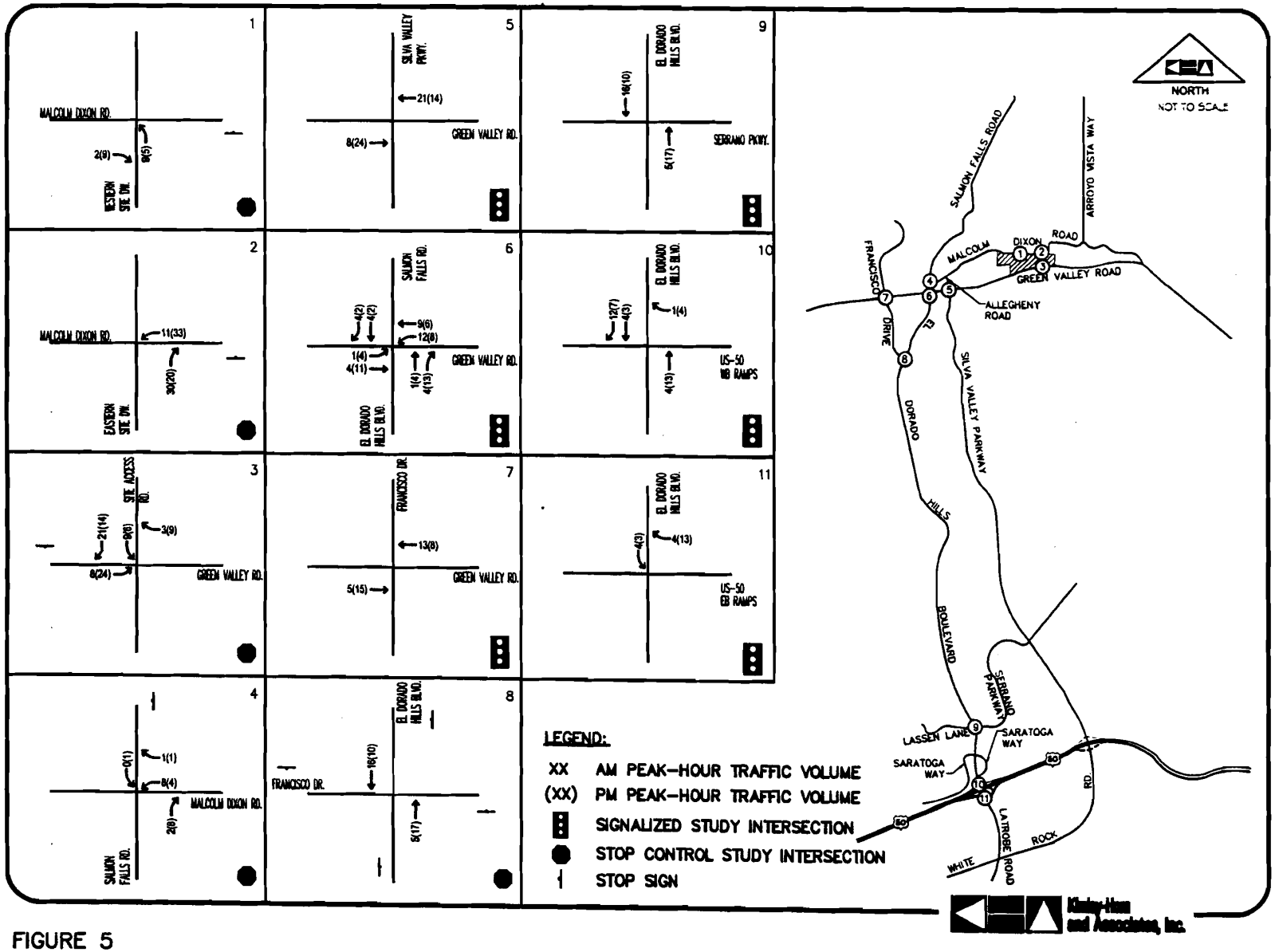


FIGURE 5

EXISTING (2010) PROPOSED PROJECT TRIP ASSIGNMENT

WILSON ESTATES
EL DORADO HILLS, CA

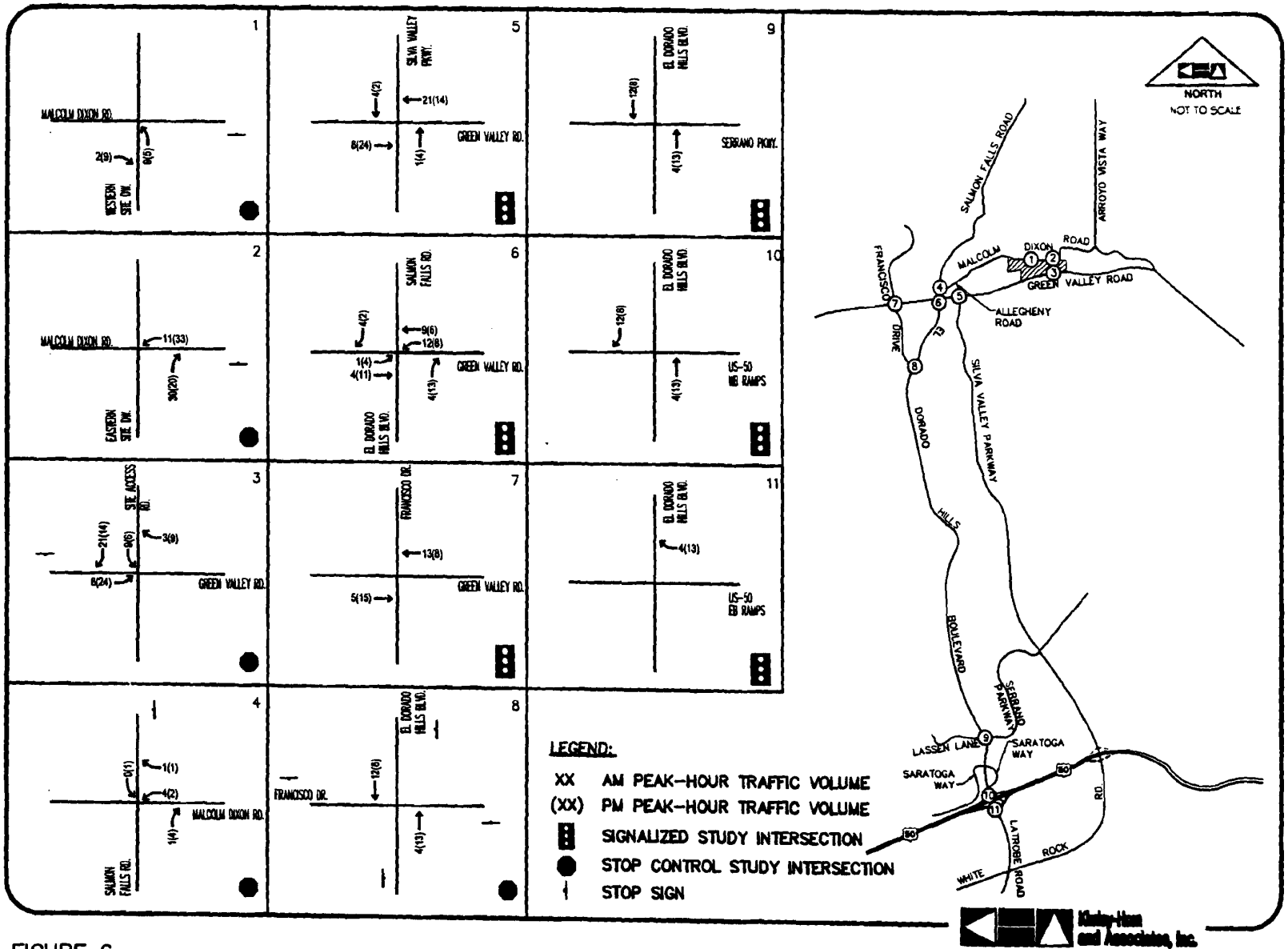


FIGURE 6

EXISTING PLUS APPROVED PROJECTS (2015) PROJECT TRIP ASSIGNMENT

WILSON ESTATES
EL DORADO HILLS, CA

TRAFFIC IMPACT ANALYSIS METHODOLOGY

Analysis of transportation facility significant environmental impacts is based on the concept of Level of Service (LOS). The LOS of a facility is a qualitative measure used to describe operational conditions. LOS ranges from A (best), which represents minimal delay, to F (worst), which represents heavy delay and a facility that is operating at or near its functional capacity. Levels of Service for this study were determined using methods defined in the *Highway Capacity Manual, 2000* (HCM) and appropriate traffic analysis software

The HCM includes procedures for analyzing two-way stop controlled (TWSC), all-way stop controlled (AWSC), and signalized intersections. The TWSC procedure defines LOS as a function of average control delay for each minor street approach movement. Conversely, the AWSC and signalized intersection procedures define LOS as a function of average control delay for the intersection as a whole. Table 2 presents intersection LOS definitions as defined in the HCM.

Table 2 – Intersection Level of Service Criteria

A	≤ 10	≤ 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80

Source: Highway Capacity Manual, 2000
* Applied to the worst lane/lane group(s) for TWSC

Consistency with General Plan Land Use Designation

According to the County's *Protocols*:

> "[A] Each traffic impact study must provide a review of a proposed project's consistency with the land use designations and zoning densities of the 2004 County General Plan to determine if the project is consistent with such designation(s) as applicable within the proposed project area...[B] If a proposed project is of a magnitude that is clearly within the amount of development which was anticipated in the traffic study conducted for the General Plan, then the General Plan's traffic analysis will serve as the basis for the cumulative traffic analysis of the project."

The proposed project (2.14 dwelling units/acre) is consistent with the *2004 General Plan* land use designation and zoning density for the site (High Density Residential (1-5 DU/acre))[4]. Therefore, the proposed project does not satisfy the first criterion [A] for determining if a new cumulative 2025 analysis is required in addition to the analysis already completed for the County's *General Plan*.

Regarding the second criterion [B], the proposed project is located within Traffic Analysis Zone (TAZ) 335. According to information provided by a representative of the County[1], "Trip generation of the proposed project does not exceed the growth anticipated in TAZ 335. Therefore no cumulative analysis is required."

[4] *2004 General Plan Land Use Diagram*, El Dorado County Planning Department.

Based on the above criteria and the County's requirements, this LOS analysis was conducted for the study facilities for the following scenarios:

A. Existing (2010) Conditions
B. Existing (2010) plus Proposed Project Conditions
C. Existing plus Approved Projects (2015) Conditions
D. Existing plus Approved Projects (2015) plus Proposed Project Conditions

The following is a discussion of the analyses for these scenarios:

EXISTING (2010) CONDITIONS

Recent peak-hour traffic volumes for the majority of the study intersections were obtained from a representative of the County[5]. For these intersections, existing counts that were collected in 2005-2008 were increased to represent current year (2010) conditions using a 2 percent annual growth rate to conservatively approximate existing conditions[6]. One (1) new weekday AM and PM peak period intersection turning movement traffic count was conducted in November 2010, for the El Dorado Hills Boulevard intersection with Francisco Drive. This count was conducted between the hours of 6:30 a.m. and 9:30 a.m. and 3:30 p.m. and 6:30 p.m. It is worth noting that a peak-hour factor (PHF) of 0.92 and a two percent heavy vehicle factor were utilized for this, and all subsequent analysis scenarios.

Existing (2010) peak-hour turn movement volumes are presented in Figure 7, and the traffic count data sheets are provided in Appendix A. Table 3 presents the peak-hour intersection operating conditions for this analysis scenario.

Table 3 – Existing (2010) Intersection Levels of Service

1	Malcolm Dixon Rd @ Western Project Site Access Dwy	*Plus Project Analysis Scenarios Only*				
2	Malcolm Dixon Rd @ Eastern Project Site Access Dwy					
3	Green Valley Rd @ Site Access Rd					
4	Salmon Falls Rd @ Malcolm Dixon Rd	TWSC*	11.5 (WB)	B	13.2 (WB)	B
5	Green Valley Rd @ Silva Valley Pkwy/Allegheny Rd	Signal	15.8	B	16.2	B
6	Green Valley Rd @ El Dorado Hills Blvd/Salmon Falls Rd	Signal	**83.2**	F	46.9	D
7	Green Valley Rd @ Francisco Dr	Signal	38.1	D	28.4	C
8	El Dorado Hills Blvd @ Francisco Dr	AWSC	**92.7**	F	49.9	E
9	El Dorado Hills Blvd @ Serrano Pkwy	Signal	16.4	B	35.7	D
10	El Dorado Hills Blvd @ US-50 Westbound Ramps	Signal	**186.1**	F	**89.9**	F
11	Latrobe Rd @ US-50 Eastbound Ramps	Signal	16.6	B	17.6	B

* Control delay for worst minor approach (worst minor movement) for TWSC. **Bold = Substandard per County**

As indicated in Table 3, the study intersections operate from LOS B to LOS F during the AM and PM peak-hours. Analysis worksheets for this scenario are provided in Appendix B.

[5] Dowling Associates, Inc., ftp://ftp.dowlinginc.com.
[6] Methodology per email from Abhi Parikh, Dowling Associates, Inc., November 11, 2010.

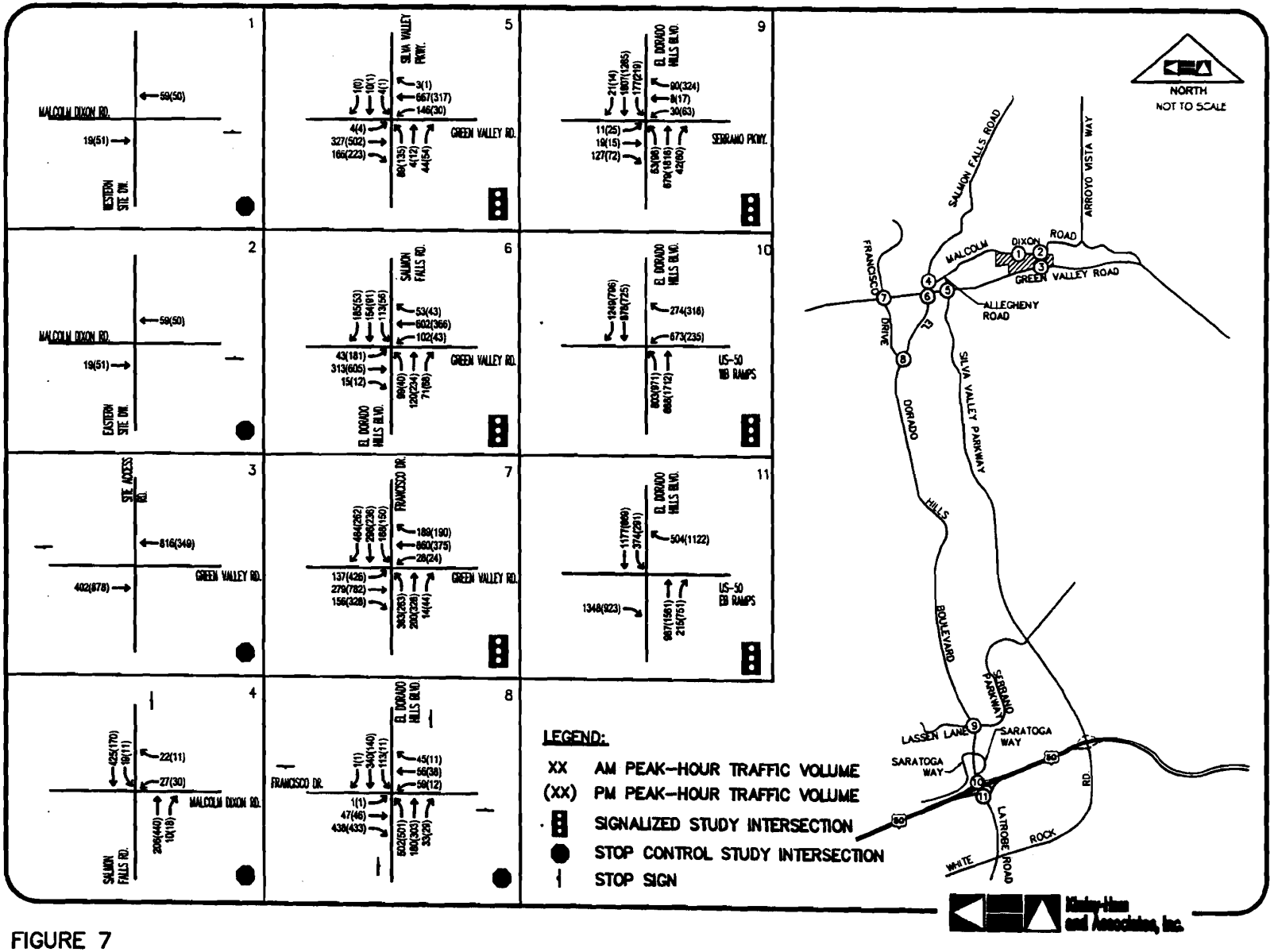


FIGURE 7

EXISTING (2010) PEAK-HOUR TRAFFIC VOLUMES

WILSON ESTATES
EL DORADO HILLS, CA

EXISTING (2010) PLUS PROPOSED PROJECT CONDITIONS

Peak-hour traffic associated with the proposed project was added to the existing traffic volumes and levels of service were determined at the study intersections. Table 4 provides a summary of the intersection analysis and Figure 8 provides the AM and PM peak-hour traffic volumes at the study intersections for this analysis scenario.

