This section describes the regional air quality, current attainment status of the air basin, local sensitive receptors, emission sources, and impacts that are likely to result from project implementation. Following this discussion is an assessment of consistency of the proposed project with applicable policies and local plans. The Greenhouse Gases and Climate Change analysis is located in Section 3.7. This section is based in part on the following resources:

- *Air Quality and Land Use Handbook: A Community Health Perspective* (California Air Resources Board 2007*),*
- *Handbook for Assessing and Mitigating Air Quality Impacts* (Yolo-Solano Air Quality Management District 2007),
- *URBEMIS2007 (v.9.24)* (California Air Resources Board 2007).

No comments were received during the public review period or scoping meeting for the Notice of Preparation regarding this topic.

3.3.1 EXISTING SETTING

ABBREVIATIONS

(AQAP)	Air Quality Attainment Plan
(AQMD)	Air Quality Management District
(ATCM)	Airborne Toxics Control Measure
(CARB)	California Air Resources Board
(CCAA)	California Clean Air Act
(CH&SC)	California Health and Safety Code
(CO)	Carbon monoxide
(EPA)	United States Environmental Protection Agency
(FCAA)	Federal Clean Air Act
(FHWA)	Federal Highway Administration
(HAPs)	Hazardous Air Pollutants
(NAAQS)	National Ambient Air Quality Standards
(NO_2)	Nitrogen dioxide
(NOx)	Nitric oxide
(O_3)	Ozone

(Pb)	Lead
(PM)	Particulate matter
(PPM)	Parts per million
(ROG)	Reactive organic gases
(SIP)	State Implementation Plan
(SO2)	Sulfur dioxide
(SVAB)	Sacramento Valley Air Basin
(TACs)	Toxic air contaminants
(TCMs)	Transportation control measures
(ug/m^3)	Micrograms per cubic meter
(VOC)	Volatile organic compounds
(YSAQMD)	Yolo-Solano Air Quality Management District

SACRAMENTO VALLEY AIR BASIN

Topography and Meteorology

The proposed project is located within the boundaries of the Sacramento Valley Air Basin (SVAB). The SVAB encompasses eleven counties including all of Shasta, Tehama, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo Counties, the westernmost portion of Placer County and the northeastern half of Solano County. The SVAB is bounded by the North Coast Ranges on the west and Northern Sierra Nevada Mountains on the east. The intervening terrain is relatively flat.

Hot dry summers and mild rainy winters characterize the Mediterranean climate of the SVAB. During the year the temperature may range from 20 to 115 degrees Fahrenheit with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 19 inches, and the rainy season generally occurs from November through March. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the "Schultz Eddy" prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north carrying the pollutants out, the Schultz Eddy causes the wind pattern to circle back to the south. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon when the delta sea breeze arrives.

CRITERIA POLLUTANTS

The United States Environmental Protection Agency (EPA) uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). Each criteria pollutant is described below.

Ozone (O_3) is a photochemical oxidant and the major component of smog. While O_3 in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O_3 at ground level are a major health and environmental concern. O_3 is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O_3 levels occur typically during the warmer times of the year. Both VOCs and NOx are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops and other sources using solvents.

The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O_3 for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

Carbon monoxide (CO) is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability and performance of complex tasks.

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban atmospheres. NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to ozone (O_3) and acid rain, and may

affect both terrestrial and aquatic ecosystems. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NOx). NOx plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NOx forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

Sulfur dioxide (SO_2) affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children and the elderly. SO_2 is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large parts of the country. This is especially noticeable in national parks. Ambient SO_2 results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills and from nonferrous smelters.

Particulate matter (PM) includes dust, dirt, soot, smoke and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO_2 and VOCs are also considered particulate matter.

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death.

Respirable particulate matter (PM_{10}) consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves, or in combination with other gases. Particulate matter is caused primarily by dust from grading and excavation activities, from agricultural uses (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. PM_{10} causes a greater health risk than larger particles, since these fine particles can more easily penetrate the defenses of the human respiratory system.

Fine particulate matter ($PM_{2.5}$) consists of small particles, which are less than 2.5 microns in size. Similar to PM_{10}, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. It is also formed through the reaction of other pollutants. As with PM_{10}, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer. In 1997, the EPA created new Federal air quality standards for $PM_{2.5}$.

The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular

disease or influenza, asthmatics, the elderly and children. Particulate matter also soils and damages materials, and is a major cause of visibility impairment.

Lead (Pb) exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil or dust. Excessive Pb exposure can cause seizures, mental retardation and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

ODORS

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

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

SENSITIVE RECEPTORS

A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals and schools. The proposed project would include residences with sensitive receptors. Additionally, there are

sensitive receptors located in the immediate vicinity of the proposed project to the south, east, and west.

AMBIENT AIR QUALITY

Both the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant.

The federal and California state ambient air quality standards are summarized in Table 3.3-1 for important pollutants. The federal and state ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and particulate matter between 2.5 and 10 microns in diameter (PM_{10}).

The U.S. Environmental Protection Agency established new national air quality standards for ground-level ozone and for fine particulate matter in 1997. The 1-hour ozone standard was phased out and replaced by an 8-hour standard of 0.075 PPM. Implementation of the 8-hour standard was delayed by litigation, but was determined to be valid and enforceable by the U.S. Supreme Court in a decision issued in February of 2001.

TABLE 3.3-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

POLLUTANT	*AVERAGING TIME*	*FEDERAL PRIMARY STANDARD*	*STATE STANDARD*
Ozone	1-Hour 8-Hour	-- 0.075 ppm	0.09 ppm 0.070 ppm
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	-- 0.53 ppm	0.03 ppm 0.18 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm --	-- 0.04 ppm 0.25 ppm
PM_{10}	Annual 24-Hour	-- 150 ug/m3	20 ug/m3 50 ug/m3
$PM_{2.5}$	Annual 24-Hour	35 ug/m3 15 ug/m3	12 ug/m3 --
Lead	30-Day Avg. 3-Month Avg.	-- 1.5 ug/m3	1.5 ug/m3 --

Notes: ppm = parts per million, ug/m3 = Micrograms per Cubic Meter

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2012

In 1997, new national standards for fine particulate matter diameter 2.5 microns or less ($PM_{2.5}$) were adopted for 24-hour and annual averaging periods. The current PM_{10} standards were to be retained, but the method and form for determining compliance with the standards were revised.

