Draft Subsequent Environmental Impact Report

EVENT CENTER AND MIXED-USE DEVELOPMENT AT MISSION BAY BLOCKS 29-32

Office of Community Investment and Infrastructure Case No. ER 2014-919-97
San Francisco Planning Department Case No. 2014.1441E
State Clearinghouse No. 2014112045

Draft SEIR Publication Date: June 5, 2015
Draft SEIR Public Hearing Date: June 30, 2015
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office of
COMMUNITY INVESTMENT
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Volume 2

TABLE OF CONTENTS

Event Center and Mixed-Use Development at Mission Bay Blocks 29-32 Draft Subsequent EIR

Page

Volume 2 (continued)

Page

Volume 2 (continued)

Volume 3 – Appendices

Page

List of Figures (Volume 2 only)

List of Tables (Volume 2 only)

Page

List of Tables (Volume 2 only – continued)

Page

List of Tables (Volume 2 only – continued)

CHAPTER 5 (continued)

Environmental Setting, Impacts, and Mitigation Measures

5.3 Noise and Vibration

5.3.1 Introduction

This section describes the existing noise environment in the project area and identifies the potential for noise and vibration associated with implementation of the proposed project to adversely affect established sensitive land uses or land use activities. The impact analysis evaluates the potential noise and vibration impacts of the proposed project and identifies mitigation measures to avoid or reduce adverse impacts.

5.3.2 Summary of Mission Bay FSEIR Noise Section

5.3.2.1 Mission Bay FSEIR Setting

The noise setting for the Mission Bay area discussed in the Mission Bay FSEIR differs from the existing setting today primarily in terms of the number of noise sources that exist in the area. Specifically, at the time of the Mission Bay FSEIR much of the Mission Bay area was underdeveloped. Since 1998, the development of the UCSF Mission Bay campus, AT&T Park and residential towers in North Mission Bay have introduced new noise sources to the area, particularly vehicle traffic. Additionally, the Muni Third Street light rail line has been constructed which is a new noise source along that corridor in front of the project site.

Another aspect of the noise setting that has changed since adoption of the 1998 SEIR is the number of noise sensitive uses that now exist in the Mission Bay area. In 1998 the Mission Bay area was developed primarily with industrial uses. Since that time residential uses have been developed including residential housing at the UCSF Mission Bay campus as well as in the north Mission Bay area. There have been no significant changes to the regulatory environment with regard to noise since certification of the 1998 FSEIR.

5.3.2.2 Mission Bay FSEIR Impacts and Mitigation Measures

Noise impacts assessed in the Mission Bay FSEIR included all of the Mission Bay plan area, including Blocks 29-32. The construction noise impact was identified as less than significant in the 1998 FSEIR for standard construction equipment. Noise from pile driving was identified as a significant impact mitigated to less than significant with Mitigation Measure G.1 to implement noise-reducing pile driving techniques.

The construction vibration impact was identified as less than significant in the 1998 FSEIR. Although the analysis acknowledged the potential existence of noise sensitive equipment in the area, it was determined that vibration from pile driving did not represent a physical impact on people or the environment, and was therefore less than significant under CEQA. A potential operational vibration impact was identified for the westernmost block of North Mission Bay due to proximity to the Caltrain tracks, which was mitigated to a less than significant level by implementation of Mitigation Measure G.2 to assess vibration levels and, if necessary, employ vibration-reducing foundation construction techniques for structure in that block.

Amplified sound was addressed in the 1998 FSEIR with respect to concert events at the San Francisco Giants ballpark. This impact was identified as less than significant with mitigation (implementation of a plan that limits concert events per year and limits the noise generated by these events to a 3 dBA increase over existing ambient levels) that was identified in the *San Francisco Giants Ballpark at China Basin Final EIR*.

Traffic noise increases were identified as less than significant in the 1998 FSEIR and no mitigation measures were required. Crowd noise from the Giants ballpark such as applause and cheering was assessed in combination with concert noise and found to be less than significant, and no mitigation measures were required for that impact.

5.3.3 Setting

5.3.3.1 Noise Background

Sound is characterized by various parameters that describe the rate of oscillation (frequency) of sound waves, the distance between successive troughs or crests in the wave, the speed that it travels, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound, and the decibel (dB) scale is used to quantify sound intensity. Because sound can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called “A-weighting,” expressed as “dBA.” The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. An increase of 10-dBA in the level of a continuous noise represents a perceived doubling of loudness. The noise levels presented herein are expressed in terms of dBA, unless otherwise indicated. **Table 5.3-1** shows some representative noise sources and their corresponding noise levels in dBA.[1]

Planning for acceptable noise exposure must take into account the types of activities and corresponding noise sensitivity in a specified location for a generalized land use type. Some general guidelines are as follows: sleep disturbance can occur at levels above 35 dBA; interference with human speech begins at about 60 dBA; and hearing damage can result from prolonged exposure to noise levels in excess of 85 to 90 dBA.[2]

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1 United States Department of Housing and Urban Development (HUD), *The Noise Guidebook*, 1985, http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/environment/training/guidebooks/noise; divided into chapters with Chapter 1 at http://portal.hud.gov/hudportal/documents/huddoc?id=DOC_16414.pdf, accessed October 14, 2014.

2 United States Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974, http://www.fican.org/pdf/EPA_Noise_Levels_Safety_1974.pdf, accessed July 9, 2013.

TABLE 5.3-1
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT

Examples of Common, Easily Recognized Sounds	Decibels (dBA) at 50 feet	Subjective Evaluations
Near Jet Engine	140	Deafening
Threshold of Pain (Discomfort)	130	
Threshold of Feeling – Hard Rock Band	120	
Accelerating Motorcycle (at a few feet away)	110	
Loud Horn (at 10 feet away)	100	Very Loud
Noisy Urban Street	90	
Noisy Factory	85	
School Cafeteria with Untreated Surfaces	80	Loud
Near Freeway Auto Traffic	60	Moderate
Average Office	50	
Soft Radio Music in Apartment	40	Faint
Average Residence Without Stereo Playing	30	
Average Whisper	20	Very Faint
Rustle of Leaves in Wind	10	
Human Breathing	5	
Threshold of Audibility	0	

NOTE: Continuous exposure above 85 dBA is likely to degrade the hearing of most people. Range of speech is 50 to 70 dBA.

SOURCE: United States Department of Housing and Urban Development, *The Noise Guidebook*, 1985.

Attenuation of Noise

Line sources of noise, such as roadway traffic, attenuate (lessen) at a rate of 3.0 to 4.5 dBA per doubling of distance from the source, based on the inverse square law and the equation for cylindrical spreading of noise waves over hard and soft surfaces.

Point sources of noise,[3] including stationary mobile sources such as idling vehicles or onsite construction equipment, attenuate at a rate of 6.0 to 7.5 dBA per doubling of distance from the source, based on the inverse square law and the equations for spherical spreading of noise waves over hard and soft surfaces. For the purposes of this analysis, it is assumed that noise from line

[3] Point sources and line sources are further defined by the California Department of Transportation (Caltrans) as follows:

> Sound from a small localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates or drops off at a rate of 6 dBA for each doubling of the distance (6 dBA/DD). This decrease, due to the geometric spreading of the energy over an ever increasing area, is referred to as the inverse square law. However, highway traffic noise is not a single, stationary point source of sound. The movement of the vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. This results in cylindrical spreading rather than the spherical spreading of a point source. (Source: Caltrans, *Technical Noise Supplement*, November 2009.)

and point sources to a distance of 200 feet attenuates at rates of between 3.0 and 6.0 dBA per doubling of distance, and the noise from line and point sources at a distance greater than 200 feet attenuates at a rate of 4.5 to 7.5 dBA per doubling of distance, to account for the absorption of noise waves due to ground surfaces such as soft dirt, grass, bushes, and intervening structures.[4]

Noise Descriptors

Time variations in noise exposure are typically expressed in terms of a steady-state energy level (L_{eq}) that represents the acoustical energy of a given measurement. L_{eq} is used to describe noise over a specified period of time, in terms of a single numerical value. The L_{eq} is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).The L_{90} is also a noise metric that can be used to describe existing ambient noise levels. Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dBA increment be added to "quiet time" noise levels to form a 24-hour noise descriptor called the day-night noise level (DNL). DNL adds a 10-dBA penalty during the night hours (10:00 p.m. to 7:00 a.m.). The maximum noise level (L_{max}) is the maximum instantaneous noise level measured during the measurement period of interest.

Health Effects of Environmental Noise

The World Health Organization (WHO) is perhaps the best source of current knowledge regarding the health effects of noise impacts because European nations have continued to study noise and its health effects, while the United States Environmental Protection Agency all but eliminated its noise investigation and control program in the 1970s.[5] According to WHO, sleep disturbance can occur when continuous indoor noise levels exceed 30 dBA or when intermittent interior noise levels reach 45 dBA, particularly if background noise is low. With a bedroom window slightly open (a reduction from outside to inside of 15 dB), the WHO criteria suggest that exterior continuous (ambient) nighttime noise levels should be 45 dBA or below, and short-term events should not generate noise in excess of 60 dBA. WHO also notes that maintaining noise levels within the recommended levels during the first part of the night is believed to be effective for the ability of people to initially fall asleep.[6]

Other potential health effects of noise identified by WHO include decreased performance for complex cognitive tasks, such as reading, attention span, problem solving, and memorization; physiological effects such as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels); and hearing impairment (again, generally after long-term occupational exposure, although shorter-term exposure to very high noise levels, for

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[4] California Department of Transportation (Caltrans), *Technical Noise Supplement*, November 2009, http://www.dot.ca.gov/hq/env/noise/pub/tens_complete2009RedlineScreenProcess.pdf, accessed July 9, 2013.

[5] The *San Francisco General Plan* Land Use Compatibility Guidelines for Community Noise, presented below in Figure 5.3-2, were created during the same era.

[6] World Health Organization, Guidelines for Community Noise, Geneva, 1999, http://www.who.int/docstore/peh/noise/guidelines2.html, accessed July 9, 2013. A copy of this document is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2007.0903E.

example, exposure several times a year to concert noise at 100 dBA, can also damage hearing). Finally, noise can cause annoyance and can trigger emotional reactions like anger, depression, and anxiety. WHO reports that, during daytime hours, few people are seriously annoyed by activities with noise levels below 55 dBA or moderately annoyed with noise levels below 50 dBA.

Vehicle traffic and continuous sources of machinery and mechanical noise contribute to ambient noise levels. Short-term noise sources, such as truck backup beepers, the crashing of material being loaded or unloaded, car doors slamming, and engines revving outside a nightclub, contribute very little to 24-hour noise levels but are capable of causing sleep disturbance and severe annoyance. The importance of noise to receptors depends on both time and context. For example, long-term high noise levels from large traffic volumes can make conversation at a normal voice level difficult or impossible, while short-term peak noise levels, if they occur at night, can disturb sleep.

5.3.3.2 Existing Noise Environment

Long-term environmental noise in urbanized areas is primarily dependent on vehicle traffic volumes and the mix of vehicle types. The existing ambient noise environment within the project area is dominated by vehicular traffic on Third Street and 16th Street. The San Francisco Municipal Railway (Muni) operated light rail service along Third Street contributes to the local noise environment. Sporting events and occasional outdoor concerts at AT&T Park totaling more than 82 events per year generate vehicle traffic that is routed south along Third Street, Illinois Street (south of Mariposa Street), and Terry A. Francois Boulevard in the area, resulting in increased periods of traffic-related noise before and particularly after events. Additionally, the newly operational UCSF Hospital, southwest of the project site on Third Street operates a helipad to accept transfers of critically ill persons from community hospitals to UCSF for the medical care. Neither the Muni light rail nor the AT&T Park were in operation at the time of certification of the Mission Bay FSEIR in 1998, although both were discussed in the cumulative noise analysis.

The San Francisco Department of Public Health (DPH) has mapped transportation noise throughout the City and County of San Francisco, based on modeled baseline traffic volumes derived from the San Francisco County Transportation Authority travel demand model.[7] DPH maps indicate the areas subject to noise levels over 60 dBA (DNL) and the range of DNL noise levels that occur on every street in San Francisco. The portions of these maps that cover the project area indicate that areas nearest Third Street between Channel Street and 16th Street experience roadway noise levels in excess of 70 dBA (DNL), while noise levels along Terry A. Francois Boulevard and 16th Street are generally between 65 and 70 dBA (DNL).

[7] San Francisco Department of Public Health (DPH), San Francisco City-wide Noise Map, August 2006, Available online at http://www.sfdph.org/dph/files/EHSdocs/ehsPublsdocs/Noise/noisemap2.pdf Accessed April 30, 2013.

Ambient Noise Measurements

Ambient long-term (24-hour) and short-term (15-minute) noise measurement data were collected in October of 2014 and April of 2015 in the project area to characterize noise conditions at locations in the project area; noise measurement locations are shown in **Figure 5.3-1**. To characterize ambient noise in the project area, short-term measurement data were collected at locations where residential and hospital land uses exist near the project site (Madrone Mission Bay residential towers on Mission Bay Boulevard North; and the new UCSF hospital southwest of the project site on Third Street), as described in **Table 5.3-2**. Long-term noise data were collected for the residential land use nearest the project site—the UCSF housing development (Hearst Tower)—located northwest of the project site on Third Street, and are presented in **Table 5.3-3**.

TABLE 5.3-2
SHORT-TERM AMBIENT NOISE LEVEL DATA IN THE PROJECT AREA

Measurement Location	Time	Noise Levels in dBA		
		Hourly L_{eq}	L_{90}	L_{max}
1. Madrone Mission Bay Residential Towers Nearby residential receptor 800 feet north of project site	3:10- 3:35 p.m.	70.1	59	88.9
2. UCSF Hospital 560 feet southwest of the Project site	8:56 – 9:11 a.m.	67.0	61	81.2

NOTE: See Figure 5.3-1 for noise measurement locations. L_{eq} represents the constant sound level; L_{max} is the maximum noise level. L90 is the background noise level. Time of day of short term monitoring reflect daytime hours during which construction activities could occur.

SOURCE: Environmental Science Associates, 2014, 2015.

TABLE 5.3-3
LONG- TERM AMBIENT NOISE LEVEL DATA IN THE PROJECT AREA

Measurement Location	Day-Night Noise level (DNL)	Noise Levels in dBA			
		Daytime hourly average Leq	Daytime hourly average L_{90}	Nighttime hourly average Leq	Nighttime hourly average L_{90}
3a. UCSF Mission Bay Housing Block 20 – No Giants Game Nearby residential receptor 400 feet from the Project site	75	71	61	68	55
3b. UCSF Mission Bay Housing Block 20 – With Giants Game Nearby residential receptor 400 feet from the Project site	75	71	61	68	56

NOTE: See Figure 5.3-1 for noise measurement locations. Nighttime noise levels represented are for the hours between 10:00 p.m. and 12:00 a.m. as the hours most likely to be affected by crowd egress from future events.

SOURCE: Environmental Science Associates, 2014.

SOURCE: Google Maps, ESA, 2014

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E: Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 5.3-1
Noise Monitoring Locations

The long term measurements were collected over a two-day period reflecting conditions both with and without a San Francisco Giants baseball game occurring at AT&T Park. As indicated in Table 5.3-3, the occurrence of the SF Giants game did not meaningfully affect the noise levels averaged over the 15 daytime hours (7:00 a.m. to 10:00 p.m.) or the 9 nighttime hours (10 p.m. to 7:00 a.m.). Data indicate that the SF Giants game traffic predominantly affects the hour after the end of the game by increasing noise levels approximately 2.9 dBA, while noise levels for the hours prior to the game are not noticeably increased.

5.3.3.3 Vibration Background

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe physical vibration impacts on buildings. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include people (especially residents, the elderly, and sick people), structures (especially older masonry structures), and vibration-sensitive equipment.

Another useful vibration descriptor is known as vibration decibels or VdBs. VdBs are generally used when evaluating human response to vibration, as opposed to structural damage (for which PPV is the more commonly used descriptor). Vibration decibels are established relative to a reference quantity, typically 1×10^{-6} inches per second.[8]

Sources of vibration in the project area primarily consist of Muni streetcars traveling along Third Street. Most motor vehicles and trucks have independent suspension systems that substantially reduce if not eliminate vibration generation, barring discontinuities in the roadway.

5.3.3.4 Sensitive Receptors

Sensitive receptors for noise are generally considered to include hospitals, nursing homes, senior citizen centers, schools, churches, libraries, and residences. The sensitive receptors nearest to the project site are residential and hospital uses, as identified in **Table 5.3-4**. The nearest library to the project site is 1,300 feet away on Owens Street; the nearest church is 3,100 feet away, and the closest school (El-Hi) is 2,800 feet away. The future Mission Bay school site is 1,900 feet away.

8 Federal Transit Administration, Transit Noise and Vibration Impact Assessment, 2006.

TABLE 5.3-4
SENSITIVE NOISE RECEPTORS IN THE PROJECT AREA

Receptor Type	Distance from Project Area
Residential: UCSF Mission Bay Housing Block 20 (Hearst Tower)	200 feet northwest
Residential: Madrone Mission Bay Residential Towers	800 feet to the north, on Mission Bay Boulevard North
UCSF Hospital: UCSF Benioff Children's Hospital facility at Mission Bay, plus the UCSF Betty Irene Moore Women's Hospital and the UCSF Bakar Cancer Hospital	560 feet to the southwest of the proposed Project

SOURCE: Environmental Science Associates, 2014.

5.3.4 Regulatory Framework

5.3.4.1 Federal Regulations

HUD Noise Abatement and Control

The U.S. Department of Housing and Urban Development (HUD) environmental noise regulations are set forth in 24 CFR, Part 51, Subpart B, Noise Abatement and Control. According to the regulations, "It is HUD's general policy to provide minimum national standards applicable to HUD programs to protect citizens against excessive noise in their communities and places of residence."[9] These regulations include criteria for assessing whether a HUD project is suitable for a particular site, given the background noise levels. HUD has defined the suitability of a site for new housing construction based on existing noise levels as follows:

- Acceptable—65 dB day-night average sound level (DNL) or less;
- Normally unacceptable—Exceeding 65 dB DNL but not exceeding 75 dB DNL; and
- Unacceptable—Exceeding 75 dB DNL.

The HUD regulations also include a goal (not a standard) that interior noise levels not exceed 45 dB DNL.[10] Sound attenuating features such as barriers or sound attenuating building materials shall be used to achieve the interior noise goal where feasible. Standard building construction generally provides 20 dB DNL of sound attenuation; therefore, if the exterior noise environment is classified as "acceptable," according to HUD standards, the interior noise environment should not exceed 45 dB DNL. The HUD regulations also encourage the use of quieter construction equipment and methods.[11]

9 HUD, Noise Abatement and Control, 24 CFR, Part 51, Subpart B.
10 24 CFR, Section 51.103(c)
11 24 CFR, Section 51.101(7)

Federal Aviation Administration

The Federal Aviation Administration (FAA) develops noise exposure maps that use average annual DNL noise contours around the airport as the primary noise descriptor. The FAA states that all land uses are considered compatible when aircraft noise effects are less than 65 decibels (dB) DNL. San Francisco International Airport is approximately seven miles south, and Oakland International Airport is approximately nine miles east, of the project site. The project site is outside the 55 dB CNEL noise contour of both airports.[12]

5.3.4.2 State Regulations

State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in Title 24 of the California Code of Regulations.

The State of California updated its Building Code requirements with respect to sound transmission, effective January 2014. Section 1207 of the California Building Code (Title 24 of the California Code of Regulations) establishes material requirements in terms of sound transmission class (STC) [13] rating of 50 for all common interior walls and floor/ceiling assemblies between adjacent dwelling units or between dwelling units and adjacent public area. The previous code requirements (before 2014) set an interior performance standard of 45 dBA from exterior noise sources. This requirement will be re-instated in July of 2015.

5.3.4.3 Local Regulations

San Francisco General Plan

Land Use Compatibility Guidelines for Community Noise

The Environmental Protection Element of the *San Francisco General Plan* contains Land Use Compatibility Guidelines for Community Noise.[14] These guidelines, which are similar to but differ somewhat from state guidelines promulgated by the Governor's Office of Planning and Research, indicate maximum acceptable exterior noise levels for various newly developed land uses. The City's guidelines, which are presented in **Figure 5.3-2**, indicate exterior noise levels that might be inappropriate for sensitive land uses and would therefore require additional noise insulation considerations beyond standard practices. Though this figure presents a range of noise

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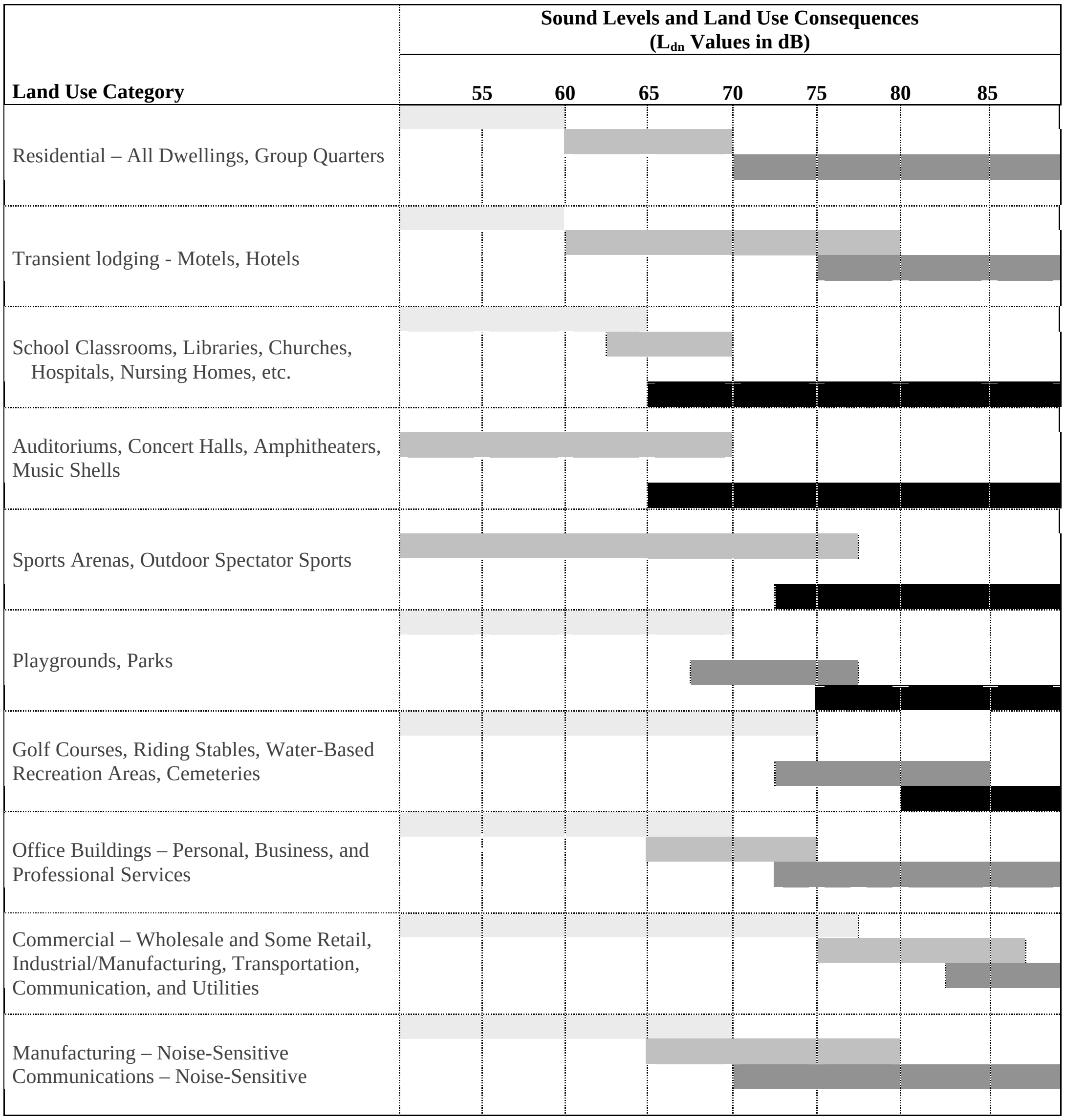
[12] San Francisco International Airport, Aircraft Noise Abatement Office, Mapping Tools, Internet Web Site: http://www.flyquietsfo.com/mapping_tools.asp, Accessed July 9, 2013, and Oakland International Airport, Fourth Quarter 2008 Noise Contours. Internet website: http://www2.oaklandairport.com/noise/pdfs/2008_Annual_Noise_Contour_Map.pdf, accessed July 9, 2013, March 2009.

[13] The STC is used as a measure of a materials ability to reduce sound. The STC is equal to the number of decibels a sound is reduced as it passes through a material.

[14] City and County of San Francisco, *San Francisco General Plan*, adopted on June 27, 1996, http://www.sf-planning.org/ftp/General_Plan/index.htm, accessed July 9, 2013.



Satisfactory, with no special noise insulation requirements.

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

New construction or development should generally not be undertaken.

SOURCE: San Francisco, 1996.
San Francisco General Plan,
adopted on June 27, 1996

Figure 5.3-2
San Francisco Land Use Compatibility Chart for Community Noise

levels that are considered compatible or incompatible with various land uses, the maximum "satisfactory" noise level is 60 dBA (DNL) for residential and hotel uses; 65 dBA (DNL) for school classrooms, libraries, churches, and hospitals; 70 dBA (DNL) for playgrounds, parks, office buildings, retail commercial uses, and noise-sensitive manufacturing/communications uses; and 77 dBA for other commercial uses such as wholesale, some retail, industrial/manufacturing, transportation, communications, and utilities. If these uses are proposed to be located in areas with noise levels that exceed these guidelines, a detailed analysis of noise reduction requirements will normally be necessary prior to final review and approval.

Noise-Related Policies

The following policies of the *San Francisco General Plan* Environmental Protection Element that relate to noise issues are relevant to the proposed project:

> ***Policy 10.1*****:** Promote site planning, building orientation and design and interior layout that will lessen noise intrusion. Because sound levels drop as distance from the source increases, building setbacks can play an important role in reducing noise for the building occupants. Buildings sited with their narrower dimensions facing the noise source and sited to shield or be shielded by other buildings also help reduce noise intrusion. Although walls with no windows or small windows cut down on noise from exterior sources, in most cases it would not be feasible or desirable to eliminate wall openings. However, interior layout can achieve similar results by locating rooms whose use require more quiet, such as bedrooms, away from the street noise.
>
> ***Policy 10.2*****:** Promote the incorporation of noise insulation materials in new construction. State-imposed noise insulation standards apply to all new residential structures except detached single-family dwellings. Protection against exterior noise and noise within a building is also important in many nonresidential structures. Builders should be encouraged to take into account prevailing noise levels and to include noise insulation materials as needed to provide adequate insulation.
>
> ***Policy 11.1*****:** Discourage new uses in areas in which the noise level exceeds the noise compatibility guidelines for that use. New development should be examined to determine whether background and/or thoroughfare noise level of the site is consistent with the guidelines for the proposed use. If the noise levels for the development site….exceed the sound level guidelines established for that use, as shown in the accompanying land use compatibility chart, then either needed noise insulation features should be incorporated in the design or else the construction or development should not be undertaken.
>
> ***Policy 11.3*****:** Locate new noise-generating development so that the noise impact is reduced. Developments which will bring appreciable traffic into or through noise-sensitive areas should be discouraged, if there are appropriate alternative locations where the noise impact would be less. For those activities—such as a hospital—that need a quiet environment, yet themselves generate considerable traffic, the proper location presents a dilemma. In those cases, the new development should locate where this traffic will not present a problem and, if necessary, incorporate the proper noise insulation.

San Francisco Noise Ordinance

In San Francisco, regulation of noise is stipulated in Article 29 of the Police Code (Regulation of Noise), which states that the City's policy is to prohibit unnecessary, excessive, and offensive noises from all sources subject to police power. Sections 2907 and 2908 of Article 29 regulate construction equipment and construction work at night, while Section 2909 provides for limits on stationary-source noise from machinery and equipment. Sections 2907 and 2908 are enforced by the Department of Building Inspection, and Section 2909 is enforced by the Department of Public Health. Summaries of these and other relevant sections are presented below.

Sections Regulating Construction Noise

Sections 2907(a) and (b) of the Police Code state that it shall be unlawful for any person, including the City and County of San Francisco, to operate any powered construction equipment, regardless of age or date of acquisition, if the operation of such equipment emits noise at a level in excess of 80 dBA when measured at a distance of 100 feet from such equipment, or an equivalent sound level at some other convenient distance. Exemptions from this requirement include:

- Impact tools and equipment with intake and exhaust mufflers recommended by the manufacturers and approved by the Director of Public Works as best accomplishing maximum noise attenuation; and
- Pavement breakers and jackhammers equipped with acoustically attenuating shields or shrouds recommended by the manufacturers and approved by the Director of Public Works as best accomplishing maximum noise attenuation.

Section 2908 prohibits any person, between the hours of 8:00 p.m. of any day and 7:00 a.m. of the following day, from erecting, constructing, demolishing, excavating for, altering, or repairing any building or structure if the noise level created is in excess of the ambient noise level by 5 dBA at the nearest property line unless a special permit has been applied for and granted by the Director of Public Works.

Sections Regulating Operational Noise

Section 2909 establishes a not-to-exceed noise standard for fixed sources of noise, such as building mechanical equipment and industrial or commercial processing machinery. Unlike the state building code (Title 24) standard, which is applicable to interior living space only, the standards in Section 2909(a), (b), and (c) are applicable outdoors, at the property line of the affected use, and vary based on the residential or commercial nature of the noise generator's use. For example, the noise limits for commercial and industrial properties (Section 2909(b)) provide that no person shall produce or allow to be produced a noise level more than 8 dBA above the local ambient level at the property plane. If the noise generated from commercial and industrial properties is generated from a licensed place of entertainment or other location subject to regulation by the Entertainment Commission, such use shall not produce or allow to be produced a noise level more than 8 dBC[15] above the local ambient level at the property plane in addition to the 8 dBA standard.

[15] C-weighted decibels include low-frequency sounds that are more common to amplified sound/concerts.

For noise generated by residential properties, the noise limits are 5 dBA above the ambient level at any point outside of the property plane of a residential use. The noise limits for public property provide that no person shall produce a noise level more than 10 dBA above the local ambient level at a distance of 25 feet or more on public property.

As is common for noise standards, the permitted noise level for fixed residential interior noise limits identified in Section 2909(d) is lower at night than during the day. For example, maximum noise levels at any sleeping or living room in any dwelling unit located on residential property must not exceed 45 dBA between 10:00 p.m. and 7:00 a.m., and 50 dBA between 7:00 a.m. and 10:00 p.m. None of the noise limits set forth in this section apply to activity for which the City and County of San Francisco has issued a permit that contains noise limit provisions that are different from those set forth in this article. Additionally, the Directors of Public Health, Public Works, or Building Inspection, or the Entertainment Commission, or the Chief of Police may grant variances to noise regulations, over which they have jurisdiction pursuant to Section 2916.

Article 1, Section 47.2 of the Police Code regulates the use of any sound amplifying equipment, whether truck-mounted or otherwise, within the City and County of San Francisco and consists of the following regulations:

1. The only sounds permitted are music or human speech.

2. Hours of operation permitted shall be between 9:00 a.m. and 10:00 p.m.; operation after 10:00 p.m. is permitted only at the location of a public event or affair of general public interest or as otherwise permitted by the Entertainment Commission.

3. Except as permitted by the Entertainment Commission, sound shall not be issued within 450 feet of hospitals, schools, churches, courthouses, public libraries, or mortuaries.

4. No sound truck with its amplifying device in operation shall traverse any one block in the City and County more than four times in any one calendar day.

5. Amplified human speech and music shall not be unreasonably loud, raucous, jarring, or disturbing to persons of normal sensitiveness within the area of audibility, nor louder than permitted in Subsections (6) and (7) hereof.

6. When the sound truck is in motion, the volume of sound shall be controlled so that it will not be audible for a distance in excess of 450 feet from its source; provided, however, that when the sound truck is stopped by traffic, the said sound amplifying equipment shall not be operated for longer than one minute at such a stop.

7. Except as permitted by the Entertainment Commission for public gatherings, in all cases where sound amplifying equipment remains at one location or when the sound truck is not in motion, the volume of sound shall be controlled so that it will not be audible for a distance in excess of 250 feet from the periphery of the attendant audience.

8. No sound amplifying equipment shall be operated unless the axis of the center of any sound reproducing equipment used shall be parallel to the direction of travel of the sound truck; provided, however, that any sound reproducing equipment may be so placed upon said sound truck as to not vary more than 15 degrees on either side of the axis of the center of the

> direction of travel and, provided further, that radial, nondirectional type of loudspeakers may be used on said sound trucks either alone or in conjunction with sound reproducing equipment placed within 15 degrees of the center line of the direction of travel.

San Francisco Entertainment Commission Permits

Section 90.1 of the San Francisco Administrative Code establishes the role of the San Francisco Entertainment Commission to regulate, promote and enhance the field of entertainment in San Francisco. The seven-member commission has powers to accept, review, and gather information to conduct hearings for entertainment-related permit applications and rule upon and issue, deny, condition, suspend, revoke or transfer entertainment-related permits in accordance with applicable laws and regulations. Additionally, the Entertainment Commission plans and coordinates the provision of City services for major events for which there is no recognized organizer, promoter, or sponsor.

The Entertainment Commission has permit authority over a variety of different permit types including Place of Entertainment permits, Outdoor Amplified Sound/Loudspeaker permits, and Limited Live Performance permits. Permit hearings require the applicant to provide proof of neighborhood outreach to the Commission. Such outreach must consist of at least two of four types of outreach: (1) presentation to a neighborhood, community or residential group; (2) presentation to the leadership of a local not-for-profit that deals with community support such as housing, at risk youth, health, or mental services; (3) a petition including an appropriate number of neighbor signatures according to the applicants business address; and/or (4) presentation to a business association if no community organization or not-for-profit exists near the venue.

The Commission also establishes Good Neighbor Policies for entertainment venues within the City. Applicable policies may include public notices urging patrons to leave the establishment and neighborhood in a quiet fashion, provision of employees at exit points, provision of adequate ventilation within venues, operation consistent with the requirements of San Francisco Municipal Code Sections 49 and 2900, and provision of a neighborhood liaison to address noise complaints.

Mission Bay Good Neighbor or Construction Noise Policy

The Mission Bay Good Neighbor Policy regarding construction noise is a standard policy of the Office of Community Investment and Infrastructure (OCII) that applies to all development within the Mission Bay Redevelopment Plan area. It specifies that:

> Pile driving or other extreme noise-generating activity (80 dBA at a distance of 100 feet) shall be limited to 8:00 a.m. to 5:00 p.m., Monday through Friday. No pile driving or other extreme noise-generating activity is permitted on Saturdays, Sundays, and holidays. Requests for pile driving on Saturdays may be considered on a case-by-case basis by the Office of Community Investment and Infrastructure (OCII) with approval at the sole discretion of the OCII Executive Director.

City holidays recognized under this policy include New Years Day, Dr. Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, the day after Thanksgiving, and Christmas Day.

5.3.5 Impacts and Mitigation Measures

5.3.5.1 Significance Thresholds

For the impacts analyzed in this section, the project would have a significant impact related to noise and vibration if it were to:

- Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

The complete list of CEQA significance criteria used in the noise analysis is included in the Initial Study (see Appendix NOP-IS, page 59), which also explains that criteria related to public airports are not applicable to the proposed project and why the proposed project would not be substantially affected by existing noise levels. No further analysis of these subjects is presented in this section. However, the potential impacts of noise from the operation of the private helipad at the UCSF hospital are addressed with regard to potential impacts on the project.

5.3.5.2 Approach to Analysis

Methodology for Analysis of Direct Impacts

Construction Impact Methodology – Noise

To assess potential short-term construction noise impacts, sensitive receptors and their relative exposure (considering structural barriers and distance) were identified. Combined intermittent noise levels from the simultaneous operation of onsite equipment expected to be used in project construction were estimated based on equipment noise data published by the Federal Highway Administration (FHWA), as shown in **Table 5.3-5**. The sources assessed were identified by the project sponsor as likely equipment to be used during project construction. The roadway noise construction model of the FHWA was then used to predict noise levels at the nearest receptors during both pile driving activity and non-impact construction activity.

Proposed construction activities would be required to comply with the San Francisco Noise Ordinance and the Mission Bay Good Neighbor Construction Noise Policy. The San Francisco Noise Ordinance prohibits construction activities between 8:00 p.m. and 7:00 a.m. and limits noise from any individual piece of construction equipment, except impact tools approved by the Department of Public Works, to 80 dBA at 100 feet. The Mission Bay Good Neighbor Construction Noise Policy limits pile driving or other extreme noise generating activity (80 dBA at a distance of

TABLE 5.3-5
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, Lmax at 50 feet)
Dump Truck	76
Air Compressor	78
Street Sweeper	82
Excavator	81
Scraper	84
Loader	79
Tractor/Dozer	82
Rapid Impact Compactor[a]	90
Auger Drill Rig	84
Crane, Mobile	81
Forklift[b]	84
Concrete saw	90
Grout-mixing Plant (pump)	81
Grandall Forklift	83
Concrete Mixer	79

NOTES:
[a] From Dietmar, et.al., Rapid Impact Compactor – An Innovative Dynamic Compaction Device for Soil Improvement, 2007.
[b] From Ventura County Construction Noise Threshold Criteria and Control Plan, 2010.

SOURCE: Federal Highway Administration, *Roadway Construction Noise Model User Guide*, 2006.

100 feet) to 8:00 a.m. to 5:00 p.m., Monday through Friday. As long as project construction activities comply with the noise ordinance, construction noise impacts from non-impact equipment would be considered less than significant. If construction activities using non-impact equipment would exceed these standards and the restrictions of the Mission Bay Good Neighbor Policy, then the noise effects would be potentially significant and mitigation measures would be required. The San Francisco Noise Ordinance does not identify any quantitative noise limit standard for impact equipment. To assess the potential impacts related to rapid impact compaction, this analysis employs the general construction noise assessment methodology and criteria suggested by the Federal Transit Administration (FTA).[16] This guidance identifies a 1-hour L_{eq} of 90 dBA for daytime and 80 dBA for nighttime construction noise exposure at residential uses. Commercial and industrial land use exposure to construction noise of 100 dBA is suggested as an assessment criterion.

In addition to the above criteria, to determine if the proposed project would result in a substantial temporary increase in noise levels in the project vicinity above levels existing without the project, persistent construction equipment noise related to an increase of 10 dBA over the existing noise

[16] U.S. Department of Transportation, Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment, May 2006.

levels would represent a perceived doubling of loudness and is considered a substantial temporary increase in noise levels warranting implementation of construction noise control measures. Consistent with FTA and FHWA methodology, this increase in construction noise is assessed relative to an hourly L_{eq} and also accounts for equipment percentage uses as inventoried by FHWA.

Construction Impact Methodology –Vibration

Vibration impacts are considered significant if they would either result in levels substantial enough to result in damage to nearby structures or buildings, or result in vibration levels generally accepted as an annoyance to sensitive land uses. Groundborne noise occurs when vibrations transmitted through the ground result in secondary radiation of noise. Groundborne noise is generally associated with transit trains through tunnels and underground blasting activities, neither of which is proposed as part of this project, and therefore, this analysis is focused on groundborne vibration.

The local regulations of the affected jurisdictions in the project area do not address vibration or provide numerical thresholds for identifying groundborne vibration impacts. In the absence of local regulatory significance thresholds for vibration from construction equipment, this evaluation uses the Caltrans-identified peak particle velocity (PPV) thresholds for adverse human reaction and risk of architectural damage to buildings. For adverse human reaction, this analysis applies the "strongly perceptible" threshold of 0.1 inches per second (in/sec) PPV.[17] For building damage, the threshold depends on the architectural characteristics of the potentially affected structure (see **Table 5.3-6**).

TABLE 5.3-6
CALTRANS GUIDELINE VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

Structure Type and Condition	Transient Vibration Sources[a]	Continuous Frequent Intermittent Vibration Sources[b]
	Maximum Peak Particle Velocity (PPV), inches per second (in/sec)	
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

NOTES:
[a] Transient sources create a single isolated vibration event, such as blasting or drop balls.
[b] Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, 2013.

[17] Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013.

Operational Impact Methodology

Operational noise issues evaluated in this section include (1) noise generated by automobile and bus traffic that would occur during typical daily conditions with the project and during event conditions; and (2) compatibility of potential future uses with San Francisco Land Use Compatibility Guidelines for Community Noise. Traffic noise modeling was completed using the Federal Highway Administration Traffic Noise Model.

Traffic noise level significance is determined by comparing the increase in noise levels (traffic contribution only) to increments recognized by Caltrans as representing a perceptible increase in noise levels. Additionally, it is widely accepted methodology by both FTA[18] and the Federal Interagency Committee on Noise (FICON)[19] that thresholds should be more stringent for environments that are already noise impacted. Consequently, for noise environments where the ambient noise level is 65 dBA DNL or less, the significance threshold applied is an increase of 5 dBA or more, which Caltrans recognizes as a readily perceptible increase. In noise environments where the ambient noise level exceeds 65 dBA DNL, the significance threshold applied is an increase of 3 dBA or more, which Caltrans recognizes as a barely perceptible increase.[20]

Operational noise from non-transportation sources such as egress of patrons from events or sound amplification equipment in common areas are assessed based on noise increases of 8 dBA (for noise generated by commercial uses) over existing ambient (L_{90}) levels and any applicable restrictions of the City's noise ordinance and Police Code. Although these operational noise increases would be of limited duration, they would be expected to occur throughout the life of the project and are therefore considered permanent changes in noise conditions.

The proposed project would not introduce new operational vibration sources (e.g., impact equipment, streetcar and rail operations, and blasting activities), and therefore, there would be no operational vibration impacts, and operational vibration is not discussed further.

Methodology for Analysis of Cumulative Impacts

Cumulative Construction Impact Methodology

Cumulative construction noise impacts are assessed by review of the cumulative project list for proposed projects that could be constructed at the same time as the proposed project and are within close enough proximity (within 1,000 feet) to make a meaningful contribution to the construction noise impact of the proposed project. An approximation is made of the cumulative construction sound levels based on the Roadway Noise Construction Model and compared to FTA criteria for construction discussed above.

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[18] Ibid.

[19] Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Analysis Issues, August 1992.

[20] Caltrans, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, p. 2-44.

Cumulative Operations Impact Methodology

Cumulative operational noise impacts are assessed by modeling cumulative plus project roadside noise levels and comparing the results with existing modeled roadside noise levels and to Caltrans perceptibility criteria discussed above.

5.3.5.3 Impact Evaluation

Project Impacts: Construction

Impact NO-1: Construction of the proposed project would not cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. (Less than Significant)

Construction activities for the proposed project are expected to occur over a 26-month period between 2015 and 2017. Construction phases would include demolition, site preparation, excavation and soil stabilization, augering and casting of piles, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition and construction activities would require the use of heavy trucks, material loaders, cranes, concrete saws, and other mobile and stationary construction equipment listed in Table 5.3-5 above. Piles would be cast in place into augured holes and would not require use of an impact or vibratory pile driver.

Other Construction Activities. Soil stabilization of the project site would involve rapid impact compaction. Rapid impact compaction is a ground improvement technique that densifies shallow, loose granular soils, using a hydraulic hammer which repeatedly strikes an impact plate. The energy is transferred to the underlying loose granular soils and rearranges the particles into a denser configuration. The impact locations are typically located on a grid pattern, the spacing of which is determined by the subsurface conditions and foundation loading and geometry.

Other construction activities such as general building construction would be less noise intrusive, involving cranes, forklifts saws, and nail guns. Trucks would be used to off-haul demolition wastes, which would also marginally increase hourly noise levels on Third Street, Mariposa Street, and Caesar Chavez Street.

Effect on Sensitive Receptors. Construction noise would be similar in magnitude to existing L_{eq} noise levels along Third Street, which are elevated due to relatively high traffic volumes on Third Street, operations of the Muni light rail line, and ongoing construction in the area, but greater than existing L_{eq} noise levels along the waterfront. However, land uses along the waterfront are recreational and are not considered noise-sensitive land uses. Thus, temporary construction noise impacts would not cause substantial increase in noise levels at nearby sensitive receptors; this impact would be *less than significant*.

Demolition/Mass Excavation. Demolition and mass excavation activities at the project site would involve three excavators, three loaders, three scrapers, and two bulldozers as well as two street sweepers and trucks to off-haul material. Noise levels at surrounding sensitive receptors from simultaneous operation of this equipment were calculated using the Roadway Noise

Construction Model. **Table 5.3-7** presents the resultant noise levels at each of the receptors. As can be seen from the Table 5.3-7, the contribution of excavation noise at residential receptors and the hospital would be less than 10 dBA over existing levels.

TABLE 5.3-7
NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AT SENSITIVE RECEPTORS IN THE PROJECT AREA

	Noise Levels in dBA (Hourly Leq)					
Location	**Existing Leq**	**Mass Excavation**	**Compaction**	**Pile Installation**	**Shoring**	**Building Construction**
1. Madrone Mission Bay Residential Towers Nearby residential receptor 800 feet north of project site	70.1	63.8	64.0	67.7	61.6	66.0
2. UCSF Mission Bay Housing (Hearst Tower) Nearby residential receptor 200 feet from the project site	71.2	75.9	75.7	79.8	73.6	78.0
3. UCSF Hospital Nearby receptor 560 feet from the project site	67.0	66.9	66.8	70.8	64.6	69.1

NOTE: See Figure 5.3-1 for noise measurement locations. L_{eq} represents the constant sound level

SOURCE*:* Environmental Science Associates, 2015.

Rapid Impact Compaction. Construction of the proposed project would involve use of rapid impact compaction to stabilize soils on the project site. Up to three tractors with compactor attached could operate at a given time over a 3-month period. Using an estimated noise level of 90 dBA,[21] a mounted impact hammer (which is also rated at 90 dBA) was used as a proxy in the Roadway Noise Construction Model to estimate noise levels from simultaneous operation of the compactors. As can be seen from the Table 5.3-7, the contribution of compaction noise at residential receptors and the hospital would be less than 10 dBA over existing levels. Actual noise levels would likely be up to 10 dBA less than indicated in the table, as compaction would occur within an excavation pit and surrounding earth walls would provide additional attenuation of compaction noise, particularly at the western site perimeter where excavation would be deepest. Predicted noise levels from impact compaction would also be less than 80 dBA at any residential receptor and less than 100 dBA at any commercial receptor, which are thresholds suggested by FTA guidance and applied here for impact equipment (since they are not subject to the noise limit restrictions of the San Francisco construction noise ordinance).

21 Dietmar, et.al., *Rapid Impact Compactor – An Innovative Dynamic Compaction Device for Soil Improvement*, June 2007.

Pile Installation. Piles for the proposed project would not be driven with an impact hammer, but rather cast in place with drilled auger holes. Pile installation activities at the project site would involve four drill rigs, four crawler cranes, two forklifts, four excavators, and concrete saws. Noise levels at surrounding sensitive receptors from simultaneous operation of this equipment were calculated using the Roadway Noise Construction Model. As can be seen from Table 5.3-7, the contribution of pile installation noise at residential receptors and the hospital would be less than 10 dBA over existing levels.

Shoring. Shoring activities at the project site would involve two drill rigs, cranes, two grout mixing plants, and two excavators. Noise levels at surrounding sensitive receptors from simultaneous operation of this equipment were calculated using the Roadway Noise Construction Model. As can be seen from Table 5.3-7, the contribution of shoring activity noise at residential receptors and the hospital would be less than 10 dBA over existing levels.

Building Construction. Building construction at the project site would involve operation of two concrete pumps, two bobcats, four excavators, eight cranes, eight grandall lifts, and a variety of small tools and equipment (e.g., chop saws, nail guns, etc.). This would be the longest phase of construction, occurring over a 21-month period. As can be seen from Table 5.3-7, the noise contribution of building construction activities at residential receptors and the hospital would be less than 10 dBA over existing levels.

Cumulative Project Construction Noise. The construction schedule indicates that excavation, compaction, pile installation, and shoring activities could take place concurrently during two months of the construction schedule. This would represent the worst case scenario in terms of cumulative construction noise from the project.

However, it would be impossible for all four activities to occur simultaneously at the same location (e.g., the nearest distance to a given receptor) and therefore, the cumulative noise level would <u>not</u> be the acoustical sum of these noise levels. To account for the geographic distribution of these potential simultaneous activities, only the noisiest activity (pile installation, due to the number of pieces of equipment) was assumed to occur at the nearest distance to a given receptor. All other activities were assumed to occur at a farther distance of 200 feet from pile installation activities. This adjustment was only meaningful for receptors No. 2 and 3 which are the closest to the project site. Predicted cumulative project construction noise levels are presented in **Table 5.3-8**, which shows that noise levels from concurrent construction activities would not exceed 10-dBA over the noise level criterion for any receptor. Therefore, this impact would be *less than significant.*

Other Construction Activities. During peak excavation activities, up to 400 truck trips could be generated to and from the site per day. These truck trips would increase hourly noise levels on Third Street, Mariposa Street, and Caesar Chavez Street. Assuming a 10-hour work day, the addition of 40 heavy duty truck trips to the existing peak hour traffic would increase traffic noise contributions by 2.3 dBA along Third Street during peak excavation activities. This would be a *less than significant* contribution to roadway noise levels.

TABLE 5.3-8
CUMULATIVE WORST CASE NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AT SENSITIVE RECEPTORS IN THE PROJECT AREA

Location	Noise Levels in dBA (Hourly L_{eq})	
	Existing Leq	**Concurrent Excavation, Compaction, Pile Installation and Shoring Activities**
1. Madrone Mission Bay Residential Towers Nearby residential receptor 800 feet north of project site	70.1	70.9
2. UCSF Mission Bay Housing (Hearst Tower) Nearby residential receptor 200 feet from the project site	71.2	80.8
3. UCSF Hospital Nearby receptor 560 feet from the project site	67.0	72.8

NOTE: See Figure 5.3-1 for noise measurement locations. L_{eq} represents the constant sound level

SOURCE: Environmental Science Associates, 2015.

Summary of Impact NO-1

Construction activities at the project site over a 26-month period would result in temporary increases in noise levels in the project vicinity, which could be noticeable at nearby residential and hospital land uses. Peak cumulative construction activities would occur during a 3-month period in 2015–2016 and during this time, the increase in noise levels over existing conditions would be less than 10 dBA (without mitigation). All other periods of construction would similarly be under 10 dBA. Therefore, this impact would be *less than significant.* Nevertheless, human annoyance associated with the temporary increases in noise levels during construction could be reduced with implementation of **Improvement Measure I-NO-1**, compliance with the Mission Bay Good Neighborhood Construction Noise Policy.

Mitigation: Not required.

Improvement Measure I-NO-1: Mission Bay Good Neighbor Construction Noise Policy

The project sponsor shall comply with the Mission Bay Good Neighbor Policy and limit all extreme noise-generating construction activities to 8:00 a.m. to 5:00 p.m., Monday through Friday. No pile driving or other extreme noise generating activity is permitted on Saturdays, Sundays, and holidays.

Comparison of Impact NO-1 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR identified construction-related noise impact as less than significant with Mission Bay FSEIR Mitigation Measure G.1 to address noise from impact pile driving. Mission Bay FSEIR Mitigation Measure G.1 requires use of noise-reducing pile driving techniques and restricting the hours of operation. Because the proposed project would be installing piles using drilling and cast-in-place techniques, the project would be implementing Mission Bay FSEIR Mitigation Measure G.1 as part of the project, and as described above, construction noise impacts would be less than significant. Thus, Mission Bay FSEIR Mitigation Measure G.1 is neither warranted nor applicable to the proposed project.

Therefore, the project would result in no new or substantially more severe significant impacts related to construction noise than was previously identified in the Mission Bay FSEIR.

Impact NO-2: Construction of the proposed project would not expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies. (Less than Significant)

Proposed construction would be required to comply with the San Francisco Noise Ordinance, which prohibits construction activities between 8:00 p.m. and 7:00 a.m. and limits noise from any individual piece of construction equipment, except impact tools approved by the Department of Public Works, to 80 dBA at 100 feet. Table 5.3-5, above, presents the maximum noise levels generated by construction equipment identified by the project sponsor as likely to be used during construction. All non-impact equipment would be consistent with the San Francisco Noise Ordinance. Consequently, the project would not generate noise levels in excess of standards established in the local, noise ordinance, and this impact would be *less than significant*.

Mitigation: Not required.

Comparison of Impact NO-2 to Mission Bay FSEIR Impact Analysis

The construction-related noise impact with respect to consistency with the San Francisco Noise Ordinance was identified as less than significant in the Mission Bay FSEIR. Consequently, the project would result in no new or substantially more severe significant impacts related to consistency with established noise standards than was previously identified.

Impact NO-3: Construction of the proposed project would not expose people and structures to or generate excessive groundborne vibration levels. (Less than Significant)

Groundborne vibration from construction activities that involve impact activities, primarily rapid impact compaction, could produce detectable vibration at nearby sensitive buildings and sensitive receptors unless proper precaution is followed.

There are no adopted state or local policies or standards for groundborne vibration. Vibration intensity is expressed as peak particle velocity (PPV), the maximum speed at which the ground moves while it temporarily shakes. Since groundshaking speeds are very slow, PPV is measured in inches per second. The average person is quite sensitive to ground motion and levels as low as 0.02 inch per second can be detected by the human body when background noise and vibration levels are low and levels of 0.1 inches per second are considered "strongly perceptible." The Federal Transit Administration has published guidance relative to vibration impacts (see

Table 5.3-6, above). According to Caltrans, new structures can be exposed to groundborne vibration PPV levels of up to 0.5 inch per second without experiencing structural damage.[22]

Building Damage

Rapid impact compaction activities are proposed during the first two to three months of construction. The magnitude of vibration caused by rapid impact compaction is a function of distance from the receptor or structure of concern and the nature of surrounding soils. Groundborne vibration from activities that involve impact tools could produce significant vibration. A recent study of vibration induced by rapid impact compaction indicates that compliance with a safe level of vibration with respect to building damage can be achieved provided that the activity occur no closer than 10 meters (33 feet) from a structure.[23] The nearest structure north, across South Street, and to the south, across 16th Street would be located farther than 75 feet away, while the nearest structure to the west would be over 100 feet away. Consequently, proposed compaction activities would result in *less than significant* vibration impacts with respect to building damage.

Human Annoyance

Vibration levels can also result in interference or annoyance impacts at residences or other land uses where people sleep, such as hotels and hospitals. Vibration impact criteria published by Caltrans relative to these land uses are stated in terms of PPV, in inches per second. For adverse human reaction, this analysis applies the "strongly perceptible" threshold of 0.1 inches per second PPV.[24]

The closest residence would be the UCSF Mission Bay Housing (Hearst Tower), approximately 200 feet from the project site while the nearest hospital would be approximately 560 feet away. A recent study of vibration induced by rapid impact compaction indicated that at a distance of 30 meters (100 feet), cumulative vibration energy results in maximum vibration level of 2.3 millimeters per second (0.09 inches per second).[25] Because sensitive land uses would be more than 100 feet away, worst-case cumulative vibration levels generated by rapid impact compaction would be below the strongly perceptible threshold. Therefore, due to the distance of receptors from the project site, impacts from vibration with respect to human annoyance would be *less than significant*.

Vibration-Sensitive Equipment

Land uses with operations that could be considered to have high sensitivity to vibrations include vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, and university research operations. The degree of sensitivity to vibration depends on the specific

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22 Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013.
23 Lauzon, Marc et.al., *Ground Vibrations Induced by Dynamic compaction and Rapid Impact Compaction*; submittal to the 2011 CGS Geotechnical Conference, 2011.
24 Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013
25 Lauzon, Marc et.al., *Ground Vibrations Induced by Dynamic compaction and Rapid Impact Compaction*; submittal to the 2011 CGS Geotechnical Conference, 2011.

equipment that would be affected by the vibration as well as on the design of the specific building in which the equipment is located. Equipment such as electron microscopes and high resolution lithographic equipment can be very sensitive to vibration, and even normal optical microscopes can sometimes be difficult to use when vibration is well below the human annoyance level. Existing medical or research uses adjacent to the project site that contain vibration-sensitive equipment could experience vibration levels during construction that exceed 0.008 inches per second (65 VdB) and potentially disturb the operation of sensitive medical equipment. As discussed in the 1998 FSEIR, construction vibration effects on sensitive equipment would be a concern for users of research buildings and could be an inconvenience. However, these users are not considered sensitive receptors, and therefore, construction vibration effects are not considered a significant environmental effect under CEQA. Nevertheless, human annoyance associated with the temporary increases in noise levels during construction could be reduced with implementation of **Improvement Measure I-NO-2**, Neighbor Notification of Vibration-Inducing Construction Operations.

Summary of Impact NO-3

Rapid impact compaction during construction at the project site would not result in excessive vibration levels that would result in structural damage or human annoyance at nearby structures or at residential or hospital receptors. All other construction activity would generate lesser vibration levels and project construction vibration-related impacts would be *less than significant*. However, implementation of Improvement Measure I-NO-3, Neighbor Notification of Vibration-Inducing Construction Operations, could reduce the temporary human annoyance associated with land uses involving vibration-sensitive equipment during construction.

Mitigation: Not required.

Improvement Measure I-NO-3: Neighbor Notification of Vibration-Inducing Construction Activities

At least one week prior to the start of rapid impact compaction activities, the project sponsor shall notify owners and occupants within 500 feet of the project site of the dates, hours, and expected duration of such activities.

Comparison of Impact NO-3 to Mission Bay FSEIR Impact Analysis

The construction-related vibration impact was identified as less than significant in the Mission Bay FSEIR as a result of modern building design and equipment installation techniques. Similarly, as described above, the proposed project would result in less than significant vibration impacts. Therefore, the project would result in no new or substantially more severe significant impacts related to vibration than was previously identified in the Mission Bay FSEIR.

Project Impacts: Operations

Impact NO-4: Operation of the proposed project could result in exposure of persons to or generation of noise levels in excess of standards established in the *San Francisco General Plan* or San Francisco Noise Ordinance. (Less than Significant with Mitigation)

Operation of the event center and mixed-use development would result in the introduction of new noise sources, both stationary and mobile, to the project area. Stationary noise sources would include the operation of five back-up diesel generators for maintenance purposes and mechanical equipment as well as the operation of public address systems and amplification equipment not only interior to the event center but also for occasional outdoor performances and events at the proposed Third Street plaza. Mobile noise sources would include increased traffic and crowd egress noise on local streets.

The San Francisco Noise Ordinance contains restrictions on noise from stationary sources, whereas noise from mobile sources is regulated at the state and federal level, generally through manufacturer specification requirements. The San Francisco Noise Ordinance does not address or establish restrictions on mobile sources. Therefore, the potential for adverse noise effects from stationary sources is addressed in this impact, which is specific to the standards of the *San Francisco General Plan* or San Francisco Noise Ordinance. The potential impact of mobile source operations generated by the project is addressed below under Impact NO-5 with respect to permanent increases in hourly traffic noise levels in the project vicinity and not in this impact.

This impact also addresses land use compatibility of the proposed office and retail land uses with respect to the noise standards of the *San Francisco General Plan.* The *San Francisco General Plan* establishes land use compatibility standards for land uses throughout the City for determining the compatibility of new land uses with an existing or future noise environment. Additionally, the nearby UCSF Hospital has recently constructed a helipad, the noise impacts of which are addressed as a cumulative impact under Impact C-NO-3, below.

Stationary Noise Sources – Generators and Mechanical Equipment

The project anticipates installing on-site generators capable of providing up to three megawatts (MW) of emergency, standby and optional power to the event center in the case of temporary loss of normal utility power.[26] In addition, each office and retail building would have an on-site generator capable of approximately 0.75 MW, and the proposed food hall would have a generator capable of approximately 0.5 MW, to provide fire and life safety emergency power in the case of temporary loss of normal utility power to those uses.

Section 2909 of the City's Police Code establishes a not-to-exceed noise standard for fixed sources of noise, such as building mechanical equipment and industrial or commercial processing machinery.

[26] Under such circumstance, the generators would provide power for fire alarms, fire command room, emergency lighting, elevators, smoke control and pressurization, fire pumps, audio system, and certain scoreboard equipment.

Unlike the state building code (Title 24) standard, which is applicable to interior living space only, the standards in Section 2909(a), (b), and (c) are applicable outdoors, at the property line of the affected use, and the standards vary based on the residential or commercial nature of the noise generator's use. The limits for noise generated by commercial and industrial properties such as the proposed project provide that no person shall produce or allow to be produced a noise level more than 8 dBA above the local ambient level at the property plane.

As is common for noise standards, the permitted noise level for fixed residential interior noise limits identified in Section 2909(d) is lower at night than during the day. For example, maximum noise levels at any sleeping or living room in any dwelling unit located on residential property must not exceed 45 dBA between 10:00 p.m. and 7:00 a.m., and 50 dBA between 7:00 a.m. and 10:00 p.m.

Under the proposed project, all emergency generators would be located within the parking structure on Lower Parking Level 1 and would be enclosed within dedicated rooms inside the lower level parking garage. Consequently, engine noise from generator testing is not expected to generate audible noise at receptors located outside of the event center and office structures. With the exception of emergency conditions during which these sources would be exempt from restrictions of the Noise Ordinance, all of these generators would be tested approximately once a week for less than one hour for maintenance purposes.

The majority of the mechanical equipment would be located on the rooftops of each office building tower. All mechanical equipment would be either fully screened or located within a fully enclosed penthouse room enclosure. At the lower levels for the office buildings, mechanical equipment would be located within fully enclosed equipment rooms. For the event center, all mechanical equipment would be located indoors within fully enclosed equipment rooms located on various levels of the building. The only mechanical equipment on the roof would be the cooling tower, which would be fully screened on all four sides. Consequently, all proposed mechanical equipment would be screened and located sufficiently distant from receptors to be operated within the restrictions of the noise ordinance.

Under the proposed project, the generators would be located in a subgrade parking garage at a distance of approximately 300 feet from the nearest existing residential land use and are not expected to increase ambient noise levels because of their protected, subgrade location. Thus, maintenance operations of the backup generators and other mechanical equipment would not result in noise levels in excess of standards established in the *San Francisco General Plan* or San Francisco Noise Ordinance, and the operational noise impacts from generators and other mechanical equipment would be *less than significant*.

Stationary Noise Source – Amplified Sound

For certain events, portions of the proposed outdoor plazas may be equipped with video screens and speakers, which would result in increased sound-level generation. This equipment could operate prior to and/or after some basketball games or events at the event center to generate excitement. In addition, as described in Chapter 3, Project Description, the proposed Third Street plaza would provide opportunities for public gatherings and events that may also involve amplified sound.

Promoters of any proposed outdoor events on the site's outdoor plaza that would use amplified sound or music would be required to obtain a permit from the City prior to the event. Section 1060.1 of the Police Code requires a permit to conduct, operate, or maintain a place of entertainment, limited live performance locale or one-time event within the City and County of San Francisco. Concerts on the plaza would require the promoter to obtain a Limited Live Performance Permit from the San Francisco Entertainment Commission, and this permit process would require a public hearing and include a neighborhood outreach requirement as discussed in the Setting section.

Article 1, Section 47.2 of the Police Code, while generally focused on truck-mounted amplification equipment, regulates the use of <u>any</u> sound amplifying equipment, whether truck-mounted or otherwise. Hours of operation are restricted to between 9:00 a.m. and 10:00 p.m., unless permitted by the San Francisco Entertainment Commission. As basketball games generally start at 7:30 p.m., operation of video screens and speakers on the plazas <u>prior</u> to basketball games would be consistent with these time restrictions of Article 1, Section 47.2. Operation of outdoor speakers on the plaza would require the applicant to obtain an Outdoor Amplified Sound/Loudspeaker Permit from the Entertainment Commission, and this permit process would require a public hearing as discussed in the Setting section. Notwithstanding this consistency with the Police Code, due to the as yet unknown nature of future outdoor events at the project site, the use of amplified sound equipment would still have the potential for *significant* noise impacts in excess of standards established in the San Francisco General Plan or San Francisco Noise Ordinance. Consequently, **Mitigation Measure M-NO-4a (Noise Control Plan for Outdoor Amplified Sound)** is identified to ensure that sound levels generated by amplified equipment would be consistent with Section 2909 of the City's Police Code, which establishes a not-to-exceed (except through a variance) noise standard for fixed sources of noise and from licensed place of entertainment or other location subject to regulation by the Entertainment Commission. For noise generated from a commercial property, the relevant noise limits are 8 dBA above the ambient L_{90} level at any point outside of the property plane of the commercial use. For a Place of Entertainment, the low-frequency dBC criterion would additionally apply, where no noise or music shall exceed the low frequency ambient criterion by more than 8 dBC.

The proposed event center would also host approximately 45 concerts a year, in addition to other events (see Chapter 3, Table 3-3), which would operate amplified sound equipment within the event center. The proposed arena would be considered a place of entertainment and the applicant would be required to obtain a Place of Entertainment permit from the Entertainment Commission, and this permit process would require a public hearing and include a neighborhood outreach requirement as discussed in the Setting section. The Entertainment Commission Good Neighbor Policy for nighttime entertainment activities requires permit holders to provide a cell phone point of contact to all interested neighbors that will be answered at all times by a manager or other responsible person who has the authority to adjust volume and respond to other complaints whenever entertainment is provided. Design of the proposed event center includes layers of doors and an intervening concourse, which would serve to minimize leakage of concert/event noise within the event center to the outside areas. Additionally, the proposed 160-foot office towers with 90-foot podium structure, and the proposed gatehouse building located on the west side of the site would provide a barrier between the event center and sensitive land uses to the northwest and southwest, which would further attenuate any potential leakage of interior concert/event noise. However, due to uncertainties as to the nature and extent of future events within the arena and lack of available details of interior acoustical treatments at the time of this planning-level CEQA review, implementation **of Mitigation Measure M-NO-4b (Noise Control Plan for Place of Entertainment Permit)** would ensure that noise levels from concerts, basketball games, and other events would comply with the noise ordinance, and this impact would be *less than significant with mitigation*.

Noise Exposure of Proposed Event Center and Office Uses

The project proposes development of office and retail land uses, which are generally not considered noise-sensitive uses. Noise monitoring in the project area indicates existing noise levels to be 75 DNL (day-night noise level) at the setback of Third Street (see Table 5.3-3 above). These levels represent the noise exposure levels which the proposed uses at the site would be subject to.

Policy 11.1 of the *San Francisco General Plan* identifies use of sound level guidelines established for a particular land use, as shown in the land use compatibility chart (see Figure 5.3-2, above). For sports event centers, an exterior sound level of 77 DNL or less is conditionally acceptable but that conventional construction with closed windows and fresh air supply systems will normally suffice. For office land uses such as those proposed under the project, the land use compatibility chart indicates that noise exposure of 75 DNL or less is conditionally acceptable but that conventional construction with closed windows and fresh air supply systems will normally suffice. Because both the event center and office and retail buildings would be constructed using modern materials and techniques which include ventilation systems and non-operable windows, these land uses would be consistent with the compatibility standards of the General Plan. Consequently, exposure to noise levels in excess of standards in the local general plan would be *less than significant*.

Summary of Impact NO-4, Operational Noise from Stationary Sources

Operation of the proposed project would introduce new stationary noise sources that would be subject to the requirements of the San Francisco Noise Ordinance. These new sources include generators and mechanical equipment, as well as the potential for amplified sound within the Third Street plaza. Due to the proposed enclosed and subgrade location for generators, enclosed location for majority of the event center mechanical equipment, and the rooftop locations and proposed mechanical screens for mechanical equipment for the office and retail buildings, predicted noise levels from proposed new stationary sources would not meaningfully contribute to the existing monitored ambient noise levels in the project area, and the project would therefore be consistent with the restrictions of the noise ordinance.

The proposed project would also introduce new land uses, and these new uses would be exposed to noise levels of up to 75 DNL. However, modern building techniques and materials as well as inclusion of non-operable windows and ventilation systems would be sufficient to ensure that the project would comply with land use compatibility requirements of the *San Francisco General Plan*, and this impact would be less than significant.

With respect to amplified sound, either interior to the event center or in open-air plazas on the project site, the predicted sound levels and hours of occurrence would be consistent with the noise ordinance. However, due to uncertainties as to the nature and extent of future outside events at the Third Street plaza, implementation **of Mitigation Measure M-NO-4a (Noise Control Plan for Outdoor Amplified Sound)** would ensure that noise levels from amplified sound exterior to the event center would comply with the noise ordinance. In addition, implementation of **Mitigation Measure M-NO-4b, Noise Control Plan for Place of Entertainment Permit,** would ensure that noise levels from concerts, basketball games, and other events would comply with the noise ordinance, regardless of current unknowns as to the nature of future events within the arena. Therefore, this impact would be *less than significant with mitigation*.

Mitigation Measure M-NO-4a: Noise Control Plan for Outdoor Amplified Sound

The project sponsor shall develop and implement a Noise Control Plan for operations at the proposed entertainment venues to reduce the potential for noise impacts from public address and/or amplified music. This Noise Control Plan shall contain the following elements:

- The project sponsor shall comply with noise controls and restrictions in applicable entertainment permit requirements for outdoor concerts.
- Speaker systems shall be directed away from the nearest sensitive receptors to the degree feasible.
- Outdoor speaker systems shall be operated consistent with the restrictions of Section 2909 of the San Francisco Police Code, and conform to a performance standard of 8 dBA and dBC over existing ambient L_{90} noise levels at the nearest residential use.

Mitigation Measure M-NO-4b: Noise Control Plan for Place of Entertainment Permit

As part of the Place of Entertainment Permit process, the project sponsor shall develop and implement a Noise Control Plan for operations at the proposed entertainment venue to reduce the potential for noise impacts from interior event noise. This Noise Control Plan shall, at a minimum, contain the following elements:

- The project sponsor shall comply with noise controls and restrictions in applicable entertainment permit requirements.
- The establishment shall provide adequate ventilation within the structures such that doors and/or windows are not left open for such purposes resulting in noise emission from the premises.
- There shall be no noise audible outside the establishment during the daytime or nighttime hours that violates the San Francisco Municipal Code Section 49 or 2900 et. seq. Further, absolutely no sound from the establishment shall be audible inside any surrounding residences or businesses that violates San Francisco Police Code section 2900.
- Permit holder shall take all reasonable measures to insure the sidewalks adjacent to the premises are not blocked or unnecessarily affected by patrons or employees due to the operations of the premises and shall provide security whenever patrons gather outdoors.

- Permit holder shall provide a cell phone number to all interested neighbors that will be answered at all times by a manager or other responsible person who has the authority to adjust volume and respond to other complaints whenever entertainment is provided.

Comparison of Impact NO-4 to Mission Bay FSEIR Impact Analysis

The operational noise impact with respect to noise from generators and mechanical equipment was not specifically addressed in the Mission Bay FSEIR. However, this project impact would be less than significant, so under the project, there would be no new or substantially more severe impacts from what were disclosed in the Mission Bay FSEIR.

The operational noise impact with respect to amplified sound was addressed in the Mission Bay FSEIR with respect to outdoor concert events at the AT&T ballpark. This impact was identified as less than significant with mitigation in the *San Francisco Giants Ballpark at China Basin Final EIR*, which included implementation of a plan limiting the frequency of events and establishing a 3 dBA increase over existing ambient noise levels as a performance standard. As described above, the proposed project impact would be similar, so there would be no new or substantially more severe impacts from what were disclosed in the Mission Bay FSEIR.

Impact NO-5: Operation of the proposed project would cause a substantial permanent increase in ambient noise levels in the project vicinity. (Significant and Unavoidable with Mitigation)

As described in Impact NO-4, above, this impact addresses the introduction of new mobile noise sources with respect to the potential for permanent, long-term increases in ambient noise levels in the project vicinity. Mobile noise sources include vehicular traffic noise and crowd noise.

Mobile Noise Source – Vehicular Traffic Noise with Transit Service Plan

Increased vehicular traffic associated with the proposed project would increase noise levels along existing roadways. Under the Muni Special Event Transit Service Plan included as part of the project, light rail service on the T Third line would be increased, and three special event shuttles would be implemented, including a 16th Street BART Shuttle, Van Ness Avenue Shuttle, and Transbay Terminal/Ferry Building Shuttle. Increases in noise from traffic on existing roadways are assessed by modeling existing and future roadway noise levels and comparing the resulting increase to standards published by FICON. For noise environments where the ambient noise level is 65 dBA DNL or less, the applicable significance threshold is an increase of 5 dBA or more, which Caltrans recognizes as a readily perceptible increase. In noise environments where the ambient noise level exceeds 65 dBA DNL, the applicable significance threshold is an increase of 3dBA or more, which Caltrans recognizes as a barely perceptible increase.

Increased traffic noise with the Muni Special Event Transit Service Plan was assessed for four separate scenarios, consistent with those analyzed in Section 5.2, Transportation and Circulation. First, roadside noise levels were modeled for existing conditions (year 2015 inclusive of traffic from foreseeable development that would be operational by the time of project completion) during the weekday peak hour (4 to 6 p.m.) and compared to conditions with the addition of proposed project traffic inclusive of a convention event at the arena. Second, roadside noise levels were modeled for existing conditions during the weekday “evening” hour (6 to 8 p.m.) and compared to conditions with the addition of pre-basketball game traffic. A third scenario assessed roadside noise levels with and without basketball game traffic during the weekday “late” hour (9 to 11 p.m.) reflecting the contributions of post basketball game traffic. Lastly, a scenario assessed roadside noise levels with and without basketball game traffic during the Saturday evening peak hour (7 to 9 p.m.).

Noise levels were determined for this analysis using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model based on baseline and future traffic projections developed as part of the transportation analysis (see Section 5.2, Transportation and Circulation). Modeled weekday and weekend traffic noise level estimates for the six roadway segments are presented in **Table 5.3-9**. Noise levels in Table 5.3-9 represent conditions with and without the project for all four analyzed project scenarios.

As shown in Table 5.3-9, weekday traffic noise level increases would be less than significant for receptors along Third Street where noise levels would increase by less than 3 dBA for all scenarios analyzed. Roadside noise levels along 16th Street and Mariposa Street would increase by as much as 4.9 dBA. However, the existing traffic noise levels along these streets is below 65 dBA and therefore the applicable threshold would be 5 dBA, which would not be met or exceeded. Thus, the roadside noise impact along these two streets would be less than significant.

Roadside noise levels at multi-family receptors adjacent to Illinois Street and Terry Francois Boulevard would increase by more than 5 dBA under several scenarios. Specifically, during the “late night” (9 to 11 p.m.) scenario post-basketball game traffic would increase roadside noise levels along Illinois Street and Terry Francois Boulevard by 10.0 and 6.8 dBA, respectively. Finally, under the Saturday “evening” scenario, basketball game traffic would increase roadside noise levels along Illinois Street by 7.2 dBA. Consequently, roadside noise level increases at multi-family receptors adjacent to Illinois Street and Terry Francois Boulevard would be a significant noise impact. While this impact would occur only for a few hours per event, given that there would be up to 225 events per year, this impact is considered a *significant* permanent increase in noise levels.

Physical noise mitigation (i.e., installation of noise barriers) does not represent a feasible mitigation measure for these event-driven noise impacts. Section 5.2, Transportation and Circulation, of this EIR identifies transportation-related mitigation measures, which would likely not reduce potential noise impacts at most of these roadway segments, where traffic volumes would need to be reduced by half of the projected volumes for noise levels to be reduced below thresholds. Mitigation in terms of rerouting project traffic would have the potential to result in secondary traffic-related impacts or transfer of noise impacts from one roadway to another. Consequently, operational noise impacts during events with implementation of the Muni Special Event Transit Service Plan would be *significant and unavoidable*, with no feasible mitigation that would reduce roadside noise levels even with implementation of transportation mitigation measures identified under Impact TR-2 in Section 5.2, Transportation and Circulation.

TABLE 5.3-9
MODELED TRAFFIC NOISE LEVELS,
PROPOSED PROJECT WITH MUNI SPECIAL EVENT TRANSIT SERVICE PLAN [a]

Roadway Segment	Existing (2015)	Existing plus Convention	dBA Difference	Significant Increase?
Weekday Peak Hour Noise Levels (4 PM – 6 PM)				
Third Street between South Street and China Basin Street	69.1	69.8	0.7	No
Third Street between 16th Street and Mariposa Street[b]	69.9	69.9	<0.1	No
Illinois Street between Mariposa Street and 20th Street	60.3	64.2	3.9	No
Terry Francois Boulevard between South Street and China Basin Street	59.8	59.8	<0.1	No
16th Street between Third Street and I-280	66.4	67.5	1.1	No
Mariposa Street between Third Street and I-280	65.5	66.7	1.2	No
Roadway Segment	**Existing (2015)**	**Existing plus Basketball Game**	**dBA Difference**	**Significant Increase?**
Weekday Evening Noise Levels (6 PM – 8 PM)				
Third Street between South Street and China Basin Street	68.5	69.7	1.2	No
Third Street between 16th Street and Mariposa Street[b]	69.1	69.1	<0.1	No
Illinois Street between Mariposa Street and 20th Street	58.2	63.1	4.9	No
Terry Francois Boulevard between South Street and China Basin Street	57.5	57.9	0.4	No
16th Street between Third Street and I-280	65.6	67.0	1.4	No
Mariposa Street between Third Street and I-280	65.4	67.6	2.2	No
Roadway Segment	**Existing (2015)**	**Existing plus Basketball Game**	**dBA Difference**	**Significant Increase?**
Weekday Late Noise Levels (9 PM – 11 PM)				
Third Street between South Street and China Basin Street	63.4	62.5	-0.9[c]	No
Third Street between 16th Street and Mariposa Street[b]	63.7	63.7	<0.1	No
Illinois Street between Mariposa Street and 20th Street	52.1	62.2	**10.1**	**Yes**
Terry Francois Boulevard between South Street and China Basin Street	53.4	60.2	**6.8**	**Yes**
16th Street between Third Street and I-280	60.2	63.3	3.1	No
Mariposa Street between Third Street and I-280	59.7	64.4	4.7	No
Roadway Segment	**Existing (2015)**	**Existing plus Basketball Game**	**dBA Difference**	**Significant Increase?**
Saturday Evening Noise Levels (6 PM – 8 PM)				
Third Street between South Street and China Basin Street	64.7	67.1	2.4	No
Third Street between 16th Street and Mariposa Street[b]	65.1	65.2	0.1	No
Illinois Street between Mariposa Street and 20th Street	54.7	61.9	**7.2**	**Yes**
Terry Francois Boulevard between South Street and China Basin Street	54.0	54.9	0.9	No
16th Street between Third Street and I-280	61.4	64.0	2.6	No
Mariposa Street between Third Street and I-280	60.4	64.9	4.5	No

NOTES:

[a] Road center to receptor distance is assumed to be 50 feet for values shown in this table. Noise levels were determined using the Federal Highway Administration (FHWA) traffic noise model. The average speed on these segments is assumed to be 25, 30 or 35 miles per hour, depending on the roadway. For all other assumptions, refer to Appendix NO. In an existing ambient noise environment of 65 dBA or greater, an incremental increase is considered significant if the noise increase is equal to or greater than 3.0 dBA. In an existing ambient noise environment below 65 dBA, an incremental increase is considered significant if the noise increase is equal to or greater than 5.0 dBA.

[b] This portion of Third Street would not see meaningful increases in traffic volumes during events due to project access limitations and egress routing during events.

[c] Traffic routing during event egress would be conducted such that volumes on Third Street would be reduced compared to a non-event scenario.

SOURCE: ESA 2015

Mobile Noise Source – Vehicular Traffic Noise, Without the Muni Special Event Transit Service Plan

Under this project scenario, it is assumed that the proposed Muni Special Event Transit Service Plan is not implemented, thus resulting in higher vehicle trip generation (see Section 5.2, Transportation and Circulation, for discussion of the rationale for analyzing this scenario). Increased vehicular traffic associated with the proposed project would further increase noise levels along roadways used to access the project site beyond the levels identified above.

Modeled weekday and weekend traffic noise level estimates for the six roadway segments without the Muni Special Event Transit Service Plan are presented in **Table 5.3-10**. Noise levels in Table 5.3-10 represent conditions with and without the project for all four analyzed project scenarios.

As shown in Table 5.3-10, without the Muni Special Event Transit Service Plan weekday traffic noise level increases would be less than significant for receptors along 3rd Street where noise levels would increase by less than 3 dBA for all scenarios analyzed. Roadside noise levels along Mariposa Street would increase by more than 5 dBA during the weekday late and Saturday evening hours which would be a significant increase that would not occur under the with Muni Special Event Transit Service Plan scenario.

Roadside noise levels at multi-family receptors adjacent to Illinois Street and Terry Francois Boulevard would increase by more than 5 dBA under several scenarios. Specifically, under the weekday p.m. peak hour and evening hours, roadside noise levels along Illinois Street would increase by more than 5 dBA with the addition of convention event traffic, the latter of which would not occur under the with- Muni Special Event Transit Service Plan scenario. During the "late night" (9 to 11 p.m.) scenario, post-basketball game traffic would increase roadside noise levels along Illinois Street and Terry Francois Boulevard by 9.8 and 6.7 dBA, respectively. Finally, under the Saturday "evening" scenario, basketball game traffic would increase roadside noise levels along Illinois Street by 7.8 dBA. Consequently, roadside noise level increases at multi-family receptors adjacent to Illinois Street and Terry Francois Boulevard would be a significant noise impact.

Physical noise mitigation (i.e., installation of noise barriers) does not represent a feasible mitigation measure for these event-driven noise impacts. Mitigation in terms of rerouting project traffic would have the potential to result in secondary traffic-related impacts or transfer of noise impacts from one roadway to another. Consequently, operational noise impacts during events without implementation of the Muni Special Event Transit Service Plan would be significant, with no feasible mitigation that would reduce roadside noise levels even with implementation of transportation mitigation measures identified under Impact TR-2 in Section 5.2, Transportation and Circulation.

While this impact would occur only for a few hours per event, given that there would be up to 225 events per year, the increased traffic associated with project operations would result in a *significant and unavoidable* permanent increase in noise levels along certain local roadway under conditions either with or without implementation of the Muni Special Event Transit Service Plan.

TABLE 5.3-10
MODELED TRAFFIC NOISE LEVELS,
PROPOSED PROJECT WITHOUT MUNI SPECIAL EVENT TRANSIT SERVICE PLAN[a]

Roadway Segment	Existing (2015)	Existing plus Convention	dBA Difference	Significant Increase?
Weekday Peak Hour Noise Levels (4 PM – 6 PM)				
Third Street between South Street and China Basin Street	69.1	69.8	0.7	No
Third Street between 16th Street and Mariposa Street[b]	69.9	69.9	<0.1	No
Illinois Street between Mariposa Street and 20th Street	60.3	64.2	3.9	No
Terry Francois Boulevard between South Street and China Basin Street	59.8	59.8	<0.1	No
16th Street between Third Street and I-280	66.4	67.5	1.1	No
Mariposa Street between Third Street and I-280	65.5	66.7	1.2	No
Roadway Segment	**Existing (2015)**	**Existing plus Basketball Game**	**dBA Difference**	**Significant Increase?**
Weekday Evening Noise Levels (6 PM – 8 PM)				
Third Street between South Street and China Basin Street	68.5	70.1	1.6	No
Third Street between 16th Street and Mariposa Street	69.1	69.2	0.1	No
Illinois Street between Mariposa Street and 20th Street	58.2	63.6	**5.4**	**Yes**[b]
Terry Francois Boulevard between South Street and China Basin Street	57.5	58.0	0.5	No
16th Street between Third Street and I-280	65.6	67.3	1.7	No
Mariposa Street between Third Street and I-280	65.4	67.9	2.5	No
Roadway Segment	**Existing (2015)**	**Existing plus Basketball Game**	**dBA Difference**	**Significant Increase?**
Weekday Late Noise Levels (9 PM – 11 PM)				
Third Street between South Street and China Basin Street	63.4	62.7	-0.7[c]	No
Third Street between 16th Street and Mariposa Street[b]	63.7	64.1	0.4	No
Illinois Street between Mariposa Street and 20th Street	52.1	61.9	**9.8**	**Yes**
Terry Francois Boulevard between South Street and China Basin Street	53.4	60.1	**6.7**	**Yes**
16th Street between Third Street and I-280	60.2	65.1	4.9	No
Mariposa Street between Third Street and I-280	59.7	65.0	**5.3**	Yes[b]
Roadway Segment	**Existing (2015)**	**Existing plus Basketball Game**	**dBA Difference**	**Significant Increase?**
Saturday Evening Noise Levels (6 PM – 8 PM)				
Third Street between South Street and China Basin Street	64.7	67.8	3.1	No
Third Street between 16th Street and Mariposa Street[b]	65.1	65.4	0.3	No
Illinois Street between Mariposa Street and 20th Street	54.7	62.5	**7.8**	**Yes**
Terry Francois Boulevard between South Street and China Basin Street	54.0	55.0	1.0	No
16th Street between Third Street and I-280	61.4	64.4	3.0	No
Mariposa Street between Third Street and I-280	60.4	65.5	**5.1**	**Yes**[b]

NOTES:

[a] Road center to receptor distance is assumed to be 50 feet for values shown in this table. Noise levels were determined using the Federal Highway Administration (FHWA) traffic noise model. The average speed on these segments is assumed to be 25 or 30 miles per hour, depending on the roadway. For all other assumptions, refer to Appendix NO. In an existing ambient noise environment of 65 dBA or greater, an incremental increase is considered significant if the noise increase is equal to or greater than 3.0 dBA. In an existing ambient noise environment below 65 dBA, an incremental increase is considered significant if the noise increase is equal to or greater than 5.0 dBA.

[b] This is a significant impact under the no Muni Special Event Transit Service Plan scenario that would not occur under the with Muni Special Event Transit Service Plan scenario.

[c] Traffic routing during event egress would be conducted such that volumes on Third Street would be reduced compared to a non-event scenario.

SOURCE: ESA 2015

Mobile Noise Source – Crowd Noise

Noise generated by event patrons and retail customers could result in increased noise along surrounding streets, particularly during the evening and nighttime hours (depending on the event timing) and at the end of scheduled games/events when large numbers of people would be departing the event center and walking on local streets to access their transit connections or access their vehicles at local parking locations. The proposed arena would be considered a place of entertainment and the applicant would be required to obtain a Place of Entertainment permit from the San Francisco Entertainment Commission, and this permit process would require a public hearing and include a neighborhood outreach requirement as discussed in the Setting section. The Commission has established a good neighbor policy for entertainment venues within the City that includes eight policies that address noise generation (see Regulatory Framework, above).

A variety of transit options would be available to event patrons under the Muni Special Event Transit Service Plan. Section 5.2, Transportation and Circulation, indicates that during the late evening egress hours (9 to 11 p.m.) of a weekday basketball or concert event, over 4,500 people would take transit options and that over 3,000 people would be using the northbound Muni T-Line platform, which is approximately 70 feet from and facing the UCSF Hearst Tower housing building. Observations of current platform occupancy during these hours indicate that fewer than 10 persons are typically present on the platform at any one time. Consequently, the proposed project would result in a substantial increase in people gathering in the median of Third Street across from the UCSF Hearst Tower housing complex during the targeted 45-minute post-event egress period for approximately 45 basketball games per year and up to 60 additional full capacity concerts and other sporting events per year (see Table 3-3 of the Project Description). In addition to this, there could be smaller capacity family events or daytime conventions.

To estimate noise levels from departing crowds after an event, noise monitoring of crowd egress to the Muni T-Line platform after a San Francisco Giants baseball game at AT&T Park was conducted in April 2015. Short-term noise monitoring was located at a setback of approximately 70 feet from the 2nd and King Street (Ballpark) platform. Although the 320-foot-long Ballpark platform is longer than the existing 160-foot T-Line platform across from the project site, the proposed project would include extension of this platform from 160 to 320 feet (see Section 5.2, Transportation and Circulation); therefore this noise measurement would be representative of future project conditions. However, it should be noted that the measured data from the Ballpark platform also included vehicle traffic on King Street and crowd noise on the north side of the street; consequently, these noise measurements may overestimate the magnitude of the potential impact at the project site.

Monitored noise levels during the egress period when the game ended averaged 69 dBA, L_{90}, with an L_{max} of 90.2 dBA. These noise levels may be compared to the existing noise level that was monitored in 2014 during the 10:00 p.m. hour at the UCSF Housing (Hearst Tower) (with no game at AT&T Park), which was 55 dBA, L_{90} and L_{max} of 89.8 dBA. The L_{90} data indicates that existing noise levels at the UCSF Hearst Tower residential building during quieter periods would be substantially increased by crowds gathering to board northbound Muni service on event days.

Given that the residential units in this building are elevated up to 15 stories, shielding does not represent a feasible option to mitigating this crowd noise impact. Relocating the northbound platform away from Hearst Tower would also likely be an infeasible option due to resultant secondary impacts to Muni operations of the T-Line. Consequently, the noise impact resulting from the increase in noise levels from crowds gathering at the Muni T-Line platform during quieter nighttime periods would be *significant and unavoidable.* Under the scenario where the proposed Muni Special Event Transit Service Plan is not implemented, it is likely that greater numbers of patrons would seek access to the Muni T-Line platform resulting in exacerbation of this significant and unavoidable impact.