Table 4 – Existing (2010) and Existing (2010) Plus Proposed Project Intersection Levels of Service

#	Intersection	Analysis Scenario[1]	Traffic Control	AM Peak Hour		PM Peak Hour	
				Delay[2] (sec/veh)	LOS	Delay[2] (sec/veh)	LOS
1	Malcolm Dixon Rd @ Western Project Site Access Dwy	Exist.	*Plus Project Analysis Scenarios Only*				
		Exist.+PP	TWSC	8.7 (NB)	A	8.7 (NB)	A
2	Malcolm Dixon Rd @ Eastern Project Site Access Dwy	Exist.	*Plus Project Analysis Scenarios Only*				
		Exist.+PP	TWSC	8.4 (NB)	A	8.5 (NB)	A
3	Green Valley Rd @ Site Access Rd	Exist.	*Plus Project Analysis Scenarios Only*				
		Exist.+PP	TWSC	22.6 (SB)	C	18.8 (SB)	C
4	Salmon Falls Rd @ Malcolm Dixon Rd	Exist.	TWSC	11.9 (WB)	B	13.2 (WB)	B
		Exist.+PP		11.9 (WB)	B	13.3 (WB)	B
5	Green Valley Rd @ Silva Valley Pkwy/Allegheny Rd	Exist.	Signal	15.8	B	16.2	B
		Exist.+PP		15.9	B	16.1	B
6	Green Valley Rd @ El Dorado Hills Blvd/Salmon Falls Rd	Exist.	Signal	83.2	F	46.9	D
		Exist.+PP		91.2	F	51.6	D
7	Green Valley Rd @ Francisco Dr	Exist.	Signal	38.1	D	28.4	C
		Exist.+PP		38.4	D	28.5	C
8	El Dorado Hills Blvd @ Francisco Dr	Exist.	AWSC	92.7	F	49.9	E
		Exist.+PP		95.5	F	50.9	F
9	El Dorado Hills Blvd @ Serrano Pkwy	Exist.	Signal	16.4	B	35.7	D
		Exist.+PP		16.5	B	36.0	D
10	El Dorado Hills Blvd @ US-50 Westbound Ramps	Exist.	Signal	186.1	F	89.9	F
		Exist.+PP		188.5	F	91.8	F
11	Latrobe Rd @ US-50 Eastbound Ramps	Exist.	Signal	16.6	B	17.6	B
		Exist.+PP		16.6	B	17.6	B

[1] Exist. = Existing (2010), Exist. + PP = Existing (2010) plus Proposed Project
[2] Control delay for worst minor approach (worst minor movement) for TWSC. **Bold = Substandard per County**

As indicated in Table 4, the study intersections operate from LOS A to LOS F with the addition of project traffic during the AM and PM peak-hours. The analysis worksheets for this scenario are provided in Appendix C.

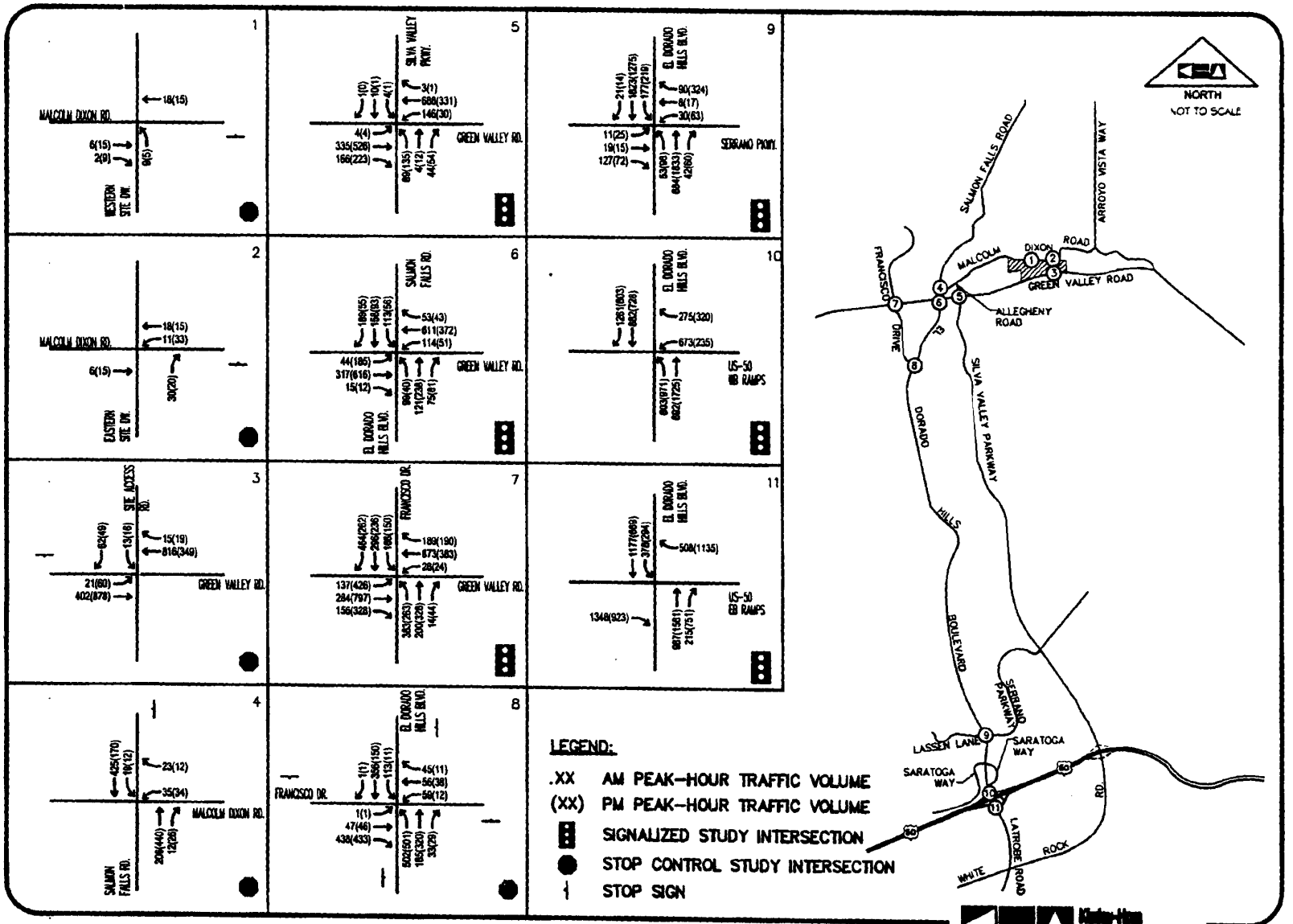


FIGURE 8

EXISTING (2010) PLUS PROPOSED PROJECT PEAK-HOUR TRAFFIC VOLUMES

WILSON ESTATES
EL DORADO HILLS, CA

EXISTING PLUS APPROVED PROJECTS (2015) CONDITIONS

Traffic volumes from the *Saratoga Way Extension Traffic Operation Study*[7] were used to establish year 2015 traffic volumes for the El Dorado Hills Boulevard intersections with Serrano Parkway, US-50 Westbound Ramps, and US-50 Eastbound Ramps. For the other study intersections, two scenarios were evaluated to determine the worst case approximation of near-term study area roadway traffic volumes. First, traffic associated with approved projects in the vicinity of the proposed project as documented in a previous study[8], as well as project traffic associated with three additional projects (Parkes Property - WO#101, Diamante Estates - WO #16, and Green Valley Center – WO#39) were combined and added to the Existing (2010) traffic conditions. Second, five years of projected growth as derived from the County's travel demand model output was applied to the Existing (2010) traffic conditions. For this second scenario, peak-hour traffic volumes for the study area roadway segments were obtained from a representative of the County for the years 1998 and 2025[5]. Using the 1998 and 2025 model data, percent annual peak growth rates were determined for each roadway segment direction and were then extended to five-year growth rates. The study intersections' Existing (2010) peak-hour traffic volumes were then increased by these five year growth rates (by direction) to obtain forecasted (year 2015) traffic conditions.

These two volume scenarios were compared and it was determined that the second scenario, the addition of five years of projected growth as derived from the County's travel demand model output, yields the worst case traffic conditions for the majority of the study intersections' movements. A list of approved projects and details regarding the comparison of year 2015 traffic conditions are presented in Appendix D.

Figure 9 indicates lane configurations assumed for Existing plus Approved Projects (2015) Conditions which includes the build-out of the US-50 interchange with El Dorado Hills Boulevard/Latrobe Road and the construction of the initial phase of the US-50 interchange with Silva Valley Parkway. Table 5 provides a summary of the intersection analysis and Figure 10 provides the AM and PM traffic volumes for this analysis scenario.

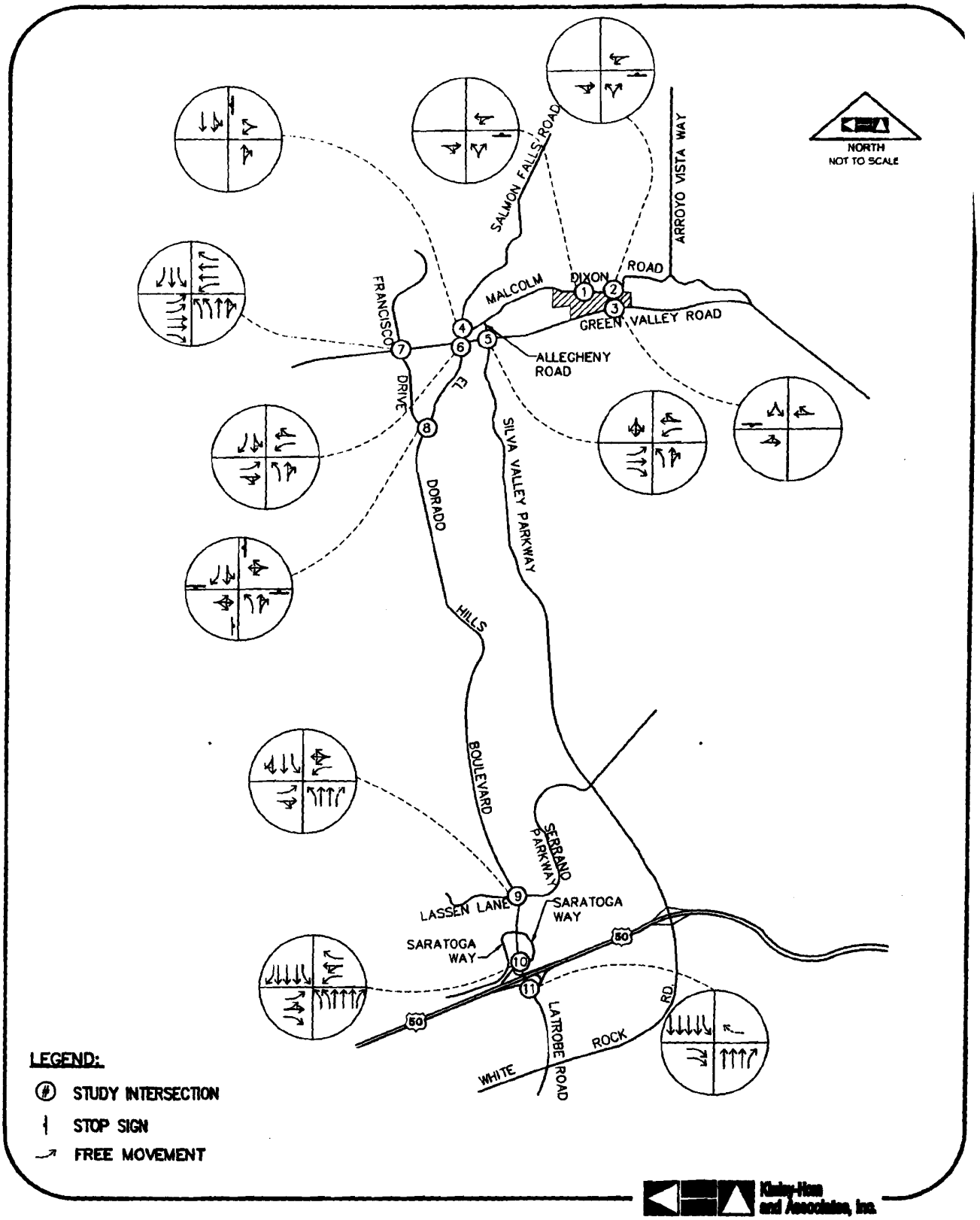
Table 5 – Existing plus Approved Projects (2015) Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
1	Malcolm Dixon Rd @ Western Project Site Access Dwy	*Plus Project Analysis Scenarios Only*				
2	Malcolm Dixon Rd @ Eastern Project Site Access Dwy					
3	Green Valley Rd @ Site Access Rd					
4	Salmon Falls Rd @ Malcolm Dixon Rd	TWSC*	12.3 (WB)	B	14.1 (WB)	B
5	Green Valley Rd @ Silva Valley Pkwy/Allegheny Rd	Signal	18.3	B	18.5	B
6	Green Valley Rd @ El Dorado Hills Blvd/Salmon Falls Rd	Signal	60.3	E	57.0	E
7	Green Valley Rd @ Francisco Dr	Signal	45.6	D	37.7	D
8	El Dorado Hills Blvd @ Francisco Dr	AWSC	**93.9**	**F**	**51.5**	**F**
9	El Dorado Hills Blvd @ Serrano Pkwy	Signal	20.1	C	63.9	E
10	El Dorado Hills Blvd @ US-50 Westbound Ramps	Signal	53.1	D	35.3	D
11	Latrobe Rd @ US-50 Eastbound Ramps	Signal	44.8	D	57.8	E

* Control delay for worst minor approach (worst minor movement) for TWSC. **Bold = Substandard per County**

As indicated in Table 5, the study intersections operate from LOS B to LOS F during the AM and PM peak-hours. The analysis worksheets for this scenario are provided in Appendix E.

[7] Dowling Associates, Inc., ftp://ftp.dowlinginc.com.
[8] *Parkes Property Traffic Impact Analysis (WO #101)*, Kimley-Horn and Associates, Inc., January 24, 2008.



Kimley-Horn and Associates, Inc.