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, CARB staff recommended lowering the

level of the annual standard for PM_{10} and establishing a new annual standard for $PM_{2.5}$. The new standards became effective on July 5, 2003, with another revision on November 29, 2005.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Existing air quality concerns within the City of Davis and the entire SVAB are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles which account for 70 percent of the ozone in the region. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

Attainment Status

In accordance with the California Clean Air Act (CCAA), the CARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A "nonattainment" designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria.

Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An "unclassified" designation signifies that the data do not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. EPA designates areas for ozone (O_3), carbon monoxide (CO), and nitrogen dioxide (NO_2) as "does not meet the primary standards," "cannot be classified," or "better than national standards." For sulfur dioxide (SO_2), areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified," or "better than national standards." However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

Yolo County has a state designation of Non-attainment for Ozone and PM_{10} and is Attainment for all other criteria pollutants. The County has a national designation of Non-attainment for ozone and $PM_{2.5}$ (partial non-attainment). The County has a national designation of either attainment or unclassified for all other criteria pollutants. Table 3.3-2 presents the state and national attainment status for Yolo County.

TABLE 3.3-2: STATE AND NATIONAL ATTAINMENT STATUS

CRITERIA POLLUTANT	*CRITERIA POLLUTANTS*	*STATE DESIGNATIONS*	*NATIONAL DESIGNATIONS*
Ozone (O_3)	1-Hour	Non-attainment	N/A
	8-Hour	Non-attainment	Non-attainment
Carbon Monoxide	1-Hour	Attainment	Unclassified/Attainment
	8-Hour	Attainment	Unclassified/Attainment
Nitrogen Dioxide	1-Hour	Attainment	N/A
	Annual	N/A	Attainment
Sulfur Dioxide	1-Hour	Attainment	N/A
	24-Hour	Attainment	Attainment
	Annual	N/A	Attainment
Coarse Particulate Matter (PM_{10})	24-Hour	Non-attainment	Unclassified
	Annual average	Non-attainment	N/A
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	N/A	Partial non-attainment
	Annual average	N/A	Attainment
Sulfates	24-Hour	Attainment	N/A
Lead	30-Day Average	Attainment	N/A
	Calendar Quarter	N/A	Attainment
Hydrogen Sulfide	1-Hour	Attainment	N/A
Vinyl Chloride	24-Hour	Attainment	N/A
Visibility Reducing Particles	8-Hour	Attainment	N/A

SOURCES: YOLO-SOLANO AQMD AND CALIFORNIA AIR RESOURCES BOARD (2012).

N/A= NOT APPLICABLE

Sacramento Valley Air Basin Monitoring

The SVAB consists of 13 counties covering approximately 13,700 square miles. The SVAB stretches about 200 miles long in a north-south direction, and has a maximum width of about 150 miles, although the width of the valley floor only averages about 50 miles. Topography in the SVAB varies drastically with valley floor, rolling foothills, and mountains. Elevations range from 40 feet to over 9,000 feet.

CARB maintains numerous air quality monitoring sites throughout each County in the Air Basin to measure ozone, $PM_{2.5}$, and PM_{10}. It is important to note that while the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards, California maintains 1-hour ozone standards, and CARB collects 1-hour ozone data at most monitoring sites. Data obtained from the monitoring sites throughout Yolo County between 2002 and 2011 are summarized in Tables 3.3-3 through 3.3-5.

TABLE 3.3-3 YOLO COUNTY AMBIENT AIR QUALITY MONITORING DATA SUMMARY - OZONE 2002-2011

Year	Days > Standard				1-Hour Observations			8-Hour Averages				Year Coverage	
	State		National			State	Nat'l	State		National			
	1-Hr	8-Hr	1-Hr	'08 8-Hr	Max.	D.V.[1]	D.V.[2]	Max.	D.V.[1]	Max.	'08 D.V.[2]	Min	Max
2011	0	4	*0*	1	0.088	0.09	0.088	0.082	0.082	0.082	0.070	98	99
2010	0	3	*0*	0	0.094	0.10	0.097	0.073	0.088	0.072	0.072	85	98
2009	0	12	*0*	3	0.093	0.10	0.097	0.082	0.088	0.082	0.074	95	100
2008	6	15	*0*	7	0.112	0.11	0.106	0.099	0.091	0.098	0.079	96	96
2007	2	5	*0*	3	0.106	0.10	0.106	0.091	0.091	0.091	0.080	97	100
2006	7	24	*0*	15	0.106	0.10	0.102	0.094	0.091	0.094	0.079	99	100
2005	2	14	*0*	6	0.099	0.10	0.097	0.086	0.086	0.086	0.077	98	100
2004	1	6	*0*	0	0.096	0.11	0.100	0.075	0.091	0.075	0.079	99	100
2003	4	21	*0*	10	0.098	0.11	0.101	0.085	0.091	0.084	0.083	97	99
2002	10	22	*0*	14	0.121	0.11	0.101	0.091	0.091	0.091	0.083	98	99

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. THE NATIONAL 1-HOUR OZONE STANDARD WAS REVOKED IN JUNE 2005 AND IS NO LONGER IN EFFECT. STATISTICS RELATED TO THE REVOKED STANDARD ARE SHOWN IN ITALICS. D.V. [1] = STATE DESIGNATION VALUE . D.V. [2]= NATIONAL DESIGN VALUE.

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2012.

TABLE 3.3-4 YOLO COUNTY AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM $_{2.5}$ 2002-2011

Year	Est. Days > Nat'l '06 Std.	Annual Average		Nat'l Ann. Std. D.V.[1]	State Annual D.V.[2]	Nat'l '06 Std. 98th Percentile	Nat'l '06 24-Hr Std. D.V.[1]	High 24-Hour Average		Year Coverage	
		Nat'l	State					Nat'l	State	Min.	Max.
2011	*	*	12.6	*	13	*	*	39.4	43.3	93	93
2010	0.0	5.7	5.7	*	10	18.6	*	26.7	38.6	96	96
2009	0.0	7.5	9.1	*	10	27.4	*	27.6	36.4	94	94
2008	*	*	9.7	*	10	*	*	41.9	78.0	92	92
2007	15.1	8.3	8.8	8.7	9	39.5	33	42.0	62.1	95	95
2006	12.3	9.3	9.3	9.4	10	36.0	30	44.0	78.6	95	95
2005	0.0	8.4	*	9.1	10	24.0	28	35.0	59.5	89	89
2004	3.4	10.4	10.4	9.8	10	31.0	30	36.0	49.5	92	92
2003	0.0	8.4	8.4	*	8	28.0	31	31.0	41.7	91	91
2002	3.4	10.7	*	*	10	31.0	35	69.0	69.0	85	85

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. D.V. [1] = STATE DESIGNATION VALUE . D.V. [2]= NATIONAL DESIGN VALUE

**= INDICATES THERE WAS INSUFFICIENT DATA AVAILABLE FOR CARB TO DETERMINE THE VALUE.*

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2012.

