

Air Quality

This chapter describes the setting and potential air quality impacts of the Project's construction and operation. It discusses applicable federal and state air quality standards and current attainment status, identifies potential air quality impacts of the Project, and proposed mitigation measures, as applicable.

4.1 Existing Setting

4.1.1 Climate and Topography

Air quality is affected by both the pollutant emissions rate and locations, and by meteorological conditions that influence movement and dispersal of pollutants in the atmosphere. San Mateo has a Mediterranean climate with warm, dry summers and mild, damp winters. Westerly through northwesterly winds are most common in the area, reflecting the orientation of San Francisco Bay and the San Francisco Peninsula. Winds are lightest, on the average, in fall and winter, when every year there are periods of several days when winds are light and local pollutants can build up. During summer, inversions could be present more than 90 percent of the time in both morning and afternoon. In winter, inversions dominate during the morning but frequently dissipate by afternoon (City of San Mateo, 2009).

Topography can restrict horizontal dilution and mixing of pollutants by creating a barrier to air movement. The South Bay has significant terrain features that affect air quality. The Santa Cruz Mountains and Hayward Hills on opposite sides of the South Bay restrict horizontal dilution; these features also channel winds from the north to south, carrying pollution from the northern peninsula toward the City (City of San Mateo, 2009).

4.1.2 Attainment Status

The Project is located in the City of San Mateo, San Mateo County, which is part of the San Francisco Bay Area Air Basin (SFBAAB). The area is currently designated as nonattainment for ozone and particulate matter with aerodynamic diameter equal to or less than 2.5 micrometers ($PM_{2.5}$) under the National Ambient Air Quality Standards (NAAQS) and nonattainment for ozone, particulate matter with aerodynamic diameter equal to or less than 10 micrometers (PM_{10}), and $PM_{2.5}$ under the California Ambient Air Quality Standards (CAAQS) (BAAQMD, 2017). The area is designated as attainment/unclassified for all other pollutants.

4.2 Regulatory Framework

4.2.1 Federal Regulations

4.2.1.1 Federal Clean Air Act and NAAQS

Federal air quality policies are regulated through the federal Clean Air Act (CAA). The U.S. Environmental Protection Agency (EPA) adopted the CAA in 1970 and its amendments in 1977 and 1990. Pursuant to the CAA, EPA has established nationwide air quality standards to protect public health and welfare with an adequate margin of safety. These federal standards, known as the NAAQS, represent the maximum allowable atmospheric concentrations and were developed for seven criteria pollutants: ozone, NO_2 , CO, PM_{10} and $PM_{2.5}$, SO_2 , and lead. The NAAQS represent safe levels of each pollutant to avoid specific adverse effects on human health and the environment. **Table 4-1** summarizes the NAAQS.

The 1977 CAA amendment required each state to develop and maintain a state implementation plan (SIP) for each criteria pollutant that violates the applicable NAAQS. The SIP serves as a tool to avoid and minimize emissions of pollutants that exceed ambient threshold criteria and to achieve compliance with the NAAQS. In 1990, the CAA was amended to strengthen regulation of both stationary and mobile emission sources for criteria pollutants. Conformity to the SIP is defined under the 1990 CAA amendments as conformity with the plan's purpose in eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of these standards.