Nevertheless, it should be noted that these noise increases at the Muni platform would be of limited duration, with post game dispersion rate of about 45 minutes and would only occur on event nights. The project sponsor, as part of its site management practices, would implement the San Francisco Entertainment Commission's Good Neighbor Policy for nighttime entertainment activities, urging patrons to respect the quiet of the neighborhood as they leave the area and providing a phone number to all interested neighbors to respond to complaints. Furthermore, it is assumed that the Hearst Towers have been designed to Title 24 noise insulation standards to mitigate exterior noise levels to a 45 dBA interior performance standard, although this standard would likely not be met if the windows are open.

Other than Hearst Tower, the UCSF Hospital is located approximately 900 feet from the southbound Muni platform and would not be expected to experience a substantial noise increase from crowd egress. An additional UCSF housing building is proposed for Block 15, west of Fifth Street, but this location, while quieter is located over 1,000 feet away from the proposed arena and transit platform and would be shielded by intervening buildings, including the Sandler Neuroscience Building, Arthur and Toni Remberock Hall, and Hearst Tower.

Summary of Impact NO-5, Operational Noise from Mobile Sources

Noise levels generated by crowds prior to, during, and after events is expected to result in a substantial increase in noise levels at the receptor adjacent to the northbound Muni T-Line transit platform, particularly during nighttime egress hours of 9 p.m. to 11 p.m., and this impact would be *significant and unavoidable*.

Operation of the proposed project would introduce new mobile noise sources that would contribute to ambient noise levels in the project vicinity. Increases in roadway traffic noise would be *significant and unavoidable* during events either with or without implementation of the Muni Special Event Transit Service Plan, even with implementation of **Mitigation Measure M-TR-2c, Additional Strategies to Reduce Transportation Impacts** and **Mitigation Measure M-TR-11c, Additional Strategies to Reduce Transportation Impacts of Overlapping Events**, as described in Section 5.2, Transportation and Circulation. These measures identify additional transportation demand management strategies beyond those already incorporated in the proposed project that the project sponsor would pursue in collaboration with the City.

Mitigation Measure M-TR-2c: Additional Strategies to Reduce Transportation Impacts (see Section 5.2, Transportation and Circulation, Impact TR-2)

Mitigation Measure M-TR-11c: Additional Strategies to Reduce Transportation Impacts of Overlapping Events (see Section 5.2, Transportation and Circulation, Impact TR-2)

Comparison of Impact NO-5 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR identified traffic noise increases as less than significant and no mitigation was required. The FSEIR also assessed crowd noise in combination with outdoor concert noise (cheering within the outdoor ballpark). Noise from patron egress was not assessed.

Consequently, the significant and unavoidable traffic and crowd noise impact identified in Impact NO-5 would be a *new significant and unavoidable* impact of the proposed project not previously identified in the Mission Bay FSEIR. This is a result not only of traffic generated by events at the proposed arena but also because of new sensitive receptors subsequently developed along Illinois Street and adjacent to Terry Francois Boulevard. In addition, neither the UCSF Hearst Tower housing building nor the Muni T-line platform were constructed at the time of the Mission Bay FSEIR impact analysis.

Cumulative Impacts

Impact C-NO-1: Construction activities of the proposed project combined with cumulative construction noise in the project area could cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction. (Less than Significant with Mitigation)

The geographic scope of analysis for cumulative noise and vibration construction impacts encompasses sensitive receptors within approximately 500 feet of the proposed project site. Beyond 500 feet, the contributions of noise from other projects would be greatly attenuated through both distance and intervening structures and their contribution would be expected to be minimal. Section 5.1, Impact Overview, presents the list of reasonably foreseeable future projects in the vicinity that could contribute to cumulative construction noise, which in particular would include the construction activities associated with implementation of the University of California, San Francisco (UCSF) Long Range Development Plan (LRDP) for the Mission Bay campus and other nearby Mission Bay development projects with construction schedules that could overlap with project construction. Some of the listed cumulative projects are sufficiently distant to not meaningfully contribute to construction noise impact.

Mission Bay Blocks 33/34 is identified as a variant in the 2014 UCSF LRDP and was analyzed as a pre-2020 project. Phase 1 of this 500,000 gsf office development is scheduled to start construction in 2016, which would occur simultaneously with construction of the proposed project. The UCSF LRDP EIR found that at the Mission Bay campus site, proposed construction activities between 2015 and 2019 include new construction at Block 15 housing, Block 33 research building, Block 33/34 parking garage, and the cancer outpatient building. These construction projects, which could occur concurrently, were identified as resulting in a significant cumulative impact on the noise environment in the site vicinity, largely as a result of pile driving activities. Construction of the proposed project would contribute to this already identified cumulative impact, either through compounding the extent and/or magnitude of construction noise in the project vicinity or through extending the duration of construction noise in the project vicinity. UCSF development located at Block 25B (across Third Street) is scheduled for construction in 2023. Additionally, the Cancer Outpatient Building is scheduled for construction starting 2018. Consequently, both of these cumulative projects would occur after completion of proposed project construction and would not combine with the proposed project in a cumulative construction noise impact.

The Uber/ARE project on Blocks 26/27 is estimated to start construction by the end of 2015, and construction could be concurrent with the proposed project. This project is immediately north of the project site, across South Street, and immediately across Third Street from the nearest sensitive receptor to the project site, the UCSF Mission Bay housing at Hearst Tower. Construction of the proposed project would contribute to cumulative construction noise from this adjacent project.

Additionally, as described in Chapter 3, Project Description, the realignment of Terry A. Francois Boulevard and development of Bayfront Park, both directly east of the project site are expected to be completed by the time the proposed project is in operation. Therefore, construction activities associated with the roadway realignment and park would likely overlap with construction of the proposed project, further contributing to cumulative construction noise. Thus, even though construction noise generated by the proposed project alone would not result in a significant noise impact, the proposed project's contribution to the cumulative noise impact from overlapping construction activities in the immediate project vicinity could be cumulatively considerable, and a potentially significant impact. However, implementation of **Mitigation Measure M-C-NO-1, Construction Noise Control Measures**, would reduce the project's contribution to cumulative construction noise impacts to a less-than-significant level. Given that this measure would implement construction-related noise control measures for a project that does not include impact pile-driving, which was the principal activity and focus of the significant and unavoidable finding of the UCSF LRDP EIR, the cumulative contribution of the proposed project's construction noise impact would be *less than significant with mitigation*.

Mitigation Measure M-C-NO-1: Construction Noise Control Measures.

Contractors shall employ site-specific noise attenuation measures during construction to reduce the generation of construction noise. These measures shall be included in a Noise Control Plan that shall be submitted for review and approval by the OCII or its designated representative to ensure that construction noise is reduced to the degree feasible. Measures specified in the Noise Control Plan and implemented during project construction shall include, at a minimum, the following noise control strategies:

- Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds).

- Construction equipment with lower noise emission ratings shall be used whenever possible, particularly for air compressors.

- Sound-control devices no less effective than those provided by the manufacturer shall be provided on all construction equipment.

- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used where feasible.

- Stationary noise sources such as material stockpiles and vehicle staging areas shall be located as far from adjacent receptors as possible.

- Enclosures and mufflers for stationary equipment shall be provided, impact tools shall be shrouded or shielded, and barriers shall be installed around particularly noisy activities at the construction sites so that the line of sight between the construction activities and nearby sensitive receptor locations is blocked to the extent feasible.

- Unnecessary idling of internal combustion engines shall be prohibited.

- Construction-related vehicles and equipment shall be required to use designated truck routes to travel to and from the project sites as determined with consultation with the SFMTA as part of the permit process prior to construction (see **Improvement Measure I-TR-1**: **Construction Management Plan and Public Updates)**.

- The project sponsor shall designate a point of contact to respond to noise complaints. The point of contact must have the authority to modify construction noise-generating activities to ensure compliance with the measures above and with the San Francisco Noise Ordinance.

Comparison of Impact C-NO-1 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR did not contain an analysis of cumulative construction noise impacts *per se*, although as a program EIR, the Mission Bay FSEIR analyzed the construction noise impact of the Mission Bay Redevelopment Plan as a whole, covering development throughout an area over 300 acres in size, which is essentially a cumulative analysis. As described above in Impact NO-1, the FSEIR identified construction-related noise impacts as less than significant with mitigation to address noise from impact pile driving. Consequently, the cumulative construction noise analysis for the proposed project would have the same significance conclusions as identified in the Mission Bay FSEIR, and there would be no new or substantially more severe significant impact than previously identified.

Impact C-NO-2: Operation of the proposed project when considered with other cumulative development would cause a substantial permanent increase in ambient noise levels in the project vicinity. (Significant and Unavoidable with Mitigation)

Operational noise impacts of the proposed project would primarily result from increased traffic on the local roadway network. Cumulative plus project traffic data were used to estimate the cumulative operational noise increases shown in **Table 5.3-11**. Significant cumulative increases in ambient roadside noise levels are predicted to occur at three of the six road segments analyzed.

While cumulative noise levels are predicted to increase by 3 dBA or more along Third Street, as can be seen from Table 5.3-10, the project contribution to this increase is less than 1.5 dBA which would not be considered a cumulatively considerable contribution, based on FICON guidance for transportation noise which indicates that noise increases of 1.5 dBA warrant further analysis. Therefore, this cumulative increase along Third Street is not a cumulative noise increase of the proposed project.

However, a significant cumulative noise increase would occur along Illinois Street during Saturday basketball events. Additionally, cumulative noise levels along Mariposa Street during Saturday basketball events would increase by more than 5 dBA with the project contributing more than 1.5 dBA of this increase. This would result in a cumulatively considerable noise impact of the proposed project. Noise from crowds gathering at the Muni T-Line platform across from Hearst Tower following the end of events would also contribute to cumulative, long-term increases in noise levels.

Operation of the proposed project would contribute to ambient noise levels in the project vicinity. Cumulative increases in roadway traffic noise would be *significant and unavoidable* during events even with implementation of transportation mitigation measures identified in Section 5.2, Transportation and Circulation.

> **Mitigation Measure M-TR-2c: Additional Strategies to Reduce Transportation Impacts** (see Section 5.2, Transportation and Circulation, Impact TR-2)
>
> **Mitigation Measure M-TR-11c: Additional Strategies to Reduce Transportation Impacts of Overlapping Events** (see Section 5.2, Transportation and Circulation, Impact TR-2)

Comparison of Impact C-NO-2 to Mission Bay FSEIR Impact Analysis

Traffic noise increases were identified in the Mission Bay FSEIR as less than significant and no mitigation was required. Consequently, the significant and unavoidable cumulative traffic noise impact identified in Impact C-NO-2 would be a new significant and unavoidable impact of the proposed project not previously identified in the 1998 FSEIR. This is a result not only of traffic generated by events at the proposed arena but also because of new sensitive receptors subsequently developed along Illinois Street and Mariposa Street.

TABLE 5.3-11
MODELED CUMULATIVE TRAFFIC NOISE LEVELS

Roadway Segment	Existing	Cumulative without Project	Cumulative plus Convention Event	Project Contribution	dBA Difference Over Existing	Significant Increase?
Weekday Peak Hour Noise Levels (4 PM – 6 PM)						
Third Street between South Street and China Basin Street	69.1	71.8	72.2	0.4	3.1	No[a]
Third Street between 16th Street and Mariposa Street	69.9	71.8	71.8	<0.1	1.9	No
Illinois Street between Mariposa Street and 20th Street	60.3	61.2	64.6	3.4	4.3	No
Terry Francois Boulevard between South Street and China Basin Street	59.8	61.9	61.9	<0.1	2.1	No
16th Street between Third Street and I-280	66.4	67.2	68.2	1.0	1.8	No
Mariposa Street between Third Street and I-280	65.5	67.1	68.0	0.9	2.5	No
Roadway Segment	**Existing**	**Cumulative without Project**	**Cumulative plus Basketball Event**	**Project Contribution**	**dBA Difference Over Existing**	**Significant Increase?**
Weekday Peak Hour Noise Levels (4 PM – 6 PM)						
Third Street between South Street and China Basin Street	69.1	71.8	72.1	0.3	3.0	No[a]
Third Street between 16th Street and Mariposa Street	69.9	71.8	71.9	0.1	2.0	No
Illinois Street between Mariposa Street and 20th Street	60.3	61.2	63.6	2.4	3.3	No
Terry Francois Boulevard between South Street and China Basin Street	59.8	61.9	62.0	0.1	2.2	No
16th Street between Third Street and I-280	66.4	67.2	67.9	0.7	1.5	No
Mariposa Street between Third Street and I-280	65.5	67.1	67.8	0.7	2.3	No
Roadway Segment	**Existing**	**Cumulative without Project**	**Cumulative plus Basketball Event**	**Project Contribution**	**dBA Difference Over Existing**	**Significant Increase?**
Saturday Evening Noise Levels (6 PM – 8 PM)						
Third Street between South Street and China Basin Street	64.7	67.5	68.9	1.4	4.2	No[a]
Third Street between 16th Street and Mariposa Street	65.1	67.3	67.5	0.2	2.4	No
Illinois Street between Mariposa Street and 20th Street	54.7	57.8	62.7	4.9	8.0	**Yes**
Terry Francois Boulevard between South Street and China Basin Street	54.0	58.2	58.5	0.3	4.5	No
16th Street between Third Street and I-280	61.4	62.4	64.6	0.2	3.2	No
Mariposa Street between Third Street and I-280	60.4	62.7	65.9	3.2	5.5	**Yes**

NOTES: Road center to receptor distance is assumed to be 50 feet for values shown in this table. Noise levels were determined using the Federal Highway Administration (FHWA) traffic noise model. The average speed on these segments is assumed to be 25, 30 or 35 miles per hour, depending on the roadway. For all other assumptions, refer to Appendix NO. The incremental increase is considered significant if the noise increase is equal to or greater than 3 dBA with an ambient noise environment greater than 65 dBA.

[a] Although a cumulative noise impact would occur along Third Street, because the projects would contribute less than 1.5 dBA to this increase, the projects contribution is not considered cumulatively considerable.

SOURCE: ESA 2015

Impact C-NO-3: Occupants of the proposed project would not be substantially affected by noise from future operations of the helipad at the adjacent UCSF Hospital. (Less than Significant)

Beginning in 2015, the UCSF Medical Center began operating a helipad that has occasional helicopter operations. Because helicopter overflights would be isolated occurrences, their single event instantaneous noise level would be of brief duration and would be greater than ambient noise levels noise contributions, with a maximum noise level of 85 dBA expected (based on a 95 dB single event noise exposure level[27]). The relative infrequency and acoustical nature of a helicopter overflight noise varies distinctly from traffic generation and other steady-state project noise sources such that the summing of the acoustical energy of ambient noise and helicopter operations is not a meaningful cumulative analysis. In other words, during the brief periods of helicopter overflight, helicopter noise will dominate over the ambient noise levels, rendering the cumulative contribution of other ambient sources insignificant. Therefore, future helicopter noise is assessed as an isolated event.

Noise modeling for helicopter operations at the UCSF Medical Center at Mission Bay was presented as part of the *Final EIR, UCSF Medical Center at Mission Bay*.[28] This modeling indicated that the 65 dB CNEL[29] noise contour during average day and busy-day helicopter operations extends to the east across Third Street, but does not include the project site. Because the event center, office and retail land uses proposed by the project are not considered noise sensitive land uses and because the 65 dB CNEL contour does not extend onto the project site, the cumulative noise impacts of operations of the UCSF Medical Center helipad would be *less than significant*.

Mitigation: Not required.

Comparison of Impact C-NO-3 to Mission Bay FSEIR Impact Analysis

An addendum to the Mission Bay FSEIR was prepared in 2008 that addressed the noise impacts of operations of the UCSF Medical Center helipad. This analysis only identified operational noise impacts to residential areas to the south and east of the hospital helipad and mitigation measures were identified to address these impacts. However, the residual noise impact, after mitigation, was determined to be significant and unavoidable for residential uses. The proposed project would not include residential or other noise sensitive land uses, so there would be no new or substantially more severe significant impacts from what were disclosed in the FSEIR and associated addenda.

[27] The single event noise exposure level, or SENEL is a noise metric that normalizes the sound energy of a single event such as an aircraft fly-over over the period when the sound level is within 10 dB of the Lmax. As stated on Page 19 of the cited report (UCSF, *UCSF Medical Center at Mission Bay—Residential Sound Reduction Program for Helicopter Operations, Final Supplemental Environmental Impact Report*, 2009), the SENEL is typically 10 dB higher than the Lmax for aircraft noise.,

[28] UCSF, *UCSF Medical Center at Mission Bay—Residential Sound Reduction Program for Helicopter Operations, Final Supplemental Environmental Impact Report*, 2009.

[29] CNEL is roughly equivalent to DNL, usually within 1 dBA

5.4 Air Quality

5.4.1 Introduction

This section discusses the existing air quality conditions in the project area, presents the regulatory framework for air quality management, and analyzes the potential for the proposed project to affect existing air quality conditions, both regionally and locally, due to activities that emit criteria and non-criteria air pollutants. It also analyzes the types and quantities of emissions that would be generated on a temporary basis due to proposed construction activities as well as those generated over the long term due to proposed operation of project elements. The analysis determines whether those emissions are significant in relation to applicable air quality standards and identifies feasible mitigation measures for significant adverse impacts. The section also includes an analysis of cumulative air quality impacts. The potential for odor impacts was addressed in the Initial Study (Appendix NOP-IS, page 60), which found that the proposed project would not result in new significant impacts or substantially increase the severity of impacts on air quality with respect to odors. Therefore, odor impacts are not addressed in this SEIR. Emissions of greenhouse gases resulting from the proposed project's potential impacts on climate change and the state's goals for greenhouse gas emissions pursuant to Assembly Bill 32 are presented and discussed in Section 5.5, Greenhouse Gas Emissions.

The analysis in this section is based on a review of existing air quality conditions in the region and air quality regulations administered by the United States Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD). This analysis includes methodologies identified in the updated BAAQMD *CEQA Air Quality Guidelines* (May 2012).

5.4.2 Summary of Mission Bay FSEIR Section

5.4.2.1 Mission Bay FSEIR Setting

The air quality setting for the Mission Bay area discussed in the Mission Bay FSEIR differs from the existing setting today in terms of air quality conditions, the regulatory environment, and in the level of available information with respect to health risks and hazards. Specifically, at the time of the Mission Bay FSEIR, localized concentrations of criteria air pollutants were higher than what are monitored today as many of the regulatory improvements implemented since then have improved air quality conditions. As an example, the FSEIR reported that carbon monoxide standards were occasionally exceeded in San Francisco and that particulate emission standards were regularly exceeded in San Francisco. Since 1998, the effect of reformulated gasoline and other regulatory changes has resulted in no carbon monoxide violations in the past 15 years and a reduction in the number of violations of the particulate matter standard despite subsequent strengthening of the ambient particulate standards.

In 1998 when the Mission Bay FSEIR was certified, the BAAQMD had published CEQA Air Quality Guidelines, however, those guidelines differed substantially from the BAAQMD guidelines published in 2012 and used in this SEIR. For example, the earlier guidelines did not recommend quantification of construction-related emissions of criteria pollutants.

5.4.2.2 Mission Bay FSEIR Impacts and Mitigation Measures

Air quality impacts assessed in the Mission Bay FSEIR included Mission Bay Blocks 29-32 as a part of the over 300-acre area analyzed in the Redevelopment Plan. The Mission Bay FSEIR identified a significant and unavoidable impact from operational vehicle emissions, while criteria pollutant emissions from stationary sources were identified as less than significant due to new source review requirements. Mitigation Measure F.1 was identified to reduce vehicle trips associated with development, although the Mission Bay FSEIR acknowledged that reduction of vehicle emissions below thresholds was not reasonably attainable because projected emissions were so far above the thresholds. Mitigation Measure F.1 essentially implemented Mitigation Measures E.46 through E.50 of the Mission Bay FSEIR Transportation analysis:

- E.46: Establishment of Transportation Management Organizations—This measure has already been implemented. See Section 5.2, Transportation and Circulation.
- E.47: Transportation System Management Plan—These measures, as applicable to the proposed project, have been incorporated into the Mission Bay South Owner Participation Agreement, and thus are assumed to be part of the project. See Section 5.2, Transportation and Circulation
- E.48: Constrain parking at UCSF—This measure was not adopted.[1]
- E.49: Good faith efforts to assist in implementation of ferry service—This measure does not apply to the proposed project, as it is currently being implemented by the Water Emergency Transportation Authority.
- E.50: Telecommuting/flexible hours—This measure was incorporated into Measure E.47.

The impact analysis also included modeling of carbon monoxide (CO) concentrations for 13 intersections in the project area. While modeling indicated that several of these intersections would potentially experience CO concentrations in excess of state and federal standards under existing plus project conditions, modeling under future year (2015) plus project conditions indicated that these violations would not be realized in the future due to planned improvements in the vehicle fleet and reformulated gasoline.

The Plan-level impact analysis conducted in the Mission Bay FSEIR assessed the consistency of population increases from development under the entire proposed plan with the growth assumptions of the applicable Clean Air Plan at the time, the *'97 Clean Air Plan*. This analysis

[1] Mission Bay FSEIR Mitigation Measure E.48 was not adopted by the San Francisco Board of Supervisors. See CEQA Findings, October 14, 1998. San Francisco Board of Supervisors Resolution No. 854-98, regarding adopting environmental findings (and a statement of overriding considerations) pursuant to the California Environmental Quality Act and State guidelines in connection with adoption of the Mission Bay North and Mission Bay South Redevelopment Plans and various other actions necessary to implement such plans.

identified a significant Plan-level air quality impact as population growth under the Plan would have exceeded that of the *'97 Clean Air Plan*.

The Mission Bay FSEIR also identified air pollutant emissions from construction and demolition activities as a less-than-significant air quality impact with implementation of Mitigation Measure F.2, which requires a menu of 14 particulate emission control measures.

Operational health risk impacts were identified as potentially significant in the Mission Bay FSEIR and mitigation was identified, but because of lack of a specific development proposal, this impact was identified as significant and unavoidable with mitigation.

The Mission Bay FSEIR mitigation measures for impacts due to emissions of toxic air contaminants (TAC) during project operations include the following:

- F.3: Require applicant to demonstrate receipt of BAAQMD permit for stationary TAC sources.
- F.4: Establish meteorological station in Mission Bay.
- F.5: Reduce exposure to dry cleaning facilities in the area that use perchloroethylene[2] and other toxic contaminants.
- F.6: Creation of buffer zones for pre-school and child care centers from TAC sources.

5.4.3 Setting

5.4.3.1 Climate and Meteorology

The project area is located within the San Francisco Bay Area Air Basin (SFBAAB). The air basin's moderate climate steers storm tracks away from the region for much of the year, although storms generally affect the region from November through April. San Francisco's proximity to the onshore breezes stimulated by the Pacific Ocean provide for generally very good air quality in the project area.

Temperatures in the project area average in the mid-50s annually, generally ranging from the low 40s on winter mornings to mid-70s during summer afternoons. Daily and seasonal oscillations of temperature are small because of the moderating effects of the nearby San Francisco Bay. In contrast to the steady temperature regime, rainfall is highly variable and confined almost exclusively to the "rainy" period from November through April. Precipitation may vary widely from year to year as a shift in the annual storm track of a few hundred miles can mean the difference between a very wet year and drought conditions.

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air

[2] In 2006, USEPA updated its air toxics rule for dry cleaners that requires operators to control percloroethylene (perc) emissions at individual dry cleaners. The rule includes a phase-out of perc use at dry cleaners located in residential buildings by December 21, 2022, along with requirements that already have reduced perc emissions at other dry cleaners.

pollutants regionally. The project area lies within the Peninsula climatological subregion. Marine air traveling through the Golden Gate is a dominant weather factor affecting dispersal of air pollutants within the region. Wind measurements collected on the San Francisco mainland indicate a prevailing wind direction from the west and an average annual wind speed of 10.3 miles per hour.[3] Increased temperatures create the conditions in which ozone formation can increase.

5.4.3.2 Ambient Air Quality – Criteria Air Pollutants

As required by the 1970 federal Clean Air Act, the USEPA initially identified six criteria air pollutants that are pervasive in urban environments and for which state and federal health-based ambient air quality standards have been established. USEPA calls these pollutants "criteria air pollutants" because the agency has regulated them by developing specific public-health-based and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead are the six criteria air pollutants originally identified by USEPA. Since that time, subsets of particulate matter have been identified for which permissible levels have been established. These include particulate matter of 10 microns in diameter or less (PM_{10}) and particulate matter of 2.5 microns in diameter or less ($PM_{2.5}$).

The BAAQMD is the regional agency with jurisdiction for regulating air quality within the nine county SFBAAB. The region's air quality monitoring network provides information on ambient concentrations of criteria air pollutants at various locations in the San Francisco Bay Area. **Table 5.4-1** presents a five-year summary for the period 2010 to 2014 of the highest annual criteria air pollutant concentrations, collected at the air quality monitoring station operated and maintained by the BAAQMD at 16th and Arkansas Streets (Potrero Hill), approximately one half mile west of the project site. Table 5.4-1 also compares measured pollutant concentrations with the most stringent applicable ambient air quality standards (state or federal). Concentrations shown in bold indicate an exceedance of the standard.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG, also sometimes referred to as volatile organic compounds or VOC by some regulating agencies) and nitrogen oxides (NOx). The main sources of ROG and NOx, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases, such as asthma, bronchitis, and emphysema.

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[3] http://www.wrcc.dri.edu/htmlfiles/westwinddir.html#CALIFORNIA, accessed on February 19, 2014.

TABLE 5.4-1
SUMMARY OF SAN FRANCISCO AIR QUALITY MONITORING DATA (2010–2014)

Pollutant	Most Stringent Applicable Standard	Number of Days Standards Were Exceeded and Maximum Concentrations Measured[a]				
		2010	2011	2012	2013	2014
Ozone						
- Days 1-Hour Standard Exceeded		0	0	0	0	0
- Maximum 1-Hour Concentration (pphm)	>9 pphm[b]	8	7	7	7	8
- Days 8-Hour Standard Exceeded		0	0	0	0	0
- Maximum 8-Hour Concentration (pphm)	>7 pphm[c]	5	5	5	6	7
Carbon Monoxide (CO)						
- Days 1-Hour Standard Exceeded		0	0	0	0	0
- Maximum 1-Hour Concentration (ppm)	>20 ppm[b]	1.8	1.8	2.0	1.8	1.8
- Days 8-Hour Standard Exceeded		0	0	0	0	0
- Maximum 8-Hour Concentration (ppm)	>9 ppm[b]	1.4	1.2	1.2	1.4	1.0
Suspended Particulates (PM_{10})						
- Days 24-Hour Standard Exceeded[d]		0	0	1	0	0
- Maximum 24-Hour Concentration (μg/m^3)	>50 μg/m^3 [b]	40	46	**51**	44	36
Suspended Particulates ($PM_{2.5}$)						
- Days 24-Hour Standard Exceeded[d]		1	3	2	1	2
- Maximum 24-Hour Concentration (μg/m^3)	>35 μg/m^3 [e]	**36**	**45**	**47**	**36**	**49**
- Annual Average (μg/m^3)	>12 μg/m^3 [b, c]	9.7	10.5	9.5	8.2	10.1
Nitrogen Dioxide (NO_2)						
- Days 1-Hour Standard Exceeded		0	0	1	0	0
- Maximum 1-Hour Concentration (pphm)	>10 pphm[c]	9	9	**12**	7	8

NOTES:
Bold values are in excess of applicable standard.
ppm = parts per million; pphm = parts per hundred million
μg/m^3 = micrograms per cubic meter
ND = No data or insufficient data.

a Number of days exceeded is for all days in a given year, except for particulate matter. PM_{10} and $PM_{2.5}$ are monitored every six days and therefore the number of days exceeded is out of approximately 60 annual samples.
b State standard, not to be exceeded.
c Federal standard, not to be exceeded.
d Based on a sampling schedule of one out of every six days, for a total of approximately 60 samples per year.
e Federal standard was reduced from 65 μg/m^3 to 35 μg/m^3 in 2006.

SOURCE: BAAQMD, Bay Area Air Pollution Summary, 209 – 2014. Available online at: http://www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Quality-Summaries.aspx. Accessed April 21, 2015.

Table 5.4-1 shows that, according to published data, the most stringent applicable standards for ozone (state 1-hour standard of 9 parts per hundred million [pphm] and the federal 8-hour standard of 8 pphm) were not exceeded in San Francisco between 2010 and 2014.

Carbon Monoxide (CO)

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of

CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal. As shown in Table 5.4-1, the more stringent state CO standards were not exceeded between 2010 and 2014. Measurements of CO indicate hourly maximums ranging between 9 to 10 percent of the more stringent state standard, and maximum 8-hour CO levels that are approximately 11 to 16 percent of the allowable 8-hour standard.

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

Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from man-made and natural sources. Particulate matter is measured in two size ranges: PM_{10} for particles less than 10 microns in diameter, and $PM_{2.5}$ for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about one-half of the air basin's particulates, through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the CARB, studies in the United States and elsewhere "have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks," and studies of children's health in California have demonstrated that particle pollution "may significantly reduce lung function growth in children." The CARB also reports that statewide attainment of particulate matter standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.[4] Among the criteria pollutants that are regulated, particulates appear to represent a serious ongoing health hazard. As long ago as 1999, the BAAQMD was reporting, in its *CEQA Air Quality Guidelines*, that studies had shown that elevated particulate levels contribute to the death of approximately 200 to 500 people per year in the Bay Area. High levels of particulate matter can exacerbate chronic respiratory ailments, such as bronchitis and asthma, and have been associated with increased emergency room visits and hospital admissions.

Table 5.4-1 shows that an exceedance of the state PM_{10} standard occurred on one monitored occasion between 2010 and 2014 in San Francisco. It is estimated that the state 24-hour PM_{10} standard of 50 micrograms per cubic meter ($\mu g/m^3$) was exceeded on up to 6 days per year between 2010 and 2014.[5] It is estimated that the state 24-hour $PM_{2.5}$ standard was exceeded on up to 48 days per year between 2010 and 2014.[4] The federal state annual average standard was not exceeded between 2010 and 2014.

4 California Air Resources, Board, "Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution," November 2007. A copy of this document is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2014.1441E

5 PM_{10} and $PM_{2.5}$ are sampled every sixth day; therefore, actual days over the standard can be estimated to be six times the numbers listed in the table.

$PM_{2.5}$ is of particular concern because epidemiologic studies have demonstrated that people who live near freeways and high-traffic roadways have poorer health outcomes, including increased asthma symptoms and respiratory infections and decreased pulmonary function and lung development in children.[6]

Nitrogen Dioxide (NO_2)

NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. Table 5.4.1 shows that the current state standard for NO_2 is being met in San Francisco. In 2010, the USEPA implemented a new 1-hour NO_2 standard presented in **Table 5.4-2**. Currently, the CARB is recommending that the Bay Area air basin be designated as an attainment area for the new standard.[7] This new federal standard was exceeded on one day at the San Francisco station between 2010 and 2014.

The USEPA has also established requirements for a new monitoring network to measure NO_2 concentrations near major roadways in urban areas with a population of 500,000 or more. Sixteen new near-roadway monitoring sites are required in California, three of which will be in the Bay Area. These monitors are planned for Berkeley, Oakland, and San Jose. The Oakland station commenced operation in February 2014 and the San Jose station commenced in March of 2015 while the Berkeley station is expected to be operational in summer 2015. The new monitoring data may result in a need to change area designations in the future. The CARB will revise the area designation recommendations, as appropriate, once the new monitoring data become available.

Sulfur Dioxide (SO_2)

SO_2 is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease.,[8] Pollutant trends suggest that the air basin currently meets and will continue to meet the state standard for SO_2 for the foreseeable future.

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[6] San Francisco Department of Public Health, Assessment and Mitigation of Air Pollutant Health Effect from Intra-urban Roadways: Guidance for Land Use Planning and Environmental Review, May 2008, p. 7. A copy of this document is available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2014.1441E.

[7] CARB, Recommended Area Designations for the 2010 Nitrogen Dioxide Standards, Technical Support Document, January 2011, http://www.airquality.org/plans/federal/no2/NO2Enclosure_1.pdf. Accessed February 25, 2015.

[8] BAAQMD, *CEQA Air Quality Guidelines*, May 2011, http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx; p. C-16.

TABLE 5.4-2
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS

Pollutant	Averaging Time	State (SAAQs[a])		Federal (NAAQS[b])	
		Standard	Attainment Status	Standard	Attainment Status
Ozone	1 hour	0.09 ppm	**N**	NA	See Note c
	8 hour	0.07 ppm	**N**[d]	0.075 ppm	**N**/Marginal
Carbon Monoxide (CO)	1 hour	20 ppm	A	35 ppm	A
	8 hour	9 ppm	A	9 ppm	A
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	A	0.100 ppm	U
	Annual	0.030 ppm	NA	0.053 ppm	A
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	A	0.075	A
	24 hour	0.04 ppm	A	0.14	A
	Annual	NA	NA	0.03 ppm	A
Particulate Matter (PM_{10})	24 hour	50 μg/m^3	**N**	150 μg/m^3	U
	Annual[e]	20 μg/m^3 [f]	**N**	NA	NA
Fine Particulate Matter ($PM_{2.5}$)	24 hour	NA	NA	35 μg/m^3	**N**
	Annual	12 μg/m^3	**N**	12 μg/m^3	U/A
Sulfates	24 hour	25 μg/m^3	A	NA	NA
Lead	30 day	1.5 μg/m^3	A	NA	NA
	Cal. Quarter	NA	NA	1.5 μg/m^3	A
Hydrogen Sulfide	1 hour	0.03 ppm	U	NA	NA
Visibility-Reducing Particles	8 hour	See Note g	U	NA	NA

NOTES:
A = Attainment; **N** = Nonattainment; U = Unclassified; NA = Not Applicable, no applicable standard; ppm = parts per million; μg/m^3 = micrograms per cubic meter.

[a] SAAQS = state ambient air quality standards (California). SAAQS for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded.
[b] NAAQS = national ambient air quality standards. NAAQS, other than ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The 8-hour ozone standard is attained when the three-year average of the fourth highest daily concentration is 0.08 ppm or less. The 24-hour PM10 standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than the standard. The 24-hour PM2.5 standard is attained when the three-year average of the 98th percentile is less than the standard.
[c] The United States Environmental Protection Agency (USEPA) revoked the national 1-hour ozone standard on June 15, 2005.
[d] This state 8-hour ozone standard was approved in April 2005 and became effective in May 2006.
[e] State standard = annual geometric mean; national standard = annual arithmetic mean.
[f] In June 2002, the California Air Resources Board (CARB) established new annual standards for PM2.5 and PM10.
[g] Statewide visibility-reducing particle standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

SOURCE: Bay Area Air Quality Management District (BAAQMD), Standards and Attainment Status, 2015, http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, accessed October 13 2014; and U.S. EPA National Ambient Air Quality Standards, 2012, http://www.epa.gov/air/criteria.html, accessed October 13, 2014.

In 2010, the USEPA implemented a new 1-hour SO_2 standard presented in Table 5.4-2. The USEPA has initially designated the SFBAAB as an attainment area for SO_2. Similar to the new federal standard for NO_2, the USEPA has established requirements for a new monitoring network to measure SO_2 concentrations beginning in January 2013.[9] No additional SO_2 monitors are required for the Bay Area because the BAAQMD jurisdiction has never been designated as non-attainment for SO_2 and no State Implementation Plans or maintenance plans have been prepared for SO_2.[10]

Lead

Leaded gasoline (phased out in the United States beginning in 1973), paint (on older houses, cars), smelters (metal refineries), and manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects, which put children at special risk. Some lead-containing chemicals cause cancer in animals. Lead levels in the air have decreased substantially since leaded gasoline was eliminated. Ambient lead concentrations are only monitored on an as-warranted, site-specific basis in California. On October 15, 2008, the USEPA strengthened the national ambient air quality standard for lead by lowering it from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$. The USEPA revised the monitoring requirements for lead in December 2010.[11] These requirements focus on airports and large urban areas resulting in an increase in 76 monitors nationally.[12] Lead monitoring stations in the Bay Area are located at Palo Alto Airport, Reid-Hillview Airport (San Jose), and San Carlos Airport. Non-airport locations for lead monitoring are Redwood City and San Jose.

Air Quality Index

The USEPA developed the Air Quality Index (AQI) scale to make the public health impacts of air pollution concentrations easily understandable. The AQI, much like an air quality "thermometer," translates daily air pollution concentrations into a number on a scale between 0 and 500. The numbers in the scale are divided into six color-coded ranges, with numbers 0-300 as outlined below.

- Green (0-50) indicates "good" air quality. No health impacts are expected when air quality is in the green range.
- Yellow (51-100) indicates air quality is "moderate." Unusually sensitive people should consider limited prolonged outdoor exertion.
- Orange (101-150) indicates air quality is "unhealthy for sensitive groups." Active children and adults, and people with respiratory disease, such as asthma, should limit outdoor exertion.

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9 U.S. EPA,2010a, *Fact Sheet: Revisions to the Primary National Ambient Air Quality Standard, Monitoring Network, and Data Reporting Requirements for Sulfur Dioxide*, June 2, 2010; http://www.epa.gov/air/sulfurdioxide/pdfs/20100602fs.pdf
10 BAAQMD, *2012 Air Monitoring Network Plan*, July 2013, www.baaqmd.gov/Divisions/Technical-Services/Ambient-Air-Monitoring/AAMN-Plan.aspx; p. 30
11 U.S. EPA, 2010b, *Fact Sheet Revisions to Lead Ambient Air Quality Monitoring Requirements*, http://www.epa.gov/air/lead/pdfs/Leadmonitoring_FS.pdf, accessed October 13, 2014.
12 U.S. EPA, Fact Sheet Revisions to Lead Ambient Air Quality Monitoring Requirements, http://www.epa.gov/air/lead/pdfs/Leadmonitoring_FS.pdf, accessed May 6, 2015.

- Red (151-200) indicates air quality is "unhealthy." Active children and adults, and people with respiratory disease, such as asthma should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
- Purple (201-300) indicates air quality is "very unhealthy." Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit outdoor exertion.

The AQI numbers refer to specific amounts of pollution in the air. They are based on the federal air quality standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM_{10}, and $PM_{2.5}$. In most cases, the federal standard for these air pollutants corresponds to the number 100 on the AQI chart. If the concentration of any of these pollutants rises above its respective standard, it can be unhealthy for the public. In determining the air quality forecast, local air districts, including the BAAQMD, use the anticipated concentration measurements for each of the major pollutants, convert them into AQI numbers, and determine the highest AQI for each zone in a district.

Readings below 100 on the AQI scale would not typically affect the health of the general public (although readings in the moderate range of 50 to 100 may affect unusually sensitive people). Levels above 300 rarely occur in the United States, and readings above 200 have not occurred in the Bay Area in decades.[13] Historical BAAQMD data indicate that the SFBAAB experienced air quality in the Red level (unhealthy) on two days between the years 2009 to 2013. As shown in **Table 5.4-3**, the SFBAAB had a total of 19 orange-level (unhealthy for sensitive groups) days in 2009, 14 days in 2010, 12 days in 2011, 8 days in 2012, and 15 days 2013.

TABLE 5.4-3
AIR QUALITY INDEX STATISTICS FOR THE SAN FRANCISCO BAY AREA AIR BASIN

AQI Statistics for City of San Francisco	Number of Days by Year				
	2009	**2010**	**2011**	**2012**	**2013**
Unhealthy for Sensitive Groups (Orange)	19	14	12	8	15
Unhealthy (Red)	0	1	0	0	1

SOURCE: Bay Area Air Quality Management District, 2014.

5.4.3.3 Toxic Air Contaminants and Local Health Risks and Hazards

In addition to criteria air pollutants, individual projects may emit toxic air contaminants (TACs). TACs collectively refer to a diverse group of air pollutants that are capable of causing chronic (i.e., of long duration) and acute (i.e., severe but short term) adverse effects to human health, including carcinogenic effects. Human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees

13 Bay Area Air Quality Management District, 2014. Website: sparetheair.org/Stay-Informed/Todays-Air-Quality/Air-Quality-Index.aspx, accessed May 15, 2015.

of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

Unlike criteria air pollutants, TACs do not have ambient air quality standards but are regulated by the BAAQMD using a risk-based approach to determine which sources and pollutants to control as well as the degree of control. A health risk assessment (HRA) is an analysis which estimates human health exposure to toxic substances, and when considered together with information regarding the toxic potency of the substances, provides quantitative estimates of health risks.[14]

Air pollution does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. Land uses such as residences, schools, children's day care centers, hospitals, and nursing and convalescent homes are considered to be the most sensitive to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress or, as in the case of residential receptors, their exposure time is greater than for other land uses. Therefore, these groups are referred to as sensitive receptors. Exposure assessment guidance typically assumes that people in residences would be exposed to air pollution 24 hours per day, 350 days per year, for 70 years. Therefore, assessments of air pollutant exposure to residents typically result in the greatest adverse health outcomes of all population groups.

Exposures to fine particulate matter ($PM_{2.5}$) are strongly associated with mortality, respiratory diseases, and lung development in children, and other endpoints such as hospitalization for cardiopulmonary disease.[15] In addition to $PM_{2.5}$, diesel particulate matter (DPM) is also of concern. The California Air Resources Board (CARB) identified DPM as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans.[16] The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

San Francisco Modeling of Air Pollutant Exposure Zones

In an effort to identify areas of San Francisco most adversely affected by sources of TACs, San Francisco partnered with the BAAQMD to inventory and assess air pollution and exposures from vehicles, stationary, and area sources within San Francisco. Citywide dispersion modeling was conducted using AERMOD[17] to assess the emissions from the following primary sources:

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[14] In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. The applicant is then subject to a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, estimating the increased risk of cancer as a result of exposure to one or more TACs.

[15] SFDPH, *Assessment and Mitigation of Air Pollutant Health Effects from Intra-Urban Roadways: Guidance for Land Use Planning and Environmental Review,* May 2008.

[16] California Air Resources Board (ARB), Fact Sheet, "The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines," October 1998.

[17] AERMOD is the USEPA's preferred/recommended steady state air dispersion plume model. For more information on AERMOD and to download the AERMOD Implementation Guide see www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod (accessed May 20, 2014).

roadways, permitted stationary sources, port and maritime sources, and Caltrain. Emissions of PM_{10} (DPM is assumed equivalent to PM_{10}), $PM_{2.5}$, and total organic gases (TOG) were modeled on a 20 meter by 20 meter receptor grid covering the entire City. The results represent a comprehensive assessment of existing cumulative exposures to air pollution throughout the City. The methodology and technical documentation for modeling citywide air pollution is available in the document entitled, *The San Francisco Community Risk Reduction Plan: Technical Support Documentation*.[18]

Model results identified areas in the City with poor air quality, termed "Air Pollutant Exposure Zones," based on the following health-protective criteria: (1) cumulative $PM_{2.5}$ concentrations greater than 10 $\mu g/m^3$, and/or (2) excess cancer risk from the contribution of emissions from all modeled sources greater than 100 per one million population. An additional health vulnerability layer was incorporated in the Air Pollutant Exposure Zone for those San Francisco ZIP codes in the worst quintile of Bay Area Health Vulnerability scores (ZIP Codes 94102, 94103, 94105, 94124, and 94130). In these areas, the standard for identifying areas as being within the zone were lowered to: (1) excess cancer risk from the contribution of emissions from all modeled sources greater than 90 per one million population, and/or (2) cumulative $PM_{2.5}$ concentrations greater than 9 $\mu g/m^3$. Lastly, all parcels within 500 feet of a major freeway were also included in the Air Pollutant Exposure Zone, consistent with findings in CARB's *Air Quality and Land Use Handbook: A Community Health Perspective*, which suggests air pollutant levels decrease substantially at about 500 feet from a freeway.[19]

The proposed project at Mission Bay Blocks 29-32 is not located within an Air Pollutant Exposure Zone.

Fine Particulate Matter

In April 2011, the USEPA published *Policy Assessment for the Particulate Matter Review of the National Ambient Air Quality Standards*. In this document, USEPA staff concludes that the then-current federal annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ should be revised to a level within the range of 13 to 11 $\mu g/m^3$, with evidence strongly supporting a standard within the range of 12 to 11 $\mu g/m^3$. Air Pollutant Exposure Zones for San Francisco are based on the health protective $PM_{2.5}$ standard of 11 $\mu g/m^3$, as supported by the USEPA's Particulate Matter Policy Assessment, although lowered to 10 $\mu g/m^3$ to account for uncertainty in accurately predicting air pollutant concentrations using emissions modeling programs.

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[18] Bay Area Air Quality Management District, San Francisco Department of Public Health, and San Francisco Planning Department, *The San Francisco Community Risk Reduction Plan: Technical Support Documentation*, December 2012. Available online at ftp.baaqmd.gov/pub/CARE/SFCRRP/ SF_CRRP_Methods_and_Findings _v9.pdf Accessed February 25, 2015.

[19] California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005 (hereinafter "ARB Air Quality and Land Use Handbook"). Available at http://www.arb.ca.gov/ch/handbook.pdf. Accessed January 29, 2015.

Excess Cancer Risk

The 100 per one million persons (100 excess cancer risk) criterion discussed above is based on USEPA guidance for conducting air toxic analyses and making risk management decisions at the facility and community-scale level.[20] As described by the BAAQMD, the USEPA considers a cancer risk of 100 per million to be within the "acceptable" range of cancer risk. Furthermore, in the 1989 preamble to the benzene National Emissions Standards for Hazardous Air Pollutants (NESHAP) rulemaking,[21] the USEPA states that it "…strives to provide maximum feasible protection against risks to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately one in one million and (2) limiting to no higher than approximately one in ten thousand [100 in one million] the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years." The 100 per one million excess cancer cases is also consistent with the ambient cancer risk in the most pristine portions of the Bay Area based on BAAQMD regional modeling.[22]

In addition to monitoring criteria pollutants, both the BAAQMD and CARB operate TAC monitoring networks in the SFBAAB. These stations measure 10 to 15 TACs, depending on the specific station. The TACs selected for monitoring are those that have traditionally been found in the highest concentrations in ambient air and therefore tend to produce the most significant risk. The nearest BAAQMD ambient TAC monitoring station to the project area is the station at 16th and Arkansas Streets in San Francisco. **Table 5.4-4** shows ambient concentrations of carcinogenic TACs measured at the Arkansas Street station, approximately one half mile west of the project site. The estimated cancer risk from a lifetime exposure (70 years) to these substances is also reported in the table. When TAC measurements at this station are compared to ambient concentrations of various TACs for the Bay Area as a whole, the cancer risks associated with mean TAC concentrations in San Francisco are similar to those for the Bay Area as a whole. Therefore, the estimated average lifetime cancer risk resulting from exposure to TAC concentrations monitored at the San Francisco station do not appear to be any greater than for the Bay Area as a region.

Roadway-Related Pollutants

Motor vehicles are responsible for a large share of air pollution, especially in California. Vehicle tailpipe emissions contain diverse forms of particles and gases, and vehicles also contribute to particulates by generating road dust through tire wear. Epidemiologic studies have demonstrated that people living in proximity to freeways or busy roadways have poorer health outcomes, including increased asthma symptoms and respiratory infections and decreased pulmonary function and lung development in children. Air pollution monitoring conducted in conjunction

[20] BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance,* October 2009, page 67.
[21] 54 Federal Register 38044, September 14, 1989.
[22] BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance,* October 2009, page 67.

TABLE 5.4-4
2013 ANNUAL AVERAGE AMBIENT CONCENTRATIONS OF CARCINOGENIC TOXIC AIR CONTAMINANTS MEASURED AT BAAQMD MONITORING STATION, 10 ARKANSAS STREET, SAN FRANCISCO

Substance	Concentration	Cancer Risk per Million[a]
Gaseous TACs	**(ppb)**	
Acetaldehyde	0.56	3
Benzene	0.20	19
1,3-Butadiene	0.036	13
Carbon Tetrachloride	0.085	23
Formaldehyde	1.37	10
Perchloroethylene	0.012	0.5
Methylene Chloride	0.124	0.4
Chloroform	0.023	0.6
Trichloroethylene	0.01	0.1
Particulate TACs	**(ng/m^3)**	
Chromium (Hexavalent)	0.053	8
Total Risk for All TACs		**77.6**

NOTES:
TACs = toxic air contaminants; BAAQMD = Bay Area Air Quality Management District; ppb = part per billion; ng/m^3 = nanograms per cubic meter.

[a] Cancer risks were estimated by applying published unit risk values to the measured concentrations.

SOURCE: California Air Resources Board, *Ambient Air Toxics Summary-2013*, available online at: http://www.arb.ca.gov/adam/toxics/sitesubstance.htmlAccesssed February 25, 2015.

with epidemiologic studies has confirmed that roadway-related health effects vary with modeled exposure to particulate matter and nitrogen dioxide. In traffic-related studies, the additional non-cancer health risk attributable to roadway proximity was seen within 1,000 feet of the roadway and was strongest within 300 feet.[23] As a result, the CARB recommends that new sensitive land uses not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day. In 2008, the City and County of San Francisco (CCSF) adopted amendments to the Health Code (discussed below under "Regulatory Framework"), by adding Article 38 (amended in 2014) requiring urban infill sensitive use projects within the Air Pollutant Exposure Zone to address air pollution hazards through design and ventilation requirements.

Diesel Particulate Matter (DPM)

The CARB identified diesel particulate matter (DPM) as a toxic air contaminant in 1998, primarily based on evidence demonstrating cancer effects in humans. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled highways. The CARB estimated average

[23] California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005 (hereinafter "ARB Air Quality and Land Use Handbook"). Available at http://www.arb.ca.gov/ch/handbook.pdf. Accessed February 25, 2015.

Bay Area cancer risk from exposure to diesel particulate, based on a population-weighted average ambient diesel particulate concentration, is about 480 in one million, as of 2000, which is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. The statewide risk from DPM as determined by the CARB declined from 750 in one million in 1990 to 570 in one million in 1995; by 2000, CARB estimated the average statewide cancer risk from DPM at 540 in one million.[24,25]

In 2000, the CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. Subsequent CARB regulations apply to new trucks and diesel fuel. With new controls and fuel requirements, 60 trucks built in 2007 would have the same particulate exhaust emissions as one truck built in 1988.[26] The regulation is anticipated to result in an 80-percent decrease in statewide diesel health risk in 2020 as compared with the diesel risk in 2000. Despite notable emission reductions, the CARB recommends that proximity to sources of DPM emissions be considered in the siting of new sensitive land uses. The CARB notes that these recommendations are advisory and should not be interpreted as defined "buffer zones," and that local agencies must balance other considerations, including transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues. With careful evaluation of exposure, health risks, and affirmative steps to reduce risk where necessary, the CARB's position is that infill development, mixed use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level.[27]

Contaminated Soil

The Mission Bay FSEIR Contaminated Soil and Groundwater section included Mitigation Measures J.1a through J.1k requiring preparation of a Risk Management Plan or Plans (RMP) incorporating specific measures that would provide for the management of risks associated with exposure to contaminated soil and groundwater and would be protective of human health and the aquatic environment. The potential for exposure impacts from contaminated soil was addressed in the Initial Study (Appendix NOP-IS, page 120), which found that compliance with the RMP, as required by the deed restriction, would ensure that human health and environmental risks during and after development of the proposed project would be within acceptable levels.

24 CARB, *California Almanac of Emissions and Air Quality - 2009 Edition*, Table 5-44 and Figure 5-12, http://www.arb.ca.gov/aqd/almanac/almanac09/chap509.htm, accessed May 16, 2011.

25 This calculated cancer risk value from ambient air exposure in the Bay Area can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which for men is more than 40 percent (based on a sampling of 17 regions nationwide), or greater than 400,000 in one million, according to the American Cancer Society. (American Cancer Society, " last revised October. 1, 2014, available online at http://www.cancer.org/cancer/cancerbasics/lifetime-probability-of-developing-or-dying-from-cancer.)

26 Pollution Engineering, *New Clean Diesel Fuel Rules Start*. July, 2006 Available online at http://www.pollutionengineering.com/articles/85480-new-clean-diesel-fuel-rules-start. Accessed April 15, 2013.

27 California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective,* April 2005 (hereinafter "ARB Air Quality and Land Use Handbook"). Available at http://www.arb.ca.gov/ch/handbook.pdf.Accessed February 25, 2015.

Naturally Occurring Asbestos

The potential for exposure impacts from naturally occurring asbestos was addressed in the Initial Study (Appendix NOP-IS, page 115), which found that this impact would be potentially significant because no sampling has been conducted to establish the asbestos content in the fill materials that would be excavated during construction. This impact would be reduced to a less-than-significant level with implementation of Mitigation Measure M-HZ-1b, identified in the Initial Study, requiring the project sponsor to implement a geologic investigation to assess the naturally occurring asbestos content of the fill materials. This mitigation also requires the project sponsor to implement the requirements of the asbestos Air Toxics Control Measure (ATCM), including implementation of a Dust Mitigation Plan for naturally-occurring asbestos, if the investigation determines that the asbestos content of the fill is 0.25 percent or greater. Implementation of this measure would ensure that if naturally occurring asbestos is present, no visible dust crosses the project boundaries, and the measure could also require air monitoring to demonstrate compliance with this criterion if deemed necessary by the BAAQMD. Rock containing naturally occurring asbestos that would be disposed of off-site would not be considered a hazardous waste under California regulations.[28]

5.4.3.4 Sensitive Receptors

Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. Population subgroups sensitive to the health effects of air pollutants include: the elderly and the young; population subgroups with higher rates of respiratory disease, such as asthma and chronic obstructive pulmonary disease; and populations with other environmental or occupational health exposures (e.g., indoor air quality) that affect cardiovascular or respiratory diseases. The BAAQMD defines sensitive receptors as children, adults, and seniors occupying or residing in residential dwellings, schools, day care centers, hospitals, and senior-care facilities. Workers are not considered sensitive receptors because all employers must follow regulations set forth by the Occupation Safety and Health Administration (OSHA) to ensure the health and well-being of their employees.[29]

The proximity of sensitive receptors to motor vehicles is an air pollution concern, especially in San Francisco where building setbacks are limited and roadway volumes are higher than most other parts of the Bay Area. Vehicles also contribute to particulates by generating road dust and through tire wear.

The closest (within 1,000 feet) sensitive receptors to the project site are inventoried in **Table 5.4-5**. As shown in Table 5.4-5, sensitive receptors include residential uses north and west of the project site (including UCSF Hearst Tower) and the new UCSF Hospital located to the southwest. The nearest day care facility is on the UCSF Mission Bay campus 1,300 feet to the west. Other residential uses to the south are over 1,000 feet away, south of Mariposa Street. None of the receptors in

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28 Department of Toxic Substances Control, 2000. *Letter to Jon A. Morgan, Director, Environmental Management Department, County of El Dorado. Naturally Occurring Asbestos.* January 20.

29 BAAQMD, Recommended Methods for Screening and Modeling Local Risks and Hazards, May 2011, page 12.

Table 5.4-5 are located within an Air Pollutant Exposure Zone, nor are there any sensitive receptors within 1,000 feet of the project site that are located within an Air Pollutant Exposure Zone.

TABLE 5.4-5
SENSITIVE RECEPTORS IN THE PROJECT SITE VICINITY

Receptor Type	Distance and Direction from the Project Site
Residential: UCSF Mission Bay Housing (Hearst Tower), Block 22	200 feet northwest
Residential: Madrone Mission Bay Residential Towers	800 feet to the north, on Mission Bay Boulevard North
Hospital: UCSF Benioff Children's Hospital facility at Mission Bay, plus the UCSF Betty Irene Moore Women's Hospital and the UCSF Bakar Cancer Hospital	300 feet southwest

SOURCE: Environmental Science Associates, 2015

5.4.3.5 Existing Stationary Sources of Air Pollution

The BAAQMD's inventory of permitted stationary sources of emissions show eight permitted stationary emission facilities present within or near the 1,000-foot zone of influence of the project site. The sources at these permitted facilities are made up of boilers, stationary diesel engines for back-up power generators or fire water pump engines, which are for emergency use only, and one body shop. The UCSF Mission Bay Campus has the largest number of permitted sources (34) which, besides generators and boilers, also include an ethylene oxide sterilizer. Additionally UCSF has two exempt sources (fume hoods and a methane gas blower).

5.4.3.6 Major Roadways Contributing to Air Pollution

Third, 16th Street and Mariposa Streets are arterial streets in the existing local roadway system within 1,000-feet of the project site that carry at least 10,000 vehicles in annual average daily traffic based on the City's SF CHAMP roadway model.[30] This traffic contributes to concentrations of $PM_{2.5}$, DPM, and other air contaminants emitted from motor vehicles near the street level. Both Interstate 280 and the Caltrain rail line are located over 1,000 feet from the project site. Aside from the surrounding major roadways, no other areas of mobile-source activity or otherwise "non-permitted" sources (e.g., railyards, trucking distribution facilities, and high-volume fueling stations) are located within 1,000 feet of the project site.

30 San Francisco Metropolitan Transportation Agency, Chained Activity Modeling Process version 4.3.0, Average Daily Traffic Volumes, provided to ESA August 2, 2012.

5.4.4 Regulatory Framework

5.4.4.1 Federal Regulations

The 1970 Clean Air Act (last amended in 1990) requires that regional planning and air pollution control agencies prepare a regional air quality plan to outline the measures by which both stationary and mobile sources of pollutants will be controlled in order to achieve all standards by the deadlines specified in the act. These ambient air quality standards are intended to protect the public health and welfare, and they specify the concentration of pollutants (with an adequate margin of safety) to which the public can be exposed without adverse health effects. They are designed to protect those segments of the public most susceptible to respiratory distress, including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that are somewhat above ambient air quality standards before adverse health effects are observed.

The current attainment status for the SFBAAB, with respect to federal standards, is summarized above in Table 5.4-2. In general, the SFBAAB experiences low concentrations of most pollutants when compared to federal standards, except for ozone and particulate matter (PM_{10} and $PM_{2.5}$), for which standards are exceeded periodically (see Table 5.4-1).

There have been changes to the federal regulatory environment with respect to air quality since certification of the Mission Bay FSEIR in 1998. In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard.[31] The USEPA lowered the national 8-hour ozone standard from 0.080 to 0.075 parts per million (ppm) effective May 27, 2008. In April 2012, the USEPA designated the Bay Area as a marginal nonattainment region for the 0.075 ppm ozone standard established in 2008 (USEPA, 2012b). The Bay Area Air Basin is in attainment for other criteria pollutants, with the exception of the 24-hour standards for PM_{10} and $PM_{2.5}$, for which the Bay Area is designated as "Unclassified." "Unclassified" is defined by the Clean Air Act as any area that cannot be classified, on the basis of available information, as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

5.4.4.2 State Regulations

California Clean Air Act

While the federal Clean Air Act established national ambient air quality standards, individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when federal standards were established, and because of the unique meteorological problems in California, there is considerable diversity between the state and national ambient air quality standards, as shown in Table 5.4-2. California ambient standards tend to be at least as protective as national ambient standards and are

[31] "Marginal nonattainment area" means an area that has a design value of 0.076 up to but not including 0.086 ppm. A design value is the mathematically determined pollutant concentration at a particular site that must be reduced to, or maintained at or below the National Ambient Air Quality Standard to assume attainment.

often more stringent. Since certification of the Mission Bay FSEIR in 1998, the state has adopted an ambient air quality standard for $PM_{2.5}$ and strengthened the ambient ozone standards.

In 1988, California passed the California Clean Air Act (California Health and Safety Code Sections 39600 et seq.), which, like its federal counterpart, called for the designation of areas as attainment or nonattainment, but based on state ambient air quality standards rather than the federal standards. As indicated in Table 5.4-2, the Bay Area Air Basin is designated as "nonattainment" for state ozone, PM_{10}, and $PM_{2.5}$ standards. The Bay Area Air Basin is designated as "attainment" for other pollutants.

Toxic Air Contaminants

In 2005, the CARB approved a regulatory measure to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles. The regulations generally limit idling of commercial motor vehicles (including buses and trucks) within 100 feet of a school or residential area for more than five consecutive minutes or periods aggregating more than five minutes in any one hour. Buses or vehicles also must turn off their engines upon stopping at a school and must not turn their engines on more than 30 seconds before beginning to depart from a school. Also, state law Senate Bill 352 (SB 352) was adopted in 2003 and limits locating public schools within 500 feet of a freeway or busy traffic corridor (Section 17213 of the Education Code; Section 21151.8 of the Public Resources Code).

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program)

The Carl Moyer Program is a grant program that reduces air pollution from vehicles and equipment by providing funds to replace or retrofit older equipment or engines with cleaner-than-(U.S. EPA) required engines, equipment, and other sources of air pollution such as ground support equipment at airports. Money collected through the Carl Moyer Program complements California's regulatory program by providing incentives to effect early or extra emission reductions, especially from emission sources in environmental justice communities and areas disproportionately impacted by air pollution. The Carl Moyer Program funds clean air projects involving a wide variety of vehicles and equipment, including:

- Repower: The replacement of an in-use engine with another, cleaner engine.
- Retrofit: An emission control system employed exclusively with an in-use engine, vehicle or piece of equipment.
- New purchases: Vehicles or equipment certified to optional, lower emission standards.
- Fleet modernization or equipment replacement: The replacement of an older vehicle or piece of equipment that still has remaining useful life with a newer, cleaner vehicle or piece of equipment. The old vehicle/equipment is scrapped. Equipment may include on-road heavy-duty vehicle and off-road equipment replacement as well as emergency vehicles (Fire Apparatus) and lawn and garden equipment replacement.

- Vehicle retirement (or car scrap): Paying owners of older, more polluting vehicles that still have remaining useful life to voluntarily retire those vehicles earlier than they would have otherwise

The Carl Moyer program establishes a cost effectiveness standard that a proposed clean air project must meet in order to receive funding under the program. On March 27, 2015, the cost effectiveness limit was updated to $18,030 per weighted ton of ROG, NOx and PM in resulting emissions reductions.[32] The program has established guidelines and criteria for the funding of emissions reduction projects. The BAAQMD administers the Carl Moyer program within the SFBAAB.

5.4.4.3 Regional and Local Regulations and Plans

Bay Area Air Quality Management District

The BAAQMD is the regional agency with jurisdiction over the nine-county region located in the SFBAAB. The Association of Bay Area Governments (ABAG), Metropolitan Transportation Commission (MTC), county transportation agencies, cities and counties, and various non-governmental organizations also participate in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs. BAAQMD is responsible for attaining and/or maintaining air quality in the region within federal and state air quality standards. Specifically, BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the region and to develop and implement strategies to attain the applicable federal and state standards.

BAAQMD does not have authority to regulate emissions from motor vehicles. Specific rules and regulations adopted by the BAAQMD limit the emissions that can be generated by various stationary sources, 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 TAC emissions sources are subject to these rules and are regulated through the BAAQMD's permitting process and standards of operation. Through this permitting process, including an annual permit review, the BAAQMD monitors the generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of the project would be subject to the BAAQMD Rules and Regulations. Both federal and State ozone plans rely heavily upon stationary source control measures set forth in BAAQMD's Rules and Regulations.

Per its Policy and Procedure Manual, the BAAQMD requires implementation of Best Available Control Technology for Toxics and would deny an *Authority to Construct* or a *Permit to Operate* for any new or modified source of TACs that exceeds a cancer risk of 10 in one million or a chronic or acute hazard index of 1.0. The permitting process under BAAQMD Regulation 2 Rule 5 requires a

[32] California Air Resources Board. Memorandum Re: Carl Moyer Program: Review and Update of the Cost-Effectiveness Limit and Capital Recovery Factors for 2015. March 27, 2015. Available online at: http://www.arb.ca.gov/msprog/mailouts/msc1509/msc1509.pdf. Accessed April 24, 2015.

Health Risk Screening Analysis, the results of which are posted on the District's website. These permitting requirements would ensure that the health risks of the project on the environment would be less than significant.

BAAQMD's Strategic Incentives Division (SID) provides incentive funding for projects that improve air quality, reduce air quality health impacts and protect the climate. Funding is primarily focused on mobile source projects that reduce or eliminate pollution from cars, trucks, marine vessels, locomotives, agricultural equipment or construction equipment. Since 1992, the SID division has awarded over $400 million in grant funding for cost-effective emission reduction projects and the program oversees approximately 1,000 projects funded by state, federal and local monies every year.

One such program administered by the SID is its Vehicle Buy Back Program (VBB). The VBB Program is a voluntary program that takes older vehicles off the road. Under this program, BAAQMD pays $1,000 for an operating and registered 1994 and older vehicle. The vehicles are then scrapped by vehicle dismantlers contracted by BAAQMD. Each vehicle removed from Bay Area roads results in an estimated reduction of 75 pounds of air pollution annually. The VBB Program is funded through the Air District's Carl Moyer, Mobile Source Incentive Fund and Transportation Fund for Clean Air (TFCA) programs. Eligibility requirements for the Vehicle Buy Back Program include:

- Vehicle must be 1994 model year or older;
- Vehicle must be currently registered as operable and must be drivable;
- Vehicle must have been registered in the Bay Area for the past 24 months;
- Vehicles within 60 days of a required smog check must take and pass their smog check.

Bay Area Air Quality Planning Relative to State and Federal Standards

Air quality plans developed to meet federal requirements are referred to as State Implementation Plans. The federal and state Clean Air Acts require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM_{10} standard). Since certification of the Mission Bay FSEIR in 1998, the most recent Bay Area ozone plan prepared in response to federal air quality planning requirements is the 2001 Ozone Attainment Plan. The State ozone plan has been updated multiple times since certification of the FSEIR.

The *2010 Bay Area Clean Air Plan* was adopted on September 15, 2010, by the BAAQMD, in cooperation with the Bay Area MTC, the Bay Conservation and Development Commission (BCDC), and ABAG. The primary objectives of the plan are to improve local and regional air quality, protect public health, and minimize climate change impacts. The *2010 Clean Air Plan* updates and replaces the *2005 Ozone Strategy* in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone; provide a control strategy to reduce ozone, particulate matter, toxic air contaminants, and greenhouse gases in a single, integrated plan; review progress in improving air quality in recent years; and establish emission control measures to be adopted or implemented in the 2010–2012 time frame. The control strategy includes stationary-source control measures to be implemented through

BAAQMD regulations; mobile-source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the MTC, local governments, transit agencies, and others. The *2010 Clean Air Plan* also represents the Bay Area's most recent triennial assessment of the region's strategy to attain the state one-hour ozone standard.[33]

San Francisco General Plan Air Quality Element

The *San Francisco General Plan* (General Plan) includes the 1997 Air Quality Element.[34] The objectives specified by the City include the following:

> ***Objective 1*:** Adhere to state and federal air quality standards and regional programs.
>
> ***Objective 2*:** Reduce mobile sources of air pollution through implementation of the Transportation Element of the General Plan.
>
> ***Objective 3*:** Decrease the air quality impacts of development by coordination of land use and transportation decisions.
>
> ***Objective 4*:** Minimize particulate matter emissions from road and construction sites.
>
> ***Objective 5*:** Link the positive effects of energy conservation and waste management to emission reductions.

San Francisco Construction Dust Control Ordinance

Since certification of the Mission Bay FSEIR in 1998, the City has adopted San Francisco Health Code Article 22B and San Francisco Building Code Section 106.A.3.2.6, which collectively constitute the Construction Dust Control Ordinance (adopted in July 2008). The ordinance requires that all site preparation work, demolition, or other construction activities within San Francisco that have the potential to create dust or to expose or disturb more than 10 cubic yards or 500 square feet of soil comply with specified dust control measures whether or not the activity requires a permit from the Department of Building Inspection (DBI). For projects over one-half acre, the Dust Control Ordinance requires that the project sponsor submit a Dust Control Plan for approval by the San Francisco Department of Public Health (DPH) prior to issuance of a building permit by the DBI.

Building permits will not be issued without written notification from the Director of Public Health that the applicant has a site-specific Dust Control Plan, unless the Director waives the requirement. The Construction Dust Control Ordinance requires project sponsors and contractors responsible for construction activities to control construction dust on the site or implement other practices that result in equivalent dust control that are acceptable to the Director of Public Health.

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[33] BAAQMD, *2010 Clean Air Plan*. Available online at http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans.aspx Accessed on April 15, 2013.

[34] San Francisco Planning Department, Air Quality Element of the *San Francisco General Plan*, July 1997, updated in 2000.

Dust suppression activities may include watering of all active construction areas sufficiently to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water must be used if required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code.

The project site is over 11 acres in size, and therefore the project sponsor would be required to prepare a Dust Control Plan.

San Francisco Health Code Provisions for Urban Infill Development (Article 38)

San Francisco adopted Article 38 of the San Francisco Health Code in 2008, with revisions taking effect in December 2014. The revised code requires that sensitive land use developments within the Air Pollutant Exposure Zone incorporate Minimum Efficiency Reporting Value (MERV) 13 equivalent ventilation systems to remove particulates from outdoor air. This regulation also applies to conversion of uses to a sensitive use (e.g., residential, senior care-facilities, day care centers, etc.). Article 38 would not be applicable to the proposed project because it does not include any sensitive uses.

5.4.5 Impacts and Mitigation Measures

5.4.5.1 Significance Thresholds

For the impacts analyzed in this section, the project would have a significant impact related to air quality if it were to:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in 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; or
- Result in a cumulative air quality impact in combination with past, present and reasonably foreseeable future projects in the vicinity.

The complete list of CEQA significance criteria relevant to the air quality analysis is included in the Initial Study (see Appendix NOP-IS, page 60), which also explains why the proposed project would not result in new significant impacts or substantially increase the severity of impacts on air quality with respect to odors. Therefore, odors are not addressed in this SEIR.

5.4.5.2 Approach to Analysis

Air quality analysis conducted for this impact assessment employs the emission factors, models and tools distributed by a variety of agencies including CARB, the California Air Pollution Officers Association (CAPCOA), the California Office of Environmental Health Hazard Assessment (OEHHA) and USEPA. Additionally, the analysis includes methodologies identified in the BAAQMD *CEQA Air Quality Guidelines* (May 2012).

Methodology for Analysis of Impacts

In general, the proposed project would result in two types of air quality impacts. First, the project would result in air pollution through construction activity. Second, the project would generate air pollutants during project operations, due to increased vehicle travel and new stationary sources (i.e., five new diesel emergency generators). This section describes the methodology used to evaluate project impacts related to consistency with the Clean Air Plan, emissions of criteria pollutants, and local health risks and hazards.

Each of these types of direct impacts are in turn separated into impacts from criteria air pollutant emissions, which are generally regional in nature, and impacts associated with exposure to toxic air contaminants (TACs) and $PM_{2.5}$, which is a localized health risk. The assessment of criteria air pollutant impacts addresses the second and third bulleted significance thresholds identified above. The assessment of localized health risk and exposure impacts addresses the fourth bulleted significance thresholds identified above.

Air Quality Plan

The applicable air quality plan is the BAAQMD's 2010 Clean Air Plan, which identifies measures to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduce greenhouse gas emissions. Consistency with the Clean Air Plan can be determined if the project supports the goals of the Clean Air Plan, includes applicable control measures from the Clean Air Plan, and if the project would not disrupt or hinder implementation of any control measures from the Clean Air Plan. Consistency with this plan is the basis for determining whether the proposed project would conflict with or obstruct implementation of an applicable air quality plan, the first bulleted significance criterion identified above.

Criteria Air Pollutants

As described above under Regulatory Framework, the SFBAAB experiences low concentrations of most pollutants when compared to federal or State standards and is designated as either in attainment or unclassified for most criteria pollutants, with the exception of ozone, $PM_{2.5}$, and PM_{10}, for which these pollutants are designated as non-attainment for either the State or federal standards.

By definition, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in non-attainment of air quality standards. Instead, a project's individual emissions are considered to contribute to the existing, cumulative air quality conditions. If a project's contribution to cumulative air quality conditions is considerable, then the project's impact on air quality would be considered significant.[35]

Table 5.4-6 identifies criteria air pollutant significance thresholds followed by a discussion of each threshold. Projects that would result in criteria pollutant emissions below these significance thresholds would not violate an air quality standard, contribute substantially to an air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants within the SFBAAB.

TABLE 5.4-6
CRITERIA AIR POLLUTANT THRESHOLDS

Pollutant	Construction Thresholds Average Daily Emissions (pounds per day)	Operational Thresholds	
		Average Daily Emissions (pounds per day)	Maximum Annual Emissions (tons per year)
ROG	54	54	10
NOx	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not applicable	

SOURCE: BAAQMD, CEQA Air Quality Guidelines. June 2011. Available at www.baaqmd.gov

The potential for a project to result in a cumulatively considerable net increase in criteria air pollutants that may contribute to an existing or projected air quality violation is based on the State and federal Clean Air Acts emissions limits for stationary sources. To ensure that new stationary sources do not cause or contribute to a violation of an air quality standard, BAAQMD Regulation 2, Rule 2 requires that any new source that emits criteria air pollutants above a specified emissions limit must offset those emissions. For ozone precursors ROG and NOx, the offset emissions level is an annual average of 10 tons per year (or 54 pounds (lbs.) per day).[36] These levels represent emissions below which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants that could result in increased health effects.

[35] Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2012.
[36] Bay Area Air Quality Management District, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, page 17, October 2009.

The federal New Source Review (NSR) program was created under the federal Clean Air Act to ensure that stationary sources of air pollution are constructed in a manner that is consistent with attainment of federal health-based ambient air quality standards. For PM_{10} and $PM_{2.5}$, the emissions limit under NSR is 15 tons per year (82 lbs. per day) and 10 tons per year (54 lbs. per day), respectively. These emissions limits represent levels at which a source is not expected to have a significant impact on air quality.[37]

Although the regulations specified above apply to new or modified stationary sources, land use development projects generate ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions as a result of increases in vehicle trips, energy use, architectural coating, and construction activities. Therefore, the identified thresholds can be applied to the construction and operational phases of land use projects. Those projects that would result in emissions below these thresholds would not be considered to contribute to an existing or projected air quality violation or result in a considerable net increase in ozone precursors or particulate matter. Due to the temporary nature of construction activities, only the average daily thresholds are applicable to construction phase emissions.

Fugitive dust emissions are typically generated during construction phases. Studies have shown that the application of best management practices (BMPs) at construction sites significantly control fugitive dust[38]and individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent.[39] The BAAQMD has identified a number of BMPs to control fugitive dust emissions from construction activities.[40] San Francisco's Construction Dust Control Ordinance requires a number of fugitive dust control measures to ensure that construction projects do not result in visible dust. This analysis assumes that the project would implement the requirements of the Construction Dust Control Ordinance, which is the basis for determining the significance of air quality impacts due to fugitive dust emissions.

Other Criteria Pollutants

Regional concentrations of CO in the Bay Area have not exceeded the state standards in the past 11 years and SO_2 concentrations have never exceeded the standards. The primary source of CO emissions from development projects is vehicle traffic. Construction-related SO_2 emissions represent a negligible portion of the total basin-wide emissions and construction-related CO emissions represent less than five percent of the Bay Area total basin-wide CO emissions. As discussed previously, the Bay Area is in attainment for both CO and SO_2. Furthermore, the BAAQMD has demonstrated, based on modeling, that in order to exceed the California ambient air quality standard of 9.0 ppm (8-hour average) or 20.0 ppm (1-hour average) for CO, project traffic in addition to existing traffic would need to exceed 44,000 vehicles per hour at affected intersections (or 24,000 vehicles per hour where vertical and/or horizontal mixing is limited). The transportation analysis indicates that the intersection in the project area with the greatest volumes would be Fifth

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[37] Bay Area Air Quality Management District, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance,* page 16, October 2009.
[38] Western Regional Air Partnership, *WRAP Fugitive Dust Handbook,* September 7, 2006. Available online at wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf (accessed February 16, 2012).
[39] Bay Area Air Quality Management District, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, page 27.
[40] Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2011.

and Harrison Streets with hourly volumes of 5,432 in year 2040 with the project and convention traffic, which is less than 24,000. Therefore, given the Bay Area's attainment status and the limited CO and SO_2 emissions that could result from the project, the project would not result in a cumulatively considerable net increase in CO or SO_2, and quantitative analysis is not required.

Local Health Risks and Hazards

In addition to criteria air pollutants, individual projects may emit TACs. As part of this project, Ramboll Environ conducted a health risk assessment (HRA) for the proposed project to provide quantitative estimates of health risks from exposures to TACs.

The threshold of significance used to evaluate health risks from new sources of TACs associated with the project is based on the potential for the proposed project to substantially affect the extent and severity of the Air Pollutant Exposure Zone[41] at sensitive receptor locations. The health protective standards used for determining the Air Pollutant Exposure Zone and evidence supporting these standards are discussed in the Setting section above and were developed in consultation with BAAQMD staff as part of the preparation of a Community Risk Reduction Plan.[42] The project site is not within an identified health vulnerable zip code; therefore the Air Pollutant Exposure Zone criteria for this location is based on: (1) cumulative $PM_{2.5}$ concentrations greater than 10 $\mu g/m^3$, and/or (2) excess cancer risk from the contribution of emissions from all modeled sources greater than 100 per one million population. For projects that could result in sensitive receptor locations meeting the Air Pollutant Exposure Zone criteria that otherwise would not occur without the project, a proposed project that would emit $PM_{2.5}$ concentration above 0.3 $\mu g/m^3$ or result in an excess cancer risk greater than 10.0 per million would be considered a significant impact. The 0.3 $\mu g/m^3$ $PM_{2.5}$ concentration and the excess cancer risk of 10.0 per million persons exposed are the levels below which the BAAQMD considers new sources not to make a considerable contribution to cumulative health risks.[43] For those locations already meeting the Air Pollutant Exposure Zone criteria, a lower significance standard is required to ensure that a proposed project's contribution to existing health risks would not be significant. Since the project is not within an Air Pollutant Exposure Zone, the above thresholds apply to the proposed project.

41 San Francisco, in partnership with BAAQMD, has modeled and assessed air pollutant impacts from mobile, stationary, and area sources within the City. This assessment identified areas with poor air quality under existing conditions—Air Pollutant Exposure Zones—which are based on health protective criteria PM2.5 and excess cancer risk. These areas warrant special attention when siting land uses that either emit toxic air contaminants (TACs) or uses that are considered sensitive to air pollution.

42 San Francisco is currently in the process of preparing a Community Risk Reduction Plan. Extensive modeling has been conducted and is documented in *The San Francisco Community Risk Reduction Plan: Technical Support Documentation.* This modeling provides the technical basis for development of the Community Risk Reduction Plan.

43 Bay Area Air Quality Management District, *California Environmental Quality Act Guidelines Update, Proposed Air Quality CEQA Thresholds of Significance*, May 3, 2010. Available online at www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Proposed_Thresholds_Report_%20May_3_2010_Final.ashx?la=en (accessed November 20, 2014).

Methodology for Analysis of Cumulative Impacts

As described in Section 5.1, Impact Overview, the following projects/programs listed below were not anticipated in the Mission Bay FSEIR and are considered in the cumulative impact analysis in this SEIR: University of California at San Francisco (UCSF), 2014 Long Range Development Plan (LRDP), Mission Bay Campus; Eastern Neighborhoods Program; Seawall Lot 337 and Pier 48 Mixed-Use Project (Mission Rock); and Pier 70 Mixed-Use Development.

While air quality analyses (both criteria air pollutants and health risk) have been conducted in the completed CEQA documentation for UCSF LRDP and the Eastern Neighborhoods Program, these analyses have not yet been completed for the other two identified projects. However, cumulative air quality analysis may be addressed by assessing whether a project's contribution is cumulatively considerable.

The contribution of a project's individual air emissions to regional air quality impacts is by its nature, a cumulative effect. Emissions from past, present and future projects in the vicinity also have or will contribute to adverse regional air quality impacts on a cumulative basis. No single project by itself would be sufficient in size to result in nonattainment of ambient air quality standards. Instead, a project’s individual emissions contribute to existing cumulative air quality conditions.[44] As described above, the project-level thresholds for criteria air pollutants are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants. Therefore, if a project’s emissions are below the project-level thresholds, the project would not be considered to result in a considerable contribution to cumulative regional air quality impacts.

Similarly, the HRA takes into account the cumulative contribution of localized health risks to sensitive receptors from sources included in the Citywide modeling plus the proposed project’s sources. Other future projects, whose emissions have not been incorporated into the existing Citywide health risk modeling, such as Pier 70 and Seawall Lot 337/Pier 48 would similarly be subject to CEQA requirements to analyze the health risk impact of their project. However, health risk impacts are localized, and health risks from sources decrease substantially with increasing distance.[45] Thus cumulative impacts from the Pier 70 and Seawall Lot 337/Pier 48 would not combine with the proposed project’s emissions to substantially increase health risks within the project vicinity. Thus, because the project-level analysis includes health risks from all known existing sources, the project-level analysis is also a cumulative health risk analysis.

[44] Bay Area Air Quality Management District, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009. A copy of this document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 2014.1441E.

[45] California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005 (hereinafter “ARB Air Quality and Land Use Handbook”). Available at http://www.arb.ca.gov/ch/handbook.pdf.

5.4.5.3 Impact Evaluation

Construction

Impact AQ-1: Construction of the proposed project would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. (Significant and Unavoidable with Mitigation)

Construction activities would result in emissions of ozone precursors and particulate matter in the form of dust (fugitive dust) and exhaust (e.g., vehicle tailpipe emissions). Emissions of ozone precursors and particulate matter are primarily a result of the combustion of fuel from on-road and off-road vehicles. However, ROGs are also emitted from activities that involve painting, other types of architectural coatings, or asphalt paving. Construction phases would include demolition, excavation and site preparation, pile installation, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition and construction activities would require the use of drill rigs heavy trucks, excavators, material loaders, cranes, and other mobile and stationary construction equipment. During the project's approximately 26-month construction period, construction activities would result in emissions of ozone precursors and particulate matter, as discussed below.

Fugitive Dust

Project-related demolition, excavation, grading, and other construction activities may cause wind-blown dust that could contribute particulate matter into the local atmosphere. Despite the established federal standards for air pollutants and ongoing implementation of state and regional air quality control plans, air pollutants continue to have impacts on human health throughout the country. California has found that particulate matter exposure can cause health effects at lower levels than national standards. The current health burden of particulate matter demands that, where possible, public agencies take feasible available actions to reduce sources of particulate matter exposure. According to the CARB, reducing ambient particulate matter from 1998–2000 levels to natural background concentrations in San Francisco would prevent over 200 premature deaths.

Dust can be an irritant causing watering eyes or irritation to the lungs, nose, and throat. Demolition, excavation, grading, and other construction activities can cause wind-blown dust that adds particulate matter to the local atmosphere. Depending on exposure, adverse health effects can occur due to this particulate matter in general as well as due to specific contaminants such as lead or asbestos that may be constituents of dust.

In response to these concerns, the San Francisco Board of Supervisors approved a series of amendments to the San Francisco Building and Health Codes, generally referred hereto as the Construction Dust Control Ordinance (Ordinance 176-08, effective July 30, 2008), with the intent of reducing the quantity of dust generated during site preparation, demolition, and overall construction work in order to protect the health of the general public and onsite workers, to minimize public nuisance complaints, and to avoid orders to stop work by the Department of Building Inspection (DBI).

The ordinance requires that all site preparation work, demolition, or other construction activities within San Francisco that have the potential to create dust or to expose or disturb more than 10 cubic yards or 500 square feet of soil comply with specified dust control measures whether or not the activity requires a permit from DBI. The Director of DBI may waive this requirement for activities on sites less than one-half acre that are unlikely to result in any visible wind-blown dust.

To comply with the Construction Dust Control Ordinance, the project sponsor and the contractor responsible for construction activities at the project site would be required to use the following practices to control construction dust on the site or other practices that result in equivalent dust control that are acceptable to the Director of DBI. Dust suppression activities may include watering all active construction areas sufficiently to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour (mph). Reclaimed water must be used for dust suppression watering, as required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code. Even if not required, reclaimed water should be used whenever possible. Contractors shall provide as much water as necessary to control dust (without creating run-off in any area of land clearing, and/or earth movement). During excavation and dirt-moving activities, contractors shall wet sweep or vacuum the streets, sidewalks, paths, and intersections where work is in progress at the end of the workday. Inactive stockpiles (where no disturbance occurs for more than seven days) greater than 10 cubic yards or 500 square feet of excavated material, backfill material, import material, gravel, sand, road base, and soil shall be covered with a 10 mil (0.01 inch) polyethylene plastic (or equivalent) tarp, braced down, or use other equivalent soil stabilization techniques.

For projects over one-half acre, such as the proposed project, the Dust Control Ordinance requires that the project sponsor submit a Dust Control Plan for approval by DPH. DBI will not issue a building permit without written notification from the Director of Public Health that the applicant has a site-specific Dust Control Plan, unless the Director waives the requirement. Interior-only tenant improvement projects that are over one-half acre in size that will not produce exterior visible dust are exempt from the site-specific Dust Control Plan requirement.

The site-specific Dust Control Plan would require the project sponsor to: submit a map to the Director of Public Health showing all sensitive receptors within 1,000 feet of the site; wet down areas of soil at least three times per day; provide an analysis of wind direction and install upwind and downwind particulate dust monitors; record particulate monitoring results; hire an independent, third-party to conduct inspections and keep a record of those inspections; establish shut-down conditions based on wind, soil migration, etc.; establish a hotline for surrounding community members who may be potentially affected by project-related dust; limit the area subject to construction activities at any one time; install dust curtains and windbreaks on the property lines, as necessary; limit the amount of soil in hauling trucks to the size of the truck bed and securing with a tarpaulin; enforce a 15 mph speed limit for vehicles entering and exiting construction areas; sweep affected streets with water sweepers at the end of the day; install and utilize wheel washers to clean truck tires; terminate construction activities when winds exceed 25 mph; apply soil stabilizers to inactive areas; and sweep off adjacent streets to reduce particulate emissions. The project sponsor would be required to designate an individual to monitor compliance with these dust control requirements.

Implementation of dust control measures in compliance with the regulations and procedures set forth by the San Francisco Dust Control Ordinance would ensure that potential dust-related construction air quality impacts of the proposed project would be *less than significant*.

Criteria Air Pollutants

As discussed above, construction activities would result in emissions of criteria air pollutants from the use of off- and on-road vehicles and equipment. Criteria and ozone precursor pollutant (NOx, ROG, PM_{10}, and $PM_{2.5}$) emissions from exhaust from construction equipment and truck and vehicle trips would incrementally add to the regional atmospheric loading of these pollutants during project construction. The BAAQMD *CEQA Air Quality Guidelines* recommend the quantification of project-related criteria pollutant exhaust emissions from construction, separate from operational emissions, and comparison with significance thresholds. Daily engine exhaust emissions from construction activities associated with the proposed project are compared with significance thresholds in **Table 5.4-7**. Total construction emissions were calculated using the latest emission factors available at the time of the Notice of Preparation (NOP) publication (EMFAC 2011 and OFFROAD 2011 equivalent), and total emissions were divided by the number of construction days to derive average daily emissions for comparison against applicable significance thresholds. The construction significance thresholds for criteria pollutants are established in terms of average daily emissions, which is how emissions are reported in Table 5.4-7.

TABLE 5.4-7
AVERAGE DAILY CONSTRUCTION-RELATED EMISSIONS

	Average Daily Construction Emissions (pounds/day)			
	ROG	NOx	PM_{10}	$PM_{2.5}$
Off-road Equipment Emissions	13	175	7.1	7.1
Truck and Vehicle emissions	7.4	51	0.84	0.77
Architectural Coating Emissions	39	0	0	0
Total[a]	59	226	8.0	7.9
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No

NOTES:
[a] The total emissions may not sum precisely due to rounding of subtotals.
SOURCE: Ramboll Environ, 2015

The emissions presented in Table 5.4-7 would be generated by many different construction sources including the following: off-road construction equipment such as excavators, loaders, backhoes, drill rigs, and cranes; and on- road trucks. As shown in the table, the predominant source of emissions of NOx, PM_{10}, and PM $_{2.5}$ would be off-road equipment, which would generate more than three times the emissions of on-road vehicles and trucks.

Construction of the proposed project would result in emissions of PM_{10} and $PM_{2.5}$ that would be below the thresholds of significance. However, the estimated construction emissions of ROG and NOx would exceed the applicable significance threshold, which would be a *significant* air quality impact. Consequently, **Mitigation Measure M-AQ-1 (Construction Emissions Minimization)** is identified to reduce ROG and NOx emissions associated with construction.

