Heatherglen Planned Development, TTM 17604, CUP 15-006

Draft Environmental Impact Report

Appendix A – Initial Study and Notice of Preparation

Air Quality and Greenhouse Gas Study
Heatherglen Residential Project
City of Highland

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Table of Contents

Appendices

List of Figures

List of Tables

1.0 INTRODUCTION

This air quality and greenhouse gas analysis has been prepared to support the proposed residential project's environmental review process and provide information regarding potential impacts to air quality and greenhouse gas (GHG) associated with the approval of the proposed project. This air quality and GHG study describes the existing air quality and GHG environment, identifies applicable rules and regulations, evaluates potential air quality and GHG impacts from development and operation of the project.

1.1 Project Location and Site Description

The 59.03- acre project site is located in the City of Highland, on the south side of Greenspot Road, east of Merris Street, and west of the Creek Flood Control Channel, as shown in **Figure 1** and **Figure 2**. The State Route (SR) 210 provides regional access to the project site. The principal local network of streets providing access to the site includes: Greenspot Road, Boulder Avenue, and Church Street.

The project site is currently vacant and undeveloped and has an existing General Plan Land Use and zoning designation of Agricultural/Equestrian Residential (AG/EQ). As described in the City of Highland General Plan Land Use Element, areas designated as Agricultural/Equestrian are appropriate for rural and equestrian-oriented residential development, and the current designations allow a maximum intensity of 2 dwelling units per l acre.

1.2 Project Description

The proposed residential project would develop up to 215 single-family dwelling units, a community park and areas designated for conservation and a retention basin l, as shown in **Figure 3**. The proposed project includes a General Plan Land Use amendment and a zoning designation change from AG/EQ to Planned Development (PD).

The proposed project is expected to be developed by Year 2019. As described by the Traffic Impact Analysis (TIA) prepared for the proposed project (LLG 2017), operation of the 215 single-family dwelling units is anticipated to generate 2,047 weekday daily vehicular trips (one-half arriving, one-half departing), with 161 trips (40 inbound, 121 outbound) in the weekday a.m. peak hour and 215 trips (135 inbound, 80 outbound) in the weekday p.m. peak hour.

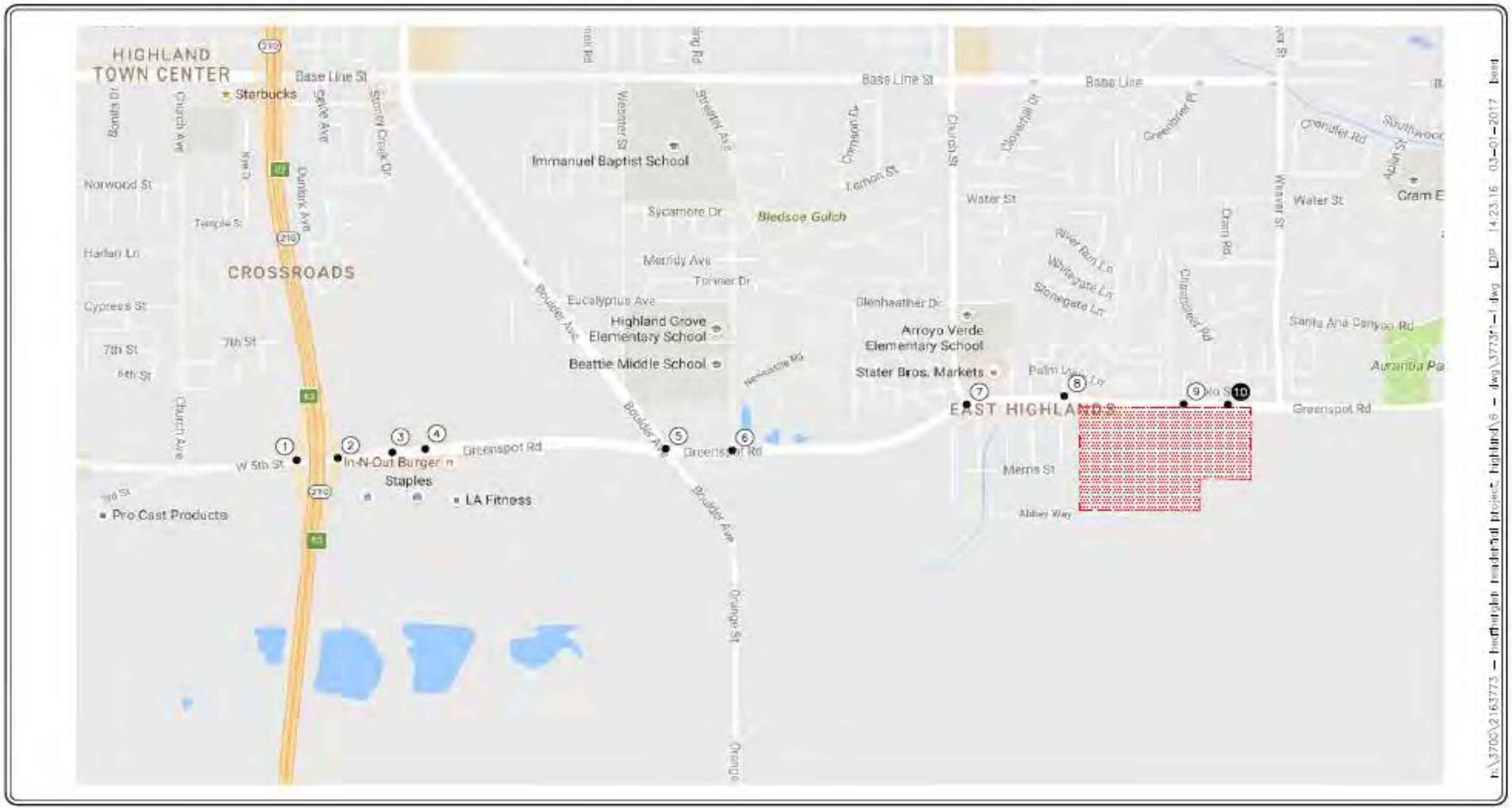

Figure 1. Regional Map of Project

N
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No Scale

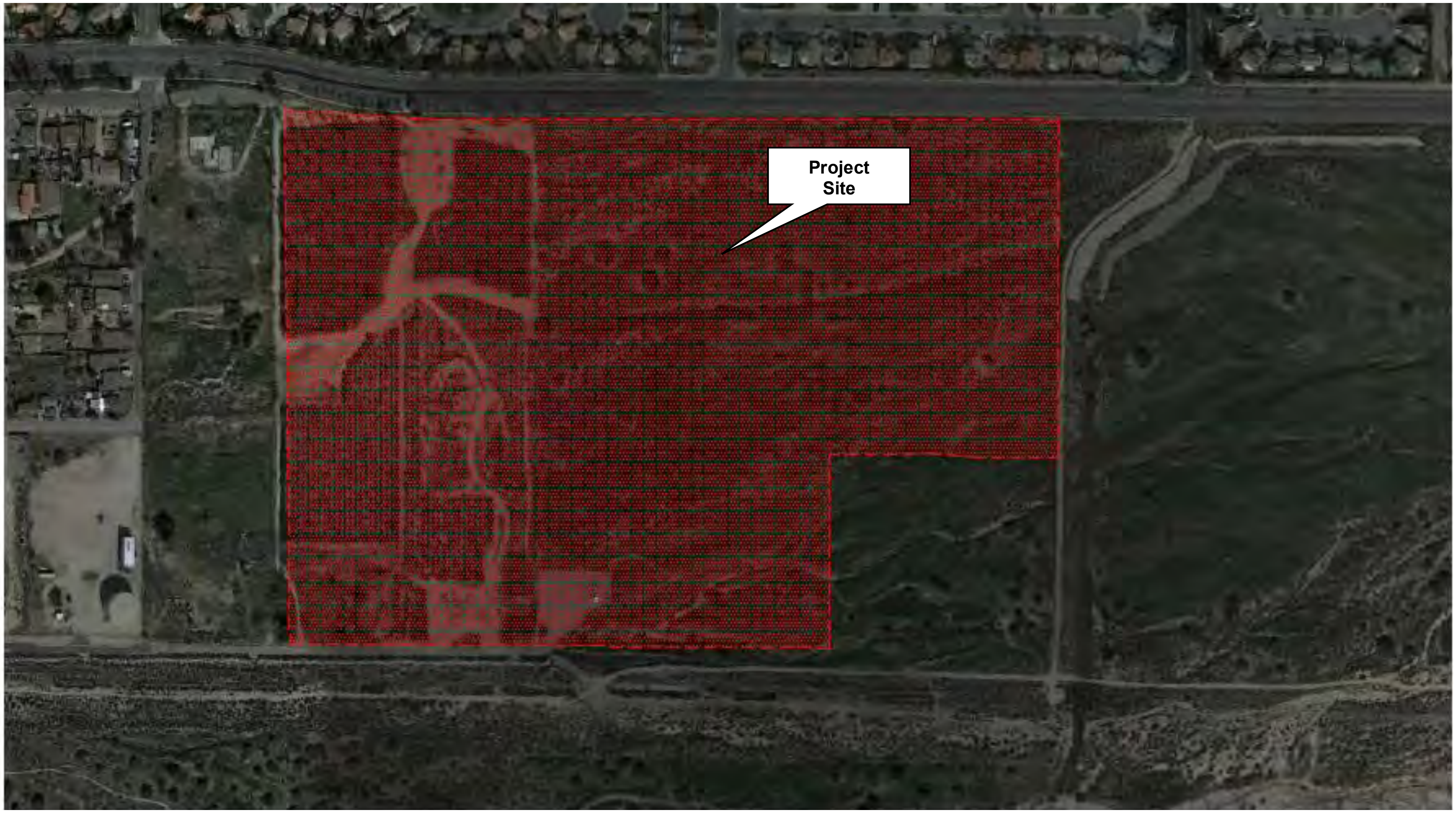

Figure 2. Project Vicinity Map Location

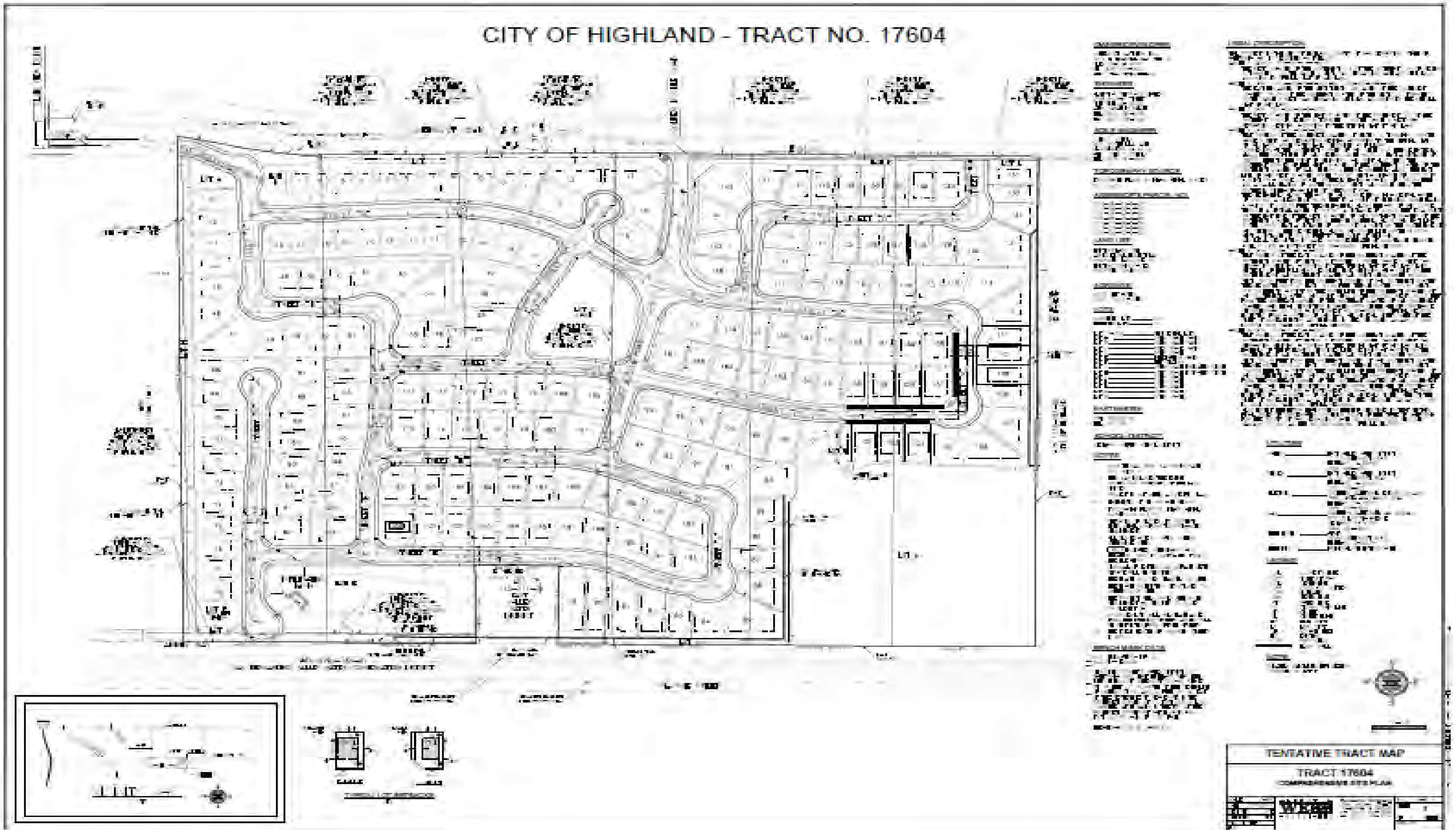

Figure 3. Proposed Project Site Plan

1.3 Sensitive Air Quality Receptors

People that are more susceptible to air quality are young children, the elderly, and people with immune deficiencies. Land uses, such as schools, daycare facilities, hospitals, elderly care facilities, residential properties and other areas that are occupied by people susceptible to air quality pollutants are considered sensitive air quality receptors.

The project area includes various different types of sensitive receptors, including residences and churches, and construction and operation related to the proposed project is approximately 100 feet from the closest sensitive receiver, which are the residences located across Greenspot Road. Due to the distance of the project to this receiver, the project has the potential to impact sensitive receivers, as described in the impact discussion in Section 6.0.

2.0 REGULATORY FRAMEWORK

The governing regulatory framework in the proposed project area includes federal, state and local agencies that enforce ambient air quality standards and specific regulations that govern project development, emitted pollutants, and ambient air quality status for the region.

2.1 Air Quality

Federal Regulations and Standards

Federal Clean Air Act

The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) [Title 40 Code of Federal Regulations (CFR), Part 50] to protect public health and the environment from the effects of air pollutants. The USEPA has identified "criteria" pollutants that are known to cause harm to public health and the environment. Currently there are standards set for sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and particulate matter less than ten micrometers in diameter (PM_{10}), particulate matter less than five micrometers in diameter ($PM_{2.5}$) and lead (Pb). These criteria pollutants are described below.

- **Sulfur Dioxide.** SO2 is a colorless, extremely irritating gas or liquid that enters the atmosphere as a pollutant mainly as a result of burning high sulfur-content fuel oils and coal, and from chemical processes occurring at chemical plants and refineries. When SO2 oxidizes in the atmosphere, it forms sulfur trioxide (SO3). Collectively, these pollutants are referred to as sulfur oxides (SOx).

  Major sources of SO2 include power plants, large industrial facilities, diesel vehicles, and oil-burning residential heaters. Emissions of SO2 aggravate lung diseases, especially bronchitis. This compound also constricts the breathing passages, especially in people with asthma and people involved in moderate to heavy exercise. SO2 potentially causes wheezing, shortness of breath, and coughing. Long-term SO2 exposure has been associated with increased risk of mortality from respiratory or cardiovascular disease.

- **Carbon Monoxide.** CO is a colorless and odorless gas, is a relatively non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicles. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia. CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, lower emissions from new vehicles, and improvements in fuels.

- **Nitrogen Dioxide.** NO2 is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO2. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO2. The combined emissions of NO and NO2 are referred to as NOx, which are reported as equivalent NO2. Aside from its contribution to ozone formation, NO2 can increase the risk of acute and chronic respiratory disease and reduce visibility. NO2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

- **Ozone.** Ozone is the main component of photochemical smog, is primarily a summer and fall pollution problem. Ozone is not emitted directly into the air, but is formed through a complex series of chemical reactions involving other compounds that are directly emitted. These directly emitted pollutants (also known as ozone precursors) include reactive organic gases (ROGs) or volatile organic compounds (VOCs), and oxides of nitrogen (NOx). While both ROGs and VOCs refer to compounds of carbon, ROG is a term used by CARB and is identified based on a list of carbon compounds that exempts carbon compounds determined by CARB to be nonreactive. VOC is a term used by the USEPA and is identified based on USEPA's separate list of exempted compounds it identifies as having negligible photochemical reactivity. The time period required for ozone formation allows the reacting compounds to spread over a large area, producing regional pollution problems. Ozone concentrations are the cumulative result of regional development patterns rather than the result of a few significant emission sources.

  Once ozone is formed it remains in the atmosphere for one or two days. Ozone is then eliminated through reaction with chemicals on the leaves of plants, attachment to water droplets as they fall to earth (rainout), or absorption by water molecules in clouds that later fall to earth with rain (washout).

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. In addition to causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

- **Particulate Matter.** PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively (a micron is one-millionth of a meter). PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis and respiratory illnesses in children. Recent mortality studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Particulate matter can also damage materials and reduce visibility. One common source of $PM_{2.5}$ is diesel exhaust emissions.

  PM_{10} consists of particulate matter emitted directly into the air (e.g., fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires, and natural windblown dust) and particulate matter formed in the atmosphere by condensation and/or transformation of SO2 and ROG. Traffic generates particulate matter emissions through entrainment of dust and dirt particles that settle onto roadways and parking lots. PM_{10} and $PM_{2.5}$ are also emitted by burning wood in residential wood stoves and fireplaces and open agricultural burning. $PM_{2.5}$ can also be formed through secondary processes such as airborne reactions with certain pollutant precursors, including ROGs, ammonia (NH3), NOx, and SOx.

- **Lead.** Lead is a metal found naturally in the environment and present in some manufactured products. There are a variety of activities that can contribute to lead emissions, which are grouped into two general categories, stationary and mobile sources. On-road mobile sources include light-duty automobiles; light-, medium-, and heavy-duty trucks; and motorcycles.

  Emissions of lead have dropped substantially over the past 40 years. The reduction before 1990 is largely due to the phase-out of lead as an anti-knock agent in gasoline for on-road automobiles. Substantial emission reductions have also been achieved due to enhanced controls in the metals processing industry. In the Basin, atmospheric lead is generated almost entirely by the combustion of leaded gasoline and contributes less than one percent of the material collected as total suspended particulates. As lead has been well below regulatory thresholds for decades and the proposed project is not a source of lead, lead is not discussed further in this analysis.

The CAA established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Federal standards are shown in **Table 1**.

The federal Clean Air Act also requires each state to prepare an air quality control plan, referred to as a state implementation plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins, as reported by their jurisdictional agencies. USEPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the federal Clean Air Act and its amendments, and to determine whether implementing the SIPs would achieve air quality goals. In addition, the USEPA sets federal vehicle and stationary source emissions standards and provides research and guidance in air pollution programs.

State Regulations and Standards

California Clean Air Act

In 1988, the state legislature passed the California Clean Air Act, which established California's air quality goals, planning mechanisms, regulatory strategies, and standards of progress for the first time. The California Clean Air Act provides the state with a comprehensive framework for air quality planning regulation and sets state air quality standards. The California Ambient Air Quality Standards, also shown in Table 1, incorporate additional standards for most of the criteria pollutants and has set standards for other pollutants recognized by the state such as sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. In general, the state standards are more health protective than the federal standards.

Table 1. Federal and State Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time[a]	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	---	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when ROG and NOX react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
	8 hours	0.070 ppm	0.075 ppm		
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm		
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	0.100 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Arithmetic Mean	0.030 ppm	0.053 ppm		
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	75 ppb	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hours	---	0.5 ppm		
	24 hours	0.04 ppm	0.14 ppm		
	Annual Arithmetic Mean	---	0.030 ppm		
Respirable Particulate Matter (PM10)	24 hours	50 μg/m^3	150 μg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Arithmetic Mean	20 μg/m^3	---		
Fine Particulate Matter (PM2.5)	24 hours	---	35 μg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
	Annual Arithmetic Mean	12 μg/m^3	12.0 μg/m^3		
Lead (Pb)	30 Day Average	1.5 μg/m^3	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction (in severe cases).	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarter	---	1.5 μg/m^3		
	Rolling 3-Month Average	---	0.15 μg/m^3		
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations).	Geothermal power plants, petroleum production and refining.
Sulfates (SO_4)	24 hour	25 μg/m^3	No National Standard	Decrease in ventilatory functions; aggravation of asthmatic symptoms; aggravation of cardio-pulmonary disease; vegetation damage; degradation of visibility; property damage.	Industrial processes.
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, and discourages tourism.	See $PM_{2.5}$.
Vinyl Chloride	24 hour	0.01 ppm	No National Standard	Short-term exposure to high levels of vinyl chloride in the air can cause dizziness, drowsiness, and headaches. Long-term exposure through inhalation and oral exposure can cause liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer in humans.	Polyvinyl chloride (PVC) plastic and vinyl products.

NOTE: ppm = parts per million; ppb = parts per billion; μg/m^3 = micrograms per cubic meter.
[a] The averaging time is the interval of time over which the sample results are reported.

SOURCE: SCAQMD 2016.

State Implementation Plan

The 1977 Clean Air Act Amendments require that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. For areas that are designated "nonattainment" with respect to a standard, the Clean Air Act specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met. Similarly, the 1988 California Clean Air Act also requires development of air quality plans and strategies to meet state air quality standards in areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM standards). Maintenance plans are required for attainment areas that had previously been designated nonattainment in order to ensure continued attainment of the standards.

Toxic Air Contaminants

TACs have been regulated under federal air quality law since the 1977 federal Clean Air Act Amendments. The most recent federal Clean Air Act Amendments (1990) reflect a technology-based approach for reducing TACs. The first phase involves requiring facilities to install Maximum Achievable Control Technology (MACT). The MACT standards vary depending on the type of emitting source. USEPA has established MACT standards for over 20 facilities or activities, such as perchloroethylene dry cleaning and petroleum refineries. The second phase of control involves determining the residual health risk represented by air toxics emissions sources after implementation of MACT standards. Two principal laws provide the foundation for state regulation of TACs from stationary sources. In 1983, the State Legislature adopted Assembly Bill 1807, which established a process for identifying TACs and provided the authority for developing retrofit air toxics control measures on a statewide basis. Air toxics from stationary sources in California are also regulated under Assembly Bill 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987. Regulation of TACs from mobile sources has traditionally been implemented through emissions standards for on-road motor vehicles (imposed on vehicle manufacturers) and through specifications for gasoline and diesel fuel sold in California (imposed on fuel refineries and retailers), rather than through land use decisions, air quality permits, or regulations addressing how motor vehicles are used by the general public.

In August 1998, CARB identified particulate emissions from diesel-fueled engines (diesel particulate matter, or DPM) as TACs. CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (CARB, 2000). This document provides a plan to reduce diesel particulate emissions, with the goal of reducing emissions and the associated health risks by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra-low sulfur diesel fuel on diesel-fueled engines.

Regional Regulations and Standards

The South Coast Air Quality Management District (SCAQMD) is responsible for managing ambient air quality and setting regulations in the South Coast Basin, establishing an air quality monitoring network for measuring levels of criteria pollutants, administering funds to reduce regional mobile source emissions, and permitting stationary air pollutant sources, such as power plants, refineries, and gas stations.

Air Quality Management Plan

The SCAQMD is responsible for developing and adopting an Air Quality Management Plan, which serves as guidance to bring the region into compliance with federal and state air quality standards. The plan includes rules to reduce emissions from various sources, including specific types of equipment, industrial processes, paints, solvents, and other consumer products.

In 2012 an AQMP was adopted by the SCAQMD to set forth a comprehensive and integrated program to obtain regional compliance with the federal 24-hour $PM_{2.5}$ air quality standard, and to provide an update to the SCAB's commitment towards meeting the federal 8-hour ozone standards. The AQMP also served to satisfy USEPA requirements for 1-hour ozone standards, as well as identifying vehicle miles travelled (VMT) emissions. The AQMP sets forth programs which require integrated planning efforts and the cooperation of all levels of government: local, regional, state, and federal. A Supplement to the 2012 AQMP was prepared to demonstrate attainment of the 24-hour $PM_{2.5}$ standard by 2015. The SCAQMD Governing Board approved the Supplement on February 5, 2015, which was also approved by CARB and the USEPA as part of the California SIP (SCAQMD 2016).

In 2016, a new AQMP was developed in partnership with CARB, USEPA, SCAG, and local governments throughout the region. The 2016 AQMP identifies control measures needed to demonstrate attainment with the federal 2008 8-hour ozone standard by 2031, the 2012 annual $PM_{2.5}$ standard by 2025, and the 24-hour $PM_{2.5}$ standard by 2019 in the SCAB and the 2008 8-hour ozone standard by 2026 in the Coachella Valley. In addition, the 2016 AQMP provides revisions to previous plans regarding attainment of the 1997 8-hour ozone standard by 2023 and the revoked 1-hour ozone standard by 2022. Further, Appendix I (Health Effects) includes a report on the health impacts of particulate matter air pollution in the South Coast Air Basin (SCAQMD 2016).

SCAQMD Rules and Regulations

All development projects are subject to SCAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction anticipated under the proposed project would include the following:

Rule 401 – Visible Emissions. A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any 1 hour that is as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.

Rule 402 – Nuisance. A person shall not discharge from any source whatsoever such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any such persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. The provisions of this rule do not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

Rule 403 – Fugitive Dust. This rule is intended to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (human-made) fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. Rule 403 applies to any activity or human-made condition capable of generating fugitive dust.

Rule 445 – Wood Burning. This rule prohibits permanently installed wood burning devices into any new development. A wood burning device means any fireplace, wood burning heater, or pellet-fueled wood heater, or any similarly enclosed, permanently installed, indoor or outdoor device burning any solid fuel for aesthetic or space-heating purposes, which has a heat input of less than one million British thermal units per hour.

Rule 481 – Spray Coating. This rule applies to all spray painting and spray coating operations and equipment and states that a person shall not use or operate any spray painting or spray coating equipment unless one of the following conditions is met:

- The spray coating equipment is operated inside a control enclosure, which is approved by the Executive Officer. Any control enclosure for which an application for permit for new construction, alteration, or change of ownership or location is submitted after the date of adoption of this rule shall be exhausted only through filters at a design face velocity not less than 100 feet per minute nor greater than 300 feet per minute, or through a water wash system designed to be equally effective for the purpose of air pollution control.

- Coatings are applied with high-volume low-pressure, electrostatic and/or airless spray equipment.

- An alternative method of coating application or control is used which has effectiveness equal to or greater than the equipment specified in the rule.

Rule 1108 - Volatile Organic Compounds. This rule governs the sale, use, and manufacturing of asphalt and limits the volatile organic compound (VOC) content in asphalt used in the Basin. This rule also regulates the VOC content of asphalt used during construction. Therefore, all asphalt used during construction of the project must comply with SCAQMD Rule 1108.

Rule 1113 – Architectural Coatings. No person shall apply or solicit the application of any architectural coating within the SCAQMD with VOC content in excess of the values specified in a table incorporated in the Rule.

Rule 1143 – Paint Thinners and Solvents. This rule governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

Rule 1186 – Fugitive Dust. This rule limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

Rule 1303 – Major Emission Sources. This rule governs the permitting of re-located or new major emission sources, requiring Best Available Control Measures and setting significance limits for PM_{10} among other pollutants.

Rule 1401– New Source Review of Toxic Air Contaminants. This rule specifies limits for maximum individual cancer risk, cancer burden, and non-cancer acute and chronic hazard index from new permit units, relocations, or modifications to existing permit units, which emit toxic air contaminants.

2.2 Greenhouse Gas

Federal Regulations and Standards

Federal Clean Air Act

The federal CAA requires the USEPA to define national ambient air quality standards to protect public health and welfare in the U.S. The CAA does not specifically regulate GHG emissions; however, on April 2, 2007 the U.S. Supreme Court in Massachusetts v. U.S. Environmental Protection Agency, determined that GHGs are pollutants that can be regulated under the CAA. Currently, there are no federal regulations that establish ambient air quality standards for GHGs.

The USEPA Administrator determined that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA, and on December 7, 2009, the EPA Administrator signed two findings regarding greenhouse gases under Section 202(a) of the Clean Air Act that include:

- **Endangerment Finding:** The current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.

- **Cause or Contribute Finding:** The combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to greenhouse gas pollution, which threatens public health and welfare.

These findings do not impose requirements on developments or agencies. However, this was a prerequisite for implementing emissions standards for vehicles.

Fuel Economy Standards

The federal Corporate Average Fuel Economy (CAFE) standards for vehicles in model years 2011 to 2016 (first phase of standards) and 2017 to 2025 (second phase) provide strict fuel economy requirements. These standards are projected to result in an average industry fleetwide level of 163 grams/mile of carbon dioxide (CO_2) in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements. The program is projected to:

- Cut 6 billion metric tons of GHG over the lifetimes of the vehicles sold in model years 2012-2025.
- Save families more than $1.7 trillion in fuel costs.
- Reduce America's dependence on oil by more than 2 million barrels per day in 2025.

As part of the 2017-2025 standards rulemaking, USEPA, National Highway Traffic Safety Administration, and California Air Resources Board, an evaluation of the standards is to be completed for vehicle model years 2022-2025.

Clean Power Plan

On August 3, 2015, President Obama and the USEPA announced the Clean Power Plan. The Clean Power Plan sets standards to reduce carbon dioxide emissions by 32 percent from 2005 levels by 2030. This Plan establishes final emissions guidelines for states to follow in developing plans to reduce GHG emissions from existing fossil fuel-fired electric generating units. Specifically, the USEPA established: (1) carbon dioxide emission performance rates representing the best system of emission reduction for fossil fuel-fired electric utility steam generating units and stationary combustion turbines; (2) state-specific CO_2 goals reflecting the CO_2 emission performance rates; and (3) guidelines for the development, submittal and implementation of state plans that establish emission standards or other measures to implement the CO_2 emission performance rates, which may be accomplished by meeting the state goals. Overall, this rule will reduce CO_2 emissions from the utility power sector (Obama 2015).

State Regulations and Standards

There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing CARB to develop actions to reduce GHG emissions, and there are several state legislative actions related to climate change and GHG emissions.

Executive Order S-3-05

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

Executive Order S-30-15

California Governor Brown announced on April 29, 2015 through Executive Order B-30-15 a new statewide policy goal to reduce GHG emissions 40 percent below their 1990 levels by 2030. This order acts as an intermediate goal to achieving 80 percent reductions by 2050 as outlined in Executive Order S-3-05, above.

Assembly Bill 32 – California Global Warming Solutions Act

California Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, requires CARB to establish a statewide GHG emissions cap for 2020 based on 1990 emission levels. In December 2007 CARB adopted 427 MT CO2e as the statewide GHG emissions limit equivalent to the statewide levels for 1990. This is approximately 28 percent below forecasted 2020 "business-as-usual" emissions of 596 MMT of CO2e, and about 10 percent below average annual GHG emissions during the period of 2002 through 2004 (CARB 2016).

Climate Change Scoping Plan

In December 2008, CARB approved the AB 32 Scoping Plan outlining the state's strategy to achieve the 2020 GHG emissions limit. This Scoping Plan, developed by CARB in coordination with the Climate Action Team (CAT), provides a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health.

As required by AB 32, the Scoping Plan must be updated at least every five years to evaluate the mix of AB 32 policies to ensure that California is on track to meet the targets set out in the legislation. In 2014 an update to the initial Scoping Plan was developed by CARB in collaboration with the California Climate Action Team (CCAT) that built upon the initial Scoping Plan with new strategies and expanded measures, and identifies opportunities to leverage existing and new funds to drive GHG emission reductions through strategic planning and targeted program investments.

As part of the updated to the Scoping Plan, emissions reductions required to meet the 2020 statewide GHG emissions limit were further adjusted. The adjustment resulted is 431 MMTCO2e, which is slightly higher than the 427 MMTCO2e limit of the initial Scoping Plan. The update also adjusted the 2020 BAU forecast of GHG emissions to 509 MMTCO2e, a 15 percent reduction below the estimated BAU levels was determined to be necessary to return to 1990 levels by 2020 (CARB 2014).

Executive Order S-1-07

Executive Order S-1-07, which was signed by Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020. As a result of this order, CARB approved a proposed regulation to implement the low carbon fuel standard (LCFS) on April 23, 2009, which will reduce GHG emissions from the transportation sector in California by about 16 MMT in 2020. The LCFS is designed to reduce California's dependence on petroleum, create a lasting market for clean transportation technology, and stimulate the production and use of alternative, low-carbon fuels in California. The LCFS is designed to provide a durable framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet each year beginning in 2011.

Senate Bill 375

SB 375 established mechanisms to develop regional targets to reduce passenger vehicle greenhouse gas emissions, and was adopted on September 30, 2008. On September 23, 2010, California ARB adopted the vehicular greenhouse gas emissions reduction targets that had been developed in consultation with the metropolitan planning organizations (MPOs); the targets require a 7 to 8 percent reduction by 2020 and between 13 to 16 percent reduction by 2035 for each MPO. SB 375 recognizes the importance of achieving significant greenhouse gas reductions by working with cities and counties to change land use patterns and improve transportation alternatives. Through the SB 375 process, MPOs, such as the Southern California Council of Governments (SCAG) will work with local jurisdictions in the development of sustainable communities strategies (SCS) designed to integrate development patterns and the transportation network in a way that reduces greenhouse gas emissions while meeting housing needs and other regional planning objectives. SCAG's reduction target for per capita vehicular emissions is 8 percent by 2020 and 13 percent by 2035 (CARB, 2010).

California Green Building Standard Code

In 2016 the California Building Standards Commission adopted the 2016 California Building Standards Code that also included the latest CALGreen Code, which became effective on January 1, 2017. The mandatory provisions of the code are anticipated to reduce emissions, reduce water use, and divert construction waste from landfills. The California Energy Commission (CEC) indicates that the 2016 Title 24 standards will reduce energy consumption by 5 percent for nonresidential buildings above that achieved by the 2013 Title 24 (CEC 2016).

Clean Energy Reduction Act

Clean Energy and Pollution Reduction Act of 2015, Senate Bill (SB) 350 (Chapter 547, Statutes of 2015) was approved by Governor Brown on October 7, 2015. SB 350 will (1) increase standards by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030; (2) require the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that would achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; (3) provide for the evolution of the Independent System Operator (ISO) into a regional organization; and (4) require the state to reimburse local agencies and school districts for certain costs mandated by the state through procedures established by statutory provisions. This Act is intended to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation (Brown 2015).

Regional Regulations and Standards

South Coast Air Quality Management District

The SCAQMD formed a working group to identify greenhouse gas emissions thresholds for land use projects that could be used by local lead agencies in the air basin in 2008. The working group developed tiered threshold options that are contained in the SCAQMD Draft Guidance Document – Interim CEQA Greenhouse Gas Significance Threshold, that could be applied by lead agencies. The working group has not provided additional guidance since release of the interim guidance in 2008; however, the Guidance Document provides substantial evidence supporting the approaches to significance of

GHG emissions that can be considered by the lead agency in adopting its own threshold. The SCAQMD identified thresholds consist of the following tiered approach:

- Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether the project is consistent with a greenhouse gas reduction plan. If a project is consistent with a qualifying local greenhouse gas reduction plan, it does not have significant greenhouse gas emissions.
- Tier 3 consists of screening values. A project's construction emissions are averaged over 30 years and are added to the project's operational emissions. If a project's emissions are below one of the following screening thresholds, then the project is less than significant:
  - All land use types: 3,000 $MTCO_2e$ per year
  - Based on land use type: residential: 3,500 $MTCO_2e$ per year; commercial: 1,400 $MTCO_2e$ per year; or mixed use: 3,000 $MTCO_2e$ per year

The Tier 3 screening threshold uses the Executive Order S-3-05 year 2050 goal as its basis. Achieving the Executive Order's objective would contribute to worldwide efforts to cap carbon dioxide concentrations at 450 ppm, thus stabilizing global climate.

Local Regulations and Standards

San Bernardino Associated Governments Regional Greenhouse Gas Reduction Plan

In June 2013, the San Bernardino Associated Governments (SANBAG) released a draft Regional Greenhouse Gas Reduction Plan, which summarizes the actions that each city has selected in order to reduce GHG emissions, state-mandated actions, GHG emissions avoided in 2020 associated with each local and state action, and each city's predicted progress towards their selected GHG reduction goals.

Each city has selected a goal to reduce their community GHG emissions from BAU levels by the year 2020. Each city has selected their goal based on what each city considers feasible given the local conditions within that city.

The City of Highland has selected a goal to reduce its community GHG emissions to a level that is 22 percent below its projected emissions in 2020. The City will meet and exceed this goal subject to reduction measures that are technologically feasible and cost-effective per AB 32 through a combination of state and local efforts. The City would exceed the goal with only state/county level actions, but has committed to several additional local measures. The Pavley vehicle standards, the state's low carbon fuel standard, the RPS, and other state measures will reduce GHG emissions in Highland's on-road, solid waste, and building energy sectors in 2020. An additional reduction of will be achieved by local measures related to water efficiency, solar energy, SmartBus technologies and wastewater treatment, as well as a performance standard for new development that seeks to achieve a 29 percent reduction below projected BAU emissions for new projects.

3.0 ENVIRONMENTAL SETTING

3.1 Air Quality

Regional Setting

The ambient concentrations of air pollutants within the basin are determined by the amount of emissions released by sources and the atmosphere's ability to transport and dilute the emissions. Air quality conditions are generated by topography, wind speed, wind direction, air temperature gradients, and emissions released by air pollutant sources, which interact to move and disperse air pollutants.

The project's planning area is located within SCAB. The topography and climate within SCAB make it an area of high air pollution potential. The SCAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountains around the rest of the perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a cap over the cool marine layer and inhibits the pollutants in the marine layer from dispersing upward. In addition, light winds during the summer further limit ventilation, and sunlight triggers the photochemical reactions that produce ozone.

Local Setting

SCAQMD maintains monitoring stations within district boundaries that monitor air quality and compliance with associated ambient standards. The project site is located in the Source Receptor Area (SRA) 34, Central San Bernardino Valley. Concentrations from the monitoring station in SRA 34 for the most recent three years (2013 – 2015) are provided in **Table 2**.

Table 2. Air Quality Data Summary (2013-2015)

Pollutant	Standard[a]	Monitoring Data by Year 2013	2014	2015
Ozone				
Highest 1 Hour Average (ppm)		0.139	0.121	0.134
Days over State Standard	0.09 ppm	22	38	52
Highest 8 Hour Average (ppm)		0.112	0.099	0.117
Days over Federal Standard	0.075 ppm	36	75	78
Days over State Standard	0.070 ppm	53	76	79
Carbon Monoxide				
Highest 8 Hour Average (ppm)		1.7	2.4	2.3
Days over Federal Standard	9.0 ppm	0	0	0
Days over State Standard	9.0 ppm	0	0	0
Nitrogen Dioxide				
Highest 1 Hour Average (ppb)		72.2	72.6	71.4
Days over Federal Standard	0.100 ppm	0	0	0
Days over State Standard	0.18 ppm	0	0	0
Annual Average (ppb)		17.6	18.0	15.2
Days over Federal Standard	0.053 ppm	0	0	0
Days over State Standard	0.030 ppm	0	0	0
Sulfur Dioxide				
Highest 1 Hour Average (ppm)		0.04	0.04	0.04
Days over Federal Standard	0.14 ppm	0	0	0
Days over State Standard	0.04 ppm	0	0	0
Particulate Matter (PM_{10})				
Highest 24 Hour Average (μg/m^3)[b]		102	140	78
Days over Federal Standard (measured)[c]	150 μg/m^3	0	0	0
Days over State Standard (measured)[c]	50 μg/m^3	3	18	17
Annual Average (μg/m^3)[b]	20 μg/m^3	31.3	34.2	30.7
Particulate Matter ($PM_{2.5}$)				
Highest 24 Hour Average (μg/m^3)[b]		55.3	73.9	53.5
Days over Federal Standard (measured)[c]	35 μg/m^3	1	1	2
Annual Average (μg/m^3)[b]		11.4	11.67	10.74

NOTES:
ppm = parts per million; μg/m^3 = micrograms per cubic meter.

[a] Generally, state standards and national standards are not to be exceeded more than once per year.

[b] Values represent federal statistics and are midnight-to-midnight 24-hour averages. State and federal statistics may differ because of different sampling methods.

[c] Measurements are usually collected every six days. Days over the standard represent the measured number of days that the standard has been exceeded.

SOURCE: SCAQMD, 2015, 2014, 2013.

Both CARB and USEPA use this type of monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment. The current attainment status for the SCAB is provided in **Table 3**.

Table 3. South Coast Air Basin Attainment Status

	Attainment Status	
Pollutant	**Federal Standards**	**State Standards**
Ozone (1-hour)	Non-attainment/Extreme	Non-attainment
Ozone (8-hour)	Non-attainment/Extreme	Non-attainment
PM_{10}	Attainment/Maintenance	Non-attainment
$PM_{2.5}$	Non-attainment	Non-attainment
Carbon Monoxide	Attainment/Maintenance	Attainment
Nitrogen Dioxide	Attainment/Maintenance	Attainment
Sulfur Dioxide	Attainment	Attainment
Sulfates	N/A	Attainment
Lead	Non-attainment	Non-attainment
Hydrogen Sulfide	N/A	Attainment
Visibility Reducing Particles	N/A	Attainment
Vinyl	N/A	Attainment

SOURCE: CARB, 2016.

Toxic Air Contaminants

Concentrations of toxic air contaminants (TACs), or in federal parlance, hazardous air pollutants (HAPs), are also used as indicators of ambient air quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to The California Almanac of Emissions and Air Quality (CARB, 2009), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, CARB has made preliminary concentration estimates based on a particulate matter exposure method. This method uses the CARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Stationary source TACs tend to be approximately the same level year-round. However, TACs from mobile sources tend to be higher during the fall and winter months (SCAQMD 2000). According to the MATES III Model Estimated Carcinogenic Risk, the Plan area is within 5 cancer risk zones where risk ranges from 500 in one million to 1,200 in one million. The project area is identified as having a cancer risk of 559 in one million, which is largely due to diesel particulate emissions from roadways (SCAQMD Mates 2017).

Odorous Emissions

Odors are generally 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). Offensive odors are unpleasant and can lead to public distress generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source, wind speed, direction, and the sensitivity of receptors. There are no existing land uses in the project area that generate noxious odorous emissions.

3.2 Greenhouse Gas

Gases that trap heat in the atmosphere are called GHGs. The major concern with GHGs is that increases in their concentrations are causing global climate change. Global climate change is a change in the average weather on Earth that can be measured by wind patterns, storms, precipitation, and temperature. Although there is disagreement as to the rate of global climate change and the extent of the impacts attributable to human activities, most in the scientific community agree that there is a direct link between increased emissions of GHGs and long term global temperature increases.

The principal GHGs are carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). Because different GHGs have different warming potential and CO2 is the most common reference gas for climate change, GHG emissions are often quantified and reported as CO2 equivalents (CO_{2e}). For example, SF6 is a GHG commonly used in the utility industry as an insulating gas in circuit breakers and other electronic equipment. SF6, while comprising a small fraction of the total GHGs emitted annually world-wide, is a much more potent GHG with 22,800 times the global warming potential as CO2. Therefore, an emission of one metric ton (MT) of SF6 could be reported as an emission of 22,800 MT of CO2e. Large emission sources are reported in million metric tons (MMT) of CO2e. The principal GHGs are described below, along with their global warming potential.

Carbon dioxide: Carbon dioxide (CO2) is an odorless, colorless, natural greenhouse gas. Carbon dioxide's global warming potential is 1. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.

Methane: Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years, and its global warming potential is 28. Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter.

Nitrous oxide: Nitrous oxide (laughing gas) is a colorless greenhouse gas that has a lifetime of 121 years, and its global warming potential is 265. Sources include microbial processes in soil and water, fuel combustion, and industrial processes.

Sulfur hexafluoride: Sulfur hexafluoride is an inorganic, odorless, colorless, and nontoxic, nonflammable gas that has a lifetime of 3,200 years and a high global warming potential of 23,500. This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.

Perfluorocarbons: Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years global warming potentials range from 7,000to 11,000. Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.

Hydrofluorocarbons: Hydrofluorocarbons are a group of greenhouse gases containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 100 to 12,000. Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.

Some of the potential effects in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more forest fires, and more drought years (CARB, 2009). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2001):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

GHGs are produced by both direct and indirect emissions sources. Direct emissions include consumption of natural gas, heating and cooling of buildings, landscaping activities and other equipment used directly by land uses. Indirect emissions include the consumption of fossil fuels for vehicle trips, electricity generation, water usage, and solid waste disposal.

California produced 459 gross MMTCO2e in 2013 (CARB, 2014a). Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2012, accounting for 36 percent of total GHG emissions in the state (CARB, 2014a). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (21 percent) and the industrial sector (19 percent) (CARB, 2014a).

4.0 Thresholds of Significance

4.1 Air Quality

Appendix G of the California Environmental Quality Act (CEQA) Guidelines states that a project could have a significant adverse effect on air quality if any of the following would occur:

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

Regional Air Quality Significance Thresholds

The City of Highland has not developed specific air quality thresholds for air quality impacts. However, as stated in Appendix G of the *CEQA Guidelines*, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. As such, the significance thresholds and analysis methodologies in SCAQMD's CEQA Air Quality Handbook are used in evaluating project impacts. SCAQMD has established daily mass thresholds for regional pollutant emissions, which are shown in **Table 4**.

Table 4. SCAQMD Regional Air Quality Significance Thresholds

	Mass Daily Thresholds (lbs/day)	
Pollutant	**Construction**	**Operations**
Oxides of Nitrogen (NO_X)	100	55
Reactive Organic Gases (ROG)	75	55
Respirable Particulate Matter (PM_{10})	150	150
Fine Particulate Matter ($PM_{2.5}$)	55	55
Oxides of Sulfur (SO_X)	150	150
Carbon Monoxide (CO)	550	550
Lead[a]	3	3
TACs (including carcinogens and non-carcinogens	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	

[a] As the proposed project would not involve the development of any major lead emissions sources, lead emissions are not analyzed further.

SOURCE: SCAQMD 2016.

Localized Air Quality Significance Thresholds

SCAQMD has developed Local Significance Thresholds (LSTs) that represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards, and thus would not cause or contribute to localized air quality impacts. LSTs are only applicable to the following criteria pollutants: NOx, CO, PM_{10}, and $PM_{2.5}$. LSTs are developed based on the ambient concentrations of that pollutant for each of the 38 source receptor areas (SRAs) in the SCAB. The localized thresholds, which are found in the mass rate look-up tables in SCAQMD's Final Localized Significance Threshold Methodology document, were developed for use on projects that are less than or equal to five acres in size or have a disturbance of less than or equal to 5 acres daily. Although the project site is 59.03-acres, the project is anticipated to have a disturbance of less than 5-acres daily. In addition, use of the 5-acre site LST threshold provides a conservative evaluation because the project activities within the 59.03-acre project site are evaluated as if they would occur within a 5-acre area; thus, concentrating pollutants over a smaller area and increasing potential to exceed an air quality standard. Therefore, if the emissions from the project would not exceed the applicable LSTs for a 5-acre site, then the project impacts would not be significant.

SCAQMD only provides LSTs at receptor distances of 82, 164, 328, 656, and 1,640 feet from the emissions source. The closest sensitive receptor are the residences located across Greenspot Road, which are approximately 100 feet away from the project site. Although this sensitive receptor is located farther than 82 feet of the project site, using the 82-foot threshold provides a conservative analysis, indicating the maximum potential impact that could occur from the proposed project. Therefore, the LSTs for a 5-acre site in SRA 34 (Central San Bernardino Valley) at a distance of 82 feet from a sensitive receiver (shown in **Table 5**), were used to evaluate the project's localized air quality impacts.

Table 5. SCAQMD Localized Significance Thresholds for a Five-Acre Site

Pollutant Monitored Within SRA 34 – Central San Bernardino Valley	Allowable Emissions (pounds/day) at 82 Feet (25 Meters)
Nitrogen Oxides (NOx)	270
Carbon Monoxide (CO)	1,746
Respirable Particulate Matter (PM_{10})	14
Fine Particulate Matter ($PM_{2.5}$)	8

SOURCE*:* SCAQMD, 2009.

Under conditions where the project's onsite emissions would, even with incorporation of mitigation, exceed the LSTs thresholds, air dispersion modeling of the project's emissions would be required to evaluate the potential localized air quality impacts of the proposed project on its surrounding sensitive receptors, in accordance with SCAQMD's recommendation. However, under conditions where it is determined that the project's peak daily emissions would not exceed the LSTs thresholds, then it can be concluded that the project's emissions would not result in adverse localized air quality impacts on surrounding sensitive receptors.

CO Hotspots

In the past, the qualitative screening procedure in the procedures in the Transportation Project-Level Carbon Monoxide Protocol (the Protocol) was used to determine whether a project poses the potential for a CO hotspot. According to the Protocol, projects may worsen air quality if they increase the percentage of vehicles in cold start modes by two percent or more; significantly increase traffic volumes (by five percent or more) over existing volumes; or worsen traffic flow, defined for signalized intersections as increasing average delay at intersections operating at level of service (LOS) E or F or causing an intersection that would operate at LOS D or better without the project, to operate at LOS E or F.

However, CO concentrations have declined dramatically in California, and most areas, including the Norco area, meet the state and federal CO standards. This is attributed to the fewer number of older polluting vehicles, fewer emissions from new vehicles, and improvements in fuels. Thus, the Protocol methodology, which is focused on traffic and the percentage of traffic increase, is obsolete for determining CO impacts.

For this reason, several air districts have adopted guidelines that focus on specific criteria other than LOS and percentage traffic increase. SCAQMD has not created any new screening criteria. However, the Bay Area Air Quality Management District (BAAQMD) has identified criteria, which is applicable to the proposed project. Because CEQA allows the Lead Agency to identify thresholds and SCAQMD does not have screening criteria, these BAAQMD screening criteria were used to determine the potential impacts related to CO hotspots and if emissions modeling is required. The BAAQMD criteria include:

1. Consistency with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.

2. Traffic volumes at affected intersections would not be increased to more than 44,000 vehicles per hour.

3. Traffic volumes at affected intersections would not be increased to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnels, parking garages, bridge underpass, natural or urban street canyon, below-grade roadway) (BAAQMD, 2009).

For the purposes of this analysis, intersections that exceed the BAAQMD screening criteria should conduct dispersion modeling to determine the potential impact from the impacted intersections. Where the screening values are not exceeded, the project would be determined to be less than significant with respect to localized CO impacts.

Toxic Air Contaminant Analysis

Currently, the SCAQMD only has significance thresholds for single stationary and mobile sources of TAC emissions, such as projects involving truck stops or warehouses (SCAQMD 2003). Of the thresholds that do exist, the SCAQMD's stationary source TAC thresholds of 10 in one million for cancer risk and 1 for hazard index is the most appropriate threshold to evaluate build out of the proposed Plan. Thus, for the purpose of this TAC analysis, the 10 in one million for cancer risk criteria would be used to assess the potential impacts of exposure of new sensitive receptors from existing mobile or stationary emissions sources.

4.2 Greenhouse Gas

Appendix G of the California Environmental Quality Act (CEQA) Guidelines states that a project could have a significant adverse effect related to greenhouse gas emissions if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

As described previously, SCAQMD has provided a tiered approach to evaluate greenhouse gas emissions generated by land use development projects. For the purposes of this analysis, the most appropriate threshold that would apply to the proposed project would be (Tier 2) to determine whether the project is consistent with the SANBAG Regional Greenhouse Gas Reduction Plan. In addition, the evaluation below provides an analysis of the proposed project based on the Tier 3 threshold of 3,500 MT/year CO2e for residential projects.

5.0 Methodology

5.1 Air Quality

This analysis focuses on the nature and magnitude of the change in the air quality environment due to implementation of the proposed project. Air pollutant emissions associated with build out of the proposed project would result from operations of the future development and from traffic volumes generated by the new industrial warehousing uses. Construction activities would also generate air pollutant emissions from construction-related traffic. The net increase in emissions generated by these activities and other secondary sources have been estimated and compared to the applicable SCAQMD thresholds of significance.

Air Quality Management Plan

The City of Highland is under the jurisdiction of the SCAQMD and the AQMP is the applicable air quality plan for the region. Projects that are consistent with the regional population, housing, and employment forecasts identified by SCAG are considered to be consistent with the AQMP growth projections, since the forecast assumptions by SCAG forms the basis of the land use and transportation control portions of the AQMP. Additionally, because SCAG's regional growth forecasts are based upon, among other things, land uses designated in general plans, a project that is consistent with the land use designated in a general plan would also be consistent with the SCAG's regional forecast projections, and thus also with the AQMP growth projections.

SCAQMD's CEQA Handbook suggests an evaluation of the following two criteria to determine whether a project involving a legislative land use action (such as the proposed project) would be consistent or in conflict with the AQMP:

- The project would not generate population and employment growth that would be inconsistent with SCAG's growth forecasts.
- The project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

Consistency Criterion No. 1 refers to the SCAG's growth forecasts and associated assumptions included in the AQMP. The future air quality levels projected in the AQMP are based on SCAG's growth projections, which are based, in part, on the general plans of cities located within the SCAG region. Therefore, projects, uses, and growth that is consistent with the applicable assumptions used in the development of the AQMP would not jeopardize attainment of the air quality levels identified in the AQMP, even if they exceed the SCAQMD's recommended daily emissions thresholds.

Consistency Criterion No. 2 refers to the California Ambient Air Quality Standards. The SCAQMD has identified CO as the best indicator pollutant for determining whether air quality violations would occur since it is most directly related to automobile traffic, the emissions of which have been modeled by the SCAQMD to determine future air quality conditions.

Construction

Short-term construction-generated emissions of criteria air pollutants and ozone precursors associated with the proposed project were modeled using the California Emissions Estimator Model (CalEEMod), Version 2016.3.1, as recommended by SCAQMD. Construction equipment horsepower and load factors are based on the CalEEMod model defaults. The model results were used to determine whether short-term construction-related emissions of criteria air pollutants associated with the project would exceed SCAQMD's applicable regional thresholds and whether mitigation would be required. Modeling Assumptions and output files are provided in Appendix A.

In addition, to determine whether construction activities associated with the proposed project would create significant adverse localized air quality impacts on nearby sensitive receptors, the worst-case daily emissions contribution from the proposed project were compared to SCAQMD's localized significance thresholds (LSTs). The analysis of localized air quality impacts focuses only on the onsite activities of a project, and does not include emissions that are generated off-site such as from on-road haul or delivery truck trips (SCAQMD, 2009).

For analyzing localized air quality impacts, SCAQMD has developed LSTs for three project site sizes: 1 acre, 2 acres and 5 acres. The LSTs established for each of the site acreages represent the amount of pollutant emissions that would not exceed the most stringent applicable federal or state ambient air quality standards. The LST threshold for a 5-acre site was used because it would provide a conservative evaluation of project activities within the 59.03-acre project site as if they would occur within a 5-acre area; thus, concentrating pollutants over a smaller area and increasing potential to exceed an air quality standard.

The SCAQMD only provides LSTs at receptor distances of 82, 164, 328, 656, and 1,640 feet from the emissions source, the LSTs for a receptor distance of 82 feet from the project site is used for determining significance because the closest sensitive receptor is approximately 100 feet from the project site, and the LST receptor distance of 82 is the closest identified by SCAQMD thresholds.

In conducting the localized air quality analysis, which focuses only on onsite emissions, the project's onsite construction emissions generated from combustion sources (e.g., off-road construction equipment) under a worst-case construction scenario were extracted from the CalEEMod model run outputs. Overall, the daily total onsite combustion, mobile, and fugitive dust emissions associated with project construction were combined and evaluated against SCAQMD's LSTs for a 5-acre site. CalEEMod data is provided in the Appendix.

Operations

Long-term (i.e., operational) regional emissions of criteria air pollutants and precursors associated with the proposed project, including mobile- and area-source emissions, were also quantified using the CalEEMod computer model. Area-source emissions, which are widely distributed and made of many small emissions sources (e.g., building heating and cooling units, landscaping equipment, consumer products, painting operations, etc.), were modeled per the size and type of land use proposed. Mass mobile-source emissions were modeled based on the daily vehicle trips that would result from the proposed project. Project trip generation rates were available from the Traffic Impact Analysis prepared for the project by Linscott, Law, and Greenspan (LLG 2017), and the net increase in long-term operational emissions that would be generated by operation of the project was compared with the applicable SCAQMD thresholds for determination of significance.

Localized air quality impacts during operation of the proposed project is also analyzed by extracting the onsite operational emissions from the CalEEMod model run for build out of the project and evaluating those emissions against SCAQMD's applicable operational LSTs. As with construction LST analysis, only onsite- emissions are used in determining a project's potential to impact local air quality for NO_X, CO, PM_{10}, and $PM_{2.5}$.

The analysis discusses impacts from Toxic Air contaminants on a qualitative basis based on compliance with the screening levels. If implementation of the project exceeds the screening levels, then dispersion modeling would be necessary to determine the potential impacts on localized receptor.

5.2 Greenhouse Gas

Construction

SCAQMD recommends the use of CalEEMod for estimating construction and operational emissions associated with land use projects. CalEEMod incorporates the most recent versions of the Emission FACtors (EMFAC) and Off-Road Emissions (OFF-ROAD) models developed by CARB. CalEEMod estimates the emissions of CO2, CH4, and N2O as well as the resulting total CO2e emissions associated with construction-related GHG sources such as off-road construction equipment, material delivery trucks, soil haul trucks, and construction worker vehicles. As CalEEMod currently uses IPCC's 1996 SAR to assign the GWPs for CH4 and N2O, the emissions for these two GHGs were taken from the CalEEMod outputs and converted to CO2e emissions outside of CalEEMod using the updated GWPs from IPCC's AR4. The GHG analysis incorporates similar assumptions as the air quality analysis for consistency. Based on SCAQMD's 2008 Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold document, SCAQMD recommends that for construction GHG emissions the total emissions for a project be amortized over a 30-year period and added to its operational emission estimates (SCAQMD, 2008).

Short-term construction-generated emissions of GHG's associated with the proposed project were modeled using the California default values where specific information was not available, and reasonable assumptions based on default model settings were used to estimate criteria air pollutant and ozone precursor emissions. GHG emissions from construction activities are associated with emissions from the construction vehicles.

Operations

Operational emissions of GHGs, including GHGs generated by direct and indirect sources, are estimated per the recommended methodologies from SCAQMD described above. Direct sources include emissions such as vehicle trips, natural gas consumption, and landscape maintenance. Indirect sources include off-site emissions occurring because of the project operations such as electricity, water consumption, and solid waste disposal. The direct and indirect emissions generated during the project operations were estimated using CalEEMod. Like the calculation of the construction-related GHG emissions, the operational emissions of CH4 and N2O were extracted from the CalEEMod output file and converted to CO2e emissions using the GWPs from IPCC's AR4. Modeling was based on project data (e.g., size and type of proposed uses) and vehicle trip information from the Traffic Impact Analysis prepared for the project by Linscott, Law, and Greenspan (LLG 2017).

6.0 AIR QUALITY ASSESSMENT

6.1 Conflict with or obstruct implementation of the applicable air quality plan

As described above, the project site is in the South Coast Air Basin, which is under the jurisdictional boundaries of the SCAQMD. The SCAQMD and Southern California Association of Governments (SCAG) are responsible for preparing the Air Quality Management Plan (AQMP), which addresses federal and state Clean Air Act (CAA) requirements. The AQMP details goals, policies, and programs for improving air quality in the Basin. In preparation of the AQMP, SCAQMD and SCAG use land use designations contained in General Plan documents to forecast, inventory, and allocate regional emissions from land use and development-related sources. For purposes of analyzing consistency with the AQMP, if a proposed project would have a development density and vehicle trip generation that is substantially greater than what was anticipated in the General Plan, then the proposed project would conflict with the AQMP. On the other hand, if a project's density is consistent with the General Plan, its emissions would be consistent with the assumptions in the AQMP, and the project would not conflict with SCAQMD's attainment plans.

The project site has an existing zoning designation of Agricultural/Equestrian Residential (AG/EQ), which allows 2 units per acre, and would result in a maximum of 118 single-family dwelling units. The proposed project includes a General Plan Land Use amendment and a zoning designation change from AG/EQ to Planned Development (PD), and would develop up to 215 single-family dwelling units. This is an increase of 97 single-family units that would be developed beyond the existing land use designations.

However, the 2016 SCAG Regional Transportation Growth Projections anticipate a 1.5 percent growth rate within the City of Highland through the year 2020. The U.S. Census FactFinder estimated that in 2015 the City of Highland had 16,554 housing units and a very low homeowner vacancy rate of 0.7 percent, which indicates that additional homeowner housing is needed to meet the needs of the City's residents, and to provide a "healthy" housing market. The 215 single-family residences that would be developed by the proposed project would equate to a 1.3 increase in total residential units within the City, which is below the SCAG anticipated 1.5 percent annual increase in housing, and would assist in providing units to fill the City's homeowner housing needs. Thus, the project would comply with Consistency Criterion No. 1 listed above in the Methodology Section.

In regards to Consistency Criterion No. 2, which evaluates the potential of the proposed project to increase the frequency or severity of existing air quality violations, the analysis (described below) indicates that the project would not result in impacts related to an increase in air quality violation, and no significant adverse impacts are anticipated. Therefore, the proposed project is consistent with Consistency Criterion No.2, and impacts related to conflict with or obstruction with an applicable air quality plan would be less than significant.

Overall, implementation of the proposed project would be consistent Consistency Criterion 1 and 2; therefore, impacts related to conflict or obstruction of the AQMP would not occur.

6.2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation

Construction

Construction activities could generate substantial amounts of dust (including PM_{10} and $PM_{2.5}$) primarily from "fugitive" sources (i.e., emissions released through means other than through a stack or tailpipe) and other criteria air pollutants primarily from the operation of heavy equipment construction machinery (primarily diesel operated) and construction worker automobile trips (primarily gasoline operated).

Fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the prevailing weather. Sources of fugitive dust during construction could include vehicle movement over paved and unpaved surfaces, demolition, excavation, earth movement, grading, and wind erosion from exposed surfaces.

Construction activities would also result in the emission of other criteria pollutants from equipment exhaust, construction-related vehicular activity and construction worker automobile trips. Emission levels for construction activities would vary depending on the number and type of equipment, duration of use, operation schedules, and the number of construction workers. Criteria pollutant emissions of ROG and NOx from these emission sources would incrementally add to the regional atmospheric loading of ozone precursors during project construction.

Mobile source emissions, primarily NOx, would result from the use of construction equipment such as graders, backhoes, and cranes. During the finishing phase, paving operations and the application of architectural coatings (i.e., paints) and other building materials would release ROG. The assessment of construction air quality impacts considers each of these potential sources.

It is mandatory for all construction projects in the SCAB to comply with SCAQMD Rule 403 for fugitive dust that include, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the construction site, and maintaining effective cover over exposed areas.

SCAQMD Rule 402 identifies standards to reduce quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause or have natural tendency to cause injury or damage to business or property. SCAQMD Rule 403 regulates operations, which periodically may cause fugitive dust emissions into the atmosphere.

SCAQMD Rule 1108 governs the VOC content of asphalt, Rules 1113 and 1143 that govern the VOC content in architectural coating, paint, thinners, and solvents, was accounted for in the construction emissions modeling. Furthermore, the use of low VOC coatings was included to reduce the ROG emissions that would be generated from the application of architectural coating.

Construction scheduling was based on CalEEMod defaults and typical construction scheduling, and CalEEMod default equipment was used. As shown in **Table 6**, the proposed project would not result in a significant impact to air quality during construction activities. The calculated emission results from CalEEMod demonstrate that the construction of this project would not exceed the SCAQMD thresholds, and that construction related impacts on regional air quality would be less than significant.

Table 6. Peak-Day Unmitigated Construction Emissions (lbs/day)

Construction Season	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Summer	30.8	68.0	39.9	0.06	21.1	12.6
Winter	30.8	68.0	39.8	0.06	21.1	12.6
SCAQMD Significance Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Exceed Significance?	No	No	No	No	No	No

However, to reduce potential impacts related to LSTs (as described below), mitigation measures would be implemented during construction, which would reduce emissions further below thresholds, as shown in **Table 7**.

Table 7. Peak-Day Mitigated Construction Emissions (lbs/day)

Construction Season	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Summer	30.6	5.4	34.1	0.06	2.8	1.5
Winter	30.6	5.4	34.0	0.06	2.8	1.6
SCAQMD Significance Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Exceed Significance?	No	No	No	No	No	No

Operation

Implementation of the proposed project would result in long-term regional emissions of criteria air pollutants and ozone precursors associated with area sources, such as natural gas consumption, landscaping, applications of architectural coatings, and consumer products, in addition to operational mobile emissions. Development of the proposed project would result in 2,047 weekday daily trips.

Operations emissions associated with the proposed project were modeled using CalEEMod. Model defaults were adjusted to reflect project-specific data, including the size and type of the proposed land use and project specific trip rates. The highest modeled operations emissions are presented in **Table 8**. Significance is determined based on the total project contribution to regional criteria pollutant emissions.

Table 8. Operational Emissions (lbs/day)

Source	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Area	14.2	3.9	67.8	0.2	8.4	8.4
Energy	0.2	1.9	0.8	0.01	0.2	0.2
Mobile	4.5	22.2	60.7	0.2	15.1	4.2
Total Emissions	**18.9**	**28.0**	**129.3**	**0.4**	**23.67**	**12.8**
Significance Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceed thresholds?	No	No	No	No	No	No

As shown in Table 9, the operational emissions of criteria pollutants that would be generated by the project would be below the SCAQMD's applicable thresholds. Therefore, the project's operational emissions would not substantially contribute to emissions concentrations that exceed the NAAQS and CAAQS and impacts would be less than significant.

6.3 Expose sensitive receptors to substantial pollutant concentrations.

Sensitive receptors are populations that are more susceptible to the effects of air pollution than are the population at large. The SCAQMD identifies the following as sensitive receptors: residences, long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, churches, schools, playgrounds, child care centers, and athletic facilities.

In an urbanized environment, air pollutant concentrations are usually most prominent along busy streets and at busy intersections, where automotive exhausts can build up while vehicles stop and idle or slow down to approach and proceed through or make turning movements. The primary source of potential air toxics associated with operation of the proposed project include diesel particulates from trucks use and idling on the project site.

Construction activities would be short-term and sensitive receptors would be exposed to air pollutants from construction emissions for short-term limited time during construction activities. Health risk is evaluated assuming a constant exposure to emissions of a 70-year lifetime, 24 hours a day, seven days a week. As the exposure to receptors would be short-term and limited during development activities, impacts from construction activities would be less than significant. Implementation of the proposed project would result in new single-family residential land uses that may utilize solvents, cleaners, and generate motor vehicle emissions, which are not anticipated to emit TAC emissions in appreciable quantities.

CO Hotspots

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during peak commute hours and certain meteorological conditions. Under specific meteorological conditions (e.g., stable conditions that result in poor dispersion), CO concentrations may reach unhealthy levels with respect to local sensitive land uses such as residential areas, schools, and hospitals. Because of reduced speeds and vehicle queuing, "hot spots" typically occur at high traffic volume intersections.

As described above, the proposed project would in 2,047 vehicle trips per day. Of these trips 161 would occur in the a.m. peak hour and 215 would occur in the p.m. peak hour. The TIA prepared for the proposed project (LLG 2017) details that the proposed project would not result in more than 44,000 vehicles per hour at an intersection, which is the volume of peak hour traffic required to generate or contribute to a CO hotspot. In addition, the project would not result in an impact to a CMP location. Therefore, CO hotspots would not result from the proposed project.

Localized Construction Air Quality Impacts – Criteria Air Pollutants

As discussed previously, the daily on-site construction emissions generated by the proposed project were evaluated against SCAQMD's LSTs for a 5-acre site to determine whether the emissions would cause or contribute to adverse localized air quality impacts. The nearest sensitive receptor is approximately 100 feet to the project site under construction; thus, the mass rate look-up table receptor distance of 82 feet is used to evaluate the potential localized air quality impacts associated with the peak day construction emissions from the project.

Table 9 identifies the daily unmitigated, localized on-site emissions that are estimated to occur during the project construction. As shown, the daily unmitigated emissions would exceed the applicable SCAQMD LST thresholds for PM_{10} and $PM_{2.5}$.

Table 9. Unmitigated Localized Daily Construction Emissions (lbs/day)

Construction Season	NOx	CO	PM_{10}	$PM_{2.5}$
Summer	52.3	23.5	20.9	12.6
Winter	52.3	23.5	20.9	12.6
SCAQMD Significance Threshold	**270**	**1,746**	**14**	**8**
Exceed Significance?	No	No	**Yes**	**Yes**

Therefore, **Mitigation Measure 1 & 2** would be implemented to provide additional requirements beyond Rule 403, which requires watering active sites at three times daily and implementation of Tier IV diesel engine standards. **Mitigation Measure 1** requires active areas to be watered three times per day to keep soil moist enough so visible plumes are eliminated, covering disturbed areas, and requirements for vehicles to travel at a maximum of 25 mph on site the project site during construction activities. With implementation of **Mitigation Measure 1**, construction emissions would be reduced below the LST thresholds, as shown in **Table 10**.

Table 10. Mitigated Localized Daily Construction Emissions (lbs/day)

Construction Season	NOx	CO	PM_{10}	$PM_{2.5}$
Summer	2.0	20.9	2.8	1.6
Winter	2.0	20.9	2.8	1.6
SCAQMD Significance Threshold	**270**	**1,746**	**14**	**8**
Exceed Significance?	No	No	No	No

Mitigation Measure 1: The construction plans and specifications shall state that in addition to standard Rule 403 requirements, the following measures shall be incorporated into project construction activities:

- All clearing, grading, earth-moving, or excavation activities shall cease when winds exceed 25 mph per SCAQMD guidelines in order to limit fugitive dust emissions.
- The contractor shall ensure that all disturbed unpaved roads and disturbed areas within the project site are watered at least three (3) times daily during dry weather; preferably in the mid-morning, afternoon, and after work is done for the day.
- The contractor shall ensure that traffic speeds within the project site areas are reduced to 15 miles per hour or less.

Mitigation Measure 2: Implementation of Tier IV Diesel Engine Standards

6.4 Create objectionable odors affecting a substantial number of people

The SCAQMD Air Quality Handbook identifies the following uses as having a potential odor issues: wastewater treatment plants, food processing plants, agricultural uses, chemical plants, composting, refineries, landfills, dairies, and fiberglass moldings. The proposed project would develop single-family residential uses that do not involve the types of uses that would emit objectionable odors affecting a substantial number of people.

