IV. ENVIRONMENTAL IMPACT ANALYSIS
D. AIR QUALITY

INTRODUCTION

This section of the Revised Draft EIR provides a description of air quality within the City of Healdsburg, information on regulations and agencies with jurisdiction over the Project area, proposed General Plan policies relevant to air quality, and an analysis of potential impacts related to air quality resulting from implementation of the proposed General Plan. Sources of information used to prepare this section include the *Healdsburg 2030 General Plan Background Report* (January 2009 Draft) and other documents summarized in the Air Quality subsection of Section VIII, References.

ENVIRONMENTAL SETTING

Physical Setting

The city is enriched by its natural setting that includes good air quality. The Planning Area is located in northern Sonoma County, which falls within the North Coast Air Basin (Basin) along with Del Norte, Humboldt, Trinity, and Mendocino Counties. The Northern Sonoma County Air Pollution Control District (NSCAPCD) is the local agency responsible for monitoring air quality conditions in northern Sonoma County, including all of the Planning Area, and for carrying out enforcement activities to maintain air quality with applicable state and federal standards.

Local Climatological Factors Affecting Air Quality

Local topography plays a significant role in affecting weather patterns throughout the Coastal Range, including the Planning Area. The Russian River drainage basin extends from Mendocino County into the northern portion of Sonoma County. This air basin extends into the Santa Rosa plain to the south. The Planning Area lies between the Mayacama Mountains to the north and east and the Coast Range to west. These mountain ranges tend to buffer the Healdsburg area from the marine weather systems that originate over the Pacific and are drawn inland by the jet stream. Air layer temperature inversions also occasionally occur in the region trapping pollutants such as ozone and particulates in the air basin between the higher mountain ranges.

The climate of the Planning Area is typically polarized between summer and winter seasons, with cool moist winters and warm dry summers. The winter season is characterized by overcast days and lengthy periods of rain and drizzle. Winter temperatures range from an average low of 37°F to an average high of 62°F, with occasional overnight freezing temperatures. Annual precipitation averages 30 inches; 81 percent falls from November through March. Summer temperatures range from an average low of 48°F to an average high of 82°F, with temperatures in excess of 100°F occasionally.

Local Air Quality

In general, air quality in the city is good most of the year due to prevailing wind conditions and the fact that most of the surrounding area remains relatively undeveloped.

Motor vehicles are a major source of air pollutants in the Project area. Although cars are producing cleaner emissions, traffic resulting from regional growth in the County and the Bay Area is still on the rise. Commuting distances between job locations have increased due to the location of available or affordable housing; therefore, vehicle miles traveled per vehicle have also increased in recent years. As in the rest of the nation, locally there has also been an increase in light trucks and larger motor vehicles such as sport utility vehicles, which are not subject to the same fuel efficiency standards as regular passenger vehicles.

While funding was recently approved a regional passenger train, service is not expected to begin until 2013. Both for local as well as regional trips, most persons in the City continue to use the automobile rather than walk or use public transit. With the exception of residential neighborhoods close to downtown or the Healdsburg Avenue transit corridor, distances are too great for many people to seriously consider walking to shop or work. Relatively low density combined with a dispersed pattern of housing and jobs also make providing public transit that could more seriously compete with automobile use less feasible. Arterial streets with relatively high-speed automobile traffic lacking bike lanes or shoulders also pose a constraint for bicycle use. This holds true for both Healdsburg and the region as a whole.

Ozone

Relatively high ozone readings occur in summer on warm sunny days when there is high pressure along with little vertical air mixing or wind dispersion. Ozone is a type of contaminant that is a photochemical byproduct of reactive organic hydrocarbons and nitrogen oxides, in which a primary source is motor vehicular emissions. While local sources provide a contribution, the main cause of high ozone concentrations in the Healdsburg area is transport of this pollution from the south, including the Santa Rosa plain and the Bay Area.

Surrounding mountain ranges, such as found near the City and throughout the Bay Area, can trap ozone precursors, particularly during air temperature inversion conditions. The potential for ozone standard violations is greatest during long, hot summer and early autumn days.

Fine Particulate Matter

Based on studies conducted by the NSCAPCD, wood-burning fireplaces and stoves have been identified as the main cause of particulate matter violations. These studies show that the pattern of wood burning in residential fireplaces and stoves is positively correlated on a seasonal basis with increased levels of fine respirable particulates (less than 10 microns in size). Other contributors to seasonal problems with particulate emissions include agricultural burning and operations, construction, road dust, and wildland

fires. Agricultural burning reaches its peak in early spring (e.g., grapevine prunings). "No burn" days are declared by the air district when pollutant concentrations are high.

Emissions from wood-burning fireplaces and stoves can be greatly reduced by the use of clean-burning fireplace inserts and stoves, such as those required by the NSCAPCD for all new and replacement devices, and/or by using dedicated gas-fired systems instead.

Approvals of major new residential and specific plan projects in the City have included conditions of approval incorporating recommendations by the NSCAPCD. These have included the requirement that no more than one wood-fired device be allowed per housing unit and that this device be certified to meet the NSCAPCD's Regulation IV standard, and that any more than one device would need to be a gas-dedicated system. Furthermore, wood-fired devices have been prohibited in areas with higher residential density and fireplaces have been limited to installation of gas-dedicated systems, as was done in the R-1 3,500 and R-1 6,000-zoned portion of Specific Plan Area A.

Diesel Particulate Matter

A more recently-recognized air quality problem is the particulate matter fraction of diesel exhaust identified by the California Air Resources Board (CARB) in 1998 as a toxic air contaminant. It is highly carcinogenic and accounts for about 80 percent of the cancer risk associated with known ambient air toxins. Cancer risks are typically much higher in areas close to freeways and warehouse operations in highly urbanized areas. Diesel PM is also linked to increased mortality from acute exposure, decreased lung growth and function, and increased lung and heart disease. Diesel PM emissions in the County and the Planning Area can result from use of emergency standby (back-up) engines, river and land-based mining equipment, agricultural pumping engines, trucks, buses, construction equipment, and a variety of other sources.

California has adopted a comprehensive diesel risk reduction program. The U.S. Environmental Protection Agency (EPA) and CARB have adopted low sulfur diesel fuel standards that will reduce diesel particulate matter substantially.

Asbestos

Asbestos is the common name for a group of naturally-occurring fibrous silicate minerals commonly associated with ultramafic rocks[1] that can separate into thin but strong durable fibers. Ultramafic rocks form in high-temperature environments well below the surface of the earth. By the time they are exposed at the surface by uplift and erosion, ultramafic rocks may be partially to completely altered to serpentinite,

[1] *Clinkenbeard, J., R. Churchill, and K. Lee, Guidelines for Geologic Investigations of Naturally Occurring Asbestos in California, Special Publication 124, 2002.*

a type of metamorphic rock. Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in the bodies of these rocks or along their boundaries.[2]

Areas of naturally-occurring asbestos (NOA), which was identified as a Toxic Air Contaminant in 1986 by CARB, are located in Sub-Areas B and C of the Planning Area. For individuals living in areas of NOA, there are many potential pathways for airborne exposure. Exposures to soil dust containing asbestos can occur under a variety of scenarios, including children playing in the dirt, dust raised from unpaved roads and driveways covered with crushed serpentine, uncontrolled quarry emissions, grading and construction associated with development of new housing, gardening, and other human activities. For homes built on asbestos outcroppings, asbestos can be tracked into the home and can also enter as fibers suspended in outdoor air. Once such fibers are indoors, they can be entrained into the air by normal household activities, such as vacuuming (as many fibers will simply pass through vacuum cleaner bags).

People exposed to low levels of asbestos may be at elevated risk (e.g., above background rates) of lung cancer and mesothelioma. The risk is proportional to the cumulative inhaled dose (number of fibers), and also increase with the time since first exposure. Although there are a number of factors that influence the disease-causing potency of any given asbestos (such as fiber length and width, fiber type, and fiber chemistry), all forms are carcinogens.

Local Air District and Air Quality Monitoring

As mentioned previously, the Planning Area is located in northern Sonoma County, which falls under the jurisdiction of the NSCAPCD. The District maintains three monitoring stations for measuring concentrations of criteria pollutants, of which two are located within the Planning Area. One is used for measuring and recording ozone levels and is located at the Healdsburg Municipal Airport. The other is used for measuring and recording particulate levels and is located at the Senior Center near downtown. Table IV.D-1 identifies pollutant concentrations that have been measured at these monitoring stations during the period of 2004 through 2007. Ambient air quality as monitored at these stations is good and there were no exceedances during this period.

Odors

Common sources of odors include wastewater treatment plants, landfills, composting facilities, refineries and chemical plants. Odors rarely have direct health impacts, but they can be very unpleasant and can lead to annoyance and concern over possible health effects among the public. 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). The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the

[2] *Churchill, R. K., and R. L. Hill, A General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos, California Division of Mines and Geology Open-File Report 2000-19, 2000.*

ability to smell very 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; an odor that is offensive to one person (e.g., fast food restaurant) may be perfectly acceptable to another. It is important to also 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.

Table IV.D-1
Summary of Ambient Air Quality in the Project Vicinity

Emissions Source	Year			
	2004	2005	2006	2007
Ozone				
Maximum 1-hour concentration measured	0.090 ppm	0.080 ppm	0.070 ppm	0.070 ppm
Days exceeding State 0.090 ppm 1-hour standard	0	0	0	0
Maximum 8-hour concentration measured	0.077 ppm	0.060 ppm	0.060 ppm	0.067 ppm
Days exceeding national 0.08 ppm 8-hour standard	0	0	0	0
Days exceeding state 0.070 ppm 8-hour standard	0	0	0	0
Respirable Particulate Matter (PM_{10})				
Maximum 24-hour concentration measured	23.0 $\mu g/m^3$	26.0 $\mu g/m^3$	30.0 $\mu g/m^3$	43.0 $\mu g/m^3$
Days exceeding State 50 $\mu g/m^3$ 24-hour standard	*	0	0	0

Note: * = *insufficient data*
ppm = parts per million by volume
$\mu g/m^3$ = micrograms per cubic meter
AAM = annual arithmetic mean

Source: California Air Resources Board, Select 8 Summary, website: http://www.arb.ca.gov/adam/php_files/aqdphp/sc8start.php, accessed January 14, 2009.