ROG and NOx are ozone precursors, and the main health concern of exposure to ground-level ozone is effects on the respiratory system, especially on lung function. Several factors influence these health impacts, including the concentrations of ground-level ozone in the atmosphere, the duration of exposure, average volume of air breathed per minute, the length of intervals between short-term exposures, and the sensitivity of the person to the exposure.[46,47] The concentration of ground-level ozone in the atmosphere is influenced by the volume of air available for dilution, the temperature, and the intensity of ultraviolet light. In the Bay Area, the worst case conditions for ozone formation occur in the summer and early fall on warm, windless, sunny days.[48]

Given these various factors, it is difficult to predict the magnitude of health effects from the project's exceedance of significance criteria for regional ROG and NOx emissions. The increase in emissions associated with the proposed project represents a fraction of total SFBAAB regional ROG emissions (59 pounds per day compared to 265 tons per day in the SFBAAB region in 2012)[49] and NOx emissions (226 pounds per day compared to 318 tons per day in the SFBAAB region in 2012). Although Table 5.4-1 indicates that the most stringent applicable ozone standards were not exceeded at the Potrero Hill monitoring station between 2010 and 2014, the SFBAAB region experienced an average of 8.4 days of exceedance per year between 2010 and 2014.[50] The proposed project's ROG and NOx increases could contribute to new or exacerbated air quality violations in the SFBAAB region by contributing to more days of ozone exceedance or result in AQI values that are unhealthy for sensitive groups and other populations. As shown in Table 5.4-3, the SFBAAB has averaged between 8 and 19 days per year that are considered unhealthy for sensitive groups and had 2 unhealthy (red) days in the last five years. On unhealthy days, persons are recommended to avoid both prolonged and heavy exertion outdoor activities.[51]

Implementation of **Mitigation Measure M-AQ-1 (Construction Emissions Minimization)** would substantially reduce construction-related emissions of ROG and NOx. The measure would require use of off-road equipment to meet minimum emission standards, and construction-related emissions of ROG and NOx would be reduced commensurate with the degree of compliance achieved (i.e., Tier 4 or Tier 4 interim or Tier 2 with 40 percent NOx VDECS). Mitigated daily engine

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46 The World Bank Group, *Pollution Prevention and Abatement Handbook 1998: Toward Cleaner Production*, pp. 227–230, 1999. Available online at www.ifc.org/wps/wcm/connect/dd7c9800488553e0b0b4f26a6515bb18/Handbook GroundLevelOzone.pdf?MOD=AJPERES (accessed July 10, 2014).

47 U.S. Environmental Protection Agency, *Air Quality Guide for Ozone*, March 2008. www.airnow.gov/index.cfm?action=pubs.aqiguideozone (accessed July 10, 2014).

48 Bay Area Air Quality Management District, *Air Pollutants*, January 30, 2013. Available online at www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Pollutants.aspx (accessed July 10, 2014).

49 California Air Resources Board, The California Almanac of Emissions and Air Quality – 2013 Edition, May 21, 2014. Available online at www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm (accessed October 3, 2014).

50 Bay Area Air Quality Management District, *Annual Bay Area Air Quality Summaries*, 2014. Available online at www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Quality-Summaries.aspx (accessed April, 23, 2015).

51 U.S. Environmental Protection Agency, *Air Quality Index, A Guide to Air Quality and Your Health*, February 2014. Available online at www.epa.gov/airnow/aqi_brochure_02_14.pdf (accessed September 8, 2014).

exhaust emissions from construction activities associated with the proposed project are compared with emission significance thresholds in **Table 5.4-8,** assuming both the maximum level and the minimum level of compliance (Tier 4 and Tier 2 with NOx VDECS). As can be seen in Table 5.4-8, construction-related emissions would be reduced to the applicable threshold for ROG with both the maximum and minimum levels of compliance. However, while NOx emissions would be reduced by as much as 68 percent with fully compliant mitigation and 36 percent with minimally compliant mitigation, project emissions of NOx would still be significant (73 pounds per day) even with maximum compliance with Mitigation Measure M-AQ-1.

TABLE 5.4-8
MITIGATED AVERAGE DAILY CONSTRUCTION-RELATED EMISSIONS

	Average Daily Construction Emissions (pounds/day)			
	ROG	**NOx**	**PM10**	**PM2.5**
With Tier 2 + NOx VDECS Off-road Equipment (minimum compliance for NOx)				
Off-road Equipment Emissions	0.52	93	0.6	0.6
Truck and Vehicle Emissions	7	51	0.8	0.8
Architectural Coating Emissions	39	0	0	0
Total[a]	**47**	**144**	**1.4**	**1.4**
Significance Threshold	54	54	82	54
Above Threshold?	No	**Yes**	No	No
With Tier 4 Off-road Equipment (maximum compliance for NOx)				
Off-road Equipment Emissions	2.5	22	0.4	0.4
Truck and Vehicle Emissions	7	51	0.8	0.8
Architectural Coating Emissions	39	0	0	0
Total[a]	**49**	**73**	**1.2**	**1.1**
Significance Threshold	54	54	82	54
Above Threshold?	No	**Yes**	No	No

NOTES:
[a] The total emissions may not sum precisely due to rounding of subtotals.
SOURCE: Ramboll Environ, 2015

A mitigation measure was considered to reduce the contribution of on-road truck emissions by restricting contractors to utilizing haul trucks manufactured in year 2010 or later (year 2007 trucks would not result in decreased emissions over the existing truck fleet). However, recent communications with contractors indicate that there is a limited supply of available trucks for off-hauling soil. Given the high excavation volumes and short construction phase of the proposed project, it is probable that not enough qualified trucks would be available to implement such a measure. Thus, the feasibility of this mitigation is uncertain at this time. Consequently, emission offsets represent the only available additional mitigation option to address construction-related NOx emissions.

Because construction-related emissions of NOx would remain significant even with implementation of Mitigation Measure M-AQ-1, Mitigation Measure M-AQ-2b (Emissions Offsets) is also identified to reduce the residual pollutant emissions (see Impact AQ-2). Mitigation Measure M-AQ-2 (Emissions Offsets) would require the project sponsor to offset remaining emissions to below significance thresholds by funding the implementation of an offsite emissions reduction project in an amount sufficient to mitigate both residual construction pollutant emissions and operational pollutant emissions described below in Impact AQ-2. As specified in Mitigation Measure M-AQ-2b, offsetting of construction emissions would follow completion of construction activities, and the mitigation offset fee would be determined by the amount of emissions to be calculated based on reporting requirements of Mitigation Measure M-AQ-1 and the degree of compliance with off-road equipment types that are determined to be reasonably commercially available. The emissions offset fee is expressed in tons per year; therefore, under the minimum level of compliance with Mitigation Measure M-AQ-1, the remaining construction emissions offset required is 11.7 tons per year of ozone precursors and under the maximum level of compliance, the construction emissions offset required is reduced to 2.5 tons per year of ozone precursors. However, as described in Impact AQ-2 below, offset of operational emissions required would be 17.0 tons per year, which is greater than the amount estimated to be required for construction emissions offset. Therefore, emissions reduction projects funded through Mitigation Measure M-AQ-2b would offset the regional criteria pollutant emissions generated by construction of the proposed project that would remain in excess of the applicable thresholds after implementation of the project-specific emission reductions required under Mitigation Measures M-AQ-1. However, upon completion of construction, if the calculated emissions based on the reporting requirements of Mitigation Measure M-AQ-1 requires offsets are in excess of 17.0 tons per year, then the applicant shall provide the additional offset fees in an amount commensurate with the calculated ozone precursor emissions exceeding 17.0 tons per year. Because implementation of the emissions reduction project would be conducted by the BAAQMD and is not fully within the control of the project sponsor (see discussion of **Impact AQ-2**), the residual impact of construction emissions is conservatively considered *significant and unavoidable with mitigation*, acknowledging the assumption that the project sponsor would implement Mitigation Measures M-AQ-1 (Construction Emissions Minimization) and Mitigation Measure M-AQ-2b (Emission Offsets).

Summary of Impact AQ-1, Construction Emissions

Construction of the proposed project would generate emissions of fugitive dust and criteria air pollutants. The project sponsor, through its contractors, would be required to implement dust control measures in compliance with the requirements of the Construction Dust Control Ordinance, which would ensure that the construction-related impacts due to fugitive dust would be *less than significant*.

Estimated emissions of criteria air pollutants indicate that average daily construction emissions of PM_{10} and $PM_{2.5}$ would be below the applicable thresholds. Emissions of ROG and NOx, however, would exceed the applicable significance thresholds. Implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization) would reduce ROG and NOx emissions but additional implementation of Mitigation Measure M-AQ-2b (Emission Offsets) would be further required to reduce NOx emissions to below the applicable threshold. However, because implementation of emissions offsets is dependent in part on the actions of a third party, this measure is not fully within the control of the project sponsor. As such, the residual impact related to regional emissions of criteria pollutants during construction is conservatively considered *significant and unavoidable with mitigation.*

Mitigation Measure M-AQ-1: Construction Emissions Minimization

A. *Construction Emissions Minimization Plan.* Prior to issuance of a construction permit, the project sponsor shall submit a Construction Emissions Minimization Plan (Plan) to the OCII or its designated representative for review and approval by an Air Quality Specialist. The Plan shall detail project compliance with the following requirements:

1. All off-road equipment greater than 25 horsepower (hp) and operating for more than 20 total hours over the entire duration of construction activities shall meet the following requirements:

a) Where access to alternative sources of power are available, portable diesel engines shall be prohibited. Where portable diesel engines are required because alternative sources of power are not available, the diesel engine shall meet the equipment compliance step-down schedule in **Table M-AQ-1-1**.

TABLE M-AQ-1-1
OFF-ROAD EQUIPMENT COMPLIANCE STEP-DOWN SCHEDULE

Compliance Alternative	Engine Emission Standard	Emissions Control
1	Tier 4 Interim	ARB NOx VDECS (40%)[52]
2	Tier 3	ARB NOx VDECS (40%)
3	Tier 2	ARB NOx VDECS (40%)

How to use the table: If the requirements of (A)(1)(b) cannot be met, then the project sponsor would need to meet Compliance Alternative 1. Should the project sponsor not be able to supply off-road equipment meeting Compliance Alternative 1, then Compliance Alternative 2 would need to be met. Should the project sponsor not be able to supply off-road equipment meeting Compliance Alternative 2, then Compliance Alternative 3 would need to be met.

b) All off-road equipment shall have engines that meet either U.S. Environmental Protection Agency (USEPA) or California Air Resources Board (CARB) Tier 4 off-road emission standards. If engines that comply with Tier 4 off-road emission standards are not commercially available, then the project sponsor shall provide the next cleanest piece of off-road equipment as provided by the step down schedules in Table M-AQ-1-1.

i. For purposes of this mitigation measure, "commercially available" shall mean the availability of Tier 4 equipment taking into consideration factors such as: (i) critical path timing of construction;

52 http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm, January 7, 2015.

(ii) geographic proximity to the Project site of equipment; and
(iii) geographic proximity of access to off haul deposit sites.

ii. The project sponsor shall maintain records concerning its efforts to comply with this requirement.

2. The project sponsor shall require the idling time for off-road and on-road equipment be limited to no more than two minutes, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment. Legible and visible signs shall be posted in multiple languages (English, Spanish, and Chinese) in designated queuing areas and at the construction site to remind operators of the two minute idling limit.

3. The project sponsor shall require that construction operators properly maintain and tune equipment in accordance with manufacturer specifications.

4. The Plan shall include estimates of the construction timeline by phase with a description of each piece of off-road equipment required for every construction phase. Off-road equipment descriptions and information may include, but are not limited to: equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, engine serial number, and expected fuel usage and hours of operation. For VDECS installed: technology type, serial number, make, model, manufacturer, ARB verification number level, and installation date and hour meter reading on installation date. For off-road equipment using alternative fuels, reporting shall indicate the type of alternative fuel being used. The plan shall also include estimates of ROG and NOx emissions.

5. The project sponsor shall keep the Plan available for public review on site during working hours. The project sponsor shall post at the perimeter of the project site a legible and visible sign summarizing the requirements of the Plan. The sign shall also state that the public may ask to inspect the Plan at any time during working hours, and shall explain how to request inspection of the Plan. Signs shall be posted on all sides of the construction site that face a public right of way. The project sponsor shall provide copies of Plan to members of the public as requested.

B. *Reporting.* Quarterly reports shall be submitted to the OCII or its designated representative indicating the construction phase and off-road equipment information used during each phase including the information required in A(4). In addition, for off-road equipment using alternative fuels, reporting shall include the actual amount of alternative fuel used.

Within six months of the completion of construction activities, the project sponsor shall submit to the OCII or its designated representative a final report summarizing construction activities. The final report shall indicate the start and end dates and duration of each construction phase. For each phase, the report shall include detailed information required in A(4). In addition, for off-road equipment using alternative fuels, reporting shall include the actual amount of alternative fuel used.

C. *Certification Statement and On-site Requirements.* Prior to the commencement of construction activities, the project sponsor must certify (1) compliance with the Plan, and (2) all applicable requirements of the Plan have been incorporated into contract specifications.

Comparison of Impact AQ-1 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR identified construction-related air quality impact as less than significant with implementation of Mitigation Measure F.2, dust control measures. Currently, however, Mitigation Measure F.2 of the Mission Bay FSEIR to control fugitive dust would effectively be implemented through compliance with the requirements of the Construction Dust Control Ordinance, which was adopted in 2008. Therefore, Mission Bay FSEIR Mitigation Measure F.2 is not applicable to the proposed project.

Criteria air pollutants from construction were not calculated or used as an assessment tool in the Mission Bay FSEIR, as BAAQMD did not recommend quantification of criteria air pollutant emissions at that time. Consequently, the proposed project would result in a *new* significant impact that was not previously identified in the Mission Bay FSEIR due to the calculated construction emissions of ozone precursors that would exceed significance thresholds.

Operational Impacts

Impact AQ-2: During project operations, the proposed project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. (Significant and Unavoidable with Mitigation)

The proposed project would generate operational emissions from a variety of sources, including the following: new vehicle trips; maintenance operation of standby diesel generators and boilers; and area sources such as landscape equipment and use of consumer products. Some of the motor vehicle trips that would be generated by Golden State Warriors basketball games at the proposed event center would be regional trips similar to those currently generated by basketball games occurring at the Oracle Arena in Oakland, and as a result, the emissions associated with these regional trips would not represent new emissions to the air basin. While it is reasonable to assume that a percentage of non-Golden State Warriors events (i.e., concerts, family shows etc.) would be transferred to the proposed event center in San Francisco without replacement at Oracle Arena, this analysis assumes that the Oracle Arena maintains its current levels of non-Golden State Warriors events and therefore is based on a conservative (i.e., higher) estimate of net new vehicle trips to the air basin.

Consequently for the purposes of this CEQA analysis, the project operational emissions do not consider regional VMT-related emissions from basketball game events due to relocation of all Golden State Warriors basketball games from Oracle Arena in Oakland to the proposed event center in San Francisco. Marketing analysis indicates that the average trip length (25 miles) is the same for either arena location. It is unlikely that there would be another NBA franchise in the Bay Area, so all of the professional basketball games occurring in the region would likely be played at the new event center. This assumption is consistent with that of the City of Oakland in its CEQA-related analyses.[53] All other project operational vehicle trips associated with the proposed land uses are considered to be "new" vehicle trips for the purposes of this analysis.

This scenario also assumes successful implementation of the proposed Muni Special Event Transit Service Plan as part of the proposed project, or implementation of Mitigation Measure M-TR-18 (Auto Mode Share Performance Standard), if the Muni Special Event Transit Service Plan is not implemented. As described in Chapter 3, Project Description and also in more detail in Section 5.2, Transportation and Circulation, as part of the proposed project, the San Francisco Municipal Transportation Agency (SFMTA) would provide additional service over existing conditions to accommodate peak evening events for basketball games and concerts with more than 14,000 attendees. Under the Muni Special Event Transit Service Plan, light rail service on the T Third line would be increased, and three special event shuttles would be implemented, including a 16th Street BART Shuttle, Van Ness Avenue Shuttle, and Transbay Terminal/Ferry Building Shuttle. However, as also discussed in Section 5.2, Transportation and Circulation, Impact TR-18, if the Muni Special Event Transit Service Plan is not fully implemented in the future due to SFMTA fiscal constraints, Mitigation Measure M-TR-18 (Auto Mode Share Performance Standard) would require the project sponsor to implement additional transportation demand management strategies as necessary to achieve a similar arrival auto mode share as with the Muni Special Event Transit Service Plan, which is no more than 53 percent for weekday events that have 12,500 or more attendees and 59 percent for weekend events that have 12,500 or more attendees.

Criteria air pollutant emissions were calculated for all project operational emission sources, including mobile sources (vehicles), generators, natural gas boilers, and area sources. USEPA emission factors were used for generators and boilers. Vehicle trip emissions were calculated using EMFAC2011 emissions factors from the CARB[54] (the latest emissions factors available at the time of the NOP publication), based on vehicle trip generation rates developed for this project (see Section 5.2, Transportation and Circulation). The proposed project would include a number of measures that would reduce criteria air pollutant emissions. For example, the project's trip generation takes into account the project's proximity to transit service. The project would also include: bicycle and pedestrian infrastructure; provision of bicycle parking; increased energy efficiency beyond Title 24; meeting Green Building Code standards; and installation of low-water use appliances and fixtures. Calculated air pollutant emissions for the proposed project have already incorporated emission reductions associated with these measures.

The results of the project operational criteria air pollutant emissions calculations are presented in **Table 5.4-9**. Details on calculations and methodology are provided in Appendix AQ. Table 5.4-9 indicates that operational criteria air pollutant emissions of the proposed project would result in emission of criteria pollutants and precursors that would be at levels below the thresholds of significance for PM_{10} and $PM_{2.5}$. However, the estimated operational emissions of ROG and NOx would exceed the significance threshold, resulting in a *significant* air quality impact.

53 City of Oakland, Draft Environmental Impact Report for Coliseum Area Specific Plan August 22, 2014.
54 Although an updated versions of EMFAC (EMFAC2014) has been released by CARB, EMFAC2011 is still the currently USEPA approved version of EMFAC. (e-mail from CARB Mobile Source emissions inventory list serve, May 15,2015).

TABLE 5.4-9
AVERAGE DAILY AND MAXIMUM ANNUAL OPERATIONAL EMISSIONS

	Average Daily Emissions (pounds/day)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile Sources	42	108	77	22
Standby Diesel Generators	0.30	0.97	0.04	0.04
Boilers	2.1	14	2.9	2.9
Area Sources	35	<0.01	<0.01	<0.01
Total[a]	79	124	80	25
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No
	Maximum Annual Emissions (short tons/year)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile Sources	7.6	20	14	4.0
Standby Diesel generators	0.06	0.18	0.01	0.01
Boilers	0.38	2.6	0.52	0.52
Area Sources	6.4	<0.01	<0.01	<0.01
Total[a]	**14**	**23**	14.6	4.5
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No
Estimated Emissions Reduction Required	**4.4**	**12.6**	0	0

NOTES:
[a] The total emissions may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

The main health concern of exposure to ground-level ozone, for which ROG and NOx are ozone precursors, is effects on the respiratory system, especially on lung function. Several factors influence these health impacts, including the concentrations of ground-level ozone in the atmosphere, the duration of exposure, average volume of air breathed per minute, the length of intervals between short-term exposures, and the sensitivity of the person to the exposure.[55,56] The concentration of ground-level ozone in the atmosphere is influenced by the volume of air

55 The World Bank Group, *Pollution Prevention and Abatement Handbook 1998: Toward Cleaner Production*, pp. 227–230, 1999. Available online at www.ifc.org/wps/wcm/connect/dd7c9800488553e0b0b4f26a6515bb18/Handbook GroundLevel Ozone.pdf?MOD=AJPERES (accessed July 10, 2014)

56 U.S. Environmental Protection Agency, *Air Quality Guide for Ozone*, March 2008. www.airnow.gov/index.cfm?action= pubs.aqiguid eozone (accessed July 10, 2014).

available for dilution, the temperature, and the intensity of ultraviolet light. In the Bay Area, the worst case conditions for ozone formation occur in the summer and early fall on warm, windless, sunny days.[57]

Given these various factors, it is difficult to predict the magnitude of health effects from the project's exceedance of significance criteria for regional ROG and NOx emissions. The increase in emissions associated with the proposed project represents a fraction of total SFBAAB regional ROG and NOx emissions (79 pounds of ROG per day compared to 265 tons per day in the SFBAAB region in 2012, and 124 pounds of NOx per day compared to 318 tons per day in the SFBAAB region in 2012).[58] Although Table 5.4-1 indicates that the most stringent applicable ozone standards were not exceeded at the Potrero Hill monitoring station between 2010 and 2014, the SFBAAB region experienced an average of 8.4 days of exceedance per year between 2010 and 2014.[59] The proposed project's ROG and NOx increases could contribute to new or exacerbated air quality violations in the SFBAAB region by contributing to more days of ozone exceedance or result in AQI values that are unhealthy for sensitive groups and other populations. As shown in Table 5.4-3, the SFBAAB has averaged between 8 and 19 days per year that are considered unhealthy for sensitive groups and had 2 unhealthy (red) days in the last five years. On unhealthy days, persons are recommended to avoid both prolonged and heavy exertion outdoor activities.[60]

Mitigation Measure M-AQ-2a (Reduce Operational Emissions) and **Mitigation Measure M-AQ-2b (Emission Offsets)** are identified to reduce ROG and NOx emissions associated with project operations.

Mitigation Measure M-AQ-2a would reduce operational emissions of ROG and NOx primarily through reduction in mobile sources through implementation of additional transportation demand measures (TDM) beyond those already included as part of the proposed project. Section 5.2, Transportation and Circulation, provides a detailed analysis regarding strategies to reduce transportation impacts, which form the basis for Mitigation Measure M-AQ-2a. However, as described in Section 5.2, Transportation and Circulation, the feasibility of the additional TDM measures listed in Mitigation Measures M-AQ-2a is currently unknown. Even though the California Air Pollution Control Officers Administration estimates that "commute trip reduction" strategies can result in a commuter trip reduction of 1.0 to 6.2 percent,[61] the specific TDM strategies identified for this project address more than just commute trips, and it is unknown if a higher percentage reduction of overall vehicle trips is attainable. Notwithstanding these estimated reductions, it is assumed that specific quantitative reduction of vehicle trips associated with the additional TDM would be difficult to quantify and the success of any one measure variable; therefore, no emissions

57 Bay Area Air Quality Management District, *Air Pollutants*, January 30, 2013. Available online at www.baaqmd.gov/Divisions/ Communications -and -Outreach/ Air-Quality-in-the-Bay-Area/Air-Pollutants.aspx (accessed July 10, 2014).

58 California Air Resources Board, The California Almanac of Emissions and Air Quality – 2013 Edition, May 21, 2014. Available online at www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm (accessed April 23, 2015).

59 Bay Area Air Quality Management District, *Annual Bay Area Air Quality Summaries*, 2014. Available online at www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Quality-Summaries.aspx (accessed October 3, 2014).

60 U.S. Environmental Protection Agency, *Air Quality Index, A Guide to Air Quality and Your Health,* February 2014. Available online at www.epa.gov/airnow/aqi_brochure_02_14.pdf (accessed September 8, 2014.

61 CAPCOA, Quantifying Greenhouse Gas Mitigation Measures, August 2010. p.218

reduction are attributed to Mitigation Measure M-AQ-2a. The analysis in Section 5.2, Transportation and Circulation, also addresses Mission Bay FSEIR Mitigation Measure F.1, which essentially reiterated the transportation-related mitigation measures related to transportation demand management that, if implemented, would reduce vehicular air pollutant emissions; as described above in Section 5.4.2.2, these Mission Bay FSEIR mitigation measures are either completed, incorporated as part of the project, or not applicable to this project.

To address operational emission levels of ROG and NOx exceeding the SEIR's significance thresholds, **Mitigation Measure M-AQ-2b, Emission Offsets,** is identified to offset project operational emissions by funding the implementation of one or more emission reduction projects within the air basin. As discussed above under "Regulatory Setting," the BAAQMD administers the Carl Moyer program within the SFBAAB, which establishes the cost-effectiveness criteria for funding emissions reduction projects at $18,030 per weighted ton of ROG, NOx and PM emissions.[62] The Carl Moyer guidelines can be used to evaluate other emissions reduction projects within the SFBAAB that are administered by the Strategic Incentive Division of BAAQMD. Based on the current Carl Moyer cost effectiveness criteria and a 5 percent administrative fee, payment of $321,646 to the Strategic Incentives Division of the BAAQMD to implement emission reduction projects within the SFBAAB would be sufficient to offset the regional criteria pollutant emissions generated by operation of the proposed project that would remain in excess of the applicable thresholds, based on 4.4 tons per year of ROG and 12.6 tons per year of NOx, as shown in Table 5.4-9, or a total of 17.0 tons per year of ozone precursors; as indicated in Impact AQ-1 above, estimated emissions offsets for construction emissions is less than 17.0 tons per year, so this payment would also mitigate for the project's construction emissions.

Mitigation Measure M-AQ-2b would require the project sponsor to pay an offset mitigation fee to the BAAQMD to fund emissions reduction projects that would reduce emissions of ozone precursors to below the applicable thresholds. Mitigation Measure M-AQ-2b also assumes that the BAAQMD would report to the lead agency the final emissions reductions funded by the mitigation fee and that the BAAQMD would refund the project sponsor for any unspent mitigation fees upon meeting the required emissions reductions indicated in Table 5.4-9 above.

The project sponsor has agreed to fund Mitigation Measure M-AQ-2b as part of its overall commitment to implement all mitigation measures identified in this SEIR. However, because implementation of an emissions offset project would be conducted by the BAAQMD and is dependent in part on the actions of a third party, this measure is not fully within the control of the project sponsor. As such, the impact related to regional emissions of criteria pollutants associated with project operations is conservatively considered *significant and unavoidable with mitigation*, acknowledging the assumption that the project sponsor would implement Mitigation Measures M-AQ-2a (Reduce Operational Emissions) and Mitigation Measure M-AQ-2b (Emission Offsets).

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[62] The following equation is used to calculated the Weighted Emissions Reductions: Weighted Emissions Reductions= NOx reductions (tons/year)+ROG Reductions (tons/year) +(20 x (PM Reductions (tons/year))).

Summary of Impact AQ-2, Operational Emissions

Operation of the proposed project would include a variety of sources that would contribute to long term emissions of criteria air pollutants (ROG, NOx, PM_{10}, and $PM_{2.5}$). These sources would include new vehicle trips, maintenance and operation of standby diesel generators, boilers, and area sources such as landscape equipment and use of consumer products. Calculations of average daily and maximum annual emissions indicate that under the proposed project without mitigation, levels of ROG and NOx would exceed significance thresholds; this would be a significant impact. With implementation of Mitigation Measures M-AQ-2a (Reduce Operational Emissions), operational emissions of ROG and NOx would still be significant due to the as yet unknown feasibility of the mitigation strategies. Consequently, emission offsets, Mitigation Measure M-AQ-2b, represent the only available mitigation option to address operations-related emissions. However, this impact is conservatively considered *significant and unavoidable with mitigation* because implementation of an emissions offset project is dependent in part on the actions of a third party, beyond the control of the project sponsor.

Mitigation Measure M-AQ-2a: Reduce Operational Emissions

The project sponsor shall implement the following measures as feasible:

- Provision of outlets for electrically powered landscape equipment
- **Mitigation Measure M-TR-2c: Additional Strategies to Reduce Transportation Impacts** (see Section 5.2, Transportation and Circulation, Impact TR-2)
- **Mitigation Measure M-TR-11c: Additional Strategies to Reduce Transportation Impacts of Overlapping Events** (see Section 5.2, Transportation and Circulation, Impact TR-11)

Mitigation Measure M-AQ-2b: Emission Offsets

Upon completion of construction, and prior to issuance of certificate of occupancy, the project sponsor shall pay a mitigation offset fee to the Bay Area Air Quality Management District's (BAAQMD) Strategic Incentives Division in an amount not to exceed $18,030 per weighted ton per year of ozone precursors plus a 5 percent administrative fee to fund one or more emissions reduction projects within the San Francisco Bay Area Air Basin (SFBAAB). This fee is intended to fund emissions reduction projects to achieve reductions of 17.0 tons per year of ozone precursors. Documentation of payment shall be provided to OCII or its designated representative.

The project sponsor shall calculate the amount of emissions offset required from construction based on the reporting requirements of Mitigation Measure M-AQ-1 and the degree of compliance with off-road equipment types that were determined to be commercially available. If the calculated construction emissions of ozone precursors requires offsets in excess of 17.0 tons per year, then the applicant shall provide the additional offset amount commensurate with the calculated ozone precursor emissions exceeding 17.0 tons per year.

Acceptance of this fee by the BAAQMD shall serve as an acknowledgment and commitment by the BAAQMD to: (1) implement an emissions reduction project(s) within one year of receipt of the mitigation fee to achieve the emission reduction objectives specified above; and (2) provide documentation to OCII or its designated representative and to the project sponsor describing the project(s) funded by the mitigation fee, including the amount of emissions of ROG and NOx reduced (tons per year) within the SFBAAB from the emissions reduction project(s). If there is any remaining unspent portion of the mitigation offset fee following implementation of the emission reduction project(s), the project sponsor shall be entitled to a refund in that amount from the BAAQMD. To qualify under this mitigation measure, the specific emissions retrofit project must result in emission reductions within the SFBAAB that would not otherwise be achieved through compliance with existing regulatory requirements.

Comparison of Impact AQ-2 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR identified the operational air quality impact with respect to criteria air pollutants as significant and unavoidable due to NOx emissions in excess of 16 times greater than the 1998 threshold, ROG emissions in excess of 10 times the 1998 threshold and PM_{10} emissions in excess of 24 times the 1998 threshold. Thus, the impact conclusion for the proposed project is essentially the same as that in the Mission Bay FSEIR for the entire Mission Bay plan area for ROG and NOx, though unlike the conclusions of the FSEIR, the proposed project's operational emissions would not exceed the PM_{10} threshold. Therefore, the project would not result in a new or substantially more severe significant impact than was previously identified. As described above in Section 5.4.2.2, Mission Bay FSEIR Mitigation Measure F.1 (which is the same as Mission Bay FSEIR Transportation Measures E.46 through E.50), has either already been implemented, is incorporated as part of the proposed project, or is not applicable to the proposed project.

Toxic Air Contaminants, Construction and Operation

Impact AQ-3: Construction and operation of the proposed project would generate toxic air contaminants, including diesel particulate matter, and could expose sensitive receptors to substantial air pollutant concentrations. (Less than Significant with Mitigation)

As discussed above, San Francisco, in partnership with BAAQMD, has modeled and assessed air pollutant impacts from mobile, stationary, and area sources within the City. As described above in Section 5.4.2.3, this assessment identified areas with poor air quality under existing conditions—Air Pollutant Exposure Zones—which are based on significance thresholds for $PM_{2.5}$ and excess cancer risk, or areas within the City that warrant special attention when siting land uses that either emit TACs or uses that are considered sensitive to air pollution. The project site is not located within an Air Pollutant Exposure Zone. Under existing conditions, sensitive land uses exist in the project vicinity, as indicated in Table 5.4-5; in addition, there is the potential that planned future development in the project vicinity could include sensitive uses, such as the planned Uber/ARE development at Blocks 26-27, north of the project site (see Section 5.1, Impact Overview, for description of planned and proposed project in the vicinity). Thus, because construction and operation of the proposed project would result in emissions of TACs and $PM_{2.5}$, this analysis evaluates the potential to expose sensitive receptors in the project vicinity to substantial air pollutant concentrations.

Construction TAC Emissions

Regarding construction emissions, off-road equipment (which includes construction-related equipment) is a large contributor to diesel particulate matter (DPM) emissions in California, although since 2007, the CARB has found the emissions to be substantially lower than previously expected.[63] Newer and more refined emission inventories have lowered the estimates of DPM emissions from off-road equipment such that off-road equipment is now considered the sixth largest source of DPM emissions in California.[64] For example, CARB's revised estimates of particulate matter (PM) emissions (of which DPM is a major component) for the SFBAAB for the year 2010 have decreased by 83 percent from previous 2010 emissions estimates.[65] Approximately half of the reduction in emissions can be attributed to the economic recession and half to updated methodologies used to better assess construction emissions.[66]

Additionally, a number of federal and state regulations are requiring cleaner off-road equipment. Specifically, both the USEPA and California have set emissions standards for new off-road equipment engines, ranging from Tier 1 to Tier 4. Tier 1 emission standards were phased in from 1996 to 2000, and Tier 4 interim and final emission standards for all new engines will be phased in between 2008 and 2015. To meet the Tier 4 emission standards, engine manufacturers will be required to produce new engines with advanced emission-control technologies. Although the full benefits of these regulations will not be realized for several years, the USEPA estimates that by implementing the federal Tier 4 standards, NO_x and PM emissions will be reduced by more than 90 percent.[67] Furthermore, California regulations limit maximum idling times to five minutes, which further reduces public exposure to NO_x and PM emissions.[68]

Furthermore, construction activities do not lend themselves to analysis of long-term health risks because of their temporary and variable nature. As explained in the BAAQMD's *CEQA Air Quality Guidelines*:

> "Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to substantial concentrations. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (CARB 2005). In addition, current models and methodologies for conducting health risk

63 ARB, *Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements*, p.1 and p. 13 (Figure 4), October 2010.

64 ARB, *Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements*, October 2010.

65 ARB, "In-Use Off-Road Equipment, 2011 Inventory Model," Query accessed online, April 2, 2012, http://www.arb.ca.gov/msei/categories.htm#inuse_or_category.

66 ARB, *Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements*, October 2010.

67 USEPA, "Clean Air Nonroad Diesel Rule: Fact Sheet," May 2004.

68 California Code of Regulations, Title 13, Division 3, § 2485.

> assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of health risk."[69]

Therefore, project-level analyses of construction activities have a tendency to overestimate assessments of long-term health risks. However, a health risk assessment (HRA) was conducted for the proposed project's 26-month construction period. The primary construction TAC emissions of concern, DPM and $PM_{2.5}$, would be emitted by diesel-powered construction equipment and truck trips hauling excavated materials. Equipment used would include cranes, excavators, loaders and backhoes. The project-specific HRA was based on the use of these and other high-powered non-standardized diesel equipment, as provided by the project sponsor.

Operational TAC Emissions

The sources of TAC emissions that would occur during the operational phase of the project include emissions from mobile sources (passenger vehicles and delivery vehicles) and five stationary sources (diesel generators). Mobile source air toxics are compounds emitted from highway vehicles, which are known or suspected to cause cancer or other serious health and environmental effects. Examples of mobile source air toxics include benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, polycyclic organic matter (POM), naphthalene, and diesel particulate matter.

Under the project, the five proposed diesel back-up generators would all be located within the parking structure on Lower Parking Level 1. Diesel generators, if larger than 50 horsepower, must obtain a permit from the BAAQMD and comply with the Air Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines. As a practical matter, the BAAQMD will not issue a permit for a new generator that results in an operational cancer risk greater than 10 in one million.

Health Risk Assessment

A heath risk assessment was conducted to asses both increased cancer risk and localized $PM_{2.5}$ concentrations from both construction and operational sources. Localized $PM_{2.5}$ concentrations are assessed based on annual average concentrations, and hence, separate evaluations are performed for construction and operations. Conversely, cancer risk is assessed based on the probability of contracting cancer over a person's lifetime, evaluated as 70 years. Therefore the probability of an increased cancer risk is determined by evaluating a sensitive receptor's exposure to both construction and operational emissions. Both the $PM_{2.5}$ and cancer risk assessments account for background (existing) concentrations and risk levels. The cumulative (project plus background) $PM_{2.5}$ and cancer risk results are compared to significance thresholds of 10 $\mu g/m^3$ and 100 per one million, respectively.

Sources considered in the HRA include un-mitigated and mitigated emissions from construction equipment and trucks, operational traffic generated by the full build out of the proposed development, and maintenance operations of the proposed diesel generators. Under California

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[69] BAAQMD, *CEQA Air Quality Guidelines,* May 2011, page 8-6.

regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole.

To evaluate TAC and $PM_{2.5}$ impacts from the proposed project, near-field air dispersion modeling of DPM and $PM_{2.5}$ from project construction emission sources was conducted using the USEPA's American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), version 14134,[70] as recommended by the BAAQMD *CEQA Air Quality Guidelines*. Air dispersion modeling applications used meteorological data from the Mission Bay meteorological site operated by the BAAQMD to provide the most representative data set for this analysis.

The ambient concentrations obtained through dispersion modeling were subsequently used in the risk assessment to quantify cancer health risk impacts and to evaluate $PM_{2.5}$ impacts. Air dispersion models such as AERMOD require a variety of inputs such as source parameters, meteorological parameters, topography information, and receptor parameters, which are discussed below.

To evaluate TAC and $PM_{2.5}$ impacts from operational sources, a screening level assessment was conducted. Emissions from the proposed emergency generators were assumed to comply with BAAQMD permitting requirements. The permitting process under BAAQMD Regulation 2, Rule 5 requires a Health Risk Screening Analysis, the results of which are posted on the District's website. Per its Policy and Procedure Manual, the BAAQMD requires implementation of Best Available Control Technology for Toxics and would deny an *Authority to Construct* or a *Permit to Operate* for any new or modified source of TACs that exceeds a cancer risk of 10 in one million. As a worst case analysis, it was conservatively assumed the two generators each associated with the retail and office buildings, respectively, could potentially be permitted by a separate entity than the permit held by the arena operator and that therefore three separate permits could be required, each allowing an increased cancer risk of up to 10 in one million. Therefore, it was conservatively assumed that increased cancer risk associated with the five proposed generators could be up to 30 in one million and no refined health risk modeling was conducted for the emergency generators.

Meteorological Data. Air dispersion modeling applications require the use of meteorological data that ideally are spatially and temporally representative of conditions in the immediate vicinity of the site under consideration. For the HRA, meteorological data collected and processed by BAAQMD[71] at the Mission Bay station were used.[72] The Mission Bay station is less than 1 mile west of the project site.

Source Configurations – Construction. Emitting activities were modeled between 7 a.m. and 1 a.m., seven days a week to reflect the duration of construction activities.

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70 U.S. Environmental Protection Agency, *User's Guide for the AMS/EPA Regulatory Model (AERMOD)*, Office of Air Quality Planning and Standards, Emissions Monitoring and Analysis Division, Research Triangle Park, North Carolina, EPA-454/B-03-001, September 2004.
71 BAAQMD processed the data using AERMET 12345.
72 The ESA Air Quality Technical Report Scope of Work approved by the San Francisco EP suggested using this meteorological station.

Source Configurations – Operation. Emissions from project-generated traffic were modeled 24 hours a day, with an hour-of-day temporal profile reflecting the fluctuation of traffic volume in San Francisco County, extracted from EMFAC 2011. Actual emission factors were generated by EMFAC2011 for the project-generated traffic increment.

Source Parameters – Construction. At any given time there would be multiple emissions sources associated with construction equipment within the construction zone. Each construction phase was modeled as a series of adjacent area sources, the dimensions of which varied depending on the sources considered. Off-site vehicles (trucks and worker trips going to and from construction zones) were included in the area sources.

Source Parameters – Operation. The proposed project would include new natural gas-fired boilers to provide heating to the proposed arena. According to the BAAQMD,[73] non-diesel boilers are regarded as minor, low-impact sources that can be excluded from the CEQA process. The project would also include five stationary emergency diesel engines which would require stationary source permits. These generators would require stationary source permits from the BAAQMD. BAAQMD Rule 2-5-302 limits project risks to 10 in one million, so for screening purposes incremental risk from the generators is assumed to be 10 in one million. In the worst case, the generators might have up to three different owners, resulting in three separate permits with risks of up to 10 in one million each, for a total potential risk of 30 in one million associated with project generators.

$PM_{2.5}$ impacts were modeled using the USEPA SCREEN3 model. SCREEN3 is a Gaussian air dispersion model that uses a worst-case, not site-specific, meteorological dataset to estimate maximum impacts. Using the concentration estimates from SCREEN3, a human health risk analysis was conducted at distances from the project site representing the residential and hospital receptors.

More specific details on the health risk and $PM_{2.5}$ calculations and methodology are provided in Appendix AQ.

Exposure to $PM_{2.5}$

Table 5.4-10 shows the results of the risk assessment for exposure to $PM_{2.5}$ during construction at the maximally impacted receptor. The Air Pollutant Exposure Zone standard for $PM_{2.5}$ is an annual average standard, and because construction and operational activities would not overlap, only the construction $PM_{2.5}$ concentrations are added to the background $PM_{2.5}$ concentrations to determine whether construction of the project would result in the project vicinity meeting the Air Pollutant Exposure Zone criteria. As shown in Table 5.4-10, cumulative $PM_{2.5}$ levels at the maximally impacted sensitive receptor would be 8.9 $\mu g/m^3$, and would not exceed the 10 $\mu g/m^3$ significance threshold. Thus, localized $PM_{2.5}$ impacts from construction activities at sensitive receptor locations would be *less than significant*.

73 BAAQMD. 2012. Recommended Methods for Screening and Modeling Local Risks and Hazards. Available online at : http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Risk%20Modeling%20Approach%20May%202012.ashx?la=en

TABLE 5.4-10
ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS AT OFF-SITE RECEPTORS

Source	$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)	
	UCSF Hearst Tower Receptor	**UCSF Hospital Receptor**
Construction		
Background at the maximally impacted receptor	8.5	8.6
Unmitigated Construction Contribution	0.31	0.31
Mitigated (Tier 2 + NOx VDECS) Construction Contribution	0.053	0.053
Cumulative Total (Unmitigated/with Mitigation)[a]	8.8 / 8.5	8.9 / 8.7
Significance Threshold	10	10
Above Threshold?	No	No
Operation		
Background at the maximally impacted receptor	8.5	8.6
Project Operations – Generators	0.055	0.055
Project Operations – Mobile Sources	0.32	0.32
Cumulative Total (Project, Unmitigated)[a]	8.9	9.0
Significance Threshold	10	10
Above Threshold?	No	No

NOTES:
[a] The total concentrations may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

Following completion of construction activities, the proposed project's operational sources would also generate $PM_{2.5}$ emissions, which are quantified in Table 5.4-10. As shown in this table, maximum cumulative (background plus project) $PM_{2.5}$ concentrations during project operations would be 9.0 $\mu g/m^3$ for the proposed project. Furthermore, at no off-site location, during construction or operations, would cumulative $PM_{2.5}$ concentrations exceed 10 $\mu g/m^3$. Therefore, the proposed project would not result in sensitive receptor locations meeting the Air Pollutant Exposure Zone criteria for $PM_{2.5}$, and construction and operational $PM_{2.5}$ emissions would be *less than significant*.

Cancer Risk

The results of the risk assessment are presented in **Table 5.4-11** below for both the unmitigated and mitigated scenarios, the latter of which assumes the minimum level of compliance (Tier 2 engines with NOx VDECS) with implementation of **Mitigation Measure M-AQ-1 (Construction Emissions Minimization)** described above under Impact AQ-1. Table 5.4-11 shows that under unmitigated conditions, the excess cancer risk for a child resident at the UCSF Hearst Tower and Hospital would exceed the significance threshold of 100 per one million persons exposed. More specifically, a resident child at the UCSF Hearst Tower could be exposed to an excess cancer risk of up to 117 per one million under unmitigated project conditions, a significant impact. The proposed project's unmitigated construction emissions would account for an excess cancer risk of 54 in one million,

TABLE 5.4-11
LIFETIME EXCESS CANCER RISK AT OFF-SITE RECEPTORS

	Excess Cancer Risk (in one million)		
	UCSF Hearst Tower Receptor		UCSF Hospital Receptor
Source	**Child Resident**	**Adult Resident**	**(Child Resident)**
Background at the maximally impacted receptor	26	26	44
Unmitigated Construction Contribution	54	2.8	28
Mitigated (Tier 2 + NOx VDECS) Construction Contribution	9.2	0.48	4.8
Project Operations – Generators	30	30	30
Project Operations – Mobile Sources	7.2	7.2	7.2
Cumulative Total (Unmitigated/with Mitigation)[a]	117 / 72	66 / 64	109 / 86
Significance Threshold	100	100	100
Above Threshold? (Unmitigated/with Mitigation)	**Yes** / No	No / No	**Yes** / No

NOTES:
a The total risks may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

and unmitigated operational emissions would account for an excess cancer risk of 37 in one million at this receptor location. Implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization) would reduce the impacts from standardized construction equipment for which "tiered" equipment is available, as shown in Table 5.4-11. With the minimum level of compliance with this mitigation measure (Tier 2 plus NOX VDECS), increased cancer risk as a result of project construction activities at the maximally impacted receptor would be approximately 9.2 in one million and cumulative excess cancer risk at all receptor locations would be reduced to below the significance threshold of 100 per one million.

While unmitigated increased cancer risk at the maximally impacted receptors would exceed the threshold of 100 in one million, with implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization), increased cancer risk at the maximally impacted receptors would be below the threshold of 100 in one million. Furthermore, at no off-site location would cumulative excess cancer risk exceed 100 per one million persons exposed with implementation of Mitigation Measure M-AQ-1. Therefore, the proposed project would not result in sensitive receptor locations meeting the Air Pollutant Exposure Zone criteria for excess cancer risk, and construction and operational cancer risk would be *less than significant with mitigation*.

Summary of Impact AQ-3, Exposure to Toxic Air Contaminants

Both construction and operation of the proposed project would generate emissions of $PM_{2.5}$ and toxic air contaminants, including DPM. The project-specific HRA conducted indicated that without mitigation, the project—including both construction and operational impacts added to the existing background levels— would exceed significance thresholds for increased cancer risk for off-site receptors; concentrations of $PM_{2.5}$ emissions would not exceed significance thresholds. With implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization) described above for Impact AQ-1, impacts related to increased cancer risk would be reduced to less than significant. Therefore, this impact is *less than significant with mitigation*.

> **Mitigation Measure M-AQ-1: Construction Emissions Minimization** (see Impact AQ-1, above)

Comparison of Impact AQ-3 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR qualitatively assessed operational health risk impacts and identified this impact as potentially significant. The FSEIR identified four mitigation measures (Mitigation Measures F.3, F.4, F.5, and F.6) to reduce impacts due to emissions of toxic air contaminants, but in the absence of specific development proposals at that time, this impact was determined to be significant and unavoidable with mitigation.

Only one of the four FSEIR mitigation measures are applicable to the proposed project. Mission Bay FSEIR Mitigation Measure F.3 requires the applicant to demonstrate receipt of BAAQMD permit for stationary TAC sources. As a permit will be required for the five proposed backup diesel generators, the applicant would be required to comply with FSEIR Mitigation Measure F.3.

Mission Bay FSEIR Mitigation Measure F.4 requires establishing a meteorological station in Mission Bay; this measure has already been implemented and information from this meteorological station was used in to conduct the HRA prepared for this SEIR. Mission Bay FSEIR Mitigation Measure F.5 requires reducing exposure to dry cleaning facilities in the area that use perchloroethylene and other toxic contaminants. Dry cleaning operations primarily emit evaporative emissions of perchloroethylene. However, BAAQMD Regulation 11, Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perchloroethylene on July 1, 2010. Additionally, all other dry cleaners must phase out use of perchloroethylene by January 1, 2023. Therefore, due to current regulations, dry cleaning facilities are not anticipated to result in substantial, long term health risks to sensitive populations in San Francisco, and this measure is no longer applicable.

Mission Bay FSEIR Mitigation Measure F.6 requires the creation of buffer zones for pre-school and child care centers from TAC sources; this measure does not apply to the proposed project because although only TAC sources (diesel generators) would be located in the garage, the nearest child care facility (UCSF Child Care Center) is located over 1,300 feet to the west and the nearest school (Daniel Webster Elementary) is located over 2,000 feet to the southwest of the proposed project. Additionally a potential San Francisco Unified School District school site is located at Block 14, approximately 1,500 feet west of the project site. BAAQMD generally recognizes a buffer distance of 1,000 feet from standard TAC sources as sufficient to avoid health impacts relative to CEQA. At this time, there is a planned development at Blocks 26/27, directly north of Blocks 29-32 (see Section 5.1, Impact Overview, for description) which could include sensitive receptors such as a day care facility. Since this facility could be located within 1,000 feet of the project during a portion of the construction period (8 months) and during operations, the potential impacts are analyzed in Impact C-AQ-2, below.

Therefore, because the project's impacts would be less than significant with mitigation, the project would not result in new or substantially more severe significant impacts than was previously identified in the Mission Bay FSEIR.

Consistency with Clean Air Plan

Impact AQ-4: The proposed project could conflict with, or obstruct implementation of, the *2010 Clean Air Plan*. (Less than Significant with Mitigation)

The most recently adopted air quality plan in the San Francisco Bay Area Air Basin is the BAAQMD's 2010 Clean Air Plan (2010 CAP) (BAAQMD, 2010). The 2010 CAP is a roadmap showing how the San Francisco Bay Area will achieve compliance with the State one-hour ozone standard as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The control strategy includes stationary source control measures to be implemented through BAAQMD regulations; mobile source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the Metropolitan Transportation Commission (MTC), local governments, transit agencies, and others. The 2010 CAP also represents the Bay Area's most recent triennial assessment of the region's strategy to attain the State one-hour ozone standard.

BAAQMD guidance states that lead agencies should consider three questions in assessing consistency with the 2010 CAP: (1) Would the project support the primary goals of the Clean Air Plan? (2) Does the project include applicable control measures from the Clean Air Plan? and (3) Does the project disrupt or hinder implementation of control measures identified in the Clean Air Plan?

Support the Primary Goals of the CAP. The first of these questions is whether a project would support the primary goals of the 2010 CAP, which include:

- Attainment of air quality standards;
- Reducing population exposure and protecting public health in the Bay Area; and
- Reducing greenhouse gases and protecting the climate.

With respect attainment of air quality standards, several mitigation measures are identified to reduce criteria air pollutants from both construction and operations. These include Mitigation Measure M-AQ-1, Construction Emissions Minimization, which would reduce construction-related ozone precursor NOx emissions by 62 percent. Mitigation Measure M-AQ-2a (Reduce Operational Emissions) would promote additional transportation demand strategies beyond those included in the proposed project, while Mitigation Measure M-AQ-2b (Emission Offsets) would offset both construction-related and operational ROG and NOx emissions to below significance thresholds. Additionally, as addressed in Impact AQ-3, Mitigation Measure M-AQ-1 (Construction Emissions Minimization) would reduce increased cancer risks from construction such that these risks would be below significance thresholds, thereby reducing population exposure and protecting public health in the Bay Area.

The proposed project's impact with respect to GHGs is discussed in Section 5.5, Greenhouse Gas Emissions. As stated in that discussion, the proposed project would be compliant with the City's Greenhouse Gas Reduction Strategy and as part of the project's status as an environmental leadership development project under AB 900, the project would result in no net increase in GHGs. Thus, the project would not result in any significant impacts associated with an increase in GHGs or conflict with measures adopted for the purpose of reducing such emissions.

The other two questions to be considered are:

- Does the project include applicable control measures from the air quality plan?
- Does the project disrupt or hinder implementation of any air quality plan control measures?

Applicable Control Measures from the CAP. To meet the primary goals, the Clean Air Plan recommends specific control measures and actions. These control measures are grouped into various categories and include stationary- and area-source measures, mobile-source measures, transportation control measures, land-use measures, and energy and climate measures. The Clean Air Plan recognizes that, to a great extent, community design dictates individual travel mode and that a key long-term control strategy to reduce emissions of criteria pollutants, air toxics, and greenhouse gases from motor vehicles is to channel future Bay Area growth into communities where goods and services are located nearby and people have a range of viable transportation options. To this end, the Clean Air Plan includes 55 control measures aimed at reducing air pollutants in the SFBAAB.

The measures most applicable to the proposed project are transportation control measures and energy and climate control measures.

The compact urban development of the proposed project and high availability of viable transportation options would ensure that event center attendees and employees could bicycle, walk, and ride transit to and from the project site instead of taking trips via private automobile. These features ensure that the project would avoid substantial growth in automobile trips and vehicle miles traveled. The proposed project's 13,691 net new daily vehicle trips (weekday with concert event) during the operational phase would result in an increase in air pollutant emissions.

Transportation control measures that are identified in the Clean Air Plan are implemented by the *San Francisco General Plan* and the Planning Code,[74] for example, through the City's Transit First Policy, the bicycle parking requirements, and transit impact development fees.

Additionally, as described in Chapter 3, Project Description, the project would incorporate a TDM program. Compliance with these requirements would ensure the project includes relevant transportation control measures specified in the Clean Air Plan. Therefore, the proposed project would include applicable control measures identified in the Clean Air Plan and supports the Clean Air Plan's primary goals. Furthermore, Mitigation Measure M-AQ-2a, Reduce Operational Emissions, and Mission Bay FSEIR Mitigation Measure F.1 would promote additional strategies to reduce vehicle trips beyond those incorporated in the project, further supporting the Clean Air Plan's goals.

The proposed project includes sustainability measures that would serve to implement control measures of the 2010 CAP, including the land use/local impact measures and energy/climate measures of the 2010 CAP. The proposed development would be subject to a number of sustainability requirements, including the California CalGreen Code, City of San Francisco Green Building Code, Design for Development for the Mission Bay South Area, and the 2012 NBA Arena Design Standards – Sustainability Requirements. The project would be designed to Leadership in Energy and Environmental Design (LEED®) Gold standards. This would be achieved through incorporation of a variety of design features and implementation of practices during construction and operation to provide energy and water conservation and efficiency, encourage alternative transportation, promote a healthy indoor environment, minimize waste, and maximize recycling opportunities.

Disruption or Hindrance of CAP Control Measures. Examples of a project that could cause the disruption or delay of Clean Air Plan control measures are projects that would preclude the extension of a transit line or bike path or projects that propose excessive parking beyond City parking requirements. The proposed project would maintain the existing character of the project site, which is a dense, walkable urban area near a concentration of local transit service. It would not preclude the extension of a transit line or a bike path or any other transit improvement. The realigned Terry A. Francois Boulevard would contain — on the east side of the roadway — a two-way cycletrack (bike path). Thus, the project would not disrupt or hinder implementation of control measures identified in the Clean Air Plan.

Therefore, the proposed project would not conflict with, or obstruct implementation of the *2010 Clean Air Plan*, particularly with implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization), Mitigation Measure M-AQ-2a (Reduce Operational Emissions), and Mitigation Measure M-AQ-2b (Emission Offsets), and this impact would be *less than significant with mitigation*.

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[74] Although the Planning Code is not applicable within the Mission Bay Area, similar requirements are implemented pursuant to the Mission Bay South Design for Development.

Summary of Impact AQ-4

The project would be consistent with the 2010 CAP, assuming implementation of mitigation measures, which include offsetting emissions to below significance thresholds in addition to project-specific measures to reduce pollutant emissions. Additionally, the project would be consistent with the 2010 CAP by virtue of incorporation of control measures of the CAP, including land use/local impact measures and energy/climate measures as well as the transportation demand management measures incorporated in the proposed project. The proposed project would also not hinder implementation of the 2010 CAP. Therefore, the proposed project would not conflict with, or obstruct implementation of the *2010 Clean Air Plan*, and this impact would be *less than significant with mitigation*.

Mitigation Measure M-AQ-1: Construction Emissions Minimization (see Impact AQ-1, above)

Mitigation Measure M-AQ-2a: Reduce Operational Emissions (see Impact AQ-2, above)

Mitigation Measure M-AQ-2b: Emissions Offsets (see Impact AQ-2, above)

Comparison of Impact AQ-4 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR identified Clean Air Plan consistency as a significant and unavoidable impact. This conclusion was based on: (1) the increase in population (819,500) would exceed that assumed in the Clean Air Plan at the time (795,800 in 2015); and (2) the increase in VMT was greater than the increase in population. No mitigation measures were identified with respect to this impact but presumably these would be the same as the operational air pollutant measures.

Based on the updated approach to analysis for the proposed project, the impact conclusion for the proposed project would have a less severe impact than what was identified in the FSEIR (i.e., less than significant with mitigation), and the project would not result in a new or substantially more severe significant impact than was previously identified.

Cumulative Impacts

Impact C-AQ-1: The project, in combination with other past, present, and reasonably foreseeable future projects, would contribute to cumulative regional air quality impacts. (Significant and Unavoidable with Mitigation)

As discussed above, regional air pollution is by its very nature a cumulative impact. Emissions from past, present, and future projects contribute to the region's adverse air quality on a cumulative basis. No single project by itself would be sufficient in size to result in regional nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulative adverse air quality impacts.[75] The project-level thresholds for

[75] BAAQMD, *CEQA Air Quality Guidelines,* May 2011, page 2-1.

criteria air pollutants are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants.

With implementation of Mitigation Measures M-AQ-1, M-AQ-2a, and M-AQ-2b, the proposed project's construction and operational emissions (Impacts AQ-1 and AQ-2) could be mitigated to below the project-level thresholds for criteria air pollutants (ROG and NOx). Mitigation Measure M-AQ-2b represents the lead agency's efforts to use offsets as air quality mitigation, and although offsets would be implemented through a known verifiable program well established by the BAAQMD, implementation of the mitigation measure is beyond the control of the project sponsor. Thus, the impact is conservatively considered *significant and unavoidable with mitigation*, and therefore, the proposed project would also be considered to result in a cumulatively considerable contribution to regional air quality impacts even with implementation of mitigation measures identified for Impacts AQ-1 and AQ-2, and the cumulative impact is also considered *significant and unavoidable with mitigation*.

Summary of Impact C-AQ-1

The analysis of construction-related and operational criteria pollutant impacts (Impact AQ-1 and Impact AQ-2, respectively) assess whether the proposed project would be considered to result in a cumulatively considerable contribution to regional and localized air quality impacts. The proposed project would result in significant and unavoidable air quality impacts after implementation of feasible mitigation measures identified in Impacts AQ-1 and AQ-2, and consequently, would result in a cumulatively considerable contribution to regional or local air quality impacts. Therefore, this impact would be *significant and unavoidable with mitigation*.

Mitigation Measure M-AQ-1: Construction Emissions Minimization (see Impact AQ-1)

Mitigation Measure M-AQ-2a: Reduce Operational Emissions (see Impact AQ-2)

Mitigation Measure M-AQ-2b: Emission Offsets (see Impacts AQ-1 and AQ-2)

Comparison of Impact C-AQ-1 to Mission Bay FSEIR Impact Analysis

Cumulative criteria air pollutant emissions were identified as significant and unavoidable in the Mission Bay FSEIR. This was based on the significant and unavoidable finding at a project level.

Since the impact conclusion for the proposed project is the same, the project would not result in a new or substantially more severe significant impact than was previously identified in the Mission Bay FSEIR.

Impact C-AQ-2: The project, in combination with other past, present, and reasonably foreseeable future projects, could generate toxic air contaminants, including diesel particulate matter, and could expose sensitive receptors to substantial air pollutant concentrations. (Less than Significant with Mitigation)

As discussed above, the project site is not located in an Air Pollutant Exposure Zone. Impact AQ-3 addresses health risk exposures from TACs resulting from both construction and operation of the proposed project and adds them to the cumulative existing contributions of risks from TACs and $PM_{2.5}$ concentrations. The analysis then compares these cumulative totals to thresholds developed for the purposes of a cumulative impacts analysis. The HRA takes into account the cumulative contribution of localized health risks to sensitive receptors from sources included in the Citywide modeling plus the proposed project's sources.

The geographic scope of analysis for cumulative localized air pollutant exposure impacts encompasses potential new sensitive land uses or emissions sources that could be developed within approximately 1,000 feet of the proposed project site. Beyond 1,000 feet, CARB has found that ground-level TAC emissions to return to background levels.[76] This is because the contribution of project emissions would be greatly dispersed through both distance and intervening structures and their contribution would be expected to be minimal.

Section 5.1, Impact Overview, presents the list of reasonably foreseeable future projects in the vicinity, which in particular would include implementation of the University of California, San Francisco (UCSF) Long Range Development Plan (LRDP) for the Mission Bay campus and other nearby Mission Bay development projects. The UCSF LRDP EIR proposes new housing at Block 15 which is over 1,000 feet from the project site and would have impacts substantially less than those identified in Impact AQ-3 for both the UCSF Hospital Receptors and UCSF Hearst Tower receptor, both of which were identified as less than significant with mitigation.

Other future projects, whose emissions have not been incorporated into the existing Citywide health risk modeling, such as the proposed Pier 70 and Seawall Lot 337/Pier 48 mixed use developments would similarly be subject to CEQA requirements to analyze the health risk impact of their project. However, health risk impacts are localized and health risks from sources decrease substantially with increasing distance. Thus, cumulative impacts from the proposed Pier 70 and Seawall Lot 337/Pier 48 developments would not combine with the proposed project's emissions to substantially increase health risks within the project vicinity.

The Uber/ARE project on Blocks 26/27 is estimated to start construction by the end of 2015, and construction could be concurrent with the proposed project. This project is immediately north of the project site, across South Street, and immediately across Third Street from the nearest sensitive receptor to the project site, the UCSF Mission Bay housing at Hearst Tower. Although primarily designated as office use this development and any development in Mission Bay could include child care facilities and therefore have the potential to represent a future sensitive

[76] California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective, Page C-3,* April 2005 (hereinafter "ARB Air Quality and Land Use Handbook"*).* Available at http://www.arb.ca.gov/ch/handbook.pdf.

receptor. Occupancy of this cumulative, offsite project would likely not occur until 2017 at which time the construction of the proposed project would be in its third and final year. Consequently, sensitive receptors at this site would be exposed to at most eight months of the construction emissions, resulting in an excess cancer risk of about 12 in one million assuming minimum compliance with **Mitigation Measure M-AQ-1, Construction Emissions Minimization**. Adding this exposure to existing levels modeled by the City and the project contributions from generators and vehicles results in a cumulative exposure of 70 in a million, which would be below the cumulative threshold of 100 in one million. In addition the Uber/ARE project would be subject to Mission Bay FSEIR Mitigation Measure J.2: Child Care Development, which sets forth the Mission Bay Risk Management Plan requirements for child care facilities to ensure that human health and environmental risks are within acceptable limits. Consequently, the project's contribution to cumulative TAC exposure to receptors potentially proposed by future cumulative projects would be *less than significant with mitigation*.

Mitigation Measure M-AQ-1: Construction Emissions Minimization (see Impact AQ-1)

Comparison of Impact C-AQ-2 to Mission Bay FSEIR Impact Analysis

Cumulative impacts regarding TACs were identified as less than significant with mitigation in the Mission Bay FSEIR. This was based on the less than significant with mitigation finding at a project level. Since the impact conclusion for the proposed project is the same, the project would not result in a new or substantially more severe significant impact than was previously identified in the Mission Bay FSEIR.

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5.5 Greenhouse Gas Emissions

5.5.1 Introduction

This section describes greenhouse gas (GHG) emissions and global climate change, the existing regulatory framework governing GHG emissions, and the potential impacts related to GHGs associated with implementation of the proposed project. The proposed project is evaluated for compliance with San Francisco's *Strategies to Address Greenhouse Gas Emissions*, recognized by the Bay Area Air Quality Management District (BAAQMD) as meeting the criteria of a qualified GHG Reduction Strategy.

5.5.2 Summary of Mission Bay FSEIR Greenhouse Gas Emissions Section

The Mission Bay FSEIR did not address GHG emissions as a distinct environmental topic. However, the Air Quality section of the Mission Bay FSEIR did acknowledge the effects of GHG emissions under the Setting section as well as the potential for the Mission Bay Redevelopment Plan to contribute to GHG emissions. The discussion indicated that the nature and extent of GHG emissions could not be quantified at that time, but because their effects on climate change occur on a global level, the Plan would not be expected to significantly alter the global atmospheric concentrations of GHG.

5.5.3 Setting

5.5.3.1 Greenhouse Gas Emissions and Climate Change

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHGs contributes to global climate change. The primary GHGs, or climate pollutants, are carbon dioxide (CO_2), black carbon, methane (CH_4), nitrous oxide (N_2O), ozone, and water vapor.

Individual development projects contribute to the cumulative effects of climate change by emitting GHGs during demolition, construction, and operational phases. While the presence of the primary GHGs in the atmosphere is naturally occurring, CO_2, CH_4, and N_2O are also emitted from human activities, accelerating the rate at which these compounds occur within the earth's atmosphere. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Black carbon has emerged as a major contributor to global climate change, possibly second only to CO_2. Black carbon is produced naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels, and biomass.[1] N_2O is a byproduct of various industrial processes. Other

1 Center for Climate and Energy Solutions. *What is Black Carbon?,* April 2010. Available online at: http://www.c2es.org/docUploads/what-is-black-carbon.pdf. Accessed January 24, 2015.

GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes. GHGs are typically reported in "carbon dioxide-equivalent" measures (CO_2E).[2]

There is international scientific consensus that human-caused increases in GHGs contribute to climate change. Many impacts resulting from climate change, including sea level rise, increased fires, floods, severe storms, and heat waves, already occur and will only become more severe and costly in the future. Secondary effects of climate change likely include impacts to agriculture, the state's electricity system, and native freshwater fish ecosystems; an increase in the vulnerability of levees such as in the Sacramento-San Joaquin Delta; changes in disease vectors; and changes in habitat and biodiversity.[3]

5.5.3.2 Greenhouse Gas Emission Estimates and Energy Providers in California

The California Air Resources Board (CARB) estimated that in 2010 California produced about 451.60 million gross metric tons of CO_2E (million $MTCO_2E$).[4] The CARB found that transportation is the source of 38 percent of the state's GHG emissions, followed by electricity generation (both in-state generation and imported electricity) at 21 percent, and industrial sources at 19 percent. Commercial and residential fuel use (primarily for heating) accounted for 10 percent of GHG emissions.[5] In San Francisco, motorized transportation and natural gas sectors were the two largest sources of GHG emissions, accounting for approximately 40 percent (2.1 million $MTCO_2E$) and 29 percent (1.5 million $MTCO_2E$) respectively, of San Francisco's 5.3 million $MTCO_2E$ emitted in 2010.[6] Electricity consumption (building operations and transit) accounts for approximately 25 percent (1.3 million $MTCO_2E$) of San Francisco's GHG emissions.[7]

Electricity in San Francisco is primarily provided by the Pacific Gas and Electricity Company (PG&E) and the San Francisco Public Utilities Commission (SFPUC). In 2010, electricity consumption in San Francisco was approximately 6.1 million megawatt-hours (MWh). Of this total, PG&E produces approximately 73 percent of the electricity distributed (4.5 million MWh; about 79 percent of San Francisco's electricity-driven GHG emissions), and the SFPUC produces approximately 14 percent of the electricity distributed (0.9 million MWh; about 0.01 percent of San Francisco's electricity-driven GHG emissions).[8]

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2 Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

3 California Energy Commission. California Climate Change Center. *Our Changing Climate 2012*. Available online at: http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf. Accessed January 24, 2015.

4 California Air Resources Board. *California Greenhouse Gas Inventory for 2000-2010— by Category as Defined in the Scoping Plan.* Available online at: http://arbis.arb.ca.gov/cc/inventory/pubs/reports/2000_2010/ghg_inventory_scopingplan_00-10_2013-02-19.pdf. Accessed January 24, 2015.

5 *Ibid*.

6 San Francisco Department of Environment (DOE), *San Francisco Climate Action Strategy, 2013 Update*.

7 *Ibid*.

8 *Ibid*. Note: the remainder of the electricity consumption is derived from third party generators or other suppliers.

The majority of land use projects in San Francisco are provided power by PG&E, whose 2010 power mix was as follows: 20 percent natural gas, 24 percent nuclear, 16 percent eligible renewables (described below), 16 percent large hydroelectric, 23 percent unspecified power, one percent coal, and one percent other fossil fuels.[9,10]

Muni, city buildings, and a limited number of other commercial accounts in San Francisco are provided energy by the SFPUC, which operates three hydroelectric power plants that are part of San Francisco's Hetch Hetchy water supply and distribution system. This system has the lowest GHG emissions of any large electric utility in California.[11]

5.5.4 Regulatory Framework

5.5.4.1 State Regulations

Executive Orders S-3-05 and B-30-15

In 2005, Executive Order (EO) S-3-05, set forth a series of target dates by which statewide emissions of GHGs need to be progressively reduced, as follows: by 2010, reduce GHG emissions to 2000 levels (approximately 457 million $MTCO_2E$); by 2020, reduce emissions to 1990 levels (estimated at 427 million $MTCO_2E$); and by 2050 reduce emissions to 80 percent below 1990 levels (approximately 85 million $MTCO_2E$). As discussed in the Setting section above, California produced about 452 million $MTCO_2E$ in 2010, thereby meeting the 2010 target date to reduce GHG emissions to 2000 levels. In April 2015, Governor Jerry Brown issued EO B-30-15, which set an additional statewide GHG reduction target of 40 percent below 1990 levels to be achieved by 2030.

Assembly Bill 32 and California Climate Change Scoping Plan

In 2006, the California legislature passed Assembly Bill No. 32 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the California Global Warming Solutions Act. AB 32 requires ARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020.

Pursuant to AB 32, the ARB adopted a Scoping Plan in December 2008, outlining measures to meet the 2020 GHG reduction limits. In order to meet the goals of AB 32, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels, about

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9 Pacific Gas & Electric (PG&E). *PG&E's 2010 Electric Power Mix Delivered to Retail Customers.* Available online at: http://www.pge-corp.com/corp_responsibility/reports/2010/index.html/en02_clean_energy.jsp Accessed January 24, 2015.

10 Pending California Public Utilities Commission approval, PG&E would include a "Green Option" program that would allow customers an opportunity to pay into a program that may lead to the development of up to 250 MW of new clean energy projects in the PG&E service area. See PG&E's, *New Green Option (Community Solar) FAQ*. Available online at: http://www.pge.com/about/environment/pge/greenoption/faq/. Accessed January 24, 2015.

11 San Francisco Public Utilities Commission (SFPUC), *Agenda Item No 20, Adopt an Enforcement Program as required under the California Renewable Energy Resources Act*, December 13, 2011. Available online at: http://www.energy.ca.gov/portfolio/rps_pou_reports.html. Accessed January 24, 2015.

15 percent below 2008 levels.[12] The Scoping Plan estimates a reduction of 174 million $MTCO_2E$ from transportation, energy, agriculture, forestry, and other high global warming sectors, as shown in **Table 5.5-1**.[13]

TABLE 5.5-1
GHG REDUCTIONS FROM THE AB 32 SCOPING PLAN SECTORS[14,15]

	GHG Reductions (million MT CO_2E)
GHG Reduction Measures By Sector	
Transportation Sector	62.3
Electricity and Natural Gas	49.7
Industry	1.4
Landfill Methane Control Measure (Discrete Early Action)	1
Forestry	5
High Global Warming Potential GHGs	20.2
Additional Reductions Needed to Achieve the GHG Cap	34.4
Total	**174**
Other Recommended Measures	
Government Operations	1-2
Methane Capture at Large Dairies	1
Additional GHG Reduction Measures:	
Water	4.8
Green Buildings	26
High Recycling/ Zero Waste • Commercial Recycling • Composting • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing	9
Total	**41.8-42.8**

$MTCO_2E$ = metrics tons of carbon dioxide equivalent

The AB 32 Scoping Plan also anticipates that local government actions will result in reduced GHG emissions because local governments have the primary authority to plan, zone, approve, and permit development to accommodate population growth and the changing needs of their

12 California Air Resources Board. *California's Climate Plan: Fact Sheet*. Available online at: http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf. Accessed January 24, 2015.
13 *Ibid*.
14 California Air Resources Board. *Climate Change Scoping Plan*, December 2008. Available online at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed January 24, 2015.
15 California Air Resources Board. *California's Climate Plan: Fact Sheet.* Available online at: http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf. Accessed January 24, 2015.

jurisdictions.[16] The Scoping Plan also relies on the requirements of Senate Bill (SB) 375 (discussed below) to align local land use and transportation planning for achieving GHG reductions.

The Scoping Plan must be updated every five years to evaluate AB 32 policies and ensure that California is on track to achieve the 2020 GHG reduction goal. In 2014, CARB released the First Update to the Scoping Plan, which builds upon the Initial Scoping Plan with new strategies and recommendations. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. This update defines CARB's climate change priorities for the next five years and sets the groundwork to reach long-term goals set forth in EO S-3-05. The update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals in the original 2008 Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use.[17]

Senate Bill 375

The Scoping Plan also relies on the requirements of Senate Bill 375 (SB 375), known as the Sustainable Communities and Climate Protection Act of 2008, to reduce carbon emissions from land use decisions. SB 375 requires regional transportation plans developed by each of the State's 18 Metropolitan Planning Organizations (MPOs) to incorporate a "sustainable communities strategy" (SCS) in each regional transportation plan that will then achieve GHG emission reduction targets set by CARB. For the Bay Area, the per-capita GHG emission reduction target is a 7 percent reduction by 2020 and a 15 percent reduction by 2035 from 2005 levels. The Metropolitan Transportation Commission's 2013 Regional Transportation Plan, Plan Bay Area, adopted in July 2013, is the region's first plan subject to SB 375 requirements.

Senate Bill 1078, 107, and X1-2 and Executive Order S-14-08 and S-21-09

California established aggressive Renewable Portfolio Standards under SB 1078 (Chapter 516, Statutes of 2002) and SB 107 (Chapter 464, Statutes of 2006), which require retail sellers of electricity to provide at least 20 percent of their electricity supply from renewable sources by 2010. EO S-14-08 (November 2008) expanded the State's Renewable Portfolio Standard from 20 percent to 33 percent of electricity from renewable sources by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing EO S-21-09, which directed CARB to enact regulations to help California meet the Reviewable Portfolio Standard goal of 33 percent renewable energy by 2020.[18]

To codify the GHG reduction goal of 33 percent by 2020 for energy suppliers, SB X1-2 (Chapter 1, Statutes of 2011) was signed by Governor Edmund G. Brown, Jr., in April 2011. This Renewable

[16] California Air Resources Board. *Climate Change Scoping Plan*, December 2008. Available online at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed January 24, 2015.
[17] ARB, "First Update to the AB 32 Scoping Plan," May 27, 2014. Available online at: http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed January 23, 2015.
[18] California Energy Commission, *Renewables Portfolio Standard (RPS).* Available online at: http://www.energy.ca.gov/portfolio/. Accessed January 24, 2015.

Portfolio Standard preempts CARB's 33 percent renewable sources electricity standard and applies to all electricity suppliers (not just retail sellers) in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must adopt the new Renewable Portfolio Standard goals of 20 percent of retail sales from renewable sources by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020.[19] Eligible renewable sources include geothermal, ocean wave, solar photovoltaic, and wind, but exclude large hydroelectric (30 MW or more). Therefore, any non-hydroelectric sources of electricity provided by the SFPUC are required to be 100 percent renewable.[20]

Assembly Bill 900

The Jobs and Economic Improvement Through Environmental Leadership Act [Assembly Bill 900 (AB 900)], signed by the Governor in September 2011 and effective on January 1, 2012, provides streamlined environmental review for "environmental leadership development projects" (leadership projects). Leadership projects include all of the following:

1. The project is residential, retail, commercial, sports, cultural, entertainment, or recreational in nature;

2. The project, upon completion, will qualify for LEED silver certification or better.

3. The project will achieve at least 10 percent greater transportation efficiency than comparable projects.

4. The project is located on an infill site and in an urbanized area.

5. The project is within a metropolitan planning organization for which a sustainable communities strategy or alternative planning strategy is in effect, and the California Air Resources Board has accepted that the strategy meets the adopted greenhouse gas reduction targets.

The Governor may certify a leadership project for streamlining under AB 900 if a number of conditions are met. One of the conditions is that the project will not result in any net additional greenhouse gas emissions, as determined by CARB. The procedures for this determination require an applicant to submit a proposed methodology and documentation to CARB that no net additional greenhouse gas emissions would result from the project; this includes quantification of direct and indirect greenhouse gas emissions associated with the project's construction and operation, including the project's energy use and transportation related emissions; and quantification of net emissions of the project after accounting for any mitigation measures. As described in Chapter 2, Introduction, the project sponsor applied for certification of the proposed project under AB 900, and on April 20, 2015, the CARB determined that the proposed event center and mixed-use development would not result in any net additional GHG emissions for

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[19] *Ibid*.

[20] San Francisco Public Utilities Commission (SFPUC), *Agenda Item No 20, Adopt an Enforcement Program as required under the California Renewable Energy Resources Act,* December 13, 2011. Available online at: http://www.energy.ca.gov/portfolio/rps_pou_reports.html. Accessed January 24, 2015.

purposes of certification under AB 900.[21] On April 30, 2015, Governor Jerry Brown certified the proposed project as a leadership project under AB 900.[22]

5.5.4.2 Regional and Local Regulations and Plans

Regional

The BAAQMD is responsible for attaining and maintaining federal and state air quality standards in the San Francisco Bay Area Air Basin (SFBAAB), as established by the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), respectively. The CAA and the CCAA require plans to be developed for areas that do not meet air quality standards, generally. The most recent air quality plan, the 2010 Clean Air Plan, includes a goal of reducing GHG emission to 1990 levels by 2020 and to 40 percent below 1990 levels by 2035.

In addition, the BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the SFBAAB; the program includes GHG-reduction measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative energy sources.[23]

The BAAQMD also assists lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality with respect to their CEQA Air Quality Guidelines. The BAAQMD advises lead agencies to consider adopting a Greenhouse Gas Reduction Strategy capable of meeting AB 32 goals and then reviewing projects for compliance with the Greenhouse Gas Reduction Strategy.[24] This is consistent with the approach to analyzing GHG emissions in the CEQA Guidelines, Section 15183.5.

Local

San Francisco Greenhouse Gas Reduction Ordinance

In May 2008, the City and County of San Francisco (CCSF) adopted Ordinance No. 81-08 amending the San Francisco Environment Code to establish GHG emissions targets and departmental action plans and to authorize the San Francisco Department of the Environment to coordinate efforts to meet these targets. The City ordinance establishes the following GHG emissions reduction limits and target dates by which to achieve them: determine 1990 Citywide GHG emissions by 2008, the baseline level, with reference to which target reductions are set; reduce GHG emissions by

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[21] Corey, Richard W., Executive Director, Air Resources Board, 2015. Air Resources Board Executive Order G-15-022, Relating to Determination of No Net Additional Greenhouse Gas Emissions Under Public Resources Code section 21183, subdivision (c) for Golden State Warriors Event Center and Mixed-Use Development at Mission Bay Blocks 29-32, dated April 20, 2015.

[22] Alex, Ken, Director, Governor's Office of Planning and Research, 2015. Governor's Certification Granting Streamlining for the Golden State Warriors Event Center and Mixed Use Development at Mission Bay, dated April 30, 2015.

[23] Bay Area Air Quality Management District (BAAQMD), *Climate Protection Program.* Available online at: http://www.baaqmd.gov/?sc_itemid=83004271-3753-4519-8B09-D85F3FC7AE70. Accessed January 24, 2015.

[24] Bay Area Air Quality Management District (BAAQMD), *California Environmental Quality Act Air Quality Guidelines*, May 2012. Available online at:http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en. Accessed January 24, 2015.

25 percent below 1990 levels by 2017; reduce GHG emissions by 40 percent below 1990 levels by 2025; and reduce GHG emissions by 80 percent below 1990 levels by 2050. The City's GHG reduction targets are consistent with—in fact, more ambitious than—those set forth in Governor Brown's recent Executive Order B-30-15 by targeting a 40 percent reduction by 2025 rather than a 40 percent reduction by 2030.

San Francisco Greenhouse Gas Reduction Strategy

San Francisco has developed a number of plans and programs to reduce the City's contribution to global climate change and to meet the goals of the City's Greenhouse Gas Reduction Ordinance. San Francisco's Greenhouse Gas Reduction Strategy documents its actions to pursue cleaner energy, energy conservation, and alternative transportation and solid waste policies. For instance, the City has implemented mandatory requirements and incentives that have measurably reduced GHG emissions including, but not limited to, increasing the energy efficiency of new and existing buildings, installation of solar panels on building roofs, implementation of a green building strategy, adoption of a zero waste strategy, a construction and demolition debris recovery ordinance, a solar energy generation subsidy, incorporation of alternative fuel vehicles in the City's transportation fleet (including buses), and a mandatory recycling and composting ordinance. The strategy also identifies 42 specific regulations for new development that would reduce a project's GHG emissions.

San Francisco's policies and programs have resulted in a reduction in GHG emissions to below 1990 levels, exceeding statewide AB 32 GHG reduction goals. San Francisco's GHG emissions in 2010 were 5.3 million $MTCO_2E$, which represents a 14.5 percent reduction in GHG emissions compared to 1990 levels (6.2 million $MTCO_2E$). The reduction is largely a result of reduced GHG emissions from the electricity sector, from 2.0 million $MTCO_2E$ (1990) to 1.3 million $MTCO_2E$ (2010), and waste sector, from 0.5 million $MTCO_2E$ (1990) to 0.2 million $MTCO_2E$ (2010).[25]

5.5.5 Impacts and Mitigation Measures

5.5.5.1 Significance Thresholds

The project would have a potentially significant impact related to GHG emissions if the project were to:

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

[25] San Francisco Department of Environment (DOE), *San Francisco Climate Action Strategy, 2013 Update*.

5.5.5.2 Approach to Analysis

GHG emissions and global climate change represent cumulative impacts of human activities and development projects locally, regionally, statewide, nationally, and worldwide. GHG emissions from all of these sources cumulatively contribute to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature; instead, the combination of GHG emissions from past, present, and future projects around the world have contributed and will continue to contribute to global climate change and its associated environmental impacts.

The BAAQMD has prepared guidelines and methodologies for analyzing the impacts associated with GHG emissions. These guidelines are consistent with CEQA Guidelines Sections 15064.4 and 15183.5, which address the analysis and determination of significant impacts from a proposed project's GHG emissions. CEQA Guidelines Section 15064.4 allows lead agencies to rely on a qualitative analysis to describe GHG emissions resulting from a project. CEQA Guidelines Section 15183.5 allows for public agencies to analyze and mitigate GHG emissions as part of a larger plan for the reduction of greenhouse gases and describes the required contents of such a plan. Accordingly, San Francisco has prepared its own Greenhouse Gas Reduction Strategy (described above), which the BAAQMD has reviewed and concluded that "Aggressive GHG reduction targets and comprehensive strategies like San Francisco's help the Bay Area move toward reaching the State's AB 32 goals, and also serve as a model from which other communities can learn."[26]

Given that the City's local greenhouse gas reduction targets are more aggressive than the State and region's 2020 and 2030 GHG reduction targets and consistent with the long-term 2050 reduction targets, the City's Greenhouse Gas Reduction Strategy is consistent with the goals of EO S-3-05, EO B-30-15, AB 32, and the Bay Area 2010 Clean Air Plan. Therefore, proposed projects that are consistent with the City's Greenhouse Gas Reduction Strategy would be consistent with the goals of EO S-3-05, EO B-30-15, AB 32, and the Bay Area 2010 Clean Air Plan, would not conflict with these plans, and would therefore not exceed the GHG significance threshold.

The following analysis of the proposed project's impact on climate change focuses on the project's contribution to cumulatively significant GHG emissions. Given the analysis is in a cumulative context, this section does not include an individual project-specific impact assessment.

[26] BAAQMD. Letter from J. Roggenkamp, BAAQMD, to B. Wycko, San Francisco Planning Department, October 28, 2010. Available online at: http://www.sf-planning.org/ftp/files/MEA/GHG-Reduction_Letter.pdf. Accessed January 24, 2015.

5.5.5.3 Impact Evaluation

Impact C-GG-1: The proposed project would generate greenhouse gas emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions. (Less than Significant)

Individual projects contribute to the cumulative effects of climate change by directly or indirectly emitting GHGs during construction and operational phases. Direct operational emissions include GHG emissions from new vehicle trips and area sources (natural gas combustion). Indirect emissions include emissions from electricity providers, energy required to pump, treat, and convey water, and emissions associated with waste removal, disposal, and landfill operations.

The proposed project would increase the activity onsite primarily by introducing occupants of the new office buildings and commercial businesses as well as event attendees. Therefore, the proposed project would contribute to annual long-term increases in GHGs as a result of increased vehicle trips (mobile sources) as well as event-related, commercial, and office operations that would result in an increase in energy use, water use, wastewater treatment, and solid waste disposal. Construction activities would also result in temporary increases in GHG emissions. However, as described above under Regulatory Framework, the proposed project is a certified environmental leadership project under AB 900 and CARB has determined that the project would not result in any net additional GHG emissions due in part to the voluntary purchase of carbon credits by the project sponsor (see Improvement Measure I-C-GG-1, below).

Moreover, the proposed project would be subject to and required to comply with several regulations adopted to reduce GHG emissions as identified in the GHG Reduction Strategy. The proposed project would comply with the following regulations or their equivalent: Commuter Benefits Ordinance; Emergency Ride Home Program; Transportation Management Programs (see Project Description and Appendix TMP); Transit Impact Development Fee to the extent applicable under the Mission Bay Redevelopment Plan; Jobs-Housing Linkage Program (residential uses less than ¼ -mile north of the project site); Bicycle Parking requirements (the project would exceed these requirements and provide a total of 586 bicycle parking spaces); Fuel Efficient Vehicle and Carpool Parking (providing 51 carpool spaces and 51 fuel efficient and vehicle charging stations); San Francisco Green Building Requirements (increased energy efficiency, purchase of renewable energy credits, reduction of potable water consumption by about 35 percent, enhanced energy commissioning); San Francisco Stormwater Management Ordinance (low impact development practices including filtration basins, rain gardens, and approximately 50,000 square feet of self-treating green roofs); San Francisco Water Efficient Irrigation Ordinance (the project's landscaped areas include low-water use planting selections, use of sedum and allium-based green roof materials, and soil mix design for a high available water holding capacity); Mandatory Recycling and Composting Ordinance (paper, glass, corrugated cardboard, plastic, and metals would be collected on site for recycling, and recycling bins and composting containers would be located throughout the buildings); San Francisco Construction and Demolition Debris Recovery Ordinance (to be included as part of the construction specifications); Street Tree Planting Requirements for New Construction (the project includes 79 new street trees); Light Pollution Reduction (exterior lighting fixture selections will have minimum backlight/uplight/glare ratings as allowed by required illuminance levels); Construction Site Runoff Control (site is served by a separate storm sewer system and construction contractors would implement best management practices to comply with conditions of a site-specific stormwater pollution prevention plan); Enhanced Refrigerant Management; Finished Material Pollutant Control; and Regulation of Diesel Backup Generators.

These regulations, as outlined in San Francisco's *Strategies to Address Greenhouse Gas Emissions*, have proven effective as San Francisco's GHG emissions have measurably reduced when compared to 1990 emissions levels, demonstrating that the City has met and exceeded the GHG reduction goals specified in EO S-3-05, EO B-30-15, AB 32, and the Bay Area 2010 Clean Air Plan for the year 2020. The proposed project was determined to be consistent with San Francisco's GHG Reduction Strategy.[27] Other existing regulations, such as those implemented through AB 32, will continue to reduce a proposed project's contribution to climate change.

In addition to compliance with the applicable provisions of the San Francisco's GHG Reduction Strategy or their equivalents, the project has been certified by Governor Brown as a leadership project under the Jobs and Economic Improvement Through Environmental Leadership Act of 2011 (AB 900). As discussed under Regulatory Framework above, on April 20, 2015, CARB determined that based on the documentation submitted by the project sponsor, the proposed project would not result in any net additional GHG emissions for purposes of certification under AB 900.[28]

As part of the AB 900 application, the project sponsor has committed to purchase carbon credits from a qualified GHG emissions broker in an amount sufficient to offset all GHG emissions from project construction and operations, as reiterated in **Improvement Measure I-C-GG-1, Purchase Voluntary Carbon Credits**. Net additional GHG emissions would be calculated in accordance with the methodology agreed upon by CARB in connection with the AB 900 certification of the project.[29] Thus, the Governor's certification of the proposed project as a leadership project further supports the determination that the proposed project would not have a significant impact on global climate change due to GHG emissions.

Therefore, the proposed project's GHG emissions would not conflict with state, regional, and local GHG reduction plans and regulations, and because the proposed project would not result in any net additional GHG emissions, the project would not contribute to cumulative GHG

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27 Greenhouse Gas Analysis: Compliance Checklist, May 22, 2015. This document is on file and available for public review at the San Francisco Planning Department as part of Case File No. 2014.1441E.

28 Corey, Richard W., Executive Director, Air Resources Board, 2015. Air Resources Board Executive Order G-15-022, Relating to Determination of No Net Additional Greenhouse Gas Emissions Under Public Resources Code section 21183, subdivision (c) for Golden State Warriors Event Center and Mixed-Use Development at Mission Bay Blocks 29-32, dated April 20, 2015.

29 Golden State Warriors, 2015. *Application for Environmental Leadership Development Project, Golden State Warriors Event Center and Mixed-Use Development at Mission Bay Blocks 29-32*, February 2015, and Addenda dated March 6, 2015 and March 16, 2015.

emissions impacts. As such, the proposed project would result in a *less-than-significant* impact with respect to GHG emissions.

Mitigation: Not required.

Improvement Measure I-C-GG-1: Purchase Voluntary Carbon Credits

***Construction Emissions*:** No later than six (6) months after the issuance of a Temporary Certificate of Occupancy for the project, the project sponsor shall provide to the Office of Community Investment and Infrastructure (OCII), a calculation of the net additional emissions resulting from the construction of the project, to be calculated in accordance with the methodology agreed upon by the California Air Resources Board (CARB) in connection with the AB 900 certification of the project. The project sponsor shall provide courtesy copies of the calculations to CARB and the Governor's office promptly following transmittal of the calculations to OCII. The project sponsor shall enter into one or more contracts to purchase voluntary carbon credits from a qualified greenhouse gas emissions broker in an amount sufficient to offset the construction emissions. The project sponsor shall provide courtesy copies of any such contracts to the ARB and the Governor's office promptly following the execution of such contracts.