In addition, odors generated that could be generated by construction activities are required to follow SCAQMD Rule 402 to prevent odor nuisances on sensitive land uses. SCAQMD Rule 402, Nuisance, states:

> *A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.*

During construction of the proposed project, emissions from construction equipment, such as diesel exhaust, and volatile organic compounds from architectural coatings and paving activities may generate odors. However, these odors would be temporary and localized to the construction site; and therefore, are not expected to affect a substantial number of people. Thus, impacts relating to both operational and construction activity odors from implementation of project would be less than significant.

6.5 Cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The Basin is considered the cumulative study area for air quality. Because the Basin is currently classified as a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, cumulative development consisting of the proposed project along with other reasonably foreseeable future projects in the Basin could violate an air quality standard or contribute to an existing or projected air quality violation. However, based on SCAQMD's cumulative air quality impact methodology, SCAQMD recommends that if an individual project results in air emissions of criteria pollutants (ROG, CO, NO_x, SO_x, PM_{10}, or $PM_{2.5}$) that exceed the SCAQMD's recommended daily thresholds for project-specific impacts, then it would also result in a cumulatively considerable net increase of these criteria pollutants for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.

As shown in Tables 7 and 8, the project's construction emissions would not exceed SCAQMD's daily thresholds. Thus, because the proposed project's construction-period impact would be less than significant, the proposed project would not result in a significant cumulative impact, when considered with other past, present and reasonably foreseeable projects.

Operational emissions associated with the proposed project, as shown in Table 9 would not exceed the SCAQMD's thresholds of significance for any criteria pollutants. Thus, because the proposed project's operational impacts would be less than significant, the proposed project would not result in a cumulatively considerable net increase in any nonattainment pollutants, and impacts would be less than significant.

7.0 GREENHOUSE GAS ASSESSMENT

7.1 The proposed project could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

Construction Emissions

Construction activities would be temporary, but could contribute to global climate change impacts. Construction activities would result in the emission of GHGs from equipment exhaust, construction-related vehicular activity and construction worker automobile trips. Emission levels for construction activities would vary depending on the number and type of equipment, duration of use, operation schedules, and the number of construction workers.

Total estimated construction-related GHG emissions for the proposed project are shown in **Table 11**. As shown, the total estimated unmitigated and mitigated GHG emissions during construction would equal approximately 460 MTCO2e. This would equal to approximately 15.3 MTCO2e per year after amortization over 30 years per SCAQMD methodology.

Table 11. Estimated Total Construction-Related GHG Emissions

Emission Source	Estimated CO_2e Emissions
Total Construction Emissions	460
Annual Construction (Amortized over 30 years)	**15.3**

Notes: CO_2e= carbon dioxide equivalent; MT =metric tons; MT/yr = metric tons per year.

Operational Emissions

Area and indirect sources of GHG emissions associated with the proposed project would primarily result from electricity and natural gas consumption, water transport (the energy used to pump water), and solid waste generation. GHG emissions from electricity consumed within the project site would be generated off-site by fuel combustion at the electricity provider. GHG emissions from water transport are also indirect emissions resulting from the energy required to transport water from its source. In addition, the project would generate GHG emissions from motor vehicle trips.

The estimated operational GHG emissions that would be generated from implementation of the project are shown in **Table 12**. Additionally, in accordance with SCAQMD's recommendation, the amortized construction-related GHG emissions from Table 11 is added to the operational emissions estimate to determine the total annual GHG emissions.

As shown in Table 13, the proposed project's annual GHG emission generation would be approximately 4,326.3 $MTCO_2e$ per year (detailed calculations are included in Appendix A of this report), which would exceed SCAQMD's Tier 3 threshold of 3,500 $MTCO_2e$ per year for residential land uses. Vehicular emissions related to operations would consists of 70.4 percent of these emissions; and energy consumption from heating, cooling, lighting, and appliance usage would generate 23.4 percent of these emissions.

Table 12. Estimated Construction and Operations-Related GHG Emissions

Emission Source	Estimated Emissions CO_2e (MT/yr)
Construction	15.3
Annual Mitigated Construction (Amortized over 30 years)	
Project Operations	
Area Sources	45.19
Energy Consumption	1,012.6
Mobile Sources	3,046.0
Solid Waste	119.8
Water Consumption	102.7
Total (Construction and Operational Emissions)	**4,326.3**
Threshold	**3,500**
Exceed Threshold?	Yes

Notes: CO_2e= carbon dioxide equivalent; MT/yr = metric tons per year; %=percent.

However, the proposed project would meet the Tier 2 threshold of being consistent with the applicable greenhouse gas reduction plan. Although most of the "local measures" in the SANBAG Regional Greenhouse Gas Reduction Plan apply to city-wide actions that are not related to specific development projects, such as the proposed project, the following project design features of the proposed project are consistent with the Regional Greenhouse Gas Reduction Plan and include: incorporation of passive solar design techniques including building orientation, energy-saving materials, roof overhangs, and window and door placement; participate in incentive programs for incorporation of solar and photovoltaic panels (active solar); provision of secure space for bicycle storage; use of native and drought-tolerant landscaping (xeriscaping) and drip irrigation to conserve water resources.

In addition, and as described previously, the project includes design features that are consistent with the Regional Greenhouse Gas Reduction Plan, and the City of Highland would require the project to meet the performance standard of 29 percent reduction below projected BAU emissions for new projects. The Regional Greenhouse Gas Reduction Plan anticipates these measures to include energy-efficient appliances and alternative energy sources, water conservation, landscaping, and site design, which are included in the proposed project, as described above. Implementation of the performance standards for new development is ensured during the City's approval and development permitting process. Thus, the proposed project would be consistent with the Regional Greenhouse Gas Reduction Plan, and would meet the Tier 2 threshold. Therefore, impacts related to the generation of GHGs would be less than significant.

7.2 The proposed project could conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

As described above, the City of Highland is a participant in the SANBAG Regional Greenhouse Gas Reduction Plan. The specific goals and actions included in the SANBAG Regional Greenhouse Gas Reduction Plan that are applicable to the proposed project include those pertaining to energy and water use reduction, promotion of green building measures, waste reduction, and reduction in vehicle miles traveled. The proposed project would be required to include all mandatory green building measures for new developments under the CALGreen Code, as required by the City's Municipal Code Chapter 15.38, which requires that the new buildings reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low pollutant emitting finish materials. In addition, the code requires that all landscaping comply with water efficient landscaping requirements. Furthermore, implementation of CALGreen compliant building and appliance standards would result in water, energy, and construction waste reductions for the proposed project.

Also as described above, the project includes design features that are consistent with the Regional Greenhouse Gas Reduction Plan, and the City of Highland would require the project to meet the performance standard of 29 percent reduction below projected BAU emissions for new projects. Thus, the proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for reducing the emissions of greenhouse gases, and impacts would be less than significant.

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Appendix A CalEEMod Results

HeatherGlen Residential Project

South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	203.00	Dwelling Unit	59.03	365,400.00	581

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project- 203 lots on 59.03 acres

Construction Phase - No demolition

Vehicle Trips - Traffic study trip gen info

Woodstoves - No wood burning or fireplaces

Construction Off-road Equipment Mitigation - Rule 403

Area Mitigation - Rule 1113

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Mobile Land Use Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	100	50
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	100
tblConstDustMitigation	WaterExposedAreaPM10PercentReduction	61	70
tblConstDustMitigation	WaterExposedAreaPM25PercentReduction	61	70
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	25
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	1,110.00	230.00
tblConstructionPhase	NumDays	70.00	0.00
tblFireplaces	NumberWood	10.15	0.00
tblLandUse	LotAcreage	65.91	59.03

tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	WD_TR	9.52	10.08

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					
2017											0.0000	406.8168	406.8168	0.1199	0.0000	409.8147
2018											0.0000	457.9942	457.9942	0.0847	0.0000	460.1112
2019											0.0000	61.5253	61.5253	0.0147	0.0000	61.8926
Maximum											**0.0000**	**457.9942**	**457.9942**	**0.1199**	**0.0000**	**460.1112**

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					
2017											0.0000	406.8164	406.8164	0.1199	0.0000	409.8143
2018											0.0000	457.9938	457.9938	0.0847	0.0000	460.1108
2019											0.0000	61.5252	61.5252	0.0147	0.0000	61.8926
Maximum											**0.0000**	**457.9938**	**457.9938**	**0.1199**	**0.0000**	**460.1108**

	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	N20	CO2e
Percent Reduction	**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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

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											13.5855	44.8553	58.4408	0.0677	7.6000e-004	60.3587
Energy											0.0000	1,008.0451	1,008.0451	0.0327	0.0126	1,012.6026
Mobile											0.0000	3,041.9349	3,041.9349	0.1628	0.0000	3,046.0056
Waste											48.3545	0.0000	48.3545	2.8577	0.0000	119.7962
Water											4.1961	84.3894	88.5854	0.4345	0.0109	102.6943
Total											**66.1360**	**4,179.2246**	**4,245.3606**	**3.5553**	**0.0242**	**4,341.4573**

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											0.0000	44.8553	44.8553	4.1500e-003	7.6000e-004	45.1855
Energy											0.0000	1,008.0451	1,008.0451	0.0327	0.0126	1,012.6026
Mobile											0.0000	3,041.9349	3,041.9349	0.1628	0.0000	3,046.0056
Waste											48.3545	0.0000	48.3545	2.8577	0.0000	119.7962
Water											4.1961	84.3894	88.5854	0.4345	0.0109	102.6943
Total											**52.5506**	**4,179.2246**	**4,231.7752**	**3.4918**	**0.0242**	**4,326.2841**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**20.54**	**0.00**	**0.32**	**1.79**	**0.00**	**0.35**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2017	5/31/2017	5	0	
2	Site Preparation	Site Preparation	6/1/2017	7/26/2017	5	40	
3	Grading	Grading	7/27/2017	12/27/2017	5	110	
4	Building Construction	Building Construction	12/28/2017	11/14/2018	5	230	
5	Paving	Paving	11/15/2018	2/27/2019	5	75	
6	Architectural Coating	Architectural Coating	2/28/2019	6/12/2019	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 275

Acres of Paving: 0

Residential Indoor: 739,935; Residential Outdoor: 246,645; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	73.00	22.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2017

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2017

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2017

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	70.6688	70.6688	0.0217	0.0000	71.2101
Total											**0.0000**	**70.6688**	**70.6688**	**0.0217**	**0.0000**	**71.2101**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.9019	3.9019	1.5000e-004	0.0000	3.9056
Total											**0.0000**	**3.9019**	**3.9019**	**1.5000e-004**	**0.0000**	**3.9056**

3.3 Site Preparation - 2017

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	70.6687	70.6687	0.0217	0.0000	71.2100
Total											**0.0000**	**70.6687**	**70.6687**	**0.0217**	**0.0000**	**71.2100**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.9019	3.9019	1.5000e-004	0.0000	3.9056
Total											**0.0000**	**3.9019**	**3.9019**	**1.5000e-004**	**0.0000**	**3.9056**

3.4 Grading - 2017

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	316.5791	316.5791	0.0970	0.0000	319.0041
Total											**0.0000**	**316.5791**	**316.5791**	**0.0970**	**0.0000**	**319.0041**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	11.9224	11.9224	4.5000e-004	0.0000	11.9337
Total											**0.0000**	**11.9224**	**11.9224**	**4.5000e-004**	**0.0000**	**11.9337**

3.4 Grading - 2017

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	316.5788	316.5788	0.0970	0.0000	319.0037
Total											**0.0000**	**316.5788**	**316.5788**	**0.0970**	**0.0000**	**319.0037**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	11.9224	11.9224	4.5000e-004	0.0000	11.9337
Total											**0.0000**	**11.9224**	**11.9224**	**4.5000e-004**	**0.0000**	**11.9337**

3.5 Building Construction - 2017

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											0.0000	2.4049	2.4049	5.9000e-004	0.0000	2.4197
Total											**0.0000**	**2.4049**	**2.4049**	**5.9000e-004**	**0.0000**	**2.4197**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.5485	0.5485	4.0000e-005	0.0000	0.5496
Worker											0.0000	0.7912	0.7912	3.0000e-005	0.0000	0.7920
Total											**0.0000**	**1.3397**	**1.3397**	**7.0000e-005**	**0.0000**	**1.3415**

3.5 Building Construction - 2017

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											0.0000	2.4049	2.4049	5.9000e-004	0.0000	2.4197
Total											**0.0000**	**2.4049**	**2.4049**	**5.9000e-004**	**0.0000**	**2.4197**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.5485	0.5485	4.0000e-005	0.0000	0.5496
Worker											0.0000	0.7912	0.7912	3.0000e-005	0.0000	0.7920
Total											**0.0000**	**1.3397**	**1.3397**	**7.0000e-005**	**0.0000**	**1.3415**

3.5 Building Construction - 2018

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											0.0000	271.0547	271.0547	0.0664	0.0000	272.7149
Total											**0.0000**	**271.0547**	**271.0547**	**0.0664**	**0.0000**	**272.7149**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	62.3216	62.3216	4.4900e-003	0.0000	62.4339
Worker											0.0000	87.6714	87.6714	3.0000e-003	0.0000	87.7464
Total											**0.0000**	**149.9930**	**149.9930**	**7.4900e-003**	**0.0000**	**150.1803**

3.5 Building Construction - 2018

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											0.0000	271.0543	271.0543	0.0664	0.0000	272.7145
Total											**0.0000**	**271.0543**	**271.0543**	**0.0664**	**0.0000**	**272.7145**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	62.3216	62.3216	4.4900e-003	0.0000	62.4339
Worker											0.0000	87.6714	87.6714	3.0000e-003	0.0000	87.7464
Total											**0.0000**	**149.9930**	**149.9930**	**7.4900e-003**	**0.0000**	**150.1803**

3.6 Paving - 2018

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											0.0000	34.3392	34.3392	0.0107	0.0000	34.6064
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**34.3392**	**34.3392**	**0.0107**	**0.0000**	**34.6064**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	2.6074	2.6074	9.0000e-005	0.0000	2.6096
Total											**0.0000**	**2.6074**	**2.6074**	**9.0000e-005**	**0.0000**	**2.6096**

3.6 Paving - 2018

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											0.0000	34.3391	34.3391	0.0107	0.0000	34.6064
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**34.3391**	**34.3391**	**0.0107**	**0.0000**	**34.6064**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	2.6074	2.6074	9.0000e-005	0.0000	2.6096
Total											**0.0000**	**2.6074**	**2.6074**	**9.0000e-005**	**0.0000**	**2.6096**

3.6 Paving - 2019

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											0.0000	42.9979	42.9979	0.0136	0.0000	43.3380
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**42.9979**	**42.9979**	**0.0136**	**0.0000**	**43.3380**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2138	3.2138	1.0000e-004	0.0000	3.2163
Total											**0.0000**	**3.2138**	**3.2138**	**1.0000e-004**	**0.0000**	**3.2163**

3.6 Paving - 2019

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											0.0000	42.9978	42.9978	0.0136	0.0000	43.3379
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**42.9978**	**42.9978**	**0.0136**	**0.0000**	**43.3379**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2138	3.2138	1.0000e-004	0.0000	3.2163
Total											**0.0000**	**3.2138**	**3.2138**	**1.0000e-004**	**0.0000**	**3.2163**

3.7 Architectural Coating - 2019

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	9.5747	9.5747	8.1000e-004	0.0000	9.5949
Total											**0.0000**	**9.5747**	**9.5747**	**8.1000e-004**	**0.0000**	**9.5949**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	5.7389	5.7389	1.8000e-004	0.0000	5.7434
Total											**0.0000**	**5.7389**	**5.7389**	**1.8000e-004**	**0.0000**	**5.7434**

3.7 Architectural Coating - 2019

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	9.5747	9.5747	8.1000e-004	0.0000	9.5949
Total											**0.0000**	**9.5747**	**9.5747**	**8.1000e-004**	**0.0000**	**9.5949**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	5.7389	5.7389	1.8000e-004	0.0000	5.7434
Total											**0.0000**	**5.7389**	**5.7389**	**1.8000e-004**	**0.0000**	**5.7434**

4.0 Operational Detail - Mobile

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											0.0000	3,041.934 9	3,041.934 9	0.1628	0.0000	3,046.005 6
Unmitigated											0.0000	3,041.934 9	3,041.934 9	0.1628	0.0000	3,046.005 6

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	2,046.24	2,011.73	1749.86	6,830,784	6,830,784
Total	2,046.24	2,011.73	1,749.86	6,830,784	6,830,784

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
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	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.548893	0.044275	0.199565	0.124385	0.017503	0.005874	0.020174	0.028962	0.001990	0.002015	0.004673	0.000702	0.000989

5.0 Energy Detail

Historical Energy Use: N

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											0.0000	605.8603	605.8603	0.0250	5.1800e-003	608.0277
Electricity Unmitigated											0.0000	605.8603	605.8603	0.0250	5.1800e-003	608.0277
NaturalGas Mitigated											0.0000	402.1848	402.1848	7.7100e-003	7.3700e-003	404.5748
NaturalGas Unmitigated											0.0000	402.1848	402.1848	7.7100e-003	7.3700e-003	404.5748

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/yr	tons/yr										MT/yr					
Single Family Housing	7.53666e+006											0.0000	402.1848	402.1848	7.7100e-003	7.3700e-003	404.5748
Total												**0.0000**	**402.1848**	**402.1848**	**7.7100e-003**	**7.3700e-003**	**404.5748**

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/yr	tons/yr										MT/yr					
Single Family Housing	7.53666e+006											0.0000	402.1848	402.1848	7.7100e-003	7.3700e-003	404.5748
Total												**0.0000**	**402.1848**	**402.1848**	**7.7100e-003**	**7.3700e-003**	**404.5748**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.90151e +006	605.8603	0.0250	5.1800e-003	608.0277
Total		**605.8603**	**0.0250**	**5.1800e-003**	**608.0277**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.90151e +006	605.8603	0.0250	5.1800e-003	608.0277
Total		**605.8603**	**0.0250**	**5.1800e-003**	**608.0277**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	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											0.0000	44.8553	44.8553	4.1500e-003	7.6000e-004	45.1855
Unmitigated											13.5855	44.8553	58.4408	0.0677	7.6000e-004	60.3587

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth											13.5855	41.4357	55.0211	0.0643	7.6000e-004	56.8551
Landscaping											0.0000	3.4197	3.4197	3.3600e-003	0.0000	3.5036
Total											**13.5855**	**44.8553**	**58.4408**	**0.0677**	**7.6000e-004**	**60.3587**

6.2 Area by SubCategory

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth											0.0000	41.4357	41.4357	7.9000e-004	7.6000e-004	41.6819
Landscaping											0.0000	3.4197	3.4197	3.3600e-003	0.0000	3.5036
Total											**0.0000**	**44.8553**	**44.8553**	**4.1500e-003**	**7.6000e-004**	**45.1855**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	88.5854	0.4345	0.0109	102.6943
Unmitigated	88.5854	0.4345	0.0109	102.6943

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	13.2263 / 8.3383	88.5854	0.4345	0.0109	102.6943
Total		**88.5854**	**0.4345**	**0.0109**	**102.6943**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	13.2263 / 8.3383	88.5854	0.4345	0.0109	102.6943
Total		**88.5854**	**0.4345**	**0.0109**	**102.6943**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	48.3545	2.8577	0.0000	119.7962
Unmitigated	48.3545	2.8577	0.0000	119.7962

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	238.21	48.3545	2.8577	0.0000	119.7962
Total		**48.3545**	**2.8577**	**0.0000**	**119.7962**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	238.21	48.3545	2.8577	0.0000	119.7962
Total		**48.3545**	**2.8577**	**0.0000**	**119.7962**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

HeatherGlen Residential Project

South Coast Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	203.00	Dwelling Unit	59.03	365,400.00	581

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project- 203 lots on 59.03 acres

Construction Phase - No demolition

Vehicle Trips - Traffic study trip gen info

Woodstoves - No wood burning or fireplaces

Construction Off-road Equipment Mitigation - Rule 403

Area Mitigation - Rule 1113

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Mobile Land Use Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	100	50
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	100
tblConstDustMitigation	WaterExposedAreaPM10PercentReduction	61	70
tblConstDustMitigation	WaterExposedAreaPM25PercentReduction	61	70
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	25
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

HeatherGlen Residential Project - South Coast Air Basin, Summer

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	1,110.00	230.00
tblConstructionPhase	NumDays	70.00	0.00
tblFireplaces	NumberWood	10.15	0.00
tblLandUse	LotAcreage	65.91	59.03

tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	WD_TR	9.52	10.08

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2017	5.8684	68.0280	39.9190	0.0645	18.2675	3.0746	21.1477	9.9840	2.8286	12.6339	0.0000	6,595.622 1	6,595.622 1	1.9535	0.0000	6,644.460 3
2018	3.1641	26.3440	21.9111	0.0416	0.9568	1.5260	2.4827	0.2569	1.4346	1.6916	0.0000	4,120.021 0	4,120.021 0	0.7204	0.0000	4,137.886 7
2019	30.8246	15.2950	15.3367	0.0246	0.1677	0.8259	0.9936	0.0445	0.7598	0.8043	0.0000	2,434.056 7	2,434.056 7	0.7196	0.0000	2,452.047 7
Maximum	**30.8246**	**68.0280**	**39.9190**	**0.0645**	**18.2675**	**3.0746**	**21.1477**	**9.9840**	**2.8286**	**12.6339**	**0.0000**	**6,595.622 1**	**6,595.622 1**	**1.9535**	**0.0000**	**6,644.460 3**

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	lb/day										lb/day					
2017	0.8816	5.4041	34.1356	0.0645	2.7362	0.1034	2.8000	1.5000	0.1033	1.5637	0.0000	6,595.622 1	6,595.622 1	1.9535	0.0000	6,644.460 3
2018	0.8125	5.1887	21.7909	0.0416	0.1470	0.0669	0.2139	0.0582	0.0655	0.1237	0.0000	4,120.021 0	4,120.021 0	0.7204	0.0000	4,137.886 7
2019	30.5879	1.2663	17.9676	0.0246	0.0219	0.0387	0.0606	8.6900e-003	0.0386	0.0473	0.0000	2,434.056 7	2,434.056 7	0.7196	0.0000	2,452.047 7
Maximum	**30.5879**	**5.4041**	**34.1356**	**0.0645**	**2.7362**	**0.1034**	**2.8000**	**1.5000**	**0.1033**	**1.5637**	**0.0000**	**6,595.622 1**	**6,595.622 1**	**1.9535**	**0.0000**	**6,644.460 3**

	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	N20	CO2e
Percent Reduction	19.01	89.19	4.24	0.00	85.02	96.15	87.51	84.77	95.87	88.53	0.00	0.00	0.00	0.00	0.00	0.00

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	lb/day										lb/day					
Area	14.1903	3.8689	67.8044	0.1815		8.4404	8.4404		8.4404	8.4404	1,198.0326	3,684.1561	4,882.1887	5.7002	0.0670	5,044.6566
Energy	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
Mobile	4.4694	21.6022	60.7204	0.1934	14.8618	0.2156	15.0774	3.9765	0.2028	4.1794		19,622.4110	19,622.4110	1.0193		19,647.8930
Total	**18.8823**	**27.3740**	**129.3345**	**0.3870**	**14.8618**	**8.8098**	**23.6716**	**3.9765**	**8.7971**	**12.7736**	**1,198.0326**	**25,735.7884**	**26,933.8210**	**6.7660**	**0.1115**	**27,136.2066**

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	lb/day										lb/day					
Area	8.7115	3.0573	18.0487	0.0192		0.3236	0.3236		0.3236	0.3236	0.0000	3,684.1561	3,684.1561	0.0996	0.0670	3,706.6100
Energy	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
Mobile	4.4694	21.6022	60.7204	0.1934	14.8618	0.2156	15.0774	3.9765	0.2028	4.1794		19,622.4110	19,622.4110	1.0193		19,647.8930
Total	**13.4035**	**26.5623**	**79.5788**	**0.2247**	**14.8618**	**0.6931**	**15.5549**	**3.9765**	**0.6803**	**4.6569**	**0.0000**	**25,735.7884**	**25,735.7884**	**1.1655**	**0.1115**	**25,798.1600**

	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	N20	CO2e
Percent Reduction	29.02	2.97	38.47	41.95	0.00	92.13	34.29	0.00	92.27	63.54	100.00	0.00	4.45	82.77	0.00	4.93

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2017	5/31/2017	5	0	
2	Site Preparation	Site Preparation	6/1/2017	7/26/2017	5	40	
3	Grading	Grading	7/27/2017	12/27/2017	5	110	
4	Building Construction	Building Construction	12/28/2017	11/14/2018	5	230	
5	Paving	Paving	11/15/2018	2/27/2019	5	75	
6	Architectural Coating	Architectural Coating	2/28/2019	6/12/2019	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 275

Acres of Paving: 0

Residential Indoor: 739,935; Residential Outdoor: 246,645; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	73.00	22.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2017

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	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2017

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	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2017

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	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.9608	52.2754	23.4554	0.0380		2.8786	2.8786		2.6483	2.6483		3,894.950 0	3,894.950 0	1.1934		3,924.785 2
Total	**4.9608**	**52.2754**	**23.4554**	**0.0380**	**18.0663**	**2.8786**	**20.9448**	**9.9307**	**2.6483**	**12.5790**		**3,894.950 0**	**3,894.950 0**	**1.1934**		**3,924.785 2**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1081	0.0796	1.0228	2.2700e-003	0.2012	1.6700e-003	0.2029	0.0534	1.5400e-003	0.0549		225.6622	225.6622	8.5200e-003		225.8752
Total	**0.1081**	**0.0796**	**1.0228**	**2.2700e-003**	**0.2012**	**1.6700e-003**	**0.2029**	**0.0534**	**1.5400e-003**	**0.0549**		**225.6622**	**225.6622**	**8.5200e-003**		**225.8752**

3.3 Site Preparation - 2017

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	lb/day										lb/day					
Fugitive Dust					2.7099	0.0000	2.7099	1.4896	0.0000	1.4896			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0380		0.0621	0.0621		0.0621	0.0621	0.0000	3,894.950 0	3,894.950 0	1.1934		3,924.785 2
Total	**0.4656**	**2.0175**	**20.8690**	**0.0380**	**2.7099**	**0.0621**	**2.7720**	**1.4896**	**0.0621**	**1.5517**	**0.0000**	**3,894.950 0**	**3,894.950 0**	**1.1934**		**3,924.785 2**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1081	0.0796	1.0228	2.2700e-003	0.0263	1.6700e-003	0.0280	0.0104	1.5400e-003	0.0120		225.6622	225.6622	8.5200e-003		225.8752
Total	**0.1081**	**0.0796**	**1.0228**	**2.2700e-003**	**0.0263**	**1.6700e-003**	**0.0280**	**0.0104**	**1.5400e-003**	**0.0120**		**225.6622**	**225.6622**	**8.5200e-003**		**225.8752**

3.4 Grading - 2017

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.7483	67.9396	38.7826	0.0620		3.0727	3.0727		2.8269	2.8269		6,344.886 3	6,344.886 3	1.9441		6,393.487 9
Total	**5.7483**	**67.9396**	**38.7826**	**0.0620**	**8.6733**	**3.0727**	**11.7460**	**3.5965**	**2.8269**	**6.4234**		**6,344.886 3**	**6,344.886 3**	**1.9441**		**6,393.487 9**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1201	0.0884	1.1365	2.5200e-003	0.2236	1.8600e-003	0.2254	0.0593	1.7100e-003	0.0610		250.7358	250.7358	9.4700e-003		250.9725
Total	**0.1201**	**0.0884**	**1.1365**	**2.5200e-003**	**0.2236**	**1.8600e-003**	**0.2254**	**0.0593**	**1.7100e-003**	**0.0610**		**250.7358**	**250.7358**	**9.4700e-003**		**250.9725**

3.4 Grading - 2017

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	lb/day										lb/day					
Fugitive Dust					1.3010	0.0000	1.3010	0.5395	0.0000	0.5395			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0620		0.1015	0.1015		0.1015	0.1015	0.0000	6,344.886 3	6,344.886 3	1.9441		6,393.487 8
Total	**0.7616**	**3.3000**	**32.9991**	**0.0620**	**1.3010**	**0.1015**	**1.4025**	**0.5395**	**0.1015**	**0.6410**	**0.0000**	**6,344.886 3**	**6,344.886 3**	**1.9441**		**6,393.487 8**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1201	0.0884	1.1365	2.5200e-003	0.0292	1.8600e-003	0.0311	0.0116	1.7100e-003	0.0133		250.7358	250.7358	9.4700e-003		250.9725
Total	**0.1201**	**0.0884**	**1.1365**	**2.5200e-003**	**0.0292**	**1.8600e-003**	**0.0311**	**0.0116**	**1.7100e-003**	**0.0133**		**250.7358**	**250.7358**	**9.4700e-003**		**250.9725**

3.5 Building Construction - 2017

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	lb/day										lb/day					
Off-Road	3.1149	26.5546	18.1825	0.0269		1.7879	1.7879		1.6791	1.6791		2,650.979 7	2,650.979 7	0.6531		2,667.307 8
Total	**3.1149**	**26.5546**	**18.1825**	**0.0269**		**1.7879**	**1.7879**		**1.6791**	**1.6791**		**2,650.979 7**	**2,650.979 7**	**0.6531**		**2,667.307 8**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1077	2.8467	0.7532	5.7400e-003	0.1408	0.0247	0.1654	0.0405	0.0236	0.0641		611.2865	611.2865	0.0443		612.3938
Worker	0.4383	0.3227	4.1482	9.2000e-003	0.8160	6.7700e-003	0.8227	0.2164	6.2500e-003	0.2227		915.1856	915.1856	0.0346		916.0495
Total	**0.5460**	**3.1694**	**4.9013**	**0.0149**	**0.9568**	**0.0314**	**0.9882**	**0.2569**	**0.0298**	**0.2868**		**1,526.472 2**	**1,526.472 2**	**0.0789**		**1,528.443 3**

3.5 Building Construction - 2017

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	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,650.9797	2,650.9797	0.6531		2,667.3078
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,650.9797**	**2,650.9797**	**0.6531**		**2,667.3078**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1077	2.8467	0.7532	5.7400e-003	0.0404	0.0247	0.0651	0.0159	0.0236	0.0395		611.2865	611.2865	0.0443		612.3938
Worker	0.4383	0.3227	4.1482	9.2000e-003	0.1066	6.7700e-003	0.1134	0.0423	6.2500e-003	0.0485		915.1856	915.1856	0.0346		916.0495
Total	**0.5460**	**3.1694**	**4.9013**	**0.0149**	**0.1470**	**0.0314**	**0.1785**	**0.0582**	**0.0298**	**0.0880**		**1,526.4722**	**1,526.4722**	**0.0789**		**1,528.4433**

3.5 Building Construction - 2018

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	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**		**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0946	2.6728	0.6784	5.7100e-003	0.1408	0.0195	0.1603	0.0405	0.0187	0.0592		609.4202	609.4202	0.0421		610.4726
Worker	0.3900	0.2812	3.6522	8.9400e-003	0.8160	6.5400e-003	0.8225	0.2164	6.0300e-003	0.2224		889.6657	889.6657	0.0304		890.4258
Total	**0.4846**	**2.9540**	**4.3306**	**0.0147**	**0.9568**	**0.0261**	**0.9828**	**0.2569**	**0.0247**	**0.2817**		**1,499.0859**	**1,499.0859**	**0.0725**		**1,500.8984**

3.5 Building Construction - 2018

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	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,620.935 1	2,620.935 1	0.6421		2,636.988 3
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,620.935 1**	**2,620.935 1**	**0.6421**		**2,636.988 3**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0946	2.6728	0.6784	5.7100e-003	0.0404	0.0195	0.0600	0.0159	0.0187	0.0346		609.4202	609.4202	0.0421		610.4726
Worker	0.3900	0.2812	3.6522	8.9400e-003	0.1066	6.5400e-003	0.1131	0.0423	6.0300e-003	0.0483		889.6657	889.6657	0.0304		890.4258
Total	**0.4846**	**2.9540**	**4.3306**	**0.0147**	**0.1470**	**0.0261**	**0.1731**	**0.0582**	**0.0247**	**0.0829**		**1,499.085 9**	**1,499.085 9**	**0.0725**		**1,500.898 4**

3.6 Paving - 2018

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	lb/day										lb/day					
Off-Road	1.6437	17.5209	14.7964	0.0228		0.9561	0.9561		0.8797	0.8797		2,294.0887	2,294.0887	0.7142		2,311.9432
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6437**	**17.5209**	**14.7964**	**0.0228**		**0.9561**	**0.9561**		**0.8797**	**0.8797**		**2,294.0887**	**2,294.0887**	**0.7142**		**2,311.9432**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0801	0.0578	0.7505	1.8400e-003	0.1677	1.3400e-003	0.1690	0.0445	1.2400e-003	0.0457		182.8080	182.8080	6.2500e-003		182.9642
Total	**0.0801**	**0.0578**	**0.7505**	**1.8400e-003**	**0.1677**	**1.3400e-003**	**0.1690**	**0.0445**	**1.2400e-003**	**0.0457**		**182.8080**	**182.8080**	**6.2500e-003**		**182.9642**

3.6 Paving - 2018

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	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,294.0887	2,294.0887	0.7142		2,311.9432
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2805**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,294.0887**	**2,294.0887**	**0.7142**		**2,311.9432**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0801	0.0578	0.7505	1.8400e-003	0.0219	1.3400e-003	0.0233	8.6900e-003	1.2400e-003	9.9300e-003		182.8080	182.8080	6.2500e-003		182.9642
Total	**0.0801**	**0.0578**	**0.7505**	**1.8400e-003**	**0.0219**	**1.3400e-003**	**0.0233**	**8.6900e-003**	**1.2400e-003**	**9.9300e-003**		**182.8080**	**182.8080**	**6.2500e-003**		**182.9642**

3.6 Paving - 2019

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	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586		2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**		**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0728	0.0510	0.6719	1.7800e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		177.0542	177.0542	5.5500e-003		177.1930
Total	**0.0728**	**0.0510**	**0.6719**	**1.7800e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**177.0542**	**177.0542**	**5.5500e-003**		**177.1930**

3.6 Paving - 2019

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	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2805**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0728	0.0510	0.6719	1.7800e-003	0.0219	1.3100e-003	0.0232	8.6900e-003	1.2100e-003	9.9000e-003		177.0542	177.0542	5.5500e-003		177.1930
Total	**0.0728**	**0.0510**	**0.6719**	**1.7800e-003**	**0.0219**	**1.3100e-003**	**0.0232**	**8.6900e-003**	**1.2100e-003**	**9.9000e-003**		**177.0542**	**177.0542**	**5.5500e-003**		**177.1930**

3.7 Architectural Coating - 2019

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	lb/day										lb/day					
Archit. Coating	30.4853					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**30.7518**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0728	0.0510	0.6719	1.7800e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		177.0542	177.0542	5.5500e-003		177.1930
Total	**0.0728**	**0.0510**	**0.6719**	**1.7800e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**177.0542**	**177.0542**	**5.5500e-003**		**177.1930**

3.7 Architectural Coating - 2019

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	lb/day										lb/day					
Archit. Coating	30.4853					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**30.5150**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0728	0.0510	0.6719	1.7800e-003	0.0219	1.3100e-003	0.0232	8.6900e-003	1.2100e-003	9.9000e-003		177.0542	177.0542	5.5500e-003		177.1930
Total	**0.0728**	**0.0510**	**0.6719**	**1.7800e-003**	**0.0219**	**1.3100e-003**	**0.0232**	**8.6900e-003**	**1.2100e-003**	**9.9000e-003**		**177.0542**	**177.0542**	**5.5500e-003**		**177.1930**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	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
	lb/day										lb/day					
Mitigated	4.4694	21.6022	60.7204	0.1934	14.8618	0.2156	15.0774	3.9765	0.2028	4.1794		19,622.4110	19,622.4110	1.0193		19,647.8930
Unmitigated	4.4694	21.6022	60.7204	0.1934	14.8618	0.2156	15.0774	3.9765	0.2028	4.1794		19,622.4110	19,622.4110	1.0193		19,647.8930

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	2,046.24	2,011.73	1749.86	6,830,784	6,830,784
Total	2,046.24	2,011.73	1,749.86	6,830,784	6,830,784

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
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	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.548893	0.044275	0.199565	0.124385	0.017503	0.005874	0.020174	0.028962	0.001990	0.002015	0.004673	0.000702	0.000989

5.0 Energy Detail

Historical Energy Use: N

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	lb/day										lb/day					
NaturalGas Mitigated	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
NaturalGas Unmitigated	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570

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/yr	lb/day										lb/day					
Single Family Housing	20648.4	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
Total		**0.2227**	**1.9029**	**0.8097**	**0.0122**		**0.1539**	**0.1539**		**0.1539**	**0.1539**		**2,429.2213**	**2,429.2213**	**0.0466**	**0.0445**	**2,443.6570**

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/yr	lb/day										lb/day					
Single Family Housing	20.6484	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
Total		**0.2227**	**1.9029**	**0.8097**	**0.0122**		**0.1539**	**0.1539**		**0.1539**	**0.1539**		**2,429.2213**	**2,429.2213**	**0.0466**	**0.0445**	**2,443.6570**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	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	lb/day										lb/day					
Mitigated	8.7115	3.0573	18.0487	0.0192		0.3236	0.3236		0.3236	0.3236	0.0000	3,684.1561	3,684.1561	0.0996	0.0670	3,706.6100
Unmitigated	14.1903	3.8689	67.8044	0.1815		8.4404	8.4404		8.4404	8.4404	1,198.0326	3,684.1561	4,882.1887	5.7002	0.0670	5,044.6566

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	lb/day										lb/day					
Architectural Coating	0.6264					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.2349					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.8138	3.6740	50.9737	0.1806		8.3482	8.3482		8.3482	8.3482	1,198.0326	3,654.0000	4,852.0326	5.6706	0.0670	5,013.7605
Landscaping	0.5152	0.1950	16.8307	8.8000e-004		0.0922	0.0922		0.0922	0.0922		30.1561	30.1561	0.0296		30.8961
Total	**14.1903**	**3.8689**	**67.8044**	**0.1815**		**8.4404**	**8.4404**		**8.4404**	**8.4404**	**1,198.0326**	**3,684.1561**	**4,882.1887**	**5.7002**	**0.0670**	**5,044.6566**

6.2 Area by SubCategory

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	lb/day										lb/day					
Architectural Coating	0.6264					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.2349					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.3350	2.8623	1.2180	0.0183		0.2314	0.2314		0.2314	0.2314	0.0000	3,654.0000	3,654.0000	0.0700	0.0670	3,675.7139
Landscaping	0.5152	0.1950	16.8307	8.8000e-004		0.0922	0.0922		0.0922	0.0922		30.1561	30.1561	0.0296		30.8961
Total	**8.7115**	**3.0573**	**18.0487**	**0.0192**		**0.3236**	**0.3236**		**0.3236**	**0.3236**	**0.0000**	**3,684.1561**	**3,684.1561**	**0.0996**	**0.0670**	**3,706.6100**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

HeatherGlen Residential Project

South Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	203.00	Dwelling Unit	59.03	365,400.00	581

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project- 203 lots on 59.03 acres

Construction Phase - No demolition

Vehicle Trips - Traffic study trip gen info

Woodstoves - No wood burning or fireplaces

Construction Off-road Equipment Mitigation - Rule 403

Area Mitigation - Rule 1113

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Mobile Land Use Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	100	50
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	100
tblConstDustMitigation	WaterExposedAreaPM10PercentReduction	61	70
tblConstDustMitigation	WaterExposedAreaPM25PercentReduction	61	70
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	25
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

HeatherGlen Residential Project - South Coast Air Basin, Winter

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	1,110.00	230.00
tblConstructionPhase	NumDays	70.00	0.00
tblFireplaces	NumberWood	10.15	0.00
tblLandUse	LotAcreage	65.91	59.03

tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	WD_TR	9.52	10.08

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2017	5.8799	68.0368	39.8232	0.0644	18.2675	3.0746	21.1477	9.9840	2.8286	12.6339	0.0000	6,580.1342	6,580.1342	1.9530	0.0000	6,628.9589
2018	3.2058	26.3775	21.6578	0.0409	0.9568	1.5263	2.4830	0.2569	1.4349	1.6919	0.0000	4,048.7204	4,048.7204	0.7201	0.0000	4,066.6134
2019	30.8317	15.3001	15.2753	0.0245	0.1677	0.8259	0.9936	0.0445	0.7598	0.8043	0.0000	2,423.0776	2,423.0776	0.7193	0.0000	2,441.0601
Maximum	**30.8317**	**68.0368**	**39.8232**	**0.0644**	**18.2675**	**3.0746**	**21.1477**	**9.9840**	**2.8286**	**12.6339**	**0.0000**	**6,580.1342**	**6,580.1342**	**1.9530**	**0.0000**	**6,628.9589**

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	lb/day										lb/day					
2017	0.9202	5.4459	34.0398	0.0644	2.7362	0.1034	2.8000	1.5000	0.1033	1.5637	0.0000	6,580.1342	6,580.1342	1.9530	0.0000	6,628.9589
2018	0.8542	5.2222	21.5376	0.0409	0.1470	0.0672	0.2142	0.0582	0.0658	0.1240	0.0000	4,048.7204	4,048.7204	0.7201	0.0000	4,066.6134
2019	30.5950	1.2714	17.9061	0.0245	0.0219	0.0387	0.0606	8.6900e-003	0.0386	0.0473	0.0000	2,423.0776	2,423.0776	0.7193	0.0000	2,441.0600
Maximum	**30.5950**	**5.4459**	**34.0398**	**0.0644**	**2.7362**	**0.1034**	**2.8000**	**1.5000**	**0.1033**	**1.5637**	**0.0000**	**6,580.1342**	**6,580.1342**	**1.9530**	**0.0000**	**6,628.9589**

	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	N20	CO2e
Percent Reduction	18.91	89.12	4.26	0.00	85.02	96.14	87.51	84.77	95.87	88.53	0.00	0.00	0.00	0.00	0.00	0.00

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	lb/day										lb/day					
Area	14.1903	3.8689	67.8044	0.1815		8.4404	8.4404		8.4404	8.4404	1,198.0326	3,684.1561	4,882.1887	5.7002	0.0670	5,044.6566
Energy	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
Mobile	4.3120	22.1948	57.2223	0.1833	14.8618	0.2170	15.0788	3.9765	0.2042	4.1807		18,612.3651	18,612.3651	1.0135		18,637.7037
Total	**18.7249**	**27.9666**	**125.8365**	**0.3770**	**14.8618**	**8.8112**	**23.6730**	**3.9765**	**8.7984**	**12.7750**	**1,198.0326**	**24,725.7426**	**25,923.7752**	**6.7603**	**0.1115**	**26,126.0172**

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	lb/day										lb/day					
Area	8.7115	3.0573	18.0487	0.0192		0.3236	0.3236		0.3236	0.3236	0.0000	3,684.1561	3,684.1561	0.0996	0.0670	3,706.6100
Energy	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
Mobile	4.3120	22.1948	57.2223	0.1833	14.8618	0.2170	15.0788	3.9765	0.2042	4.1807		18,612.3651	18,612.3651	1.0135		18,637.7037
Total	**13.2461**	**27.1549**	**76.0808**	**0.2146**	**14.8618**	**0.6945**	**15.5563**	**3.9765**	**0.6817**	**4.6582**	**0.0000**	**24,725.7426**	**24,725.7426**	**1.1597**	**0.1115**	**24,787.9707**

	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	N20	CO2e
Percent Reduction	29.26	2.90	39.54	43.06	0.00	92.12	34.29	0.00	92.25	63.54	100.00	0.00	4.62	82.84	0.00	5.12

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2017	5/31/2017	5	0	
2	Site Preparation	Site Preparation	6/1/2017	7/26/2017	5	40	
3	Grading	Grading	7/27/2017	12/27/2017	5	110	
4	Building Construction	Building Construction	12/28/2017	11/14/2018	5	230	
5	Paving	Paving	11/15/2018	2/27/2019	5	75	
6	Architectural Coating	Architectural Coating	2/28/2019	6/12/2019	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 275

Acres of Paving: 0

Residential Indoor: 739,935; Residential Outdoor: 246,645; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	73.00	22.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2017

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	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2017

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	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2017

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	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.9608	52.2754	23.4554	0.0380		2.8786	2.8786		2.6483	2.6483		3,894.950 0	3,894.950 0	1.1934		3,924.785 2
Total	**4.9608**	**52.2754**	**23.4554**	**0.0380**	**18.0663**	**2.8786**	**20.9448**	**9.9307**	**2.6483**	**12.5790**		**3,894.950 0**	**3,894.950 0**	**1.1934**		**3,924.785 2**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1184	0.0875	0.9366	2.1300e-003	0.2012	1.6700e-003	0.2029	0.0534	1.5400e-003	0.0549		211.7231	211.7231	8.0300e-003		211.9240
Total	**0.1184**	**0.0875**	**0.9366**	**2.1300e-003**	**0.2012**	**1.6700e-003**	**0.2029**	**0.0534**	**1.5400e-003**	**0.0549**		**211.7231**	**211.7231**	**8.0300e-003**		**211.9240**

3.3 Site Preparation - 2017

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	lb/day										lb/day					
Fugitive Dust					2.7099	0.0000	2.7099	1.4896	0.0000	1.4896			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0380		0.0621	0.0621		0.0621	0.0621	0.0000	3,894.950 0	3,894.950 0	1.1934		3,924.785 2
Total	**0.4656**	**2.0175**	**20.8690**	**0.0380**	**2.7099**	**0.0621**	**2.7720**	**1.4896**	**0.0621**	**1.5517**	**0.0000**	**3,894.950 0**	**3,894.950 0**	**1.1934**		**3,924.785 2**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1184	0.0875	0.9366	2.1300e-003	0.0263	1.6700e-003	0.0280	0.0104	1.5400e-003	0.0120		211.7231	211.7231	8.0300e-003		211.9240
Total	**0.1184**	**0.0875**	**0.9366**	**2.1300e-003**	**0.0263**	**1.6700e-003**	**0.0280**	**0.0104**	**1.5400e-003**	**0.0120**		**211.7231**	**211.7231**	**8.0300e-003**		**211.9240**

3.4 Grading - 2017

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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.7483	67.9396	38.7826	0.0620		3.0727	3.0727		2.8269	2.8269		6,344.886 3	6,344.886 3	1.9441		6,393.487 9
Total	**5.7483**	**67.9396**	**38.7826**	**0.0620**	**8.6733**	**3.0727**	**11.7460**	**3.5965**	**2.8269**	**6.4234**		**6,344.886 3**	**6,344.886 3**	**1.9441**		**6,393.487 9**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1316	0.0972	1.0407	2.3700e-003	0.2236	1.8600e-003	0.2254	0.0593	1.7100e-003	0.0610		235.2479	235.2479	8.9300e-003		235.4711
Total	**0.1316**	**0.0972**	**1.0407**	**2.3700e-003**	**0.2236**	**1.8600e-003**	**0.2254**	**0.0593**	**1.7100e-003**	**0.0610**		**235.2479**	**235.2479**	**8.9300e-003**		**235.4711**

3.4 Grading - 2017

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	lb/day										lb/day					
Fugitive Dust					1.3010	0.0000	1.3010	0.5395	0.0000	0.5395			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0620		0.1015	0.1015		0.1015	0.1015	0.0000	6,344.8863	6,344.8863	1.9441		6,393.4878
Total	**0.7616**	**3.3000**	**32.9991**	**0.0620**	**1.3010**	**0.1015**	**1.4025**	**0.5395**	**0.1015**	**0.6410**	**0.0000**	**6,344.8863**	**6,344.8863**	**1.9441**		**6,393.4878**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1316	0.0972	1.0407	2.3700e-003	0.0292	1.8600e-003	0.0311	0.0116	1.7100e-003	0.0133		235.2479	235.2479	8.9300e-003		235.4711
Total	**0.1316**	**0.0972**	**1.0407**	**2.3700e-003**	**0.0292**	**1.8600e-003**	**0.0311**	**0.0116**	**1.7100e-003**	**0.0133**		**235.2479**	**235.2479**	**8.9300e-003**		**235.4711**

3.5 Building Construction - 2017

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	lb/day										lb/day					
Off-Road	3.1149	26.5546	18.1825	0.0269		1.7879	1.7879		1.6791	1.6791		2,650.9797	2,650.9797	0.6531		2,667.3078
Total	**3.1149**	**26.5546**	**18.1825**	**0.0269**		**1.7879**	**1.7879**		**1.6791**	**1.6791**		**2,650.9797**	**2,650.9797**	**0.6531**		**2,667.3078**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1121	2.8565	0.8287	5.5900e-003	0.1408	0.0250	0.1658	0.0405	0.0240	0.0645		595.4672	595.4672	0.0473		596.6505
Worker	0.4803	0.3547	3.7985	8.6300e-003	0.8160	6.7700e-003	0.8227	0.2164	6.2500e-003	0.2227		858.6548	858.6548	0.0326		859.4694
Total	**0.5924**	**3.2112**	**4.6272**	**0.0142**	**0.9568**	**0.0318**	**0.9886**	**0.2569**	**0.0302**	**0.2871**		**1,454.1221**	**1,454.1221**	**0.0799**		**1,456.1199**

3.5 Building Construction - 2017

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	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,650.9797	2,650.9797	0.6531		2,667.3078
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,650.9797**	**2,650.9797**	**0.6531**		**2,667.3078**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1121	2.8565	0.8287	5.5900e-003	0.0404	0.0250	0.0655	0.0159	0.0240	0.0398		595.4672	595.4672	0.0473		596.6505
Worker	0.4803	0.3547	3.7985	8.6300e-003	0.1066	6.7700e-003	0.1134	0.0423	6.2500e-003	0.0485		858.6548	858.6548	0.0326		859.4694
Total	**0.5924**	**3.2112**	**4.6272**	**0.0142**	**0.1470**	**0.0318**	**0.1788**	**0.0582**	**0.0302**	**0.0884**		**1,454.1221**	**1,454.1221**	**0.0799**		**1,456.1199**

3.5 Building Construction - 2018

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	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**		**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0987	2.6785	0.7492	5.5600e-003	0.1408	0.0198	0.1606	0.0405	0.0190	0.0595		593.2109	593.2109	0.0450		594.3363
Worker	0.4277	0.3090	3.3282	8.3900e-003	0.8160	6.5400e-003	0.8225	0.2164	6.0300e-003	0.2224		834.5743	834.5743	0.0286		835.2889
Total	**0.5263**	**2.9875**	**4.0774**	**0.0140**	**0.9568**	**0.0264**	**0.9831**	**0.2569**	**0.0250**	**0.2819**		**1,427.7852**	**1,427.7852**	**0.0736**		**1,429.6252**

3.5 Building Construction - 2018

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	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,620.935 1	2,620.935 1	0.6421		2,636.988 3
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,620.935 1**	**2,620.935 1**	**0.6421**		**2,636.988 3**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0987	2.6785	0.7492	5.5600e-003	0.0404	0.0198	0.0603	0.0159	0.0190	0.0349		593.2109	593.2109	0.0450		594.3363
Worker	0.4277	0.3090	3.3282	8.3900e-003	0.1066	6.5400e-003	0.1131	0.0423	6.0300e-003	0.0483		834.5743	834.5743	0.0286		835.2889
Total	**0.5263**	**2.9875**	**4.0774**	**0.0140**	**0.1470**	**0.0264**	**0.1734**	**0.0582**	**0.0250**	**0.0832**		**1,427.785 2**	**1,427.785 2**	**0.0736**		**1,429.625 2**

3.6 Paving - 2018

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	lb/day										lb/day					
Off-Road	1.6437	17.5209	14.7964	0.0228		0.9561	0.9561		0.8797	0.8797		2,294.0887	2,294.0887	0.7142		2,311.9432
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6437**	**17.5209**	**14.7964**	**0.0228**		**0.9561**	**0.9561**		**0.8797**	**0.8797**		**2,294.0887**	**2,294.0887**	**0.7142**		**2,311.9432**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0879	0.0635	0.6839	1.7200e-003	0.1677	1.3400e-003	0.1690	0.0445	1.2400e-003	0.0457		171.4879	171.4879	5.8700e-003		171.6347
Total	**0.0879**	**0.0635**	**0.6839**	**1.7200e-003**	**0.1677**	**1.3400e-003**	**0.1690**	**0.0445**	**1.2400e-003**	**0.0457**		**171.4879**	**171.4879**	**5.8700e-003**		**171.6347**

3.6 Paving - 2018

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	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,294.0887	2,294.0887	0.7142		2,311.9432
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2805**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,294.0887**	**2,294.0887**	**0.7142**		**2,311.9432**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0879	0.0635	0.6839	1.7200e-003	0.0219	1.3400e-003	0.0233	8.6900e-003	1.2400e-003	9.9300e-003		171.4879	171.4879	5.8700e-003		171.6347
Total	**0.0879**	**0.0635**	**0.6839**	**1.7200e-003**	**0.0219**	**1.3400e-003**	**0.0233**	**8.6900e-003**	**1.2400e-003**	**9.9300e-003**		**171.4879**	**171.4879**	**5.8700e-003**		**171.6347**

3.6 Paving - 2019

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	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586		2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**		**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6105	1.6700e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		166.0751	166.0751	5.2100e-003		166.2053
Total	**0.0800**	**0.0560**	**0.6105**	**1.6700e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**166.0751**	**166.0751**	**5.2100e-003**		**166.2053**

3.6 Paving - 2019

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	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2805**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6105	1.6700e-003	0.0219	1.3100e-003	0.0232	8.6900e-003	1.2100e-003	9.9000e-003		166.0751	166.0751	5.2100e-003		166.2053
Total	**0.0800**	**0.0560**	**0.6105**	**1.6700e-003**	**0.0219**	**1.3100e-003**	**0.0232**	**8.6900e-003**	**1.2100e-003**	**9.9000e-003**		**166.0751**	**166.0751**	**5.2100e-003**		**166.2053**

3.7 Architectural Coating - 2019

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	lb/day										lb/day					
Archit. Coating	30.4853					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**30.7518**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6105	1.6700e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		166.0751	166.0751	5.2100e-003		166.2053
Total	**0.0800**	**0.0560**	**0.6105**	**1.6700e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**166.0751**	**166.0751**	**5.2100e-003**		**166.2053**

3.7 Architectural Coating - 2019

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	lb/day										lb/day					
Archit. Coating	30.4853					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**30.5150**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

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	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6105	1.6700e-003	0.0219	1.3100e-003	0.0232	8.6900e-003	1.2100e-003	9.9000e-003		166.0751	166.0751	5.2100e-003		166.2053
Total	**0.0800**	**0.0560**	**0.6105**	**1.6700e-003**	**0.0219**	**1.3100e-003**	**0.0232**	**8.6900e-003**	**1.2100e-003**	**9.9000e-003**		**166.0751**	**166.0751**	**5.2100e-003**		**166.2053**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	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
	lb/day										lb/day					
Mitigated	4.3120	22.1948	57.2223	0.1833	14.8618	0.2170	15.0788	3.9765	0.2042	4.1807		18,612.3651	18,612.3651	1.0135		18,637.7037
Unmitigated	4.3120	22.1948	57.2223	0.1833	14.8618	0.2170	15.0788	3.9765	0.2042	4.1807		18,612.3651	18,612.3651	1.0135		18,637.7037

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	2,046.24	2,011.73	1749.86	6,830,784	6,830,784
Total	2,046.24	2,011.73	1,749.86	6,830,784	6,830,784

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
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	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.548893	0.044275	0.199565	0.124385	0.017503	0.005874	0.020174	0.028962	0.001990	0.002015	0.004673	0.000702	0.000989

5.0 Energy Detail

Historical Energy Use: N

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	lb/day										lb/day					
NaturalGas Mitigated	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
NaturalGas Unmitigated	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570

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/yr	lb/day										lb/day					
Single Family Housing	20648.4	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
Total		**0.2227**	**1.9029**	**0.8097**	**0.0122**		**0.1539**	**0.1539**		**0.1539**	**0.1539**		**2,429.2213**	**2,429.2213**	**0.0466**	**0.0445**	**2,443.6570**

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/yr	lb/day										lb/day					
Single Family Housing	20.6484	0.2227	1.9029	0.8097	0.0122		0.1539	0.1539		0.1539	0.1539		2,429.2213	2,429.2213	0.0466	0.0445	2,443.6570
Total		**0.2227**	**1.9029**	**0.8097**	**0.0122**		**0.1539**	**0.1539**		**0.1539**	**0.1539**		**2,429.2213**	**2,429.2213**	**0.0466**	**0.0445**	**2,443.6570**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	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	lb/day										lb/day					
Mitigated	8.7115	3.0573	18.0487	0.0192		0.3236	0.3236		0.3236	0.3236	0.0000	3,684.1561	3,684.1561	0.0996	0.0670	3,706.6100
Unmitigated	14.1903	3.8689	67.8044	0.1815		8.4404	8.4404		8.4404	8.4404	1,198.0326	3,684.1561	4,882.1887	5.7002	0.0670	5,044.6566

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	lb/day										lb/day					
Architectural Coating	0.6264					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.2349					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.8138	3.6740	50.9737	0.1806		8.3482	8.3482		8.3482	8.3482	1,198.0326	3,654.0000	4,852.0326	5.6706	0.0670	5,013.7605
Landscaping	0.5152	0.1950	16.8307	8.8000e-004		0.0922	0.0922		0.0922	0.0922		30.1561	30.1561	0.0296		30.8961
Total	**14.1903**	**3.8689**	**67.8044**	**0.1815**		**8.4404**	**8.4404**		**8.4404**	**8.4404**	**1,198.0326**	**3,684.1561**	**4,882.1887**	**5.7002**	**0.0670**	**5,044.6566**

6.2 Area by SubCategory

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	lb/day										lb/day					
Architectural Coating	0.6264					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.2349					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.3350	2.8623	1.2180	0.0183		0.2314	0.2314		0.2314	0.2314	0.0000	3,654.000 0	3,654.000 0	0.0700	0.0670	3,675.713 9
Landscaping	0.5152	0.1950	16.8307	8.8000e-004		0.0922	0.0922		0.0922	0.0922		30.1561	30.1561	0.0296		30.8961
Total	**8.7115**	**3.0573**	**18.0487**	**0.0192**		**0.3236**	**0.3236**		**0.3236**	**0.3236**	**0.0000**	**3,684.156 1**	**3,684.156 1**	**0.0996**	**0.0670**	**3,706.610 0**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Heatherglen Planned Development

TTM 17604, CUP 15-006

Initial Study – Notice of Preparation

Appendix B – Phase 1 Cultural Resources Assessment

(Confidential Maps Removed)

L&L ENVIRONMENTAL, INC.
REGULATORY SERVICES
BIOLOGICAL & CULTURAL INVESTIGATIONS & MONITORING

December 11, 2017

Tom Bassett
℅ Stan Stringfellow
Greenspot Partners, Inc.
5120 Live Oak Canyon Road
La Verne, CA 91750

REGARDING: PHASE 1 CULTURAL RESOURCES ASSESSMENT FOR THE HEATHERGLEN/TRACT 17604 PROJECT, ±60 ACRES IN THE CITY OF HIGHLAND, SAN BERNARDINO COUNTY, CALIFORNIA

L&L Environmental, Inc. (L&L) is pleased to present the attached Phase I Cultural Resources Assessment report for your review. The attached report has been prepared in accordance with the California Environmental Quality Act (CEQA).

Thank you for the opportunity to work with you and please feel free to contact us at 909-335-9897 should you have any questions or comments. It has been a pleasure working with you!

Sincerely,
L&L Environmental, Inc.

Leslie Nay Irish
CEO

Celebrating 20 Years of Service to Southern CA and the Great Basin, WBE Certified (Caltrans, CPUC, WBENC)
Mailing Address: 700 East Redlands Blvd., Suite U, PMB #351, Redlands CA 92373
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L&L ENVIRONMENTAL, INC.
REGULATORY SERVICES

BIOLOGICAL & CULTURAL INVESTIGATIONS & MONITORING

PHASE 1 CULTURAL RESOURCES ASSESSMENT FOR THE HEATHERGLEN/TRACT 17604 PROJECT ±60 ACRES IN THE CITY OF HIGHLAND, SAN BERNARDINO COUNTY, CALIFORNIA

Redlands, CA USGS 7.5-Minute Topographic Quadrangle Map
Township 1 South, Range 3 West, Section 2

Prepared on Behalf of:
Tom Bassett
% Stan Stringfellow
Greenspot Partners, Inc.
5120 Live Oak Canyon Road
La Verne, CA 91750
Contact: Stan Stringfellow

Prepared For:
City of Highland
27215 Base Line
Highland, CA 92346
909-864-6861

Prepared By:
L&L Environmental, Inc.
Jennifer M. Sanka, M.A., RPA, Principal Investigator
William R. Gillean, B.S., Archaeologist
Leslie Nay Irish, CEO/Principal Project Manager

Fieldwork Completed By:
William R. Gillean

Fieldwork Date(s):
July 11, 2017; July 18, 2017; October 3, 2017

Report Date:
December 11, 2017

Keywords:
±60 Acres, Positive Results, 36-6848/CA-SBR-6848H, 36-6853/CA-SBR-6853H, 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, 36-12265, Cram-Van Leuven Ditch, Historic Refuse Scatter/Deposit, Historic Citrus/Poultry Ranching Complex, Greenspot Road, *Redlands, CA* 7.5-minute topographic quadrangle

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TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

MANAGEMENT SUMMARY

This report documents a California Environmental Quality Act (CEQA) Phase I Cultural Resources Assessment (CRA) for the Heatherglen/Tract 17604 Project. The purpose of this study was to determine if cultural resources more than 45 years old were observable or known in the project area and then evaluate the potential for the proposed project to impact cultural resources. The project would construct a residential development as outlined in Tract 17604. This development is located within a ±60 acre project area in the City of Highland, San Bernardino County, California. The project area includes Assessor's Parcel Numbers (APNs) 1210-211-18-0000, 1210-211-21-0000, 1210-211-23-0000, 1210-281-01-0000, 1210-281-02-0000, 1210-281-03-0000, and 1210-281-04-0000. L&L Environmental, Inc. (L&L) has completed this CRA at the request of Stan Stringfellow on behalf of Tom Bassett of Greenspot Partners, Inc.

A cultural resources records search was completed at the South Central Coastal Information Center (SCCIC) located at California State University, Fullerton. L&L Archaeologist William R. Gillean completed the search on July 6, 2017 for the project area and all lands found within one mile (Appendix B). The records search showed that 100 percent of the project area has been previously inventoried via two (2) reports (SB-2828/Gallegos & Associates 1993; SB-5671/ECORP 2006a). Including the two (2) reports that address the project area, a total of 16 studies have been completed within one mile and these studies have addressed approximately 30 percent of the land within the search radius. As a result of these studies, a total of 39 resources have been recorded within a one mile radius. Five (5) of these resources have been mapped within or partially within the project area:

- 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch)
- 36-6853/CA-SBR-6853H (Historic Refuse Scatter)
- 36-7434/CA-SBR-7434H (Historic Refuse Dump)
- 36-12264/CA-SBR-12205H (Historic Refuse Scatter)
- 36-12265 (Historic Citrus/Poultry Ranching Complex)

According to the resource locations as mapped at the SCCIC, all of these resources are located entirely within the project area boundary, with the exception of 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch). 36-6848/CA-SBR-6848H generally trends east-west through the project and extends beyond the project area boundaries. A segment of the resource measuring approximately 1,900 feet in length traverses the central portion of the project area. The resource locations are shown in relation to the project area boundary in Figure 11.

Records and maps available from the Bureau of Land Management (BLM) General Land Office (GLO) were reviewed to provide information about historic era land use and development within the project area (BLM 2017). Archival topographic maps dating between 1895 and 1999 and aerial photographs dating between 1938 and 2012 were also reviewed (NETR 2017). Additional research was completed for the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) at the A.K. Smiley Library, the Feldhym Library, the San Bernardino County Historical Archives, the Highland Area Historical Society (HAHS) website, and via inquires to local historians. The results of the review indicated that the Old North Fork Ditch, which is another name for the Cram-Van Leuven Ditch, has been variably mapped near or within the project area since the late 1880s. In addition, a water feature is observable on aerial photographs at the mapped location of the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) since 1938. Finally, various structures have been located within the southwestern portion of the project area over time and in association with a historic age citrus and poultry ranching complex (36-12265). This complex includes several structures and active fields or groves that were present by at least 1938 and the structures were removed by 2009 (NETR 2017).

L&L contacted the Native American Heritage Commission (NAHC) requesting a Sacred Lands File database search (SLS). The SLS was requested on June 28, 2017 and a response was received on June 29, 2017 (Appendix D). The NAHC SLS failed to indicate the presence of Native American cultural resources in the immediate project area. However, the NAHC noted that the absence of specific site information does not indicate the absence of cultural resources in any project area and that other resources should be consulted to obtain information regarding known and previously recorded sites. Scoping letters were sent to the 19 contacts listed by the NAHC on July 6, 2017. These packages included a letter to the San Manuel Band of Mission Indians (SMBMI) in accordance with Goal 5.8, Policy 3 of the City of Highland General Plan (GP) (Highland 2006). As of the date of this report, one (1) response has been received from the SMBMI. This response stated that the project is located within Serrano ancestral territory and they requested additional project-related information and the completion of background research. Specifically, they recommended a records search at the SCCIC and an archaeological pedestrian survey. In addition, they requested that the results be provided for their review and consideration. All coordination efforts are presented in detail in Table 3 of this report and copies of all correspondence are included in Appendix E.

Site visits were completed on July 11, 2017 and October 3, 2017 to relocate and document previously recorded resources and the Phase I pedestrian survey was conducted on July 18, 2017. During the pedestrian survey and site visits, no new prehistoric or historic resources were detected and four (4) previously recorded historic resources were relocated (36-6848/CA-SBR-6848H, 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265). One (1) previously recorded historic site could not be relocated (36-6853/CA-SBR-6853H). Department of Parks and Recreation (DPR) 523 Update Forms were prepared for all resources associated with the project area and they were submitted to the SCCIC for their files. The DPR 523 Forms have been incorporated into Appendix F. The resources associated with the project area consist of the following:

- 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch): This resource consists of the mapped location of the Cram-Van Leuven Ditch, which is an irrigation ditch constructed in 1858 by members of the Cram and the Van Leuven families. This ditch was one (1) of the first irrigation systems emerging from the Santa Ana Canyon and it connected the mouth of the canyon with the Cram and Van Leuven lands located at the base of the East Highlands bench. When originally constructed, the ditch measured several miles in length. A segment measuring about 1,900 feet has been mapped in the project area. This segment was originally recorded in 1993 and it was updated in 2006 (Eighmey, et al. 1993a; ECORP 2006b). L&L detected a water feature at the location of the recorded segment in 2017 and determined that the dimensions and description provided in 2006 were generally accurate.

- 36-6853/CA-SBR-6853H (Historic Refuse Scatter): This site was originally recorded in 1990 as a historic age refuse scatter with artifacts dating from about World War I (1914-1918) to the 1930s or 1940s (Romani, et al. 1990b). It could not be relocated during studies completed in 1993, 2006, or during the current study and is presumed destroyed (Gallegos & Associates 1993; ECORP 2006a).

- 36-7434/CA-SBR-7434H (Historic Refuse Dump): Initially recorded in 1993 and updated in 2006, this site was described as a historic age domestic refuse dump with artifacts dating to 1932 or later (Phillips and McHenry 1993; Gallegos & Associates 1993; ECORP 2006a; ECORP 2006c). L&L relocated this site in 2017 and found that the site exhibits the same dimensions as described in 1993 and 2006. However, only five (5) artifacts and a scatter of milled wood planks with modern nails were detected at the site location. While many of the diagnostic artifacts were collected in 1993, numerous artifacts remained in 2006 and the majority of these artifacts could not be detected by

L&L.

- 36-12264/CA-SBR-12205H (Historic Refuse Scatter): This site was originally recorded in 2006 as a sparse historic age refuse scatter dating between about 1880 and 1925 (Cotterman and Sharp 2006; ECORP 2006a). L&L relocated this site in 2017 and it currently reflects the same dimensions and general composition as described in 2006. However, many of the artifacts described in the original site record could not be detected.

- 36-12265 (Historic Citrus/Poultry Ranching Complex): 36-12265 was originally recorded in 2006 and it was described as an early 20th century citrus and poultry ranching complex comprised of four (4) houses and a variety of associated features (Cotterman 2006; ECORP 2006a). L&L relocated this site in 2017; however, all of the houses and the majority of the recorded features have been removed. A total of three (3) previously recorded features are currently extant, including a round concrete cistern, a stone irrigation reservoir, and a concrete well pad.

36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch) is an irrigation ditch constructed in 1858 by members of the Cram and the Van Leuven families. This ditch was one (1) of the first irrigation systems emerging from the Santa Ana Canyon, was the subject of the first water-rights suit in the Santa Ana River basin to be adjudicated by a court (DeWitt, et al. vs Van Leuven, et al. 1860; Beattie 1951), and it directly affected the development patterns of East Highland through an increase in water availability and reliability. For these reasons, 36-6848/CA-SBR-6848H appears to meet the significance criteria of the California Register of Historical Resources (CRHR) under Criterion 1 (Event) and the City of Highland Municipal Code cultural resource criteria under Criterion A (Section 16.32.060). However, the water feature segment in the project area does not appear to reflect the location of the ditch during its period of significance (1858-1881). Instead, it may represent a mapping error or a later and more southerly extension of the ditch dating to after 1891 (see Section 2.5). In addition, the existing water feature in the project area is in very poor condition, as it has been adversely affected by erosion over time and is currently overgrown with vegetation and is filled with cobbles and boulders. As such, this ditch segment possesses low integrity in general and low integrity for its period of significance (1858-1881). Thus, the segment of 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch) mapped within the project area is recommended not eligible for inclusion in the CRHR, not eligible as a City of Highland cultural resource, and not significant under CEQA. The research efforts completed during this study and recordation onto a DPR 523 Update Form exhausts this resource segment's research value and no further work is recommended prior to project implementation.

36-6853/CA-SBR-6853H (Historic Refuse Scatter) could not be relocated within the project area and is presumed to be destroyed. As this resource is considered destroyed, no known artifacts or features will be impacted by the project and no further work is recommended prior to project implementation.

36-7434/CA-SBR-7434H (Historic Refuse Dump), 36-12264/CA-SBR-12205H (Historic Refuse Scatter), and 36-12265 (Historic Citrus/Poultry Ranching Complex) currently lack the artifact content or features once recorded at each site and all three (3) sites have been subject to soil disturbances associated with erosion. 36-12265 has additionally been adversely impacted by demolition activities. None of these resources appear to retain sufficient integrity to be considered eligible for inclusion in the CRHR and no evidence was detected to indicate that any of these resources have the potential to yield additional information important to history (Criterion 4). Therefore, L&L recommends 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265 not eligible for inclusion in the CRHR and not significant pursuant to CEQA. In addition, L&L recommends these sites not eligible as cultural resources under Section 16.32.060 of the City of Highland Municipal Code. Recordation onto DPR 523 Update Forms exhausts each site's research value and no further work is recommended for any of these resources prior to project implementation.