TABLE 3.3-5: SACRAMENTO VALLEY AIR BASIN AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM $_{10}$ 2002-2011

Year	Est. Days > Std.		Annual Average		3-Year Average		High 24-Hr Average		Year Coverage
	Nat'l	State	Nat'l	State	Nat'l	State	Nat'l	State	
2011	0.0	24.4	24.2	25.1	23	26	73.5	73.0	100
2010	0.0	12.2	20.5	21.0	26	33	87.4	87.4	100
2009	0.0	18.4	25.6	26.4	28	33	76.0	76.0	100
2008	6.6	68.7	32.9	33.4	28	33	236.7	232.0	100
2007	0.0	36.4	27.5	28.1	26	29	119.0	119.0	100
2006	1.1	53.3	37.8	28.7	28	35	159.6	111.0	100
2005	0.0	42.3	27.2	27.9	26	35	110.0	109.0	100
2004	6.1	79.5	34.5	35.1	27	35	169.0	171.0	100
2003	0.0	30.6	28.4	28.8	29	32	89.0	123.0	100
2002	*	41.0	30.9	31.8	30	32	144.8	96.0	100

NOTES: THE NATIONAL ANNUAL AVERAGE PM10 STANDARD WAS REVOKED IN DECEMBER 2006 AND IS NO LONGER IN EFFECT. AN EXCEEDANCE IS NOT NECESSARILY A VIOLATION. STATISTICS MAY INCLUDE DATA THAT ARE RELATED TO AN EXCEPTIONAL EVENT. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. NATIONAL STATISTICS ARE BASED ON STANDARD CONDITIONS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA.

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2012.

3.3.2 REGULATORY SETTING

FEDERAL

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The EPA is responsible for administering the FCAA. The FCAA requires the EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

The law recognizes the importance for each state to locally carry out the requirements of the FCAA, as special consideration of local industries, geography, housing patterns, etc. is needed to have full comprehension of the local pollution control problems. As a result, the EPA requires each state to develop a State Implementation Plan (SIP) that explains how each state will implement the

FCAA within their jurisdiction. A SIP is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. CARB is the state agency that is responsible for preparing the California SIP.

Transportation Control Measures

One particular aspect of the SIP development process is the consideration of potential control measures as a part of making progress towards clean air goals. While most SIP control measures are aimed at reducing emissions from stationary sources, some are typically also created to address mobile or transportation sources. These are known as transportation control measures (TCMs). TCM strategies are designed to reduce vehicle miles traveled and trips, or vehicle idling and associated air pollution. These goals are achieved by developing attractive and convenient alternatives to single-occupant vehicle use. Examples of TCMs include ridesharing programs, transportation infrastructure improvements such as adding bicycle and carpool lanes, and expansion of public transit.

Air Quality Standards

National Ambient Air Quality Standards (NAAQS) are determined by the EPA. The standards include both primary and secondary ambient air quality standards. Primary standards are established with a safety margin. Secondary standards are more stringent than primary standards and are intended to protect public health and welfare. States have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM_{10}) and lead. In addition, California has created standards for pollutants that are not covered by federal standards. The state and federal primary standards for major pollutants are shown in Table 3.3-1.

STATE

CARB Mobile-Source Regulation

The State of California is responsible for controlling emissions from the operation of motor vehicles in the state. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB's motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations which required auto manufacturers to phase in less polluting vehicles.

California Clean Air Act

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant

to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards. The Yolo-Solano Air Quality Management District is one of 35 air quality management districts that have prepared air quality management plans to accomplish a five percent annual reduction in emissions documenting progress toward the state ambient air quality standards.

Tanner Air Toxics Act

California regulates toxic air contaminants (TACs) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and has adopted EPA's list of hazardous air pollutants (HAPs) as TACs. Most recently, diesel PM was added to the ARB list of TACs. Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology to minimize emissions.

The AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators).

LOCAL

Yolo-Solano Air Quality Management District

The Yolo-Solano Air Quality Management District (YSAQMD) is the local agency with primary responsibility for compliance with both the federal and state standards and for ensuring that air quality conditions are maintained. They do this through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues.

Activities of the YSAQMD include the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, issuance of permits for stationary sources of air pollution, inspection of stationary sources of air pollution and response to citizen complaints, monitoring of ambient air quality and meteorological conditions, and implementation of programs and regulations required by the FCAA and CCAA.

In July 2007, the YSAQMD adopted the *Handbook for Assessing and Mitigated Air Quality Impacts*, which provides quantitative emission thresholds and established protocols for the analysis of air quality impacts for projects and plans. The YSAQMD has also adopted numerous rules that regulate air quality emissions. A list of applicable rules are listed below.

YSAQMD RULES

The YSAQMD has adopted numerous rules and regulations to implement its air quality plans. Following, are significant rules that will apply to the proposed project.

- District Rule 2.3: Ringelmann Chart Visible emissions from stationary diesel-powered equipment are not allowed to exceed 40 percent opacity for more than three minutes in any one-hour.
- District Rule 2.5: Dust emissions must be prevented from creating a nuisance to surrounding properties.
- District Rule 2.9: Outside fires for the purpose of disposing petroleum waste, demolition debris, construction debris, tires or other rubber materials, materials containing tar, or for metal salvage or burning of vehicle bodies is prohibited.
- District Rule 2.8. Any open burning requires approval and issuance of a burn permit from the District.
- District Rule 2.14: Architectural coatings and solvents used at the project are regulated by the District.
- District Rule 2.28: Cutback and emulsified asphalt application is regulated by the District.
- District Rule 2.40: Installation of any new traditional "open hearth" type fireplace is prohibited.
- District Rule 9.9: Demolition, renovation or removal of asbestos-containing materials requires District consultation and permit prior to commencing demolition or renovation work.
- Portable equipment greater than 50 horsepower, other than vehicles, must be registered with either the ARB Portable Equipment Registration Program (PERP) (http://www.arb.ca.gov/perp/perp.htm) or with the District.

