4.11 AIR QUALITY

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4.11 AIR QUALITY

This section describes ambient air quality conditions and regulatory standards and provides information regarding potential air quality impacts resulting from the Seasonal Storage Project (SSP) including criteria pollutants, air toxics, and odors. In keeping with guidelines for CEQA air quality studies, this report describes existing air quality, potential short-term construction-related impacts, potential direct and indirect long-term emissions associated with the Project and the impacts of these emissions on both the local and regional scale.

IMPACTS EVALUATED IN OTHER SECTIONS

All impacts relating to air quality are discussed in this section.

SETTING

Motor vehicles are the primary source of ambient air pollution in the SSP study area. Other local sources of air pollution include industry, residential heating by burning wood and natural gas, and agricultural practices. Small miscellaneous sources such as lawn mowers, coffee roasters, char broilers, dry cleaners, gasoline stations, and many other small business operations also contribute air pollutants. Air pollutant concentrations are affected by both emissions and meteorology. While meteorology tends to create short-term variations in pollutant concentrations, changes in emissions create long-term variations. Topographical and meteorological conditions are important factors in affecting local air pollutant concentrations. Meteorological effects such as wind speed, wind direction and air temperature gradients interact with topographical features to direct the movement and dispersal of air pollutants.

Meteorology

The Pacific Ocean is a dominating influence on the climate of the Santa Rosa Plain and surrounding areas. Local wind patterns are strongly influenced by the Petaluma Gap. As marine air travels through the Petaluma Gap, it splits into northward and southward paths. In the Santa Rosa area, prevailing winds flow generally from the south about 60 percent of the time. Moderate to strong northwesterly winds blow over 50 percent of the time in summer, and about 30 percent of the time annually. Calm conditions occur about 14 percent of the time in winter, and eight percent of the time annually. In Santa Rosa, the average annual wind speed is five miles per hour.

Sonoma County is a sub-region of the San Francisco Bay Area Air Basin. The climate of the Bay Area is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean. High-pressure systems are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, resulting in subsidence inversions. During summer and fall, locally generated emissions can, under the restraining influences of topography and subsidence inversions, create ozone and secondary particulates, such as nitrates and sulfates. In the

winter, the Pacific high pressure system weakens and shifts southward, allowing storms to pass through the area. Between storm cycles, inversions often develop, and local pollution levels can build up to unhealthful concentrations.

Strong sunlight provides a catalyst for ozone precursor pollutants to react in the atmosphere and form high levels of ground level ozone smog. Thus, highest annual ambient ozone-smog levels typically occur from May to October. In winter, periods of stagnant air (calm or very low wind speeds) can occur, especially between storms. This stagnation can allow respirable and fine particulate matter levels to build up to unhealthful levels, especially when fireplaces are being heavily used (as at year-end holidays). Typical winter temperatures in Sonoma County range from the 30s in the mornings to the upper 40s to about 60 during the afternoons. Typically, summer temperatures range from the 50s in morning to the 80s and 90s in the afternoon. Coldest weather is typically in December and January, while warmest temperatures generally occur June through October. Rainfall at lower elevations averages about 30 inches per year and is confined primarily to the wet season from late October to early May. In coastal mountain areas, rainfall can exceed 60 inches per year. Except for occasional light drizzles from thick marine stratus clouds, summers are almost completely dry.

Air Pollutants Evaluated

Air pollutant levels are typically described in terms of "concentrations," which refer to the amount of pollutant material per volumetric unit of air. Concentrations are measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The Federal and California Clean Air Acts have established ambient air quality standards for different pollutants. National Ambient Air Quality Standards (NAAQS) were established by the federal Clean Air Act for six criteria pollutants including carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), small particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and lead. Pollutants regulated under the California Clean Air Act are similar to those regulated under the Federal Clean Air Act. In many cases, the California Ambient Air Quality Standards (CAAQS) are more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) review ambient air quality standards on a regular basis and make necessary adjustments in response to updated scientific information. Ambient air quality standards are shown in Table 4.11-1. In addition, the U.S. EPA has identified over a hundred other contaminants as hazardous air pollutants. CARB has identified contaminants that can cause cancer or other health effects as toxic air contaminants.

TABLE 4.11-1
Relevant California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
Ozone	8-hour	0.07 ppm ($137\ \mu g/m^3$)	0.08 ppm ($176 \mu g/m^3$)
	1-hour	0.09 ppm ($180\ \mu g/m^3$)	—

TABLE 4.11-1
Relevant California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Carbon monoxide	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen dioxide	1-hour	0.18 ppm (338 µg/m^3)	—
	Annual	0.03 ppm (56 µg/m^3)	0.053 ppm (100 µg/m^3)
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
Sulfur Dioxide	1-hour	0.25 ppm (655 µg/m^3)	—
	Annual	—	0.03 ppm (56 µg/m^3)
Respirable Particulate Matter (PM_{10})	Annual	20 µg/m^3	—
	24-hour	50 µg/m^3	150 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)	Annual	12 µg/m^3	15 µg/m^3
	24-hour	—	35 µg/m^3

Notes:
ppm = parts per million mg/m3 = milligrams per cubic meter µg/m^3 = micrograms per cubic meter

Ozone (O_3)

Ground-level ozone is the principal component of smog. Ozone is not directly emitted into the atmosphere, but instead forms through a photochemical reaction of reactive organic gases (ROG) and nitrogen oxides (NOx), which are known as ozone precursors. Ozone levels are highest from late spring through autumn when precursor emissions are high and meteorological conditions are warm and stagnant. Motor vehicles create the majority of ROG and NOx emissions in the North Bay region. Exposure to levels of ozone above current ambient air quality standards can lead to human health effects such as lung inflammation and tissue damage and impaired lung functioning. Ozone exposure is also associated with symptoms such as coughing, chest tightness, shortness of breath, and the worsening of asthma symptoms. The greatest risk for harmful health effects belongs to outdoor workers, athletes, children and others who spend greater amounts of time outdoors during smoggy periods. Elevated ozone levels can reduce crop and timber yields, as well as damage native plants. Ozone can also damage materials such as rubber, fabrics and plastics. In April 2005, the CARB approved a new eight-hour standard of 0.070 ppm and retained the one-hour ozone standard of 0.09 ppm after an extensive review of the scientific literature. Evidence from the reviewed studies indicates that significant harmful

health effects could occur among both adults and children if exposed to levels above these standards.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are defined as "respirable particulate matter" or "PM_{10}". Fine particles are 2.5 microns or less in diameter ($PM_{2.5}$) and can contribute significantly to regional haze and reduction of visibility. Inhalable particulates come from smoke, dust, aerosols, and metallic oxides. Although particulates are found naturally in the air, most particulate matter found in the area is emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities, and wind erosion of disturbed areas. Most $PM_{2.5}$ is comprised of combustion products such as smoke. Extensive research reviewed by CARB indicates that exposure to outdoor PM_{10} and $PM_{2.5}$ levels exceeding current ambient air quality standards is associated with increased risk of hospitalization for lung and heart-related respiratory illness, including emergency room visits for asthma. PM exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between PM exposure and reduced lung function and increased respiratory symptoms and illnesses. Besides reducing visibility, the acidic portion of PM (nitrates, sulfates) can harm crops, forests, and aquatic and other ecosystems. In June 2002, the CARB adopted new ambient air quality standards for PM_{10} and $PM_{2.5}$, resulting from an extensive review of the health-based scientific literature. The U.S. EPA adopted a more stringent 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ in September 2006, replacing the older standard of 65 $\mu g/m^3$.