Table 4-1. Ambient Air Quality Standards and Attainment Status

Underground Flow Equalization System Project, Environmental Impact Report

Pollutant	Averaging Time	CAAQS ^a		NAAQS ^b		
		Standard	Status	Primary ^c	Secondary ^d	Status
Ozone	8 hours	0.070 ppm	Nonattainment	0.070 ppm	0.070 ppm	Nonattainment
	1 hour	0.09 ppm		—	—	
PM ₁₀	Annual Arithmetic Mean	20 µg/m ³	Nonattainment	—	—	—
	24 hours	50 µg/m ³		150 µg/m ³	150 µg/m ³	
PM _{2.5}	Annual Arithmetic Mean	12 µg/m ³	Nonattainment	12 µg/m ³	15 µg/m ³	Attainment/ Unclassified
	24 hours	—		35 µg/m ³	35 µg/m ³	
CO	8 hours	9.0 ppm	Attainment	9 ppm	—	Attainment
	1 hour	20 ppm		35 ppm	—	
NO ₂	Annual Arithmetic Mean	0.03 ppm	Attainment	0.053 ppm	0.053 ppm	Unclassified
	1 hour	0.18 ppm		0.100 ppm	—	
SO ₂	24 hours	0.04 ppm	Attainment	—	0.5 ppm	Unclassified
	1 hour	0.25 ppm		0.075 ppm ^g	—	
Lead ^e	Calendar Quarter	—	Attainment	1.5 µg/m ³	1.5 µg/m ³	Attainment
	Rolling 3-month Average	—		0.15 µg/m ³	—	
	30-day Average	1.5 µg/m ³		—	—	
Visibility-Reducing Particles	8 hours	f	Unclassified	—	—	—
Sulfates	24 hours	25 µg/m ³	Attainment	—	—	—
Hydrogen Sulfide	1 hour	0.03 ppm	Unclassified	—	—	—
Vinyl Chloride ^e	24 hours	0.01 ppm	Unclassified	—	—	—

^a California standards for ozone, CO (except Lake Tahoe), SO₂ (1-hour and 24-hour), NO₂, and suspended particulate matter (PM₁₀, PM_{2.5}, and visibility-reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded.

^b National standards other than ozone, PM, and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM₁₀, 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 1. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, is equal to or less than the standard.

^c National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

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

Table 4-1. Ambient Air Quality Standards and Attainment Status
Underground Flow Equalization System Project, Environmental Impact Report

Pollutant	Averaging Time	CAAQS ^a		NAAQS ^b		Status
		Standard	Status	Primary ^c	Secondary ^d	

^e The California Air Resources Board (ARB) has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. ARB made this determination following the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

^f Insufficient amount to produce an extinction coefficient of 0.23 per kilometer because of particles when the relative humidity is less than 70 percent.

^g Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 parts per billion (ppb).

Notes:

µg/m³ = micrograms per cubic meter.

ppm = parts per million

Source: BAAQMD, 2017a.

4.2.1.2 Hazardous Air Pollutants

Controlling air toxic emissions became a national priority with the passage of the CAA Amendments of 1990, whereby Congress mandated that EPA regulates 188 air toxics, also known as hazardous air pollutants (HAP). Prior to the 1990 CAA Amendments, EPA created a program to establish national emission standards for HAPs. National emission standards were established for benzene, vinyl chloride, radionuclides, mercury, asbestos, beryllium, inorganic arsenic, radon 222, and coke oven emissions. In 1994, EPA began issuing the new standards, while national emission standards set before 1991 remain applicable. In addition, in February 2007, EPA finalized the rule entitled Control of Hazardous Air Pollutants from Mobile Sources, to reduce hazardous air pollutants from moveable sources.

4.2.2 State Regulations

4.2.2.1 California State Ambient Air Quality Standards

The California Air Resources Board (ARB) oversees California air quality policies (ARB, 2013). CAAQS were first established in 1969 pursuant to the Mulford-Carrell Act. These standards are generally more stringent than the NAAQS and include four additional pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates. Relevant CAAQS are listed in **Table 4-1**.

The California CAA, which was approved in 1988, requires each local air district in the state to prepare an air quality management plan (part of the SIP) that complies with the CAAQS. ARB has ultimate responsibility for the SIP for nonattainment pollutants but relies on each local air district to adopt mandatory statewide programs and provide tailored additional strategies for sources under its local jurisdiction.