3.3.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines and the Yolo-Solano Air Quality Management District's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007), the proposed project will have a significant impact on the environment associated with air quality if it will:

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

Impacts related to greenhouse gases and climate change are addressed in Section 3.7.

The Yolo-Solano Air Quality Management District's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007) provides project-level thresholds of significance for: particulate matter less than 10 micrometers in diameter (PM_{10}), carbon monoxide (CO), and the precursors to ozone, which are reactive organic gases (ROG) and nitrogen oxides (NOx). The thresholds apply to both construction and operational impacts.

TABLE 3.3-5a. THRESHOLDS OF SIGNIFICANCE FOR CRITERIA POLLUTANTS OF CONCERN.

Pollutant	*Thresholds of Significance*
ROG	10 tons/year
NOx	10 tons/year
PM_{10}	80 lbs/day
CO	Violation of a state ambient air quality standard for CO

SOURCES: YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT'S HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2007)

METHODOLOGY

Operational Emissions

There are three types of emission sources: area sources, mobile sources, and stationary sources. These collectively make up the project's operational emissions. The methodology used in this analysis to address each source is presented below.

AREA SOURCES

The term area source emissions refer to equipment or devices operating within a project that individually emit small quantities of air pollutants, but when considered collectively, represent large quantities of emissions. Examples include water and space heaters, fireplaces, wood burning heaters, lawn maintenance equipment, and application of paints and lacquers.

URBEMIS2007 (v.9.24) was used to estimate area source emissions. As recommended by Yolo-Solano AQMD in the *Handbook for Assessing and Mitigating Air Quality Impacts* (2007), the default for open-hearth fireplaces was modified to reflect District Rule 2.40, which bans open hearth fireplaces for new developments. The modification is consistent with the Yolo-Solano AQMD recommendation of a worst case scenario, which assumes the 10 percent default value for wood fireplaces was added to the wood stove percentage (i.e. 0% wood fireplace, 45% wood stoves, and 55% natural gas). The emission factors defaults for all other area source emissions were not modified for this model.

MOBILE SOURCES

The term mobile source emissions refer to vehicle emissions generated by a project. Mobile source emissions are dependent on a large number of variables including trip length, average speed, trip generation rates, vehicle fleet mix, starting conditions, temperature, year, and other factors.

URBEMIS2007 (v.9.24) was used to estimate mobile source emissions. The land use inputs were derived from the project description. The land use inputs include: single family housing units, apartment units, park acreage, office square footage, community center square footage, and retail square footage. The traffic inputs were derived from the traffic analysis. The traffic inputs include trip generation rates, vehicle mix, average trip length by trip type, and average speed.

STATIONARY SOURCES

The term stationary source emissions refer to equipment or devices operating at industrial and commercial facilities. Examples of facilities with stationary sources include manufacturing plants, quarries, print shops and gasoline stations. The proposed project does not propose stationary source emitters; therefore, this air quality analysis does not include stationary source emission estimates.

Construction Emissions

Construction activities can generate a substantial amount of air pollution. In some cases, the emissions from construction represent the largest air quality impact associated with a project. While construction-related emissions are considered temporary, these short-term impacts can contribute to the pollution load recorded at monitoring stations. Emissions from construction are assessed in this document to determine whether the thresholds of significance established by the Yolo-Solano Air Quality Management District would be exceeded.

Construction activities include: phase 2 demolition, clear and grub, rough grading, trench/backfill, finish grading of road and building pads, place base rock, concrete work, asphalt paving, building construction, and architectural coatings. The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips.

URBEMIS2007 (v.9.24) was used to estimate the construction emissions from construction activities. As recommended by Yolo-Solano AQMD in the *Handbook for Assessing and Mitigating Air Quality Impacts* (2007), the default construction equipment was modified to reflect the construction equipment needs for each construction phase. The construction equipment list and construction time assumptions used for this model is presented below.

EQUIPMENT LIST/CONSTRUCTION TIME

Phase 2 Demolition of Processing Facility: (March 2013 - June 30, 2013):

Asphalt, concrete removal

- 3 Excavator (30 days)
- 1 Loader (30 days)
- 1 Dump Truck (30 days)
- 1 Crusher (15 days)

Tree removal

- 1 Dump truck (2 days)

Removal/disposal/recycle of underground utilities.

- 1 Excavator (30 days)
- 1 loader (30 days)

Removal of monitoring well and oil-water clarifier unit

- 1 Excavator (1 day)
- 1 loader (1 day)

Material Hauling

- 110 tons green waste hauled offsite (recycled)
- 285 tons metal hauled offsite (recycled)
- 67,000 tons of concrete/asphalt to be crushed/stockpiled onsite for reuse in site development.

Site Construction

Clear and Grub: (July 1, 2013 - July 15, 2013):

- 1 dozer (5 days)

Rough Grading: (Aug 1, 2013 - August 15, 2013):

- 2-scrapers (15 days)
- 1-compactor (15 days)
- 1-water truck (15 days)
- 1-grader (10 days)
- 1 loader (10 days)
- Soil Import/Export
    - Total Import: 110,000 cubic yards
    - Total Export: No export
    - Haul Truck Capacity: 20 cubic yards
    - Haul Trips/Day: 180 haul trips per day (30 days)

Trench/Backfill: (Sept 1, 2013 - Oct 31, 2013):

- 1-excavator(30 days)

- 1-backhoe (30 days)

Finish grading of road and building pads: (Aug 15, 2013 - Aug 30, 2013):

- 1- grader (10 days)
- 1-loader (10 days)

Place base rock: (Nov 1, 2013 - Nov 30, 2013):

- 1- grader (15 days)
- 1-compactor (15 days)
- Haul trucks (22,600 cy of rock (1130+/- loads);

Concrete work: (Dec 1, 2013 - Dec 30, 2013):

- 1-curb extruding machine (10 days)
- Haul Trucks (concrete trucks to deliver approximately 1,400 cy of concrete) (175 loads);

AC Paving: (Jan 1, 2014 - Jan 15, 2014):

- 1-paver (5 days)
- 2-compactors (5 days)

Building Construction/Architectural Coatings: (Feb 1, 2014 - May 2017)

IMPACTS AND MITIGATION MEASURES

Impact 3.3-1: Operation of the project may cause a violation of an air quality standard or contribute substantially to an existing or projected air quality violation (Significant and Unavoidable)

The proposed project would be a direct and indirect source of air pollution, in that it would generate and attract vehicle trips in the region (mobile source emissions) and it would increase area source emissions. The mobile source emissions would be entirely from vehicles, while the area source emissions would be primarily from the use of natural gas fuel combustion, hearth fuel combustion, landscape fuel combustion, consumer products, and architectural coatings.