Nitrogen Dioxide (NO_2)

NO_2 is an essential ingredient in the formation of ground-level ozone pollution. NO_2 is one of the nitrogen oxides (NOx) emitted from high-temperature combustion processes, such as those occurring in trucks, cars and power plants. Home heaters and gas stoves also produce NO_2 in indoor settings. Besides causing adverse health effects, NO_2 is responsible for the visibility reducing reddish-brown tinge seen in smoggy air in California. NO_2 is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract. Studies suggest that NO_2 exposure to levels near the current standard may worsen the effect of allergens in allergic asthmatics, especially in children. Due to potential health effects at or near the current air quality standard, CARB recently revised the state ambient air quality standard for NO_2. Fortunately, levels measured in Northern California are well below the most up-to-date standards.

Carbon Monoxide (CO)

CO is a non-reactive pollutant that is toxic, invisible, and odorless. It is formed by the incomplete combustion of fuels. The largest sources of CO emissions are motor vehicles, wood stoves, and fireplaces. Unlike ozone, CO is directly emitted to the atmosphere. The highest CO concentrations occur during the nighttime and early mornings in late fall and winter. CO levels are strongly influenced by meteorological factors such as wind speed and atmospheric stability. The health threat from elevated ambient levels of CO is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at relatively low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death. CO levels measured in the Bay Area and Sonoma County are well below the health-based standards.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer or serious illness) and include, but are not limited to, the criteria air pollutants listed above. 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., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level. The identification, regulation and monitoring of TACs is relatively new compared to that for criteria air pollutants that have established ambient air quality standards. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an ambient air quality standard or emission-based threshold.

Diesel Exhaust

Diesel exhaust is the predominant TAC in urban air with the potential to cause cancer. It is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). According to the 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 U.S. EPA and CARB have adopted low sulfur diesel fuel standards in 2006 that reduce diesel particulate matter substantially.

Existing Pollution Levels

Ambient air quality is affected by the rate and concentration of pollutant emissions and meteorological conditions. Factors such as wind speed, atmospheric stability, and mixing height all affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in emissions, while short-term variations result from changes in atmospheric conditions. There is one continuous air monitoring station operated by government agencies in Santa Rosa and one in Healdsburg. Measured air pollutant data indicate that PM_{10}, and $PM_{2.5}$, are the air pollutants of greatest concern. In recent years, ground-level ozone concentrations have not exceeded state and federal standards.

Measured Pollutant Concentrations

The air quality monitors in Healdsburg and Santa Rosa are considered generally representative of air quality in urbanized parts of Sonoma County. Ambient air pollution data typically receives great scrutiny and quality assurance testing, so final data lags about one year behind the current calendar year. State and federal air quality standards, and the highest local air pollutant levels measured over the past five years (2002-2006), are reported in Table 4.11-2 below.

TABLE 4.11-2
Highest Measured Air Pollutant Concentrations

Pollutant	Average Time	Measured Air Pollutant Levels				
		2002	2003	2004	2005	2006
Healdsburg at Airport						
Ozone (O_3)	1-Hour	0.08 ppm	0.09 ppm	0.09 ppm	0.08 ppm*	0.05 ppm
	8-Hour	0.07 ppm	0.08 ppm	0.08 ppm	0.06 ppm*	0.05 ppm
Healdsburg at 133 Matheson Street						
Fine Particulate Matter (PM_{10})	24-Hour	27 µg/m^3	32 µg/m^3	23 µg/m^3	26 µg/m^3	--
	Annual	16 µg/m^3	13 µg/m^3	14 µg/m^3	13 µg/m^3	
Santa Rosa						
Ozone (O_3)	1-Hour	0.08 ppm	0.10 ppm	0.08 ppm	0.07 ppm	0.08 ppm
	8-Hour	0.06 ppm	0.08 ppm	0.06 ppm	0.05 ppm	0.06 ppm
Carbon Monoxide (CO)	1-Hour	3.7 ppm	3.1 ppm	2.7 ppm	2.5 ppm	2.4 ppm
	8-Hour	2.1 ppm	1.8 ppm	1.6 ppm	2.0 ppm	1.7 ppm
Nitrogen Dioxide (NO_2)	1-Hour	0.06 ppm	0.05 ppm	0.06 ppm	0.05 ppm	0.04 ppm
	Annual	0.013 ppm	0.013 ppm	0.012 ppm	0.011 ppm	0.011 ppm

TABLE 4.11-2
Highest Measured Air Pollutant Concentrations

Pollutant	Average Time	Measured Air Pollutant Levels				
		2002	2003	2004	2005	2006
Respirable Particulate Matter (PM_{10})	24-Hour	60 µg/m^3	36 µg/m^3	48 µg/m^3	39 µg/m^3	90 µg/m^3
	Annual	20 µg/m^3	17 µg/m^3	18 µg/m^3	16 µg/m^3	19 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	51 µg/m^3	39 µg/m^3	27 µg/m^3	34 µg/m^3	59 µg/m^3
	Annual	11 µg/m^3	9 µg/m^3	8 µg/m^3	8 µg/m^3	9 µg/m^3

Notes:
* Less than 80% data captured for that year.
Source: BAAQMD 2007 http://www.baaqmd.gov/pio/aq_summaries/index.htm.
ppm = parts per million and µg/m^3= micrograms per cubic meter
Values reported in bold exceed ambient air quality standard
NA = data not available.

In general, air quality in and around Santa Rosa and Healdsburg is good. Neither the state nor national ambient air quality standards for ozone were exceeded during the last five years. CARB adopted the 8-hour State ozone standard in 2005 and that was not exceeded in 2005 or 2006; however, it would have been exceeded in 2003 and 2004 had it been in place. The federal PM_{10} standards have not been exceeded during that period, but the State standard was exceeded twice in 2002 and 2006. $PM_{2.5}$ is only measured in Santa Rosa where the new national standard was exceeded once in 2006. All other criteria pollutants are not measured because the area has a long history of compliance with those air quality standards or there is a lack of emission source.