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.

Certain activities within the city emit odors occasionally that are not considered unpleasant, such as restaurants, coffee roasting and grape crushing. Odors that could be objectionable, such as those associated with vehicle painting, are controlled by requiring that such activities occur indoors. There are no heavy industries within the city that emit odors through manufacturing processes such as canning or wood pulp processing.

Existing facilities that represent potential odor emitters near the city include the Healdsburg Transfer Station and Healdsburg Landfill. The transfer station is currently operational. The transfer station is operated by Sonoma County in accordance with California Integrated Waste Management Board (CIWMB) requirements that include development and implementation of an odor control plan. The facility is not allowed to store more than 300 cubic yards of waste within the housed tipping area overnight to control odors.

The Healdsburg Landfill, located adjacent to the transfer station, was a Class III sanitary landfill operated through 1989 and closed in late 1995 in conformance with applicable regulations. Closure activities included construction of a low-permeability soil cap and subsequent construction of a soil gas collection system. Landfill gas is currently controlled using a gas collection system, consisting of more than 30 gas wells, and a flare to incinerate the gas. The flare was permitted by NSCAPCD when it was installed (permit no. 9908). Direct emission of fugitive soil gas into the atmosphere is prevented by the soil cap, which consists of 2 feet of foundation soil, 1 foot of low-permeability clay, and a 1-foot-thick topsoil layer with vegetation (Saggio Hills project EIR, 2008).

No garbage or landfill-type odors were detected during any of the site visits conducted in 2008 by the consultants for the Saggio Hills project EIR. The northern boundary of the Saggio Hills site, which is located immediately south of the transfer station and landfill, was traversed at various times when the wind was blowing from the waste transfer station and closed landfill toward the proposed new residences, and no odors were detected. Furthermore, according to NSCAPCD, no verified odor complaints regarding the waste transfer station or closed landfill have been received (Saggio Hills project EIR, 2008).

Health Effects of Air Pollutants

The 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. The health effects of these criteria pollutants (i.e., ozone, carbon monoxide, fine suspended particulate matter, nitrogen dioxide, sulfur dioxide, and lead) and toxic air contaminants are described below:[3]

[3] *The descriptions of the health effects of the criteria pollutants are taken from Appendix C (Health Effects of Ambient Air Pollutants) of South Coast Air Quality Management District's "Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning" document.*

Ozone Individuals exercising outdoors, children and people with pre-existing lung disease such as asthma and chronic pulmonary lung disease are considered to be the most susceptible sub-groups for ozone (O_3) effects. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Elevated ozone levels are associated with increased school absences. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in high ozone communities. Ozone exposure under exercising conditions is known to increase the severity of the above-mentioned observed responses. Animal studies suggest that exposures to a combination of pollutants that include ozone may be more toxic than exposure to O_3 alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

Carbon Monoxide Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of carbon monoxide (CO) exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses, and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes. Reduction in birth weight and impaired neurobehavioral development has been observed in animals chronically exposed to CO resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels. These include pre-term births and heart abnormalities. Additional research is needed to confirm these results.

Fine Suspended Particulate Matter A consistent correlation between elevated ambient fine particulate matter (PM_{10} and $PM_{2.5}$) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the U.S. and various areas around the world. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in life-span, and an increased mortality from lung cancer. Fine particulate matter has also been related to hospital admissions for acute respiratory conditions in children, to school absences, to a decrease in lung volumes in children and to increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long-term exposure to particulate matter. The elderly, people with pre-existing respiratory or cardiovascular disease and children appear to be more susceptible to the effects of PM_{10} and $PM_{2.5}$.

Nitrogen Dioxide Studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to nitrogen dioxide

(NO_2). An increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. In animals, exposure to levels of NO_2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of O_3 and NO_2.

Sulfur Dioxide A few minutes' exposure to low levels of sulfur dioxide (SO_2) can result in airway constriction in some asthmatics, all of whom are sensitive to its effects. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties are observed after acute exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2. Animal studies suggest that despite SO_2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

Lead Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure. Lead poisoning can cause anemia, lethargy, seizures and death. It appears that there are no direct effects of lead on the respiratory system. Lead can be stored in the bone from early-age environmental exposure, and elevated blood lead levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland) and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of lead because of previous environmental lead exposure of their mothers.

Sulfates Most of the health effects associated with fine particles and SO_2 at ambient levels are also associated with sulfates (SO_4). Thus, both mortality and morbidity effects have been observed with an increase in ambient SO_4 concentrations. However, efforts to separate the effects of SO_4 from the effects of other pollutants have generally not been successful. Clinical studies of asthmatics exposed to sulfuric acid suggest that adolescent asthmatics are possibly a subgroup susceptible to acid aerosol exposure. Animal studies suggest that acidic particles such as sulfuric acid aerosol and ammonium bisulfate are more toxic than non-acidic particles like ammonium sulfate. Whether the effects are attributable to acidity or to particles remains unresolved.

Toxic Air Contaminants Toxic Air Contaminants (TACs) are a broad class of compounds known to cause or contribute to cancer or non-cancer health effects such as birth defects, genetic damage, and other adverse health effects. As discussed previously, effects from TACs may be both chronic and acute on human health. Acute health effects are attributable to sudden exposure to high quantities of air toxics. These effects include nausea, skin irritation, respiratory illness, and, in some cases, death. Chronic health effects result from low-dose long-term exposure from routine releases of air toxics. The effect of major concern for this type of exposure is cancer, which requires a period of 10-30 years after exposure to develop.[4] TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., benzene near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level. Diesel exhaust is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average).[5] According to CARB, diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants programs. California has adopted a comprehensive diesel risk reduction program. The EPA has adopted low sulfur diesel fuel standards that will reduce diesel particulate matter substantially. These went into effect in June 2006.

Greenhouse Gas Emissions and Climate Change

Climate change is the shift of "average weather" patterns observed on earth, and can be measured by such variables as temperature, wind patterns, storms, and precipitation. The temperature on earth is regulated by the "greenhouse effect," where naturally occurring gases, such as carbon dioxide, absorb infrared radiation emitted by the earth's surface and radiate it back to the surface, thus trapping heat within the atmosphere (IPCC 2001a). Without this naturally-occurring greenhouse effect, the earth's temperature would be about 61 degrees Fahrenheit (34 degrees Centigrade) cooler (CAT 2006). Changing the atmospheric abundance or properties of these gases can lead to a warming or cooling of the climate system. Human activities result in emission of four principal greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and halocarbons (IPCC 2007b).

Of all human activities, the burning of fossil fuels is the largest contributor in overall greenhouse gas emissions, releasing CO_2 into the atmosphere (IPCC 2007b). The resulting increases in greenhouse gas emissions from human activities are leading to higher concentrations and a change in composition of the atmosphere. During the previous 10,000 years, up to the year 1750, CO_2 measured within the range of

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[4] *South Coast Air Quality Management District, CEQA Handbook, Chapter 3, 1993.*

[5] *South Coast Air Quality Management District, Air Toxics Control Plan, website: http://www.aqmd.gov/aqmp/docs/AirToxicsControlPlan.pdf, October 23, 2007.*

280 ppm, give or take 20 ppm. During the industrial era, CO_2 rose to 367 ppm in 1999 and 379 ppm in 2005 (ICPP 2007a).

California is the second largest emitter of greenhouse gas emissions in the United States, after Texas. In 2004, California produced an estimated 492 million metric tons of CO_2 equivalents (MMTCO2e), including emissions associated with imported electricity. Eighty-one percent of the emissions came from the combustion of fossil fuels. In California, the majority of greenhouse gas emissions caused by human activity come from transportation, industrial, electrical power, and agriculture/forestry. The transportation sector was the single largest source of California's greenhouse gas emissions in 2004, accounting for 40.7 percent of the total greenhouse gas emissions in the state. This sector was followed by the electrical power sector at 22.2 percent (including both in-state and out-of-state sources) and the industrial sector at 20.5 percent. (CEC 2006)

Many sources and models indicate that temperatures on earth are warming and will continue to warm at unprecedented levels. The global mean surface temperature has increased by 1.1 degrees Fahrenheit (^oF) since the 19th century (IPCC 2001b) and the 10 warmest years of the last 100 years all occurred within the last 15 years. The Intergovernmental Panel on Climate Change (IPCC) also reports that the average global temperature is expected to rise by 1.1 to 6.4 ^oC by the end of the 21st century – depending on future greenhouse gas emission scenarios (IPCC 2007a).

Resource areas other than air quality and atmospheric temperature could be indirectly affected by the accumulations of greenhouse gas emissions. An increase in the average global temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada range. The Sierra snowpack provides both water supply and storage, which is a major source of water for the state. Although current forecasts are uncertain, it is evident that this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population. Beyond the issue of water supply, an increase of precipitation falling as rain rather than snow could lead to an increased potential for flooding as water that would normally be reserved in the Sierras as snowpack until spring could flow into the Sacramento-San Joaquin River systems concurrently with winter storm events. Such a scenario could put more pressure on the state's levee/flood control system (DWR 2006).

Regulatory Setting

Air quality within the Basin is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for regulating and improving the air quality within the Basin are discussed below.

Federal Regulations

The EPA is responsible for setting and enforcing the federal ambient air quality standards for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. EPA also has jurisdiction over emissions sources outside state waters (outer continental shelf), and establishes various emissions standards for vehicles sold in states other than California.

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP.

State Regulations

Executive Order S-02-05

In 2005, Governor Schwarzenegger issued Executive Order S-02-05, calling for statewide reductions to 2000 levels by 2010, 1990 levels by 2020 and to 80 percent below 1990 levels by 2050. The Executive Order also called for the creation of a state "Climate Action Team," which would report to the Governor every two years on progress toward meeting the targets and the effects of greenhouse gas emissions on the state.