FIGURE 9

EXISTING PLUS APPROVED PROJECTS (2015)
INTERSECTION CONFIGURATIONS

WILSON ESTATES
EL DORADO HILLS, CA

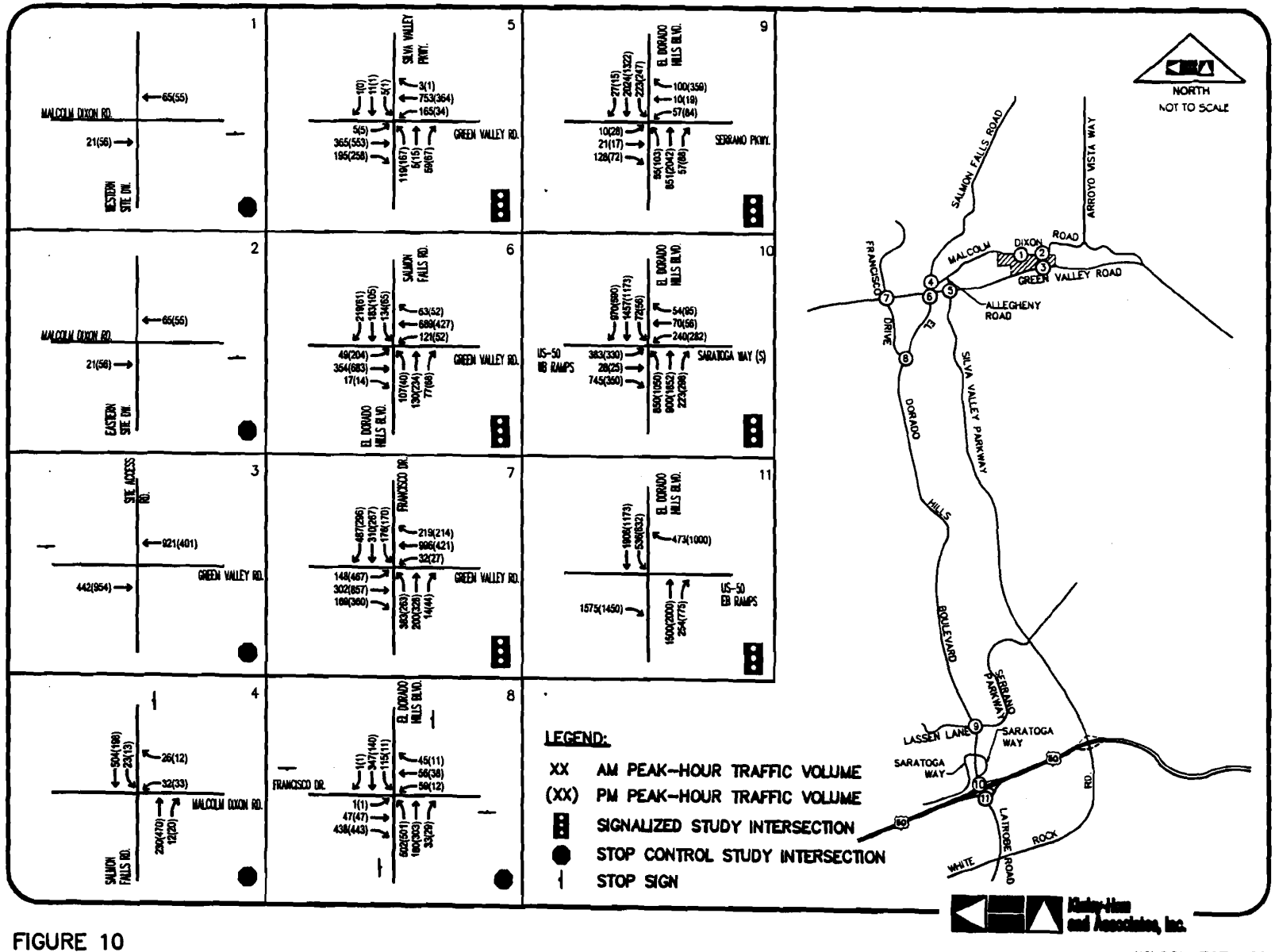


FIGURE 10

EXISTING PLUS APPROVED PROJECTS (2015) PEAK-HOUR TRAFFIC VOLUMES

WILSON ESTATES
EL DORADO HILLS, CA

EXISTING PLUS APPROVED PROJECTS (2015) PLUS PROPOSED PROJECT CONDITIONS

Peak-hour traffic associated with the proposed project was added to the Existing plus Approved Projects (2015) traffic volumes, and levels of service were determined at the study facilities. Table 6 provides a summary of the intersection operating conditions for this analysis scenario. Figure 11 provides the AM and PM traffic volumes for this analysis scenario.

Table 6 – Existing plus Approved Projects (2015) and Existing plus Approved Projects (2015) plus Proposed Project Intersection Levels of Service

#	Intersection	Analysis Scenario	Traffic Control	AM Peak Hour Delay	AM Peak Hour LOS	PM Peak Hour Delay	PM Peak Hour LOS
1	Malcolm Dixon Rd @ Western Project Site Access Dwy	EPAP	*Plus Project Analysis Scenarios Only*				
		EPAP+PP	TWSC*	8.7 (NB)	A	8.7 (NB)	A
2	Malcolm Dixon Rd @ Eastern Project Site Access Dwy	EPAP	*Plus Project Analysis Scenarios Only*				
		EPAP+PP	TWSC*	8.5 (NB)	A	8.5 (NB)	A
3	Green Valley Rd @ Site Access Rd	EPAP	*Plus Project Analysis Scenarios Only*				
		EPAP+PP	TWSC*	28.5 (SB)	D	22.4 (SB)	C
4	Salmon Falls Rd @ Malcolm Dixon Rd	EPAP	TWSC*	12.3 (WB)	B	14.1 (WB)	B
		EPAP+PP		12.5 (WB)	B	14.3 (WB)	B
5	Green Valley Rd @ Silva Valley Pkwy/Allegheny Rd	EPAP	Signal	18.3	B	18.5	B
		EPAP+PP		19.4	B	18.5	B
6	Green Valley Rd @ El Dorado Hills Blvd/Salmon Falls Rd	EPAP	Signal	60.3	E	57.0	E
		EPAP+PP		62.5	E	61.8	E
7	Green Valley Rd @ Francisco Dr	EPAP	Signal	45.6	D	37.7	D
		EPAP+PP		46.0	D	37.9	D
8	El Dorado Hills Blvd @ Francisco Dr	EPAP	AWSC	93.9	F	51.5	F
		EPAP+PP		96.1	F	52.3	F
9	El Dorado Hills Blvd @ Serrano Pkwy	EPAP	Signal	20.1	C	63.9	E
		EPAP+PP		23.0	C	65.2	E
10	El Dorado Hills Blvd @ US-50 Westbound Ramps	EPAP	Signal	53.1	D	35.3	D
		EPAP+PP		52.3	D	35.2	D
11	Latrobe Rd @ US-50 Eastbound Ramps	EPAP	Signal	44.8	D	57.8	E
		EPAP+PP		44.8	D	57.7	E

+ EPAP = Existing plus Approved Projects (2015), EPAP + PP = EPAP (2015) plus Proposed Project
* Control delay for worst minor approach (worst minor movement) for TWSC. **Bold = Substandard per County**

As indicated in Table 6, the study intersections operate from LOS A to LOS F during the AM and PM peak-hours. The analysis worksheets for this scenario are provided in Appendix F.

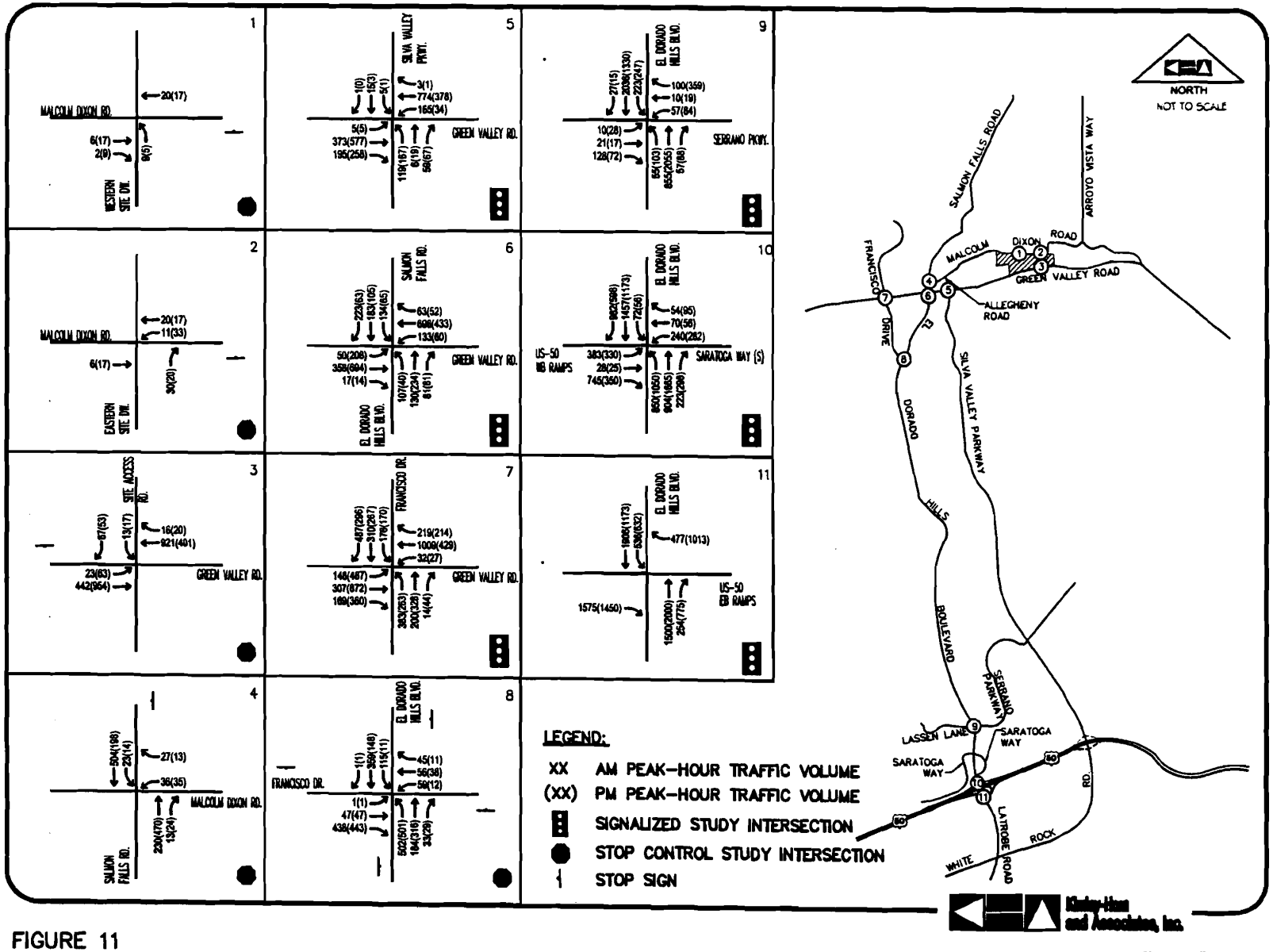


FIGURE 11

EXISTING PLUS APPROVED PROJECTS (2015)
PLUS PROPOSED PROJECT PEAK-HOUR TRAFFIC VOLUMES

WILSON ESTATES
EL DORADO HILLS, CA

IMPACTS AND MITIGATION

Standards of Significance

Project impacts were determined by comparing conditions with the proposed project to those without the project. Impacts for intersections are created when traffic from the proposed project forces the LOS to fall below a specific threshold.

The County's standards[9] specify the following:

> "Level of Service (LOS) for County-maintained roads and State highways within the unincorporated areas of the County *shall not be worse than* ***LOS E in the Community Regions***." (El Dorado County General Plan Policy TC-Xd) The proposed project is located within the El Dorado Hills Community Region.
>
> "If a project causes the peak-hour level of service...on a County road or State highway that would otherwise meet the County standards (without the project) to exceed the [given] values, then the impact shall be considered significant."
>
> "If any county road or state highway fails to meet the [given] standards for peak hour level of service...under existing conditions, and the project will 'significantly worsen' conditions on the road or highway, then the impact shall be considered significant." According to General Plan Policy TC-Xe[10], 'significantly worsen' is defined as "a 2 percent increase in traffic during the a.m. peak hour, p.m. peak hour, or daily, or the addition of 100 or more daily trips, or the addition of 10 or more trips during the a.m. peak hour or the p.m. peak hour."

In summary, **LOS E** will be used for all study intersections.

Impacts and Mitigation

Existing (2010) plus Proposed Project Conditions

As reflected in Table 4, the addition of the proposed project results in two (2) significant impacts as defined by the County. The following is a discussion of each of these impacts and their associated mitigations.

Impacts:

I1. Intersection #6, Green Valley Road @ El Dorado Hills Boulevard/Salmon Falls Road
As shown in Table 4, this intersection operates at LOS F during the AM peak-hour without the project, and the project contributes more than 10 peak-hour trips to the intersection during a peak-hour (Figure 5). ***This is a significant impact.***

I2. Intersection #8, El Dorado Hills Boulevard @ Francisco Drive
As shown in Table 4, this intersection operates at LOS F during the AM peak-hour without the project, and the project contributes more than 10 peak-hour trips to the intersection during a peak-hour (Figure 5). In addition, this intersection operates at LOS E during the PM peak-hour without the project, and the project results in LOS F. ***This is a significant impact.***

I3. Intersection #10, El Dorado Hills Boulevard @ US-50 Westbound Ramps
As shown in Table 4, this intersection operates at LOS F during the AM and PM peak-hours without the project, and the project contributes more than 10 peak-hour trips to the intersection during a peak-hour (Figure 5). ***This is a significant impact.***

[9] *Traffic Impact Study Protocols and Procedures,* El Dorado County Department of Transportation, June 2008.
[10] *El Dorado County General Plan, Transportation and Circulation Element,* July 2004.

Mitigation:

M1. Intersection #6, Green Valley Road @ El Dorado Hills Boulevard/Salmon Falls Road

The significant impact at this intersection during the AM peak-hour can be mitigated with signal cycle length optimization and reallocation of the green time. As shown in Table 7, this mitigation measure results in the intersection operating at LOS D during the AM peak-hour. Therefore, ***this impact is less than significant.*** The proposed project should contribute its proportionate share toward these improvements.

M2. Intersection #8, El Dorado Hills Boulevard @ Francisco Drive

The significant impact at this intersection during the AM and PM peak-hours can be mitigated with the addition of an eastbound channelized right-turn lane. Channelization of the eastbound right-turn lane will require the addition of a southbound receiving lane. As shown in Table 7, this mitigation measure results in the intersection operating at LOS D and LOS C during the AM and PM peak-hours, respectively. Therefore, ***this impact is less than significant.*** The proposed project should contribute its proportionate share toward these improvements.

M3. Intersection #10, El Dorado Hills Boulevard @ US-50 Westbound Ramps

The significant impact at this intersection during the AM and PM peak-hours can be mitigated with the implementation of the ultimate configuration of the US-50 interchange with El Dorado Hills Boulevard/Latrobe Road. The ultimate interchange configuration is currently under construction and is assumed to be in place for the Existing plus Approved Projects (2015) Conditions. As shown in Table 7, incorporation of the ultimate intersection lane configuration results in the intersection operating at LOS C and LOS B during the AM and PM peak-hours, respectively. Therefore, ***this impact is less than significant.***

Table 7 – Intersection Levels of Service –
Existing (2010) plus Proposed Project Mitigated Conditions

#	Intersection	Analysis Scenario	Traffic Control	AM Peak-Hour Delay (seconds)	AM LOS	PM Peak-Hour Delay (seconds)	PM LOS
6	Green Valley Rd @ El Dorado Hills Blvd/Salmon Falls Rd	Exist.	Signal	83.2	F	46.9	D
		Exist.+PP		91.2	F	51.6	D
		Exist.+PP (Mit)		39.8	D	50.7	D
8	El Dorado Hills Blvd @ Francisco Dr	Exist.	AWSC	92.7	F	49.9	E
		Exist.+PP		95.5	F	50.9	F
		Exist.+PP (Mit)		27.8	D	16.8	C
10	El Dorado Hills Blvd @ US-50 Westbound Ramps	Exist.	Signal	186.1	F	89.9	F
		Exist.+PP		188.5	F	91.8	F
		Exist.+PP (Mit)		20.4	C	14.1	B

[+] Exist. = Existing (2010), Exist. + PP = Existing (2010) plus Proposed Project, Mit = Mitigated

Analysis worksheets for this scenario are provided in Appendix G.

Existing plus Approved Projects (EPAP) plus Proposed Project Conditions

As reflected in Table 6, the addition of the proposed project results in one (1) significant impact as defined by the County. The following is a discussion of each of these impacts and their associated mitigations.

Impacts:

I4. Intersection #8, El Dorado Hills Boulevard @ Francisco Drive
As shown in Table 6, this intersection operates at LOS F during the AM and PM peak-hours without the project, and the project contributes more than 10 peak-hour trips to the intersection during a peak-hour (Figure 6). ***This is a significant impact.***

Mitigation:

M4. Intersection #8, El Dorado Hills Boulevard @ Francisco Drive
The significant impact at this intersection during the AM and PM peak-hours can be mitigated with the addition of an eastbound channelized right-turn lane. Channelization of the eastbound right-turn lane will require the addition of a southbound receiving lane. As shown in Table 8, this mitigation measure results in the intersection operating at LOS D and LOS C during the AM and PM peak-hours, respectively. Therefore, ***this impact is less than significant***. The proposed project should contribute its proportionate share toward these improvements.