Attainment Status

The project sites are located within the San Francisco Bay Area air basin. The San Francisco Bay Area air basin is considered nonattainment for ozone under both the state and national ambient air quality standards. The basin is also considered nonattainment for PM_{10} and $PM_{2.5}$ under the state standards, but not the federal standards.

Carbon Dioxide/Greenhouse Gases

Background

Climate change is a shift in the average weather patterns observed on earth, which can be measured by such variables as temperature, wind patterns, storms and precipitation. The temperature on earth is regulated by what is commonly known as the "greenhouse effect." Naturally occurring greenhouse gases in the atmosphere, including carbon dioxide, methane, nitrous oxides, and water vapor, absorb heat from the earth's surface and radiate it back to the surface.

Human activities result in emissions of four principal greenhouse gases: carbon dioxide, methane, nitrous oxide, and halocarbons. Of all human activities, the burning of fossil fuels is the largest contributor in overall greenhouse gas emissions, releasing carbon dioxide gas into the atmosphere (IPCC 2007).

The resulting increases in greenhouse gas emissions from human activities are leading to higher concentrations of CO_2 and a change in composition of the atmosphere. For instance, the concentration of CO_2 in the atmosphere has risen about 30 percent since the late 1800s. Many sources and models indicate that temperatures on earth are currently warming and will continue to warm at unprecedented levels. The global mean surface temperature has increased by 1.1^{o} F since the 19th century (IPCC 2001), and the 10 warmest years of the last century all occurred within the last 15 years (IPCC 2007).

No current CEQA regulation, statute or published judicial decision outlines how CEQA analysis of a project's greenhouse gas emissions impact should be performed. Senate Bill 97, adopted in August 2007, requires the Office of Planning and Research to develop CEQA Guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions. SB 97 directs OPR to issue such guidance by July 1, 2009, and directs the State Resources Agency to certify and adopt regulations by January 1, 2010. These prospective Guidelines will likely provide needed guidance on significance criteria and reconciling AB 32 rollback provisions with CEQA's mandate that project EIRs are not required to mitigate existing pre-project conditions. As of March 2008, neither the State Air Resources Board nor the Bay Area Air Quality Management District has identified a project-specific significance threshold for analyzing the effects of greenhouse gases.

The regulatory climate and ability to quantify greenhouse gas emissions accurately, as applicable within Santa Rosa, are uncertain. Emission reduction measures implemented as a result of regional, State, federal and global regulatory mandates cannot at this time be quantified. In addition, CEQA is only one of many tools being used to approach the greenhouse gas problem, and it is unclear to what extent CEQA documents may rely on other efforts, such as State or Air District measures adopted pursuant to AB 32.

State of California

In 2005, Governor Schwarzenegger issued Executive Order S-02-05, calling for statewide reductions of greenhouse gas emissions 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 both progress toward meeting the targets and effects of climate change on the State.

In the Fall of 2006, the Governor signed Assembly Bill 32 (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 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.

The initial report of the Climate Action Team was published in March 2006. This report identifies recommended measures that account for a reduction of approximately 68 million metric tons of CO_2-equivalents ($MMTCO_2E$). In June 2007, the CARB approved the *Proposed Early Actions to Mitigate Climate Change in California* (April 20, 2007). In September 2007 CARB published the *Draft Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California*. The two ARB reports combined include 44 measures that are estimated to reduce greenhouse gas emissions by 42 $MMTCO_2E$. Of the 44 measures, nine are identified as "discrete early actions" that are regulated and enforceable by January 1, 2010. The remaining 35 measures are to be initiated by CARB between 2007 and 2012 (CARB, September 2007). To achieve the 2020 target, California must reduce its emissions by 177 $MMTCO_2E$ (CEC 2006). The remaining reduction needed will come from a Scoping Plan due in late 2008 for public review, and adopted no later than January 1, 2009 by CARB. At this time what additional measures may be included in the Scoping Plan are not known.

City of Santa Rosa

On December 4, 2001 the Santa Rosa City Council adopted a resolution to become a member of Cities for Climate Protection (CCP), a project of the International Council on Local Environmental Initiatives. Since that time all eight Sonoma County municipalities and Sonoma County also have become members. By becoming a member, local governments commit to completing five milestones: 1) conduct a greenhouse gas emissions analysis; 2) set a target for emissions reduction; 3) draft a local action plan for meeting the target; 4) implement the action plan; and 5) monitor and report on the progress (City of Santa Rosa 2002).

In October 2002, the City completed the first milestone: *Cities for Climate Protection Santa Rosa Milestone One: GHG Inventory*. On August 2, 2005 the City completed the second milestone through the adoption of Resolution 26341 which committed the City of Santa Rosa (City) to reduce the City's municipal (i.e., city government) greenhouse gas emissions by 20 percent below 2000 levels by 2010 (City of Santa Rosa 2005). A local action plan is in the process of being developed. In response to this commitment, the City has implemented, or is in the process of implementing and developing, numerous programs to reduce the City's municipal greenhouse gas emissions as described below.

Environmental Committee

Formed in 2004, the Environmental Committee is made up of representatives from City departments, other local jurisdictions, and various local businesses and organizations. The Committee is responsible for developing programs and policies

that integrate environmental sustainability, with the goal of transforming the City into a successful environmental model. The committee provides advice and recommendations on environmental issues, works to identify community environmental needs, assists in the development of City goals and policies, and acts as a resource for the public.

As part of its role the Committee drafted the City's Environmental Strategic Plan 2007-2009. The goal of this plan is: "Support a reduction in greenhouse gas (GHG) emissions and the attendant climate change initiatives; Evaluate existing policies and consider policy modifications to increase water conservation, water reuse, solid waste reduction, energy efficiency, and renewable energy. Continue to work on the full range of environmental issues locally and in collaboration with our regional and State partners." The Plan includes six strategies to implement the goal covering such topics as developing renewable energy, water conservation, community outreach, and supporting regional, State and national programs. Sample projects are listed below.

Biodiesel Pilot Project

The Laguna Plant, in collaboration with Sonoma State University, has constructed wetlands to demonstrate the ability to grow energy rich non-food biomass in wastewater. This novel process not only would produce renewable energy, it would also assist in removing nutrients, phosphates, and metals from the wastewater. The potential biodiesel produced would be used for the City's growing biodiesel fleet. The by-products from the extraction will then be fed into the City's anaerobic digesters to produce energy that will help offset the Laguna Plant's energy consumption from the electrical grid.

Geysers Recharge Project and IRWP Geysers Expansion Project

In November 2003 the Subregional Water Reuse System began pumping 11 million gallons per day of highly treated wastewater from the Laguna Plant to the Geysers Steamfield. There it is used to generate 85 megawatts of clean renewable energy or enough electricity to supply 85,000 households. The Geysers Expansion Project, approved in August 2007, provides additional deliveries of recycled water to the steamfield that will result in electric generation ranging from 117 to 153 MW, an addition of up to 68 MW of "green" energy.