URBEMIS2007 (v.9.24) was used to estimate operational emissions for the proposed project. Table 3.3-6 shows the operational emissions, which includes both mobile and area source emissions of criteria pollutants that would result from the proposed project. Detailed URBEMIS2007 (v.9.24) emissions calculations are presented in Appendix C.

TABLE 3.3-6: TOTAL PROJECT GENERATED EMISSIONS AT FULL BUILDOUT

	ROG (tons/year)	***NO_X (tons/year)***	***PM_{10} (lbs/day)***
Area Source			
Natural Gas	0.11	1.49	0.02
Hearth	3.59	0.64	29.15[1]
Landscape	0.3	0.02	0.07
Consumer Products	5.8	--	--
Architectural Coatings	1.51	--	--
Area Source Total	**11.31 (tons/year)**	**2.15 (tons/year)**	**29.22** (lbs/day)
Mobile Source			
Single family housing	4.6	6.39	55.69
Apartments low rise	2.17	2.77	24.18
City park	0.01	0.01	0.07
Office park	2.76	3.85	33.38
Community Center	0.11	0.17	1.48
Retail	3.79	5.79	50.47
Mobile Source Total	**13.44**	**18.98**	**165.27** (lbs/day)
Total	**24.75 (tons/year)**	**21.13 (tons/year)**	**194.49** (lbs/day)
YSAPCD Threshold	**10 (tons/year)**	**10 (tons/year)**	**80 (lbs/day)**

NOTES: 1= PM_{10} FROM HEARTH EMISSIONS IS SHOWN IN AVERAGE POUNDS PER DAY OVER THE COURSE OF ONE YEAR. EMISSIONS OF PM_{10} FROM HEARTHS WOULD BE HIGHER THAN THIS DAILY AVERAGE DURING DAYS IN THE WINTER, AND AT OR NEAR ZERO ON DAYS DURING THE SUMMER MONTHS. SOURCES: URBEMIS2007 (V.9.24) AND YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT'S HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2007)

The Yolo-Solano Air Quality Management District has established an operational emissions threshold of significance for ozone precursors of 10 tons per year for ROG and NO_X, and 80 pounds per day for PM_{10}. The YSAQMD utilizes a screening process and separate model for CO impacts. As shown in the table above, project generated emissions are above the YSAQMD 10 tons per year threshold for ROG and NOx, and 80 pounds per day threshold for PM_{10}. This is a potentially significant impact. Implementation of the following mitigation measures would reduce project-related operational emissions (area source and mobile source) by an estimated 1.9% for ROG, 3.12% for NOx, and 1.69% for PM_{10}, as calculated using URBEMIS2007 (v.9 24).

It is noted that the mitigation requirements listed below are largely incorporated into the proposed project description and are planned for implementation by the project applicant regardless of whether or not these mitigation measures were included as a requirement in this EIR. These measures are included in this EIR in order to provide additional certainty that the project would implement all applicable requirements of the YSAQMD.

The percent reductions achieved by these mitigation measures and the project's design features would not bring the operational source emissions below the below the YSAQMD thresholds of significance for ROG, NOx or PM_{10}. Therefore, implementation of the proposed project would have a **significant and unavoidable** impact.

MITIGATION MEASURES

Mitigation Measure 3.3-1*: Prior to the issuance of each building permit, the project applicant shall incorporate green building designs into the residential and commercial components of the project to help offset area source emissions. Such green building designs will reduce area source emissions by using energy more efficiently and reducing the use of non-renewable energy resources. The Yolo-Solano AQMD suggests the following as potential green building measures:*

- *Duct system within the building thermal envelope, or insulated to R-8*
- *Passive cooling strategies including passive or fan-aided cooling planned for or designed into structure, a cupola or roof opening for hot air venting or underground cooling tubes*
- *Outdoor lighting designed for high efficiency, solar-powered or controlled by motion detectors*
- *Natural lighting in buildings*
- *Building siting and orientation to reduce energy use*
- *Summer shading and wind protection measures to increase energy efficiency*
- *Use of concrete or other non-polluting materials for parking lots instead of asphalt*
- *Use of landscaping to shade buildings and parking lots*
- *Use of photovoltaic and/or wind generators*
- *Installation of energy efficient appliances and lighting*
- *Installation of mechanical air conditioners and refrigeration units that use non-ozone depleting chemicals*

Mitigation Measure 3.3-2*: Prior to the approval of the Tentative Map, or as a condition of Tentative Map approval, the project applicant shall incorporate design measures that function to reduce vehicle emissions by increasing the use of alternative modes of transportation. The Yolo-Solano AQMD suggests the following as potential design measures:*

- *Street trees*
- *Direct pedestrian connections*
- *Zero building setbacks*
- *Pedestrian signalization and signage*
- *Street furniture and artwork*
- *Street lighting*
- *Availability of bicycle parking*
- *Design safe routes to schools*
- *Ensure that infrastructure is provided to accommodate transit. This may include:*
    - *Transit route signs and displays*
    - *Transit stop amenities*
    - *Bus turnouts and bulbs*
- *Design building elevations maximizing visual interest for pedestrians.*

Impact 3.3-2: Construction activities may result in temporary air quality impacts (Less than Significant with Mitigation)

Construction activities associated with construction and implementation of the proposed project would result in temporary short-term emissions associated with vehicle trips from construction workers, operation of construction equipment, and the dust generated during construction activities. These temporary and short-term emissions would generate additional ozone precursors (ROG and NOx) as well as PM_{10}, which could exacerbate the County's existing non-attainment status for these criteria pollutants. Below is an estimated construction schedule for the proposed project.