Table 8 – Intersection Levels of Service –
Existing plus Approved Projects (2015) plus Proposed Project Mitigated Conditions

#	Intersection	Analysis Scenario	Traffic Control	AM Peak Hour		PM Peak Hour	
				Delay[*] (sec)	LOS	Delay[*] (sec)	LOS
8	El Dorado Hills Blvd @ Francisco Dr	EPAP	AWSC	93.9	F	51.5	F
		EPAP+PP		96.1	F	52.3	F
		EPAP+PP (Mit)		28.0	D	16.7	C

[+] EPAP = Existing plus Approved Projects (2015), EPAP + PP = Existing plus Approved Projects (2015) plus Proposed Project , Mit = Mitigated, [*] Control delay for worst minor approach (worst minor movement) for TWSC.

Analysis worksheets for this scenario are provided in Appendix G.

OTHER CONSIDERATIONS

Peak-Hour Traffic Signal Warrant Evaluation

A planning level assessment of the need for traffic signalization was performed for the un-signalized study intersections. This evaluation was performed consistently with the peak-hour warrant methodologies noted in Section 4C of the *California Manual on Uniform Traffic Control Devices (CMUTCD)*, dated January 21, 2010. A summary of the peak-hour warrant results are presented in Table 9.

Table 9 – Traffic Signal Warrant Analysis Results

#	Intersection	Analysis Scenario			
		Existing (2010)	Existing (2010) plus PP	EPAP (2015)	EPAP (2015) plus PP
1	Malcolm Dixon Rd @ Western Site Dwy		No / No		No / No
2	Malcolm Dixon Rd @ Eastern Site Dwy		No / No		No / No
3	Green Valley Rd @ Site Access Rd		No / No		No / No
4	Salmon Falls Rd @ Malcolm Dixon Rd	No / No	No / No	No / No	No / No
8	El Dorado Hills Blvd @ Francisco Dr	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes

Results are presented in **AM / PM format.**
Note: Peak-hour warrant is satisfied if Condition A or B is met.

As shown in Table 9, intersection #8 (El Dorado Hills Blvd @ Francisco Dr) satisfies the peak-hour signal warrant with and without the addition of the proposed project. However, the proposed project does not cause the peak-hour signal warrant to be satisfied at any of the study intersections. Detailed results of this analysis are presented in Appendix H.

Sight Distance Evaluation

A sight distance evaluation was completed for the two Malcolm Dixon Road intersections with the site access driveways (Intersections #1 and #2), as well as the Green Valley Road intersection with the proposed site access roadway (Intersection #3). These evaluations were based on observed horizontal and vertical geometric conditions and were performed in accordance with the guidelines presented in the *Geometric Design of Highways and Streets, 2004,* published by the American Association of State Highway and Transportation Officials (AASHTO).

According to AASHTO, an assumed 40 mph design speed (35 mph posted speed limit) requires a minimum of 305 feet of Stopping Sight Distance (SSD). Adequate sight distance was observed in both directions for the Malcolm Dixon Road intersections with the site access driveways. Furthermore, an assumed 60 mph design speed (55 mph posted speed limit) requires a minimum of 570 feet of SSD. Adequate sight distance was observed in both directions for the Green Valley Road intersection with the site access roadway. In all cases, roadside vegetation should be maintained to preserve sight distance.

Intersection Queuing Evaluation

Vehicle queuing for three (3) intersections was evaluated. For the queuing analysis, the anticipated vehicle queues for critical movements at these intersections were evaluated. The calculated vehicle queues were compared to actual or anticipated vehicle storage/segment lengths. Results of the queuing evaluation are presented in Table 10. Analysis sheets that include the anticipated vehicle queues are presented in Appendices B, and D-G. As presented in Table 10, the addition of the proposed project adds additional queuing to several of the study locations.

Site Plan, Access, and On-site Circulation Evaluation

The site plan for the proposed project (Figure 2) was qualitatively reviewed for general access and on-site circulation. According to the site plan, access to the site will be provided via two (2) full access driveways along Malcolm Dixon Road. Level of service, delay, and queuing data was previously reported for these intersections. It is important to note that the proposed project is also assumed to include (either as part of the project or to have been previously constructed by others) the construction of a new access road connecting Malcolm Dixon Road and Green Valley Road through the eastern portions of the site. Although not critical to the project site access from Malcolm Dixon Road, this connection to Green Valley Road will enhance project area traffic access by minimizing the reliance on Malcolm Dixon Road to the east and west. In conclusion, the proposed project appears to have adequate access to/from both Malcolm Dixon Road and Green Valley Road.

According to AASHTO, the combination of the volume of eastbound left-turns onto the project site access roadway with the proportion of this movement to the approach volumes suggests the need to consider an exclusive eastbound left-turn lane along Green Valley Road[11]. Considering the high speed, rural nature of Green Valley Road through the project area, an exclusive eastbound left-turn lane should be considered as a means by which to enhance safety at the project site access roadway intersection. Said left-turn lane should be designed with appropriate storage and deceleration distances consistent with the County's applicable design standards.

[11] *A Policy on Geometric Design of Highways and Streets*, AASHTO, 2004. Exhibit 9-75, Page 685.

Table 10 – Intersection Queuing Evaluation Results for Select Locations

Intersection / Analysis Scenario	Movement	AM Peak-Hour		PM Peak-Hour	
		Available Storage (ft)	95th % Queue (ft)	Available Storage (ft)	95th % Queue (ft)
#3, Green Valley Rd @ Site Access Rd	**SBL**				
Existing (2010)		*	-	*	-
Existing plus Proposed Project (2010)			28		20
EPAP (2015)			-		-
EPAP plus Proposed Project (2015)			39		26
	EBL				
Existing (2010)		*	-	*	-
Existing plus Proposed Project (2010)			2		4
EPAP (2015)			-		-
EPAP plus Proposed Project (2015)			3		5
#5, Green Valley Rd @ Silva Valley Pkwy	**WBL**				
Existing (2010)		350	121	350	41
Existing plus Proposed Project (2010)			121		41
EPAP (2015)			132		45
EPAP plus Proposed Project (2015)			133		45
#6, Green Valley Rd @ El Dorado Hills Blvd	**EBL**				
Existing (2010)		85	86	85	228
Existing plus Proposed Project (2010)			89		234
EPAP (2015)			105		288
EPAP plus Proposed Project (2015)			108		295
	WBL				
Existing (2010)		105	186	105	86
Existing plus Proposed Project (2010)			206		102
EPAP (2015)			171		110
EPAP plus Proposed Project (2015)			194		127

Source: *Highway Capacity Manual (HCM) 2000* methodology per Synchro® v7.
* Intersection approach with available storage length equal to segment length

In addition, *Fire Safe Regulations*[12] state that on-site roadways shall "provide for safe access for emergency wildland fire equipment and civilian evacuation concurrently, and shall provide unobstructed traffic circulation during a wildfire emergency..." All project roadways shall be designed and constructed in accordance with these requirements.

Preliminary Traffic Safety Evaluation

According to the County's 2007 *Accident Location Study*[13], several study area sites (i.e., intersections and roadway segments) experienced three (3) or more accidents during a three-year period between January 1, 2005, and December 31, 2007. According to the Study, these sites were selected for investigation and determination of corrective action(s). Table 11 provides a summary of the study area sites and their selected actions.

[12] *Fire Safe Regulations*, Title 14 Natural Resources, Division 1.5 Department of Forestry, Chapter 7 – Fire Protection, Subchapter 2 SRA Safe Regulations, Article 2 Emergency Access, El Dorado County Building Department.
[13] *Annual Accident Location Study 2007*, County of El Dorado Department of Transportation, March 28, 2008.

Table 11 – Project Area Sites Selected for Investigation

Site #	Location Description	Accident Rate*	Identified Action
14	El Dorado Hills Blvd, North of US-50	1.28	Pending Improvements
15	El Dorado Hills Blvd, at Lassen Ln	0.46	None Required
16	El Dorado Hills Blvd, at Olson Ln	0.36	None Required
19	Green Valley Rd, from Amy's Ln to Miller Rd	1.33	Recent Improvements
20	Green Valley Rd, at Francisco Dr	0.44	None Required
21	Green Valley Rd, at El Dorado Hills Blvd	0.49	None Required
44	Salmon Falls Rd, vicinity of Lakehills Dr	1.06	Proposed CIP

Source: *Annual Accident Location Study 2007*, County of El Dorado Department of Transportation, March 28, 2008.
* # Accidents per Million Vehicles (MV) for single sites (intersections/curves), # Accidents per Million Vehicle Miles (MVM) for roadway sections.

According to the *Study*, four (4) sites "do not require further review at this time. However, these sites will continue to be monitored and any subsequent increase in the frequency of accidents may necessitate further review and analysis." One (1) site has a pending improvement and it is anticipated that, "upon completion, [this] improvement will substantially reduce the number of accidents." Site 44, Salmon Falls Road in the vicinity of Lakehills Drive, has been identified for inclusion in the County's Capital Improvement Program (CIP). "The scope of these improvements would require budget consideration and subsequent inclusion within the CIP...[this project] will compete for funding and consequently may, or may not, be funded."

Bicycle and Pedestrian Facilities Evaluation

According to Chapter 5 of the *El Dorado County Bicycle Transportation Plan*, Class II Bike Lanes are proposed for Green Valley Road, Francisco Drive, and El Dorado Hills Boulevard in the vicinity of the project site. In addition, Class III Bike Routes are proposed for Francisco Drive and Salmon Falls Road/Lakehills Drive north of Green Valley Road. A Class I Bike Path is also proposed for El Dorado Hills Boulevard, south of Francisco Drive.

While the project will not result in removal of a bikeway/bike lane or prohibition of implementation of the facilities identified in the *Plan*, it is required to include pedestrian/bicycle paths connecting to adjacent commercial, research and development, or industrial projects and any schools, parks, or other public facilities. The proposed project will be required to construct on-site roadway and pedestrian facilities in accordance with County design guidelines. These on-site pedestrian and bicycle facilities will connect the project with the proposed adjacent Class II Bike Lanes along Green Valley Road. Through this connection to the proposed bike lane network, the project will provide continuity with adjacent projects, schools, parks, and other public facilities.

CONCLUSIONS

Based upon the analysis documented in this report, the following conclusions are offered:

- The proposed project is expected to generate 650 total daily trips, including 52 AM peak-hour trips and 66 PM peak-hour trips.
- The proposed project is consistent with the zoning density and the 2004 General Plan land use designation for the site. Furthermore, the proposed project trip generation is not projected to exceed 2025 thresholds assumed in the County's 2004 *General Plan* trip generation. Therefore, cumulative (year 2025) analyses are not required.

- As defined by the County, the addition of the proposed project to the Existing (2010) and Existing plus Approved Projects (2015) scenarios significantly worsens conditions at three (3) study intersections. However, these impacts can be mitigated to be ***less than significant***.
- The combination of the volume of eastbound left-turns onto the project site access roadway with the proportion of this movement to the approach volumes suggests the need to consider an exclusive eastbound left-turn lane along Green Valley Road. Considering the high speed, rural nature of Green Valley Road through the project area, an exclusive eastbound left-turn lane should be considered as a means by which to enhance safety at the project site access roadway intersection. Said left-turn lane should be designed with appropriate storage and deceleration distances consistent with the County's applicable design standards.

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Dowling Associates, Inc.

Date: 4-Apr-11

Memorandum

See also May 3, 2012 Kimley-Horn Supplemental Traffic Analysis

To: Eileen Crawford

cc: Matt Weir, File

From: Abhishek Parikh

Reference #: P08-044.1-38

Subject: Review Comments for Wilson Estates TIS WO # 38

Dowling Associates has reviewed the Revised Traffic Report for Wilson Estates, dated March 3, 2011. We concur with the findings of the report.

Recommended Conditions of Approval

Conditions of Approval can be limited to statements similar to the following:

1) The project applicant shall pay the TIM fees as calculated by the County Engineer at the time of application approval.
2) Project may be required to pay the fair share cost of mitigating queue impacts.
3) Construct new on site local roads per County standards.

Should you have any questions, contact Abhi Parikh at (916) 266-2190 x 306

Attachment 17

Z 11-0007
PD 11-0004/TM11-1504

Kimley-Horn
and Associates, Inc.

May 3, 2012

Mr. David Crosariol
CTA Engineering & Surveying
3233 Monier Circle
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Suite 200
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95670

Re: Supplemental Traffic Impact Analysis for Wilson Estates (WO#38)

Dear Mr. Crosariol:

As a result of recent coordination, we have prepared a supplemental traffic analysis pertaining to your proposed Wilson Estates project. More specifically, the purpose of this supplemental analysis is to evaluate weekday AM and PM peak-hour, Existing (2010) and Existing plus Approved Projects (2015) operations resulting from the revised project site plan and reduced number of proposed units for the project.

It is our understanding that you have provided an alternative design to the original proposed project site plan considered in the Final Traffic Impact Analysis for this project[1]. The alternative site layout reduces the project size from the previous sixty (60) single-family detached housing units to forty-nine (49). In addition, the proposed site plan relocates the eastern site driveway with Malcolm Dixon Road to the New Connector Road. Furthermore, the western site driveway along Malcolm Dixon Road shifts east in an effort to reduce the attractiveness of Malcolm Dixon Road. Both proposed project access points are assumed to be full access driveways. Because the Final Traffic Impact Analysis for this project[1] considered a different site layout, the following discussion documents the limited effects due to the change in project site access and size on delay, LOS, and queuing at the immediately effected intersections. All other previously documented operational results are anticipated to be no worse than what has been previously documented[1].

Please note that our previous traffic study for the project[1] serves as the starting point for this analysis. The following intersections are included in this supplemental evaluation:

1. Malcolm Dixon Road at Western Site Access Driveway
2. New Connector Road at Eastern Site Access Driveway
3. Green Valley Road at New Connector Road

[1] *Final Traffic Impact Analysis, Wilson Estates (WO #38)*, Kimley-Horn and Associates, Inc., March 3, 2011.

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Attachment 18

This supplemental evaluation includes the following specific analysis scenarios:

1. Existing (2010) plus Proposed Project
2. Existing plus Approved Projects (2015) plus Proposed Project

Consistent with the County's requirements, delay, LOS, and queuing for each scenario were determined using methods defined in the *Highway Capacity Manual, 2000,* using appropriate traffic analysis software (Synchro). As required by El Dorado County Department of Transportation's *Traffic Impact Study Protocols and Procedures*, impacts at study intersections were determined based on the change of LOS when project trips were added to the Existing (2010) and Existing plus Approved Projects (2015) Conditions.

Project Trip Generation
The numbers of trips anticipated to be generated by the proposed project were derived using data included in *Trip Generation, 8th Edition,* published by the Institute of Transportation Engineers (ITE). The anticipated trip generation for this project is shown in Table 1.

Table 1 – Proposed Project Trip Generation

Land Use (ITE Code)	Size (# units)	Daily Trips	AM Peak-Hour					PM Peak-Hour				
			Total Trips	IN		OUT		Total Trips	IN		OUT	
				%	Trips	%	Trips		%	Trips	%	Trips
Single-Family Detached Housing (210)	49	540	44	25%	11	75%	33	55	63%	35	37%	20
Net New External Trips:		***540***	***44***		***11***		***33***	***55***		***35***		***20***

Source: *Trip Generation, 8th Edition*, ITE.

As shown in Table 1, the proposed project is estimated to generate 540 total new daily trips, with 44 new trips occurring during the AM peak-hour, and 55 new trips occurring during the PM peak-hour. When compared to the previously documented project[1], 110 fewer daily, 8 fewer AM peak-hour, and 11 fewer PM peak-hour trips are anticipated.

Existing (2010) plus Proposed Project Conditions
For this scenario, peak-hour traffic associated with the proposed project was added to the Existing (2010) traffic volumes and levels of service were determined at the applicable study facilities.

Attachment A provides the AM and PM traffic volumes for this analysis scenario. The analysis worksheets for this scenario are provided in Attachment B.

Table 2 provides a summary of the intersection operating conditions for this analysis scenario.