When the Geysers Expansion Project is fully implemented, together with the original Geysers Recharge Project, approximately 45,000 tons of greenhouse gas emissions will be avoided because of the additional green energy produced by the Geysers.

Santa Rosa Build It Green

Santa Rosa - Build It Green (SR-BIG) is a voluntary program to promote environmental protection through building and remodeling with a more sustainable approach. The City encourages contractors and homeowners to build and design their homes to increase energy and water efficiency, resource conservation, and indoor air

quality by following the SR-BIG certification guidelines. In August 2004, Santa Rosa City Council passed Resolution No. 26572 adopting a voluntary green building program. The City is currently in the process of making this a mandatory program starting in 2008.

Finley Center Cogeneration

The City is in the planning stages of installing a cogeneration system(s) at the Finley Community and Swim Center (Finley Center). A cogeneration system for the Finley Center should significantly reduce on-site energy costs as well as provide additional power quality improvements.

Intelligent Transportation and LED Traffic Signals

In 2007 the City installed an adaptive traffic control system along the College Avenue corridor between Dutton Avenue and Brookwood. This system allows the City to monitor intersections along this segment of College Avenue from a central observation station at the Public Works Department offices. The system is estimated to result in a fuel savings of 171,370 gallons per year which translates to a 1,650-ton reduction in eCO_2 emissions per year. This is a result of fewer stops and more efficient flow along the corridor. The City is currently looking to expand this system to other congested corridors within the City.

The City has implemented the use of LED's (Light Emitting Diodes) in all of the signalized intersections within the City. LED units reduce energy consumption by as much as 90 percent. Currently the City is replacing crosswalk signals with LED's. Crosswalk signals will be replaced overtime as those signals require replacement.

Renewable Energy – Solar Systems

The City has installed five photovoltaic (solar) systems providing approximately 222,400 kWh of green energy each year and reducing eCO_2 emission by approximately 76 tons. Below is a summary of the systems.

Laguna Plant: The City began implementing solar energy in 2004 at the Laguna Plant with a 21kW solar panel system. This array generates approximately 33,400 kWh of energy annually which helps offset the operational energy use of the plant.

Municipal Service Center: In 2005, the City expanded its efforts to offset energy consumption by installing a 29kW system on top of the City's vehicle fueling station. The array is connected to the lighting meter at the City's Municipal Service Center and provides enough energy to accommodate the daily lighting load.

Alpha Farm: In 2006 the City completed a 31 kW photovoltaic solar array at Alpha Farm. This system is offsetting the pumping power costs for farmland irrigation with recycled water.

Water Station 4: In June 2007 a 69kW solar array was installed at Water Station 4 on Farmers Lane.

Bennett Valley Golf Course: In 2007, a 21kW solar array system was installed on the roof of the new Bennett Valley Golf Course Club house. The Club house also is LEED Silver Certified.

Environmentally Preferable Purchasing

On March 20, 2007 the City Council adopted an Environmentally Preferable Purchasing (EPP) Policy. This policy was developed by the Environmental Committee to replace the City's Recycled Product Procurement Policy. Environmentally preferable goods and services are those that have a lesser or reduced effect on human health and the environment when specifically compared with other goods or services that serve the same purpose. The new policy improves purchasing by focusing on resource conservation and toxics reduction as well as recycled content and source reduction that were covered in the previous policy.

Laguna Plant Pumping Systems.

The City is actively replacing older inefficient pumping systems with variable frequency drives and will continue to evaluate and upgrade existing pump stations where variable frequency drives can improve energy efficiencies.

Cities of Rohnert Park, Sebastopol, and Cotati

Each of the Subregional Partners is also a member of Cities for Climate Protection (CCP), and as a member has committed to completing the five milestones: 1) conduct a greenhouse gas emissions analysis; 2) set a target for emissions reduction; 3) draft a local action plan for meeting the target; 4) implement the action plan; and 5) monitor and report on the progress. Each city has completed the first two milestones, and has adopted goals to reduce municipal greenhouse gas emission by 20 percent to 30 percent below 2000 levels by 2010. Each city is in the process of developing its local action plan and has numerous programs designed to reduce greenhouse gas emissions to meet its goals.

Regulatory Context

The Federal Clean Air Act governs air quality in the United States. In addition to being subject to federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act. At the federal level, the U.S. EPA administers the Clean Air Act. The California Clean Air Act is administered by the California Air Resources Board (CARB) and by the Air Quality Management Districts at the regional and local levels. The Bay Area Air Quality Management District (BAAQMD) regulates air quality at the regional level, which includes the southern and central portions of Sonoma County where Santa Rosa and Sebastopol are located.

Federal Plans, Policies, Regulations, and Laws

The U.S. EPA is responsible for enforcing the federal CAA. U.S. EPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the 1977 Clean Air Act and subsequent amendments. The U.S. EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The U.S. EPA has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by the CARB.

California Clean Air Act and CARB

In California, the CARB, which is part of the California Environmental Protection Agency, is responsible for meeting the State requirements of the federal Clean Air Act, administering the California Clean Air Act, and establishing the California Ambient Air Quality Standards (CAAQS). The California Clean Air Act, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. The CARB regulates mobile air pollution sources, such as motor vehicles. The CARB is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. The CARB established passenger vehicle fuel specifications, which became effective on March 1996. The CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

Regional and Local Plans, Policies, Regulations, and Laws

The BAAQMD's primary responsibility is to attain and maintain healthy air quality in the region. The CARB and U.S. EPA have jurisdiction over controlling emissions from mobile sources. Both air districts are 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, and responding to citizen complaints. The BAAQMD's responsibilities are more considerable and include operating an air quality monitoring network as well as awarding grants to reduce motor vehicle emissions, conducting public education campaigns, and many other activities. The BAAQMD has jurisdiction over most of the nine-county Bay Area, including the SSP sites. Because PM_{10} standard violations have continued for many years, the air districts must persevere in controlling PM_{10} emissions.

Regional Clean Air Plans

The BAAQMD along with the other regional agencies (i.e. Association of Bay Area Governments [ABAG] and Metropolitan Transportation Commission) has prepared an Ozone Attainment Plan to address the 1-hour NAAQS for ozone. Although U.S.

EPA revoked the 1-hour NAAQS, commitments made in that plan along with emissions budgets remain valid until the region develops an attainment demonstration/maintenance plan for the 8-hour ozone NAAQS. The region will be required to submit a maintenance plan and demonstration of attainment with a request for redesignation to the U.S. EPA when the 8-hour O_3 NAAQS is met. A Carbon Monoxide Maintenance Plan was approved in 1998 by the U.S. EPA, which demonstrated how the NAAQS for carbon monoxide standard would be maintained. The Bay Area continues to maintain the carbon monoxide NAAQS.