- Phase 2 Demolition of Processing Facility: (March 2013 - June 30, 2013):
- Clear and Grub: (July 1, 2013 - July 15, 2013):
- Rough Grading: (Aug 1, 2013 - August 15, 2013):
- Trench/Backfill: (Sept 1, 2013 - Oct 31, 2013):
- Finish grading of road and building pads: (Aug 15, 2013 - Aug 30, 2013):
- Place base rock: (Nov 1, 2013 - Nov 30, 2013):
- Concrete work: (Dec 1, 2013 - Dec 30, 2013):
- AC Paving: (Jan 1, 2014 - Jan 15, 2014):
- Building Construction/Architectural Coatings: (Feb 1, 2014 - May 2017)

URBEMIS2007 (v.9.24) was used to estimate construction emissions for the proposed project. Table 3.3-7 shows the construction emissions that would result from the proposed project. Detailed URBEMIS2007 (v.9.24) emissions calculations are presented in Appendix C.

TABLE 3.3-7: TOTAL CONSTRUCTION GENERATED EMISSIONS (5-YEAR CONSTRUCTION SCHEDULE)

	ROG (tons/year)	***NO_X (tons/year)***	***PM10 (lbs/day)***
Construction Source			
2013	0.52	4.71	98.19
2014	3.44	3.82	1.53
2015	5.21	3.66	1.59
2016	5.15	3.32	1.42
2017	3.61	1.25	.55
Peak Emissions	**5.21 (tons/year)**	**4.71 (tons/year)**	**98.19** (lbs/day)
YSAPCD Threshold	**10 (tons/year)**	**10 (tons/year)**	**80 (lbs/day)**

SOURCES: URBEMIS2007 (V.9.24) AND YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT'S HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2007)

The Yolo-Solano Air Pollution Control District has established a construction emissions threshold of significance for ozone precursors of 10 tons per year for ROG and NO_X, and 80 pounds per day for PM_{10}. The YSAQMD utilizes a screening process and separate model for CO impacts. As shown in the table above, Year 2015 is the year with the peak construction emissions of ROG with 5.21 tons per year, which is below the 10 tons per year threshold for ROG. Year 2013 is the peak year for construction emissions of NOx, with 4.71 tons/year, which is below the 10 tons per year threshold for NOx. Construction emissions are below the 80 pounds per day threshold for PM_{10} in years 2014 through 2017; however, they exceed the threshold in the first year of construction (2013) as a result of the grading activities. This is a **potentially significant** impact.

Approximately 99 percent of the PM_{10} emissions during peak emissions year of 2013 are related to PM_{10} dust, with the remainder related to PM_{10} exhaust. The Yolo-Solano Air Pollution Control District recommends the use of construction dust mitigation measures to reduce PM_{10} emissions during construction. The Yolo-Solano Air Quality Management District's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007) provides a list of dust mitigation measures along with their effectiveness at reducing PM_{10} emissions. Below is a list of construction dust mitigation reduction assumptions used for this analysis.

TABLE 3.3-8: CONSTRUCTION DUST MITIGATION REDUCTION ASSUMPTIONS

Mitigation Measure	*Source Category*	*Effectiveness*	*References*
Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.	Fugitive emissions from active, unpaved construction areas	50%	U.S. EPA, AP-42
Haul trucks shall maintain at least 2 feet of freeboard.	Spills from haul trucks	90%	Monterey Bay Unified APCD
Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.	Wind erosion from inactive areas	Up to 80% (assumed 40%)	U.S. EPA, AP-42
Sweep streets if visible soil material is carried out from the construction site.	On-road entrained PM10	14%	U.S. EPA Report Number EPA-600/R-95-171
Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.	Mud/dirt carryout on-road entrained PM10	42-52% (assumed 42%)	U.S. EPA Report Number EPA-600/R-95-171

SOURCES: YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT'S HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2007)

Implementation of the dust mitigation listed above would reduce project-related construction PM_{10} emissions to an estimated 25 pounds per day during the 2013 construction year (an approximately 75% reduction), which is below the 80 pounds per day threshold (calculations are shown in Appendix C). With implementation of the following mitigation measure, the proposed project would have a **less than significant** impact.

MITIGATION MEASURES

Mitigation Measure 3.3-3: *The project applicant shall implement the following dust control measures during all construction activities. These measures shall be a condition of the grading permit.*

- *Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.*
- *Haul trucks shall maintain at least 2 feet of freeboard.*
- *Cover all trucks hauling dirt, sand, or loose materials.*
- *Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.*
- *Sweep streets if visible soil material is carried out from the construction site.*
- *Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.*

Impact 3.3-3: Project implementation may result in carbon monoxide hotspot impacts (Less than Significant)

Project traffic would increase concentrations of carbon monoxide along streets providing access to the project. Carbon monoxide is a local pollutant (i.e., high concentrations are normally only found very near sources). The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations (i.e. hotspots), therefore, are usually only found near areas of high traffic volume and congestion.

The CO screening approach outlined in the Yolo-Solano Air Quality Management District's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007) was used to estimate whether or not the proposed project's traffic impact would cause a potential CO hotspot. The CO screening approach uses the following screening criteria:

- Does the peak-hour Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity reduce to an unacceptable LOS (typically LOS E or F[1])? or
- Will the proposed project substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity? (Note: This includes situations where the average delay would increase by 10 seconds or more when project-generated traffic is included.)

If the answer to the screening criteria is "yes," then the proposed project can be said to have the potential to create a violation of the CO standard and further modeling is warranted. If the answer to the screening criteria is "no," then the proposed project further modeling is not warranted and the proposed project would not create a violation of the CO standard.

The traffic impact analysis contained in Section 3.14 examined Level of Service (LOS) for intersections affected by the proposed project. No existing or future street or intersection is forecast to operate at an unacceptable LOS F or worse following implementation of the recommended mitigation. Additionally, as shown in Section 3.14, project traffic would not result in an increase of 10 seconds or more of average delay at any of the study intersection as a result of project-generated traffic. Since the project is within an attainment area for carbon monoxide (ambient air quality standards are currently attained) and in an area with low background concentrations, changes in carbon monoxide levels resulting from the proposed project would not result in violations of the ambient air quality standards, and would represent a **less than significant** impact.

[1] The City of Davis has generally established LOS E as the significance level for intersection operations within the City. However, LOS F is acceptable in the downtown core area, and within areas with a corridor plan. A corridor plan is currently being prepared for East Covell Blvd., adjacent to the project site. As such, LOS F was used in the CO screening analysis.