4.2.2.2 Toxic Air Contaminants

ARB regulates the toxic air contaminant sources and emissions in California. The Air Toxics “Hot Spots” Information and Assessment Act (Assembly Bill [AB] 2588) was enacted in September 1987. AB 2588 requires that toxic air emissions from stationary sources (facilities) be quantified and compiled into an inventory, that risk assessments be conducted according to methods developed by the Office of Environmental Health Hazard Assessment, and that the public be notified of significant risks posed by nearby facilities. Since the amendment of the statute in 1992 by enactment of Senate Bill (SB) 1731, facilities that pose potentially significant health risks to the public are required to reduce those risks. ARB has also developed regulations and air toxic control measures for mobile and stationary sources to reduce toxic air contaminant emissions.

4.2.3 Local Regulations

The Project area is located in San Mateo County, which is within the SFBAAB under the jurisdiction of BAAQMD. BAAQMD is the local agency responsible for ensuring that federal and state ambient air quality standards are attained in the Project area; responsibilities include rulemaking, permitting, and enforcement activities affecting stationary sources in the Bay Area. Specific rules and regulations adopted by BAAQMD limit the emissions that can be generated by various activities and identify specific pollution reduction measures that must be implemented in association with various activities. These rules regulate not only emissions of the six criteria air pollutants but also toxic emissions and acutely hazardous non-radioactive materials emissions. Any sources of stationary emissions constructed as part of a project would be subject to the BAAQMD rules and regulations. Federal and state ozone plans rely on stationary source control measures in BAAQMD rules and regulations. Additionally, the BAAQMD's *California Environmental Quality Act Air Quality Guidelines* that were adopted in 2017 contain specific measures, *Basic Construction Mitigation Measures*, for reducing construction-related emissions from projects. These measures are recommended for all projects, regardless whether construction-related emissions exceed applicable thresholds of significance.

The *San Francisco Bay Area 2001 Ozone Attainment Plan for the 1-hour National Ozone Standard* (BAAQMD, 2001) was prepared in response to federal planning requirements. BAAQMD also adopted the *Bay Area 2017 Clean Air Plan* (BAAQMD, 2017b), which provides an integrated, multi-pollutant control strategy to reduce emissions of ozone, particulates, air toxics, and GHGs. BAAQMD is currently designated as nonattainment for the federal 24-hour PM_{2.5} standards; recent monitoring data indicate that PM_{2.5} levels have decreased in the Bay Area air basin since 2011. On January 9, 2013, EPA issued a final rule to determine that the Bay Area has attained the federal 24-hour PM_{2.5} standard. The Bay Area will continue to be nonattainment for the federal 24-hour PM_{2.5} standard until a “redesignation request” and a “maintenance plan” are submitted to EPA and the agency approves the proposed redesignation (BAAQMD, 2017a).

BAAQMD is designated nonattainment for state PM₁₀ standards and has implemented a particulate matter (PM) control program. The program includes emission limits for primary PM and PM precursors from stationary sources, wood smoke regulations, and PM control measures outlined in the *Bay Area 2010 Clean Air Plan* (BAAQMD, 2010a).

Although odors generally do not pose a health risk, they can be unpleasant and lead to complaints from the community (BAAQMD, 1999). Regulation 7, Odorous Substances (BAAQMD, 1982) applies to operating facilities and places general limitations on odorous substances and specific limitations on emissions of certain odorous compounds. Limitations are only applicable when BAAQMD receives 10 or more “confirmed” odor complaints within a 90-day period. A confirmed odor complaint is confirmed by a BAAQMD trained inspector. To be a confirmed odor complaint, a BAAQMD inspector must visit the complainant within 30 minutes and verify and confirm the source of the odor. Typically, a confirmed odor complaint is followed up with a BAAQMD Violation Notice. Once triggered, Regulation 7 limitations are enforced until no citizen complaints are received by the BAAQMD for 1 full year.

BAAQMD's Regulation 9, Rule 2, Inorganic Gaseous Pollutants – Hydrogen Sulfide limits ground-level concentrations of hydrogen sulfide to below 0.06 parts per million (ppm) averaged over 3 consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes in any 24-hour period (BAAQMD, 1979).