Based on the results of a records search completed at the SCCIC; the pedestrian survey and site visits; and the research, recording, and evaluation efforts, no known historical or archaeological resources pursuant to CEQA are located in the project area. However, archaeological monitoring is recommended during project implementation. This monitoring program is intended to address the high sensitivity of the project area for historic age resources and a moderate to low sensitivity for prehistoric resources. This monitoring program is outlined in Table 4 of this report (Recommended Cultural Resources Mitigation Measures).

It should also be noted that the SMBMI have indicated that the project area lies within Serrano ancestral territory. In addition, they have requested additional project-related information, including the results of archaeological research and survey efforts. Upon their review of the requested information, the SMBMI may provide additional comments or recommendations. The results of this process may further assist in outlining the sensitivity of the project area for Native American resources and the need or lack thereof for Native American monitoring during project implementation.

1.0) INTRODUCTION AND ENVIRONMENTAL SETTING

1.1) Introduction

The following report documents a Phase I CRA for the Heatherglen/Tract 17604 Project and was completed in accordance with CEQA. This report follows the California Office of Historic Preservation (OHP) procedures for cultural resource surveys and is generally based on the OHP Archaeological Resource Management Report (ARMR) format (OHP 1990).

1.2) Project Location

The proposed project is generally located in the southwestern portion of San Bernardino County, California, and is situated north of Interstate 10 (Figure 1). Specifically, it can be found within Section 2 of Township 1 South, Range 3 West as shown on the USGS *Redlands, CA* 7.5' topographic quadrangle map (Figure 2). The project is located immediately to the south of Greenspot Road in the City of Highland (Figure 3). The project site consists of APNs 1210-211-18-0000, 1210-211-21-0000, 1210-211-23-0000, 1210-281-01-0000, 1210-281-02-0000, 1210-281-03-0000, and 1210-281-04-0000 and measures ±60 acres.

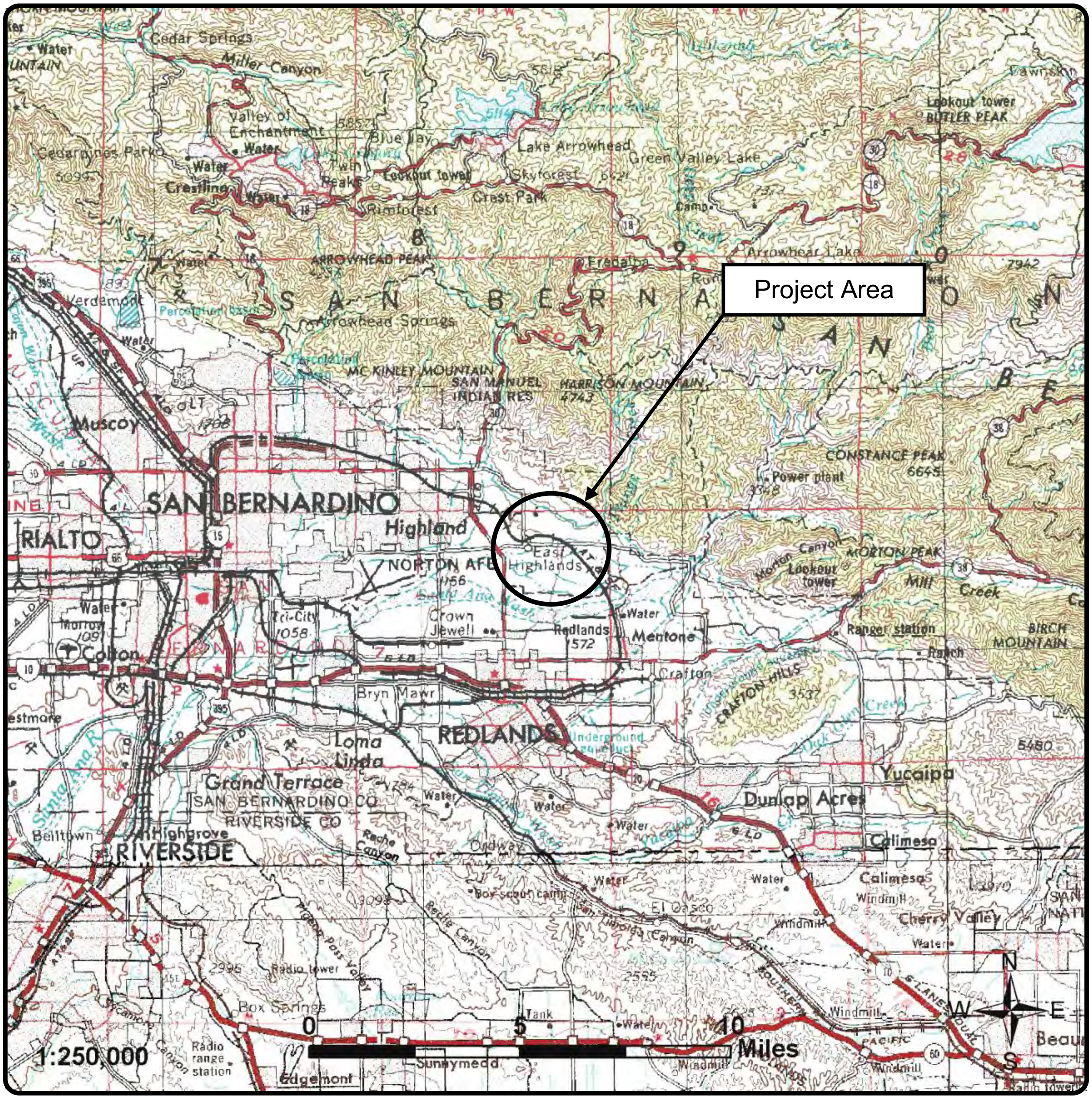
1.3) Project Description

The proposed project is the development of a planned housing community as outlined in Tract 17604. This development occupies ±60 acres and includes various lots and associated streets. The development plan is shown in relation to the project area boundary in Figure 4.

1.4) Cultural Resources Staff

The cultural resources records search was conducted on July 6, 2017 at the SCCIC by L&L Archaeologist William R. Gillean, B.S. W. Gillean completed site visits to relocate and document previously recorded resources on July 11, 2017 and October 3, 2017 and he performed the pedestrian survey on July 18, 2017. He acquired research materials from the A.K. Smiley Library, the Feldhym Library, the San Bernardino County Historical Archives, and local historians in November 2017. L&L Archaeologist Jennifer M. Sanka, M.A., RPA completed additional research via the HAHS website and via inquires to local historians in November 2017. J. Sanka authored the CRA with contributions from W. Gillean. L&L CEO/Principal Project Manager Leslie Irish provided quality control oversight and J. Sanka served as the Principal Investigator.

Professional qualifications for all team members are located in Appendix A.



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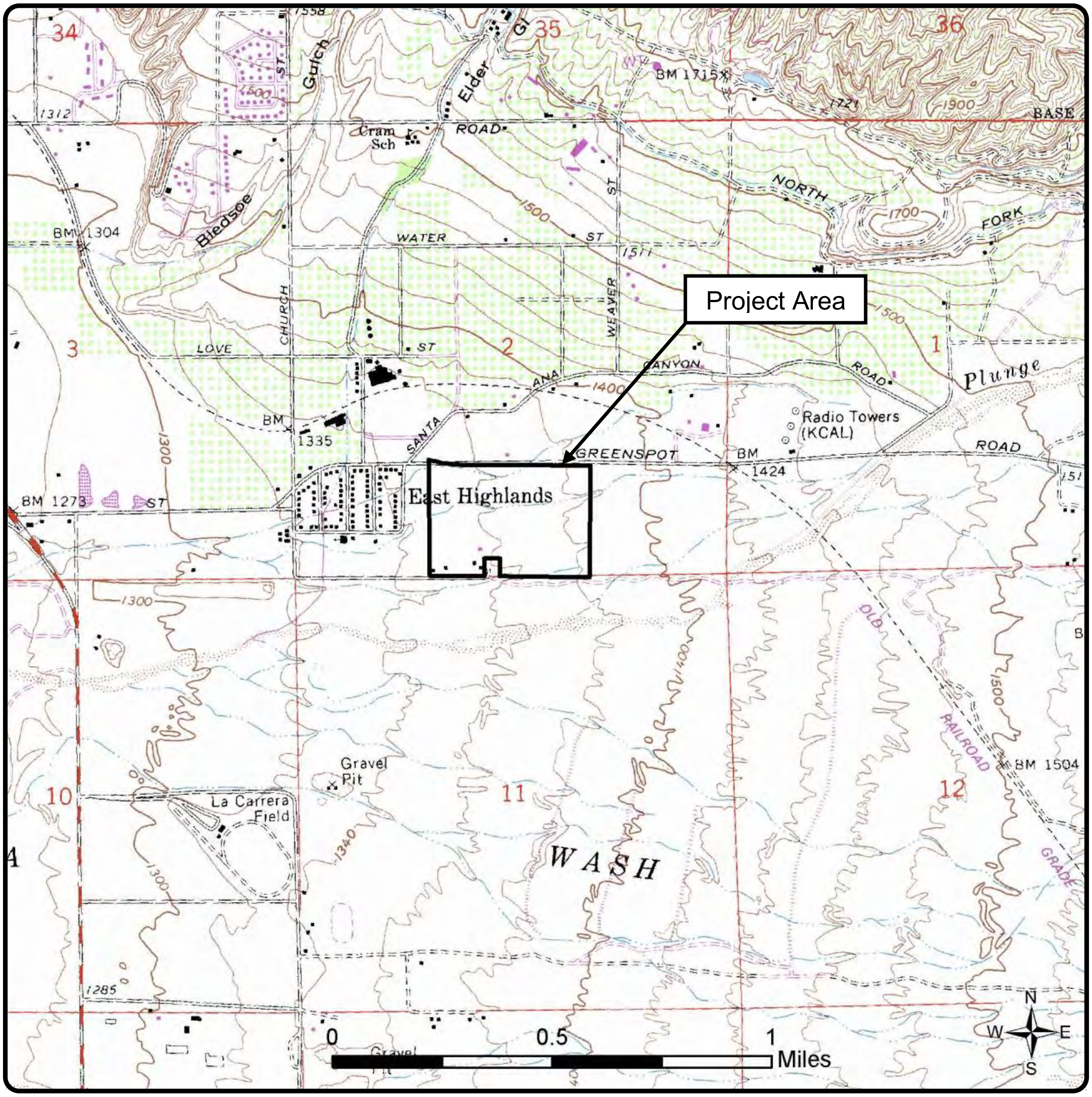
GSPI-05-646
December 2017

Figure 1

Project Vicinity Map

Heatherglen/Tract 17604 Project
City of Highland
San Bernardino County, California



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GSPI-05-646
December 2017

Figure 2

Project Location Map
(USGS Redlands [1988] quadrangle, Section 2, Township 1 South, Range 3 West)
Heatherglen/Tract 17604 Project
City of Highland
San Bernardino County, California

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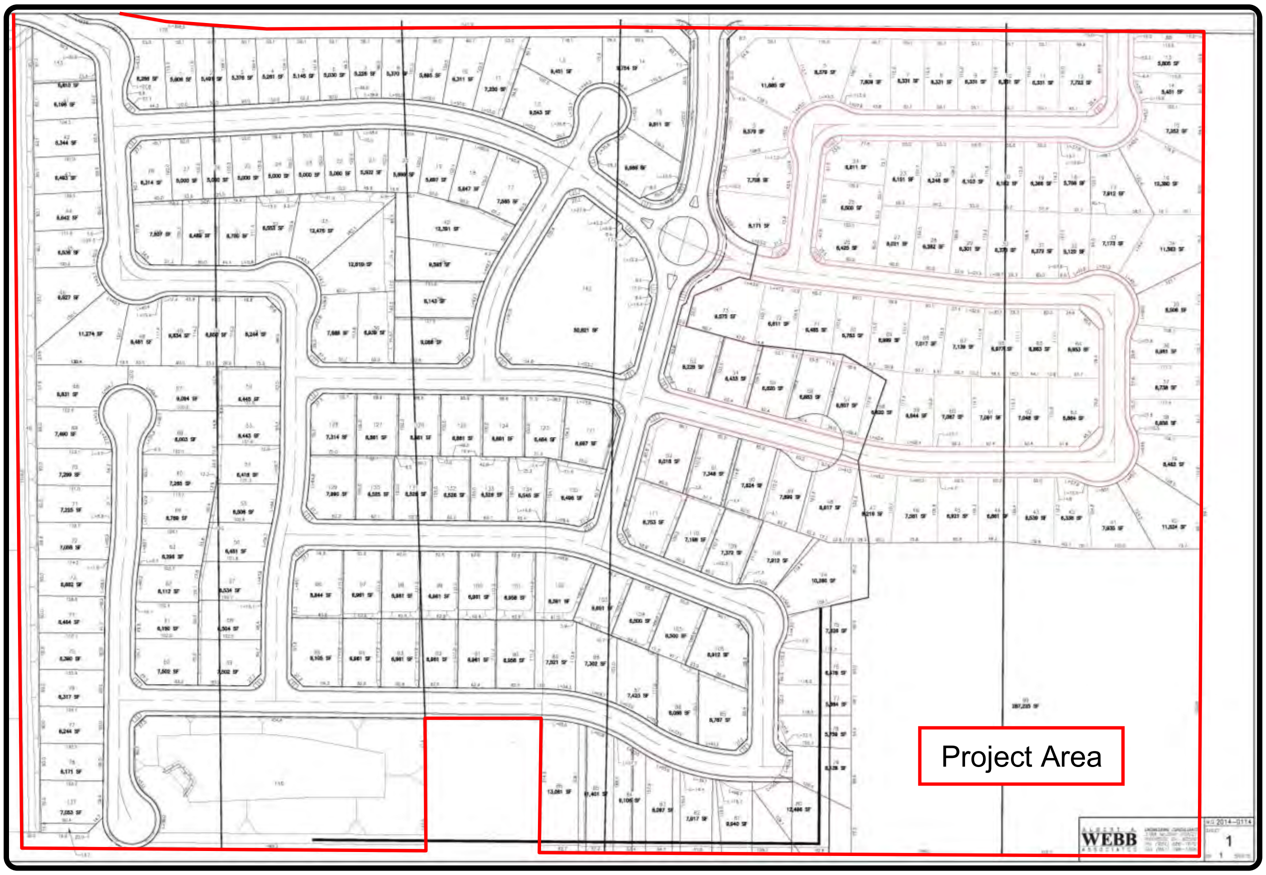
GSPI-05-646
December 2017

Figure 3

Aerial Photograph
(Photo obtained from Google Earth, October 2016)
Heatherglen/Tract 17604 Project
City of Highland
San Bernardino County, California



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GSPI-05-646
December 2017

Figure 4

Development Plan
(Plan obtained from Albert A. Webb Associates, 7-21-2016)
Heatherglen/Tract 17604 Project
City of Highland
San Bernardino County, California

1.5) Environmental Setting

1.5.1) Existing Land Use/Topography/Geology

The project area is currently undeveloped; however, the remnants of a historic age citrus and poultry ranching complex are located in the southwestern corner (36-12265). The lands surrounding the project area are generally characterized by residential developments of varying densities and undeveloped lands. The project area is bound to the north by Greenspot Road, followed by a high-density residential development. It is bound to the east, south, and west by dirt roads and undeveloped lands. To the west, the undeveloped lands are followed by residential development.

Topographically, the project area is primarily flat and exhibits low-relief rolling hills and shallow depressions. Elevation ranges from about 1,350 feet to 1,385 above mean sea level. Soils in the western portion of the project area are mapped as Soboba gravelly loamy sand (SoC) while the soils in the eastern portion are mapped as Soboba stony loamy sand (SpC) (NRCS 2017). Geologic mapping indicates that the majority of the project area is underlain by young axial-valley deposits of the latest Holocene (Qya5). These deposits consist of slightly to moderately consolidated silt, sand, and gravel deposits. Smaller areas within the project area are mapped as very young wash deposits from the latest Holocene (Qvyw). They are very slightly consolidated sand and gravel deposits in active washes (Matti, et al. 2003).

1.5.2) Vegetation

The eastern portion of the project area is characterized by relatively undisturbed alluvial fan sage scrub inhabited by a mixture of non-native and native plants. Areas within the western portion of the project area are comparatively more disturbed in association with past and ongoing human activities, such as the cultivation of *Eucalyptus* and jojoba. This portion of the project area also exhibits invasive non-native plant species (L&L 2017).

1.5.3) Water Resources

A portion of the Santa Ana Wash is located approximately 0.10 mile to the south of the project area. In addition, a water feature trends east-west across the central portion of the project area. Currently, no water is observable in the water feature and it does not convey flows either to or from the project area. The western end terminates near two (2) dirt roads while the eastern end terminates at about the project area boundary and is interrupted by a modern north-south trending flood control channel.

2.0) CULTURAL SETTING

2.1) Prehistoric Setting

The following section provides a brief discussion on the prehistoric and historic setting to provide a context for understanding the relevance of resources found in and near the project area. Additional information can be found in ethnographic studies, mission records, and major published sources, including Kroeber (1925), Wallace (1955), Warren (1968), Heizer (1978), Moratto (1984), Chartkoff and Chartkoff (1984), Fagan (2003), and Jones and Klar (2007).

The purpose of establishing a cultural sequence is to allow for the meaningful comparison of material culture attributes on an intra- and inter-site basis and to provide the basis for culture-model building. To this end, regional archaeologists often follow Wallace's southern California format (1955 and 1978) for discussing the prehistoric chronology of the project area. However, the established chronologies are often augmented or even abandoned. For example, Fagan (2003) does not use the traditional archaeological cultural sequences for his regional analysis, instead he describes the stages as generalized models related to recent environmental change and socio-economic models, all associated with an ever-changing environment. Thusly, it should be noted that all of the presented cultural sequences are regularly challenged, as are the meanings of the individual frames of reference. Wallace's prehistoric format is as follows:

- Early Period (before 6000 B.C.)
- Millingstone Period (6000 to 3000 B.C.)
- Intermediate Period (3000 B.C. to A.D. 500)
- Late Prehistoric Period (A.D. 500 to A.D. 1769)

Wallace also argued (Wallace, in Heizer 1978) that the stages prior to 2000 B.C. in southern California could be assigned to:

- San Dieguito Period (Period I: 9000 to 6000 B.C.)
- Standard Millingstone Period (Period II: 6000 to 3000 B.C.)
- Modified Millingstone Period (Period III: 3000 to 2000 B.C.)

Warren (1968) uses the following terms to subdivide the periods:

- San Dieguito Tradition (before 5500 B.C.)
- Encinitas Tradition (5500 B.C. to A.D. 600)
- Shoshonean Tradition (A.D. 600 to A.D. 1769)

2.1.1) Early Period (before 6000 B.C.)

Beginning with the first human presence in California, prehistoric artifacts and cultural activities appear to represent a big-game hunting tradition. Very few sites from the Early Period exist, especially in inland areas. Of the Early Period sites that have been excavated and dated, most exhibit a refuse assemblage suggesting short-term occupation. Such sites have been detected in caves and around fluvial lakes fed by streams that existed near the end of the last glaciation. Chipped stone tools at these sites are surmised to reflect a specialized tool kit used by hunters. Large-stemmed bifaces are common. Millingstones and dart points are not part of the Early Period tool assemblage.

2.1.2) Millingstone Period (6000 to 3000 B.C.)

Characterized by the appearance of handstones and millingstones, the onset of the Millingstone Period appears to correspond with an interval of warm and dry weather known as the Altithermal (Wallace 1978). Artifact assemblages begin to reflect an emphasis on plant foods and foraging subsistence systems, as evidenced by the grinding tools found at these sites. Assemblages also include choppers and scraper planes; however, there is a reduced number of large bifaces. Sites are occupied for a greater duration than Early Period sites, based on an increase in occupational debris. The distribution of millingstone sites reflects the theory that groups may have followed a modified central-based wandering settlement pattern. In this semi-sedentary pattern a base camp would have been occupied for a portion of the year, but small population groups seasonally occupied subsidiary camps in order to exploit resources not generally available near the base camp. Sedentism apparently increased in areas possessing an abundance of resources that were available for longer periods. More arid inland regions would have provided a seasonally dispersed resource base, restricting sedentary occupation.

2.1.3) Intermediate Period (3000 B.C. to A.D. 500)

Dating between roughly 3000 B.C. and A.D. 500, the Intermediate Period represents a slow technological transition, which is presumably related to the slowly drying and warming climate.

Site artifact assemblages retain many attributes of the Millingstone Period. Technologically, these sites are difficult to distinguish from earlier sites in the absence of radiometric dates. Additionally, these sites generally contain a reduced number of large-stemmed or notched projectile points, but there is an increase in portable mortars and pestles. The lack of large points, combined with the mortars and pestles, suggest that the indigenous populations may have preferred harvesting, processing, and consuming acorns and other seeds over hunting. Due to a general lack of data, neither the settlement and subsistence systems nor the cultural evolution of this period are well understood. It has been proposed by some researchers that group sedentism increased with the exploitation of storable, high-yield plant food resources, such as acorns. The duration and intensity of occupation at base camps increased during this period, especially in the later part of the period.

2.1.4) Late Prehistoric Period (A.D. 500 to A.D. 1769)

Extending from about A.D. 500 to Spanish contact in A.D. 1769, the Late Prehistoric Period reflects an increased sophistication and diversity in technology. Cultural complexes appeared that have modern ethnographic counterparts. Occupation sites consisted of major villages with cemeteries, as well as “special purpose” and seasonal sites. Village sites are common. Late assemblages characteristically contain small projectile or dart points, which imply the use of the bow and arrow. Use of bedrock milling stations is purported to have been widespread during this period, as it was in the previous period. Increased hunting efficiency and widespread exploitation of acorns provided reliable and storable food resources. Desert series projectile points, buffware and brownware ceramics, shell, steatite beads, slate pendants, incised stones, and milling tools constitute the tool assemblage. Regional differences, such as Cottonwood Projectile Points, were common and the use of obsidian increased in some areas and decreased in others.

2.2) Ethnographic Setting

The project area is located in an ethnographic transition region adjacent to the borders of the Traditional Use Areas (TUAs) of the Gabrieliño (Tongva), Cahuilla, and Serrano (Highland 2006). Tribal boundaries were likely very fluid in this area, allowing for the exchange of ideas and technology among these groups. The project area is situated near the far northeastern edge of an area that is associated with the Gabrieliño (Tongva) (Bean and Smith 1978), along the far northwestern extent of an area that is associated with the Cahuilla (Bean 1978), and at the southern edge of an area that is associated with the Serrano (Heizer 1978). Gabrieliño tribal territory is mapped as extending north from Aliso Creek to just beyond Topanga Canyon along the Pacific Coast and inland to the City of San Bernardino (Bean and Smith 1978). The Cahuilla northern border trends to the southeast along the southern margin of the San Bernardino Mountains from near the modern City of Riverside in the west (Bean 1978). Serrano lands are mapped as encompassing the San Bernardino Mountains from the Cajon Pass in the west to beyond modern Twentynine Palms in the east and from about Victorville in the north to near the San Gorgonio Pass in the south (Heizer 1978). The following sections provide brief summaries of these tribal groups.

2.2.1) Gabrieliño (Tongva)

Kroeber (1925) and Bean and Smith (1978) form the primary historical references for the Gabrieliño (Tongva). The arrival of Spanish explorers and the establishment of missions and outposts during the 18th century ended the prehistoric period in California. At this time, traditional Gabrieliño society began to fragment as a result of foreign diseases and the mass removal of local Native American groups to the Mission San Gabriel and Mission San Juan Capistrano.

The Gabrieliño spoke a language that belongs to the Cupan group of the Takic subfamily of the Uto-Aztecan language family (a language family that includes the Shoshonean groups of the Great Basin). The total Gabrieliño population in about A.D. 1770 was roughly 5,000 persons, based on an estimate of 100 small villages, with approximately 50 to 200 people per village. Their range is generally thought to have been located along the Pacific coast from Malibu to San Pedro Bay, south to Aliso Creek, east to Temescal Canyon, then north to the headwaters of the San Gabriel River. Also included were several islands, such as Catalina. This large area encompasses the City of Los Angeles, much of Rancho Cucamonga, Corona, Glendale, Long Beach, and San Dimas. By 1800, most traditional Gabrieliños had either been killed or subjugated by the Spanish.

The first modern social analyses of Gabrieliño culture took place in the early part of the 20th century (Kroeber 1925). By this time, acculturation and disease had devastated this group, and the population studied was a remnant of their pre-contact form. Nonetheless, the early ethnographers viewed the Gabrieliño as a chief-oriented society of semi-sedentary hunter-gatherers. Influenced by coastal and interior environmental settings, their material culture was quite elaborate and consisted of well-made wood, bone, stone, and shell items.

Located in an area of extreme environmental diversity, large villages may have been permanent, such as that found on or near Red Hill in Rancho Cucamonga, with satellite villages utilized seasonally. Their living structures were large, domed, and circular thatched rooms that may have housed multiple families. The society exhibited ranked individuals, possibly chiefs, who possessed a much higher level of economic power than unranked persons.

2.2.2) Cahuilla

The Cahuilla TUA is vast, with borders extending southeast from the modern City of Riverside in the north to Borrego Springs in the south. From Borrego Springs, the border trends east below the Santa Rosa Mountains, bisecting the Salton Sea, and further inland past the Chocolate Mountains. The Cahuilla northern border then trends southeast from near the modern City of Riverside in the west, along the southern margin of the San Bernardino Mountains, to beyond the Chocolate Mountains in the east (Bean 1978).

The Cahuilla belong to the Shoshonean linguistic family and have had definitive historical relationships with the Hopi of Arizona, the Gabrieliño, and Digueño of the southern California coast and the Luiseño of Riverside County, as well as other desert tribes such as the Kamia, Chemehuevi, Paiute, and Serrano. The Cahuilla population prior to Spanish contact could have been as numerous as 6,000 persons in an area encompassing more than 2,400 square miles (Bean 1978; Bean and Saubel 1979; Strong 1972).

Villages were determined according to their proximity to a defined water source and access to a food-gathering locale. Village sites were usually located near alluvial fans, streams, or at the base of mountains for protection against the winds. In the desert, some settlements were located around hand dug wells and watering holes. The Cahuilla can be discussed according to their primary village locality: Desert Cahuilla, Mountain Cahuilla, and Valley Cahuilla. Typically, a clan or family occupied several food-gathering locations and guarded these areas against other Cahuilla clans (Bean 1972 and 1978; Oswalt 1988; Strong 1972).

Cahuilla homes were generally constructed with forked posts, which supported wood ceiling beams. These structures were completely covered in thatch, which was slightly mixed with sand or soil. In some cases, the floor was slightly subterranean and each house was positioned so that a level of privacy was attained (Bean 1978; Kroeber and Hooper 1978). Wilke (1978) notes that the Cahuilla homes were generally hidden in mesquite groves, which effectively obscured them from plain view.

Ceremony and ritual was of great importance to the Cahuilla (Bean 1978). Deep ceremonial ties existed between the Serrano and the Cahuilla, and it is thought that the Desert Cahuilla may have adopted certain ceremonial practices from the Serrano. Frequently practiced ceremonies include multiple rituals for the mourning of the dead, the eagle dance, summer and winter solstice celebrations, and separate initiation rites for boys and girls (Strong 1972).

2.2.3) Serrano

The Serrano TUA is mapped as encompassing the San Bernardino Mountains from the Cajon Pass in the west to beyond modern Twentynine Palms in the east and from about Victorville in the north to near the San Gorgonio Pass in the south (Bean and Smith 1978). However, these borders are ill defined due to a lack of reliable data and to the Serrano sociopolitical organization. The Serrano were organized into autonomous lineages occupying defined territories; however, these groups rarely identified a permanent habitation site. These groups were neither politically aligned, nor were they socially connected outside of each localized lineage (Strong 1972). For these reasons, the borders of the arbitrarily grouped Serrano peoples would vary greatly from lineage to lineage, depending upon their respective worldviews.

Studies on linguistic characteristics have indicated that the term Serrano had been academically applied to four (4) different groups, including the Serrano, Kitanemuk, Vanyume, and the Tataviam (Alliklik) (Bean and Smith 1978; Johnston 1965). The Vanyume use area has been mapped to the north of Victorville, extending from the Cajon Pass in the west, to near modern Ludlow between the Cady and Bristol Mountains (Bean and Smith 1978). The Kitanemuk and Tataviam are found within the general vicinity of the Tehachapi Mountains.

The Serrano generally spoke a language that also belongs to the Cupan group of the Takic subfamily of the Uto-Aztecan language family, a language family that includes the Shoshonean groups of the Great Basin. The total Serrano population at contact was roughly 2,000 persons. The range of this group was limited and restricted by reliable water sources.

The Spanish decimated all indigenous groups adjacent to the San Bernardino Mountains, but some Serrano survived for many years. This was due to the ruggedness of the terrain in the far eastern San Bernardino Mountains and to their dispersed population. Serrano populations studied in the early part of the last century were a remnant of their cultural form prior to contact with the Spanish Missionaries. Nonetheless, the Serrano are viewed as clan and moiety-oriented or local lineage-oriented group tied to traditional territories or use-areas. Typically, a "village" consisted of a collection of families centered about a ceremonial house, with individual families inhabiting willow-framed huts with tule thatching. Considered hunter-gatherers, the Serrano exhibited a sophisticated technology devoted to hunting small animals and gathering roots, tubers, and seeds of various kinds. Today, Serrano descendants are found mostly on the Morongo and San Manuel reservations. The term Morongo is derived from Maringa, which is a shortened form of Maringayam. This term is applied to the easternmost division of the Serrano peoples and is a generic term that incorporates all the families and lineages in the general area, including the Tumukvayam in Banning Water Canyon and Tamianutcem at Twentynine Palms (Johnston 1965).

2.3) Historic Setting

The historic period (post-contact) in southern California is commonly presented in terms of Spanish, Mexican, and American political domination. Certain themes are common to all periods, such as the development of transportation, military activities, settlement, and agriculture.

2.3.1) Spanish Period (1769 to 1821)

The first Europeans to travel in the vicinity of the project area were Spanish soldier Pedro Fages and Father Francisco Garcés. This expedition to locate deserting soldiers brought the group through the foothills of the San Jacinto Mountains and along Coyote Canyon on the southern edge of Riverside County. They then continued into the Anza Valley, the San Jacinto Valley, Riverside, and eventually into San Bernardino and the Cajon Pass. Such expeditions sparked an influx of non-natives to southern California and the first of these groups were the Spanish. Associated with the Spanish migration is the establishment of missions and military presidios along the coast of California. Between 1769 and 1823, Spanish explorers and missionaries established 21 missions, four (4) presidios, and four (4) pueblos between San Diego and Sonoma (Bean and Rawls 1983). Although none of the missions were located within modern San Bernardino County, their influence was far-reaching. Lands within the southwestern portion of modern San Bernardino County were utilized for agriculture and pasturage under the supervision of the Mission San Gabriel (Redlands 1995).

Beginning in the late 18th century, the missions began establishing Ranchos for the purpose of expanding their agricultural holdings. The establishment of the Ranchos is important to the development of the area as a center of mission activity for inland southern California and it encouraged population expansion into the region. Modern Highland is situated at the eastern edge of the San Bernardino Valley and the valley includes substantial acreage affiliated with the Rancho San Bernardino established by the Mission San Gabriel (Redlands 1995; ECORP 2006a).

In 1819, the Rancho San Bernardino was formally established. This followed a decision by the heads of the mission system to expand their agricultural holdings into the interior and later establish a chain of additional missions in the desert region (Harley 1989). A decision was made to create an estancia, or a ranch headquarters, with a chapel that was occasionally visited by church fathers at the Guachama Ranchería. However, local Native American attacks forced the estancia overseers to move the headquarters from the original site to a better-protected location. The San Bernardino Asistencia was located on high ground approximately 1.50 miles to the east-southeast of the original estancia. Construction began about 1830 and was not yet finished when the project was abandoned in 1834 (Lugo 1950). The San Bernardino Asistencia (36-17534/36-2307/CA-SBR-2307H) is located approximately five (5) miles to the southwest of the project area and is listed as California Historic Landmark (CHL)-42.

2.3.2) Mexican Period (1821 to 1848)

By the early decades of the 19th century, the growth of Spanish California had come to a halt. Embroiled in the Napoleonic wars and a subsequent struggle to evade French rule, Spain was unable to effectively rule its North American colonies. In 1821, and after more than a decade of revolutionary struggle, Mexico achieved independence from Spain and California became a distant outpost of the Mexican Republic. Following Mexican Independence, the secularization of the missions and the mission holdings took place over the next decade and the former mission lands were transferred to prominent Mexican families. In 1842, the Lugo family received a land grant from the Mexican government for portions of the San Bernardino and Yucaipa Valleys. They occupied a large house and several other buildings that had been constructed at the San Bernardino Asistencia (Lugo 1950; Redlands 1995). The Highland area was not included in the land grant; however, the San Bernardino grant was located to the west of the project area and it included modern San Bernardino and Redlands (ECORP 2006a).

2.3.3) American Period (1848 to Present)

The Mexican Period formally ends in 1848, following the signing of the Treaty of Guadalupe Hidalgo. This event marked the end of the Mexican-American War and ceded the northern provinces of Mexico to the United States. The following decades saw an influx of American settlers to the region, sparked by the discovery of gold, agricultural possibilities, and land speculation. Mexican ranchos were subdivided or sold during this period, and much of the land that once constituted rancho holdings became available for settlement by immigrants to California.

Some of the first settlers in the area that would become known as East Highlands were members of the Cram family, including John, Lewis, and Henry Cram. They established their homesteads in the late 1850s and the area was initially named Cramville. Shortly after their arrival, they began experimenting with citrus agriculture and their efforts proved so profitable that other farmers in the region also began to plant orchards (Gallegos & Associates 1993; ECORP 2006a; Donahue and Suttle 2017; Quales n.d.)

By 1858, there was an increasing need for water to irrigate crops and the Cram family joined the Van Leuven family to excavate the Cram-Van Leuven Ditch. Stretching several miles from the Santa Ana River to their lands in Cramville, the ditch was the first large-scale water diversion project in the area and it lead to the establishment of citrus as the dominant crop in the Cramville region (Gallegos & Associates 1993; Highland 2006; San Bernardino 2017). This ditch is mapped as trending east-west through the central portion of the project area and it extends beyond the project area boundaries (36-6848/CA-SBR-6848H). Over the ensuing decades, the Cram-Van Leuven Ditch was continually altered and modified. It was enlarged after a flooding event in 1862 and a north trending extension was added that connected to the North Fork Ditch. This extension passed through the East Highlands Ranch founded by James S. Edwards (Gallegos & Associates 1993; ECORP 2006a).

In the 1870s, Edwards devised a plan to acquire property, access water, and further expand the citrus industry. He established the East Highlands Orange Company (EHOC) in 1893 and immediately embarked upon a process of community development and an expansion of the irrigation system. The success of the EHOC soon lead to the end of Cramville and the establishment of the Community of East Highlands (Gallegos & Associates 1993; ECORP 2006a).

During the 20th century, suburbanization of the area began to occur as early as 1943. This coincided with the establishment of the San Bernardino Army Air Depot, which is now the San Bernardino International Airport. Through this process, citrus groves were removed and replaced with residential housing and packing houses were converted to industrial uses. This change in land use occurred throughout Highland, but was slower to occur at East Highlands Ranch. The ranch lands remained primarily rural and devoted to the cultivation of citrus until the 1980s. In 1987, the Communities of East Highland, West Highland, and Highland incorporated to create the City of Highland (ECORP 2006a; Highland 2006).

2.4) History of the Cram-Van Leuven Ditch

Following the initial settlement of the East Highlands area and in an effort to irrigate crops and procure drinking water, Lewis F. Cram, Henry Cram, John Cram, and Frederick Van Leuven built an irrigation ditch in May of 1858 (DeWitt, et al. vs Van Leuven, et al. 1860; Beattie 1951; Atchley 2017; Quales n.d.) This ditch was initially called the Mesa Ditch, but it was later known as the Cram-Van Leuven Ditch (Atchley 2017). The head of the ditch was located at the mouth of the Santa Ana River canyon and it extended to City Creek (Beattie 1951). The initial construction likely included some digging at the mouth of the canyon for a diversion, but then it followed a natural overflow of the river to the lands located to the east of modern Merris Street. Thereafter, more digging was likely, following the contour of the land situated below the mesa (Atchley 2017).

The beginning of the Cram-Van Leuven Ditch was located upstream from the original headworks of the existing North Fork Ditch and the Timber Ditch. The diversion of water to the Cram-Van Leuven Ditch reduced the river flow to the other ditches and at times, there was an insufficient flow of water to satisfy the needs of the North Fork and Timber Ditches (Beattie 1951; Scott 1977). By August of 1860, the competition for water from the Santa Ana River amongst the existing ditches elicited a lawsuit. This suit was filed by the majority owners of the Timber Ditch against the owners of the Cram-Van Leuven Ditch (DeWitt, et al. vs Van Leuven, et al. 1860; Beattie 1951). The suit did not go to trial; rather, it was settled by a compromise court judgment on June 18, 1861. This judgment gave the owners of the Cram-Van Leuven Ditch a right to one-sixth of the river flow at the mouth of the canyon (Hall 1888; Beattie 1951; Atchley 2017; Quales n.d.) This suit was the first water right in the Santa Ana River basin to be adjudicated by a court (Beattie 1951).

A disastrous flood occurred in 1862 and this event had a significant effect on the San Bernardino Valley and the Santa Ana River. Prior to the flood, the river was a well-defined and narrow channel and it was lined with alder, cottonwood, sycamore, and willow trees. The flood uprooted and washed away the trees and deposited sand, gravel, and boulders in the riverbed and on adjacent lands (Beattie 1951). Following the flood, the river failed to follow a well-defined course and it flowed through several channels below the mouth of the canyon. This area was located upstream from the common point of diversion for the North Fork and Timber Ditches and the new river channels resulted in a significant water deficiency for the ditches (Scott 1977; Quales n.d.)

As a result of the water deficiency after the flood of 1862, the North Fork Ditch owners decided to extend the ditch to a new heading nearer the mouth of the canyon. They decided that the most economical manner to accomplish this task would be to use the existing Cram-Van Leuven Ditch. In 1865, they requested permission from the owners of the Cram-Van Leuven Ditch for a connection to be constructed between the two (2) ditches. As part of the agreement, the North Fork Ditch offered to enlarge the Cram-Van Leuven Ditch and share operating expenses (Beattie 1951; Scott 1977; Quales n.d.) Thus, the ditch was enlarged, a connection was completed to the east of the City Creek Wash (see Figure 8), and from this time the North Fork Ditch and the Cram-Van Leuven Ditch diverted water via a common point at the mouth of the canyon (Scott 1977). As a result of this development, the Cram-Van Leuven Ditch located upstream from the connection with North Fork Ditch also became known as North Fork Ditch (Hall 1888; Scott 1977). During the ensuing years, the ditches were extended and new distributaries were built as irrigation needs increased and water-rights were divided and sold (Hall 1888).

Throughout the late 1860s and 1870s, agricultural development continued to occur in the San Bernardino Valley. The lands between Base Line Road and City Creek were planted in deciduous fruits and other crops, such that the majority of the land in this area was under cultivation during the early 1880s (Scott 1977). In 1879, E. G. Judson and Frank E. Brown became interested in the potential of the land above the Cram-Van Leuven Ditch and the North Fork Ditch for growing oranges. They also built a fruit dryer near the Cram Homestead (36-4220/CA-SBR-4220H/CPHI-31) and began working with peaches, apricots, and some apples (Beattie 1951; Quales n.d.) Judson and Brown then purchased the claims of settlers living near Plunge Creek and secured options on other parcels of land in the vicinity. To bring water to the benchland, Judson and Brown met several times with owners of the North Fork and Cram-Van Leuven Ditches and offered to build a new high-line ditch at a cost of $1,000. The North Fork Ditch owners opposed the plan, but by 1880, several benchland area owners had purchased lowland water rights and requested the transfer of those rights to the benchland. In the spring of 1881, Judson and Brown and the owners of North Fork Ditch rights signed an agreement, exclusive of the Cram-Van Leuven owners (Hall 1888; Scott 1977). This agreement allowed for the construction of a high-line ditch to serve the benchlands, which would become known as the North Fork Canal (Scott 1977; Quales n.d.)

Construction of the North Fork Canal commenced in 1881 and it was completed in early 1882. The canal departed from the original Cram-Van Leuven Ditch approximately four (4) miles to the east of the project area (see Figure 8; Scott 1977; Quales n.d.) After this point, the Cram-Van

Leuven Ditch owners ran their water in the new high-line canal built by Judson and Brown to a point called the Cram and Van Leuven Divide. The divide was located about four (4) miles below the mouth of the canyon and from this point, they built a connecting ditch to their old ditch located below the bench (Beattie 1951). The Cram-Van Leuven Divide or the connecting line of 1882-1883 (36-6850/CA-SBR-6850H) is located to the west of the project area. The advent of the high-line ditch rendered a portion of the Cram-Van Leuven Ditch unnecessary for watering lands in the area. Specifically, the segment located between the North Fork Canal departure in the east and the Cram-Van Leuven Divide in the west became unnecessary. Thus, once the North Fork Canal was built and after about 1881, only the Cram-Van Leuven Divide was needed to bring water to the East 3rd Street lands (Atchley 2017).

In the following years, numerous changes occurred with regard to the owners of the Santa Ana River water-rights and the control of the water flows. In 1885, the North Fork owners chose to incorporate their water rights and they established the North Fork Water Company (Beattie 1951). The Cram-Van Leuven Ditch owners were not included in this deal and they instead remained affiliated with the portion located upstream from the North Fork Canal (Quales n.d.) In September of 1883, the Bear Valley Land and Water Company was established and they gained control of the Santa Ana River water. The Big Bear Dam was constructed in 1884 and this affected those with water-rights in the North and South Fork due to the availability of water distribution. Thereafter, an agreement was signed between the North Fork Water Company, the Cram-Van Leuven owners, and the Bear Valley Land and Water Company on May 5, 1885. In this agreement, the amount of water received for the entire year was set and it provided the first definite schedule for water users measured in inches of water (Beattie 1951). In this manner, the North Fork was able to secure their water supply in relatively dry months and 50 percent more land was able to be irrigated than before the agreement (Quales n.d.)

Eventually, the Cram and Van Leuven interests incorporated into a separate company in 1890 and they continued to operate for the next 35 years. In March of 1925, the Cram-Van Leuven owners moved to completely merge with the North Fork Water Company and all Cram-Van Leuven stock was transferred to the North Fork (Beattie 1951; Quales n.d.) Thus, while the necessity waned for the central portion of the Cram-Van Leuven Ditch after about 1881, its construction allowed for the importation of water to the Cramville/East Highlands area and directly affected the development patterns through an increase in water availability and reliability.

2.5) Location of the Cram-Van Leuven Ditch in the Vicinity of the Project Area

The Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) was first identified in the project area by Gallegos & Associates in 1993 (see Figure 11; Gallegos & Associates 1993). This identification was based on the mapping of the Old North Fork Ditch in the project area on the USGS 1899 Redlands, CA map (see Figure 7). However, determining the actual location of the Cram-Van Leuven Ditch as constructed in 1858; its configurations when upgraded, as needed; its later permutations when combined with the North Fork Ditch; and where the ditch was located after it fell out of necessary use post-1881 is a complicated endeavor. This is due to a lack of maps dating to the period of initial construction, an extensive flooding event in 1862 that changed the flow of the Santa Ana River and affected the ditch, and an additional heavy flooding event in 1867. In addition, there is a time delay between the date when portions of the ditch became unnecessary and were effectively replaced by the high-line North Fork Canal (about 1881) and the earliest available maps showing the ditch (late 1880s and early 1890s).

In an effort to identify the location of the Cram-Van Leuven Ditch in Section 2 of Township 1 South, Range 3 West, L&L contacted several local libraries and historians to obtain maps and information. While there is no map associated with the ditch on-file at the San Bernardino County Historical Archives (SB County 2017), L&L did obtain numerous maps of irrigation features in the Highland area from other resources. The earliest available map dates to 1888 and consists of the San Bernardino Sheet of an irrigation map prepared by the California State Engineering Department. This map depicts the Old North Fork Ditch in the immediate vicinity of the project area. The Old North Fork Ditch is an alternative name for the Cram-Van Leuven Ditch and refers to the combined ditch that existed following the flood of 1862 and after the two (2) ditches were connected in 1865 (Scott 1977). In the 1888 map, the Old North Fork Ditch is shown to the north of the project area. This map additionally shows a very short segment of a ditch labeled as the C.&V.L. Ditch to the west of the project area and within the City Creek Wash (CSED 1888; Figure 5).

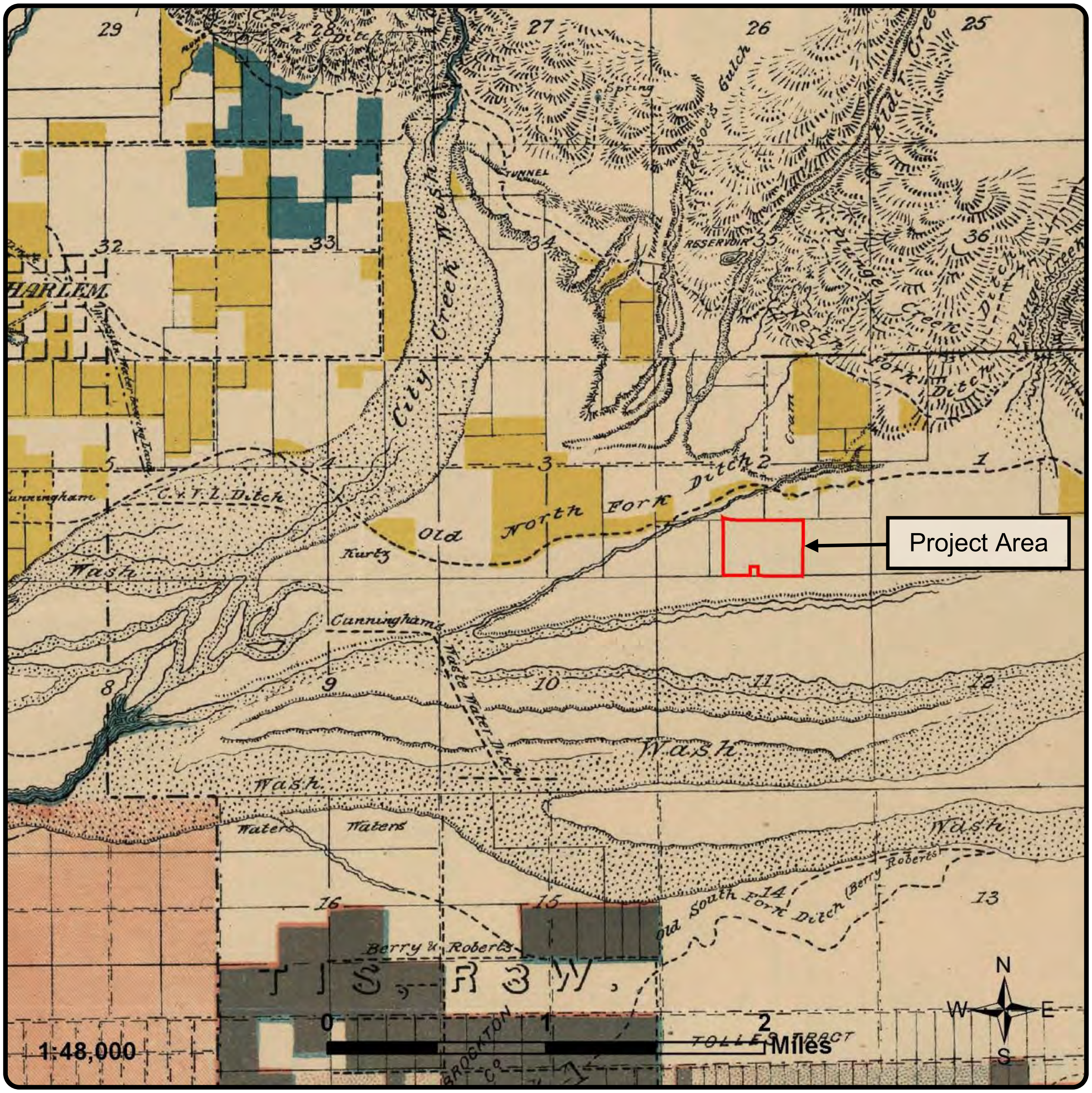
A map dating to 1891 and depicting irrigation systems in the east end of the San Bernardino Valley was obtained from the HAHS collection of research resources on water history. This map is similar to the 1888 map and it shows the Old North Fork Ditch to the north of the project area. This map additionally depicts a drainage feature traversing the northern edge of the project area (HAHS 2017; Figure 6).

L&L also reviewed numerous archival aerial photographs and topographic maps (NETR 2017).

The earliest maps date to the late 1800s and the very early 1900s. In 1895, the ditch is not shown or labeled and instead, a water feature is depicted that traverses the project area and extends between Plunge Creek in the north and the Santa Ana River in the south (NETR 2017). The next available topographic map is the USGS 1899 Redlands, CA map. On this map, the Old North Fork Ditch is shown trending much further south than on the 1888 and 1891 irrigation maps and it is depicted as extending into the project area (Figure 7). This map represents the first time that the ditch is shown in the project area on a primary resource. This map may show a mapping error or an altered path or flow for the Old North Fork Ditch, as this map was generated almost 20 years after the ditch went out of necessary use post-1881. The ditch continues to be observable on topographic maps until 1955, when the ditch is no longer depicted and an unnamed, blue-line water feature is shown trending east-west across the northern edge of the project area. The water feature that has been recorded as 36-6848/CA-SBR-6848H appears on topographic maps beginning in 1969 and is observable on aerial photographs as early as 1938 (NETR 2017).

Several reports were also obtained during the research for 36-6848/CA-SBR-6848H that contain maps. In 1977, M. B. Scott compiled a history of water facilities in the Santa Ana River Basin. In this document, he produced a map documenting ditches and canals at the eastern end of the San Bernardino Valley that was based on the compilation of his research on water companies, diversions, and water rights. According to this map, the Cram-Van Leuven Ditch extends from the Santa Ana Canyon, to the Cram homestead in Section 3 (36-4220/CA-SBR-4220H/CPHI-31), and on to City Creek Wash. The ditch was connected to the North Fork Ditch after the flood of 1862 and at a point located immediately to the east of City Creek Wash. In the vicinity of the project area, the original Cram-Van Leuven Ditch (1858) is mapped as trending east-west to the north of modern Greenspot Road and to the north of the project area (Scott 1977; Figure 8).

Another map available from the HAHS shows the location of canals and ditches used in the early development of the east San Bernardino Valley water supply. This map informs the research work completed by K. Quales (n.d.) for the North Fork Canal and does not appear to have a date. This map depicts the Cram-Van Leuven Ditch and the later North Fork Extension to the north of Greenspot Road (Quales n.d.; Figure 9). However, this map is potentially problematic because it depicts Greenspot Road connecting into 3rd Street, rather than connecting into 5th Street. For this reason, it is difficult to ascertain the exact placement of the project area on this map.



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GSPI-05-646
December 2017

Figure 5
1888 Detail Irrigation Map, San Bernardino Sheet

CSED 1888 (California State Engineering Department [CSED]. 1888. Detail Irrigation Map, San Bernardino Sheet. On-file at the A. K. Smiley Library Heritage Room, Redlands, California.)

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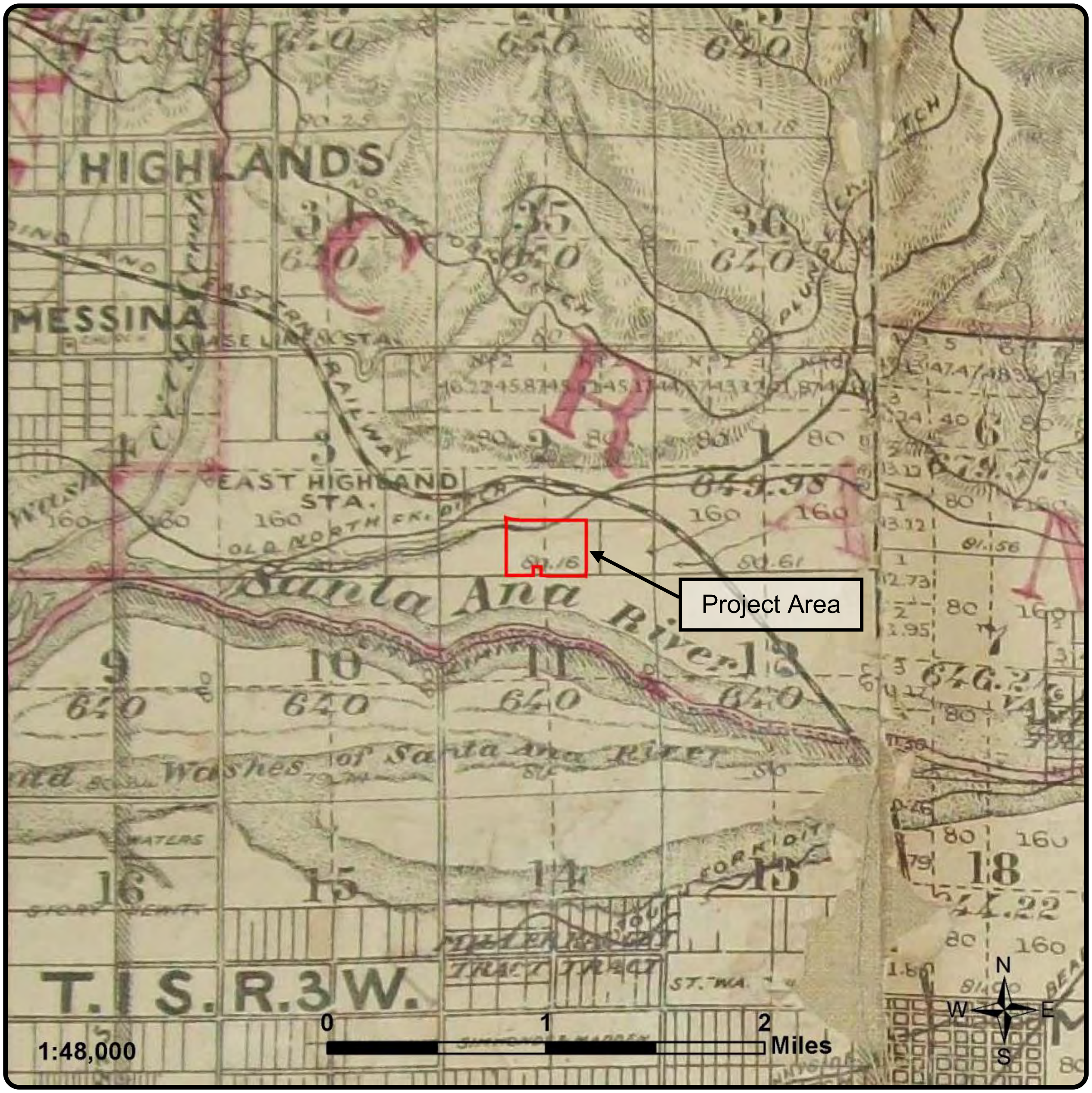
City of Highland
San Bernardino County, California



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December 2017

Figure 6
1891 Irrigation Systems Map

HAHS 2017 (Highland Area Historical Society [HAHS]. 2017. Research Resources of Water History in the Highland Area. Website accessed October 2017. http://www.highlandhistory.org/waterhistory.php)

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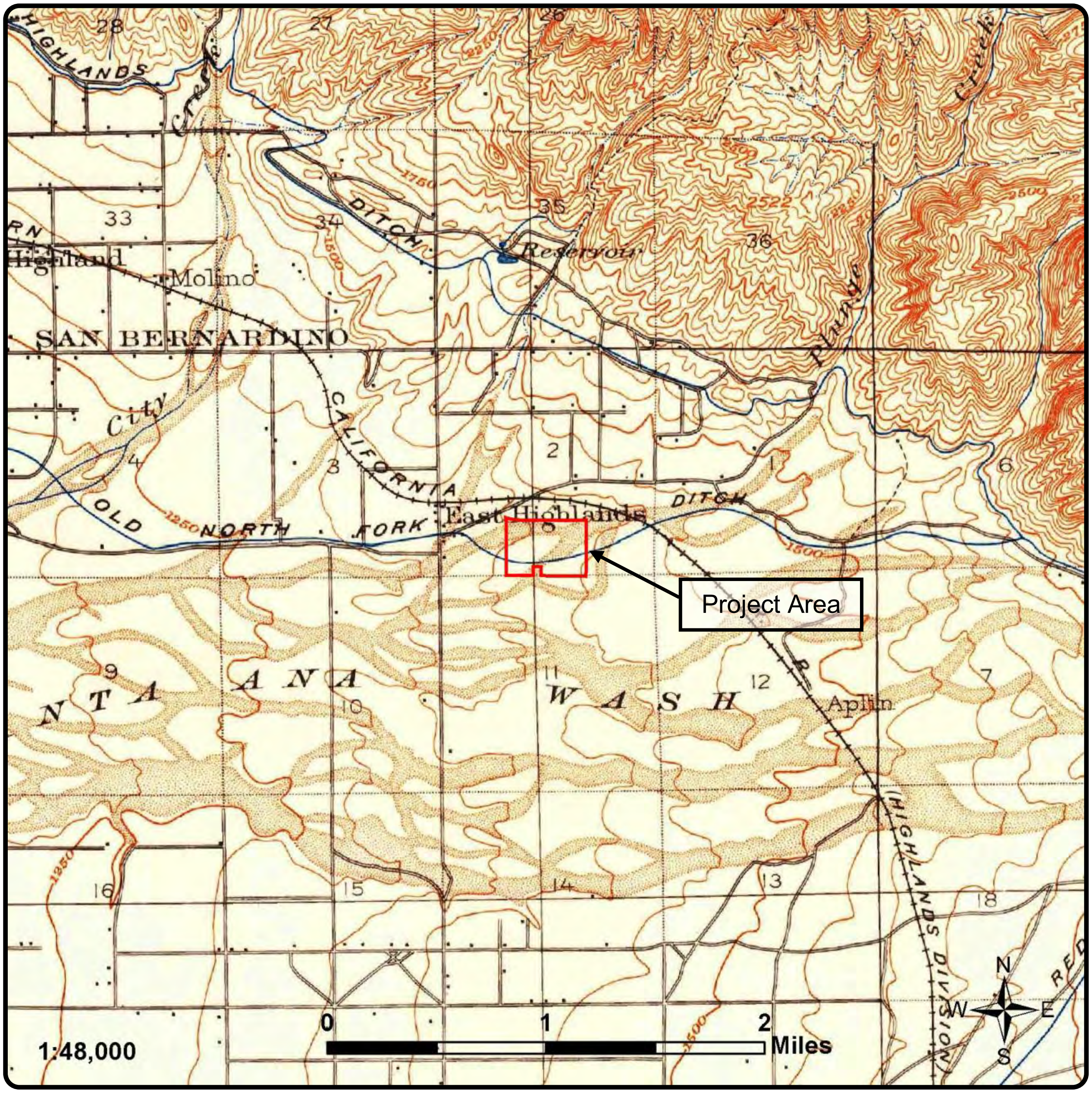
City of Highland
San Bernardino County, California



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GSPI-05-646
December 2017

Figure 7
USGS 1899 Redlands, CA Topographic Map
USGS: https://store.usgs.gov/map-locator

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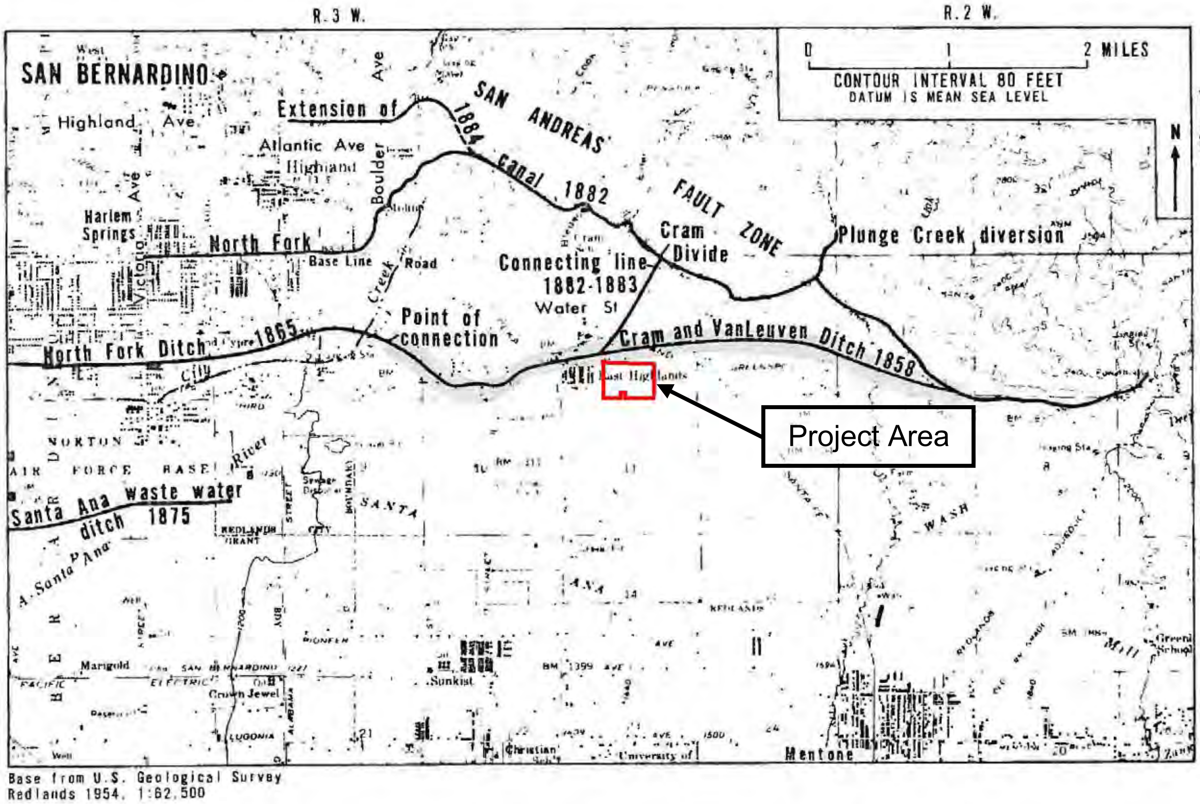
San Bernardino County, California



Source: Scott 1977 (Scott, M. B. 1977. Development of Water Facilities in the Santa Ana River Basin, California, 1810-1968: A Compilation of Historical Notes Derived from Many Sources Describing Ditch and Canal Companies, Diversions, and Water Rights. Report #77-398. On-file at the Feldhym Library California Room, San Bernardino, California.)

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GSPI-05-646
December 2017

Figure 8

Cram and Van Leuven Ditch and North Fork Canal Map

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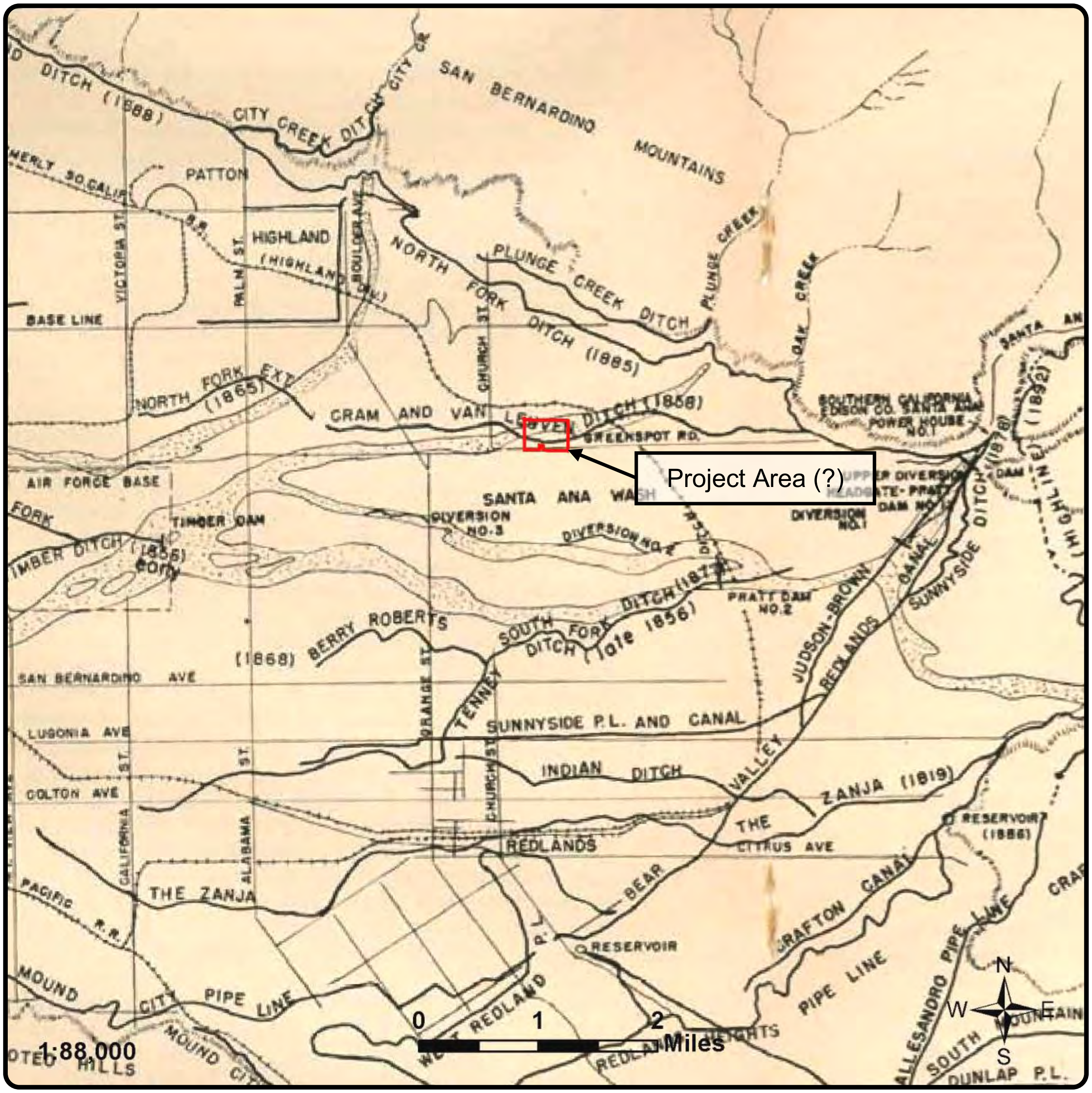

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GSPI-05-646
December 2017

Figure 9
Canals and Ditches Map

Quales n.d. (Quales, K. n.d. A Brief History of the North Fork Canal, San Bernardino, CA. Electronic document accessed October 2017. http://www.highlandhistory.org/Water_History/Quarles_FinalReport.pdf)

Heatherglen/Tract 17604 Project
City of Highland
San Bernardino County, California

Based on the earliest available maps focused on irrigation features (1888 and 1891), the Old North Fork Ditch/Cram-Van Leuven Ditch was located in the northern half (N ½) of the southern half (S ½) of Section 2 of Township 1 South, Range 3 West in the vicinity of the project area. This places the ditch to the north of modern Greenspot Road and outside the current project area. Later USGS maps dating to 1899 and into the early 20th century begin to depict the Old North Fork Ditch in the project area. This may be a mapping error where a drainage feature was identified as part of the ditch or a more southerly route for this portion of the ditch that came into use sometime after 1891.

3.0) REGULATORY SETTING AND METHODS

3.1) Regulatory Setting

Government agencies, including federal, state, and local agencies, have developed laws and regulations designed to protect significant cultural resources that may be affected by projects regulated, funded, or undertaken by an agency. Under CEQA, public agencies must consider the effects of their actions on both historical resources and unique archaeological resources. Pursuant to Public Resources Code (PRC) Section 21084.1, a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. Section 21083.2 requires agencies to determine whether proposed projects would have effects on unique archaeological resources.

Historical resource is a term with a defined statutory meaning (see PRC, Section 21084.1 and CEQA Guidelines, Section 15064.5(a) and (b)). The term embraces any resource listed in or determined to be eligible for listing on the CRHR. The CRHR includes resources listed in or formally determined eligible for listing in the National Register of Historic Places (NRHP), as well as some CHLs and California Points of Historical Interest (CPHIs).

Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be historical resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (PRC, Section 5024.1 and California Code of Regulations, Title 14, Section 4850). Unless a resource listed in a survey has been demolished, lost substantial integrity, or there is a preponderance of evidence indicating that it is otherwise not eligible for listing, a lead agency should consider the resource to be potentially eligible for the CRHR.

In addition to assessing whether historical resources potentially impacted by a proposed project are listed or have been identified in a survey process, lead agencies have a responsibility to evaluate them against the CRHR criteria prior to making a finding as to a proposed project's impacts to historical resources (PRC, Section 21084.1 and CEQA Guidelines, Section 15064(a)(3)). The following criteria were used to evaluate the significance of potential impacts to cultural resources for the proposed project. An impact would be considered significant if the proposed project affects the qualities that render a resource eligible for listing in the NRHP or the CRHR.

3.1.1) Federal Significance Criteria

Evaluation of a resource for listing on the NRHP requires that specific elements be addressed: the criteria of significance and the integrity of the property.

Regulations found in Title 36 Code of Federal Regulations (CFR) Part 60.4 list the criteria for evaluating site significance for listing on the NRHP. Following the standards and guidelines, resources are considered significant if they meet at least one (1) of four (4) significance criteria (A-D), retain integrity, and are at least 50 years old. In rare cases, sites may be considered significant if they are of exceptional value and do not meet any other requirements. The criteria for determining the significance of a property are as follows:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of significant persons in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded or may be likely to yield information important in prehistory or history.

In addition to meeting one (1) of the significance criteria listed above, a property must also demonstrate a sufficient degree of integrity so that it is capable of conveying such significance (Hardesty and Little 2000). The seven (7) elements of integrity identified by the NRHP include location, design, setting, materials, workmanship, feeling, and association (NPS 1991).

3.1.2) State Significance Criteria

Given that the CRHR was modeled after the NRHP, it has very similar eligibility criteria. Generally, to be considered significant under CEQA, a resource must possess integrity and demonstrate eligibility under at least one of the following criteria (California Code of Regulations 15064.5):

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

As noted above, CEQA also requires lead agencies to consider whether projects will impact unique archaeological resources. PRC Section 21083.2(g) states that a unique archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Treatment options under Section 21083.2 include activities that preserve such resources in place and in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation, or study in place without excavation and curation (if the study finds that the artifacts would not meet one [1] or more of the criteria for defining a unique archaeological resource).

3.1.3) Local Regulations

The City of Highland has addressed cultural resources in their Municipal Code and GP (Highland 2006).