***Operational Emissions*:** No later than six (6) months after project stabilization, to be defined as the date following project completion when the project is 90 percent leased and occupied (and with respect to the arena component, 90 percent of the available booking dates are utilized), the project sponsor shall submit to OCII a projection of operational emissions arising from the project, based on data accumulated to that date and reasonable projections of operational emissions for the useful life of the project (30 years), to be calculated in accordance with the methodology agreed upon by CARB in connection with the AB 900 certification of the project. The project sponsor shall provide courtesy copies of the calculations to CARB and the Governor's office promptly following transmittal of the calculations to OCII. The project sponsor shall enter into one or more contracts to purchase voluntary carbon credits from a qualified greenhouse gas emissions broker in an amount sufficient to offset the operational emissions, on a net present value basis in light of the fact that the project sponsor is proposing to acquire such credits in advance of any creation of the emissions subject to the offset. The project sponsor shall provide courtesy copies of any such contracts to CARB and the Governor's office promptly following the execution of such contracts.

Comparison of Impact C-GG-1 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR did not specifically address impacts associated with GHG emissions. However, because the proposed project would have a less-than-significant impact on GHG emissions, the project would result in no new or substantially more severe significant impacts than those previously identified in the FSEIR.

5.6 Wind and Shadow

5.6.1 Introduction

This section of the SEIR analyzes potential wind and shadow impacts that could occur as a result of the proposed project, and assesses the potential for project implementation to adversely affect existing wind and shadow patterns. The analyses in this section are based in part on a wind study prepared by Rowan Williams Davies & Irwin Inc. (RWDI)[1], and a shadow analysis conducted by ESA (see Appendix WS).

5.6.2 Summary of Wind and Shadow Impacts in Mission Bay FSEIR

5.6.2.1 Summary of Wind Impacts in Mission Bay FSEIR Initial Study Air Quality/Climate Section

The Mission Bay FSEIR Initial Study Air Quality/Climate section discussed wind significance criteria and impacts. The Mission Bay FSEIR Initial Study Air Quality/Climate section reported that while the City Planning Code contained specific wind hazard and comfort criteria for evaluating wind effects of new buildings in the Downtown Commercial (C-3) District and the Rincon Hill, Van Ness Avenue and South of Market areas, there were no wind criteria in the City Planning Code that specifically applied to the Mission Bay Plan area.

The Mission Bay FSEIR Initial Study summarized the wind analysis from the Mission Bay FEIR, and reported that proposed buildings 100 feet or higher could generate pedestrian-level wind effects, including increased wind speeds and turbulence (i.e., variability in wind speed). The Mission Bay FSEIR Initial Study also reported that buildings up to 100 feet in height would not be expected to generate hazardous winds. Hazardous winds are defined in the City Planning Code Section 148 as an hourly average of 26 miles per hour (mph), for more than any single hour of the year. The Mission Bay FSEIR Initial Study reported that the extent and magnitude of wind effects attributable to new buildings developed within the Mission Bay Plan area would depend on the actual design, height, bulk and placement of each specific structure in relationship to adjacent buildings, streets and open space areas.

The Mission Bay FSEIR Initial Study indicated that while the standards of City Planning Code Section 148 do not apply to the Mission Bay plan area, Section 148's wind standards nonetheless provide an appropriate methodology and criteria for the analysis of wind effects in the Plan area. The Mission Bay FSEIR Initial Study included Mitigation Measure D.7, adapted from the Mission Bay FEIR, that required wind review, including wind tunnel testing, of proposed structures within the Mission Bay Plan area over 100 feet in height, which would have the potential to create wind hazards. The mitigation measure also provided for design-specific analysis of wind hazards of

[1] Rowan Williams Davies & Irwin Inc., *Warriors Arena, San Francisco California, Pedestrian Wind Study*, April 23, 2015.

individual projects and a basis to incorporate design modifications to reduce significant wind hazards. With implementation of this mitigation measure, the Mission Bay FSEIR concluded that Mission Bay plan wind impacts would be less than significant.

5.6.2.2 Summary of Shadow Impacts in Mission Bay FSEIR Initial Study Air Quality/Air Climate Section

The Mission Bay FSEIR Initial Study Air Quality/Climate section discussed shadow significance criteria and impacts. The Mission Bay FSEIR Initial Study Air Quality/Climate section reported that City Planning Code Section 295 (Sunlight Ordinance), which provides for the protection of public open spaces under the jurisdiction of the City Recreation and Parks Department from shadowing from new structures, did not apply to proposed development within the Mission Bay plan area.

The Mission Bay FSEIR Initial Study included a shadow analysis to assess potential shading effects of full development under the Mission Bay plan by using generalized buildings masses for the land uses and maximum height zones proposed by the Mission Bay plan. The shadow analysis revealed that proposed development under the Mission Bay plan would not shade any nearby City Recreation and Parks Department open space area at any time, and consequently, would have a less-than-significant effect on these facilities.

The shadow analysis also indicated that development under the Mission Bay plan would shade open space areas within the Mission Bay plan area, including proposed open space area near the waterfront of the Bay along the eastern plan area boundary, proposed open space along the China Basin Channel, and the proposed open space areas along Mission Bay Boulevard. The Mission Bay FSEIR Initial Study included Mitigation Measure D.8, adapted from the Mission Bay FEIR, which required analysis of potential shadows on existing and proposed open spaces during the building design and review process for any development that would exceed the design height and/or bulk criteria of the plan. With implementation of this mitigation measure, the Mission Bay FSEIR concluded that Mission Bay plan shadow impacts on open space within the Mission Bay plan area would be less than significant.

The Mission Bay FSEIR Initial Study also determined that Mission Bay plan shading effects on vegetation or wildlife within or near the Plan area, including along the Bay shore and at China Basin Channel, would be less than significant.

5.6.3 Setting

5.6.3.1 Wind

San Francisco's Existing Wind Environment

In San Francisco, average winds speeds are the highest in the summer and lowest in winter. However, the strongest peak wind speeds occur in winter. The highest average wind speeds occur in mid-afternoon and the lowest in the early morning. Based on over 40 years of recordkeeping, the highest mean hourly wind speeds (approximately 20 mph) occur mid-afternoon in July, while the lowest mean hourly wind speeds (in the range of 6 to 9 mph) occur throughout the day in November.

Meteorological data collected at the old San Francisco Federal Building at 50 United Nations Plaza over a 6-year period[2] show that westerly[3] through northwesterly winds are the most frequent and strongest winds during all seasons. Of the 16 primary wind directions, four have the greatest frequency of occurrence: these are northwest, west-northwest, west, and southwest. Analysis of the Federal Building wind data shows that during the hours from 6:00 a.m. to 8:00 p.m., about 70 percent of the winds blow from five adjacent directions of the 16 directions, as follows: northwest (10 percent of all winds), west-northwest (14 percent of all winds), west (35 percent of all winds), west-southwest (accounting for 2 percent of all winds), and southwest (9 percent of all winds). Over 90 percent of all measured winds with speeds over 13 mph blow from these five directions. The other 10 percent of winds over 13 mph are from storms and can come from any other direction.

Wind Effects on People

The comfort of pedestrians varies under different conditions of sun exposure, temperature, clothing, and wind speed.[4] Winds up to about 4 mph have no noticeable effect on pedestrian comfort. With speeds from 4 to 8 mph, wind is felt on the face. Winds from 8 mph to 13 mph will disturb hair, cause clothing to flap, and extend a light flag mounted on a pole. Winds from 13 to 19 mph will raise loose paper, dust, and dry soil, and will disarrange hair. For winds from 19 to 26 mph, the force of the wind will be felt on the body. With 26 to 34 mph winds, umbrellas are used with difficulty, hair is blown straight, there is difficulty in walking steadily, and wind noise is unpleasant. Winds over 34 mph and gusts can blow people over.

Wind Effects from Buildings

Tall buildings and exposed structures can strongly affect the wind environment for pedestrians. A building that stands alone or is much taller than the surrounding buildings can intercept and redirect winds that might otherwise flow overhead and bring them down the vertical face of the building to ground level, where they create ground-level wind and turbulence. These redirected winds can be relatively strong and turbulent, and may in some instances be incompatible with the intended uses of nearby ground-level spaces. Moreover, structure designs that present tall flat surfaces square to strong winds can create ground-level winds that can prove to be hazardous to pedestrians in the vicinity. Conversely, a building with a height that is similar to the heights of surrounding buildings typically would cause little or no additional ground-level wind acceleration and turbulence.

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2 Arens, E. *et al.*, "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance," Building and Environment, Vol. 24, No. 4, p. 297-303, 1989.

3 Wind directions are reported as directions from which the winds blow.

4 Lawson, T.V. and A.D. Penwarden, "The Effects of Wind on People in the Vicinity of Buildings," Proceedings of the Fourth International Conference on Wind Effects on Buildings and Structures, London, 1975, Cambridge University Press, Cambridge, U.K., 605-622 1976.

Thus, wind impacts are generally caused by large building masses extending substantially above their surroundings, and by buildings oriented so that a large wall catches a prevailing wind, particularly if such a wall includes little or no articulation. In general, new buildings less than approximately 80 feet in height are unlikely to result in substantial adverse effects on ground-level winds such that pedestrians would be uncomfortable. Such winds may occur under existing conditions, but shorter buildings typically do not cause substantial changes in ground-level winds.

Wind Patterns in the Mission Bay Plan Area Vicinity

As discussed above, in San Francisco, including Mission Bay, over 90 percent of all measured winds with speeds greater than 13 mph blow from the northwest, west-northwest, west, and west-southwest. These are the directions of primary concern for potential wind effects of the proposed project.

The wind conditions for pedestrians in the Mission Bay Plan area are determined by the interactions between the higher-speed northwest, west-northwest, west and southwest winds, and the combined effects of the Mission Bay Plan street grid and the large footplate buildings within the Plan area. The west and the west-northwest winds, which in combination make up nearly half of all winds, align closely with the street grid and contribute to the strong winds that flow along the east-west-oriented streets within the Plan area. Although the northwest and southwest winds are misaligned with the street grid, both also contribute to winds flowing eastward along the east-west-oriented streets. Located on the eastern waterfront of San Francisco, the project site is fully exposed to storm winds that approach from over the Bay from the southeast through the east and northeast.

The existing pedestrian wind conditions on large vacant parcels of land in the Mission Bay South Plan area can be characterized as windy. However, prior wind tunnel testing conducted within Mission Bay South Plan area has demonstrated that existing wind conditions within the Plan area have improved over time as planned buildings have been constructed in accordance with the *Mission Bay South Design for Development* (see *Regulatory Framework,* below). Groups of buildings built according to these guidelines substantially slow winds in their vicinity.

5.6.3.2 Shadow

Background

In an urban environment, shadow is a function of the height, size, and massing of buildings and other elements of the built environment, and the angle of the sun. The angle of the sun varies due to the time of day (from rotation of the earth) and the change in seasons (due to the earth's elliptical orbit around the sun and the earth's tilted axis). The longer mid-day shadows are cast during the winter (when the mid-day sun is lowest in the sky) and the shorter mid-day shadows are cast during the summer (when the mid-day sun is higher in the sky). At the time of the summer solstice (which falls approximately on June 21 of every year), the mid-day sun is highest in the sky, and the longest day and shortest night occur on this date. Conversely, the shortest day and longest night occur on the winter solstice (which falls on approximately December 21 of every year). The vernal and fall equinoxes (when day and night are equal in length) represent the halfway point between solstices.

Existing/Planned Open Spaces Under Public Jurisdiction in the Vicinity of the Project Site

Bayfront Park is a planned linear park comprising Mission Bay plan parcels P21 through P24, and when completed, will extend from Mission Bay Boulevard south to Mariposa Street. The north portion of the park (P21, located east of Terry A. Francois Boulevard, between Mission Bay Boulevard South and just south of Pierpoint Lane) is complete, and includes a landscaped parking lot and boat launch. Construction is underway in 2015 for the south portion of Bayfront Park (P23 and P24, located west of Terry A. Francois Boulevard, between 16th Street and Mariposa Street), and construction of this portion of the park will be complete by the end of 2016. Following realignment of Terry A. Francois Boulevard, the central portion (P22) of Bayfront Park located east of the project site and consisting of approximately 5.5 acres will be developed. Potential park uses for this portion of Bayfront Park being considered at this time include, but are not limited to, pathways, outdoor performance area, kiosks, outdoor dining areas, and informal playing field(s). Both the realignment of Terry A. Francois Boulevard and Bayfront Park public access improvements on P22 are triggered by development on Block 29-32 and would be implemented by the master developer, FOCIL-MB, LLC, prior to occupancy of buildings at the project site.

Agua Vista Park is an existing shoreline landscaped area and fishing pier located east of the project site across from the existing alignment of Terry A. Francois Boulevard. Agua Vista Park is on Port of San Francisco property and is outside of the Mission Bay plan area. The Port is currently renovating Agua Vista Park, include new pathways, seating areas, interpretation and/or fishing facility improvements; these improvements are planned to be completed in August 2015.

5.6.4 Regulatory Framework

Development within the Mission Bay South Redevelopment Plan Area, including Blocks 29-32, is subject to the development controls of the South Plan, the *Mission Bay South Design for Development* (South Design for Development), as amended, and other related documents. The South Plan and South Design for Development supersede the City’s *Planning Code*, except as otherwise specifically provided in those documents and associated documents for implementing the Plans. The regulatory framework discussion presented below focuses on the guidelines and design standards contained in the Mission Bay South Design for Development that are applicable to the proposed project.

5.6.4.1 Wind

Mission Bay South Design for Development

The Mission Bay South Design for Development includes *Wind Analysis* standards for new development in Mission Bay South. These standards were prepared with the objective to use all feasible means to eliminate wind hazards and to reduce adverse wind impacts, including potentially uncomfortable wind conditions. The Mission Bay South Design for Development states that wind review, including potential wind tunnel testing, is required for all projects that include buildings over 100 feet in height. The Mission Bay South Design for Development specifies that the wind analysis shall be conducted to assess wind conditions for the project in conjunction with the anticipated pattern of development on surrounding blocks.

The Mission Bay South Design for Development also provides design guidelines for new development within Mission Bay South on blocks that would be exposed to winds from the west or north-west, particularly if they front open space. Examples include modulation of western facades through the use of architectural devices (e.g., surface articulation, variation of planes, wall surfaces, and heights; and placement of stepbacks, courtyards, plazas, and other features); landscaping in appropriate locations and use of porous materials (vegetation, hedges, screens, latticework, perforated or expanded metal); avoidance of use of "breezeways" or notches at the upwind corners of the building, and use of building setbacks to reduce ground level wind accelerations.

5.6.4.2 Shadow

Mission Bay South Design for Development

The Mission Bay South Design for Development includes *Sunlight Access to Open Space* design standards. These standards were prepared with the objective of encouraging new developments to ensure sunlight access to public open spaces and limit the extent and duration of shadows on these public open spaces. The South Design for Development notes that shadow studies have determined that development complying with the design standards will reasonably limit areas of shadow on public open spaces during the active months of the year (March to September) and during the most active times of the day (10:00 a.m. to 4:00 p.m.). The South Design for Development requires that additional shadow analysis be conducted for a project that would need a variance from South Design for Development's design standards for height, bulk and coverage and streetwall.

5.6.5 Impacts and Mitigation Measures

5.6.5.1 Significance Thresholds

Wind

The proposed project would have a significant impact related to wind if it were to:

- Alter wind in a manner that substantially affects public areas.

As discussed above, while City Planning Code Section 148 does not apply to the Mission Bay Plan area, Section 148's wind standards nonetheless provide an appropriate methodology and criteria for the analysis of wind effects in the Plan area. Consequently, for the purposes of CEQA review, an exceedance of the Planning Code's wind hazard criterion is used in this SEIR as the standard for determining whether the project would alter pedestrian winds in a manner that would substantially alter public areas.

Shadow

The proposed project would have a significant shadow impact if it were to create new shadow in a manner that would:

- Substantially affect the use of publicly accessible open space or outdoor recreation facilities or other public areas.

5.6.5.2 Approach to Analysis

Wind

The methodology and the criteria for analyzing potential project wind impacts in this SEIR are derived from Section 148 of the Planning Code. Section 148 establishes a wind hazard criterion, whereby project buildings may not cause wind speeds that meet or exceed 26 mph, averaged for a full hour for any hour of the year.[5] Potential project exceedance of this hazard criterion in off-site public areas would be a significant environmental impact. Wind effects on on-site publically accessible areas are not considered a significance threshold.

Section 148 also establishes wind comfort criterion, whereby a project shall not cause ground-level wind currents to exceed, more than 10 percent of the time, 11 mph in areas of substantial pedestrian use, and 7 mph in public seating areas.[6] The Section 148 wind comfort criterion is not used to judge significance of project wind impacts in the Mission Bay Plan area and in this SEIR. Accordingly, exceedance of wind speeds[7] that exceed wind comfort criteria but do not reach hazard levels would not be a significant impact, and accordingly, would not require mitigation. Nevertheless, project effects on wind comfort are presented in this SEIR for informational purposes.

A wind tunnel test was conducted by RWDI in April, 2015 to characterize the pedestrian wind environment that currently exists and to determine future wind conditions on sidewalks and open spaces around the project site should the project be constructed. A one-inch-to-25-foot scale model of the project site and vicinity was constructed in order to simulate existing and existing-plus-project wind conditions. The wind model included all relevant surrounding buildings within a 1,200 foot radius of the center of the project site, including both existing and cumulative conditions.

The wind tunnel test measured wind speeds for the existing setting and the existing-plus-project scenarios, as well as a project-plus-cumulative scenario. Pedestrian-level wind speeds were measured at up to 142 on- and off-site locations (depending on the test scenario), that were selected for the study area to quantify resulting pedestrian-level winds on sidewalks and in other publically accessible spaces where the project would be expected to have the most effect on winds. Locations for wind speed sensors, or study test points, were selected to indicate how the general flow of winds would be directed around the new buildings. Consistent with Section 148, the locations of interest are public sidewalks and public parks, including areas of substantial pedestrian use and/or public seating areas. As a result, test points were included along sidewalks,

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5 The wind hazard criterion is derived from the wind condition that would generate a 3-second gust of wind at 20 meters per second, a commonly used guideline for wind safety. This wind speed, on an hourly basis, is a 26 mph average for a full hour. Because the original Federal Building wind data were collected at one-minute averages, the 26 mph hourly average is converted to a one-minute average of 36 mph, which is used to determine compliance with the 26 mph one-hour hazard criterion in the *Planning Code*. (Arens, E. *et al.*, "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance," Building and Environment, Vol. 24, No. 4, p. 297-303, 1989.)

6 The wind comfort criteria are defined in terms of *equivalent wind speed*, which is an average wind speed (mean velocity), adjusted to include the level of gustiness and turbulence. *Equivalent wind speed* is defined as the mean wind velocity, multiplied by the quantity (one plus three times the turbulence intensity) divided by 1.45. This calculation magnifies the reported wind speed when turbulence intensity is greater than 15 percent.

7 Throughout this document, unless otherwise stated, use of the term "wind speeds" in connection with the wind-tunnel tests refers to equivalent wind speeds that are exceeded 10 percent of the time.

near existing/planned open space and other areas of substantial pedestrian use. Consistent with City guidance, the wind analysis results presented for the various scenarios in this SEIR do not consider existing or planned landscaping.

In accordance with the protocol for wind tunnel testing under Section 148, the three scenarios were tested for each of four prevailing wind directions: northwest, west-northwest, west, and west-southwest. These winds are the most common in San Francisco, including within Mission Bay, and are therefore most representative for evaluation of the proposed project.

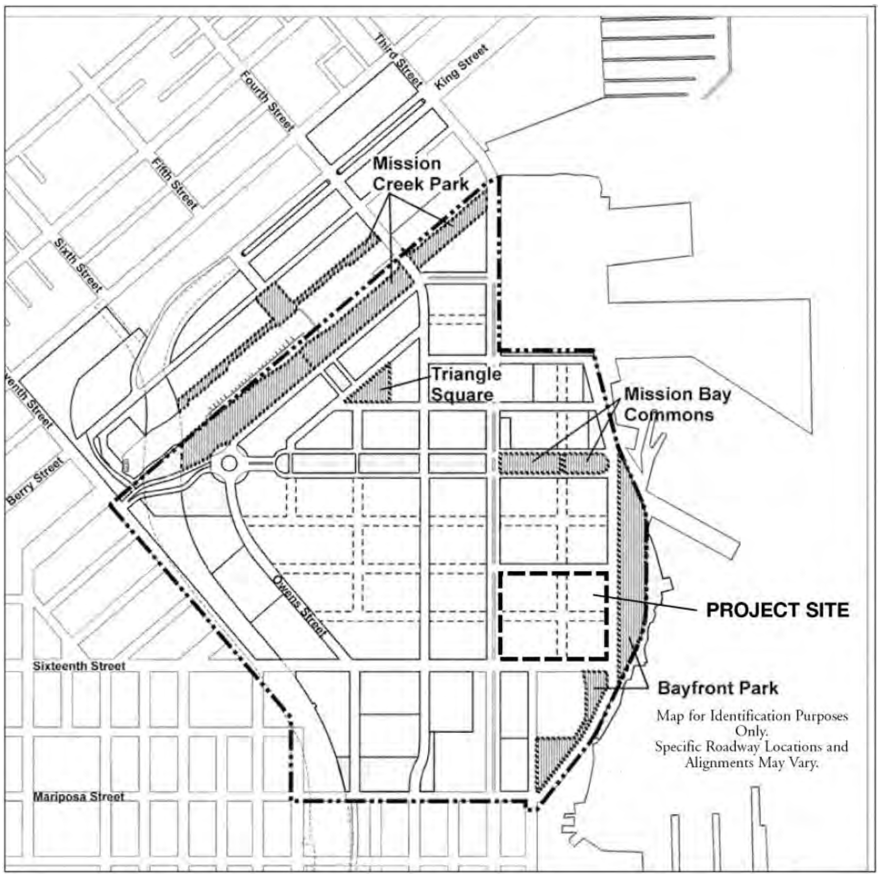
Shadow

For projects subject to a shadow analysis per the South Design for Development, the amount of area shadowed, the duration of the shadow, and the importance of sunlight to the use patterns of open spaces are taken into account when determining the impact of shadows from development. The South Design for Development provides the following methodology:

- For the purposes of assessing the impact of shadows on Mission Bay open spaces, open spaces have been divided into four areas: Mission Creek Park (which includes both North and South), Bayfront Park, Triangle Square, and the section of Mission Bay Commons, between Third Street and Terry Francois Boulevard. (See **Figure 5.6-1,** below, for project location in relation to the existing/planned Mission Bay South open spaces.)
- Shadow analysis should study the area of public open space in continuous shadow for periods of one hour, during the most active months of the year (March to September) and during the most active times of the day (10:00 a.m. to 4:00 p.m.).
- Analysis for a specific development proposal should take into account aggregate shadow impacts from all buildings over 40 feet in height adjacent to the public open space. For the purpose of shadow analysis, undeveloped parcels should be analyzed using either approved plans for future development or a plan that resembles the maximum allowable building envelope for that parcel.
- The total area of each of the described public open spaces should be the basis for shadow calculation. To reasonably limit areas of open space in continuous shadow for extended periods of time, the area of public open space in continuous shadow for a period of one hour from March to September between 10:00 a.m. and 4:00 p.m. should not exceed the following percentages:

Mission Creek Park:	13 percent
Bayfront Park:	20 percent
Triangle Square	17 percent
Mission Bay Commons	11 percent

As shown in **Figure 5.6-1**, given the proposed project's location, the purpose of this shadow analysis within the Mission Bay South plan area is to evaluate the potential shadow impacts on the planned Bayfront Park, a linear park that will extend from Mission Bay Boulevard south to Mariposa Street. No other existing or planned open space in the Mission Bay South plan area, including Mission Bay Commons, Mission Creek Park, Triangle Square, or Mariposa Park would be shadowed by the proposed project.



SOURCE: South Design for Development, 2004

Figure 5.6-1
Existing/Planned Public Open Space in Mission Bay South

To evaluate the shadow impact of the proposed project, ESA prepared an up-to-date three-dimensional (3-D) model of the Mission Bay South plan area, which included the following:

- Current ground and roadway elevations for the study area in the 3-D model using the maps provided by the Office of Community Investment and Infrastructure (OCII).
- The digital 3-D model of the proposed event center and mixed-use development as provided by the sponsor.
- Cumulative development in the study area consistent with the maximum dimensions and bulks provided for in the South Design for Development.

ESA conducted a shadow screening study for the proposed project by casting shadows on the hour starting at noon and 4:00 p.m. continuing through the 21st of each month of concern – March, April, May, June, July, August, and September. (As discussed in the Setting, the equinoxes and solstices occur on approximately the 21st of the month, and consequently, are representative of the entire month). Given the project site's location relative to Bayfront Park, there is no potential for project shadows to be cast on Bayfront Park between 10:00 a.m. and noon, and consequently, no shadow screening images were needed for times before noon.

Images of the resulting shadows cast for the study months/times are presented in **Appendix WS**.

Given that this shadow analysis follows the methodology from the South Design for Development, which requires the analysis "take into account shadow impacts from all building development over 40 feet in height adjacent to public open space," the shadow analysis for this SEIR is essentially a cumulative analysis and project-specific impacts are addressed within the cumulative context.

5.6.5.3 Impact Evaluation

Wind

Wind Hazards at Off-site Public Areas

Impact WS-1: The project would alter wind in a manner that would substantially affect off-site public areas. (Significant and Unavoidable with Mitigation)

The proposed project would include development of an event center, office and retail buildings, and other structures that would have the potential to alter winds off-site, including at pedestrian use areas such as public walkways and public open space in the project vicinity.

As discussed in the Setting, prior wind tunnel tests conducted within the Mission Bay South Plan area have demonstrated that historical wind conditions within the Plan area have improved over time as planned buildings have been constructed in accordance with the *Mission Bay South Design for Development.* This general trend is expected to continue as more buildings are constructed in the Plan area. Accordingly, as more buildings are built and fill in vacant sites in the Plan area, wind speeds in pedestrian areas around the buildings will generally continue to decrease.

As discussed under Section 5.6.5.2, Approach to Analysis, a wind tunnel test was conducted to define the pedestrian wind environment that currently exists, and to determine future wind conditions on public use areas around the project site with implementation of the project. **Table 5.6-1** presents the wind analysis results, namely the 10-percent exceeded equivalent wind speeds and the number of hours per year the wind hazard criterion would be exceeded at 46 off-site study test points located on public walkways along the site perimeter and vicinity for the existing and existing-plus-project wind scenarios. **Figure 5.6-2** presents a map showing the location of the off-site wind test points, including the location of wind hazards for the existing-plus-project scenario.

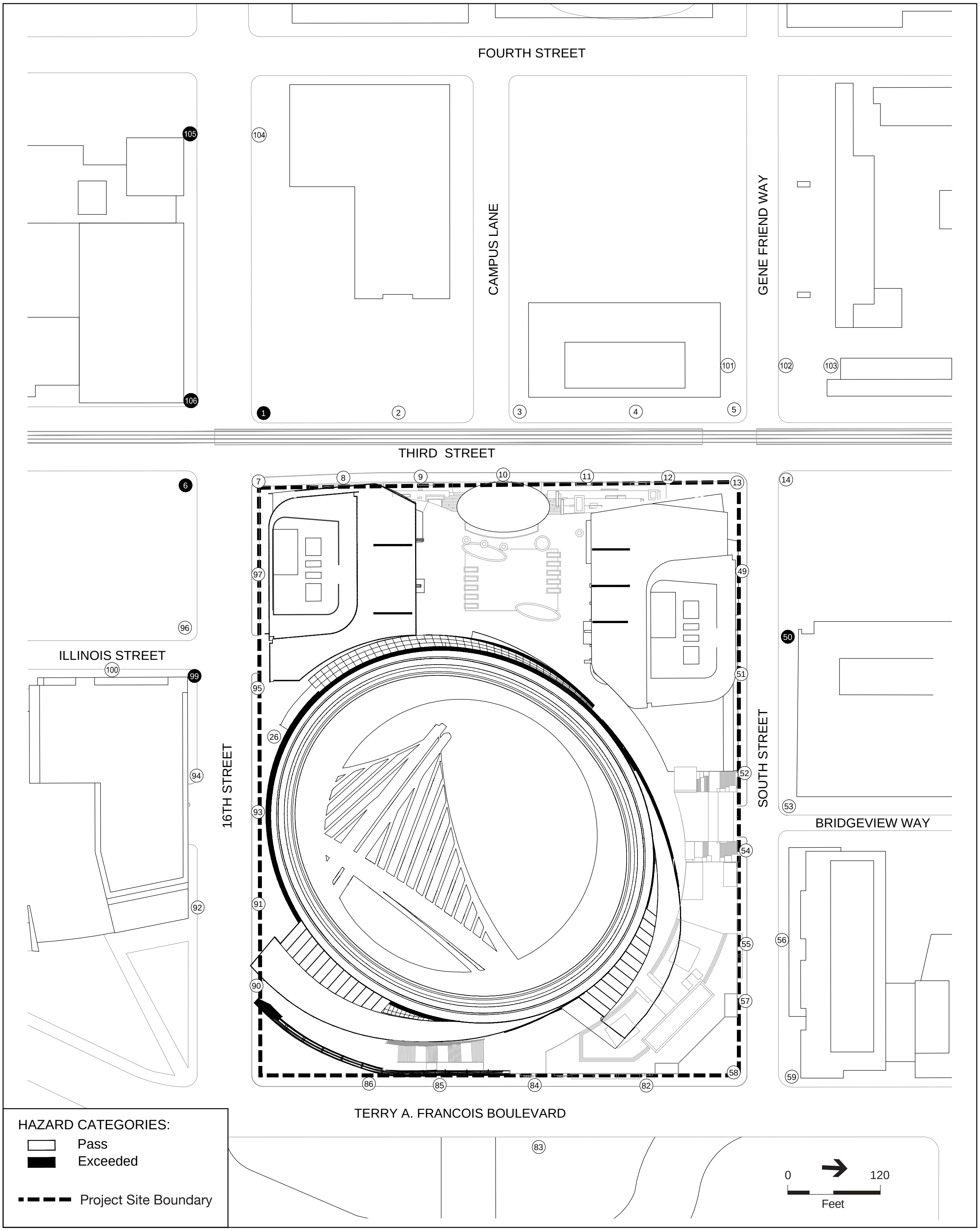
Existing Wind Hazard Conditions. Under existing conditions, the wind hazard criterion is exceeded at seven test locations on public walkways in the project vicinity. Currently, five test locations with wind hazards occur along 16th Street at test points adjacent to, across the street from, or upwind of the project site, one wind hazard location occurs along Gene Friend Way upwind of the project site, and one wind hazard location occurs on South Street adjacent to the project site. The total duration of the existing wind hazards at the seven locations on public walkways in the project vicinity is 106 hours per year, with 101 of those hours occurring at the five test points along 16th Street.

INSERT TABLE 5.6-1
EXISTING PLUS PROJECT WIND HAZARD CONDITIONS

WIND HAZARD ANALYSIS - OFF-SITE STUDY POINTS

References		Existing			Project			
Wind Test Location Number	Wind Hazard Criterion Speed miles/hour	1-hr./yr. Equivalent Wind Speed miles/hour	Wind Hazard Criterion Exceeded, hours/year	Source	1-hr./yr. Equivalent Wind Speed miles/hour	Wind Hazard Criterion Exceeded, hours/year	Hazard Hours Relative to Existing	Source
1	36	41	13	e	42	12	-1	e
2	36	28			23			
3	36	22			17			
4	36	14			21			
5	36	36			29			
6	36	36			44	39	39	p
7	36	39	6	e	34		-6	-
8	36	35			24			
9	36	29			28			
10	36	24			24			
11	36	15			28			
12	36	24			23			
13	36	33			27			
14	36	30			28			
49	36	31			19			
50	36	35			40	5	5	p
51	36	34			33			
52	36	31			28			
53	36	23			27			
54	36	38	3	e	26		-3	-
55	36	29			25			
56	36	22			28			
57	36	30			23			
58	36	19			23			
59	36	21			19			
82	36	31			24			
83	36	31			28			
84	36	34			20			
85	36	31			26			
86	36	32			22			
90	36	29			24			
91	36	34			25			
92	36	32			20			
93	36	31			30			
94	36	29			20			
95	36	35			29			
96	36	29			32			
97	36	34			23			
99	36	40	8	e	41	14	6	p
100	36	22			21			
101	36	32			29			
102	36	35			33			
103	36	37	1	e	35		-1	-
104	36	33			35			
105	36	45	70	e	43	57	-13	e
106	36	39	5	e	42	12	7	p
Ave 1-hr. Equivalent Wind Speed		30.7			27.9			
Total Hours Winds Exceeds Criterion			106			139	33	

Total Exceedances:	Total:	7		Total:	6	
Subtotals by type:	*Existing*	7	e	*Existing*	2	e
				New, or increased time	4	p
				New, at new location	0	n
				Eliminated by Project	3	-



SOURCE: RWDI, 2015

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E:
Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 5.6-2
Existing Plus Project Wind Hazard Conditions

Existing-Plus-Project Wind Hazard Conditions at Off-site Public Use Areas. Development of the proposed project would alter wind speeds among individual study test points at off-site public walkways. Under existing-plus-project conditions, the total net number of off-site study test points at which wind speed would exceed the wind hazard criterion would be reduced from 7 to 6. However, there would also be a net increase in the total duration of wind hazards on the off-site public walkways in the project vicinity, increasing from 106 hours per year under existing conditions to 139 hours per year under existing-plus-project conditions (an increase of 33 hours).

When considering individual wind test points, the proposed project would result in the following changes to the wind environment in the project vicinity compared to existing conditions (see Figure 5.6-2 for test point locations):

- Create new exceedances of the wind hazard criterion at two test points: at the southeast corner of Third Street and 16th Street (Test Point No. 6: 39 hours per year); and on the north side of South Street between Third Street and Bridgeview Way across from the project site (Test Point No. 50: 5 hours per year);
- Increase the duration of two existing wind hazard exceedances: at the southeast corner of 16th Street and Illinois Street (Test Point No. 99: 6 hour increase per year); and at the southwest corner of Third Street and 16th Street (Test Point No. 106: 7 hour increase per year);
- Decrease the duration of two existing wind hazards: at the northwest corner of Third Street and 16th Street (Test Point No. 1: 1 hour decrease per year); and on 16th Street between Third and Fourth Streets (Test Point No. 105: 13 hour decrease per year) and
- Eliminate three existing exceedances of the wind hazard criterion: at the northeast corner of Third Street and 16th Street (Test Point No. 7: 6 hours eliminated per year); on South Street adjacent to the site (Test Point No. 54: 3 hours eliminated per year); and on Gene Friend Way adjacent to UCSF Hearst Tower (Test Point No. 103: 1 hour eliminated per year).

It should be noted that the wind test results indicate that under existing-plus-project conditions, no wind hazard exceedances would occur on public walkways located on the east side of the project site. Given that the planned Bayfront Park is located even further east, it can also be inferred from the wind test data that the project would not cause a new wind hazard within the planned Bayfront Park.

In summary, the project would result in a net increase in the total duration of the wind hazard exceedance at off-site public walkways in the project vicinity. Consequently, the project would alter wind in a manner that would substantially affect off-site public areas, and accordingly, the impact would be significant. **Mitigation Measure M-WS-1**, identified below, describes potential design measures that would serve to reduce or avoid related project wind hazards. Preliminary evaluation by the project sponsor of certain potential on-site design modifications indicate such modifications would be effective in reducing the project wind hazard impact to a less than significant level. However, given that the project design is not yet finalized, the impact is conservatively identified as *significant and unavoidable with mitigation*. It should be noted that the project impact discussed above is identified only for the interim conditions prior to implementation of planned cumulative development in the project vicinity. As described in

Impact C-WS-1, below, under cumulative-plus-project conditions, wind hazard impacts would be less than significant.

Mitigation Measure M-WS-1: Develop and Implement Design Measures to Reduce Project Off-site Wind Hazards

The project sponsor shall develop and implement design measures to reduce the identified project off-site wind hazards to the extent feasible. This may include on-site project design modifications or additions, additional on-site landscaping; and the implementation of potential additional off-site streetscape landscaping or other off-site wind-reducing features. Potential on- and/or off-site project site wind-reduction design measures developed by the sponsor would be coordinated with, and subject to review and approval, by OCII.

Comparison of Impact WS-1 to Mission Bay FSEIR Impact Analysis

As discussed under Summary of Impacts in the Mission Bay FSEIR, the Mission Bay FSEIR reported that proposed buildings 100 feet or higher could generate pedestrian-level wind effects, including increased wind speeds and turbulence. The Mission Bay FSEIR determined that with implementation of Mitigation Measure D.7, which required wind review, including wind tunnel testing, of proposed structures over 100 feet in height, and provided for design-specific analysis of wind hazards and a basis to incorporate design modifications to reduce significant wind hazards, that Mission Bay plan wind impacts would be less than significant.

Consistent with Mission Bay FSEIR Mitigation Measure D.7 (and the South Design for Development *Wind Analysis* standards), wind tunnel testing and analysis was conducted for the proposed project. As discussed above, project wind hazard impacts at off-site public areas are conservatively determined to be significant. If implementation of Mitigation Measure M-WS-1 does not effectively mitigate the project off-site wind hazard to a less than significant level, then the project would result in a substantially more severe significant wind impact than was previously identified in the Mission Bay FSEIR. As discussed above, this would be an interim significant wind impact, and under cumulative-plus-project conditions, wind hazard impacts would be less than significant.

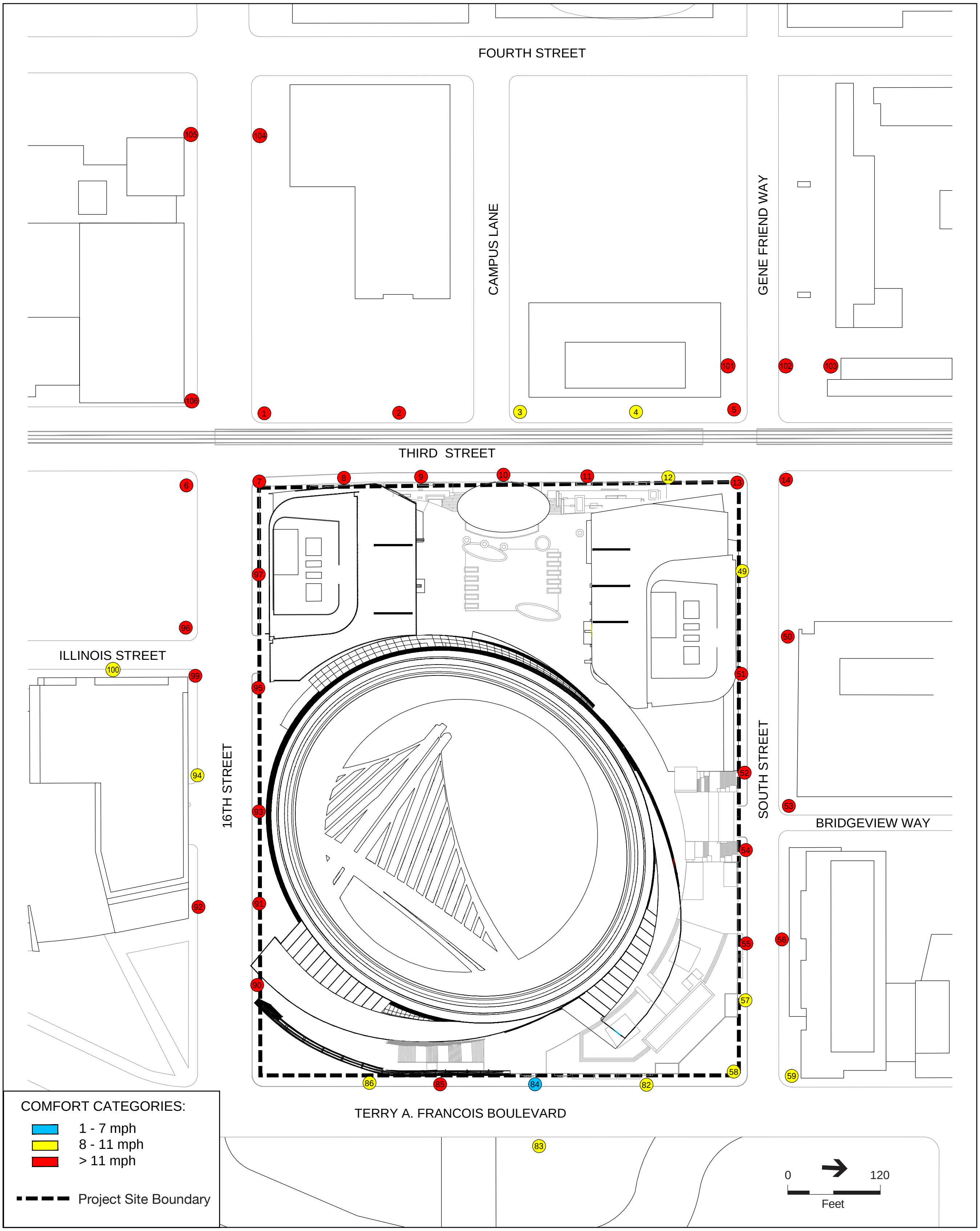
Supplemental Information – Project Wind Comfort Effects at Off-site Public Areas

As discussed under Section 5.6.5.2, above, the wind comfort criterion is not used to judge significance of project wind impacts in the Mission Bay Plan area and in this SEIR. Nonetheless, project effects on wind comfort at off-site public areas may be of interest to members of the public and to decision-makers, and are therefore presented herein for informational purposes. **Table 5.6-2** presents the pedestrian comfort analysis results, namely the average wind speeds that are exceeded 10 percent of the time, and the percentage of time that the 11-mph comfort criterion is exceeded for each off-site study test location, including the test points located on public walkways along the site perimeter and vicinity, for the existing and existing-plus-project wind scenarios. **Figure 5.6-3** presents a map showing the location of the off-site wind test points, and summarizes wind comfort speed results for the existing-plus-project scenario.

INSERT TABLE 5.6-2
EXISTING PLUS PROJECT WIND COMFORT CONDITIONS

WIND COMFORT ANALYSIS - OFF-SITE STUDY POINTS

References		Existing			Project			
Wind Test Location Number	Wind Comfort Criterion Speed miles/hour	Wind Speed Exceeded 10% of Time, miles/hour	Percent of Time Wind Wind Speed Exceeds Criterion	Source	Wind Speed Exceeded 10% of Time, miles/hour	Percent of Time Wind Wind Speed Exceeds Criterion	Speed Change Relative to Existing miles/hour	Source
1	11	20	46	e	19	38	-1	e
2	11	16	30	e	14	22	-2	e
3	11	13	16	e	10	5	-3	-
4	11	6	0		10	7	4	
5	11	19	45	e	15	25	-4	e
6	11	17	32	e	22	52	5	e
7	11	19	41	e	20	48	1	e
8	11	17	34	e	13	21	-4	e
9	11	15	26	e	16	30	1	e
10	11	14	19	e	13	18	-1	e
11	11	8	1		13	19	5	p
12	11	11	10		11	10	0	
13	11	18	37	e	15	25	-3	e
14	11	17	35	e	16	31	-1	e
49	11	16	33	e	10	7	-6	-
50	11	16	32	e	22	52	6	e
51	11	18	39	e	16	30	-2	e
52	11	14	25	e	13	15	-1	e
53	11	12	14	e	13	15	1	e
54	11	18	36	e	12	13	-6	e
55	11	15	24	e	12	13	-3	e
56	11	12	16	e	14	19	2	e
57	11	16	31	e	11	10	-5	-
58	11	10	6		11	10	1	
59	11	12	12	e	11	10	-1	-
82	11	17	35	e	9	6	-8	-
83	11	16	33	e	11	10	-5	-
84	11	18	38	e	7	2	-11	-
85	11	17	35	e	14	22	-3	e
86	11	17	37	e	9	4	-8	-
90	11	15	25	e	14	19	-1	e
91	11	17	34	e	15	23	-2	e
92	11	16	30	e	12	12	-4	e
93	11	16	28	e	17	33	1	e
94	11	14	23	e	11	10	-3	-
95	11	17	36	e	16	30	-1	e
96	11	16	31	e	16	30	0	e
97	11	17	31	e	13	19	-4	e
99	11	21	48	e	23	52	2	e
100	11	11	10		11	10	0	
101	11	15	26	e	14	23	-1	e
102	11	18	40	e	17	33	-1	e
103	11	19	44	e	18	40	-1	e
104	11	18	41	e	20	47	2	e
105	11	25	51	e	26	50	1	e
106	11	18	36	e	19	41	1	e
Ave of Wind Speeds Exceeding 10%		15.8			14.4			
Ave % of Time Winds Exceeds Criterion			29%			23%		
Total Exceedances:		Total:	41			Total:	33	
Subtotals by type:		*Existing*	41	e		*Existing*	32	e
						New, due to Project	1	p
						New, at new location	0	n
						Eliminated by Project	9	-



SOURCE: RWDI, 2015

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E:
Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 5.6-3
Existing Plus Project Wind Comfort Conditions

Existing Wind Comfort Conditions. Under existing conditions, the average wind speed exceeded 10 percent of the time at the off-site study test points on public walkways is 15.8 mph. 41 of the 46 study test points currently experience existing wind speeds that exceed the 11-mph pedestrian comfort criterion. The windiest public areas in the study area are along the 16th Street and Gene Friend Way corridors.

A review of additional study test points located within the vacant project site revealed similarly windy conditions, where the average wind speed exceeded 10 percent of the time across the site was 15.3 mph (i.e., similar to, but slightly less than the average of the off-site study test points).

Existing-Plus-Project Wind Comfort Conditions at Off-site Public Use Areas. Development of the proposed project would alter wind speeds at individual study test points, but would not result in an overall substantial change in wind comfort conditions at off-site public walkways and open space. Under existing-plus-project conditions, the average wind speed exceeded 10 percent of the time on public walkways in the project site vicinity would decrease by 1.4 mph, from 15.8 to 14.4 mph, and the average percentage of time the wind speed would exceed the wind comfort criterion would be reduced from 29 to 23 percent.

Furthermore, the project would result in a net reduction in the total number of off-site exceedances of the 11-mph pedestrian comfort criterion, from 41 to 33 test points. When considering individual wind test points, the proposed project would:

- Create one new exceedance of the 11-mph pedestrian comfort criterion: on Third Street adjacent to site at southwest corner of proposed South Street office and retail building (Test Point No. 11);
- Create a new exceedance of the 7-mph seating comfort criterion on Third Street across from site (Test Point No. 4);
- Further increase wind speeds at eight existing exceedances of the 11-mph pedestrian comfort criterion on Third, 16th and South Streets adjacent to, across or upwind from site (Test Point Nos. 6, 7, 9, 50, 53, 56, 93, 99 and 104-106);
- Reduce wind speeds, but not eliminate existing exceedances of the 11-mph pedestrian comfort criterion, at 18 locations on Third Street, 16th Street, South Street, and Terry A. Francois Boulevard adjacent to and/or across from site (Test Point Nos. 1, 2, 5, 8, 10, 13, 14,51, 52, 54, 55, 85, 90-92, 95, 97, and 101-103);
- Eliminate nine existing exceedances of the 11-mph pedestrian comfort criterion on Third Street, 16th Street, South Street, and Terry A Francois Boulevard adjacent to and/or across from site (Test Point Nos. 3, 49, 57, 59, 82-84, 86, and 94); and
- Result in minor or no change in wind speeds at four test points (Test Point Nos. 12, 58, 96 and 100).

The majority of locations that would experience project-associated increases or decreases in off-site wind speeds exceeded 10 percent of the time would be in the ±1 to 5 mph range. However, larger reductions in off-site wind speeds exceeded 10 percent of the time would occur on Terry A. Francois Boulevard between the project site and the planned Bayfront Park (-1 to -11 mph).

Accordingly, the project would not be anticipated to result in substantial changes in wind comfort within the planned Bayfront Park

In conclusion, with respect to off-site wind comfort, the project would result in a net reduction in the average of wind speeds exceeded 10 percent of the time, a net reduction in the average percentage of time the wind speed would exceed the pedestrian comfort criterion, and a net reduction in the number of exceedances of the 11-mph pedestrian comfort criterion at off-site public areas. Consequently, the project would meet the wind comfort criterion at off-site public areas.

Supplemental Information – Project Wind Effects at On-site Publically Accessible Areas of Substantial Pedestrian Use

The project would include a variety of privately-owned, publically accessible on-site plazas and exterior walkways that would be located throughout and at varying elevations on the project site. These proposed publically accessible areas on the project site would experience wind effects resulting from proposed on-site development and surrounding off-site development in the project vicinity. On-site publically accessible areas that may be subject to periods of high pedestrian use, particularly prior to and following games/events at the event center, include the following:

- *Third Street Plaza (10 feet el.) and Approaches (0 to 10 feet el.):* This area includes the elevated Third Street Plaza and adjacent on-site pedestrian approaches from Third Street. The primary entrance to the event center is accessed via this plaza.
- *Event Center North Side Pedestrian Path (10 to 26 feet el.):* This proposed walkway would serve as the primary pedestrian pathway around the north side of the event center, and would connect the Third Street Plaza with the bayfront overlook and Southeast Plaza. This proposed walkway would provide access to the secondary entrance to the event center for large events.
- *Event Center Southwest Side Pedestrian Path (0 to 10 feet el.):* This proposed walkway would provide pedestrian access around the southwest side of the event center, and provide access between 16th Street and the Third Street Plaza.
- *Southeast Plaza (0 feet el.)*: This proposed ground-level plaza would be located in the southeast corner of the project site. The primary entrance to the event center for smaller "theater" events, and the secondary entrance for large events, would be via this plaza.
- *Bayfront Overlook (26 feet el.):* This elevated area is located on the east side of the site adjacent to the event center and would overlook the Bay.

As discussed above, wind effects on on-site publically accessible areas are not considered a significance threshold. Nonetheless, project wind effects at on-site publically accessible areas that would be subject to substantial pedestrian use may be of interest to members of the public and to decision-makers, and are therefore presented herein for informational purposes. A discussion of potential wind effects at the on-site areas of substantial pedestrian use identified above is presented herein for informational purposes.

Other outdoor areas within the project site that may offer private and/or public pedestrian access, include the office and retail building podium roofs (90 foot el.), the food hall roof (41-foot el.), and the event center bayfront terrace (pedestrian deck at approximate 100-foot el.). However, since the event center and/or office and retail building operators would have greater access control over these site areas so as to be able to restrict pedestrian access in the event of hazardous windy conditions, potential project wind effects at these specific areas are not discussed further.

Pedestrian-level winds were measured at numerous locations on-site for each of four prevailing wind directions for existing and existing-plus-project conditions. Since the existing project site form would be completely altered by the proposed development, many wind test points used for analysis of existing conditions were not applicable for the existing-plus-project conditions, and a number of additional wind test study points were used solely for existing-plus-project conditions. Consequently, while a broad comparison of existing and proposed on-site wind conditions can be discussed, direct comparisons of individual on-site test points for these conditions are neither applicable nor useful for the discussion of on-site wind comfort and wind hazard effects.

Project Wind Hazard Effects at On-Site Publically Accessible Areas of Substantial Pedestrian Use. Under existing-plus-project conditions, three on-site study test points at the proposed event center on the north side pedestrian path would exceed the wind hazard criterion, for a total of 31 hours per year. No exceedances of the wind hazard criterion would occur at any of the other areas of substantial pedestrian use at the project site.

Project Wind Comfort Effects at On-Site Publically Accessible Areas of Substantial Pedestrian Use. Under existing-plus-project conditions, the average wind speed exceeded 10 percent of the time across the site would be 8.3 mph, lower than the average wind speed exceeded 10 percent of the time across the site under existing conditions (15.3 mph).

Under existing-plus-project conditions, 15 on-site study test points in the areas of substantial pedestrian use would exceed the 11-mph pedestrian comfort criterion, including 8 of 16 wind study test points on the Third Street Plaza and approaches, the 5 wind study test points on the event center north-side pedestrian path, and 2 of the 3 wind test study points on the event center southwest side pedestrian path. No exceedances of the 11-mph pedestrian comfort criterion would occur at any of the other areas of substantial pedestrian use at the project site. The project sponsor would consider a range of feasible design refinements to effectively reduce on-site wind effects. Design refinements that could be incorporated into the project might include the proposed addition of landscaping within the plazas; and the potential installation of vertical porous screens, overhead protection such as tilted foils and archways, and/or other screening features on the event center perimeter walkway and other publicly accessible areas.

Cumulative Impact— Wind

Wind Hazards at Off-site Public Areas

Impact C-WS-1: The project, in combination with cumulative development, would not alter wind in a manner that would substantially affect off-site public areas. (Less than Significant)

Under cumulative conditions, past, present, and reasonably foreseeable future buildings 100 feet and taller within the project vicinity would have the potential to result in localized wind effects that could be adverse. As part of the wind tunnel testing, one test was conducted to evaluate the pedestrian wind environment that would exist with the project, in combination with reasonably foreseeable cumulative development, on public use areas around the project site. In the immediate project vicinity, this included assumed cumulative development on currently undeveloped portions of Blocks 27, 25, X3 and 33, located north, west, southwest and south of the project site, respectively (see Section 5.1 for discussion of cumulative projects).

Cumulative development would alter wind speeds among individual off-site study test points. The off-site wind hazards that would occur under cumulative-plus-project conditions would be fewer than would occur under both existing conditions (reduced from 7 to 3) and existing-plus-project conditions (reduced from 6 to 3). Furthermore, the duration of the wind hazards that would occur under cumulative-plus-project conditions -54 hours – would be less than would occur under existing conditions (106 hours) and existing-plus-project conditions (139 hours). Consequently, cumulative wind hazard impacts would be *less than significant*.

Mitigation: Not required.

Comparison of Impact WS-1 to Mission Bay FSEIR Impact Analysis. Consistent with Mission Bay FSEIR Mitigation Measure D.7 (and the South Design for Development *Wind Analysis* standards), wind tunnel testing and analysis was conducted for both project and cumulative conditions. As discussed above, cumulative impacts of wind hazards at off-site public areas would be less than significant. Therefore, the project would not result in any new or substantially more severe significant cumulative wind hazard impacts than those previously identified in the Mission Bay FSEIR.

Supplemental Information – Cumulative Wind Comfort Effects at Off-site Public Areas

As discussed above, the wind comfort criterion is not used to judge significance of project wind impacts in this SEIR; however, a discussion of potential cumulative effects on wind comfort is presented herein for informational purposes. Under cumulative-plus-project conditions, the average wind speed exceeded 10 percent of the time on public walkways in the project site vicinity – 12.2 mph - would be less than that which would occur under both existing conditions (15.8 mph) and existing-plus-project conditions (14.4 mph). In addition, the average percentage of time the wind speed would exceed the wind comfort criterion on public walkways – 16 percent - would be less than that which would occur under both existing conditions (29 percent) and existing-plus-project conditions (23 percent). Furthermore, the estimated 22 off-site exceedances of the 11-mph pedestrian comfort criterion that would occur under cumulative-plus-project conditions would be less than that which would occur under both existing conditions (41) and existing-plus-project conditions (33). Given these factors, cumulative wind comfort effects would not be substantial.

Supplemental Information – Cumulative Wind Effects at On-site Publically Accessible Areas of Substantial Pedestrian Use

For reasons discussed above, wind effects on on-site publically accessible areas are not considered a significance threshold; however, a discussion of potential cumulative wind effects at on-site areas of substantial pedestrian use is presented herein for informational purposes.

Cumulative Wind Hazard Effects at On-Site Publically Accessible Areas of Substantial Pedestrian Use. Under cumulative-plus-project conditions, one on-site study test point on the event center north side pedestrian path would exceed the wind hazard criterion, for a total of 20 hours; however, this would be less than the total duration of the exceedance that would occur on this pedestrian path under existing-plus-project conditions (31 hours). No exceedances of the wind hazard criterion would occur at any of the other areas of substantial pedestrian use at the project site.

Cumulative Wind Comfort Effects at On-Site Publically Accessible Areas of Substantial Pedestrian Use. Under cumulative-plus-project conditions, the average wind speed exceeded 10 percent of the time across the site would be 7.9 mph, lower than that which would occur under both existing conditions (15.3 mph) and existing-plus-project conditions (8.3 mph).

Under cumulative-plus-project conditions, 14 on-site study test points in the areas of substantial pedestrian use would exceed the 11-mph pedestrian comfort criterion, including 8 of 16 wind study test points on the Third Street Plaza and approaches, the 5 wind study test points on the event center north-side perimeter walkway, and 1 of the 3 wind test study points on the event center southwest side pedestrian path. This would be less than the 15 exceedances experienced at the areas of substantial pedestrian use within the project site under existing-plus-project conditions. No exceedances of the 11-mph pedestrian comfort criterion would occur in any of the other areas of substantial pedestrian use of the project site. The design refinements discussed under existing-plus-project conditions, above, that the project sponsor would consider would also be applicable for reducing on-site wind effects on cumulative-plus-project conditions.

Shadow

Impact C-WS-2: The project, in combination with cumulative development, would create new shadow but not in a manner that would substantially affect the use of publicly accessible open space or outdoor recreational facilities or other public areas within the Mission Bay South plan area. (Less than Significant)

The proposed project would include development of an event center, office and retail buildings, and other structures that would have the potential to cast shadows off-site, including on nearby public open space within the Mission Bay South plan area. The project also includes on-site public plazas, walkways and other open space that would be shadowed by proposed on-site development and existing and/or future off-site cumulative development in the project vicinity.

As discussed under Regulatory Framework above, the South Design for Development indicates that the prior shadow studies have determined that development within the Mission Bay South plan area complying with the design standards will reasonably limit areas of shadow on public open spaces during the active months of the year and during the most active times of the day. However, consistent with Mission Bay FSEIR Mitigation Measure D.8, the South Design for Development requires that additional shadow analysis be conducted for projects that would need a variance from the South Design for Development's design standards that establish the shape and location of buildings. Accordingly, the proposed project is subject to a shadow analysis per the South Design for Development *Sunlight Access to Open Space* methodology.

As described above under Approach to Analysis, the shadow analysis evaluated the potential shadow impacts on the planned Bayfront Park. Given the project site's location relative to the planned Bayfront Park, the project could not cast any shadows on Bayfront Park between 10:00 a.m. and noon during any of the seven-month study interval, given that the sun rises in the east and all morning shadows would be cast towards the west. Furthermore, review of the shadow screening study images (Appendix WS) shows that shadow coverage (either project or cumulative) of Bayfront Park would be well under 20 percent at any time between noon and 4:00 p.m. during the seven-month study interval. Therefore, the area of public open space in Bayfront Park that would be in continuous shadow for a period of one hour from March to September between 10:00 a.m. and 4:00 p.m. would be less than 20 percent, and consequently, the project design satisfies the South Design for Development criterion for sunlight access to open space. Accordingly, the project's shadow impact and its contribution to cumulative shadow impacts, on publicly accessible open space or outdoor recreation facilities or other public areas within the Mission Bay plan area would be less significant.

Mitigation: Not required.

Comparison of Impact C-WS-2 to Mission Bay FSEIR Impact Analysis

As discussed under Summary of Impacts in the Mission Bay FSEIR, the Mission Bay FSEIR included a shadow analysis that indicated that the Mission Bay plan would shade open space areas within the Mission Bay plan area, including proposed open space area near the waterfront of the Bay along the eastern plan area boundary. The Mission Bay FSEIR determined that with implementation of Mitigation Measure D.8, which required analysis of potential shadows on existing and proposed open spaces during the building design and review process for any development that would exceed the design height and/or bulk criteria of the plan, Mission Bay plan shadow impacts on open space within the Mission Bay plan area would be less than significant.

Consistent with Mission Bay FSEIR Mitigation Measure D.8, a shadow analysis was conducted for the proposed project per the South Design for Development *Sunlight Access to Open Space* methodology. As discussed above, the project's shadow impact and its contribution to cumulative shadow impacts, on publicly accessible open space or outdoor recreation facilities or other public areas within the Mission Bay plan area would be less significant. Therefore, the project would result in no new or substantially more severe significant impacts than those previously identified in the Mission Bay FSEIR.

Impact C-WS-3: The project, in combination with cumulative development, would create new shadow but not in a manner that would substantially affect the use of publicly accessible open space or outdoor recreational facilities or other public areas outside the Mission Bay South plan area. (Less than Significant)

As discussed in the Setting, Agua Vista Park, an existing public open space is located on Port of San Francisco land adjacent to, and outside of, the Mission Bay plan area boundary. (Agua Vista Park is not under the jurisdiction of the City Recreation and Parks Department, and consequently, not subject to Planning Code 295.)

The shadow analysis conducted for the project in support of this SEIR reveals that the project would not cast a shadow on any of Agua Vista Park during the study timeframe analyzed (March through September, 10:00 a.m. to 4:00 p.m.). The shadow analysis also determined the proposed project, and other existing and/or cumulative Mission Bay South plan development in the vicinity of Agua Vista Park would create shadows that would extend onto Agua Vista Park in late afternoons (after 4:00 p.m.) at or near the summer solstice. However, the design standards established for the Mission Bay South plan area ensure that development within Mission Bay South limit areas of shadow on public open spaces – including the adjacent Agua Vista Park - during the most active times of the day during the most active months. Accordingly, any project shadow effects, including project contribution to cumulative effects on publicly accessible open space or outdoor recreational facilities or other public areas outside the Mission Bay South plan area, would be less than significant.

Mitigation: Not required.

Comparison of Impact C-WS-3 to Mission Bay FSEIR Impact Analysis

As discussed under Summary of Impacts in the Mission Bay FSEIR, the Mission Bay FSEIR determined that development that would occur under the Mission Bay plan would not shade any City Recreation and Parks Department open space area located outside the Mission Bay plan area at any time, and consequently, would have a less-than-significant effect on these facilities. The Mission Bay FSEIR also determined that Mission Bay plan shading effects on vegetation or wildlife near the Mission Bay plan area, including along the Bay shore, would be less than significant. As discussed above, any project shadow effects, including project contribution to cumulative effects on publicly accessible open space or outdoor recreational facilities or other public areas outside the Mission Bay South plan area, would be less than significant. Therefore, the project would result in no new or substantially more severe significant impacts than those previously identified in the Mission Bay FSEIR.

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5.7 Utilities and Service Systems

5.7.1 Introduction

This section addresses potential effects of the project on existing wastewater and stormwater systems. The existing wastewater and stormwater infrastructure at the time the Mission Bay FSEIR was published is described along with changes to the infrastructure constructed by the master developer in accordance with mitigation required by the Mission Bay FSEIR. The impact analysis considers whether project-generated wastewater and stormwater flows would result in the need to construct new or expanded facilities, the construction of which could cause significant environmental effects.

Utilities impacts related to water supply and solid waste are described in the Initial Study (see Appendix NOP-IS). The project's impacts related to exceeding the wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board and on combined sewer discharges, are addressed in Section 5.9, Hydrology and Water Quality.

5.7.2 Summary of Mission Bay FSEIR Utilities Analysis

5.7.2.1 Mission Bay FSEIR Setting

Wastewater/Stormwater Collection and Treatment

The Mission Bay FSEIR described the City's combined wastewater and stormwater collection and treatment systems in two different sections of the document, the Community Services and Utilities section and the Hydrology and Water Quality section. The Mission Bay Plan area is located in the City's Bayside drainage basin, in which combined stormwater and sanitary sewage (wastewater) are collected, then conveyed to and treated at the Southeast Water Pollution Control Plant (SEWPCP) near Islais Creek. At the time the Mission Bay FSEIR was published, the entire Mission Bay Redevelopment Plan area was located in four sub-basins, with the project site at Blocks 29-32 draining to two of the sub-basins (see Mission Bay FSEIR, Figure V.K.1). The north and east portions of the Blocks 29-32 site drained to the Bay sub-basin, and stormwater from the Bay sub-basin drained directly to the Bay, not the combined sewer system. The balance of Blocks 29-32 drained to the Mariposa sub-basin. Wastewater flows from both basins were collected in the combined sewer system and conveyed to the SEWPCP for treatment. Wastewater flows from the Mariposa sub-basin were transported from the Mariposa dry-weather pump station to the SEWPCP via a 10-inch force main. This drainage system has since been completely reconfigured, as described in Section 5.7.2.2, Mission Bay FSEIR Impacts and Mitigation Measures, below.

Stormwater in the Mariposa sub-basin was directed to the Mariposa wet weather pump station via the Mariposa storage/transport sewer under Mariposa Street, and ultimately to the SEWPCP. During wet weather, the wet-weather pump station system transported combined storm runoff and sewage south to gravity sewers at 21st Street and Illinois Street via a 20-inch force main under Third Street. At the time the Mission Bay FSEIR was published, the existing Third Street sewer was inadequate to handle wet-weather flows and the City planned to construct the Illinois Street Auxiliary Sewer to accommodate the flows and transport them from the Mariposa Pump Station to the SEWPCP. As planned, this auxiliary sewer would be a 60-inch gravity sewer extending beneath Illinois Street, between 24th Street and the Islais Creek Transport Storage Structure located at the intersection of Third Street and Caesar Chavez Street. The auxiliary sewer was constructed in 1999.

North of Blocks 29-32, wastewater and stormwater generated in the Plan area drained to the Central sub-basin, which directed flows to the Channel and North-of-Channel storage sewers and ultimately to the Channel Pump Station. From there, flows were pumped to the SEWPCP through a 66-inch-diameter force main. Excess wet weather flows from this sub-basin were discharged to China Basin Channel (Mission Creek) via six combined sewer discharge structures.

The Mission Bay FSEIR reported the existing wastewater generation from the Mission Bay Plan area (based on the 1990 FEIR) was approximately 0.072 million gallons per day (mgd), and the existing wastewater volume treated at the SEWPCP was an average of 67 mgd.

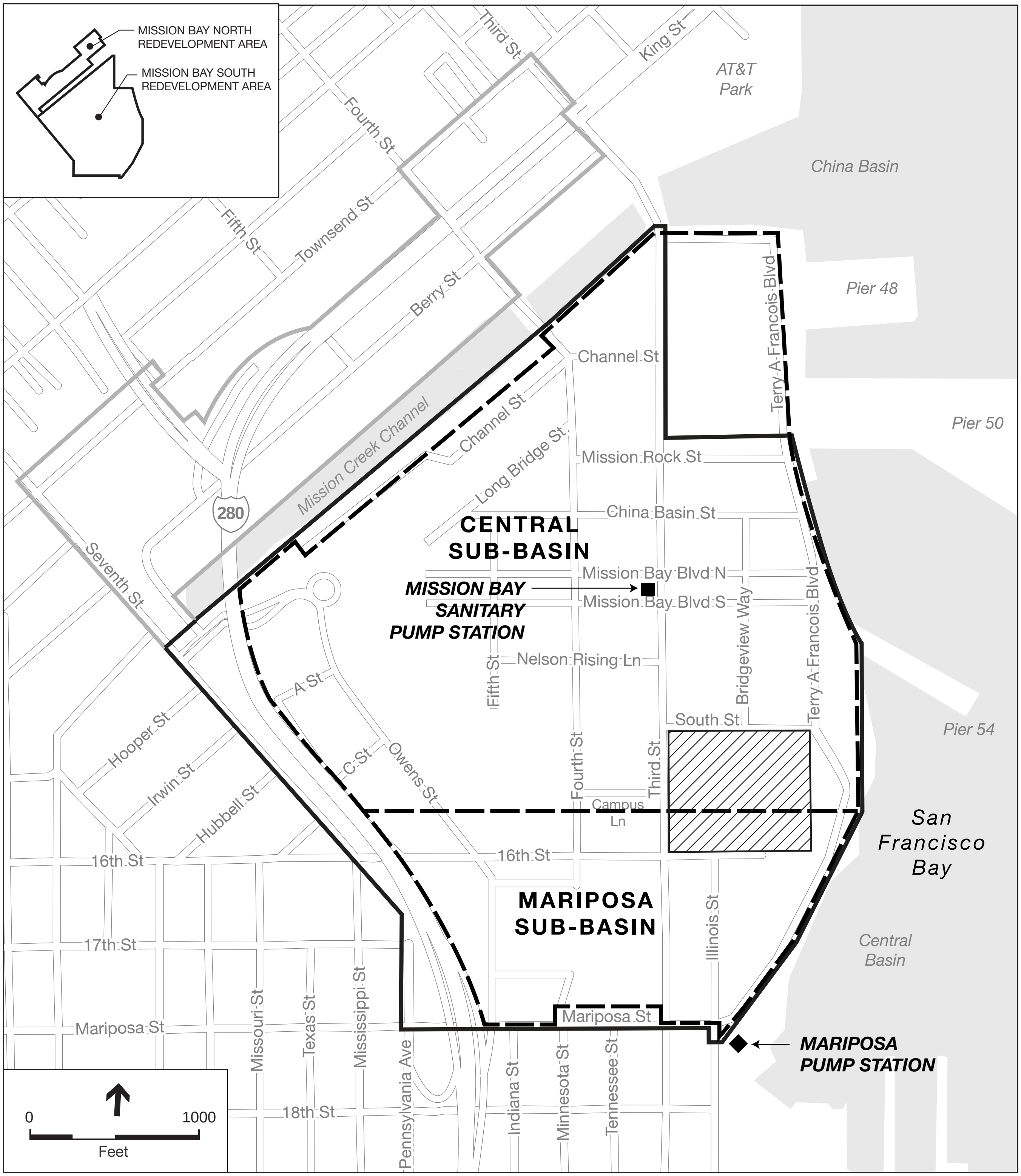
5.7.2.2 Mission Bay FSEIR Impacts and Mitigation Measures

The Mission Bay FSEIR described major sewer upgrades within the Mission Bay Plan area that were proposed as part of the Mission Bay Plan. The proposed improvements included changes to both the Central/Bay and Mariposa sub-basins of the City's combined sewer system. As indicated in the Mission Bay FSEIR, the Central and Bay sub-basins would be reconfigured into one basin as shown on **Figure 5.7-1**. The reconfigured Central sub-basin would direct wastewater and stormwater flows into distinct, separate sanitary-sewer-only and storm-drainage–only lines, respectively. This sub-basin would extend from about 300 feet north of 16th Street to China Basin Channel (Mission Creek), and would include the northern portions of Blocks 29-32. Wastewater flows from the reconfigured Central sub-basin would drain to the Channel Street storage sewer.

The Mariposa sub-basin of the combined sewer system would also be reconfigured as shown on Figure 5.7-1. The planned reconfigured Mariposa sub-basin would extend from about 300 feet north of 16th Street south to Mariposa Street.[1] The Mission Bay FSEIR determined that the projected increases in wastewater generation and stormwater flows could be accommodated by the planned infrastructure, and the Mission Bay Plan's effects on wastewater and stormwater collection and treatment facilities would be less than significant.[2]

1 The original approach presented in the Draft Mission Bay SEIR was based on using the Mariposa sub-basin of the combined sewer system to collect both wastewater and stormwater. However, the Final SEIR revised this approach to include construction of a separate stormwater system in this area.

2 The original approach presented in the Draft Mission Bay SEIR was based on the assumption that the stormwater pump stations would direct the initial 80 percent of stormwater flows to the combined sewer system for ultimate treatment at the SEWPCP. The remainder of the stormwater flows, approximately 20 percent of the annual stormwater flows, would be discharged to China Basin Channel (Mission Creek) or the Bay through one of the four new stormwater outfalls adjacent to the new pump stations. This approach was revised in the Final SEIR and resulted in implementation of Mitigation Scenario B described in the text that follows, which does not include diverting any stormwater to the combined sewer system.



Mission Bay South Redevelopment Plan Area Boundary

Combined Sewer Drainage Basins in Mission Bay South as Reconfigured Under Mission Bay Plan

Project Site

SOURCE: ESA, 2015

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E: Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 5.7-1
Combined Sewer Drainage Basins in Mission Bay South as Reconfigured Under Mission Bay Plan

However, the Mission Bay FSEIR determined that the Plan would result in a cumulatively considerable and significant contribution to combined sewer discharges during wet weather. Mitigation Measure K.3 of the Mission Bay FSEIR requires design and construction of sewer improvements to ensure that wastewater and stormwater flows from the Plan area to the City's combined sewer system do not contribute to combined sewer discharges. The master developer adopted Mitigation Scenario B described in the Summary of Comments and Responses of the Mission Bay FSEIR (in Volume III, beginning on p. XII.253). This scenario meets the requirements of Mitigation Measure K.3 by constructing a separate stormwater system throughout Mission Bay South, in both the reconfigured Mariposa and Central/Bay sub-basins. This system is included in the approved Mission Bay South Infrastructure Plan.[3]

The separate stormwater system for the Mission Bay South Plan area is currently being implemented by the master developer and includes four drainage zones within the geographic boundaries of the reconfigured Central sub-basin that have already been constructed and one drainage zone within the geographic boundaries of the reconfigured Mariposa sub-basin which is currently under construction. Stormwater in each of the drainage zones flows by gravity to one of five stormwater pump stations in the locations shown on **Figure 5.7-2**, including Pump Station SDPS-5 near the east end of 16th Street. When construction of the fifth drainage basin is completed (anticipated in 2015, prior to construction and operation of the proposed project), all stormwater runoff from Mission Bay South will be conveyed through the separate stormwater system and discharged to the Bay and China Basin Channel (Mission Creek).

The Mission Bay FSEIR identified Mitigation Measure M.5 requiring conveyance of all stormwater runoff from newly developed areas in the former Bay sub-basin to the combined sewer system as an interim measure to address potential sewer capacity and associated water quality impacts until the appropriate infrastructure would be completed. However, this mitigation measure is not applicable to the proposed project because stormwater from the project site would discharge to the separate stormwater system being constructed in accordance with the approved Mission Bay South Infrastructure Plan as described above.

Mission Bay FSEIR Estimates of Wastewater Flows

The Mission Bay FSEIR Community Services and Utilities impacts section estimated that the Mission Bay Plan would generate approximately 2.5 mgd of wastewater at build-out (average dry weather flow), or 3.7 percent of the volume of wastewater treated at the SEWPCP at the time of Mission Bay FSEIR publication. For Blocks 29-32, equal amounts of wastewater were expected to be routed to the Mariposa sub-basin via the City’s Mariposa Pump Station and to the reconfigured Central sub-basin via the City’s Mission Bay Sanitary Pump Station located at Park P15. The estimated peak wastewater flow to each sub-basin from the project site was 0.29 mgd, and the estimated average flow was 0.096 mgd.

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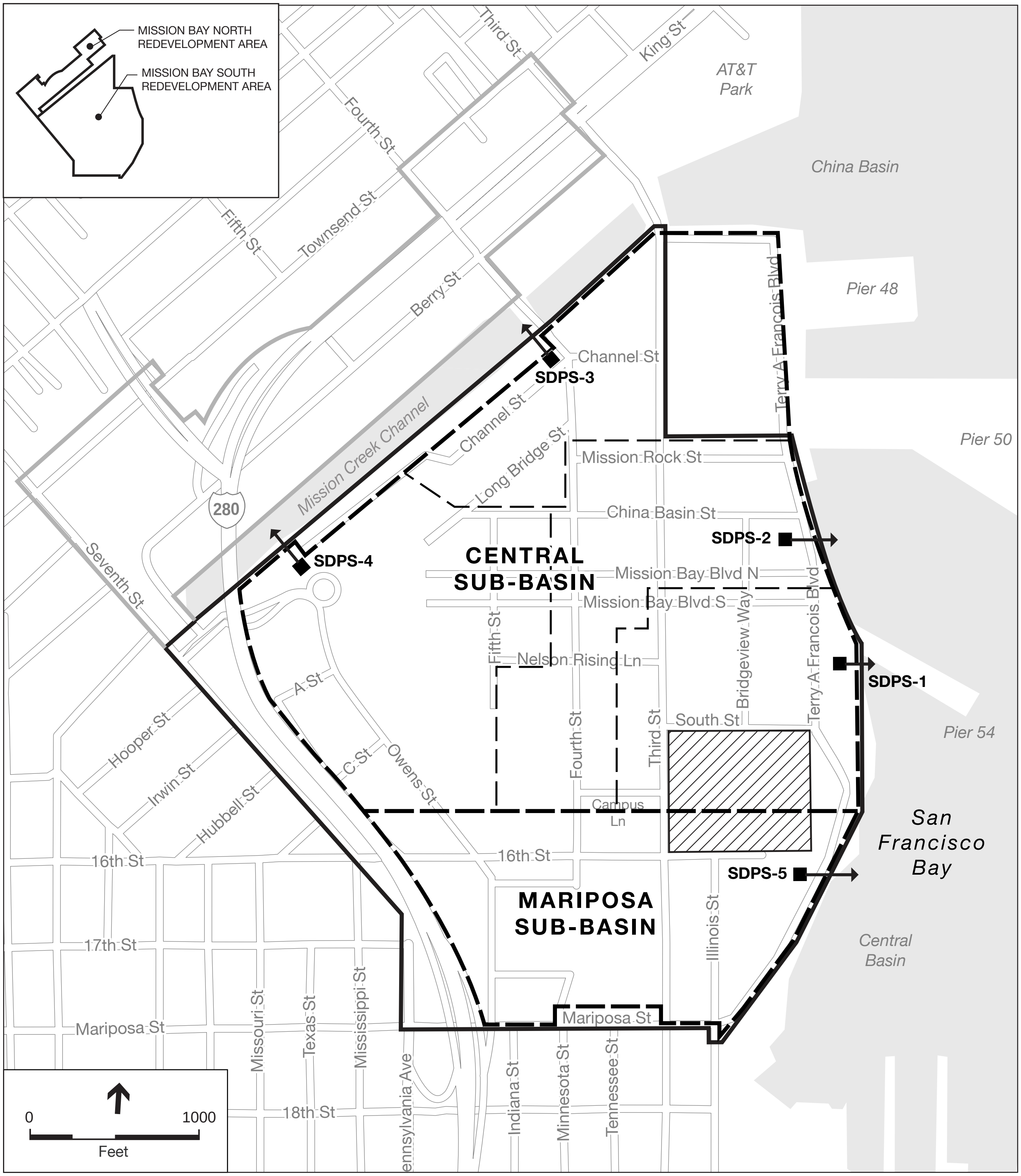
3 San Francisco Redevelopment Agency and Catellus Development Corporation, Mission Bay South Infrastructure Plan.



Mission Bay South Redevelopment Plan Area Boundary

Project Site

Approximate Stromwater Drainage Basin Boundaries in Mission Bay South

Stormwater System Pump Station

Stormwater Outfall

SOURCE: ESA, 2015

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E: Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 5.7-2
Separate Stormwater Drainage Basins in Mission Bay South Constructed as Part of Mission Bay Plan

The Mission Bay FSEIR concluded that the effects on wastewater collection and treatment facilities would be less than significant because the proposed sewer system improvements under the Mission Bay Plan, including reconfiguration of the Central/Bay and Mariposa sub-basins, would accommodate the projected increases in wastewater generation. Similarly, the Mission Bay FSEIR concluded that the effects related to construction of new storm drainage facilities would be less than significant because the proposed sewer system improvements under the Mission Bay Plan, including reconfiguration of the Central/Bay and Mariposa sub-basins, would accommodate the projected changes in stormwater flows.

5.7.3 Setting

5.7.3.1 Combined Sewer System

Currently, the SEWPCP treats both dry and wet-weather flows from the eastside of the City—specifically the Bayside drainage basin of the City's combined sewer system (shown on Figure 5.9-1 in Section 5.9, Hydrology and Water Quality) — similar to what was described in the Mission Bay FSEIR (see Section 5.9, Hydrology and Water Quality, for a more detailed description). The plant has a dry-weather capacity of 84.5 mgd. During dry weather, wastewater flows consist mainly of municipal and industrial sanitary sewage and wastewater, and the annual average wastewater flow during dry weather is 60 mgd[4] (a reduction of 7 mgd from the 67 mgd reported by the Mission Bay FSEIR in 1998). The wet-weather facilities in the Bayside drainage basin have a combined capacity of 400 mgd, plus the 125-million gallon volume of storage and transport boxes that retain the combined stormwater and wastewater flows during wet weather. Flows in excess of the wet-weather capacity of the Bayside treatment facilities receive flow-through treatment in the storage and transport boxes that is the equivalent of primary treatment. The treated flows are discharged to the Bay through 29 combined sewer discharge structures located along the shoreline.

As discussed above, the Mission Bay Plan included reconfiguration of the combined sewer system drainage sub-basins in the Mission Bay South portion of the Bayside drainage basin. As reconfigured, the northern portion of the project site is located in the Central sub-basin, and wastewater flows to this sub-basin are conveyed to the SEWPCP via the Mission Bay Sanitary Pump Station. The southern portion of the project site is located in the Mariposa sub-basin, and wastewater flows to this sub-basin are conveyed to the SEWPCP via the Mariposa Pump Station. However, since the project site is currently undeveloped, except for a parking lot, there are no wastewater flows contributing to either sub-basin.

4 San Francisco Water Power Sewer, *San Francisco's Wastewater Treatment Facilities*. June, 2014.

Mariposa Pump Station

The 240-acre reconfigured Mariposa sub-basin of the combined sewer system is divided into two tributary areas that direct flow to the Mariposa Pump Station. Tributary B includes Potrero Hill to the south of Mariposa Street and is outside of the Mission Bay Plan area; this tributary area directs both rainwater and wastewater to the pump station. Tributary A includes areas to the north of Mariposa Street that are located within the Plan area; in this area, stormwater flows are directed to the separate stormwater system constructed for the Mission Bay South development, and only wastewater flows are directed to the Mariposa Pump Station.

The Mariposa Pump Station consists of a dry-weather and wet-weather pump station. The dry-weather pump station was built in 1954 and has a capacity of 1.2 mgd. With the addition of peak wastewater flows from the planned and approved University of California, San Francisco (UCSF) developments in the Plan area, the SFPUC anticipates that peak flows would exceed the capacity of the dry-weather pump station. To address this need for additional capacity, the SFPUC is connecting the 10-inch dry weather force main to the 20-inch wet weather force main and upsizing the influent sewer, which will increase the capacity of the dry-weather pump station to 3.5 mgd in dry weather conditions on an interim basis until long term improvements can be constructed to permanently increase the capacity of the pump station.[5] Completion of this connection is expected by fall of 2015.

The 10 mgd wet-weather pump station and associated 0.7 million gallon transport/storage structure were built in 1993, and new chopper pumps were installed in 2014 to manage debris that accumulates at the pump station. In the event that wet weather flows in the Mariposa sub-basin exceed the combined capacity of the Mariposa pump station and transport/storage structure (11.2 mgd), the excess flows are discharged to the Bay as a combined sewer discharge after receiving flow-through treatment in the transport and storage structure. This system is designed to achieve an annual average of 10 combined sewer discharges per year, but has historically exceeded this average.[6]

Mission Bay Sanitary Pump Station

The Mission Bay Sanitary Pump Station was constructed by the master developer in 2011 and accepted by the City in 2012. This pump station receives only wastewater (dry-weather) flows from within the Mission Bay South area and is equipped with four submersible pumps. It is designed for average wastewater flows of 2.0 mgd and peak wastewater flows of 6.0 mgd; this design capacity allows for an average wastewater contribution of 0.1 mgd and peak contribution of 0.29 mgd from Blocks 29 and 30 at the project site.[7] Testing in 2010 indicated that the pump

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5 San Francisco Department of Public Works, Memo to Manfred Wong and Bessie Tam of the San Francisco Public Utilities Commission, *Mariposa Pump Station (MPS) Dry Weather Flow Hydraulic Analysis*. February 3, 2015.

6 San Francisco Public Utilities Commission, *Task 600, Technical Memorandum No. 603, Collection System Configurations Analysis and Impact on Combined Sewer Discharge, Final Draft*. December, 2010.

7 San Francisco Department of Public Works, 2015. Hydraulic Assessment of Mission Bay Sanitary Pump Station. February 25.

station has the capability of pumping 6.7 mgd, but new testing would be needed to confirm this conclusion because the capacity of all pumps operating simultaneously was not measured during the 2010 test. Monitoring by the SFPUC in 2015 indicates that existing average wastewater flows to the pump station are 2.2 mgd and peak flows are 3.3 mgd.

5.7.3.2 Sewer System Improvement Program

The SFPUC is currently implementing the Sewer System Improvement Program (SSIP), a 20-year, multi-billion dollar citywide program to upgrade the City's aging sewer infrastructure and ensure a reliable and seismically safe sewer system. Bayside projects currently planned under this program include the Central Bayside System Improvement Project, which will include improvements to provide redundancy to the Channel force main (which transports flows from the Channel Pump Station to the SEWPCP); operational and seismic improvements to the SEWPCP; operational improvements to the North Point Wet Weather Facility; and green infrastructure projects to manage stormwater before it enters the combined sewer system.

5.7.3.3 San Francisco Municipal Separate Storm Sewer Systems (MS4s)

Municipal separate storm sewer systems (MS4s) within San Francisco are stormwater systems that carry stormwater in a separate set of pipes from the SFPUC's combined sewer system. These MS4 systems do not discharge to the combined sewer system and are operated in compliance with State Water Resources Control Board Water Quality Order No. 2013-001-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit for Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems. The separate stormwater system constructed by the master developer in Mission Bay South is subject to this permit.

As described above, the separate stormwater system for the Mission Bay South area includes four drainage zones within the geographic boundaries of the reconfigured Central sub-basin and one drainage zone within the geographic boundaries of the reconfigured Mariposa sub-basin.[8] Stormwater in each of the drainage zones flows by gravity to one of five stormwater pump stations, as shown on Figure 5.7-2. Construction of this separate stormwater system is scheduled to be completed in 2015.

5.7.4 Regulatory Framework

Please see Section 5.9, Hydrology and Water Quality, Regulatory Framework, for descriptions of federal, state, and local regulations regarding wastewater and stormwater.

8 San Francisco Redevelopment Agency and Catellus Development Corporation, Mission Bay South Infrastructure Plan.

5.7.5 Impacts and Mitigation Measures

5.7.5.1 Significance Thresholds

For the impacts analyzed in this section, the project would have a significant impact related to utilities and service systems if it were to:

- Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or
- Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

The complete list of CEQA significance criteria used in the utilities and service systems analysis is included in the Initial Study (see Appendix NOP-IS, pp. 64 through 72), which explains why the proposed project would have a sufficient water supply available to serve the project and would not require new or expanded water supply resources or entitlements (Impact UT-1). Similarly, the Initial Study explains why the project would not require or result in the construction of new water treatment facilities or expansion of existing facilities (Impact UT-2); would be served by landfills with sufficient capacity to accommodate the project's solid waste needs (Impact UT-3); and would comply with federal, state, and local statutes related to solid waste (Impact UT-4). Therefore, no further analysis of these subjects is presented in this section.

The criterion related to the potential to exceed the wastewater treatment requirements of the San Francisco Bay Region Regional Water Quality Control Board is addressed in Section 5.9, Hydrology and Water Quality, under Impact HY-1, in combination with the water quality criterion regarding the potential to violate any water quality standards or waste discharge requirements. The remaining significance criteria are addressed below.

5.7.5.2 Approach to Analysis

Construction Impact Methodology

The impact analysis in this section focuses on Utilities impacts related to operation of the project because the project construction's temporary increase in demand on wastewater and storm drainage services over the 26-month construction duration would not be substantial and would not warrant construction or expansion of existing wastewater or storm drainage facilities. However, as discussed in Section 5.9, Hydrology and Water Quality, Impact HY-1a, construction dewatering discharges would result in short-term increases in demand on the existing wastewater or storm drainage facilities but, proposed dewatering discharge methods would include options for direct discharge to the Bay under an existing general NPDES permit to ensure that any discharges to the combined sewer system would be within the capacity of existing facilities and would not require the construction or expansion of existing facilities. Therefore, construction-related impacts to wastewater and storm drainage facilities are not further addressed in the analysis below.

Operations Impact Methodology

In order to address the known capacity issues related to wastewater facilities, the project's direct impact on the capacity of existing facilities addresses whether the project's wastewater flows would be within the capacity of the existing facilities under existing conditions, while the cumulative impact analysis accounts for the long-term effects of wastewater flows of the project in combination with the flows from past, present, and foreseeable future projects served by the same infrastructure.

With respect to stormwater facilities, however, the stormwater system improvements already constructed and currently under construction address both the near-term and long-term needs. Therefore, the impact analysis accounts for the cumulative effects of stormwater flows of the project in combination with the flows from past, present, and foreseeable future projects within the drainage basin, and the project's direct impacts are analyzed in the context of cumulative impacts. A separate project impact analysis is not provided.

Methodology for Analysis of Direct Impacts

Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities: This analysis compares the estimated peak wastewater flows from the proposed project to the remaining capacity of the Mariposa Pump Station and Mission Bay South Pump Station sewer drainage areas as well as downstream facilities. If the increase in wastewater flows is within the remaining capacity, the impact would be less than significant.

Methodology for Analysis of Cumulative Impacts

Cumulative impacts related to utilities systems result from past, present, and future projects that would utilize the same infrastructure. Accordingly, the geographic scope of cumulative wastewater impacts includes areas that drain to the reconfigured Mariposa and Central sub-basins of the combined sewer system. The geographic scope of cumulative stormwater impacts includes areas that drain to the same stormwater drainage basin.