Impact 3.3-4: Project implementation may result in land use conflicts that could expose sensitive receptors to harmful pollutant concentrations (Less than Significant)

The screening approach outlined in the Yolo-Solano Air Quality Management District's *Handbook for Assessing and Mitigating Air Quality Impacts* (2007) was used to estimate whether or not the proposed project would air quality impacts associated with land use conflicts and sensitive receptors. The screening approach uses the project location relative to other uses to determine if there is the potential for localized air quality impacts. Localized air pollution impacts generally occur in one of two ways:

- a (new) source of air pollutants is proposed to be located close to existing receptors. For example, an industrial facility is proposed for a site near a school; or
- a (new) development project with receptors is proposed near an existing source of air pollutants. For example, a hospital is proposed for a site near an industrial facility.

The amount of emissions, the proximity between the emissions source and the nearest receptor, the direction of prevailing winds, and local topography can all influence the severity of a localized impact. The most frequent impacts are those related to: Toxic Air Contaminants (TACs), Odors, and Construction Dust. In addition, potential impacts arise from the proximity of urban uses on the project site to agricultural operations, both on-site and the adjacent Covell Village property to the north and east. These impacts to urban uses could occur as a result of dust, odor, or chemical migration from the agricultural operations within the range of effect.

TACs

A toxic air contaminant (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 very low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

The California Air Resources Board (ARB) published the *Air Quality and Land Use Handbook: A Community Health Perspective* (2007) to provide information to local planners and decision-makers about land use compatibility issues associated with emissions from industrial, commercial and mobile sources of air pollution. The ARB Handbook indicates that mobile sources continue to be the largest overall contributors to the State's air pollution problems, representing the greatest air pollution health risk to most Californians. The most serious pollutants on a statewide basis include diesel exhaust particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are emitted by motor vehicles. These mobile source air toxics are largely associated with freeways and high traffic roads. Non-mobile source air toxics are largely associated with industrial and commercial uses. Table 3.3-9 provides the California Air Resources Board minimum separation recommendations on siting sensitive land uses.

TABLE 3.3-9: CARB MINIMUM SEPARATION RECOMMENDATIONS ON SITING SENSITIVE LAND USES

Source Category	*Advisory Recommendations*
Freeways and High-Traffic Roads	• Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.1
Distribution Centers	• Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). • Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	• Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. • Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	• Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the ARB on the status of pending analyses of health risks.
Refineries	• Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	• Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro- ethylene	• Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. • Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline Dispensing Facilities	• Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.

SOURCES: YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT'S HANDBOOK FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2007)

The proposed project does not include any of the source categories listed in Table 3.3-9. The proposed project does not include the long-term operation of any other major onsite stationary sources of TACs. In addition, no major stationary sources of TACs have been identified in the immediate vicinity of the project site. The project site is not located adjacent to a freeway or high traffic road that is considered a significant source of mobile source air toxics. The closest traffic facility that poses a risk from mobile source air toxics is Interstate 80 located approximately 1.25 miles to the south of the project site. While application of pesticides and fertilizers is anticipated in conjunction with the urban farm on the Project site, restrictions on the use of these products will ensure that nearby urban uses are not adversely affected. See discussion under impact 3.2-1 (Agriculture and Forest Resources) and associated Mitigation Measure 3.2-1. Potential exposure of Project residents, employees and visitors to chemical agents from off-site agricultural operations is addressed by the incorporation of 150-foot buffer zones in accordance with City requirements. Implementation of the proposed project would not be anticipated to result in an increased exposure of sensitive receptors to localized concentrations of TACs that would exceed applicable standards. This proposed project would have a **less than significant** impact on sensitive receptors.

DUST/PARTICULATE MATTER

The proposed project requires earthmoving during the project's construction phase. The majority of earthmoving would be associated with the following construction activities:

- Phase 2 Demolition of Processing Facility: (March 2013 - June 30, 2013):
- Clear and Grub: (July 1, 2013 - July 15, 2013):
- Rough Grading: (Aug 1, 2013 - August 15, 2013):
- Trench/Backfill: (Sept 1, 2013 - Oct 31, 2013):
- Finish grading of road and building pads: (Aug 15, 2013 - Aug 30, 2013):
- Place base rock: (Nov 1, 2013 - Nov 30, 2013):

These construction activities would result in temporary dust generation (PM_{10}). Without control, dust emissions can create nuisances or localized health impacts. URBEMIS2007 (v.9.24) was used to estimate construction PM_{10} emissions for the proposed project. Construction emissions are discussed in more detail under Impact 3.3-2 Construction Impacts. Detailed URBEMIS2007 (v.9.24) emissions calculations are presented in Appendix C. Mitigation Measure 3.3-3 requires the implementation of construction dust mitigation measures to reduce PM_{10} emissions during construction. This mitigation measure is consistent with the recommendations of the Yolo-Solano Air Pollution Control District in *Handbook for Assessing and Mitigating Air Quality Impacts* (2007). Below is a list of the best management practices that are required under this mitigation measure.

- Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.
- Haul trucks shall maintain at least 2 feet of freeboard.
- Cover all trucks hauling dirt, sand, or loose materials.
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.
- Sweep streets if visible soil material is carried out from the construction site.
- Treat accesses to a distance of 100 feet from the paved road with a 6-inch layer of gravel.

Implementation of the dust mitigation required under Mitigation Measure 3.3-3 would ensure that dust emissions are below the YSAQMD thresholds, and that the proposed project would have a **less than significant** impact on sensitive receptors. While dust-generating activities are anticipated in conjunction with the urban farm on the Project site, such as soil tilling, restrictions will ensure that nearby urban uses are not adversely affected. See discussion under impact 3.2-1 (Agriculture and Forest Resources) and associated Mitigation Measure 3.2-1. Potential exposure of Project residents, employees and visitors to dust/particulate matter from off-site agricultural operations is addressed by the incorporation of 150-foot buffer zones in accordance with City requirements. As a result, impacts would be **less than significant.**

Impact 3.3-5: Project implementation may result in the generation of objectionable odors (Less than Significant)

While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the YSAQMD. The general nuisance rule (Heath and Safety Code §41700 and YSAQMD District Rule 2.5) is the basis for the YSAQMD threshold. A project may reasonably be expected to have a significant adverse odor impact where it "generates odorous emissions in such quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property."