City of Highland Municipal Code

Chapter 16.32 of the Municipal Code addresses Historic and Cultural Preservation in the City, establishes the Historic and Cultural Preservation Board (Section 16.32.030), and provides the local criteria for cultural resource designation (Section 16.32.050). Any improvement, natural feature, or site may be nominated as a cultural resource by the Historic and Cultural Preservation Board of the City pursuant to Section 16.32.060 if it meets the criteria for listing on the NRHP or the following:

A. It exemplifies or reflects special elements of the City's cultural, social, economic, political, aesthetic, engineering, architectural, or natural history;

B. It is identified with persons or events significant in local, state, or national history;

C. It embodies distinctive characteristics of a style, type, period, or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship;

D. It is representative of the work of a notable builder, designer, or architect;

E. It contributes to the significance of an historic area, being a geographically definable area possessing a concentration of historic or scenic properties or thematically related grouping of properties which contribute to each other and are unified aesthetically by plan or physical development;

F. It has a unique location or singular physical characteristics or is a view or vista representing an established and familiar visual feature of a neighborhood, community, or the City of Highland;

G. It embodies elements of architectural design, detail, materials, or craftsmanship that represent a significant structural or architectural achievement or innovation;

H. It is similar to other distinctive properties, sites, areas, or objects based on a historic, cultural, or architectural motif;

I. It reflects significant geographical patterns, including those associated with different eras of settlement and growth, particular transportation modes, or distinctive examples of park or community planning; and/or

J. It is one (1) of the few remaining examples in the City, region, state, or nation possessing distinguishing characteristics of an architectural or historical type of specimen.

City of Highland General Plan

The GP provides guidance for the preservation of historic built-environment resources in the Land Use Element, while archaeological resources are addressed in the Conservation and Open Space Element (Highland 2006). Information about development in and near historic areas, as well as adaptive reuse of historic structures, can be found in Section 2 of the GP (Land Use Element) and the City has established the following Goal and Policies for archaeological resources:

Goal 5.8: Protect, document, and minimize disruption of sites that have archaeological significance.

Policies

1. Avoid significant impacts in all new developments within areas determined to be archaeologically sensitive through the following measures:

- Conduct an archaeological records search with the Archaeological Information Center (AIC) [sic] in order to identify potential on-site sensitivities;

- In cooperation with a qualified archaeologist, develop mitigation measures for projects found to be located in or near sensitive areas or sites; and

- Require that environmental review be conducted for all applications within the area designated as archaeologically sensitive, including but not limited to grading, earth moving and stockpiling, and building and demolition permits.

2. Include the following statement as a condition of approval on all development projects:

- "If cultural resources are discovered during project construction, all work in the area of the find shall cease, and a qualified archaeologist shall be retained by the project sponsor to investigate the find, and to make recommendations on its disposition. If human remains are encountered during construction, all work shall cease and the San Bernardino County Coroner's Office shall be contacted pursuant to Health and Safety Code provisions."

3. Coordinate with the SMBMI when proposals for development projects are filed within the Areas of Sensitivity for Archaeological Resources (Illustrated in Figure 5.2 of the GP) through the following actions:

- Notify the SMBMI via notification mailings about proposed projects in archaeologically sensitive areas; and

- Invite comments and suggestions to be forwarded to City staff and appropriate decision makers to aid the preservation and development review processes.

3.2) Methods

The primary purpose of this CRA is to determine whether cultural resources more than 45 years old are located within or near the project area and whether these resources will be or could be impacted by the proposed project. To accomplish this, research and a pedestrian survey were conducted. The results of these efforts assist in determining if resources are present and, if present, considered eligible for inclusion in the NRHP, CRHR, or local designation. This allows for the consideration of the impacts of the proposed project on cultural resources, including resources considered significant under the parameters of the Regulatory Setting. The assessment included the following tasks:

- Review of regional history and previous cultural resource sites and studies within the project area and the vicinity.
- Examination of archival topographic maps and aerial photographs for the project area and the general vicinity.
- Research the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) via inquiries for maps and associated documents at various locations, including local libraries and the San Bernardino County Archives.
- Request of an NAHC SLS for the project area and contact with Tribal groups and individuals as named by the NAHC.
- Notification and information scoping efforts with the SMBMI pursuant to Goal 5.8, Policy 3 of the City of Highland GP, as the project area is located in an Area of Sensitivity for Archaeological Resources as illustrated in Figure 5.2 of the GP (Highland 2006).
- Complete site visits to relocate previously recorded resources in the project area and collect information for DPR 523 Update Forms.
- Conduct a non-collection Phase I pedestrian survey of the project area.
- Prepare DPR 523 Update Forms for all previously recorded resources located in the project area (36-6848/CA-SBR-6848H, 36-6853/CA-SBR-6853H, 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265).
- Submit all DPR 523 Update Forms to the SCCIC for their files.
- Evaluate the potential for the proposed project to result in significant impacts to cultural resources.
- Develop recommendations associated with impacts to cultural resources following the guidelines as outlined in the Regulatory Setting.

3.2.1) Cultural Resources Records Search

A records search was conducted by L&L Archaeologist William R. Gillean on July 6, 2017 at the SCCIC (Appendix B). The records search consisted of a check for previously recorded cultural resource sites and isolates and previous cultural resources studies on or within a one-mile radius of the project area. In addition, the records search included a review of the NRHP, Archaeological Determinations of Eligibility (ADOE), and the OHP Historic Property Data File (HPDF).

3.2.2) Historic Records Review

Information available from the BLM was reviewed, including maps and GLO records pertinent to the project area (BLM 2017). Archival topographic maps and aerial photographs containing the project area were also reviewed (NETR 2017). In addition, research was completed for the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) at the A.K. Smiley Library Heritage Room in Redlands, the Feldhym Library California Room in San Bernardino, the San Bernardino County Historical Archives, and the HAHS website. L&L also contacted Tom Atchley of the Redlands Historical Society at the recommendation of staff from the San Bernardino County Historical Archives. Additional contact was made via email with Nancy Alexander of the HAHS at the recommendation of Mr. Atchley.

3.2.3) Native American Coordination

A request was sent to the NAHC asking for an SLS and a contacts list on June 28, 2017. A response was received on June 29, 2017 (Appendix D). The NAHC contacts were sent project location information and were asked for their potential concerns regarding the project area. The information scoping packages were sent to the 19 contacts listed by the NAHC on July 6, 2017 (Appendix E). These packages included a letter to the SMBMI in accordance with Goal 5.8, Policy 3 of the City of Highland GP (Highland 2006). As of the date of this report, one (1) response has been received from the SMBMI. All L&L coordination efforts are summarized in Table 3 of this report and copies of correspondence are included in Appendix E.

3.2.4) Pedestrian Survey and Site Visits

The primary purpose of the pedestrian survey is to locate and document previously recorded or new cultural resource sites or isolates that are more than 45 years old within the project area, and to determine whether such resources will be or could be impacted by project implementation. The pedestrian survey was completed on July 18, 2017 via east-west trending transects at intervals of no more than 15 meters. During the survey, digital photographs and notes were taken to characterize conditions in the project area.

Previously recorded resource locations for 36-6848/CA-SBR-6848H, 36-6853/CA-SBR-6853H, 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265 were visited on July 11, 2017 and October 3, 2017 and were documented through photographs and notes. Location information was also obtained for all resources via Universal Transverse Mercator (UTM), North American Datum of 1983 (NAD83). Data collected in the field were used to record resources onto DPR 523 Update Forms.

If previously unrecorded resources were detected during the survey or the site visits, they would be measured, photographed, and mapped in the field. All data obtained in the field would be used to record resources onto new DPR 523 Forms.

4.0) RESULTS

4.1) Cultural Resources Records Search

L&L Archaeologist William R. Gillean conducted the records search on July 6, 2017 at the SCCIC (Appendix B). The records search was completed for the project area and all lands found within one mile. The results indicated that 100 percent of the project area has been previously inventoried via two (2) reports (SB-2828/Gallegos & Associates 1993; SB-5671/ECORP 2006a). In addition, a total of five (5) resources have been mapped within or partially within the project area:

- 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch)
- 36-6853/CA-SBR-6853H (Historic Refuse Scatter)
- 36-7434/CA-SBR-7434H (Historic Refuse Dump)
- 36-12264/CA-SBR-12205H (Historic Refuse Scatter)
- 36-12265 (Historic Citrus/Poultry Ranching Complex)

The results additionally revealed that a total of 39 resources have been recorded within the one mile search radius. Of these resources, five (5) are located in the project area, nine (9) are located within 0.25 mile of the project area, five (5) are located within 0.25 and 0.50 mile of the project area, and 20 are located between 0.50 mile and one mile of the project area.

The identified resources consist entirely of historic age resources, including 37 historic sites, structures, and buildings and two (2) historic isolated finds. The resources are predominately refuse scatters (n=18) and irrigation complexes or features (n=10). The refuse scatters are generally domestic in nature and consist of cans, ceramics, glass, and other items dating between the late 1800s and the modern era, while the irrigation complexes include a variety of ditches, flumes, and other features. Other historic resources consist of refuse scatters in association with foundation remains (n=2) or in association with irrigation features (n=1); a bridge (n=1); the remains of agricultural properties with associated residences (n=3); the Cram Ranch and House location (n=1); and the Cram Schools location (n=1). The isolated finds consist of a can (n=1) and a fragment of solarized glass (n=1). These previously recorded resources and their locations relative to the project area are outlined below in Table 1.

Table 1. Previously Recorded Cultural Resources Located Within One Mile of the Project Area

Resource Number	Recorder Name and Date	Resource Description	Within ~One to 0.50 Mile Radius	Within ~0.50 to 0.25 Mile Radius	Within ~0.25 Mile Radius	Within Project Area?
36-4220/CA-SBR-4220H/CPHI-31	G. Teal ,1980	Historic: The Cram Ranch and House. This resource consists of the first homestead in the East Highlands area, established by the John Cram family. The Crams planted the first orange groves in the Highland area and assisted in establishing the citrus industry in the region. The house reportedly burned down in 1982.	●	—	—	No
36-6068/CA-SBR-6068H	R. Hampson, M. Doyle, R. Brown, and D. Adams of Greenwood and Associates, 1987	Historic: This site consists of a small scatter of domestic debris.	●	—	—	No
36-6073/CA-SBR-6073H	Originally recorded by R. Hampson, M. Doyle, and R. Brown of Greenwood and Associates, 1987 Updated by M. Pritchard-Parker, H. Peterson, and A. Delu of LSA Associates, Inc. (LSA), 1994 and D. McDougall and D. Bircheff of Applied EarthWorks, Inc., 1999	Historic: This site consists of five (5) historic debris loci possibly associated with a historic residence or other structure. Research completed in 1999 at Loci 1 and 2 indicated that the deposits likely reflected intermixed and unrelated materials deposited over several decades in the 20th century. These deposits appeared to be the result of long-term refuse disposal activities in the area.	—	●	—	No
36-6074/CA-SBR-6074H	J. Wishner, R. Brown, and P. Easter of Greenwood and Associates, 1987	Historic: A single episode domestic debris disposal consisting of cans, ceramics, and glass.	●	—	—	No
36-6075/CA-SBR-6075H	M. Doyle, D. Adams, J. Schmidt, S. Wakefield, and R. Brown of Greenwood and Associates, 1987	Historic: This site consists of five (5) concentrations of domestic debris resulting from multiple dumping episodes.	●	—	—	No
36-6076/CA-SBR-6076H	S. Wakefield, J. Wishner, D. Adams, M. Doyle, R. Brown, R. Hampson, and J. Schmidt of Greenwood and Associates, 1987	Historic: Three (3) concentrations of domestic debris resulting from multiple dumping episodes.	●	—	—	No
36-6078/CA-SBR-6078H	G. Romani, J. Schmidt, S. Wakefield, P. Easter, and J. Wishner of Greenwood and Associates, 1987	Historic: A stone foundation with an associated refuse scatter. The refuse appears to date to the 1930s and 1940s.	●	—	—	No

Resource Number	Recorder Name and Date	Resource Description	Within ~One to 0.50 Mile Radius	Within ~0.50 to 0.25 Mile Radius	Within ~0.25 Mile Radius	Within Project Area?
36-6079/CA-SBR-6079H	G. Romani, J. Schmidt, S. Wakefield, and J. Wishner of Greenwood and Associates, 1987	Historic: A domestic refuse scatter and a power pole. The refuse appears to date between the late 19th century and early 20th century; however, modern refuse was also observed at the site.	—	●	—	No
36-6080/CA-SBR-6080H	Originally recorded by G. Romani, J. Schmidt, S. Wakefield, and J. Wishner of Greenwood and Associates, 1987 Updated by A. Belcourt of ICF International, 2016	Historic: A domestic debris scatter consisting of glass, ceramics, and cans. This site could not be relocated during a study completed in 2016.	—	●	—	No
36-6081/CA-SBR-6081H	G. Romani, J. Schmidt, S. Wakefield, and J. Wishner of Greenwood and Associates, 1987	Historic: A sparse domestic debris scatter, mainly consisting of cans.	●	—	—	No
36-6082/CA-SBR-6082H	G. Romani, J. Schmidt, S. Wakefield, and J. Wishner of Greenwood and Associates, 1987	Historic: This site consists of a sparse refuse scatter resulting from a single dumping episode or short-term occupation.	●	—	—	No
36-6083/CA-SBR-6083H	R. Hampson and J. Wishner of Greenwood and Associates, 1987	Historic: A sparse scatter of domestic debris dating to the late 19th century and early 20th century.	●	—	—	No
36-6087/CA-SBR-6087H	J. Sorenson, K. Vander Veen, M. Imwalle, and G. Toren of Greenwood and Associates, 1987	Historic: Three (3) refuse scatters containing domestic debris.	●	—	—	No
36-6088/CA-SBR-6088H	J. Sorenson, K. Vander Veen, M. Imwalle, and G. Toren of Greenwood and Associates, 1987	Historic: The remains of a ranch or homestead. This site includes the remains of a residence, the foundation of an outbuilding, walkways, driveways, and refuse.	●	—	—	No
36-6089/CA-SBR-6089H	J. Sorenson, K. Vander Veen, M. Imwalle, and G. Toren of Greenwood and Associates, 1987	Historic: A refuse scatter consisting of cans, ceramics, and glass.	●	—	—	No
36-6848/CA-SBR-6848H	Originally recorded by G. Romani, G. Head, N. Kaptain, and T. Webb of Greenwood and Associates, 1990 Updated by J. McKenna of	Historic: The Cram-Van Leuven Ditch. This resource consists of an irrigation ditch constructed in 1858 by members of the Cram and the Van Leuven families. It connected the mouth of the Santa Ana Canyon with the Cram and Van Leuven lands located at the base of the East Highlands bench. This ditch was one (1) of the earliest irrigation systems emerging from the	●	●	●	Yes. This resource traverses the central portion of the project area and trends east-west. It was relocated during the

Resource Number	Recorder Name and Date	Resource Description	Within ~One to 0.50 Mile Radius	Within ~0.50 to 0.25 Mile Radius	Within ~0.25 Mile Radius	Within Project Area?
	McKenna, et al., 1992; J. Eighmey, I. Strudwick, R. Phillips, P. McHenry, J. Boughton, and R. Collett of Gallegos & Associates, 1993; and R. Mason and C. Cotterman of ECORP Consulting, Inc. (ECORP), 2006	Santa Ana Canyon. It was also the subject of the first court decision addressing water rights in the Upper Santa Ana River in 1861. This resource was originally recorded in 1990 as a segment located to the west of Church Street and an update completed in 1992 addresses a possible portion of the ditch located to the east of the project area. The portion of the ditch found in the project area was addressed by updates completed in 1993 and 2006. In the project area, the ditch is described as unlined and lacking dams or diversions. In 1993, this resource was described as damaged by numerous flooding episodes. Nonetheless, it was recommended for avoidance during future development, if feasible. However, if avoidance was not possible, then recordation was considered sufficient to mitigate impacts and no further work was recommended (Gallegos & Associates 1993). This resource was relocated in 2006. At this time, the ditch was described as likely eligible for the CRHR under Criteria 1 and 2; however, its integrity was potentially compromised. It was recommended that the entirety of the ditch be assessed in order to more accurately address the integrity of the segment located in the project area (ECORP 2006a). The Cram-Van Leuven Ditch is listed in the HPDF as a resource that has been determined ineligible for the NRHP by consensus through the Section 106 process. In addition, this resource has not been evaluated for the CRHR or for local listing (NRS 6Y).				current study.
36-6849/CA-SBR-6849H	G. Romani, G. Head, N. Kaptain, and T. Webb of Greenwood and Associates, 1990	Historic: An irrigation complex consisting of flumes, drains, standpipes, and earthen canals.	—	—	●	No
36-6850/CA-SBR-6850H	G. Romani and N. Kaptain of Greenwood and Associates, 1990	Historic: A connecting ditch for the Cram-Van Leuven Ditch and the North Fork Ditch constructed in 1882-1883. This resource was recorded as a small segment located to the west of the project area in 1990. No other portions of the resource have been addressed by survey or updates. Nonetheless, the SCCIC base maps depict this resource in its assumed original location, which shows the ditch	—	—	●	No. However, this resource may have trended southwest-northeast near the northwestern corner of the project area. This resource was not

Resource Number	Recorder Name and Date	Resource Description	Within ~One to 0.50 Mile Radius	Within ~0.50 to 0.25 Mile Radius	Within ~0.25 Mile Radius	Within Project Area?
		extending near the northwestern corner of the project area.				observed in the project area during the survey or during a historic aerial review (NETR 2017).
36-6851/CA-SBR-6851H	G. Romani, G. Head, N. Kaptain, and T. Webb of Greenwood and Associates, 1990	Historic: This site consists of six (6) stone and mortar foundations with associated refuse deposits. The refuse deposits are primarily comprised of cans. In 1990, the site was described as situated in an area that was currently being developed.	—	—	●	No. However, this site is mapped immediately to the north of the northern project area boundary (Greenspot Road).
36-6852/CA-SBR-6852H	G. Romani, G. Head, N. Kaptain, and T. Webb of Greenwood and Associates, 1990	Historic: Water control/conveyance structures, including a cistern, wellhead, and pipelines.	—	—	●	No. However, this site is mapped immediately to the north of the northern project area boundary (Greenspot Road).
36-6853/CA-SBR-6853H	Originally recorded by G. Romani, G. Head, N. Kaptain, and T. Webb of Greenwood and Associates, 1990 Updated by J. Eighmey, I. Strudwick, R. Phillips, P. McHenry, J. Boughton, and R. Collett of Gallegos & Associates, 1993	Historic: Refuse scatter consisting of glass, cans, and domestic refuse. This resource was described as likely surficial in nature. This site could not be relocated during surveys completed in 1993 and 2006 (Gallegos & Associates 1993; ECORP 2006a).	—	—	—	Yes. This resource is recorded in the north-central portion of the project area. However, it could not be relocated during previous studies (Gallegos & Associates 1993; ECORP 2006a) or during the current study.
36-6854/CA-SBR-6854H	G. Romani, G. Head, N. Kaptain, and T. Webb of Greenwood and Associates, 1990	Historic: This resource consists of a concrete trough, domestic refuse, a fence line, and a portion of the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H).	●	—	—	No
36-7051/CA-SBR-7051H	Originally recorded by J. J. Schmidt, G. Romani, J. Schmidt, and B. Texier of Greenwood and Associates, 1990 Updated by M. Pritchard-Parker, A. Delu, and H.	Historic: An extensive irrigation complex within an active orange grove. Structures include flumes, weirs, canals, standpipes, a reservoir, ditches, and retaining walls.	●	—	—	No

Resource Number	Recorder Name and Date	Resource Description	Within ~One to 0.50 Mile Radius	Within ~0.50 to 0.25 Mile Radius	Within ~0.25 Mile Radius	Within Project Area?
	Peterson of LSA, 1994 and C. Harper and P. Shattuck of LSA 2003					
36-7165/CA-SBR-7165H	Originally recorded by R. Hatheway of Hatheway and Associates, 1987 Updated by J. McKenna of McKenna, et al., 1992	Historic: The Plunge Creek Bridge. This bridge was constructed in about 1933 and is an example of the Pratt Pony Truss style that was patented in 1844.	●	—	—	No
36-7434/CA-SBR-7434H	Originally recorded by R. Phillips and P. McHenry of Gallegos & Associates, 1993 Updated by ECORP, 2006	Historic: Refuse dump consisting of glass, cans, ceramics, and domestic refuse. This site was detected on the northern edge of the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) and was described as eroding into the ditch. When originally recoded, it measured 4 meters (north-south) by 5 meters (east-west) (13 feet by 16 feet). In 1993, probing via trowel indicated that the site extended to a depth of approximately 10 centimeters. Diagnostic artifacts were collected and identified a date of 1932 or later for the deposit. Based on these results, the interpretive value of information available from this site was identified as low and it was recommended not important under CEQA. As such, no additional work was recommended for this resource prior to any impacts (Gallegos & Associates 1993). The site was relocated in 2006. At this time, various artifacts were detected, but the site was described as comparatively more eroded than when originally recorded. Testing was recommended to evaluate the site under CEQA (ECORP 2006a).	—	—	—	Yes. This resource is located in the central portion of the project area and remnants of the site were relocated during the current study.
36-7995/CA-SBR-7995H	D. McLean and M. Pritchard-Parker of LSA, 1994	Historic: The Cram School Irrigation Channels. This resource consists of the remains of three (3) irrigation channels constructed of split granite cobbles and mortar. They were likely installed in the late 19th century or early 20th century.	●	—	—	No
36-7996/CA-SBR-7996H	B. Sturm and D. McLean of LSA, 1994	Historic: The Cram Schools. This site consists of two (2) features that may be associated with the Cram Schools. Feature 1 may be associated with the 1882 school and consists of a brick and mortar flagpole base and associated concrete swale for water run-off. Feature 2 may be associated the 1902 school and appears to be a possible concrete footing.	●	—	—	No

Resource Number	Recorder Name and Date	Resource Description	Within ~One to 0.50 Mile Radius	Within ~0.50 to 0.25 Mile Radius	Within ~0.25 Mile Radius	Within Project Area?
36-10181/CA-SBR-10181H	D. McDougall and D. Bircheff of Applied Earthworks, Inc., 1999	Historic: A small surface scatter of domestic refuse dating between about 1917 and the 1950s (or later).	—	●	—	No
36-10182/CA-SBR-10182H	D. McDougall and D. Bircheff of Applied Earthworks, Inc., 1999	Historic: A small surface scatter of domestic refuse dating between pre-1917 and the 1950s.	—	—	●	No
36-10183/CA-SBR-10183H	D. McDougall and D. Bircheff of Applied Earthworks, Inc., 1999	Historic: This site consists of four (4) loci comprised of surficial domestic refuse scatters. The observed refuse indicates that the site location has been used as a refuse dump throughout the 20th century.	—	—	●	No. However, this site is located immediately to the southwest of the project area.
36-11475/CA-SBR-11475H	D. McLean of LSA, 1998	Historic: A Craftsman style residence constructed in 1915, a cobble and mortar wall, an irrigation flume, and an orange orchard in operation since approximately 1895 or 1896.	●	—	—	No
36-11476/CA-SBR-11476H	D. McLean of LSA, 1998	Historic: Eight (8) mortar and cobble walls, a concrete gutter, and a cobble irrigation ditch.	●	—	—	No
36-12264/CA-SBR-12205H	C. Cotterman and W. Sharp of ECORP, 2006	Historic: Refuse scatter dominated by domestic food containers and consisting of glass, cans, and ceramics. One (1) small concentration of artifacts was noted and the resource was described as surficial in nature. This site measured 50 feet (north-south) by 75 feet (east-west) and diagnostic artifacts suggested a date range of 1880 and 1925. This site was recommended for testing to evaluate the site under CEQA (ECORP 2006a).	—	—	—	Yes. This resource is located in the central portion of the project area and remnants of the site were relocated during the current study.
36-12265	C. Cotterman of ECORP, 2006	Historic: The remains of an early 20th century citrus/poultry ranching complex. This complex pre-dates 1948 and includes four (4) houses, associated garages, a well and pump stand, two (2) cisterns, a reservoir, a chicken coop, a swimming pool, concrete and iron water pipes, a concrete foundation, and boulders. This resource was recommended for additional research to evaluate the site under CEQA (ECORP 2006a).	—	—	—	Yes. This resource is located in the southwest corner of the project area and remnants of the site were relocated during the current study.
36-24384/CA-SBR-15513H	D. Ballester and R. Porter of CRM Tech, 2012	Historic: An earthen canal measuring approximately 1,867 feet in length. This resource was recommended not eligible for inclusion in the NRHP and the CRHR.	●	—	—	No
36-31127	A. Belcourt and S. Kitchel of ICF International, 2016	Historic: Isolated find consisting of one (1) crushed, single hinged tobacco tin.	—	—	●	No

Resource Number	Recorder Name and Date	Resource Description	Within ~One to 0.50 Mile Radius	Within ~0.50 to 0.25 Mile Radius	Within ~0.25 Mile Radius	Within Project Area?
36-31128/CA-SBR-31128H	A. Belcourt and S. Kitchel of ICF International, 2016	Historic: A water channel comprised of two (2) parallel berms constructed of soil and cobbles. This resource dates to 1938 or earlier. The resource was recommended not eligible under Criteria 1 through 4 (NRHP) or Criteria A through D (CRHR).	—	—	●	No
36-31129/CA-SBR-31129H	A. Belcourt and S. Kitchel of ICF International, 2016	Historic: A water channel comprised of two (2) parallel berms constructed of soil and cobbles. This resource dates to 1938 or earlier. The resource was recommended not eligible under Criteria 1 through 4 (NRHP) or Criteria A through D (CRHR).	—	—	●	No
36-060,195	G. Romani of Greenwood and Associates, 1987	Historic: Isolated find consisting of a fragment of amethyst bottle glass.	—	●	—	No

The SCCIC records search also indicated that 16 area-specific technical reports are on file for the project area and the one mile search radius. Two (2) of these reports address the project area (SB-2828/Gallegos & Associates 1993; SB-5671/ECORP 2006a), indicating that the project area has been previously surveyed for the presence or absence of observable cultural resources. One (1) of these reports (SB-5671/ECORP 2006a) addressed the entire project area and the other report (SB-2828/Gallegos & Associates 1993) addressed the east half of the project area. Collectively, the 16 previous reports address approximately 30 percent of the land located within the search radius. The survey coverage varies throughout the search radius with the lands located within 0.25 mile exhibiting 35 percent coverage, between 0.25 and 0.50 mile 20 percent coverage, and 0.50 and one mile of the project area exhibiting about 30 percent coverage. The details of these reports are summarized below in Table 2.

Table 2. Previous Cultural Resources Studies Within One Mile of the Project Area

Report #	Date	Rsrcs	Report	Author
SB-0667	1978	Yes	Cultural Resources Assessment for Tentative Tract 10501, East Highland Area	San Bernardino County Museum Association (SBCM)
SB-1124	1981	No	Cultural Resources Assessment of the East Highlands Ranch, San Bernardino County, California	SBCM
SB-1125	1986	No	Cultural Resources Assessment of Tentative Tracts 13467, 13468, and 13469, East Highlands Ranch Phase 3, San Bernardino County, California	Lerch & Associates

Report #	Date	Rsrcs	Report	Author
SB-1566	1986	Yes	Santa Ana River Upstream Alternatives, Cultural Resources Survey	ECOS Management Criteria, Inc.
SB-1783	1988	Yes	Seven Oaks Dam Project: Water Systems	Area Location Systems
SB-1824	1988	Yes	Old Webster Quarry EIR: Historic Resources	Hatheway & McKenna
SB-1878	1989	No	Cultural Resource Survey for a Proposed Storm Drain Channel, Near East Highlands, San Bernardino County, California	Greenwood and Associates
SB-2679	1992	No	Archaeological Investigations at the Abbey Way Well Site Property for the East Valley Water District, San Bernardino County, California	McKenna, et al.
SB-2828	1993	Yes	Cultural Resource Survey Report for the Concordia Homes Project, City of Highlands, California	Gallegos & Associates
SB-2936	1993	No	Picnic/Staging Area	M. Mlazovsky
SB-3036	1995	Yes	Archaeological and Historical Investigations of the Cram School Site and Tentative Tracts 13551 and 15554, East Highlands, San Bernardino County, California	LSA
SB-3037	1995	Yes	Cultural Resources Assessment for 278.4 Acres Within East Highlands Ranch, San Bernardino County, California	LSA
SB-4831	2005	No	Cultural Resource Assessment: Upper Santa Ana River Wash Land Management and Habitat Conservation Plan, San Bernardino County, California	D. Brunzell
SB-5671	2006	Yes	Cultural Resources Survey Report for the Heather Glen Project (TT17604), City of Highland, San Bernardino County, California	ECORP
SB-6638	2010	No	Cultural Resource Survey Report: Greenspot Road Site, San Bernardino County, California	Dynamic Environmental Associates, Inc.
SB-7146	2011	No	Identification and Evaluation of Historic Properties: East Valley Water District Plant 143 Project, City of Highland, San Bernardino County, California	D. Encarnacion

4.2) Historic Records Review

Historic documents and maps available from the BLM GLO website were reviewed to provide information about historic era land use and development within the project area (BLM 2017). In addition, archival topographic maps and aerial photographs containing the project area were reviewed. This review included topographic maps dating between 1895 and 1999 and aerial photographs dating between 1938 and 2012 (NETR 2017).

A review of land patents for Section 2 of Township 1 South, Range 3 West indicated that the southeast quarter (SE ¼) of the southwest quarter (SW ¼) and the SW ¼ of the SE ¼ were transferred to Titus H. Woodruff on October 5, 1907. This transfer occurred under the authority of the Original Homestead Entry of May 20, 1862 (12 Stat. 392). Additional land transfers are listed for Section 2; however, none of these transfers include the project area. These transfers address lands that were allotted to the Cram and Van Leuven families. Specifically, lands within the northeast quarter (NE ¼) and the southeast quarter (SE ¼) were transferred to Henry, John, and/or Lorenzo Cram between 1879 and 1882. Lands within the northwest quarter (NW ¼) and the S ½ were transferred to Benjamin, Frederick, and/or Sydney Van Leuven between 1875 and 1891.

Topographic maps dating between 1895 and 1951 do not depict structures within or near the project area. However, the Old North Fork Ditch is shown trending within the project area as early as 1899. In 1955, the ditch is no longer depicted and a water feature trends east-west across the northern edge of the project area. In addition, three (3) structures are located in the southwestern portion of the project area at the mapped location of 36-12265. This development pattern is consistent between 1955 and 1964. In 1969, a total of four (4) structures are depicted in the mapped location of 36-12265 and a blue-line water feature consistent with the mapped location of 36-6848/CA-SBR-6848H is shown. By 1980, five (5) structures are shown in the location of 36-12265. This development pattern is consistent with the modern topographic map dating to 1999 and is generally reflected in the available aerial photographs.

The earliest aerial photograph dates to 1938 and shows several structures and active fields or groves in the southwestern portion of the project area. These structures correspond to the mapped location of 36-12265. Between 1959 and 1980, the number of structures at the mapped location of 36-12265 appears to increase, as does the size of the associated ornamental vegetation. The development in this area remains relatively consistent between about 1995 and 2005, but by 2009 the structures appear to have been removed. Also, beginning in 1938 and extending to the most recent aerial photograph (2016; Figure 3), a water feature is observable trending east-west across the central portion of the project area. This water feature corresponds to the mapped location of previously recorded resource 36-6848/CA-SBR-6848H.

4.3) Native American Coordination

An SLS was requested from the NAHC on June 28, 2017 and a response was received on June 29, 2017 (Appendix D). The NAHC SLS failed to indicate the presence of Native American cultural resources in the immediate project area. However, the NAHC noted that the absence of specific site information does not indicate the absence of cultural resources in any project area and that other resources should be consulted to obtain information regarding known and previously recorded sites.

A total of 19 scoping letters were sent to the contacts named by the NAHC on July 6, 2017. As a result of the information scoping process, one (1) response has been received from the SMBMI. The SMBMI stated that the project is located within Serrano ancestral territory and they requested additional project-related information and the completion of area-specific research. Specifically, they recommended the completion of a records search at the SCCIC and an archaeological pedestrian survey. All correspondence has been incorporated into Appendix E and a summary of the detail is provided below in Table 3.

Table 3. Summary of Native American Coordination

Contact Name and Title	Contact Affiliation	Method of Contact and Date	Response	Action(s) Required?
Jeff Grubbe, Chairperson	Agua Caliente Band of Cahuilla Indians	Scoping letter sent via U.S. Mail on July 6, 2017	No response received.	N/A
Patricia Garcia-Plotkin, Director	Agua Caliente Band of Cahuilla Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A
Amanda Vance, Chairperson	Augustine Band of Cahuilla Mission Indians	Scoping letter sent via U.S. Mail on July 6, 2017	No response received.	N/A
Doug Welmas, Chairperson	Cabazon Band of Mission Indians	Scoping letter sent via U.S. Mail on July 6, 2017	No response received.	N/A
Daniel Salgado, Chairperson	Cahuilla Band of Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A
John Perada, Environmental Director	Los Coyotes Band of Mission Indians	Scoping letter sent via U.S. Mail on July 6, 2017	No response received.	N/A
Shane Chapparosa, Chairperson	Los Coyotes Band of Mission Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A
Robert Martin, Chairperson	Morongo Band of Mission Indians	Scoping letter sent via U.S. Mail on July 6, 2017	No response received.	N/A
Denisa Torres, Cultural Resources Manager	Morongo Band of Mission Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A

Contact Name and Title	Contact Affiliation	Method of Contact and Date	Response	Action(s) Required?
Joseph Hamilton, Chairperson	Ramona Band of Cahuilla Mission Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A
John Gomez, Environmental Coordinator	Ramona Band of Cahuilla Mission Indians	Scoping letter sent via Email on July 6, 2017	No response received	N/A
John Valenzuela, Chairperson	San Fernando Band of Mission Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A
Lee Clauss, Director of Cultural Resources	SMBMI	Scoping letter sent via Email on July 6, 2017	No response received.	N/A
Jessica Mauck, Cultural Resources Analyst	SMBMI	Response received via Email on August 3, 2017	In an email dated August 3, 2017, Ms. Mauck indicated that the project area was located within Serrano ancestral territory and in an area of interest to the Tribe. This interest was based on the proximity of the project area to Plunge Creek as it extends from the San Bernardino Mountains near the SMBMI reservation. For these reasons, they requested additional project-related information and the completion of a Phase I investigation. Specifically, the SMBMI requested the following: • The name and contact information of the Lead Agency Point of Contact, once determined; • An NAHC SLS; • A records search at the SCCIC using a one mile radius; • Additional research performed via historical documents and maps; • A map showing the results of the background research with the search radius; • Photographs of the project area; • Site/design plans with information about the horizontal and vertical extent of the project; and • A Phase I archaeological investigation with 100 percent coverage.	Advise the Lead Agency of the Tribe's requests and recommendations.
Steven Estrada, Chairperson	Santa Rosa Band of Mission Indians	Scoping letter sent via U.S. Mail on July 6, 2017	No response received.	N/A
Goldie Walker, Chairperson	Serrano Nation of Mission Indians	Scoping letter sent via U.S. Mail on July 6, 2017	No response received.	N/A
Joseph Ontiveros, Cultural Resource Department	Soboba Band of Luiseno Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A
Rosemary Morillo, Chairperson	Soboba Band of Luiseno Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A

Contact Name and Title	Contact Affiliation	Method of Contact and Date	Response	Action(s) Required?
Carrie Garcia, Cultural Resources Manager	Soboba Band of Luiseno Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A
Michael Mirelez, Cultural Resource Coordinator	Torres-Martinez Desert Cahuilla Indians	Scoping letter sent via Email on July 6, 2017	No response received.	N/A

4.4) Pedestrian Survey and Site Visits

L&L Archaeologist William R. Gillean, B.S. performed site visits on July 11, 2017 and October 3, 2017 to relocate and document previously recorded resources. Mr. Gillean completed the pedestrian survey on July 18, 2017. During the survey, east-west trending transects were completed at intervals of no more than 15 meters throughout the entire ±60 acre project area. Survey coverage is shown in relation to the project area boundary in Figure 10 and photographs of the project area are included in Appendix C.

The project area is generally rectangular in shape. It is located immediately to the south of Greenspot Road and approximately 340 feet to the west of the intersection of Greenspot Road and Weaver Street. The northern boundary consists of Greenspot Road and it exhibits plastic and wire fencing immediately to the south of the road (Appendix C: Photographs 1 and 2). The western boundary is formed by a dirt road with chain-link and wire fencing (Appendix C: Photographs 3 and 4). It is bounded to the south by Abbey Way (Appendix C: Photographs 5 and 6) and to the east by wire fencing (Appendix C: Photographs 7 and 8). A small area located along the southern project area boundary is not included in Tract 17604 and this area is currently occupied by an East Valley Water District facility.

L&L Environmental, Inc.

BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

GSPI-05-646
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Figure 10
Survey Coverage in the Project Area
(Photo obtained from Google Earth, October 2016)
Heatherglen/Tract 17604 Project
City of Highland
San Bernardino County, California

Ground surface visibility was generally poor, at approximately 10 to 20 percent, due to presence of vegetation (Appendix C: Photographs 1, 7, and 8). Areas covered by dirt roads and comparatively sparse vegetation exhibited excellent visibility (90 to 100 percent). These areas were generally located in the western portion of the project area (Appendix C: Photographs 4, 9, and 10).

During the pedestrian survey and site visits, no new prehistoric or historic resources were detected and four (4) previously recorded historic resources were relocated (36-6848/CA-SBR-6848H, 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265). One (1) previously recorded historic site could not be relocated (36-6853/CA-SBR-6853H). These resources are described in detail in Section 4.5 below. In addition, numerous modern and recent historic refuse concentrations were noted in the central and southern portions of the project area (Appendix C: Photographs 9 and 10). One (1) representative example included construction debris, such as metal paint cans, rectangular cans, and spools, a pull-tab drink container, and glass from a soft drink bottle (Appendix C: Photograph 11), while another example included fragments of cobble and mortar with a fence post exhibiting modern nails and barbed wire (Appendix C: Photograph 12). The prevalence of refuse within and near the project area reflects the intensive use of the area for refuse disposal activities over time.

4.5) Resources Located in the Project Area

Four (4) previously recorded historic resources were relocated during the pedestrian survey and the site visits (36-6848/CA-SBR-6848H, 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265). One (1) previously recorded historic site could not be relocated (36-6853/CA-SBR-6853H). These resources are described in detail below and are shown in relation to the project area boundary in Figure 11.

4.5.1) 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch)

36-6848/CA-SBR-6848H is mapped as trending east-west across the central portion of the project area (Figure 11). This resource was originally recorded in December of 1990 by Greenwood and Associates as a segment located to the west of Church Street (Romani, et al. 1990a). An update was completed in May of 1992 that addresses a possible portion of the ditch located to the east of the project area (McKenna 1992). The segment of the ditch found in the project area was addressed by updates completed in 1993 and 2006 (Eighmey, et al. 1993a;

ECORP 2006b). 36-6848/CA-SBR-6848H consists of the mapped location of the Cram-Van Leuven Ditch, which is an irrigation ditch constructed in 1858 by members of the Cram and the Van Leuven families. This ditch was one (1) of the first irrigation systems emerging from the Santa Ana Canyon and it connected the mouth of the canyon with the Cram and Van Leuven lands located at the base of the East Highlands bench. When originally constructed, the ditch measured several miles in total length.

In the project area, the ditch was first addressed by Gallegos & Associates in March of 1993 (Eighmey, et al. 1993a; Gallegos & Associates 1993). At this time, the ditch was described as measuring approximately 30 feet in width (maximum) with a depth of about 10 feet (maximum). It also contained a small terrace feature on either side of the ditch that was situated about four (4) feet from the existing ground surface. Furthermore, it was unlined and it lacked dams, diversions, or any other associated features. The ditch was relocated in March of 2006 by ECORP (ECORP 2006a; ECORP 2006b). In 2006, the description provided in 1993 was determined to be accurate, but the ditch was found to be irregular in width and depth. At the eastern end of the segment, the ditch measured about 75 feet in width with a depth of 10 feet, while the western end measured 30 feet or less in width with a depth of about five (5) feet. The eastern end was also described as terminating at a north-south trending modem flood control channel comprised of concrete.

L&L relocated this resource during the pedestrian survey and site visits conducted in 2017. The dimensions and description provided by ECORP in 2006 were found to be generally accurate; however, the terrace feature first noted by Gallegos & Associates in 1993 was not observable. Rather, the water feature appeared to exhibit a “U” or “V” shape. The absence of the terrace feature may be the result of erosion, as the water feature exhibits friable soils. Currently, the water feature is overgrown with vegetation and is filled with cobbles and boulders. No water is observable in the feature and it does not convey flows either to or from the project area. The western end terminates near two (2) dirt roads while the eastern end terminates at about the project area boundary and is interrupted by a modern north-south trending flood control channel (Appendix C: Photographs 13 and 14).

4.5.2) 36-6853/CA-SBR-6853H (Historic Refuse Scatter)

36-6853/CA-SBR-6853H is mapped near the northern project area boundary (Figure 11). This site was originally recorded in December of 1990 by Greenwood and Associates (Romani, et al. 1990b). The site was described as a historic age domestic refuse scatter dominated by cans, but also containing saw-cut mammal bone; ceramic fragments; and glass fragments, including solarized glass. It also included intermingled recent refuse, but the historic age artifacts dated the site from about World War I (1914-1918) to the 1930s or 1940s. The scatter appeared to be surficial in nature and it measured approximately 69 feet (length) by 59 feet (width).

This site could not be relocated during studies completed in 1993 and 2006 (Gallegos & Associates 1993; ECORP 2006a). In addition, L&L could not relocate this site during the pedestrian survey or the site visits in 2017. The original site record from 1990 and an update prepared in 1993 provide conflicting information when the location map is considered against the provided UTMs and the sketch map (Romani, et al. 1990b; Eighmey, et al. 1993b). L&L attempted to relocate the site at each of the areas indicated; but, no evidence of the site could be detected. The site is mapped immediately to the south of Greenspot Road and this resource was likely destroyed by associated road widening activities that occurred in the 1990s (Gallegos & Associates 1993) (Appendix C: Photograph 15).

4.5.3) 36-7434/CA-SBR-7434H (Historic Refuse Dump)

36-7434/CA-SBR-7434H is mapped on the northern edge of the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) in the central portion of the project area (Figure 11). This site was originally recorded in March of 1993 by Gallegos & Associates (Phillips and McHenry 1993; Gallegos & Associates 1993). The site was described as a historic age domestic refuse dump mainly consisting of cans, glass fragments, and ceramic fragments. Several diagnostic artifacts were collected and analyzed and these artifacts dated the site to 1932 or later. The refuse dump was described as eroding into the ditch, exhibiting fair integrity, and it measured approximately 13 feet (north-south) by 16 feet (east-west).

This site was relocated in 2006 and was found to generally reflect the description provided in 1993 (ECORP 2006a; ECORP 2006c). In 2006, the site was described as containing fragments of glass, ceramics, rusted cans, and bailing wire. It was situated on the northern bank of the Cram-Van Leuven Ditch and continued down into the ditch. At this time, the site was determined to be more affected by erosion than when originally recorded in 1993.

L&L relocated this site during the pedestrian survey and site visits in 2017; but, the site was detected at a different location than the area indicated by the UTMs included in the 1993 site record. The 1993 record contains two (2) sets of UTMs that plot the site approximately 100 feet to the south of the Cram-Van Leuven Ditch. These UTMs are inconsistent with the sketch map and location map that show the site on the northern edge of the ditch (Phillips and McHenry

1993). L&L relocated the site to the north of the ditch and recorded updated UTMs. At this time, the site exhibits the same dimensions as described in 1993 and 2006, but only four (4) fragments of glass, a possible tractor motor, and a scatter of milled wood planks with modern nails were detected at the site location. While many of the diagnostic artifacts were collected in 1993, numerous artifacts remained in 2006 and the majority of these artifacts could not be relocated by L&L. 36-7434/CA-SBR-7434H is a sparse scatter that appears to be in poor condition as the majority of the recorded artifacts are no longer present and the soils have been severely impacted by erosion (Appendix C: Photograph 16).

4.5.4) 36-12264/CA-SBR-12205H (Historic Refuse Scatter)

36-12264/CA-SBR-12205H is mapped in the central portion of the project area (Figure 11). This site was originally recorded in March of 2006 by ECORP (Cotterman and Sharp 2006; ECORP 2006a). It was described as a sparse historic age refuse scatter with a small concentration of artifacts located near the western end of the site. The recorded artifacts mainly consisted of domestic refuse with limited agricultural refuse and included cans, glass fragments, ceramic fragments, bailing wire, barbed wire, and metal floodgates associated with irrigation standpipes. Several diagnostic artifacts were analyzed and they dated the site between about 1880 and 1925. The scatter was described as surficial in nature and it measured approximately 50 feet (north-south) by 75 feet (east-west).

L&L relocated this site during the pedestrian survey and site visits in 2017. Currently, the site reflects the same dimensions and general composition as described in 2006 (Cotterman and Sharp 2006; ECORP 2006a). Specifically, the artifact concentration noted at the western end of the site and measuring about three (3) feet in diameter was detected. In addition, the base of a sun-altered octagonal drinking glass, a sherd of terracotta, barbed wire, bailing wire, and metallic pipe or tubing were detected. However, none of the remaining artifacts described in the original site record were detected. 36-12264/CA-SBR-12205H appears to be a very sparse surface scatter currently containing approximately 18 artifacts within an area measuring about 3,750 square feet. It appears to be in fair to poor condition as several of the originally recorded artifacts are no longer present and the soils have been impacted by erosion (Appendix C: Photograph 17).

4.5.5) 36-12265 (Historic Citrus/Poultry Ranching Complex)

36-12265 is mapped in the southwestern corner of the project area (Figure 11). This resource was originally recorded in March of 2006 by ECORP and it was described as an early 20th century citrus and poultry ranching complex (Cotterman 2006; ECORP 2006a). The site occupies an area measuring approximately 400 feet (north-south) by 650 feet (east-west) and is comprised of four (4) houses and numerous associated features as summarized below:

- One (1) house located at 29152 Abbey Way;
- One (1) house located at 29172 Abbey Way;
- Two (2) houses located at 29242 Abbey Way;
- Associated garages;
- A well and pump stand;
- Two (2) cisterns;
- A stone irrigation reservoir;
- A chicken coop;
- A concrete swimming pool;
- Segments of concrete and iron pipe;
- Remnants of a concrete building foundation; and
- Lines of boulders resulting from land clearance.

All of the features recorded in 2006 were present at the site when the property was acquired by the owner in 1948 and based on the architectural styles of the homes, ECORP estimated that the houses dated to the 1930s or earlier.

L&L relocated the site during the pedestrian survey and site visits in 2017; however, the four (4) houses and the majority of the features have been completely removed. At this time, the site retains a total of three (3) previously recorded features, including the round concrete cistern, the stone irrigation reservoir, and a concrete well pad that may correspond to a well recorded in conjunction with a pump stand at 29152 Abbey Way. 36-12265 currently appears to be in very poor condition as all of the recorded houses and the majority of the associated features have been removed and the surrounding soils have been impacted by erosion and demolition activities (Appendix C: Photograph 18).

4.6) Eligibility Recommendations and Project Impacts

4.6.1) 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch)

36-6848/CA-SBR-6848H was initially recorded as a segment located to the west of the project area in 1990 and an update was completed in May of 1992 that addresses a possible portion of the ditch located to the east of the project area (Romani, et al. 1990a; McKenna 1992). The segment of the ditch found in the project area was addressed by updates completed in 1993 and 2006 (Eighmey, et al. 1993a; ECORP 2006b).

In 1993, the segment located in the project area was described as considerably damaged by numerous flooding episodes. Nonetheless, it was recommended for avoidance during future development, if feasible. If avoidance was not possible, then recordation was considered sufficient to mitigate impacts and no further work was recommended (Gallegos & Associates 1993). This resource was relocated in the project area in 2006 by ECORP (ECORP 2006a; ECORP 2006b). ECORP noted that the ditch was likely eligible for the CRHR under Criteria 1 and 2, but that it may no longer possess integrity. They recommended that the portions of the ditch located outside of the project area be assessed in order to more accurately address the integrity of the segment (ECORP 2006a).

As of 2010, the Cram-Van Leuven Ditch has been found ineligible for the NRHP; but, it has not been formally evaluated for the CRHR or for any local registers. It is listed in the HPDF with a status code of 6Y, indicating that it has been determined ineligible for the NRHP by consensus through the Section 106 process. In addition, this resource has not been evaluated for the CRHR or for local listing.

Currently, a segment of this ditch is mapped within the project area and L&L detected a water feature at the resource location in 2017. However, the water feature located in the project area could not be verified as a segment of the Cram-Van Leuven Ditch during its period of significance (1858-1881) (see below [Theme and Period of Significance] and Section 2.5).

Theme and Period of Significance

The portion of 33-6848/CA-SBR-6848H located in the project area has been mapped as a segment of the larger Cram-Van Leuven Ditch measuring approximately 1,900 feet in length. The entirety of the ditch measured several miles in length when originally constructed in 1858. The ditch connected the mouth of the Santa Ana Canyon with the Cram and Van Leuven family lands located at the base of the East Highlands bench and it was one (1) of the first irrigation systems emerging from the canyon (Gallegos & Associates 1993; ECORP 2006). The ditch allowed for the water supply needed to support agriculture and domestic life in the burgeoning Community of Cramville, which was later renamed East Highlands and incorporated as part of the City of Highland (ECORP 2006a; Highland 2006).

This segment of the Cram-Van Leuven Ditch could not be verified as segment of the Cram-Van Leuven Ditch constructed in 1858; rather, it may be a mapping error or a segment of a later iteration of the Cram-Van Leuven/Old North Fork Ditch. If this segment is part of a later iteration of the ditch, then it shares the potential significance and historic context of the entire ditch alignment as a contributor to the development of agricultural and domestic life in Highland. The theme of significance is Community Water System Development (JRP and Caltrans 2000). The period of significance is 1858 to 1881, which represents the time between the initial date of construction for the ditch and the date when the central portion of the ditch becomes unnecessary and is effectively replaced by the high-line North Fork Canal (Beattie 1951; Scott 1977; Atchley 2017; Quales n.d.)

Integrity

The site was evaluated against the seven (7) aspects of integrity as outlined in National Register Bulletin 15, including location, setting, design, workmanship, materials, feeling, and association (NPS 1991).

Location: The ditch segment located in the project area was first identified as a portion of the Cram-Van Leuven Ditch by Gallegos & Associates in 1993 (Gallegos & Associates 1993). This identification was based upon the mapping of the Old North Fork Ditch in the project area on the USGS 1899 Redlands, CA map (Figure 7). However, determining the actual location of the original Cram-Van Leuven Ditch as constructed in 1858; its permutations when upgraded; its later iterations when combined with the North Fork Ditch in 1865; and where the ditch was located after it fell out of necessary use post-1881 is a complicated task. This is due to a lack of maps dating to the period of initial construction, an extensive flooding event in 1862 that changed the flow of the Santa Ana River and affected the ditch, and an additional heavy flooding event in 1867. In addition, there is a time delay between the last necessary date of the central portion of the ditch (after 1881) and the earliest available maps showing the ditch (late 1880s and early 1890s).

In an effort to identify the location of the Cram-Van Leuven Ditch in Section 2 of Township 1 South, Range 3 West, L&L contacted several local libraries and local historians to obtain maps and information. While there is no map associated with the ditch on-file at the San Bernardino County Historical Archives (SB County 2017), L&L did obtain numerous maps of irrigation features in the Highland area from other resources (see Section 2.5). Based on the review of the earliest available maps focused on irrigation features (1888 [Figure 5] and 1891 [Figure 6]), the Old North Fork Ditch/Cram-Van Leuven Ditch was located in the N ½ of the S ½ of Section 2 of Township 1 South, Range 3 West in the vicinity of the project area. This places the ditch to the north of modern Greenspot Road and outside the current project area. Later USGS maps dating to 1899 and into the early 20th century begin to depict the Old North Fork Ditch in the project area (Figure 7). This may be a mapping error where a drainage feature was identified as part of the ditch or a more southerly route for this portion of the ditch that came into use sometime after 1891. Thus, the segment of the ditch mapped in the project area could not be verified as a segment of the Cram-Van Leuven Ditch as it existed from its date of construction until the date it fell out of necessary use (1858-1881). As such, the resource segment does not appear to follow the alignment of its period of significance and does not retain integrity of location.

Setting: The surrounding physical environment of this resource segment has been modified over time. When the Cram-Van Leuven Ditch was constructed in 1858, it conveyed water from the Santa Ana River to the Cram and Van Leuven family lands. In addition, the ditch brought water to one (1) of the earlier settlements in the area that became known as Cramville and later East Highlands (ECORP 2006a; Highland 2006). The lands surrounding the burgeoning community were generally undeveloped at this time, including the lands surrounding the ditch segment in the project area. While the project area itself has remained undeveloped, the lands located immediately to the north of Greenspot Road are currently developed with high-density residential housing that extends to the west, north, and east and into the surrounding foothills. Thus, the setting of this segment has been significantly altered.

Design, Materials, and Workmanship: This resource segment does not appear to follow the alignment of its period of significance and may reflect a later and more southerly route for the ditch that came into use sometime after 1891. As such, it does not retain integrity of its original design, materials, or workmanship.

Feeling and Association: Due to a lack of integrity in terms of location, setting, design, materials, and workmanship, this resource segment also lacks feeling and association. As discussed above, this segment possibly reflects a different route for the ditch that may have come into use after the end of its period of significance (post-1881). As such, it fails to convey its historic character and its association to events affiliated with its original construction in 1858.

Although the segment of 36-6848/CA-SBR-6848H may reflect a route for the Cram-Van Leuven Ditch/Old North Fork Ditch, this alignment was not present during the period of significance. As such, the evaluated segment does not reflect the period of time for which its significance is gained (1858-1881) and it fails to retain its integrity under any of the aspects outlined in National Register Bulletin 15 (NPS 1991).

CRHR Eligibility Evaluation

This resource was evaluated at the local level for its association with Community Water System Development in the Cramville/East Highland area of modern Highland between the years of 1858 and 1881. Following is a discussion of the application of the CRHR criteria:

Criterion 1: This resource segment was assessed under CRHR Criterion 1 for its potential significance as part of historic events that have made a significant contribution to the broad patterns of California's history and cultural heritage (Event). Water conveyance systems are often found eligible under this type of criterion, as they are indispensable to the communities they serve and they provide the infrastructure needed for agricultural and community development (JRP and Caltrans 2000). Water supply is particularly important in the state of California and the Highland area as the arid lands require a reliable water source to irrigate crops. The Cram Van-Leuven Ditch was constructed in 1858 as the first major water diversion project in the area. It was implemented to bring water from the Santa Ana Canyon to the East Highlands bench and it provided a reliable source of water for the burgeoning community. The ditch represents the advent of the agricultural history and success of the East Highlands area, which has a rich tradition of agricultural pursuits extending from the late 1850s into the modern era. Therefore, this resource segment appears to qualify for the CRHR under Criterion 1.

Criterion 2: This resource segment was considered under Criterion 2 for its association with the lives of persons important in our past (Person). While the ditch is associated with members of the Cram and Van Leuven families and both families played a significant role in the settlement of East Highland, the ditch must be associated with their productive life and must be the property that is most closely associated with each person. Water conveyance systems are rarely found eligible under this type of criterion, as there are typically other more suitable criteria (see Criterion 1 above) and they are typically not the most closely associated properties (JRP and Caltrans 2000). For example, a property that may be better associated with the Cram family could be the site of the original Cram homestead located in nearby Section 3. Though the home is no longer extant, the homestead location has been recorded as 36-4220/CA-SBR-4220H and is listed as CPHI-31 (Teal 1980). Therefore, while this resource segment is associated with the lives of persons important to the past of Highland, it is arguably better classified eligible as a contributor to the broad patterns of local history (Criterion 1/Event) and does not appear to qualify for the CRHR under Criterion 2.

Criterion 3: This resource segment was evaluated for Criterion 3 for embodying the distinctive characteristics of a type, period, region, or method of construction; as representing the work of an important creative individual; or possessing high artistic values (Construction/Architecture). Under this type of criterion, water conveyance systems have been found eligible for their engineering or design values. In this case, the resource consists of a segment of a hand-hewn earthen ditch and it does not represent a design innovation or an example of an evolutionary trend in engineering. As such, this resource segment does not appear to qualify for the CRHR under Criterion 3.

Criterion 4: This segment was also considered for Criterion 4 for the potential to yield or likelihood to yield information important to prehistory or history (Information Potential). This resource does not have the potential to provide information about history that is not available through historic research. Therefore, this resource segment does not appear to qualify for the CRHR under Criterion 4.

To be considered eligible for inclusion in the CRHR, a resource must possess integrity and demonstrate eligibility under at least one of the CRHR criteria. This resource segment represents the agricultural history and success of the East Highlands area and is directly associated with the success of the early East Highlands community. As such, it appears to meet the significance criteria of the CRHR under Criterion 1 (Event). However, the water feature segment in the project area does not appear to reflect the location of the ditch during its period of significance (1858-1881). Instead, it may represent a mapping error or a later and more southerly extension of the ditch (see Section 2.5). In addition, the existing water feature is in very poor condition, as it has been adversely affected by erosion over time and is currently overgrown with vegetation and is filled with cobbles and boulders. As such, this ditch segment possesses low integrity in general and low integrity for its period of significance (1858-1881). Thus, the segment of 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch) mapped within the project area is recommended not eligible for inclusion in the CRHR.

City of Highland Cultural Resource Eligibility Evaluation

This resource was also evaluated for eligibility as a cultural resource pursuant to Section 16.32.060 of the City of Highland Municipal Code. For the same reasons outlined above in the CRHR eligibility assessment under Criterion 1 (Event), this resource segment appears eligible as a City of Highland cultural resource under Criterion A. However, in order to be considered eligible as a cultural resource by the City, a resource must generally meet the criteria for listing on the NRHP and/or qualify under additional criteria identified by the City (A-J).

In order to be listed on the NRHP, a resource must meet at least one (1) of the significance criteria (A-D) and the resource must also demonstrate a sufficient degree of integrity so that it is capable of conveying such significance. In the case of the water feature located in the project area, this feature does not appear to reflect the location of the Cram-Van Leuven Ditch during its period of significance (1858-1881). Rather, it may represent a mapping error or a later and more southerly extension of the ditch as outlined above in the CRHR eligibility assessment (see also Section 2.5). Thus, the segment of 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch) mapped within the project area is recommended not eligible as a City of Highland cultural resource.

Project Impacts

The project proposes to construct a portion of Tract 17604 at the recorded location of a segment of 36-6848/CA-SBR-6848H (Figure 12). Therefore, this resource segment could be directly impacted by the proposed project. The research efforts completed during this study and recordation onto a DPR 523 Update Form exhausts this resource segment's research value and no further work is recommended prior to project implementation.

4.6.2) 36-6853/CA-SBR-6853H (Historic Refuse Scatter)

36-6853/CA-SBR-6853H could not be relocated in 1993, 2006, or during the current study (Gallegos & Associates 1993; ECORP 2006a). The site is mapped immediately to the south of Greenspot Road and this resource was likely destroyed by associated road widening activities (Gallegos & Associates 1993).

The project proposes to construct a portion of Tract 17604 at the recorded location of 36-6853/CA-SBR-6853H (Figure 12). As this resource cannot be relocated and is considered destroyed, no known artifacts associated with 36-6853/CA-SBR-6853H will be impacted by the project.

4.6.3) 36-7434/CA-SBR-7434H (Historic Refuse Dump)

36-7434/CA-SBR-7434H was initially recorded during the completion of a pedestrian survey performed on 114 acres (Phillips and McHenry 1993; Gallegos & Associates 1993). This survey was completed to support the construction of a storm drain for Tract 13936, which was also identified as the Concordia Homes Project. At this time, probing via trowel indicated that the site extended to a depth of approximately 10 centimeters. Diagnostic artifacts were collected and identified a date of 1932 or later for the deposit. Based on these results, the interpretive value of the information available from this site was identified as low and it was recommended not important under CEQA. As such, no additional work was recommended for this resource prior to any impacts (Gallegos & Associates 1993). The site was relocated by ECORP in 2006. At this time, various artifacts were detected, but the site was described as comparatively more eroded than when originally recorded. ECORP recommended that the site be tested and evaluated for CRHR eligibility if it could not be avoided and preserved (ECORP 2006a).

To be considered eligible for inclusion in the CRHR, a resource must possess integrity and demonstrate eligibility under at least one (1) of the CRHR criteria. In 1993 and 2006, the site was described as impacted by erosion (Phillips and McHenry 1993; ECORP 2006c). Currently, the site consists of a very sparse surface scatter containing four (4) fragments of glass, a possible tractor motor, and a scatter of milled wood planks with modern nails. It appears to be in very poor condition as many of the originally recorded artifacts are no longer present and the soils have been severely impacted by erosion. Thus, this site does not appear to retain sufficient integrity to be considered eligible for inclusion in the CRHR and no evidence was detected to indicate that this resource has the potential to yield additional information important to history (Criterion 4). Therefore, L&L recommends this site as not eligible for inclusion in the CRHR. Furthermore, L&L recommends that this site does not qualify as a historical resource pursuant to CEQA or as a cultural resource under Section 16.32.060 of the City of Highland Municipal Code.

The project proposes to construct a portion of Tract 17604 at the location of 36-7434/CA-SBR-7434H (Figure 12). Therefore, this resource could be directly impacted by the proposed project. Recordation onto a DPR 523 Update Form exhausts the site's research value and no further work is recommended for this resource prior to project implementation.

4.6.4) 36-12264/CA-SBR-12205H (Historic Refuse Scatter)

36-12264/CA-SBR-12205H was initially recorded during the completion of a pedestrian survey performed on 58.71 acres (Cotterman and Sharp 2006; ECORP 2006a). This survey was completed to support the HeatherGlen/Tract 17604 Project. At this time, the site was described as in fair condition and impacted by erosion. ECORP recommended that the site be tested and evaluated for CRHR eligibility if it could not be avoided and preserved.

To be considered eligible for inclusion in the CRHR, a resource must possess integrity and demonstrate eligibility under at least one (1) of the CRHR criteria. In 2006, the site was described as a sparse refuse scatter impacted by erosion (Cotterman and Sharp 2006; ECORP 2006a). Currently, the site consists of a very sparse surface scatter containing approximately 18 artifacts within an area measuring about 3,750 square feet. It appears to be in fair to poor condition as several of the originally recorded artifacts are no longer present and the soils have been impacted by erosion. Thus, this site does not appear to retain sufficient integrity to be considered eligible for inclusion in the CRHR and no evidence was detected to indicate that this resource has the potential to yield additional information important to history (Criterion 4). Therefore, L&L recommends this site as not eligible for inclusion in the CRHR. Furthermore, L&L recommends that this site does not qualify as a historical resource pursuant to CEQA or as a cultural resource under Section 16.32.060 of the City of Highland Municipal Code.

The project proposes to construct a portion of Tract 17604 at the location of 36-12264/CA-SBR-12205H (Figure 12). Therefore, this resource could be directly impacted by the proposed project. Recordation onto a DPR 523 Update Form exhausts the site's research value and no further work is recommended for this resource prior to project implementation.

4.6.5) 36-12265 (Historic Citrus/Poultry Ranching Complex)

36-12265 was initially recorded during the completion of a pedestrian survey performed on 58.71 acres (Cotterman 2006; ECORP 2006a). This survey was completed to support the HeatherGlen/Tract 17604 Project. At this time, ECORP recommended that the site be further researched and evaluated for CRHR eligibility if it could not be avoided and preserved.

To be considered eligible for inclusion in the CRHR, a resource must possess integrity and demonstrate eligibility under at least one (1) of the CRHR criteria. In 2006, the site exhibited a total of four (4) houses and a variety of associated outbuildings and features (Cotterman 2006; ECORP 2006a). Currently, all of the recorded houses and the majority of the features have been completely removed. The removal of these buildings and features have rendered the site, including the surrounding soils, in very poor condition. Thus, this site does not appear to retain sufficient integrity to be considered eligible for inclusion in the CRHR and no evidence was detected to indicate that this resource has the potential to yield additional information important to history (Criterion 4). Therefore, L&L recommends this site as not eligible for inclusion in the CRHR. Furthermore, L&L recommends that this site does not qualify as a historical resource pursuant to CEQA or as a cultural resource under Section 16.32.060 of the City of Highland Municipal Code.

The project proposes to construct a portion of Tract 17604 at the location of 36-12265 (Figure 12). Therefore, this resource could be directly impacted by the proposed project. Recordation onto a DPR 523 Update Form exhausts the site's research value and no further work is recommended for this resource prior to project implementation.

5.0) CONCLUSIONS AND RECOMMENDATIONS

In accordance with CEQA, L&L has assessed the impacts of the proposed development on the project area. A records search at the SCCIC indicated that five (5) resources have been mapped within or partially within the project area: 36-6848/CA-SBR-6848H, 36-6853/CA-SBR-6853H, 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265. In addition, the records search showed that 100 percent of the project area has been previously inventoried via two (2) reports (SB-2828/Gallegos & Associates 1993; SB-5671/ECORP 2006a). Including the two (2) reports that address the project area, a total of 16 studies have been completed within one mile. These studies have addressed approximately 30 percent of the land within the search radius and have recorded 39 cultural resources.

A historic records review included the examination of documents and maps available from the BLM GLO (BLM 2017), archival topographic maps (NETR 2017), and aerial photographs (NETR 2017). Additional research was completed for the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) at the A.K. Smiley Library, the Feldhym Library, the San Bernardino County Historical Archives, the HAHS website, and via inquires to local historians. The results of the review indicated that the Old North Fork Ditch/Cram-Van Leuven Ditch has been variably mapped near or within the project area since the late 1880s. In addition, a water feature is observable on aerial photographs at the mapped location of the Cram-Van Leuven Ditch (36-6848/CA-SBR-6848H) since 1938. Finally, various structures have been located within the southwestern portion of the project area over time and in association with a historic age citrus and poultry ranching complex (36-12265). This complex includes several structures and active fields or groves that were present by at least 1938 and the structures were removed by 2009 (NETR 2017).

An SLS was completed by the NAHC and the search failed to indicate the presence of Native American cultural resources in the immediate project area (Appendix D). Information scoping letters were sent to the 19 contacts listed by the NAHC on July 6, 2017. As of the date of this report, one (1) response has been received from the SMBMI. The SMBMI stated that the project is located within Serrano ancestral territory and they requested additional project-related information and the completion of background research. Specifically, they recommended a records search at the SCCIC and an archaeological pedestrian survey. Finally, they requested that the results be provided for their review and consideration. All L&L correspondence completed to date has been incorporated into Appendix E.

Site visits were completed on July 11, 2017 and October 3, 2017 to relocate and document previously recorded resources and the Phase I pedestrian survey was conducted on July 18, 2017. During the pedestrian survey and site visits, no new prehistoric or historic resources were detected and four (4) previously recorded historic resources were relocated (36-6848/CA-SBR-6848H, 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265). One (1) previously recorded historic site could not be relocated (36-6853/CA-SBR-6853H). DPR 523 Update Forms were prepared for all resources associated with the project area and they were submitted to the SCCIC for their files (Appendix F).

36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch) is an irrigation ditch constructed in 1858 by members of the Cram and the Van Leuven families. Based on its association with the early development of East Highland, 36-6848/CA-SBR-6848H appears to meet the significance criteria of the CRHR under Criterion 1 (Event) and the City of Highland Municipal Code cultural resource criteria under Criterion A (Section 16.32.060). However, the water feature segment in the project area does not appear to reflect the location of the ditch during its period of significance (1858-1881). Instead, it may represent a mapping error or a later and more southerly extension of the ditch that came into use sometime after 1891 (see Section 2.5). In addition, the existing water feature is in very poor condition, as it has been adversely affected by erosion over time and is currently overgrown with vegetation and is filled with cobbles and boulders. As such, this ditch segment possesses low integrity in general and low integrity for its period of significance (1858-1881). Thus, the segment of 36-6848/CA-SBR-6848H (Cram-Van Leuven Ditch) mapped within the project area is recommended not eligible for inclusion in the CRHR, not eligible as a City of Highland cultural resource, and not significant under CEQA. The research efforts completed during this study and recordation onto a DPR 523 Update Form exhausts this resource segment's research value and no further work is recommended prior to project implementation.

36-6853/CA-SBR-6853H (Historic Refuse Scatter) could not be relocated within the project area and is presumed to be destroyed. As this resource is considered destroyed, no known artifacts or features will be impacted by the project and no further work is recommended prior to project implementation.

36-7434/CA-SBR-7434H (Historic Refuse Dump), 36-12264/CA-SBR-12205H (Historic Refuse Scatter), and 36-12265 (Historic Citrus/Poultry Ranching Complex) currently lack the artifact content or features once recorded at each site and all three (3) sites have been subject to soil disturbances associated with erosion. 36-12265 has additionally been adversely impacted by demolition activities. None of these resources appear to retain sufficient integrity to be considered eligible for inclusion in the CRHR and no evidence was detected to indicate that any of these resources have the potential to yield additional information important to history (Criterion 4). Therefore, L&L recommends 36-7434/CA-SBR-7434H, 36-12264/CA-SBR-12205H, and 36-12265 not eligible for inclusion in the CRHR and not significant pursuant to CEQA. In addition, L&L recommends these sites not eligible as cultural resources under Section 16.32.060 of the City of Highland Municipal Code. Recordation onto DPR 523 Update Forms exhausts each site's research value and no further work is recommended for any of these resources prior to project implementation.

Based on the results of a records search completed at the SCCIC; the pedestrian survey and site visits; and the research, recording, and evaluation efforts, no known historical or archaeological resources pursuant to CEQA are located in the project area. However, archaeological monitoring is recommended during project implementation and this monitoring program is outlined below in Table 4.

It should also be noted that the SMBMI have indicated that the project area lies within Serrano ancestral territory. In addition, they have requested additional project-related information, including the results of archaeological research and survey efforts. Upon their review of the requested information, the SMBMI may provide additional comments or recommendations. The results of this process may further assist in outlining the sensitivity of the project area for Native American resources and the need or lack thereof for Native American monitoring during project implementation.

5.1) Recommendations

Based on the results of the current study, the project area appears to have a high sensitivity for historic age resources and moderate to low sensitivity for prehistoric resources. Therefore, a mitigation-monitoring program is recommended during project implementation and this program is outlined below in Table 4.

Table 4. Recommended Cultural Resources Mitigation Measures

Mitigation Number	Mitigation Text
CR-1	The project area has a high sensitivity for historic age resources and a moderate to low sensitivity for prehistoric resources. This is based on the intensive historic era use of the project area and surrounding lands. To address this sensitivity, L&L recommends that an archaeological mitigation-monitoring program be implemented within the project boundaries during all ground-disturbing activities. Full-time monitoring is recommended throughout the entire project area, with attention focused on any intact soils that may be found beneath soils that have been disturbed by soil erosion and previous land uses in the project area. Full-time monitoring should continue until the project archaeologist determines that the overall sensitivity of the project area has been reduced from high to low as a result of mitigation-monitoring. Should the monitor(s) determine that there are no cultural resources within the impacted areas or should the sensitivity be reduced to low during monitoring, all monitoring should cease.
CR-2	Should any cultural resources be discovered, the monitor(s) are authorized to temporarily halt all grading in the immediate vicinity of the discovery while the resource is recorded onto appropriate DPR 523 Forms and evaluated for significance. If the resource is determined to be significant, the monitor shall make recommendations to the Lead Agency on the measures that shall be implemented to protect the discovered resources, including but not limited to, avoidance, excavation, and further evaluation of the finds in accordance with CEQA. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any archaeological artifacts recovered as a result of mitigation, excluding items covered by the provisions of applicable Treatment Plans or Agreements, shall be donated to a qualified scientific institution approved by the Lead Agency where they would be afforded long-term preservation to allow future scientific study.
CR-3	The results of the mitigation-monitoring program shall be incorporated into a final report and submitted to the Lead Agency for review and approval. Upon approval by the Lead Agency, the final report, including any associated DPR 523 Forms, shall be submitted to the SCCIC.