Global Warming Solutions Act of 2006 (AB32)

In 2006, the Governor signed AB32, the "Global Warming Solutions Act of 2006", committing the State of California to reducing greenhouse gas emissions to 1990 levels by 2020. The statute requires the California Air Resources Board (CARB) to track emissions through mandatory reporting, determine what 1990 emissions were, set annual emissions limits that will result in meeting the 2020 target, and identify a list of discrete early actions that directly address greenhouse gas emissions, are regulatory, and can be enforced by January 1, 2010.

AB 32 addresses six greenhouse gases:

> *Carbon Dioxide (CO_2):* CO_2 is an odorless, colorless gas. Natural sources include decomposition of dead organic matter, respiration of plants and animals, evaporation from oceans and volcanic outgassing. Human activities contribute to CO_2 emissions from the burning of fossil fuels for transportation, building heating and cooling, and the manufacturing of goods. In addition deforestation releases CO_2 and reduces its uptake by plants (IPCC, 2007b).

Methane (CH_4): CH_4, a colorless, odorless gas, is the principal component of natural gas. CH_4 is released naturally through the anaerobic decay of organic matter such as the natural processes that occur in wetlands. Human activities contributing to CH_4 include agricultural activities and landfills. Global Warming Potential factors represent the ratio of the heat-trapping ability of each greenhouse gas to that of carbon dioxide. One ton of CH_4 has 21 times more ability to trap heat in the atmosphere than one metric ton of CO_2 (IPCC, 1995).*Nitrous Oxide (N_2O):* N2O, commonly known as laughing gas, is a colorless gas with a slightly sweet order. N_2O is released through natural processes in the soil and oceans. Human activities contribute to N_2O emissions through the use of fertilizers and the burning of fossil fuels. N_2O has a global warming potential 310 times greater than CO_2 (IPCC, 1995).

Sulfur Hexafluoride (SF_6): SF_6 is a colorless, odorless, non-toxic and non-flammable gas. The most common human activity contributing to SF6 is as an electrical insulator in high voltage equipment that transmits and distributes electricity replacing oil filled circuit breakers. SF_6 has a global warming potential 23,900 times greater than CO_2 (IPCC, 1995).

Hydrofluorocarbons (HFCs): Hydrofluorocarbons (HFCs) are synthetic man-made chemicals that are used as a substitute for Chlorofluorocarbons (CFCs) in applications such as automobile air conditioners and refrigerants. Of all the greenhouse gases, they are one of three groups with the highest global warming potential ranging from 12 for C_2H_5F to 11,700 for CHF_3 (IPCC, 2001). Human activity use is increasing due to its use as a refrigerant.

Perfluorocarbons (PFCs): PFCs are a non-flammable, non-toxic gas. Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere over a very long time. The two main human activity sources of PFCs are aluminum production and semiconductor manufacture. On average, PFCs have the highest global warming potential ranging from 6,500 for CF_4 to 9,200 for C_2F_6 (IPCC, 1995).

The initial report of the State's Climate Action Team (CAT) was published in 2006. This report identified over 40 recommended strategies that account for a statewide reduction of approximately 193 MMTCO2e (CAT 2006). The CAT report was updated in the *Updated Macroeconomic Analysis of Climate Strategies* published in October 2007. This report updated the strategies and refined the methodology for analyzing the strategies and estimating the macroeconomic impacts. As a result of this refinement, the emission reduction from the CAT strategies is now estimated at 132 $MMTCO_2e$ by 2020..

In June 2007, CARB approved *Proposed Early Actions to Mitigate Climate Change in California* (April 20, 2007), which identifies numerous strategies to be initiated prior to 2012. In September 2007, CARB published the *Draft Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California*. The two CARB reports combined include 44 measures that are estimated to reduce greenhouse gas emissions by 42 $MMTCO_2e$.

In December 2007, CARB approved the 2020 emissions limit at 427 $MMTCO_2e$. Projected emissions for 2020 are 596 $MMTCO_2e$. Therefore, a reduction of 169 $MMTCO_2e$ is needed to meet the goal. On December 11, 2008, CARB approved the *Climate Change Proposed Scoping Plan* (Scoping Plan). This document is a comprehensive plan that identifies how California will meet the 2020 greenhouse gas emission limit. It incorporates many of the strategies included in the earlier CAT and CARB documents. According to the Plan, the strategies would result in a reduction of 174 $MMTCO_2e$, or 5 $MMTCO_2e$ more than is needed for the 427 $MMTCO_2e$.

Some of the State measures identified in these documents have broad implications and would reduce impacts at the local level. For example, in 2003, the State of California adopted a goal to achieve 20 percent of retail electricity sales from renewable energy sources by 2010, referred to as the Renewable Portfolio Standard (RPS). The average RPS was 12.7 percent in 2007 (PUC, website). The Scoping Plan calls for increasing the RPS to 33 percent by 2020. Increased RPS is expected to reduce emissions by 21.3 $MMTCO_{2e}$, CARB is also developing a Low Carbon Fuel Standard (LCFS) which would reduce the carbon intensity of transportation fuels by at least 10 percent by 2020. LCFS is expected to reduce emissions by 15 $MMTCO_2e$. Other strategies involve increasing the efficiency of light-duty vehicles, planting trees in urban areas, increasing energy efficiency standards, and implementing green building standards.

CEQA

The State Office of Planning and Research (OPR), as required by SB 97 (2007), has released for public review and comment draft guidelines for the analysis and mitigation of greenhouse gas emissions in CEQA documents. The Resources Agency must adopt the regulations by January 1, 2010. In the interim, OPR has released guidance through a Technical Advisory, *CEQA and Climate Change: Addressing Climate Change Through CEQA Review* (June 19, 2008).

On October 24, 2008, CARB released a preliminary draft staff proposal for *Recommended Approaches for Setting Interim Significant Thresholds for Greenhouse Gases under the California Environmental Quality Act*. This document looks at emissions from two sectors: Industrial and Residential/Commercial. For the industrial sector the preliminary proposal suggests a quantitative threshold of 7,000 $MTCO_2$ for operational emissions, and performance based standards for construction and transportation emissions. For the residential/commercial sector the preliminary proposal is to develop "clear and stringent performance standards." The performance standards would address five major emission sub-sources for the sector: energy use, transportation, water use, waste, and construction. Even if a project had met all performance standards, the project's total net emissions would still need to be less than an, as yet unspecified, quantified level for a determination of non-significance. As mentioned above, the thresholds and performance standards are preliminary and under public review. In addition, there are several sectors (landfill, agriculture, etc) for which preliminary thresholds are still being developed. Until such time as Guidelines become finalized and adopted, the City analyzes this important issue using the current available information and available regulatory guidance.

Federal and State Air Quality Standards

National Ambient Air Quality Standards (NAAQS) have been established by the EPA for six major air pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O_3), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulfur oxides (SO_2), and lead. The California Ambient Air Quality Standards (CAAQS) apply to these same six criteria. The CAAQS are more stringent than the federal standards and, in the case of PM_{10} and SO_2, far more stringent. The federal and state standards summarized in Table IV.D-2 establish upper limits for these pollutants to protect all segments of the population, including those most susceptible to the pollutants' adverse effects (e.g., children, the elderly, people weak from illness or disease, or persons doing heavy work or exercise).

Pursuant to Clean Air Act requirements, all areas of California have been classified by attainment status with regard to NAAQS. The EPA has designated northern Sonoma County as an attainment area for all federal standards.

The North Coast Basin is currently classified as "non-attainment" for the state standard for one-hour ozone. Because the state ozone standard has not been exceeded in the Basin during the last three "ozone seasons" (i.e., 2006, 2007, 2008), the California Air Resource Board is expected to reclassify the basin to "attainment" status for ozone in 2009[6].

Regional Regulations

Northern Sonoma County Air Pollution Control District

The role of NSCAPCD is to achieve clean air to protect public health and the environment. NSCAPCD's primary responsibility is for attaining and maintaining the NAAQS and CAAQS. NSCAPCD is responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, and monitoring ambient air quality and meteorological conditions.

CARB has ruled that NSCAPCD is a downwind receptor of ozone transported from the San Francisco Bay Area. As such, NSCAPCD relies on CARB ozone control plans to reduce ambient levels in northern Sonoma County by reducing emissions in upwind areas.

Specific NSCAPCD rules applicable to development and activities under the proposed General Plan may include, but are not limited to:

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[6] *Alex Saschin, Northern Sonoma County Air Pollution Control District, E-mail message, January15, 2009.*

Table IV.D-2
Applicable Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1] (concentration)[3]	National Standards[2] (concentration)[3]	
			Primary [3,4]	Secondary [3,5]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	-	Same as primary standard
	8 Hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	150 µg/m^3	
	Annual Arithmetic Mean	20 µg/m^3	-	
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	-	35 µg/m^3	
	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	9 ppm (10 mg/m^3)	-
	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary standard
	1 Hour	0.18 ppm (338 µg/m^3)	-	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	-	0.030 ppm (80 µg/m^3)	-
	24 Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	-
	3 Hour	-	-	0.5 ppm (1300 µg/m^3)
	1 Hour	0.25 ppm (655 µg/m^3)	-	-
Lead[6]	30 day average	1.5 µg/m^3	-	-
	Calendar quarter	-	1.5 µg/m^3	Same as primary standard
	Rolling 3-month average	-	0.15 µg/m^3	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer - Visibility of 10 miles or more due to particles when relative humidity is < 70%.	None	
Sulfates	24 Hour	25 µg/m^3		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride[6]	24 Hour	0.01 ppm (26 µg/m^3)		

[1] *California standards for ozone, carbon monoxide, sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.*

[2] *National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.*

[3] *Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.*

[4] *National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.*

[5] *National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.*

[6] *CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.*

- Rule 220 – New Source Review (NSR) Standards

The NSR program ensures that air quality is not significantly degraded from the addition of new and modified factories, industrial boilers and power plants. In areas with unhealthy air, NSR assures that new emissions do not slow progress toward cleaner air. The NSR program also assures people that any large new or modified industrial source in their neighborhoods will be as clean as possible, and that advances in pollution control occur concurrently with industrial expansion.