4.3 Assessment Methods and Thresholds of Significance

Under CEQA, project proponents are required to identify any significant environmental effects that would occur as a result of their actions. CEQA also requires that project proponents avoid or mitigate any impacts to the extent feasible. Impacts on air quality may occur if the proposed Project would result in the following:

- Conflict with or obstruct implementation of the applicable air quality plan
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)
- Expose sensitive receptors to substantial pollutant concentrations
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people

Evaluation of impacts based on the two three criteria uses BAAQMD emissions limits of criteria pollutants of concern. BAAQMD published guidelines for evaluating, measuring, and mitigating projects' air quality impacts, including impacts from criteria air pollutants and toxic air contaminants for CEQA purposes (BAAQMD, 2017c). The thresholds of significance are shown in **Table 4-2** and are used for the impact analysis.

Table 4-2. Bay Area Air Quality Management District Air Quality CEQA Thresholds of Significance for Criteria Pollutants
Underground Flow Equalization System Project, Environmental Impact Report

Pollutant	Threshold of Significance for Construction Average Daily (lb/day)	Threshold of Significance for Operation	
		Average Daily (lb/day)	Maximum Annual (tpy)
ROG	54	54	10
NO _x	54	54	10
PM ₁₀ (exhaust)	82	82	15
PM _{2.5} (exhaust)	54	54	10
PM ₁₀ (fugitive dust)	Best Management Practices (BMPs)		None
PM _{2.5} (fugitive dust)	Best Management Practices (BMPs)		None
Local CO	None	9.0 ppm (8-hour average); 20.0 ppm (1-hour average)	

Notes:

lb/day = pounds per day

NO_x = nitrogen oxide

tpy = tons per year

ROG = reactive organic gases

Source: BAAQMD (2017c)

To determine if the proposed Project would create objectionable odors affecting a substantial number of people, the BAAQMD 2017 CEQA guidelines were used. The 2017 CEQA guidelines address the significance of potential odor impacts, in this case for a wastewater pumping facility, as summarized below.

1. Projects that result in a significant new odor impact that are sited within a 1-mile distance (based on Table 3-3 of the 2017 BAAQMD guidelines) of an existing receptor.
2. A type of odor source with five or more confirmed complaints in the new source area per year, averaged over 3 years.

4.4 Environmental Impacts

Impact 4-1. Would the proposed Project conflict with or obstruct implementation of an applicable air quality plan or result in a cumulatively considerable net increase of any criteria pollutant?

The Project would involve several construction elements that have the potential to generate temporary air pollutants, including exhaust emissions from the construction equipment and vehicles, and fugitive dust emissions from earthmoving activities and vehicle travel on paved and unpaved roads.

The Project would be constructed over a 25-month period starting in 2020. Maximum daily construction emissions of reactive organic gases (ROG), NO_x, CO, SO₂, PM₁₀, and PM_{2.5} were estimated using CALEMOD version 2016.3.2 (California Air Pollution Control Officers Association, 2017).

The estimated average daily construction emissions for the Project are summarized in **Table 4-3**.

Appendix A provides the construction calculations and assumptions used to assess air quality impacts.

Table 4-3. Estimated Average Daily Construction Emissions
Underground Flow Equalization System Project, Environmental Impact Report

	ROG	CO	NO _x	SO _x	PM ₁₀ Fugitive	PM ₁₀ Exhaust	PM _{2.5} Fugitive Dust	PM _{2.5} Exhaust
Construction year ^a	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Year 1	1.92	32.78	15.46	0.09	2.45	0.59	0.64	0.56
Year 2	1.98	35.26	16.18	0.11	2.79	0.55	0.75	0.52
Year 3	0.40	9.39	2.92	0.03	1.04	0.04	0.28	0.04
Thresholds of Significance	54	--	54	--	BMP	82	BMP	54
Exceeds threshold?	No	N/A	No	N/A	N/A	No	N/A	No

^a Construction assumptions used for Project assessment assumed a start date of January 1, 2019, and a construction duration of 25 months.