5.2) Unanticipated Discovery of Human Remains

There is always the possibility that ground-disturbing activities during construction may uncover previously unknown and buried human remains. If human remains are discovered during any phase of construction, including disarticulated or cremated remains, all ground-disturbing activities should cease within 100 feet of the remains and the County Coroner and the Lead Agency (City of Highland) should be immediately notified.

California State Health and Safety Code 7050.5 dictates that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to CEQA regulations and PRC Section 5097.98. If the County Coroner determines that the remains are Native American, the NAHC shall be notified within 24 hours and the guidelines of the NAHC shall be adhered to in the treatment and disposition of the remains. The Lead Agency shall also retain a professional archaeologist with Native American burial experience to conduct a field investigation of the find and consult with the Most Likely Descendant, if any, identified by the NAHC. As necessary and appropriate, the archaeologist may provide professional assistance to the Most Likely Descendant, including the excavation and removal of the human remains. The Lead Agency shall be responsible for approval of recommended mitigation as it deems appropriate, taking account of the provisions of State law, as set forth in CEQA Guidelines Section 15064.5(e) and PRC Section 5097.98. The project contractor shall implement approved mitigation measure(s), to be verified by the Lead Agency, prior to resuming ground-disturbing activities within 100 feet of where the remains were discovered.

5.3) Unanticipated Discovery of Cultural Resources

It is always possible that ground-disturbing activities may uncover presently obscured or buried and previously unknown cultural resources. In the event that buried cultural resources are discovered during construction, such resources could be damaged or destroyed, resulting in impacts to potentially significant cultural resources. If subsurface cultural resources are encountered during construction, if evidence of an archaeological site is observed, or if other suspected historic resources are encountered, it is recommended that all ground-disturbing activity cease within 100 feet of the resource. A professional archaeologist shall be consulted to assess the find and to determine whether the resource requires further study. The qualified archeological personnel shall assist the Lead Agency by generating measures to protect the discovered resources. Potentially significant cultural resources could consist of, but are not limited to: stone, bone, fossils, wood, or shell artifacts or features, including structural remains, historic dumpsites, hearths, and middens. Midden features are characterized by darkened soil and could conceal material remains, including worked stone, fired clay vessels, faunal bone, hearths, storage pits, or burials and special attention should always be paid to uncharacteristic soil color changes. Any previously undiscovered resources found during construction should be recorded on appropriate DPR forms and evaluated for significance under all applicable regulatory criteria.

If the resources are determined to be unique historic resources as defined under §15064.5 of the CEQA Guidelines, mitigation measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds.

No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the Lead Agency where they would be afforded long-term preservation to allow future scientific study.

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Eighmey, J., I. Strudwick, R. Phillips, P. McHenry, J. Boughton, and R. Collett. 1993a. Archaeological Site Record Update for 36-6848/CA-SBR-6848H. Form on-file at the South Central Coastal Information Center, California State University, Fullerton.

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Wilke, P. J. 1978. Late Prehistoric Human Ecology at Lake Cahuilla, Coachella Valley, California. Contributions of the University of California Archaeological Research, Facility 38. University of California, Berkeley.

7.0) CERTIFICATION

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this archaeological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: December 11, 2017 SIGNED: Leslie Irish

PRINTED NAME: Leslie Nay Irish, CEO, L&L Environmental, Inc.

DATE: December 11, 2017 SIGNED: Jennifer Sanka

PRINTED NAME: Jennifer M. Sanka, M.A., RPA, L&L Archaeologist

APPENDICES

APPENDIX A

Personnel Qualifications

Leslie Nay Irish
Principal Project Manager
Cal Trans (CT) 022889

Leslie Irish is the qualifying principal for WBE certification with CALTRANS, with both a State and Federal designation as a 100% WBE and Small Business Enterprise. Ms. Irish has multi-disciplinary experience in environmental, engineering, land development and construction management and administration.

Ms. Irish has more than 25 years of experience as a project manager on public and private NEPA / CEQA projects overseeing the areas of biology, archaeology, paleontology, regulatory services and state and federal level permit processing.

Ms. Irish is a certified to perform wetland / jurisdictional delineations and holds a responsible party permit for performing archaeological and paleontological investigations on (BLM) public lands. She has attended the desert tortoise handling class, passed the practicum and the test and was awarded a certificate. She remains an active participant in the oversight of mitigation monitoring and reporting programs, the installation and monitoring of revegetation programs and the development of project impact mitigation plans. Her principal office duties include a review of all environmental documents authored by the firm; oversight of regulatory permits, agency consultation and negotiations; impact mitigation review; and long-term permit compliance. Her field duties are more limited but include delineations / compliance monitoring and reporting (coordination), constraints analysis, plan for corrective measures and resolution of “problem projects”.

Ms. Irish’s responsibilities include direct contact with clients/project proponents, scientists and agencies and involve her in all aspects of the project from a request for proposal to project completion. Ms. Irish has a complex understanding of the industry from various perspectives. As a result, she uses her personal understanding of team member positions and responsibilities in her role as the principal management and quality control lead.

CREDENTIALS AND PERMITS

- ACOE, Wetlands Delineation Certification Update, 2015
- ACOE, Advanced Wetlands Delineation and Management, 2001
- ACOE, Wetlands Delineation and Management, 1999, Certificate No. 1257
- U.S. Government, Permit for Archaeology & Paleontology on Federal Lands, Responsible Party
- MOU, County of Riverside, Archaeology, Biology, Paleontology and Wetlands ID/Delineation
- CALTRANS WBE Certification
- Public Utilities Commission, WBE Certified
- WBENC, WBE Certified

EDUCATION

Certificate in Project Management, Initiating and Planning Projects, UC, Irvine, June 20, 2015
Foundations of Business Strategy, Darden School of Business, UVA, Jan 2014
Design Thinking for Business Innovation (audit), Darden School of Business, UVA, Nov 2013
Update, Storm Water Management BMPs, University of California, Riverside Extension, 2005
Certificate, Wetland Delineation & Management, ACOE, 2000 and Advanced Certificate: 2002
Certificate Program, Field Natural Environment, University of California, Riverside, 1993

Leslie Nay Irish
Continued

Certificate Program, Light Construction, Developmental Management, University of California, Riverside, 1987
Certificate Program, Construction Technologies, Administrative Management, Riverside City College, 1987
License B-General and C-Specialties (Concrete/Masonry) and General Law sections, 1986
Core Teaching and Administrative Management, Primary (K-3) and Early Childhood, Cal State, San Bernardino, Lifelong Learning Program, 1973-2005
Behavioral Sciences and Anthropology, Chaffey and Valley Jr./Community Colleges, 1973 – 1976

PROFESSIONAL HISTORY

L&L Environmental, Inc. - Principal, Project Manager / Principal in Charge: 1993 - present: Site assessments, surveys, jurisdictional delineations, permit processing, agency consultation/negotiation, impact mitigation, project management, coordination, report writing, technical editing, and quality control.
Marketing Consultant - Principal: 1990 - 1993: Engineering / architectural, environmental, and water resource management consultant.
Warmington Homes - Jr. Project Manager: 1989 - 1990: Residential development, Riverside and Los Angeles Counties.
The Buie Corporation - Processor / Coordinator: 1987 - 1990: The Corona Ranch, Master Planned Community.
Psomas & Associates - Processor / Coordinator- 1986 - 1987: Multiple civil engineering and land surveying projects.
Irish Construction Company – Builder Partner: (concurrently with above) 1979 - 1990: General construction, residential building (spec. housing), and concrete and masonry product construction.

PROFESSIONAL AFFILIATIONS

Member, Building Industry Association
Member, Southern California Botanists
Member, Archaeological Institute of America
Member, Society for California Archaeology
Member, California Chamber of Commerce
Member, CalFlora
Member, San Bernardino County Museum Associates
Member, Orange County Natural History Museum Associates
Life Member, Society of Wetland Scientists
1994-97 President, Business Development Association, Inland Empire
1993-94 Executive Vice President, Building Industry Association, Riverside County
2010 Chair of the Old House Interest Group – Redlands Area Historical Society

SYMPOSIA, SEMINARS, AND WORKSHOPS

Assembly Bill 52 Tribal Consultation Process Overview. Pechanga Band of Luiseno Indians Cultural Resources Group. Temecula, CA. October 2015
ACOE Compensatory Mitigation Workshop – Wilshire Blvd Office, July 16, 2015
May 27, 2015, CWA Rule, Update, San Diego CA, October 20-23, 2015

Leslie Nay Irish
Continued

ACOE 2 Day Workshop, Mitigation Rule & Mitigation Checklist, Carlsbad, March 20, 2015
Desert Tortoise Handling Class, update (DT Consortium / Joint Agencies USFWS/CDFG) 2013 Update
Bedrock Food Processing Centers in Riverside County, TLMA, 2009
Nexus Geology-Archaeology, Riverside County, TLMA, 2009
Desert Tortoise Handling Class, (DT Consortium / Joint Agencies USFWS/CDFG), 2008 Certificate Granted
Ecological Islands and Processes (vernal pools, alkali wetlands, etc.), Southern California Botanists, 2004
Low Impact Development, State Water Board Academy, 2004
Inland Empire Transportation Symposium, 2004
Western Riverside County MSHCP Review and Implementation Seminar, 2004
Field Botany and Taxonomy, Riverside City College, 2002
Construction Storm Water Compliance Workshop, BIA, 2002
Identifying Human Bone: Conducted by L&L Environmental, County Coroner and Page Museum, 2002
CEQA/NEPA Issues in Historic Preservation, UCLA, 2000
CEQA and Biological Resources, University of California, Riverside, 2000
CEQA Law Update 2000, UCLA
Land Use Law/Planning Conference, University of California, Riverside
CALNAT “95”, University of California, Riverside
Desert Fauna, University of California, Riverside
Habitat Restoration/Ecology, University of California, Riverside
Geology of Yosemite and Death Valley, University of California, Riverside
San Andreas Fault: San Bernardino to Palmdale, University of California, Riverside
Historic Designations and CEQA Law, UCLA

Jennifer M. Sanka, M.A., RPA
Principal Investigator
Archaeologist

Ms. Sanka has gained more than 17 years of archaeological fieldwork and project-related experience in the U.S., including projects in Alaska, Arizona, California, Indiana, Maryland, Nevada, Ohio, Oregon, and North Carolina. She has conducted all aspects of archaeological fieldwork; has authored and provided third party assessments of numerous cultural resources sections for California Environmental Quality Act (CEQA) environmental impact reports (EIR), National Environmental Policy Act (NEPA) environmental impact statements (EIS), NEPA environmental assessments (EA), constraints analyses and CEQA initial studies; and has certified more than 75 CEQA and Section 106 of the National Historic Preservation Act (NHPA)-compliant documents. She is a Registered Professional Archaeologist ([RPA] #15927, 2006), meets the Secretary of Interior (SOI) Standards for Archaeology and has served as a Principal Investigator on projects reviewed by the Bureau of Land Management (BLM), U.S. Forest Service (USFS), U.S. Army Corps of Engineers (ACOE), Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service, U.S. Department of Veterans Affairs, and the Federal Highway Administration (FHWA). Ms. Sanka has spent over a decade working in the archaeological field in southern California. She is a Riverside County Certified Archaeologist (#103, 2007) and is a Certified San Diego County CEQA Consultant for Archaeological Resources (2010). She is also qualified as a Principal Investigator for the BLM Cultural Resources Use Permit (CRUP) for the State of California and the State of Nevada (Historic Resources).

PROFESSIONAL HISTORY

2014-present – Archaeologist, L&L Environmental, Inc. Redlands, CA. Perform field survey and site recordation for projects in southern California. Author, certify, and serve as the Principal Investigator for projects in southern California.

2014 – Cultural Resources Specialist, Burns & McDonnell. Kansas City, MO. Perform field survey and site recordation for projects in Carroll, Howard, Miami, and White Counties, IN.

2009-2014 – Associate Project Manager/Archaeologist, Atkins. San Bernardino, CA. Performed field surveys and subsurface testing programs throughout California and Alaska. Authored and certified numerous survey and testing program reports. Served as an Associate Project Manager, Principal Investigator, and Regional Cultural Lead for projects throughout California and Alaska.

2006-2009 – Project Manager/Archaeologist, Michael Brandman Associates (currently First Carbon Solutions). Irvine, CA. Performed field surveys, subsurface testing programs, and data recovery projects throughout southern California. Authored and certified numerous survey and testing program reports. Served as a Project Manager and Principal Investigator for projects throughout southern California.

2005-2006 – Archaeological Field Technician, ASM Affiliates. Pasadena, CA and Reno, NV. Performed field surveys, subsurface testing programs, and data recovery projects in Barstow (Marine Corps Air Ground Combat Center [MCAGCC]), Fontana, Hemet, Moreno Valley, Palm Springs, Ridgecrest (China Lake Naval Air Warfare Station), and Twentynine Palms (MCAGCC), CA.

2005-2006 – Archaeological Field Technician, EDAW, Inc. (currently AECOM). San Diego and Los Angeles, CA. Performed field surveys and data recovery projects in El Centro (Chocolate Mountains Aerial Gunnery Range), Los Angeles (Los Angeles Public School #9 Cemetery Relocation), and Oceanside (Camp Pendleton Marine Corps Air Station), CA.

Jennifer M. Sanka, M.A., RPA
Continued

2003-2004 – Archaeological Laboratory Technician, TRC-Garrow Associates, Inc. (currently TRC Solutions). Durham, NC. Performed subsurface testing programs and data recovery projects in Pokomoke City, MD (18-WO-183), Greensboro, NC, and Fayetteville, NC (Fort Bragg Army Airborne and Special Forces Installation). Completed artifact curation and collection management for 18-WO-183 and for various Fort Bragg collections.
2001-2003 – Teaching and Research Assistant, Duke University, Department of Religion. Durham, NC. Screened films, led group discussions, graded documents, and performed research on the Reformation Period to support faculty research projects.
2000 and 2002 – Trench Supervisor, North Carolina State University, Department of History. Aqaba, Kingdom of Jordan. Supervised up to five Jordanian archaeological technicians/laborers during trench excavations for the Roman Aqaba Project (RAP). Experience included the excavation of a probe along the Byzantine Era curtain wall and salvage archaeology within a Nabatean–Early Roman transition period domestic complex.
1999 – Student, Miami University, Department of Anthropology. Oxford, OH. Completed salvage excavation at Milford Works I.

PROFESSIONAL AFFILIATIONS

Society for California Archaeology
Register of Professional Archaeologists

PROFESSIONAL DEVELOPMENT

2015 – *Assembly Bill 52 Tribal Consultation Process Overview.* Pechanga Band of Luiseno Indians Cultural Resources Group. Temecula, CA.
2013 – *Advanced Seminar: Reaching Successful Outcomes in Section 106 Review.* Advisory Council on Historic Preservation (ACHP). Palm Springs, CA.
2010 – *The Natural and Cultural History of Ancient Lake Cahuilla.* County of Riverside Transportation and Land Management Agency Continuing Education Professional Seminar. Palm Desert, CA.
2010 – *Connecting the Dots with a Regional Perspective: Village Footprints (Pechanga Cultural Resources Department).* County of Riverside Transportation and Land Management Agency Continuing Education Professional Seminar. Palm Desert, CA.
2009 – *Geology for Archaeologists.* County of Riverside Transportation and Land Management Agency Continuing Education Professional Seminar. Palm Desert, CA.
2009 – *Riverside County History and Research Resources.* County of Riverside Transportation and Land Management Agency Continuing Education Professional Seminar. Palm Desert, CA.
2007 – *An Introduction to Professional Practice under Section 106 of the NHPA.* SWCA. Mission Viejo, CA.
2006 – *Project Management Fundamentals*. ZweigWhite AIA/CES course. Michael Brandman Associates, Irvine, CA.
2006 – *CEQA Basics: Understanding the California Environmental Process*. AEP. Chapman University, Orange, CA.
2006 – *Governor's Office of Planning and Research (OPR) Land Use Planning and the Protection of Native American Cultural Places.* AEP. Irvine, CA.

Jennifer M. Sanka, M.A., RPA
Continued

EDUCATION

M.A., Religion (Hebrew Bible and Archaeology) – 2003, Duke University, Durham, NC
Graduate Certificate, Women's Studies – 2003, Duke University, Durham, NC
B.A., Anthropology, Comparative Religion (with Honors Thesis), and Classical Humanities – 2001, Miami University, Oxford, OH

Selected Project Experience

2015-2016
Requa Avenue Sewer Interceptor Project Cultural Resources Survey and State Water Resources Control Board (SWRCB)/State Historic Preservation Officer (SHPO) Coordination, Indio, Riverside County, CA; Valley Sanitary District. Principal Investigator and author of a cultural resources assessment (CRA) addressing upgrades to the existing City of Indio sewer system. This study was completed in accordance with the SWRCB CEQA-Plus guidelines. Responsibilities included generating the technical report, supporting memorandums, SHPO cover letter, and SHPO review package in coordination with the SWRCB Cultural Resources Officer. In addition, seven previously recorded resources were addressed via DPR 523 Update Forms and one new resource was recorded. Recommendations for NRHP eligibility were provided for resources located in the project's APE.

2015-2016
6563 East Avenue Project Archaeological Resources Survey, City of Rancho Cucamonga, San Bernardino County, CA; GFR Homes. Principal Investigator and author of a Phase I CRA completed in accordance with CEQA. This project included the recordation and CRHR evaluation of the archaeological component of an NRHP eligible built-environment resource.

2015 **APN 963-010-006 Project (TR 32323) Cultural Resources Survey, French Valley Area, Riverside County, CA; Richland Communities.** Principal Investigator and author of a Phase I CRA addressing proposed residential development on 19.36 acres. The study was completed in accordance with CEQA and the County of Riverside Guidelines for Cultural Resources Review.

2012-2014
Johnson Avenue Sewer Relief Project Cultural Resources Survey and SHPO Coordination, El Cajon, San Diego County, CA; City of El Cajon. Principal Investigator responsible for a pedestrian survey and author of a CRA addressing upgrades to the existing City of El Cajon sewer system. The study was performed at the request of the City of El Cajon and was completed in accordance with the SWRCB CEQA-Plus guidelines. Responsibilities included generating the technical report, a Mitigation-Monitoring and Treatment Plan, and coordination with the SWRCB Cultural Resources Officer, local Native American groups and individuals, and SHPO.

2011 **Massachusetts Avenue and Boulevard Drive Sewer Main Improvements Project Cultural Resources Survey, La Mesa, San Diego County, CA; City of La Mesa.** Principal Investigator responsible for a pedestrian field survey and author of a CRA. The archaeological survey was completed at the request of the City of La Mesa and considered proposed improvements to an existing sewer main. The resultant study was completed in accordance with Section 106 of the NHPA to support ACOE permitting efforts for the project.

Jennifer M. Sanka, M.A., RPA
Continued

Selected Project Experience (Continued)

2010-2011

Ivy Street Bridge Replacement Archaeological Monitoring Project, Murrieta, Riverside County, CA; City of Murrieta. Principal Investigator for the mitigation-monitoring program implemented for the Ivy Street Bridge Replacement Project. The monitoring program was required by an IS-MND for the project, as well as the recommendations of Caltrans. The IS-MND and Caltrans-compliant cultural resources documentation identified one historic property within the Ivy Street Bridge Replacement project site and established an ESA where all ground-disturbing activities required full-time archaeological and Native American monitoring. The detected prehistoric resources were documented and evaluated in the field and subsequently provided to the Native American monitors in accordance with a Mitigation Monitoring and Resource Treatment plan drafted by the Pechanga Band of Luiseno Indians. Responsibilities included management of field crew members, coordination with Native American monitors, and certifying the resultant report.

2007-2013

Public Safety Enterprise Communication (PSEC) Project, Orange, Imperial, Riverside, San Bernardino, and San Diego Counties, CA; Riverside County Facilities Management. Associate Project Manager, Principal Investigator (Archaeology) and Cultural Resources Task Manager for the PSEC project, which involved the placement of up to 87 new communication facilities for the county sheriff and fire departments throughout Riverside County. Phases 1 and 2 (2007-2009) included experience as the Principal Investigator and Cultural Resources Task Manager for the cultural resources constraints analysis in support of an EIR-EA. Responsibilities included conducting and managing records searches and Class III intensive pedestrian surveys/Phase I surveys for over 165 proposed emergency services radio tower facilities throughout Riverside County and along the Riverside County borders in Orange, Imperial, San Bernardino, and San Diego counties. This sizable work effort included communication and permitting efforts with several district offices of the BLM, the USFS, and the National Park Service, as well as informal consultation efforts with local resource agencies and numerous southern California Native American groups and individuals. Phases 1 and 2 involved the supervision of various staff members and several subcontracted archaeologists and architectural historians. Phase 3 (2009-2013) included the management of mitigation compliance at all PSEC project sites, as well as the compilation of EAs for 25 sites on BLM, USFS, ACOE, NPS, and BIA lands. All EAs required the completion of cultural resources technical reports. Three EAs were prepared for the BLM, one for the ACOE, and three for the BIA. The preparation of the BIA EA documents included close coordination with the Santa Rosa Band of Cahuilla Indians and the Colorado River Indian Tribes. Additional duties included aiding the USFS in the preparation of multiple EAs located on the San Bernardino and Cleveland National Forests.

William R. Gillean, B.S.
Archaeologist

Mr. Gillean has gained more than 10 years of archaeological survey, testing, and excavation experience in Arizona, California, and Nevada. His duties at L&L include archaeological mitigation monitoring, Phase I surveys, California Historical Resources Information System (CHRIS) research, Native American Heritage Commission (NAHC) Sacred Lands Search (SLS) requests, Native American information scoping, completion of site records, and assisting senior staff with technical reports. He has experience with a wide range of GPS data collectors, photographic equipment, and software programs. He holds a Bachelor of Science in Anthropology with an emphasis in Cultural Resource Management from Cal Poly, Pomona.

PROFESSIONAL HISTORY

2015-present – Archaeologist, L&L Environmental, Inc. Redlands, CA. Performs field surveys, research, and completes site recordation for projects in southern California. Contributes to technical reports.

2013-present – Archaeologist, First Carbon Solutions. Irvine, CA. Performs archaeological mitigation monitoring in San Bernardino and Riverside Counties, California.

2010-2015 – Archaeologist, Atkins. San Bernardino, CA. Performed field surveys, research, completed site records, contributed to technical reports, assisted with Native American information scoping letters, and coordinated with the NAHC for SLS requests. Performed archaeological mitigation monitoring in San Bernardino and Riverside Counties, California.

2006-2010 – Archaeologist, U.S. Department of Agriculture (USDA) Forest Service, Skyforest, CA. Performed field surveys, subsurface testing programs, and data recovery projects throughout the San Bernardino and Angeles National Forests in southern California. Completed site records, authored and contributed to technical reports, conducted archaeological reconnaissance and inventory of fire suppression activities in support of the Butler II, Grass Valley, Slide, and Station fires. Made recommendations for minimizing impacts to archeological sites and performed mitigation monitoring in archaeologically sensitive areas during project implementation.

2004-2007 – Archaeologist, L&L Environmental, Inc. Corona, CA. Performed field surveys, research, subsurface testing programs, and data recovery projects in Riverside, San Bernardino, and Inyo Counties, California. Contributed to technical reports and performed archaeological mitigation monitoring.

2003-2004 – Field Technician, Center for Archaeological Research, California State University, Bakersfield. Bakersfield, CA. Provided technical support for the archaeological reconnaissance and inventory of over 40 miles of the Southern California Edison power line corridor located within the San Bernardino National Forest.

PROFESSIONAL DEVELOPMENT

2010 – Applied NEPA. USDA Forest Service. San Bernardino, CA.
2008 – The Section 106 Essentials. USDA Forest Service. Sacramento, CA.

EDUCATION

B.S., Anthropology (Cultural Resource Management Emphasis) – 2002, Cal Poly, Pomona, CA

William R. Gillean, B.S.
Continued

Selected Project Experience

Murrieta Hills Specific Plan, Murrieta, Riverside County, CA. Field technician for the pedestrian survey of over 900 acres of the Murrieta Hills. Project responsibilities included intensive pedestrian survey, relocation and updating of previously recorded sites, and recordation of sites not previously recorded or encountered.

Habitat Conservation Plan for the Federally Endangered Delhi Sands Flower-Loving Fly, Colton, San Bernardino County, CA. Field technician for the City of Colton Habitat Conservation Plan for the Federally Endangered Delhi Sands Flower-Loving Fly Project. This project considers the issuance of an incidental take permit by the U.S. Fish and Wildlife Service (USFWS) under Section 10 of the Endangered Species Act, and requires USFWS review under Section 106 of the NHPA. The project area considers approximately 150-acres of land proposed to be subject to the permit, and was completed at the request of The Altum Group for the City of Colton. Responsibilities included completing a records search at the AIC, Native American information-scoping, field survey, and contributions to the technical report.

Safe Routes to School Project, Palm Springs, Riverside County, CA. Field technician responsible for assisting with the completion of an ASR and an HPSR in support of the City of Palm Springs Safe Routes to School Project. This FHWA Local Assistance Funding Project requires Caltrans-compliant documentation and Caltrans review under Section 106 of the NHPA. The proposed project includes the installation of a variety of medians, bulb-outs and chokers designed to control the flow of traffic in the vicinity of local elementary and middle schools. The project area consists of ten non-contiguous sites found throughout the entire City. Responsibilities included completing a records search at the Eastern Information Center (EIC), Native American information scoping, field survey, and contributions to the technical report.

Adelfa Booster Station Redesign Survey, Community of Lakeland Village, Riverside County, CA. Field technician assisting with a Phase I Cultural Resources Assessment addressing upgrades to the existing Elsinore Valley Municipal Water District (EVMWD) distribution system. The study was performed at the request of the EVMWD and was completed in accordance with CEQA. Responsibilities included completing a records search at the EIC, Native American information scoping, field survey, and contributions to the technical report.

Temescal Canyon Road Improvements Survey, Corona Vicinity, Riverside County, CA. Field technician responsible for assisting with the field survey and completion of a Phase I Cultural Resources Assessment for proposed improvements to Temescal Canyon Road. The study was performed at the request of the Riverside County Redevelopment Agency and was completed in accordance with CEQA. One previously recorded prehistoric archaeological site was detected within the project area and was recommended ineligible for inclusion in the CRHR. The Cultural Resources Assessment was submitted to the USACE to support permitting efforts for the project.

William R. Gillean, B.S.
Continued

Selected Project Experience (Continued)

Ivy Street Bridge Replacement Archaeological Monitoring Project, Murrieta, Riverside County, CA. Monitoring Crew Chief for the mitigation monitoring program implemented for the Ivy Street Bridge Replacement Project. All detected prehistoric resources were documented and evaluated in the field and subsequently provided to the Native American monitors in accordance with a Mitigation Monitoring and Resource Treatment plan drafted by the Pechanga Band of Luiseno Indians. Responsibilities included coordination with Native American monitors, completing DPR 523 Forms, and co-authoring the resultant report.

Baldy Mesa Unauthorized OHV Rehabilitation Project on the Front Country Ranger District, San Bernardino National Forest, CA. Archaeologist responsible for pedestrian survey of several miles of unauthorized OHV trails, the relocation and update of previously recorded sites, location and recordation of new sites, and mitigation monitoring during project implementation.

San Sevaine Hazard Tree Removal Project on the Front Country Ranger District, San Bernardino National Forest, CA. Archaeologist responsible for the relocation and update of previously recorded sites, location and recordation of new sites, and performed mitigation-monitoring during project implementation.

Butler II, Grass Valley, and Slide Fires Survey Project on the Mountain Top Ranger District, San Bernardino National Forest, CA. Conducted archeological reconnaissance/inventory of fire suppression dozer lines in support of the Butler II, Grass Valley, and Slide fires. Made recommendations for minimizing impacts to archeological sites, and performed mitigation monitoring in archaeologically sensitive areas.

APPENDIX B

SCCIC Records Search Form

SCCIC JOB #	DATE	ACCESS #	TIME IN/OUT	COUNTY SEARCHED	CLIENT INFO	SCCIC USE ONLY	SCCIC INV INFO
17808	7/6		Time in: 9:30 Time out: 2:00	CIRCLE ONE OR MORE Los Angeles Orange Ventura San Bernardino	Your Name: Bill Gillean Company Name: L&L Environmental, Inc Billing Address: 700 E. Redlands Blvd suite U-351 Redlands, CA 92373 jsanka@llenvironinc.com E-Mail Address for Invoice Project Name: Greenspot Partners, Inc GSPI-05-646	Copy Code 45 In-House Regular Rush Handling QC PDF Flat Fee Copies /PDF 453 Biblio Pgs /PDF 2 TOTAL Copies /PDF	# EMAIL___ MAIL___ N/C___ VOID___

APPENDIX C

Photographs

Photograph 1. Overview of the northern project area boundary, taken from the northeast project corner. View to the west.

Photograph 4. Overview of the western project area boundary, taken from near the center of the boundary. View to the south.

Photograph 2. Overview of the northern project area boundary, taken from the northwest project corner. View to the east.

Photograph 5. Overview of the southern project area boundary, taken from the southwest project corner. View to the east.

Photograph 3. Overview of the western project area boundary, taken from the northwest project corner. View to the south.

Photograph 6. Overview of the southern project area boundary, taken from the southeast project corner. View to the west.

Photograph 7. Overview of the eastern project area boundary, taken from near the center of the boundary. View to the south.

Photograph 10. Overview of an area exhibiting excellent surface visibility and modern refuse. View to the east.

Photograph 8. Overview of the eastern project area boundary, taken from near the center of the boundary. View to the north.

Photograph 11. Overview of construction debris, facing east.

Photograph 9. Overview of an area exhibiting excellent surface visibility and modern refuse. View to the south.

Photograph 12. Overview of cobble and mortar, facing south.

Photograph 13. View of the eastern extent of 36-6848/CA-SBR-6848H within the project area, facing west.

Photograph 14. View of the western extent of 36-6848/CA-SBR-6848H within the project area, facing east.

Photograph 15. Overview of the recorded location of 36-6853/CA-SBR-6853H. View to the west.

Photograph 16. Overview of 36-7434/CA-SBR-7434H, facing north.

Photograph 17. Overview of 36-12264/CA-SBR-12205H, facing north.

Photograph 18. Overview of 36-12265 taken from near the eastern site boundary. View to the west.

APPENDIX D

Sacred Lands Search

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission

1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: HeatherGlen Project/City of Highland Tract 17604 (L&L Project Number GSPI-05-646)

County: San Bernardino Count

USGS Quadrangle Name: Redlands, CA

Township: 1 South Range: 3 West Section(s): 2

Company/Firm/Agency: L&L Environmental, Inc.

Contact Person: Jennifer M. Sanka, Archaeologist

Street Address: Physical Address – 721 Nevada Street, Suite 307 // Mailing Address - 700 East Redlands Boulevard, #U351

City: Redlands, CA Zip: 92373

Phone: 909-335-9897

Fax: 909-335-9893

Email: JSanka@llenviroinc.com

Project Description:

The proposed project is the construction of a residential development as outlined in Tract 17604. The project occupies approximately 60 acres and is generally located in the southwestern portion of San Bernardino County, California. Specifically, it can be found within Section 2 of T1S, R3W as shown on the USGS *Redlands, CA* 7.5' topographic quadrangle map

STATE OF CALIFORNIA Edmund G. Brown, Jr., *Governor*

NATIVE AMERICAN HERITAGE COMMISSION

Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

June 29, 2017

Jennifer M. Sanka
L&L Environmental, Inc.

Sent by E-mail: jsanka@llenviroinc.com

RE: Proposed Heather Glen/ City of Highland Tract 17604 (L&L Project Number GSPI-05-646) Project, City of Highland; Redlands USGS Quadrangle, San Bernardino County, California

Dear Ms. Sanka:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. Please note that the intent of the reference codes below is to avoid or mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects under AB-52.

As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 **require public agencies** to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

> **Within 14 days** of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.3.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.3.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:
   - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
   - If the probability is low, moderate, or high that cultural resources are located in the APE.
   - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and
   - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. A search of the SFL was completed for the project with negative results.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand well help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

Native American Heritage Commission
Native American Contact List
San Bernardino County
6/29/2017

Agua Caliente Band of Cahuilla Indians
Patricia Garcia-Plotkin, Director
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264 — Luiseno
Phone: (760) 699 - 6907
Fax: (760) 699-6924
ACBCI-THPO@aguacaliente.net

Agua Caliente Band of Cahuilla Indians
Jeff Grubbe, Chairperson
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264 — Luiseno
Phone: (760) 699 - 6800
Fax: (760) 699-6919

Augustine Band of Cahuilla Mission Indians
Amanda Vance, Chairperson
P.O. Box 846 — Cahuilla
Coachella, CA, 92236
Phone: (760) 398 - 4722
Fax: (760) 369-7161

Cabazon Band of Mission Indians
Doug Welmas, Chairperson
84-245 Indio Springs Parkway — Cahuilla
Indio, CA, 92203
Phone: (760) 342 - 2593
Fax: (760) 347-7880

Cahuilla Band of Indians
Daniel Salgado, Chairperson
52701 U.S. Highway 371 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 5549
Fax: (951) 763-2808
Chairman@cahuilla.net

Los Coyotes Band of Mission Indians
Shane Chapparosa, Chairperson
P.O. Box 189 — Cahuilla
Warner Springs, CA, 92086-0189
Phone: (760) 782 - 0711
Fax: (760) 782-0712
Chapparosa@msn.com

Los Coyotes Band of Mission Indians
John Perada, Environmental Director
P. O. Box 189 — Cahuilla
Warner Springs, CA, 92086
Phone: (760) 782 - 0712
Fax: (760) 782-2730

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 849 - 8807
Fax: (951) 922-8146

Morongo Band of Mission Indians
Denisa Torres, Cultural Resources Manager
12700 Pumarra Rroad — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 849 - 8807
Fax: (951) 922-8146
dtorres@morongo-nsn.gov

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, Chairperson
P.O. Box 391670 — Cahuilla
Anza, CA, 92539
Phone: (951)763-4105
Fax: (951)763-4325
admin@ramonatribe.com

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Heather Glen/ City of Highland Tract 17604 Project, San Bernardino County.

PROJ-2017-003571 — 06/29/2017 08:46 AM — 1 of 2

Native American Heritage Commission
Native American Contact List
San Bernardino County
6/29/2017

Ramona Band of Cahuilla Mission Indians
John Gomez, Environmental Coordinator
P. O. Box 391670 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
jgomez@ramonatribe.com

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838 — Kitanemuk, Serrano, Tataviam
Newhall, CA, 91322
Phone: (760) 885 - 0955
tsen2u@hotmail.com

San Manuel Band of Mission Indians
Lee Clauss, Director of Cultural Resources
26569 Community Center Drive — Serrano
Highland, CA, 92346
Phone: (909) 864 - 8933
Fax: (909) 864-3370
lclauss@sanmanuel-nsn.gov

Santa Rosa Band of Mission Indians
(951) 659-2700Steven Estrada, Chairperson
P.O. Box 391820 — Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228

Serrano Nation of Mission Indians
Goldie Walker, Chairperson
P.O. Box 343 — Serrano
Patton, CA, 92369
Phone: (909)528-9027

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 — Cahuilla, Luiseno
San Jacinto, CA. 92581
Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Soboba Band of Luiseno Indians
Carrie Garcia, Cultural Resources Manager
P. O. Box 487 — Cahuilla, Luiseno
San Jacinto, CA, 92583
Phone: (951)654-2765
Fax: (951)654-4198
carrieg@soboba-nsn.gov

Soboba Band of Luiseno Indians
Rosemary Morillo, Chairperson
P. O. Box 487 — Cahuilla, Luiseno
San Jacinto, CA, 92583
Phone: (951) 654 - 2765
Fax: (951) 654-4198
rmorillo@soboba-nsn.gov

Torres-Martinez Desert Cahuilla Indians
Michael Mirelez, Cultural Resource Coordinator
P.O. Box 1160 — Cahuilla
Thermal, CA, 92274
Phone: (760) 399 - 0022
Fax: (760) 397-8146
mmirelez@tmdci.org

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Heather Glen/ City of Highland Tract 17604 Project, San Bernardino County.

PROJ-2017-003571 06/29/2017 08:46 AM 2 of 2

APPENDIX E

Native American Coordination

L&L ENVIRONMENTAL, INC. REGULATORY SERVICES
BIOLOGICAL & CULTURAL INVESTIGATIONS & MONITORING

July 06, 2017

SAMPLE

REGARDING: INFORMATION REQUEST LETTER ASSOCIATED WITH ONE CULTURAL RESOURCES ASSESSMENT PROJECT – THE HEATHERGLEN/TRACT 17604 PROJECT, LOCATED ON ±60 ACRES IN THE CITY OF HIGHLAND, SAN BERNARDINO COUNTY, CALIFORNIA (USGS REDLANDS, CA 7.5-MINUTE TOPOGRAPHIC QUADRANGLE) (L&L PROJECT GSPI-05-646)

To Whom It May Concern:

L&L Environmental, Inc. (L&L) is in the process of completing a California Environmental Quality Act (CEQA) compliant cultural resources assessment for a project area totaling ±60 acres in the City of Highland, San Bernardino County, California. The proposed project includes the construction of a residential development with associated roads.

Environmental regulations, including CEQA, consider the impacts a project may have on cultural resources. To determine whether the proposed project may impact any cultural resources, L&L has conducted research on the project area, including the request of a Sacred Land Search (SLS) from the Native American Heritage Commission (NAHC). The NAHC does not indicate that any NAHC-recorded Native American cultural resources are located in the project area. However, the NAHC recommends additional coordination with regard to development projects in order to avoid any unanticipated discoveries. To this end, the NAHC has listed you as a contact and has indicated that you may have information about the potential for this project area to contain resources not found in the SLS. This letter is not associated with a formal consultation process, but is an information request that shall be included in our cultural resources assessment document.

We have enclosed maps showing the location of the project area. Generally, the project area is located in the southwestern portion of San Bernardino County, California, and is situated north of Interstate 10 (Figure 1). Specifically, it can be found within Section 2 of Township 1 South, Range 3 West as shown on the USGS *Redlands, CA* 7.5' topographic quadrangle map (Figure 2). The project is located immediately to the south of Greenspot Road in the City of Highland (Figure 3).

We wish to ask if you have any information or concerns about this project area and/or if the proposed project may have an impact on cultural resources that are important to you. Please feel free to contact me at 909.335.9897 or JSanka@llenviroinc.com if you have any questions or information or you may address and mail a response to my attention at our office.

\\Fileserver\l&l documents\SERVER PROJECT FILES\UNIFIED PROJECTS\GSPI-05-646 HeatherGlen NAR\2017 ARS\Report\Appendices\App E – NA Coordination\1 - GSPI-05-646_NA Scoping Letter_SAMPLE.docx

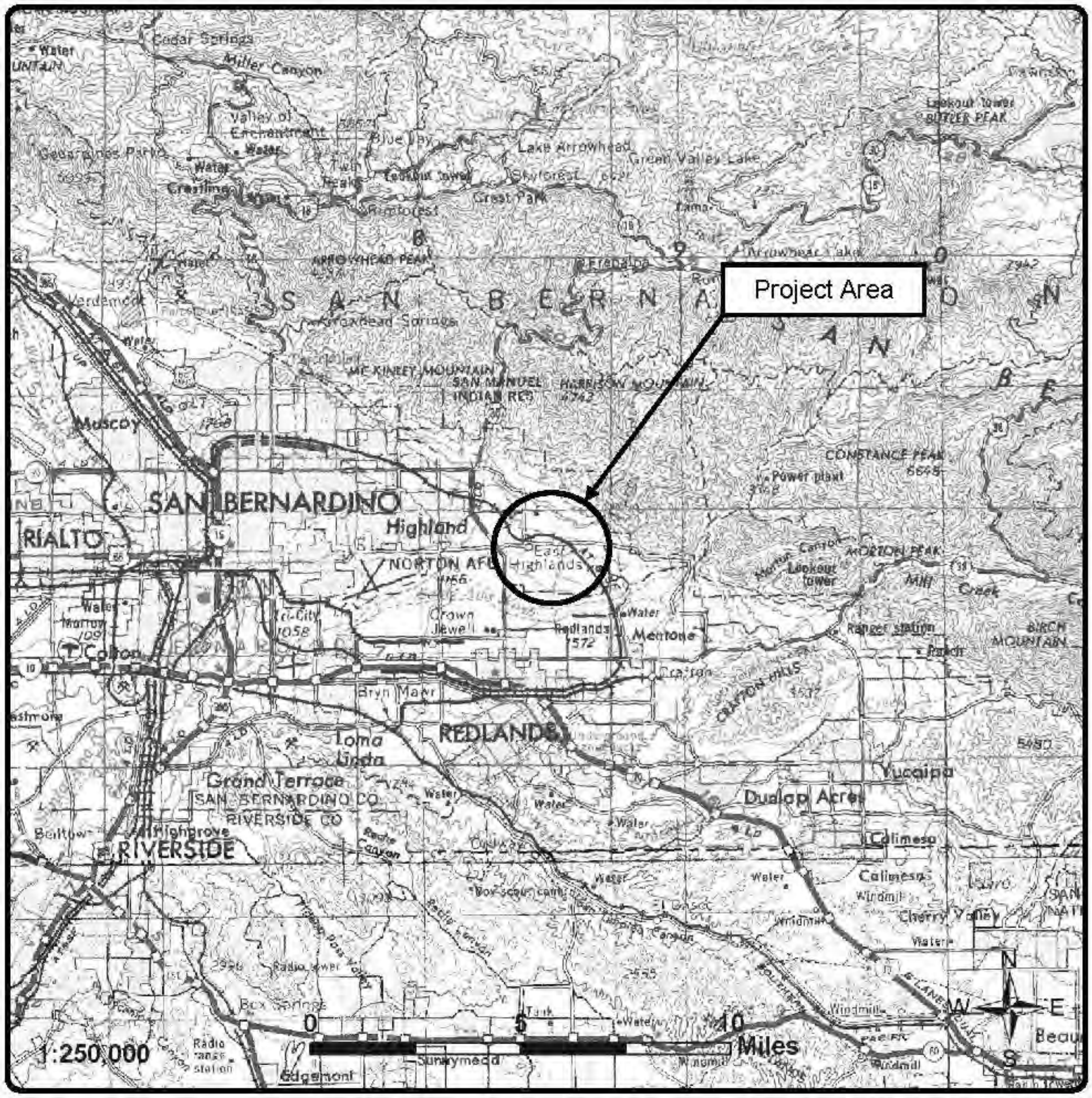
Celebrating 20 Years of Service to Southern CA and the Great Basin, WBE Certified (Caltrans, CPUC, WBENC)
Mailing Address: 700 East Redlands Blvd, Suite U, PMB #351, Redlands CA 92373
Delivery Address: 721 Nevada Street, Suite 307, Redlands, CA
• Phone ☏ 909-335-9897 • ☏ 909-335-9893

Sincerely,
L&L Environmental, Inc.

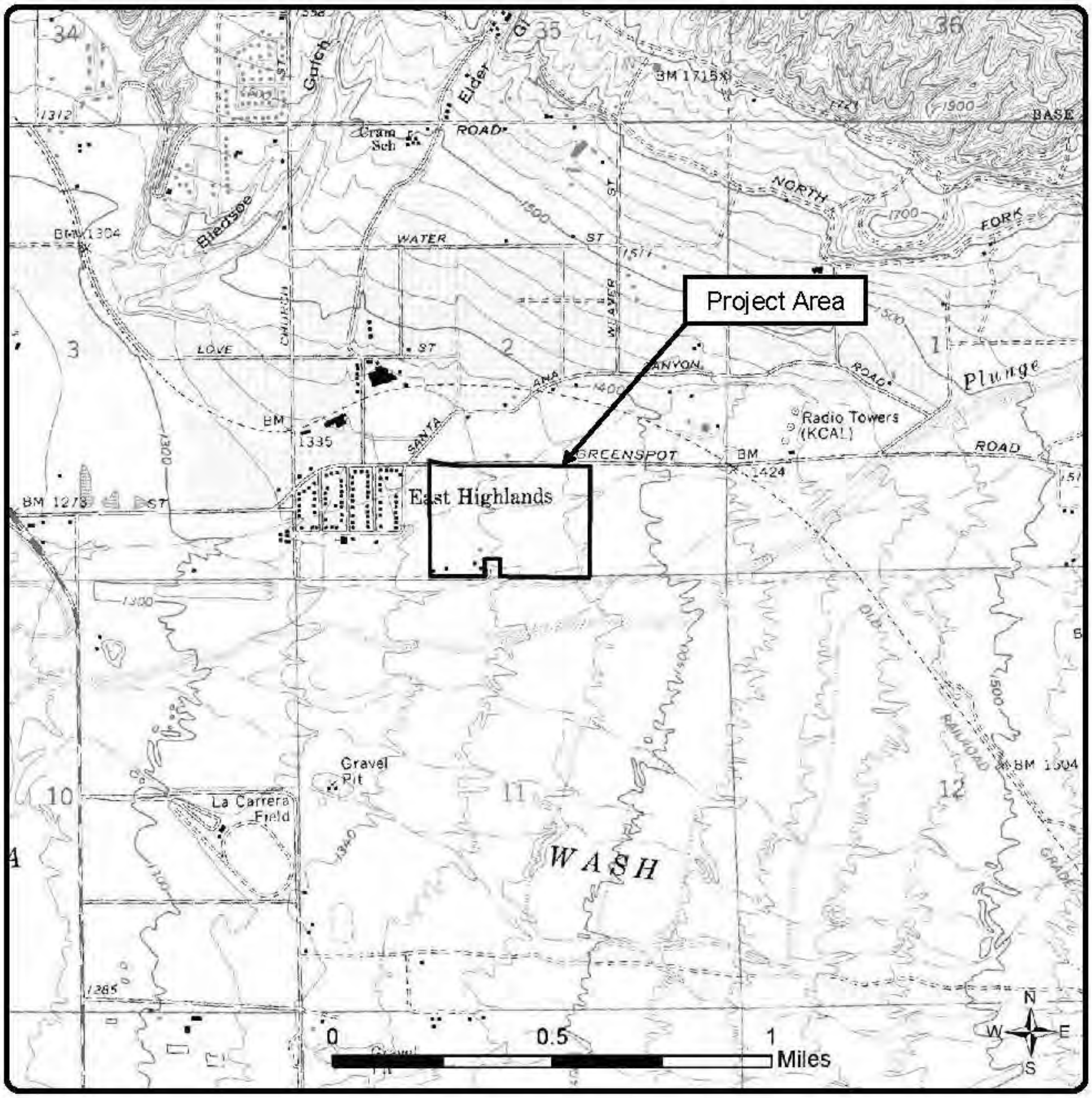
Jennifer M. Sanka, M.A., RPA
Archaeologist

JMS/al

Encl: Figure 1: Project Vicinity Map
Figure 2: Project Location Map
Figure 3: Aerial Photograph



L&L Environmental, Inc. *BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING* *GSPI-05-646* *July 2017*	**Figure 1** **Project Vicinity Map** *HeatherGlen/Tract 17604 Project* *City of Highland* *San Bernardino County, California*



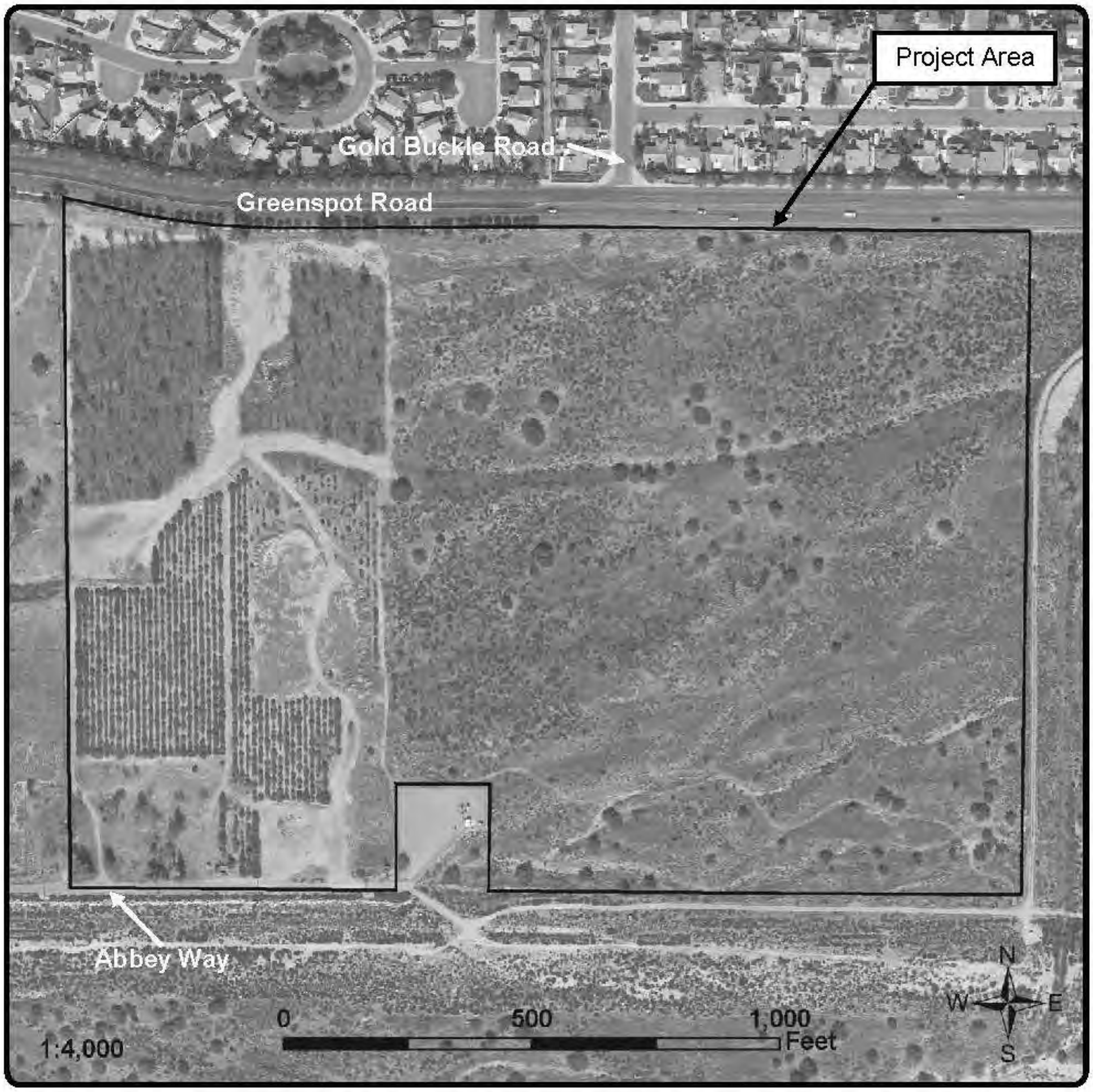
L&L Environmental, Inc.

BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

GSPI-05-646
July 2017

Figure 2

Project Location Map
(USGS Redlands [1988] quadrangle, Section 2, Township 1 South, Range 3 West)
HeatherGlen/Tract 17604 Project
City of Highland
San Bernardino County, California



L&L Environmental, Inc.

BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

GSPI-05-646
July 2017

Figure 3

Aerial Photograph
(Photo obtained from Google Earth, October 2016)
HeatherGlen/Tract 17604 Project
City of Highland
San Bernardino County, California

Heather Glen/Tract 17604 Project, Highland, CA

Jessica Mauck <JMauck@sanmanuel-nsn.gov>

Thu 8/3/2017 3:51 PM

To:Jennifer Sanka <jsanka@llenviroinc.com>;

Hello Jennifer,

Thank you for contacting the San Manuel Band of Mission Indians (SMBMI) regarding the above referenced project. SMBMI appreciates the opportunity to review the project documentation, which was received by our Cultural Resources Management Department on 6 July 2017. The proposed project area exists within Serrano ancestral territory and, therefore, is of interest to the Tribe. The proposed project location is located approximately .05 - .10 miles from Plunge Creek as it comes down from the San Bernardino Mountains near the SMBMI reservation. This body of water is significant to SMBMI and the areas around along the creek contain significant cultural resources throughout. Due to the nature and location of the proposed project, SMBMI respectfully requests a copy of the cultural report and planning documents, to include:

1. The name and contact information of the lead agency POC, once determined;
2. A records search of the Sacred Lands Files managed by the CA Native American Heritage Commission (NAHC) and a site file and associated literature search at the appropriate California Historical Resources Information System Information Center (CHRIS) to identify any and all recorded cultural resources within a <u>1-mile radius of the proposed project location(s)</u>, as well as general background research using GLO maps, Sanborn maps, historical atlases, city and state records, and other historical documents;
3. Additional maps/illustrations be provided, specifically including:
   a. an aerial map;
   b. a map indicating the search radius of the background research, as well as the locations where previous studies were conducted and where known historic resources are located;
   c. photographs of the proposed project area;
   d. engineering/design plans for the proposed project, especially plans indicating where ground-disturbing activities will occur and to what horizontal and vertical extent.
4. A Phase I archaeological investigation of the totality (100%) of the proposed project's area of potential effect (APE) via the employ of a number of methods, including <u>pedestrian survey that employs a transect interval of no more than 10 meters</u>, shovel test probes, remote sensing, and/or deep testing via controlled units or trenching of appropriate landscapes. The use of specific field methods and techniques must be justifiable and dependent upon the type and amount of ground cover present (visibility), the topographic setting (degree of slope, proximity to water, etc.), past land use (degree of prior disturbance), and probability for encountering previously undocumented resources during the proposed project (low, moderate, high probability). We strongly recommend that visibility must equal 50% or greater of the ground surface area to use pedestrian survey/reconnaissance only. Areas that have not been disturbed in the past and/or high probability areas must be explored using sub-surface testing methods in addition to pedestrian survey. Additionally, we ask that there be no collection of artifacts or excavation of features during any Phase I archaeological survey.

The provision of this information will assist San Manuel Band of Mission Indians in ascertaining whether or not the Tribe will assume consulting party status under CEQA with the lead agency. If you would prefer we contact the lead agency directly for the information above, though compiled by the consulting party, please let us know and provide the information in line 1. This letter is merely intended to take part in information sharing to ensure efficiency of the process for SMBMI, the lead agency, and the consultants. If you should have any further questions with regard to this matter, please do not hesitate to contact me at your convenience, as I will be your Point of Contact (POC) for SMBMI with respect to this project.

Respectfully,

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249
M: (909) 725-9054
26569 Community Center Drive, Highland California 92346
SAN MANUEL
BAND OF MISSION INDIANS

APPENDIX F

DPR 523 Forms

Heatherglen Planned Development, TTM 17604, CUP 15-006

Initial Study – Notice of Preparation

Appendix C – Energy Analysis

Technical Memorandum

DATE: May 20, 2019

PREPARED FOR: Stan Stringfellow

PREPARED BY: Michelle A. Jones, Principal Entech Consulting Group

SUBJECT: CEQA Energy Analysis for Heatherglen Residential Community

1.0 Energy

This technical memorandum provides a summary of the energy regulatory framework, discusses the existing conditions of the project site, discloses potential energy use during construction and operation of the proposed project and identifies any project design features and/or mitigation measures that may reduce energy consumption.

1.1 Existing Conditions

Electricity

Electricity is produced through the conversion of natural energy resources including water, wind, oil, gas, coal, solar, geothermal and nuclear resources into energy. The delivery of electricity to the end users requires a network of distribution components, including substations and transformers convey the electricity through transmission lines.

Southern California Edison (SCE) is the primary local public utility and energy supplier that services a majority of southern California, including the Proposed Project site, via a statewide network of power plants and transmission lines. SCE produces and purchases electricity from renewable and nonrenewable sources. SCE will supply electrical power to the Proposed Project site from electrical service lines located in the Proposed Project vicinity.

Natural Gas

Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas consumed in California is obtained from naturally occurring reservoirs, mainly located outside the state, and delivered through high-pressure transmission pipelines. The natural gas transportation system is a nationwide network and, therefore, resource availability is typically not an issue. Natural gas satisfies almost one-third of the total energy requirements and is used in electricity generation, space heating, cooking, water heating, industrial processes, and as a transportation fuel. Quantities of natural gas are measured in billion cubic feet (Bcf), with the average home requiring approximately 1,000 cubic feet of natural gas for space-heating, water-heating, cooking, etc. for four days.

Natural gas is provided to the Proposed Project site by the Southern California Gas Company (SoCalGas). The service territory of SoCalGas encompasses approximately 20,000 square miles in diverse terrain throughout Central and Southern California, from the City of Visalia to the Mexican border. SoCalGas receives gas supplies from several sedimentary basins in the western United States and Canada, including the Rocky Mountains and western Canada, as well as local California supplies. Natural gas for SoCalGas is delivered to the region through interstate pipelines.

2.0 Applicable Regulations

2.1 Federal Regulations

2.1.1 Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the transmission and sales of electricity, natural gas, and oi in interstate commerce, licensing of hydroelectric projects, and oversight of related environmental matters. The setting and enforcing of interstate transmission sales is also regulated by FERC.

2.1.2 Federal Energy Policy and Conservation Act

In 1975, Congress enacted the Federal Energy Policy and Conservation Act to serve the nation's energy demands and promote feasibly attainable conservation methods. This act established the first fuel economy standards for on-road motor vehicles in the United States.

2.1.3 Energy Policy Act of 2005

On August 8, 2005, President George W. Bush signed the National Energy Policy Act of 2005 into law. This comprehensive energy legislation contains several electricity-related provisions that aim to:

- Help ensure that consumers receive electricity over a dependable, modern infrastructure
- Remove outdated obstacles to investment in electricity transmission lines
- Make electric reliability standards mandatory instead of optional
- Give federal officials the authority to site new power lines in Department of Energy-designated national corridors in certain limited circumstances.

2.2 State Regulations

2.2.1 Senate Bill 1389

Senate Bill 1389 requires the development of an integrated plan for electricity, natural gas, and transportation fuels. The California Energy Commission (CEC) must adopt and transmit to the Governor and Legislature an Integrated Energy Policy Report (IEPR) every two years.

The *2019 IEPR* will continue to expand on efforts to decarbonize California's energy system while ensuring that the benefits are equitable. The *2019 IEPR* will focus on actions needed to transform the transportation sector to dramatically reduce GHG emissions while making sure that low-income and disadvantaged communities reap the benefits. The topics that will be addressed include:

Transportation - Pollution from the transportation sector must be reduced significantly to help meet the state's clean air standards and climate goals. The *2019 IEPR* analysis will include:

• Discussion of the success and benefits the Energy Commission's Alternative and Renewable Fuel Vehicle Technology Program and, more broadly, the state's efforts to reduce GHG emissions from the transportation sector.

• Update on the status of the zero-emission vehicle market and infrastructure. There will also be an exploration of the charging infrastructure needed to meet the state's goals as part of implementing AB 2127 (Ting, Chapter 365, Statutes of 2018).

• Update to the *Vehicle-Grid Integration Roadmap* as a follow-up to a recommendation in the *2017 IEPR*.

Energy Equity - The state must continue to advance energy equity so that low-income and disadvantaged communities share the benefits of a transformed energy sector. The analysis will include:

• Update on the implementation status of the recommendations developed in response to SB 350 in the *Low-Income Barriers Study Part A: Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers and Small Business Contracting Opportunities in Disadvantaged Communities* and the *Low-Income Barriers Study Part B: Overcoming Barriers to Clean*

Transportation Access for Low-Income Residents.

• Assessment of whether charging station infrastructure is disproportionately deployed by population density, geographical area, and population income level as required by SB 1000 (Lara, Chapter 368, Statutes of 2018).

Energy Efficiency and Building Decarbonization - Advancements in energy efficiency and building decarbonization efforts statewide are key strategies in the state's approach to creating a clean economy. The analysis will summarize an Energy Commission report scheduled to be published this year that will include:

• Analysis of actions needed to decarbonize buildings in support of AB 3232 (Friedman, Chapter 373, Statutes of 2018).

• An update of the doubling of energy efficiency targets developed in the *2017 IEPR* as required by SB 350 and updating the *2016 Existing Building Energy Efficiency Action Plan*.

• Comparison of publicly owned utility (POU) energy efficiency targets with actual savings. (Public Utilities Code 9505, Public Resources Code [PRC] 25305.2).

Additionally, the *2019 IEPR* will:

• Consider the role of load management in minimizing renewable curtailment and facilitating the decarbonization of the electricity system in a least-cost manner. In particular, the report will examine the status of demand response.

• Evaluate the actual energy efficiency savings from negative therm interactive effects generated as a result of electricity efficiency improvements, as required in PRC 25302.2.

Electricity Sector - The Energy Commission will explore changes needed in the electricity sector to support California's 2030 goals for GHG reductions, zero-emission vehicles, and a 60 percent Renewables Portfolio Standard. The analysis will include an assessment of the POUs' progress in meeting the 2030 goals of SB 350 based on their integrated resource plans. The *2019 IEPR* will also explore the 2045 near-zero-carbon goal set by SB 100.

Electricity, Natural Gas, and Transportation Demand Forecasts - The Energy Commission will prepare a new 10-year forecast of electricity consumption and peak electricity demand for California and for individual utility planning areas and forecast zones in the state. The Energy Commission will further enhance its electricity and natural gas demand forecast to support the energy efficiency and renewable energy goals in SB 350. This includes providing more granularity in the temporal, locational, and sector-specific electricity and natural gas demand trends. Additionally, the Energy Commission will refine its transportation forecast with updated inputs and assumptions that reflect an evolving transportation market.

Natural Gas Assessment - The Energy Commission will explore the role of natural gas in a decarbonized future. The analysis will include:

• Evaluation of the trends in natural gas prices, supply, and demand in California and the nation.

• Update of the analysis of the strategies and options for using natural gas as called for in AB 1257 (Bocanegra, Chapter 749, Statutes of 2013) and the recommendation in the *2017 IEPR* to "coordinate closely with the California Public Utilities Commission to ensure California's continued shift away from fossil fuels, including methane.

Southern California Energy Reliability – Maintaining energy reliability in Southern California requires ongoing monitoring and assessment. The *2019 IEPR* analysis will include analysis of:

• Natural gas prices as a follow up to a workshop held on January 11, 2019, as part of the *2018 IEPR Update Volume II*, on natural gas price spikes.

• Risks such as extreme weather on the reliability of the system.

Climate Adaptation - Continued actions are needed to address major climate risks to the state's communities and energy system. These actions must recognize the unique vulnerabilities climate change poses to the natural gas and electricity sectors.

The *2019 IEPR* will discuss:
• Flexible and adaptive strategies to increase the state's resilience to multiple stressors from climate change on the energy system, with attention to vulnerable populations.

• Research to increase the state's resiliency to climate change as the state progresses towards its 2030 and 2045 climate goals.

2.2.2 Assembly Bill 32

Assembly Bill 32, also known as the California Global Warming Solutions Act of 2006, commits the State to achieving year 2000 GHG emission levels by 2010 and year 1990 levels by 2020. To achieve these goals, AB 32 tasked the California Public Utilities Commission and the CEC with providing information, analysis, and recommendations to CARB regarding ways to reduce GHG emissions in the electricity and natural gas utility sectors.

2.2.3 California Building Standards Code (Title 24)

The following subsections delineate the relevant parts under California Building Standards Code (Title 24).

2.2.3.1 California Building Energy Efficiency Standards (Title 24, Part 6)

The California Building Energy Efficiency Standards for Residential and Nonresidential Buildings were adopted to ensure that building construction and system design and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. The California Building Energy Efficiency Standards are updated every three years. The current California Building Energy Efficiency

Standards are the 2016 Building Energy Efficiency Standards, which became effective January 1, 2017. The 2016 Building Energy Efficiency Standards focus on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings and include requirements to enable both demand reductions during critical peak periods and future solar electric and thermal system installations. The most significant efficiency improvements to the residential standards include improvements for attics, walls, water heating, and lighting.

2.2.3.2 California Green Building Standards (Title 24, Part 11)

The California Green Building Standards Code, commonly referred to as the CALGreen Code, went into effect on January 1, 2017. The 2016 CALGreen Code includes mandatory measures for non-residential development related to site development; water use; weather resistance and moisture management; construction waste reduction, disposal, and recycling; building maintenance and operation; pollutant control; indoor air quality; environmental comfort; and outdoor air quality. Mandatory measures for residential development pertain to green building; planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; environmental quality; and installer and special inspector qualifications.

2.3 Local Regulations

The City of Highland understands that energy efficiency can greatly reduce the impact of residential development and provide cost savings for its residents. On a regulatory level, the City enforces the State Energy Conservation Standards (California Code of Regulations Title 24). Residential development in Highland is evaluated for energy efficiency during the plan review process. The following elements of the City of Highland's general plan policies for encouraging energy efficiency for new construction are outlined below.

2.3.1 City of Highland General Plan-Housing Element

8.Innovative and Efficient Housing

8f. Reduce energy waste by reviewing all residential buildings for compliance with Title 24, State of California Energy Standards.

2.3.2 City of Highland General Plan-Conservation and Open Space Element

Encourage site design practices that reduce and conserve energy use.

Policies

1) Encourage energy and environmentally sustainable designs— such as "Green Development Standards"—in the design and approval of new projects.

2) Orient buildings on the site to maximize the natural ventilation provided by prevailing breezes.

3) Incorporate passive solar design techniques including building orientation, energy-saving materials, roof overhangs, and window and door placement.

4) Increase minimum building insulation standards.

5) Encourage landscape design that cools buildings and blocks solar rays, such as the planting of deciduous trees on south and west facing elevations and give Title 24 credit for landscaping.

6) Channel runoff to permeable surfaces through the design of roofs and rain gutter systems and drainage courses.

7) Encourage energy-efficient retrofitting of existing buildings, where practical, throughout the City including assisting applicants in the installation of more efficient HVAC (heating, ventilation, air conditioning) systems.

8) Distribute and participate in incentive programs for incorporation of solar and photovoltaic panels (active solar) into existing or new buildings.

9) Establish a "green building" site design incentive program, such as density or height bonuses, reduced parking requirements, expedited plan check, and recognition programs.

10) Adopt LEED (Leadership in Energy and Environmental Design) design standards for public buildings.

11) Participate in the CEEP (Community Energy Efficiency Program) Certificate and Recognition Program.

12) Encourage a grey water recycling plan.

3.0 Impacts and Mitigation

3.1 Threshold

Appendix F of the California Environmental Quality Act (CEQA) requires a discussion of the potential energy impacts of proposed project, with particular emphasis on whether the proposed project would result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. Further, the proposed project should not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. The analysis below demonstrates compliance with these energy thresholds.

3.2 Construction Energy Consumption

Construction of the proposed project would last for approximately four years. Construction activities would consume energy through the operation of heavy off-road equipment, trucks, and worker traffic. Construction equipment fuel consumption was based on equipment lists generated using California Emissions Estimator Model (CalEEMod) default values and input from the project applicant. The construction equipment summarized in Table 1 is anticipated to be used in each phase of the project. The fuel consumption of off-road equipment calculated in this analysis is based on the fuel consumption rates in the OFFROAD 2011 statewide data sets as well as the horsepower, usage hours, and load factors from CalEEMod as part of the proposed project's air quality analysis.

Based on the information in Table 1 and the anticipated construction schedule, construction equipment would result in the consumption of approximately 272,397 gallons of diesel fuel over the entire construction period.

Worker, vendor, and haul trips would result in approximately 15,935 VMT over the entire construction period. As part of the proposed project cut and fill would be balanced on site therefore no haul trips would result in the consumption of fuel during construction. A countywide average fuel consumption of 20.48 mpg was used to determine fuel consumption from worker and vendor trips because these trips would occur in a variety of different vehicle types and classes (CNRA 2009). As a result, is it estimated that construction worker and vendor trips would result in the consumption of approximately 344,421 gallons of fuel during the entire construction phase.

Although the proposed project would result in the consumption of an estimated 272,397 gallons of diesel and 344,421 gallons of gasoline during construction, the project is designed to balance the grading on site. This would substantially reduce the amount of potential haul trips associated with the

Table 1. Construction Equipment Usage

Construction Phase Name	Off Road Equipment Type	Off Road Equipment Unit Amount	Usage Hours	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	3	8	247	0.4
Site Preparation	Tractors/Loaders/Backhoes	4	8	97	0.37
Grading	Excavators	2	8	158	0.38
Grading	Graders	1	8	187	0.41
Grading	Rubber Tired Dozers	1	8	247	0.4
Grading	Scrapers	2	8	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8	97	0.37
Building Construction	Cranes	1	7	231	0.29
Building Construction	Forklifts	3	8	89	0.2
Building Construction	Generator Sets	1	8	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37
Building Construction	Welders	1	8	46	0.45
Paving	Pavers	2	8	130	0.42
Paving	Paving Equipment	2	8	132	0.36
Paving	Rollers	2	8	80	0.38
Architectural Coating	Air Compressors	1	6	78	0.48

import and export of soil for construction of the proposed project, which in turn would reduce the amount of fuel required by the project. Additionally, construction equipment fleet turnover and increasingly stringent state and federal regulations on engine efficiency combined with local, state, and federal regulations limiting engine idling times and require recycling of construction debris, would further reduce the amount of transportation fuel demand during project construction. Considering these reductions in transportation fuel use, the proposed project would not result in the wasteful and inefficient use of energy resources during construction and impacts would be **less than significant**.

3.1.2 Operation Energy Consumption

During operations the proposed project would consume natural gas for space heating, water heating, and cooking associated with the residential land uses on the project site. The natural gas consumption was estimated for each of the project’s land uses based on the CalEEMod default values. Based on these calculations the proposed project is estimated to consume approximately 7,536,660 thousand British thermal units of natural gas per year during operation.

In addition to the consumption of natural gas, the proposed project would use electricity for lighting, appliances, and other uses associated with the project’s land uses. Annual electricity demand by utilizing CalEEMod default values for project’s specific land uses. Based on this methodology the proposed project is estimated to use approximately 1,901,510 kilowatt-hours (kWh) of electricity per year. The project design includes installation of solar panels on site, however the number of solar panels and the amount of electricity that will be produced has not yet been determined.

As described above the proposed project would result in a long-term increase in demand for electricity and natural gas. However, the project would be designed according to the most recent Title 24 standards of the California Code of Regulations. Part 6 of Title 24 specifically establishes energy efficiency standards for residential and non-residential buildings constructed in the State of California in order to reduce energy demand and consumption. Part 6 is updated periodically to incorporate and consider new energy efficiency technologies and methodologies. The most recent amendments, referred to as the 2016 standards, became effective on January 1, 2017. The proposed project would meet current Title 24 requirements. These measures would reduce inefficient, wasteful and unnecessary consumption of energy to the extent feasible. Therefore, impacts from the wasteful or inefficient use of electricity or natural gas during operation of the project would be **less than significant**.