- Rule 400 – General Limitations

The general limitations rule ensures that a person may not create a public nuisance by discharging 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 an natural tendency to cause injury or damage to business or property. NSCAPCD has established a nuisance rule to address odor issues. Rule 400 states that air contaminants will not be discharged in quantities sufficient to constitute a public nuisance to any considerable number of persons or the public or that would endanger the comfort or repose of any person or the public. Odors would be considered a nuisance by NSCAPCD if a complaint is received from a significant number of people and the odor issue is verified upon inspection.

- Rule 410 – Visible Emissions

The visible emissions rule ensures that a person may not create a public nuisance by discharging into the atmosphere from any source whatsoever any air contaminant for a period or periods aggregating more than three (3) minutes in any one hour which is as dark or darker in shade as that designated as No. 2 on the Ringlemann Chart, as published by the United States Bureau of Mines or of such opacity as to obscure an observer's view to a degree equal to or greater than Ringlemann 2 or forty (40) percent opacity.

- Rule 420 – Particulate Matter

The particulate matter rule ensures that no person may discharge particulate matter into the atmosphere causing a public nuisance or causing an exceedance of state or national ambient air quality standards. Various emission limits are defined in the rule governing particulate emissions from different sectors of industry.

- Rule 430 – Fugitive Dust Emissions

The Fugitive dust rule ensures that the handling, transporting, or open storage of materials in such a manner which allows or may allow unnecessary amounts of particulate matter to become airborne, shall not be permitted. The rule also defines a set of reasonable precautions designed to aid in preventing violation the rule.

- Regulation II – Open Burning

This regulation prohibits the use of open outdoor fires within the Basin with certain exemptions as outlined in the regulation.

- Regulation IV – Control Measure for Wood-Fired Appliance Emissions

This regulation is intended to limit and/or reduce particulate emissions caused by the use of wood-fired appliances, which must be EPA or District certified, and emit less than or equal to 7.5 grams particulate per hour for a non catalytic wood fired appliance or 4.1 grams per hour for a catalytic wood fired appliance.

City of Healdsburg

In 2002, the Healdsburg City Council adopted Resolution 78-2002, committing to participate in the Cities for Climate Protection (a program of the International Council for Local Environmental Initiatives). By doing so the City committed to:

- Taking a leadership role in promoting public awareness about the causes and impacts of climate change.

- Undertaking the Cities for Climate Protection program's five milestones to reduce greenhouse gas and air pollution emissions throughout the community by:

    1. Conducting a greenhouse gas emissions inventory and forecast to determine the source and quantity of greenhouse gas emissions;
    2. Establishing a greenhouse gas emissions reduction target;
    3. Developing an action plan with both existing and future actions to meet the greenhouse gas reduction target;
    4. Implementing the action plan; and
    5. Monitoring to review progress.

In 2003, the City prepared a municipal greenhouse gas inventory which established the 2000 baseline at approximately 1,423 tons per year. The inventory identifies emissions from six City sectors: buildings, streetlights, water and sewer, commute, fleet, and waste.

In 2005, the City completed step 2 with the passage of Resolution 84-2005, establishing greenhouse gas emission reduction targets. The targets were set at 25% below 1990 levels by 2015 for community emissions and 20% below 2000 levels by 2010 for municipal operations. The City's reduction targets are more stringent than those passed by the State in AB 32. In May 2008, the City published *City of Healdsburg Greenhouse Gas Emissions Reduction Action Plan Analysis* (Healdsburg 2008). The Plan identified five individual action plans the City could choose to adopt, with each plan ranging from a 21% to 68% reduction in municipal greenhouse gas emissions. In October 2008, the City Council completed step 3 by adopting Action Plan B as the preferred plan. Action Plan B consists of a combination of 15 measures related to building efficiency (lighting), photovoltaic systems, pump efficiency, and fleet vehicle and fuel alternatives. Action Plan B is expected to result in a 22.9% reduction in municipal GHG emissions or 326 tons of CO2e.

In November 2008, the Healdsburg City Council approved the City's participation in the development of a Regional Climate Protection Coordination Plan (City Resolution 141-2008). The purpose of the RCPCP is to organize and focus all county-wide efforts to reach the community emission reduction goal of 25% below 1990 levels by the year 2015, adopted by all the cities in Sonoma County, including Healdsburg, and Sonoma County. This effort will be lead by the Sonoma County Transportation Authority and includes an aggressive schedule for completion by December 2009.

Healdsburg Electric Utility

Unlike other communities in Sonoma County, most of the City of Healdsburg is not served by PG&E for its electricity needs. The Healdsburg Electric Utility owns and operates its own electric distribution, purchasing a majority of its electricity from the Northern California Power Agency (NCPA). NCPA is a not-for-profit joint powers agency that represents and provides support to 17 communities and districts in Northern and Central California. NCPA was founded in 1968 as a forum through which community-owned utilities could make investments to ensure an affordable, reliable and clean future energy supply for the members served.

NCPA owns and operates several power plants that together comprise a 95% emission-free generation portfolio, of which 65% qualifies for the Renewable Portfolio Standard (RPS). The resource mix includes geothermal, hydroelectric, wind, solar, and natural gas facilities. Of this mix, the City owns a share in two of the geothermal plants and the Calaveras Hydroelectric Project, giving the City a RPS of 48% for 2007. This is significantly higher than the 12.7% RPS average of the three largest Investor-Owned Utilities serving California, and exceeds the State-adopted RPS standard of 20% by 2010 as well as the State proposed standard of 33% by 2020.

Green City Program

In 2005, the City Council adopted Resolution 136-2005 supporting green building practices and providing for expedited permit review and acknowledgment for those developments choosing to incorporate green components into their building design and construction. In November 2008, the City created the Green City Program to serve as a framework for the implementation of projects and activities designed to promote environmentally sound practices, develop green and sustainable alternatives, and reduce greenhouse gas emissions (City Resolution 143-2008).

The Green City Program includes developing a Green Building Program, community education and outreach, a program to green the existing housing stock, developing a Green Business Certification Program, and pursuing a photovoltaic (PV) Cooperative Program. In terms of the future Green Building Program, the framework requires the City to consider requiring new residential dwellings to achieve a minimum of 60 green points based on the New Home Construction Green Building Guidelines checklist promulgated by Build It Green. Currently there are no green building requirements for commercial development but they may be adopted as part of Implementation Measure NR-11(e).

Photovoltaic Systems

In January 2007, the City installed an 18 kW photovoltaic (PV) system at City Hall. In 2007 the system produced approximately 11,000 kWh of green electricity. In addition, as briefly noted above, the Green Building Committee is considering using a City-owned facility to install a privately-owned and operated PV system which could generate credits that the City's electric customers would be able to purchase to off-set electricity usage.

Energy Efficient Programs - Rebates

The Energy Efficiency Program offers rebates to customers who purchase Energy Star and other energy efficient products for their residences. The Program includes light bulbs, air conditioners, heat pumps, refrigerators, washers and dryers, water heaters, and weatherization improvements. Since its inception in 2006, the City has authorized 176 rebates. In addition, the City has a photovoltaic incentive program which offers rebates on the installation of PV systems. Since its inception, 14 systems have been installed for a total of 20.57 kW.

Energy Audit Program

Approximately 60 energy audits have been conducted since this program began in 2006. The audits have primarily involved businesses and commercial uses, many of which have subsequently replaced their lighting fixtures with more efficient models, taking advantage of the City's Energy Efficiency Rebate Program.

Bicycle and Pedestrian Master Plan

Adopted by the City Council on October 20, 2008, the Healdsburg Bicycle and Pedestrian Master Plan identifies a set of improvements and implementation strategies that will encourage more people to walk and bicycle. The Master Plan includes recommendations for physical improvements and programs that could enhance and expand existing facilities, close gaps, remove constraints, provide for greater local and regional connectivity and increase the potential for walking and bicycling as transportation modes. Class 1 bicycle facilities would increase by 600%, Class II by 10% and Class III by 130%. The Master Plan was developed as a component of the Sonoma County Transportation Authority (SCTA) 2008 Countywide Bicycle and Pedestrian Master Plan to improve coordination of the countywide bicyclist and pedestrian system.

Healdsburg Transit

Healdsburg Transit is a flexible bus system with 28 scheduled stops throughout the City and a door-to-door service for those with physical limitations. In addition, under certain conditions, the bus will deviate from its fixed route up to ¾ of a mile to drop off or pick up a customer. During the summer students are offered a discounted pass for $15 for unlimited use all summer long.

HealdsBag Tote Program

Through the HealdsBag Tote Program the City offers its citizens a low-cost alternative to plastic and paper bags. Canvas and polypropylene reusable totes can be purchased for a nominal amount at a local grocery store, the Chamber of Commerce, and City Hall.

Solar Sonoma County

Solar Sonoma County is a consortium of local governments (including Healdsburg), businesses and other local entities and individuals working collaboratively to identify and implement initiatives to promote, expand, and accelerate solar photovoltaic and solar thermal energy generation and energy efficiency throughout Sonoma County. The mission of Solar Sonoma County is to promote installation of solar PV and solar thermal on public facilities, homes, and private properties and to promote energy efficiency countywide (http://www.solarsonomacounty.com/). One goal of Solar Sonoma County is to generate 25 MW of new solar power in the county by 2011. In September, 2008, Healdsburg joined Solar Sonoma County (City Resolution 100-2008). By doing so the City agreed to work with other cities and the County to mainstream solar installation throughout the county.

Electric Vehicles

In October 2008 the Healdsburg City Council authorized the City Manager to execute a Confidential Non-Disclosure Agreement and Memorandum of Understanding between the City of Healdsburg and Nissan (City Resolution 119-2008), the purpose of which would be to explore a program that would introduce and utilize electric vehicles in Healdsburg. The Agreement and Memorandum have since been executed.