Table 2 – Intersection Levels of Service -
Existing (2010) and Existing (2010) plus Project Conditions

#	Intersection	Analysis Scenario[†]	Traffic Control	AM Peak-Hour		PM Peak-Hour	
				Delay (seconds)	LOS	Delay (seconds)	LOS
1	Malcolm Dixon Rd @ Western Site Access Dwy	Exist.	*Plus Project Analysis Scenarios Only*				
		Exist.+PP (Orig.)	TWSC[*]	8.7 (NB)	A	8.7 (NB)	A
		Exist.+PP		8.7 (NB)	A	8.7 (NB)	A
2	New Connector Rd @ Eastern Site Access Dwy	Exist.	*Intersection not studied in original TIA*				
		Exist.+PP (Orig.)					
		Exist.+PP	TWSC[*]	9.4 (WB)	A	9.8 (WB)	A
3	Green Valley Rd @ New Connector Rd	Exist.	*Plus Project Analysis Scenarios Only*				
		Exist.+PP (Orig.)	TWSC[*]	22.6 (SB)	C	18.8 (SB)	C
		Exist.+PP		22.6 (SB)	C	18.3 (SB)	C

[†] Exist. = Existing (2010), Exist. + PP (Orig.) = Existing (2010) plus Proposed Project as studied in 3/3/2011 Final TIA.
Exist. + PP = Existing (2010) plus Proposed Project
[*] Control delay for worst minor approach (worst minor movement) for TWSC.

As indicated in Table 2, the study intersections operate from LOS A to LOS C during the AM and PM peak-hours.

Existing plus Approved Projects (2015) plus Proposed Project Conditions
Peak-hour traffic associated with the proposed project was added to the Existing plus Approved Projects (2015) traffic volumes, and levels of service were determined at the applicable study facilities.

Attachment C provides the AM and PM traffic volumes for this analysis scenario. The analysis worksheets for this scenario are provided in Attachment D.

Table 3 provides a summary of the intersection operating conditions for this analysis scenario. As indicated in Table 3, the study intersections operate from LOS A to LOS D during the AM and PM peak-hours.

Impacts and Mitigations
As reflected in Table 2 and Table 3, the addition of the proposed project does not result in a significant impact as defined by the County at the three intersections considered in this evaluation. Therefore, no mitigation measures are required.

Table 3 – Intersection Levels of Service -
EPAP (2015) and EPAP (2015) plus Project Conditions

#	Intersection	Analysis Scenario[+]	Traffic Control	AM Peak-Hour		PM Peak-Hour	
				Delay (seconds)	LOS	Delay (seconds)	LOS
1	Malcolm Dixon Rd @ Western Site Access Dwy	EPAP	*Plus Project Analysis Scenarios Only*				
		EPAP+PP (Orig.)	TWSC[*]	8.7 (NB)	A	8.7 (NB)	A
		EPAP+PP		8.7 (NB)	A	8.7 (NB)	A
2	New Connector Road @ Eastern Site Access Dwy	EPAP EPAP+PP (Orig.)	*Intersection not studied in original TIA*				
		EPAP+PP	TWSC[*]	9.5 (WB)	A	9.9 (WB)	A
3	Green Valley Rd @ New Connector Rd	EPAP	*Plus Project Analysis Scenarios Only*				
		EPAP+PP (Orig.)	TWSC[*]	28.5 (SB)	D	22.4 (SB)	C
		EPAP+PP		28.0 (SB)	D	21.6 (SB)	C

[+] EPAP = Existing plus Approved Projects (2015), EPAP+PP (Orig) = EPAP (2015) plus Proposed Project as studied in 3/3/2011 Final TIA, EPAP+PP = EPAP (2015) plus Proposed Project; [*] Control delay for worst minor approach (worst minor movement) for TWSC.

Intersection Queuing Evaluation

Vehicle queuing for the study intersections was considered for the northbound left-turning movement at intersection #2, as well as the same movements as evaluated in the previous traffic study[1]. The calculated vehicle queues were compared to actual or anticipated vehicle storage/segment lengths. Results of the queuing evaluation are presented in Table 4.

Table 4 – Intersection Queuing Evaluation Results for Select Locations

Intersection / Analysis Scenario	Movement	AM Peak-Hour		PM Peak-Hour	
		Available Storage (ft)	95th % Queue (ft)	Available Storage (ft)	95th % Queue (ft)
#2, New Connector Rd @ Eastern Site Dwy	**NBL**				
Existing (2010)		200*	-	200*	-
Existing plus Proposed Project (2010)			1		2
EPAP (2015)			-		-
EPAP plus Proposed Project (2015)			1		2
#3, Green Valley Rd @ New Connector Rd	**SBL**				
Existing (2010)		200*	-	200*	-
Existing plus Proposed Project (2010)			29		19
EPAP (2015)			-		-
EPAP plus Proposed Project (2015)			39		25
	EBL				
Existing (2010)		100	-	100	-
Existing plus Proposed Project (2010)			2		4
EPAP (2015)			-		-
EPAP plus Proposed Project (2015)			3		5

Source: *Highway Capacity Manual (HCM) 2000* methodology per Synchro® v7.
* Intersection approach with available storage length equal to segment length

As presented in Table 4, the addition of the proposed project does not result in vehicle queues greater than the available storage pockets or available segment lengths. Furthermore, the southbound left turn queue is not projected to exceed the available segment length along the New Connector Road between the two closely spaced intersections (Green Valley Road and site access driveway). In addition, the northbound left turn queue from the New Connector Road into the project site is not shown to exceed the segment length and is not anticipated to spill back onto Green Valley Road.

Peak-Hour Traffic Signal Warrant Evaluation

A planning level assessment of the need for traffic signalization was performed for the study intersections. This evaluation was performed consistently with the peak-hour warrant methodologies noted in Section 4C of the *California Manual on Uniform Traffic Control Devices (CMUTCD), 2012 Edition*. A summary of the peak-hour warrant evaluation results are presented in Table 5.

Table 5 – Traffic Signal Warrant Analysis Results

#	Intersection	Analysis Scenario			
		Existing (2010)	Existing (2010) plus PP	EPAP (2015)	EPAP (2015) plus PP
1	Malcolm Dixon Rd @ Western Site Dwy		No / No		No / No
2	New Connector Road @ Eastern Site Dwy		No / No		No / No
3	Green Valley Rd @ New Connector Rd		No / No		No / No
Results are presented in AM / PM format. Note: Peak-hour warrant is satisfied if Condition A or B is met.					

The addition of the proposed project does not result in the peak-hour signal warrant being satisfied at the intersections studied in this analysis. Detailed results of this analysis are presented in Attachment E.

On-site Circulation and Access Evaluation

The site plan for the proposed project (Attachment F) was qualitatively reviewed for general access and on-site circulation. As previously mentioned, the proposed site plan relocates the eastern site driveway along Malcolm Dixon Road to the New Connector Road, and shifts the western driveway along Malcolm Dixon Road further to the east. It is understood that driveways to the proposed project site were repositioned in an effort to reduce the attractiveness of Malcolm Dixon Road. The Final Traffic Impact Analysis for this project[1] assumed 22 percent of the project traffic would utilize Malcolm Dixon Road to the west. Based on project area roadway volumes, general knowledge of project area traffic patterns, and engineering judgment, the reconfigured project site is anticipated to make Malcolm Dixon Road approximately half as attractive (11 percent) as the previous site configuration. Understanding that the most likely location for project impacts between the three intersections considered is at the intersection of Green Valley Road and the New Connector Road, an additional 1

percent of project traffic was assigned to use Green Valley Road. As a result, 10 percent of the project traffic was assigned to Malcolm Dixon Road, while the remaining 90 percent was assigned to Green Valley Road. Based on the documented results, all intersections are projected to operate at an acceptable level of service per the County's requirements.

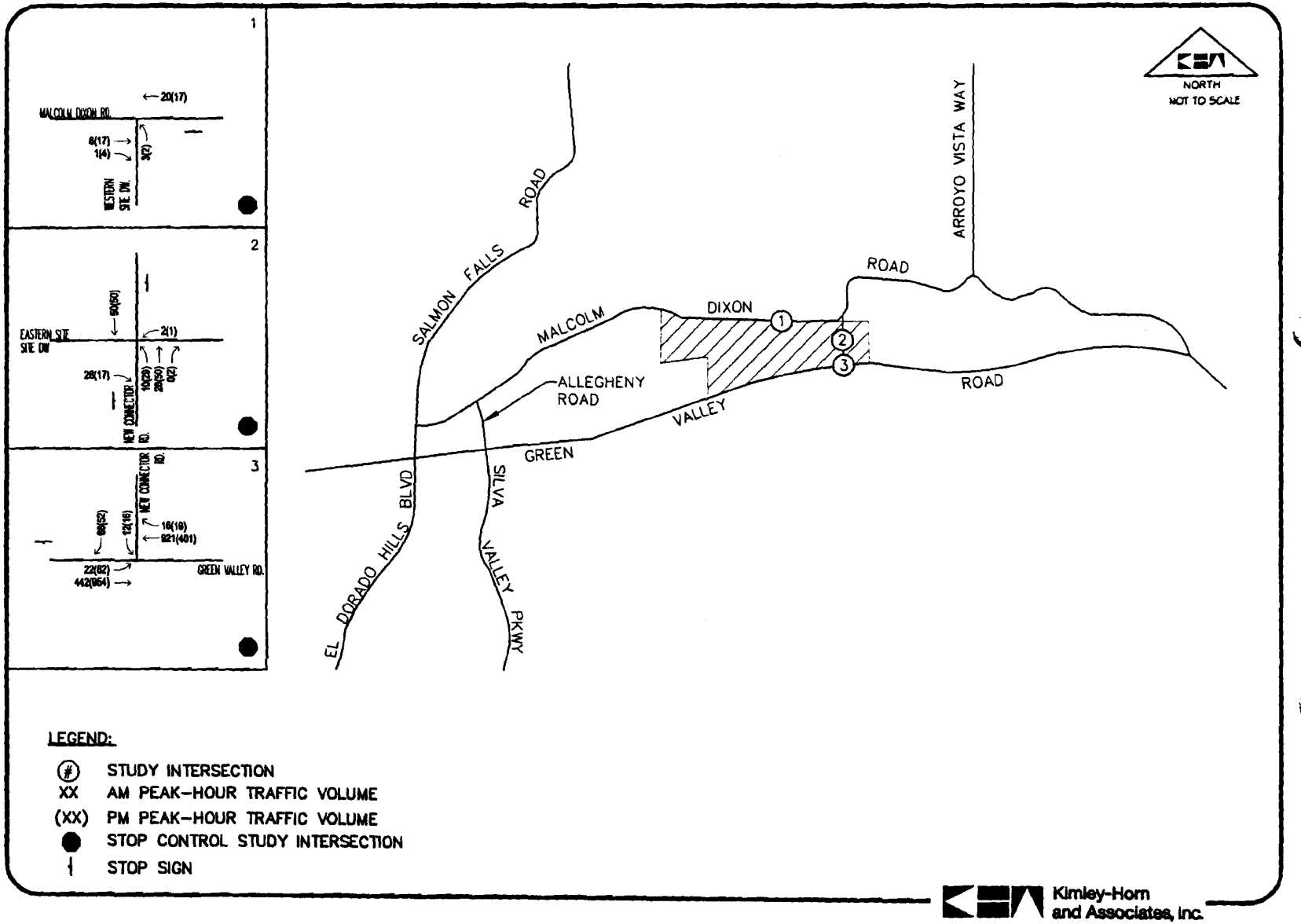
Please contact me at (916) 859-3617 or via e-mail at matt.weir@kimley-horn.com if you have any questions or require additional information.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.

Matthew D. Weir, P.E., T.E., PTOE
PE No. C70216 & TR2424

Attachments:
- A – Existing (2010) plus Proposed Project Peak-Hour Traffic Volumes
- B – Existing (2010) plus Proposed Project Analysis Worksheets
- C – Existing plus Approved Projects (2015) plus Proposed Project Peak-Hour Traffic Volumes
- D – Existing plus Approved Projects (2015) plus Proposed Project Analysis Worksheets
- E – Signal Warrant Analysis Worksheets
- F – Proposed Project Site Plan, dated March, 2012



ATTACHMENT C

EXISTING PLUS APPROVED PROJECTS (2015)
PLUS PROPOSED PROJECT PEAK-HOUR TRAFFIC VOLUMES

WILSON ESTATES
EL DORADO HILLS, CA

Attachment B:

Existing (2010) plus Proposed Project Analysis Worksheets

HCM Unsignalized Intersection Capacity Analysis
1: Malcolm Dixon Rd. & Western Dw.

Existing + Project
AM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	6	1	0	18	3	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1	0	20	3	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			8		27	7
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			8		27	7
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1613		989	1075

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	8	20	3
Volume Left	0	0	3
Volume Right	1	0	0
cSH	1700	1613	989
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (mn)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Eastern Dw. & New Connector Rd.

Existing + Project
AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	28	2	0	0	10	25	0	0	45	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	30	2	0	0	11	27	0	0	49	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	98	98	49	126	98	27	49			27		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98	98	49	126	98	27	49			27		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	100	100	100	99			100		
cM capacity (veh/h)	880	787	1020	815	787	1048	1558			1587		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	2	38	49
Volume Left	0	2	11	0
Volume Right	30	0	0	0
cSH	1020	815	1558	1587
Volume to Capacity	0.03	0.00	0.01	0.00
Queue Length 95th (ft)	2	0	1	0
Control Delay (s)	8.6	9.4	2.1	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	9.4	2.1	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (mn)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Green Valley Rd. & New Connector Rd.

Existing + Project
AM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	20	402	816	15	12	63
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	437	887	16	13	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	903				1376	895
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	903				1376	895
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				92	80
cM capacity (veh/h)	753				155	339

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	22	437	903	82
Volume Left	22	0	0	13
Volume Right	0	0	16	68
cSH	753	1700	1700	285
Volume to Capacity	0.03	0.26	0.53	0.29
Queue Length 95th (ft)	2	0	0	29
Control Delay (s)	9.9	0.0	0.0	22.6
Lane LOS	A			C
Approach Delay (s)	0.5		0.0	22.6
Approach LOS				C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Malcolm Dixon Rd. & Western Dw.

Existing + Project
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	15	4	0	15	2	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	4	0	16	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			21		35	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			21		35	18
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1595		978	1060

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	21	16	2
Volume Left	0	0	2
Volume Right	4	0	0
cSH	1700	1595	978
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Eastern Dw. & New Connector Rd.

Existing + Project
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	0	0	17	1	0	0	29	46	2	0	45	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	18	1	0	0	32	50	2	0	49	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	163	164	49	182	163	51	49			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	163	164	49	182	163	51	49			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	100	98			100		
cM capacity (veh/h)	789	714	1020	754	715	1017	1558			1554		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	1	84	49
Volume Left	0	1	32	0
Volume Right	18	0	2	0
cSH	1020	754	1558	1554
Volume to Capacity	0.02	0.00	0.02	0.00
Queue Length 95th (ft)	1	0	2	0
Control Delay (s)	8.6	9.8	2.9	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	9.8	2.9	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	20.8%	ICU Level of Service	A	
Analysis Period (min)	15			

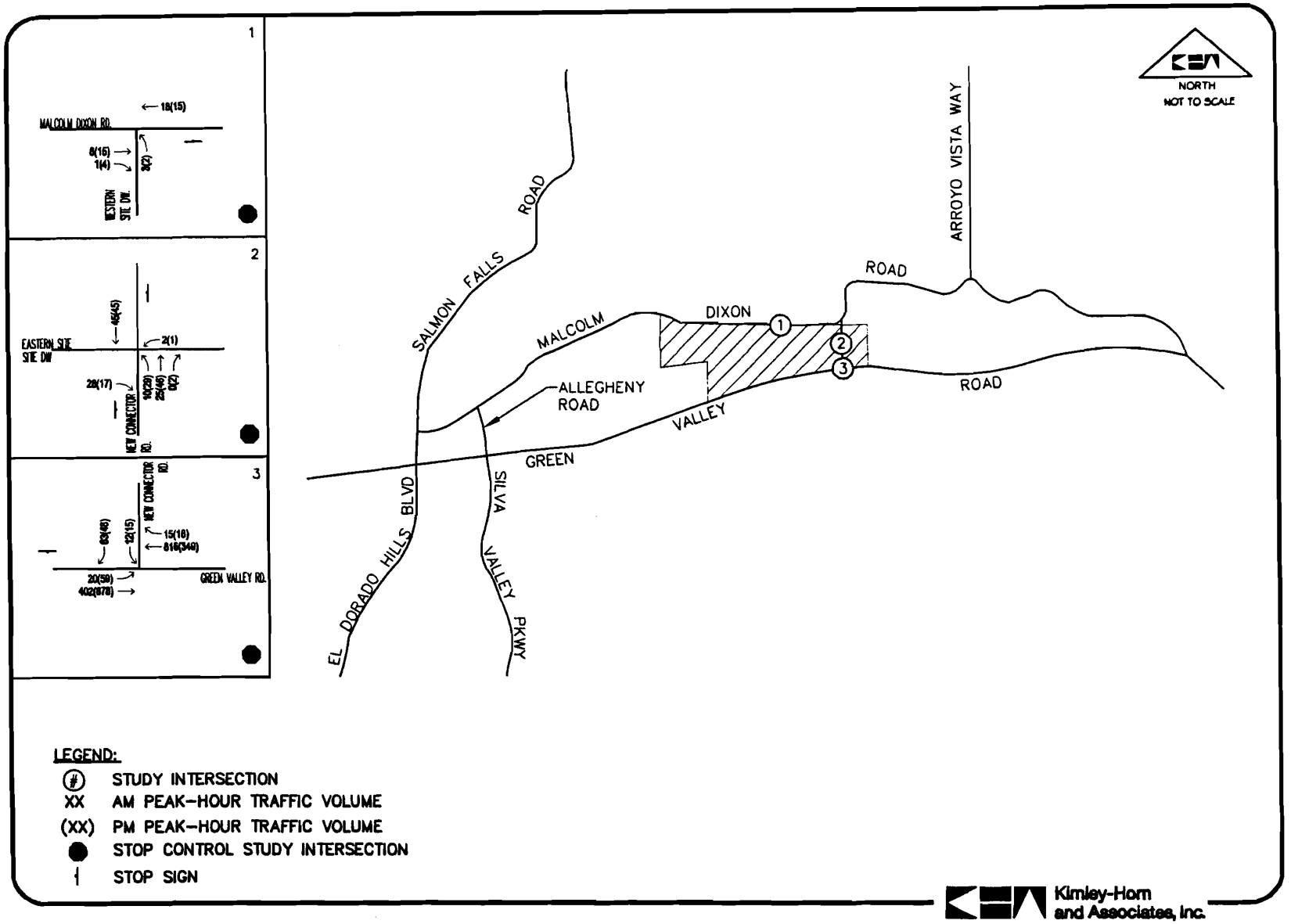
HCM Unsignalized Intersection Capacity Analysis
3: Green Valley Rd. & New Connector Rd.