Water Treatment, Conveyance, and Distribution

Water used for both indoor and outdoor requires electricity for water treatment, conveyance, and distribution. The proposed project's water demand was calculated based on default values for the specific land uses proposed by the project in CalEEMod for the project's specific land uses. Based on this methodology the proposed project is estimated to use approximately 13.22 million gallons of indoor water per year as well as 8.33 million gallons of outdoor water per year. This would result in a total of approximately 299,085 kWh per year of electricity for indoor and outdoor water treatment, conveyance, and distribution (CEC 2006).

Although the proposed project would result in electricity use from the treatment, conveyance, and distribution of water to the project site, the project would also require all water fixtures to be compliant with the 2016 California Green Building Standards Code and updated amendments of the County Landscape Ordinance, which would reduce the amount of water used by the project and require compliance with regulations relating to drought conditions. Therefore, the proposed project would not result in the wasteful or inefficient use of electricity for water treatment, conveyance, and distribution and impacts would be **less than significant**.

Wastewater Service

Wastewater generation is included in the CalEEMod data for water, discussed above under Water-Related Energy. Additionally, energy demand related to wastewater treatment is accounted for in the CEC's recommended water-energy proxies based on the water-use cycles for indoor and outdoor uses, as described above (CEC 2006). It should be noted that the energy consumption associated with the proposed project's water demand (including wastewater conveyance) was estimated using the CEC-recommended water energy proxies for southern California, which include substantial energy usage associated with water conveyance and distribution. Since the project includes on-site utilization of reclaimed water, the project's water-related energy demand is likely overstated.

The incremental increase of energy use associated with implementation of the project would not require the construction of new energy facilities and sources of energy that would not otherwise be needed to serve the region. Wastewater service would require an extension of sewer line. The energy added for the extension and use of these facilities combined with the project's estimated electricity and natural gas consumption would not result in additional energy generation or transmission infrastructure due to the location and capacity of existing energy infrastructure near the project site. Therefore, the project would not result in the wasteful or inefficient use of electricity for wastewater treatment, and impacts would be **less than significant**.

Fuel Consumption

During operation of the proposed project, vehicle trips would be generated by the proposed project's specific land uses. The proposed project's specific land uses were modeled in CalEEMod using default vehicle trip generation rates for park, residential, and other uses on the project site. The vehicle trips generated would result in approximately 6,830,784 VMT. Based on a countywide average fuel consumption of 20.43 mpg, the proposed project would result in the consumption of an estimated 334,351 gallons of transportation fuel.

Various federal and state regulations including the Low Carbon Fuel Standard, Pavley Clean Car Standards, and Low Emission Vehicle Program would serve to reduce the project's transportation fuel consumption progressively into the future. Therefore, the project would be designed to avoid the wasteful and inefficient use of transportation fuel during operations and impacts would be **less than significant**.

It should be noted that state and federal regulatory requirements addressing fuel efficiency are expected to increase fuel efficiency over time as older, less fuel-efficient vehicles are retired. The federal CAFE standards and AB 1493 fuel efficiency standard (analogous to the federal CAFÉ standard), as well as light/heavy vehicle efficiency/hybridization programs, all contribute to increased fuel efficiency and therefore would reduce vehicle fuel energy consumption rates over time. While the project would increase the consumption of gasoline and diesel proportionately with projected population growth, the increase would be accommodated within the projected growth as part of the energy projections for the state and the region and would not require the construction of new regional energy production facilities. Because gasoline and diesel are transported via truck to individual service stations, the increase in demand also is not anticipated to require major improvements to local fueling infrastructure. Therefore, energy impacts related to fuel consumption/efficiency during project operations would be **less than significant**.

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Appendix A: Energy Calculations

Construction Fuel Usage

PhaseName	Off Road Equipment Type	Off Road Equipment Unit Amount	UsageHours	HorsePower	LoadFactor	Avg. Daily Factor	Number of days	Diesel Fuel Usage
Site Preparation	Rubber Tired Dozers	3	8	247	0.4	0.6	40	2,845
Site Preparation	Tractors/Loaders/Backhoes	4	8	97	0.37	0.6	40	1,378
Grading	Excavators	2	8	158	0.38	0.6	110	3,170
Grading	Graders	1	8	187	0.41	0.6	110	2,024
Grading	Rubber Tired Dozers	1	8	247	0.4	0.6	110	2,608
Grading	Scrapers	2	8	367	0.48	0.6	110	9,301
Grading	Tractors/Loaders/Backhoes	2	8	97	0.37	0.6	110	1,895
Building Construction	Cranes	1	7	231	0.29	0.6	1110	15,615
Building Construction	Forklifts	3	8	89	0.2	0.6	1110	14,226
Building Construction	Generator Sets	1	8	84	0.74	0.6	1110	16,559
Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	0.6	1110	25,098
Building Construction	Welders	1	8	46	0.45	0.6	1110	5,514
Paving	Pavers	2	8	130	0.42	0.6	75	1,966
Paving	Paving Equipment	2	8	132	0.36	0.6	75	1,711
Paving	Rollers	2	8	80	0.38	0.6	75	1,094
Architectural Coating	Air Compressors	1	6	78	0.48	0.6	75	505
Gallons of construction diesel fuel								**105,511**

Phase Name	Worker Trips	Days	Vendor Trips	***Length per trip (miles)***		***Total Length (miles)***		Avg Daily Factor	***Gallons of Fuel***	
				Worker Trip Length	*Vendor Trip Length*	*Total Vendor Trips*	*Total Haul Trips*		*Gasoline*	*Diesel Fuel*
Site Preparation	126	40		14.7	6.9	1,852	-	0.6	2,171	
Grading	160	110		14.7	6.9	2,352	-	0.6	7,580	
Building Construction	693	1110	207	14.7	6.9	10,187	1,428	0.6	331,280	166,886
Paving	90	75		14.7	6.9	1,323	-	0.6	2,907	
Architectural Coating	15	75		14.7	6.9	221	-	0.6	484	
Total Gasoline						15,935			**344,421**	166,886
subtotal from construction										105,511
Total construction Diesel fuel										**272,397**

EMFAC2011 Emissions Inventory												
Region Type: Air Basin												
Region: South Coast												
Calendar Year: 2019												
Season: Annual												
Vehicle Classification: EMFAC2011 Categories												
Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed	Population	VMT	Trips	Fuel_GAS	Fuel_DSL	Miles per Gallon
						(miles/hr)	(vehicles)	(miles/day)	(trips/day)	(1000 gallons/day)	(1000 gallons/day)	
South Coast	2019	Annual	LDA	GAS	Aggregated	Aggregated	5919080.897	201726794.5	37369376.96	8872.432331	0	22.7
South Coast	2019	Annual	LDT1	GAS	Aggregated	Aggregated	693717.2286	23623176.31	4202494.757	1200.094998	0	19.7
South Coast	2019	Annual	LDT2	GAS	Aggregated	Aggregated	1960776.565	71580572.68	12342715.58	4265.262875	0	16.8
South Coast	2019	Annual	T7 tractor	DSL	Aggregated	Aggregated	4217.99922	331838.0226	0	0	57.98147024	5.7
Average fuel consumption												20.48
Notes: Consistent with CalEEMod, a construction work trip is assumed to be a composite of 50% LDA, 25% LDT1 and 25% for LDT2. Used EMFAC 2011 Categories:												
for construction as EMFAC2011 has specific categories for vehicle class T7.												

Heatherglen Planned Development, TTM 17604, CUP 15-006

Initial Study – Notice of Preparation

Appendix D – Engineering Geology Investigation

ENGINEERING GEOLOGY INVESTIGATION
PROPOSED HEATHERGLEN PROPERTY
APPROXIMATELY 58 ¾ ACRES, BETWEEN
GREENSPOT ROAD AND ABBEY WAY,
EAST HIGHLANDS AREA,
HIGHLAND, CALIFORNIA

January 5, 2006

Project No. 3555

Prepared For

North American Residential Communities
326 West Arrow Highway
San Dimas, California 91773

GARY S. RASMUSSEN & ASSOCIATES, INC. / *ENGINEERING GEOLOGY*

1811 COMMERCENTER WEST • SAN BERNARDINO, CALIFORNIA 92408 • (909) 888-2422 • FAX (909) 888-6806

January 5, 2006

North American Residential Communities
326 West Arrow Highway
San Dimas, California 91773

Project No. 3555

Attention: Jenine Murrin

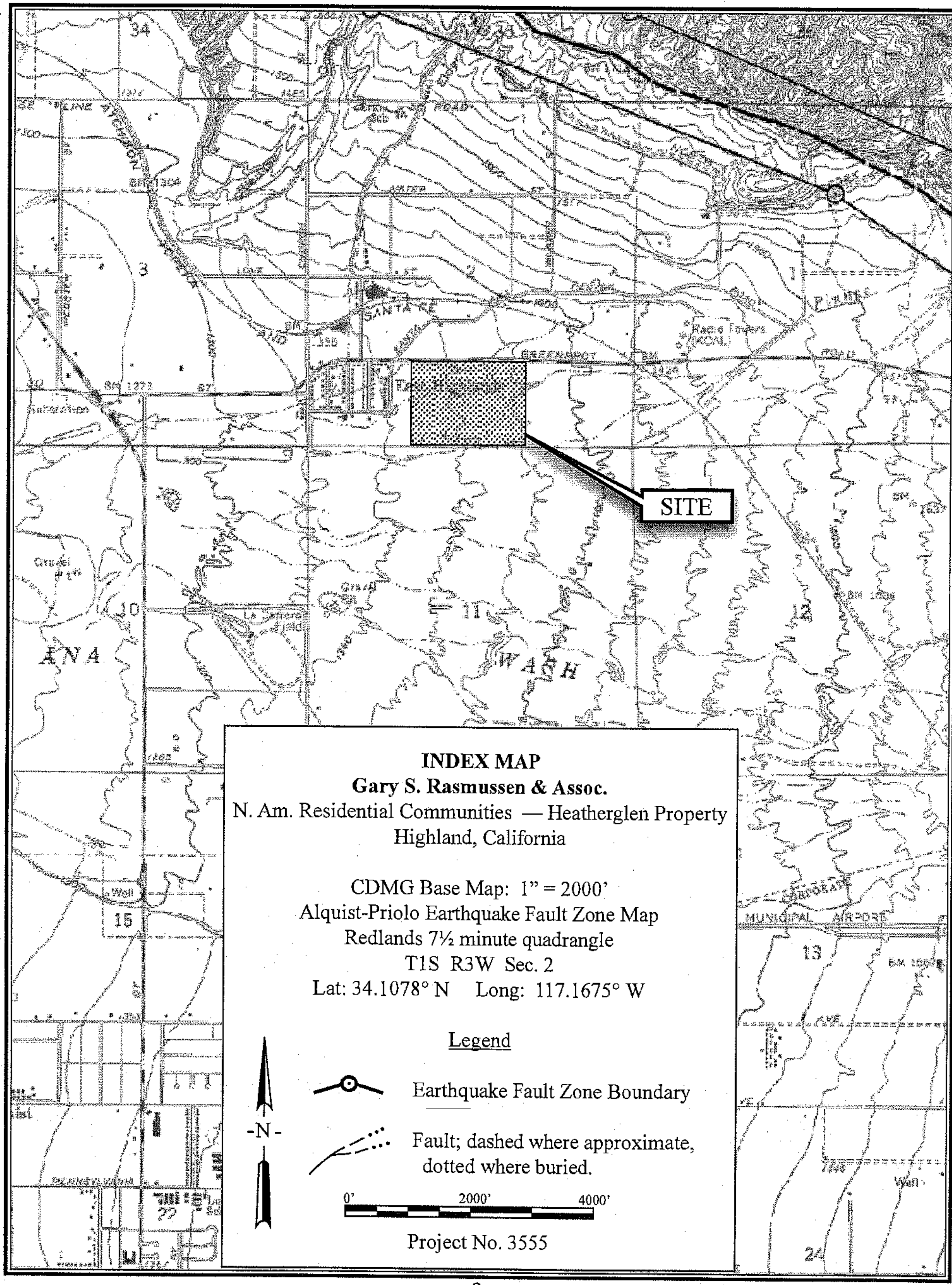
Subject: Engineering Geology Investigation, Proposed Heatherglen Property, Approximately 58¾ acres, between Greenspot Road and Abbey Way, East Highlands Area, Highland, California.

An engineering geology investigation of the proposed Heatherglen Property has been conducted in accordance with your request. The approximately 58¾ acre-site is located in the East Highlands area of Highland, California, between Greenspot Road and Abbey Way. The purpose of our investigation was to relate general geologic conditions of the site to future residential development. Approximately 330-scale San Bernardino County Assessor's maps dated September, 2001, were used in our investigation. The approximate location of the site is shown on the index map on page 2.

No grading plans were available at the time of our investigation. Existing site topography suggests that cut and fill slopes approximately 20 feet in maximum height may be required for development of the site.

SITE INVESTIGATION

A geologic field reconnaissance of the site and surrounding area was conducted on December 8, 2005. In addition, our investigation included review of stereoscopic aerial photographs flown in 1938, 1953, 1959, 1961, 1964, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1977, 1978, 1984, 1986, 1987, 1988, 1991, 1996, 2001 and 2005; review of pertinent geologic literature and maps, including reports in our files on nearby projects; and review of significant seismic information, including historic seismic activity. A list of aerial photographs reviewed and references cited in this report is included as Enclosure 1.


SITE
INDEX MAP
Gary S. Rasmussen & Assoc.
N. Am. Residential Communities — Heatherglen Property
Highland, California
CDMG Base Map: 1" = 2000'
Alquist-Priolo Earthquake Fault Zone Map
Redlands 7½ minute quadrangle
T1S R3W Sec. 2
Lat: 34.1078° N Long: 117.1675° W
Legend
Earthquake Fault Zone Boundary
Fault; dashed where approximate, dotted where buried.
-N-
0'
2000'
4000'
Project No. 3555
34
3
10
11
13
24
15
ANA
WASH
SANTA FE
Radio Towers
MUNICIPAL AIRPORT

SITE DESCRIPTION

The approximately 58 ¾ acre site is located east of East Street between Greenspot Road and Abbey Way in the East Highlands area of Highland, California. At the time of our investigation, the northwest portion of the site was occupied by groves of Eucalyptus trees. The southwest portion of the site was occupied by the remnants of a vineyard. At least 5 residences and at least 8 out-buildings were also observed in the southwest portion of the site. A former reservoir was located in the southern portion of Lot 23. Former irrigation cisterns were observed in the southeast corner of Lots 18 and 21. End dumped piles were observed in the central portion of Lot 21 on the aerial photographs reviewed. Evidence for moist soil conditions was also observed in the vicinity of these piles on the 2005 aerial photographs. Landscaping and trees grow adjacent to the residences in the southwestern portion of the site. Review of the aerial photographs suggests that a significant amount of end dumped fill formerly occupied the southern portion of Lot 21. This portion of the site was disced at the time of our reconnaissance. The central portion of Lots 18 and 21 were formerly occupied by orchards. Former sheds and out buildings occupied the southern portions of Lots 18, 21, 23 and 2 at various times based on review of the aerial photographs. Evidence for significant disturbances of the ground surface and filling was observed in the southwestern portion of the site and associated with a distributary drainage of Plunge Creek that traverses the north central portion of the site. The central and eastern portions of the site were occupied by brush, weeds, trees and boulders. East Valley Water District's Well No. 147 and associated equipment, supplies and infrastructure were located immediately south of Lot 23. Four relatively large west to southwest trending drainages traverse the site. Numerous smaller channels also traverse the site. The natural ground surface on the site slopes downward toward the west at an overall rate of approximately 2 percent. Total relief across the site is approximately 35 feet.

A partially concrete-lined, south trending flood control channel is coincident with the eastern boundary of the site. The remainder of the channel is unlined. Earthen fill berms border this channel. This flood control channel intercepts west-to southwest trending distributary drainages of Plunge Creek that traverse the site. Residences were observed north and west of the site. The drainage of Plunge Creek is located approximately 500 feet south of the site. Vacant land was observed east of the site.

SITE GEOLOGY

The San Bernardino Valley Block is bounded on the northeast by the San Andreas fault and the San Bernardino Mountains, and on the southwest by the San Jacinto fault. The San Bernardino Valley Block is subsiding in relation to the Perris Block, located southwest of the San Jacinto fault, and in relation to the San Bernardino Mountains, located northeast of the San Andreas fault.

The entire site is underlain by alluvium of Holocene age (Dutcher and Garrett,1963; Morton, 1974, 1978; Dibblee, 1970, 1974; Rogers, 1969; Bortugno and Spittler, 1986; Matti, *et al.*, 1992; Morton & Miller, 2003). Surficial materials on the site consist of gravelly sand with boulders. A geologic index map is included as Enclosure 2.

East Valley Water District's Production Water Well No. 147 is located immediately south of Lot 23. This well encountered sand, gravel, cobbles and boulders with trace amounts of silt and clay to a depth of approximately 360 feet during drilling (Rasmussen, February 1, 2001). Continued drilling encountered fine to course-grained sand with clay and minor gravel to a depth of 737 feet (Rasmussen, February 1, 2001).

The geologic subsurface materials underlying the site are considered to be characterized by dense, or stiff, soil, which corresponds to Classification S_D of Table 16A-J of the California Building Code (International Conference of Building Officials, 2001) to a depth of at least 100 feet below the ground surface, based on published geologic data and geologic field reconnaissance. This classification is equivalent to NEHRP Type D soil, as classified by the Building Seismic Safety Council (1994) and Boore *et al.* (1997). The corresponding Seismic Acceleration Coefficient, Ca, is 0.44 × Na from Table 16A-Q of the 2001 California Building Code. The Seismic Velocity Coefficient, Cv, is 0.64 × Nv from Table 16A-R of the 2001 California Building Code.

SEISMIC SETTING

The site lies within Seismic Zone 4 of the Seismic Hazard Zone Map for Hospitals and Public Schools in California on Figure 16A-2 of the 2001 California Building Code. The corresponding Seismic Zone Factor, Z, is 0.40 from Table 16A-I of the 2001 California Building Code.

The site does not lie within or immediately adjacent to an Earthquake Fault Zone (formerly Special Studies Zone) as defined by the Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 1999). The closest Alquist-Priolo Earthquake Fault Zone is located approximately ¾ mile northeast of the site associated with the San Andreas fault.

Dutcher and Garrett (1963) mapped a northwest trending ground water barrier traversing the northwest portion of the site (Enclosure 2). Dutcher and Garrett (1963) identified this northwest-trending ground water barrier as Fault "K." Northwest trending tonal lineaments were observed traversing the site and southwest of the site on the aerial photographs reviewed. One of these lineaments is approximately coincident with fault "K", as shown by Dutcher and Garrett. These lineaments may represent fault strands associated with fault "K." Dana identified a northwest trending fault similar in trend and location to Fault "K" during a gravimetric study conducted 6 miles northwest of the site (San Bernardino Valley Municipal Water District, 1968). Dana identified this fault as the Shandin Hills fault. Morton (1974), Matti and Carson (1991) and Matti *et al.* (1992) showed the northwest-trending Oak Glen fault located approximately 4 miles southeast of the site. Rasmussen (March 12, 1999) and URS (1986) suggested that the Shandin Hills fault, Fault "K" and the Oak Glen fault are probably all portions of the same fault. These faults are probably an ancestral branch of, or related to, the San Andreas fault system. Fault "K" acts as a significant barrier to the southwestward flow of ground water (Rasmussen, March 12, 1999). Jennings (1994), Bortugno (1986), and Ziony and Jones (1989) did not show the Shandin Hills fault or Fault "K". Jennings (1975) and Ziony and Jones (1989) showed the Oak Glen fault as a potentially active fault.

Probably the most important fault to the site from a seismic shaking standpoint is the San Andreas fault. The active, northwest trending San Andreas fault is located approximately 1 mile northeast of the site. The location of the main, active trace of the San Andreas fault is evidenced by vegetation lineaments, fault scarps, springs, linear ridges, and offset drainages. Although the San Andreas fault is characterized overall by right-lateral, strike-slip movement, the San Bernardino Mountains have been uplifted along its trace.

Dutcher and Garrett (1963), Morton (1974) and Fife *et al.* (1976) showed a northwest trending ground water barrier located approximately 2 miles west of the site. Dutcher and Garrett (1963) identified this ground water barrier as Fault "L." Fault "L" also acts as a barrier to the southwestward flow of ground water. The northwest terminus of Fault "L" as shown by Dutcher and Garrett (1963) is approximately coincident with the northeast portion of Perris Hill. Perris Hill is composed of metamorphic rock consisting of Pelona Schist. Jennings (1994), Ziony and Jones (1989), and Bortugno (1986) did not show Fault "L". Dutcher and Garrett (1963), Izbicki *et al.,* (1998) and Danskin (1998) suggested that Fault "K" and Fault "L" form the northeast and southwest boundaries, respectively, of a fault-bounded graben.

The northeast trending Mentone branch of the Redlands fault is located approximately 2 ¼ miles southeast of the site. The northeast trending Redlands fault, located approximately 4 miles south of the site, forms a barrier to the subsurface movement of ground water. Its location is based, in part, on apparent termination of Pleistocene-age alluvium against older (Plio-Pleistocene-age) deposits. The Redlands fault apparently bifurcates 4 miles south of the site to form the Redlands and Mentone faults (Burnham and Dutcher, 1960; Eccles and Bradford, 1977). The northeast trending Mentone fault has been defined only from well logs and its effect on ground-water movement (Burnham and Dutcher, 1960). Bortugno (1986), Ziony and Jones (1989) and Jennings (1994) showed the Redlands fault as a potentially active fault.

Burnham and Dutcher (1960), Morton (1974), Ziony and Jones (1989) and Matti *et al.,* (1992a, 1992b), mapped the northwest trending Greenspot fault located approximately 2 ¾ miles east of the site. Motion along the Oak Glen fault may have transferred *en echelon* along the Greenspot fault to the San Andreas fault. The Greenspot fault is an effective ground-water barrier (Burnham and Dutcher, 1960). Wells drilled northeast of the fault reportedly had ground water rising to the surface when drilled. Springs and perched ground water were reported within a shallow drainage immediately northeast of the fault. The fault is associated with a degraded, southwest facing scarp in older alluvial material. Locally, the fault scarp is buried by younger alluvium. Bortugno (1986) and Jennings (1994) did not show the Greenspot fault. However, Ziony and Jones (1989) showed the Greenspot fault as a potentially active fault.

The northeast trending Crafton fault (also known as the Reservoir Canyon fault) is located approximately 4 miles southeast of the site. The Crafton fault forms the northwest boundary of the Crafton Hills. Ziony and Jones (1989) and Jennings (1994) showed the Crafton fault as a potentially active fault. Bortugno (1986) differentiated the Reservoir Canyon fault (southwest portion of the Crafton fault) from the remainder of the Crafton fault, but showed both portions of the fault as potentially active faults.

Izbicki *et al.*, (1998) and Danskin (1998) identified a northwest-trending fault located approximately 3 miles southwest of the site and suggested that this fault may be the northwest extension of the Banning fault. Burnham and Dutcher (1960) and Morton (1974) showed the northwest terminus of the Banning fault offsetting, or offset by, the Loma Linda fault approximately 6 ¼ miles southwest of the site. Morton (1974) inferred an unnamed, northwest-trending fault approximately coincident with the Banning(?) fault shown by Izbicki *et al.*, (1998) and Danskin (1998) based on microseismic activity. Izbicki *et al.*, (1998) and Danskin (1998) presented evidence that this fault offsets bedrock at depth but does not disrupt overlying alluvial units. The Banning(?) fault and the Loma Linda fault may form the northeast and southwest limits, respectively, of a fault-bounded graben (Izbicki *et al.*, 1998; Danskin, 1998).

The northwest-trending Loma Linda fault is located approximately 6 ¼ miles southwest of the site. The Loma Linda fault acts as a barrier to the southwest flow of ground water in the southwest portion of the San Bernardino Valley. Subsurface investigations conducted by our firm have shown the Loma Linda fault not to be an active fault as defined by the State of California. The Loma Linda fault may represent an older branch of the San Jacinto fault. The fault is also a source of geothermal water.

The northwest trending San Jacinto fault, located approximately 7 miles southwest of the site, is considered to be the most active fault in southern California (Allen *et al.*, 1965). Trenching in very young alluvium across the San Jacinto fault has confirmed very recent episodes of fault rupture. The San Jacinto fault is characterized by right-lateral, strike-slip movement.

The Glen Ivy North branch of the Elsinore fault zone is located approximately 30 miles southwest of the site. The Elsinore fault zone extends southeast into Mexico (Biehler *et al.,* 1964). The Elsinore fault separates the Santa Ana Mountains from the Temescal Basin on the Perris Block. Subsurface investigations by Rockwell *et al.,* (1986) have shown that the Elsinore fault is active and may have a recurrence interval of approximately 250 years for large earthquakes. Bergmann and Rockwell (1996) and Vaughan *et al.,* (1999) found additional evidence of active faulting associated with the Elsinore fault. Ziony *et al.,* (1974), Ziony and Jones (1989) and Jennings (1994) showed portions of the Elsinore fault zone to be active faulting. The State included portions of the Elsinore fault zone within Alquist-Priolo Earthquake Fault Zones.

A summary of significant faults and their distances from the site is presented in the following table:

FAULT	**DISTANCE (MILES)**	**DIRECTION**
Fault "K"	on site	---
San Andreas	1	northeast
Fault "L"	2	west
Mentone	2 ¼	southeast
Greenspot	2 ¾	east
Banning	3	southwest
Redlands	4	south
Crafton	4	southeast
Loma Linda	6 ¼	southwest
San Jacinto	7	southwest
Elsinore	30	southwest

Other active or potentially active faults are located within the general region, but because of their greater distance from the site and/or lower expected maximum probable earthquake, they are less important to the site.

SEISMIC HISTORY

The accuracy of locating earthquake epicenters is not always sufficient to determine which fault they are associated with. Estimates of magnitude and epicenter locations for earthquakes prior to implementation of recording instruments were based on descriptions of the earthquakes by individuals in different areas. Seismic instrumentation did not become available until about 1932, and these earlier instruments were imprecise. An earthquake epicenter map showing earthquake epicenters within 25 miles of the site is included as Enclosure 3 (EPI SoftWare, 2005). The earthquake locations shown on the earthquake epicenter map are based on instrument locations (Southern California Earthquake Center, 2005).

Magnitudes reported for earthquakes usually fall in a range of values depending on the recorded strength and frequency of the strong ground motion, type of seismometer recording the ground motion, location of the seismometer with respect to the earthquake, subsurface conditions at the seismometer location, and the scale used to classify the magnitude. Common scales used to classify earthquake magnitudes include the familiar Richter or "local" magnitude (M_L), moment magnitude (M_W) derived from the seismic moment (M_0), body-wave magnitude (M_b) and surface-wave magnitude (M_S). Estimates of earthquake size utilizing the moment magnitude scale and the seismic moment are preferred due to limitations associated with other measurement scales, including variations among distant recording locations, frequency response of geologic materials, and saturation (or response) of the recording seismometers (Wells and Coppersmith, 1994).

No significant earthquakes are known to have occurred during historic time along Faults "K" or "L", or along the Mentone, Greenspot, Redlands, Crafton, west portion of the Banning, or Loma Linda faults.

No large earthquakes have occurred along the San Andreas fault in the southern California area in recent time. This fault has a pattern of almost no movement for long periods of time (131 years, Pallett Creek, Sieh, 1984; 105 years, Wrightwood, Weldon *et al.,* 2004), followed by a sudden release of energy. The last major earthquake along it in this area was the great earthquake of January 9, 1857, which was centered at Fort Tejon, north of Gorman. The Fort Tejon earthquake had an estimated magnitude of approximately M8.0, comparable to the 1906 San Francisco earthquake (Wood, 1955). A large earthquake that occurred on December 8, 1812, affected a wide area of southern California and is now attributed to the San Andreas fault in the San Bernardino area (Jacoby, *et al.*, 1988; Fumal, *et al.*, 1993). The magnitude of the 1812 earthquake is estimated to have been approximately M7.5 (Petersen and Wesnousky, 1994). On December 4, 1948, a large earthquake occurred in the Desert Hot Springs area. This earthquake was originally assigned a magnitude of M_L6.5 and attributed to the Mission Creek fault (north branch of the San Andreas fault in this area) by Richter *et al.*, (1958). An evaluation of this earthquake by Nicholson (1996) placed the Desert Hot Springs earthquake on the Banning fault (south branch of the San Andreas fault) and revised the magnitude to M_L6.3 (M_W6.2). An earthquake of M_L6.0 (M_W6.1) occurred along the Banning fault on July 8, 1986, northwest of the 1948 earthquake (Jones *et al.*, 1986; Nicholson, 1996). Field reconnaissance by our firm found evidence for surface ground rupture associated with the 1986 earthquake. Other smaller earthquakes have occurred along the San Andreas fault northwest and southeast of these two locations.

The San Jacinto fault has been the most seismically active fault in southern California (Allen *et al.*, 1965). Between 1899 and 1995, eight earthquakes of M6.0 or greater have occurred somewhere along the San Jacinto fault between the San Gabriel Mountains and Mexico (Lamar *et al.*, 1973; Kahle *et al.*, 1988).

A summary of the dates of these earthquakes, their approximate locations, and their estimated magnitude is presented in the following table:

DATE	LOCATION	MAGNITUDE
December 25, 1899	Anza Valley	(estimated) 7.1
April 21, 1918	San Jacinto Valley	(estimated) 6.9
July 22, 1923	South of Loma Linda	(estimated) 6.3
March 25, 1937	Southeast of Anza	6.0
October 21, 1942	Fish Creek Mountains	6.6
March 19, 1954	East of Borrego	6.2
April 9, 1968	Borrego Mountain	6.5
November 24, 1987	Superstition Hills	6.6

Since 1899, earthquakes on the San Jacinto fault of magnitude 6.0 or greater have occurred every 5 to 19 years. The earthquakes in 1899, 1918 and 1923 occurred along the northern portion of the San Jacinto fault; the earthquake in 1937 occurred along the middle reach of the San Jacinto fault; and the earthquakes in 1942, 1954, 1968 and 1987 occurred along the southern portion of the San Jacinto fault (Lamar *et al.,* 1973; Kahle *et al.,* 1988).

Several earthquakes with estimated magnitudes between 6.0 and 6.5 have been located along the Elsinore fault zone between the Santa Ana River and the Gulf of California during historic time. In 1910, a moderately large earthquake (~M6) occurred in the Temescal Valley area, probably along the Glen Ivy North fault. In 1956 an earthquake of approximately Richter magnitude 4.7 occurred in the Temescal Valley area causing rock slides. A magnitude 7.0 earthquake occurred on the Laguna Salada strand of the Elsinore fault zone in northern Mexico in 1892 (Townley and Allen, 1939). However, no earthquakes of this magnitude or greater have been recorded along the northern end of the fault since 1910 (Lamar *et al.,* 1973).

SEISMIC ANALYSIS

Significant earthquakes affecting the site may occur on the San Andreas fault during the lifetime of the proposed residences. The San Andreas fault is considered to be the most important fault to the site from a seismic shaking standpoint due to its proximity to the site, style of faulting, recurrence interval, and Design Basis Earthquake ground motion. The Design Basis Earthquake (DBE) is that earthquake ground motion which has a 10 percent probability of exceedance in 50 years. The statistical return period for the DBE is approximately 475 years.

Recurrence intervals for large earthquakes cannot yet be precisely determined from a statistical standpoint, because recorded information on seismic activity does not encompass a sufficient span of time. However, based on the information available at this time, it is our opinion that a MPE of M_W7.3 along the San Andreas fault may occur. Large earthquakes could occur on other faults in the general area, but because of their greater distance and/or lower probability of occurrence, they are less important to the site from a seismic shaking standpoint.

Several authors presented data that showed a relationship between the distance from a causative fault and peak horizontal ground accelerations. Equations predicting the relationship between the earthquake magnitude, site parameters and peak ground acceleration were developed by Campbell (1997 [revised 2000, 2001]), Boore *et al.,* (1997), Bozorgnia *et al.,* (1999), Sadigh *et al.,* (1997), Abrahamson and Silva (1997) and Campbell and Bozorgnia (2003 [revised 2004]). Numerous additional attenuation relationships have been developed by various researchers over the years. Attenuation relationships developed after 1996 were considered appropriate for this site.

The California Geological Survey (2003) calculated the peak ground acceleration for a Design Basis Earthquake (DBE) in alluvium at the site as 0.76g. We have used the results of the attenuation relationship derived by Campbell (1997) for alluvium to derive ground motion parameters for the site. Based on Campbell's attenuation relationships for alluvium, a DBE ground motion based on the 2002 State fault model would result in a mean value of the peak ground acceleration on the site of 0.72g (Blake, 2000, revised 2002). This value is slightly lower than the State's calculated acceleration. These accelerations should not necessarily be used as design values for insertion in California Building Code formulas; rather, they should be considered as an aid in the evaluation of a structural design of the residences to be placed on the site.

Due to the proximity of the site to the San Andreas fault, near-field effects from strong ground motion associated with a large earthquake along this fault may occur at the site. These near-field effects, including "fling", focusing, and directivity of strong ground motion, may result in significantly higher accelerations at the site.

The San Bernardino segment of the San Andreas fault is the most significant fault for determining the Near-Source Acceleration and Velocity Factors applicable to the site. The San Bernardino segment of the San Andreas fault is considered to be a Type A fault (Cao *et al.,* 2003). The San Bernardino segment of the San Andreas fault is located approximately 1 mile (1½ kilometers) northeast of the site. The corresponding Near-Source Acceleration Factor, Na, is 1.5 from Table 16A-S of the 2001 California Building Code. The Near-Source Velocity Factor, Nv, for the site is 2.0 from Table 16A-T of the 2001 California Building Code.

The San Andreas fault is considered to be the most important fault to the site from a seismic shaking standpoint due to its proximity, style of faulting, recurrence interval and maximum probable earthquake ground motion. Fault lengths were determined from Jennings (1994) and California Geological Survey (2002). All criteria outlined in California Geological Survey Note 43 and Section 1631A of the 2001 California Building Code were considered when estimating the MPE for faults in the vicinity of the site. The Design Basis Earthquake is synonymous with the Maximum Probable Earthquake (California Geological Survey Note 48). The maximum magnitude earthquake (M_{max}) for individual faults presented by Working Group (1995, 1999, 2003), Cao *et al.,* (2003), and the Southern California Earthquake Center (1996) were also reviewed. The maximum magnitude earthquake (M_{max}) is the largest earthquake expected to occur on a fault under the current tectonic framework. The relationship of fault length versus earthquake magnitude as presented by Wells and Coppersmith (1994) constitute only one of those criteria. The structural geometry of the fault was considered very important in deciding the MPE for specific faults (Rasmussen, 1981).

SLOPE STABILITY

The State of California has not conducted seismic hazards mapping for the Redlands 7 ½ minute quadrangle and did not include the site within a Seismic Hazard Earthquake-Induced Landslide Zone as defined by the Seismic Hazards Mapping Act (California Division of Mines and Geology, 1997). The City of Highland (2005) did not show the site located within a landslide susceptibility area. San Bernardino County (1993) showed the closest area susceptible to landsliding located approximately 1,000 feet north of the site.

No evidence for landsliding was observed on or in the immediate vicinity of the site, in the field or on the aerial photographs reviewed. Due to the lack of significant topography, landsliding is not expected on the site.

GROUND WATER

The State of California has not conducted seismic hazards mapping for the Redlands, 7½ minute quadrangle and the site is not included within a Seismic Hazard Liquefaction Zone as defined by the Seismic Hazards Mapping Act (California Division of Mines and Geology, 1997). Matti and Carson (1991) included the entire site within a potential liquefaction area. Toppozada *et al.*, (1993) showed the extreme southeast portion of the site located adjacent to a potential liquefaction area. Highland (2005) and San Bernardino County (1993) showed the entire site located within an area of high liquefaction susceptibility.

No springs are known to exist on the site. No perched ground-water conditions are known to exist under the site. No evidence for spring activity or perched ground-water conditions was observed on or in the immediate vicinity of the site during the geologic field reconnaissance or on the aerial photographs reviewed.

Matti and Carson (1991) showed the minimum depth to ground water in the vicinity of the site during the period from 1973 through 1983 to have been between 30 and 50 feet in the western portion of the site and to have been between 10 and 30 feet in the eastern portion of the site. Following the years of abnormally high precipitation from 1978 to 1983, ground water levels in the basin rose significantly.

East Valley Water District Well No. 147 is located immediately south of Lot 23. The depth to ground water at the time of testing of Well No. 147 was approximately 130 feet below the ground surface (Rasmussen, February 1, 2001). East Valley Water District Well No. 143 is located approximately 550 feet west of the site and Well No. 146 is located approximately 1,500 feet west of the site. Well No. 143 has been abandoned. The depth to groundwater at Well No. 146 was approximately 200 feet (Rasmussen, February 1, 2001).

Fault "K" is mapped traversing the northwest portion of the site (Dutcher and Garrett, 1963). The trend of Fault "K" is subparallel to trend of the San Andreas fault. The location of Fault "K" was based primarily on differences in ground levels and wells located on opposite sides of the fault (Dutcher and Garret, 1963). Morton (1974) and Fife *et al.,* (1976) showed a ground water barrier traversing the northwest portion of the site approximately coincident with Fault "K."

Geomorphology suggests that Fault "K" may extend to the southeast and may represent an extension of the Oak Glen fault. The ground water barrier effect of Fault "K" is relatively strong during periods of historically low ground water conditions (Rasmussen, March 12, 1999). Portions of Fault "K" also act as significant barriers to the southwestern flow of ground water during periods of historically high ground water conditions (Dutcher and Garrett, 1963; Matti and Carson, 1991; Rasmussen, March 12, 1999). The ability of Fault "K" to influence ground water conditions at relatively shallow depths suggests that Fault "K" extends relatively close to the surface. In addition, Fault "K" appears to act as a barrier to the recharged ground water in the vicinity of the Santa Ana River (Rasmussen, March 12, 1999). Historic changes in ground water levels in the vicinity of the site suggest that natural and artificial recharge along the Santa Ana River is partially blocked by Fault "K" and migrates northwestward toward the vicinity of the site (Rasmussen, March 12, 1999). Fault "K" may act as a significant ground water barrier on the site. Shallower ground water may be present in the northeast portion of the site with respect to the ground water in the southwest portion of the site.

Youd and Perkins (1978) and Youd *et al.,* (1978) listed the parameters for increased liquefaction susceptibility as: 1) high ground water (less than 33 feet below the surface); 2) sandy sedimentary deposits; 3) recent age of material; and 4) close proximity to an active fault. The sediments encountered on the site fall into all four of these geologic parameters. Therefore, the sediments on the site are considered to have a high potential for liquefaction from a geologic standpoint.

SUBSIDENCE

Subsidence of the ground surface has occurred in the San Bernardino, San Jacinto, Antelope and Murrieta Valleys, and in the Chino Basin. The primary cause of non-tectonic subsidence in these areas has been the removal of large quantities of ground water from their respective ground-water basins (Miller and Singer, 1971; Lofgren, 1971, 1976; Fife *et al.,* 1976; Riverside County, 1988; Egan and Hall, 1994; Egan *et al.,* 1995).

Static ground-water levels in the vicinity of the site have declined by as much as 190 feet since the turn of the century (Mendenhall, 1905; California Department of Water Resources, 1990, 2005; East Valley Water District, 1996, 1997; Western Municipal Water District, 2005; Rasmussen, March 12, 1999). The greatest ground water declines have occurred in the East Highlands area between Fault "K" and the south branch of the San Andreas fault. The barrier effect of Fault "K" is more pronounced when ground water levels are lower (Rasmussen, March 12, 1999). Ground water levels have also declined significantly immediately southwest of Fault "K", reflecting a flattening of the static ground water table overall (Rasmussen, March 12, 1999).

Ground water levels in the vicinity of the site have risen by as much as 220 feet over the last 30 years This increase in the ground water levels is considered to be the result of natural and artificial recharge of water along the Santa Ana River.

Subsidence due to ground-water withdrawal may be a potential hazard to the site if static ground-water levels are allowed to decline significantly in the future. Cracking from subsidence in the future would be expected to occur along the boundaries of ground-water basins. Traces of Fault "K", if they traverse the site, could act as these basin boundaries.

FLOODING

The entire site lies within a 100-year flood plain associated with Plunge Creek (Highland, 2005; Federal Emergency Management Agency, 1996). San Bernardino County (1989) also showed the northern portion of the site located within a 100-year flood plain associated with Plunge Creek. The County showed a 100-year flood plain associated with the Santa Ana River coincident with the southern boundary of the site. At least four west-trending drainages traverse the site. Evidence for flooding of the site was observed during the geologic field reconnaissance and on the aerial photographs reviewed. Geologic field reconnaissance and review of the aerial photographs indicates that a concrete-lined diversion channel is coincident with the east boundary of the site. Sheet flow runoff on the site is expected during periods of intense or prolonged precipitation. An evaluation of the potential for flooding of the site falls under the purview of the project engineer.

The entire site is located within the limit of a Flooded Area associated with potential failure of Seven Oaks Dam (Highland, 2005). The County (1989) showed the entire site located within a dam inundation area.

No other large water storage reservoirs are located topographically higher than the site in the immediate vicinity of the site.

SEISMIC SETTLEMENT AND DIFFERENTIAL COMPACTION

Seismic settlement occurs when relatively loose natural materials undergo compaction due to seismic shaking. This results in settlement of the natural ground surface. Differential compaction of natural materials may occur across a site if significant geologic features (i.e. faults, bedrock contacts, landslide contacts, etc.) result in different thicknesses or different densities of materials across a site.

Seismic settlement or differential compaction may be potential problems on the site, if Fault "K" traverses the site. Seismic settlement or differential compaction on the remainder of the site are not expected, as no unusual geologic conditions or structures are known to exist under the remainder of the site.

MISCELLANEOUS

The San Bernardino County General Plan (1989, 1993) and Highland General Plan (2005) were reviewed and geologic hazards to the site have been addressed.

CONCLUSIONS

The site does not lie within or immediately adjacent to an Earthquake Fault Zone (formerly Special Studies Zone) as defined by the Alquist-Priolo Earthquake Fault Zoning Act.

The site lies within Seismic Zone 4 of the Seismic Hazard Zone Map for Hospitals and Public Schools in California on Figure 16A-2 of the 2001 California Building Code. The corresponding Seismic Zone Factor, Z, is 0.40 from Table 16A-I of the 2001 California Building Code.

Published geologic maps indicate that Fault "K" traverses the site. Evidence for northwest trending tonal lineaments traverse the site and vicinity on the aerial photographs reviewed. However, no indicators of fault movement were observed on the site during the geologic field reconnaissance or on the aerial photographs reviewed. Ground rupture on the site from surface faulting associated with Fault "K" is not expected during the lifetime of the proposed residences.

Severe shaking of the site can be expected within the lifetime of the proposed residences from an earthquake along the San Andreas fault.

The San Andreas fault is located approximately 1 mile northeast of the site. Therefore, near-field effects from strong ground motion associated with a large, nearby earthquake may occur at the site.

The mean value of the peak ground acceleration at the site may be higher due to the near field effect and directivity.

Published geologic maps indicate that the site is underlain by young alluvium. Near surface natural materials are considered to be relatively loose. Moderate to severe seismic shaking of the site is expected in the event of a large, nearby earthquake. Therefore, seismic settlement of natural materials on the site may be a concern. An evaluation of the suitability of natural materials on the site to support proposed structures and fills falls under the purview of the project geotechnical engineer.

The San Bernardino segment of the San Andreas fault is the most significant fault for determining the Near-Source Acceleration and Velocity Factors applicable to the site. The San Bernardino segment of the San Andreas fault is considered to be a Type A fault. The geologic subsurface materials underlying the site are considered to be characterized by dense, or stiff, soil, which corresponds to Classification S_D of Table 16A-J of the California Building Code to a depth of at least 100 feet below the ground surface. This classification is equivalent to NEHRP Type D soil, as classified by the Building Seismic Safety Council (1994) and Boore *et al.,* (1997). The corresponding

Near-Source Acceleration and Velocity Factors (Na and Nv), and Seismic Acceleration and Velocity Coefficients (Ca and Cv) are presented in the following table:

Na = 1.5	Ca = 0.44 x 1.5 = 0.66
Nv = 2.0	Cv = 0.64 x 2.0 = 1.28

The State of California has not conducted seismic hazards mapping for the Redlands 7 ½ minute quadrangle and did not include the site within a Seismic Hazard Earthquake-Induced Landslide Zone as defined by the Seismic Hazards Mapping Act. The City of Highland (2005) did not show the site within a landslide susceptibility area. San Bernardino County (1993) showed the closest area susceptible to landsliding located approximately 1,000 feet north of the site.

No evidence for landsliding was observed on or in the immediate vicinity of the site, in the field or on the aerial photographs reviewed. Due to the lack of significant topography, landsliding is not expected on the site.

The State of California has not conducted seismic hazards mapping for the Redlands 7 ½ minute quadrangle and the site is not included within a Seismic Hazard Liquefaction Zone as defined by the Seismic Hazards Mapping Act. Matti and Carson (1991) included the entire site within a potential liquefaction area. Toppozada *et al.,* (1993) showed the extreme southeast portion of the site located adjacent to a potential liquefaction area. Highland (2005) and San Bernardino County (1993) showed the entire site located within an area of high liquefaction susceptibility.

Fault "K" is mapped traversing the northwest portion of the site. Geomorphology suggests that Fault "K" may extend to the southeast and may represent an extension of the Oak Glen fault. The ground water barrier effects of Fault "K" are relatively strong during periods of both historically low and historically high ground water conditions. The ability of Fault "K" to influence ground water conditions to relatively shallow depths suggests that Fault "K" extends relatively close to the surface. In addition, historic changes in ground water levels in the vicinity of the site suggests that natural and artificial recharge along the Santa Ana River is partially blocked by Fault "K" and migrates northwestward toward the vicinity of the site. Fault "K" may act as a significant ground water barrier on the site. Ground water may be shallower in the northeast portion of the site with respect to the southwest portion. The sediments encountered on the site may fall into all four of the geologic parameters required for increased liquefaction susceptibility when shallow groundwater is present. Therefore, the sediments on the site are considered to have a high potential for liquefaction from a geologic standpoint.

Surficial materials on the site are considered to be moderately to highly susceptible to erosion by water.

Historic and recent depth to ground water data in the vicinity of the site suggest that static ground water levels in the vicinity of the site have declined more than 190 feet since the turn of the century, but may have recovered by as much as 220 feet during the past 30 years. Due to the significant decline in ground water levels in the vicinity of the site, subsidence may be a potential hazard to the site. Any future subsidence of the ground surface may affect proposed structures or facilities and subsidence of subsurface materials may affect proposed gravity sensitive pipelines such as sewers. Cracking from any subsidence in the future would be expected to occur along the boundaries of ground water basins. The northwest trending Fault "K", which may traverse the central portion of the site, could act as one of these basin boundaries.

The Federal Emergency Management Agency (1996) showed the entire site located within a 100-year flood plain associated with Plunge Creek. San Bernardino County (1989) also showed the northern portion of the site located within a 100-year flood plain associated with Plunge Creek. The County showed a 100-year flood plan associated with the Santa Ana River coincident with the southern boundary of the site. At least four west-trending drainages traverse the site. Evidence for flooding of the site was observed during the geologic field reconnaissance and on the aerial photographs reviewed. Geologic field reconnaissance and review of the aerial photographs indicates that a concrete lined diversion channel is coincident with the east boundary of the site. Sheet flow runoff on the site is expected during periods of intense or prolonged precipitation. An evaluation of the potential for flooding of the site falls under the purview of the project engineer.

The entire site is located within the limit of a Flooded Area associated with potential failure of Seven Oaks Dam (Highland, 2005). The County (1989) showed the entire site located within a dam inundation area. No other large water storage reservoirs are located topographically higher than the site in the immediate vicinity of the site.

An evaluation of the significance of all on-site fill to the proposed residences falls under the purview of the project geotechnical engineer.

The San Bernardino County General Plan (1989, 1993) and Highland General Plan (2005) were reviewed and geologic hazards to the site have been addressed.

RECOMMENDATIONS

A maximum probable earthquake of M_W 7.3 may occur along the San Bernardino segment of the San Andreas fault, located approximately 1 mile northeast of the site. Therefore, we recommend that the proposed human occupancy structures be designed accordingly.

Fault "K" may traverse the central portion of the site. Evidence for tonal lineaments was observed traversing the site on the aerial photographs reviewed. These lineaments may represent older faulting associated with Fault "K.". However, no evidence for active faulting was observed associated with Fault "K" on or in the vicinity of the site, on the aerial photographs reviewed or in the field. Ground surface rupture associated with Fault "K" is not expected during the lifetime of the proposed residences. Therefore, setbacks for human occupancy structures from Fault "K" are not recommended.

The maximum inclination of all cut slopes in alluvial materials on the site should be 2 horizontal to 1 vertical up to a maximum height of 15 feet. All cut slopes should be planted as soon as possible to minimize erosion, as material on-site may be susceptible to erosion from water.

Liquefaction may be a potential hazard to the site as the historic ground water table has been reported to be less than 30 feet below the ground surface in the eastern portion of the site. The additional parameters of soil density, grain size distribution and exact depth to ground water should be evaluated by the project geotechnical engineer to ascertain the final susceptibility of the site to liquefaction. We recommend that a depth to ground water of 10 feet from the ground surface be used for calculating the liquefaction potential of the site.

Positive drainage of the site should be provided, and water should not be allowed to pond behind or flow over any natural, cut or fill slopes. Where water is collected in a common area and discharged, protection of the native soils should be provided, as the native soils are moderately to highly susceptible to erosion by running water.

Subdrains may be recommended beneath any proposed fills placed within the on-site drainages. The need for subdrains should be evaluated by the engineering geologist during grading.

If shallow, perched ground water exists on the site, moisture sensitive structures should be protected.

The significance of all on-site fill with respect to the proposed development should be addressed by the project geotechnical engineer.

An evaluation of the potential for seismically induced flooding of the site in the event of a large earthquake should be addressed by the project engineer.

The final grading plan for the site should be reviewed and approved by an engineering geologist prior to any grading.

Grading of the site should be evaluated by the engineering geologist by in-grading inspections.

Any water wells that exist on the site that will not be used in the future should be abandoned in accordance with applicable state and local regulations.

Due to the potential hazard of tensional ground surface fracturing on the site as a result of differential response of geologic materials across the suspected traces of Fault "K" in the event of a large, nearby earthquake, subsidence, differential compaction, or seismic settlement, we recommend that foundations and slabs of the proposed residences be reinforced to resist tensional ground cracking.

Respectfully Submitted,
Gary S. Rasmussen & Associates, Inc.

Frank F. Jordan, Jr.

Frank F. Jordan, Jr.
Engineering Geologist, EG 1913

FFJ/mc

Enclosure 1: References
Enclosure 2: Geologic Index Map
Enclosure 3: Earthquake Epicenter Map

Distribution: Jenine Murrin (6)

ENCLOSURE 1
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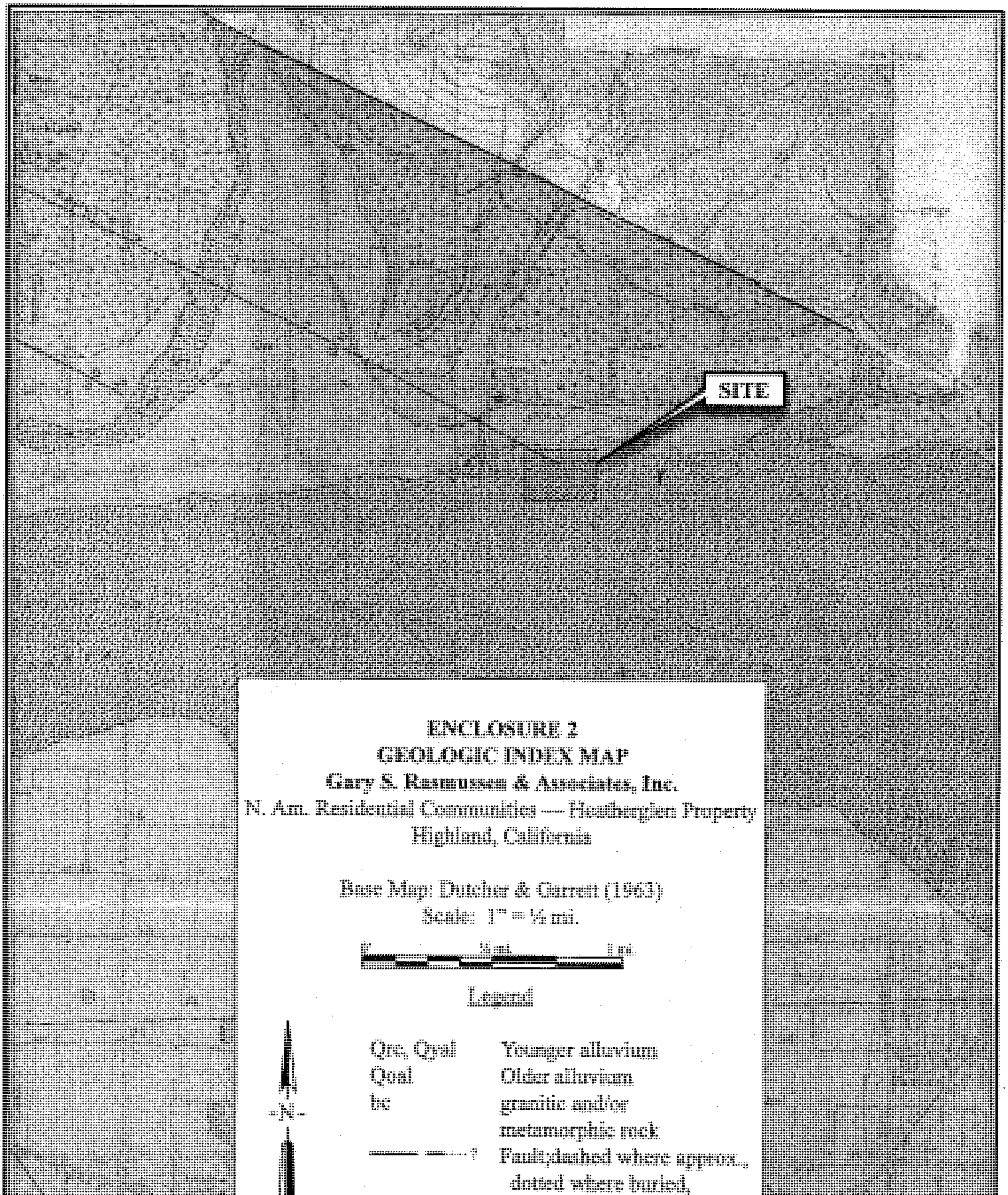


ENCLOSURE 2
GEOLOGIC INDEX MAP
Gary S. Rasmussen & Associates, Inc.
N. Am. Residential Communities — Heatherglen Property
Highland, California

Base Map: Dutcher & Garrett (1963)
Scale: 1" = ½ mi.

Legend

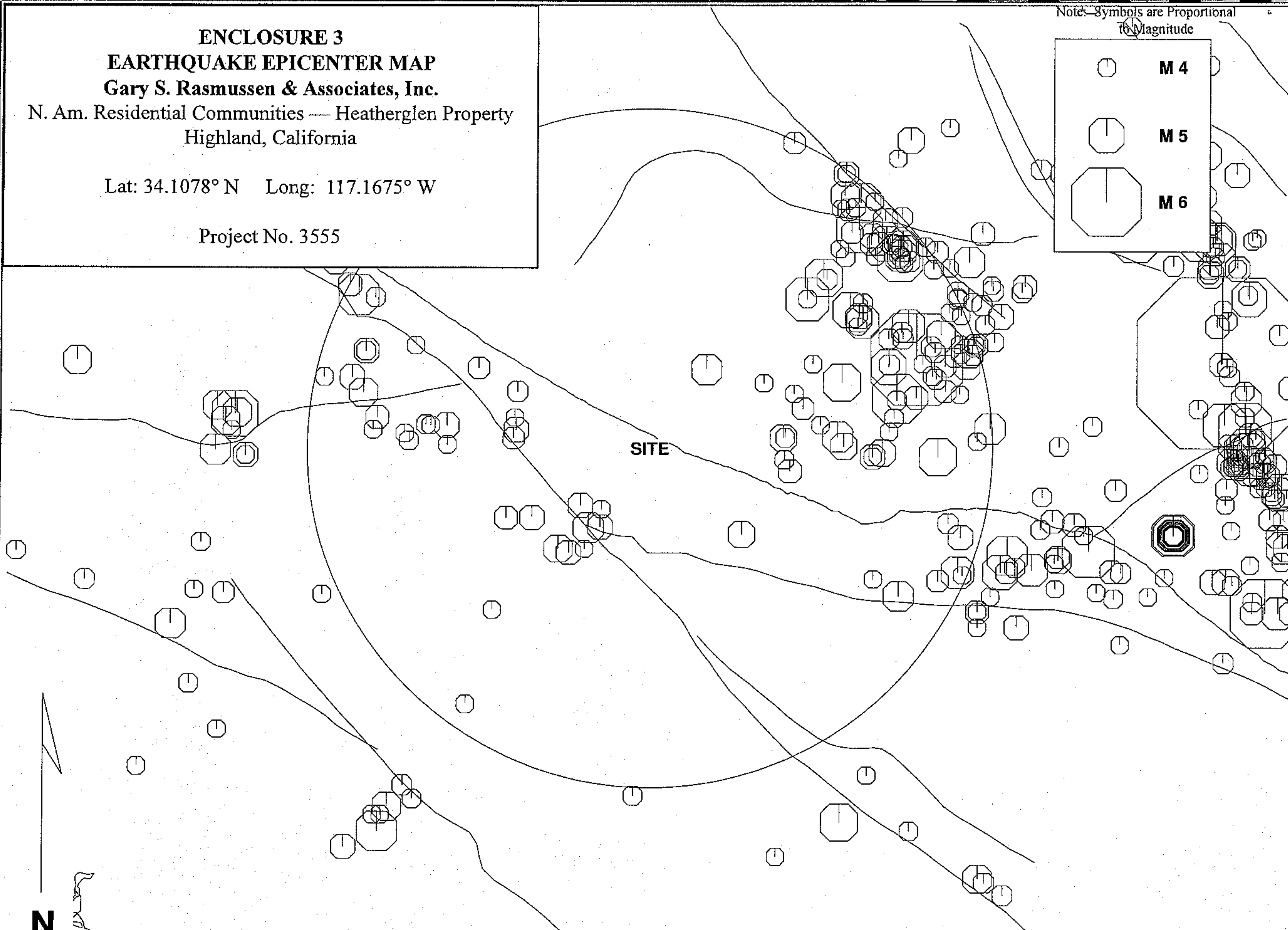
Qre, Qyal	Younger alluvium
Qoal	Older alluvium
bc	granitic and/or metamorphic rock
——— ——· · · ?	Fault, dashed where approx., dotted where buried, queried where uncertain.

Project No. 3555

ENCLOSURE 3
EARTHQUAKE EPICENTER MAP
Gary S. Rasmussen & Associates, Inc.
N. Am. Residential Communities — Heatherglen Property
Highland, California

Lat: 34.1078° N Long: 117.1675° W

Project No. 3555



Seismicity 1932-2005 (Magnitude 4.0+) 25 mile radius

Heatherglen Planned Development, TTM 17604, CUP 15-006

Initial Study – Notice of Preparation

Appendix E – Noise Study

Noise Study
Heatherglen Residential Project
City of Highland

Prepared for:

Development 1 Group
2011 E. Financial Way, Suite 203
Glendora, CA, 91741

Prepared by:

Entech Consulting Group
Planning • Environmental • Construction Management

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April 2017

Table of Contents

Appendices

List of Figures

List of Tables

1.0 INTRODUCTION

This noise analysis has been prepared to support the environmental review process for the proposed residential development project and provide information regarding potential impacts related to noise that could be generated. This noise study describes the existing land uses and ambient noise environment, identifies applicable rules and regulations, evaluates potential noise impacts of the proposed project.

1.1 Project Location and Site Description

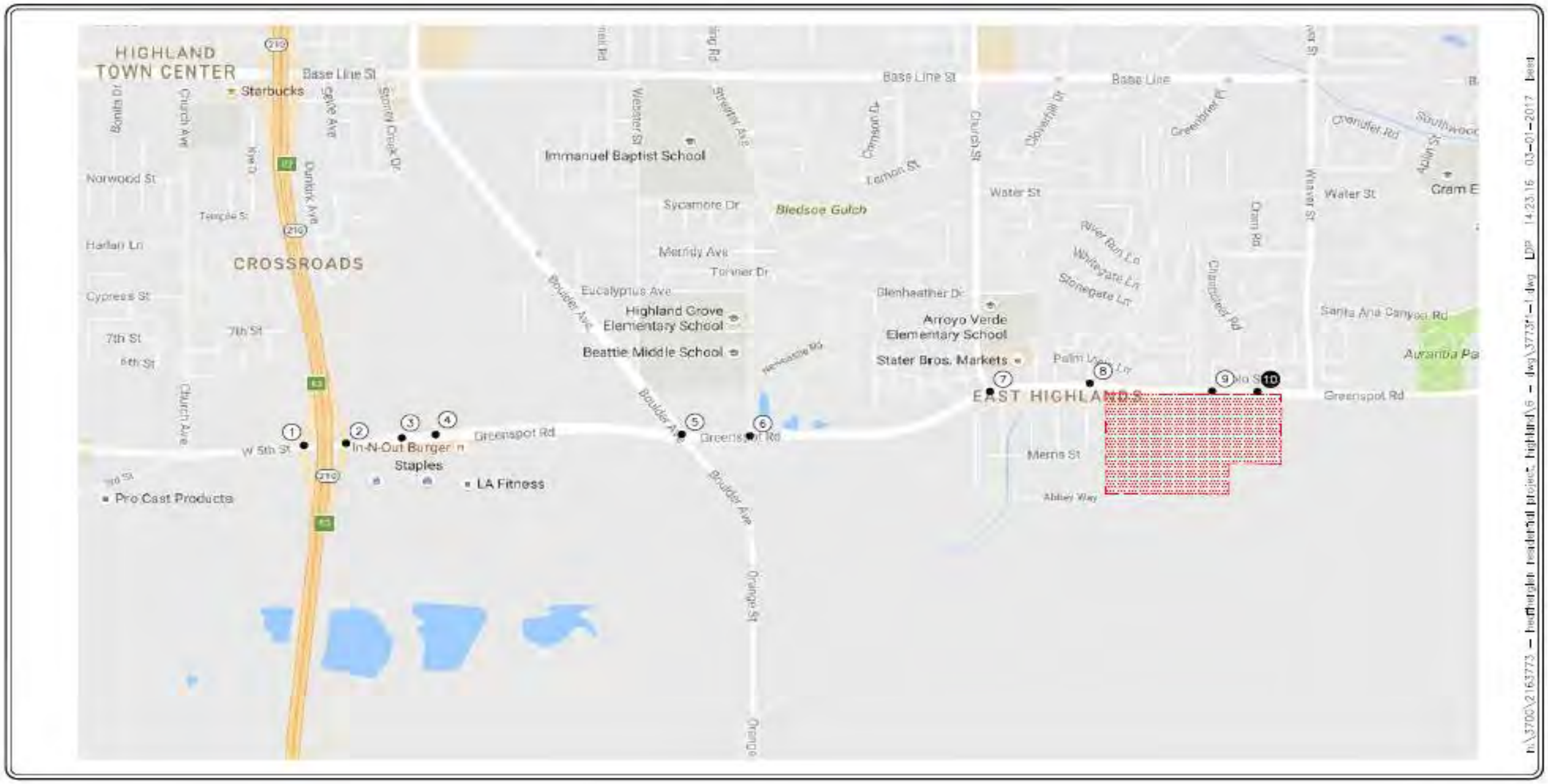
The 59.03- acre project site is located in the City of Highland, on the south side of Greenspot Road, east of Merris Street, and west of the Creek Flood Control Channel, as shown in **Figure 1** and **Figure 2**. The State Route (SR) 210 provides regional access to the project site. The principal local network of streets providing access to the site includes: Greenspot Road, Boulder Avenue, and Church Street.

The project site is currently vacant and undeveloped and has an existing General Plan Land Use and zoning designation of Agricultural/Equestrian Residential (AG/EQ). As described in the City of Highland General Plan Land Use Element, areas designated as Agricultural/Equestrian are appropriate for rural and equestrian-oriented residential development, and the current designations allow a maximum intensity of 2 dwelling units per l acre.

1.2 Project Description

The proposed residential project would develop up to 215 single-family dwelling units, a community park and areas designated for conservation and a retention basin l, as shown in **Figure 3**. The proposed project includes a General Plan Land Use amendment and a zoning designation change from AG/EQ to Planned Development (PD).

The proposed project is expected to be developed by Year 2019. As described by the Traffic Impact Analysis (TIA) prepared for the proposed project (LLG 2017), operation of the 215 single-family dwelling units is anticipated to generate 2,047 weekday daily vehicular trips (one-half arriving, one-half departing), with 161 trips (40 inbound, 121 outbound) in the weekday a.m. peak hour and 215 trips (135 inbound, 80 outbound) in the weekday p.m. peak hour.



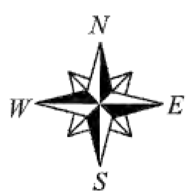


Figure 1. Regional Map of Project Location

Figure 2. Project Vicinity Map Location

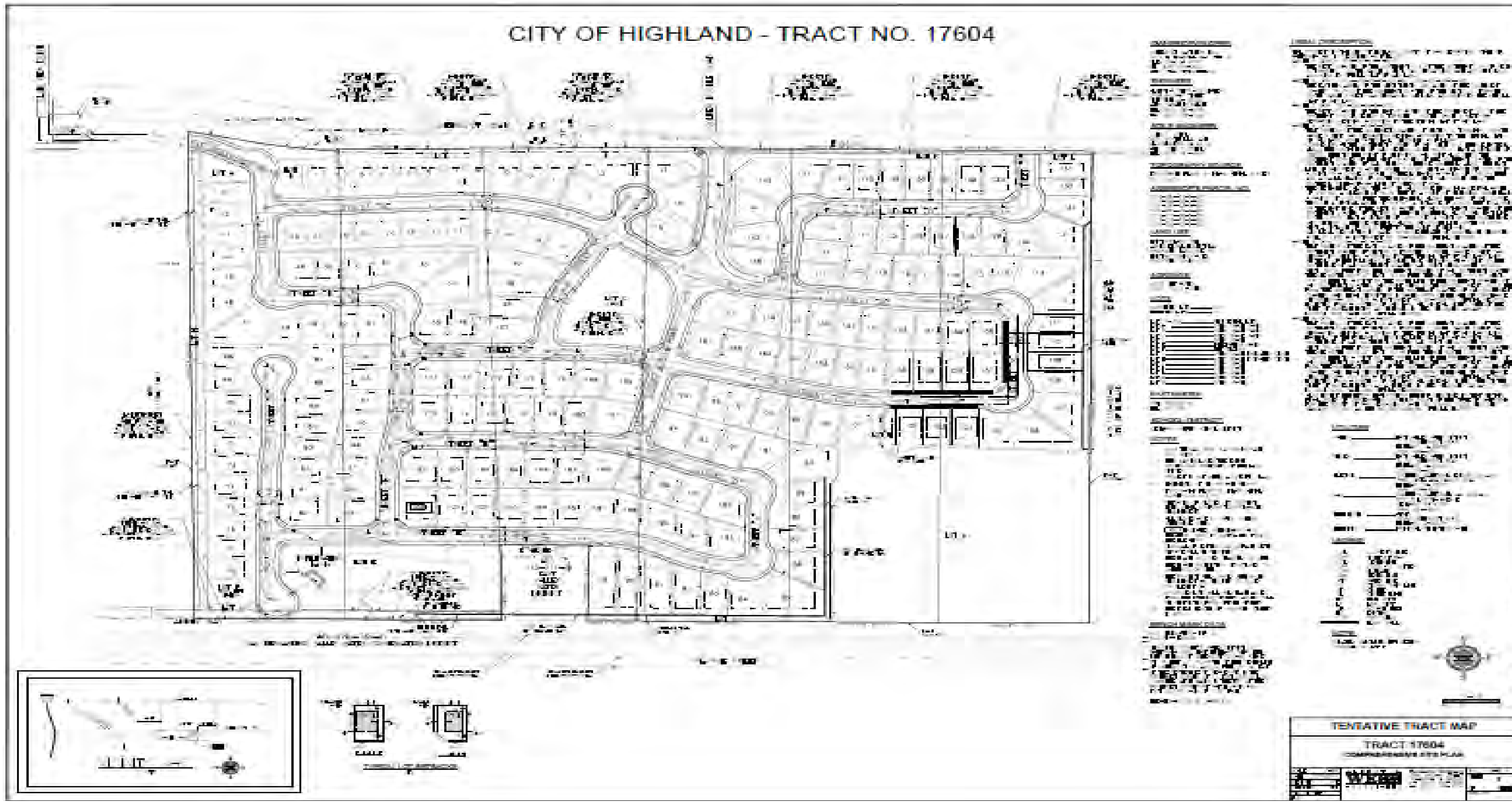


Figure 3. Proposed Project Site Plan

1.3 Fundamentals of Sound

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted or excessive sound, which can vary in intensity by over one million times within the range of human hearing; therefore, a logarithmic scale, known as the decibel scale (dB), is used to quantify sound intensity. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. As such, background noise level changes throughout a typical day, corresponding with the addition and subtraction of distant noise sources such as traffic, and single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

Because the noise environment is continually changing, average noise over a period of time is generally used to describe the community noise environment, which requires the measurement of noise over a period of time to accurately characterize a community noise environment. This time-varying characteristic of environmental noise is described using various noise descriptors, which are defined below:

L_{eq}: The L_{eq}, or equivalent sound level, is used to describe noise over a specified period of time in terms of a single numerical value; the L_{eq} of a time-varying signal and that of a steady signal are the same if they deliver the same acoustic energy over a given time. The L_{eq} may also be referred to as the average sound level.

Lmax: The maximum, instantaneous noise level experienced during a given period of time.

Lmin: The minimum, instantaneous noise level experienced during a given period of time.

Lx: The noise level exceeded a percentage of a specified time period. The “x” represents the percentage of time a noise level is exceeded. For instance, L50 and L90 represents the noise levels that are exceeded 50 percent and 90 percent of the time, respectively.

Ldn: Also termed the day-night average noise level (DNL), the Ldn is the average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dBA to measured noise levels between the hours of 10:00 pm to 7:00 am to account nighttime noise sensitivity.

CNEL: CNEL, or Community Noise Equivalent Level, is the average A-weighted noise level during a 24-hour day that is obtained after an addition of 5 dBA to measured noise levels between the hours of 7:00 pm to 10:00 pm and after an addition of 10 dBA to noise levels between the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the evening and nighttime, respectively.

In addition, sound is characterized by both its amplitude and frequency (or pitch). The human ear does not hear all frequencies equally. In particular, the ear deemphasizes low and very high frequencies. To approximate the sensitivity of human hearing, the A-weighted decibel scale (dBA) is used. On this scale, the human range of hearing extends from approximately 3 dBA to around 140 dBA. Table 1 includes examples of A-weighted noise levels from common indoor and outdoor activities.