Regional Climate Protection Coordination Plan

In November 2008, the Healdsburg City Council approved the City's participation in the development of a Regional Climate Protection Coordination Plan (City Resolution 141-2008). The purpose of the RCPCP is to organize and focus all county-wide efforts to reach the community emission reduction goal of 25% below 1990 levels by the year 2015, adopted by all the cities in Sonoma County, including Healdsburg, and Sonoma County. This effort will be lead by the Sonoma County Transportation Authority and includes an aggressive schedule for completion by December 2009.

Recycled Water Program

The City is in the process of implementing an urban and agricultural recycled water program that will reuse up to 150 million gallons per year of tertiary recycled water from the Healdsburg Waste Water Treatment Plant during the summer non-discharge season (May 15 to September 30).

PROPOSED GENERAL PLAN POLICIES AND IMPLEMENTATION MEASURES

Proposed General Plan policies and implementation measures that affect or pertain to air quality are listed below.

Policies

- *LU-F-1:* Land uses adjacent to designated transit facilities should derive maximum benefit from transit facilities and may include retail, office, employment and higher-density residential uses.
- *LU-F-2:* The City shall encourage mixed use development, including new housing and employment opportunities, as well as reuse of underutilized or vacant industrial land, around the historic railroad depot to support transit use at the depot.
- *T-A-13:* The City will seek to improve motor vehicle, bicycle and pedestrian circulation at the intersection of Healdsburg Avenue, Mill Street and Vine Street.
- *T-D-1:* The use of alternative transportation modes shall be encouraged by establishing a safe and convenient bicycle and pedestrian network connecting residential areas with recreation, shopping and employment areas.
- *T-D-2:* The Foss Creek Pathway shall provide a central bicycle and pedestrian pathway through town.
- *T-E-1:* Ensure that sufficient land is designated in the General Plan for transit facilities, including park-and-ride lots, bus stations and rail transit facilities.
- *T-E-2:* The historic railroad depot shall be the designated multi-modal transit center for Healdsburg. The designation of this facility shall not be deemed to preclude the development of other uses under the General Plan. Other potential transit facility sites may be considered provided they support the railroad depot facility and their effects on circulation and the environment have been fully analyzed.
- *T-E-3:* The City shall encourage Sonoma County Transit to maintain, at a minimum, present level of service in the Healdsburg area.
- *T-E-4*: The City shall work closely with Sonoma County Transit and other transit service providers to develop and maintain public transportation facilities in the community, including park-and-ride lots and rail transit stations that are well planned and convenient to use. These include the park-and-ride lot at the south end of Healdsburg (at Healdsburg Avenue/U.S. 101) and a proposed park-and-ride lot near the train station, since a commuter rail system station is being considered at the site of the City's existing train station.
- *T-E-5:* The City shall maintain its own intra-city transit service as long as the service is financially feasible.

- *T-E-6:* The City shall work closely with Sonoma County Transit in coordinating bus stop locations and bus schedules to facilitate transfers between bus systems.
- *T-E-7:* The City will encourage development of a centrally-located common bus terminus equipped with a permanent shelter and will encourage the County's bus system to coordinate its stops at the common terminus.
- *T-E-8:* The City will continue to maintain a tour bus parking area in the downtown area.
- *T-E-9:* The City will require new public facilities and private developments that are suitably located to provide connections to the Foss Creek Pathway.
- *PS-A-5:* The City will promote water conservation in both city operations and private development to minimize the need for development of new water sources.
- *PS-C-4*: The City will promote energy conservation in its operations and private development, including programs to reduce dependency on fossil fuels.
- *NR-B-2:* Large, mature trees that contribute to the visual quality of the environment or provide important wildlife habitat shall be protected.
- *NR-B-3:* New development shall be sited to maximize the protection of native tree species, riparian vegetation, important concentrations of native plants, and important wildlife habitat.
- *NR-B-4:* The use of native plant species in landscaping and in the replanting of cut slopes is encouraged.
- *NR-B-6:* The use of large-scale trees in new development is encouraged where adequate space can be provided for the trees' ultimate size, such as in open space areas, parks, large lots, and wide parkway strips, to visually blend new development with the older parts of the City.
- *NR-C-6:* Protection of distinctive natural vegetation such as oak woodlands, riparian corridors, and mixed evergreen forest is encouraged.
- *NR-E-1:* The City will reduce greenhouse gas emissions produced communitywide.
- *NR-E-2:* The City will reduce greenhouse gas emissions produced by internal municipal operations.
- *NR-E-3:* The City will comply with California's Publicly Owned Electric Utilities' Principles Addressing Greenhouse Gas Reduction Goals.
- *NR-E-4:* The City will support sustainable development and building practices and lead by example in municipal projects.
- *NR-E-5*: The City will encourage the use of large-scale trees in new development to lessen heat build-up from solar radiation.
- *NR-E-6*: The City will comply with state climate protection goals and programs to the maximum extent allowed by the City's jurisdictional authority.

- *NR-F-1:* The City will encourage the use of transit systems and other alternatives to automobile use.
- *NR-F-2:* The City will promote land use patterns that support the use of transit systems and pedestrian and bicycle facilities.
- *NR-F-3:* The City will seek to minimize particulate matter emissions from woodburning fireplaces and stoves, and construction activities.
- *S-D-4:* The City shall endeavor to improve its overall fire insurance (ISO) rating and lower the fire insurance rating in commercial and industrial areas of the city that currently have higher ratings than the citywide rating.
- *S-H-2:* The City shall protect new development from existing hazardous materials.
- *S-H-3:* The City shall strongly encourage Sonoma County to mitigate any identified impacts on the landfill site that pose health or safety hazards

Policy Implementation Measures

- *T-6:* Continue to explore the engineering and financial feasibility of constructing a roundabout at the intersection of Healdsburg Avenue, Mill Street and Vine Street.
- *T-12:* Implement the Bicycle & Pedestrian Master Plan and require development projects to be coordinated with the plan.
- *T-13:* Complete gaps in the city's pedestrian and bicycle system.
- *T-14:* Maintain the city's pedestrian and bicycle system in good condition.
- *T-17:* Implement the Foss Creek Pathway Plan, as funding allows.
- *T-18/NR-20:* Work closely with the Sonoma County Transit Authority and other transit service providers to develop and maintain public transportation facilities in the community, including park-and-ride lots and the Intermodal Transportation Center.
- *PS-3:* Continue to enforce state-mandated provisions of building codes requiring low flush toilets and other types of water-conserving features and provide permit assistance to building projects that conserve water.
- *PS-4:* Continue to maintain a monitoring program for the City's water system and replace faulty meters in the system with technologically superior meters as necessary. The city shall also identify and replace faulty meters at service connections and require cathode protection devices on an ongoing basis.
- *PS-5:* Review the Healdsburg Urban Water Management Plan every five years and revise as deemed necessary by the City Council.

- *PS-6:* Explore options and opportunities to expand urban and agricultural use of the City's reclaimed water. Seek grants and/or low-interest loans for the City's reclaimed water irrigation system.
- *PS-29:* Require public access easements along Foss Creek and Russian River where deemed feasible by the City Council to facilitate a public trail system along these waterways.
- *NR-2:* Continue to enforce the riparian setback requirements of the Zoning Ordinance.
- *NR-6:* Use native plant species in City landscaping projects to the maximum feasible extent.
- *NR-9*: Support the continuation of local farmers markets.
- *NR-10:* Support efforts in Sonoma County to retain local agricultural land use activities.
- *NR-11:* Promote the conservation of energy and natural resources by:
    (a) Allowing the use of alternative materials, designs and methods of construction not specifically prescribed by the Uniform Building Code to conserve energy and/or natural resources, if they have been approved and their use authorized by the City Building Official.
    (b) Waiving design review approval for most solar installations for existing buildings.
    (c) Granting rebates for such items as energy-efficient residential and commercial lighting, appliances, heat pumps, air conditioning, weatherization and photo voltaic systems.
    (d) Adopting and implementing a green building program.
- *NR-12:* Employ green building design and practices in the construction and renovation of city facilities whenever feasible.
- *NR-13:* Implement greenhouse gas emissions reduction measures adopted by the City Council.
- *NR-14:* The City will:
    (a) Develop a community greenhouse gas reduction plan, consistent with the State's reduction goals. The plan shall be reviewed and updated at least once per year to identify progress and incorporate new information, regulatory standards, and technologies.
    (b) Acquire all available energy efficiency and demand reduction resources that are cost-effective, reliable and feasible.
    (c) Pursue renewable energy supplies and non-greenhouse gas-emitting energy resources and clean fossil resources.
    (d) Provide education for its customers on ways that they can reduce their greenhouse gas emissions, and provide assistance where feasible.
    (e) Implement Action Plan B of the City of Healdsburg Greenhouse Gas Emissions Reduction Action Plan Analysis to reduce greenhouse gas emissions related to municipal operations.

- *NR-16*: Complete gaps in the city's pedestrian and bicycle systems.
- *NR-17*: Maintain the city's pedestrian and bicycle systems in good condition.
- *NR-18*: Require bicycle parking at multi-family, commercial and employment sites.
- *NR-19*: Implement the Foss Creek Pathway Plan, as funding allows.
- *NR-21*: Encourage the planting of large shade trees where adequate space can be provided for the trees' ultimate size, such as in open space areas, parks, large lots and wide parkway strips.
- *NR-22*: Evaluate the existing transportation network to identify areas suitable for improvements as they relate to efficient vehicle movements, including: installation of dedicated left and right turn lanes, construction of roundabouts, development of Intelligent Transportation systems such as synchronized signal timing and adaptive traffic control systems, removal of unwarranted stop signs, and construction of new and improved freeway on and off ramps. Implement identified measures as feasible.
- *NR-23:* Enforce the requirements of the Northern Sonoma County Air Pollution Control District to ensure that installation of all new and replacement wood-burning fireplaces and stoves meet the District's regulations.
- *NR-24:* Require the use of best management practices, such as those promulgated by the Bay Area Air Quality Management District, during construction to minimize emissions.
- *CD-9:* Require the planting of street trees as a part of development projects where feasible, guided by the Master Tree List and the Master Street Tree Plan.