Air quality plans addressing the California Clean Air Act are developed about every three years in nonattainment areas (i.e., San Francisco Bay Area). The plans are meant to demonstrate progress toward meeting the more stringent 1-hour O_3 CAAQS. The latest plan, which was adopted in January 2006, is called the *Bay Area 2005 Ozone Strategy*. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter state air quality standards, as mandated by the California Clean Air Act. The plan is designed to achieve a region-wide reduction of O_3 precursor pollutants through the expeditious implementation of all feasible measures. The plan proposes expanded implementation of transportation control measures (TCMs) and programs such as Spare the Air. Spare the Air is a public outreach program designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. Some of these measures or programs rely on local governments for implementation. The clean air planning efforts for ozone will also reduce PM_{10} and $PM_{2.5}$, since a substantial amount of this air pollutant comes from combustion emissions such as vehicle exhaust. In addition, the BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM_{10} and $PM_{2.5}$ emissions (e.g., Spare the Night Program). SB 656 requires further action by CARB and air districts to reduce public exposure to PM_{10} and $PM_{2.5}$. Efforts identified by the BAAQMD in response to SB656 are primarily targeting reductions in wood smoke emissions and adoption of new rules to further reduce NOx and particulate matter from internal combustion engines and reduce particulate matter from commercial charbroiling activities. NOx emissions contribute to ammonium nitrate formation that resides in the atmosphere as particulate matter. The Bay Area experiences the highest PM_{10} and $PM_{2.5}$ in winter when wood smoke and ammonium nitrate contributions to particulate matter are highest.

GOALS, OBJECTIVES, AND POLICIES

Table 4.11-3 identifies air quality related goals, objectives, and policies. The table also indicates which criteria in the Air Quality Section are responsive to each set of policies.

TABLE 4.11-3
Goals, Objectives, and Policies – Air Quality

Adopted Plan Document	Document Section	Document Numeric Reference	Policy	Relevant Evaluation Criteria1
Santa Rosa General Plan	Open Space Conservation Element	OSC-G OSC-G-2 OSC-I	Help maintain good air quality Use low-emitting diesel fuel (biodiesel and lo-NOx additives) Encourage development of non-traditional and distributed sources of electricity generation	1-4

Source: City of Santa Rosa 2002

Note: 1. Evaluation criteria are identified in Table 4.11-4.

EVALUATION CRITERIA WITH SIGNIFICANCE THRESHOLDS

TABLE 4.11-4
Evaluation Criteria with Significance Thresholds – Air Quality

Evaluation Criteria	As Measured by	Significance Thresholds	Sources of Criteria
1. Will construction of the SSP generate emissions that expose people to high levels of dust and equipment exhaust?	Size of construction area, duration of construction, amount and size of large equipment, and proximity of receptors	Non-compliance with measures recommended by BAAQMD.	CEQA Guidelines Appendix G, Checklist Item III (d). - Bay Area Air Quality Management District CEQA Guidelines for Assessing Impacts of Projects and Plans
2. Will SSP long-term emissions cumulatively exceed allowable limits or conflict with or obstruct the implementation of the Bay Area Ozone Attainment Plan?	Long-term emissions of Reactive Organic Compounds, Nitrogen Oxides, and respirable Particulate Matter	Greater than 80 pounds/day for ozone precursor pollutants (nitrogen oxides and reactive organic gases) and PM10; and 550 pounds/day of carbon monoxide.	CEQA Guidelines Appendix G, Checklist Item III (a) and Item III (c) Bay Area Air Quality Management District CEQA Guidelines for Assessing Impacts of Projects and Plans

TABLE 4.11-4
Evaluation Criteria with Significance Thresholds – Air Quality

Evaluation Criteria	As Measured by	Significance Thresholds	Sources of Criteria
3. Will the SSP expose people to substantial levels of toxic air contaminants?	Risk associated with emissions of toxic air contaminants	Probability of contracting cancer for maximally exposed individual (MEI) exceeds ten in one million or exposure to non-carcinogenic toxic air contaminants would result in a Hazard Index greater than 1 for the MEI	Bay Area Air Quality Management District CEQA Guidelines for Assessing Impacts of Projects and Plans
4. Will the SSP violate or contribute to violation of ambient an air quality standard?	Emissions of carbon monoxide.[1]	Greater than 550 pounds per day of CO and leads to exceedences of a CO ambient air quality standard.	CEQA Guidelines Appendix G, Checklist Item III (b). - Bay Area Air Quality Management District CEQA Guidelines for Assessing Impacts of Projects and Plans
5. Will the SSP cause odor impacts?	Complaints	Potential for greater than ten odor complaints in a 90 day period or greater than 1 confirmed or 3 unconfirmed complaints per year averaged over 3 years	CEQA Guidelines Appendix G, Checklist Item III (b). - Bay Area Air Quality Management District CEQA Guidelines for Assessing Impacts of Projects and Plans
6. Will the SSP increase greenhouse gas emissions?	Tons of increase of equivalent carbon dioxide (eCO2) emissions over 2006 levels	Any increase	City of Santa Rosa, City of Cotati, City of Rohnert Park, and City of Sebastopol as members of Cities for Climate Protection

Source: BAAQMD 1999

Notes:

1. CO is the only criteria air contaminant that is normally modeled for its ambient concentration impacts (such as CO "hotspots" at congested intersections). Impacts for the other criteria air contaminants are assessed against criterion number 2 according to their mass emissions.

METHODOLOGY

Construction

Construction of the seasonal storage ponds, access roads, pump stations and other facilities would produce emissions of dust and criteria air pollutants. Excavation, grading and construction of storage pond embankments would result in the most emissions through ground disturbance, operation of diesel construction equipment and truck trips.

Within the jurisdiction of the BAAQMD, the significance of air quality impacts from construction dust or PM_{10} is typically determined by the control measures that would be implemented. Projects that would move substantial amounts of earth or take place close to sensitive receptors require the greatest level of mitigation. Therefore, quantifiable emissions thresholds are not used. Instead, construction phase impact were found to be less than significant because construction phase mitigation measures would be implemented for all construction activities.

Construction activity associated with building of the storage ponds would require substantial excavation, grading and hauling of materials, with the potential for large quantities of emissions. Some project alternatives could involve a large number of daily haul trips to import fill. At the same time, large quantities of construction equipment would be utilized to construct the storage ponds.