As discussed under Impact 3.3-4, implementation of the proposed project would not directly create or generate objectionable odors to a significant degree. While application of pesticides and fertilizers is anticipated in conjunction with the urban farm on the Project site, and may result in potential odor effects, restrictions on these uses will ensure that nearby urban uses are not adversely affected. See discussion under impact 3.2-1 (Agriculture and Forest Resources) and associated Mitigation Measure 3.2-1. Potential exposure of Project residents, employees and visitors to odors from off-site agricultural operations is addressed by the incorporation of 150-foot buffer zones in accordance with City requirements. The two closest producers of odors include the Yolo County Landfill located northwest of the County Road 104 and County Road 28H intersection, and the Davis Waste Water Treatment facility located on County Road 28H just east of County Road 105. These facilities are located 2.5 and 2.75 miles away, respectively, from the project site. This distance is beyond the screening distance of one mile that is recommended by the YSAQMD. There are no other known producers of odors within vicinity of the project site. This impact is considered **less than significant**.

Impact 3.3-6: Project implementation may result in cumulative air quality impacts (Cumulatively Considerable)

A cumulative impact is defined as two or more individual effects which, when considered together, are either significant or "cumulatively considerable," meaning they add considerably to a significant environmental impact. A cumulative impact is considered over time and in conjunction with other past, present, and reasonably foreseeable future projects whose impacts might compound those of the project being assessed. A proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative impact.

Cumulative Operational Emissions: The region is designated nonattainment for Ozone and PM_{10}. Operational activities would increase emissions of ROG and NOx (Ozone precursors), and PM_{10}. The emissions model showed that ROG, NOx, and PM_{10} emissions are projected to exceed the YSAQMD threshold of significance. Mitigation measures are available to reduce project-related operational emissions (area source and mobile source) by 2.2% for ROG, 2.8% for NOx, and 2% for

PM_{10}. However, these percent reductions would not bring the operational source emissions below the YSAQMD thresholds of significance. Individually, the proposed project was determined to have a significant and unavoidable relative to operational emissions. As such, the proposed project would have a **cumulatively considerable** impact on operational emissions. At the same time, the project has been determined to be consistent with the Sustainable Communities Strategy (SCS) adopted by SACOG, as a plan for reducing greenhouse gas and air emissions associated with growth and related activities.

Cumulative Construction Emissions: The region is designated nonattainment for Ozone and PM_{10}. Construction activities would increase emissions of ROG and NOx (Ozone precursors), and PM_{10}. The emissions model showed that ROG and NOx emissions are projected to fall below the YSAQMD 10 tons per year threshold of significance. The emissions model showed that PM_{10} emissions are projected to exceed the threshold of significance during the 2013 construction year. This projected exceedance is associated with dust from earthmoving activities. However, with the implementation of the YSAQMD recommended dust mitigation, the PM_{10} emissions from construction activities would be reduced to an estimated 11.9 pounds per day during the 2013 construction year. This mitigated emissions level would be below the threshold of significance. Individually, the proposed project was determined to have a less than significant impact relative to construction emissions. Implementation of the proposed project would have a **less than cumulatively considerable** impact from construction emissions.

Cumulative CO Emissions: The region is designated attainment for CO, which means that there are low background concentrations of CO. The screening-level of analysis found that there are not any risks for CO hotspots because there is no existing or future street or intersection that is forecast to operate at an unacceptable LOS F or worse with the recommended mitigation. Individually, the proposed project was determined to have a less than significant impact relative to CO emissions. Implementation of the proposed project would have a **less than cumulatively considerable** impact from CO emissions

Cumulative TAC Emissions-Sensitive Receptors: The proposed project does not include any of the TAC source categories listed in the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB 2007). The proposed project does not include the long-term operation of any other major onsite stationary sources of TACs. In addition, no major stationary sources of TACs have been identified in the immediate vicinity of the project site. The project site is not located adjacent to a freeway or high traffic road that is considered a significant source of mobile source air toxics. The closest traffic facility that poses a risk from mobile source air toxics is Interstate 80 located approximately 1.25 miles to the south of the project site. Implementation of the proposed project would not be anticipated to result in an increased exposure of sensitive receptors to localized concentrations of TACs that would exceed applicable standards. Individually, the proposed project was determined to have a less than significant impact relative to TACs on sensitive receptors. Implementation of the proposed project would have a **less than cumulatively considerable** impact from to TACs on sensitive receptors.

Cumulative Odors-Sensitive Receptors: The two closest producers of odors include the Yolo County Landfill and the Davis Waste Water Treatment facility, which are located 2.5 and 2.75 miles

away, respectively, from the project site. This distance is beyond the screening distance of one mile that is recommended by the Yolo-Solano Air Quality Management District. There are no other known producers of odors within vicinity of the project site. With the exception of the urban farm, the proposed project does not include uses that would directly create or generate objectionable odors, as potential odor-generating activities on the urban farm will be limited to minimize potential impacts. Odors from the urban farm, if any, will be limited to minimize potential impacts. Odors from the urban farm, if any, will not combine with other off-site sources to create a significant impact. Individually, the proposed project was determined to have a less than significant impact relative to objectionable odors on sensitive receptors. Implementation of the proposed project would have a **less than cumulatively considerable** impact from to objectionable odors on sensitive receptors.

Cumulative Dust Emissions-Sensitive Receptors: The region is designated nonattainment for PM_{10}, which is largely attributed to dust. Construction activities would increase dust emissions. The emissions model showed that PM_{10} emissions are projected to exceed the threshold of significance during the 2013 construction year; however, with the implementation of the YSAQMD recommended dust mitigation requirements, the PM_{10} emissions from construction activities would be reduced to below the threshold of significance. Individually, the proposed project was determined to have a less than significant impact relative to construction related dust emissions. Implementation of the proposed project would have a **less than cumulatively considerable** impact from dust emissions.

Consistency with Plans: The land use assumptions used for the applicable air quality attainment plan (AQAP) and SIP are based on the adopted City of Davis General Plan. The proposed project is located within the City of Davis city limits and is designated for development under the adopted City of Davis General Plan. As such, the proposed project does not conflict with the land use assumptions used to prepare the AQAP and SIP. The proposed project does not include any federal activities for which a transportation conformity analysis is warranted.