The cumulative analysis utilizes a list-based approach to analyze the effects of the project in combination with past, present, and probable future projects in this geographic area, including wastewater and storm water flows resulting from full build-out of the Mission Bay South area and development of the Mission Bay Campus under the UCSF Long Range Development Plan (LRDP, described in Section 5.1.5.2, Cumulative Projects for Operational Impacts). The analysis evaluates future flows from these projects, then considers whether or not there would be a significant, adverse cumulative impact associated with project implementation in combination with past, present, and probable future projects in the geographical area, and if so, whether or not the project's contribution to the cumulative impact would be significant (i.e., cumulatively considerable).

Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities: This analysis compares the estimated peak wastewater flows from the proposed project in combination with existing wastewater flows and wastewater flows from the Mission Bay South Plan area at full build out to the existing capacity of the Mariposa Pump Station and Mission Bay South Pump Station sewer drainage areas as well as downstream facilities. The analysis uses this information to determine whether new or upgraded wastewater treatment facilities, such as pump stations and sewer lines used to convey the wastewater, would be required. If the total wastewater flow is within the existing capacity, then the project's contribution to cumulative wastewater facilities impacts would be less than significant.

Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities: The impact analysis assesses the stormwater flows from the proposed project site and considers whether these flows in combination with other Mission Bay South area flows would exceed the capacity of the separate stormwater system constructed in Mission Bay South by the master developer. If the anticipated combined stormwater flows at build out of Mission Bay South would be within the capacity of the stormwater system, then the project's contribution to cumulative stormwater facilities impacts would be less than significant.

Result in a determination by the wastewater treatment provider that it has inadequate capacity for the project flows in addition to existing commitments. This analysis compares the estimated peak wastewater flows from the proposed project in combination with existing and planned future flows to the capacity of the Mariposa Pump Station and Mission Bay Sanitary Pump Station sewer drainage areas as well as downstream facilities. If the SFPUC determines that no new wastewater treatment facilities would be required, then the project's contribution to this cumulative impact would be less than significant.

5.7.5.3 Impact Evaluation

Project Impacts

Impacts UT-1 to UT-4: See Initial Study (Appendix NOP-IS)

Impact UT-5: The proposed project in itself would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Less than Significant)

As discussed above in Section 5.7.2.2, Mission Bay FSEIR Impacts and Mitigation Measures, the Mission Bay Plan includes reconfiguration of the Central and Mariposa sub-basins of the City's combined sewer system to collect wastewater and stormwater in separate systems. The northern portion of the project site is now included in the reconfigured Central sub-basin, and the southern portion of the project site is now included in the reconfigured Mariposa sub-basin, although project-related wastewater flows could be directed to either sub-basin.

The sewer analysis for the proposed project conducted by BKF Engineers estimates that the daily average wastewater flow during an event at full capacity (e.g., a sold-out NBA basketball game) would be 0.164 mgd, and the daily peak wastewater flows would be 1.074 mgd.[9,10] The preliminary project design indicates that 0.844 mgd of the peak wastewater flows from the project site would be discharged to the sewer drainage area of the Mariposa Pump Station (within the reconfigured Mariposa sub-basin), and 0.230 mgd of the peak flows could be directed to the Mission Bay Sanitary Pump Station located at Park P15 (within the reconfigured Central sub-basin).[11]

Mariposa Pump Station

The SFPUC has indicated that with the recent addition of peak wastewater flows from UCSF planned developments, the total existing peak dry-weather flows to the Mariposa sub-basin would be up to 2.54 mgd[12] which would exceed the 1.2 mgd capacity of the Mariposa Pump Station. To address this, the SFPUC is constructing interim improvements to temporarily increase the dry-weather capacity of the pump station to 3.5 mgd by cross connecting the dry- and wet-weather force mains and upsizing the influent sewer, as discussed in Section 5.7.5.3, Combined Sewer System. With the proposed additional discharge of 0.844 mgd of peak wastewater flows from the project site to this pump station, the total peak wastewater flows would be increased to 3.38 mgd. This is within the 3.5 mgd capacity of the interim improvements.

Mission Bay Sanitary Pump Station

As discussed in Section 5.7.5.3, Combined Sewer System, the Mission Bay Sanitary Pump Station has the capability of pumping up to 6.7 mgd of wastewater and existing peak flows to the pump station are 3.3 mgd. The project's addition of 0.230 mgd would increase peak flows to 3.53 mgd, which would be within the 6.7 mgd capacity of the pump station.

Because the addition of project-related peak wastewater flows would be within the remaining capacity of the interim improvements already planned and currently under construction by the SFPUC for the Mariposa Pump Station and would be within the remaining capacity of the Mission Bay Sanitary Pump Station, the proposed project would not require the construction of new wastewater treatment facilities or expansion of existing facilities, and this project-level impact would be *less than significant*.

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9 BKF Engineers, 2015. *Water and Sewer Analyses for Golden State Warriors Arena @ Mission Bay Blocks 29-32*. January 9.

10 As described in the Utilities and Service Systems section of the Initial Study (see Appendix NOP-IS), the *annual average* water demand for the project would be 0.100 mgd. For wastewater planning purposes, wastewater flows are directly related to water usage; however, for sizing of wastewater infrastructure, daily peak flows are used rather than annual average flows. While the daily average wastewater flow during an event at full capacity would be 0.164 mgd, events would not be held every day, and the annual average wastewater flows would be similar to the estimated 0.100 mgd water demand.

11 Moala, Tommy T., Assistant General Manager, Wastewater Enterprise, San Francisco Public Utilities Commission, 2015. Letter to Clarke Miller, Strada Investment Group. May 15.

12 Hydroconsult Engineers, Inc. 2015. Combined Sewer Impact Analysis, Golden State Warriors Arena EIR. February 18.

Comparison of Impact UT-5 to Mission Bay FSEIR Impact Analysis

As discussed in Section 5.7.2.2, Mission Bay FSEIR Impacts and Mitigation Measures, the FSEIR estimated that peak wastewater flows from the project site to the Mariposa Pump Station and the Mission Bay Sanitary Pump Station would be 0.29 mgd. The project's addition of 0.844 mgd of peak flows to the Mariposa Pump Station would exceed this amount, but the impact would remain less than significant because the additional flows would be within the capacity of interim improvements already planned by the SFPUC. The project's addition of 0.230 mgd of peak flows to the Mission Bay Sanitary Pump Station would be less than the originally estimated 0.29 mgd and would be within the remaining capacity of the pump station. Therefore, the project would not result in new or substantially more severe impacts related to wastewater facilities than was previously identified in the Mission Bay FSEIR.

Cumulative Impacts

Impact C-UT-1: See Initial Study (Appendix NOP-IS)

Impact C-UT-2: The proposed project, in combination with past, present, and foreseeable future development in the Mission Bay South area, would require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Significant and Unavoidable)

Mariposa Pump Station

As discussed above in Impact UT-5, total wastewater flows to the Mariposa Pump Station would be 3.38 mgd with the addition of flows from the proposed project. The SFPUC estimates that an additional 1.20 mgd of peak flows would result from UCSF planned developments that have not been constructed (including the Phase 2 Medical Center and developments on Blocks 25b and 33/34) as well as the mixed use development on Block 40.[13] This would increase peak flows to the pump station to 4.58 mgd and would exceed the 3.5 mgd capacity of the interim improvements planned by the SFPUC. Therefore, permanent improvements to the pump station and a long term increase in capacity would be needed to accommodate the proposed project in combination with other proposed and planned development in the Mission Bay South Plan area. In addition, as discussed in Section 5.9, Hydrology and Water Quality, the increased wastewater flows from the proposed project in combination with other foreseeable future projects could increase the volume of combined sewer discharges (CSDs) from the Mariposa Pump Station which could necessitate improvements to the Mariposa wet weather pump station.

[13] Hydroconsult Engineers, Inc. 2015. Combined Sewer Impact Analysis, Golden State Warriors Arena EIR. February 18.

As the owner and operator of the combined sewer system, the SFPUC is responsible for construction of the needed improvements to the wastewater facilities in the Mariposa sub-basin. Engineering planning and design for these improvements or replacement have not been completed, and are preliminarily scheduled to commence by mid-2015. However, the SFPUC anticipates that improvements might include actions such as complete pump station replacement, enlarging or realigning the existing sewer main on Mariposa Street between 3rd Street and the Mariposa Pump Station; upgrading and adding dry weather pumps with potential temporary wet weather pump modifications; upgrading or replacing the dry-weather sump in the pump station; constructing new connections to the transport and storage box structure and rehabilitating the structure; and improving the hydraulic capacity of the downstream gravity sewers, if needed.[14] If a new dry weather pump station is required, it could potentially be constructed within approximately a quarter mile radius of the existing Mariposa Pump Station.

Construction of the permanent improvements to the wastewater facilities in the Mariposa sub-basin to accommodate increased peak flows from the proposed project in combination with other foreseeable projects in the Mission Bay South Plan area could potentially result in significant environmental effects. Therefore, this would be a *significant* cumulative impact and the project's contribution would be cumulatively considerable.

While the SFPUC has conducted flow monitoring to establish wastewater flows at the pump station and provided a conceptual description of the permanent improvements that could be required, the SFPUC has not completed the planning and design of specific improvements or replacement to these pump stations. However, regardless of the design of the specific improvements, it can be assumed that the pump station, force main, and conveyance system improvements would generally be built at or near the same location as the existing facilities (i.e., within the same sewage drainage sub-basin). Standard construction techniques would likely be used and confined within a limited area, with construction lasting for several months to a year. Construction could include activities such as construction staging, clearing and grubbing, limited excavation and grading, foundation work, and construction/installation of the new facilities. Depending on site-specific conditions, groundwater dewatering and material off-haul could be required as part of the construction activities. These construction activities would be expected to result in temporary increases in truck and construction employee traffic, noise, and air pollutant and greenhouse gas emissions. In addition, depending on the site-specific design and location, the pump station improvements could result in physical effects on cultural resources, biological resources, water quality, and hazardous materials. Most, if not all, of these potential impacts can generally be mitigated to a less-than-significant level with typical mitigation measures, similar to those identified in the Initial Study and the SEIR for this project. Long-term operational impacts would likely be less than significant because operation of the pump stations would be similar to existing operations of these facilities.

[14] San Francisco Public Utilities Commission, 2014. Email to Chris Kern, San Francisco Planning Department and Elaine Warren, City Attorney's Office, Mariposa Pump Station Description for GSW Admin DEIR. December 24.

Prior to SFPUC's implementation of the required long term wastewater facilities improvements (e.g., permanent pump station, force main, and conveyance system improvements), project-level CEQA review would be required to identify potential impacts associated with construction and operation of these improvements and project-specific mitigation measures for any significant impacts. This analysis cannot be performed until the SFPUC identifies the specific improvements that will be constructed. CEQA environmental review of the future improvements/replacement of the Mariposa and/or Mission Bay Sanitary Pump Station, associated force mains, and conveyance system would ensure that measures to avoid or minimize impacts on the environment would be considered in the approval process for these improvements.

The SFPUC has not identified a timetable for completing these long term improvements.

Thus, in the absence of specific plans and design for pump station improvements and the completion of CEQA environmental review for those improvements, it is not possible to determine at this time whether impacts resulting from construction and/or operation of the required long term wastewater facilities improvements could be mitigated to a less than significant level. Furthermore, implementation of any improvements to the City's facilities is outside of the project sponsor's control. Lastly, there is uncertainty in timing as to when the SFPUC will be able to complete the necessary capacity improvements. Therefore, because the cumulative increase in wastewater flows would require the construction of new wastewater facilities or expansion of existing facilities, the construction of which could cause significant environmental effects, this impact would be *significant and unavoidable* and the project’s contribution would be cumulatively considerable.

While the system can currently accommodate project-related wastewater flows as discussed in Impact UT-5, the capacity of the Mariposa Sanitary Pump Station could be exceeded as future projects are implemented, including UCSF’s Phase 2 Medical Center. It is assumed that the SFPUC will implement the permanent pump station and associated force main and conveyance piping improvements at the Mariposa Pump Station as soon as feasible, but the schedule for these improvements is currently unknown and completion could occur after the proposed project is constructed and operational.[15] In the event that additional future wastewater flows would exceed the pump station capacities before the needed wastewater system improvements could be completed, it is assumed that the SFPUC would make internal operational or piping changes to accommodate the additional flows in the interim in order to remain in compliance with RWQCB permit requirements. The interim system modifications would be subject to the approval of the RWQCB under the terms of the Bayside NPDES permit. Approval by the RWQCB would ensure that water quality of the Bay would be protected during the interim period. Any interim system modifications are assumed to be operational or internal to the existing pump stations and therefore would not result in any physical environmental effects.

[15] Note that the SFPUC is considering a design/build project delivery model which will expedite implementation of the pump station and force main improvements.

Mission Bay Sanitary Pump Station

As discussed above in Impact UT-5, total wastewater flows to the Mission Bay Pump Station would be 3.53 mgd with the addition of flows from the proposed project. UCSF has indicated to the SFPUC that under full build out of its recently approved LRDP, UCSF flows to this pump station would be 6.63 mgd, close to the most recently measured capacity of 6.7 mgd. To address this, the LRDP recommends replacing the existing pumps to increase the capacity to 7.34 mgd, although this recommendation has not been approved by the SFPUC. The SFPUC has indicated that potential upgrades and modifications might include actions such as replacing existing pumps with larger pumps; installing additional pumps; enlarging the pump station wet well and installing associated controls; and modifying or realigning the force main.[16] Operation of the larger pump station could result in greater maintenance needs, requiring additional visits by operations staff as well as additional trips by dump trucks to collect and dispose of accumulated debris.[17]

Construction of the permanent improvements to the Mission Bay Sanitary Pump Station and associated wastewater facilities to accommodate the projected cumulative increased peak flows from the proposed project could potentially result in significant environmental effects, similar to the improvements to the wastewater facilities in the Mariposa sub-basin. Therefore, this would be a significant cumulative impact. However, the projects contribution would not be cumulatively considerable (*less than significant*) because the Mission Bay Sanitary Pump Station was designed to accommodate 0.29 mgd of wastewater flows from the project site, and the project would discharge only 0.23 mgd to the pump station which is less than the design flow rate.

Summary of Impact C-UT-2, Wastewater Treatment Capacity

As discussed above, the SFPUC has determined that under the proposed project in combination with full build out of Mission Bay South, wastewater flows could exceed the capacity of the Mariposa Pump Station and associated force mains and conveyance piping. Therefore, improvements to the Mariposa Pump Station and associated facilities would be required to accommodate the cumulative wastewater flows. While temporary or interim measures to accommodate the flows would not result in significant environmental effects because they would be operational or internal to the pump stations, construction of the permanent improvements could potentially result in significant environmental effects. Because specific plans and design for permanent pump station improvements have not been finalized and CEQA environmental review has not been completed, it is not possible at this time to conclude whether impacts resulting from these improvements could be mitigated to a less than significant level. Furthermore, implementation of any improvements to the City's pump stations and force mains is outside of the project sponsor's control and there is uncertainty in timing as to when the SFPUC will be able to complete the necessary capacity improvements. Therefore, this

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[16] Eickman, Kent, Technical Services Manager, San Francisco Public Utilities, 2015, Memorandum to Chris Kern, Senior Planner, San Francisco Planning Department, regarding Mission Bay Sanitary Pump Station. May 15, 2015.

[17] San Francisco Water Power Sewer, Memo from Irina Torrey, Bureau Manager, to Chris Kern, Environmental Planning Division, San Francisco Planning Department. Review of Screencheck Administrative Draft Supplemental Environmental Impact Report Sections 3.0 - Project Description, 5.7 - Utilities, and 5.9 - Hydrology and Water Quality for the Event Center and Mixed-Use Development at Mission Bay (Golden State Warriors Arena); Planning Department Case Number E 2014.1441E. May 15, 2015.

would be a *significant and unavoidable* impact related to requiring construction of new wastewater facilities or the expansion of existing wastewater facilities in the Mariposa sub-basin, with no feasible mitigation available to the project sponsor.

Cumulative wastewater flows would also exceed the capacity of the Mission Bay Sanitary Pump Station, resulting in a significant impact related to construction and/or expansion of related wastewater facilities. However, the project's the projects contribution would not be cumulatively considerable (*less than significant*) because the Mission Bay Sanitary Pump Station was designed to accommodate 0.29 mgd of wastewater flows from the project site, and the project would discharge only 0.23 mgd to the pump station which is less than the design flow rate, and the estimated wastewater flows from the previously entitled office space.[18]

Mitigation: None currently available.

Comparison of Impact C-UT-2 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR concluded that, as designed, the wastewater collection systems would have sufficient capacity for the estimated wastewater flows at full build out of Mission Bay South and the effects related to expansion of existing wastewater treatment facilities or construction of new facilities would be less than significant. As described above, the proposed project would generate an average daily wastewater flow of 0.164 mgd during an event at full capacity, which is less than what was identified in the Mission Bay FSEIR, but the peak flow is estimated to be 1.074 mgd, nearly twice what was estimated in the Mission Bay FSEIR.

The Mission Bay FSEIR Community Services and Utilities section (p. V.M.51) stated that if a specific development phase triggers the need for increased sewer capacity, upgraded sewer lines, or expanded sewer service, the proposed improvements would require the approval of the San Francisco Clean Water Program (now part of the SFPUC) staff. The proposed improvements would be based on the "adjacency" concept, meaning that the improvements would need to provide adequate conveyance and storage capacity for the phase under development and for expected future development to be served by the improved sewer facilities. Large scale improvements needed for cumulative effects of development phases would be reviewed by the Clean Water Program (i.e., SFPUC) staff and could include improvements such as installation of new sewer lines or a pump station. While the Mission Bay FSEIR acknowledged the potential for needed upgrades to the wastewater system, specific upgrades were not identified. Therefore, the project would result in a *substantially more* severe significant cumulative impact than was identified in the Mission Bay FSEIR.

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18 Moala, Tommy T., Assistant General Manager, Wastewater Enterprise, San Francisco Public Utilities Commission, 2015. Letter to Clarke Miller, Strada Investment Group. May 15.

Impact C-UT-3: The proposed project, in combination with past, present, and foreseeable future development in the Mission Bay South area, would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Less than Significant)

Currently, the project site contains a paved parking lot on the north and west portions of the site, and the remainder of the site consists of an undeveloped lot largely covered in gravel, with sparse ruderal vegetation and a depressed area that collects surface drainage. Implementation of the project would eliminate the undeveloped portions of the site and would increase the overall impervious surfaces at Blocks 29-32, thereby increasing the volume of stormwater runoff.

The project site would be served by the Mission Bay South storm drain infrastructure, as constructed and operated by the master developer,[19] which will include two separated stormwater systems within the perimeter streets. As described in the stormwater hydraulic analysis prepared for the project,[20] stormwater flows from the northern portion of the project site would be routed by gravity to Storm Drain Pump Station No. 1 (SDPS-1), which has been designed to handle stormwater flows generated from the planned build-out of the tributary drainage area. This pump station has five high-flow or wet weather pumps, with a combined design capacity of 27,810 gallons per minute.

Stormwater flows from the southern portion of the project site would be conveyed to Storm Drain Pump Station No. 5 (SDPS-5) located to the south of proposed project site, across from 16th Street within Park P23. This pump station will be equipped with five submersible wet weather only pumps, one submersible treatment pump, and two submersible dry weather pumps with a combined capacity of 32,500 gallons per minute. This system, including SDPS-5, is currently under construction and anticipated to be completed in 2015, prior to construction and operation of the proposed project.

The project stormwater analysis completed for the project sponsor concluded that the capacity of the separated stormwater system as built is adequate to serve the project as well as other development projects that would be constructed at full build out of Mission Bay South. Therefore, the project, either individually or cumulatively, would not require the construction of new stormwater drainage facilities nor expansion of the existing facilities, and this impact would be *less than significant*.

Mitigation: Not required.

[19] The initial stormwater infrastructure, including the pump station, is anticipated to be completed in fall 2015, although final completion, particularly the bioswales, is not expected to be completed until 2016.
[20] BKF, Mission Bay Blocks 29-32 – Stormwater Memorandum, January 6, 2015

Comparison of Impact C-UT-3 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR determined that with the sewer system improvements proposed as part of the plan, including reconfiguration of the Central and Mariposa sub-basins and construction of a separate stormwater system, the Mission Bay Plan would accommodate the projected changes to stormwater flows. The Mission Bay FSEIR concluded that the effects of implementation of the Mission Bay Plan on stormwater collection and treatment facilities would be less than significant.

Because project-related stormwater flows would be within the capacity of the Mission Bay South infrastructure and the project would be consistent with the projected build out condition, the project would not result in any new or substantially more severe significant impacts than those identified in the Mission Bay FSEIR.

Mitigation Measure M.5 in the Mission Bay FSEIR Community Services and Utilities section requires conveying all stormwater runoff from newly developed areas in the former Bay basin to the combined sewer system prior to completion of the initial-flow diversion system. However, this mitigation measure is not applicable to the proposed project because the Bay basin has been incorporated into the reconfigured Central sub-basin, and the project would discharge to the Mission Bay separate stormwater system that has already been constructed within the geographic boundaries of the Central sub-basin and is currently being constructed within the geographic boundaries of the Mariposa sub-basin. Construction of the separate stormwater system will be completed before construction of the proposed project is scheduled to begin.

Impact C-UT-4: The project, in combination with past, present, and foreseeable future development in the Mission Bay South area, would result in a determination by the SFPUC that it has inadequate capacity to serve the project's projected wastewater demand in addition to its existing commitments. (Significant and Unavoidable with Mitigation)

As discussed in Impact C-UT-2, Improvements to the Mariposa Pump Station as well as associated force mains and gravity sewers connecting to the SEWPCP would be required to accommodate cumulative wastewater flows.[21] As stated above, the capacity shortfall for this pump station is due to the proposed project in combination with the cumulative effects of increased wastewater flows from other projects in the sewer drainage area that have been identified subsequent to the publication of the Mission Bay FSEIR. In particular, existing and planned UCSF developments (including the existing Phase 1 Medical Center and the planned Phase 2 Medical Center and developments on Blocks 25b and 33/34) as well as the planned mixed use development on Block 40 contribute to the cumulative wastewater flows in the subbasin.[22]

21 San Francisco Department of Public Works, Memo to Manfred Wong and Bessie Tam of the San Francisco Public Utilities Commission, *Mariposa Pump Station (MPS) Dry Weather Flow Hydraulic Analysis*. February 3, 2015.

22 Hydroconsult Engineers, Inc. 2015. Combined Sewer Impact Analysis, Golden State Warriors Arena EIR. February 18.

The UCSF LRDP Final EIR also notes that average dry weather flows to the Mariposa Pump Station exceed previous projections and the existing capacity for dry weather flows at the time of Final EIR publication, even without flows from the Mission Bay campus. As stated in the UCSF LRDP Final EIR, the Mariposa Pump Station would need to be upgraded and the SFPUC is analyzing temporary measures (referred to as "interim improvements" in Impacts UT-5 and C-UT-2) to accommodate flows in the interim period between opening the Phase 1 Medical Center on February 1, 2015 and construction of a long-term solution to increase the dry-weather capacity of the Mariposa Pump Station.

Based on this, the UCSF LRDP EIR concluded that there would be a significant and unavoidable cumulative impact because improvements to the Mariposa Pump Station could be required to accommodate wastewater flows from the Mission Bay campus site; construction of the improvements could result in environmental effects; it was unknown whether the SFPUC would approve the upgrades or require additional modifications; and implementation of the necessary improvements is outside of the UCSF jurisdiction.

Because the SFPUC has determined that there is currently inadequate capacity to serve the project's wastewater demand (as well as UCSF's demand), this cumulative impact would be *significant*. Implementation of **Mitigation Measure M-C-UT-4, Fair Share Contribution for Pump Station Upgrades**, would offset the project's contribution to this impact. The measure would require the project sponsor to contribute its fair share to the SFPUC for the required improvements to the Mariposa Pump Stations and associated wastewater facilities. However, because the necessary improvements have not been completely defined and implementation of the improvements to the City's wastewater system is outside of the project sponsor's control, this impact would be *significant and unavoidable, with mitigation*.

Mitigation Measure M-C-UT-4: Fair Share Contribution for Mariposa Pump Station Upgrades

The project sponsor shall pay its fair share for improvements to the Mariposa Pump Station and associated wastewater facilities required to provide adequate sewer capacity within the project area and serve the project as determined by the SFPUC. The contribution shall be in proportion to the wastewater flows from the proposed project relative to the total design capacity of the upgraded pump station(s). The project sponsor shall not be responsible for any share of costs to address pre-existing pump station deficiencies.

Comparison of Impact C-UT-4 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR Community Services and Utilities impacts section estimated that the Mission Bay Plan would generate approximately 2.5 mgd of wastewater at build-out (average dry weather flow), and it concluded that as designed, the wastewater collection systems would have sufficient capacity for these estimated flows. The Mission Bay FSEIR determined that, based on anticipated land uses as offices, the estimated average wastewater flow to each sub-basin from the project site would be 0.096 mgd and the estimated peak flow would be 0.29 mgd; this corresponds to a total average flow of 0.192 mgd and a total peak flow of 0.578 mgd. At that time, the SFPUC had not indicated that there could be inadequate capacity to serve individual project's wastewater demand within the Mission Bay Plan area in addition to its other known commitments. Therefore, this impact was less than significant as analyzed in the Mission Bay FSEIR.

However, as described above, the project would result in a *new* significant impact not previously identified in the Mission Bay FSEIR because project-related peak wastewater flows would be greater than analyzed in the Mission Bay FSEIR and subsequent to publication of the Mission Bay FSEIR, the SFPUC has determined that the wastewater system would have inadequate capacity to serve the project's projected wastewater demand in the Mariposa sub-basin in combination with all development projects that would be constructed at full build out under the Mission Bay Plan.

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5.8 Public Services

5.8.1 Introduction

This section of the SEIR addresses potential impacts associated with public services—including fire protection, emergency medical services, and law enforcement—due to implementation of the proposed project. The section evaluates whether the project would require new or physically altered governmental facilities to maintain adequate service ratios, response times, or other performance objectives, the construction of which would result in substantial adverse physical impacts on the environment. Potential project effects on other public services, including public school facilities, health services, childcare services, library services, and street maintenance services are addressed in the Initial Study, Section 12, Public Services, and potential project effects on public parks are addressed in the Initial Study, Section 10, Recreation (see Appendix NOP-IS).

5.8.2 Summary of Mission Bay FSEIR Public Services, and Community Services and Utilities Sections

The Mission Bay FSEIR Community Services and Utilities setting section characterized existing fire and police protection services serving the Mission Bay plan area and surrounding area at that time. The Mission Bay FSEIR noted that there were no San Francisco Fire Department (SFFD) fire stations operating within the Mission Bay plan area in 1998; however, the plan area was served by up to six surrounding fire stations. The Mission Bay FSEIR also reported that the Mission Bay South area was located within the San Francisco Police Department's (SFPD) Bayview District.

The Mission Bay FSEIR Community Services and Utilities impacts section determined that the Mission Bay plan would potentially result in a significant increase in demand for fire protection and associated emergency medical services in the Mission Bay plan area, and that a new fire station and additional fire department personnel and equipment would be required in the Mission Bay South plan area at build-out in order to facilitate access in the event of a major emergency and maintain adequate levels of service. The FSEIR also indicated the Mission Bay plan would increase demand for a new police station and additional police protection personnel.

The Mission Bay plan included the provision of land at the corner of Third Street and Mission Rock Street in the Mission Bay plan area for a new police/fire station. The Mission Bay FSEIR concluded that with implementation of Mitigation Measures M.6a (Construct New Fire Station) and M.6b (Provide New Engine Company) that would ensure funding for additional fire protection personnel, equipment and fire station, impacts to fire protection services would be less than significant. Furthermore, the Mission Bay FSEIR determined that the new police station proposed under the Mission Bay plan would increase community involvement and lower crime rates in the Mission Bay plan area and ensure impacts to police protection services would be less than significant. Potential impacts associated with the construction and operation of the new police/fire station itself were included in the overall analysis of the Mission Bay plan in the FSEIR.

As explained below, the new Public Safety Building at Third Street and Mission Rock Street in the Mission Bay plan area became operational in April 2015.

5.8.3 Setting

5.8.3.1 Fire Protection and Emergency Medical Services

San Francisco Fire Department

The SFFD provides fire protection and emergency medical services for the City and County of San Francisco. Emergency medical transportation to San Francisco hospitals is provided by a dynamically deployed fleet of both public and private ambulance services.

Currently, the nearest SFFD stations to the project site that would provide the first response for fire suppression, rescue, and emergency medical service include the following:

- Station 4 in Public Safety Building at Third Street and Mission Rock Street (one-third mile from the project site)
- Station 8 at 36 Bluxome Street and Fourth Street (one mile from the project site)
- Station 25 at 3305 Third Street at Cargo Way (1.3 miles from the project site)
- Station 29 at 299 Vermont Street at 16th Street (0.9 miles from the project site)

The City's Public Safety Building at Third and Mission Rock Streets, which includes Station 4, became operational in April 2015. The traffic signals at the intersection of Mission Rock Street with Third Street and Terry Francois Boulevard can be controlled by the SFFD for preemptive signal control to allow unimpeded travel by SFFD emergency vehicles through these intersections in an emergency.

Table 5.8-1 summarizes the existing SFFD staffing and equipment in the project area.

TABLE 5.8-1
SUMMARY OF EXISTING SFFD STAFFING AND EQUIPMENT IN PROJECT AREA

SFFD Fire Station	Staffing per Shift	Total Members	Special Unit	Fire Engines/ Trucks	Command Unit
No. 4: Third St. / Mission Rock St.	9	35		1 engine 1 truck	
No. 8: Bluxome St. / Fourth St.	10	40		1 engine 1 truck	Battalion Chief
No. 25: 3305 Third Street at Cargo Way	4	16		1 engine	
No. 29: 299 Vermont Street at 16th Street	4	16		1 engine	

SOURCE: San Francisco Fire Department, 2015

Table 5.8-2 summarizes the number of SFFD responses in the project area from December 2013 through November 2014 and the average response time.

TABLE 5.8-2
SUMMARY OF SFFD RESPONSES FOR FIRE STATIONS IN PROJECT AREA
(DECEMBER 2013 THROUGH NOVEMBER 2014[a])

SFFD Fire Station No.	Fire Responses	Medical Responses	Total Responses	Average Response Time (minutes)
4[b]	1,038	580	1,618	5.98
8	1,681	5,599	7,280	5.98
25	1,045	1,551	2,596	6.53
29	1,204	2,972	4,176	5.71

a SFFD data reported for December 1, 2013 through November 30, 2014.
b New SFFD Fire Station No. 4 at San Francisco Public Safety Building in Mission Bay became operational in April 2015. Reported response data presented in this table is from existing fire stations that currently serve Station 4's proposed response area.

SOURCE: San Francisco Fire Department, 2015

The SFFD formerly operated and maintained the Auxiliary Water Supply System (AWSS) used for fire protection use only, but since publication of the Mission Bay FSEIR, management of this system has been transferred to the San Francisco Public Utilities Commission's (SFPUC) City Distribution Division. This high pressure water supply system is distinct and separate from the City's domestic water and standard fire hydrant system. The AWSS consists of 150 miles of 8- to 20-inch diameter mains, 1,550 special fire hydrants, a high elevation water reservoir and two large water tanks, emergency saltwater pump stations, and series of underground cisterns. The two AWSS emergency saltwater pumping stations (located at Second Street/Townsend Street and at Fort Mason) each have a pumping capacity of 10,000 gallons per minute (gpm) to supplement the AWSS with saltwater. An existing AWSS water line extends along Third Street adjacent to the project site (see Initial Study, Section 11, Appendix NOP-IS for more discussion).

The SFFD fire boats the *Phoenix* and the *Guardian (*stationed at Station No. 35 at Pier 22½) can make those connections directly into the AWSS via five special manifolds installed along the Bay shoreline to serve as a backup to the City's landside saltwater pumping stations. The nearest SFFD fire boat manifolds to the project site are at Islais Creek/Third Street to the south, and at Pier 22½ to the north. The *Phoenix* has a pumping capacity of over 9,600 gpm, equal to that of one of the landside pumping stations. The *Guardian* has the largest pumping capacity of any fireboat in the world (24,000 gpm) and is the only fireboat that is outfitted with a 5½-inch monitor tip, capable of pumping 9,000 gpm onto a fire from just one of its monitors. The SFFD has also received federal grant money to procure a third fireboat, anticipated to be operational in summer 2015 and stationed at Pier 22½.[1]

1 San Francisco Fire Department, communications with Assistant Deputy Chief Ken Lombardi, January 11, 2015 and January 21, 2015.

5.8.3.2 Law Enforcement Services

San Francisco Police Department

The SFPD provides law enforcement services in the City and County of San Francisco. The SFPD is mandated by the City Charter to maintain a sworn staff of 1,971, excluding officers assigned to the San Francisco International Airport, and officers not available for field duty (e.g., due to on-duty injuries, temporary modified duty, medical leave, and administrative leave). During 2014, the Department averaged 1,715 total full-duty sworn officers. In 2012, the SFPD initiated a six-year hiring plan to gradually increase the number of SFPD officers (with an average of three recruit academies of 50 new hires planned per year) and the mandated SFPD staffing level goal is anticipated to be reached in mid-2018.[2]

The SFPD assigns its officers to ensure adequate staff are available to provide minimum safety services as well as to staff special events and deploy officers to meet unexpected needs when services require "all hands," such as during October of every year when multiple major events are held in the City.[3]

Patrol functions are performed by the police officers of the SFPD Field Operations Bureau from ten district stations. The project site is currently within the jurisdiction of the SFPD's Bayview District. The SFPD Bayview District currently covers an approximately 9.1-square mile area, extending south from the Mission Creek Channel covering all of Mission Bay South plan area, and continuing south through the Potrero Hill, Dogpatch and Bayview neighborhoods to the San Mateo County line. The SFPD Bayview District Station is located at 201 Williams Street, approximately 2½ miles south of the project site.

However, with the recent relocation of the SFPD headquarters and Southern District Station to the Public Safety Building at Third Street at Mission Rock Street, the SFPD district boundaries are being revised. By June 2015, the project site is anticipated to be within the jurisdiction of the SFPD's Southern District.[4] The SFPD Southern District currently covers an approximately 3-square mile area, from roughly Market Street on the north, The Embarcadero waterfront on the east, the Mission Creek Channel on the south, and Division Street on the west, but these boundaries are expected to be revised by June 2015 to include Mission Bay Blocks 29-32. The Southern District Station contains five patrol sectors on the mainland and one on Treasure Island, in addition to several foot beats and officers that patrol on bicycles.

The SFPD's Southern District is responsible for managing the law enforcement services for many events each year, including San Francisco Giants home games at AT&T Park, Oracle World, Macworld, Google Convention, St. Patrick's Day Parade, and Gay Pride Parade, and in 2013, the 34th America's Cup event. The SFPD routinely provides increased police protection for special

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2 San Francisco Police Department, *2013 Annual Report*, available online at http://sf-police.org/index.aspx?page=3992, accessed January 22, 2015.

3 *Ibid*.

4 San Francisco Police Department, communications with Captain Michael Redmond, Commanding Officer, Southern District Station, January 5, 2015, January 6, 2015, and January 15, 2015.

events, including assigning additional SFPD personnel (police officers and on-site command/ dispatch center) specifically for these events. The level of SFPD personnel required for a particular event is determined by the SFPD's Event Commander in coordination with the event sponsor in advance of the event as well as by levels established in event security/operations plans. The Department of Parking and Traffic typically provides traffic control services for special events.[5]

For example, for San Francisco Giants home games at AT&T Park, the SFPD typically provides on-duty officers from five or more SFPD district stations to provide police protection in the ballpark vicinity during games, along with motorized patrol support from the SFPD Honda unit and the SFPD Southern District Station's radio car as needed. In addition, the SFPD's Municipal Transportation Agency (MTA) Division provides officers to assist with facilitation of pedestrian traffic through Muni Metro areas for Giants games. Additional off-duty officers are used to provide additional police protection within the interior of the ballpark. Also, the SFPD maintains agreements with certain parking lot operators in Mission Bay, where SFPD bicycle officers provide security at lots used by ballgame patrons.[6]

Table 5.8-3 summarizes the average annual number and types of crimes that occurred within the Mission Bay Plan area between 2012 and 2014. The SFPD indicates that the crime rate within the immediate project site vicinity (e.g., one-half mile radius of the project site) is lower than elsewhere within the Bayview District, as well as lower than the City as a whole.[7]

TABLE 5.8-3
SUMMARY OF ANNUAL CRIMES IN
MISSION BAY PLAN AREA[a] (AVERAGE 2012-2014)

Crime	Number
Arson	1
Assault	20
Burglary	65
Larceny/Theft	489
Robbery	20
Sex Offense	2
Vehicle Theft	42
Total	**638**

[a] The area for which the SFPD collected statistics approximates, but does not match exactly, the Mission Bay Plan area.

SOURCE: San Francisco Police Department, 2015

5 *Ibid*.
6 *Ibid*.
7 *Ibid*.

Port of San Francisco Police

The Port of San Francisco employs one police officer based at Pier 26 who responds to complaints and actively patrols the Port property from Pier 90 to Aquatic Park (including the area directly east of the project site) from 7:00 a.m. to 4:00 p.m., Monday through Friday. SFPD provides backup to the Port's officer and law enforcement services after 4:00 p.m. and on weekends.

San Francisco Sheriff's Department

The San Francisco Sheriff's Department (SFSD) manages the San Francisco County Jail and protects City-owned critical infrastructure. In addition, the SFSD augments law enforcement at the request of the SFPD.

California Highway Patrol

The California Highway Patrol (CHP) provides law enforcement services on state highways, including the San Francisco-Oakland Bay Bridge. The nearest CHP station to the project site is Station 335, at 455 Eighth Street in San Francisco.

University of California Police Department

The University of California Police Department (UCPD) provides police protection services for University of California properties and facilities, including the University of California at San Francisco (UCSF) Mission Bay campus. The UCPD is comprised of the Field Services Division, which provides police and investigative services, the Professional Standards Division, and the Homeland Security and Emergency Management Division. The UCSF Police Department maintains its headquarters at 654 Minnesota Street, and a patrol substation at the Mission Bay campus.

5.8.4 Regulatory Framework

5.8.4.1 State Regulations

California Master Mutual Aid Agreement

The California Master Mutual Aid Agreement is a framework agreement between the State of California and local governments for aid and assistance by the interchange of services and facilities, including but not limited to fire, police, medical and health, communication, and transportation services and facilities to cope with the problems of rescue, relief, evacuation, rehabilitation, and reconstruction.

California Fire Code

State fire regulations are set forth in Sections 13000, et seq. of the California Health and Safety Code, which includes regulations concerning building standards (as set forth in Title 24 of the California Code of Regulations, the California Building Code), fire protection and notification systems, fire protection devices (such as fire extinguishers and smoke alarms), high-rise building and child care facility standards, and fire suppression training. California Fire Code Section 403.2

addresses public safety for both indoor and outdoor gatherings, including emergency vehicle ingress and egress, fire protection, emergency medical services, public assembly areas and the directing of both attendees and vehicles (including the parking of vehicles), vendor and food concession distribution, and the need for the presence of law enforcement and fire and emergency medical services personnel at the event.

5.8.4.2 Local Regulations

San Francisco General Plan

The *San Francisco General Plan* provides general policies and objectives to guide land use decisions and development throughout the city, as described in Chapter 4, Plans and Policies. The Community Facilities Element of the General Plan contains the following objectives and policies relevant to public services:

> ***Objective 1*****:** Distribute, locate and design police facilities in a manner that will enhance the effective, efficient and responsive performance of police functions.
>
> ***Policy 1.1*****:** Locate police functions that are best conducted on a centralized basis in a police headquarters building.
>
> ***Policy 1.2*****:** Provide the number of district stations that balance service effectiveness with community desires for neighborhood police facilities.
>
> ***Policy 1.3*****:** Enhance closer police/community interaction through the decentralization of police services that need not be centralized.
>
> ***Policy 1.4*****:** Distribute, locate, and design police support facilities so as to maximize their effectiveness, use, and accessibility for police personnel.
>
> ***Policy 1.6*****:** Design facilities to allow for flexibility, future expansion, full operation in the event of a seismic emergency, and security and safety for personnel, while still maintaining an inviting appearance that is in scale with neighborhood development.
>
> ***Policy 1.7*****:** Combine police facilities with other public uses whenever multi-use facilities support planning goals, fulfill neighborhood needs, and meet police service needs.
>
> ***Policy 2.1*****:** Provide expanded police/community relations and police services through outreach programs, primarily utilizing existing facilities.
>
> ***Policy 2.2*****:** Establish police district boundaries along natural neighborhood edges, and reinforce neighborhood identity by locating district stations near the centers of their service areas.
>
> ***Policy 2.3*****:** Design police facilities to maximize opportunities for promoting community/ police relations through dual use of facilities.
>
> ***Objective 5*****:** Development of a system of firehouses which will meet the operating requirements of the Fire Department in providing fire protection services and which will

be in harmony with related public service facilities and with all other features and facilities of land development and transportation provided for in other sections of the General Plan.

San Francisco Police Code

The San Francisco Police Code contains regulations for various types of activities such as automobile use, permitting and licensing, and disorderly conduct. The City's noise ordinance is also part of the Police Code (Article 29) – see Section 5.3, Noise Regulatory Framework.

San Francisco Fire Code

The San Francisco Fire Code was revised in 2007 to regulate and govern the safeguarding of life and property from fire and explosion hazards arising from the storage, handling, and use of hazardous substances, materials, and devices, and from conditions hazardous to life or property in the occupancy of buildings and premises; to provide for the issuance of permits, inspections, and other SFFD services; and to provide for the assessment and collection of fees for those permits, inspections, and services. The SFFD reviews building plans to ensure that fire and life safety is provided and maintained in the buildings that fall under its jurisdiction. SFFD building plan review applies to all of the following occupancy types:

- All Assembly Occupancies (including restaurants and other gathering places for 50 or more occupants)
- All Educational Occupancies (including commercial day care facilities)
- All Hazardous Occupancies (including repair garages, body shops, fuel storage, and emergency generator installation)
- All Storage Occupancies where potential exists for high-piled storage as defined by Fire Code
- All Institutional Occupancies
- All High-Rise Buildings of all occupancies
- Residential Occupancies, such as hotels, motels, lodging houses, residential care facilities, apartment houses, small- and large-family day care homes, and R-1 artisan buildings (excluding minor residential repairs such as kitchen and bath remodeling and dry rot repair)
- Certified family-care homes, out-of-home placement facilities, halfway houses, drug and/or alcohol rehabilitation facilities
- Tents, awnings, or other fabric enclosures used in connection with any occupancy
- All fire alarm and fire suppression systems

In coordination with the San Francisco Department of Building Inspection and the Port Building Department, the SFFD conducts plan checks to ensure that all structures, occupancies, and systems outlined above are designed in accordance with the San Francisco Building Code prior to the issuance of a building permit.

5.8.5 Impacts and Mitigation Measures

5.8.5.1 Significance Thresholds

The project would have a significant impact related to public services if the project were to:

- Result in substantial adverse physical impacts associated with the provision of or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire protection, law enforcement, or other services.

Impacts regarding emergency vehicle access are addressed in Section 5.2, Transportation and Circulation.

5.8.5.2 Approach to Analysis

Methodology for Analysis of Direct Impacts

The proposed project could have a significant impact on public services if (1) it would require the construction of new or physically altered governmental facilities in order to maintain acceptable levels of public services, *and* (2) the construction or alteration of such facilities would result in one or more substantial adverse impacts on the environment. While the proposed project includes provision of space at the event center for the SFFD and SFPD to use during games/events (e.g., command center), the physical impacts related to construction and operation of those facilities are addressed as part of the proposed project and included within the analyses in the appropriate environmental resource topic sections of this SEIR.

Other effects that could result from the proposed project—such as the potential for an increase in crime, public drinking, outdoor crowd noise, building defacement, public urination, ticket scalping, pan-handling, vandalism, litter, graffiti, and other activities that may result in a diminished quality of life for neighborhood residents—are not considered impacts under CEQA unless such effects result in the need for the construction of new or physically altered governmental facilities in order to maintain acceptable levels of public services, *and* the construction of such facilities result in adverse physical environmental impacts. These quality of life issues would be considered as part of OCII and the City's project planning and approval processes, outside of the CEQA environmental review process.

Nevertheless, the proposed project would incorporate certain services, facilities, and site management practices that would minimize the project's effects on the quality of life for the surrounding neighborhood. These include: the provision of on-site space, including a command center at the event center for use by the sponsor's security personnel, SFPD, SFFD, and San Francisco Municipal Transportation Agency (SFMTA); provision of private security guards to regularly patrol buildings and grounds, and increased security for games/events to provide on-site crowd management and public safety; inclusion of applicable on-site security equipment; use of traffic control personnel and implementation of a transportation management plan for games/events to facilitate safe movement of, and minimize potential conflicts among pedestrians, bicyclists, and vehicles; use of maintenance and cleaning staff to regularly clean and maintain the buildings and grounds and provide litter control; incorporation of public restroom facilities in proposed buildings and open space areas; and installation of recycling/trash/compost receptacles as required by the City.

The impact analysis below first considers whether the project would require the construction of new or altered governmental facilities (beyond those included in the proposed project), in order to maintain acceptable performance standards for public services. If new or altered public service facilities are determined to be required to serve the project, then the analysis evaluates whether construction of such facilities would have a substantial adverse physical impact on the environment. For example, if the SFPD determined that a new police station would be required to be constructed to maintain adequate service levels for law enforcement, the impact analysis would evaluate whether construction or operation of the new police station would have significant impacts on the physical environment.

If the project were to result in increased demand for law enforcement, fire protection, and/or emergency medical services, there could be economic impacts that are unrelated to the construction of new or altered facilities. Costs incurred by the agencies that would provide law enforcement, fire protection, and emergency medical services would not be considered an environmental impact under CEQA, and as such, CEQA environmental review does not address mitigation measures to compensate public service agencies for such costs.

For purposes of the impact analysis, it is assumed that project improvements would be designed and constructed in compliance with all applicable building and fire codes, which include requirements for fire alarms, smoke detectors, sprinkler systems, fire extinguishers, and the number and location of exits.

Methodology for Analysis of Cumulative Impacts

The geographic scope of potential cumulative impacts on public services encompasses the areas served by the SFFD, SFPD, and other federal and state government facilities that provide fire protection, emergency medical, and law enforcement services in the project area.

Foreseeable past, present, and probable future projects in the project area that could result in cumulative impacts on public services in combination with the proposed project are described in Section 5.1, Impact Overview. For the public services cumulative impact analysis, future development projects considered in the analysis include those that would require law enforcement services and fire protection/emergency medical services. Similar to the analysis for project impacts, the cumulative impact analysis assumes that construction and operations of other projects in the immediate vicinity would also be completed in compliance with applicable regulations regarding the provision of public services. The analysis considers whether or not there would be a significant, adverse cumulative impact associated with project implementation in combination with past, present, and probable future projects in the immediate vicinity, and if so, whether or not the project's contribution to the cumulative impact would be significant (i.e., cumulatively considerable).

5.8.5.3 Impact Evaluation

Impact PS-1: See Initial Study (Appendix NOP-IS)

Construction

Fire Protection, Emergency Medical Services, and Law Enforcement

Impact PS-2: Construction of the proposed project would not result in substantial adverse physical impacts associated with the provision of or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, emergency medical services, or law enforcement. (Less than Significant)

As discussed in Chapter 3, Project Description, construction of the proposed project is anticipated to begin in late 2015, and occur over an approximate 26-month period. The number of construction workers present on-site daily would vary, depending on the specific construction activities being performed and the overlap between construction phases. During peak overlapping construction periods, there would be between approximately 330 and 700 construction workers at the project site. The presence of construction workers on-site could result in an incremental, temporary increase in demand for fire protection, emergency medical services, and law enforcement. As described in Section E.3, Population and Housing, in the Initial Study (see Appendix NOP-IS), it is expected that a portion of the construction labor needs would be met by residents of San Francisco, who are currently being served by these City services and therefore would not represent an increase in demand for City services. In any case, this incremental, temporary increase in demand for services during construction could be accommodated by the existing fire protection, emergency medical services, and law enforcement services and would not require construction of new or physically altered facilities to maintain services. Therefore, maintaining acceptable fire protection, emergency medical services, and law enforcement during construction of the proposed project would be *less than significant*, and no mitigation would be required.

Mitigation: Not required.

Comparison of Impact PS-2 to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR did not specifically address potential construction-related impacts to fire protection, emergency medical, or law enforcement services. However, because project impacts would be less than significant, the project would result in <u>no</u> new or substantially more severe significant impacts than was previously identified in the FSEIR.

Operation

Fire Protection and Emergency Medical Services

Impact PS-3: Operation of the proposed project would not result in substantial adverse physical impacts associated with the provision of or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection or emergency medical services. (Less than Significant)

An increase in population at the project site and vicinity, including patrons attending games and other events, customers frequenting proposed retail uses and restaurants; event center, office and retail employees; and visitors to the proposed public plazas would result in periodic increases in demand for fire protection and emergency medical services compared to existing conditions. Because the project does not include any residential uses, there would be no permanent increase in population at the project site. As discussed below, the periodic increases in demand for fire protection and emergency medical services would not require construction of new or physically altered fire protection or emergency medical facilities.

The population increases associated with the project would be minimal in comparison to the population served by the existing fire stations in the project area. The increase in calls for fire protection and medical emergency response would not be substantial in light of the existing demand and capacity for fire protection and emergency medical services in the City. The project site is located in an existing urban area and would not extend demand of the SFFD beyond the current limits of its service capabilities. The proposed development would neither adversely affect SFFD service standards nor require an increase in SFFD staff that would require the construction of new fire protection facilities.[8]

As discussed above in the Setting, the newly-operational Fire Station 4 operates within the Public Safety Building, approximately one-third mile north of the project site; this fire house would serve as a first responder to fire and emergency medical incidences at the project site. In addition, there are several other existing fire stations (e.g., Fire Stations No. 8, 25 and 29) located within the project site vicinity that would provide supplemental fire protection and emergency medical response personnel and equipment at the project site, if needed.[9]

A high pressure AWSS water line currently extends along Third Street adjacent to the project site that would serve the proposed project. There are no AWSS deficiencies in the project area, and if needed, existing emergency saltwater pump stations and/or the SFFD fire boats could provide a supplemental source for emergency water for the AWSS.[10]

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8 Communications with Assistant Deputy Chief Ken Lombardi, San Francisco Fire Department, January 11, 2015 and January 21, 2015.
9 *Ibid*.
10 *Ibid*.

As part of project operations for games and large events at the event center, the Warriors or other event sponsors would provide on-site medical services, including a first aid station and on-site medical personnel to provide first aid to game/event patrons or employees that may require medical assistance, which would further reduce potential effects on general emergency medical response providers.

The proposed development would be designed to comply with the most up-to-date building and fire codes and include state-of-the-art fire safety measures and equipment, including but not limited to, use of fire retardant building materials, inclusion of emergency water infrastructure (fire hydrants and sprinkler systems), installation of smoke detectors and fire extinguishers, emergency response notification systems, and provision of adequate emergency access ways within the project site for emergency vehicles. Project fire safety plans would be subject to review and approval by the SFFD.

Furthermore, as part of the project, a proposed command center at the event center would be used prior to, during, and after games/events by the SFFD, SFPD, SFMTA, and/or the project's private security and emergency medical staff to coordinate incident response, facilitate communication and surveillance, implement the transportation management plan (TMP), and deploy parking control officers (PCOs).

The periodic increase in demand for fire protection services discussed above would not require construction of new or physically altered fire protection facilities. The existing SFFD fire stations in the project vicinity (including the newly-operational Fire Station 4, located one-third mile north of the site), in combination with the proposed provision for on-site emergency medical staff for games/events, and provision of on-site fire prevention/protection measures, equipment and facilities at the project site, are currently adequate to meet the increases in demand for fire protection and emergency medical response services associated with the proposed project. No additional new or physically altered facilities would be necessary. Therefore, the proposed project would have a *less than significant* impact related to the construction of new or physically altered fire protection facilities.

Mitigation: Not required.

Comparison of Impact PS-3 to Mission Bay FSEIR Impact Analysis

As discussed above, the Mission Bay FSEIR determined that the Mission Bay plan would potentially result in a significant increase in demand for fire protection services in the Mission Bay plan area, and that a new fire station and additional fire department personnel and equipment would be required in the Mission Bay South plan area at build-out in order to facilitate access in the event of a major emergency, and maintain adequate levels of service. The Mission Bay FSEIR concluded that with implementation of Mitigation Measures M.6a (Construct New Fire Station) and M.6b (Provide New Engine Company) to ensure funding for additional fire protection personnel, equipment and fire station, impacts to fire protection services would be less than significant. The City's Public Safety Building at Third and Mission Rock Streets, which includes SFFD Fire Station 4 became operational in April 2015, and consequently, Mission Bay

FSEIR Mitigation Measures M.6a and M.6b have been implemented and are not applicable to the proposed project.

Therefore, the project would not result in any new or substantially more severe significant impacts than those previously identified in the Mission Bay FSEIR.

Law Enforcement Services

Impact PS-4: Operation of the proposed project would not result in substantial adverse physical impacts associated with the provision of or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for law enforcement services. (Less than Significant)

An increase in population at the project site and vicinity, including patrons attending games and events, customers frequenting proposed retail uses and restaurants, event center, office and retail employees, and visitors to the proposed public plazas would result in a periodic increase in demand for law enforcement services. Because the project does not include any residential uses, there would be no permanent increase in population at the project site. The periodic increases in demand for law enforcement services would not require construction of new or physically altered law enforcement facilities.

During non-event periods at the project site, the proposed project would require typical SFPD police protection services, which are expected to be similar to those services currently being provided to other mixed-use developments in the City. As discussed above, the newly-operational SFPD headquarters and Southern District police station are based in the Public Safety Building in Mission Bay, approximately one-third mile north of the project site. In addition, the event center, office and retail uses would provide their own on-site private security personnel and install proper security equipment (e.g., security nightlighting, CCTV system for video surveillance, and security gates/locks) similar to other mixed use developments in the City. The event center would also provide an on-site command center for on-site security personnel to monitor access to the site and provide communications resources seven days a week, 24 hours a day.

However, when games and other large capacity events would occur at the event center, an increased level of SFPD police protection personnel would be required on- and/or off-site for patrolling and responding to potential incidences associated with the temporary increases in visitors. The SFPD anticipates that for games/events at the proposed event center, typical police responses would be associated with actions such as citations, ejections of fans from the arena and arrests, public intoxication, thefts from vehicles, and low-level assaults.[11] The temporary

[11] San Francisco Police Department, communications with Captain Michael Redmond, Commanding Officer, Southern District Station, January 5, 2015, January 6, 2015 and January 15, 2015.

increases in project-related visitors within the immediate vicinity of the adjacent UCSF Mission Bay campus could also result in periodic incidences requiring response from the UCSF Police Department.

As discussed in the Setting, the SFPD routinely provides increased police protection for sports games (e.g., SF Giants baseball home games at AT&T Park) and other events in the City, and assigns and dedicates additional SFPD personnel specifically for these games/events. Accordingly, the SFPD would increase local staffing for the games/events at event center, as needed. The level of SFPD personnel required on- and/or off-site for games/events would be determined in advance of the game/event by the SFPD's Event Commander in coordination with the Warriors and/or event sponsor and would be specified in event security/operations plans.[12]

During games and events at the event center, the Warriors and/or event sponsor would also provide increased private security to assist in on-site crowd management and public safety during events, and would use traffic control personnel to assist in implementing the TMP to facilitate safe movement of, and minimize potential conflicts among pedestrians, bicyclists, and vehicles.

Furthermore, as part of the project, space within the event center would be provided for SFPD personnel to use during games/events for police administrative and operational functions, and could include police-related facilities typically included at sports arenas such as temporary detention facilities. In addition, as discussed in Impact PS-3, above, a separate proposed command center at the event center would be used prior to, during, and after games/events by the SFPD, SFFD, SFMTA and/or the project's private security and emergency medical personnel to coordinate incident response, facilitate communication and surveillance, and implement the TMP and PCOs. Consequently, adequate police protection services and facilities would be available and provided for the games/events at the project site, and such services would not detract from other SFPD police operations within the City.[13] See cumulative impacts below regarding impacts on SFPD personnel during concurrent events at the project site and AT&T Park.

The periodic increase in demand for law enforcement services discussed above would not require construction of new or physically altered police stations. The existing police protection facilities in the project site vicinity, including the newly-operational Southern District police station located one-third mile north of the site, in combination with proposed event security/operations plans, and provision of on-site security facilities and personnel for the project, are currently adequate to meet the increase in demand for service associated with the proposed project. No new or physically altered facilities would be necessary. Therefore, the proposed project would have a *less than significant* impact related to the construction of new or physically altered police protection facilities.

12 *Ibid*.
13 *Ibid*.

Mitigation: Not required.

Comparison of Impact PS-4 to Mission Bay FSEIR Impact Analysis

As discussed above, the Mission Bay FSEIR determined that the Mission Bay plan would increase demand for a new police station and additional police protection personnel, although not significantly. The Mission Bay FSEIR also concluded that a new police station proposed under the Mission Bay plan would increase community involvement and lower crime rates in the Mission Bay plan area and ensure impacts to police protection services would be less than significant. Consistent with the Mission Bay plan, the City's Public Safety Building at Third and Mission Rock Streets, which includes new SFPD headquarters and Southern Station, became operational in April 2015.

Therefore, the project would not result in any new or substantially more severe significant impacts than those previously identified in the Mission Bay FSEIR.

Cumulative Impacts

Impact C-PS-1: See Initial Study (Appendix NOP-IS)

Impact C-PS-2: The project, in combination with other past, present, and reasonably foreseeable future projects, would not result in significant adverse cumulative impacts on fire protection, emergency medical, and law enforcement services. (Less than Significant)

The geographic scope of the potential cumulative impacts of the proposed project related to public services includes the areas served by the fire and police stations and other facilities of the federal, state, and local government agencies that provide fire protection, emergency medical, and law enforcement services in the project area.

As stated above, the proposed project would increase demand for fire protection, emergency medical, and law enforcement services. The project could have a significant cumulative impact if (1) this increase in demand would make a cumulatively considerable contribution to the public service demands of other past, present, and future projects described in Section 5.1 in this SEIR that, in combination, would require the construction of new or physically altered governmental facilities (i.e., fire or police stations); *and* (2) the construction of such facilities would have a significant adverse impact on the environment.

Neither the SFPD nor SFFD have identified a citywide service gap. Therefore, the increased need for law enforcement or fire protection services resulting from the proposed project and reasonably foreseeable projects would not be above levels anticipated by the SFFD or SFPD. With respect to the potential need for SFPD police protection for multiple special events that may occur concurrently within the City (e.g., a game or event at the project site in combination with a SF Giants baseball home game at AT&T Park), the SFPD indicates that separate security/operations plans and dedicated SFPD personnel would be used concurrently for each individual event.[14] When considering that dedicated SFPD staff, in combination with each event sponsors' private security and public safety staff, would be available to serve the respective events, no delays in response times would be expected to occur for the individual events or for service in the City as a whole.

Given these factors, the contribution to cumulative impacts by the project would not be considerable, and the impact would be *less than significant*.

Mitigation: Not required.

Comparison of Impact C-PS-2 to Mission Bay FSEIR Impact Analysis

The 1998 Mission Bay FSEIR did not contain an analysis of cumulative impacts on fire protection, emergency medical, and law enforcement services *per se*, although as a program EIR, the FSEIR analyzed the fire protection, emergency medical, and law enforcement services impact of the Mission Bay North and South Redevelopment Plans as a whole, covering development throughout an area over 300 acres in size, which is essentially a cumulative analysis.

As described above, with completion of the City's Public Safety Building at Third and Mission Rock Streets, public services impacts of the Mission Bay Plan previously identified in the FSEIR have now been reduced to less than significant. Consequently, the cumulative impacts for the Plan area are now less than significant. Therefore, the project would not result in any new or substantially more severe significant impacts than those previously identified in the Mission Bay FSEIR.

[14] *Ibid*.

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5.9 Hydrology and Water Quality

5.9.1 Introduction

This section describes the potential effects of the project on the existing hydrology and water quality in the project area, with a focus on operational impacts associated with changes in stormwater and wastewater flows. The potential for flooding as a result of sea level rise is also addressed.

The impact evaluation in the Hydrology and Water Quality section of the Initial Study (see Appendix NOP-IS, pp. 86 through 98) explains why the proposed project would not result in new significant impacts or substantially increase the severity of impacts on hydrology and water quality with respect to depletion of groundwater and interference with groundwater recharge; alteration of drainage patterns; degradation of water quality; placement of housing within a 100-year flood zone; placement of structures within a 100-year flood zone; flooding as a result of failure of a levee or dam; and inundation by seiche, tsunami, or mudflow.

Project effects on the capacity of wastewater and stormwater systems, which are related to water hydrology and water quality impacts, are addressed in Section 5.7, Utilities and Service Systems, of this SEIR.

5.9.2 Summary of Mission Bay FSEIR Hydrology and Water Quality Analysis

Hydrology and water quality setting information and impact analyses were addressed in the Mission Bay FSEIR in the Hydrology/Water Quality and Community Services/Utilities sections as well as in the Mission Bay Initial Study Water and Geology/Topography sections. Those sections of the Mission Bay FSEIR discuss and analyze a preliminary approach to managing stormwater and wastewater in the Mission Bay South area. However, the approach that was ultimately adopted and implemented was described and analyzed as a Mitigation Scenario B in the Mission Bay FSEIR Summary of Comments and Responses (FSEIR Volume III, beginning on p. XII.253). Information from these sections relevant to the analysis of hydrology and water quality impacts is summarized below.

5.9.2.1 Mission Bay FSEIR Setting

Mission Bay Plan Stormwater Drainage Setting

The Mission Bay FSEIR Hydrology/Water Quality setting section characterized existing drainage patterns and municipal sewer treatment facilities serving the Mission Bay Plan area at the time of FSEIR publication. As presented in that description, the Mission Bay Plan area was located in the City's Bayside drainage basin, in which combined stormwater and sanitary sewage were collected in the same set of pipes, conveyed to and treated at the Southeast Water Pollution Control Plant (SEWPCP) near Islais Creek, and treated wastewater was then discharged to the

Bay in a deep water outfall at Pier 80. At that time, the Mission Bay Plan area was located in four sub-basins, with the project site draining to two of the sub-basins. The north and east portions of the Blocks 29-32 site drained to the Bay sub-basin, in which stormwater drained directly to the Bay, and the balance of Blocks 29-32 drained to the Mariposa sub-basin of the Bayside drainage basin of the combined sewer system. Stormwater collected in the Mariposa sub-basin was directed to the Mariposa Pump Station, and from there, to the SEWPCP.

As reported in the Mission Bay FSEIR, the annual average dry weather flows at the SEWPCP at that time were estimated at 67 million gallons per day (mgd). During wet weather, the SEWPCP could treat up to 150 mgd to a secondary level, and an additional 100 mgd to a primary level.[1] In addition, up to an additional 150 mgd of wet weather flows received primary treatment at the North Point Water Pollution Control Plant, increasing total wet weather treatment capacity for the Bayside drainage basin to 400 mgd. As also reported in the Mission Bay FSEIR, if rainfall resulted in total combined wastewater and stormwater flows exceeding the total capacity of the SEWPCP, the North Point facility, and storage/transport facilities, then excess flows are directed to combined sewer discharge (CSD) structures located along the City's bayside. These flows receive flow-through treatment (similar to primary treatment) and were discharged to the Bay in compliance with the City's National Pollutant Discharge Elimination System (NPDES) permit issued by the Regional Water Quality Control Board (RWQCB).

Mission Bay Plan Flooding Setting

The Mission Bay FSEIR Initial Study Water section summarized relevant information from the 1990 Mission Bay FEIR regarding the issue of potential flooding. The 1990 Mission Bay FEIR indicated that the elevation of the Mission Bay Plan area ranged from approximately +6 to -2 feet San Francisco City Datum (SFD)[2], or 17 to 9 feet based on the 1988 North American Vertical Datum (NAVD88). Groundwater in the Mission Bay Plan area was reported at 3.5 to 9 feet below ground surface, and contiguous with the mean sea level in the adjacent Bay. As referenced in the Mission Bay FSEIR Initial Study, the 1990 Mission Bay FEIR determined that proposed structures or roadways in Mission Bay placed at elevations at or below -2 feet SFD (9 feet NAVD88), after settling on the site, could be subject to tidal flooding during the 100-year flood event, and that if sea levels were to rise, groundwater levels in Mission Bay could also rise.

5.9.2.2 Mission Bay FSEIR Impacts and Mitigation Measures

As discussed in Section 5.7, Utilities and Service Systems, the Mission Bay Draft SEIR described major sewer upgrades within the Mission Bay Plan area that were proposed as part of the Mission Bay Plan. Additional improvements were planned as part of Mitigation Scenario B

1 Secondary treatment is the treatment of wastewater or sewage involving removal of organic matter using biological and chemical processes. This is a higher level of treatment than primary treatment, which is removal of floating and settleable solids using physical operations such as screening and sedimentation.

2 San Francisco City Datum (SFD) establishes the City's zero point for surveying purposes at approximately 8.6 feet above the mean sea level established by 1929 U.S. Geological Survey datum, and approximately 11.3 feet above the 1988 North American Vertical Datum.

described in the Comments and Responses of the Mission Bay FSEIR. The adopted approach included reconfiguring the Central and Mariposa sub-basins of the combined sewer system for the collection of wastewater and; constructing a separate stormwater collection system in the entire Mission Bay South Plan area. ; The separate stormwater system in the reconfigured Central sub-basin has been constructed, and the separate stormwater system in the reconfigured Mariposa sub-basin is currently under construction and anticipated to be completed in 2015, prior to construction and operation of the proposed project.

Mission Bay Plan Effects on Stormwater Drainage

The Mission Bay FSEIR Hydrology and Water Quality impacts section described the proposed Mission Bay Plan's drainage plan, which included reconfiguring the drainage basins of the combined sewer, as shown on Figure 5.7-1 in Section 5.7, Utilities and Service Systems. As part of Mitigation Scenario B, a new separate stormwater system was proposed in both the reconfigured Central and Mariposa sub-basins. With construction of this system, stormwater that previously discharged to the combined sewer system or directly to the Bay would drain into the new separate stormwater infrastructure. The reconfigured Central and Mariposa sub-basins of the combined sewer system would convey wastewater to the SEWPCP for treatment.

The separate stormwater system is currently being implemented by the master developer and includes four drainage zones within the geographic boundaries of the reconfigured Central sub-basin (construction completed) and one drainage zone within the geographic boundaries of the reconfigured Mariposa sub-basin (currently under construction). Stormwater in each of the drainage zones flows by gravity to one of five stormwater pump stations in the locations shown on Figure 5.7-2, including Pump Station SDPS-5 near the east end of 16th Street. When construction of the fifth drainage basin is completed (anticipated to be in 2015, prior to construction and operation of the proposed project), all stormwater runoff from Mission Bay South will be conveyed through the separate stormwater system and discharged to the Bay and China Basin Channel (Mission Creek).

The Mission Bay FSEIR Hydrology and Water Quality section indicated that implementation of the Mission Bay Plan would contribute pollutants to the Bay through: (1) the discharge to municipal wastewater effluent from the SEWPCP; (2) the discharge of treated combined sewer overflows (CSOs) (these events are now referred to as combined sewer discharges or CSDs); and (3) the discharge of untreated stormwater. As described below, the Mission Bay FSEIR found that these water quality impacts would be less than significant. As also discussed below, the Mission Bay FSEIR included Mitigation Measures K.3 and K.4 to address cumulative effects related to an increase in CSDs and water quality effects of untreated stormwater discharges, and these mitigation measures were implemented as part of Mitigation Scenario B of the FSEIR Comments and Responses.

Mission Bay Plan Effects on Volume and Quality of Municipal Wastewater Effluent

The Mission Bay FSEIR estimated that under the original Mission Bay Draft SEIR approach the Mission Bay Plan would generate municipal wastewater and increase the total effluent discharged from the SEWPCP to the Bay by about 3 percent, and result in an approximate 3 percent increase in the pollutant loading to the Bay from the City's municipal wastewater effluent discharges. The Mission Bay FSEIR reported that for the most part, the quality of municipal wastewater from the Mission Bay Plan area would not differ substantially from the quality of other City wastewater conveyed to the SEWPCP, and would not materially change the concentrations of pollutants in the effluent. The Mission Bay FSEIR determined that the effluent increases would be well within the City's treatment plant capacity, and would not cause a violation of the City's NPDES permit requirements for its discharge from the SEWPCP. The Mission Bay FSEIR also determined that the pollutant concentrations in the treated wastewater would be within water quality screening values, including water quality objectives adopted by the RWQCB.

However, the Mission Bay FSEIR determined that the University of California, San Francisco (UCSF) and some commercial or industrial operations could involve the discharge of some pollutants not typically associated with most other San Francisco wastewater, and these sources could potentially discharge chemicals, radioactive materials, and biohazardous materials to the SEWPCP. If improperly handled, these discharges could potentially result in a violation of the NDPES permit. The FSEIR identified Mitigation Measure K.2 in the Hydrology and Water Quality section, which required facilities with these discharges to install sampling ports to facilitate demonstration of compliance with discharge limitations. Implementation of this measure would reduce impacts related to municipal wastewater effluent to less than significant.

Mission Bay Plan Effects of Volume and Quality of Combined Sewer Discharges

The Mission Bay FSEIR estimated that under the Mission Bay Draft SEIR approach, the Mission Bay Plan would increase the average annual volume of CSDs (formerly referred to as combined sewer overflows, or CSOs) by approximately 0.2 percent, and increase the duration of each overflow event by a few minutes. The Mission Bay FSEIR reported that the Mission Bay Plan would not change the concentrations of pollutants in the treated CSDs. In addition, this slight increase in CSD volumes and duration would not cause a violation of the City's NPDES permit requirements for the CSDs, and thus, would not adversely affect existing near-shore aquatic biota or water-contact recreation in the Bay. Given these factors, the Mission Bay FSEIR concluded that Mission Bay Plan effects of CSDs on water quality would be less than significant.

Mission Bay Plan Effects of Volume and Quality of Direct Stormwater Discharge

The Mission Bay FSEIR reported that under the Mission Bay Draft SEIR approach, the Mission Bay Plan would increase the volume of stormwater directly discharged from the Plan area to the Bay by approximately 2 percent and would also change the concentration of pollutants in the stormwater discharge due to the intensification of land uses proposed in the Mission Bay Plan. However, the Mission Bay FSEIR concluded that any potential increase in pollutants from stormwater discharges would be very small relative to those associated with municipal wastewater and treated CSDs. The Mission Bay FSEIR determined that this increase in volumes and change in pollutant concentrations would not adversely affect existing aquatic biota in the Bay. Given these factors, the Mission Bay FSEIR concluded that Mission Bay Plan effects of direct stormwater discharge on water quality would be less than significant.

Mission Bay Plan Effects on Sediment Quality

The Mission Bay FSEIR reported that the RWQCB identified China Basin Channel (Mission Creek) and Islais Creek as candidate toxic hot spots for sediment quality. The Mission Bay FSEIR indicated under the original Mission Bay Draft SEIR approach, the Mission Bay Plan would increase the volume of CSDs from the combined sewer system to Islais Creek as well as the volume of direct stormwater discharges to China Basin Channel (Mission Creek). The Mission Bay FSEIR concluded that increased discharges would cause a corresponding increase in sediment deposition at these locations. However, the discharges would not measurably change the physical or chemical composition of the sediment layer, nor affect any determination by the RWQCB to designate China Basin Channel (Mission Creek) or Islais Creek as toxic hot spots. Given these factors, the Mission Bay FSEIR concluded that Mission Bay Plan effects on sediment quality in Islais Creek and China Basin Channel (Mission Creek) would be less than significant.

Mission Bay Plan Effects on Water Contact Recreation

The Mission Bay FSEIR reported that under the original Mission Bay Draft SEIR approach the Mission Bay Plan would increase CSDs from both the Mariposa and Islais Creek sub-basins of the City's combined sewer system, which could affect water quality as well as the use of these areas for water contact recreation. However, the Mission Bay FSEIR concluded that water contact recreation occurs infrequently on the Bayside, and there would be no impact related to water contact recreation.

Mission Bay Plan Contribution to Cumulative Effects

The Mission Bay FSEIR concluded that there were no significant cumulative impacts identified from the estimated increased volume and pollutant load of treated municipal wastewater effluent, treated CSDs, and direct stormwater discharges, because there would not be substantial degradation in water quality of the Bay or near-shore waters, no toxic effect on aquatic biota, and no substantial change in sediment quality or beneficial uses.

However, the Mission Bay FSEIR determined that due to the lack of conclusive evidence refuting a causal relationship between treated CSDs, stormwater discharges, and sediment quality, the Mission Bay Plan could contribute to a potentially significant cumulative impact on water quality of near-shore waters of the Bay from multiple sources of CSDs and direct stormwater discharges to China Basin Channel (Mission Creek) under the Mission Bay Draft SEIR approach. The Mission Bay FSEIR concluded that the estimated Plan contribution (0.2 percent) to the potential cumulative increase (11 percent) in Bayside CSD volumes, and the contribution of Plan-related stormwater discharges to possible cumulative impacts would be reduced to less than significant with the implementation of Mitigation Measures K.3 and K.4 regarding CSD volumes and alternative treatment technologies for treatment of direct stormwater discharges (described below).

Mission Bay Plan Phased Development Effects on Water Quality from Stormwater

The Mission Bay FSEIR discussed U.S. Environmental Protection Agency (U.S. EPA) Phase II stormwater regulations that had been proposed but not finalized at the time of publication of the Mission Bay FSEIR. These proposed regulations would require the City to develop and implement a stormwater management program to reduce the discharge of pollutants from stormwater to the maximum extent practicable and to protect water quality. The Mission Bay FSEIR indicated that the absence of adopted regulatory requirements for a stormwater management program that addressed Mission Bay stormwater quality, and a failure to implement other best management practices (BMPs) to minimize stormwater pollution, could potentially conflict with the intent of the proposed stormwater permit requirements and result in a significant impact.

Mitigation Measure M.5 in the Mission Bay FSEIR Community Services and Utilities section (see Section 5.7, Utilities and Service Systems) required conveying all stormwater runoff from newly developed areas in the Bay drainage basin to the combined sewer system prior to completion of the initial-flow diversion system. Mitigation Measure K.5 in the Mission Bay FSEIR Hydrology and Water Quality section identified implementation of an individual stormwater management program that utilizes BMPs for Mission Bay until the Phase II regulations become final and Mission Bay is included in the City's stormwater management program. Implementation of this measure would reduce impacts to less than significant.

Mission Bay Plan Effects on Flooding

The Mission Bay FSEIR Initial Study included Mitigation Measures K.6a through K.6f, adapted from the 1990 Mission Bay FEIR that required structures in the Mission Bay area to be designed and located in a way to protect low-lying shoreline areas from the dangers of tidal flooding, including consideration of a rise in relative sea level. The mitigation specified that to address effects of sea level rise, specific flood protection and engineering and building analyses must be conducted by a licensed engineer where structures are proposed below an elevation of -1 foot SFD (10 feet NAVD88). Potential measures identified by the mitigation included setback from the water's edge, installation of seawalls, dikes and/or berms during construction of infrastructure; reducing the amount of excavation for utilities or basements; and use of topsoil to raise the level of public open spaces. With implementation of this mitigation, the Mission Bay FSEIR determined that the Plan's effects related to flooding and sea level rise would be less than significant.

5.9.2.3 Mission Bay FSEIR Mitigation Approach

As discussed above, the Mission Bay FSEIR determined that the Mission Bay Plan could contribute to a potentially significant cumulative impact on the quality of near-shore waters of the Bay as a result of combined sewer discharges and direct stormwater discharges to China Basin Channel (Mission Creek). The Plan's contribution to this cumulative impact would be reduced to less than significant with implementation of FSEIR Mitigation Measures K.3 and K.4 requiring the master developer and the City to design and construct sewer improvements and implement alternative technologies to avoid increases in CSD volumes and to reduce settleable solids and floatable materials in stormwater discharges to China Basin Channel (Mission Creek). As written in the FSEIR, Measure K.3 applies to the entire project area and Measure K.4 applies only to the planned separate stormwater system that would discharge stormwater flows directly to China Basin Channel (Mission Creek) and the Bay.

The Mission Bay FSEIR Summary of Comments and Responses (in Volume III, beginning on p. XII.253) identified Mitigation Scenario B, which included separating the stormwater collection system and sanitary sewer in the reconfigured Mariposa sub-basin as well as in the reconfigured Central sub-basin. All stormwater runoff from Mission Bay South would flow to one of five pump stations (shown on Figure 5.7-2, see Section 5.7, Utilities and Service Systems) via gravity and would be pumped to China Basin Channel (Mission Creek) or the Bay after vortex treatment to reduce the total settleable solid concentrations in the runoff. Other methods identified to reduce particulate matter in the stormwater discharges included street sweeping to remove particulates from streets and parking lots. Under this mitigation approach, the separate stormwater systems would no longer divert 80 percent of the initial stormwater flows to the combined sewer system, but instead, all stormwater from the Mission Bay South area would be directed to a separate stormwater system and discharged directly to the Bay. The master developer ultimately adopted and is currently implementing Mitigation Scenario B, as described in the Mission Bay South Infrastructure Plan.

The FSEIR estimated that by diverting all stormwater runoff from the combined sewer system, implementation of Mitigation Scenario B would increase direct stormwater discharges from Mission Bay South to the Bay by 107.2 million gallons per year. Because none of the stormwater from Mission Bay South would be discharged to the combined sewer system, this mitigation approach would reduce the total Bayside CSD volume by 33 million gallons per year relative to baseline conditions at the time of Mission Bay FSEIR publication. Implementation of this mitigation approach satisfies the requirements of Mission Bay FSEIR Mitigation Measures K.3 and K.4.

5.9.3 Setting

5.9.3.1 Combined Sewer System

The Bayside drainage basin covering the east side of San Francisco consists of three distinct regulatory receiving water CSD basins and their watershed associations: North Shore (North Shore watershed), Central (Channel watershed in its entirety and a portion of Islais Creek watershed), and South (remainder of the Islais Creek Watershed and the entirety of Yosemite and Sunnydale watersheds), as shown on **Figure 5.9-1**. As also described in the Mission Bay FSEIR, the SEWPCP continues to treat up to 150 mgd of wastewater from each of these CSD basins to a secondary level.[3] During dry weather, wastewater flows consist mainly of municipal and industrial sanitary sewage, and the annual average wastewater flow during dry weather is 60 mgd[4] (reduced by 7 mgd from the 67 mgd reported in the Mission Bay FSEIR in 1998). The average dry weather design flow capacity of the SEWPCP is 84.5 mgd; therefore the existing flows are about 71 percent of the treatment capacity, and all dry weather wastewater flow is

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3 Secondary treatment is the treatment of wastewater or sewage involving removal of organic matter using biological and chemical processes. This is a higher level of treatment than primary treatment, which is removal of floating and settleable solids using physical operations such as screening and sedimentation. Secondary treatment is less intensive than tertiary treatment, in which additional chemical and biological treatment processes are used to remove additional compounds that may be required for discharge or reuse purposes.

4 San Francisco Water Power Sewer, *San Francisco's Wastewater Treatment Facilities*. June, 2014.

SOURCE: San Francisco Water Power Sewer, 2013; RWQCB, 2013

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E:
Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 5.9-1
Bayside Drainage Basin Urban Watersheds

treated to a secondary level at the SEWPCP. The treated wastewater is then discharged to the Bay through the deep water outfall at Pier 80, located immediately to the north of the Islais Creek Channel in compliance with the current NPDES permit.

In areas of the City without separate stormwater systems, the combined sewer system collects large volumes of stormwater runoff in addition to municipal and industrial sanitary sewage during wet weather (generally October through April). The combined wastewater and stormwater flow is conveyed to treatment facilities, including the SEWPCP and North Point Wet Weather Facility, before eventual discharge to the Bay. The combined flows that exceed the total 400 mgd capacity of the SEWPCP and the North Point Wet Weather Facility and the 125-million-gallon storage capacity of the transport and storage structures receive the equivalent of primary treatment in the structures; excess flows are directed to CSD structures located along the shoreline in compliance with the City's NPDES permit issued by the RWQCB.

The CSD structure for the reconfigured Mariposa sub-basin discharges to the Central Basin of Lower San Francisco Bay[5] at Mariposa Street when the 11.2 mgd wet weather capacity of the Mariposa Pump Station and 0.7 million gallon capacity of the Mariposa storage and transport box is exceeded (see Section 5.7, Utilities and Service Systems, for a description of these facilities). The Mariposa sub-basin is designed for a long-term average of 10 CSDs per year.[6] Although the system was designed and constructed based on meeting this long-term average, it is understood that some years are wetter than others. Therefore, the NPDES permit allows the 10-discharge annual average to be exceeded in any particular year as long as the long-term average is maintained at the appropriate level. Historically, the Mariposa sub-basin has exceeded an average of 10 overflows per year.[7]

The CSDs from the reconfigured Central sub-basin in the project vicinity are discharged to Mission Creek via six discharge structures when flows at the Channel Pump Station exceed 80 mgd, or when total flows to the SEWPCP from the Channel and Bruce Flynn Pump Stations and SEWPCP lift station exceed 250 mgd. The facilities in this basin are also designed for a long-term average of 10 overflows per year, and the basin has historically reported an average of 10 overflows per year.[8]

5.9.3.2 Flooding

Some low lying areas along San Francisco’s Bay shoreline are subject to flooding during periods of extreme high tides, storm surge and waves, although these occurrences are relatively rare in San Francisco compared to areas prone to hurricanes or other major coastal storms or to developed areas near or below sea level. In 2008, the City and County of San Francisco (CCSF)

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5 This basin is a surface water body that is an inlet of Lower San Francisco Bay, and is not the same as the Central sub-basin of the City’s combined sewer system where the northern portion of the project site is located.

6 San Francisco Public Utilities Commission, *Task 500, Technical Memorandum No. 509, Combined Sewer Discharges, Final Draft*. December, 2010.

7 San Francisco Public Utilities Commission, *Task 600, Technical Memorandum No. 603, Collection System Configurations Analysis and Impact on Combined Sewer Discharge, Final Draft*. December, 2010.

8 San Francisco Public Utilities Commission, *Task 600, Technical Memorandum No. 603, Collection System Configurations Analysis and Impact on Combined Sewer Discharge, Final Draft*. December, 2010.

adopted interim flood maps depicting the 100-year flood zone along the City's Bay shoreline; the identified flood zones in the project area are shown on **Figure 5.9-2**. The 100-year flood zone represents areas that are subject to flooding once every 100 years on average or that have a 1-percent chance of flooding in any single year. Flooding in these areas has the potential to damage buildings and infrastructure. Due to the continuing development of Mission Bay, some of the areas identified as being subject to flooding may no longer be flood prone when grading is completed to raise building sites above the 100-year floodplain.

As shown on Figure 5.9-2, the project site is not located within a currently identified 100-year flood zone based on the City's interim floodplain maps. Therefore, this section discusses the factors contributing to coastal flooding and the potential for increased flooding in the future as a result of sea level rise.

Factors Contributing to Coastal Flooding

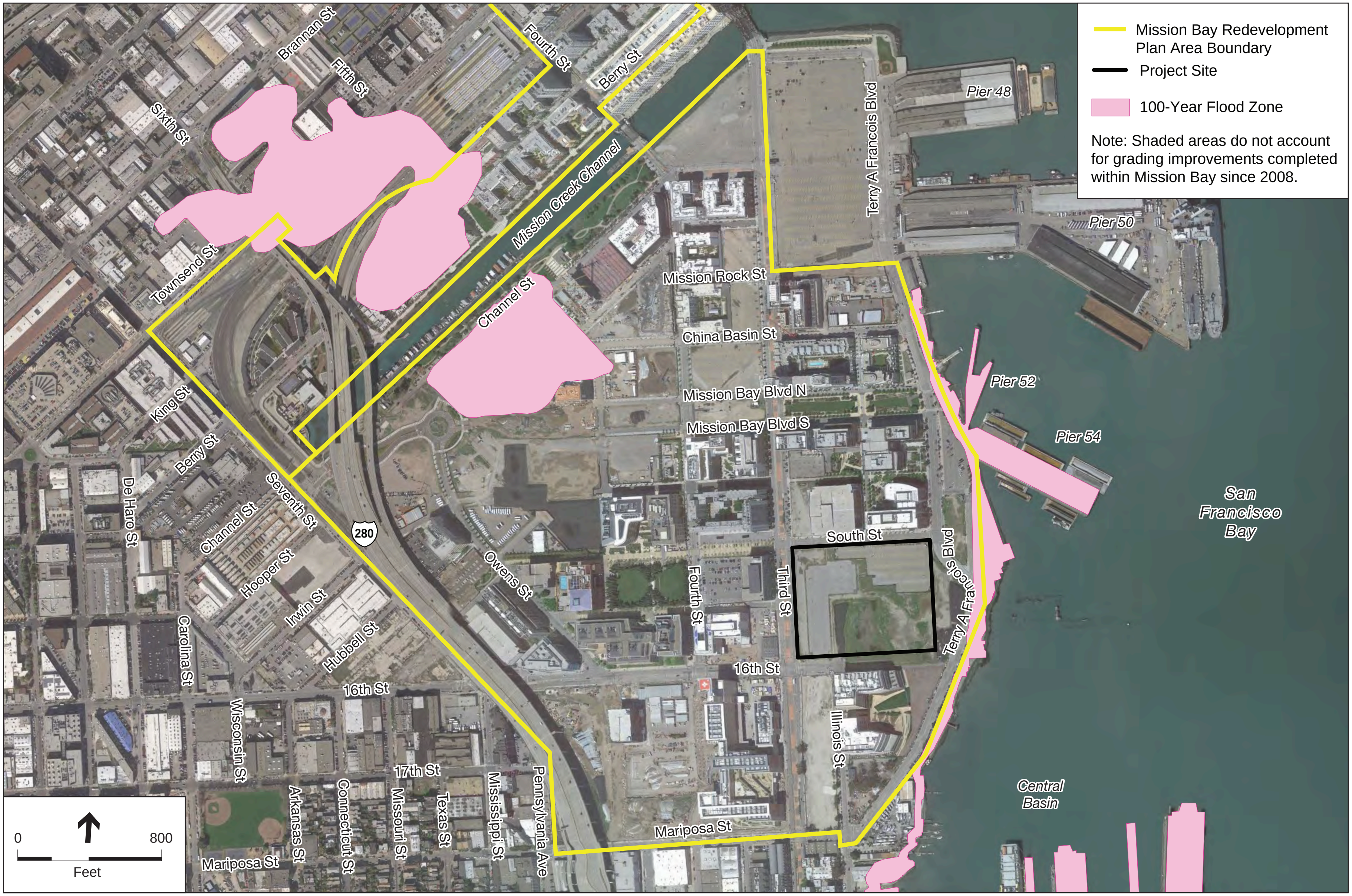
Coastal areas are vulnerable to periodic flooding due to storm surge, extreme tides, and waves. Rising sea level due to climate change has the potential to increase the frequency, severity, and extent of flooding in coastal areas. These factors are described below.

Storm Surge. Storm surge occurs when persistent high winds and changes in air pressure push water towards the shore, which can raise the water level near the shoreline by several feet and may persist for several days. Along San Francisco's bay shoreline, storm surge typically raises the surface water elevation 2 to 3 feet during major winter storms several times a year. Extreme high tides in combination with storm surge can cause inundation of low-lying roads, boardwalks, and promenades; can exacerbate coastal flooding; and can interfere with stormwater and sewer outfalls.

The degree of storm surge depends on the severity of the storm as well as tidal levels at the time of the storm and is characterized using a return period which represents the expected frequency of a storm event occurring based on historical information. One-year storm surge is expected to occur each year while 100-year storm surge (which represents more extreme conditions) has a one percent chance of occurring in any year.

Tides. Diurnal (twice daily) high tides along San Francisco's bay shoreline typically range from approximately 5 to 7 feet (NAVD88), though annual maximum tides may exceed 7 feet. The twice yearly extreme high and low tides are called "king tides." These occur each year during the winter and summer when the earth, moon and sun are aligned, and may be amplified by winter weather. King tides and other high tides can result in temporary inundation of low-lying roads, boardwalks, and waterfront promenades. A portion of The Embarcadero Promenade near Pier 14 and the Marina area in San Francisco experience inundation under current king tide conditions.[9]

[9] San Francisco Public Utilities Commission. *Climate Stressors and Impact: Bayside Sea Level Rise Mapping, Final Technical Memorandum.* June 2014. A copy of this document is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2014.1441E.



SOURCE: City and County of San Francisco, 2008

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E:
Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 5.9-2
2008 Adopted Interim Flood Map of 100-Year Flood Zones

Waves. Waves and wave run-up primarily affect a narrow band along the shoreline where wave energy can damage structures and overtop both natural embankments and shoreline protection structures such as seawalls and levees. The influence of waves diminishes inland as wave energy dissipates. In addition, the Pacific Ocean waves which are generally larger than those originating in the Bay are substantially dampened along the Bay shoreline due to transformation processes within San Francisco Bay.