Maximum daily emissions from construction activities were modeled. Approximate emission estimates are based on modeling using the URBEMIS2007 (version 9.2) model and construction activity estimates provided by the SSP project engineers. The URBEMIS2007 model uses the CARB EMFAC2007 model to predict on-road vehicle emissions and the CARB OFFROAD2007 model to predict construction equipment emissions. Emission estimates would vary considerably from day-to-day. The amount and activity of construction equipment on a daily basis are difficult to predict. Construction activity rough estimates were provided and used to develop daily emission estimates for this activity. Emissions associated with the different phases are provided for informational purposes.

Operation and Maintenance

Operation of the Project would involve the operation and maintenance of pump stations to pump the recycled water from the storage ponds back into the Subregional System. These pumps would be operated by electricity, and therefore, would not result in air pollutant emissions from normal operations.

Typically, operation and maintenance activities would generate about two vehicle trips per week. Experience with the Subregional System's existing recycled water storage ponds has shown that operational storage ponds, even when empty, do not generate airborne particulates; therefore no further analysis of dust during operation has been performed.

Odors

Odor impacts are judged on the potential to create or exacerbate odor/nuisance complaints. The odor analysis methodology evaluates the potential for odors to be generated by the Project and then considers the proximity to sensitive receptors and the duration that such odors might occur. Where potential odors are identified, similar operational projects are reviewed to identify any past odor complaint history.

Carbon Dioxide/Greenhouse Gases

The greenhouse gas emissions for operation of SSP facilities were determined 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 equivalent carbon dioxide (eCO_2) emissions for the California/Nevada portion of the Western Electricity Coordinating Council. This is the same software used by the City for their greenhouse gas emissions inventory.

Emissions during construction would primarily come from construction vehicles. Due to the intermittent and temporary nature of these emissions, construction impacts are not evaluated for eCO_2 emissions.

IMPACTS AND RECOMMENDED MITIGATION MEASURES

TABLE 4.11-5
Air Quality Impacts

Evaluation Criteria	Significance Threshold	Impact	Type of Impact[1]	Level of Significance[2]
11.1. Will construction of the SSP facilities generate emissions that expose people to high levels of dust and equipment exhaust?	Non-compliance with measures recommended by BAAQMD and the Northern Sonoma County APCD.	Less than significant	C	❍
11.2. Will the SSP emissions cumulatively exceed allowable limits or conflict with or obstruct the implementation of the Bay Area Ozone Attainment Plan?	Operational activity exceeds 80 pounds per day of nitrogen oxides, reactive organic gases, or PM10; or exceeds 550 pounds per day of carbon monoxide	Less than significance threshold	P	❍
11.3. Will the SSP expose people to substantial levels of toxic air contaminants?	Probability of developing cancer for maximally exposed individual (MEI) exceeds ten in one million, or exposure to non-	Less than significance threshold	P	❍

TABLE 4.11-5
Air Quality Impacts

Evaluation Criteria	Significance Threshold	Impact	Type of Impact[1]	Level of Significance[2]
	carcinogenic toxic air contaminants would result in a Hazard Index greater that 1 for the MEI.			
11.4. Will the SSP violate or contribute to violation of an ambient air quality standard?	Greater than 9.0 ppm CO for 8-hour averaging periods.	Less than significance threshold	P	❍
11.5. Will the SSP potentially cause odors?	Potential for greater than ten odor complaints in a 90 day period or greater than 1 confirmed or 3 unconfirmed complaints annually (three year average).			
Storage component		Less than significance threshold	P	❍
Pump Station component		No impact	P	==
11.6. Will the SSP increase greenhouse gas emissions?	Tons of increase over 2006 eCO2 emissions			
Storage component		No Impact	P	==
Pump Station component		12 to 28 tons	P	●

Notes: 1. Type of Impact:
C: Construction
O&M: Operation and Maintenance
P: Permanent

2. Level of Significance:
● Significant impact before and after mitigation
⊙ Significant impact before mitigation; less than significant impact after mitigation
❍ Less than significant impact; no mitigation proposed
== No impact

Impact: 11.1. Will construction of the SSP facilities generate emissions that expose people to high levels of dust and equipment exhaust?

Analysis: *Storage component - Less than Significant: KF1, KF2, BF1, BF2, and AF*

Implementation of the Storage component at each of the alternative sites entails construction activities that would include mobilizing construction equipment, excavating soil and rock and moving it on-site, building access roads, soil compaction and dust control, delivering piping and pumps, and worker commute trips. Excavation and grading would be substantial. Construction would extend about two seasons, with much of the work conducted in the first season. The permanent disturbance areas would range

from 47 to 74 acres, and temporary construction activities would cover from 67 to 77 acres.

Assuming that 20 acres are actively disturbed during busy construction periods, approximately 400 pounds per day of PM_{10} could be emitted from this activity. Approximately 10 to 20 pieces of large off-road construction equipment would be continuously operated on any given workday. Based on rough estimates of daily activity that would apply to all sites, approximately 200 daily one-way truck trips would occur. Emissions associated with construction activities are summarized in Table 4.11-6.

TABLE 4.11-6
Maximum Daily Air Pollutant Emissions Associated with Construction Activities

	Daily Emissions in pounds per day				
Description/Phase	**ROG**	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Cut/Fill activities					
Ground disturbance (20 acres/day)				400	84
Equipment (17 pieces – 8hrs/day)	28	247	131	11	10
Haul trucks (100 one-way trips/day)	4	64	20	82	20
Total	32	311	151	493	114
Excavation/Export Fill activities					
Ground disturbance (20 acres/day)				400	84
Equipment (4 pieces – 8hrs/day)	6	55	31	3	2
Haul trucks (100 one-way trips/day)	4	64	20	82	20
Total	10	119	51	485	106
Typical Import/Embankment activities					
Ground disturbance (20 acres/day)				400	84
Equipment (7 pieces – 8hrs/day)	6	46	23	3	2
Haul trucks (100 one-way trips/day)	4	64	20	82	20
Total	10	110	43	485	106
Miscellaneous Equipment					
Equipment (7 pieces – 8hrs/day)	11	95	41	5	5
Paving					
Equipment (4 pieces – 8hrs/day) & Off-gas	6	41	20	2	2

Project Measures 3.2.16 Dust Control Program and 3.2.17 Equipment Exhaust Control Program provide feasible control measures that are consistent with

BAAQMD-recommended measures to reduce PM_{10} emissions to less than significant.

Construction activities would create emissions of criteria air contaminants including TACs as a component of diesel exhaust or ROG emissions. However, with implementation of Project Measure 3.2.17, these emission levels would be less than significant.

Pump Station component - Less than Significant: KF1, KF2, BF1, BF2 and AF

Construction activities associated with the inboard pump stations for each of the alternatives would be temporary and are included in the emissions calculated in Table 4.11-6. Project Measures 3.2.16 and 3.2.17 would reduce these emissions to less than significant. Operational and maintenance activities are estimated to cause two trips per week on average and would have negligible emissions. No other air quality impacts are expected.

Mitigation: No mitigation is needed.