Existing + Project
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Volume (veh/h)	59	878	349	16	15	46
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	954	379	20	16	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	399				1472	389
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	399				1472	389
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				88	92
cM capacity (veh/h)	1160				132	658

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	64	954	399	68
Volume Left	64	0	0	16
Volume Right	0	0	20	52
cSH	1160	1700	1700	338
Volume to Capacity	0.06	0.56	0.23	0.20
Queue Length 95th (ft)	4	0	0	19
Control Delay (s)	8.3	0.0	0.0	18.3
Lane LOS	A			C
Approach Delay (s)	0.5		0.0	18.3
Approach LOS				C

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	56.7%	ICU Level of Service	B	
Analysis Period (min)	15			



ATTACHMENT A

EXISTING (2010) PLUS PROPOSED PROJECT PEAK-HOUR TRAFFIC VOLUMES

WILSON ESTATES
EL DORADO HILLS, CA

Attachment D:

Existing plus Approved Projects (2015) plus Proposed Project Analysis Worksheets

HCM Unsignalized Intersection Capacity Analysis
1: Malcolm Dixon Rd. & Western Dw.

EPAP + Project
AM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	6	1	0	20	3	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1	0	22	3	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			8		29	7
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			8		29	7
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1613		986	1075

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	8	22	3
Volume Left	0	0	3
Volume Right	1	0	0
cSH	1700	1613	986
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
2: Eastern Dw. & New Connector Rd.

EPAP + Project
AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	28	2	0	0	10	28	0	0	50	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	30	2	0	0	11	30	0	0	54	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	107	107	54	137	107	30	54			30		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	107	107	54	137	107	30	54			30		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	100	100	100	99			100		
cM capacity (veh/h)	868	778	1013	805	778	1044	1551			1582		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	2	41	54
Volume Left	0	2	11	0
Volume Right	30	0	0	0
cSH	1013	805	1551	1582
Volume to Capacity	0.03	0.00	0.01	0.00
Queue Length 95th (ft)	2	0	1	0
Control Delay (s)	8.7	9.5	2.0	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.7	9.5	2.0	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		18.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
3: Green Valley Rd. & New Connector Rd.

EPAP + Project
AM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	22	442	921	16	12	68
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	480	1001	17	13	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1018				1538	1010
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1018				1538	1010
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				89	75
cM capacity (veh/h)	681				123	291

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	24	480	1018	87
Volume Left	24	0	0	13
Volume Right	0	0	17	74
cSH	681	1700	1700	242
Volume to Capacity	0.04	0.28	0.60	0.36
Queue Length 95th (ft)	3	0	0	39
Control Delay (s)	10.5	0.0	0.0	28.0
Lane LOS	B			D
Approach Delay (s)	0.5		0.0	28.0
Approach LOS				D

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Malcolm Dixon Rd. & Western Dw.

EPAP + Project
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	17	4	0	17	2	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	4	0	18	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			23		39	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			23		39	21
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1592		973	1057

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	23	18	2
Volume Left	0	0	2
Volume Right	4	0	0
cSH	1700	1592	973
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Eastern Dw. & New Connector Rd.

EPAP + Project
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	0	0	17	1	0	0	29	50	2	0	50	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	18	1	0	0	32	54	2	0	54	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	173	174	54	191	173	55	54			57		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	173	174	54	191	173	55	54			57		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	100	98			100		
cM capacity (veh/h)	778	705	1013	743	706	1011	1551			1548		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	1	88	54
Volume Left	0	1	32	0
Volume Right	18	0	2	0
cSH	1013	743	1551	1548
Volume to Capacity	0.02	0.00	0.02	0.00
Queue Length 95th (ft)	1	0	2	0
Control Delay (s)	8.6	9.9	2.7	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.6	9.9	2.7	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay		2.5		
Intersection Capacity Utilization		21.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
3: Green Valley Rd. & New Connector Rd.

EPAP + Project
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑		↰	
Volume (veh/h)	62	954	401	19	16	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	1037	436	21	17	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	457				1618	446
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	457				1618	446
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				84	91
cM capacity (veh/h)	1104				107	612

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	67	1037	457	74
Volume Left	67	0	0	17
Volume Right	0	0	21	57
cSH	1104	1700	1700	290
Volume to Capacity	0.06	0.61	0.27	0.26
Queue Length 95th (ft)	5	0	0	25
Control Delay (s)	8.5	0.0	0.0	21.6
Lane LOS	A			C
Approach Delay (s)	0.5		0.0	21.6
Approach LOS				C

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		61.0%	ICU Level of Service	B
Analysis Period (min)		15		

Attachment E

Signal Warrant Analysis Worksheets

Scenario Report
Scenario: Existing + PM AM

Command: Default Command
Volume: Existing + PM AM
Geometry: Default Geometry
Impact Fee: Default Impact Fee
Trip Generation: Default Trip Generation
Trip Distribution: Default Trip Distribution
Paths: Default Path
Routes: Default Route
Configuration: Default Configuration

Existing + PF AM Tue May 1, 2012 11:03:17 Page 1-1

Peak Hour Delay Signal Warrant Report

Intersection #1 Malcolm Dixon Rd & Western Site Dr

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Lanes:	1 0 1 0 1	0 0 2 0 0	1 0 1 0 1	0 0 2 0 0
Initial Vol:	1 0 3	4 2 0	2 1 1	0 1 0
Approach-hr:	4.0	XXXXXX	XXXXXX	XXXXXX

Approach northbound lanes=1|control=Stop Sign
Signal Warrant Rule #1: [vehicle-hours>4.0]
  FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=4]
  FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach volume=4][total volume=6]
  FAIL - Total volume less than 650 for intersection
         with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of a one and two lane intersection warrant or a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Signal Warrant Report

Intersection #1 Malcolm Dixon Rd & Western Site Dr

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Lanes:	1 0 1 0 1	0 0 2 0 0	1 0 1 0 1	0 0 2 0 0
Initial Vol:	1 0 3	4 2 0	2 1 1	0 1 0
Approach-hr:	4.0	XXXXXX	XXXXXX	XXXXXX

Major Street Volume: 4
Minor Approach Volume: 4
Minor Approach Volume threshold is 1

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of a one and two lane intersection warrant or a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Existing + PM AM [illegible] Peak Hour vs Full Volume? [illegible]

Peak Hour Delay Signal Warrant Report

Intersection #2 New Connector & Eastern Pw

Base Volume Alternative: Peak Hour Warrant Not Met

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Lanes:	0 1 0 0	0 1 0 0	0 1 0 1	1 0 1 0
Initial Vol:	10 65 0	0 42 0	0 [illegible]	[illegible]
ApproachLoS:	A	A	XXXXXX	XXXXXX

Approach northbound||lanes=1||control=Stop Sign|
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=45]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=150
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach|southbound||lanes=1||control=Stop Sign|
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=45]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=150
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant rules such as the 4-hour or 8-hour warrants.

The peak hour warrant analysis in this report is not intended to replace a timeless and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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Existing + PM AM [illegible] Peak Hour vs Full Volume? [illegible]

Peak Hour Delay Signal Warrant Report

Intersection #2 New Connector & Eastern Pw

Base Volume Alternative: Peak Hour Warrant Not Met

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Lanes:	0 1 0 0	0 1 0 0	0 1 0 1	1 0 1 0
Initial Vol:	10 65 0	0 42 0	0 [illegible]	[illegible]
ApproachLoS:	A	A	XXXXXX	XXXXXX

Approach northbound||lanes=1||control=Stop Sign|
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=45]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=150
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach|southbound||lanes=1||control=Stop Sign|
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=45]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=150
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant rules such as the 4-hour or 8-hour warrants.

The peak hour warrant analysis in this report is not intended to replace a timeless and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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Existing + PP AM Thu May 17, 2018 11:49:17 Page 1-1

Peak Hour Vehicle Signal Warrant Report

Intersection #3 Green Valley Rd & Site Access 1W

Base Volume Alternative: Peak Hour Warrant (AM) Set

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	T	R	R	L	T	R	R	L	T	R	R	L	T	R	R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Lanes:	0	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1
Initial Vol:	0	0	0	12	0	0	0	0	40	0	0	0	0	0	0	15
ApproachDel:	XXXXXX				XXXXXX				XXXXXX				XXXXXX			

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours>4.0]
  FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume>75]
  FAIL - Approach volume less than 150 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1,650]
  SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood that one or more intersection warrants for a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Existing + PP PM

Scenario Report

Scenario:	Existing + PP PM
Command:	Default Command
Volume:	Existing + PP PM
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Traffix [illegible] Dowling Assoc. Licensed to FINLEY HORN, [illegible]ANGE, CA

Existing + PP PM

[illegible]

Intersection

[illegible]

Traffix [illegible]

Existing + PM PH Tue May 1, 201. 1:1:1. Page 1.

Peak Hour Delay Signal Warrant Report

Intersection #1 Meridian Dixon Rd & Western Blvd Pm

Base Volume Alternative: Peak Hour Warrant Not Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	1	0	1	0	1	0	0	2	0	1	0	1
Initial Vol:	2	9	2	6	0	1	0	15	4	1	11	0
Approaches:	8.7			xxxxxx			xxxxxx			xxxxxx		

Approach[northbound]lanes=1[control-Stop Sign]
Signal Warrant Rule #1: [Vehicle-hours=8.7]
  FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=?]
  FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach volume=?][total volume=?]
  FAIL - Total volume less than 650 for intersection
         with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of any one type intersection warrant of a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Existing + PP PM Tue May 1, 2012 Interim Page 1-1

Peak Hour Delay Signal Warrant Report

Intersection #7 New Connector & Eastern Dr

Base Volume Alternative: Peak Hour Warrant Not Met

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Lanes:	0 0 1! 0 0	0 0 1! 0 0	0 0 1 0 0	0 0 1! 0 0
Initial Vol:	29 49 0	0 45 0	0 0 17	0 0 0
Approach Del:	9.4	9.7	xxxxxx	xxxxxx

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
  FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=77]
  FAIL - Approach volume less than 150 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=210]
  FAIL - Total volume less than 650 for intersection
         with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
  FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=45]
  FAIL - Approach volume less than 150 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=210]
  FAIL - Total volume less than 650 for intersection
         with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered only as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a thorough and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Existing + PF EA Tue May 7, 2013 12:04:14 Page 1-1

Peak Hour Delay Signal Warrant Report

Intersection #7 Green Valley Rd & Site Access 1e

Base Volume Alternative: Peak Hour Warrant 9-5 Ref

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Lanes:	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0
Initial Vol:	0	0	0	0	15	0	45	0	650	475	0	0	0	100	0	0
ApproachDel:	XXXXXX				21.0				XXXXXX				XXXXXX			

Approach[south-bound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hour=40.3]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=42]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count-adjusted volume=15]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of a one-lane, two-lane intersection warrant as a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one of more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Scenario Report

Scenario:	EPAF + 2P AM
Command:	Default Command
Volume:	EPAF + 2P AM
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Scenario Report

Scenario:	EPAF + 2P AM
Command:	Default Command
Volume:	EPAF + 2P AM
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

EPA2 v 0* AM [illegible]

Peak Hour Delay Signal Warrant Report

Intersection #1 Malcolm Dixon Rd & Western Gate Dr.

Base Volume Alternative: Peak Hour Warrant Not Met

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Lanes:	1 0 0 0 1	1 0 0 0 1	0 1 0 0 1	0 1 0 0 1
Initial Vol:	9 0 9	0 0 0	0 0 0	0 0 0
ApproachDel:	8.7	xxxxxx	xxxxxx	xxxxxx

Approach[NorthBound] [Lanes=1] [Control=Stop Sign]
Signal Warrant Rule #1: [Vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=9]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach counts=1] [total volume=9]
FAIL - Total volume less than 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood that one and two lane intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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EPAP + PP AM Tue May 1, 2012 (Study) Page 2-1

Peak Hour Delay Signal Warrant Report

****

Intersection #2 New Connector & Eastern Dr

****

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0	1	0	0	1	0	0	0	1	0	0	0
Initial Vol:	10	26	0	0	50	6	0	0	25	2	0	2
Approach%:		0.1			0.4			xxxxxx			xxxxxx	

Approach[northbound]{lanes=1,|control=Stop Sign}
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=36]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4]|total volume=114
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach[southbound]{lanes=1|control=Stop Sign}
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=56]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4]|total volume=114
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

EPAP + PP AM Tue May 1, 2012 (Study) Page 2-2

Peak Hour Delay Signal Warrant Report (Cont)

****

Intersection #2 New Connector & Eastern Dr

****

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0	1	0	0	1	0	0	0	1	0	0	0
Initial Vol:	10	26	0	0	50	6	0	0	25	2	0	2
Approach%:		0.1			0.4			xxxxxx			xxxxxx	

Approach[northbound]{lanes=1,|control=Stop Sign}
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=36]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4]|total volume=114
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach[southbound]{lanes=1|control=Stop Sign}
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=56]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4]|total volume=114
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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5PM - 7:30 PM Tue May 1, 2012 Page 1-5

Peak Hour Delay Signal Warrant Report

Intersection #3 Green Valley Rd & Site Access Dr

Future Volume Alternative: Peak Hour Warrant Not Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	T	R	R	L	T	R	R	L	T	R	R	L	T	R	R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Lanes:	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0
Initial Vol:	0	0	0	0	12	0	16	0	22	441	0	0	0	421	0	0
Approachbl:	XXXXXX								XXXXXX				XXXXXX			

Approach Southbound[Lanes=1][Control=Stop Sign]
Signal Warrant Rule #1: [Vehicle-Hours=4.5]
  FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [Approach Volume=80]
  Fail - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [Approach or Intersection Total Volume=649]
  SUCCESS - Total volume greater than or equal to 649 for intersection
            with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered only as an "indicator" of the likelihood that one and two hour delay on warrant my a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Scenario Report

Scenario:	BEAR + 25 PM
Comment:	Default Comment
Volume:	BEAR + 25 PM
Severity:	Default Severity
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Intersection	Volume Method	Volume Delay Method
1 Mission Trail & Old Highway 395	Default	Default
2 New Goldcliff Ln & Eastern	Default	Default
3 Hemet Valley Dr & Tyler St [illegible]	Default	Default

EPAP + 45 EB

Tue May 21 2013 Scenario

Page 1

Peak Hour Level Signal Warrant Report

Intersection #1 Malcolm Dixon Rd & Western Site In

Page Volume Alternative: Peak Hour Warrant Not Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Stop Sign					Stop Sign					Uncontrolled					Uncontrolled				
Lanes:	1	0	1	0	1	1	0	1	0	1	0	1	1	0	0	0	1	1	0	0
Initial Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Approachbl:		0.7					xxxxxx					0	12		4		0	1		0
Approach Warrantmul:							xxxxxx										xxxxxx			

Signal Warrant Rule #1: (Vehicle-Hours>4.0)
FAIL - Vehicle-Hours less than 4 for one lane approach.
Signal Warrant Rule #2: (Approach Volume>100)
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: (Approach Conditional Volume>40)
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of a long term need for intersection warrant a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant issues as the amount of each warranted.