ENVIRONMENTAL IMPACTS

Thresholds of Significance

In accordance with Appendix G to the CEQA Guidelines, the proposed Project would have a significant impact related to air quality if it would:

(a) Conflict with or obstruct implementation of the applicable air quality plan,;

(b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation,

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

(d) Expose sensitive receptors to substantial pollutant concentrations, or

(e) Create objectionable odors affecting a substantial number of people.

Impacts from exposure of sensitive receptors to substantial pollutant concentrations are evaluated based on the project's contribution to localized concentrations of carbon dioxide (CO). Impacts from localized

concentrations of CO are considered significant if the following state ambient air quality standards thresholds are exceeded:

(a) 20 parts per million averaged over 1 hour

(b) 9 parts per million averaged over 8 hours

The proposed project would have a significant impact related to greenhouse gas emissions if it would:

(a) Result in community greenhouse gas emission levels that exceed pre-project levels by a substantial margin.

(b) Conflict with Assembly Bill 32 and its governing regulations.

Project Impacts

Impact IV.D-1: The proposed Project would not conflict with or obstruct implementation of an applicable air quality plan.

There are no air quality plans that apply to the proposed General Plan. The North Coast Air Basin is in attainment for all federal ambient air quality standards, and, as such, the NSCAPCD is not required to prepare or implement an air quality plan. Therefore, there would be ***no impact***.

Impact IV.D-2: The proposed Project would not violate an air quality standard or contribute substantially to an existing or projected air quality violation.

Construction Period Impacts

Construction activities would occur intermittently in the city throughout the time that the proposed Project would be implemented. Construction activities would have the potential to generate substantial amounts of dust (including PM_{10} and $PM_{2.5}$) as well as other criteria pollutants from operation of heavy construction equipment.

NSCAPCD has not established explicit numerical standards of significance for construction activities. Instead, the District suggests that best management practices and other management methods be used to reduce construction-related project emissions. District representatives have indicated that the use of the Bay Area Air Quality Management District's (BAAQMD) mitigation measures for construction would fulfill this requirement to implement best management practices (BMPs) to control construction-related emissions and result in less-than-significant construction impacts on air quality.

As construction emissions can vary greatly depending on the level of activity and specific operations taking place, BAAQMD suggests that analysis of construction impacts emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. Therefore, BAAQMD considers any project's construction-related impacts to be less than significant if the following dust-control measures are implemented:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

In addition to the control measures listed above, the following must be implemented at construction sites greater than four acres in area:

- Hydroseed or apply (non-toxic) soil stabilizers to inactive areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Furthermore, the following control measures are strongly encouraged at construction sites that are large in area, located near sensitive receptors or which for any other reason may warrant additional emission reductions:

- Install wheel washers for all exiting trucks, or wash off the tires of all trucks and equipment leaving the site.
- Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.
- Limit the area subject to excavation, grading and other construction activity at any one time.

Proposed General Plan Implementation Measure NR-24 would reduce emissions from construction activities by enforcing best management practices, such as those recommended by BAAQMD. Therefore impacts from construction-related emissions would be ***less than significant***.

Operational Period Impacts

Emissions generated by ongoing operations associated with development that could occur under the proposed General Plan would be subject to the NSCAPCD rules and regulations described above under Regional Regulations that are intended to maintain air quality standards at acceptable levels. For example, proposed General Plan Implementation Measure NR-23 requires that all new or replacement wood-burning fireplaces and stoves meet the District's regulations.

Additionally, Table IV.D-3 outlines transportation control measures (TCMs) recommended by BAAQMD to reduce ozone precursor emissions and how the proposed General Plan addresses each measure. As shown, the proposed General Plan would demonstrate reasonable efforts to implement these TCMs. Therefore, the impacts from operational period emissions would be ***less than significant.***

Table IV.D-3
Proposed General Plan Consistency with BAAQMD Transportation Control Measures (TCMs)

Transportation Control Measure	Description	Applicable Draft General Plan Policies and Implementation Measures
Support Voluntary Employer-Based Trip Reduction Programs	Provide assistance to regional and local ridesharing organizations; advocate legislation to maintain and expand incentives.	Policy T-E-1: Ensure that sufficient land is designated in the General Plan for transit facilities, including park-and-ride lots, bus stations and rail transit facilities. Implementation Measure T-18: Work closely with the Sonoma County Transit Authority and other transit service providers to develop and maintain public transportation facilities in the community, including park-and-ride lots and the Intermodal Transportation Center.
Improve Bicycle Access and Facilities	Improve and expand bicycle lane system by providing access in plans for all new road construction or modifications. Develop and implement comprehensive bicycle plans. Encourage employers and developers to provide bicycle access and facilities.	Policy T-D-1: The use of alternative transportation modes shall be encouraged by establishing a safe and convenient bicycle and pedestrian network connecting residential areas with recreation, shopping and employment areas. Policy T-D-4: The City shall continue to provide secure bicycle parking at public facilities and require secure bicycle racks at large commercial and employment sites. Policy T-D-5: The Foss Creek Pathway shall provide a central bicycle and pedestrian pathway through town as well as provide access to Foss Creek. Implementation Measure T-12: Update the Bicycle Master Plan in coordination with the Countywide Bicycle Plan and require specific plans and other development projects to be coordinated with the plan. Implementation Measure T-16: Provide bicycle racks at local public destinations such as the Plaza, and continue to require bicycle racks at large commercial

Table IV.D-3 (Continued)
Proposed General Plan Consistency with BAAQMD Transportation Control Measures (TCMs)

Transportation Control Measure	Description	Applicable Draft General Plan Policies and Implementation Measures
		employment sites.
Improve Arterial Traffic Management	Improve arterials for bus operations and to encourage bicycling and walking.	Policy T-A-13: The City will seek to improve motor vehicle, bicycle and pedestrian circulation at the intersection of Healdsburg Avenue, Mill Street and Vine Street. Implementation Measure T-14: Complete gaps in the pedestrian and bicycle system.
Local Clean Air Plans, Policies and Programs	Incorporate air quality beneficial policies and programs into local planning and development activities, with a particular focus on subdivision, zoning and site design measures that reduce the number and length of single-occupant automobile trips.	Policy NR-F-2: The City will promote land use patterns that support the use of transit systems and pedestrian and bicycle facilities. Policy T-E-9: Require new public facilities and private developments suitably located and with significant service jobs to provide connections to the Foss Creek Pathway. Policy LU-F-1: Land uses adjacent to designated transit facilities should derive maximum benefit from transit facilities and may include retail, office, employment and higher-density residential uses. Policy LU-F-2: The City shall encourage mixed use development, including new housing and employment opportunities, as well as reuse of underutilized or vacant industrial land, around the historic railroad depot to support transit use at the depot.
Conduct Demonstration Projects	Promote demonstration projects to develop new strategies to reduce motor vehicle emissions. Projects include: low emission vehicle fleets and LEV refueling infrastructure.	Policy NR-E-2: The City will reduce greenhouse gas emissions produced by internal municipal operations. The City currently has several hybrid vehicles in its fleet.
Pedestrian Travel	Review/revise general/specific plan policies to promote development patterns that encourage walking and circulation policies that emphasize pedestrian travel and modify zoning ordinances to include pedestrian-friendly design standards. Include pedestrian improvements in capital improvement programs.	Policy T-A-13: The City will seek to improve motor vehicle, bicycle and pedestrian circulation at the intersection of Healdsburg Avenue, Mill Street and Vine Street. Policy T-D-1: The use of alternative transportation modes shall be encouraged by establishing a safe and convenient bicycle and pedestrian network connecting residential areas with recreation, shopping and employment areas. Policy T-D-5: The Foss Creek Pathway shall provide a central bicycle and pedestrian pathway through town as well as provide access to Foss Creek. Policy NR-F-2: The City will promote land use

Table IV.D-3 (Continued)
Proposed General Plan Consistency with BAAQMD Transportation Control Measures (TCMs)

Transportation Control Measure	Description	Applicable Draft General Plan Policies and Implementation Measures
		patterns that support the use of transit systems and pedestrian and bicycle facilities.
Promote Traffic Calming Measures	Include traffic calming strategies in the transportation and land use elements of the general and specific plans.	Policy T-A-13: The City will seek to improve motor vehicle, bicycle and pedestrian circulation at the intersection of Healdsburg Avenue, Mill Street and Vine Street. Implementation Measure CD-9: Require the planting of street trees as a part of all development projects, guided by the Master Tree List.
Source: Christopher A. Joseph and Associates, September 2007.		

Impact IV.D-3: The proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable NAAQS or CAAQS (including releasing emissions that exceed quantitative thresholds for ozone precursors).

The geographic context for the analysis of cumulative air quality impacts consists of the North Coast Air Basin. The Basin is in attainment for all criteria pollutants under state and federal standards with the exception of the state standard for one-hour ozone; however, CARB is expected to designate the Basin as being in attainment in 2009. Therefore, there would be ***no impact***.

Impact IV.D-4: The proposed Project would not expose sensitive receptors to substantial pollutant concentration.

Increases in traffic generated under the buildout of the proposed Project would have the potential to expose sensitive receptors to substantial concentrations of carbon monoxide (CO). This CO "hotspots" analysis is based on the projected traffic volumes contained in Section IV.O (Transportation/Traffic) of this Revised Draft EIR. These future roadway traffic volumes were based on the original project description, which assumed a greater amount of development in Planning Sub-Area C than is now reflected in the revised project. However, since the difference in traffic volumes is only two percent, the analysis that follows was not updated and the actual CO emissions estimates shown in Table IV.D-4 would be approximately two percent less than as presented for the revised project. The two percent reduction in traffic volume is not large enough to change the significance conclusions described in this analysis.

For this analysis, localized CO concentrations were calculated based on a simplified CALINE4 screening procedure developed by the BAAQMD. The simplified procedure is intended as a screening analysis,

which identifies a potential CO hotspot. This methodology assumes worst-case conditions and provides a screening of maximum, worst-case CO concentrations.