Impact: 11.2 Will the SSP emissions cumulatively exceed allowable limits or conflict with or obstruct the implementation of the Bay Area Ozone Attainment Plan?

Analysis: *Storage component - Less than Significant: KF1, KF2, BF1, BF2 and AF*

Long-term operation and maintenance of storage facilities would not involve much energy use or use of vehicles or equipment that would emit substantial air pollutants. There would be only minor emissions associated with routine maintenance, estimated to cause two trips per week on average, such as vehicle trips or infrequent operation of construction type equipment to make repairs. Therefore, there would be no long-term air quality impacts that would affect air quality regionally or locally.

Pump Station component - Less than Significant: KF1, KF2, BF1, BF2 and AF

Long-term operation and maintenance of pump station would not involve much energy use or use of vehicles or equipment that would emit substantial air pollutants. There may be only minor emissions associated with routine maintenance, such as vehicle trips or infrequent operation of construction type equipment to make repairs. Therefore, there would be no long-term air quality impacts that would affect air quality regionally or locally.

Mitigation: No mitigation is needed.

Impact: 11.3. Will the SSP expose people to substantial levels of toxic air contaminants?

Analysis: *Storage component – Less than Significant: KF1, KF2, BF1, BF2 and AF*

No sources of toxic air contaminants have been identified from operation of the storage ponds. There may be minor emissions associated with routine maintenance, such as vehicle trips or infrequent operation of construction type equipment to make repairs. However, these activities are not anticipated to result in emissions of TACs or other air pollutants that would create a health risk or hazard to sensitive receptors. Therefore, exposure to substantial levels of TACs caused by the Storage component would be less than significant.

Pump Station component – Less than Significant: KF1, KF2, BF1, BF2 and AF

Long-term operation and maintenance of pump stations would not involve routine emissions of air pollutants. There may be minor emissions associated with routine maintenance, such as vehicle trips or infrequent operation of construction type equipment to make repairs. However, these activities are not anticipated to result in emissions of TACs or other air pollutants that would create a health risk or hazard to sensitive receptors. Therefore, exposure to substantial levels of TACs caused by the Pump Station component would be less than significant.

Mitigation: No mitigation is needed.

Impact: 11.4. Will the SSP violate or contribute to violation of an ambient air quality standard?

Analysis: *Storage component - Less than Significant: KF1, KF2, BF1, BF2 and AF*

As described under Impacts 11.2.2 and 11.2.3, operation and maintenance of the storage ponds would have very minor emissions. The impact would be less than significant.

Pump Station component - Less than Significant: KF1, KF2, BF1, BF2 and AF

Long-term operation and maintenance of pump station would not involve routine emissions of air pollutants. One or two vehicle trips may be generated per day, which would not affect local air quality in such a manner as to cause a violation of an ambient air quality standard. Therefore, no violation or contribution to a violation of an ambient air quality standard would be caused by the Pump Station component of the Project. The impact would be less than significant.

Mitigation: No mitigation is needed.

Impact: 11.5 Will the SSP potentially cause odors?

Analysis: *Storage component - Less than Significant: KF1, KF2, BF1, BF2 and AF*

Except during construction, the Project is not anticipated to result in odors that would be detectable beyond the project boundaries. Recycled water has been found to have no noticeable odors. Theoretically, draining the storage ponds could lead to localized odors as vegetation dies and decays. In practice, the

Subregional System has not found even empty ponds to have odor problems, and no complaints of such have been filed. Odors during operation are considered less than significant.

Construction activities associated with construction of storage ponds may result in temporary odors, primarily from diesel exhaust. These temporary construction odor impacts would be addressed through implementation of Project Measure 3.2.17 Equipment Exhaust Control Program. Therefore the impact would be less than significant.

Pump Station component – No Impact: KF1, KF2, BF1, BF2 and AF

Since the pumps would be powered by electricity, operation of the pump stations would not cause any emissions with odors. After treatment, recycled water has essentially no odor, as has been demonstrated with the operation of the existing system. Therefore, there would be no impact.

Mitigation: No mitigation is necessary

Impact: 11.6. Will the SSP increase greenhouse gas emissions?

Analysis: *Storage component – No Impact: KF1, KF2, BF1, BF2 and AF*

The Storage component does not include energy use and therefore would not contribute to the increase of eCO_2 emissions.

Pump Station component – Significant: KF1, KF2, BF1, BF2 and AF

The SSP would utilize energy from the existing E Pump Station at the Laguna Plant and from the on-site pumping facilities that constitute the Pump Station component. Energy use for off-site and on-site pump station operations would range from 31,601 to 72,602 kWh per year, depending upon the Alternative. Energy use, and corresponding eCO_2 emissions, for each Alternative are summarized below in Table 4.11-7. BF2 has the least emissions at 12 tons and KF1 has the most at 28 tons.

TABLE 4.11-7
eCO_2 Emissions by Alternative

Site	kWh per Year	eCO2 Emissions per year
KF1	72,602	28 tons
KF2	48,776	19 tons
BF1	61,074	23 tons
BF2	31,601	12 tons
AF	52,511	20 tons

Mitigation: *Storage component: KF1, KF2, BF1, BF2, and AF*

No mitigation is needed.

Pump Station component: KF1, KF2, BF1, BF2, and AF

3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program

After Mitigation: *Pump Station component – Significant: KF1, KF2, BF1, BF2 and AF*

Mitigation Measure 3.5.19 provides that SSP greenhouse gas emissions shall be reduced to the extent feasible. For emissions that cannot be avoided, the City would commit to providing compensatory programs to the extent feasible, meeting one of two listed performance standards or, alternately, to comply with the future guidance regarding mitigation of greenhouse gas emissions to be promulgated by the Resources Agency in 2010.

For the first performance standard, the cities of the Subregional System would commit to achieving the goals set forth for municipal governmental activities as members of the Cities for Climate Protection. Because the local goals require more greenhouse gas emissions reductions than the State goals expressed in AB32, achievement of local goals would also achieve State goals. Achievement of the local goals would be required through development, adoption, and successful implementation of the local action plans of each city, offsetting the project impact and reducing the cumulative impact to the extent feasible.

For the second performance standard, the City would offset SSP emissions by reducing emissions from other sources to the extent feasible, such that no net increase in emissions would occur. Because the project's eCO_2 emissions would be a net "zero", the Project would not contribute to the cumulative impacts of greenhouse gas emissions, and the project impact and cumulative impact after mitigation would be less than significant.

The mitigation measure provides that the compensation for greenhouse gas emissions need only occur as SSP is implemented.

The analysis in this Draft EIR has been prepared in the face of the unresolved status of many of the issues and regulatory and voluntary efforts to combat greenhouse gas impacts. However, this analysis represents the result of the City's best efforts to reconcile existing law, available information and anticipated impacts of statewide programs in the context of statewide reduction standards, local programs and policies, Subregional System partners' "targets" for greenhouse gas reductions and the partners' desire to reduce greenhouse gas emissions.