Table 1. Typical A-Weighted Noise Levels

Common Outdoor Noise	Noise Level (dBA)	Common Indoor Noise
	— 110 —	Rock band (noise to some, music to others)
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher in neighboring room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing
SOURCE: Caltrans 1998.		

Using the decibel scale, sound levels from two or more sources cannot be directly added together to determine the overall sound level. Rather, the combination of two sounds at the same level yields an increase of 3 dBA. The smallest recognizable change in sound levels is approximately 1 dBA. A 3-dBA increase is generally considered perceptible, whereas a

5-dBA increase is readily perceptible. A 10-dBA increase is judged by most people as an approximate doubling of the sound loudness.

Two of the primary factors that reduce levels of environmental sounds are increasing the distance between the sound source to the receiver and having intervening obstacles such as walls, buildings, or terrain features between the sound source and the receiver. Factors that act to increase the loudness of environmental sounds include moving the sound source closer to the receiver, sound enhancements caused by reflections, and focusing caused by various meteorological conditions.

1.4 Effects of Noise on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance)
- Interference effects (e.g., communication, sleep, and learning interference)
- Physiological effects (e.g., startle response)
- Physical effects (e.g., hearing loss)

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Interference effects refer to interruption of daily activities and include interference with human communication activities, such as normal conversations, watching television, telephone conversations, and interference with sleep. Sleep interference effects can include both awakening and arousal to a lesser state of sleep. With regard to the subjective effects, the responses of individuals to similar noise events are diverse and are influenced by many factors, including the type of noise, the perceived importance of the noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity.

Overall, a wide variation of tolerance to noise exists, based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted (i.e., comparison to the ambient noise environment). In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships generally occur:

- **Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.**
- **Outside of the laboratory, a 3 dBA change in noise levels is considered to be a barely perceivable difference.**
- **A change in noise levels of 5 dBA is considered to be a readily perceivable difference.**
- **A change in noise levels of 10 dBA is subjectively heard as doubling of the perceived loudness.**

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion, hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

1.5 Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement (Caltrans 1998).

1.6 Fundamentals of Vibration

Vibration is energy transmitted in waves through the ground or man-made structures. These energy waves generally dissipate with distance from the vibration source. Common sources of groundborne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving, and operation of heavy earth-moving equipment. As described in the Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment (FTA 2006), ground-borne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The relationship of PPV to RMS velocity is expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the RMS amplitude. Peak particle velocity is typically a factor of 1.7 to 6 times greater than RMS vibration velocity (FTA 2006). The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration sensitive equipment.

The effects of ground-borne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration levels exceed the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 in/sec PPV (FTA 2006).

In residential areas, the background vibration velocity level is usually around 50 VdB (approximately 0.0013 in/sec PPV). This level is well below the vibration velocity level threshold of perception for humans, which is approximately 65 VdB. A vibration velocity level of 75 VdB is considered to be the approximate dividing line between barely perceptible and distinctly perceptible levels for many people (FTA 2006).

1.7 Existing Noise Environment

Sensitive Land Uses

Noise sensitive land uses are generally defined to include: places where people sleep, such as residences, hospitals, and hotels; institutional land uses where it is important to avoid interference with speech or reading, including schools, libraries, and churches; and outdoor areas where quiet is fundamental to its specific use (i.e. amphitheaters and National Parks).

The project site is vacant and undeveloped, but located adjacent to an urban and generally developed area. The closest residence is approximately 100 feet west of the project site, a mobile home and 100 feet from two-story residences located across Greenspot Road, bound by a 6-foot high cement block wall.

Noise Measurements

Sources of noise in the City of Highland are typical of those found in other urban developed areas include, but not limited to, traffic, construction work, commercial and residential operations, human activities, emergency vehicles, aircraft overflights, etc. One long-term and three short-term noise measurements of existing ambient noise levels were taken on and adjacent to the project site on April 5th and 6th, 2017 to characterize existing ambient noise levels. **Figure 4** shows the noise measurement locations.

Tables 3 lists the long-term ambient noise levels at the long-term measurement location. The highest hourly noise measurement over the 24-hour period was 65.4 dBA L_{eq} and the lowest noise was 50.6 dBA L_{eq}. The existing CNEL is 66 dBA L_{eq}. In addition, as shown in **Table 4**, the short-term noise measurements identified existing ambient noise at sensitive receiver's ranges between 46.4 dBA L_{eq} and 68.8 dBA L_{eq}.

Existing Vibration Levels

Aside from periodic construction work that may occur in the vicinity of the project area, other sources of groundborne vibration include heavy-duty vehicular travel (e.g., refuse trucks and delivery trucks) on the roadways that are adjacent to the project site. Trucks traveling at a distance of 50 feet typically generate groundborne vibration velocity levels of around 63 VdB (approximately 0.006 in/sec PPV), and these levels could reach 72 VdB (approximately 0.016 in/sec PPV) when trucks pass over bumps in the road (FTA 2006).

N
W
E
S

Figure 4. Noise Measurement and Sensitive Receiver Locations

Table 2. Summary of Long-Term Noise Measurement LT-1

Hour Beginning	dBA L_{eq}[h]
11:00 AM	61.5
12:00 PM	60.4
1:00 PM	62.5
2:00 PM	62.6
3:00 PM	64
4:00 PM	65.4
5:00 AM	63.2
6:00 AM	63.1
7:00 AM	63.2
8:00 PM	61
9:00 PM	59.5
10:00 PM	58.1
11:00 PM	54.3
12:00 AM	51.5
1:00 AM	50.8
2:00 AM	50.6
3:00 AM	52.7
4:00 AM	59.1
5:00 AM	63.4
6:00 AM	63.1
7:00 AM	61.9
8:00 AM	60.4
9:00 AM	59.6
10:00 AM	60.2

Table 3. Summary of Short-Term Noise Measurements

Location	dBA L_{eq}
ST-1	58.6
ST-2	46.4
ST-3	68.8

2.0 REGULATORY FRAMEWORK

The governing regulatory framework in the City of Highland includes federal, state, and local agencies that enforce noise and vibration standards.

2.1 Federal Regulations and Standards

There are no federal noise standards that directly regulate environmental noise related to the construction or operation of the proposed project. With regard to noise exposure and workers, the Office of Safety and Health Administration (OSHA) regulations safeguard the hearing of workers exposed to occupational noise. Federal regulations also establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 Code of Federal Regulations (CFR), Part 205, Subpart B. The federal truck pass-by noise standard is 80 dB at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

Federal Transit Authority Vibration Standards

The FTA has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. The vibration damage criteria adopted by the FTA are shown in **Table 4**.

Table 4. Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12
SOURCE: FTA, 2006.	

The FTA has also adopted the following standards for groundborne vibration impacts related to human annoyance: Vibration Category 1 – High Sensitivity, Vibration Category 2 – Residential, and Vibration Category 3 – Institutional. The FTA defines Category 1 as buildings where vibration would interfere with operations, such as vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and research operations. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference. The vibration thresholds associated with human annoyance for these three land-use categories are shown in **Table 5**. No thresholds have been adopted or recommended for commercial and office uses.

Table 5. Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Frequent Events [a]	Occasional Events [b]	Infrequent Events [c]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[d]	65 VdB[d]	65 VdB[d]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

[a] Frequent Events" is defined as more than 70 vibration events of the same source per day.
[b] Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
[c] Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.
[d] This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.
SOURCE: FTA, 2006

2.2 State Regulations and Standards

Noise Standards

The California Department of Health Services has established guidelines for land use and noise exposure compatibility that are listed in **Table 6**. In addition, the California Government Code (Section 65302(g)) requires a noise element to be included in general plans, and requires that the noise element: (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

In addition, state noise regulations include requirements for the construction of new residential structures that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior sources, the noise insulation standards set forth an interior standard of DNL 45 dBA in any habitable room and, where such units are proposed in areas subject to noise levels greater than DNL

60 dBA require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard. If the interior noise level depends upon windows being closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

Table 6. California Community Noise Exposure (Ldn or CNEL)

Land Use	Normally Acceptable[a]	Conditionally Acceptable[b]	Normally Unacceptable[c]	Clearly Unacceptable[d]
Single-family, Duplex, Mobile Homes	50 - 60	55 - 70	70 - 75	above 75
Multi-Family Homes	50 - 65	60 - 70	70 - 75	above 75
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 - 70	60 - 70	70 - 80	above 80
Transient Lodging – Motels, Hotels	50 - 65	60 - 70	70 - 80	above 75
Auditoriums, Concert Halls, Amphitheaters	---	50 - 70	---	above 70
Sports Arena, Outdoor Spectator Sports	---	50 - 75	---	above 75
Playgrounds, Neighborhood Parks	50 - 70	---	67 - 75	above 75
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 - 75	---	70 - 80	above 80
Office Buildings, Business and Professional Commercial	50 - 70	67 - 77	above 75	---
Industrial, Manufacturing, Utilities, Agriculture	50 - 75	70 - 80	above 75	---

a Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

b Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

c Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

d Clearly Unacceptable: New construction or development should generally not be undertaken.

SOURCE: FTA, 2006.

The state has also established the California Noise Insulation Standards (Title 24, California Code of Regulations) that provide an interior standard of 45 dB Ldn/CNEL for any habitable room. In addition, it requires an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than 60 dB Ldn/CNEL. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

Additionally, the state has noise limits for vehicles licensed to operate on public roads. For heavy trucks, the state pass-by standard is consistent with the federal limit of 80 dB. The state pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

Vibration Standards

There are no state vibration standards applicable to the proposed project. In addition, the California Department of Transportation's (Caltrans) *Transportation and Construction Vibration Guidance Manual* (2013), does not provide official Caltrans standards for vibration. However, this manual provides guidelines that can be used as screening tools for assessing the potential for adverse vibration effects related to structural damage and human perception. The manual is meant to provide guidance related to vibration issues associated with the construction, operation, and maintenance of Caltrans projects. The vibration criteria established by Caltrans for assessing structural damage and human perception are shown in **Tables 7** and **8**, respectively.

Table 7. Caltrans Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous / Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans, 2006.

Table 8. Caltrans Vibration Annoyance Potential Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	**Continuous / Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: Caltrans, 2006.

2.3 Local Regulations and Standards

The City of Highland outlines their noise regulations and standards within the Noise Element from the General Plan and the Noise Ordinance from the Municipal Code.

Noise Regulations

The City categories land uses into designated noise zones to assign appropriate interior and exterior noise standards. The appropriate noise standards for residential land uses require noise levels to be below 60 dBA CNEL for exterior areas and 45 dBA for interior areas.

Construction Noise Regulations

The City of Highland Noise Ordinance, section 8.50.060(l) states that the following activities and noise sources shall not be subject to the provisions of (the Noise Control) Chapter:

> *Construction, repair or excavation work performed pursuant to a valid written agreement with the city or any of its political subdivisions, which the agreement provides for noise mitigation measures.*

3.0 THRESHOLDS OF SIGNIFICANCE

Appendix G of the California Environmental Quality Act (CEQA) Guidelines states that a project could have a significant adverse effect related to noise if any of the following would occur:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

3.1 Noise Criteria

The *CEQA Guidelines* does not define the levels at which permanent and temporary increases in ambient noise are considered "substantial." Therefore, the significance of the project's noise impacts can be determined by comparing estimated project-related noise levels to existing no-project noise levels. With respect to the traffic noise environment, the average healthy ear can barely perceive a noise level change of 3 dBA. A change from 3 to 5 dBA may be noticed by some individuals who are sensitive to changes in noise. A 5 dBA increase is readily noticeable, while the human ear perceives a 10 dBA increase as a doubling of sound (Caltrans 2013). Thus, a significant impact related to a substantial increase in traffic noise would occur if the project results in an increase of 5 dBA, which would be readily noticeable.

3.2 Vibration Criteria

The *CEQA Guidelines* do not define the levels at which groundborne vibration or groundborne noises are considered "excessive." The City does not have a significance threshold to assess vibration impacts during construction. Additionally, there are no federal, state, or local vibration regulations or guidelines directly applicable to the proposed project. However, publications of the FTA and Caltrans are two of the seminal works for the analysis of vibration relating to transportation and construction-induced vibration. The proposed project is not subject to FTA or Caltrans regulations; nonetheless, these guidelines serve as a useful tool to evaluate vibration impacts. For the purpose of this analysis, the vibration criteria for structural damage and human annoyance established in the most recent Caltrans' *Transportation and Construction Vibration Guidance Manual* (2013), which are shown previously in Tables 8 and 9, are used to evaluate the potential vibration impacts of the project on sensitive receptors.

4.0 METHODOLOGY

The primary sources of noise associated with the proposed project would be construction activities and project-related traffic volumes associated with the operational developments. Secondary sources of noise would include new stationary sources (such as heating, ventilation, and air conditioning units) associated with the new residential uses. The increase in noise levels generated by these activities and other sources associated with the proposed project have been quantitatively estimated and compared to the applicable noise standards and thresholds of significance.

Additionally, groundborne vibration would be generated during the construction activities. Thus, the groundborne vibration levels generated by these sources have also been quantitatively estimated and compared to applicable thresholds of significance.

4.1 Construction Noise Levels

For the purpose of this analysis, an approximate estimate of the construction noise levels is conducted based on the general assessment approach recommended by the FTA. The FTA's general construction noise assessment approach recommends assessing the two noisiest pieces of construction equipment operating concurrently at the center of the project site (FTA 2006). The maximum noise level was predicted at a reference distance 50 feet.

4.2 Traffic Generated Noise Levels

Traffic generated noise from implementation of the proposed project were calculated based on information provided in the Traffic Impact Analysis Report that was prepared for the proposed project by Linscott Law & Greenspan (LLG 2017). The noise levels were calculated using the FHWA's Highway Traffic Noise Prediction Model version 2.5 (TNM 2.5). From the modeling data, existing noise levels in the project area are compared to noise levels with operation of the proposed project to determine whether a substantial increase in noise would occur.

4.3 Groundborne Vibration from Construction and Operation

Groundborne vibration levels resulting from construction activities were estimated using data published by the FTA in its *Transit Noise and Vibration Impact Assessment* (2006) document. Potential vibration levels resulting from construction activities are identified at the nearest off-site sensitive receptor location, which for the purpose of this analysis is assumed to be adjacent sensitive uses, which are the residences located approximately 100 feet to the north and west of the project site. The potential vibration levels at off-site sensitive locations resulting from implementation of the proposed project are analyzed against the vibration thresholds established by Caltrans to determine whether an exceedance of allowable vibration levels would occur.

5.0 NOISE ASSESSMENT

This noise impact assessment is conducted to determine the significance of the impact created by construction and operation of the proposed project on the noise sensitive land uses adjacent to the project area. Construction may affect ambient noise as a result of construction equipment and vehicles traveling to/from construction sites by construction workers. Operation related impacts would be generated primarily from vehicle and truck trips and from mechanical equipment, such as HVAC units.

5.1 Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

Construction

Construction, although short-term, can be a significant source of noise. Construction activity noise levels fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction of the proposed project would require the use of heavy construction equipment for activities such as excavation, grading, installation of utilities, paving, and building fabrication. Development activities would also involve the use of smaller power tools, generators, and other sources of noise. During each stage of construction, a different mix of equipment operating noise levels would occur and would vary based on the amount of equipment in operation and the location of the activity.

The FHWA has compiled data for outdoor noise levels for typical construction activities. **Table 9** provides average (L_{eq}) noise levels produced by various types of construction equipment at a distance of 50 feet between the equipment and noise receptor. These noise levels would diminish with distance from a construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 84 dBA L_{eq} measured at 50 feet from the noise source to the receptor would reduce to 78 dBA L_{eq} at 100 feet from the source to the receptor.

Table 9. Construction Equipment Noise Levels

Construction Equipment	Noise Level at 50 Feet (dBA, L_{eq})
Air Compressor	78
Backhoe	78
Chain Saw	84
Compactor	83
Concrete Mixer	79
Concrete Pump	81
Dozer	82
Generator	81
Grader	85
Dump Truck	76
Paver	77
Pneumatic Tools	85
Jackhammer	89
Roller	80
Front End Loader	79
Scraper	84
Tractor	84
Truck	75

Source: FHWA Construction Noise Handbook.

The construction activities would expose the nearby existing uses to increased noise levels. The highest construction noise would occur during the excavation and grading activities. As shown in **Table 9**, use of grading equipment generates noise levels of approximately 85 dBA at a distance of 50 feet; at a distance of 100 feet the noise would attenuate to approximately 79 dBA.

As described above, the closest sensitive receptors to the project site would be the adjacent mobile home single-family residences to the west. The loudest construction related exterior noise would be approximately 79 dBA Leq at this receptor (100 feet from the site) when the loudest equipment is used.

However, the City's Municipal Code, because the project site is not adjacent to residential uses, construction noise is exempt as long as it does not occur any earlier than one-half hour before sunrise or to terminate no later than one-half hour after sunset Monday through Sunday. The proposed project would not involve the need for construction during these hours, and the construction activities related to the project would be consistent with the City's Municipal Code. Thus, the proposed project would be in compliance with the City's construction related noise standards, and impacts would be less than significant.

Operation

With respect to operational noise levels, the City has established exterior noise standards that are correlated with land use classifications. As described above, the exterior noise standards are 60 dBA CNEL during the daytime and 55 dBA during the nighttime for residential land uses.

Traffic Generated Noise

Ambient noise levels within and surrounding the project area are influenced primarily by traffic on local roadways. With respect to vehicle traffic generated by the project, approximately 2,047 daily trips are anticipated (LLG 2017). The increase in traffic resulting from implementation of the project would increase the ambient noise levels at land uses fronting roadways. To evaluate the future traffic noise environment in the project area, the future traffic noise levels were estimated based on future traffic volumes provided in the project's traffic study using the FHWA's TNM 2.5 model. As described above in Section 3.1, *Noise Criteria*, a significant impact related to a substantial increase in noise would occur if the project results in an increase of 5 dBA, which would be readily noticeable.

As shown in **Table 10**, existing noise levels at sensitive receptors in the project area range from 48.9 dBA to 68.3 dBA. Traffic resulting from the proposed project would increase noise levels to a maximum of 0.5 dBA. Because the project related increase in noise is less than the 5 dBA threshold, noise impacts would be less than significant.

Table 10. Increase in Noise Levels from Operational Traffic

Receptor	Existing CNEL	Existing with Project CNEL	Increase
R1	48.9	49.3	0.4
R2	52.7	53.2	0.5
R3	59.1	59.6	0.5
R4	61.6	62.1	0.5
R5	56.4	56.9	0.5
R6	63	63.5	0.5
R7	61.8	62.3	0.5
R8	64	64.5	0.5
R9	56.4	56.9	0.5
R10	67.9	68.1	0.2
R11	62.3	62.4	0.1
R12	68.3	68.4	0.1

Stationary Equipment Noise

Once the proposed residences are operational, noise levels generated at the project site would occur from new stationary equipment such as heating, ventilation, and air conditioning (HVAC) units that would be installed for the building. Although the operation of this equipment would generate noise, the design of these onsite HVAC units and exhaust fans would be required to comply with the noise limit regulations of the City's Noise Element that does not allow exterior noise to exceed 55 dBA CNEL between 10:00 p.m. and 7:00 a.m., and 60 dBA CNEL between 7:00 a.m. and 10:00 p.m. Meeting these exterior standards would also meet the City's interior noise standards with implementation of standard construction, which would be required by the City. Therefore, impacts related to generation of noise in excess of standards would not occur from operation of the proposed project.

5.2 Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels

Construction

As described previously, construction activities for the project would include excavation and grading activities, which has the potential to generate groundborne vibration. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Site ground vibrations from construction activities very rarely reach the levels that can damage structures, but they can be perceived in the audible range and be felt in buildings very close to a construction site.

The construction that would occur by the project would involve the temporary use of construction equipment, which can result in the generation of groundborne vibration levels. The various PPV vibration velocities for several types of construction equipment that can generate perceptible vibration levels are identified in **Table 11.** As shown, vibration velocities could range from approximately 0.003 to 0.089 inch-per-second PPV at 25 feet from the source activity, depending on the type of construction equipment in use. For the purpose of this analysis, the vibration level for a large bulldozer provided in **Table 11** was used to evaluate vibration source levels at the nearest sensitive receptor from construction activity. In comparison to the Caltrans vibration criteria provided in **Tables 7 and 8**, vibration impacts from construction activities would not exceed the criteria.

Table 11. Vibration Source Levels for Construction Equipment at 25 Feet

Equipment	PPV (in/sec) at 25 Feet	PPV (in/sec) at 50 Feet	PPV (in/sec) at 100 Feet
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Jackhammer	0.035	0.012	0.004
Small Bulldozer	0.003	0.001	<0.000
SOURCE: FTA, 2006			

As described above, the closest sensitive uses to the project site are the residences, which are modern structures that are located 100 feet away. At this distance, the maximum vibration of 0.011 in/sec PPV is estimated to occur during construction. **Table 11** shows that the vibration levels generated would be below levels that could create structural damage to modern buildings (0.5 in/sec PPV), and below the strongly perceptible level for human response (0.9 in/sec PPV). Thus, vibration at 100 feet away from construction activity would be less than significant, and construction of the project would not generate excessive generation of ground-borne vibration.

Operation

The proposed warehousing uses do not involve activities or operation of stationary or mobile equipment that would result in high vibration levels, which are more typical for large industrial projects that employ heavy machinery. During project operations, the primary source of vibration would likely be delivery/garbage truck circulation within and adjacent to the project area. However, the FTA's *Transit Noise and Vibration Impact Assessment* states that it is unusual for vibration from vehicular sources (including buses and trucks) to be perceptible, even in locations close to major roads. As such, no sources of "excessive" groundborne vibration or noise levels are anticipated during project operations.

5.3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Traffic Noise

As described above in Section 3.1, *Noise Criteria*, the significance of the project's noise impacts in regards to traffic noise is determined by comparing estimated project-related noise levels, and a substantial increase in noise would occur if the project resulted in an increase of 5 dBA or more. As shown in Table 12, the project would result in maximum noise increase of 0.5 dBA. Because the project related increase in noise is less than the 5 dBA threshold, impacts related to a substantial permanent increase in ambient noise would be less than significant.

Onsite Stationary Noise Sources

As described previously, in Section 5.1, equipment on the project site, including HVAC units and exhaust fans would be installed in compliance with the City's Noise Element, such that it would not cause noise to exceed the City's noise limit. Therefore, onsite stationary noise equipment associated with the proposed project would not result in a substantial permanent increase in ambient noise levels, and impacts would be less than significant.

5.4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

As shown in Table 13, Existing noise levels at sensitive receptors in the project area range from 46.4 dBA to 68.8 dBA; and as described previously, in Section 5.1. The loudest construction related exterior noise would be approximately 79 dBA at the closest residences where existing noise is approximately 66 dBA CNEL. The loudest construction noise would occur during excavation activities. However, this noise level is not anticipated to occur throughout the entire course of a construction day, as construction equipment and activities rarely operate continuously for a full day at a construction site. Typically, the operating cycle for construction equipment would involve one or two minutes of full power operation followed by three or four minutes at lower power settings. Additionally, construction equipment engines would likely be intermittently turned on and off over the course of a construction day.

Therefore, implementation of the proposed project would result in a less than significant impact related to a substantial temporary or periodic increase in ambient noise levels.

5.5 For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels

The project site is over approximately 2.9 miles east of the Ontario International Airport. The project site is not located within the Airport Land Use Plan of the airport. Due to the distance of the facilities from the project site, people residing or working in the project area would not be exposed to excessive noise levels related to the airport; and impacts would not occur.

5.6 For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels

The proposed project is not located in the vicinity of a private airstrip. Therefore, the proposed project would not expose people working in the area to excessive noise levels associated with a private airstrip.

6.0 REFERENCES

California Department of Transportation's (Caltrans). 2004. *Transportation- and Construction-Induced Vibration Guidance Manual*. http://www.dot.ca.gov/hq/env/noise/pub/vibrationmanFINAL.pdf

California Department of Transportation (Caltrans). 2013. Technical Noise Supplement (TeNS), A Technical Supplement to the Traffic Noise Analysis Protocol. http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf

City of Highland: Noise Element of the Highland General Plan, March 2006

City of Highland: City of Highland Noise Ordinance. January, 2015

FHWA Construction Noise Handbook Section 9.0. Accessed at: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm

FHWA Construction Noise Handbook Section 8.0. Accessed at: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook08.cfm

Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment. https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/fta-noise-and-vibration-impact-assessment

State of California General Plan Guidelines: 1998. Governor's Office Planning and Research

Appendix A Noise Modeling Results

(See attached electronic files)

TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT:
RUN:
BARRIER DESIGN:

ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
LT	17	1	0	64.2	66	64.2	10	----	64.2	0	8	-8
ST-1	18	1	0	51.6	66	51.6	10	----	51.6	0	8	-8
ST-2	19	1	0	64.2	66	64.2	10	----	64.2	0	8	-8
ST-3	20	1	0	71.4	66	71.4	10	Snd Lvl	71.4	0	8	-8
R1	21	1	0	49.3	66	49.3	10	----	49.3	0	8	-8
R2	22	1	0	53.2	66	53.2	10	----	53.2	0	8	-8
R3	23	1	0	59.6	66	59.6	10	----	59.6	0	8	-8
R4	24	1	0	62.1	66	62.1	10	----	62.1	0	8	-8
R5	25	1	0	56.9	66	56.9	10	----	56.9	0	8	-8
R6	26	1	0	63.5	66	63.5	10	----	63.5	0	8	-8
R7	27	1	0	62.3	66	62.3	10	----	62.3	0	8	-8
R8	28	1	0	64.5	66	64.5	10	----	64.5	0	8	-8
R9	29	1	0	56.9	66	56.9	10	----	56.9	0	8	-8
R10	30	1	0	68.1	66	68.1	10	Snd Lvl	68.1	0	8	-8
R11	31	1	0	62.4	66	62.4	10	----	62.4	0	8	-8
R12	32	1	0	68.4	66	68.4	10	Snd Lvl	68.4	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	16	0	0	0
All Impacted	3	0	0	0
All that meet NR Goal	0	0	0	0

Heatherglen Planned Development, TTM 17604, CUP 15-006

Initial Study – Notice of Preparation

Appendix F – East Valley Water District Will Serve Letter

EAST VALLEY WATER DISTRICT

LEADERSHIP • PARTNERSHIP • STEWARDSHIP

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John Mura, General Manager/CEO

January 29, 2019

Stan Stringfellow
Development 1 Group, Inc.
2011 E. Financial Way, Suite 203
Glendora, CA 91741

Subject: Tentative Tract #17604

APN: 1210-281-01; 1210-281-02; 1210-281-03; 1210-281-04; 1210-211-18; 1210-211-21; 1210-211-23.

Location: Greenspot Road and Abby Way

Dear Mr. Stringfellow,

Pursuant to your recent request, this letter confirms that the East Valley Water District will provide water and sewer collection services to the above-mentioned parcel for domestic, fire protection, and sanitary sewer purposes.

All improvements necessary for water and sewer services are subject to approval by the District and must meet all District Standards. You must comply with all District rules, regulations, policies and procedures, including payment for all capital improvements, main lines, extensions, sewer capacity or other commitment or commitments of the District's resources. The District will operate and maintain all water and sewer improvements upon their dedication to the East Valley Water District.

The commitment to provide water and sewer service outlined in this letter will expire two (2) years from the date of this letter.

East Valley Water District

Jeff Noelte

Jeff Noelte, PH.D, PE, BCEE
Director of Engineering & Operations

N:\Administration\Will Serve Letters

CITY OF HIGHLAND

27215 Base Line, Highland, CA 92346
Telephone (909) 864-6861 FAX: (909) 862-3180

INITIAL STUDY

1.	Case No:	Tentative Tract Map No. 17604 (TTM 015-001); Conditional Use Permit 15-006
	Project title:	Heatherglen Planned Development
2.	Lead agency:	City of Highland, 27215 Base Line, Highland, CA 92346
3.	Contact person:	Kim Stater, Assistant Community Development Director Tel: (909) 864-6861, Ext. 204
4.	Project location:	East of Merris Street/Club View Drive, west of Alta Vista, south of Greenspot Road and north of Abbey Way and Plunge Creek. The site is 59.03 (gross) acres consisting of seven Assessor Parcel Numbers: 1210-281-01, 1210-281-02, 1210-281-03, 1210-281-04, 1210-211-18, 1210-211-21, 1210-211-23.
5.	Project applicant:	Greenspot Partners 1, Inc., 2011 E. Financial Way, Glendora, CA 91741

6. Description of project:

Tentative Tract Map (TTM) 17604 is a low density, single-family residential development Project in the City of Highland (City) on approximately 59 acres that includes 203 numbered residential lots and 13 lettered lots for various open space uses (entry points, public park, irrigated slopes/easements, infiltration basin, open space habitat preservation, and East Valley Water District facilities). These lettered lots (A through M) total 12.44 acres of the Project site. A public park is planned and is located at the southwest corner of Gold Buckle Road and Street "B." The park (Lot C) is ½ acre and will be improved with a small tot-lot containing a low maintenance multi-faceted play structure with a soft fall zone area, benches, and shade structure. The balance of the park will be a passive play area with water efficient landscaping. The park will be maintained by a Homeowners Association (HOA) or assessment district, as will all of the letter lots. The Project will include a community trail (12 feet wide) along the western boundary of the site from Greenspot Road to the southern boundary of the site. The Project will include construction of the Pole Line Trail (12 feet wide) along southern portion of the Project site. Lot L is 6.53 acres and will not be graded and developed but set aside and preserved as open space as designated on the Tract 17604 Comprehensive Site Plan.

A network of local public streets will provide internal circulation and access to Greenspot Road, a four-lane divided major highway along the northern boundary of the site. There will be three access points from Greenspot Road to the Project site. The first access point to Greenspot Road will be via Old Greenspot Road at Club View Drive at the westerly edge of the Project's site. The second is a new street (Gold Buckle Road) generally located in the center of the Project site. The third access point to Greenspot Road will be on the Project site's most easterly edge as Street "P."

Potable water and sewer service would be provided by East Valley Water District (EVWD). EVWD has an existing water main and a sewer pipeline in Greenspot Road. Service to the new residences will require a new connection to these lines and will be extended into the Project site.

Stormwater and non-stormwater runoff from the majority of the site (western) will be conveyed within the site (storm drains within the network of streets) to an infiltration basin located in the southern portion of the Project site. Stormwater and non-stormwater runoff from a small area from the eastern portion of the site will be conveyed through a swale in Lot D to the open space habitat preservation area in Lot L. No off-site stormwater facilities are required or proposed.

Development of the tract will include grove removal, grubbing, grading, development of internal roadways, and off-site improvements. Grading of the site is estimated to require 107,121 cubic yards of cut and 126,140 cubic yards of fill. A net import of 19,019 cubic yards of fill will be required from an off-site location. Construction is anticipated to take approximately 4 years with the following sequential phases: 1) site preparation (clearing and grubbing) approximately 1.5 months; 2) grading approximately 3.5 months; 3) building construction approximately 3 years; 4) paving and architectural coatings approximately 2.5 months.

7.	Present Land Use:	Undeveloped, eucalyptus groves, jojoba field, and natural sage scrub habitat
8.	General Plan designation:	PD/LDR (Planned Development/ Low Density Residential)
9.	Zoning:	PD-R1 (Single-Family Residential)

10.	Is the proposed action a "project" as defined by CEQA? (See Section 2.6 of State CEQA Guidelines. If more than one project is present in the same area, cumulative impact should be considered)	Yes ☑ No ☐
11.	If "yes" on 10, does the project fall into any of the Emergency Projects listed in Section 15269 of the State CEQA Guidelines?	Yes ☐No ☑
12.	If "no" on 10, does the project fall under any of the Ministerial Acts listed in Section 15268(b) of the State CEQA Guidelines?	Yes ☐No ☑
13.	If "no" on 12, does the project fall under any of the Statutory Exemptions listed in Article 18 of the State CEQA Guidelines?	Yes ☐No ☑
14.	If "no" on 13, does the project qualify for one of the Categorical Exemptions listed in Article 19 of the State CEQA Guidelines? (Where there is a reasonable probability that the activity will have a significant effect due to special circumstances, a categorical exemption does not apply).	Yes ☐No ☑

15. Surrounding land uses and setting (briefly describe the project's surroundings):

North:	Greenspot Road, single-family detached residential
South:	Open space, Upper Santa Ana River Wash Habitat Conservation Plan (HCP) area
East:	Plunge Creek storm drain channel, open space, Upper Santa Ana River Wash HCP area
West:	Vacant/ disturbed land, single-family detached residential

16. Surrounding General Plan and Zoning:

North:	Single-Family Residential / PD and R-1 | East Highlands Ranch Planned Unit Development
South:	Open Space / Open Space
East:	Open Space / Open Space
West:	Planned Development (PD), Neighborhood Commercial (NC) and East Highland Village (EHV)

17. Is the proposed project consistent with (if answered "yes" or "n/a", no explanation is required)

City of Highland General Plan	Yes ☑ No ☐ N/A ☐
Applicable Specific Plan	Yes ☐ No ☐ N/A ☑
City of Highland Zoning Code	Yes ☑ No ☐ N/A ☐
South Coast Air Quality Management Plan	Yes ☑ No ☐ N/A ☐
San Bernardino International Airport Master Plan	Yes ☐ No ☐ N/A ☑
Other: Redlands Airport Special Compatibility Zone	Yes ☑ No ☐ N/A ☐

18. Are any of the following studies required?

Soils Report	Yes ☑ No ☐
Slope Study	Yes ☐ No ☑
Geological Report	Yes ☑ No ☐
Traffic Study	Yes ☑ No ☐
Air Quality Study	Yes ☑ No ☐
Hydrology	Yes ☑ No ☐
Sewer Study	Yes ☐ No ☑
Biological Study	Yes ☑ No ☐
Noise Study	Yes ☑ No ☐
Hazardous Materials Study	Yes ☐ No ☑
Housing Analysis	Yes ☐ No ☑
Archaeological Report	Yes ☑ No ☐
Groundwater Analysis	Yes ☐ No ☑
Water Quality Report	Yes ☑ No ☐
Other	Yes ☐ No ☑

19. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement). Only required at the time of development.

Public Agencies:
East Valley Water District, State Water Resources Control Board, San Bernardino County Flood Control District, US Fish and Wildlife Service, California Department of Fish and Wildlife, Redlands Municipal Airport

Other service providers:
Cal Disposal Co. Inc., Burrtec Waste Disposal, Southern California Edison, Southern California Gas.

INFORMATION SOURCES CITED: The documents below are incorporated herein by reference and are available for review at Highland City Hall, located at 27215 Base Line, California or online at the website address indicated below.

1. Air Quality and Greenhouse Gas Study. Entech Consulting Group. March 2017. (Appendix A)

2. California Important Farmland Finder, California Department of Conservation, https://maps.conservation.ca.gov/DLRP/CIFF/, 2016.

3. CalRecycle, Estimated Solid Waste Generation Rates, https://www2.calrecycle.ca.gov/wastecharacterization/general/rates

4. City of Highland General Plan and Environmental Impact Report, Adopted by the City Council March 14, 2006.

5. City of Highland General Plan Land Use Amendment & Zoning Amendment GPA 017-002 and ZC 017-002 (Greenspot Road/Pole Line Road) Initial Study Negative Declaration, Adopted by the City Council April 17, 2018.

6. City of Highland Municipal Code

7. Draft Environmental Impact Statement/ Supplemental Environmental Impact Report Proposed Habitat Conservation Plan and Section 10 Permit for the Upper Santa Ana River Wash Plan, US Fish and Wildlife Service, Pacific Southwest Region, Carlsbad Office and San Bernardino Valley Water Conservation District, December 2019, https://www.sbvwcd.org/our-projects/wash-plan.html

8. East Valley Water District, “Will Serve” Letter, January 29, 2019. Appendix F)

9. Energy Analysis Technical Memorandum. Entech Consulting Group. May 2019. (Appendix C)

10. Engineering Geology Investigation Proposed Heatherglen Property. Gary S. Rasmussen & Associates, Inc. January 5, 2006. (Appendix D)

11. Flood Insurance Rate Map Number 06071C 8707J, dated September 2, 2016.

12. Noise Study Heatherglen Residential Project. Entech Consulting Group. April 2017. (Appendix E)

13. Phase 1 Cultural Resources Assessment for the Heatherglen/Tract 17604 Project. L&L Environmental, Inc. December 11, 2017. (Appendix B)

14. Preliminary Water Quality Management Plan for Tract 17606, Albert A. Webb Associates. November 5, 2014.

15. Regional Transportation Plan/Sustainable Communities Strategy

(RTP/SCS) 2016-2040, Southern California Area of Governments (SCAG), April 7, 2016. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx

16. “San Bernardino County Important Farm Land 2010” Sheet 2 of 2. Farmland Mapping and Monitoring Program. ftp://ftp.consrv.ca.gov/pub/dlrp/wa/SanBernardino_so_15_16_WA.pdf

17. San Bernardino Valley Regional Water Management Plan, 2015. Water Systems Consulting, Inc., https://www.sbvmwd.com/reports/-folder-1081

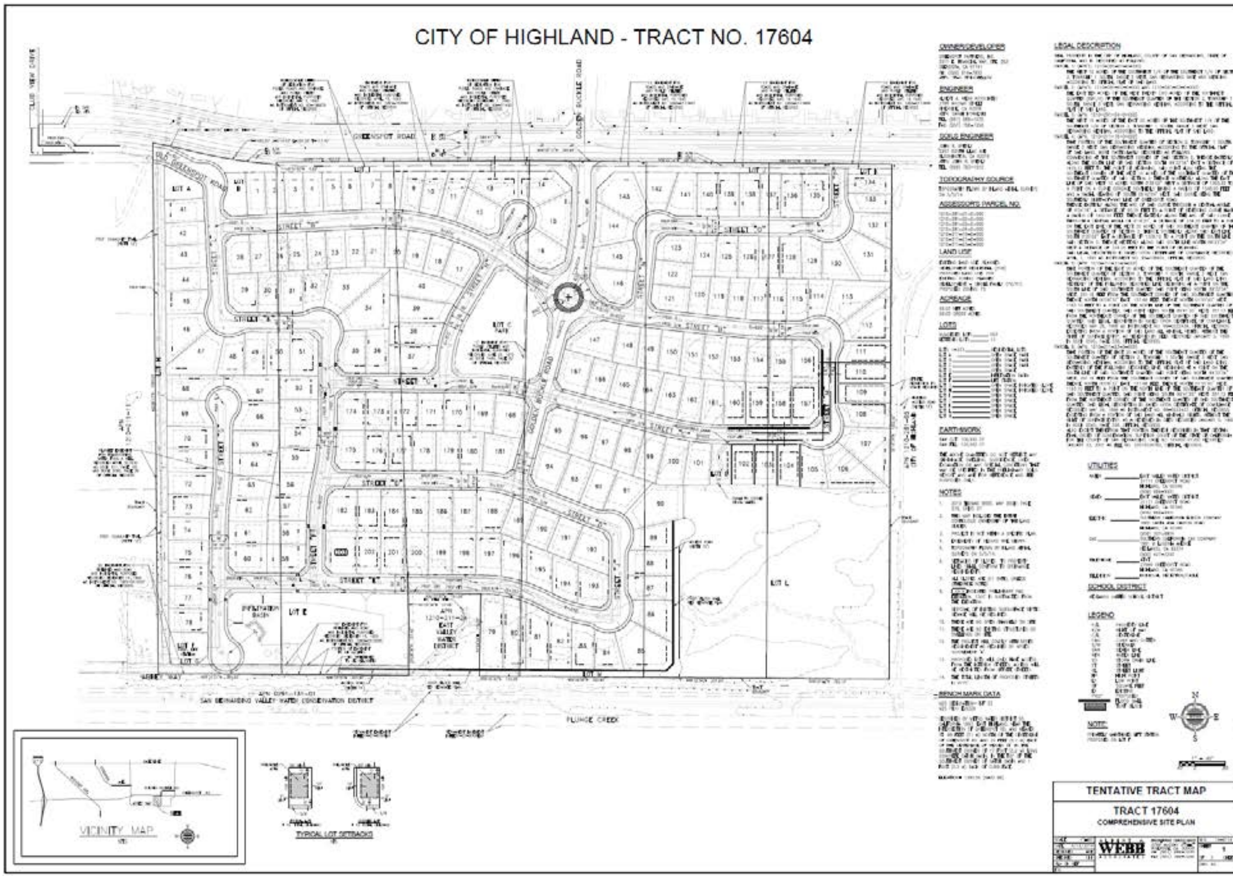
18. Sewer System Management Plan (SSMP), 2014. East Valley Water District, https://www.eastvalley.org/294/Sewer-System-Management-Plan-SSMP

Attachment 1
Location Map

Attachment 2
Project Site

Figure 2	**Project Site Map** Heatherglen Planned Development City Of Highland San Bernandino County, CA	Assessor Parcel Numbers: 1210-281-01, 1210-281-02, 1210-281-03, 1210-281-04, 1210-211-18, 1210-211-21, 1210-211-23.	RVA

Attachment 3
Tentative Tract Map/Comprehensive Site Plan



1. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or a "Less Than Significant With Mitigation Incorporated" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☑	Air Quality
☑	Biological Resources	☑	Cultural Resources	☐	Energy
☑	Geology /Soils	☐	Greenhouse Gas Emissions	☑	Hazards & Hazardous Materials
☑	Hydrology / Water Quality	☐	Land Use / Planning	☐	Mineral Resources
☑	Noise	☐	Population / Housing	☐	Public Services
☑	Recreation	☑	Transportation	☑	Tribal Cultural Resources
☐	Utilities / Service Systems	☐	Wildfire	☑	Mandatory Findings of Significance

EVALUATION OF ENVIRONMENTAL IMPACTS

1. AESTHETICS – Except as provided in Public Resources Code Section 21099, would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☑	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☑	☐
c) Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☑	☐
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☑	☐

Explanation:

1a Less Than Significant Impact: The San Bernardino mountains are a prominent scenic vista for the City and are visible to the north from the Project site. North of the Project site is Greenspot Road and residential development. West of the Project site is vacant/disturbed land and the East Highland Village residential development. East of the

Project site is Plunge Creek and open space. South of the Project site is open space. The San Bernardino mountains to the north consists of background views for most of the surrounding community. The Project would construct 203 new residential homes on approximately 59 acres. From Greenspot Road, the existing homes to the north are at a higher elevation than the Project's homes would be to the south. Similar to the existing residential homes to the north, the Project's new homes would have a maximum structure height (highest ridge cap/non-architectural projection) of 30 feet for the 2-story homes and a maximum height of 20 feet for the 1-story homes. The Project would not substantially impact views of the San Bernardino mountains from Greenspot Road.

From Greenspot Road, the views to the open space south of the Project site would be partially obscured with the new residential development, but not at a considerable level due to the southward sloping topography of the open space land and its vegetation. Additionally, other portions of Greenspot Road to the west and east of the Project site would still allow for views of the open space from Greenspot Road. The Project's residential development would not have a substantial adverse effect on a scenic vista.

1b Less Than Significant Impact: The Project site is not located along a designated state scenic highway and the nearest officially designated State Scenic Highway is Route 38, more than ten miles to the east of the Project site. Therefore, the Project does not have the potential to damage trees, rock outcroppings, or historic buildings within state scenic highways. No mitigation measures are required.

1c Less Than Significant Impact: The visual character of the Project site includes an undeveloped area with eucalyptus trees, a jojoba grove and natural but disturbed scrub vegetation. The Project site is located in a mostly urbanized area (west, north, and northeast) with open space to the south. Thus, this subdivision will require a Design Review Application approval for homes designed to comply with development standards set forth in the Heatherglen Planned Development guidelines and the R-1 zoning designation (See Highland Municipal Code Section 16.16.030). As outlined in the Heatherglen Planned Development document for this project (Section 4.4, *Heatherglen PD Land Use and Development Standards*) the intention of the Architectural Design Guidelines is to provide guidance to design an interesting, livable community with variation of housing types, architectural relief and function, and aesthetics. Appropriate detail shall be included on all sides of the residences, paying particular attention to roof pitch, eave details, material and finishes, color, lighting, banding, and trims. It is encouraged when and where appropriate to utilize new materials to convey forms and features of the historic styles of the following four (4) architectural motifs/styles proposed for the Project: American Craftsman Style, Spanish Revival Style, Cape Cod Style, and Tuscan Style. Community landscaping (i.e. letter lots and park are) will contribute to the overall aesthetics of the Heatherglen PD and where appropriate, be functional for a vibrant and active community. Plant palettes shall be planned to encourage water-wise material but emphasize the need for color and diversity of form and shape. Landscape palettes for individual lots shall pay particular attention to the architectural style of the home, avoiding conflicting architectural styles with landscaping. The size and scale of the proposed development would be consistent with surrounding properties to the north. Therefore, no significant impacts to the existing visual character or quality of public views of the Project's surroundings would occur as a result of the proposed Project. The proposed Project would not conflict with applicable zoning and other regulations governing scenic quality. No mitigation measures are required.

1d Less Than Significant Impact: The proposed Project, once developed with 203 single-family homes, will not be a substantial source of light and glare. Night lighting standards are established in the City's General Plan and development code. These standards require that the Project control light and glare from new lighting so that it is directed to remain within the Project site, except for street lights adjacent to Greenspot Road. As outlined in the Heatherglen Planned Development document for this project (Section 4.4, *Heatherglen PD Land Use and Development Standards, Subsection H, Lighting Standards*), exterior lighting fixtures shall be shielded so that illumination is fully confined within the Heatherglen PD boundaries, street light standards and fixtures shall not exceed 25 feet (25') in height, exterior-mounted security lighting fixtures shall not project above fascia or roofline of any residential building or accessory structure, and rear lights of a residence abutting open space/habitat areas shall be shielded to minimize glare spilling onto any open spaces/habitat areas. All required lighting will be in compliance with City standards and any light increase would be similar to that in the neighboring residential developments. Impacts would be less than significant. No mitigation measures are required.

2. AGRICULTURE AND FORESTRY RESOURCES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? ?	☐	☐	☐	☑
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑

e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☑

Explanation:

2a No Impact: The Project Site is not mapped as Prime, Unique, or Farmland of Statewide Importance. Therefore, Project implementation would not convert Prime, Unique, or Farmland of Statewide Importance. No impacts would occur. No mitigation measures are required.

2b No Impact: The proposed Project Site is zoned for Planned Development, Single-Family Residential (PD/R-1) and is consistent with the City's General Plan. The proposed Project is not under a Williamson Act contract. No impacts would occur.

2c-e No Impact: There are no mapped areas of Farmland surrounding the Project site and there are no off-site improvements required by the proposed development that would result in indirect conversion of Farmland. The Project site does not include forest land or timberland and there are no off-site improvements required that would result in the indirect conversion of forest land or timberland. Implementation of the proposed Project would not result in any other conversion of Farmland to non-agricultural production on the Site, as the property is vacant. No impacts would occur.

Mitigation Measures: None required.

3. AIR QUALITY	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☑	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☑	☐	☐
d) Result in other emissions (such as those leading to odors affecting a substantial number of people?	☐	☐	☑	☐

Explanation:

3a No Impact: An Air Quality and Greenhouse Gas Study (AQ/GHG Study) was prepared for the proposed Project and is included in Appendix A. The Air Quality Management Plan (AQMP) details goals, policies, and programs for improving air quality in multiple air basins in California, including the South Coast Air Basin (SCAB) in which the Project is located. In preparation of the AQMP, South Coast Air Quality Management District (SCAQMD) and Southern California Association of Governments (SCAG) use land use designations contained in General Plan documents to forecast, inventory, and allocate regional emissions from land use and development-related sources. For purposes of analyzing consistency with the AQMP, if a proposed Project would have a development density and vehicle trip generation that is substantially greater than what was anticipated in the General Plan, then the proposed project would conflict with the AQMP. On the other hand, if a project's density is consistent with the General Plan, its emissions would be consistent with the assumptions in the AQMP, and the Project would not conflict with SCAQMD's attainment plans. SCAQMD's CEQA Handbook suggests an evaluation of the following two criteria to determine whether a Project involving a legislative land use action would be consistent with or in conflict with the AQMP: 1) The Project would not generate population and employment growth that would be inconsistent with SCAG's growth forecasts, and 2) The Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

A summary of SCAB's current attainment status for criteria air pollutants under federal and state standards is shown below in Table 1 (page 26, Table 3 of the Air Quality and Greenhouse Gas Study). The purpose of these designations is to identify the areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment.

Table 1 South Coast Air Basin Attainment Status

	Attainment Status	
Pollutant	**Federal Standards**	**State Standards**
Ozone (1-hour)	Non-attainment/Extreme	Non-attainment
Ozone (8-hour)	Non-attainment/Extreme	Non-attainment
PM_{10}	Attainment/Maintenance	Non-attainment
$PM_{2.5}$	Non-attainment	Non-attainment
Carbon Monoxide	Attainment/Maintenance	Attainment
Nitrogen Dioxide	Attainment/Maintenance	Attainment
Sulfur Dioxide	Attainment	Attainment
Sulfates	N/A	Attainment
Lead	Non-attainment	Non-attainment
Hydrogen Sulfide	N/A	Attainment
Visibility Reducing Particles	N/A	Attainment

Vinyl	N/A	Attainment

At the time the Air Quality and Greenhouse Gas Study was prepared (March 2017) the Project site was designated under the City of Highland's 2006 General Plan as AG/EQ, which allows 2 residential units per acre, and would allow a maximum of 118 single-family dwelling units. The proposed Project would develop up to 203 single-family dwelling units, an increase of 85 single-family units that would be developed beyond the land use designation in the 2006 General Plan, which is the document that SCAQMD utilized in developing the AQMP.

However, in June 2018, the City approved a City initiated General Plan Amendment (GPA) and Zone Change (ZC) to update the City's General Plan land use designations and zoning. The GPA/ZC redesignated approximately 192 acres of land from Agricultural/Equestrian (AG/EQ) and Public/Quasi Public (P/Q) to Open Space consistent with the 2008 Upper Santa Ana Wash Land Management Plan and HCP, and also redesignated approximately 125 acres of land, which included the Project site, from AG/EQ to Planned Development – Residential Overlay-Low Density Detached Residential (PD/LDR). This GPA and ZC was to allow LDR consistent with what was envisioned under the General Plan and designate Open Space consistent with the Upper Santa Ana Wash Land Management Plan and HCP. This GPA/ZC, in general, allowed for a transfer of the density that was lost from conversion to Open Space to the newly designated PD/LDR use areas.

As outlined in the City of Highland General Plan Land Use Amendment & Zoning Amendment GPA 017-002 and ZC 017-002 (Greenspot Road/Pole Line Road) Initial Study Negative Declaration, the maximum number of dwelling units allowed under the previous land use categories (based on total acreage of each category) is 543. The number of dwelling units allowed under the redesignated land use categories of OS (no dwelling units allowed) and PD/R1 (2.1-6.0 dwelling units/acre) is 262-748. Future development in the redesignated areas would not be allowed to exceed the 543 maximum dwelling units allowed under the previous General Plan and EIR without a separate CEQA analysis. Therefore, the potential future development following the GPA and ZC is consistent with the population projections set forth by SCAG for the City based on the General Plan land use categories. The GPA and ZC does not indirectly result in development of more residential units and does not exceed the established population or growth projections for the City. As a result of the GPA/ZC, the proposed Project would not result in residential development beyond the land use designation in the 2006 General Plan and therefore the AQMP.

In addition, the 2016 SCAG Regional Transportation Growth Projections anticipate a 1.5 percent growth rate within the City of Highland through the year 2020. The U.S. Census FactFinder estimated that in 2015 the City of Highland had 16,554 housing units and a very low homeowner vacancy rate of 0.7 percent, which indicates that additional homeowner housing is needed to meet the needs of the City's residents, and to provide a "healthy" housing market. The 203 single-family residences that would be developed by the proposed Project would equate to a 1.3 increase in total residential units within the City, which is below the SCAG anticipated 1.5 percent annual increase in housing and would assist in providing units to fill the City's homeowner housing needs. Thus, the Project would comply with Consistency Criterion No. 1 of the SCAQMD's CEQA Handbook.

In regard to Consistency Criterion No. 2, which evaluates the potential of the proposed Project to increase the frequency or severity of existing air quality violations, the AQ/GHG Study y indicates that the Project would not result in impacts related to an increase in air quality violation, and no significant adverse impacts are anticipated. Therefore, the proposed Project is consistent with Consistency Criterion No.2, and impacts related to conflict with or obstruction with an applicable air quality plan would be less than significant.

Overall, implementation of the proposed Project would not conflict with or obstruct the AQMP and there would be no impacts.

3b <u>Less Than Significant Impact:</u> Construction activities could generate substantial amounts of dust (including particulate matter less than ten and 2.5 micrometers in diameter, PM_{10} and $PM_{2.5}$, respectively) primarily from “fugitive” sources (i.e., emissions released through means other than through a stack or tailpipe) and other criteria air pollutants primarily from the operation of heavy equipment construction machinery (primarily diesel operated) and construction worker automobile trips (primarily gasoline operated).

Fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the prevailing weather. Sources of fugitive dust during construction could include vehicle movement over paved and unpaved surfaces, demolition, excavation, earth movement, grading, and wind erosion from exposed surfaces.

Construction activities would also result in the emission of other criteria pollutants from equipment exhaust, construction-related vehicular activity and construction worker automobile trips. Emission levels for construction activities would vary depending on the number and type of equipment, duration of use, operation schedules, and the number of construction workers. Criteria pollutant emissions of reactive organic gases (ROG) and oxides of nitrogen (NOx) from these emission sources would incrementally add to the regional atmospheric loading of ozone precursors during project construction.

Mobile source emissions, primarily NOx, would result from the use of construction equipment such as graders, backhoes, and cranes. During the finishing phase, paving operations and the application of architectural coatings (i.e., paints) and other building materials would release ROG. The assessment of construction air quality impacts considers each of these potential sources.

All development projects are subject to SCAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction anticipated under the proposed project would include Rule 401, Rule 403, Rule 402, Rule 445, Rule 481, Rule 1108, Rule 1113, Rule 1143, Rule 1186, Rule 1303, and Rule 1401.

It is mandatory for all construction projects in the SCAB to comply with SCAQMD Rule 403 for fugitive dust that include, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the construction site, and maintaining effective cover over exposed areas. SCAQMD Rule 403 regulates construction, which periodically may cause fugitive dust emissions into the atmosphere.

SCAQMD Rule 402 identifies standards to reduce quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause or have natural tendency to cause injury or damage to business or property.

SCAQMD Rule 445 prohibits permanently installed wood burning devices into any new development. A wood burning device means any fireplace, wood burning heater, or pellet-fueled wood heater, or any similarly enclosed, permanently installed, indoor or outdoor device burning any solid fuel for aesthetic or space-heating purposes, which has a heat input of less than one million British thermal units per hour.

SCAQMD Rule 481 applies to all spray painting and spray coating operations and equipment and states that a person shall not use or operate any spray painting or spray coating equipment unless one of the following conditions is met:

- The spray coating equipment is operated inside a control enclosure, which is approved by the Executive Officer. Any control enclosure for which an application for permit for new construction, alteration, or change of ownership or location is submitted after the date of adoption of this rule shall be exhausted only through filters at a design face velocity not less than 100 feet per minute nor greater than 300 feet per minute, or through a water wash system designed to be equally effective for the purpose of air pollution control.
- Coatings are applied with high-volume low-pressure, electrostatic and/or airless spray equipment.
- An alternative method of coating application or control is used which has effectiveness equal to or greater than the equipment specified in the rule.

SCAQMD Rule 1108 governs the volatile organic compounds (VOC) content of asphalt, Rules 1113 and 1143 that govern the VOC content in architectural coating, paint, thinners, and solvents, was accounted for in the construction emissions modeling. Furthermore, the use of low VOC coatings was included to reduce the ROG emissions that would be generated from the application of architectural coating.

SCAQMD Rule 1186 limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

SCAQMD Rule 1303 governs the permitting of re-located or new major emission sources, requiring Best Available Control Measures and setting significance limits for PM10 among other pollutants.

SCAQMD Rule 1401 specifies limits for maximum individual cancer risk, cancer burden, and non-cancer acute and chronic hazard index from new permit units, relocations, or modifications to existing permit units, which emit toxic air contaminants.

Construction scheduling was based on CalEEMod defaults and typical construction scheduling, and CalEEMod default equipment was used. As shown in Table 2, the proposed Project would not result in a significant impact to air quality during construction activities. The calculated emission results from CalEEMod demonstrate that the construction of this Project would not exceed the SCAQMD thresholds, and that construction related impacts on regional air quality would be less than significant.

Table 2 Peak-Day Unmitigated Construction Emissions (lbs/day)

Construction Season	**ROG**	**NOx**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Summer	30.8	68.0	39.9	0.06	21.1	12.6
Winter	30.8	68.0	39.8	0.06	21.1	12.6
SCAQMD Significance Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Exceed Significance?	No	No	No	No	No	No

However, to reduce potential impacts related to Local Significance Thresholds (LSTs, as described below), mitigation measures (AQ-1) would be implemented during construction, which would reduce emissions further below thresholds, as shown in Table 3.

Table 3 Peak-Day Mitigated Construction Emissions (lbs/day)

Construction Season	**ROG**	**NOx**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Summer	30.6	5.4	34.1	0.06	2.8	1.5
Winter	30.6	5.4	34.0	0.06	2.8	1.6
SCAQMD Significance Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Exceed Significance?	No	No	No	No	No	No

Implementation of the proposed Project would result in long-term regional emissions of criteria air pollutants and ozone precursors associated with area sources, such as natural gas consumption, landscaping, applications of architectural coatings, and consumer products, in addition to operational mobile emissions. Development of the proposed Project would result in 2,047 weekday daily trips.

Operations emissions associated with the proposed Project were modeled using CalEEMod. Model defaults were adjusted to reflect project-specific data, including the size and type of the proposed land use and project specific trip rates. The highest modeled operations emissions are presented in Table 4. Using the highest modeled operations emissions in the CalEEMod produces conservative results where the actual operations emissions is likely to be lower. Significance is determined based on the total project contribution to regional criteria pollutant emissions.

Table 4 Operational Emissions (lbs/day)

Source	**ROG**	**NOx**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Area	14.2	3.9	67.8	0.2	8.4	8.4
Energy	0.2	1.9	0.8	0.01	0.2	0.2
Mobile	4.5	22.2	60.7	0.2	15.1	4.2
Total Emissions	**18.9**	**28.0**	**129.3**	**0.4**	**23.67**	**12.8**
SCAQMD Significance Threshold	**55**	**55**	**550**	**150**	**150**	**55**
Exceed Significance?	No	No	No	No	No	No

As shown in Table 4, the operational emissions of criteria pollutants that would be generated by the Project would be below the SCAQMD's applicable thresholds. Therefore, the Project's operational emissions would not substantially contribute to emissions concentrations that exceed the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS).

The CEQA Guidelines require that projects be evaluated with respect to their contribution to the cumulative baseline conditions for criteria pollutants. The SCAB is considered the cumulative study area for air quality. Because the SCAB is currently classified as a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, cumulative development consisting of the proposed Project along with other reasonably foreseeable future projects in the Basin could violate an air quality standard or contribute to an existing or projected air quality violation. However, based on SCAQMD's cumulative air quality impact methodology, SCAQMD recommends that if an individual project results in air emissions of criteria pollutants (ROG, CO, NO_X, SO_X, PM_{10}, or $PM_{2.5}$) that exceed the SCAQMD's recommended daily thresholds for project-specific impacts, then it would also result in a cumulatively considerable net increase of these criteria pollutants for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.

As shown in Tables 3 and 4, the project's construction emissions would not exceed SCAQMD's daily thresholds. Thus, because the proposed project's construction-period impact would be less than significant, the proposed project would not result in a significant cumulative impact, when considered with other past, present and reasonably foreseeable projects. Operational emissions associated with the proposed project, as shown in Table 4 would not exceed the SCAQMD's thresholds of significance for any criteria pollutants. Per SCAQMD's cumulative air quality impact methodology and because the proposed project's operational daily emissions impacts would be less than significant, the proposed Project would not result in a cumulatively considerable net increase in any nonattainment pollutants, and impacts would be less than significant.

3c Less Than Significant Impact with Mitigation Incorporated: Sensitive receptors are populations that are more susceptible to the effects of air pollution than are the population at large. The SCAQMD identifies the following as sensitive receptors: residences, long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, churches, schools, playgrounds, childcare centers, and athletic facilities.

In an urbanized environment, air pollutant concentrations are usually most prominent along busy streets and at busy intersections, where automotive exhausts can build up while vehicles stop and idle or slow down to approach and proceed through or make turning movements. The primary source of potential air toxics associated with construction of the proposed Project includes diesel particulates from trucks use and idling on the Project site.

Construction activities would be short-term and sensitive receptors would be exposed to air pollutants from construction emissions for short-term limited time during construction activities. Health risk is evaluated assuming a constant exposure to emissions of a 70-year lifetime, 24 hours a day, seven days a week. As the exposure to receptors would be short- term and limited during development activities, impacts from construction activities would be less than significant.

Once operational the proposed Project would result in new single-family residential land uses that may utilize solvents, cleaners, and generate motor vehicle emissions, which are not anticipated to emit Toxic Air Contaminants (TAC) emissions in appreciable quantities.

Carbon monoxide (CO) concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during peak commute hours and certain meteorological conditions. Under specific meteorological conditions (e.g., stable conditions that result in poor dispersion), CO concentrations may reach unhealthy levels with respect to local sensitive land uses such as residential areas, schools, and hospitals. Because of reduced speeds and vehicle queuing, “hot spots” typically occur at high traffic volume intersections.

As described in response 3b above, the proposed Project would result in 2,047 vehicle trips per day. Of these trips 161 would occur in the a.m. peak hour and 215 would occur in the p.m. peak hour. The Traffic Impact Analysis (TIA) prepared for the proposed Project details that the proposed Project would not result in more than 44,000 vehicles per hour at an intersection, which is the volume of peak hour traffic required to generate or contribute to a CO hotspot. In addition, the project would not result in an impact to a Congestion Management Plan location. Therefore, CO hotspots would not result from the proposed Project.

The daily on-site construction emissions generated by the proposed Project were evaluated against SCAQMD’s LSTs for a 5-acre site to determine whether the emissions would cause or contribute to adverse localized air quality impacts. The nearest sensitive receptor is approximately 100 feet to the Project site under construction; thus, the mass rate look-up table receptor distance of 82 feet is used to evaluate the potential localized air quality impacts associated with the peak day construction emissions from the project.

Table 5 identifies the daily unmitigated, localized on-site emissions that are estimated to occur during the project construction. As shown, the daily unmitigated emissions would exceed the applicable SCAQMD LST thresholds for PM_{10} and $PM_{2.5}$.

Table 5 Unmitigated Localized Daily Construction Emissions (lbs/day)

Construction Season	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Summer	52.3	23.5	20.9	12.6
Winter	52.3	23.5	20.9	12.6
SCAQMD Significance Threshold	**270**	**1,746**	**14**	**8**
Exceed Significance?	No	No	Yes	Yes

Therefore, Mitigation Measure 1 & 2 (AQ-1 & AQ-2) would be implemented to provide additional requirements beyond Rule 403, which requires watering active sites at three times daily and implementation of Tier IV diesel engine standards. Mitigation Measure AQ-1 requires active areas to be watered three times per day to keep soil moist enough so visible dust plumes (PM_{10}) are eliminated, covering disturbed areas, and requirements for vehicles to travel at a maximum of 25 mph on the Project site during construction activities. Mitigation Measure AQ-2 requires use of Tier IV diesel engine standards for construction operations, which reduces diesel emissions, a source of $PM_{2.5}$. With implementation of Mitigation Measures AQ-1 and AQ-2, PM_{10} and $PM_{2.5}$

construction emissions would be reduced below the LST thresholds, as shown in Table 6.

Table 6 Mitigated Localized Daily Construction Emissions (lbs/day)

Construction Season	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Summer	2.0	20.9	2.8	1.6
Winter	2.0	20.9	2.8	1.6
SCAQMD Significance Threshold	**270**	**1,746**	**14**	**8**
Exceed Significance?	No	No	No	No

Mitigation Measure AQ-1
The construction plans and specifications shall state that in addition to standard Rule 403 requirements, the following measures shall be incorporated into project construction activities:

- All clearing, grading, earth-moving, or excavation activities shall cease when winds exceed 25 mph per SCAQMD guidelines in order to limit fugitive dust emissions.
- The contractor shall ensure that all disturbed unpaved roads and disturbed areas within the Project site are watered at least three times daily during dry weather; preferably in the mid-morning, afternoon, and after work is done for the day.
- The contractor shall ensure that traffic speeds within the Project site areas are reduced to 15 miles per hour or less.

Mitigation Measure AQ-2
Implementation of Tier IV Diesel Engine Standards shall be required for construction activities.

With implementation of Mitigation Measures AQ-1 and AQ-2, construction emissions would be reduced below the LST thresholds and are less than significant.

3d Less Than Significant Impact: The SCAQMD Air Quality Handbook identifies the following uses as having a potential odor issues: wastewater treatment plants, food processing plants, agricultural uses, chemical plants, composting, refineries, landfills, dairies, and fiberglass moldings. The proposed Project would develop single-family residential uses that do not involve the types of uses that would emit emissions including those leading to objectionable odors affecting a substantial number of people.

In addition, odors generated that could be generated by construction activities are required to follow SCAQMD Rule 402 to prevent odor nuisances on sensitive land uses. SCAQMD Rule 402, Nuisance, states:

A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

During construction of the proposed project, emissions from construction equipment, such as diesel exhaust, and volatile organic compounds from architectural coatings and paving activities may generate odors. However, these odors would be temporary and localized to the construction site; and therefore, they are not expected to affect a substantial number of people. Thus, impacts relating to both operational and construction activity odors would be less than significant.

Mitigation Measures: Required

4. BIOLOGICAL RESOURCES Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☑	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☑	☐	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☑	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☑	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☑	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☑	☐	☐	☐

Explanation:

4a <u>Potentially Significant Impact</u>: This topic will be evaluated in the forthcoming EIR for the Project.

4b <u>Potentially Significant Impact</u>: This topic will be evaluated in the forthcoming EIR for this Project.

4c <u>Potentially Significant Impact</u>: This topic will be evaluated in the forthcoming EIR for this Project.

4d Potentially Significant Impact: This topic will be evaluated in the forthcoming EIR for this Project.

4e Potentially Significant Impact: This topic will be evaluated in the forthcoming EIR for this Project.

4f Potentially Significant Impact: This topic will be evaluated in the forthcoming EIR for this Project.

5. CULTURAL RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☑	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☑	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☑	☐	☐

Explanation:

5a Less Than Significant with Mitigation Incorporated: A Phase I Cultural Resources Assessment was conducted for the proposed Project and is included in Appendix B for reference. A records search at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton indicated that five resources have been mapped within or partially within the Project site. In addition, the records search showed that 100 percent of the Project site has been previously inventoried via two reports. Including the two reports that address the Project site, a total of 16 studies have been completed within one mile. These studies have addressed approximately 30 percent of the land within the search radius and have recorded 39 cultural resources. Various structures have been located within the southwestern portion of the Project site over time and in association with a historic age citrus and poultry ranching complex. This complex includes several structures and active fields or groves that were present by at least 1938 and the structures were removed by 2009.

After two visits to the site in July and October 2017, two of the five historical resources could not be located and are considered destroyed, no known artifacts or features for these two resources would be impacted by the Project, and no further work is recommended prior to Project implementation. The other three historical resources currently lack the artifact content or features once recorded at each site and all three sites have been subject to soil disturbances associated with erosion. These three resources do not appear to retain sufficient integrity to be considered eligible for inclusion in the California Register of Historical Resources (CRHR) and no evidence was detected to indicate that any of these resources have the potential to yield additional information important to history (Criterion 4). Therefore, it is recommended as not eligible for inclusion in the CRHR and not significant pursuant to CEQA. In addition, these sites are recommended by the Phase I Cultural Resources Assessment as not eligible as cultural resources under Section 16.32.060 of the City of Highland Municipal Code. Therefore, implementation of the proposed Project would not result in a substantial adverse change to documented historic age resources and no further work or mitigation is recommended for these sites. However, the Project site is considered to have a high sensitivity for historic age resources based on the intensive historic era use of the Project site and surrounding lands. Mitigation is required to reduce the potential adverse impacts to historic age resources that may be encountered during ground-disturbing construction activities. With implementation of Mitigation Measure (MM) CR-1 and MM CR-2, potential impacts would be less than significant.

5b Less Than Significant with Mitigation Incorporated: Based on the results of a records search, pedestrian survey, site visits, and the research, recording, and evaluation efforts, no known archaeological resources pursuant to CEQA are located in the Project site. However, archaeological monitoring is recommended during Project implementation because the Project site appears to have a high sensitivity for historic age resources and moderate to low sensitivity for prehistoric resources. With implementation of Mitigation Measure (MM) CR-1 and MM CR-2 impacts would be less than significant.

5c Less Than Significant with Mitigation Incorporated: No human remains are known to exist within the Project site. However, should any human remains be uncovered during construction activities, implementation of the following MM CR-3 would reduce this potential impact to below a level of significance. Therefore, no significant impacts related to human remains will be result from the proposed Project.

Mitigation Measures:

Mitigation Measure CR-1

The Project site has a high sensitivity for historic age resources and a moderate to low sensitivity for prehistoric resources. This is based on the intensive historic era use of the Project site and surrounding lands. To address this sensitivity, an archaeological monitor with at least 3 years of regional experience in archaeology shall be present for all ground-disturbing activities that occur within the proposed Project site (which includes, but is not limited to, tree/shrub removal and planting, clearing/ grubbing, grading, excavation, compaction, fence/gate removal and installation, drainage and irrigation removal and installation, hardscape installation [benches, signage, boulders, walls seat walls, fountains, etc.], and archaeological work.) A sufficient number of archaeological monitors shall be present each workday to ensure that simultaneously occurring ground-disturbing activities receive thorough levels of monitoring coverage. A monitoring and treatment plan that is reflective of the Project mitigation (“Cultural Resources” and “Tribal Cultural Resources”) shall be completed by the archaeologist and submitted to the Lead Agency for dissemination to the San Manuel Band of Mission Indians (SMBMI) Cultural Resources Department. Once the City and SMBMI review and agree to the plan, it shall be adopted by the Lead Agency – the plans must be adopted prior to issuance of a grading permits for the Project. Any and all findings will be subject to the protocol detailed within the monitoring and treatment plan.

Mitigation Measure CR-2

Per CR-1, an archaeologist will be present for any and all ground-disturbing activity. If a pre-contact or post-contact cultural resource is discovered during project implementation, ground-disturbing activities shall be suspended 60 feet around the resource(s) and an Environmentally Sensitive Area (ESA) physical demarcation/barrier constructed. Representatives from the San

Manuel Band of Mission Indians (SMBMI) Cultural Resources Department, the Archaeological Monitor/applicant, and the Lead Agency shall confer regarding treatment of the discovered resource, as detailed within the monitoring and treatment plan. A research design shall be developed and will include a plan to evaluate the resource for significance under CEQA criteria. The research design shall also acknowledge that, regardless of significance under CEQA, all pre-contact discoveries, as well as post-contact resources associated with the citrus industry shall be subject, if feasible, to avoidance and preservation in place as treatment.