Table IV.D-4
Future Local Carbon Monoxide Concentrations Under Proposed General Plan Buildout

Intersection	CO Concentrations in Parts Per Million (ppm)					
	Roadway Edge		25 Feet		50 Feet	
	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
1. Healdsburg Ave/Parkland Farms Blvd	4.3	3.1	3.5	2.6	3.3	2.5
2. Healdsburg Ave/Grove St	4.4	3.1	3.6	2.6	3.3	2.5
3. Healdsburg Ave/Sunnyvale Dr	3.6	2.7	3.1	2.4	3.0	2.3
4. U.S. 101 South Ramps/Dry Creek Rd	4.2	3.0	3.4	2.6	3.2	2.4
5. U.S. 101 North Ramps/Dry Creek Rd	5.1	3.5	4.0	2.9	3.6	2.7
6. Grove St/Dry Creek Rd	5.0	3.5	3.9	2.8	3.6	2.6
7. Healdsburg Ave/Dry Creek Rd-March Ave	4.4	3.1	3.6	2.6	3.3	2.5
8. University St/March Ave	3.1	2.4	2.8	2.2	2.8	2.2
9. Healdsburg Ave/Powell Ave	4.2	3.0	3.4	2.6	3.2	2.4
10. Fitch St/Powell Ave	3.2	2.4	2.9	2.2	2.8	2.2
11. University St/Powell Ave	3.5	2.6	3.1	2.4	3.0	2.3
12. Grove St/West Grant Ave	3.5	2.6	3.1	2.4	2.9	2.3
13. Healdsburg Ave/Grant St	3.9	2.8	3.3	2.5	3.1	2.4
14. Fitch St/Grant St	2.8	2.2	2.7	2.1	2.6	2.1
15. University St/Grant St	3.2	2.4	2.9	2.3	2.8	2.2
16. Healdsburg Ave/Piper St	4.0	2.9	3.3	2.5	3.1	2.4
17. Healdsburg Ave/North St	3.8	2.8	3.3	2.5	3.1	2.3
18. Vine St/Matheson St	4.1	3.0	3.4	2.5	3.2	2.4
19. Healdsburg Ave/Matheson St	3.9	2.8	3.3	2.5	3.1	2.4
20. Fitch St/Matheson St	2.9	2.3	2.8	2.2	2.7	2.1
21. University St/Matheson St	3.3	2.5	3.0	2.3	2.9	2.2
22. U.S. 101 North Ramp/Westside Rd	3.8	2.8	3.2	2.4	3.0	2.3
23. U.S. 101 South Ramp/Westside Rd	3.6	2.6	3.1	2.4	3.0	2.3
24. Healdsburg Ave-Vine St/Mill St	4.1	2.9	3.4	2.5	3.2	2.4
25. Healdsburg Ave/Exchange Ave	4.9	3.4	3.8	2.8	3.5	2.6
26. Healdsburg Ave/Front St	4.3	3.1	3.5	2.6	3.3	2.5
27. U.S. 101 South Ramps/Old Redwood Hwy	3.7	2.7	3.2	2.4	3.0	2.3
28. U.S. 101 North Ramps/Healdsburg Ave	3.9	2.8	3.3	2.5	3.1	2.4

Notes: National 1-hour standard is 35.0 ppm.
State 1-hour standard is 20.0 ppm.
National and State standard is 9.0 ppm.

Source: Christopher A. Joseph & Associates, 2007. Calculation sheets are provided in Appendix D. Based on year 2007 EMFAC2007 Winter emission factors

Maximum 1-hour and 8-hour CO concentrations generated by the proposed Project upon buildout were calculated for intersections provided in the traffic study using the screening procedure described above.

As projected emissions factors provided by most current emission factors model (EMFAC 2007) assume that motor vehicles will burn cleaner each year, emission factors decrease over time. Therefore, the proposed Project was analyzed using 2007 emission factors to determine concentrations based on the worst-case scenario. These CO concentrations were then compared to state and federal ambient air quality standards. The state 1-hour and 8-hour standards for CO are 20.0 ppm and 9.0 ppm respectively. The federal 1-hour and 8-hour standards for CO are 35.0 ppm and 9.0 ppm respectively. As shown in Table IV.D-4, CO concentrations generated by the proposed Project would not exceed state or federal ambient air quality standards. Therefore, this impact would be ***less than significant***.

Impact IV.D-5: The proposed Project would not create objectionable odors affecting a substantial number of people.

Objectionable odors associated with development under the proposed General Plan would be controlled by NSCAPCD Rule 400, which prohibits air contaminants from being discharged in quantities sufficient to constitute a public nuisance to any considerable number of persons or the public or that would endanger the comfort or repose of any person or the public. Additionally, proposed General Plan Policy LU-C-4 requires that development at the interface of different land use designations be designed to ensure compatibility between uses, which could include a buffer zone and the regulation of operations that may create objectionable odors. An ongoing odor control program has been instituted at the Healdsburg Transfer Station and Healdsburg Landfill. Therefore, potential impacts related to objectionable odors are ***less than significant***.

Impact IV.D-6: It cannot be determined to a reasonable degree of certainty that buildout under the General Plan will not result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change.

Methodology and Assumptions

Potential greenhouse gas emissions related to buildout under the *Healdsburg 2030 General Plan* were calculated using the Clean Air and Climate Protection Software (released May 2003). The software converts fuel types (gas, electricity, etc.) and fuel units (therms, MWh, etc.) into carbon dioxide-equivalents for CO_2, N_2O, and CH_4 (CO_2e) emissions. Standard emissions factors related to the production of electricity were changed to reflect the Northern California Power Agency's energy mix. In all cases, estimates were based on 2007 per capita emissions data applied to the buildout population estimate (i.e., 14,468), therefore presenting a "business as usual" scenario not reflective of changing habitats, new state regulations, General Plan policies, etc. Greenhouse gas emissions are shown as carbon dioxide equivalent in tons (TCO_2e).

Energy use by the community was determined as follows:

> Electricity Usage: Electricity usage for 1990 and 2007 was taken from City records. Estimated usage at buildout was projected based on the per capita usage in 2007, multiplied by the projected

population under buildout of the proposed General Plan. Greenhouse gas emission factors for electricity for 1990 and 2007 were provided by NCPA.

Natural Gas Usage: Natural gas usage for 2007 was provided by PG&E. PG&E was not able to provide information on natural gas usage prior to 2003. Therefore, per capita usage for 2007 (adjusted to include an 8 percent decrease in usage from 1990 through 2007 for Sonoma County as indicated in information provided by the California Energy Commission) was applied to 1990 population to determine natural gas usage in 1990.

Solid Waste: Waste generation for 1990 was taken from the August 1994 *Sonoma County Integrated Waste Management Plan*. The 2007 waste generation was provided by the Sonoma County Waste Management Agency.

Transportation: Vehicle miles traveled (VMT) for 1990, 2007 and 2025 were provided by the Sonoma County Transportation Authority using the Highway Performance Monitoring System. For years 1990 and 2007, information regarding lane miles and traffic counts was used to determine existing and past VMT. VMT for 2025 was projected based on past trends, such as employment and tourist activities, as well as travel behavior. It was not feasible to project VMT at General Plan buildout because it is not directly correlated with population increase, and past trends may not accurately predict employment and travel patterns in the future.

The following analysis provides a general inventory of the City's largest emitting sectors and does not attempt to characterize all emissions such as those related to industry or refrigerants, or the benefits from carbon sequestration from trees.

Estimated Greenhouse Gas Emissions

Greenhouse gas emissions for the community of Healdsburg in 2007 (pre-project conditions) and under buildout of the proposed General Plan are identified by the primary emissions source in Table IV.D-5. Greenhouse gas emissions for year 2007 are estimated at 58,504 tons. Nearly half of all emissions are attributed to the transportation sector, 45 percent to the use of electricity and natural gas (from buildings and municipal operations), and 6 percent to the disposal of solid waste.

As noted under Methodology and Assumptions, emissions under General Plan buildout are projected from 2007 per capita use and the estimated General Plan buildout population of 14,468. Following Table IV.D-5 is an estimate of greenhouse gas emissions that takes into account City and State policies and regulations that reduce and mitigate those projected emissions.

Proposed General Plan Policies and Implementation Measures

It would be difficult to quantify the reduction in emissions from each of the policies and implementation measures listed in the proposed General Plan in a reliable manner. However, a few are specific enough that benefits can be estimated, as show in Table IV.D-5.

Table IV.D-5
Estimated GHG Emissions for 1990, 2007 and General Plan Buildout

Emissions Source	1990			2007 Baseline/Pre-Project Conditions			Proposed General Plan Buildout (assumes business as usual)		
		TCO_2e	% of Total		TCO_2e	% of Total		TCO_2e	% of Total
Electricity[1]	**MWh** 60,409	23,257	34%	**MWh** 74,586	11,113	19%	**MWh** 89,037	13,267	18%
Natural Gas	**Therms** 2,358,948	14,574	21%	**Therms** 2,463,635	15,221	26%	**Therms** 3,210,859	19,837	27%
Solid Waste	**Tons** 15,843	1,719	3%	**Tons** 17,989	3,390	6%	**Tons** 21,476	4,047	5%
Transportation	**VMT** 37,230,000	28,971	42%	**VMT** 44,332,900	28,780	49%	**VMT**[2] 59,523,105	36,775	50%
Totals		**68,521**	100%		**58,504**	100%		**73,926**	100%
				Change from 2007 to General Plan Buildout				***+15,422***	***+26%***

[1] *As reported by the NCPA, the greenhouse gas emission factor for 1990 was 770 pounds per MWh and for 2007 was 298 pounds per MWH.*
[2] *Figure represents VMT for 2025, as projected by the Sonoma County Transportation Authority, 2009.*
Note: MWh = Megawatt hours
TCO2e = Tons of carbon dioxide equivalent or tons of greenhouse gas emissions

The estimated emission reduction from the selected policies shown in Table IV.D-6 is 11,129 tons of CO_2e. Brief notes following Table IV.D-6 describe how these estimates were derived; for more detailed information refer to Appendix D2.