As described in more detail in the Setting section above, the policies and science surrounding greenhouse gas emissions are changing rapidly. New regulations, new initiatives, new data, and new solutions are announced daily

during this period of time when government and private interests are turning their attention to solving this problem. Although this Draft EIR is based upon the best data and most recent policies and regulations available in March 2008, it is not possible to foresee all of the actions which the Subregional System may be required to take relative to greenhouse gases through implementation of the SSP.

A substantial level of uncertainty remains regarding the best means of calculating emissions, about the appropriate method for calculating the effectiveness of mitigation measures, about the feasibility of mitigation measures, and about how emission reductions that result from federal, state, or local programs should be factored into a project-level evaluation such as this Draft EIR. Due to these uncertainties, the project impact is found to be significant even after implementation of all feasible mitigation.

If solar panels were chosen from Mitigation Measure 3.5.19 as the compensatory program to offset greenhouse gases of the Pump Station component the system would be sized approximately as shown in Table 4.11-8.

TABLE 4.11-8
Size of Solar Systems Needed for eCO2 Offset by Alternative

Alternative	Size (kW)
KF1	44
KF2	29
BF1	37
BF2	19
AF	32

No Project Alternative

Impact: 11.1 through 11.6. Will the No Project Alternative impact air quality based on evaluation criteria 4.11-1 through 4.11-5?

Analysis: *No Impact*

The No Project Alternative would not result in air quality impacts, as it involves no new construction or operations.

Mitigation: No mitigation is needed.

CUMULATIVE IMPACTS

Impact: **11.1C through 11.5C: Will the SSP and cumulative projects have the potential to impact air quality under criteria 11.2.1 through 11.2.5?**

Analysis: *Less than Significant*

Under the BAAQMD CEQA Guidelines, projects that individually have a significant air quality impact would be considered to have a cumulative impact to air quality. For projects that do not individually have a significant impact to air quality, the determination of a significant cumulative impact is based on the consistency of the project with the local General Plan and the Bay Area Clean Air Plan (i.e., 2005 Bay Area Ozone Strategy). With construction period mitigation measures, the Project is not anticipated to have a significant air quality impact. As a result, the Project is not expected to conflict or obstruct the implementation of local and regional air quality planning efforts and would not cause cumulative impacts to air quality.

Mitigation: No mitigation is needed.

Impact: **11.6C Will the SSP and cumulative projects have the potential to increase greenhouse gas emissions?**

Analysis: *Significant*

The City is implementing projects to conserve energy and reduce greenhouse gas emissions (GHG) emissions; however, new projects, including expansion of existing facilities, lessen the overall impact of the conservation programs.

The SSP would produce eCO_2 emissions associated with the energy requirements of the Pump Station component and off-site pumping to fill the ponds. These emissions in combination with the projects listed in Appendix C Cumulative Projects List, would constitute a significant cumulative impact, and the Project's contribution to the impact would be considerable.

In addition, the SSP is part of the IRWP, which was found in the Program EIR to be growth inducing. The indirect impacts of the SSP therefore induce growth within the Subregional System and induce increased greenhouse gas emissions from that growth.

Mitigation: **3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program**

After Mitigation: *Significant*

Mitigation Measure 3.5.19 provides that SSP greenhouse gas emissions shall be reduced to the extent feasible. For emissions that cannot be avoided, the City would commit to providing compensatory programs to the extent feasible, meeting one of two listed performance standards or, alternately, to

comply with the future guidance regarding mitigation of greenhouse gas emissions to be promulgated by the Resources Agency in 2010.

For the first performance standard, the cities of the Subregional System would commit to achieving the goals set forth for municipal governmental activities as members of the Cities for Climate Protection. Because the local goals require more greenhouse gas emissions reductions than the State goals expressed in AB32, achievement of local goals would also achieve State goals. Achievement of the local goals would be required through development, adoption, and successful implementation of the local action plans of each city, offsetting the project impact and reducing the cumulative impact to the extent feasible.

For the second performance standard, the City would offset SSP emissions by reducing emissions from other sources to the extent feasible, such that no net increase in emissions would occur. Because the Project's eCO_2 emissions would be a net "zero", the Project would not contribute to the cumulative impacts of greenhouse gas emissions, and the Project and cumulative impact after mitigation would be less than significant.

The mitigation measure provides that the compensation for greenhouse gas emissions need only occur as SSP is implemented.

The analysis in this Draft EIR has been prepared in the face of the unresolved status of many of the issues and regulatory and voluntary efforts to combat greenhouse gas impacts. However, this analysis represents the result of the City's best efforts to reconcile existing law, available information and anticipated impacts of statewide programs in the context of statewide reduction standards, local programs and policies, Subregional System partners' "targets" for greenhouse gas reductions and the partners' desire to reduce greenhouse gas emissions.

As described in more detail in the Setting section above, the policies and science surrounding greenhouse gas emissions are changing rapidly. New regulations, new initiatives, new data, and new solutions are announced daily during this period of time when government and private interests are turning their attention to solving this problem. Although this Draft EIR is based upon the best data and most recent policies and regulations available in March 2008, it is not possible to foresee all of the actions which the Subregional System may be required to take relative to greenhouse gases through implementation of the SSP.

A substantial level of uncertainty remains regarding the best means of calculating emissions, about the appropriate method for calculating the effectiveness of mitigation measures, about the feasibility of mitigation measures, and about how emission reductions that result from federal, state, or local programs should be factored into a project-level evaluation such as this Draft EIR. Due to these uncertainties, the Project impact is found to be significant even after implementation of all feasible mitigation.

SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

TABLE 4.11-9
Summary of Significant Impacts and Mitigation Measures – Air Quality

Impact	Level of Significance	Mitigation Measure
KF1		
11.6. The Pump Station component would increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
11.6C. The Pump Station component plus cumulative projects have the potential to increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
KF2		
11.6. The Pump Station component would increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
11.6C. The Pump Station component plus cumulative projects have the potential to increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
BF1		
11.6. The Pump Station component would increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
11.6C. The Pump Station component plus cumulative projects have the potential to increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
BF2		
11.6. The Pump Station component would increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
11.6C. The Pump Station component plus cumulative projects have the potential to increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
AF		
11.6. The Pump Station component would increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program
11.6C. The Pump Station component plus cumulative projects have the potential to increase greenhouse gas emissions.	●	3.5.19 Avoid Greenhouse Gas Emissions and Implement Emission Reduction Program

Notes: Level of Significance:
- ● Significant impact before and after mitigation
- ⊙ Significant impact before mitigation; less than significant impact after mitigation

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