Sea Level Rise. Seas are rising globally due to climate change, and they are expected to continue to rise at an accelerating rate for the foreseeable future. The sea level at the San Francisco tidal gauge has risen 8 inches over the past century.

The National Research Council's (NRC) 2012 report, *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (the NRC Report) provides a scientific review of sea level rise for the West Coast and provides the most recent regional sea level rise predictions for 2030, 2050, and 2100, relative to the year 2000 sea level.[10] In this report, the NRC projects that sea levels in the San Francisco Bay area will rise 11 inches by 2050 and 36 inches by 2100 as presented in **Table 5.9-1**. As presented in the NRC Report, these sea level rise projections represent likely sea level rise values based on the current understanding of global climate change and assuming a moderate level of greenhouse gas (GHG) emissions[11] and extrapolation of continued accelerating land ice melt patterns, plus or minus one standard deviation.[12]

TABLE 5.9-1
SEA LEVEL RISE ESTIMATES FOR
SAN FRANCISCO BAY RELATIVE TO THE YEAR 2000

Year	Projection
2030	6 ± 2 inches
2050	11 ± 4 inches
2100	36 ± 10 inches

SOURCE: National Research Council, 2012

10 National Research Council, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*. Washington, DC: The National Academies Press, 2012. Available on the internet at: http://www.nap.edu/catalog.php?record_id=13389. Accessed on October 1, 2014.

11 Future emissions of greenhouse gases depend on a collection of human decisions at local, regional, national, and international levels as well as potential unknown technological developments. For this reason, future changes in greenhouse gas emissions cannot be accurately estimated, and a range of emissions levels is considered in the NRC Report. Estimates of sea level rise relative to thermal expansion of the oceans were formulated using the mid-level, or moderate level, of predicted changes in greenhouse gas emissions (from a combination of fossil and non-fossil fuels), as well as an assumption of high economic growth; this represents scenario "A1B" as described by the Intergovernmental Panel on Climate Change (IPCC).

12 One standard deviation roughly corresponds to a 15 percent/85 percent confidence interval, meaning that there is approximately 15 percent chance the value will exceed the high-end projection (8 inches for the 2030 example) and a 15 percent chance the value will be lower than the low-end projection (4 inches in 2030).

The estimates represent the permanent increase in Mean Sea Level and the associated average daily high tide conditions (represented by Mean Higher High Water, or MHHW)[13] that could result from sea level rise; they do not take into account storm surge, extreme tides, or waves, all of which can result in water levels that are temporarily higher than MHHW as discussed above.

In March 2013, the California Ocean Protection Council updated its 2010 statewide sea level rise guidance to adopt the NRC Report as the current, best available science on sea level rise for California.[14] The California Coastal Commission supports the use of the NRC Report as the best science currently available in its 2013 Draft Sea-Level Rise Policy Guidance, which also emphasizes the importance of regularly updating sea level rise projections as the science continues to advance.[15] The San Francisco Bay Conservation and Development Commission (BCDC) also considers the NRC Report to be the best available science-based prediction of sea level rise for San Francisco Bay. Accordingly, this SEIR considers the NRC Report to be the best science currently available on sea level rise affecting San Francisco for both CEQA and planning purposes.

Although the NRC Report provides the best available sea level rise projections for San Francisco Bay at this time, scientific uncertainty remains regarding the rate and magnitude of sea level rise. Sea level rise projections beyond 2050 are highly dependent on assumptions regarding future global GHG emissions and future changes in the rate of land ice melting. As a result of the uncertainties inherent in these assumptions, the range of sea level rise predictions becomes substantially broader beyond 2050 (see Table 5.9-1). In recognition of this uncertainty, the State of California Sea-Level Rise Guidance recommends an adaptive management approach for development in areas that may be subject to sea level rise beyond 2050.

Sea Level Rise Inundation Mapping

The San Francisco Public Utilities Commission (SFPUC), as part of the planning for its Sewer System Improvement Program, has developed a series of maps published in 2014 that represent areas of inundation along both the Bay and Ocean shorelines of San Francisco. These maps use a 1-meter horizontal grid resolution[16] based on the 2010/2011 California Coastal Mapping Program LiDAR.[17] The inundation maps leverage data from the Federal Emergency Management Agency's (FEMA) California Coastal Mapping and Analysis Project, which includes detailed coastal engineering analyses and mapping of the San Francisco Bay shoreline.

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13 Mean higher high water is the higher of each day's two high tides averaged over time.

14 *State of California Sea-Level Rise Guidance Document.* Developed by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust. March 2013 Update. Available on the internet at http://www.opc.ca.gov/webmaster/ftp/pdf/docs/2013_SLR_Guidance_Update_FINAL1.pdf. Accessed on October 1, 2014.

15 California Coastal Commission *Draft Sea Level Rise Policy Guidance, Public Review Draft. October* 14, 2013. Available on the internet at: http://www.coastal.ca.gov/climate/SLRguidance.html. Accessed on October 1, 2014.

16 The horizontal grid resolution of a digital elevation model (DEM) defines the scale of the features that are modeled; this is generally the minimum resolution necessary to depict levees, berms, and other topographic features important to diverting floodwaters.

17 LiDAR (Light Detection and Ranging) is a remote sensing technology that measures distance by illuminating a target with a laser and analyzing the reflected light. LIDAR is commonly used to create high-resolution terrain models, topography data sets, and topographic maps.

The SFPUC inundation maps evaluate scenarios that represent the NRC projections of sea level rise in combination with the effects of storm surge. They represent permanent inundation that could occur as a result of total water level rises (over and above year 2000 MHHW) based on daily tidal fluctuations. Each scenario also addresses temporary inundation that could occur from extreme tides and from 1-year, 2-year, 5-year, 25-year, 50-year, and 100-year storm surge. Flooding as a result of storm surge would occur on a temporary basis, during and immediately after a storm event or extreme tide.

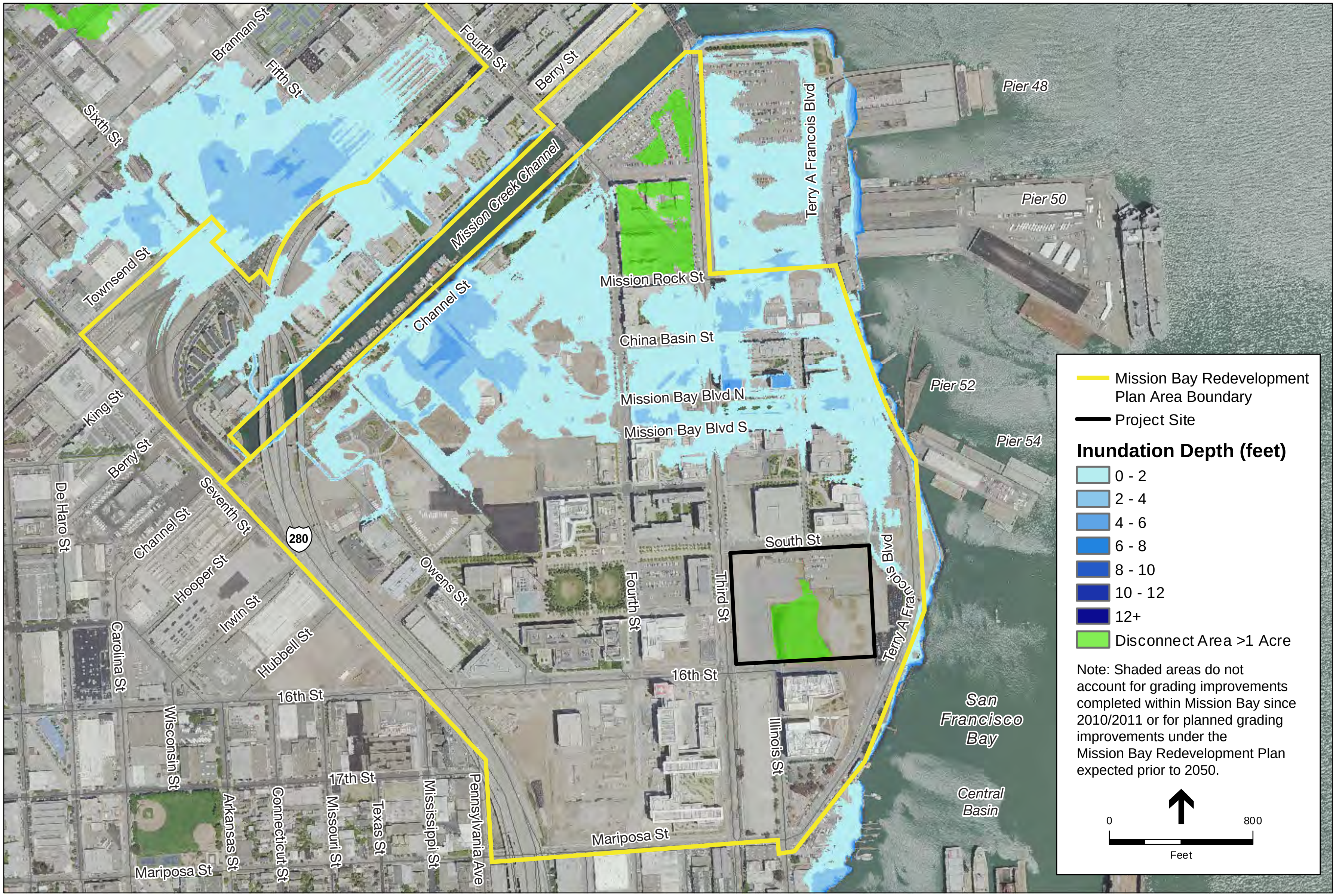
The scenarios used in this SEIR analysis, listed below, are representative of inundation that could occur by the year 2050 and the year 2100, based on the NRC's projected level of sea level rise and considering a 100-year storm surge:

- MHHW plus 12 inches of sea level rise (representative of NRC's projected sea level rise by 2050);
- MHHW plus 36 inches of sea level rise (representative of NRC's projected sea level rise by 2100);
- MHHW plus 52 inches of sea level rise (representative of NRC's projected sea level rise by the year 2050 in combination with a 100-year storm surge); and
- MHHW plus 77 inches of sea level rise (representative of NRC's projected sea level rise by the year 2100 in combination with a 100-year storm surge).

The SFPUC cautions that its maps represent a "do nothing" scenario, in which no measures are taken to prevent future flooding and no area-wide measures such as waterfront protection structures are constructed. In the event that the City undertakes area-wide measures to protect against inundation in the future, the mapping would need to be revised to reflect the modified inundation areas with construction of these measures. In addition, because the SFPUC sea level rise maps are based on 2010/2011 topographic mapping, they do not account for planned increases in the base elevation of sites within Mission Bay that are provided in the 1998 Mission Bay Redevelopment Plan to prevent future flooding due to sea level rise.

As shown on **Figure 5.9-3**, the SFPUC inundation maps indicate that the project site would not be inundated with water level rises of 12 inches, which is expected by 2050, even when the effects of 100-year storm surge are considered.[18] In addition, the project site would not be inundated with 36 inches of sea level rise which is expected by 2100. However, when the effects of a 100-year storm surge are considered in combination with 36 inches of sea level rise, the site could be flooded to depths of between 2 and 4 feet as shown on **Figure 5.9-4**.[19]

[18] Note that the green zone shown within the project site on Figure 5.9-3 is the open excavation that is not hydrologically connected to flooding zones and would be filled when the site is developed.
[19] Note that greater inundation depths are indicated on Figure 5.9-4 in the area of the open excavation, but this excavation would be filled when the site is developed.

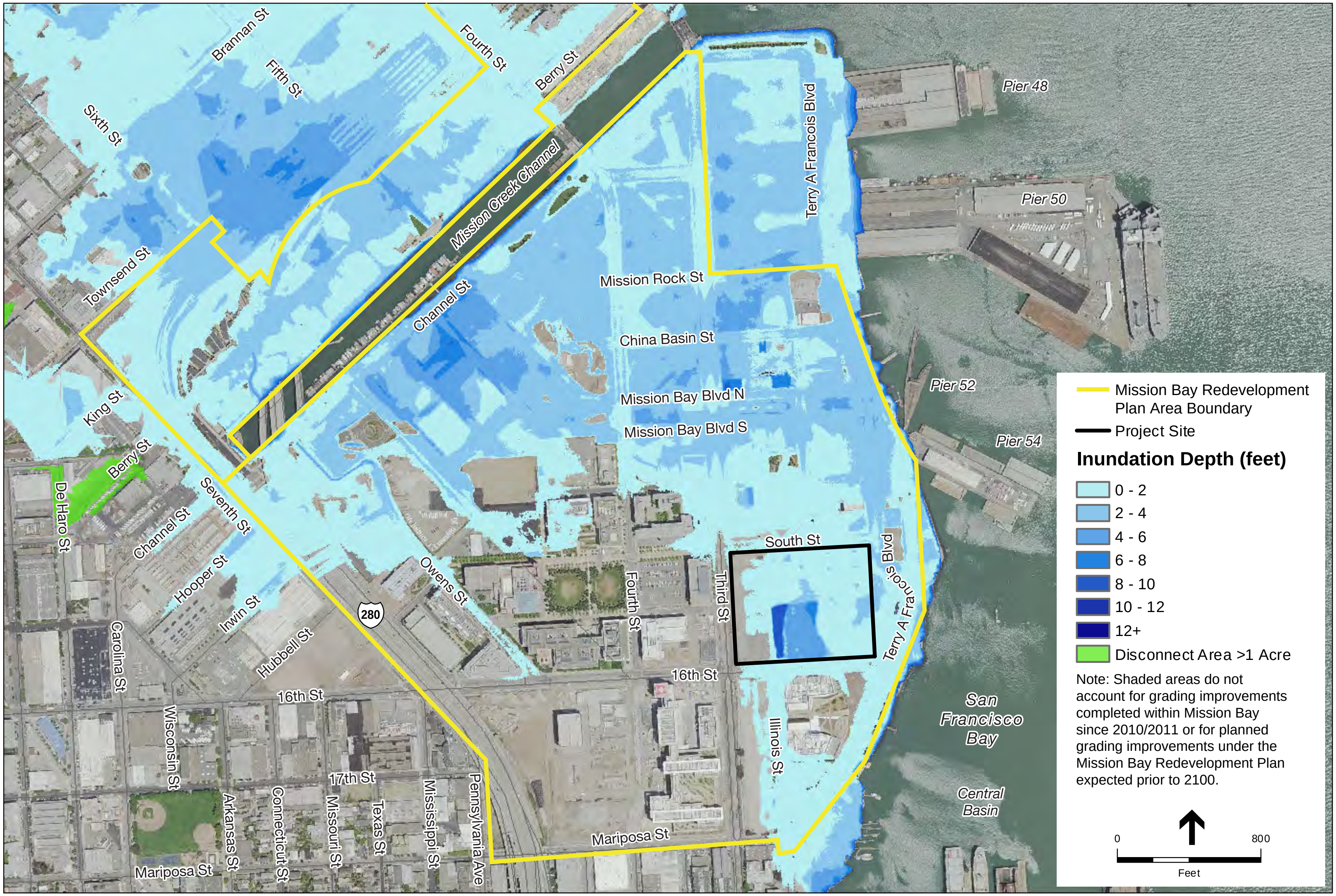


Note: Inundated area within the project site shown in green color is an existing open excavation that is not hydrologically connected to the flooding zones and would be filled as part of the project when the site is developed.

SOURCE: USDA, 2014; San Francisco Public Utilities Commission, 2014; AECOM, 2014; ESA, 2015

Note: The flood zones depicted are based on topographic data from 2010/2011 and do not account for planned increases in the base elevation of sites within Mission Bay that are provided for in the Mission Bay Redevelopment Plan. Actual flood zones will be determined by topography under built out conditions, and the effects of area-wide flood protection measures that may be provided in the future.

Figure 5.9-3
Projected Inundation by 2050, with 12 Inches of Sea Level Rise Plus 100-Year Storm Surge



Note: Inundated area within the project site with depths greater than four feet is an existing open excavation that would be filled as part of the project when the site is developed.

SOURCE: USDA, 2014; San Francisco Public Utilities Commission, 2014; AECOM, 2014; ESA, 2015

Note: The flood zones depicted are based on topographic data from 2010/2011 and do not account for planned increases in the base elevation of sites within Mission Bay that are provided for in the Mission Bay Redevelopment Plan. Actual flood zones will be determined by topography under built out conditions, and the effects of area-wide flood protection measures that may be provided in the future.

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E: Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 5.9-4

Projected Inundation by 2100, with 36 Inches of Sea Level Rise Plus 100-Year Storm Surge

Planning for Sea Level Rise in San Francisco

The City has convened an inter-agency Climate Adaptation Working Group to identify ways to make sure that it is prepared to adapt to effects of sea level rise. Participating agencies include the Department of the Environment, SFPUC, Planning Department, City Administrator's office, Port of San Francisco (Port), San Francisco International Airport (SFO), Department of Public Works (DPW), Municipal Transportation Agency (MTA), Department of Public Health, and Department of Recreation and Parks. The working group is focusing its effort on the City's most imminent adaptation concerns, including sea level rise along Ocean Beach and shores, flooding from storm surge and extreme rain events, an increased likelihood of extreme heat, and decreased fog that supports redwoods and local ecosystems. To address sea level rise and flooding, the working group is focusing on efforts to improve the existing coastal flood protection infrastructure in time to prevent significant flooding impacts from sea level rise. The working group will establish requirements addressing proper flood insurance for structures in low lying areas, flood-resilient construction of new developments within inundation areas, and a low-carbon foot print for new developments. The working group is also assessing the use of natural solutions such as wetlands to protect the shoreline.

On September 22, 2014, the City's Capital Planning Committee (CPC) adopted the *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation*, which was prepared by an inter-agency committee including the CPC, SFPUC, Port, SFO, DPW, MTA, and the Planning Department.[20] Accordingly, the City's capital planning program now requires the preparation of project-level sea level rise vulnerability and risk assessments for all City capital projects with a cost of $5 million or more that are located in areas potentially vulnerable to future flooding due to sea level rise.

Mayor Edwin M. Lee also established two interdepartmental committees to manage the City's efforts on addressing sea level rise: the Sea Level Rise (SLR) Coordinating and SLR Technical Committees. The SLR Coordination Committee was established in February of 2005 and is a director-level committee co-chaired by the Director of Citywide Planning at the Planning Department and the City Engineer and Deputy Director at the Department of Public Works. SLR Coordination Committee members also include the Chief Resiliency Officer, and senior staff from the Mayor's Office, the City Administrator's Office, SFO, the Port, the SFPUC, MTA, Department of Building Inspection (DBI), Office of Community Investment and Infrastructure (OCII), Office of Economic and Workforce Development (OEWD), and the Capital Planning Committee. The responsibilities of the Coordination Committee are as follows:

1. Coordinate the efforts of city departments and advise the Mayor's Office on policies, strategies, initiatives, and resolutions to deal with and plan for potential impact on San Francisco from sea level rise;

[20] City and County of San Francisco Sea Level Rise Committee, *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation*. September 22, 2014. Available online at http://onesanfrancisco.org/wp-content/uploads/San%20Francisco%20SLR%20Guidance%20Adopted%209.22.14%2012182014.pdf, accessed on February 5, 2015.

2. Coordinate local efforts and initiatives with the work of other governmental entities and various stakeholders at the regional, state, and national levels such as U.S. EPA, U.S. Department of Housing and Urban Development (HUD), Department of the Interior, California Coastal Commission, California Ocean Protection Council, Bay Conservation and Development Commission, etc.;

3. Provide guidance and specific recommendations to City departments with regard to land use and strategies to protect assets and communities along the shoreline;

4. Oversee and guide the existing SLR Technical Committee and implementation of the Capital Planning Guidance to address vulnerability and risks, and adaptability of the city's physical infrastructure; and

5. Promote coordination and collaboration among city departments, private utility providers, and other stakeholders.

The SLR Coordinating Committee is first charged with assessing the City's risk to sea-level rise. Once the data analysis phase is complete, the SLR Coordinating Committee will coordinate the City's SLR vulnerability assessment and adaptation planning efforts with local, regional, and national governmental and non-governmental organizations and with community stakeholders, as needed. Key to this effort will be determining how to best involve the community.

The SLR Technical Committee was established in February of 2015 and is comprised of the same membership that developed the Capital Planning Committee's Sea Level Rise Guidance, including the SFPUC, Port, DPW, SFO, SFMTA, SFMTA, Capital Planning, and the Planning Department. This committee is charged with assisting all city agencies with consistent implementation of the Guidance, revising the Guidance as needed, and assisting the SLR Coordinating Committee as requested.

The SFPUC is also addressing sea level rise as part of its Sewer System Improvement Program, and is conducting a detailed analysis of the potential for new and existing combined sewer infrastructure to be affected by sea level rise. [21] Accordingly, all new facilities will be built using a climate change criterion so the combined sewer system will be better able to respond to rising sea levels. Because rising sea levels and storm surge could potentially inundate the combined sewer system and exacerbate existing flooding from the sewer system, or cause new flooding, the SFPUC is also evaluating alternatives such as the installation of backflow preventers on the combined sewer discharge structures to restrict the intrusion of Bay water into the combined sewer system.

5.9.3.3 Trash in Waterways

Trash is of concern for San Francisco Bay because Lower San Francisco Bay is listed as an impaired water body under Section 303(d) of the Clean Water Act for trash. Plastic in the marine environment breaks into smaller and smaller pieces and it is eaten—often with fatal consequences—by fish,

[21] San Francisco Public Utilities Commission. *Bayside Drainage Basin Urban Watershed Opportunities, Final Draft Technical Memorandum.* July, 2014.

turtles, birds, and whales.[22] Aquatic debris threatens sensitive ecosystems and has been documented to kill or harm nearly 700 wildlife species. The debris also interferes with navigation, degrades natural habitats, costs millions of dollars in lost revenue, and is a threat to human health and safety. Most aquatic debris comes from land-based sources including littering, legal and illegal dumping, a lack of or poor waste management practices and recycling capacity, stormwater discharges, animal interference with garbage, and extreme natural events. The growing quantity of single-use plastic packaging contributes substantially to the amount of trash transported to waterways.

5.9.4 Regulatory Framework

5.9.4.1 Federal Regulations

Clean Water Act – Water Quality

In 1972, the Clean Water Act (CWA) established the basic structure for regulating discharges of pollutants into the waters of the United States and gave the U.S. EPA the authority to implement pollution control programs. The CWA sets water quality standards for contaminants in surface waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, to finance municipal wastewater treatment facilities, and to manage polluted runoff. The U.S. EPA has delegated responsibility for implementation of portions of the CWA, including water quality control planning and programs in California to the State Water Resources Control Board (SWRCB) and the nine RWQCBs. Water quality standards applicable to the project are listed in the *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan), discussed further below under State Regulations.

Section 303(d) and Total Maximum Daily Loads

In accordance with Section 303(d) of the CWA, States must present the U.S. EPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. The CWA requires the development of total maximum daily loads (TMDLs) to improve water quality of impaired water bodies. Implementation of this program in the project area is conducted by the RWQCB and is discussed below in Section 5.9.4.2, State Regulations.

Section 402

Section 402 of the CWA authorizes the U.S.EPA to establish a nationwide surface water discharge permit program for municipal and industrial point sources known as the NPDES program. Under Section 402, the San Francisco Bay RWQCB has set standard conditions for each permittee in the Bay Area, including effluent limitation and monitoring programs. Discharges of stormwater and wastewater from the proposed project would be subject to NPDES permits issued to the CCSF that are described in Section 5.9.4.2, State Regulations, below.

[22] National Resources Defense Council, *NRDC News Brief, Waste in our Water: The Annual Cost to California Communities of Reducing Litter That Pollutes our Waterways*. August, 2013.

Federal Combined Sewer Overflow Control Policy

In 1994, the U.S. EPA adopted the Combined Sewer Overflow Control Policy (CSO Control Policy), which became part of the CWA in December 2000. This policy establishes a consistent national approach for controlling discharges from combined sewers to the nation's waters. Using the NPDES permit program, the permittee is required to implement the following nine minimum controls that constitute the technology-based requirements of the CWA and can reduce the frequency of CSDs and their effects on receiving water quality:

1. Conduct proper operation and regular maintenance programs for the combined sewer system and CSD outfalls;
2. Maximize the use of the collection system for storage;
3. Review and modify pretreatment programs to minimize the effect of non-domestic discharges to the collection system;
4. Maximize flow to the SEWPC and North Point Facility for treatment;
5. Prohibit CSDs during dry weather;
6. Control solids and floatable materials in CSDs;
7. Develop and implement a pollution prevention program focused on reducing the effect of CSDs on receiving waters;
8. Notify the public of CSDs; and
9. Monitor to effectively characterize CSD effects and the efficacy of CSD controls.

The City is currently implementing these controls as required by the CSO Control Policy and has also developed a long-term control plan to optimize operations of the wastewater collection and treatment system and maximize pollutant removal during wet weather.

Consistent with the CSO Control Policy and the Long-Term Control Plan, the City captures and treats 100 percent of the combined sewage flow collected in the combined sewer system during precipitation events. Captured flows are directed first to the SEWPCP and North Point Facility for primary or secondary treatment. Flows in excess of the capacity of these facilities are diverted to storage and transport boxes constructed around much of the City, and receive the equivalent to primary treatment prior to discharge to San Francisco Bay. The Long-Term Control Plan specifies operational parameters that must be met in each drainage basin before a CSD can occur, and includes the following long-term average annual design goals for CSDs:

- Four CSD events along the North Shore
- Ten CSD events from the Central Basin
- One CSD event along the Southeast Sector

Although the Mariposa sub-basin has historically exceeded the long-term goal of ten CSD events per year as discussed above, the City is currently meeting these long-term average design goals for the overall Bayside drainage basin.

5.9.4.2 State Regulations

California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for protection of the quality of waters of the State of California for use and enjoyment by the people of California. The act also establishes provisions for a statewide program for the control of water quality, recognizing that waters of the state are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the state. The statewide program for water quality control is therefore administered most effectively on a local level with statewide oversight. Within this framework, the act authorizes the SWRCB and RWQCBs to oversee the coordination and control of water quality within California.

San Francisco Bay Water Quality Control Plan (Basin Plan)

San Francisco Bay waters are under the jurisdiction of the San Francisco Bay RWQCB which established regulatory standards and objectives for water quality in the Bay in the *Water Quality Control Plan for the San Francisco Bay Basin*, commonly referred to as the Basin Plan.[23] The Basin Plan identifies existing and potential beneficial uses for surface waters and provides numerical and narrative water quality objectives designed to protect those uses. The preparation and adoption of water quality control plans is required by the California Water Code (Section 13240) and supported by the federal CWA. Because beneficial uses, together with their corresponding water quality objectives, can be defined per federal regulations as water quality standards, the Basin Plan is a regulatory reference for meeting the state and federal requirements for water quality control. Adoption or revision of surface water standards is subject to the approval of the U.S. EPA.

The proposed project site is located adjacent to Lower San Francisco Bay which extends from approximately the Bay Bridge on the north to the Dumbarton Bridge on the south. The CSD structure for the Mariposa sub-basin of the City's combined sewer system discharges to Central Basin, an inlet of Lower San Francisco Bay along the City's bay shoreline. The CSD structures for the Central sub-basin of the combined sewer system discharge to Mission Creek which ultimately drains to Lower San Francisco Bay. Identified beneficial uses for Central Basin of Lower San Francisco Bay and Mission Creek include commercial and sport fishing, estuarine habitat, wildlife habitat, water contact recreation, noncontact water recreation, and navigation. Identified beneficial uses for Lower San Francisco Bay include industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation.

[23] San Francisco Bay Regional Water Quality Control Board (RWQCB), *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan), June 29, 2013. Available online at http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/planningtmdls/basinplan/web/docs/BP_all_chapters.pdf. Accessed February 5, 2015.

Impaired Water Bodies and Total Maximum Daily Loads

As described above under Section 303(d) of the CWA, States must present the U.S. EPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. The proposed project is located approximately 230 feet inland from Lower San Francisco Bay. The RWQCB has listed Lower San Francisco Bay as an impaired water body for chlordane, DDT, dieldrin, dioxins, furan compounds, mercury, PCBs, invasive species, and trash.[24]

The Central Basin of Lower San Francisco Bay, where the CSD structure for the Mariposa sub-basin discharges, is listed as an impaired water body for the chlordane, DDT, dieldrin, dioxin compounds, furan compounds, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, mercury, selenium, and invasive species. The sediments of the Central Basin are listed for mercury and polycyclic aromatic hydrocarbons.

Mission Creek, where the CSD structures for the reconfigured Central sub-basin of the combined sewer system discharge, is listed as an impaired water body for ammonia, hydrogen sulfide, and polycyclic aromatic hydrocarbons. The sediment of Mission Creek is listed for chlordane, dieldrin, lead, mercury, PCBs, silver, and zinc.

As required by the CWA, the U.S. EPA requires the development of TMDLs to improve water quality of impaired water bodies. The first step of the TMDL process is development of a TMDL report describing the water quality problem, detailing the pollutant sources, and outlining the solutions. An implementation plan, included in the TMDL report, describes how and when pollution prevention, control, or restoration activities will be accomplished and who will be responsible for these actions. The final step of the TMDL process is adopting and amending the Basin Plan to legally establish the TMDL and to specify regulatory requirements for compliance. As part of a Basin Plan amendment, waste load allocations are specified for entities that have permitted discharges.

TMDLs for polychlorinated biphenyls and mercury in San Francisco Bay have been approved by the U.S. EPA and officially incorporated into the Basin Plan. The RWQCB also adopted the San Francisco Bay Watershed Permit (Order No. R2-2012-0096) which addresses mercury and polychlorinated biphenyls (PCBs) in municipal and industrial wastewater discharges.[25]

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[24] State Water Resources Control Board, 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) — Statewide. http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed on October 2, 2014.

[25] San Francisco Bay Regional Water Quality Control Board, *Waste Discharge Requirements for Mercury and PCBs from Municipal and Industrial Wastewater Discharges to San Francisco Bay, Order No. R2-2012-0096, NPDES No. CA0038849*, adopted December 12, 2012. http://www.waterboards.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2012/R2-2012-0096.pdf pdf, accessed on October 2, 2014.

NPDES Waste Discharge Regulations

As discussed above in Section 5.9.4.1, Federal Regulations, Section 402 of the federal CWA established the NPDES program to protect water quality of receiving waters. The NPDES program requires all facilities that discharge pollutants into waters of the United States to obtain a permit. The permit provides two levels of control – technology-based limits and water-quality-based limits – to control discharge of pollutants for the protection of water quality. Technology-based limits are based on the ability of dischargers in the same category to treat wastewater, while water quality-based limits are required if technology-based limits are not sufficient to protect the water body. Water quality-based effluent limitations required to meet water quality criteria in the receiving water are based on criteria specified in the National Toxics Rule, the California Toxics Rule, and the Basin Plan. NPDES permits must also incorporate TMDL wasteload allocations when they are developed. In California, the SWRCB and the RWQCBs implement and enforce the NPDES program.

Small MS4 General Stormwater Permit

In 2003, the SWRCB adopted the General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer System (MS4s), SWRCB Order No. 2003-0005-DWQ. An updated permit, Order No. 2013-001-DWQ, was adopted by the SWRCB on February 5, 2013 and became effective on July 1, 2013 (the updated Phase II General MS4 NPDES Permit). Areas that drain to separate stormwater collection systems in San Francisco are subject to this permit. The Mission Bay FSEIR was published in 1998, prior to passage of the first Phase II General MS4 NPDES Permit.

The updated Phase II General MS4 Permit identifies specific BMPs and management measures to be addressed and requires permittees to submit a guidance document to the SWRCB documenting their strategies for complying with permit requirements. The required program includes specific elements related to program management, education and outreach on stormwater impacts, public involvement/participation, illicit discharge detection and elimination, construction site stormwater runoff and control, pollution prevention/good housekeeping for permittee operations, post-construction stormwater management for new development and re-development, water quality monitoring requirements, program effectiveness assessment, and annual reporting. For renewal permittees such as the CCSF, the guidance document must identify and describe BMPs included in their previous Stormwater Management Plan that may be more protective of water quality than the minimum requirements of the updated permit, and identify whether the permittee proposes to maintain, reduce, or cease implementation of the BMP.

While the UCSF Mission Bay Campus utilizes the Mission Bay South separate stormwater system that has been constructed within the reconfigured Central sub-basin and will use the separate system under construction in the Mariposa sub-basin along with the rest of the development in Mission Bay South, the campus is considered a non-Traditional Small MS4 permittee under the updated Phase II General MS4 NPDES permit. In accordance with this permit, UCSF has implemented its own management program for stormwater discharges from campus facilities.

Southeast Plant, North Point, and Bayside Facilities NPDES Permit

The City currently holds an NPDES permit (RWQCB Order No.R2-2013-0029) adopted by the RWQCB in August 2013, that covers the SEWPCP, the North Point Wet Weather Facility, and all of the Bayside wet-weather facilities, including CSDs to the Bay.[26] The permit specifies discharge prohibitions, dry-weather effluent limitations, wet-weather effluent performance criteria, receiving water limitations, sludge management practices, and monitoring and reporting requirements. The permit prohibits overflows from the CSD structures during dry weather, and requires wet-weather overflows to comply with the nine minimum controls specified in the federal Combined Sewer Overflow Control Policy, described above, and the City's Long Term Control Plan. Areas in the Bayside drainage basin that drain to the City's combined sewer system are subject to this permit.

As discussed above in Section 5.9.4.2, Federal Regulations (Federal Combined Sewer Overflow Control Policy), the NPDES permit does not explicitly regulate the number, volume, duration, or frequency of CSDs from the combined sewer system, but instead requires that the system meets the long-term average annual design goals for CSDs from each sub-basin. Under the Long-Term Control Plan, the City must optimize operations of the combined sewer system to minimize CSD frequency, magnitude, and duration and maximize pollutant removal during wet weather and must also provide treatment of all discharges from the combined sewer system, including CSDs. The NPDES permit also requires the City to monitor the water quality of all CSDs and the efficacy of wet weather discharge controls. If the CSDs cause a violation of water quality standards in the receiving water, the City must evaluate its Long-Term Control Plan and combined sewer system operation to ensure compliance with water quality standards.

Volatile Organic Compound and Fuel General NPDES Permit

The RWQCB has issued Order Number R2-2012-0012 which is a general permit for the discharge of extracted and treated groundwater resulting from the cleanup of groundwater polluted by volatile organic compounds and fuels (VOC and Fuel General Permit).[27] The permit specifies water quality criteria for the discharges, receiving water limitations, and discharge prohibitions (including flow rate and restrictions on scouring and erosion). Monitoring requirements for demonstrating permit compliance are also specified. To obtain authorization to discharge under this permit, the discharger must submit a Notice of Intent describing the proposed discharge and treatment system and the RWQCB must issue an Authorization to Discharge once it is determined that the discharger is eligible to discharge under the permit.

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[26] Regional Water Quality Control Board, San Francisco Bay Region, National Pollutant Discharge Elimination System (NPDES) Permit No. CA0037664, Order No.R2-2013-0029, for City and County of San Francisco Southeast Water Pollution Control Plant, North Point Wet Weather Facility, Bayside Wet Weather Facilities and Wastewater Collection System., adopted January 31, 2008.

[27] San Francisco Bay Regional Water Quality Control Board, General Waste Discharge Requirements for Discharge or Reuse of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Volatile Organic Compounds (VOC), Fuel Leaks and Other Related Wastes (VOC and Fuel General Permit). Order No. R2-2012-0012, NPDES No. CAG912002.

5.9.4.3 Local and Regional Regulations and Plans

Stormwater and Wastewater Management

SFPUC Storm Water Management Plan

San Francisco has obtained coverage under the updated Phase II General MS4 Permit described above for separate storm sewer systems under its jurisdiction. In accordance with this permit, the SFPUC is required to submit a guidance document to the SWRCB documenting its strategies for complying with permit requirements. San Francisco's Storm Water Management Plan (SWMP), prepared under the previous General MS4 Permit,[28] will remain in effect until the guidance document is completed. The SWMP is comprised of six program areas that address water quality: public education and outreach, public involvement/participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management in new development and redevelopment, and pollution prevention/good housekeeping for municipal operations. The SWMP thereby requires implementation of a variety of stormwater pollution reduction measures that mirror these six program areas, including the implementation of stormwater BMPs (such as construction period BMPs and post-construction BMPs).

The project area would drain to the new separate stormwater system and would be subject to all provisions and regulatory requirements set forth by the SFPUC, including compliance with the SWMP and the guidance document, once the SFPUC assumes jurisdiction over the storm sewer system.

Stormwater Design Guidelines

Development projects that discharge stormwater to either the combined sewer system or a separate stormwater system must comply with Article 4.2 of the San Francisco Public Works Code, Section 147, which was adopted in 2010 (subsequent to publication of the Mission Bay FSEIR). The SFPUC and the Port of San Francisco have developed *San Francisco Stormwater Design Guidelines* in accordance with the requirements of the Phase II General MS4 NPDES Permit and Article 4.2, Section 147. [29] The SFPUC is currently updating the guidelines to reflect changes in the updated Phase II General MS4 Permit.

The Stormwater Design Guidelines require compliance with specified stormwater management requirements and provide five tools to help project developers achieve compliance with stormwater management requirements:

- A step-by-step guide describing how to manage stormwater onsite
- A set of stormwater BMP fact sheets

[28] San Francisco Public Utilities Commission, *San Francisco Stormwater Management Plan, Annual Report 2009 (Year 6)*, March 30, 2010.

[29] San Francisco Public Utilities Commission and Port of San Francisco, *San Francisco Stormwater Design Guidelines, November 2009*, http://www.sfwater.org/modules/showdocument.aspx?documentid=2779, accessed on October 2, 2014.

- A vegetation palette to assist in BMP-appropriate plant selection
- Sizing calculators to determine the required size of each BMP
- Maintenance checklists explaining the types and frequencies of the maintenance activities associated with each BMP

In accordance with the San Francisco Stormwater Design Guidelines, developers of projects that disturb more than 5,000 square feet of ground and discharge to a separate stormwater system must implement BMPs to reduce the flow rate and volume and improve the quality of stormwater going into the separate stormwater system. For covered projects, the stormwater management approach must capture and treat rainfall from the design storm of 0.75 inches. These projects would reduce or eliminate downstream water pollution by reducing impervious cover, eliminating sources of contaminants, treating pollutants in stormwater runoff, or increasing onsite infiltration.

The SFPUC inspects stormwater BMPs once they are constructed, and any issues noted by the inspection must be corrected. The owner is responsible for completing an annual self-certification inspection, and must submit completed checklists and maintenance logs for the year to the SFPUC. In addition, the SFPUC inspects all stormwater BMPs every third year. Any issues identified by either inspection must be resolved before the SFPUC can renew the certificate of compliance.

Projects that are required to implement the *San Francisco Stormwater Design Guidelines* are also subject to review by the San Francisco Building Inspection Commission, and are subject to building codes that include provisions for managing drainage for new construction. Specifically, Section 1101.1.1 of the San Francisco Plumbing Code and Section 1503.4 of the San Francisco Building Code allow roofs and other building areas to drain to locations other than the combined sewer.

Wastewater Discharges to the Combined Sewer System

Discharges of non-sewage wastewater to the combined sewer system are subject to the permit requirements specified in Article 4.1 of the San Francisco Public Works Code and supplemented by Department of Public Works Order No. 158170. The permit requires development and implementation of a pollution prevention program and specifies discharge limitations for specific chemical constituents as well as general conditions for the discharge. In addition, the discharge must meet the pretreatment standards specified in Article 4.1 and the discharger must monitor the discharge quality for compliance with permit limitations. The discharger must also submit periodic reports to the SFPUC and the CCSF conducts periodic inspections to ensure compliance.

San Francisco Sea Level Rise Guidance

As noted above, the CCSF has developed guidance for incorporating sea level rise into the planning of capital projects in San Francisco.[30] The guidance presents a framework for considering the effects of sea level rise on capital projects implemented by the CCSF and selecting appropriate adaptation

[30] City and County of San Francisco Sea Level Rise Committee, *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation*. September 22, 2014. Available online at http://onesanfrancisco.org/wp-content/uploads/San%20Francisco%20SLR%20Guidance%20Adopted%209.22.14%2012182014.pdf, accessed on February 5, 2015.

measures based on site-specific information. The planning process described in the guidance includes six primary steps:

- Review sea level rise science
- Assess vulnerability
- Assess risk
- Plan for adaptation
- Implement adaptation measures
- Monitor

As of September 2014, the CCSF considers the NRC report as the best available science on sea level rise in California. However, the guidance acknowledges that the science of sea level rise is continually advancing and projections of sea level rise may need to be updated at some point to reflect the most updated science. Sea level rise inundation maps prepared by the SFPUC, described above in Section 5.9.3.2, Flooding, are considered the most up-to-date maps and take into account both water level rises and the temporary effects of storm surge along the shoreline based on existing topography and conditions. The guidance states that the review of available sea level science should determine whether the project site could be subject to flooding during the lifespan of the project.

For those projects that cost $5 million or more that could be flooded during their lifespan, the guidance requires a vulnerability assessment based on the degree of flooding that could occur, the sensitivity of the project to sea level rise, and the adaptive capacity of the project site and design (the ability to adjust to sea level rise impacts without the need for substantial intervention or modification). The risk assessment takes into consideration the likelihood that the project could be adversely affected by sea level rise and the related consequences of flooding. An adaptation plan is required for projects that are found to be vulnerable to sea level rise and have a potential for substantial consequences. The plan should focus on those aspects of the project that have the greatest consequences if flooded. It should include clear accountability and trigger points for bringing adaptation strategies online as well as a well-defined process to ensure that milestones are being met and the latest science is being considered.

The CCSF sea level rise guidance document also acknowledges that there is some flexibility in how to plan for adaptations, and it may not always be feasible or cost effective to design and build for long-term potential sea level rise scenarios that are of a highly uncertain nature, such as the upper end of the NRC report range for the year 2100 (66-inches of sea level rise). In this case, a capital project constructed by the City could be designed and constructed to be resilient to the likely mid-century sea level rise (11± 4 inches by 2050). Under this guidance, an alternative approach for a city capital project would be to build the project to be resilient to the *likely* sea level rise by 2100 (36 inches), while including adaptive capacity to be resilient to the *upper range* of sea level rise estimates for 2100 (66 inches).

Under CEQA, the CCSF considers city projects that could be vulnerable to 100-year flooding in combination with sea level rise during their lifespan to have a significant risk related to flooding.

San Francisco Floodplain Management

San Francisco's Floodplain Management requirements are specified in the San Francisco Administrative Code, Article XX, Sections 2A.280 through 2A.285. For buildings located within a flood-prone area, this code requires the following:

- The building must be adequately anchored to prevent flotation, collapse, or lateral movement.
- The building must be constructed with materials and utility equipment that is resistant to flood damage, and with methods and practices that minimize flood damage.
- Electrical, heating, ventilation, plumbing, and air conditioning equipment must be designed or located to prevent water from entering or accumulating within the components during flooding.
- All water supply and sanitary sewage systems must be designed to minimize or eliminate infiltration of flood waters into the system as well as discharges from the systems into floodwaters.

For projects located in areas that could be prone to flooding from the combined sewer system during wet weather, the SFPUC may require additional actions such as provision of a pump station for sewage flows, raised elevation of entryways, special sidewalk construction, and deep gutters.[31]

Trash Management

Article 6 of the San Francisco Health Code, Garbage and Refuse, requires that properties have appropriate containers placed in appropriate locations for the collection of refuse. In accordance with this article, the refuse containers must be constructed with tight fitting lids or sealed enclosures, and the contents of the container may not extend above the top of the rim. The property owner must also have adequate refuse collection service. Article 6 also prohibits the dumping of refuse onto any streets or lands within San Francisco.

5.9.5 Impacts and Mitigation Measures

5.9.5.1 Significance Thresholds

For the impacts analyzed in this section, the project would have a significant impact related to hydrology and water quality if it were to:

- Violate any water quality standards or waste discharge requirements;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality; or

[31] San Francisco Planning Department, Planning Director Bulletin No. 4, Review of Project Identified in Areas Prone to Flooding.

- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

The analysis of violation of water quality standards or waste discharge requirements discussed in Impact HY-6 below also addresses the following significance criterion from Section 5.7, Utilities and Service Systems:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

The complete list of CEQA significance criteria used in the hydrology and water quality analysis is included in the Initial Study (see Appendix NOP-IS, pp. 86 through 98), which also explains why the proposed project would not result in new significant impacts or substantially increase the severity of impacts previously identified in the 1998 FSEIR on hydrology and water quality with respect to degradation of water quality during construction (Impact HY-1); depletion of groundwater and interference with groundwater recharge (Impact HY-2); alteration of drainage patterns (Impact HY-3); placement of housing within a 100-year flood zone; placement of structures within a 100-year flood zone (Impact HY-4); and flooding as a result of failure of a levee or dam; and inundation by seiche, tsunami, or mudflow (Impact HY-5). Therefore, no further analysis of these subjects is presented in this section. The hydrology and water quality section of the Initial Study determined that all construction-related hydrology and water quality impacts of the proposed project would be less than significant.

5.9.5.2 Approach to Analysis

Methodology for Analysis of Direct Impacts

Construction Impacts

Subsequent to publication of the Initial Study, the project sponsor conducted additional evaluation of dewatering requirements during construction and provided additional information regarding construction dewatering discharge options. This section presents a revised analysis of the water quality impacts of groundwater discharges based on the additional information. The analysis assumes that construction dewatering activities would be conducted in compliance with all applicable regulations, and the impact would be considered less than significant if proposed dewatering activities would not violate any water quality standards or waste discharge requirements, or otherwise degrade water quality. All other construction-related impacts of the proposed project are unchanged from what is presented in the Initial Study (see Appendix NOP-IS).

Operational Impacts

This section addresses two impacts associated with long-term operation of the proposed project. The first impact analyzes the potential for project-related changes in wastewater and stormwater to result in water quality effects; this impact addresses related significance criteria and is broken down into various aspects of wastewater and stormwater management. The second impact analyzes the potential for flooding impacts as related to sea level rise. The approach to analyzing these impacts is shown below relative to the applicable significance criteria:

***Exceed wastewater treatment requirements, violate water quality standard or waste discharge requirement, exceed the capacity of a storm drainage system, provide a substantial source of stormwater pollutants, or substantially degrade water quality*:** This analysis is related to the analysis presented in Section 5.7, Utilities and Service Systems, which evaluates impacts related to the *capacity* of wastewater or stormwater facilities, but this impact analysis focuses primarily on the potential to affect *water quality*. The impact analysis is broken down as described below.

- *Dry weather flows to combined sewer system:* The analysis considers whether the project would contribute additional wastewater to the City's combined sewer system to the extent that the contribution would cause the system to exceed the treatment requirements (with respect to volume and treatment level) or other permit requirements of the San Francisco Bay RWQCB NPDES permit for the SFPUC's Bayside wastewater facilities. The impact is considered less than significant if the increase in dry weather flows remains within the treatment capacity of the SEWPCP.

- *Wet weather flows to combined sewer system*: The impact analysis examines whether project-related increases in wastewater flows would contribute to combined sewer discharges during wet weather. The impact is considered less than significant if the increased flows would not increase the frequency of combined sewer discharges above the long-term average specified in the NPDES permit for the SEWPCP, the North Point Wet Weather Facility, and Bayside wet-weather facilities.

- *Effluent discharges from SEWPCP*: For the analysis of impacts related to changes in the quality of effluent discharges from the SEWPCP, the analysis considers whether discharges of wastewater to the combined sewer system would cause effluent quality to exceed the discharge limitations of the NPDES permit for the SEWPCP. If not, the impact is considered less than significant.

- *Direct discharges of stormwater runoff and storm drainage capacity*: The analysis considers whether the post-construction flows would be within the capacity of the newly constructed separate stormwater system in Mission Bay South or provide an additional source of stormwater pollutants that could degrade water quality. The impact is considered less than significant if the flows would be within the capacity of the stormwater system, and would not result in an additional source of stormwater pollutants.

- *Litter*: The analysis considers whether compliance with regulatory requirements for trash management would prevent substantial water quality degradation from litter that could be transported to the Bay via stormwater runoff or wind. If so, the impact is considered less than significant.

Expose people or structures to a significant risk from future flooding: The analysis considers whether people or structures on the project site could be exposed to a significant risk of loss, injury or death involving flooding as a result of sea level rise in combination with storm surge and extreme tides. The impact is considered less than significant if the project site would not be inundated during a 100-year coastal flood within the life of the project, or if the project would conform to flood resistant building standards and be capable of adapting to future flood hazard conditions.

Methodology for Analysis of Cumulative Impacts

Cumulative impacts related to combined sewer discharges and stormwater system inadequacies in the reconfigured Mariposa and Central sub-basins are operational impacts that could ultimately affect the water quality of Lower San Francisco Bay. Accordingly, the geographic scope of cumulative water quality impacts includes areas that drain to the reconfigured Mariposa and Central sub-basins. The cumulative analysis utilizes a list-based approach to analyze the effects of the project in combination with past, present, and probable future projects in this geographic area, including wastewater and stormwater flows resulting from full build-out of the Mission Bay South area and development of the Mission Bay Campus under the UCSF Long Range Development Plan (described in Section 5.1.5.2, Cumulative Projects for Operational Impacts), and assumes that operations of these projects would have to comply with the same regulatory requirements as the project. The analysis then considers whether or not there would be a significant, adverse cumulative impact associated with project implementation in combination with past, present, and probable future projects in the geographical area, and if so, whether or not the project's contribution to the cumulative impact would be significant (i.e., cumulatively considerable).

5.9.5.3 Impact Evaluation

Impacts HY-1 to HY-5: See Initial Study (Appendix NOP-IS), which includes all construction-related impacts of the proposed project, except that Impact HY-1 is modified below to account for new information regarding groundwater discharges during construction-related dewatering.

Project Impacts: Construction

Impact HY-1a: The project would not violate water quality standards or otherwise substantially degrade water quality with respect to construction-related dewatering. (Less than Significant)

Impact HY-1 of the Initial Study evaluated the potential for groundwater dewatering discharges during construction to violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality. Subsequent to publication of the Initial Study, the project sponsor developed additional information regarding construction dewatering discharge options, and the discussion below augments the discussion in the Initial Study.

Water Quality Effects of Groundwater Dewatering During Construction

Construction dewatering is expected to last approximately nine months. The initial estimated and peak water discharge rate is 1,850 gallons per minute (gpm) and would last three to four days.[32] By the end of the first week, the discharge rate would decrease to about 300 gpm, and by the end of the second week, to about 100 gpm. By the end of the initial 45-day construction period, the

[32] Shipman, Dorinda and Kimbrel, Elizabeth, Langan Treadwell Rollo, 2015. Memorandum to Kate Aufhauser, Golden State Warriors and Clarke Miller, Strada Investment Group regarding Construction Dewatering Discharge Options, Golden State Warriors Arena, San Francisco, California. February 17, 2015.

discharge rate would decrease to approximately 30 to 40 gpm, and this rate is expected to last for the remaining duration of the dewatering period, approximately seven and a half months. The project sponsor has evaluated multiple options for discharge of groundwater produced during construction dewatering including the following: (1) directly discharging to the City's combined sewer system; (2) installing an on-site dewatering treatment system and discharging the treated water to the Bay through an existing outfall if the capacity of the Mariposa pump station would be exceeded with the discharge; and (3) a combination of the first two options.()

For water discharged from the construction site to the combined sewer system, the discharges would be subject to the City's Industrial Waste Ordinance, adopted in 1992. This ordinance is found in Article 4.1 of the Public Works Code, as supplemented by Order No. 158170, which regulates the quantity and quality of discharges to the combined sewer system. In accordance with Article 4.1 and Order No. 158170, the discharge permit would contain appropriate discharge standards and may require installation of meters to measure the volume of the discharge. Although the groundwater could contain contaminants related to past site activities, as well as sediment and suspended solids, the construction contractors would be required to treat the groundwater as necessary to meet permit requirements prior to discharge to the combined sewer system, and discharge rates would be controlled so that the capacity of the sewer system would not be exceeded.

If discharged directly to the Bay, the discharges would be subject to permitting requirements of the RWQCB under the VOC and Fuel General NPDES permit, described in Section 5.9.4.2, State Regulations, which specifies water quality criteria and monitoring requirements for discharges of extracted and treated groundwater. Accordingly, under this option, the project sponsor or its contractors would be required to submit a Notice of Intent to the RWQCB describing the proposed discharge and treatment system, and the RWQCB must issue an Authorization to Discharge once it is determined that the discharger is eligible to discharge under the permit. The contractors would install an on-site treatment system that includes settling tanks for removal of sediments and treatment for hydrocarbons and metals. A treatability study would be conducted prior to discharge to demonstrate that the treatment system can effectively meet the discharge limitations.[33] The treated water would likely be discharged through a stormwater swale or an existing outfall pipe. Regular influent and effluent water quality monitoring would be conducted to demonstrate permit compliance.

The combined option could include directing a portion of the initial discharges to the Bay as described above until flows have subsided to the point that they are within the capacity of and meet the influent constituent concentration requirements of the Mariposa Pump Station. Discharges to both the Bay and the combined sewer system would be subject to the same permitting requirements as described above. With discharge to the combined sewer system in accordance with the City's Industrial Waste Ordinance as supplemented by Order No. 158170, or discharge to the Bay in accordance with the VOC and Fuel General NPDES permit as authorized by the RWQCB, water quality impacts related to a violation of water quality standards or

33 *Ibid.*

degradation of water quality due to discharge of groundwater produced during construction-related dewatering would be *less than significant*.

Mitigation: None required.

Comparison of Impact HY-1 (revised) to Mission Bay FSEIR Impact Analysis

The Mission Bay FSEIR determined that water quality impacts associated with groundwater discharges during construction-related discharges would be less than significant with discharge to the combined sewer system in accordance with Article 4.1 of the Public Works Code, as supplemented by Order No. 158170. While the anticipated flow rates could temporarily exceed those analyzed in the Mission Bay FSEIR, the discharge would be subject to Article 4.1 of the Public Works Code, as supplemented by Order No. 158170 or the VOC and Fuel General NPDES permit, which would ensure that the discharges do not exceed water quality criteria or cause water quality degradation. Therefore, the project would not result in any new significant impacts or substantially more severe impacts on water quality from construction-related dewatering activities than previously identified in the Mission Bay FSEIR.

Project Impacts: Operation

Impact HY-6: Operation of the proposed project could exceed the wastewater treatment requirements of the NPDES permit for the SEWPCP, violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality as a result of changes in wastewater and stormwater discharges to the Bay, or exceed the capacity of the separate stormwater system constructed in Mission Bay, or provide a substantial source of polluted runoff. Operation of the proposed project would not contribute to a substantial increase in combined sewer discharges. (Less than Significant with Mitigation)

This impact discussion covers multiple sources of potential effects on water quality and is broken down as follows: dry weather flows (sanitary sewage only) to the combined sewer system; wet weather flows (sanitary sewage and stormwater) to the combined sewer system; effluent discharges from the SEWPCP; direct discharges of stormwater runoff and storm drainage capacity; and litter.

Dry Weather Flows to the Combined Sewer System

The sewer analysis for the proposed project estimates that the total average wastewater flow would be 0.164 mgd and the peak wastewater flows would be 1.074 mgd.[34] During dry weather (typically, May 1 to October 15), all wastewater generated from the proposed project would be conveyed to and treated at the SEWPCP, which currently has available dry-weather treatment capacity of about 24.5 mgd, as described above in Section 5.9.3.1, Combined Sewer System. The

[34] BKF Engineers, 2015. Water and Sewer Analyses for Golden State Warriors Arena @ Mission Bay Blocks 29-32. January 9.

average flow from the project would be less than 0.7 percent of the remaining dry-weather treatment capacity of the SEWPCP, and the peak daily flow would be approximately 4.4 percent of the available capacity. Therefore, during dry weather, impacts related to exceeding the wastewater treatment requirements of the San Francisco RWQCB would be *less than significant*.

Wet Weather Flows to the Combined Sewer System

During wet weather (typically October 15 to April 30), there is a wide variation in volume of flow to the combined sewer system due to the addition of stormwater flows from areas of the City without separate stormwater systems. During severe rainstorms, the increased wet weather flows can exceed the combined 400 mgd treatment capacity of the Bayside wet weather facilities and the 125 million gallon capacity of the transport and storage boxes, resulting in a combined sewer discharge. The combined sewer system is currently in compliance with applicable regulations and permits for discharges to the Bay and Mission Creek, including discharges from the Mariposa sub-basin, although discharges from this sub-basin have historically exceeded the long-term average design goal for CSDs.

Under the proposed project, stormwater at the project site would be diverted to the Mission Bay South separate stormwater system, which would be a decrease of stormwater flows to the combined sewer system compared to existing conditions. Wastewater would be conveyed to the combined sewer system during both wet and dry weather and as discussed in Section 5.7, Utilities and Service Systems, the preliminary project design indicates that 0.844 mgd of the peak wastewater flows from the project site would be discharged to the sewer drainage area of the Mariposa Pump Station (within the reconfigured Mariposa sub-basin), and 0.230 mgd of the peak flows could be directed to the Mission Bay Sanitary Pump Station located at Park P15 (within the reconfigured Central sub-basin).[35] The increase in wastewater would represent an incremental increase in wastewater volume from the project site compared to existing conditions that could affect the overall combined sewer system's wet weather operations in both sub-basins. The potential effect would be greatest in the reconfigured Mariposa sub-basin, which has a wet weather capacity of 12 mgd. Comparatively, CSDs in the reconfigured Central sub-basin occur when flows at the Channel Pump Station exceed 80 mgd, or when total flows to the SEWPCP from the Channel and Bruce Flynn Pump Stations and SEWPCP lift station exceed 250 mgd (see Section 5.9.3.1, above, regarding the existing conditions of the City's combined sewer system).

Existing average wastewater flows from development projects completed within the Mariposa sub-basin of the combined sewer system as of February 2015 are approximately 1.21 mgd, including 0.31 mgd of existing flows from UCSF and other developments as well as infiltration flows and flows from Basin B[36] Conservatively assuming that all of the wastewater flows from the project site would discharge to the Mariposa sub-basin, the incremental increase from the project site would be an average of 0.16 mgd and the total *average* flows to the Mariposa sub-

[35] Moala, Tommy T., Assistant General Manager, San Francisco Public Utilities Commission, 2015. Letter to Clarke Miller, Strada Investment Group. May 15.

[36] Hydroconsult Engineers, Inc. 2015. Combined Sewer Impact Analysis, Golden State Warriors Arena EIR. February 18.

basin and pump station would be 1.38 mgd. Conservatively assuming that all 1.074 mgd of the peak wastewater flows from the project site would discharge to the Mariposa sub-basin and pump station, the total combined flows could be up to 2.28 mgd.

Hydroconsult Engineers, Inc. analyzed the effect of project-related increases in wastewater discharges on CSDs from the Mariposa sub-basin using the DPW's Hydrocalc model.[37] The modeling report is included as Appendix HYD of this SEIR. Using the wastewater flows described above and standard rainfall assumptions used by the DPW, the model estimated the annual average frequency, volume, and duration of CSDs that would occur once the Mariposa wet- and dry-weather pump stations reach the combined capacity of 11.2 mgd under existing and project conditions. The model estimates that under existing conditions, CSDs from the Mariposa sub-basin occur approximately 10 times per year with an average volume of 5.34 million gallons and duration of 17.2 hours.

The model analyzed the effects of discharging the average flows from the proposed project in combination with the existing average flows in the drainage area. Under this scenario, the frequency of CSDs would not increase, but the volume of the CSDs would increase from 5.34 to 5.63 million gallons and the duration would increase from 17.2 to 17.3 hours. As a worst case, the model also assumed that peak project-related wastewater flows would occur during every large storm which is an unlikely scenario (i.e., the model assumed that there would be a capacity event at the event center at the exact same time as every large storm of the rainy season). However, even using this worst case scenario, there would be no increase in the frequency of CSDs with the addition of peak project-related flows, but the volume of the CSDs would increase from 5.34 to 7.20 million gallons and the duration would increase from 17.2 to 19.4 hours. Under all conditions, all CSDs would receive the equivalent of primary treatment in the Mariposa transport and storage structure prior to discharge to the Bay.

If a portion of the project-related wastewater flows were discharged to the reconfigured Central Basin (via the Mission Bay Sanitary Sewer Pump Station) as indicated by the preliminary project design, a portion of the above stated increase in CSD volumes and durations would likewise shift to the Channel transport storage structure in the reconfigured Central sub-basin. However, given the relatively larger storage and pumping capacities at Channel, the effect on CSD volumes and durations would be less than that estimated for the Mariposa sub-basin.

As discussed in Section 5.9.4.2, State Regulations, the NPDES permit for the SEWPCP, the North Point Wet Weather Facility, and all of the Bayside wet-weather facilities does not limit the specific annual number of CSD events. Instead, the permit acknowledges that some years are wetter than others and requires that the combined sewer system is designed and constructed based on meeting the specified long-term average number of CSDs from each sub-basin. Therefore, the NPDES permit allows the limitation of 10 CSDs for the Mariposa sub-basin to be exceeded in any particular year, as long as the long-term average of 10 CSDS per year is met. Because average and peak wastewater flows from the project site would not increase the frequency of CSD events from the

[37] *Ibid.*

Mariposa sub-basin and would be consistent with the requirements of the NPDES permit, project-level water quality impacts related to contributions to an increase in CSD frequency would be *less than significant.*

Effluent Discharges from the SEWPCP

Consistent with what was identified in the Mission Bay FSEIR, some wastewater discharges associated with future uses at the project site could involve the discharge of some pollutants not typically associated with most other San Francisco discharges. If improperly handled, discharges of unusual chemicals such as radioactive materials and biohazardous materials to the SEWPCP could result in violation of the NPDES permit for the SEWPCP, which would be a potentially significant impact. While these discharges would be regulated under Article 4.1 of the San Francisco Public Works Code, the Mission Bay FSEIR included Mitigation Measure K.2 requiring facilities anticipated to have a potentially significant discharge of pollutants to the sanitary sewer to install sampling ports to facilitate sampling to monitor discharge quality. At this time, it is not known specifically what uses might occupy the proposed office development at Blocks 29-32, and the possibility of uses that would handle radioactive or biohazardous materials cannot be precluded. Thus, as identified in the Mission Bay FSEIR, in the event that there could be future activities that handle radioactive or biohazardous materials, implementation of FSEIR Mitigation Measure K.2 (same as Mitigation Measure M-HY-6) would reduce this impact to *less than significant with mitigation*.

Direct Discharges of Stormwater Runoff and Storm Drainage Capacity

Currently, approximately half of the project site is paved, and the rest is undeveloped. Runoff from portions of the paved and unpaved areas drain to perimeter streets, but a majority of runoff is contained in a low lying area within the site. There are no storm drains on the site. The runoff that drains to the perimeter streets currently flows to the combined sewer system.

Under the proposed project, all stormwater would be diverted to the separate stormwater system constructed by the master developer in the reconfigured Central sub-basin and under construction in the reconfigured Mariposa sub-basin. Discharges of stormwater from the project site to the separate stormwater system would be subject to the regulatory requirements of the updated Phase II General MS4 NPDES Permit, Section 147 of Article 4.2 of the San Francisco Public Works Code, and the City's Stormwater Design Guidelines, all of which were adopted since publication of the Mission Bay FSEIR and are described in Section 5.9.4, Regulatory Framework. Accordingly, the project sponsor would be required to implement BMPs to improve the quality of stormwater entering the stormwater system. The stormwater management approach must capture and treat rainfall from the design storm of 0.75 inches and include measures to reduce or eliminate downstream water pollution by reducing impervious cover, eliminating sources of contaminants, treating pollutants in stormwater runoff, or increasing onsite infiltration. The project would primarily utilize two Low Impact Development (LID) strategies to achieve the requirements for capture and treatment of stormwater: green roofs on several buildings, rainwater harvesting, and flow-through biotreatment planters. Treated water from these facilities would be directed to proposed on-site storm drains, which would connect to the separate stormwater collection system in the adjacent streets.

Implementation of BMPs and other stormwater control measures required by the updated Phase II General MS4 NPDES Permit; Article 4.2 of the San Francisco Public Works Code, Section 147; and the City's Stormwater Design Guidelines would ensure that the project does not contribute to an increase in discharge of stormwater pollutants to the Bay in discharges from the separate stormwater system. Therefore, impacts related to degradation of water quality and providing an additional source of stormwater pollutants are *less than significant* in relation to direct stormwater discharges.

As described in Impact C-UT-3 in Section 5.7, Utilities and Service Systems, the Mission Bay South stormwater system is designed to convey runoff from a 5-year storm event under build-out conditions. While the project would increase runoff relative to existing conditions because the amount of impervious surfaces would be increased, the volume of offsite stormwater discharges would be consistent with the projected build-out condition that the Mission Bay South separate stormwater system was designed to serve. Therefore, stormwater runoff from the project would not exceed the capacity of the stormwater system and this impact would be *less than significant*.

Litter

The proposed public use of the project site as an event center could increase the potential for litter. In accordance with Article 6 of the San Francisco Health Code, Garbage and Refuse, the project sponsor would be required to place containers in appropriate locations for the collection of refuse. In accordance with this article, the refuse containers must be constructed with tight fitting lids or sealed enclosures, and the contents of the container may not extend above the top of the rim. The project sponsor must also have adequate refuse collection service. Further, Article 6 prohibits the dumping of refuse onto any streets or lands within San Francisco.

The project would also be required to comply with several City ordinances which would decrease the amount of non-degradable trash generated under the proposed project, as discussed in Section 11 of the Initial Study, Utilities and Service Systems (see Appendix NOP-IS). The San Francisco Mandatory Recycling and Composting Ordinance requires facilities to separate their refuse into recyclables, compostables, and trash, and the Food Service Waste Reduction Ordinance prohibits any establishment that serves food prepared in San Francisco from using polystyrene foam (Styrofoam) to-go containers. This ordinance also requires that any containers used in the City’s programs be either recyclable or compostable.

Compliance with Article 6 of the San Francisco Health Code and the City ordinances described above would reduce the amount of non-recyclable and non-compostable wastes produced during events, and would ensure that adequate containers and refuse service are provided. This would reduce the potential for transport of litter to the separate stormwater system (including the UCSF MS-4) and Bay via wind or stormwater runoff. Furthermore, as indicated in Chapter 3, Project Description, the project sponsor would implement a number of event center site management practices to minimize potential disruption associated with event center operations, including the

San Francisco Entertainment Commission's Good Neighbor Policy. This policy includes the following provision:

- Employees of the establishment shall walk a 100-foot radius from the premises sometime between 30 minutes after closing time and 8:00 a.m. the following morning, and shall pick up and dispose of any discarded beverage containers and other trash left by area nighttime entertainment patrons.

Therefore, for reasons stated above, water quality impacts related to littering would be *less than significant*.

Summary of Impact HY-6, Water Quality Impact Analysis

Impact HY-6 describes potential water quality impacts of the proposed project related to dry weather wastewater flows and compliance with the wastewater treatment requirements of the RWQCB; wet weather wastewater flows; effluent discharges from the SEWPCP; direct discharges of stormwater; and litter. The analysis determined that project-related effects on dry weather wastewater flows would be less than significant because the wastewater flows would be within the remaining capacity of the SEWPCP. Impacts related to wet weather flows and CSDs were determined to be less than significant because the discharge of project-related peak wastewater flows would not result in an increase in frequency of CSD events from the Mariposa sub-basin.

Potential impacts related to effluent discharges from the SEWPCP would be *less than significant with mitigation*, assuming implementation of FSEIR Mitigation Measure K.2 which requires implementation of measures to ensure that businesses that discharge pollutants that are not typically associated with most wastewater discharges to the City’s combined sewer system do not cause a violation of the NDPES permit for the SEWPCP. Impacts related to direct discharges of stormwater and litter would be less than significant due to compliance with existing regulations and implementation of proposed event center site management practices.

Mitigation Measure M-HY-6. Wastewater Sampling Ports

Mission Bay FSEIR Mitigation Measures K.2. Participate in the City’s existing Water Pollution Prevention Program. Facilitate implementation of the City’s Water Pollution Prevention Program by providing and installing wastewater sampling ports in any building anticipated to have a potentially significant discharge of pollutants to the sanitary sewer, as determined by the Water Pollution Prevention Program of the San Francisco Public Utilities Commission’s Bureau of Environmental Regulation and Management, and in locations as determined by the Water Pollution Prevention Program.

Comparison of Impact HY-6 to Mission Bay FSEIR Impact Analysis

Dry-Weather Flows to Combined Sewer System. The Mission Bay FSEIR determined that, based on anticipated land uses as offices, the estimated total wastewater flow from the project site would be an average of 0.192 mgd and a peak of 0.578 mgd. The average flows for the proposed project would be less than analyzed in the Mission Bay FSEIR, but the peak flows would be almost two times greater than previously anticipated. Although the project would result in a somewhat more severe impact than analyzed in the Mission Bay FSEIR, the impact would remain less than significant because the dry-weather flows would be within the capacity of the SEWPCP. Therefore, the project would not result in new or substantially more severe impacts related to dry weather flows to the combined sewer system than was previously identified in the Mission Bay FSEIR.

Wet Weather Flows to Combined Sewer System. The Mission Bay FSEIR anticipated that stormwater within the reconfigured Central sub-basin would be collected in a separate stormwater system and wastewater flows generated within this basin would be conveyed in the City's combined sewer system. The Mission Bay FSEIR also anticipated that both stormwater and wastewater flows generated in the Mariposa sub-basin would be conveyed to the combined sewer system. With this configuration, the Mission Bay FSEIR indicated that increases in combined sewer discharges and associated pollutants were anticipated in the Mariposa and Islais Creek discharge locations. The Mission Bay Plan's contribution to an increase in the frequency, volume, or duration of combined sewer discharges would be reduced to less than significant with implementation of FSEIR Mitigation Measure K.3 requiring the master developer and SFPUC to consider sewer improvements to avoid increases in CSD volumes.

The master developer has proceeded with implementation of Mitigation Scenario B described in the FSEIR Summary of Comments and Responses (in Volume III, beginning on p. XII.253) and described in Section 5.9.2.3 (FSEIR Mitigation Approach), above. This scenario includes separating the stormwater collection system and sanitary sewer in the reconfigured Mariposa sub-basin as well as in the reconfigured Central sub-basin as originally planned in the FSEIR. Because none of the stormwater from Mission Bay South would be discharged to the combined sewer system, the Mission Bay FSEIR estimated that this mitigation approach would reduce the total Bayside CSD volume by 33 million gallons per year.

As discussed above, under the worst case conditions analyzed, discharge of the peak wastewater flows from the project site could increase the volume of each CSD from the Mariposa sub-basin by about 1.9 million gallons but would not increase the frequency of CSD events from this sub-basin. While the project would result in slightly more severe effects than analyzed in the FSEIR, this impact would be less than significant because the existing frequency of CSD events would not be exceeded and would be within the limitations of the NPDES permit for the SEWPCP, the North Point Wet Weather Facility, and Bayside wet-weather facilities. Therefore, the project would not result in new or substantially more severe impacts related to CSD events than was previously identified in the Mission Bay FSEIR.

Effluent Discharges from SEWPCP. The FSEIR concluded that UCSF and some commercial or industrial operations may involve the discharge of some pollutants not typically associated with most other San Francisco discharges, and discharges from these businesses could potentially result in a violation of the NDPES permit. The FSEIR identified Mitigation Measure K.2 in the Hydrology and Water Quality section requiring facilities with these discharges to install sampling ports to facilitate demonstration of compliance with discharge limitations. The proposed project could involve some of the same land uses, but as discussed above would require implementation of Mitigation Measure K.2 from the FSEIR. Therefore, the project would not result in new or substantially more severe impacts related to effluent discharges from the SEWPCP than was previously identified in the Mission Bay FSEIR.

Direct Discharges of Stormwater Runoff and Storm Drainage Capacity. The Mission Bay FSEIR concluded that with the sewer system improvements proposed as part of the Plan, including reconfiguration of the Central and Mariposa sub-basins and construction of a separate stormwater system in the reconfigured Central sub-basin, the Mission Bay Plan would accommodate the projected changes to stormwater flows. Impacts related to exceeding the capacity of the stormwater system would be less than significant.

The Mission Bay FSEIR also determined that the direct stormwater discharges under the Mission Bay Plan could contribute to a potentially significant cumulative impact on the quality of near-shore waters of the Bay and China Basin Channel (Mission Creek). The project's contribution would be reduced to less than significant with implementation of Mitigation Measure K.4 requiring treatment of all separate stormwater discharges.

As described above, stormwater discharges from the project would discharge to the Mission Bay South stormwater system constructed in accordance with Mitigation Scenario B described in the FSEIR Summary of Comments and Responses (in Volume III, beginning on p. XII.253). This separate stormwater system provides treatment of stormwater discharges at each of the five outfalls. Further, stormwater discharges from the project site would be subject to the regulatory requirements of the SWRCB and City which require treatment of stormwater before it is discharged to a separate stormwater system. Therefore, the project would result in less severe water quality impacts than analyzed in the FSEIR related to direct stormwater discharges, and the project would not result in new or substantially more severe impacts related to stormwater runoff and discharges than was previously identified.

Mission Bay FSEIR Mitigation Measure K.5 requires implementation of an individual stormwater management program that utilizes BMPs for Mission Bay until the Phase II regulations become final and Mission Bay is included in the City's stormwater management program. However, subsequent to publication of the Mission Bay FSEIR, the SWRCB adopted the General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems. The CCSF also adopted Section 147 of Article 4.2 of the San Francisco Public Works Code in 2010 and published the associated Stormwater Design Guidelines. Discharges of stormwater from the project site to the separate storm sewer would be required to comply with these regulatory requirements as further described above. Therefore, Mission Bay FSEIR Mitigation Measure K.5 is not applicable to the proposed project.

Mission Bay FSEIR Mitigation Measure M.5 in the Community Services and Utilities section required conveying all stormwater runoff from newly developed areas in the Bay drainage sub-basin to the combined sewer system prior to completion of the initial-flow diversion system. However, as discussed in Section 5.7 of this SEIR, Utilities and Service Systems, this mitigation measure is no longer warranted for the proposed project because the project would discharge stormwater to the separate stormwater system being constructed in accordance with the approved Mission Bay South Infrastructure Plan.

Impact HY-7: Operation of the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding. (Less than Significant)

Existing grades at the project site range from -1 to +3 feet SFD (10 to 14 feet NAVD88). As discussed in Impact HY-4 of the Initial Study (see pp. 102 to 103 of the Initial Study in Appendix NOP-IS), the project site is not located within a 100-year flood zone depicted on San Francisco's interim flood maps prepared in 2008. The project site is also generally above the projected 2050 flood elevation of -0.6 feet SFD (11 feet NAVD88), which combines 12 inches of sea level rise with the effects of a 100-year storm surge. Thus, as shown on Figure 5.9-3 and described in the Setting, the project site would not be subject to flooding in 2050 with projected sea level rise.[38] In addition, the project site would not be flooded during daily high tide conditions (MHHW) with the 36 inches of sea level rise that is expected by 2100.

However, when the effects of a 100-year storm surge are considered in combination with 36 inches of sea level rise, the flood elevation would be 1.5 feet SFD (13 feet NAVD88), and the site at its existing grade could be temporarily flooded to depths of up to about 2.5 feet. This is consistent with the SFPUC mapping depicted on Figure 5.9-4, which shows flooding depths at 2-foot intervals and indicates that the site could be temporarily flooded to depths of between 2 and 4 feet.[39] Thus, the project site could be prone to flooding by 2100 based on projected sea level rise in combination with the effects of storm surge.

However, as noted in the Setting, this flooding scenario is based on 2010/2011 topographic conditions and assumes that no site-specific flood protection measures such as filling to raise the grade of low lying areas or area-wide measures such as construction of berms, levees or seawalls would be implemented to protect the project site or surrounding area during the intervening period. As such, it is likely that the actual flood zone would be different by 2100 than what is illustrated on Figure 5.9-4 under built conditions, and the actual flood zone would include only those areas of the site with ground elevations below the flood elevation of 1.5 feet SFD (13 feet NAVD88) that are not protected by area-wide flood protection measures.

Development in the flood zone could expose people or structures to a significant risk of loss, injury or death unless designed and constructed in accordance with flood resistant building standards. San Francisco's Floodplain Management Ordinance (Chapter 2A, Article XX, Sections 2A.280 through 2A.285 of the San Francisco *Administrative Code*) provides standards for

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[38] Note that the green zone shown within the project site on Figure 5.9-3 is the open excavation that is not hydrologically connected to the Bay or flooding zones and would be filled when the site is developed.

[39] Note that greater inundation depths are indicated on Figure 5.9-4 in the area of the open excavation, but this excavation would be filled when the site is developed.

building in flood prone areas. For building sites in flood prone areas, Section 2A.283 (b)(1) specifically requires that:

- The building must be adequately anchored to prevent flotation, collapse, or lateral movement.
- The building must be constructed with materials and utility equipment that is resistant to flood damage, and with methods and practices that minimize flood damage.
- Electrical, heating, ventilation, plumbing, and air conditioning equipment must be designed or located to prevent water from entering or accumulating within the components during flooding.
- All water supply and sanitary sewage systems must be designed to minimize or eliminate infiltration of flood waters into the system as well as discharges from the systems into floodwaters.

The Floodplain Management Ordinance is applicable only in areas that are designated by the City Administrator as susceptible to being inundated by a 100-year flood. At present, the City's designated 100-year flood zone is that shown on the 2008 interim flood map, which does not consider projected sea level rise and does not therefore include the project site. As such, the Floodplain Management Ordinance does not apply to the project site.

However, although it is not subject to the San Francisco Floodplain Management Ordinance, the project would be designed and constructed consistent with flood-resistant building standards or, in some cases, to be capable of adapting to meet these standards when needed in the future in recognition of future flood hazards due to sea level rise. These features or strategies that have been incorporated in the project design include:

- Locating the base of the main event center entry at an elevation of 10 feet SFD (21 feet NAVD88), which would be 8.5 feet above the projected flood elevation in 2100. Access to office and retail uses from the main plaza would be provided at this elevation.
- Raising pedestrian access and outdoor areas to an elevation of 10 feet SFD (21 feet NAVD88), which would be 8.5 feet above the projected flood elevation in 2100. These areas include the Third Street Plaza, main pedestrian path around the event center, Bayfront Overlook, and Bayfront Terrace. The project would also provide access to the upper floors of the Food Hall from the elevated pedestrian path.
- Locating the base of the secondary arena entry on the southeast portion of the event center at an elevation of 26 feet SFD (37 feet NAVD88), 24.5 feet above the projected flood elevation in 2100, and making it accessible from the elevated pedestrian path or stairs from the southeast plaza.
- Providing expanded height first floors in the retail uses and lobbies in the South Street and 16th Street buildings, Food Hall, and buildings fronting Terry Francois Boulevard which would provide space to raise the floor level above the projected flood elevation.
- Minimizing to the extent feasible the number of building wall penetrations below an elevation of 3.5 feet SFD (15 feet NAVD88), which is two feet higher than the projected flood elevation in 2100, to preclude inside flooding.

- Waterproofing the below ground features to address fluctuations in groundwater levels that may result from sea level rise.

- Designing the water supply and wastewater facilities to minimize or eliminate infiltration of flood waters as well as discharges from these systems into flood waters.

Three components of the proposed project would be constructed below ground, and would also be below the projected flood elevation in 2100. These include the team practice courts at an elevation of -14 feet SFD (-22.7 feet NAVD88), the below grade parking and loading dock at an elevation of -10.7 feet SFD (00.6 foot NAVD88), and the event level (floor of the basketball court) at an elevation of - 6 feet SFD (5.3 feet NAVD88). To prevent inundation of these areas by flood waters, the garage and loading dock entries would be designed to allow future installation of floodgates and a solid curb could be constructed alongside landscaped areas to prevent flood flows from encroaching onto the site. Sand bags could also be available to provide temporary protection from future flooding.

Mechanical systems for the event center that would be located in the below-grade parking could also be flooded by 2100. However, the project design includes providing space for emergency pumps in these areas, including the area adjacent to the mechanical systems. Further, the mechanical systems could be moved to areas of the site that are above future flood levels if necessary.

The project features described above would be consistent with San Francisco's Floodplain Management requirements specified in the San Francisco Administrative Code, Article XX, Sections 2A.280 through 2A.285 and discussed in the Setting. In addition, the stormwater bioretention areas and stormwater drain inlets located along the property perimeter would facilitate drainage of flood waters. Terry A. Francois Boulevard and the planned waterfront park to the east would also serve as a buffer for the project site against coastal flooding.

While the project site could be temporarily flooded at depths of up to 2.5 feet with 36 inches of sea level rise in combination with 100-year storm surge by 2100, the project would be designed and constructed to resist flood damage and provide for the safety of occupants and visitors in the event of flooding. Therefore, impacts related to flooding would be *less than significant*.

Mitigation: None required.

Comparison of Impact HY-7 to Mission Bay FSEIR Impact Analysis

As discussed above, the Mission Bay FSEIR concluded that portions of the Mission Bay Plan area could be subject to inundation as a result of sea level rise and included Mitigation Measures K.6a through K.6f for structures proposed below an elevation of -1 foot SFD (10 feet NAVD88). The mitigation required implementation of construction specifications to address effects of sea level rise that would be based on specific flood protection and engineering and building analyses by a licensed engineer where structures are proposed below an elevation of -1 foot SFD (10 feet NAVD88).

Elevations at the project site range from approximately -1 foot SFD (10 feet NAVD88) to +3 feet SFD (14 feet NAVD88),[40] however some of the project components would extend below grade. The SFPUC inundation maps completed in 2014 have provided a more detailed assessment of areas of the project site that could be inundated due to sea level rise and indicate an area greater than previously anticipated in the Mission Bay FSEIR. However, the above-described measures that are incorporated into the project design fulfill the requirements of FSEIR Mitigation Measure K.6, which is no longer warranted for the proposed project. Therefore, the proposed project would not result in new or substantially more severe significant impacts than those identified in the FSEIR regarding flooding from sea level rise.

Cumulative Impacts

Impact C-HY-1: See Initial Study (Appendix NOP-IS)

Impact C-HY-2: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not exceed the wastewater treatment requirements of the NPDES permit for the SEWPCP; violate water quality standards or waste discharge requirements, or otherwise substantially degrade water quality as a result of changes in wastewater and stormwater discharges to the Bay; or exceed the capacity of the separate stormwater system constructed in Mission Bay, or provide a substantial source of polluted runoff. Cumulative wet weather flows would not contribute to an increase in combined sewer discharges. (Less than Significant)

Impacts related to the wastewater treatment requirements of the NDPES permit for the SEWPCP and contributions to CSDs could occur within the reconfigured Mariposa and Central sub-basins. Accordingly, the geographic scope of cumulative impacts related to these topics is the geographical area that drains to the reconfigured Mariposa and Central sub-basins. Regarding contributions to CSDs, the cumulative analysis considers wastewater and storm water flows resulting from full build-out of the Mission Bay South area and development of the Mission Bay Campus under the UCSF LRDP (described in Section 5.1.5.2, Cumulative Projects for Operational Impacts), and assumes that operations of these projects would have to comply with the same regulatory requirements as the project.

Impacts related to exceeding the capacity of the stormwater system and providing additional sources of stormwater pollutants could occur within the Mission Bay South separate stormwater system. Accordingly, the geographic scope of cumulative impacts related to this topic is the geographical area that drains to the same separate stormwater system.

[40] Langan Treadwell Rollo, Preliminary Geotechnical Evaluation, Block 29-32 Mission Bay, San Francisco, California. March 28, 2014.

The geographical scope for littering includes all of Lower San Francisco Bay, which is listed as an impaired water body for trash.

Dry Weather Flows to Combined Sewer System

As discussed in Section 5.7, Utilities and Service Systems, the SFPUC estimates that under full build out of Mission Bay South, average wastewater flows to the Mariposa sub-basin would be 1.69 mgd and peak wastewater flows would total 4.8 mgd, including all of the flows from the proposed project.[41] During dry weather (typically, May 1 to October 15), all wastewater generated by the project would be conveyed to and treated at the SEWPCP, which currently has available dry-weather capacity of about 24.5 mgd, as described above in Section 5.9.3.1, Combined Sewer System. The average flow at full build out of Mission Bay South would be less than 7 percent of the available dry-weather capacity of the SEWPCP, and the peak daily flow would be approximately 20 percent. Therefore, during dry weather, cumulative impacts related to exceeding the wastewater treatment requirements of the San Francisco RWQCB would be *less than significant*.

Wet Weather Flow to Combined Sewer System

Existing average wastewater flows from development projects completed within the Mariposa sub-basin of the combined sewer system as of February 2015 are approximately 1.21 mgd, including 0.31 mgd of existing flows from UCSF and other developments as well as flows from infiltration and from Basin B.[42] Assuming the addition of all of the average flow from the proposed project and average flows from future developments at full build out of Mission Bay South, the average cumulative flows to the Mariposa sub-basin and pump station would be 1.69 mgd. Conservatively assuming that all 1.074 mgd of the peak wastewater flows from the project site would discharge to the Mariposa sub-basin and pump station, the combined flows would total approximately 2.6 mgd at full build out. As described in Impact HY-6, above, Hydroconsult Engineers, Inc. analyzed the effect of cumulative increases in wastewater discharges on CSDs from the Mariposa sub-basin using the San Francisco DPW's Hydrocalc model.[43] The modeling report is included as Appendix HYD of this SEIR. Using the wastewater flows described above and standard rainfall assumptions used by the DPW, the model estimated the annual average frequency, volume and duration of CSDs that would occur once the Mariposa wet and dry-weather pump stations reach the combined capacity of 11.2 mgd. Considering average flows within the Mariposa sub-basin and all of the project site, the model estimated that under cumulative conditions, the number of CSD events would not increase, but the volume of the CSDs would increase from 5.34 to 6.32 million gallons and the duration would increase from 17.2 to 18.2 hours. Considering peak flows from the project site, the frequency of CSDs would increase from 10 to 11, the average volume would increase from 5.34 to 7.98 million gallons, and the duration would increase from 17.2 to 21.8 hours.

41 Hydroconsult Engineers, Inc. 2015. Combined Sewer Impact Analysis, Golden State Warriors Arena EIR. February 18.
42 *Ibid.*
43 *Ibid.*

As noted in Impact HY-6, the model analyzed worst-case conditions assuming that all project-related peak wastewater flows would discharge to the Mariposa sub-basin and would occur concurrently with each large rainstorm. However, these conditions would not be expected to occur on a regular basis, if at all, and as discussed in Section 5.7, Utilities and Service Systems, a portion of the wastewater flows from the project site would be discharged to the reconfigured Central sub-basin. As discussed above, the NPDES permit for the SEWPCP, the North Point Wet Weather Facility, and all of the bayside wet-weather facilities does not limit the specific annual number of CSD events. Instead, the permit acknowledges that some years are wetter than others and requires that the combined sewer system is designed and constructed to meet the specified long-term average number of CSDs from each sub-basin. Thus, the NPDES permit allows an annual average of 10 CSDs for the Mariposa sub-basin to be exceeded in any particular year, as long as the long-term average is met. Because cumulative conditions would not likely result in exceeding the long-term annual average of 10 CSDs allowed for the Mariposa sub-basin in the NPDES permit for the SEWPCP, North Point Wet Weather Facility, and Bayside wet-weather facilities, cumulative impacts related to contributions to an increase in CSD frequency would be *less than significant.*

Further, as discussed in Section 5.7, Utilities and Service Systems, the SFPUC will be constructing future improvements to increase the capacity of the Mariposa Pump Station and associated facilities, and this would increase the amount of wastewater that could be conveyed to the SEWPCP and Northpoint Wet Weather facilities for treatment, resulting in a corresponding reduction in CSD volumes from the Mariposa sub-basin (see Impacts C-UT-2 and C-UT-4).

Effluent Discharges from SEWPCP

As discussed in Impact HY-6, if the proposed office space includes biotech uses, the project could result in discharge of biohazardous and radioactive materials that, if improperly handled, could result in violation of the NPDES permit for the SEWPCP. The cumulative effects of wastewater discharges containing such materials could result in an exceedance of the NPDES discharge limitations of the SEWPCP, resulting in a potentially significant cumulative impact. However, the project's contribution would not be cumulatively considerable (*less than significant*) with implementation of Mission Bay FSEIR Mitigation Measure K.2, which requires installation of wastewater sampling ports for business that discharge unusual materials to facilitate sampling.