As shown in **Table 4-3**, average daily construction equipment and vehicle exhaust emissions would be below the BAAQMD construction emission Thresholds of Significance. The Project will implement best management practices (BMPs) to minimize fugitive dust emissions during construction, including implementation of the BAAQMD's *Basic Construction Mitigation Measures*, and would comply with all other applicable state and local regulations.

Therefore, given construction emissions would be short term, lower than the BAAQMD CEQA significance thresholds, and comply with BAAQMD requirements, Project construction emissions would be less than significant.

Routine maintenance activities of the pipelines, temporary holding structure, odor control facilities, and pump stations would occur after wet weather events and as part of routine maintenance of the entire collection system. Inspection of the interior of the temporary holding structure from the surface following each event would occur to verify the tipping buckets are functioning properly and solids have been flushed from the interior. It is expected that wet weather events would occur approximately 15 times per year. Maintenance vehicles would consist of up to two City vehicles traveling to the site per inspection. Ongoing maintenance would include replacement of equipment necessary to maintain optimal operation approximately every 5 to 25 years (see Section 2.5, *Maintenance*). Given the limited

number of maintenance vehicles and trips to the Project site, air emissions from maintenance activities would not significantly increase and impacts would be less than significant.

The Project also includes the installation of a new emergency diesel generator to allow processes to continue during periods of power outages. Normal operation of the diesel generator, including maintenance and testing, will be limited to 50 hours per year. **Table 4-4** details expected emissions associated with operation of the generator. As shown, operational emissions would be considerably lower than the thresholds, and would not result in a cumulatively considerable net increase of any criteria pollutant; therefore, impacts would be less than significant.

Table 4-4. Estimated Average Daily Operational Emissions
Underground Flow Equalization System Project, Environmental Impact Report

	ROG	CO	NO _x	SO _x	PM ₁₀ Fugitive	PM ₁₀ Exhaust	PM _{2.5} Fugitive Dust	PM _{2.5} Exhaust
Average Daily (lb/day) ^b	0.026	2.895	9.306	0.012	N/A	0.207	N/A	0.207
Threshold of Significance (lb/day)	54	--	54	--	--	82	--	54
Exceeds threshold?	No	N/A^a	No	N/A	N/A	No	N/A	No
Maximum Annual (tpy)	0.0003	0.036	0.116	0.0002	N/A	0.003	N/A	0.003
Threshold of Significance (tpy)	10	--	10	--	--	15	--	10
Exceeds threshold?	No	N/A	No	N/A	N/A	No	N/A	No

^a The BAAQMD CEQA threshold for localized CO concentrations is not applicable. The proposed Project would result in a less-than-significant impact to localized CO concentrations because operations of the proposed Project would meet the screening criteria for CO impacts in the 2017 BAAQMD CEQA guidelines, Section 3.3, Carbon Monoxide Impacts (BAAQMD 2017). The Project would not be one of the categories of projects subject to congestion management plans or programs. In addition, Project-related traffic volumes would be small and would not result in traffic-related impacts at local intersections. No further analysis is required.

^b Emissions for the emergency diesel generator were conservatively assessed for a 350-kW generator; however, the expectation is that a 175-kW generator will be used for the Project.

Impact 4-2. Would the proposed Project expose sensitive receptors to substantial pollutant concentrations?

Exhaust emissions from construction equipment would contain toxic air contaminants, such as diesel particulate matter (DPM). The Project alignment would be near residential areas, parks, and schools. Therefore, during Project construction, some of the residential and other sensitive receptors may be exposed to emissions from the construction activities. The main pollutant of concern during Project construction would be DPM emitted from the diesel-powered construction equipment and heavy-duty haul trucks because long-term exposure to DPM has the potential to cause cancer and non-cancer chronic health effects. The construction activities and the associated emissions would be temporary and relatively short term and would be limited to a relatively small area where only a few pieces of construction equipment would be operating at any one time. As a result, long-term exposure of sensitive receptors to DPM from construction of the Project would not occur. In addition, implementation of the BAAQMD's *Basic Construction Mitigation Measures*, such as minimizing idling times and maintaining equipment in good condition, would reduce the exposure of nearby sensitive receptors to the construction-related pollutants. Therefore, the Project would not expose sensitive receptors to substantial pollutant concentrations during construction.