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

TRAP - PM PM Tue May , 2012 12:26:10 Page 1-1

Peak Hour Delay Signal Warrant Report

Intersection #2 New Connector W Eastern Dw

Base Volume Alternative: Peak Hour Warrant Not Met

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Lanes:	0 0 1! 0 0	0 0 1! 0 0	0 0 0 0 1! 0	1 0 0 0 0 0
Initial Vol:	29 50 0	0 50 0	0 0 17	1 0 0
ApproachDel:	9.5	9.2	XXXXXX	XXXXXX

Approach(northbound)[lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=81]
FAIL - Approach volume less that 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=145
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach(southbound)[lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=50]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=145
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered only as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a judicious and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

EPAD + 99 PM Tue May 1, 2012 Scenario Page 1

Peak Hour Factor Signal Warrant Report

Intersection #: Green Valley Rd & Site Access 1a

Note: Volume Adjustment Peak Hour Warrant Not Met

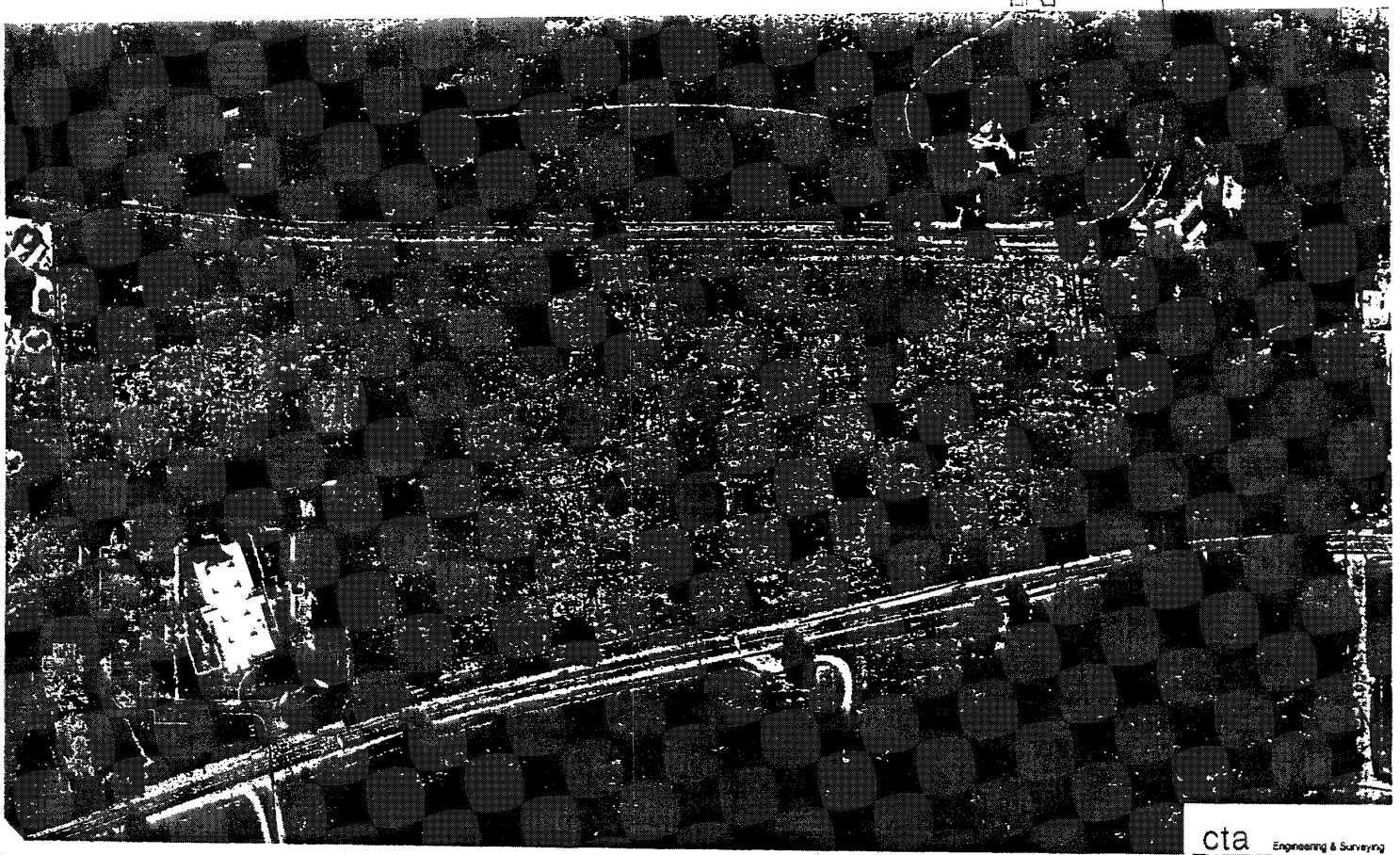
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0	0	0	0	1	0	1	1	0	0	1	1
Initial Vol:	0	0	0	26	6	21	60	584	1	0	42	14
ApproachPct:	xxxxxx			25%			xxxxxx			xxxxxx		

Approach=(u)nsig(n)alized(s)top(c)ontrol/Stop Sign.
Signal Warrant Rule #1: (vehicle-hours>4);
FAIL = Vehicle-hours less than 4 for the lane approach.
Signal Warrant Rule #2: (approach volume>=50);
FAIL = Approach volume less than 100 for the lane approach.
Signal Warrant Rule #3: (approach count=(1)or(2) volume>=594)
SUCCESS = Total volume greater than or equal to 594 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered only as an "indicator" of the likelihood that one or more signal warrants may be met in a traffic signal in the future. Whether or not signal warrants are probably more likely to be met due to future volume driven signal warrant such as the 4-hour or peak hour warrants.

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

WILSON ESTATES
REVISED TENTATIVE MAP EXHIBIT ALT A
EL DORADO HILLS, CALIFORNIA
SCALE 1"=60' MARCH 2012



cta Engineering & Surveying
Civil Engineering · Land Surveying · Land Planning

ATTACHMENT F

Kimley»Horn

Memorandum

To: Dave Crosariol
CTA Engineering & Surveying

From: Matt Weir, P.E., T.E., PTOE

Re: **Traffic Impact Analysis Addendum #2**
Wilson Estates – El Dorado Hills, California

Date: May 15, 2014

As requested, I am writing to provide qualitative traffic information pertaining to a revised project in which 28 single-family detached housing units are proposed. It is our understanding that you have provided an alternative design to the previous project site plans considered in both the *Final Traffic Impact Analysis*[1] (60 single-family units) and the *Supplemental Traffic Impact Analysis*[2] (49 single-family units) for this project. This memorandum includes information pertaining to the currently proposed project's proposed access and network connectivity, trip generation/assignment characteristics, and other considerations including CIP projects and concurrent County activities along the Green Valley Road corridor. The following is a discussion of each of these items.

I. Site Access & Network Connectivity

According to the attached project site plan, we understand that the following are the primary attributes of the currently proposed project:

- 28 single-family detached dwelling units;
- Two points of access along Malcolm Dixon Road, one of which is for emergency vehicle access (EVA) only, with gated operation at the main access driveway; and
- The "Wilson Connector" roadway between Malcolm Dixon Road and Green Valley Road (depicted as "Lot A") is not planned to be constructed with the proposed project. Rather, it is understood that development of any of the projects located north of Malcolm Dixon Road (Alto, La Canada, Chartraw, Diamante Estates, or Farren) would trigger the need to build this connector road as part of their conditions of approval.

As a result of the elimination of the "Wilson Connector" roadway, all project access is now proposed to be achieved via Malcolm Dixon Road in the near-term. It is important to note that this limited access condition would be altered with the development of any of the projects contemplated for the area north of Malcolm Dixon Road with the aforementioned requirement for the construction of the Wilson Connector roadway at that time.

II. Trip Generation & Assignment

The currently proposed project (28-units) is anticipated to generate approximately half the number of trips of the original project (60-units). As shown in **Table 1**, the current project is anticipated to generate 324 daily trips, with 29 trips occurring during the AM peak-hour and 33 trips occurring during the PM peak-hour.

[1] *Traffic Impact Analysis, Wilson Estates (WO#38)*, Kimley-Horn and Associates, Inc., March 3, 2011.
[2] *Supplemental Traffic Impact Analysis for Wilson Estates (WO#38)*, Kimley-Horn and Associates, Inc., May 3, 2012.

Attachment 19

Table 1 – Trip Generation Comparison

Land Use (ITE Land Use Code)	Size	Total Daily Trips	AM Peak-Hour					PM Peak-Hour				
			Total Trips	IN		OUT		Total Trips	IN		OUT	
				%	Trips	%	Trips		%	Trips	%	Trips
Single-Family Detached Housing (210)	60-units	650	52	25%	13	75%	39	66	63%	42	37%	24
Single-Family Detached Housing (210)	49-units	540	44	25%	11	75%	33	55	63%	35	37%	20
Single-Family Detached Housing (210)	28-units	324	29	25%	7	75%	22	33	63%	21	37%	12

Source: *Trip Generation Manual, 9th Edition*, ITE.

Using the same global project trip assignment scheme incorporated in the previous analyses[1,2], although the project is anticipated to generate approximately half the trips as the 60-unit project, without the Wilson Connector in the near-term, an additional 12 AM peak-hour (23 total) and 13 PM peak-hour (27 total) trips are anticipated to use Malcolm Dixon Road to/from the west of the project site. As previously discussed, the distribution of project trips will be affected by the construction of the connector roadway when other development in the area occurs.

III. Other Considerations

County CIP Projects

Two of the three significant impacts originally documented for the proposed project (60-lots) are understood to be included in current County Capital Improvement Program (CIP) projects. The following is a brief summary of these projects, both of which were indicated as necessary project mitigations in the original traffic study:

- Green Valley Road Traffic Signal Interconnect (CIP Project #73151)
  This County project is scheduled to be completed in 2014/15. This project is anticipated to address the signal timing modification needs at the Green Valley Road intersection with El Dorado Hills Boulevard/Salmon Falls Road (study intersection #6).

- Francisco Drive Right Turn Pocket (CIP Project #71358)
  This County project is scheduled to be completed in 2013/14-2014/15. This project will provide an eastbound right-turn lane and southbound receiving lane at the El Dorado Hills Boulevard intersection with Francisco Drive.

City of Folsom Green Valley Road Project

The City of Folsom was awarded a grant from the Sacramento Area Council of Governments (SACOG) to widen Green Valley Road from two lanes to four lanes between East Natoma Street and Sophia Parkway in El Dorado County. This capacity improvement project will complete the widening of Green Valley Road along the south side of Folsom Lake, providing a continuous, high quality transportation connection between Roseville/Granite Bay and El Dorado Hills. According to the City[3], the project is scheduled to perform preliminary engineering and environmental documentation over the next year. Final design and right-of-way activities will follow in 2015/16, with construction anticipated in 2016/17.

[3] Email from Mark Rackovan, City of Folsom, May 5, 2014.

Project's Traffic Contribution to US-50

The reduction in the number of lots for the proposed project results in a decrease in the number of trips added to the US-50 ramps and mainline at the El Dorado Hills Boulevard/Latrobe Road interchange. The reduction in trips equates to an approximately 45 percent decrease in trips along the US-50 westbound on-ramp (7 AM and 4 PM trips total), and an approximately 35 percent decrease in trips along the US-50 eastbound off-ramp (3 AM and 7 PM trips total).

Attachment: Project Site Plan

TENTATIVE MAP

WILSON ESTATES

COUNTY OF EL DORADO APRIL, 2014 STATE OF CALIFORNIA

OWNERS OF RECORD

APPLICANT

ENGINEER

cta Engineering & Surveying

MAP SCALE

CONTOUR INTERVAL

SOURCE OF TOPOGRAPHY

SECTION, TOWNSHIP and RANGE

ASSESSOR'S PARCEL NUMBERS

GENERAL PLAN

PRESENT ZONING

PROPOSED ZONING

TOTAL AREA

TOTAL NUMBER OF PARCELS

MINIMUM LOT AREA

WATER SUPPLY and SEWAGE DISPOSAL

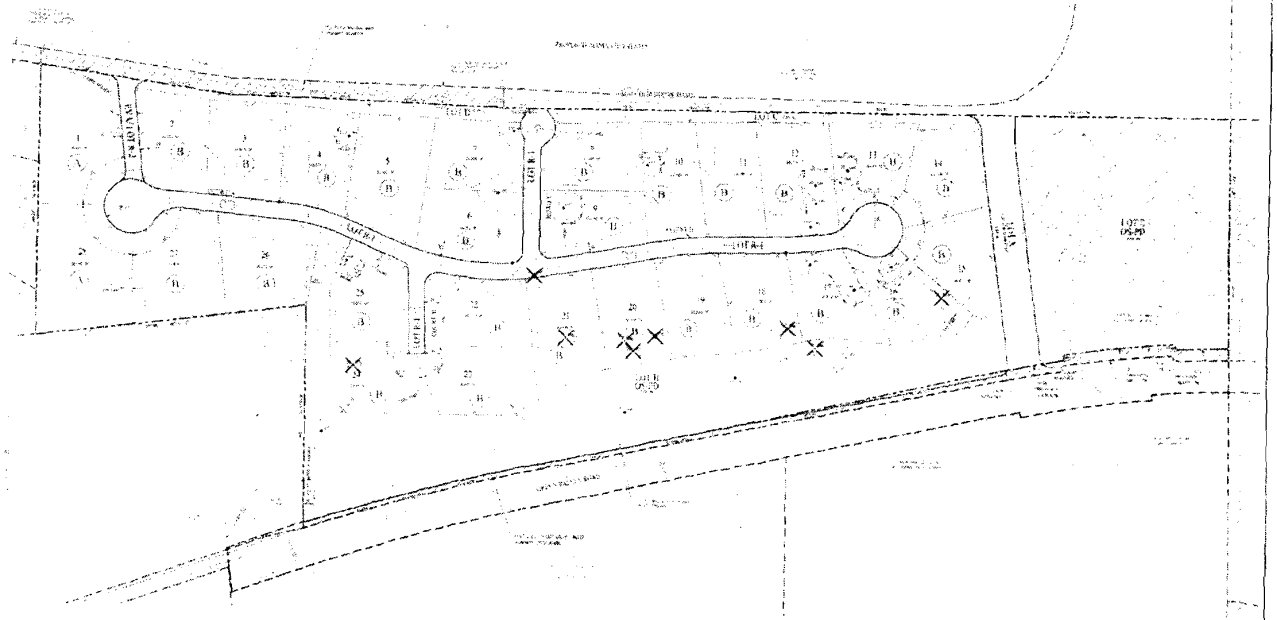
PROPOSED STRUCTURAL FIRE PROTECTION

DATE OF PREPARATION

PHASING PLAN NOTICE

ENGINEER'S CERTIFICATE

4-14-14



TYPICAL ROAD SECTION - INCLUDING EVA

TYPICAL BUILDING SETBACKS
ONE-FAMILY RESIDENTIAL
UNLESS OTHERWISE NOTED ON TENTATIVE MAP

In Reply Refer To: FIL0912-015

September 14, 2012

VIA FIRST-CLASS MAIL

Ann Ryan Wilson Revocable Trust
c/o John Vogelsang
4101 Greenview Drive
El Dorado Hills, CA 95762

SUBJECT: Facility Improvement Letter (FIL), Wilson Estates
Assessor's Parcel No. 126-070-22, 23 & 30 (El Dorado Hills)
EDC Project No: TM11-1504

Dear Mr. Vogelsang:

This letter is in response to your request dated August 2, 2012. This letter is valid for a period of three years. If a Facility Plan Report (FPR) for your project has not been submitted to the District within three years of the date of this letter, a new Facility Improvement Letter will be required.

Design drawings for your project must be in conformance with the District's *Water, Sewer and Recycled Water Design and Construction Standards*.

This project is an 49-lot residential subdivision on 28.18 acres. Water service, sewer service, and fire hydrants are requested. The property is within the District boundary. This letter is not a commitment to serve, but does address the location and approximate capacity of existing facilities that may be available to serve your project.