Direct Discharges of Stormwater Runoff and Storm Drainage Capacity

As discussed in Impact HY-6, the project site would be served by the Mission Bay South separate stormwater infrastructure. As discussed in Impact C-UT-1 (see Section 5.7, Utilities and Service Systems), Storm Drain Pump Station No. 1 (SDPS-1) in the reconfigured Central sub-basin has been constructed and SDPS-5 in the Mariposa sub-basin is currently under construction. These stormwater pump stations and associated stormwater infrastructure would accommodate stormwater flows from the proposed project and have been designed to handle stormwater flows generated from the planned build-out of the entire tributary drainage area. Further, the project would conform to the City's *Stormwater Design Guidelines* for treatment of stormwater runoff to separate stormwater systems. Similar to the proposed project, all future projects in the vicinity that disturb greater than 5,000 square feet would be required to comply with the City's *Stormwater Design Guidelines*, which require capture and treatment of stormwater discharged to separate stormwater systems. Therefore, cumulative impacts within the Mission Bay South area related to exceeding the capacity of a stormwater system, providing additional sources of polluted runoff, and water quality degradation as a result of direct stormwater discharges would be *less than significant*.

Litter

As discussed in Impact HY-6, the project's water quality impacts related to littering would be less than significant through compliance with Article 6 of the San Francisco Health Code and the City ordinances addressing recycling and composting of wastes as well as the project's proposed event center site management practices (including implementation of the San Francisco Entertainment Commission's Good Neighbor Policy). Other projects in the area are also required to comply with these requirements. Therefore, the project's contribution to cumulative water quality impacts related to litter would not be cumulatively considerable (i.e., *less than significant*).

Comparison to FSEIR Significance Determination

Dry Weather Flow to Combined Sewer System. The Mission Bay FSEIR did not specifically address cumulative effects related to dry weather flows to the City's combined sewer system. However, the Mission Bay FSEIR Community Services and Utilities impacts section estimated that the Mission Bay Plan would generate approximately 2.5 mgd of wastewater at build-out (average dry weather flow), or 3.7 percent of the volume of wastewater treated at the SEWPCP at the time of FSEIR publication, and determined this to be a *less than significant* impact.

Under full build out of Mission Bay South, average wastewater flows in the Mariposa sub-basin would be 1.69 mgd, or less than 3 percent of the 60 mgd of wastewater currently treated at the SEWPCP. Therefore, the proposed project would not result in any new significant impacts or substantially severe impacts relative to those analyzed in the Mission Bay FSEIR.

Wet Weather Flow to Combined Sewer System. The Mission Bay FSEIR determined that the Plan's estimated 0.2 percent contribution to the 11 percent cumulative increase in Bayside combined sewer discharge volumes would be a significant impact. The Plan's contribution would be reduced to *less than significant with mitigation*, assuming implementation of FSEIR Mitigation Measure K.3 requiring design and construction of sewer improvements to ensure that wastewater and stormwater flows from the Plan area to the combined sewer do not contribute to combined sewer discharges.

As described in Section 5.9.2.3 (FSEIR Mitigation Approach) above, the master developer has implemented Mitigation Scenario B that includes separating the stormwater collection system and sanitary sewer in the reconfigured Central and Mariposa sub-basins in Mission Bay South. Implementation of this mitigation approach satisfies the requirements of Mission Bay FSEIR Mitigation Measure K.3 and is estimated to reduce total Bayside CSD volume by 33 million gallons per year, less than baseline conditions before the Mission Bay Plan was implemented.

As discussed above, under the worst case conditions analyzed, cumulative wastewater discharges to the Mariposa sub-basin could increase the volume of each CSD from the Mariposa sub-basin by about 7.98 million gallons but would not increase the long-term average frequency of CSD events from this sub-basin. While the cumulative wastewater flows would result in slightly more severe effects than analyzed in the FSEIR, this impact would be less than significant because the long-term average frequency of CSD events would not be exceeded and the system would remain in compliance with the NPDES permit for the SEWPCP, the North Point Wet Weather Facility, and Bayside wet-weather facilities. Therefore, the project would not result in new or substantially more severe cumulative impacts related to CSD events than was previously identified in the Mission Bay FSEIR.

Effluent Discharges from SEWPCP. Cumulative impacts related to exceeding the discharge limitations of the SEWPCP were not specifically addressed in the Mission Bay FSEIR. However, while the cumulative effects of wastewater discharges containing radioactive and biohazardous materials could be potentially significant, the contribution of both the project and the Mission Bay Plan would not be cumulatively considerable (*less than significant*) with implementation of Mission Bay FSEIR Mitigation Measure K.2. Therefore, the proposed project would not result in any new significant impacts or substantially more severe impacts relative to those analyzed in the FSEIR.

Direct Discharges of Stormwater Runoff and Storm Drainage Capacity. The Mission Bay FSEIR determined that the Mission Bay Plan could contribute to a *potentially significant* cumulative impact on the quality of near-shore waters of the Bay and China Basin Channel (Mission Creek) as a result of direct stormwater discharges. However, the Plan's contribution would be reduced to *less than significant with mitigation*, assuming implementation of FSEIR Mitigation Measure K.4. The Mission Bay South storm drain infrastructure was constructed in accordance with Mitigation Scenario B described in the Mission Bay FSEIR Summary of Comments and Responses and conforms to the requirements of this mitigation measure. The proposed project would not result in any new significant impacts or substantially more severe impacts relative to those analyzed in the Mission Bay FSEIR regarding this topic.

Litter. Cumulative impacts related to littering were not considered in the Mission Bay FSEIR. Regardless, the proposed project would not result in any new significant cumulative impacts or substantially more severe cumulative impacts relative to those analyzed in the Mission Bay FSEIR.

Impact C-HY-3: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not result in a significant impact related to exposing people or structures to a significant risk of loss, injury, or death involving flooding. (Less than Significant)

As described in Section 5.9.3.2, Flooding, the City's Bay shoreline will be subject to an increased risk of flooding in the future due to sea level rise. Accordingly, the geographic scope for impacts related to flood risk includes those areas in the project vicinity that could be subject to flooding by 2100. Past, present, and foreseeable future development in such areas could expose people or structures to a cumulatively significant risk of loss, injury or death due to flooding. However, as described above, the proposed project would be designed and constructed in accordance with flood resistant building standards and could feasibly be adapted as necessary to respond to future flood hazards. Therefore, the proposed project's contribution to cumulative impacts related to future flood hazard risks due to sea level rise would not be cumulatively considerable (i.e., *less than significant*).

Comparison to FSEIR Significance Determination

Cumulative impacts related to future flooding were not considered in the Mission Bay FSEIR. Regardless, the proposed project would not result in any new significant cumulative impacts or substantially more severe cumulative impacts on future flooding relative to those analyzed in the FSEIR.

CHAPTER 6
Other CEQA Issues

6.1 Growth-Inducing Impacts

Section 15126.2(d) of the California Environmental Quality Act (CEQA) Guidelines requires that an environmental impact report (EIR) discuss "the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth…. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment."

As discussed in the Initial Study (Appendix NOP-IS), Section 3, Population and Housing, the project would not directly provide new housing or directly increase San Francisco's population. The project would generate about 3,578 new jobs. The Association of Bay Area Governments (ABAG) forecasts that San Francisco's population will increase by about 238,700 people between 2015 and 2040 and that the City will gain about 142,080 new jobs over this period.[1] New jobs at Mission Bay Blocks 29–32 would represent about 2.5 percent of citywide job growth. In addition, as stated in Appendix NOP-IS, the new jobs would represent about 0.7 percent of San Francisco's current labor force and 0.2 percent of the labor force in the five-county region. Thus, while development of the project would represent growth, the generation of new jobs would not encourage substantial new growth that is not currently projected for San Francisco.

The proposed development of Mission Bay Blocks 29–32 would be located within the Mission Bay Priority Development Area (PDA), one of 10 designated PDAs in San Francisco. PDAs are locally identified areas located near transit and having infill development opportunities; they are part of a regional planning initiative led by the ABAG and the Metropolitan Transportation Commission (MTC). The initiative links land use and transportation planning and promotes a connected and more compact land use pattern. Under the initiative, future growth in the region would be focused in the community-identified PDAs. Growth proposed at the project site would be consistent with the City's identification of Mission Bay as an area of San Francisco where future growth will be focused.

PDAs are also important components of "Plan Bay Area," which is the regional planning effort undertaken in response to the Sustainable Communities Strategy (Senate Bill 375), a state law passed in 2008. ABAG and MTC, the agencies leading the Bay Area's regional planning for the

1 Association of Bay Area Governments, Bay Area Plan Projections 2013, December 2013.

Sustainable Communities Strategy, released the final version of Plan Bay Area in December 2013. The plan focuses much of the region's projected growth within the PDAs. San Francisco elected officials and agency staff have participated in the Sustainable Communities Strategy development process since its inception, and in 2012 the San Francisco Planning Department updated the City's long-range land use allocation based on ABAG's forecast for the Sustainable Communities Strategy.

Based on this analysis, the project would not have a substantial growth-inducing impact, and no mitigation is required.

6.2 Significant and Unavoidable Impacts

In accordance with CEQA Section 21067 and Sections 15126(b) and 15126.2(b) of the CEQA Guidelines, the purpose of this section is to identify impacts that could not be eliminated or reduced to less-than-significant levels by mitigation measures included as part of the project, or by other mitigation measures that could be implemented, as identified in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures. These findings are subject to final determination by the OCII Commission as part of the CEQA findings for the SEIR. If necessary, this chapter will be revised in the Final SEIR to reflect the findings of the Commission.

As described in Chapter 5, the impacts listed below would be considered significant and unavoidable, even with implementation of feasible mitigation measures. With the exception of the impacts listed below, all other project impacts would either be less than significant or reduced to less-than significant levels by implementation of the identified mitigation measures.

Transportation and Circulation

- The project would result in significant and unavoidable traffic impacts at multiple intersections in the project area that would operate at Level of Service (LOS) E or LOS F, under conditions without or with an overlapping SF Giants game at AT&T Park, and with or without implementation of the Muni Special Event Transit Service Plan, as well as under 2040 cumulative conditions, even with implementation of identified mitigation measures. Because the proposed project would result in significant traffic impacts at additional intersections, these would be new significant and unavoidable impacts not previously identified in the Mission Bay FSEIR. (Impacts TR-2, TR-11, TR-18, and C-TR-2)

- The project would result in significant and unavoidable traffic impacts at freeway ramps in the project area intersections that would operate at LOS E or LOS F, under conditions without or with an overlapping SF Giants game at AT&T Park, and with or without implementation of the Muni Special Event Transit Service Plan, as well as under 2040 cumulative conditions, even with implementation of identified mitigation measures. These would be new significant and unavoidable impacts not previously identified in the Mission Bay FSEIR. (Impacts TR-3, TR-12, TR-19, and C-TR-3)

- The project would result in a substantial increase in transit demand that could not be accommodated by adjacent Muni transit capacity such that significant adverse impacts to Muni transit service would occur, under conditions without implementation of the Muni

Special Event Transit Service Plan, even with implementation of identified mitigation measures. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact TR-20)

- The project would result in a significant adverse increase in transit demand that could not be accommodated by regional transit capacity such that significant adverse impacts to regional transit service would occur, under conditions without or with an overlapping SF Giants game at AT&T Park, and with or without implementation of the Muni Special Event Transit Service Plan, as well as under 2040 cumulative conditions, even with implementation of identified mitigation measures. These would be new significant and unavoidable impacts not previously identified in the Mission Bay FSEIR. (Impacts TR-5, TR-14, TR-21, and C-TR-5)

Noise and Vibration

- Operation of the proposed project would cause a substantial permanent increase in ambient noise levels in the project site vicinity, due to increased roadway noise levels from increased traffic in the project area and due to crowd noise following events affecting nearby sensitive receptors, even with implementation of identified mitigation measures. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact NO-5)

- Operation of the proposed project, when considered with other cumulative development, would cause a substantial permanent increase in ambient noise levels in the project site vicinity due to increased roadway noise levels from cumulative increases in traffic in the project area, even with implementation of identified mitigation measures. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact C-NO-2)

Air Quality

- Construction of the proposed project would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants, even with implementation of identified mitigation measures. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact AQ-1)

- During project operations, the proposed project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants, even with implementation of identified mitigation measures. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact AQ-2)

- The project, in combination with other past, present, and reasonably foreseeable future projects, would contribute to cumulative regional air quality impacts, even with implementation of identified mitigation measures. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact C-AQ-1)

Wind

- The proposed project structures would alter wind in a manner that would substantially increase the number of wind hazard hours at off-site public areas, and while feasible mitigation measures have been identified, the design refinements required to reduce this impact to a less-than-significant level have not been finalized. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact WS-1)

Utilities

- The project, in combination with past, present, and reasonably foreseeable future projects, would require the construction of new or upgraded wastewater facilities, the construction of which could cause significant environmental effects. This would be a significant and unavoidable impact with no feasible mitigation measures because mitigation is beyond the control of the project sponsor. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact C-UT-2)

- The project, in combination with past, present, and reasonably foreseeable future developments in the Mission Bay South area, would result in the determination by the San Francisco Public Utilities Commission (SFPUC) that it has inadequate capacity to serve the project's projected wastewater demand in addition to the SFPUC's existing commitments, even with implementation of identified mitigation measures. This would be a significant and unavoidable impact not previously identified in the Mission Bay FSEIR. (Impact C-UT-4)

6.3 Effects Found Not to Be Significant

The NOP distributed for the proposed project included an Initial Study that analyzed resource topics that were determined either not to apply to the proposed project or to have no impact, a less-than-significant impact, or a less-than-significant impact with mitigation. These topics, listed below, are not analyzed in this SEIR:

- **Land Use and Land Use Planning**—The project would not physically divide an established community; conflict with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect; or have impacts on the existing character of the vicinity.

- **Population and Housing**— The project would not induce substantial population growth; displace a substantial amount of existing housing or create demand for additional housing; or displace substantial numbers of people, necessitating replacement housing elsewhere.

- **Cultural and Paleontological Resources**— The project would not cause an adverse change to historic architectural resources or archaeological resources; destruction of paleontological resources; or disturbance of remains.

- **Noise**— The project would not expose people to excessive noise levels in airport or airstrip areas; or be substantially affected by existing noise levels.

- **Air Quality**— The project would not create objectionable odors.

- **Recreation**— The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated; include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment; physically degrade existing recreational resources.

- **Utilities and Service Systems**— The project would not require the construction of new water facilities; affect the availability of water supply; exceed landfill capacity; or fail to comply with solid waste regulations.

- **Public Services**— The project would not create impacts associated with the need for new or altered schools, parks, or other services.

- **Biological Resources**— The project would not cause effects on special-status species, riparian habitat, wetlands, migratory wildlife corridors or sites, or conflict with plans or policies protecting resources, including habitat conservation plans.

- **Geology and Soils**— The project would not expose people or structures to geologic hazards; cause soil erosion or loss of topsoil; be affected by the presence of unstable soils or geologic units; be affected by the presence of expansive soils or soils incapable of adequately supporting wastewater disposal systems; or cause a substantial change of topography.

- **Hydrology and Water Quality**— The project would not deplete groundwater supplies; alter drainage patterns, resulting in erosion; place housing and/or structures within a 100-year flood zone; expose people and structures to hazards associated with flooding, failure of a levee or dam, seiche, tsunami, or mudflow; or cause construction-related water quality impacts.

- **Hazards and Hazardous Materials**— The project would not cause risk of upset and accident conditions involving release of hazardous materials; emit hazardous materials within 0.25 mile of a school; be located on a site listed on a hazardous materials database; be located on airport or air strip land use areas; impair implementation of emergency response or evacuation plan; expose people or structures to fire risk; or create construction-related hazards and hazardous materials impacts.

- **Mineral and Energy Resources**— The project would not cause the loss of known valuable mineral resources of the state or locally important resources; encourage activities that result in wasteful use of energy resources.

- **Agriculture and Forest Resources**— The project would not convert resources identified by the Farmland Mapping and Monitoring Program to nonagricultural use; conflict with existing zoning for agricultural use or Williamson Act contract; or involve changes that could result in Farmland of Statewide Importance to nonagricultural use.

Other topics determined to result in less-than-significant impacts or less-than-significant impact with mitigation, in Chapter 5 of this SEIR include the following:

- **Transportation and Circulation** — With implementation of identified mitigation measures, the project would not cause: construction-related ground transportation impacts; a substantial increase in transit demand that could not be accommodated by adjacent Muni transit capacity such that significant adverse impacts to Muni transit service would occur under conditions without or with an overlapping SF Giants game at AT&T Park, or under cumulative conditions; substantial overcrowding on public sidewalks, hazardous conditions for pedestrians, or pedestrian accessibility under conditions without or with an overlapping SF Giants Game at AT&T Park, and with or without implementation of the Special Event Transit Service Plan, or under cumulative conditions; cause hazardous conditions for bicyclists or bicycle accessibility under conditions without or with an overlapping SF Giants Game at AT&T Park, and with or without implementation of the Special Event Transit Service Plan, or under cumulative conditions; result in a loading demand that would create potentially hazardous conditions or significant delays for traffic, transit, bicyclists, or pedestrians under conditions without or with an overlapping SF Giants Game at AT&T Park, and with or without implementation of the Special Event Transit Service Plan, or under cumulative conditions; cause significant impacts on emergency vehicle access under conditions without or with an overlapping SF Giants Game at AT&T Park, and with or without implementation of the Special Event Transit Service Plan, or under cumulative conditions; and would not adversely affect UCSF helipad operations.

- **Noise and Vibration** — With implementation of identified mitigation measures, the project would not cause a substantial increase in ambient noise levels during construction, including under cumulative conditions; expose people to or generate noise levels in excess of established standards during construction or operation; expose people and structures to or generate excessive groundborne vibration levels; or be substantially affected by noise from future operations at the helipad at the adjacent UCSF hospital.

- **Air Quality** — With implementation of identified mitigation measures, the project would generate toxic air contaminants, including diesel particulate matter but would not expose sensitive receptors to substantial air pollutant concentrations under project or cumulative conditions; and would not conflict with, or obstruct implementation of, the *2010 Clean Air Plan*.

- **Greenhouse Gas Emissions** — With purchase of voluntary carbon credits, the project would result in no net increase in greenhouse gas emissions, and would be consistent with plans or policies adopted for the purpose of reducing emissions of greenhouse gases.

- **Shadow** — The project would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas.

- **Utilities and Service Systems** — The project would not in itself require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

- **Public Services**—The project would not create impacts associated with the need for new or altered fire protection, emergency medical services, or law enforcement facilities during construction or operation, either directly or cumulatively.

- **Hydrology and Water Quality**—With implementation of identified mitigation measures, the project would not exceed the wastewater treatment requirements of the NPDES permit for the Southeast Water Pollution Control Plan; violate any water quality standards or waste discharge requirements; otherwise substantially degrade water quality as a result of changes in discharges to the Bay; exceed the capacity of the separate stormwater system; provide substantial additional sources of polluted runoff; or expose people or structures to a significant risk of loss, injury or death involving flooding due to sea level rise.

6.4 Irreversible and Irretrievable Commitments of Resources

In accordance with Section 21100(b)(2)(B) of CEQA, and Section 15126.2(c) of the CEQA Guidelines, an EIR must identify any significant irreversible environmental changes that could result from implementation of the proposed project. This may include current or future uses of non-renewable resources, and secondary or growth-inducing impacts that commit future uses of non-renewable resources, and secondary or growth-inducing impacts that commit future generations to similar uses. According to the CEQA Guidelines, irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

In general, such irreversible commitments include resources such as energy consumed and construction materials used in construction of a proposed project, as well as the energy and natural resources (notably water) that would be required to sustain a project and its inhabitants or occupants over the usable life of the project.

The project would use fossil fuel during demolition of existing parking lots where new buildings would be located, and during construction of the proposed new buildings. Construction would also require the commitment of construction materials, such as steel, aluminum, and other metals, concrete, masonry, lumber, sand and gravel, and other such materials, as well as water. The proposed project would commit future generations to an irreversible commitment of energy, primarily in the form of fossil fuels for heating and cooling of buildings, for automobile and truck fuel, and for energy production. The project would require an ongoing commitment of potable water for building occupants and landscaping.

However, all development would comply with *California Code of Regulations* Title 24 and the City's Green Building Ordinance and the project would be built to Leadership in Energy and Environmental Design (LEED©) Gold standards. Furthermore, with purchase of voluntary carbon credits, the project would result in no net increase in greenhouse gas emissions. Thus, overall, this development would be expected to use less energy and water over the lifetime of the proposed buildings than comparable structures not built to these same standards.

6.5 Areas of Known Controversy and Issues to Be Resolved

On November 11, 2014, the Office of Community Infrastructure and Investment issued a Notice of Preparation (NOP) of a Subsequent Environmental Impact Report (SEIR). Individuals, groups, and agencies that received these notices included owners of properties within 300 feet of the project site and other potentially interested parties, including various regional, state, and local agencies. A scoping meeting was held on December 9, 2014, to solicit comments on the scope of the SEIR. The NOP and Initial Study are included in Appendix NOP-IS of this document.

Based on the number of comments received, controversial issues for the proposed project, as expressed by community members, are the following:

- Site should be reserved for potential future expansion of the UCSF campus;
- Effect of project construction and operations on UCSF helipad operations;
- Why the project is analyzed under a Subsequent Environmental Impact Report;
- Which City ordinances, regulations, and approval requirements are superseded or otherwise different in the Mission Bay area;
- Aesthetic effects of the proposed development, including views through the project site and view easements, light and glare effects from construction, building lighting, and outdoor events;
- The approach to the transportation impact analysis, reasons for the assumptions incorporated (specifically into mode share), times of day and week studied, and cumulative projects considered;
- Impacts on transportation and circulation (including highways, arterial streets, local streets, pinch points, transit stations and service, and emergency response), as well as mitigation measures—specifically a Transportation Management Plan—that would reduce such impacts;
- Provision of sufficient bicycle and pedestrian circulation facilities and impacts to bicyclists and pedestrians;
- Parking supply and demand under both existing conditions and with the project;
- Financing, monitoring, and responsibility for implementation of mitigation measures;
- Noise from construction, outdoor events, crowds, operational traffic and generators;
- Impact from exposure to air pollutants during construction and operation;
- Effects on nearby infrastructure and facilities, including the Mariposa pump station and Bayfront Park;
- Security and crowd management, provision of public restrooms, provision of trash receptacles, littering, vermin, graffiti, and public intoxication;
- Economic effects of the project on the surrounding neighborhood and City; and
- Cumulative impacts of development of the project combined with development of other projects, and development under other plans, in the vicinity.

CHAPTER 7
Alternatives

7.1 Introduction

This chapter presents the alternatives analysis as required by the California Environmental Quality Act (CEQA) for the proposed multi-purpose event center and mixed-use development on Blocks 29-32 in the Mission Bay South Redevelopment Plan Area of San Francisco. The discussion includes a review of the alternatives analyzed in the 1998 Mission Bay Final Subsequent Environmental Impact Report (Mission Bay FSEIR), followed by the methodology used to select alternatives to the proposed project for detailed CEQA analysis, with the intent of developing potentially feasible alternatives that could avoid or substantially lessen the significant impacts identified for the proposed project while still meeting most of the project objectives. The chapter identifies a reasonable range of alternatives that meet these criteria, and these alternatives are evaluated for their comparative merits with respect to minimizing adverse environmental effects. For the alternatives selected for detailed analysis, the chapter evaluates the alternatives' impacts against existing environmental conditions and compares the potential impacts of the alternatives with those of the proposed project. Based on this analysis, this chapter then identifies the environmentally superior alternative. Finally, it describes other alternative concepts that were considered but eliminated from detailed consideration and reasons for their elimination.

7.1.1 CEQA Requirements for Alternatives Analysis

The CEQA Guidelines, Section 15126.6(a), state that an environmental impact report (EIR) must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the project's basic objectives, but that would avoid or substantially lessen any identified significant adverse environmental effects of the project. An EIR is not required to consider every conceivable alternative to a proposed project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation.

CEQA, the CEQA Guidelines, and the case law on the subject have found that feasibility can be based on a range of factors and influences. CEQA Guidelines, Section 15364, defines "feasibility" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." CEQA Guidelines Section 15126.6(f)(1) states that the factors that may be taken into account when addressing the feasibility of alternatives include site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (or the site is already owned by the proponent).

CEQA Guidelines Section 15126.6(e) states that, "The specific alternative of 'no project' shall also be evaluated along with its impact."

The EIR must evaluate the comparative merits of the alternatives and include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Specifically, the CEQA Guidelines set forth the following criteria for selecting and evaluating alternatives:

- An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation. An EIR is not required to consider alternatives which are infeasible. (Section 15126.6[a])

- [T]he discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. (Section 15126.6[b])

- The range of potential alternatives shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. (Section 15126.6[c])

- The specific alternative of "no project" shall also be evaluated along with its impact. (Section 15126.6[e][1])

- The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision-making. (Section 15126.6[f])

7.1.2 Mission Bay FSEIR Alternatives Analysis

The Mission Bay FSEIR identified and analyzed alternatives to the Mission Bay North and Mission Bay South Redevelopment Plans (Plans). As required under CEQA, the selected alternatives would reduce or avoid identified significant impacts of the Plans as well as meet most of the Plans objectives. The Mission Bay FSEIR also analyzed the required No Project alternative. The three alternatives analyzed in the Mission Bay FSEIR included:

- **No Project/Expected Growth Alternative**—is a reasonable estimate of development within the Plan area that could occur through 2015 under 1998 zoning regulations. About half as much residential and non-residential development would occur compared to the proposed Plans.

- **Redevelopment North of Channel/Expected Growth South of Channel Alternative**—is a combination of the proposed North Plan and instead of the South Plan, the expected growth scenario for the South Plan area. About the same amount of residential but 80 percent less non-residential development would occur compared to the proposed Plans.

- **Residential/Open Space Alternative**—A new overall scenario with about 65 percent more housing and 80 percent less non-residential development compared to the proposed Plans.

The Mission Bay FSEIR determined that all of the alternatives would result in the same significant and unavoidable adverse impacts identified for the Plans (i.e., traffic, vehicular air pollution emissions, potential combined toxic air contaminants, cumulative hazardous waste generation and disposal, and cumulative water quality), but the severity of the impacts would be somewhat lessened though not to a less-than-significant level. The Residential/Open Space Alternative was identified as the environmentally superior alternative.

As a program-level EIR, the Mission Bay FSEIR analyzed program-level alternatives that addressed the overall objectives of the Plans for the entire Plan area, and thus, did not examine specific alternatives for individual blocks or parcels such as Blocks 29-32. This SEIR, as discussed below, addresses site-specific alternatives for Blocks 29-32.

7.1.3 Organization of this Chapter

Following this introductory section, Section 7.2 describes the basis for selecting the alternatives analyzed in this SEIR; it reviews the project objectives, summarizes the significant impacts of the project that were identified in Chapter 5, and describes the alternatives screening and selection process. Section 7.3 provides a detailed description of each of the selected alternatives, its ability to meet the project objectives, and an evaluation of its environmental impacts compared to those of the proposed project. Section 7.4 compares the impacts of the alternatives to the impacts of the proposed project and to one another, and it identifies the environmentally superior alternative. The alternative concepts considered but rejected from further study are then discussed in Section 7.5.

7.2 Alternatives Selection

This section describes the basis for determining the range of CEQA alternatives and identifies the specific alternatives that are analyzed in this SEIR.

7.2.1 Project Objectives

As presented in Chapter 3, the objectives of the project, reiterated below, are consistent with the objectives of the Mission Bay Redevelopment Plan (see Chapter 3, Section 3.2). These alternatives were used in the identification and selection of alternatives. As noted above, an EIR need only consider alternatives that would feasibly accomplish most of the project's basic objectives.

The project sponsor’s objectives for the proposed project are to:

- Construct a state-of-the-art multi-purpose event center in San Francisco that meets NBA requirements for sports facilities, can be used year-round for sporting events and entertainment and convention purposes with events ranging in capacity from approximately 3,000-18,500, and expands opportunities for the City’s tourist, hotel and convention business.

- Provide sufficient complementary mixed-use development, including office and retail uses, to create a lively local and regional visitor-serving destination that is active year-round, promotes visitor activity and interest during times when the event center is not in use, provides amenities to visitors of the event center as well as the surrounding neighborhood, and allows for a financially feasible project.

- Develop a project that meets high-quality urban design and high-level sustainability standards.

- Optimize public transit, pedestrian, and bicycle access to the site by locating the event center within walking distance to local and regional transit hubs, and adjacent to routes that provide safe and convenient access for pedestrians and bicycles.

- Provide adequate parking and vehicular access that meets NBA and project sponsor’s reasonable needs for the event center and serves the needs of project visitors and employees, while encouraging the use of transit, bicycle, and other alternative modes of transportation.

- Provide the City with a world class performing arts venue of sufficient size to attract those events which currently bypass San Francisco due to lack of a world class 3,000-4,000 seat facility.

- Develop a project that promotes environmental sustainability, transportation efficiency, greenhouse gas reduction, stormwater management using green technology, and job creation consistent with the objectives of the California Jobs and Economic Improvement Through Environmental Leadership Act (AB 900), as amended.

7.2.2 Summary of Significant Impacts

As stated in the CEQA Guidelines, alternatives to a project must substantially lessen or avoid any of the significant environmental impacts associated with the project. The following summarizes the conclusions for potentially significant and significant impacts identified in Chapter 5 of this SEIR and in the Initial Study (see Appendix NOP-IS).

7.2.2.1 Significant and Unavoidable Impacts

The proposed project was determined to have the following significant and unavoidable impacts, as described in detail in Chapter 5 of this SEIR.

Transportation and Circulation

- The project would result in significant and unavoidable traffic impacts at multiple intersections in the project area that would operate at Level of Service (LOS) E or LOS F, under conditions without or with an overlapping SF Giants game at AT&T Park, and with or without implementation of the Muni Special Event Transit Service Plan, as well as under 2040 cumulative conditions, even with implementation of identified mitigation measures. (Impacts TR-2, TR-11, TR-18, and C-TR-2)

- The project would result in significant and unavoidable traffic impacts at freeway ramps in the project area intersections that would operate at LOS E or LOS F, under conditions without or with an overlapping SF Giants game at AT&T Park, and with or without implementation of the Muni Special Event Transit Service Plan, as well as under 2040 cumulative conditions, even with implementation of identified mitigation measures. (Impacts TR-3, TR-12, TR-19, and C-TR-3)

- The project would result in a substantial increase in transit demand that could not be accommodated by adjacent Muni transit capacity such that significant adverse impacts to Muni transit service would occur, under conditions without implementation of the Muni Special Event Transit Service Plan, even with implementation of identified mitigation measures. (Impact TR-20)

- The project would result in a significant adverse increase in transit demand that could not be accommodated by regional transit capacity such that significant adverse impacts to regional transit service would occur, under conditions without or with an overlapping SF Giants game at AT&T Park, and with or without implementation of the Muni Special Event Transit Service Plan, as well as under 2040 cumulative conditions, even with implementation of identified mitigation measures. (Impacts TR-5, TR-14, TR-21, and C-TR-5)

Noise and Vibration

- Operation of the proposed project would cause a substantial permanent increase in ambient noise levels in the project site vicinity, due to increased roadway noise levels from increased traffic in the project area and due to crowd noise following events affecting nearby sensitive receptors, even with implementation of identified mitigation measures. (Impact NO-5)

- Operation of the proposed project, when considered with other cumulative development, would cause a substantial permanent increase in ambient noise levels in the project site vicinity due to increased roadway noise levels from cumulative increases in traffic in the project area, even with implementation of identified mitigation measures. (Impact C-NO-2)

Air Quality

- Construction of the proposed project would generate fugitive dust and criteria air pollutants, which would violate an air quality standard, contribute substantially to an existing or projected air quality violation, and result in a cumulatively considerable net increase in criteria air pollutants, even with implementation of identified mitigation measures. (Impact AQ-1)

- During project operations, the proposed project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants, even with implementation of identified mitigation measures. (Impact AQ-2)

- The project, in combination with other past, present, and reasonably foreseeable future projects, would contribute to cumulative regional air quality impacts, even with implementation of identified mitigation measures. (Impact C-AQ-1)

Wind

- The proposed project structures would alter wind in a manner that would substantially increase the number of wind hazard hours at off-site public areas, and while feasible mitigation measures have been identified, the design refinements required to reduce this impact to a less-than-significant level have not been finalized. (Impact WS-1)

Utilities

- The project, in combination with past, present, and reasonably foreseeable future projects, would require the construction of new or upgraded wastewater facilities, the construction of which could cause significant environmental effects. This would be a significant and unavoidable impact with no feasible mitigation measures because mitigation is beyond the control of the project sponsor. (Impact C-UT-2)

- The project, in combination with past, present, and reasonably foreseeable future developments in the Mission Bay South area, would result in the determination by the San Francisco Public Utilities Commission (SFPUC) that it has inadequate capacity to serve the project's projected wastewater demand in addition to the SFPUC's existing commitments, even with implementation of identified mitigation measures. (Impact C-UT-4)

7.2.2.2 Significant Impacts that can be Mitigated to Less than Significant

The proposed project was determined to have the following potentially significant impacts, all of which could be mitigated to a less-than-significant level with implementation of identified mitigation measures, as described in detail in Chapter 5 of this SEIR and in the Initial Study (see Appendix NOP-IS).

Transportation and Circulation

- The project could result in a significant adverse increase in transit demand that could not be accommodated by adjacent Muni transit capacity under the existing plus Muni Special Event Transit Service Plan, under conditions with an overlapping SF Giants game at AT&T Park and under 2040 cumulative conditions, but identified mitigation measures to provide supplemental Muni transit service during overlapping events would reduce these impacts to less than significant. (Impact TR-13 and Impact C-TR-4)

- The project could result in a substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility on the site and adjoining areas, under conditions without or with an overlapping SF Giants game at AT&T Park and with or without implementation of the Muni Special Event Transit Service Plan, and under 2040 cumulative conditions, but identified mitigation measures to actively manage pedestrian flows at certain locations would reduce these impacts to less than significant. (Impacts TR-6, TR-15, TR-22, and C-TR-6)

- Construction of the project could temporarily obstruct helipad airspace surfaces under project or cumulative conditions, and operation of the project could affect helipad flight operations, but identified mitigation measures to prepare and implement a crane safety plan for project construction and an event center exterior lighting plan would reduce these impacts to less than significant. (Impact TR-9 and Impact C-TR-9)

Noise

- Operation of the project could result in exposure of persons to or generation of noise levels in excess of standards established in the San Francisco General Plan or San Francisco Noise Ordinance. Potentially significant operational noise impacts due to use of amplified sound in outdoor spaces at the project could be mitigated with implementation of a noise control plan for outdoor amplified sound, and potential noise impacts from interior event noise could be mitigated with implementation of a noise control plan for the San Francisco Entertainment Commissions' Place of Entertainment Permit. (Impact NO-4)

- Potentially significant construction noise impact due to the project's contribution to cumulative noise from construction of the project concurrent with other construction projects in the immediate vicinity could be mitigated to less than significant by implementing construction noise control measures. (Impact C-NO-1).

Air Quality

- Exposure of sensitive receptors to emissions of toxic air contaminants, including diesel particulate matter, from project construction and operation and under cumulative conditions, could result in a significant cancer risk but could be mitigated through implementation of construction emissions minimization measures. (Impact AQ-3 and C-AQ-2)

- The potential for the project to conflict with implementation of the *2010 Clean Air Plan* could be mitigated through implementation of construction minimization measures, reduction of operational emissions, transportation demand management measures, and purchase of emission offsets. (Impact AQ-4)

Hydrology and Water Quality

- Potentially significant impacts related to discharges of unusual chemicals such as radioactive materials and biohazardous materials to the Southeast Water Pollution Control Plant (SEWPCP) that could result in violation of the NPDES permit for the SEWPCP would be mitigated by providing sampling ports to facilitate sampling of wastewater discharges. (Impact HY-6)

Cultural Resources

- Project construction, both directly and cumulatively, could cause a substantial adverse change in the significance of archaeological resources, but implementation of archaeological testing, monitoring, data recovery, and accidental discovery measures would reduce this impact to less than significant. (Impact CP-2 and Impact C-CP-1, Initial Study)

Biological Resources

- Project construction could affect breeding birds which may nest within the project site, but implementation of preconstruction surveys for nesting birds would reduce this impact to less than significant. In addition, proposed structures could increase the risk of bird collisions with buildings, but implementation of bird safe building practices would reduce this impact to less than significant. (Impact BI-4, Initial Study)

Hazards and Hazardous Materials

- As identified in the Mission Bay FSEIR, site development could involve uses that handle biohazardous materials, but implementation of FSEIR mitigation measures providing guidelines for handling biohazardous materials would reduce this impact to less than significant. In addition, proposed construction could encounter naturally occurring asbestos, but implementation of geologic investigations and dust mitigation plans would reduce this impact to less than significant. (Impact HZ-1, Initial Study)

- As identified in the Mission Bay FSEIR, site development could include child care facilities that could be exposed to human health risks, but implementation of FSEIR mitigation measures providing risk management planning provisions for child care facilities would reduce this impact to less than significant. (Impact HZ-2, Initial Study)

7.2.3 Alternatives Screening and Selection

7.2.3.1 Alternatives Screening

In accordance with CEQA Guidelines Section 15126.6(a), this project-level SEIR examines a reasonable range of alternatives to the proposed project or to the location of the project. An alternative selected for analysis must meet three criteria: (1) the alternative would attain *most* of the project's basic objectives; (2) the alternative would *avoid or substantially lessen* the significant environmental impacts of the proposed project; and (3) the alternative must be potentially *feasible*.

An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. Furthermore, an EIR need not consider every conceivable alternative, but must consider a reasonable range of alternatives that will foster informed decision-making and public participation.

Screening Process

The alternatives selection process for the proposed project was based on first identifying strategies that would avoid or lessen the significant and potentially significant impacts identified above, with particular focus on strategies that address significant and unavoidable impacts of the proposed project. In addition, potential alternatives, options, and strategies were identified from review of scoping comments received following issuance of the Notice of Preparation (see Chapter 2, Section 2.4.1, Notice of Preparation and Public Scoping, and Section 2.6, Summary of Scoping Comments). Mitigation measures identified for the proposed project were also considered in the context of the alternatives screening process as possible strategies to avoid or substantially lessen significant impacts. The alternative strategies were then screened for their feasibility, and the potentially feasible strategies were then screened for their ability to meet most of the project objectives. This process resulted in the final alternatives that were determined to represent a reasonable range of alternatives that are described and analyzed in this SEIR.

Identification of Strategies to Avoid or Lessen Significant Impacts

All of the significant and potentially significant impacts identified for the proposed project, as summarized above, can be broken down into the following categories with respect to strategies for avoiding or lessening impacts related to: traffic; wastewater treatment capacity impacts; crowd and amplified noise; UCSF hospital helipad safety; wind hazards; construction; water quality and hazardous materials; and bird collisions. These strategies were then used to formulate alternatives for analysis in this chapter.

Transportation-related Impacts

Increased traffic generated by the proposed project would result in multiple significant impacts on transportation, noise, and air quality, many of which would be significant and unavoidable. The proposed project already incorporates extensive transportation demand management strategies and a transportation management plan, and the Transportation analysis in Chapter 5, Section 5.2, identifies numerous mitigation measures to further reduce transportation impacts. However, beyond those already identified measures, potential alternative strategies to lessen transportation impacts could include further decreasing project-generated traffic through reducing the scale and intensity of the land uses proposed at the project site (either the mixed uses and/or the event center) or by relocating the project to an alternate site where fewer trips would occur by auto and/or where traffic generated from the proposed uses would result in less severe impacts. These strategies are discussed below.

Wastewater Treatment Capacity Impacts

As discussed further below, the only feasible approach to addressing the significant and unavoidable wastewater treatment capacity impact of the proposed project would be to re-locate the project to a different sewage drainage area where there is sufficient capacity for the projected wastewater demand.

Crowd and Amplified Sound Noise Impacts

As described in Chapter 3, Project Description, the event center would be designed as a year-round destination attraction for a wide variety of sports, entertainment, and convention purposes as well as to provide amenities to serve visitors and the surrounding neighborhood. Thus, by design, large numbers of people would congregate at the project site, resulting in crowd noise, which in turn would result in a significant, unavoidable impact on nearby sensitive receptors following evening events. Further, without appropriate mitigation, the event center could result in significant impacts related to amplified sound in outdoor spaces, noise leakage from the events within the event center, and overcrowding on public sidewalks. Beyond the mitigation measures identified in Chapter 5, alternative strategies to reduce or lessen these event-center related impacts would be either to reduce the size of the event center, thereby reducing the number of event attendees and associated crowding effects, or to relocate the event center away from sensitive receptors. These strategies are discussed below.

UCSF Hospital Helipad Safety Impacts

Chapter 5, Section 5.2, included an analysis of the impacts of the proposed project on the UCSF Hospital helipad. The analysis determined that operation of the proposed event center could affect helipad flight operations due to the potential for use of specialty exterior lighting. While the identified mitigation measure of preparing and implementing an event center exterior lighting plan would reduce this impact to less than significant, the only alternative strategy to avoid this impact would be to relocate the event center away from the UCSF Hospital helipad. This strategy is discussed below.

Wind Hazards Impacts at Off-site Public Areas

Chapter 5, Section 5.6, conservatively determined that the proposed project would result in significant and unavoidable wind hazard impacts, even with implementation of identified mitigation measures, because the wind effects of final design refinements have not yet been confirmed. The only feasible strategy to avoid or lessen wind hazards impacts, regardless of the location of the proposed project, would be to implement the identified mitigation measure, namely to develop and test design measures (using wind tunnel testing methodologies) to confirm site-specific changes in wind conditions attributable to the proposed project, as indicated in Mitigation Measure M-WS-1, Develop and Implement Design Measures to Reduce Off-site Wind Hazards. Thus, even though Impact WS-1 was identified as significant and unavoidable with mitigation, it is anticipated that during final project design and prior to construction, the project sponsor would implement Mitigation Measure M-WS-1 and develop appropriate project design refinements to reduce the wind hazard impact at off-site pubic areas to less than significant. Therefore, no specific alternative strategies are discussed in this alternatives analysis regarding avoiding or lessening wind hazard impacts. However, please see Chapter 8, Third Street Plaza Variant, which analyzes a variation of the proposed project that would result in less-than-significant wind hazards impacts without the need for mitigation.

Construction-related Impacts

Construction activities would result in a significant and unavoidable impact on air quality, as well as significant impacts that can be reduced to less than significant with identified mitigation measures related to the following: (1) UCSF helipad airspace surfaces, (2) cumulative noise in combination with other planned construction projects in the immediate vicinity, (3) exposure of sensitive receptors to toxic air contaminants, (4) archaeological resources, and (5) nesting birds.

Chapter 5, Section 5.4 identifies mitigation measures for construction air quality and toxic air contaminants, which include construction emissions minimization as well as emission offsets; these measure represent the only feasible strategies to lessen air quality impacts of a construction project of this magnitude within the San Francisco Bay Area Air Basin. However, reducing the scale of the project (either the event center and/or the mixed-use development) would represent a potential alternative strategy that could reduce these air quality impacts; this strategy is discussed below. With respect to construction-related cumulative noise and helipad impacts, Chapter 5 indicates that these impacts could be mitigated to a less-than-significant level with identified mitigation measures; however, alternative strategies to avoid or lessen these impacts would be either to reduce the size/scale of the project (to the extent that construction would not contribute substantially to cumulative construction noise) or to relocate the project to an alternate site where there is no adjacent private helipad and no other construction projects in the immediate vicinity. These strategies are discussed below.

Construction impacts related to the potential to encounter archaeological resources or nesting birds would be mitigated to less than significant with identified mitigation measures. These impacts would occur regardless of the size or scale of the project, and no on-site alternative strategies would reduce or lessen these mitigable effects. These impacts are associated with any project that involves grading or excavation activities. For this reason, off-site alternatives, depending on the location, would likely result in the same potential impacts and require the same mitigation measures if grading and excavation were required or if any vegetation is present on the site. Therefore, no alternative strategies are designed to specifically address these impacts.

Water Quality and Hazardous Materials Impacts

Potentially significant impacts associated with possible future uses at the project site include one water quality impact and two hazardous materials impacts; these impacts were all identified in the Mission Bay FSEIR with respect to the entire Plan area and would also apply to the proposed project at Blocks 29-32. The water quality impact is due to the possibility that proposed commercial uses, particularly research uses, could discharge unusual chemicals to the SEWPCP, and the hazardous materials impact is due to the possibility that certain future uses could involve handling of biohazardous materials. An additional hazardous materials impact is due to the potential for future child care facilities to be present in areas subject to a risk management plan for exposure to hazardous materials in soil and groundwater. The FSEIR identified feasible mitigation measures that would reduce these impacts to less than significant. All of these impacts apply to the proposed project and would apply to any proposed development at this site, because such potential uses are allowed under the Mission Bay South Plan. Therefore, no on-site alternative strategy would address these impacts, given that the identified mitigation measures would adequately mitigate this impact under any allowable development at this site. An off-site alternative strategy, which, depending on the location, could avoid these potentially significant impacts, is discussed below.

Bird Collisions Impact

The biological resources impact analysis in the Initial Study (see Appendix NOP-IS) identified the potential for the proposed project to result in increased risk for bird collisions with buildings due to the proximity of the site to the Bay and the fact that the proposed project is not subject to the City's *Standards for Bird-Safe Buildings* (Planning Code Section 139) because the site is within the Mission Bay Redevelopment Plan Area. However, the identified mitigation measure to implement bird safe building practices consistent with the City's *Standards for Bird-Safe Buildings* (Planning Code Section 139) would ensure that the project would result in a less-than-significant impact on birds. This mitigation measure would apply to any alternative development on the project site or elsewhere within the Plan area. For any off-site alternative located anywhere else in the City, the *Standards for Bird-Safe Buildings* (Planning Code Section 139) would apply and compliance with this regulation would result in no impact on bird collisions. Therefore, no alternative strategies are designed to address this impact.

Evaluation of Potential Strategies that Would Avoid or Lessen Significant Impacts

As described above, alternative strategies that could avoid or lessen the identified significant impacts of the proposed project include: (1) reducing the intensity of the mixed uses; (2) reducing the size/scale of the event center; and (3) relocating the project to an alternate site.

Alternative Strategy to Reduce the Intensity of the Mixed Uses

This strategy was determined to be potentially feasible and is the basis for one of the alternatives selected for detailed analysis, Alternative B, Reduced Intensity Alternative. Alternative B was developed with the intent of reducing transportation- and construction-related impacts, and Section 7.3, below, presents the assumptions and description of the Reduced Intensity Alternative, its ability to meet the project objectives, and a comparison of its environmental impacts compared to those of the proposed project.

Alternative Strategy to Reduce Size/Scale of the Event Center

As described above, this strategy could potentially reduce traffic-related and event-center impacts. The size and scale of the proposed event center is currently designed to meet the primary objective of meeting the NBA requirements for sports facilities, and specifically for use as the home court for the Golden State Warriors basketball team. The proposed capacity of 18,064 seats is nearly 1,600 fewer seats than the average capacity of all current NBA facilities (19,662 average capacity, 19,862 median capacity). The proposed 18,064-seat capacity is also well below the capacity of the Warriors' current home court at the Oracle Arena in Oakland (capacity 19, 956). However, while the event center is designed to meet the specific needs for NBA basketball games, it is also designed on balance to achieve the overall project objectives (see Section 7.2.1, above) of providing a year-round venue for a variety of sporting events, entertainment, and convention purposes that promotes environmental sustainability, transportation efficiency, greenhouse gas reduction, and job creation.

If the proposed event center were to open in 2015, the proposed 18,064-seat capacity would be the fourth lowest capacity in the NBA, despite the high current market demand for season tickets. Currently, the Warriors have 14,500 season ticket holders and there are over 13,000 people on the waiting list for season tickets. Therefore, the project sponsor has indicated that reducing the capacity of the event center below 18,064 is not feasible due to its already small size relative to other NBA facilities and the overwhelming market demand for season tickets.

Furthermore, as described above, most of the event center-related impacts could be mitigated with identified mitigation measures, and it is unlikely that reducing the size/scale of the event center could effectively or substantially lessen the project's significant transportation-related impacts.

Detailed traffic modeling of a smaller event center has not been performed. For this reason, it is not possible to determine exactly how small the event center would need to be in order to avoid some or all of the project's significant and unavoidable traffic impacts. Based on the modeling that has been performed, however, it would be expected that a smaller event center would result in significant impacts at fewer intersections, but as indicated by the modeling conducted for the No Event scenario, an arena of any size would result in a significant impact at the intersection of 16th/Seventh/Mississippi. Thus, even a substantially smaller event center than the proposed 18,064-seat event center would still have a significant and unavoidable impact, would not meet NBA standards for an arena, and would not meet the basic project objectives.

Furthermore, reducing the scale of operations at the proposed event center—such as reducing the number or size of events—would reduce the frequency of the significant transportation-related impacts but would not lessen or avoid the magnitude of the impact of any individual event; the same transportation impacts would remain significant and unavoidable. Therefore, this alternative strategy would not effectively avoid or lessen transportation-related impacts. Thus, reducing the size and scale of the event center was screened from further consideration for detailed alternatives analysis. It should be noted, however, that reducing the size of project features other than the event center is included under Alternative B, Reduced Intensity Alternative, which is analyzed in this chapter of the SEIR.

Alternative Strategy to Relocate the Project to an Alternate Site

Relocating the project to an alternate site could potentially avoid or lessen significant transportation-related impacts, wastewater capacity impacts, operational noise impacts, UCSF Hospital helipad safety impacts, construction-related impacts, and/or future use-related impacts that were identified for the proposed project at Blocks 29-32. However, the feasibility of an alternate location is highly site-specific and dependent on numerous factors, including among other factors, site suitability, economic viability, availability of infrastructure, general plan consistency, and whether or not the project sponsor can reasonably acquire, control, or otherwise have access to the alternate site, per CEQA Guidelines Section 15126.6(f)(1). Furthermore, relocating the project to an alternate site could result in the same, greater, or different significant impacts than those identified for the proposed project. For the purposes of this SEIR, twelve alternate sites in San Francisco were examined as potential candidates for an off-site alternative based in part on scoping comments received, as described in more detail in Section 7.5 below. One site was selected to represent the alternative strategy of relocating the project.

Given the history of the proposed project and known objectives of the project sponsor, Alternative C, Off-site Alternative at Piers 30-32 and Seawall Lot 330, was identified as a potentially feasible option for an off-site alternative for analysis in this SEIR. As described in Chapter 2 of this SEIR, in 2012, the project sponsor submitted an application to the San Francisco Planning Department for a proposed event center and mixed-use development on Piers 30-32 and Seawall Lot 330. The project sponsor conducted a number of studies and investigations for a project at this site, including preparation of detailed site-specific plans and programming and conducting discussions and negotiations with responsible and approving agencies. Thus, Piers 30-32 and Seawall Lot 330 is considered to be a feasible location for an off-site alternative for the purposes of this SEIR due to its site suitability (based on the existing studies that have been conducted for this site), proximity to the downtown and local/regional transit services its previous history of potential economic viability, and the potential ability of the project sponsor to reasonably acquire, control, or otherwise have access to this site (based on previous negotiations and discussions with the Port of San Francisco).

Since the issuance of the Notice of Preparation for this previous proposal in November of 2012, a number of changes in circumstances have occurred, leading in part to the project sponsor's decision to withdraw its application for development of the previously proposed project at Piers 30-32 and Seawall Lot 330. The proposed project at Piers 30-32 and Seawall Lot 330 generated extensive public controversy. In addition, the voters of San Francisco approved Proposition B in June 2014, which requires voter approval for any increase in existing zoning heights along the waterfront. While there is currently a lawsuit challenging the validity of this proposition, if upheld in court, the ballot measure would require the Off-site Alternative at Piers 30-32 and Seawall Lot 330 to obtain approval of a zoning height change from the San Francisco voters. Many individuals credit this ballot measure along with increased project costs, lengthy regulatory approvals, and opposition to the project location as the basis for the project sponsor to relocate the project to Mission Bay. Yet, in November 2014, the San Francisco voters approved Proposition F to allow a height increase for a development project at Pier 70. The Seawall Lot 337 LLC, an affiliate of the San Francisco Giants, is currently collecting signatures to qualify for a ballot measure for the November 2015 election to approve height increases for a proposed development at Seawall Lot 337 (which incidentally is one of the off-site locations considered and eliminated from further consideration, as discussed in Section 7.5, below). These efforts indicate that while it is difficult to obtain approval at the ballot for height increases on waterfront property and may extend the project approval time horizon, it is not unreasonable to expect that public support for a ballot measure to approve a GSW project at this alternative location is possible and would represent a viable project. In addition, the San Francisco voters have historically approved certain aspects of a professional sports franchise at the ballot;

there have been successful prior ballot measures involving projects related to facilities for professional sports franchises: "Ballpark" (Proposition B) in March 1996 and "Candlestick Point Stadium Land Use" (Proposition F) in June 1997. Consequently, relocating the proposed project to its previously proposed location with many of the project elements as originally proposed constitutes a potentially feasible off-site alternative despite the abovementioned hurdles necessary for project approval.

Therefore, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 was selected for detailed analysis in this SEIR, with the intent of reducing transportation-related impacts, wastewater capacity impacts, operational noise impacts, UCSF hospital helipad safety impacts, construction-related impacts, and water quality and hazardous materials impacts that were identified for the proposed project. Section 7.3, below, presents the assumptions and description of the Off-site Alternative at Piers 30-32 and Seawall Lot 330, its ability to meet the project objectives, and a comparison of its environmental impacts compared to those of the proposed project.

7.2.3.2 Alternatives Selected for Detailed Analysis

The following alternatives are analyzed in this chapter:

- Alternative A: No Project Alternative
- Alternative B: Reduced Intensity Alternative
- Alternative C: Off-site Alternative at Piers 30-32 and Seawall Lot 330

These three alternatives were determined to adequately represent the range of feasible alternatives required under CEQA for this project. These alternatives would lessen, and in some cases avoid, significant and potentially significant adverse impacts related to transportation, air quality, noise, utilities, water quality, and hazardous materials that were identified for the proposed project. Alternative A is included as required by CEQA Guidelines Section 15126.6(e), even though it would not meet the basic project objectives, but Alternatives B and C are potentially feasible options that would likely meet most of the project objectives. **Table 7-1** summarizes and compares the characteristics of the proposed project with those of Alternatives A, B, and C. Detailed descriptions of each alternative are presented in Section 7.3, below, along with an evaluation of their environmental impacts. **Table 7-2** summarizes the ability of the three alternatives to meet the project objectives. In addition, as noted in Chapter 8 of this SEIR, a project variant is analyzed in equal level of detail as the proposed project, and this variant incidentally reduces one of the significant impacts of the proposed project while meeting all of the project objectives. Thus, this variant represents a fourth alternative considered in detail in this alternatives analysis. Please refer to Chapter 8 for the description and analysis of the Third Street Plaza Variant (and the fourth project alternative).

TABLE 7-1
COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

Characteristic	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-Site at Piers 30-32/SWL 330
Summary				
Size, gross square feet (gsf)	750,000 event center 25,000 GSW offices 580,000 other office uses 125,000 retail use 475,000 parking and loading 1,955,000 Total	1,056,000 commercial/industrial 31,700 retail 1,087,700 Total	750,000 event center 25,000 GSW offices 348,000 other office uses 75,000 retail use 350,000 parking and loading 1,548,000 Total	694,944 event center, including GSW offices 25,946 event hall 90,000 retail at Piers 30-32 13,172 services 252,554 parking and loading 1,820 Red's Java House 1,078,436 Total at Piers 30-32 208,844 residential at SWL 330 178,406 hotel at SWL 330 29,854 retail at SWL 330 106,339 parking at SWL 330 11,447 support at SWL 330 534,890 Total at SWL 330
Parking, number of spaces	950 spaces onsite, plus 132 spaces off-site	1,050 spaces onsite plus 132 spaces off-site	750 spaces onsite, plus 132 spaces off-site	500 at Piers 30-32 259 at SWL 330
Public Open Space	3.2 acres	Not defined	3.2 acres	7.26 acres on Piers 30-32
Event Center				
Location	Mission Bay South Redevelopment Area, Blocks 29-32	Oracle Arena, Oakland (rebuilt, or possibly re-located)	Same as Project	Piers 30-32
Basketball Seating Capacity, number of seats	18,064	19,596 (current capacity)	Same as Project	Same as Project
Size of Event Center, gsf	750,000	~ 500,000 (current size)	Same as Project	694,944
GSW Management Offices and Practice Facilities, gsf	25,000	~ 16,000 sq. ft. in downtown Oakland (current location)	Same as Project	Approx. same as Project
Operations	Approx. 225 events per year (see Chapter 3, Project Description)	Same as existing, in Oakland (see Chapter 3, Project Description)	Same as Project	Same as Project

TABLE 7-1 (Continued)
COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

Characteristic	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-Site at Piers 30-32
Mixed-Use Development				
Total Mixed Uses (non-event center), gsf	580,000, office use 125,000, retail use	1,056,000 commercial/industrial 31,700 retail	373,000 office use 75,000 retail use	90,000 retail at Piers 30-32 29,854 retail at SWL 330 208,844 residential at SWL 330 178,406 hotel at SWL 330
Maximum Height, feet (Building heights are measured from finished grade to top of building, consistent with the South Design for Development. Heights of proposed office and retail buildings excludes unoccupied top floor level with mechanical equipment.)	Blocks 29-32, Event Center: 135 feet Block 29, South St. Tower: 160 feet Block 29, Podium: 90 feet Block 31, 16th St. Tower: 160 feet Block 31, Podium: 90 feet	Block 29, Third St. Tower: 160 feet Blocks 31 and 32: Max. 90 feet (7 stories) Block 30: Approx. 75 feet (5 stories)	Blocks 29-32, Event Center: 135 feet Block 29, South St. Tower: 160 feet Block 29, Podium: 90 feet Block 31: 55 feet	Event Center at Piers 30-32: 128 feet Residential Uses at SWL 330: 175 feet Hotel Uses at SWL 330: 105 feet
Operations	Year-round operations, 7 days a week (see Chapter 3, Project Description)	Typical year-round schedule expected for commercial/industrial/retail uses	Same as Project	Event Center, same as Project Typical year-round schedule expected for retail/residential/ hotel uses
Construction				
Duration	26 months	Approx. same as Project	Approx. same as Project	Approx. 32 months
Construction Hours	Monday through Friday, 7:00 a.m. to 6:00 p.m., plus some nights and weekends	Approx. same as Project	Approx. same as Project	Approx. same as Project
Permits and Approvals				
Project approvals	See Chapter 3	• Approval by the OCII Commission of a new Major Phase for Blocks 29-32 • Approval by the OCII Commission of individual Combined Basic Concept and Schematic Designs for the project	Same as Project	• United States Army Corps of Engineers • United States Fish and Wildlife Service • National Marine Fisheries Service • State Lands Commission (public trust determination for Piers 30-32) • San Francisco Bay Conservation and Development Commission

TABLE 7-1 (Continued)
COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

Characteristic	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-Site at Piers 30-32
Permits and Approvals				
		• San Francisco Department of Public Works and Board of Supervisors approval of subdivision maps, including acceptance of public improvements, and right-of-way dedications • Termination or relocation of existing City-reserved easements by applicable City departments to the extent required • San Francisco Department of Building Inspection approval of a building/site permit, and related approvals from other City departments include the SFPUC for utility connections	Same as Project	• California Department of Fish and Wildlife • San Francisco Regional Water Quality Control Board (RWQCB) • San Francisco Planning Commission • San Francisco Port Commission • San Francisco Board of Supervisors • Voter approval under Proposition B (June 2014)

TABLE 7-2
SUMMARY OF ABILITY OF ALTERNATIVES TO MEET PROJECT OBJECTIVES

Project Objective	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32/SWL 330
	Would the alternative meet this objective?		
1. Construct a state-of-the-art multi-purpose event center in San Francisco that meets NBA requirements for sports facilities, can be used year-round for sporting events and entertainment and convention purposes with events ranging in capacity from approximately 3,000-18,500, and expands opportunities for the City's tourist, hotel and convention business.	No	Yes	Yes
2. Provide sufficient complementary mixed-use development, including office and retail uses, to create a lively local and regional visitor-serving destination that is active year-round, promotes visitor activity and interest during times when the event center is not in use, provides amenities to visitors of the event center as well as the surrounding neighborhood, and allows for a financially feasible project.	Potentially	Financial feasibility unknown	Financial feasibility unknown
3. Develop a project that meets high-quality urban design and high-level sustainability standards.	Yes	Yes	Yes
4. Optimize public transit, pedestrian, and bicycle access to the site by locating the event center within walking distance to local and regional transit hubs, and adjacent to routes that provide safe and convenient access for pedestrians and bicycles.	No	Yes	Yes
5. Provide adequate parking and vehicular access that meets NBA and project sponsor's reasonable needs for the event center and serves the needs of project visitors and employees, while encouraging the use of transit, bicycle, and other alternative modes of transportation.	No	Yes	Yes
6. Provide the City with a world class performing arts venue of sufficient size to attract those events which currently bypass San Francisco due to lack of world class 3,000 to 4,000 seat facility	No	Yes	Yes
7. Develop a project that promotes environmental sustainability, transportation efficiency, greenhouse gas reduction, stormwater management using green technology, and job creation consistent with the objectives of the California Jobs and Economic Improvement Through Environmental Leadership Act (AB 900), as amended.	Potentially	Yes	Yes

7.3 Alternatives Analysis

This section presents the detailed analysis of the impacts of the selected alternatives compared to the proposed project. For each of the three alternatives, this section presents a description of the alternative and assumptions used in analyzing that alternative, assesses the ability of the alternative to meet each of the project objectives, and analyzes the impacts of the alternative compared to those of the proposed project. The impact analysis is based on the same environmental setting and significance thresholds as presented for each resource topic in Chapter 5 and uses the same approach to analysis. Except as noted, the impact analysis of the alternatives is qualitative, relative to the identified impacts of the project, and the reader is referred to Chapter 5 and the Initial Study for the more detailed analysis. For transportation, noise, and air quality, however, the analyses are quantitative in order to provide a more refined comparison of the severity of impacts associated with the alternatives relative to those of the proposed project.

7.3.1 Alternative A: No Project

As required by CEQA Guidelines Section 15126.6(e), the No Project Alternative is evaluated to allow decision-makers to compare the environmental effects of approving the proposed project with the effects of not approving the project. The No Project Alternative represents what would reasonably be expected to occur in the foreseeable future if the project is not approved.

7.3.1.1 Description of the No Project Alternative

Under the No Project Alternative, the Golden State Warriors organization would not relocate to San Francisco, and Blocks 29-32 in the Mission Bay South Plan area would not be developed with the proposed event center and mixed-use development described in Chapter 3 of this SEIR. Instead, it is assumed that in the short term, the Warriors organization would exercise its option to stay in Oakland, and accordingly, the team would continue to play its home games at Oracle Arena and lease their management offices and practice facility at the Oakland Convention Center in Oakland. Oracle Arena, built in 1966 and remodeled in 1996, is the oldest facility still in use by the NBA. Therefore, under this alternative, it is likely that the Warriors organization would either build a new arena at its current location or relocate and build a new facility in the long term in the Bay Area or elsewhere.

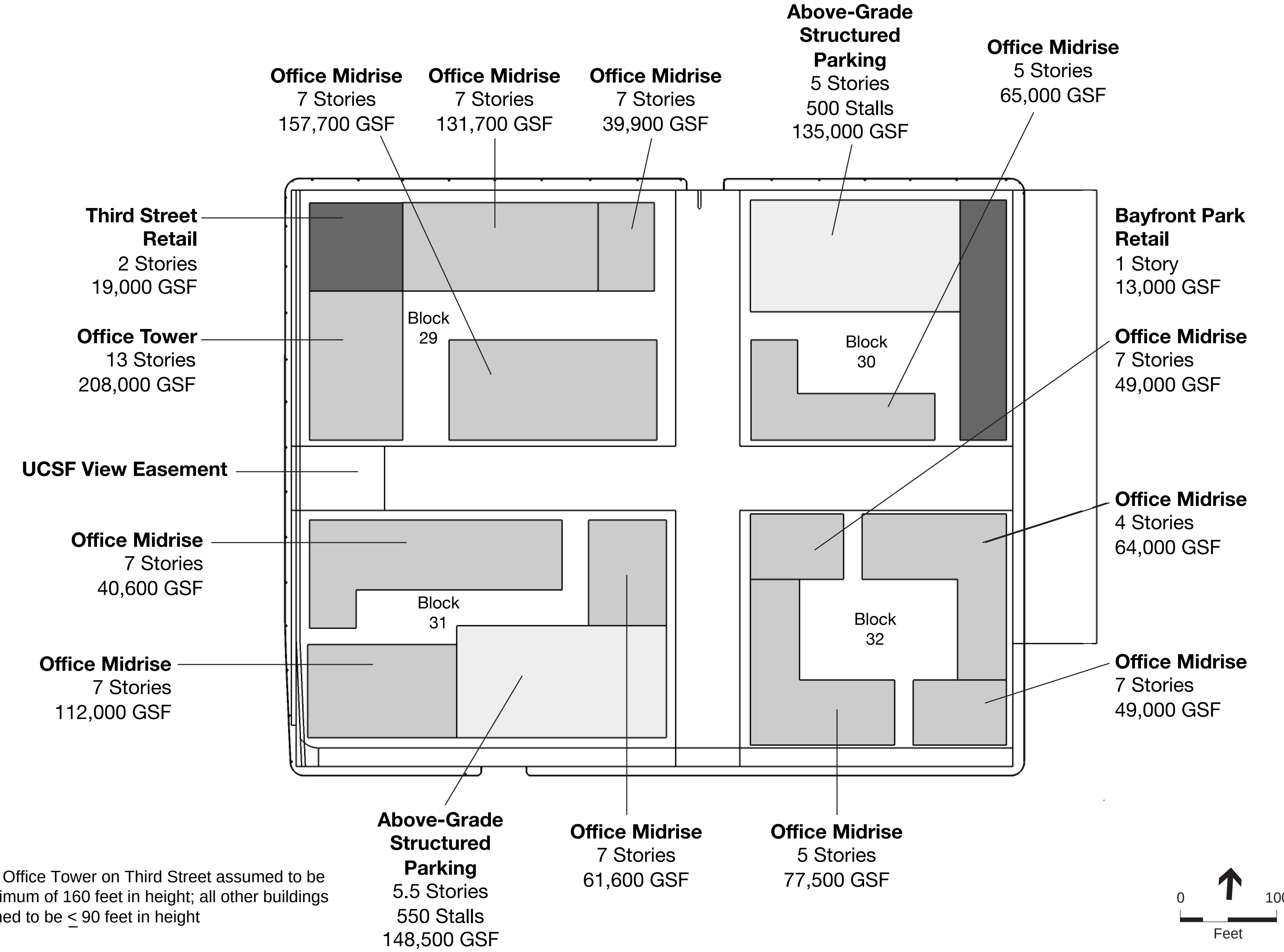
Currently, there are no other development proposals pending at Blocks 29-32, but given its prime location, existing entitlement, and ongoing development on similar sites adjacent to or near to Blocks 29-32, it is reasonable to expect that development at Blocks 29-32 would occur in the foreseeable future. Thus, the No Project Alternative does not assume that Blocks 29-32 would remain under their current vacant conditions, but rather that the site would be developed as was proposed in the Mission Bay FSEIR. Consistent with CEQA Guidelines Section 15126.6(e)(2), this scenario represents what is reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans, available infrastructure, and community services. Specifically, the No Project Alternative assumes that Blocks 29-32 would be developed consistent with the restrictions and controls established in the Mission Bay South Redevelopment Plan (South Plan) and the South Design for Development.[1]

For the purposes of this SEIR, a hypothetical development scenario was developed that conforms to the South Plan and associated Design for Development, which allows all building to be a maximum of 90 feet in height, except for one 160-foot high tower on Block 29. As depicted in **Figure 7-1**, the No Project Alternative assumes that approximately 1,056,000 gross square feet (gsf) of commercial/industrial plus 31,700 gsf of retail uses would be developed at Blocks 29-32, for a total of 1,087,700 gsf. There would be no event center. The commercial/industrial uses would presumably consist of office and research/development uses, with a 13-story, 160-foot tall office tower located on Block 29 along Third Street and varying heights of office mid-rise buildings, all less than 90 feet in height, throughout Blocks 29, 30, 31, and 32. One- to two-story retail uses would be located at the corner of Third and South Streets on Block 29 and along the re-aligned Terry A. Francois Boulevard on Block 30. There would be two, above-grade, five- to five-and-a-half-story parking structures, one on South Street and one on 16th Street, with 1,050 parking stalls on-site, plus 132 spaces off-site at the South Street garage, for a total of 1,182 spaces.[2] It is assumed that publically accessible open spaces would be provided amidst the office buildings. Possible future uses for this hypothetical development scenario could include biotech uses, UCSF-related uses, or a wide variety of private or public uses that are allowed as primary uses under the Mission Bay South Redevelopment Plan.

This scenario assumes that no further CEQA environmental review would be required beyond the Mission Bay FSEIR and that no amendments to the South Plan or Design for Development would be needed, although OCII would make a final determination as to the need for supplemental CEQA environmental review or minor changes to Mission Bay planning documents on a project-specific basis.

1 There have been two previously approved projects, or Major Phase approvals for Blocks 29-32. Similar to those projects, the No Project Alternative would be subject to the established protocols in the Mission Bay South Owner Participation Agreement (OPA), through the Design Review and Document Approval Procedure (DRDAP), and the Interagency Cooperation Agreement (ICA) between the OCII and City departments. Under these agreements, the sponsor of the No Project Alternative development would be required to submit its overall plans for development in "Major Phases" and in combined Basic Concept and Schematic Design (Schematic Design) applications. If each Major Phase and Schematic Design submission is consistent with the South Plan, the Design for Development, the Mission Bay South Infrastructure Plan, and other Plan documents, then the OCII Commission approves each Major Phase and Schematic Design. The OPA vests the rights of an applicant or project sponsor to develop a program of the number of square feet and intensity of uses described in the No Project Alternative.

2 Based on the requirements of the South Plan and the Design for Development, a minimum of 1,061 and maximum of 1,081 spaces would be needed for a proposed development of this size. With the inclusion of the 132 spaces at the South Street garage, the requirements for on-site parking would range from 929 to 949 spaces. Thus, the parking estimates used for the No Project Alternative exceed the requirements, though would likely be adjusted should an actual development proposal be submitted.



Note: Office Tower on Third Street assumed to be a maximum of 160 feet in height; all other buildings assumed to be ≤ 90 feet in height

SOURCE: Manica Architecture, 2015

Figure 7-1
No Project Alternative, Conceptual Site Plan

7.3.1.2 Ability of the No Project Alternative to Meet Project Objectives

As shown in Table 7-2, the No Project Alternative could potentially meet three of the seven project objectives, depending on the proposed program. However, the No Project Alternative would fail to achieve the primary objective of the project sponsor of constructing a new event center and home court for the Golden State Warriors NBA basketball team. Consequently, this alternative would not optimize or provide public transit, pedestrian, parking, and vehicular and bicycle access to an event center, nor would it provide the City with a 3,000 to 4,000 seat performing arts venue. However, given that there is currently no specific design or proposal for the hypothetical No Project development scenario, it is reasonable to assume that the development could be designed to create a lively, year-round visitor-serving destination that meets high quality urban design and high-level sustainability standards. Furthermore, it can be assumed that the No Project Alternative could promote environmental sustainability, transportation efficiency, greenhouse gas reduction, and other green building technologies, though it would be unlikely that the project sponsor for the No Project Alternative would pursue AB 900 certification.

7.3.1.3 Impacts of the No Project Alternative

The No Project Alternative would result in similar impacts to those disclosed in the Mission Bay FSEIR and would be subject to all mitigation measures identified in the Mission Bay FSEIR applicable to Blocks 29-32. Impacts of the No Project Alternative would also be similar to those of the proposed project. This is because many of the impacts would result from the conversion of a vacant parcel at this same location to a fully developed City block, regardless of the size of the development, and the same or similar mitigation or improvement measures identified for the proposed project would apply to the No Project Alternative. The impacts of the No Project Alternative as compared to those of the proposed project are summarized below by resource topic. The reader is referred to Initial Study (Appendix NOP-IS) and Chapter 5 of this SEIR for the full analysis of impacts similar to those of the proposed project.

The environmental impact analysis of the No Project Alternative considers only the hypothetical development scenario on Blocks 29-32 described above and does not consider any effects associated with building a new arena for the Warriors basketball team at another location. However, it should noted that in March 2015, the City of Oakland certified a Final EIR on the Coliseum Area Specific Plan,[3] which discloses the environmental impacts of a new sports venue at the current location of Oracle Arena and the surrounding area.

Land Use

Like the proposed project, the No Project Alternative would not physically divide an established community, conflict with applicable land use plans, or have a substantial impact upon the existing character of the vicinity. The commercial/industrial/retail uses would occur within the boundary

[3] City of Oakland, 2015. Coliseum Area Specific Plan, Final Environmental Impact Report. State Clearing House #2013042066, City Case #ER13-0004, published February 20, 2015. Certified March 31, 2015.

of existing lot lines, would be consistent with the South Plan and associated Design for Development, and would be comparable in character to surrounding land uses. All land use impacts would be *less than significant* and no mitigation would be required.

Aesthetics

Like the proposed project, the No Project Alternative would be on an infill site, within a transit priority area, and an employment center, therefore under Public Resources Code Section 21099, aesthetics are not to be considered in determining significant environmental effects.

Population and Housing

Like the proposed project, the No Project Alternative would not induce substantial population growth, displace housing units, create substantial demand for additional housing, or displace substantial numbers of people. Employment projections for both construction and operation would be similar to or less than that for the proposed project, based on the reduced gross square footage of development, and could be met by the local and regional labor force. As described for the proposed project in the Initial Study, no housing would be displaced, and housing needs would be met by residents already living in the region. All population and housing impacts would be *less than significant* and no mitigation would be required.

Cultural and Paleontological Resources

Like the proposed project, the No Project Alternative would not affect the significance of a historical resource, not destroy a unique paleontological resource, and not disturb any human remains, assuming compliance with applicable regulations; these impacts would be *less than significant* and no mitigation would be required. Also, because construction of the No Project Alternative would be comparable to that of the proposed project, although excavation requirements would be less because parking would be above rather than below grade, this alternative, like the proposed project, could cause a substantial adverse change in the significance of an archaeological resource that could be mitigated to less than significant. Ground disturbance associated with grading and foundation work could affect unidentified archaeological resources, and the same mitigation measures, Mitigation Measure M-CP-2a, Archaeological Testing, Monitoring and/or Data Recovery Program, and Mitigation Measure M-CP-2b, Accidental Discovery of Archaeological Resource, would be applicable to the No Project Alternative and would make this impact *less than significant with mitigation*.

Transportation and Circulation

The No Project Alternative would include a greater amount of office uses than the proposed project (an additional 451,000 gsf), but 93,300 gsf less retail space, and no event center uses. Under the No Project Alternative, about 1,050 on-site vehicle parking spaces plus 132 spaces off-site at the South Street garage would be provided, compared to 1,082 vehicle parking spaces for the proposed project; vehicular ingress and egress from the proposed parking garage would be from South and 16th Streets, similar to the proposed project. Also similar to the proposed project, on-site loading spaces would be provided within the garage, and, it is anticipated that some additional on-street parking spaces adjacent to the project site would be designated as commercial loading spaces. However, because the No Project Alternative would not include an event center or restaurant uses, taxi and paratransit zones would not be provided on the curb adjacent to the project site. Under this alternative, 16th Street would be extended between Illinois Street and Terry A. Francois Boulevard with a configuration consistent with the Mission Bay South Infrastructure Plan, and Terry A. Francois Boulevard would be realigned to the west, adjacent to the project site.

Table 7-3 presents the travel demand for weekday p.m. and Saturday evening peak hours for the proposed project and the three alternatives. As indicated in **Table 7-3**, the number of weekday p.m. and Saturday evening person trips and vehicle trips generated by the No Project Alternative would be less than with the proposed project. The No Project Alternative would generate 1,917 person trips by all modes, compared to 2,796 person trips for the proposed project (i.e., 879 fewer person trips) during the weekday p.m. peak hour, and 199 person trips for the No Project Alternative compared to 3,130 person trips for the proposed project (i.e., 2,931 fewer person trips) during the Saturday evening peak hour. Because the No Project Alternative would not include an event center, the comparison of travel demand and transportation impacts are presented for the proposed project's No Event scenario. (See Chapter 5, Section 5.2, Table 5.2-24, which presents the travel demand for the proposed project for the Basketball Game and Convention Event scenarios.)

Construction Impacts. Construction-related ground transportation impacts would be similar to the proposed project and would be less than significant. Improvement Measure I-TR-1: Construction Management Plan and Public Updates, identified for the proposed project, would also be applicable to this alternative.

Traffic Impacts. The No Project Alternative would generate fewer vehicle trips than the proposed project. During the weekday p.m. peak hour, the No Project Alternative would generate about 445 vehicle trips compared to 702 vehicle trips for the proposed project, while during the Saturday evening peak hour the No Project Alternative would generate 60 vehicle trips compared to 785 vehicles for the proposed project (see **Table 7-3**, below). The intersection LOS for the proposed project and No Project Alternative are shown in **Table 7-4** and **Table 7-5** for the weekday p.m. and Saturday evening peak hours, respectively. With a reduction in the number of vehicles added to the study intersections, the increase in average vehicle delay during the peak hours compared to the existing conditions would be less than would occur under the proposed project. During the weekday p.m. peak hour, four study intersections would operate at LOS E or LOS F conditions, similar to the proposed project for both the No Event and Basketball Game scenarios, however the LOS at the intersection of Seventh/Mississippi/16th would remain at the existing LOS E, as compared to LOS F for the proposed project. Similar to the proposed project for the No Event and Basketball Game scenarios, the No Project Alternative's contribution to the existing LOS E and LOS F conditions at the intersections of King/Third, King/Fifth/I-280 ramps, and Fifth/Bryant/I-80 westbound off-ramp would not be considerable, and traffic impacts at these three intersections would therefore, be less than significant. The No Project Alternative's contribution to the existing LOS E conditions at the intersection of Seventh/Mississippi/16th would be considerable, and would

TABLE 7-3
PROPOSED PROJECT AND PROJECT ALTERNATIVES TRIP GENERATION BY MODE, LAND USE – WEEKDAY PM AND SATURDAY EVENING PEAK HOURS

Project Land Use	Proposed Project – No Event[a]				Alternative A No Project Alternative[b]				Alternative B Reduced Intensity Alternative – No Event[c]				Alternative C Off-Site Alternative at Piers 30-32 and SWL 330 – No Event[d]			
	Auto	Transit	Walk/ Other[e]	Total	Auto	Transit	Walk/ Other	Total	Auto	Transit	Walk/ Other	Total	Auto	Transit	Walk/ Other	Total
Weekday PM																
Event Center	6	14	3	22	0	0	0	0	6	14	3	22	8	11	2	21
Office	298	506	127	931	520	884	221	1,625	183	312	79	574	21	26	8	55
Retail/Restaurant	1,041	360	441	1,843	180	43	69	292	624	217	264	1,105	468	353	469	1,290
Residential and Hotel	0	0	0	0	0	0	0	0	0	0	0	0	157	124	140	421
Total person trips	1,344	881	570	2,796	700	927	290	1,917	813	543	346	1,702	654	514	619	1,787
Vehicle trips	702	--	--	--	445	--	--	--	427	--	--	--	355	--	--	--
- Inbound	255	--	--	--	80	--	--	--	154	--	--	--	149	--	--	--
- Outbound	447	--	--	--	365	--	--	--	273	--	--	--	206	--	--	--
Transit trips	--	881	--	--	--	927	--	--	--	543	--	--	--	514	--	--
- Inbound	--	157	--	--	--	42	--	--	--	94	--	--	--	177	--	--
- Outbound	--	724	--	--	--	885	--	--	--	448	--	--	--	337	--	--
Saturday Evening																
Event Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office	7	17	3	27	13	29	5	47	4	11	2	17	0	0	0	0
Retail/Restaurant	1,700	656	747	3,103	94	22	36	152	1,020	393	449	1,862	843	678	804	2,324
Residential and Hotel	0	0	0	0	0	0	0	0	0	0	0	0	134	115	107	357
Total person trips	1,707	673	750	3,130	107	51	41	199	1,024	404	451	1,879	976	792	911	2,680
Vehicle trips	785	--	--	--	60	--	--	--	471	--	--	--	435	--	--	--
- Inbound	367	--	--	--	24	--	--	--	220	--	--	--	192	--	--	--
- Outbound	418	--	--	--	36	--	--	--	251	--	--	--	293	--	--	--
Transit trips	--	673	--	--	--	51	--	--	--	404	--	--	--	792	--	--
- Inbound	--	261	--	--	--	8	--	--	--	156	--	--	--	279	--	--
- Outbound	--	413	--	--	--	43	--	--	--	248	--	--	--	513	--	--

NOTES:
[a] Proposed Project includes 605,000 gsf of office use, 62,500 gsf of retail use, 11,000 gsf of quick service restaurant use, 51,500 gsf of sit-down restaurant use, and a 750,000 gsf event center.
[b] The No Project Alternative includes 1,056,000 gsf of office use, and 31,700 gsf of retail use.
[c] The Reduced Development Alt includes 373,000 gsf of office use, 37,500 gsf of retail use, 6,600 gsf of quick service restaurant use, 30,900 gsf of sit-down restaurant use, and a 750,000 gsf event center.
[d] The Off-site Alternative at Piers 30-32 and SWL 330 includes 35,600 gsf of office, 40,390 gsf of retail, 36,000 gsf of quick service and 43,464 gsf of sit-down restaurant, 176 residential units, 227-room hotel, and a 695,000 gsf event center.
[e] "Other" includes walk, bicycle, motorcycle, taxis, limousines, etc.

TABLE 7-4
INTERSECTION LEVEL OF SERVICE - EXISTING PLUS PROJECT ALTERNATIVE CONDITIONS – WITHOUT A SF GIANTS GAME - WEEKDAY PM PEAK HOUR

#	Intersection Location		Existing		Proposed Project – No Event		Proposed Project – Basketball Game		No Project Alternative		Reduced Intensity Alternative – No Event	
			Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	King St	Third Street	**72.7**	**E**	**73.2**	**E**	**72.7**	**E**	**73.0**	**E**	**72.9**	**E**
2	King St	Fourth Street	51.9	D	52.5	D	**60.2**	**E**	52.6	D	52.7	D
3	King St/Fifth St	I-280 ramps	**59.2**	**E**	**59.2**	**E**	**59.2**	**E**	**59.2**	**E**	**59.2**	**E**
4	Fifth St/Harrison	I-80 WB off-ramp	48.4	D	48.5	D	49.8	D	48.4	D	48.5	D
5	Fifth St/Bryant St	I-80 EB on-ramp	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
6	Third Street	Channel Street	38.0	D	38.3	D	46.0	D	35.5	D	33.0	C
7	Fourth Street	Channel Street	< 10	A	< 10	A	11.3	B	< 10	A	< 10	A
8	Seventh Street	Mission Bay Dr	23.1	C	30.2	C	52.3	D	27.0	C	27.0	C
9	TA Francois Blvd	South Street[c]	11.1(eb)	B	< 10	A	< 10	A	< 10	A	< 10	A
10	Third Street	South Street	24.9	C	28.5	C	27.4	C	26.9	C	27.7	C
11	TA Francois Blvd	16th Street[c]	--	--	17.2	B	16.8	A	17.2	B	17.2	B
12	Illinois Street	16th Street[c]	12.6(nb)	B	12.8 (nb)	B	11.5(nb)	B	10.9 (nb)	B	11.3 (nb)	B
13	Third Street	16th Street[e]	29.3	C	32.2	C	33.6	C	31.3	C	31.2	C
14	Fourth Street	16th Street[e]	21.5	B	32.7	C	28.0	C	26.3	C	25.7	C
15	Owens Street	16th Street[e]	35.5	C	41.2	D	44.2	C	37.3	D	37.8	D
16	7th/Mississippi	16th Street[e]	**68.6**	**E**	**> 80**	**F**	**> 80**	**F**	**67.9**	**E**	**73.4**	**E**
17	Illinois Street	Mariposa Street[c]	10.6(eb)	B	16.1	B	17.0	B	14.8 (sb)	B	15.8	B
18	Third Street	Mariposa Street	36.2	D	42.5	D	42.0	D	37.3	D	39.4	D
19	Fourth Street	Mariposa Street	13.2	B	15.3	B	14.3	B	14.5	B	14.0	B
20	Mariposa Street	I-280 NB off-ramp	25.8	C	26.4	C	25.8	C	26.6	C	26.1	C
21	Mariposa Street	I-280 SB on-ramp[d]	11.9	B	12.9	B	12.8	B	12.9	B	12.5	B
22	Third Street	Cesar Chavez St	43.0	D	49.7	D	47.6	D	46.4	D	48.5	D

NOTES:

[a] Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
[b] Intersections operating at LOS E or LOS F conditions highlighted in **bold**. Significant project impacts shaded.
[c] All-way stop-controlled intersection. The intersections of Terry A. Francois/South and Illinois/Mariposa would be signalized as part of the proposed project.
[d] The traffic signal at the intersection of Mariposa/I-280 southbound on-ramp is part of the roadway improvements on Mariposa Street between the I-280 northbound off-ramp and I-280 southbound on-ramp and the extension of Owens Street between 16th and Mariposa Streets, and is currently planned to be operational by fall 2015.
[e] Includes implementation of the 22 Fillmore Transit Priority Project, which includes converting one mixed-flow lane in each direction to a side-running transit-only lane.

SOURCE: Adavant Consulting/Fehr & Peers/LCW Consulting, 2015.

TABLE 7-5
INTERSECTION LEVEL OF SERVICE - EXISTING PLUS PROJECT ALTERNATIVE CONDITIONS – WITHOUT A SF GIANTS GAME – SATURDAY EVENING PEAK HOUR

			Existing		Proposed Project – No Event		Proposed Project – Basketball Game		No Project Alternative		Reduced Intensity Alternative – No Event	
#	Intersection Location		Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	King St	Third Street	26.6	C	28.4	C	29.0	C	26.7	C	27.7	C
2	King St	Fourth Street	22.6	C	23.0	C	31.8	C	22.7	C	22.9	C
3	King St/Fifth St	I-280 ramps	< 10	A	< 10	A	<10	A	< 10	A	< 10	A
4	Fifth St/Harrison	I-80 WB off-ramp	29.2	C	29.5	C	**64.9**	**E**	29.5	C	29.4	C
5	Fifth St/Bryant St	I-80 EB on-ramp	27.0	C	27.6	C	32.8	C	27.1	C	27.3	C
6	Third Street	Channel Street	< 10	A	< 10	A	**78.9**	**E**	< 10	A	< 10	A
7	Fourth Street	Channel Street	13.6	B	13.0	B	45.7	D	13.6	B	13.4	B
8	Seventh Street	Mission Bay Dr	12.4	B	12.5	B	**>80**	**F**	11.6	B	12.1	B
9	TA Francois Blvd	South Street[c]	< 10(eb)	A	< 10	A	<10	A	< 10	A	< 10	A
10	Third Street	South Street	< 10	A	10.1	B	15.3	B	< 10	A	< 10	B
11	TA Francois Blvd	16th Street[c]	--	--	17.4	B	18.2	B	17.4	B	17.4	B
12	Illinois Street	16th Street[c]	< 10(nb)	A	12.3(eb)	B	11.8(nb)	B	< 10 (nb)	A	<10(nb)	A
13	Third Street	16th Street[e]	10.7	B	13.8	B	14.0	B	10.7	B	12.6	B
14	Fourth Street	16th Street[e]	14.3	B	12.9	B	16.2	B	14.1	B	13.1	B
15	Owens Street	16th Street[e]	< 10	A	13.6	B	20.4	C	< 10	A	11.0	B
16	7th/Mississippi	16th Street[e]	18.4	B	29.3	C	40.7	D	18.8	B	22.8	C
17	Illinois Street	Mariposa Street[c]	< 10(eb)	A	15.8	B	44.6	D	< 10 (eb)	A	15.2	B
18	Third Street	Mariposa Street	16.6	B	19.4	B	21.1	C	16.8	B	19.0	B
19	Fourth Street	Mariposa Street	< 10	A	< 10	A	<10	A	< 10	A	< 10	A
20	Mariposa Street	I-280 NB off-ramp	16.1	B	16.3	B	24.8	C	16.1	B	16.2	B
21	Mariposa Street	I-280 SB on-ramp[d]	< 10	A	< 10	A	<10	A	< 10	A	< 10	A
22	Third Street	Cesar Chavez St	18.4	B	17.5	B	18.2	B	18.4	B	17.3	B

NOTES:

a Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
b Intersections operating at LOS E or LOS F conditions highlighted in **bold**. Significant project impacts shaded.
c All-way stop-controlled intersection. The intersections of Terry A. Francois/South and Illinois/Mariposa would be signalized as part of the proposed project.
d The traffic signal at the intersection of Mariposa/I-280 southbound on-ramp is part of the roadway improvements on Mariposa Street between the I-280 northbound off-ramp and I-280 southbound on-ramp and the extension of Owens Street between 16th and Mariposa Streets, and is currently planned to be operational by fall 2015.
e Includes implementation of the 22 Fillmore Transit Priority Project, which includes converting one mixed-flow lane in each direction to a side-running transit-only lane.