Should any resources not be a candidate for avoidance or preservation in place, and full data recovery is necessary, the research design shall include a comprehensive discussion of resource processing, analysis, curation, and reporting protocols and obligations. All analysis shall be conducted in conference with the SMBMI Cultural Resources Department. All removed material shall be temporarily curated on site and a fully executed reburial agreement shall be developed with the SMBMI Cultural Resources Department. This agreement shall include measures and provisions to protect the future reburial area from any future impacts (vis a vis project plans, conservation/preservation easements, deed riders, etc.). Reburial shall not occur until all ground-disturbing activities associated with the Project have been completed, all monitoring has ceased, all cataloguing and basic recordation of cultural resources have been completed, and a final monitoring report has been issued to Lead Agency, CHRIS, and the SMBMI Cultural Resources Department.

Should it occur that avoidance, preservation in place, or on-site reburial are not an option for treatment, the landowner shall relinquish all ownership and rights to this material and confer with the SMBMI Cultural Resources Department to identify an American Association of Museums (AAM)-accredited facility within San Bernardino County that can accession the materials into their permanent collections and provide for the proper care of these objects in accordance with the 1993 CA Curation Guidelines. A curation agreement with an appropriate qualified repository shall be developed between the landowner and museum that legally and physically transfers the collections and associated records to the facility. This agreement shall stipulate the payment of fees necessary for permanent curation of the collections and associated records and the obligation of the Project developer/applicant to pay for those fees.

All draft reports containing the significance and treatment findings and data recovery results shall be prepared by the archaeologist and submitted to the Lead Agency and the SMBMI Cultural Resources Department for their review and comment. After approval from the City and SMBMI, the final reports are to be submitted to the local CHRIS Information Center, the Lead Agency, and the SMBMI Cultural Resources Department.

Mitigation Measure CR-3

The Lead Agency and the applicant/developer shall immediately contact the County Coroner and the San Manuel Band of Mission Indians (SMBMI) Cultural Resources Department in the event that any human remains are discovered during implementation of the Project. If the Coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, the Coroner shall ensure that notification is provided to the Native American Heritage Commission (NAHC) within 24 hours of the determination, as required by California Health and Safety Code § 7050.5 (c). The NAHC-identified Most Likely Descendant (MLD), shall be allowed, under California Public Resources Code § 5097.98 (a), to (1) inspect the site of the discovery and (2) make determinations as to how the human remains and funerary objects shall be treated and disposed of with appropriate dignity. The MLD, Lead Agency, and landowner agree to discuss in good faith what constitutes "appropriate dignity" as that term is used in the applicable statutes. The MLD shall complete its inspection and make recommendations within 48 hours of receiving notification from either the Developer or the NAHC, as required by California Public Resources Code § 5097.98.

Reburial of human remains and/or funerary objects (those artifacts associated with any human remains or funerary rites) shall be accomplished in compliance with the California Public Resources Code § 5097.98 (a) and (b). The MLD in consultation with the landowner, shall make the final discretionary determination regarding the appropriate disposition and treatment of human remains and funerary objects. All parties are aware that the MLD may wish to rebury the human remains and associated funerary objects on or near the site of their discovery, in an area that shall not be subject to future subsurface disturbances. The applicant/developer/landowner should accommodate on-site reburial in a location mutually agreed upon by the Parties.

It is understood by the City and SMBMI that unless otherwise required by law, the site of any reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The Coroner, parties, and Lead Agencies will be asked to withhold public disclosure information related to such reburial, pursuant to the specific exemption set forth in California Government Code § 6254 (r).

6. ENERGY – Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☑	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☑	☐

Explanation:

6a-b <u>Less than Significant Impact</u>: An Energy Analysis was prepared for the proposed Project and is included in Appendix C. Construction activities are expected to last for approximately four years. Construction activities would consume energy through the operation of heavy off-road equipment, trucks, and worker traffic. Construction equipment fuel consumption was based on equipment lists generated using California Emissions Estimator Model (CalEEMod) default values and input from the Project applicant. The fuel consumption of off-road equipment calculated in the analysis was based on the fuel consumption rates in the OFFROAD 2011 statewide data sets as well as the horsepower, usage hours, and load factors from CalEEMod as part of the proposed Project's air quality analysis. Construction equipment would result in the consumption of an estimated 272,397 gallons of diesel fuel over the entire construction period. Worker, vendor, and haul trips would result in approximately 15,935 Vehicle Miles Traveled (VMT) over the entire construction period. A countywide average fuel consumption of 20.48 miles per gallon (mpg) was used to determine fuel consumption from worker and vendor trips because these trips would occur in a variety of different vehicle types and classes. The construction worker and vendor trips would result in the consumption of an estimated 344,421 gallons of gasoline/fuel during the construction phase.

Although the Project would result in the consumption of an estimated 272,397 gallons of diesel and 344,421 gallons of gasoline during construction, the Project is designed to balance the grading on site. This would substantially reduce the amount of potential haul trips associated with the import and export of soil for construction of the proposed Project, which in turn would reduce the amount of fuel required by the Project. Additionally, construction equipment fleet turnover and increasingly stringent state and federal regulations on engine efficiency combined with local, state and federal regulations limiting engine idling times and requiring recycling of construction debris, would further reduce the amount of transportation fuel demand during the Project's construction. Considering these reductions in transportation fuel use, the proposed Project would not result in the wasteful and inefficient use of energy resources during construction and impacts would be less than significant.

During operations the proposed Project would consume natural gas for space heating, water heating, and cooking associated with the proposed residential land use. The natural gas consumption was estimated using CalEEMod default values to consume approximately 7,536,660 thousand British thermal units of natural gas per year.

During operations the proposed Project would use electricity for lighting, appliances, and other uses. Annual electricity demand was estimated using CalEEMod default values to be 1,901,510 kilowatt-hours (kWh) of electricity.

The proposed Project would result in a long-term increase in demand for electricity and natural gas. However, the Project would be designed according to the most recent Title 24 standards of the California Code of Regulations. Part 6 of Title 24 specifically establishes energy efficiency standards for residential and non-residential buildings constructed in the State of California in order to reduce energy demand and consumption. Part 6 is updated periodically to incorporate and consider new energy efficiency technologies and methodologies. The most recent amendments, referred to as the 2016 standards, became effective January 1, 2017. The proposed Project would meet current Title 24 requirements. These measures would reduce inefficient, wasteful and unnecessary use of electricity or natural gas during operation of the Project and impacts would be less than significant.

Water used for both indoor and outdoor requires electricity for water treatment, conveyance, and distribution. The Project's water demand was calculated based on default values in CalEEMod for the project's specific land uses. The proposed Project is estimated to use approximately 13.22 million gallons of indoor water per year as well as 8.33 million gallons of outdoor water per year. This would result in a total of approximately 299,085 kWh per year of electricity for indoor and outdoor water treatment, conveyance, and distribution. As required within the California Code of Regulations Title 24, Part 11, Chapter 4, all water fixtures would be required to be compliant with the California Green Building Standards Code, which would reduce the amount of water used by the Project. Energy demand related to wastewater treatment is accounted for in the energy consumption associated with the Project's water demand above. The proposed Project is not expected to result in wasteful or inefficient use of electricity for water or wastewater treatment or conveyance and impacts would be less than significant.

During operation of the proposed Project, vehicle trips would be generated. The proposed Project's specific land uses were modeled in CalEEMod using default vehicle trip generation rates with vehicle trips generated at approximately 6,830,784 Vehicle Miles Traveled (VMT). Based on a countywide average fuel consumption of 20.43 mpg, the Project would result in consumption of an estimated 334,351 gallons of fuel for transportation. Various federal and state regulations including the Low Carbon Fuel Standard, Pavley Clean Car Standards, and Low Emission Vehicle Program would serve to reduce the Project's transportation fuel consumption progressively into the future. Therefore, the Project would be designed to avoid the wasteful and inefficient use of transportation fuel during operations and impacts would be less than significant.

Mitigation Measures: Not Required

7. GEOLOGY AND SOILS -- Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☑	☐	☐
ii) Strong seismic ground shaking?	☐	☑	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☑	☐	☐
iv) Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☑	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (2001), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☑	☐	☐

Explanation:

7a) i Less Than Significant Impact with Mitigation Incorporated: The City of Highland General Plan identifies in Figure 6-2, Potential Geological Hazards that the San Andres Fault System is located out of the Project site to the north. An Engineering Geology Investigation was conducted for the Project site in 2006 in which information from that is used herein and can be found in Appendix D. The site does not lie within or immediately adjacent to an Earthquake Fault Zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act. The closest Alquist-Priolo Earthquake Fault Zone is located approximately 3/4-mile northeast of the site associated with the San Andreas Fault. Due to the proximity of the site to the San Andreas Fault, strong ground motion associated with a large earthquake along this fault may occur at the site. As outlined in the Engineering Geology Investigation, a northwest trending groundwater barrier traversing the northwest portion of the site was mapped in 1963 and referred to as Fault “K.” Northwest trending tonal lineaments were observed traversing the site on the aerial photographs reviewed as part of the Engineering Geology Investigation. However, no evidence for active faulting was observed associated with Fault “K” on or in the vicinity of the site, on the aerial photographs reviewed, or in the field. Due to the potential of tensional ground surface fracturing on the site as a result of differential response of geological materials across the suspected traces of Fault “K” in the event of a large nearby earthquake, subsidence, differential compaction, or seismic settlement, Mitigation Measure GEO-1 shall be implemented. In addition, all structures constructed at the Project site would be required to follow California Building Code (CBC) and to be designed and constructed to resist the effects of strong ground motion. Less than significant impacts would occur with implementation of Mitigation Measure GEO-1.

7a) ii Less Than Significant Impact with Mitigation Incorporated: The site is located in a seismically active area of Southern California and will likely be subjected to very strong seismically related ground shaking over the anticipated life span of the Project. Structures within the site would be required to be designed and constructed to resist the effects of strong ground motion in accordance with the most recent California Building Code. As outlined above, due to the potential of tensional ground surface fracturing on the site as a result of differential response of geological materials across the suspected traces of Fault “K” in the event of a large nearby earthquake, subsidence, differential compaction, or seismic settlement, Mitigation Measure GEO-1 shall be implemented. Less than significant impacts would occur with implementation of Mitigation Measure GEO-1.

7a) iii Less Than Significant Impact with Mitigation Incorporated: Figure 6.3 of the City of Highland General Plan shows that the Proposed site is located within the High Liquefaction Susceptibility Area, which includes the southern portion. No evidence for spring activity or perched ground-water conditions was observed on or in the immediate vicinity of the site during the geologic field reconnaissance or on the aerial photographs reviewed.

However, the sediments on the site are considered to have a high potential for liquefaction from a geologic standpoint based on 1) high groundwater, 2) sandy sedimentary deposits, 3) recent age of material, and 4) close proximity to an active fault. Damage from earthquake-induced ground failure associated with liquefaction could be high in buildings constructed on improperly engineered fills or saturated alluvial sediments that have not received adequate compaction or treatment in accordance with current building code requirements. Structures within the site are required to be designed and constructed to in accordance with the most recent California Building Code requirements and standard industry practices and all recommendations for site preparation (including compaction and treatment) made by the Geotechnical Engineer shall be implemented as outlined in Mitigation Measure GEO-2. Less than significant impacts would occur.

7a) iv <u>No Impact</u>: According to Figure 6.3 of the City of the Highland General Plan, a portion of the proposed site is susceptible to landslide. Per the Engineering Geology Investigation, no evidence for landsliding was observed on or in the immediate vicinity of the site, in the field or on the aerial photographs reviewed. The proposed site is relatively flat and gently sloping with no substantial hills, slopes nor drop offs. Due to the lack of significant topography, landsliding is not expected on the site. No mitigation measures are required.

7b <u>Less Than Significant Impact:</u> This Project's future development of the property may result in minor soil erosion or loss of topsoil during construction activities from wind and water erosion. The City will condition the Project to submit grading plans and a Storm Water Pollution and Prevention Plan (SWPPP), as well as, be in conformity with the Water Quality Management Plan (WQMP) for post-construction drainage. Less than significant impacts would occur, and no mitigation measures are required.

7c <u>Less Than Significant Impact With Mitigation Incorporated:</u> As outlined in 6a) i and ii above, due to the potential of tensional ground surface fracturing on the site as a result of differential response of geological materials across the suspected traces of Fault "K" in the event of a large nearby earthquake, subsidence, differential compaction, or seismic settlement, Mitigation Measure GEO-1 shall be implemented. In addition, all structures constructed at the Project site would be required to follow California Building Code (CBC) and to be designed and constructed to resist the effects of strong ground motion. Less than significant impacts would occur with implementation of Mitigation Measure GEO-1. As outlined in 6a) iii above, due to the site's potential for liquefaction implementation of Mitigation Measure GEO-2 is required to reduce potential impacts to less than significant.

7d <u>No Impact</u>: The Project site is not located on known or mapped expansive soil. Structures within the site are required to be designed and constructed to in accordance with the most recent California Building Code requirements and standard industry practices. No mitigation measures are required.

7e <u>No Impact:</u> The proposed Project will connect to the local water and sewer delivery system, therefore no impacts. No mitigation measures are required.

7f <u>Less Than Significant with Mitigation Incorporated:</u> No paleontological resources or unique geologic features were identified within the Project Site. While no paleontological resources have currently been identified within the Project Site, there is still potential for the presence of paleontological resources to be uncovered during grading activities. With the monitoring of ground-disturbing activities from implementation of MM CR -1 and CR-2, impacts would be less than significant.

Mitigation Measures:

Mitigation Measure GEO-1

Due to the potential hazard of tensional ground surface fracturing on the site as a result of differential response of geological materials across the suspected traces of Fault "K" in the event of a large, nearby earthquake, subsidence, differential compaction, or seismic settlement, the foundations and slabs of the proposed residences shall be reinforced to resist tensional ground cracking.

Mitigation Measure GEO-2

Due to the potential for liquefaction at the site the additional parameters of soil density, grain size distribution and exact depth to groundwater, a geotechnical engineer shall ascertain the final susceptibility of the site to liquefaction. A depth to groundwater of 10 feet from the ground surface shall be used for calculating the liquefaction potential of the site. The Geotechnical/Soils evaluation shall be submitted to the City with building plans for review and approval and all site preparation recommendations shall be implemented by the grading contractor. The final grading plan for the site shall be reviewed and approved by an engineering geologist prior to grading of the site and grading of the site should be evaluated by the engineering geologist by in-grading inspections.

8. GREENHOUSE GAS EMISSIONS – Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☑	☐

Explanation:

8a-b <u>Less than Significant Impact</u>: An Air Quality and Greenhouse Gas Study was prepared for the proposed Project and is included in Appendix A. Construction activities would be temporary but could contribute to global climate change impacts. Construction activities would result in the emission of greenhouse gases (GHGs) from equipment exhaust, construction-related vehicular activity and construction worker automobile trips. Emission levels for construction activities would vary depending on the number and type of equipment, duration of use, operation schedules, and the number of construction workers.

In 2008, the SCAQMD formed a working group to identify greenhouse gas emissions thresholds for land use projects that could be used by local lead agencies in the South Coast Air Basin. The working group developed tiered threshold options that are contained in the SCAQMD Draft Guidance Document – Interim CEQA Greenhouse Gas Significance Threshold, that could be applied by lead agencies. The working group has not provided additional guidance since release of the interim guidance in 2008; however, the Guidance Document provides substantial evidence supporting the approaches to significance of GHG emissions that can be considered by the lead agency in adopting its own threshold.

The current interim SCAQMD thresholds consist of the following tiered approach:

- Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether the project is consistent with a greenhouse gas reduction plan. If a project is consistent with a qualifying local greenhouse gas reduction plan, it does not have significant greenhouse gas emissions.
- Tier 3 consists of screening values. A project's construction emissions are averaged over 30 years and are added to the project's operational emissions. If a project's emissions are below one of the following screening thresholds, then the project is less than significant:
  - Residential and Commercial land use: 3,000 MTCO2e per year
  - Industrial land use: 10,000 MTCO2e per year
  - Based on land use type: residential: 3,500 MTCO2e per year; commercial: 1,400 MTCO2e per year; or mixed use: 3,000 MTCO2e per year
- Tier 4 has the following options:
  - Option 1: Reduce BAU emissions by a certain percentage; this percentage is currently undefined
  - Option 2: Early implementation of applicable AB 32 Scoping Plan measures
  - Option 3: 2020 target for service populations (SP), which includes residents and employees: 4.8 MTCO2e/SP/year for projects and 6.6 MTCO2e/SP/year for plans
  - Option 4: 2035 target: 3.0MTCO2e/SP/year for projects and 4.1 MTCO2e/SL/year for plans
- Tier 5 involves mitigation offsets to achieve target significance threshold.

The Tier 3 screening threshold uses the Executive Order S-3-05 year 2050 goal as its basis. Achieving the Executive Order's objective would contribute to worldwide efforts to cap CO2 concentrations at 450 ppm, thus stabilizing global climate.

Total estimated construction related GHG emissions for the proposed Project are shown in Table 7 below (page 48, Table 11 of the Air Quality and Greenhouse Gas Study). As shown, the total estimated unmitigated and mitigated GHG emissions during construction would equal approximately 460 MTCO2e. This would equal approximately 15.3 MTCO2e per year after amortization over 30 years per SCAQMD methodology.

Table 7 Estimated Total Construction-Related GHG Emissions

Emission Source	**Estimated CO2e Emissions**
Total Construction Emissions	460
Annual Construction (Amortized over 30 years)	15.3
Notes: CO2e = carbon dioxide equivalent; MT =metric tons; MT/yr = metric tons per year.	

Area and indirect sources of GHG emissions associated with the proposed Project would primarily result from electricity and natural gas consumption, water transport (the energy used to pump water), and solid waste generation. GHG emissions from electricity consumed within the Project site would be generated off site by fuel combustion at the electricity provider. GHG emissions from water transport are also indirect emissions resulting from the energy required to transport water from its source. In addition, the

Project would generate GHG emissions from motor vehicle trips.

As shown in Table 8 below (page 49, Table 12 of the Air Quality and Greenhouse Gas Study), the proposed Project's annual GHG emission generation would be approximately 4,326.3 MTCO2e per year, which would exceed SCAQMD's Tier 3 threshold of 3,500 MTCO2e per year for residential land uses. Vehicular emissions related to operations would consists of 70.4 percent of these emissions; and energy consumption from heating, cooling, lighting, and appliance usage would generate 23.4 percent of these emissions.

Table 8 Estimated Construction and Operations-Related GHG Emissions

Emission Source	**Estimated Emissions CO2e (MT/yr)**
Construction Annual Mitigated Construction (Amortized over 30 years)	15.3
Project Operations	
Area Sources	45.19
Energy Consumption	1,012.6
Mobile Sources	3,046.0
Solid Waste	119.8
Water Consumption	102.7
Total (Construction and Operational Emissions)	**4,326.3**
Threshold	**3,500**
Exceed Threshold?	**Yes**
Notes: CO2e= carbon dioxide equivalent; MT/yr = metric tons per year; %=percent.	

Although the Project would exceed SCAQMD's Tier 3 threshold of 3,500 MTCO2e per year for residential land uses, because the proposed Project would be consistent with the Regional Greenhouse Gas Reduction Plan and would meet the Tier 2 threshold, as outlined in more detail below, it would be less than significant. The proposed Project would meet the Tier 2 threshold of being consistent with the applicable greenhouse gas reduction plan. Although most of the "local measures" in the SANBAG Regional Greenhouse Gas Reduction Plan apply to city-wide actions that are not related to specific development projects, such as the proposed Project, the following project design features of the proposed Project are consistent with the Regional Greenhouse Gas Reduction Plan and include: incorporation of passive solar design techniques including building orientation, energy-saving materials, roof overhangs, and window and door placement; participate in incentive programs for incorporation of solar and photovoltaic panels (active solar); provision of secure space for bicycle storage; use of native and drought-tolerant landscaping (xeriscaping) and drip irrigation to conserve water resources.

The City of Highland has selected a goal to reduce its community GHG emissions to a level that is 22 percent below its projected emissions in 2020. The City will meet and exceed this goal subject to reduction measures that are technologically feasible and cost-effective per AB 32 through a combination of state and local efforts. The City would exceed the goal with only state/county level actions but has committed to several additional local measures. The Pavley vehicle standards, the state's low carbon fuel standards, the Renewable Portfolio Standard (RPS), and other state measures will reduce GHG emissions in Highlands's on-road, solid waste, and building energy sectors in 2020. An additional reduction will be achieved by local measures related to water efficiency, solar energy, SmartBus technologies and wastewater treatment, as well as a performance standard for new development that seeks to achieve a 29 percent reduction below projected BAU emissions for new projects.

In addition, the Project includes design features that are consistent with the Regional Greenhouse Gas Reduction Plan, and the City of Highland would require the Project to meet the performance standard of 29 percent reduction below projected Business as Usual (BAU) emissions for new projects. The Regional Greenhouse Gas Reduction Plan anticipates these measures to include energy-efficient appliances and alternative energy sources, water conservation, landscaping, and site design, which are included in the proposed Project, as described above. Implementation of the performance standards for new development is ensured during the City's approval and development permitting process. Thus, the proposed Project would be consistent with the Regional Greenhouse Gas Reduction Plan and would meet the Tier 2 threshold. Therefore, impacts related to the generation of GHGs would be less than significant.

The City of Highland is a participant in the SANBAG Regional Greenhouse Gas Reduction Plan. The specific goals and actions included in the SANBAG Regional Greenhouse Gas Reduction Plan that are applicable to the proposed Project include those pertaining to energy and water use reduction, promotion of green building measures, waste reduction, and reduction in vehicle miles traveled. The proposed Project would be required to include all mandatory green building measures for new developments under the CALGreen Code, as required by the City's Municipal Code Chapter 15.38, which requires that the new buildings reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low pollutant emitting finish materials. In addition, the code requires that all landscaping comply with water efficient landscaping requirements. Furthermore, implementation of CALGreen compliant building and appliance standards would result in water, energy, and construction waste reductions for the proposed Project.

The Project includes design features that are consistent with the Regional Greenhouse Gas Reduction Plan, and the City of Highland would require the Project to meet the performance standard of 29 percent reduction below projected BAU emissions for new projects. Thus, the proposed Project would not conflict with any applicable plan, policy or regulation of an agency adopted for reducing the emissions of greenhouse gases, and impacts would be less than significant.

Mitigation Measures: Not Required

9. HAZARDS AND HAZARDOUS MATERIALS – Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☑	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☑	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☑
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☑	☐	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☑	☐

Explanation:

9a Less Than Significant: While grading and construction activities of the proposed Project may involve the limited transport, storage, use or disposal of hazardous materials, such as demolition and removal of material on site, and in the fueling/servicing of construction equipment on site, these activities would be short-term or one-time in nature and would be subject to Federal, State, and local health and safety requirements. Long-term use of the project consists of residential use and would not involve the routine transport, use, and disposal of hazardous materials. Therefore, impacts would be less than significant. No mitigation measures are required.

9b Less Than Significant: No significant quantities of hazardous materials are known to be located on the site. Future development on the site of single-family homes is not an activity or use typically associated hazardous materials and therefore none are expected to be released. No mitigation measures are required.

9c No Impact: The proposed project would permit future development of single-family residences beyond a quarter mile of a school. Therefore, the proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials in the proximity of a school. Any hazardous materials on site would be those typically associated with residential developments including household cleaners, lawn care chemicals, and automotive care products. None of these hazardous materials would pose a hazard to a school. No mitigation measures are required.

9d No Impact: The Site is not known to have been listed as a Site with Hazardous Materials. No mitigation measures are required.

9e Less Than Significant Impact with Mitigation Incorporated: The southern portion of the proposed Project site is located approximately 1.5 miles away from the western extent of the Redlands Municipal Airport runway (the closest to the Project site) and approximately 2.8 miles from the eastern extent of the San Bernardino International runway. There are no private airports near the project site. Per the General Plan Figure 6-7, *San Bernardino International Airport Influence Area (AIA)/Redlands Municipal Airport Compatibility Map*, the Project site is located just outside of the San Bernardino International Airport Influence Area and outside of the Redlands Municipal Airport Influence Area while the southern portion of the Project site is located within the Redlands Municipal Airport Area of Special Compatibility Concern. The San Bernardino International Airport does not have an adopted Airport Land Use Compatibility Plan (ALUCP).

Policy 2.2.4 of the Redlands Municipal ALUCP sates:
Areas of Special Compatibility Concern – The purpose of this designation is to take note of the locations which: (1) are routinely overflown by aircraft approaching and/or departing the Redlands Municipal Airport, but at some distance from the airport; and (2) have existing and planned land uses which are compatible with airport activity.
(a) Notation of areas of special compatibility concern is limited to serve as a reminder that airport impacts should be carefully considered in any decision to change the current land use designation.
(b) These areas are not part of the Redlands Municipal Airport influence area and are not subject to the review policies contained in this Compatibility Plan, except with respect to the notification requirements indicated in Paragraph 1.8.4. Also, establishment of a buyer awareness program is encouraged if any of these areas are to be converted to residential uses.
(c) The only portion of the Redlands Municipal Airport environs designated in this manner is the southern edge of the City of Highland.

The Redlands ALUCP, Section 1.8 *Relationship to Other Local Agencies*, Paragraph 1.8.4 indicates:
Actions Requiring Notification by City of Highland – The City of Highland shall notify the City of Redlands regarding any of the following types of actions which have the potential to affect or be affected by Redlands Municipal Airport operations:

a. Any proposal for construction or alteration of an object which would be located within 20,000 feet of the Redlands Municipal Airport runway and which would require notice to the Federal Aviation Administration in accordance with Federal Aviation Regulations Park 77, Paragraph 77.13.
b. Any proposal for construction of a public-use or special-use heliport or airport which would be located within 20,000 feet of the Redlands Municipal Airport runway and which would require a permit from the California Department of Transportation.

The notification requirements in Paragraph 1.8.4 above are for any proposal for construction located within 20,000 feet (approximately 3.8 miles) of the runway. The proposed Project involves construction of single-family residences within 20,000 feet of the runway; therefore, with notification from the City of Highland to the City of Redlands regarding this Project, the Project is in compliance with the Redlands Municipal ALUCP. It is the City's policy to have notices & disclosures included on the map and provided to all potential homebuyers. Less than significant impacts would occur with implementation of Mitigation Measure HAZ-1.

9f Less Than Significant Impact: The primary access to the Project site is from Greenspot Rd. and is within Fire Severity Zone II. Internally the roadways connected to the site are looped together and a total of three ingress/egress points can be taken out of the neighborhood. Development of the site would not involve street closures during construction nor operations and would not impair implementation or interfere with an adopted emergency response plan within the City. No mitigation measures are required.

9g Less Than Significant Impact: The proposed Project is located within the limits of Fire Severity Zone II and adjacent to existing undeveloped land and natural vegetation. When a residential development plan is submitted, design and construction methods will be required to be in compliance with all current building and fire codes and regulations designed for safe development in Fire Severity Zones. With development in compliance with these building and fire code standards, no persons or structures will be placed at significant risk of loss, injury or death involving wildland fires. Therefore, no mitigation measures are required.

Mitigation Measures:

Mitigation Measure HAZ-1

The City will condition the Project to provide notices & disclosures on the map that the southern portion of the site is located in the Redlands Municipal Airport *Area of Special Compatibility Concern,* and notice shall be given to all potential home buyers that the property is in *Area of Special Compatibility Concern* that is routinely overflown by aircraft approaching and/or departing the Redlands Municipal Airport.

10. HYDROLOGY AND WATER QUALITY -- Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☑	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☑	☐

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner, which would;				
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☑	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;	☐	☐	☑	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☑	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☑	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☑	☐

Explanation:

10a Less Than Significant Impact: This Project would not violate water or waste discharge requirements. Development on the Project site will be required to comply with Storm Water Regulations for new developments. Construction related impacts are regulated by a Storm Water Pollution Prevention Plan (SWPPP), while long-term impacts generated by development are regulated through the project-specific Water Quality Management Plan (WQMP) for City compliance. Compliance with existing regulations and standard conditions reduce the opportunity for violations. No mitigation measures are required.

10b Less Than Significant Impact: Water service would be provided to the Project by East Valley Water District (EVWD), which provides water to an approximately 30 square mile area in San Bernardino County. The EVWD derives its water sources from local groundwater and surface sources and supplements these sources with imported water from the San Bernardino Valley Municipal Water District (SBVMWD). The 2015 San Bernardino Valley Regional Urban Water Management Plan (RUWMP) for the San Bernardino Valley area, is represented by the SBVMWD service area, and nine participating retail water purveyors: City of Colton, East Valley Water District, City of Loma Linda, City of Redlands, City of Rialto, Riverside Highland Water Company, City of San Bernardino Municipal Water Department, West Valley Water District, and Yucaipa Valley Water District. The Urban Water Management Planning Act of 1983 requires urban water suppliers servicing 3,000 or more connections or supplying more than 3,000 acre-feet (AF) of water annually, to prepare an UWMP. For wholesale water agencies (like SBVMWD), without retail connections, the requirement is triggered by the annual delivery of 3,000 AF or more. The RUWMP is intended to function as a planning tool to guide broad-perspective decision making by the management of water suppliers. SBVMWD and the retail water purveyors wish to deliver a sufficient, reliable, and high-quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years, in combination with conservation of non-essential demand during certain dry years, the RUWMP successfully achieves this goal. (2015 RUWMP)

The groundwater basins utilized by the RUWMP agencies includes the San Bernardino Basin Area (SBBA), which encompasses several basins, including the Bunker Hill and Lytle Creek Basins. The basins of the RUWMP area are among the most rigorously managed in the State. Planning and management efforts evaluating needs and supplies have been established for most of the basins within the watershed throughout the next 20 to 40 years. Groundwater extractions and conditions are monitored and tracked by the Western-San Bernardino Watermaster and Basin Technical Advisory Committee. (2015 RUWMP) As outlined in 3a above, the proposed Project would not result in residential development beyond the land use designation in the 2006 General Plan and therefore would not exceed planned or anticipated growth in the region. With implementation of the 2015 RUWMP by EVWD, the proposed Project would not substantially decrease groundwater supplies or impede sustainable groundwater management of the SBBA. Also, San Bernardino Valley Water Conservation District recharges groundwater in spreading basins located to the east of the Project site; none are located on site. The Project site does not currently serve as a significant location for groundwater recharge. Development of the Project site will increase the extent of impervious surfaces however, it will not substantially interfere with groundwater recharge. Therefore, significant impacts would not occur from the implementation of the Project. No mitigation measures are required.

10c Less Than Significant Impact: There are no streams or rivers located within the Project site. Refer to Section 4b above for a discussion of streambeds regulated by the California Department of Fish and Wildlife and lack of occurrence of these on site. Although, the site will be graded and improved the proposed Project would not significantly alter drainage patterns currently developed on or off the Site. As outlined in the WQMP, stormwater is generally conveyed through storm drain pipes into a proposed water quality infiltration basin located in the southwest portion of the Project site. No mitigation measures are required.

10c i-iii) Less Than Significant Impact: As outlined in the WQMP, stormwater is generally conveyed through storm drain pipes into a proposed water quality infiltration basin located in the southwest portion of the Project site. With the Implementation of the Water Quality Management Plan (WQMP), the proposed development will not increase off-site runoff or result in substantial erosion or siltation on or off site or substantially increase the rate or amount of surface runoff in a manner which would cause flooding on site or off site. In addition, the area to the south of the Project site is not developed and is designated as open space. Stormwater runoff from the site generally sheet flows in a north to south direction. The area to the south is in the historic floodplain of the Santa Ana River and its tributaries, including Plunge Creek. There are no planned stormwater channels or underground storm drains for the area south of the Project site and therefore the project would not exceed the capacity of existing or planned stormwater drainage systems. With implementation of the WQMP, the Project would not provide substantial additional sources of polluted runoff. No mitigation measures are required.

10d Less than Significant with Mitigation Incorporated: The Project site is within the 100-year flood hazard area and the site is located in Zone AE of the Flood Insurance Rate Map (FIRM) Panel 8706H OF 9400, dated August 28, 2008. Zone AE Areas are determined to be within the 1 percent annual chance floodplains. Design and development of the Project is required to take into consideration the area to assure no development occurs within the flood zone that impedes flood flows nor locate a home within this area. As outlined in the WQMP, a flood control channel runs in a southerly direction just east of the site and has an adequate levee to prevent storm flows from entering the Project site. However, the Project also includes a proposed floodwall that runs along a portion of the western boundary adjacent to lots 106-113, 131, 132 and the Plunge Creek Channel, and along a portion of the southern boundary, along lots 79-85, the East Valley Water District property (APN 1210-211-24 that is not a part of TTM 17604), and lot E with the proposed infiltration basin. The proposed flood wall would vary in height, but based on the design included in the WQMP, would typically be 9 feet tall above the existing ground level and the height would be at a minimum of 3 inches above the 100-year water surface elevation. The Project's developer is currently in the process of processing a CLOMR (Conditional Letter of Map Revision) with FEMA (Federal Emergency Management Agency). A CLOMR is FEMA's comment on a proposed project that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations (BFEs), or the Special Flood Hazard Area (SFHA). The letter does not revise an effective NFIP map, it indicates whether the project, if built as proposed, would be recognized by FEMA. Building permits cannot be issued based on a CLOMR, because a CLOMR does not change the National Flood Insurance Program (NFIP) map. Once a project is completed, the community must request a revision to the Flood Insurance Rate Map (FIRM) to reflect the project.[1] Potential impacts from flooding are less than significant with implementation of Mitigation Measure HYDRO-1.

The Project Site is located within the Seven Oaks Dam inundation area. The Seven Oaks Dam is a single purpose flood control project located just outside the Highland's northeastern boundary. The Dam is a major feature of the Santa Ana River Mainstem Project designed to protect Orange, Riverside, and San Bernardino County from flood. The Dam was designed to resist an earthquake measuring 9.0 on the Richter scale with any point able to sustain a displacement of four feet without causing any overall structural damage; therefore, impacts from flooding as a result of failure of the dam is remote and considered less than significant.

Seiche are of concern relative to water storage facilities because inundation from a seiche can occur if the wave overflows a containment wall, such as the wall of a reservoir, water storage tank, dam, or other artificial body of water. No such water storage facilities are planned on site or nearby. As a result, the proposed development would not be adversely impacted by the reservoirs. No tsunamis are anticipated due to the distance from ocean waves. Therefore, the proposed Project is not anticipated to release pollutants due to inundation from tsunami or seiche. With compliance with the WQMP and Mitigation Measure HYDRO-1 potential impacts from flooding and release of pollutants is reduced to less than significant levels.

10e Less Than Significant Impact: As outlined in 10a and 10b above, the proposed Project is not anticipated to conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. No mitigation measures are required.

Mitigation Measures:

Mitigation Measure HYDRO-1

The City will condition the Project to provide notices & disclosures to all potential home buyers that the property is within the 100-year flood hazard area, in Zone AE of the Flood Insurance

[1] https://www.fema.gov/conditional-letter-map-revision

Rate Map (FIRM), and the purchase of flood insurance is required. Mandatory flood insurance purchase requirements and floodplain management standards apply until the National Insurance Program (NFIP) map for the project area is revised and it is no longer in the 100-year flood hazard area.

11. LAND USE AND PLANNING - Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Physically divide an established community?	☐	☐	☐	☑
b) Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☑	☐

Explanation:

11a No Impact: The proposed Project would result in the conversion of vacant land to residential uses. There are no existing residences or established community at the Project site. This Project would include the development of residential units and associated infrastructure consistent with the City's Development Code and General Plan. The proposed Project will not physically divide an established community. No mitigation measures are required.

11b Less Than Significant Impact: This Project would result in the conversion of vacant land to residential uses. The General Plan Land Use Designation for the site is Planned Development/ Low Density Residential (PD/LDR) which limits uses to single-family detached residential, and mobile homes with a maximum intensity of six dwelling units per 1.0 acre. The existing zoning for the site is PD/R-1 Single-Family Residential which allows for small lot single-family detached and mobile homes parks and subdivisions at a maximum allowable density of six dwelling units per gross acre and further establishes minimum parcel sizes of 7,200, 10,000, 15,000, and 20,000 square feet. The proposed development proposes 203 single-family residences on approximately 59 acres, with a density of one dwelling unit per 3.4 acres that is within the allowable intensity. Therefore, the proposed development is consistent with the existing General Plan Land Use Designation and zoning for the site. No mitigation measures are required.

Mitigation Measures: Not required.

12. MINERAL RESOURCES -- Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☑	☐
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☑	☐

Explanation:

12a,b <u>Less Than Significant Impact</u>: The proposed Project is located within a Mineral Resource Zone 2 (MRZ 2). Category 2 indicates that significant deposits are likely to be present. More than half of the City is underlain by MRZ-2 rated mineral resources. The General Plan provides for areas south of the Project site within the Santa Ana River Wash as Open Space which allows for mining of sand and gravel in MRZ 1. Development of the Project site would not result in a less than significant loss of land with potential sand and gravel resources. There are no other known mineral resource or important mineral resource recovery site within the Project site. No mitigation measures are required.

Mitigation Measures: Not Required

13. NOISE Would the project result in:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☑	☐	☐

13a <u>Less Than Significant Impact</u>: Construction, although short-term, can be a significant source of noise. Construction activity noise levels fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction of the proposed Project would require the use of heavy construction equipment for activities such as excavation, grading, installation of utilities, paving, and building fabrication. Development activities would also involve the use of smaller power tools, generators, and other sources of noise. During each stage of construction, a different mix of equipment operating noise levels would occur and would vary based on the amount of equipment in operation and the location of the activity.

The Federal Highway Administration (FHWA) has compiled data for outdoor noise levels for typical construction activities. Table 9 provides average (Leq) noise levels produced by various types of construction equipment at a distance of 50 feet between the equipment and noise receptor. These noise levels would diminish with distance from a construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 84 dBA Leq measured at 50 feet from the noise source to the receptor would reduce to 78 dBA Leq at 100 feet from the source to the receptor.

Table 9 Construction Equipment Noise Levels

Construction Equipment	**Noise Level at 50 Feet (dBA, Leq)**
Air Compressor	78
Backhoe	78
Chain Saw	84
Compactor	83
Concrete Mixer	79
Concrete Pump	81
Dozer	82
Generator	81
Grader	85
Dump Truck	76
Paver	77
Pneumatic Tools	85
Jackhammer	89
Roller	80
Front End Loader	79
Scraper	84
Tractor	84
Truck	75
Source: FHWA Construction Noise Handbook.	

The construction activities would expose the nearby existing uses to increased noise levels. The highest construction noise would occur during the excavation and grading activities. As shown in Table 9, use of grading equipment generates noise levels of approximately 85 dBA at a distance of 50 feet; at a distance of 100 feet the noise would attenuate to approximately 79 dBA.

A Noise Study was completed for the Project (Appendix E) and as described above, the closest sensitive receptors to the Project site and used in the analysis would be the adjacent single-family residences approximately 100 feet to the north and west. The loudest construction related exterior noise would be approximately 79 dBA Leq at this receptor (100 feet from the site) when the loudest equipment is used.

However, per the City's Municipal Code, because the Project site is not adjacent to residential uses, construction noise is exempt as long as construction activities do not commence prior to 7:00 a.m. and end no later than 7:00 p.m. Monday through Saturday with no construction activities performed during city or federal observed holidays. The proposed Project would not involve the need for construction during these hours, and the construction activities related to the Project would be consistent with the City's Municipal Code. Thus, the proposed Project would be in compliance with the City's construction related noise standards, and impacts would be less than significant.

With respect to operational noise levels, the City has established exterior noise standards that are correlated with land use classifications. As described above, the exterior noise standards are 60 dBA CNEL during the daytime and 55 dBA during the nighttime for residential land uses.

Ambient noise levels within and surrounding the Project area are influenced primarily by traffic on local roadways. With respect to vehicle traffic generated by the Project, approximately 2,047 daily trips are anticipated. The increase in traffic resulting from implementation of the Project would increase the ambient noise levels at land uses fronting roadways. To evaluate the future traffic noise environment in the Project area, the future traffic noise levels were estimated based on future traffic volumes provided in the Project's traffic study using the FHWA's TNM 2.5 model. As described in the Noise Study, Section 3.1, Noise Criteria, a significant impact related to a substantial increase in noise would occur if the Project results in an increase of 5 dBA, which would be readily noticeable.

As shown in Table 10, existing noise levels at sensitive receptors in the Project area range from 48.9 dBA to 68.3 dBA. Traffic resulting from the proposed Project would increase noise levels to a maximum of 0.5 dBA. Because the project-related increase in noise is less than the 5 dBA threshold, noise impacts would be less than significant.

Table 10 Increase in Noise Levels from Operational Traffic

Receptor	Existing CNEL	Existing with Project CNEL	Increase
R1	48.9	49.3	0.4
R2	52.7	53.2	0.5
R3	59.1	59.6	0.5
R4	61.6	62.1	0.5
R5	56.4	56.9	0.5
R6	63	63.5	0.5
R7	61.8	62.3	0.5
R8	64	64.5	0.5
R9	56.4	56.9	0.5
R10	67.9	68.1	0.2
R11	62.3	62.4	0.1
R12	68.3	68.4	0.1

Once the proposed residences are operational, noise levels generated at the Project site would occur from new stationary equipment such as heating, ventilation, and air conditioning (HVAC) units that would be installed for the building. Although the operation of this equipment would generate noise, the design of these on-site HVAC units and exhaust fans would be required to comply with the noise limit regulations of the City's Noise Element that does not allow exterior noise to exceed 55 dBA CNEL between 10:00 p.m. and 7:00 a.m., and 60 dBA CNEL between 7:00 a.m. and 10:00 p.m. Meeting these exterior standards would also meet the City's interior noise standards with implementation of standard construction, which would be required by the City. Therefore, impacts related to generation of noise in excess of standards would not occur from operation of the proposed Project.

The Project site is located adjacent to and north of the Upper Santa Ana River Wash Habitat Conservation Plan (Wash Plan). A Draft Environmental Impact Statement/ Supplemental Environmental Impact Report (DEIS/SEIR) for the Wash Plan was prepared in December 2019.[2] The proposed action/projects covered in the DEIS/SEIR for the Wash Plan include aggregate mining by CEMEX Construction Materials Pacific, LLC (CEMEX) and Robertson's Ready Mix (Robertson's) as well as construction and/or operation and maintenance of facilities for water conservation, wells and water infrastructure, transportation, flood control, trails, habitat enhancement, and agriculture. Potential noise impacts from these proposed actions/projects, including aggregate mining, on nearby sensitive receptors were evaluated. Per the Wash Plan DEIS/SEIR (Executive Summary page ES-7), "Construction noise and groundborne vibration from aggregate mining would not exceed standards at nearby sensitive receptors. Aggregate mining operations would not generate noise from mobile or stationary sources that would exceed standards and impacts on sensitive receptors are less than significant."

13b Less Than Significant Impact: As described above in 13a, construction activities for the Project would include excavation and grading activities, which has the potential to generate groundborne vibration. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Site ground vibrations from construction activities very rarely reach the levels that can damage structures, but they can be perceived in the audible range and be felt in buildings very close to a construction site.

The construction that would occur by the project would involve the temporary use of construction equipment, which can result in the generation of groundborne vibration levels. The various Peak Particle Velocity (PPV) vibration velocities for several types of construction equipment that can generate perceptible vibration levels are identified in Table 11. As shown, vibration velocities could range from approximately 0.003 to 0.089 inch-per-second PPV at 25 feet from the source activity, depending on the type of construction equipment in use. For the purpose of this analysis, the vibration level for a large bulldozer provided in Table 11 was used to evaluate vibration source levels at the nearest sensitive receptor from construction activity. In comparison to the Caltrans vibration criteria, vibration impacts from construction activities would not exceed the criteria.

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[2] https://www.sbvwcd.org/our-projects/wash-plan.html

Table 11 Vibration Source Levels for Construction Equipment at 25 Feet

Equipment	PPV (in/sec) at 25 Feet	PPV (in/sec) at 50 Feet	PPV (in/sec) at 100 Feet
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Jackhammer	0.035	0.012	0.004
Small Bulldozer	0.003	0.001	<0.000
SOURCE: FTA, 2006			

As described above in 13a, the closest sensitive uses to the Project site are the residences, which are modern structures that are located 100 feet away. At this distance, the maximum vibration of 0.011 in/sec PPV is estimated to occur during construction. Table 11 shows that the vibration levels generated would be below levels that could create structural damage to modern buildings (0.5 in/sec PPV), and below the strongly perceptible level for human response (0.9 in/sec PPV). Thus, vibration at 100 feet away from construction activity would be less than significant, and construction of the Project would not generate excessive generation of ground-borne vibration.

The proposed residential uses do not involve activities or operation of stationary or mobile equipment that would result in high vibration levels, which are more typical for large industrial projects that employ heavy machinery. During project operations, the primary source of vibration would likely be delivery/garbage truck circulation within and adjacent to the Project area. However, the FTA's Transit Noise and Vibration Impact Assessment states that it is unusual for vibration from vehicular sources (including buses and trucks) to be perceptible, even in locations close to major roads. As such, no sources of "excessive" groundborne vibration or noise levels are anticipated during project operations. Less than significant impacts would occur. No mitigation measures are required.

13c Less Than Significant Impact with Mitigation: There are no private airports or airstrips in the vicinity of this Project site. The southern portion of the proposed Project is located approximately 1.5 miles away from the western extent of the Redlands Municipal Airport runway (the closest to the Project site) and approximately 2.8 miles from eastern extent of the San Bernardino International Airport runway. Per the City of Highland General Plan Figure 6-7, *San Bernardino International Airport Influence Area (AIA)/Redlands Municipal Airport Compatibility Map*, the Project site is located just outside of the San Bernardino International Airport Influence Area and outside of the Redlands Municipal Airport Influence Area while the southern portion of the Project site is located within the Redlands Municipal Airport Area of Special Compatibility Concern. The San Bernardino International Airport does not have an adopted Airport Land Use Compatibility Plan (ALUCP) and the Project site is not within 2 miles of the San Bernardino International Airport. As outlined above in Hazards and Hazardous Materials 9e above, the proposed Project involves construction of single-family residences within 20,000 feet of the Redlands Municipal Airport runway; therefore, with notification from the City of Highland to the City of Redlands regarding this Project, the Project is in compliance with the noticing requirements of the Redlands Municipal ALUCP. It is the City's policy to have notices & disclosures included on the map and provided to all potential homebuyers. Less than significant impacts would occur with implementation of Mitigation Measure HAZ-1.

Mitigation Measures:

Mitigation Measure Haz-1

The City will condition the Project to provide notices & disclosures on the map that the southern portion of the site is located in the Redlands Municipal Airport *Area of Special Compatibility Concern,* and notice shall be given to all potential home buyers that the property is in *Area of Special Compatibility Concern* that is routinely overflown by aircraft approaching and/or departing the Redlands Municipal Airport.

14. POPULATION AND HOUSING -- Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☑	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Explanation:

14a Less Than Significant Impact: The proposed development proposes 203 lots for single-family residences on approximately 59 acres, with a density of one dwelling unit per 3.4 acres that is within the allowable intensity. Therefore, the proposed development is consistent with the existing General Plan Land Use Designation and zoning for the site. Thus, development potential is limited to these parameters and the proposed Project's population projection will be within those planned for within the City's General Plan and is not considered significant. No mitigation measures are required.

14b No Impact: The proposed Project site is currently vacant thus the proposed Project does not have the potential to displace people or existing housing. No impacts to housing would occur. No mitigation measures are required.

Mitigation Measures: Not required

15. PUBLIC SERVICES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	☑	☐
b) Police protection?	☐	☐	☑	☐
c) Schools?	☐	☐	☑	☐
d) Parks?	☐	☐	☑	☐
e) Other public facilities?	☐	☐	☑	☐

Explanation:

15a Less Than Significant Impact: Fire suppression, prevention, and medical services are critical to the protection of people, property, and the natural environment. The CalFire provides fire protection and emergency medical services to the City of Highland through a cooperative agreement. The City has three fire stations: Station 541 located at 26974 Base Line; Station 542 located at 29507 Base Line; and Station 543 located at 7469 Sterling Avenue. The proposed project will be served by CalFire, specifically Station 2 at 29507 Baseline Street, Highland, CA 92346. Project related fire protection demand impacts are mitigated through the mandatory payment of Development Impact Fees (DIF), and construction of the new residences in accordance with current Uniform Building and Fire Code requirements. Based on these findings and requirements, the proposed project is not forecast to cause or contribute to significant new demand for fire protection services. The Project will have less than significant impacts on Fire protection. No mitigation measures are required.

15b Less Than Significant Impact: The protection of City's residents, visitors, businesses, and property from crime depends on the adequate provisions of law enforcement services, supporting facilities, and prevention strategies. The City of Highland contracts with the San Bernardino County Sheriff's Department for its law enforcement and police services. The project will add incrementally to the existing demand for law enforcement services, but the City recently installed a new Department station and does not anticipate the need for new facilities in the immediate future. Also, this incremental demand is offset through the mandatory payment of DIF for law enforcement protection services. Impacts from development of the Project on Police protection is less than significant. No mitigation measures are required.

15c. Less Than Significant Impact: The proposed Project is located within the service boundaries of the Redlands Unified School District. School mitigation fees are required to be paid to the Redlands Unified School District for every unit constructed in the Project. Through payment of the mandatory School Mitigation Fee, implementation of the proposed Project would have a less than significant impact to schools. No mitigation measures are required.

15d Less Than Significant Impact: The City's Community Center and Park is located to the west on Central Avenue just north of 5th Street. Both of the facilities were constructed within the past 10 years. The YMCA of the East Valley currently provides recreation programs to residents. It is not anticipated that the residents of the Project Site would affect the YMCA services.

A second park, Aurantia Park, is located on Greenspot Road, approximately one-half mile to the east of the Project site. This ten-acre Park has a combination of natural habitat, orange grove, tot lot, and a dog park. The park will serve as an amenity to the proposed future residents of the proposed Project and impacts would be less than significant. No mitigation measures are required.

15e Less Than Significant Impact. The Sam J. Racadio Library and Environmental Learning Center is located to the west on Central Avenue just north of 5th Street. The facility was constructed in 2008 and is the only such facility in the City. The County of San Bernardino currently operates the facility and is part of the County library system. The facility was planned to accommodate the future growth of the City's east end and therefore, the proposed Project would not affect the City's ability to provide library services to its residents. Impacts would be less than significant and no mitigation measures are required.

Mitigation Measures: Not Required

16. RECREATION	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☑	☐	☐	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☑	☐	☐	☐

Explanation:

16a,b Potentially Significant Impact: This topic will be evaluated in the forthcoming EIR for this Project.

17. TRANSPORTATION -- Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☑	☐	☐	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☑	☐	☐	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☑
d) Result in inadequate emergency access?	☐	☐	☐	☑

Explanation:

17a Potentially Significant Impact: This topic will be evaluated in the forthcoming EIR for this Project.

17b Potentially Significant Impact: This topic will be evaluated in the forthcoming EIR for this Project.

17c No Impact: The proposed Project would include the development of single-family homes on property adjacent to an existing and improved street system designed in accordance with City standards. Access to the Project site is provided from Greenspot Road, designated a Major Highway in the General Plan Circulation Element (Figure 3-2 Roadway Network), a four-lane 80-foot roadway curb-to-curb (including a 12-foot median). The proposed Project does not include any geometric changes to Greenspot Road. A new signal and crosswalks will be installed at the Project's main entrance at Gold Buckle Road on Greenspot Road for safe ingress and egress from the site. There will be no impact thus no mitigation measures are required.

17d No Impact: The proposed Project site is adjacent to an existing roadway with full emergency ingress and egress off of Greenspot Road, a major highway, that are considered acceptable for emergency access. No mitigation measures are required.

18. TRIBAL CULTURAL RESOURCES -- Would the project result in	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☑	☐	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☑	☐	☐

Explanation:

18a-b) Less Than Significant with Mitigation Incorporated: Consultation was initiated by the City of Highland as lead agency with a letter dated February 23, 2016 to the following tribes: San Manuel Band of Mission Indians (SMBMI), Soboba Band of Luiseño Indians, and Gabrieleño Band of Mission Indians – Kizh Nation.

The City received email correspondence from SMBI on March 1, 2016 that indicated the following: “The project is located within the Tribe’s ancestral territory. We do not have any specific information about tribal cultural resources at the project location. We recommend that a records search including a minimum of one-mile radius of information be prepared and that a copy of the results be forwarded to our office. Once we receive the results, we will comment on what we think the next steps ought to be for this project. We do know that the project area was an important prehistoric plant gathering area. If you are unable to provide the records search results prior to the AB 52 response deadline, we will opt for consultation for this project and review the information as soon as it can be provided to us.”

The City provided the Phase I Cultural Resources Assessment, dated December 11, 2017 to SMBMI via email on September 27, 2018. SMBMI responded via email on October 1, 2018 indicating "In reviewing the cultural resources report, SMBMI noted that there are historic resources that exist within the project area that overlap with SMBMI's historic presence in the area. The San Manuel Reservation was established in 1891, though Serrano men were working in the citrus industry in the area both before and after that date. Highland in particular contained a great deal of Serrano labor, given its proximity to the reservation, and consequently this project area is quite sensitive. Should there be any feasibility in avoiding the resources on the surface of the site, SMBMI would prefer that option. However, if avoidance is not feasible, the next option would be collection of artifacts and reburial in a place that will be protected from future disturbance. Additionally, SMBMI requests an archaeologist be on site during all ground-disturbing activity to ensure any additional resources are treated in the same way. Please see the attached MM language for the Cultural Resources and Tribal Resources sections for the City's use…"

The Mitigation Measure language that was provided in the attachment from SMBMI were incorporated as mitigation measures CR-1, CR-2, and CR-3 above in Section 5, Cultural Resources. Implementation of mitigation measures CR-1, CR-2, and CR-3 would reduce potential impacts to Tribal Cultural Resources to less than significant levels.

The Soboba Band of Luiseño Indians provided a response letter dated March 22, 2016 indicating "The Soboba Band of Luiseño Indians appreciates your observance of Tribal Cultural Resources and their preservation in your project. The information provided to us on said project(s) has been assessed through our Cultural Resources Department. At this time the Soboba Band does not have any specific concerns regarding known cultural resources in the specified areas that the project encompasses but does request that the appropriate consultation continue to take place between concerned tribes, project proponents, and local agencies." "Also, working in and around traditional use areas intensifies the possibility of encountering cultural resources during any future construction/excavation phases that may take place. For this reason, the Soboba Band of Luiseño Indians requests that approved Native American Monitor(s) be present during any future ground-disturbing proceedings, including surveys and archaeological testing, associated with the project. The Soboba Band wishes to defer tot the San Manuel Band of Mission Indians, who are in closer proximity to the Project."

The Gabrieleño Band of Mission Indians – Kizh Nation provided a response letter dated March 7, 2016 indicating "Due to the project location and the high sensitivity of the area location , we would like to request one of our certified Native American Monitors to be on the site during any and all ground disturbances to protect any cultural resources which may be effected during construction development." "While the property may be located in an area that has been previously developed, numerous examples can be shared to show that there still is a possibility that unknown, yet significant, cultural resources will be encountered during ground disturbance activities. Please note, if they haven't been listed with the NAHC [Native American Heritage Commission], it doesn't mean that they aren't there. Not everyone reports what they know."

Mitigation Measures: CR-1, CR-2, and CR-3 above in Section 5, Cultural Resources.

19. UTILITIES AND SERVICE SYSTEMS – Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Require or result in the relocation or construction of new or expanded water, wastewater, or storm water drainage, electric power, natural gas or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☑	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☑	☐
c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☑	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☑	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☑	☐

Explanation:

19a Less Than Significant Impact: The proposed Project is located directly adjacent to Greenspot Road. There are existing water, wastewater, electric power, natural gas, and telecommunication facilities in the Greenspot Road public right-of-way. The proposed Project will include the construction of connections to these existing utilities along Greenspot Road and will not require or result in the relocation or construction of any other new or expanded facilities which would cause significant environmental effects. As outlined above in Section 10 Hydrology and Water Quality, the site will be graded and improved the proposed Project would not significantly alter drainage patterns currently developed on or off the Site. As outlined in the WQMP, stormwater is generally conveyed through storm drain pipes into a proposed water quality infiltration basin located in the southwest portion of the Project site. No new off-site stormwater drainage facilities are required or required to be upgraded. Potential impacts are less than significant. No mitigation measures are required.

18b-c Less Than Significant Impact: The proposed Project would permit future construction of single-family units. East Valley Water District (EVWD) will provide water and wastewater (sewer) collection services to the Project for domestic, fire protection, and sanitary sewer purposed, as outlined in a Will Serve Letter dated January 29, 2019 (Appendix F). According to EVWD, the wastewater service provider (SBMWD) has adequate capacity to serve the development.

As outlined above in Section 10 Hydrology and Water Quality (10b), water service would be provided to the Project by East Valley Water District (EVWD), which provides water to an approximately 30 square mile area in San Bernardino County. The EVWD derives its water sources from local groundwater and surface sources and supplements these sources with imported water from the San Bernardino Valley Municipal Water District (SBVMWD). The 2015 San Bernardino Valley Regional Urban Water Management Plan (RUWMP) for the San Bernardino Valley area, is represented by the SBVMWD service area, and nine participating retail water purveyors: City of Colton, East Valley Water District, City of Loma Linda, City of Redlands, City of Rialto, Riverside Highland Water Company, City of San Bernardino Municipal Water Department, West Valley Water District, and Yucaipa Valley Water District. The Urban Water Management Planning Act of 1983 requires urban water suppliers servicing 3,000 or more connections or supplying more than 3,000 acre-feet (AF) of water annually, to prepare an UWMP. For wholesale water agencies (like SBVMWD), without retail connections, the requirement is triggered by the annual delivery of 3,000 AF or more. The RUWMP is intended to function as a planning tool to guide broad-perspective decision making by the management of water suppliers. SBVMWD and the retail water purveyors wish to deliver a sufficient, reliable, and high-quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next 25 years, in combination with conservation of non-essential demand during certain dry years, the RUWMP successfully achieves this goal. (2015 RUWMP)

The sewerage system would have adequate capacity to serve the proposed residential development. EVWD's Sewer System Management Plan (SSMP) outlines the standards for operation and maintenance of the sewer collection system, improvements for reliable service capacity now and in the future, and compliance with the State Water Resources Control Board (SWRCB) adopted *Order No. 2006-0003, Statewide General Waste Discharge Requirements (WERs) for Sanitary Sewer Systems*. EVWD has existing water and sewer lines within the Greenspot Road right-of-way to adequately provide services to the proposed Project. No additional facilities would be required to serve water to or handle the wastewater flows from the proposed development. No mitigation measures are required.

18d Less Than Significant Impact: The proposed Project is served by the San Timoteo Sanitary Landfill in Redlands, California. According to the California Department of Resources Recycling and Recovery (CalRecycle), over 66 percent of the San Timoteo Sanitary Landfill's 20,400,000 cubic yard capacity has been used. The average inflow to the landfill each day is 854 tons, while the maximum permitted inflow is 2,000 tons per day. The San Tomoteo Sanitary Landfill's estimated closure date is 2043. The proposed Project includes 203 new single-family residences. With an estimated waste generation rate of approximately 12.23 pounds of waste per day per household, in accordance with the California Integrated Waste Management Board, the proposed Project is forecast to generate approximately 2,483 pounds (lbs) of waste per day, or approximately 453 tons per year. Thus, the San Timoteo Sanitary Landfill has the capacity to accept waste from the proposed Project.

The proposed Project is subject to Assembly Bill 1327, Chapter 18, Solid Waste Reuse and Recycling Access Act of 1991 (Act). This Act requires that adequate areas be provided for collecting and loading recyclable materials such as paper products, glass, and other recyclables. The Project must conform to the City's requirements to ensure compliance with this Act. Based on these factors, it is anticipated that the proposed Project would have a less than significant impact related to solid waste. No mitigation measures are required.

18e Less Than Significant Impact: The proposed Project is subject to Assembly Bill 1327, Chapter 18, Solid Waste Reuse and Recycling Access Act of 1991 (Act). This Act requires that adequate areas be provided for collecting and loading recyclable materials such as paper products, glass, and other recyclables. The project must conform to the City's requirements to ensure compliance with this Act. Based on these factors, it is anticipated that the proposed Project would have a less than significant impact from solid waste resources. No mitigation measures are required.

Mitigation Measures: Not Required

20. WILDFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☑	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☑	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☑	☐

Explanation:

20a Less Than Significant Impact: The primary access to the Project site is from Greenspot Rd. The Project site is located within Fire Severity Zone II (General Plan Safety Element Figure 6-6, Fire Hazards and Safety Overlay Areas). Internally the roadways connected to the site are looped together and a total of three ingress/egress points can be taken out of the development. Development of the site would not involve street closures during construction or operations and would not impair implementation or interfere with an adopted emergency response plan within the City. Potential impacts are less than significant, and no mitigation measures are required.

20b Less Than Significant Impact: Although the Project site is located within the limits of Fire Severity Zone II it includes the development of residential units and associated infrastructure consistent with the City's Development Code and General Plan. The proposed Project is located adjacent to existing residential development to the west, north and northeast. The Project site is not located on steep slopes or immediately adjacent to the foothills of the San Bernardino Mountains. When a residential development plan is submitted, design and construction methods must be in compliance with all current building and fire codes and regulations designed for safe development in Fire Severity Zones. Due to the Project's location and with development in compliance with these building and fire code standards, the Project would not be expected to significantly exacerbate wildfire risks. Therefore, potential impacts are less than significant, and no mitigation measures are required.

20c Less Than Significant Impact: The primary access to the Project site is from Greenspot Rd. Internally the roadways connected to the site are looped together and a total of three ingress/egress points can be taken out of the development. The proposed Project does not require the installation of infrastructure (roads, power lines, etc.) in undeveloped natural areas that are susceptible to fire. Therefore, the proposed Project would not be expected to exacerbate fire risk and potential impacts are less than significant. No mitigation measures are required.

20d Less Than Significant Impact: The proposed Project is located adjacent to existing residential development to the west, north and northeast. The Project site is not located on steep slopes or immediately adjacent to the foothills of the San Bernardino Mountains. As outlined in 7a iv above, according to Figure 6.3 of the City of the Highland General Plan, a portion of the proposed site is susceptible to landslide. However, per the Engineering Geology Investigation, no evidence for landsliding was observed on or in the immediate vicinity of the site, in the field or on the aerial photographs reviewed. The proposed site is relatively flat and gently sloping with no substantial hills, slopes nor drop offs. Due to the lack of significant topography, landsliding is not expected on the site. As outlined in 10c ii above, with the Implementation of the Water Quality Management Plan (WQMP), the proposed development will not increase off-site runoff or result in substantial erosion or siltation on- or off-site or substantially increase the rate or amount of surface runoff in a manner which would cause flooding on site or off site. Therefore, the proposed Project is not expected to result in downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes. Potential impacts are less than significant, and no mitigation measures are required.

Mitigation Measures: Not Required

21. MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☑	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☑	☐	☐	☐
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☑	☐	☐

Explanation:

21a Potentially Significant Impact: The proposed Project can be implemented without causing significant adverse environmental effects with implementation of mitigation measures outlined in the preceding analysis. The City will require implementation of mitigation measures to ensure that potentially significant impacts do not occur to any of the following resource values or physical conditions that occur within the proposed improvements area: air quality, cultural resources, geology & soils, hazards and hazardous materials, hydrology and water quality, noise, and tribal cultural resources. Therefore, with mitigation, the proposed Project would not eliminate important examples of the major periods of California history or prehistory.

However, the Project may have potential impacts on sensitive biological resources, including the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal and this topic will be analyzed in the forthcoming EIR.

21b Potentially Significant Impact: This topic will be evaluated in the forthcoming EIR for this Project.

21c Less Than Significant Impact with Mitigation Incorporated: Mitigation measures were identified to ensure the nearest sensitive receptors (i.e. residences) are not exposed to substantial pollutant concentrations during construction activities. Mitigation Measure

AQ-1 requires active areas to be watered three times per day to keep soil moist enough so visible dust plumes (PM_{10}) are eliminated, covering disturbed areas, and requirements for vehicles to travel at a maximum of 25 mph on site the Project site during construction activities. Mitigation Measure AQ-2 requires use of Tier IV diesel engine standards for construction operations, which reduces diesel emissions, a source of $PM_{2.5}$. With implementation of Mitigation Measures AQ-1 and AQ-2, PM_{10} and $PM_{2.5}$ construction emissions would be reduced below significance thresholds.

This report analyzed the proposed Project's potential impacts related to geology issues because of the Project site's proximity to a fault zone. As outlined in the Engineering Geology Investigation prepared for the Project (Appendix D),due to the potential of tensional ground surface fracturing on the site as a result of differential response of geological materials across the suspected traces of Fault "K" in the event of a large nearby earthquake, subsidence, differential compaction, or seismic settlement, Mitigation Measure GEO-1 shall be implemented. In addition, all structures constructed at the Project site would be required to follow California Building Code (CBC) and to be designed and constructed to resist the effects of strong ground motion. Due to the potential for liquefaction at the site the additional parameters of soil density, grain size distribution and exact depth to groundwater shall a geotechnical engineer to ascertain the final susceptibility of the site to liquefaction. A depth to groundwater of 10 feet from the ground surface shall be used for calculating the liquefaction potential of the site. The Geotechnical/Soils evaluation shall be submitted to the City with building plans for review and approval and all site preparation recommendations shall be implemented by the grading contractor. The final grading plan for the site shall be reviewed and approved by an engineering geologist prior to grading of the site and grading of the site should be evaluated by the engineering geologist by in-grading inspections. Less than significant impacts would occur with implementation of Mitigation Measures GEO-1 and GEO-2.

The southern portion of the proposed Project site is located approximately 1.5 miles away from the western extent of the Redlands Municipal Airport runway (the closest to the Project site) and approximately 2.8 miles from the eastern extent of the San Bernardino International Airport runway. It is the City's policy to have notices & disclosures included on the map and provided to all potential homebuyers. Mitigation measure HAZ-1 indicates the City condition will the Project to provide notices & disclosures on the map that the southern portion of the site is located in the Redlands Municipal Airport *Area of Special Compatibility Concern,* and notice shall be given to all potential home buyers that the property is in *Area of Special Compatibility Concern* that is routinely overflown by aircraft approaching and/or departing the Redlands Municipal Airport.

The Project Site is within the 100-year flood hazard area and the site is located in Zone AE of the Flood Insurance Rate Map (FIRM) Panel 8706H OF 9400, dated August 28, 2008. Zone AE Areas are determined to be within the 1 percent annual chance floodplains. Design and development of the Project is required to take into consideration the area to assure no development occurs within the flood zone that impedes flood flows nor locate a home within this area. Mitigation measure HYDRO-1 indicates the City will condition the Project to provide notices & disclosures to all potential home buyers that the property is within the 100-year flood hazard area, in Zone AE of the Flood Insurance Rate Map (FIRM), and the purchase of flood insurance is required. Mandatory flood insurance purchase requirements and floodplain management standards apply until the National Insurance Program (NFIP) map for the Project area is revised and it is no longer in the 100-year flood hazard area.

Mitigation Measures: AQ-1 & 2, GEO-1 & 2, HAZ-1, and HYDRO-1.

DETERMINATION

On the basis of this initial evaluation:

- ☐ I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☑ I find that the proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Kim Stater

Kim Stater, Assistant Community Development Director

2-26-20

Date

CITY OF HIGHLAND

27215 Base Line, Highland, CA 92346

Telephone (909) 864-8732 FAX: (909) 862-3180

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Pursuant to Title 14 of the California Code of Regulations Sections 15082, this is to advise that the City of Highland, which is the lead agency overseeing this project, plans to oversee the preparation of an Environmental Impact Report (EIR) for the below described project. The purpose of this notice is to solicit guidance as to the scope and content of the environmental information to be included in the EIR. Information in that regard should be submitted to the City at the below -listed address as soon as possible, no later than 30 days after receiving this notice. The 30-day comment period is from February 28, 2020 to March 30, 2020. A Notice of Intent to adopt a Mitigated Negative Declaration was previously prepared and available for public and agency review from July 26, 2019 to August 26, 2019 (State Clearinghouse No. 2019079098). However, the City has since then determined that an EIR is required.

PROJECT TITLE & FILE NO.: Heatherglen Planned Development, Tentative Tract Map No. 17604 (TTM 015-001), Conditional Use Permit CUP-15-006

PROJECT LOCATION: East of Merris Street/Club View Drive, west of Alta Vista, south of Greenspot Road, and north of Abbey Way and Plunge Creek. (APNs: 1210-281-01, -02, -03, -04, 1210-211-18, -21, & -23)

PROJECT DESCRIPTION: Heatherglen Planned Development, subdivided by Tentative Tract Map No. 17604, is a low density, single-family residential development project that includes 203 residential lots and 13 lettered lots for various open space uses (entry points, public park, irrigated slopes/easements, infiltration basin, open space habitat preservation, and East Valley Water District Facilities). Development of the tract is expected to occur over an approximate 4-year period and will include grove removal, grubbing, grading, development of internal roadways, and off-site improvements (roadway improvements and utility connections). The site is 59.03 acres.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: The City, as the Lead Agency, oversaw preparation of an Initial Study and has determined that an EIR will need to be prepared. The EIR will only address issues which have been identified as potentially significant in the Initial Study. The following issues will be addressed in the DEIR:

• Biological Resources	• Recreation
• Transportation	

The EIR will address the short- and long-term effects of the Project on the environment and will evaluate the potential for the Project to cause direct and indirect impacts, as well as cumulative impacts. Alternatives to the Project will be evaluated that may reduce impacts that are determined to be significant in the EIR. For those impacts determined to be significant, feasible mitigation measures will be proposed. A mitigation monitoring program will be developed as required by State CEQA Guidelines Section 15097.

PUBLIC REVIEW PERIOD: The Initial Study which includes the project description, location and potential environmental effects is available for public review and comment pursuant to California Code of Regulations, Title 14, Sections 15082 (California Environmental Quality Act). Your comments may be sent as soon as possible, but **no later than 5:00 p.m., Monday, March 30, 2020.** All comments must be submitted in writing to City Hall or via email at the addresses provided below. Please refer to this project by the project title and file number listed above. If you have no comment, no reply is necessary. The comment period during which the City will receive comments on the Initial Study and Notice of Preparation (of an EIR) is:

Starting Date: February 28, 2020 **Ending Date: March 30, 2020**

RESPONSES AND COMMENTS: Please send your written comments to:

Kim Stater, Assistant Community Development Director
City of Highland, Community Development Department
27215 Base Line
Highland, California 92346
Phone: (909) 864-8732 Extension 204
Email: kstater@cityofhighland.org

DOCUMENT AVAILABILITY: Copies of Notice of Preparation and Initial Study are available for public review on the City's website at http:www.cityofhighland.org/PublicNotices/, and at the following locations:

- Highland City Hall, Community Development Department, 27215 Base Line, Highland, CA 92346
- Highland Sam J. Racadio Library, 7863 Central Ave, Highland, CA 92346

If you require additional information, please contact Kim Stater at (909) 864-8732 Extension 204.