Assessment District No. 3

Assessment District No. 3 (AD3) was established to provide water and sewer facilities to serve the El Dorado Hills area. Parcels 126-070-22 and 126-070-23 are in AD3 and currently have an allotment of 2 equivalent dwelling units (EDUs) of water and sewer service.

Attachment 20

Water Supply

In terms of water supply, as of January 1, 2012, there were approximately 4,752 equivalent dwelling units (EDUs) available in the El Dorado Hills Water Supply Region. Your project as proposed on this date would require a total of 50 EDUs of water supply.

Water Facilities

The El Dorado Hills Fire Department has determined that the minimum fire flow for this project is 1,000 GPM for a 2-hour duration while maintaining a 20-psi residual pressure. According to the District's hydraulic model, the existing system can deliver the required fire flow. In order to receive service, you must construct a water line extension connecting to the existing 12-inch water line in Green Valley Road (see enclosed system map). The hydraulic grade line for the existing water distribution facilities is 960 feet above mean sea level at static conditions and 926 feet above mean sea level during fire flow and maximum day demands.

The flow predicted above was developed using a computer model and is not an actual field flow test.

Sewer Facilities

A 6-inch gravity sewer line located at the intersection of Green Valley Road and Allegheny Road. This sewer line has adequate capacity at this time. In order to receive service from this line, an extension of facilities of adequate size must be constructed. Your project as proposed on this date would require 49 EDUs of sewer service.

Facility Plan Report

An FPR will be required for this project. The FPR shall address the expansion of the water and sewer facilities, and the specific fire flow requirements for all phases of the project. A meeting to discuss the content of the report is optional. Please contact this office to arrange the meeting. A preliminary utility plan prepared by your engineer must be brought to the meeting.

Two copies of the FPR will be required along with a $2,000.00 deposit. You will be billed for actual time spent in review and processing of your FPR. Please submit the FPR and fee to our Customer and Development Services Department. Enclosed is the FPR description and transmittal form for your use. The items listed under content in the description and the completed transmittal form must be bound in each copy of the FPR.

Easement Requirements

Proposed water lines, sewer lines and related facilities must be located within an easement accessible by conventional maintenance vehicles. When the water lines or sewer lines are within streets, they shall be located within the paved section of the roadway. No structures will be permitted within the easements of any existing or proposed facilities. The District must have unobstructed access to these easements at all times, and does not generally allow water or sewer facilities along lot lines.

Easements for any new District facilities constructed by this project must be granted to the District prior to District approval of water and/or sewer improvement plans, whether onsite or offsite. In addition, due to either nonexistent or prescriptive easements for some older facilities, any existing onsite District facilities that will remain in place after the development of this property must also have an easement granted to the District.

Environmental

The County is the lead agency for environmental review of this project per Section 15051 of the California Environmental Quality Act Guidelines (CEQA). The County's environmental document should include a review of both offsite and onsite water and sewer facilities that may be constructed by this project. You may be requested to submit a copy of the County's environmental document to the District if your project involves significant off-site facilities. If the County's environmental document does not address all water and sewer facilities and they are not exempt from environmental review, a supplemental environmental document will be required. This document would be prepared by a consultant. It could require several months to prepare and you would be responsible for its cost.

Summary

Service to this proposed development is contingent upon the following:

- The availability of uncommitted water supplies at the time service is requested.
- Approval of the County's environmental document by the District (if requested)
- Approval of an extension of facilities application by the District
- Approval of a Facility Plan Report by the District
- Executed grant documents for all required easements
- Approval of facility improvement plans by the District
- Construction by the developer of all onsite and offsite proposed water and sewer facilities
- Acceptance of these facilities by the District
- Payment of all District connection costs

Services shall be provided in accordance with El Dorado Irrigation District Board Policies and Administrative Regulations, as amended from time-to-time. As they relate to conditions of and fees for extension of service, District Administrative Regulations will apply as of the date of a fully executed Extension of Facilities Agreement.

If you have any questions, please contact Marc Mackay at (530) 642-4135.

Sincerely,

EL DORADO IRRIGATION DISTRICT

Elizabeth D. Wells, P.E.
Engineering Division Manager

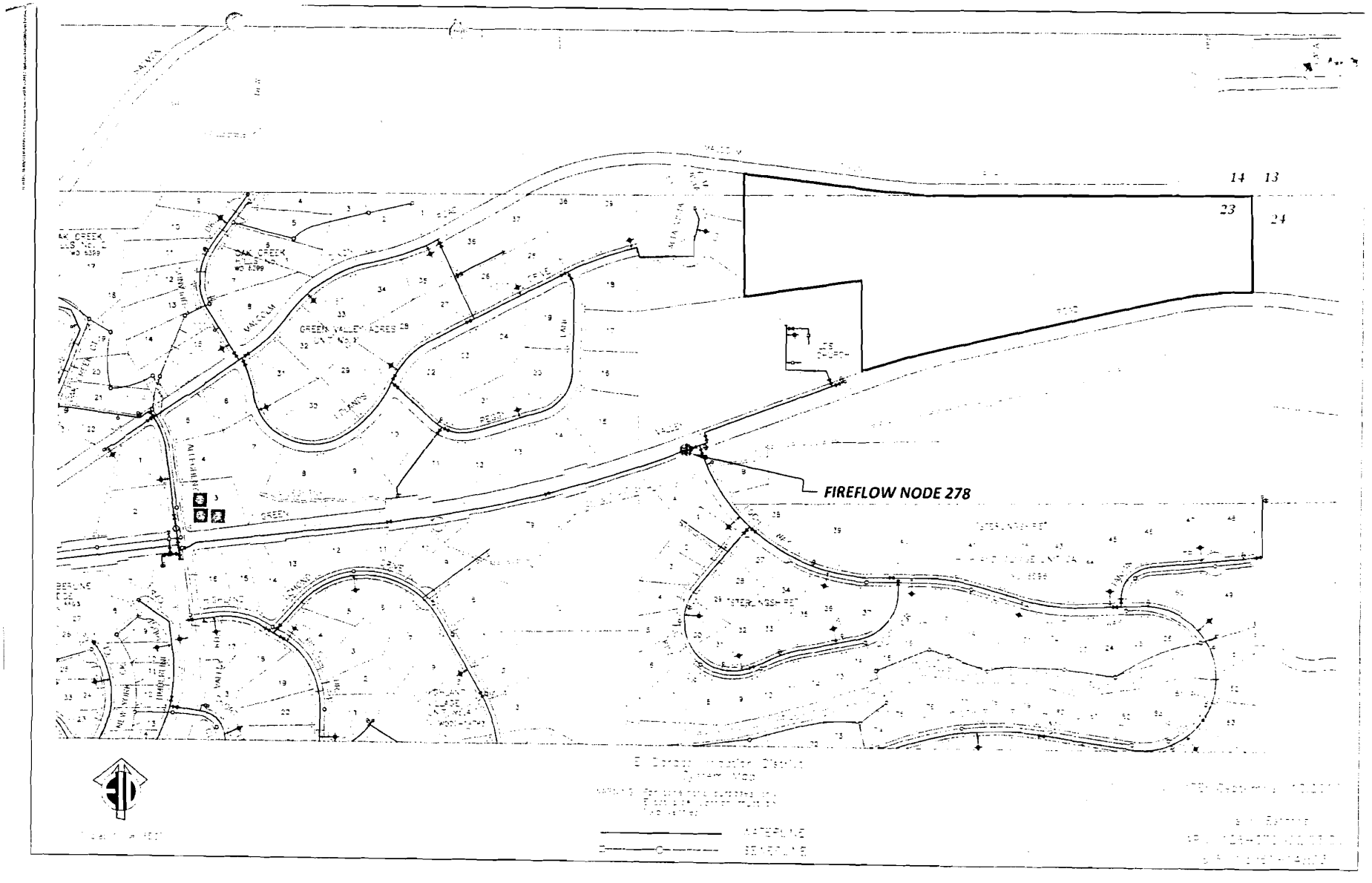
EW/MM:lk

Enclosures: System Map
FPR Guidelines and transmittal

cc: w/System Map
Brad Ballenger, Fire Marshal, El Dorado Hills Fire Department
1050 Wilson Blvd, El Dorado Hills, CA 95762

Roger Trout, Director- El Dorado County Development Services Department
2850 Fairlane Court, Placerville, CA 95667

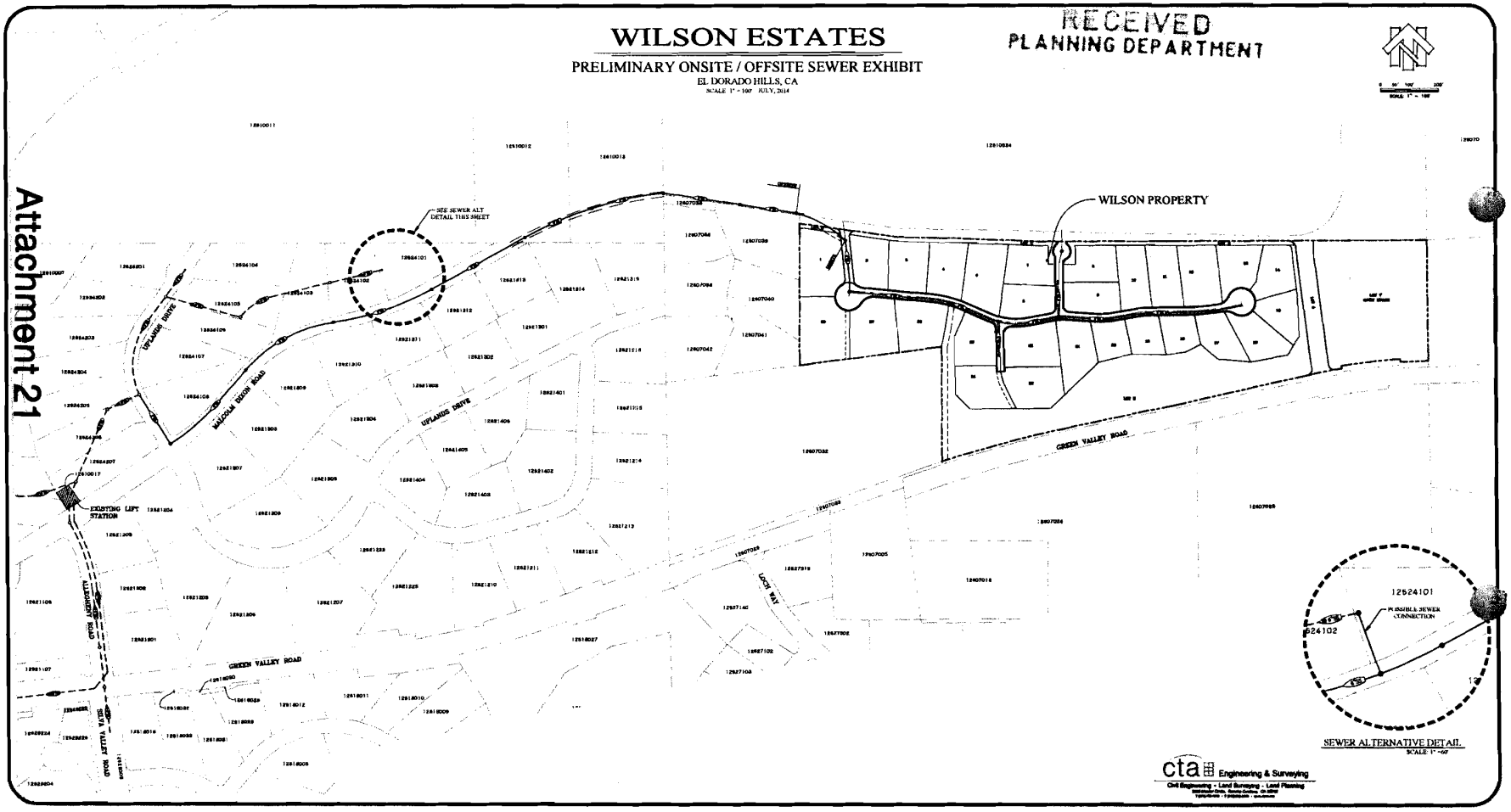
David R. Crosariol, CTA Engineering & Surveying
3233 Monier Circle, Rancho Cordova, CA 95742


14
13
23
24
FIREFLOW NODE 278

14 JUL 22 PM 1:54

RECEIVED
PLANNING DEPARTMENT

Attachment 21

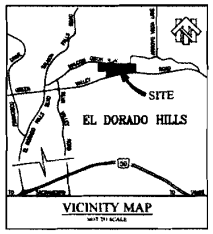


Attachment 22

PRELIMINARY GRADING, DRAINAGE & TREE PRESERVATION PLAN

WILSON ESTATES

COUNTY OF EL DORADO JULY, 2014 STATE OF CALIFORNIA



SCALE: 1"=60'

TREE PRESEVATION PLAN

CANOPY REMOVAL NOTES:

1. TOTAL SITE AREA = 38.18 AC
TOTAL SITE CANOPY = 29 AC (10.2% OF PROJECT SITE)
ALLOWABLE REMOVAL UNDER OPTION "A" = 10% (EXISTING CANOPY) =2.29 AC
TOTAL REMOVAL PER PLAN =0.66 AC
MITIGATION AREA REQUIRED = 0.66 AC
MITIGATION AREA AVAILABLE= 0.66 AC
2. THIS PROJECT PROVIDENT SMALL COMPLY WITH THE PROVISIONS OF POLICY 7.4.4.4 BY MEETING THE RETENTION REQUIREMENTS AND 1:1 REPLACEMENT RATIO OF OPTION A, PROVIDING ON - OR OFF-SITE MITIGATION AS ESTABLISHED IN OP POLICY 7.4.4.4. AND ITS INTERIM GUIDELINES
3. GRANTING OF ANY REQUIRED EASEMENTS SHALL BE REQUIRED AS A CONDITION OF APPROVAL OF ALL DISCRETIONARY PERMITS FOR WHICH THESE PROVISIONS APPLY, AND SHALL BE COMPLETED PRIOR TO ISSUANCE OF A GRADING OR BUILDING PERMIT, FILING OF A PARCEL OR FINAL MAP, OR OTHERWISE COMMENCING WITH THE PROJECT
4. THE PROJECT IMPACTS WILL RESULT IN THE FOLLOWING MITIGATION ALLOCATION:
OPTION A REMOVAL & OTS ONLY) ..... 0.66 AC (BY DEVELOPER)
5. THE ARBORIST MAY REQUIRE THE REMOVAL OF ADDITIONAL TREES IF HE WARRANTS THEM TO BE A HAZARD WITHIN OR OUTSIDE OF THE CONSTRUCTION LIMITS AND/OR BUILDING SITES. THESE TREES ARE NOT SUBJECT TO REPLACEMENT STANDARDS PER INTERIM GUIDELINES APPROVED FOR POLICY 7.4.4.4 IF THE ARBORIST FINDS THEM DEAD, DISEASED OR DYING.
6. TREE PROTECTION FENCING SHALL BE PLACED AFTER COMPLETION OF TREE REMOVAL OPERATIONS AND PRIOR TO CLEARING AND GRUBBING
7. IN AN EVENT PAYMENT OF FEE IN LIEU OF CANOPY REPLACEMENT BECOMES AVAILABLE, THE APPLICANT RESERVES THE RIGHT TO CHANGE HIS MITIGATION OPTION IN COMPLIANCE WITH ADOPTED OPTION B GUIDELINES

EARTHWORK

APPROXIMATE CUT:	62,000 CY
APPROXIMATE FILL:	62,000 CY

LEGEND

- (P) SUBDIVISION BOUNDARY
- (P) RIGHT OF WAY LINE
- (P) LOT LINE
- EXISTING LOT LINE
- DAYLIGHT LINE
- GRADE BREAK
- PROPOSED CONTOUR
- EXISTING CONTOUR
- P=880.5 PROPOSED PAD ELEVATION
- FLARED END SECTION
- STORM DRAIN LINE
- DRAINAGE INLETS
- PROPOSED DRAINAGE OUTFALL
- (P) 6' NOISE BARRIER
- (P) RETAINING WALL
- (P) DRAINAGE DITCH
- (P) TREE REMOVAL
- (P) TREE MITIGATION AREA
- (P) SLOPE DIRECTION
- (P) GRADING

14 JUL 22 PM 1:54
RECEIVED
PLANNING DEPARTMENT

cta Engineering & Surveying
Civil Engineering · Land Surveying · Land Planning