State Scoping Plan

As noted in the Regulatory Setting section, the State has approved the Scoping Plan that outlines 16 programs and measures to reach the 2020 greenhouse gas emissions limit mandated by AB 32. Some programs have been formally adopted, other have not. Some of these measures will have a direct impact on local emissions. Table IV.D-7 summarizes the programs and measures presented in the Scoping Plan, identifies the statewide emission reduction associated with that measure, and then identifies, where applicable, the reduction in emissions applicable to Healdsburg. The reduction credited to Healdsburg is determined by the percentage of Healdsburg's population as compared to the State's population (0.03 percent). In addition, Table IV.D-7 summarizes those proposed General Plan policies and measures that support the State programs and measures.

Table IV.D-6
Estimated Greenhouse Gas Emission Reductions
from Selected General Plan Policies and Implementation Measures

Policy	CO_2e Reduction at Proposed General Plan Buildout
NR-11(d): Adopting a Green Building Program[1]	4,963
NR-11(d) and NR-14(b) & (d): Promote energy-efficiency[2]	30
NR-14(e): Implement Action Plan B for municipal operations	326
NR-22: Evaluate existing transportation network to identify areas suitable for improvements as they relate to efficient vehicle movement and implement identified improvements[3]	5,516
PS-34: 70% Waste Diversion[4]	~~209~~290
LU-F-2, LU-12, T-D-5, T-E-2, T-E-4: Mixed-use around SMART Depot, path connection to SMART Depot, support of SMART Depot (implementation of SMART train)[5]	4
Total	**11,129 tons**

[1] *Assumes a Build-It-Green rating system with a minimum of 60 points is used for residential and that future commercial projects meet the draft performance standards for energy use being developed by CARB for use in recommending significance thresholds for GHG emissions under CEQA.*

[2] *The City of Healdsburg's commitment to reduce energy by approximately 198 MWh per year through 2016, as outlined in* Establishing Energy Efficiency Targets: A Public Power Response to AB2021 *(October 2007), is used to determine the savings from these policies.*

[3] *A 15% reduction in emissions was estimated by taking into consideration Healdsburg's street system and EMFAC 2007 V2.3 average emission factors for various vehicle speeds. This number is considered conservative and a higher reduction is feasible depending on the types of improvements implemented.*

[4] *Sonoma County currently achieves a 64% diversion. This assumes that Healdsburg's portion of meeting the 70% diversion goal by 2015 is equivalent to the County's and that future waste tonnage will be 6% less per capita.*

[5] *Information on ridership from the Sonoma-Marin Area Rail Transit Draft EIR is used to determine savings from implementation of the SMART train.*

Despite the City's best efforts to identify probable greenhouse gas emissions reductions from state measures and proposed General Plan policies and implementation measures, not all the Scoping Plan measures have been formally adopted at this time. Additionally, there is some level of uncertainty about their effectiveness and how they will apply to local governments. Therefore, it cannot be determined to a reasonable degree of certainty that buildout under the General Plan will not result in a cumulatively considerable contribution to the significant cumulative impact of global climate change. Therefore, cumulative global climate change impacts would be ***significant and unavoidable***.

Table IV.D-7
State Scoping Plan Measures

State Scoping Program/Measure	Statewide Reduction by 2020 ($MMTCO_2e$)	Related Proposed General Plan Policies and Implementation Measures	State Program Reduction as Applied to Healdsburg (TCO_2e)
California Light-Duty Vehicle GHG Standards • Pavley Vehicle Standards • Zero Emission Vehicle Program • Alternative/Renewable Fuel and Vehicle Technology Program	31.7	The City does not have the authority to regulate vehicle or fuel standards, but supports the Scoping Plan through NR-E-6.	10,461
Energy Efficiency • Utility Efficiencies • Building Standards • Appliance Standards	26.3	Supported by PS-C-4, PS-3, PS-7, NR-E-1, NR-E-2, NR-E-3, NR-E-4, NR-11, NR-12, NR-13, NR-14	8,650[1]
Renewable Portfolio Standard (33% by 2020)	21.3		NA: The energy mix of Healdsburg's Electric Utility already achieves 48%, on average
Low Carbon Fuel Standard	15	The City does not have the authority to regulate fuel standards but supports the Scoping Plan through NR-E-6.	4,950
Regional Transportation-Related GHG Targets	5	Supported by LU-A-1, LU-F-1, LU-F-2, LU-12, LU-16, LU-18, T-D-1, T-D-5, T-E-1, T-E-2, T-E-4, T-E-6, T-E-8, T-E-9, T-10 thru T-18, NR-F-2	1,650
Vehicle Efficiency Measures (consumer education, engine load, tire inflation, etc)	4.5	The City does not have the authority to regulate vehicle efficiency standards but supports the Scoping Plan through NR-E-6.	1,485
Goods Movement • Port Electrification • Heavy-Duty Engine Efficiency	3.7		NA: Healdsburg does not have a port, nor does it have any industry of signifi-cance as related to the movement of goods.
Million Solar Roofs (3,000 MW)	2.1	Supported by NR-E-4, NR-11(b), NR-11(c), NR-11 (e), NR-12, NR-14 (b), NR-14 (c), NR-14 (d)	693

Table IV.D-7 (Continued)
State Scoping Plan Measures

State Scoping Program/Measure	Statewide Reduction by 2020 ($MMTCO_2e$)	Related Proposed General Plan Policies and Implementation Measures	State Program Reduction as Applied to Healdsburg (TCO_2e)
Medium/Heavy Duty Vehicles	1.4	The City does not have the authority to regulate vehicle standards but supports the Scoping Plan through NR-E-6.	462
High Speed Rail (between northern and southern California)	1.0	Supported by NR-F-1, NR-F-2, TE-1, TE-2, TE-4	330
Industrial Measures	1.4		NA: Healdsburg does not have refineries, or extract or transmit oil or gas.
High Global Warming Potential Gas Measures (ex: refrigerants)	20.2	The City does not have the authority to regulate refrigerants, blowing agents, etc, but supports the Scoping Plan through NR-E-6.	6,666
Sustainable Forests (sequestration)	5.0	Supported by NR-E-5, NR-B-2, NR-B-6, NR-C-6, HCR-5	1,650
Recycling and Waste • Landfill Methane Control • High Recycling/Zero Waste	1.0	Supported by PS-J-1, PS-34 thru PS-38	330
TOTAL	**174 MMT**		**37,356 Tons**

[1] *Energy efficiency under state measures includes, among other things, the publicly-owned utilities obligations under AB2021. Healdsburg's estimated greenhouse gas emission reduction related to energy efficiency and AB2021 is shown in Table IV.D-6 as 30 tons. Therefore, the reduction applicable to Healdsburg from the state Scoping Plan is reduced by 30 tons to avoid double counting.*

$MMTCO_2e$ = Million metric tons of carbon dioxide equivalent or million metric tons of greenhouse gas emissions

TCO_2e = Tons of carbon dioxide equivalent or tons of greenhouse gas emissions

Table IV.D-8 summarizes the information presented in Tables IV.D-5 through IV.D-7. To maintain the pre-project or 2007 baseline conditions of 58,504 tons of annual greenhouse gas emissions at General Plan buildout, a 26 percent reduction of the projected buildout emissions would be necessary. The General Plan policies and implementation measures from Table IV.D-7 are estimated to reduce emissions by 15 percent. The State Scoping Plan would further reduce emissions by an estimated 59 percent to 25,441 tons of annual emissions, less than half of the 2007 baseline emissions.

Impact IV.D-7: The proposed Project will not conflict with Assembly Bill 32 and its governing regulations.

As shown in Table IV.D-7, the City supports the implementation of AB32 through numerous policies and implementation measures throughout the proposed General Plan, particularly Policy NR-E-6, which requires compliance with state climate protection goals and programs. In addition, as described in the Regulatory Setting section, the City of Healdsburg has adopted, or is in the process of adopting, many programs supporting the reduction of greenhouse gas emissions, including an energy efficiency program and a green building program. Therefore, ***the proposed project will not conflict with AB32 or its governing regulations***.

Table IV.D-8
Summary of Annual Greenhouse Gas Emissions

Scenario	Estimated TCO_2e
Pre-project, 2007 baseline emissions	**58,504**
Estimated General Plan buildout emissions (i.e., business as usual, no mitigation)	73,926
Reduction from proposed General Plan policies and implementation measures	<11,129>
Estimated buildout emissions with GP policies and implementation measures incorporate	62,797
Reduction from State Scoping Plan measures	<37,356>
Estimated buildout emissions with GP & state Scoping Plan measures incorporated	**25,441**
TCO_2e = Tons of carbon dioxide equivalent or tons of greenhouse gas emissions	

CUMULATIVE IMPACTS

The geographic context for the analysis of cumulative air quality impacts consists of the North Coast Air Basin. Development that could occur under the proposed General Plan as well as within the basin would be subject to the NSCAPCD rules and regulations that are intended to continue the basin's existing compliance with applicable federal and state air quality standards. Therefore, the cumulative air quality impacts would be ***less than significant.***

Despite the reduction in greenhouse gas emissions that will occur through proposed General Plan policies and implementation measures, not all the state Scoping Plan measures have been formally adopted at this time. Additionally, there is some level of uncertainty about their effectiveness and how they will apply to local governments. Therefore, it cannot be determined to a reasonable degree of certainty that buildout under the General Plan, along with development in other North Coast Air Basin locations, will not result

in a cumulatively considerable contribution to the significant cumulative impact of global climate change. Therefore, cumulative global climate change impacts would be ***significant and unavoidable***.

MITIGATION MEASURES

There are no identified impacts for items IV.D-1 and IV.D-3. With implementation of applicable regulations, and the proposed General Plan policies and implementation measures listed above, no mitigation measures would be required for Impacts IV.D-2. IV.D-4. IV.D-5 and IV.D-7.

Despite the mitigation of greenhouse gas emissions that will occur through the proposed General Plan policies and implementation measures as well as implementation of the state Scoping Plan, there are no feasible mitigation measures that would reduce the cumulative impacts related to Impact IV.D-6, greenhouse gas emissions, to a less-than-significant level.

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