Vehicle usage associated with Project operations would include regular maintenance activities by City staff and are expected to be minimal; therefore, emissions from maintenance vehicles during operations would be negligible. Expected emission from the backup generator would be well below the BAAQMD significance thresholds; therefore, operation of the Project would not expose sensitive receptors to substantial pollutant concentrations, and impacts would be less than significant.

Impact 4-3. Would the proposed Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Odor impacts are dependent on the distance, frequency, and intensity of the source as well as environmental factors such as wind speed and direction, air temperature, and atmospheric conditions. Sensitive receptors are located near the Project site. Sensitive receptors include residences, schools, parks, and other public facilities.

As discussed in Section 4.3.1, for potential odor sources locating near existing receptors, the determination of significance is based on the distance and frequency at which confirmed odor complaints from the public have occurred in the vicinity of a similar facility.

There is an existing pump station located near the current Project site (Bay Meadows Pump Station). However, no odor complaints have been received for this existing pump station.

The Project would include construction of odor control equipment (see Section 2.4, *Project Description*) that would reduce the potential for odor from the Project. Odor control would consist of foul air fans that draw air from each of the chambers and media vessels containing granular activated carbon for adsorption of odorous compounds. In addition, the odor control system would include fiberglass-reinforced plastic ductwork for transmission of air, control dampers, and a controls system for operation and monitoring. The odor control system would be designed to achieve the BAAQMD Regulation 7, Section 302 limit on odorous substances.

In addition to odor control, the temporary holding structure would be operated in such a way to reduce the generation of odors (see **Figure 2-7**). Within 24 hours of a wet weather event, the structure would be pumped out and flushed, reducing the time that stored waters can become anoxic, which would help prevent the generation of odorous compounds such as hydrogen sulfide. Even during times when the temporary holding structure is empty and idle, there is still a risk of untreated air escaping. To prevent such an occurrence, the odor control system would continue to operate at a reduced capacity to maintain a constant negative pressure within the structure.

Because the Project incorporates odor control per 2016 Final PEIR **Mitigation Measure 4-4**, which requires that the Project incorporate odor control systems for facilities with odor potential, odor-related impacts would be less than significant.

4.5 Mitigation Measures

All impacts to air quality would be less than significant and no mitigation measures are required.

4.6 References

Bay Area Air Quality Management District (BAAQMD). 1979. *Rule 9-2. Inorganic Gaseous Pollutants, Hydrogen Sulfide*. Adopted December 19. Amended March 17, 1982, and October 6, 1999.

_____. 1982. *Manual of Procedures*. Regulation 7 Odorous Substances. March 17.

_____. 1999. *BAAQMD CEQA Guidelines; Assessing the Air Quality Impacts of Projects and Plans*. December.

_____. 2001. *San Francisco Bay Area 2001 Ozone Attainment Plan for the 1-hour National Ozone Standard*. October.

_____. 2017a. Air Quality Standards and Attainment Status. <http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status#five>. January.

_____. 2017b. Spare the Air/Cool the Climate: A Blueprint for Clean Air and Climate Protection in the Bay Area. Final 2017 Clean Air Plan. April.

_____. 2017c. California Environmental Quality Act Air Quality Guidelines. May.

California Air Pollution Control Officers Association. 2017. *California Emission Estimator Model User's Guide* Version 2013.2. July.

California Air Resources Board (ARB). 2013. *Ambient Air Quality Standards*. <http://www.arb.ca.gov/research/aags/aaqs2.pdf>.

City of San Mateo. 2009. *Draft Environmental Impact Report for the City of San Mateo General Plan Update*. July 27.