SOURCE: Adavant Consulting/Fehr & Peers/LCW Consulting, 2015.

be a significant impact. Therefore, similar to the proposed project for the No Event and Basketball Game scenarios, the No Project Alternative would result in *significant and unavoidable* impacts at one study intersection (i.e., at Seventh/Mississippi/16th) during the weekday p.m. peak hour, although the magnitude of the additional vehicle delay would be less than for conditions with the proposed project.

During the Saturday evening peak hour for the No Event scenario, under the No Project Alternative, all study intersections would operate at LOS D or better, and therefore, traffic impacts would be *less than significant*, similar to the proposed project for the No Event and Basketball Game scenarios. The freeway ramp LOS for the proposed project and No Project Alternative are shown in **Table 7-6** and **Table 7-7** for the weekday p.m. and Saturday evening peak hours, respectively. The No Project Alternative would add fewer vehicle trips to the I-280 and I-80 freeway mainline and ramps than the proposed project, and, similar to the proposed project for the No Event and Basketball Game scenarios, would not result in project-specific impacts or contribute considerably to existing LOS E or LOS F conditions during the weekday p.m. or Saturday evening peak hours. Because the No Project Alternative would not include an event center, the significant and unavoidable traffic impacts associated with events, including overlapping evening events at AT&T Park, at the study intersections and I-80 and I-280 freeway ramps would not occur.

Transit Impacts. During the weekday p.m. peak hour, the No Project Alternative would generate 927 transit trips compared to 881 transit trips for the proposed project under the No Event scenario (i.e., 46 more transit trips), while during the Saturday evening peak hour the No Project Alternative would generate 51 transit trips compared to 673 transit trips for the proposed project under the No Event scenario (i.e., 662 fewer transit trips). The additional 46 transit trips generated by the No Project Alternative during the weekday p.m. peak hour would be accommodated on the T Third light rail line and 22 Fillmore bus route serving the project site, and on the regional transit providers, and transit impacts would be *less than significant*. Because the No Project Alternative would not include an event center, the significant and unavoidable impacts on Muni and regional transit associated with events, including overlapping events at AT&T Park would not occur.

Bicycle and Pedestrian Impacts. The No Project Alternative would result in fewer person-trips and bicycle trips compared to the proposed project. Similar to the proposed project, the No Project Alternative would result in an increase in the number of vehicles, pedestrians, and bicycles in the vicinity of the project site, however, this increase would be less than for the proposed project, and, similar to the proposed project, would not be substantial enough to impede pedestrian travel on adjacent sidewalks and crosswalks, or affect bicycle travel or facilities in the area. Therefore, similar to the proposed project, the No Project Alternative's impacts on pedestrians and bicycles would be *less than significant*.

Loading Impacts. Similar to the proposed project, the No Project Alternative would include on-site and on-street commercial loading spaces to accommodate the loading demand, although the number of loading spaces provided on site would be less than for the proposed project (i.e., five on-site loading spaces based on the Mission Bay South Design for Development

TABLE 7-6
FREEWAY RAMP LEVEL OF SERVICE - EXISTING PLUS PROJECT ALTERNATIVE CONDITIONS – WITHOUT A SF GIANTS GAME - WEEKDAY PM PEAK HOUR

#	Ramp Location	Existing		Proposed Project – No Event		Proposed Project- Basketball Game		No Project Alternative		Reduced Intensity Alternative – No Event	
		Density[a]	LOS[b]	Density	LOS	Density	LOS	Density	LOS	Density	LOS
1	I-80 EB on-ramp at Sterling	**35**	**E**	**36**	**E**	**36**	**E**	**36**	**E**	**36**	**E**
2	I-80 EB on-ramp at Fifth/Bryant	**--**	**F**	**--**	**F**	**--**	**F**	**--**	**F**	**--**	**F**
3	I-80 WB off-ramp at Fifth/Harrison	30	D	30	D	31	D	30	D	30	D
4	I-280 SB on-ramp at Pennsylvania	**35**	**E**	**35**	**E**	**35**	**E**	**35**	**E**	**35**	**E**
5	I-280 NB off-ramp at Mariposa	26	C	26	C	28	C	26	C	26	C
6	I-280 SB on-ramp at Mariposa	31	D	32	D	32	D	32	D	32	D

NOTES:

[a] Density of vehicles in merge and diverge influence area for on-ramp and off-ramp analysis, respectively. Measured in passenger cars per mile per lane. Density value is not presented for ramp analyses where the demand volume exceeds the capacity.

[b] Ramps operating at LOS E or LOS F conditions highlighted in bold. Significant project impacts shaded.

SOURCE: Adavant Consulting/Fehr & Peers/LCW Consulting, 2015.

TABLE 7-7
FREEWAY RAMP LEVEL OF SERVICE - EXISTING PLUS PROJECT ALTERNATIVE CONDITIONS – WITHOUT A SF GIANTS GAME – SATURDAY EVENING PEAK HOUR

#	Ramp Location	Existing		Proposed Project – No Event		Proposed Project – Basketball Game		No Project Alternative		Reduced Intensity Alternative - No Event	
		Density[a]	LOS[b]	Density	LOS	Density	LOS	Density	LOS	Density	LOS
1	I-80 EB on-ramp at Sterling	22	C	22	C	22	C	22	C	22	C
2	I-80 EB on-ramp at Fifth/Bryant	**35**	**E**	**36**	**E**	**36**	**E**	**35**	E	**36**	**E**
3	I-80 WB off-ramp at Fifth/Harrison	25	C	26	C	34	D	25	C	25	C
4	I-280 SB on-ramp at Pennsylvania	13	B	13	B	13	B	13	B	13	B
5	I-280 NB off-ramp at Mariposa	16	B	17	B	25	C	16	B	17	B
6	I-280 SB on-ramp at Mariposa	12	B	13	B	12	B	12	B	13	B

NOTES:

[a] Density of vehicles in merge and diverge influence area for on-ramp and off-ramp analysis, respectively. Measured in passenger cars per mile per lane. Density value is not presented for ramp analyses where the demand volume exceeds the capacity.

[b] Ramps operating at LOS E or LOS F conditions highlighted in bold. Significant project impacts shaded.

SOURCE: Adavant Consulting/Fehr & Peers/LCW Consulting, 2015.

requirements, compared to 13 spaces provided as part of the proposed project). The No Project Alternative would generate 229 daily truck and service vehicle trips compared to 396 for the proposed project. Because the No Project Alternative would provide commercial loading spaces, the loading demand would be accommodated, and loading impacts under this alternative, similar to the proposed project, would be *less than significant*. Improvement Measure I-TR-8: Truck and Service Vehicle Loading Operations Plan, identified for the proposed project, would also be applicable to the No Project Alternative.

Emergency Vehicle Access Impacts. As part of the No Project Alternative, the roadway network adjacent to the project site on 16th Street and Terry A. Francois Boulevard would be built out in accordance with the Mission Bay South Infrastructure Plan, which would facilitate emergency vehicle access to the site. Similar to the proposed project, the impacts of the No Project Alternative on emergency vehicle access would be *less than significant*.

Cumulative Impacts. Similar to the proposed project, the No Project Alternative would not contribute considerably to significant cumulative construction-related ground transportation impacts, and the No Project Alternative's cumulative impacts related to bicycle, loading, and emergency vehicle access would be less than significant. The No Project Alternative's cumulative transit and pedestrian impacts would be less than significant, compared to less than significant with mitigation for the proposed project. The No Project Alternative would contribute considerably to significant 2040 cumulative traffic impacts at two intersections (i.e., Owens/16th and Seventh/Mississippi/16th), compared to 16 study intersections for the proposed project, and would not significantly contribute to any freeway ramps (compared to three for the proposed project).

Helipad Safety. Like the proposed project, construction of the No Project Alternative could result in temporary obstruction of the UCSF helipad airspace surfaces, although given the absence of a tower at Third and 16th Street, the impacts could be less severe. Regardless, implementation of the same mitigation measure (Mitigation Measures M-TR-9a, Crane Safety Plan for Project Construction) would reduce this impact to less than significant. Unlike the proposed project, the No Project Alternative would not involve specialized outdoor lighting associated with the event center, so the operational lighting impacts would be *no impact*.

Noise

Construction Impacts. Like the proposed project, construction of the No Project Alternative would not cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity; expose people to or generate noise levels in excess of applicable standards; or expose people and structures to excessive groundborne vibration levels. Under the No Project Alternative, the same or similar construction equipment would be used, construction duration would likely be shorter due to the reduced amount of excavation, and compliance with the San Francisco Noise Ordinance would be required. Construction noise impacts would be the same or less than the proposed project, and all impacts would be *less than significant* with no mitigation required. However, similar to the proposed project, the No Project Alternative could contribute considerably to cumulative construction noise impacts depending on the extent of other construction activities occurring concurrently in the immediate vicinity. While there is no defined construction schedule for this alternative, there is the potential for the planned construction elsewhere in Mission Bay, including multiple elements of the University of California, San Francisco (UCSF) Long Range Development Plan (LRDP) at the Mission Bay Campus, to overlap with construction activities at this site. Regardless, like the proposed project, implementation of Mitigation Measure M-C-NO-1 (Construction Noise Control Measures) would reduce this alternative's contribution to cumulative construction noise impacts to *less than significant with mitigation*.

Operational Impacts. With respect to operations, the No Project Alternative would have less severe noise impacts than the proposed project. This alternative would introduce fewer noise sources to the project area, both stationary and mobile noise sources. Under the No Project Alternative, noise impacts related to amplification equipment for interior or outdoor performances or with operation of public address systems would be *no impact*, and this alternative would avoid this operational noise impact. Mitigation Measures M-NO-4a (Noise Control Plan for Outdoor Amplified Sound) and M-NO-4b (Noise Control Plan for Place of Entertainment Permit), which were identified for the proposed project, would not be required.

Similarly, while the No Project Alternative would increase the vehicular traffic in the project vicinity, the increased weekday and weekend traffic noise levels would be less severe than those under the proposed project, and unlike the proposed project, would not exceed significance thresholds at any of the six modeled roadway segments, as shown in **Table 7-8**.

Under the proposed project, as shown in Table 5.3-9 in Chapter 5, roadside noise levels at multi-family receptors adjacent to Illinois Street and Terry A. Francois Boulevard would exceed significance thresholds under several scenarios: weekday late night 9 to 11 p.m. period due to post-basketball game traffic at Illinois Street and at Terry Francois Boulevard; and on Saturday evening 6 to 8 p.m. period due to basketball game traffic at Illinois Street. As described in Chapter 5, Section 5.3, Noise, these impacts are considered a significant and unavoidable permanent increase in noise levels, even with mitigation. Under the No Project Alternative, modeled noise levels at none of the roadway segments in the project vicinity would exceed significance thresholds, and specifically no exceedances would occur on weekday 9 to 11 p.m. due to post-basketball game traffic or on Saturdays 6 to 8 p.m. Therefore, operational noise impacts would be *less than significant*, and this alternative would *avoid* the significant and unavoidable operational noise impacts identified for the proposed project.

Similarly, unlike the proposed project, under cumulative conditions, the No Project Alternative's contribution to roadway noise increases would be *less than significant*, including during the weekday p.m. peak hour. In contrast, the proposed project would result in a significant and unavoidable contribution to cumulative roadway noise impacts along Illinois Street between Mariposa and 20th Streets (during weekday p.m. peak hour and during Saturday evening 6 to 8 p.m.) and on Mariposa Street between Third Street and I-280 (during Saturday evening 6 to 8 p.m.). Therefore, the No Project Alternative would *substantially lessen* the significant and unavoidable cumulative roadway noise impacts of the proposed project.

TABLE 7-8
MODELED TRAFFIC NOISE LEVELS, NO PROJECT ALTERNATIVE[a]

Roadway Segment	Existing (2015)	Existing plus No Project Alternative	dBA Difference	Significant Increase?
Weekday Peak Hour Noise Levels (4PM – 6PM)				
Third Street between South Street and China Basin Street	69.1	69.3	0.2	No
Third Street between 16th Street and Mariposa Street[b]	69.9	69.9	0.0	No
Illinois Street between Mariposa Street and 20th Street	60.3	62.8	2.5	No
Terry Francois Boulevard between South Street and China Basin Street	59.8	59.8	0.0	No
16th Street between Third Street and I-280	66.4	67.0	0.6	No
Mariposa Street between Third Street and I-280	65.5	66.2	0.7	No
Roadway Segment	**Existing (2015)**	**Existing plus No Project Alternative**	**dBA Difference**	**Significant Increase?**
Saturday Evening Noise Levels (6PM – 8PM)				
Third Street between South Street and China Basin Street	64.7	64.8	0.1	No
Third Street between 16th Street and Mariposa Street	65.1	65.2	0.1	No
Illinois Street between Mariposa Street and 20th Street	54.7	55.8	1.1	No
Terry Francois Boulevard between South Street and China Basin Street	54.0	54.0	0.0	No
16th Street between Third Street and I-280	61.4	61.7	0.3	No
Mariposa Street between Third Street and I-280	60.4	60.6	0.2	No

NOTES:
[a] Road center to receptor distance is assumed to be 50 feet for values shown in this table. Noise levels were determined using the Federal Highway Administration (FHWA) traffic noise model. The average speed on these segments is assumed to be 25 or 30 miles per hour, depending on the roadway. For all other assumptions, refer to Appendix NO. In an existing ambient noise environment of 65 dBA or greater, an incremental increase is considered significant if the noise increase is equal to or greater than 3.0 dBA. In an existing ambient noise environment below 65 dBA, an incremental increase is considered significant if the noise increase is equal to or greater than 5.0 dBA.
[b] This portion of Third Street would not see meaningful increases in traffic volumes during events due to project access limitations and egress routing during events.

SOURCE: ESA 2015

Furthermore, as described in Chapter 5, Section 5.3, Noise, the proposed project would have a significant and unavoidable impact associated with the increased noise levels due to crowds gathering at the Muni T-Line platform near the UCSF Hearst Tower housing building during quieter nighttime periods, when event patrons would be departing the project site. Under the No Project Alternative, there would be *no impact* related to crowd noise, and this alternative would *avoid* this significant and unavoidable impact.

Like the proposed project, under the No Project Alternative, the cumulative noise impacts of future operations of the UCSF Medical Center helipad would be *less than significant* because office and research/development uses are not considered noise sensitive land uses.

Air Quality

Construction Impacts. Unlike the proposed project, construction impacts of the No Project Alternative would be less than significant, compared to a significant and unavoidable impact for the project. As described in Chapter 5, Section 5.4, Air Quality, estimated construction-related emissions of ROG and NOx for the proposed project would be 59 and 226 pounds per day, respectively, which would exceed the applicable significance thresholds. Even with mitigation, NOx levels would exceed the significance threshold, at 144 pounds per day, assuming the minimum level of compliance (Tier 2 with NOx VDECS) with Mitigation Measure M-AQ-1 (Construction Emissions Minimization). However, while construction activities for the No Project Alternative would be similar to those of the proposed project, the construction duration would likely be shortened as the amount of excavation would be reduced. Although similar equipment would be used in construction of the No Project Alternative, resultant emissions would be less because the scale of construction and the intensity of construction are assumed to be reduced. **Table 7-9** presents the construction-related criteria air pollutant emissions for the No Project Alternative. Construction of the No Project Alternative would result in emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$ that would be below the thresholds of significance. Consequently, construction-related criteria pollutant emissions under the No Project Alternative would be *less than significant*.

TABLE 7-9
AVERAGE DAILY CONSTRUCTION-RELATED EMISSIONS
FOR THE NO PROJECT ALTERNATIVE

	Average Daily Construction Emissions (pounds/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Off-road Equipment Emissions	3.6	32	2.1	2.0
Truck and Vehicle emissions	3.3	17	0.26	0.24
Architectural Coating Emissions	30	0	0	0
Total[a]	37	49	2.3	2.2
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No

NOTES:

[a] The total emissions may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

Operational Impacts. Unlike the proposed project, operational impacts of the No Project Alternative would be less than significant, compared to a significant and unavoidable impact for the project. As described in Chapter 5, Section 5.4, Air Quality, estimated operational emissions of ROG and NOx under the proposed project would be 79 and 124 pounds per day, respectively, exceeding significance thresholds. However, under the No Project Alternative, operational emissions would be less than those of the proposed project because of reduced trip lengths associated with worker commutes versus the regional trip lengths generated by events at the arena under the proposed project. **Table 7-10** presents the operational criteria air pollutant emissions for the No Project Alternative. Operation of the No Project Alternative would result in emissions of

ROG, NOx, PM_{10}, and $PM_{2.5}$ that would be below the thresholds of significance. Consequently, operational criteria pollutant emissions under the No Project Alternative would be *less than significant*.

TABLE 7-10
AVERAGE DAILY AND MAXIMUM ANNUAL OPERATIONAL EMISSIONS FOR THE NO PROJECT ALTERNATIVE

	Average Daily Emissions (pounds/day)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile Sources	14	31	22	6.3
Standby Diesel Generators (assumes 5)	0.30	1.0	0.04	0.04
Boilers	0.54	4.9	0.37	0.37
Area Sources	20	<0.01	<0.01	<0.01
Total[a]	35	36	23	6.7
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
	Maximum Annual Emissions (short tons/year)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile Sources	2.6	5.6	4.0	1.2
Standby Diesel Generators (assumes 5)	0.06	0.18	<0.01	<0.01
Boilers	0.10	0.89	0.07	0.07
Area Sources	3.6	<0.01	<0.01	<0.01
Total[a]	**6.4**	**6.7**	4.1	1.2
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No

NOTES:
[a] The total emissions may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

Toxic Air Contaminants. Similar to the proposed project, construction and operation of the No Project Alternative would generate toxic air contaminants, including diesel particulate matter. However, given the reduced level of construction and the reduced mobile sources, the No Project Alternative would have somewhat less severe impacts than the proposed project. Thus, like the project (see Table 5.4-10 in Section 5.4, Air Quality), $PM_{2.5}$ concentrations at off-site receptor locations would be below significance thresholds for construction and operation, as shown in **Table 7-11**. Cumulative (background plus No Project Alternative) $PM_{2.5}$ concentrations during project operations would be 9.0 $\mu g/m^3$. Furthermore, at no off-site location, during construction or operations, would cumulative $PM_{2.5}$ concentrations exceed the 10 $\mu g/m^3$ threshold. Therefore, the No Project Alternative would not result in sensitive receptor locations meeting the Air Pollutant Exposure Zone criteria for $PM_{2.5}$, and impacts related to construction and operational $PM_{2.5}$ concentrations would be *less than significant.*

TABLE 7-11
ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS AT OFF-SITE RECEPTORS FOR THE NO PROJECT ALTERNATIVE

Source	$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)	
	UCSF Hearst Tower Receptor	**UCSF Hospital Receptor**
Construction		
Background at the maximally impacted receptor	8.5	8.6
Unmitigated Construction Contribution	0.10	0.10
Cumulative Total (Unmitigated)[a]	8.6	8.7
Significance Threshold	10	10
Above Threshold?	No	No
Operation		
Background at the maximally impacted receptor	8.5	8.6
Project Operations – Generators	0.06	0.06
Project Operations – Mobile	0.32	0.32
Cumulative Total (Unmitigated)[a]	8.9	9.0
Significance Threshold	10	10
Above Threshold?	No	No

NOTES:
[a] The total concentrations may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

Similarly, the lifetime cancer risk at off-site receptors under the No Project Alternative would also be less than significant, which would be less severe than the comparable impact under the proposed project. For the proposed project (see Table 5.4-11 in Section 5.4, Air Quality), the unmitigated risk would exceed the significance threshold but implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization) would reduce the risk to less than significant. As shown in **Table 7-12**, under the No Project Alternative, the cumulative excess cancer risk at all receptor locations would be below the significance threshold of 100 per one million persons exposed. Therefore, the No Project Alternative would not result in sensitive receptor locations meeting the Air Pollutant Exposure Zone criteria for excess cancer risk, and construction and operational cancer risk would be *less than significant* and no mitigation is required.

Consistency with Clean Air Plan. The No Project Alternative would be consistent with the 2010 Clean Air Plan (CAP) by resulting in non-attainment criteria air pollutant and precursor emissions that would be less than the quantity considered to represent a cumulatively considerable contribution to regional air quality. The No Project Alternative would be consistent with the 2010 CAP by virtue of incorporation of control measures of the CAP, including land use/local impact measures and energy/climate measures now required through the various components of the City's Greenhouse Gas Reduction Strategy and the numerous transportation

TABLE 7-12
LIFETIME EXCESS CANCER RISK AT OFF-SITE RECEPTORS
FOR THE NO PROJECT ALTERNATIVE

	Excess Cancer Risk (in one million)		
	UCSF Hearst Tower Receptor		UCSF Hospital Receptor
Source	**Child Resident**	**Adult Resident**	**(Child Resident)**
Background at the maximally impacted receptor	26	26	44
Unmitigated Construction Contribution	12	0.6	8
Project Operations – Generators	30	30	30
Project Operations – Mobile	7.2	7.2	7.2
Cumulative Total[a]	75	64	90
Significance Threshold	100	100	100
Above Threshold?	No	No	No

NOTES:
[a] The total concentrations may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

demand management measures are included as part of the overall Mission Bay Redevelopment Plan, with which this alternative would be consistent. The No Project Alternative would also not hinder implementation of the 2010 CAP. Therefore, the No Project Alternative would not conflict with, or obstruct implementation of the *2010 Clean Air Plan*, and this impact would be *less than significant* and no mitigation would be required. In comparison, the proposed project would be consistent with the Clean Air Plan for reasons described in Section 5.4, Air Quality, with implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization), Mitigation Measure M-AQ-2a (Reduce Operational Emissions), Mitigation Measure M-AQ-2b (Emission Offsets), and FSEIR Mitigation Measure F.1 (Measures to Reduce Vehicle Trips).

Odors. Like the proposed project, this alternative would not create objectionable odors that would affect a substantial number of people.

Cumulative Air Quality Impacts. The No Project Alternative would not result in significant and unavoidable air quality impacts, and consequently, would not result in a cumulatively considerable contribution to regional or local air quality impacts. Therefore, unlike the proposed project, the cumulative air quality impacts of the No Project Alternative would be *less than significant*. This is in contrast to the proposed project, for which the project's contribution to cumulative air quality impacts is considered significant and unavoidable, even with mitigation, because the proposed project would result in both construction and operational emissions of ROG and NOx exceeding their respective significance thresholds.

The No Project Alternative would also not result in a considerable contribution to cumulative health risk impacts for existing or future sensitive receptors, and cumulative impacts would be *less than significant*. This is because unmitigated construction and operational emissions would not exceed the significance thresholds of 10 $\mu g/m^3$ for $PM_{2.5}$ or an excess cancer risk greater than 100 per one million persons exposed. Although the Uber/ARE project could locate childcare facilities on Blocks 26/27, these sensitive receptors would be exposed to at most eight months of construction period emissions and these receptors' health risk exposure would not exceed significance thresholds. This is in contrast to the proposed project, for which the project's cumulative health risk impact is considered less than significant with mitigation, requiring implementation of Mitigation Measure M-AQ-1.

Greenhouse Gas Emissions

Similar to the proposed project, the No Project Alternative would generate greenhouse gas (GHG) emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing GHG emissions. As described in Chapter 5, Section 5.5, the proposed project is a certified environmental leadership project under AB 900 and the California Air Resources Board (CARB) has determined that the proposed project would result in no net increase in GHG emissions based on the AB 900 application which includes voluntary acquisition of carbon credits by the project sponsor. However, even though the development under the No Project Alternative is only a hypothetical scenario at this time, it can be expected that this alternative would include strategies to reduce GHG emissions that would be consistent with the City's GHG Reduction Strategy, including compliance with San Francisco Green Building Requirements, San Francisco Stormwater Management Ordinance, San Francisco Water Efficient Irrigation Ordinance, Mandatory Recycling and Composting Ordinance, and San Francisco Construction and Demolition Debris Recovery Ordinance to name a few. Furthermore, consistent with the Mission Bay South Redevelopment Plan, the alternative would include transportation management programs. Given the reduced size of the No Project Alternative compared to the proposed project, overall GHG emissions during construction and operations would be expected to be the same or less than those calculated for the proposed project. However, since the proposed project would purchase carbon offset credits to result in no net increase in GHG emissions, the GHG emissions of the No Project Alternative would be greater than those of the proposed project, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing GHG emissions. Therefore, impacts related to GHG emissions for the No Project Alternative would be *less than significant* assuming compliance with applicable policies and regulations, and no mitigation is required.

Wind and Shadow

Wind. As described in Chapter 5, Section 5.6, the proposed project would result in significant and unavoidable wind hazard impacts at off-site public areas based results on wind tunnel testing. Under the hypothetical development scenario for the No Project Alternative, the 135-foot tall event center proposed in the east and central part of the project site under the project would be replaced with a variety of buildings 7 stories high or less, and on the west side of the project site there would be only one 160-foot tall office tower instead of the two towers proposed by the project. The different building massing, configuration and heights on the project site under the No Project Alternative would result in different wind conditions, including at pedestrian use areas, than that described for the proposed project. However, in the absence of wind tunnel testing for the No Project Alternative, the specific change in wind conditions of the No Project Alternative compared to proposed project cannot be quantified. Consequently, the effect of the change in wind conditions on the conclusion of the significance of off-site wind hazards for the No Project Alternative under existing plus project and cumulative conditions is not known

However, like the proposed project, the No Project Alternative would be subject to the Mission Bay South Design for Development wind analysis standards and design guidelines, which were prepared with the objective to use all feasible means to eliminate wind hazards and to reduce adverse wind impacts. Since the No Project Alternative hypothetical scenario would contain buildings over 100 feet in height, it would be also subject to wind review, including potential wind tunnel testing, under the Mission Bay South Design for Development.

Shadow. Since it is assumed that the No Project Alternative would comply with the design standards of the South Design for Development, it is therefore determined to reasonably limit areas of shadow on public open spaces during the active months of the year (March to September) and during the most active times of the day (10:00 a.m. to 4:00 p.m.), and would not be subject to a shadow analysis. Similar to the proposed project, the No Project Alternative shadow impact and its contribution to cumulative shadow impacts, on publicly accessible open space or outdoor recreation facilities or other public areas within the Mission Bay plan area (i.e., Bayfront Park), and outside the plan area (i.e., Agua Vista Park), would be *less than significant* and no mitigation would be required.

Recreation

Like the proposed project, the No Project Alternative would not substantially increase the use of existing recreational facilities or require the construction or expansion of recreational facilities. Employment under this scenario would be the same or less than that for the proposed project, based on the reduced gross square footage, and recreational demands would be met by existing and planned parks and open space provided for as part of the overall Mission Bay Plan. All recreation impacts would be *less than significant* and no mitigation would be required.

Utilities and Service Systems

Water Supply Resources, Water Treatment Facilities, and Solid Waste. Like the proposed project, the No Project Alternative would not require new or expanded water supply resources, require construction of new water treatment facilities, and would be served by existing landfills for solid waste disposal. Given the reduced gross square footage of uses, projected demands for water supply resources, water treatment facilities, and solid waste disposal would be less than that of the proposed project. These impacts would be *less than significant* and no mitigation would be required.

Wastewater Treatment Capacity. Like the proposed project, the No Project Alternative in combination with past, present, and foreseeable future development in the Mission Bay South area, would require the construction of new or expanded wastewater treatment facilities, the construction of which could cause significant environmental effects; this would be a *significant and unavoidable* impact, with no mitigation available to the project sponsor. As described in

Chapter 5, Section 5.7, the wastewater pump stations serving the project site are currently at capacity, and new development at Blocks 29-32, regardless of the intensity of land uses, in combination with other planned development in the Mission Bay South area, would trigger the need for new or expanded wastewater treatment facilities, the construction of which could result in significant environmental impacts. However, given the reduced gross square footage of development, the wastewater demand from the No Project Alternative would be less than that identified for the proposed project, and the amount of additional wastewater treatment capacity required would accordingly be less.

Stormwater Drainage Facilities. With respect to demand for stormwater facilities, the No Project Alternative would have the same demand as the proposed project and would be subject to the same stormwater management regulations. Stormwater drainage would be accommodated by the same stormwater facilities as the proposed project, as planned and provided for under the Mission Bay Infrastructure Plan. Like the proposed project, impacts related to stormwater drainage facilities for the proposed project would be *less than significant* and no mitigation would be required.

Wastewater Demand. Like the proposed project, development of the No Project Alternative would likely result in a determination by the San Francisco Public Utilities Commission (SFPUC) that it has inadequate capacity to serve the project's projected wastewater demand in addition to its existing commitments. Even though the No Project Alternative would have a reduced gross square footage of uses and therefore a reduced wastewater demand compared to the proposed project, the existing shortfall in capacity at the Mariposa Pump Station and/or the Mission Bay Sanitary Pump Station would indicated that an increase in capacity and associated improvements to these facilities would still be required. Therefore, it would be expected that the SFPUC would make the same determination for the No Project Alternative as they did for the proposed project, and Mitigation Measure M-C-UT-4 (Fair Share Contribution for Pump Station Upgrades) would apply. As for the proposed project, this impact would be *significant and unavoidable with mitigation*.

Public Services

Schools, Public Health, Childcare, Library, and Street Maintenance Services. Like the proposed project, the No Project Alternative would not result in increased demand for schools because it would not include residential uses. Other public services, such as demand for public health, childcare, library, street maintenance, and emergency medical would be within the assumptions provided for in the overall Mission Bay Redevelopment Plan and analyzed in the Mission Bay FSEIR. These impacts would be *less than significant* and no mitigation would be required.

Fire Protection and Emergency Medical Services. Like the proposed project, construction and operation of the No Project Alternative would not result in the need for new or physically altered governmental facilities for fire protection and emergency medical services. Construction of this alternative would require the same or fewer employees and have the same or shorter duration. Similarly, given the reduced gross square footage of proposed uses under this alternative, population increases at the site —and consequently demand for fire protection and emergency medical services—during construction and operation would be the same or less than that of the proposed project, as described in Chapter 5, Section 5.8. This impact would be *less than significant* and no mitigation would be required.

Law Enforcement Services. Like the proposed project, construction and operation of the No Project Alternative would not result in the need for new or physically altered governmental facilities for law enforcement services. Construction of this alternative would require the same or fewer employees and have the same or shorter duration. Similarly, given the reduced gross square footage of proposed uses under this alternative, population increases at the site —and consequently demand for law enforcement services—during construction and operation would be the same or less than that of the proposed project, as described in Chapter 5, Section 5.8. This impact would be *less than significant* and no mitigation would be required.

Biological Resources

Like the proposed project, the No Project Alternative would not have an effect on any special status species, federally protected wetlands, riparian habitat or other sensitive natural community, or conflict with any local policies protecting biological resources; these impacts would be *less than significant* and no mitigation would be required. Similar to the proposed project, under the No Project Alternative, potential impacts on breeding birds which may be nesting within the project site could be mitigated to less than significant with implementation of Mitigation Measure M-BI-4a (Preconstruction Surveys for Nesting Birds), and potential impacts related to avian collisions with buildings or night lighting could be mitigated to less than significant with implementation of Mitigation Measure M-BI-4b (Bird Safe Building Practices); these impacts would be *less than significant with mitigation*.

Geology and Soils

Like the proposed project, the No Project Alternative would not expose people or structures to substantial earthquake or landslide hazards, result in erosion or loss of top soil, be located on a geologic unit that could become unstable, be located on corrosive or expansive soils, substantially change the topography, or affect any unique geologic features. These impacts would be *less than significant* with implementation of protective measures required by applicable regulations, and no mitigation would be required.

Hydrology and Water Quality

Construction Impacts. Like the proposed project, the No Project Alternative's construction-related water quality impacts would be *less than significant* and no mitigation would be required. Management of stormwater and groundwater discharges during construction would be required to comply with local and state regulations designed to protect water quality.

Operational Impacts—Groundwater, Drainage, Flooding, and Inundation by Seiche or Tsunami. Like the proposed project, the No Project Alternative would not deplete groundwater supplies or interfere with groundwater recharge; would not alter existing drainage pattern that would result in erosion, siltation, or flooding; expose people, housing, or structures to substantial risk of loss due to flooding risks; redirect or impede flood flows; or expose people or structures to significant risk involving inundation by seiche or tsunami. These impacts would be *less than significant* with compliance with applicable regulations, and no mitigation would be required.

Operational Impacts—Water Quality. The No Project Alternative would have the same or less severe operational water quality impacts as the proposed project. Both the proposed project and the No Project Alternative would have the potential to affect water quality due to dry weather flows (sanitary sewage only), wet weather flows (sanitary sewage and stormwater), discharges from the Southeast Water Pollution Control Plant (SEWPCP), stormwater runoff and drainage discharges, and litter. However, in all cases, given the reduced gross square footage of the development under the No Project Alternative compared to that of the proposed project (which would be expected to result in a reduced volume of sanitary sewage), all water quality impacts would be the same or less severe than those described in Chapter 5, Section 5.9. All discharges to the Bay, whether sanitary sewage, stormwater, or a combination of both, would be treated as required by the San Francisco Regional Water Quality Control Board (RWQCB), and all discharges would be in compliance with applicable National Pollutant Discharge Elimination System (NPDES) permits that have been issued by the RWQCB for the express purpose of protecting water quality. Potential impacts related to effluent discharges from the SEWPCP would *be less than significant with mitigation*, assuming implementation of FSEIR Mitigation Measure K.2 which requires implementation of measures to ensure that businesses that discharge pollutants that are not typically associated with most wastewater discharges to the City's combined sewer system do not cause a violation of the NDPES permit for the SEWPCP.

Operational Impacts—Sea Level Rise. Like the proposed project, it would be expected that operation of the No Project Alternative would not expose people or structures to a significant risk of loss, injury, or death involving flooding associated with sea level rise. As described in Chapter 5, Section 5.9, the project site could be temporarily flooded at depths of up to 2.5 feet with 36 inches of sea level rise in combination with 100-year storm surge by 2100. The proposed project would be designed and constructed to resist flood damage and provide for the safety of occupants and visitors in the event of flooding. Although there is no specific design for the hypothetical No Project Alternative, it is assumed that this alternative would be designed consistent with San Francisco's Floodplain Management requirements and would include appropriate provisions to resist flood damage and provide for the safety of occupants and visitors in the event of flooding. Therefore, like the proposed project, this impact would be *less than significant* and no mitigation would be required.

Hazards and Hazardous Materials

All impacts related to hazards and hazardous materials would be identical for the No Project Alternative to those identified for the proposed project, since all impacts would result from the conversion of a vacant parcel to a mixed-use development on Blocks 29-32, regardless of the design or size of the development. Like the proposed project, the No Project Alternative would not impair implementation or physically interfere with an adopted emergency response plan or expose people or structures to a significant risk involving fires; these impacts would be *less than significant* and no mitigation would be required.

The No Project Alternative would be required to implement all required measures in compliance with applicable hazardous materials and hazardous waste regulations such that impacts related to routine use, transport, and disposal of hazardous materials would be less than significant; however, like the proposed project, because the future uses are currently unknown, there is a potential that future uses could involve handling of biohazardous materials, but implementation of mitigation measures identified in the Mission Bay FSEIR would reduce potential health and safety impacts to less than significant. Similarly, potential impacts related to encountering naturally occurring asbestos during construction could be reduced to less than significant with implementation of Mitigation Measure M-HZ-1b (Geologic Investigation and Dust Mitigation Plan for Naturally Occurring Asbestos). Furthermore, impacts related to excavation and construction on a site with identified hazardous waste contamination would be reduced to *less than significant with mitigation* measures previously identified in the Mission Bay FSEIR.

Mineral and Energy Resources

Like the proposed project, the No Project Alternative would not result in the use of large amounts of fuel, water, or energy, or use of these materials in a wasteful manner. These impacts would be *less than significant* with compliance with applicable regulations, including the San Francisco Green Building Code, and no mitigation would be required.

Agricultural and Forest Resources

As described for the proposed project, Blocks 29-32 does not contain agricultural or forest resources, and development under the No Project Alternative would have *no impact* on these resources.

7.3.1.4 No Project Alternative – Conclusions

The No Project Alternative would fail to meet the basic objective of building an event center that can be used for NBA basketball games, although depending on the specific design proposal, it could potentially meet four of the seven project objectives. The No Project Alternative would have many of the same or similar environmental impacts as those of the proposed project identified in Chapter 5 of this SEIR and in Appendix NOP-IS, although key differences in the impact conclusions for the No Project Alternative compared to the impact conclusions of the proposed project are summarized below. As defined in Chapter 5, Section 5.1, the following abbreviations are used for the impact significance determinations: SU = significant and unavoidable; SUM = significant and unavoidable with mitigation; LSM = less than significant with mitigation; LS = less than significant; and NI = no impact.

The No Project Alternative would ***avoid*** or ***substantially lessen*** the significant and unavoidable impacts that were identified for the proposed project (i.e., the significance determination would change from SU or SUM to LS or NI) with respect to:

- Traffic impacts at study intersections and at I-80 and I-280 freeway ramps associated with events at the proposed event center, including overlapping events with evening events at AT&T Park (Impact would change from SUM to LS.)

- Transit impacts on regional transit capacity associated with events at the proposed event center, including overlapping events with evening events at AT&T Park (Impact would change from SUM to LS.)
- Contribution to cumulative traffic impacts at freeway ramps (Impact would change from SUM to LS.)
- All transportation impacts under the "With an Overlapping SF Giants Game at AT&T Park" scenario (Impacts would change from SUM to NI.)
- Noise impacts from crowd noise at the Muni platform following events (Impact would change from SU to LS.)
- Permanent increases in noise levels on local roadway exceeding thresholds during the weekday late night 9 to 11 p.m. period and the Saturday evening 6 to 8 p.m. period (Impact would change from SUM to LS.)
- Cumulative traffic noise levels on local roadways (Impact would change from SUM to LS.)
- Air quality impacts due to construction emissions (Impact would change from SUM to LS.)
- Air quality impacts due to operational emissions (Impact would change from SUM to LS.)
- Cumulative air quality impacts (Impact would change from SUM to LS.)

The No Project Alternative would have ***less severe*** significant impacts than the proposed project (i.e., the significance determination would change from LSM to LS or NI) with respect to:

- Transit impacts on Muni service under conditions with overlapping events at AT&T Park and under cumulative conditions (Impacts would change from LSM to LS.)
- Cumulative pedestrian impact (Impact would change from LSM to LS.)
- Noise associated with amplified sound equipment and leakage of interior concert or other event noise (Impact would change from LSM to NI.)
- Helipad impacts associated with specialized outdoor lighting for the event center (Impact would change from LSM to NI.)
- Cancer risk associated with emissions of toxic air contaminants (Impact would change from LSM to LS.)
- Cumulative cancer risk associated with emissions of toxic air contaminants (Impact would change from LSM to LS).
- Consistency with the Clean Air Plan (Impact would change from LSM to LS.)

The No Project Alternative would have ***similar but slightly less severe*** significant impacts than the proposed project (i.e., the significance determination would be the same but the severity, magnitude and/or frequency of the impact would be notably less) with respect to:

- Traffic impacts during the weekday p.m. peak hour at the intersection of Seventh/Mississippi/16th (Impact remains SU, but the magnitude of the delay would be less and the intersection would remain at LOS E, compared to LOS F for the project.)

- Cumulative traffic impact (Impact would remain SUM, but only at two intersections for the No Project Alternative compared to 16 study intersections for the proposed project.)
- Wastewater demand requiring construction or expansion of wastewater treatment facilities (Impact would remain SU, but there would be reduced wastewater demand.)
- Wastewater demand resulting in the determination by the SFPUC that it has inadequate capacity to serve the project (Impact would remain SUM, but there would be reduced wastewater demand.)

Overall, the No Project Alternative would result in substantially less severe environmental impacts than the proposed project but would fail to meet the basic objectives of the project.

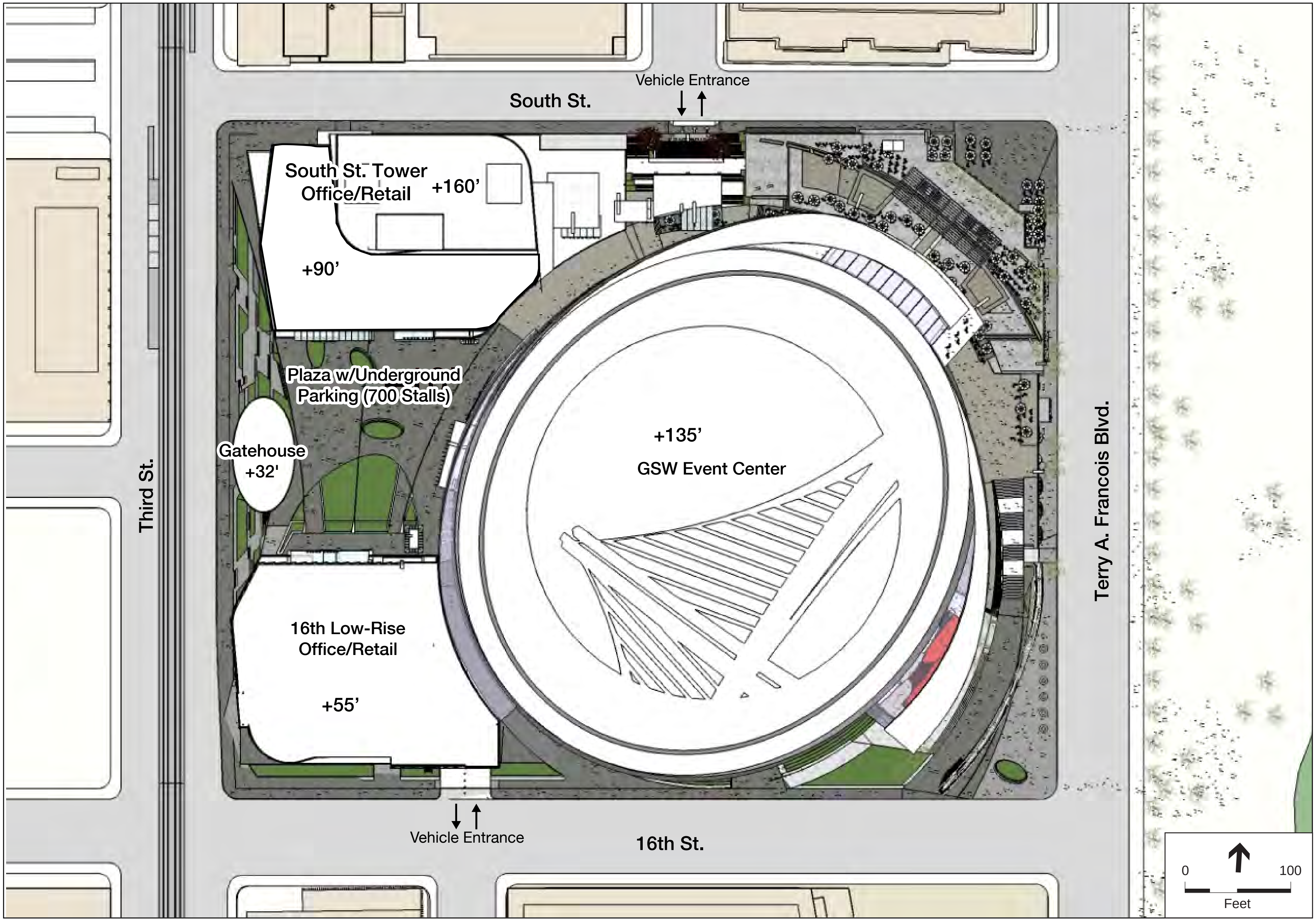
7.3.2 Alternative B: Reduced Intensity Alternative

This alternative was designed to address significant impacts associated with the proposed intensity of development at Blocks 29-32, while still meeting most of the project objectives. For the purposes of the CEQA alternatives analysis, Alternative B was designed to reduce significant impacts in the areas of transportation, noise, and air quality that were identified in Chapter 5 for the proposed project and summarized in Section 7.2 above.

7.3.2.1 Description of Reduced Intensity Alternative

The Reduced Intensity Alternative, developed as a hypothetical scenario for the purposes of this SEIR, is designed to reduce transportation and construction-related impacts that were identified for the proposed project. This alternative would be identical to the proposed project with respect to the event center's design and siting on Blocks 29-32, but the mixed use development of commercial-industrial-retail uses throughout the rest of the site would be reduced in scale by 40 percent. The office uses would be reduced from 580,000 to 373,000 gsf, retail uses would be reduced from 125,000 to 75,000 gsf, and on-site, subgrade parking reduced from 950 to 750 stalls. The total development would be reduced from 1,955,000 to 1,673,000 gsf, or a reduction of 282,000 gsf. As described above in Section 7.2.3, reducing the size of the event center was determined not to be feasible due to the current standards of the NBA for professional basketball games, the current market demand for season tickets, and the likelihood that reducing the size or scale of the event center would not avoid or lessen the significant and unavoidable transportation-related impacts.

In addition, there would be only one instead of two 160-foot-tall office towers; the tower at Third and 16th Streets would be lowered by seven floors, such that the height of this structure would be 55 feet instead of 160 feet. Retail uses would be reduced across the project site, with 5,000 gsf less at the South Street podium, 5,000 gsf less at the Gatehouse, 11,000 gsf less at the 16th Street podium, and 29,000 gsf less at the Market Hall complex at South Street and Terry A. Francois Boulevard. Like the proposed project, the same gatehouse would be located mid-block along Third Street, and vehicle access would be from South and 16th Streets. The area of open space would be the same as that for the proposed project, or 3.2 acres. A schematic of the Reduced Intensity Alternative site plan is presented in **Figure 7-2**.



SOURCE: Manica Architecture, 2015

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E:
Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 7-2
Reduced Intensity Alternative, Conceptual Site Plan

Operations under the Reduced Intensity Alternative would be essentially the same as that for the proposed project. The event center operations would be identical, as described in Chapter 3, Table 3-3. Operations of the office and retail uses would be expected to be the same as for the proposed project, though reduced in scale commensurate with the reduced gross square footage of uses. For the purposes of this alternatives analysis, it is assumed that the Reduced Intensity Alternative would incorporate the same design standards, infrastructure improvements, and transportation management planning assumptions as those under the proposed project.

7.3.2.2 Ability of the Reduced Intensity Alternative to Meet Project Objectives

As shown in Table 7-2, the Reduced Intensity Alternative would meet most of the project objectives and potentially all of the project objectives. Because the Reduced Intensity Alternative would include an event center identical to the proposed project, this alternative would meet all of the project objectives related to providing a venue for sporting events, entertainment, and convention purposes. Specific design of the mixed-use portion of the development has not yet been defined, so it is unknown if the Reduced Intensity Alternative would meet the objectives related to the financial feasibility of the mixed use development. However, all other aspects of this alternative would be essentially equivalent to the proposed project with respect to meeting the objectives related to optimizing public transit, pedestrian, and bicycle access, provision of adequate parking, developing a year-round visitor-serving destination; and promoting environmental sustainability.

7.3.2.3 Impacts of the Reduced Intensity Alternative

Impacts of the Reduced Intensity Alternative would be similar to those of the proposed project with respect to nearly all resource areas. This is because many of the impacts would result from the development of a vacant parcel with an event center and mixed-use development, regardless of the size of the mixed-use development. And in all cases, the same mitigation or improvement measures identified for the proposed project would apply to the Reduced Intensity Alternative. The impacts of the Reduced Intensity Alternative as compared to those of the proposed project are summarized below by resource topic. The reader is referred to Initial Study (Appendix NOP-IS) and Chapter 5 of this SEIR for the full analysis of impacts similar to those of the proposed project.

Land Use

Like the proposed project, the Reduced Intensity Alternative would not physically divide an established community, conflict with applicable land use plans, or have a substantial impact upon the existing character of the vicinity. The event center and commercial/industrial/retail uses would occur within the boundary of existing lot lines, would be consistent with the South Plan and associated Design for Development, as amended for this alternative, and would be comparable in character to surrounding land uses. All land use impacts would be *less than significant* and no mitigation would be required.

Aesthetics

Like the proposed project, the Reduced Intensity Alternative would be on an infill site, within a transit priority area, and an employment center, therefore under CEQA Public Resources Code Section 21099, aesthetics are not to be considered in determining significant environmental effects.

Population and Housing

Like the proposed project, the Reduced Intensity Alternative would not induce substantial population growth, displace housing units, create substantial demand for additional housing, or displace substantial numbers of people. Employment projections for both construction and operation would be similar to or less than that for the proposed project, based on the reduced gross square footage of development, and could be met by the local and regional labor force. No housing would be displaced, and housing needs would be met by residents already living in the region. All population and housing impacts would be *less than significant* and no mitigation would be required.

Cultural and Paleontological Resources

Like the proposed project, the Reduced Intensity Alternative would not affect the significance of a historical resource, not destroy a unique paleontological resource, not disturb any human remains, assuming compliance with applicable regulations; these impacts would be *less than significant* and no mitigation would be required. Also like the proposed project, this alternative could cause a substantial adverse change in the significance of an archaeological resource that could be mitigated to less than significant. Construction of the Reduced Intensity Alternative would be comparable to that of the proposed project, and ground disturbance associated with grading and foundation work could affect unidentified archaeological resources. The same mitigation measures, Mitigation Measure M-CP-2a, Archaeological Testing, Monitoring and/or Data Recovery Program, and Mitigation Measure M-CP-2b, Accidental Discovery of Archaeological Resource, would be applicable to the Reduced Intensity Alternative and would make this impact *less than significant with mitigation*.

Transportation and Circulation

Under the Reduced Intensity Alternative, the amount of office, restaurant and retail uses would be about 60 percent of the proposed project, however, the event center would be the same as for the proposed project (i.e., 750,000 gsf and 18,064 seats). Under this alternative, 882 vehicle parking spaces (750 on-site and 132 at the 450 South Street garage) would be provided (compared to 1,082 vehicle parking spaces for the proposed project), and vehicular ingress and egress from the proposed parking garage would be from South and 16th Streets, similar to the proposed project. The Reduced Intensity Alternative would provide transportation improvements similar to those included as part of the proposed project, as described in Section 5.2.5.2, Project Transportation Improvements Assumptions, including roadway, transit, pedestrian and bicycle improvements, as well as an event center Transportation Management Plan (TMP) and a Muni Special Event Transit Service Plan.

As indicated in **Table 7-3**, above, for conditions without an event at the site, the number of weekday p.m. and Saturday evening person trips and vehicle trips generated by the Reduced Intensity Alternative would be less than with the proposed project. The Reduced Intensity Alternative would generate 1,702 person trips by all modes, compared to 2,796 person trips for the proposed project (i.e., 1,094 fewer person trips) during the weekday p.m. peak hour, and 1,879 person trips for the Reduced Intensity Alternative compared to 3,130 person trips for the proposed project (i.e., 1,251 fewer person trips) during the Saturday evening peak hour. For conditions with an event at the project site, the number of person and vehicle trips would be similar to those reported for the proposed project for the Convention Event and Basketball Game scenarios (see Chapter 5, Table 5.2-24).

Construction Impacts. Construction-related ground transportation impacts associated with the Reduced Intensity Alternative would be similar to the proposed project, and would be *less than significant*. Improvement Measure I-TR-1: Construction Management Plan and Public Updates, identified for the proposed project, would also be applicable to this alternative.

Traffic Impacts. Because the Reduced Intensity Alternative would include less retail, restaurant and office uses, it would generate fewer vehicle trips than the proposed project. For the No Event scenario, the Reduced Intensity Alternative would generate about 427 vehicle trips compared to 702 vehicle trips for the proposed project during the weekday p.m. peak hour, and would generate 435 vehicle trips compared to 785 vehicles for the proposed project during the Saturday evening peak hour (see **Table 7-3**, above). With a reduction in the number of vehicles added to the study intersections, the increase in average vehicle delay during the peak hours would be less than for the proposed project. During the weekday p.m. peak hour, four study intersections would operate at LOS E or LOS F conditions, similar to the proposed project; however, the LOS at the intersection of Seventh/Mississippi/16th would remain at LOS E, as compared to LOS F for the proposed project for the No Event and Basketball Game scenarios. Similar to the proposed project for the No Event and Basketball Game scenarios, the Reduced Intensity Alternative's contribution to the existing LOS E and LOS F conditions for the weekday p.m. peak hour at the intersections of King/Third, King/Fifth/I-280 ramps, and Fifth/Bryant/I-80 westbound off-ramp would not be considerable, and traffic impacts at these intersections would therefore, be less than significant. During the weekday p.m. peak hour, the LOS at the intersection of Seventh/Mississippi/16th would remain the same as under existing conditions (i.e., LOS E), compared to LOS F for the proposed project for the No Event and Basketball Game scenarios, however, the Reduced Intensity Alternative contribution to the existing LOS E conditions would be considerable, which would be considered a significant impact. Therefore, similar to the proposed project, the Reduced Intensity Alternative would result in *significant and unavoidable* impacts at one study intersection (i.e., at Seventh/Mississippi/16th) during the weekday p.m. peak hour, although the magnitude of the additional vehicle delay would be less than for conditions with the proposed project. During the Saturday evening peak hour, all study intersections would operate at LOS D or better, and therefore, traffic impacts at all study intersections would be less than significant, similar to the proposed project for the No Event and Basketball Game scenarios. **Table 7-6** and **Table 7-7**, above, present the freeway ramp LOS for the proposed project and the Reduced Intensity Alternative for the weekday p.m. and Saturday evening peak hours for the No Event scenario, respectively. The Reduced Intensity Alternative would add fewer vehicle trips to the I-280 and I-80 freeway mainline and ramps than the proposed project, and, similar to the proposed project for the No Event and Basketball Game scenarios, would not result in project-specific impacts or contribute considerably to existing LOS E or LOS F conditions during the weekday p.m. or Saturday evening peak hours.

Because the Reduced Intensity Alternative would include an event center, the proposed project's significant and unavoidable traffic impacts associated with events at seven study intersections (King/Fourth, Fifth/Harrison/I-80 westbound off-ramp, Fifth/Bryant I-80 eastbound on-ramp, Third/Channel, Fourth/Channel, Seventh/Mission Bay Drive, and Seventh/Mississippi/16th) and one I-80 freeway ramp (I-80 westbound off-ramp at Fifth/Harrison) would also occur under the Reduced Intensity Alternative, and these traffic impacts would be *significant and unavoidable with mitigation*. Mitigation Measure M-TR-2a: Additional PCOs during Events and Mitigation Measure M-TR-2b: Additional Strategies to Reduce Transportation Impacts, identified for the proposed project, would also be applicable to the Reduced Intensity Alternative.

On days when a basketball game at the project site overlaps with a SF Giants evening game, the Reduced Intensity Alternative, similar to the proposed project, would result in *significant and unavoidable* impacts at six additional intersections (i.e., King/Fifth/I-280 ramps, Third/South, Fourth/16th, Owens/16th, Illinois/Mariposa, and Mariposa/I-280 northbound off-ramp). Proposed project Mitigation Measure M-TR-2b: Additional Strategies to Reduce Transportation Impacts, Mitigation Measure M-TR-11a: Additional PCOs during Overlapping Events, Mitigation Measure M-TR-11b: Participation in the Ballpark/Mission Bay Transportation Coordinating Committee, and Mitigation Measure M-TR-11c: Additional Strategies to Reduce Transportation Impacts of Overlapping Events, would also be applicable to the Reduced Intensity Alternative.

Transit Impacts. Under the No Event scenario, the Reduced Intensity Alternative would generate 543 transit trips compared to 881 transit trips for the proposed project (i.e., 130 fewer transit trips) during the weekday p.m. peak hour, and 404 transit trips compared to 673 transit trips for the proposed project (i.e., 269 fewer transit trips) during the Saturday evening peak hour. Thus, similar to the proposed project, the new transit trips would be accommodated on the T Third light rail line and 22 Fillmore bus route serving the project site, and on the regional transit service providers during the weekday p.m. and Saturday evening peak hours, and impacts on transit would be *less than significant*.

Because the number of transit trips traveling to and from the project site during an event under the Reduced Intensity Alternative would be similar to that for the proposed project, the significant and unavoidable impact on regional transit (i.e., Caltrain and North Bay Ferry and Bus Service) would occur, and this regional transit impact, similar to the proposed project, would be *significant and unavoidable with mitigation*. Mitigation Measure M-TR-5a: Additional Caltrain Service and Mitigation Measure M-TR-5b: Additional North Bay Ferry and Bus Service would also be applicable to Alternative B. Improvement Measure I-TR-4: Operational Study of the Southbound Platform at the T Third UCSF/Mission Bay Station, which would study the feasibility of physical improvements to the existing light rail platform would also be applicable to the Reduced Intensity Alternative.

On days when a basketball game overlaps with a SF Giants evening game, the Reduced Intensity Alternative, similar to the proposed project, would result in *less-than-significant impacts with mitigation* on Muni transit, and Mitigation Measure M-TR-13: Additional Muni Transit Service during Overlapping Events would be applicable to the Reduced Intensity Alternative. In addition, similar to the proposed project, on days with overlapping evening events, additional capacity would be required to accommodate the combined BART East Bay transit demand. Therefore, similar to the proposed project, on days when a basketball game overlaps with a SF Giants evening game, the Reduced Intensity Alternative would result in a significant impact on one additional regional transit service provider (i.e., BART). Implementation of Mitigation Measure M-TR-14: Additional BART Service to the East Bay during Overlapping Events would reduce or minimize the severity of the regional transit impact, however, since the provision of additional East Bay, South Bay, and North Bay transit service is uncertain and full funding for the service has not been identified, the Reduced Intensity Alternative's significant impacts to BART, Caltrain, Golden Gate Transit and WETA would, similar to the proposed project, be *significant and unavoidable with mitigation*.

Pedestrian Impacts. Under the No Event scenario, the Reduced Intensity Alternative would result in fewer person-trips and bicycle trips compared to the proposed project, and therefore, similar to the proposed project, impacts on pedestrians and bicycles would be *less than significant*. Because the Reduced Intensity Alternative would include an event center, the proposed project's significant impacts at the intersection of Third/South for the Basketball Game scenario during the weekday evening, weekday late evening, and Saturday evening peak hours would also occur under the Reduced Intensity Alternative. Proposed project Mitigation Measure M-TR-6: Active Management of Pedestrian Flows at the Intersection of Third/South would also be applicable to the Reduced Intensity Alternative, and with implementation of this measure, the Reduced Intensity Alternative impacts on pedestrians, similar to the proposed project, would be *less than significant with mitigation*.

Bicycle Impacts. Under the Reduced Intensity Alternative, similar to the proposed project, it is anticipated that the existing, planned, and proposed bicycle facilities in the project vicinity would be well utilized, and it is not expected that the vehicle, bicycle or pedestrian trips associated with the Reduced Intensity Alternative would result in significant impacts on bicyclists. Because the Reduced Intensity Alternative includes the event center, similar to the proposed project, it is possible that increased congestion associated with the proposed project, particularly during post-event conditions, could result in an increased potential for vehicular-bicycle and pedestrian-bicycle conflicts, however, it would not increase to a level that would adversely affect bicycle facilities in the area. Therefore, similar to the proposed project, the impacts of the Reduced Intensity Alternative on bicycle facilities and circulation would be *less than significant.*

Loading Impacts. Similar to the proposed project, the Reduced Intensity Alternative would include on-site and on-street commercial loading spaces to accommodate the loading demand, however, because the Reduced Intensity Alternative would provide less office and retail/restaurant uses, the number of loading spaces provided on site would be less than for the proposed project (i.e., 11 on-site loading spaces based on the Mission Bay South Design for

Development requirements, compared to 13 for the proposed project). The Reduced Intensity Alternative would generate 252 daily truck and service vehicle trips compared to 396 for the proposed project. Because the Reduced Intensity Alternative would provide commercial loading spaces, the loading demand would be accommodated, and loading impacts under this alternative, similar to the proposed project, would be less than significant. Improvement Measure I-TR-8: Truck and Service Vehicle Loading Operations Plan, identified for the proposed project, would also be applicable to the Reduced Intensity Alternative.

Emergency Vehicle Access Impacts. As part of the Reduced Intensity Alternative, the roadway network adjacent to the project site on 16th Street and Terry A. Francois Boulevard would be built out, which would facilitate emergency vehicle access to the site. Emergency vehicle access to the project site and nearby hospital uses would be maintained before and after events, as would emergency access for persons traveling to the emergency room and urgent care center in their personal vehicles. Similar to the proposed project, the Reduced Intensity Alternative would not inhibit emergency vehicles access to the project site and nearby vicinity, and impacts would be *less than significant*. Improvement Measure I-TR-10a: UCSF Emergency Vehicle Access and Garage Signage Plan and Improvement Measure I-TR-10b: Mariposa Street Restriping Study, identified for the proposed project, would also be applicable to the Reduced Intensity Alternative.

Cumulative Impacts. The Reduced Intensity Alternative's contribution to 2040 cumulative impacts would be similar to the proposed project. Similar to the proposed project, the Reduced Intensity Alternative would not contribute considerably to significant cumulative construction-related ground transportation impacts, and the Reduced Intensity Alternative's cumulative impacts related to bicycle, loading, and emergency vehicle access would be less than significant. Similar the proposed project, the Reduced Intensity Alternative's cumulative Muni transit and pedestrian impacts would be less than significant with mitigation, and cumulative regional transit impacts would be significant and unavoidable with mitigation. The Reduced Intensity Alternative would result in the same significant and unavoidable with mitigation cumulative traffic impacts as the proposed project (i.e., at 16 study intersections and at three freeway ramp locations).

Helipad Safety. Like the proposed project, construction of the Reduced Intensity Alternative could result in temporary obstruction of the UCSF helipad airspace surfaces, despite the reduced height of the building at Third and 16th Street from 160 to 90 feet, the impact could be potentially significant. In addition, like the proposed project, use of specialized outdoor lighting associated with event center operations could affect helipad flight operations. However, implementation of the same mitigation measures (Mitigation Measures M-TR-9a, Crane Safety Plan for Project Construction, and M-TR-9d, Event Center Exterior Light Plan) would reduce these potential impacts to *less than significant with mitigation*.

Noise

Construction Impacts. Like the proposed project, construction of the Reduced Intensity Alternative would not cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity; expose people to or generate noise levels in excess of applicable standards; or expose people and structures to excessive groundborne vibration levels. Under the Reduced

Intensity Alternative, the same construction equipment would likely be used, construction duration would likely be about the same, and compliance with the San Francisco Noise Ordinance would be required. Construction noise impacts would be therefore be the same or similar to those of the proposed project, and all impacts would be *less than significant* with no mitigation required. However, similar to the proposed project, the Reduced Intensity Alternative could contribute considerably to cumulative construction noise impacts depending on the extent of other construction activities occurring concurrently in the immediate vicinity. Like the proposed project, it would be assumed that planned construction elsewhere in Mission Bay, including multiple elements of the UCSF LRDP at the Mission Bay Campus, would likely overlap with construction activities at this site. Regardless, like the proposed project, implementation of Mitigation Measure M-C-NO-1 (Construction Noise Control Measures) would reduce this alternative's contribution to cumulative construction noise impacts to *less than significant*.

Operational Impacts. With respect to operations, the Reduced Intensity Alternative would introduce the same noise sources to the project area, both stationary and mobile noise sources, and operations under the Reduced Intensity Alternative would have the same noise impacts associated with extensive amplification equipment for interior or outdoor performances and with operation of public address systems, as the proposed project. Similar to the proposed project, implementation of Mitigation Measures M-NO-4a (Noise Control Plan for Outdoor Amplified Sound) and M-NO-4b (Noise Control Plan for Place of Entertainment Permit) would reduce this impact to less than significant.

Similarly, the Reduced Intensity Alternative would have essentially the same, though slightly less severe noise impacts associated with vehicular traffic than the proposed project. The Reduced Intensity Alternative would have less of an increase in the vehicular traffic in the project vicinity than the proposed project, and increased traffic noise levels would generally be less severe compared to those under the proposed project (see **Table 7-13** as compared to Table 5.3-9 in Chapter 5). For both the proposed project and the Reduced Intensity Alternative, the increased noise levels at all modeled roadway segments during the weekday 4 to 6 p.m. peak hour would be *less than significant*.

Under the proposed project, as shown in Table 5.3-9 in Chapter 5, roadside noise levels at multi-family receptors adjacent to Illinois Street and Terry A. Francois Boulevard would exceed significance thresholds under several scenarios: weekday late night 9 to 11 p.m. period due to post-basketball game traffic at Illinois Street and at Terry Francois Boulevard; and on Saturday evening 6 to 8 p.m. period due to basketball game traffic at Illinois Street. As described in Chapter 5, Section 5.3, Noise, these impacts are considered a significant and unavoidable permanent increase in noise levels, even with mitigation. Similarly, under the Reduced Intensity Alternative, increases in roadway noise levels during the weekday 9 to 11 p.m. period due to post-basketball game traffic at Illinois Street and at Terry Francois Boulevard would be expected to exceed significance thresholds, since the reduction in commercial and retail uses would likely not change traffic patterns during this period (which is why this scenario was not modeled for this alternative and is not shown in Table 7-13); this impact would be *significant and unavoidable*. Also, like the proposed project, noise increases during the Saturday 6 to 8 p.m. period on

TABLE 7-13
MODELED TRAFFIC NOISE LEVELS, REDUCED INTENSITY ALTERNATIVE[a]

Roadway Segment	Existing (2015)	Existing plus Reduced Intensity Alternative	dBA Difference	Significant Increase?
Weekday Peak Hour Noise Levels (4PM – 6PM)				
Third Street between South Street and China Basin Street	69.1	69.7	0.6	No
Third Street between 16th Street and Mariposa Street	69.9	69.9	0.0	No
Illinois Street between Mariposa Street and 20th Street	60.3	63.3	3.0	No
Terry Francois Boulevard between South Street and China Basin Street	59.8	59.8	0.0	No
16th Street between Third Street and I-280	66.4	67.2	0.8	No
Mariposa Street between Third Street and I-280	65.5	66.5	1.0	No
Roadway Segment	**Existing (2015)**	**Existing plus Reduced Intensity Alternative**	**dBA Difference**	**Significant Increase?**
Saturday Evening Noise Levels (6PM – 8PM)				
Third Street between South Street and China Basin Street	64.7	66.9	2.2	No
Third Street between 16th Street and Mariposa Street	65.1	65.3	0.4	No
Illinois Street between Mariposa Street and 20th Street	54.7	61.1	**6.4**	**Yes**
Terry Francois Boulevard between South Street and China Basin Street	54.0	54.9	0.9	No
16th Street between Third Street and I-280	61.4	63.8	2.4	No
Mariposa Street between Third Street and I-280	60.4	64.7	4.3	No

NOTES:
[a] Road center to receptor distance is assumed to be 50 feet for values shown in this table. Noise levels were determined using the Federal Highway Administration (FHWA) traffic noise model. The average speed on these segments is assumed to be 25 or 30 miles per hour, depending on the roadway. For all other assumptions, refer to Appendix NO. In an existing ambient noise environment of 65 dBA or greater, an incremental increase is considered significant if the noise increase is equal to or greater than 3.0 dBA. In an existing ambient noise environment below 65 dBA, an incremental increase is considered significant if the noise increase is equal to or greater than 5.0 dBA.

SOURCE: ESA 2015

Illinois Street due to basketball game traffic would be *significant and unavoidable*, as shown in Table 7-13. Therefore, noise impacts due to increased traffic on local roadways would be essentially the same under this alternative as for the proposed project.

Similarly, under cumulative conditions, the Reduced Intensity Alternative's contribution to significant roadway noise increases along Illinois Street between Mariposa and 20th Street during the Saturday evening period would be *significant and unavoidable*, similar to the proposed project, although the proposed project would also result in a significant and unavoidable contribution to cumulative roadway noise impacts along this same roadway segment during the weekday p.m. peak hour. Therefore, the Reduced Intensity Alternative would have somewhat less severe, cumulative roadway noise impacts than the proposed project because there would be less frequent occurrences of significant roadway noise increases along Illinois Street between Mariposa and 20th Street.

Like the proposed project, the Reduced Intensity Alternative would have a *significant and unavoidable* impact associated with the increased noise levels due to crowds gathering at the Muni T-Line platform near the UCSF Hearst Tower housing building during quieter nighttime periods, when event patrons would be departing the project site.

Like the proposed project, under the Reduced Intensity Alternative, the cumulative noise impacts of future operations of the UCSF Medical Center helipad would be less than significant because office and research/development uses are not considered noise sensitive land uses.

Air Quality

Construction Impacts. Like the proposed project, construction impacts of the Reduced Intensity Alternative would be significant and unavoidable with mitigation. As described in Chapter 5, Section 5.4, Air Quality, estimated construction-related emissions of ROG and NOx for the project would be 59 and 226 pounds per day, respectively, which would exceed the applicable significance thresholds. Even with implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization), NOx levels would exceed the significance threshold, at 144 pounds per day, assuming the minimum level of compliance (Tier 2 with NOx VDECS). Similarly, as shown in **Table 7-14**, the construction-related criteria air pollutant emissions for the Reduced Intensity Alternative would exceed the thresholds for emissions of NOx, and as shown in **Table 7-15**, emissions of NOx under the Reduced Intensity Alternative would still be significant even with implementation of Mitigation Measure M-AQ-1. Thus, similar to the proposed project, an offset emissions mitigation measure would be required to provide for reduction of levels of ozone precursors exceeding the significance thresholds through implementation of pollution reduction programs elsewhere in the air basin. Consequently, construction-related criteria pollutant emissions under the Reduced Intensity Alternative would be *significant and unavoidable with mitigation*.

TABLE 7-14
AVERAGE DAILY CONSTRUCTION-RELATED EMISSIONS
FOR THE REDUCED INTENSITY ALTERNATIVE

	Average Daily Construction Emissions (pounds/day)			
	ROG	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Off-road Equipment Emissions	11	154	6.2	6.2
Truck and Vehicle Emissions	6.7	48	0.80	0.73
Architectural Coating Emissions	31	0	0	0
Total[a]	**49**	**203**	7.0	7.0
Significance Threshold	54	54	82	54
Above Threshold?	No	**Yes**	No	No

NOTES:

[a] The total emissions may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

TABLE 7-15
MITIGATED AVERAGE DAILY CONSTRUCTION-RELATED EMISSIONS FOR THE REDUCED INTENSITY ALTERNATIVE

	Average Daily Construction Emissions (pounds/day)			
	ROG	**NOx**	**PM10**	**PM2.5**
With Tier 2 + NOx VDECS Off-road Equipment				
Off-road Equipment Emissions	0.46	82	0.51	0.51
Truck and Vehicle Emissions	6.7	48	0.80	0.73
Architectural Coating Emissions	31	0	0	0
Total[a]	**39**	**130**	**1.3**	**1.2**
Significance Threshold	54	54	82	54
Above Threshold?	No	**Yes**	No	No

NOTES:
[a] The total emissions may not sum precisely due to rounding of subtotals.
SOURCE: Ramboll Environ, 2015

Operational Impacts. Like the proposed project, operational impacts of the Reduced Intensity Alternative would be significant and unavoidable even with mitigation. As described in Chapter 5, Section 5.4, Air Quality, estimated operational emissions of ROG and NOx under the proposed project would be 79 and 124 pounds per day, respectively, exceeding significance thresholds. As shown in **Table 7-16**, the Reduced Intensity Alternative would result in operational criteria air pollutant emissions of ROG and NOx slightly lower than those for the proposed project, but still at levels that would exceed the applicable significance thresholds. The same mitigation measures identified for the proposed project would apply to the Reduced Intensity Alternative, although the amount of emissions offset would need to be adjusted to the emissions calculated for this alternative. Therefore, the operational air quality impacts of the Reduced Intensity Alternative would be *significant and unavoidable with mitigation.*

Toxic Air Contaminants. Similar to the proposed project, construction and operation of the Reduced Intensity Alternative would generate toxic air contaminants, including diesel particulate matter. Like the project (see Table 5.4-10 in Section 5.4, Air Quality), $PM_{2.5}$ concentrations at off-site receptor locations would be below significance thresholds for construction and operation of the Reduced Intensity Alternative, as shown in **Table 7-17**. Cumulative (background plus Reduced Intensity Alternative) $PM_{2.5}$ levels at the maximally impacted sensitive receptor during construction would be 8.9 $\mu g/m^3$, and would not exceed the 10 $\mu g/m^3$ threshold. Following completion of construction activities, the Reduced Intensity Alternative's operational sources would also generate $PM_{2.5}$ emissions, which are also quantified in Table 7-17. As shown in this table, cumulative (background plus Reduced Intensity Alternative) $PM_{2.5}$ concentrations during project operations would be 9.0 $\mu g/m^3$. Furthermore, at no off-site location, during construction or operations, would cumulative $PM_{2.5}$ concentrations exceed the 10 $\mu g/m^3$ threshold. Therefore, the Reduced Intensity Alternative would not result in sensitive receptor locations meeting the Air Pollutant Exposure Zone criteria for $PM_{2.5}$, and impacts related to construction and operational $PM_{2.5}$ concentrations would be *less than significant*.

TABLE 7-16
AVERAGE DAILY AND MAXIMUM ANNUAL OPERATIONAL EMISSIONS FOR THE REDUCED INTENSITY ALTERNATIVE

	Average Daily Emissions (pounds/day)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile (Alternative–GSW Trips)	34	90	64	18
Standby Diesel Generators (assumes 5, same as project)	0.30	0.97	0.04	0.04
Boilers (assumes 4, same as project)	2.1	14	2.9	2.9
Area Sources	28	<0.01	<0.01	<0.01
Total[a]	**64**	**105**	**67**	**21**
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No
	Maximum Annual Emissions (short tons/year)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile (Alternative–GSW Trips)	6.2	16	12	3.3
Standby Diesel Generators (assumes 5)	0.055	0.18	<0.01	<0.01
Boilers (assumes 4)	0.38	2.6	0.52	0.52
Area Sources	5.2	<0.01	<0.01	<0.01
Total[a]	**12**	**19**	12	3.8
Significance Threshold	10	10	15	10
Above Threshold?	**Yes**	**Yes**	No	No
Estimated Emissions Reduction Required by Offsets	1.77	9.25	0	0

NOTES:
[a] The total emissions may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

Similarly, the lifetime cancer risk at off-site receptors under the Reduced Intensity Alternative would be less than significant with mitigation, the same as that identified for the proposed project, and the same mitigation measure would apply to this alternative. For the proposed project (see Table 5.4-11 in Section 5.4, Air Quality), the unmitigated risk would exceed the significance threshold but implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization) would reduce the risk to less than significant. For the Reduced Intensity Alternative, as shown in **Table 7-18**, under unmitigated conditions, the excess cancer risk for a child resident at the UCSF Hearst Tower and Hospital would exceed the significance threshold of 100 per one million persons exposed. More specifically, a resident child at the UCSF Hearst Tower could be exposed to an excess cancer risk of up to 111 per one million under unmitigated conditions, a significant impact. The Reduced Intensity Alternative 's unmitigated construction emissions would account for an excess cancer risk of 48 in one million and unmitigated operational emissions would account for an excess cancer risk of 37.2 in one million at this receptor location. Implementation of Mitigation Measure M-AQ-1 (Construction Vehicle Emissions Minimization) would reduce the impacts from standardized construction equipment for which "tiered"

TABLE 7-17
ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS AT OFF-SITE RECEPTORS FOR THE REDUCED INTENSITY ALTERNATIVE

Source	$PM_{2.5}$ Concentration (µg/m³, Annual Average)	
	UCSF Hearst Tower Receptor	UCSF Hospital Receptor
Construction		
Background at the maximally impacted receptor	8.5	8.6
Unmitigated Construction Contribution	0.27	0.27
Mitigated (Tier 2 + NOx VDECS) Construction Contribution	0.049	0.048
Cumulative Total (Unmitigated/with Mitigation)	8.8/8.5	8.9/8.7
Significance Threshold	10	10
Above Threshold?	No	No
Operation		
Background at the maximally impacted receptor	8.5	8.6
Project Operations – Generators	0.055	0.055
Project Operations – Mobile	0.32	0.32
Cumulative Total (Unmitigated)	8.9	9.0
Significance Threshold	10	10
Above Threshold?	No	No

NOTES:
[a] The total emissions may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

TABLE 7-18
LIFETIME EXCESS CANCER RISK AT OFF-SITE RECEPTORS FOR THE REDUCED INTENSITY ALTERNATIVE

Source	Excess Cancer Risk (in one million)		
	UCSF Hearst Tower Receptor		UCSF Hospital Receptor
	Child Resident	Adult Resident	Child Resident
Background at the maximally impacted receptor	26	26	44
Unmitigated Construction Contribution	48	2.5	25
Mitigated (Tier 2 + NOx VDECS) Construction Contribution	8.5	0.44	4.4
Project Operations – Generators	30	30	30
Project Operations – Mobile	7.2	7.2	7.2
Cumulative Total (Unmitigated/ Mitigated)[a]	111 / 72	66 / 64	106 / 86
Significance Threshold	100	100	100
Above Threshold? (Unmitigated/ Mitigated)	**Yes**/No	No/No	**Yes**/No

NOTES:
[a] The total risks may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

equipment is available, as shown in Table 5.4-11. With the minimum level of compliance with this mitigation measure (Tier 2 plus NOX VDECS), increased cancer risk as a result of project construction activities at the maximally impacted receptor would be approximately 8.5 in one million and cumulative excess cancer risk at all receptor locations would be reduced to below the significance threshold of 100 per one million.

While unmitigated increased cancer risk at the maximally impacted receptors would exceed the threshold of 100 in one million, with implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization), increased cancer risk at the maximally impacted receptors would be below the threshold of 100 in one million. Furthermore, at no off-site location, would cumulative excess cancer risk exceed 100 per one million persons exposed with implementation of Mitigation Measure M-AQ-1. Therefore, the Reduced Intensity Alternative would not result in sensitive receptor locations meeting the Air Pollutant Exposure Zone criteria for excess cancer risk, and construction and operational cancer risk *would be less than significant with mitigation*.

Consistency with Clean Air Plan. Like the proposed project, impacts related to consistency with the 2010 Clean Air Plan (CAP) for the Reduced Intensity Alternative would be less than significant with mitigation. The Reduced Intensity Alternative would be consistent with the 2010 CAP by virtue of incorporation of mitigation measures that include offsetting emissions to below significance thresholds. Additionally, the Reduced Intensity Alternative would be consistent with the 2010 CAP by virtue of incorporation of control measures of the CAP, including land use/local impact measures and energy/climate measures now required through the various components of the City's Greenhouse Gas Reduction Strategy as well as the transportation demand management measures that would be assumed to part of this alternative, similar to those for the proposed project. The Reduced Intensity Alternative would also not hinder implementation of the 2010 CAP. Therefore, the Reduced Intensity Alternative would not conflict with, or obstruct implementation of the 2010 CAP, and this impact would be *less than significant with mitigation*.

Odors. Like the proposed project, this alternative would not create objectionable odors that would affect a substantial number of people.

Cumulative Air Quality Impacts. Like the proposed project, the cumulative air quality impacts of the Reduced Intensity Alternative would be significant and unavoidable with mitigation. Because the proposed project would result in both construction and operational emissions of ROG and NOx exceeding their respective significance thresholds, the project's contribution to cumulative air quality impacts is considered significant and unavoidable, even with mitigation. Similarly, the Reduced Intensity Alternative would result in significant and unavoidable air quality impacts after implementation of feasible mitigation measures, and consequently, would result in a cumulatively considerable contribution to regional and local air quality impacts. Therefore, this impact would be *significant and unavoidable with mitigation*.

The Reduced Intensity Alternative would result in a similar cumulative health risk impact as the proposed project, which was determined to be *less than significant* with implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization). The planned Uber/ARE project could locate childcare facilities on Blocks 26/27, directly north of the project site. However, these sensitive receptors would be exposed to at most eight months of construction period emissions and these receptors' health risk exposure would not exceed significance thresholds with implementation of Mitigation Measure M-AQ-1.

Greenhouse Gas Emissions

Similar to the proposed project, construction and operation of the Reduced Intensity Alternative would generate GHG emissions, but also similar to the proposed project, it can be assumed that the Reduced Intensity Alternative would qualify as an environmental leadership project under AB 900. As described in Chapter 5, Section 5.5, the proposed project is a certified environmental leadership project under AB 900 and the CARB has determined that the proposed project would result in no net increase in GHG emissions based on the AB 900 application which includes voluntary acquisition of carbon credits by the project sponsor. Therefore, it is assumed that the Reduced Intensity Alternative would be designed and constructed to the same green building and sustainability standards as the proposed project, and would include strategies to reduce GHG emissions that would be consistent with the City's GHG Reduction Strategy and the AB 900 application submitted for the proposed project. Given the reduced size of the Reduced Intensity Alternative compared to the proposed project, overall GHG emissions during construction and operations would be expected to be somewhat less than that of the project, but given the assumption that this alternative would also qualify as an environmental leadership project under AB 900 and purchase carbon offset credits, the Reduced Intensity Alternative would result in no net increase in GHG emissions, like the proposed project. Therefore, impacts related to GHG emissions would be *less than significant* and no mitigation is required.

Wind and Shadow

Wind. As described in Chapter 5, Section 5.6, the proposed project would result in significant and unavoidable wind hazard impacts at off-site public areas based on results of wind tunnel testing. Under the Reduced Intensity Alternative, the 135-foot tall event center in the east and central part of the project site would be the same as under the proposed project, but instead of two 160-foot tall office towers on the west side of the site, there would be one 160-foot-tall tower (along South Street) and a 55-foot tall building (along 16th Street). The different building heights on the project site under the Reduced Intensity Alternative would result in different wind conditions, including at pedestrian use areas, than that described for the proposed project. However, in the absence of wind tunnel testing for the Reduced Intensity Alternative, the specific change in wind conditions of the Reduced Intensity Alternative compared to proposed project cannot be quantified. Consequently, the effect of the change in wind conditions on the conclusion of the significance of off-site wind hazards for the Reduced Intensity Alternative under existing plus project and cumulative conditions is not known.

However, like the proposed project, the Reduced Intensity Alternative would be subject to the Mission Bay South Design for Development wind analysis standards and design guidelines, which were prepared with the objective to use all feasible means to eliminate wind hazards and to reduce adverse wind impacts. Since the Reduced Intensity Alternative would contain buildings over 100 feet in height, it would be also subject to wind review, including potential wind tunnel testing, under the Mission Bay South Design for Development. Therefore, the severity of the wind impacts of the Reduced Intensity Alternative is unknown at this time, although if wind testing were to determine that the impacts would exceed significance thresholds, the same mitigation measure identified for the proposed project would apply to this alternative.

Shadow. Like the proposed project, the Reduced Intensity Alternative, in combination with cumulative development, would create new shadow but not in a manner that would substantially affect the use of publicly accessible open space or outdoor recreational facilities or other public areas within the Mission Bay South Plan area. The only difference between the Reduced Intensity Alternative and the proposed project design is associated with the height of the South Street office and retail building, located on the west side of the site. Similar to the proposed project, the shadow effect of the Reduced Intensity Alternative and its contribution to cumulative shadow impacts, on publicly accessible open space or outdoor recreation facilities or other public areas within the Mission Bay plan area (i.e., Bayfront Park), and outside the plan area (i.e., Agua Vista Park), would be *less than significant* and no mitigation would be required.

Recreation

Like the proposed project, the Reduced Intensity Alternative would not substantially increase the use of existing recreational facilities or require the construction or expansion of recreational facilities. Employment under this scenario would be the same or less than that for the proposed project, based on the reduced gross square footage, and recreational demands would be met by existing and planned parks and open space provided for as part of the overall Mission Bay Plan. All recreation impacts would be *less than significant* and no mitigation would be required.

Utilities and Service Systems

Water Supply Resources, Water Treatment Facilities, and Solid Waste. Like the proposed project, the Reduced Intensity Alternative would not require new or expanded water supply resources, require construction of new water treatment facilities, and would be served by existing landfills for solid waste disposal. Given the reduced gross square footage of uses, projected demands for water supply resources, water treatment facilities, and solid waste disposal would be less than that of the proposed project. These impacts would be *less than significant* and no mitigation would be required.

Wastewater Treatment Capacity. Like the proposed project, the Reduced Intensity Alternative in combination with past, present, and foreseeable future development in the Mission Bay South area, would require the construction of new or expanded wastewater treatment facilities, the construction of which could cause significant environmental effects; this would be a *significant and unavoidable* impact, with no mitigation available to the project sponsor. As described in Chapter 5, Section 5.7, the wastewater pump stations serving the project site are currently at capacity, and new development at Blocks 29-32, regardless of the intensity of land uses, in combination with other planned development in the Mission Bay South area, would trigger the need for new or expanded wastewater treatment facilities, the construction of which could result in significant environmental impacts. However, given the reduced gross square footage of development, the wastewater demand from the Reduced Intensity Alternative would likely be less than that identified for the proposed project, and the amount of additional wastewater treatment capacity required would accordingly be reduced.

Stormwater Drainage Facilities. With respect to demand for stormwater facilities, Reduced Intensity Alternative would have the same demand as the proposed project and would be subject to the same stormwater management regulations. Stormwater drainage would be accommodated by the same stormwater facilities as the proposed project, as planned and provided for under the Mission Bay Infrastructure Plan. Like the proposed project, impacts related to stormwater drainage facilities for the proposed project would be *less than significant* and no mitigation would be required.

Wastewater Demand. Like the proposed project, development of the Reduced Intensity Alternative would likely result in a determination by the San Francisco Public Utilities Commission (SFPUC) that it has inadequate capacity to serve the project's projected wastewater demand in addition to its existing commitments. Even though the Reduced Intensity Alternative would have a reduced gross square footage of uses and therefore a reduced wastewater demand compared to the proposed project, the existing shortfall in capacity at the Mariposa Pump Station and/or the Mission Bay Sanitary Pump Station indicate that an increase in capacity and associated improvements to these facilities would still be required. Therefore, it would be expected that the SFPUC would make the same determination for the Reduced Intensity Alternative as it did for the proposed project, and Mitigation Measure M-C-UT-4 (Fair Share Contribution for Pump Station Upgrades) would apply. As for the proposed project, this impact would be *significant and unavoidable with mitigation*.

Public Services

Schools, Public Health, Childcare, Library, and Street Maintenance Services. Like the proposed project, the Reduced Intensity Alternative would not result in increased demand for schools because it would not include residential uses. Other public services, such as demand for public health, childcare, library, street maintenance, and emergency medical would be within the assumptions provided for in the overall Mission Bay Redevelopment Plan and analyzed in the Mission Bay FSEIR. These impacts would *be less than significant* and no mitigation would be required.

Fire Protection and Emergency Medical Services. Like the proposed project, construction and operation of the Reduced Intensity Alternative would not result in the need for new or physically altered governmental facilities for fire protection and emergency medical services. Construction of this alternative would require about the same number of employees and have about the same duration. Similarly, given the reduced gross square footage of proposed uses under this alternative, population increases at the site —and consequently demand for fire protection and emergency medical services—during construction and operation would be the same or less than that of the proposed project, as described in Chapter 5, Section 5.8. This impact would be *less than significant* and no mitigation would be required.

Law Enforcement Services. Like the proposed project, construction and operation of the Reduced Intensity Alternative would not result in the need for new or physically altered governmental facilities for law enforcement services. Construction of this alternative would require about the same number of employees and have about the same duration. Similarly, given the reduced gross square footage of proposed uses under this alternative, population increases at the site —and consequently demand for law enforcement services—during construction and operation would be the same or less than that of the proposed project, as described in Chapter 5, Section 5.8. This impact would be *less than significant* and no mitigation would be required.

Biological Resources

Like the proposed project, the Reduced Intensity Alternative would not have an effect on any special status species, riparian habitat or other sensitive natural community, or conflict with any local policies protecting biological resources; these impacts would be *less than significant* and no mitigation would be required. Similar to the proposed project, under the Reduced Intensity Alternative, potential impacts on breeding birds which may be nesting within the project site could be mitigated to less than significant with implementation of Mitigation Measure M-BI-4a (Preconstruction Surveys for Nesting Birds), and potential impacts related to avian collisions with buildings or night lighting could be mitigated to less than significant with implementation of Mitigation Measure M-BI-4b (Bird Safe Building Practices); these impacts would be *less than significant with mitigation*.

Geology and Soils

Like the proposed project, the Reduced Intensity Alternative would not expose people or structures to substantial earthquake or landslide hazards, result in erosion or loss of top soil, be located on a geologic unit that could become unstable, be located on corrosive or expansive soils, substantially change the topography, or affect any unique geologic features. These impacts would be *less than significant* with implementation of protective measures required by applicable regulations, and no mitigation would be required.

Hydrology and Water Quality

Construction Impacts. Like the proposed project, the Reduced Intensity Alternative's construction-related water quality impacts would be *less than significant* and no mitigation would be required. Management of stormwater and groundwater discharges during construction would be required to comply with local and state regulations designed to protect water quality.

Operational Impacts—Groundwater, Drainage, Flooding, and Inundation by Seiche or Tsunami. Like the proposed project, the Reduced Intensity Alternative would not deplete groundwater supplies or interfere with groundwater recharge; would not alter existing drainage pattern that would result in erosion, siltation, or flooding; expose people, housing, or structures to substantial risk of loss due to flooding risks; redirect or impede flood flows; or expose people or structures to significant risk involving inundation by seiche or tsunami. These impacts would be *less than significant* with compliance with applicable regulations, and no mitigation would be required.

Operational Impacts—Water Quality. The Reduced Intensity Alternative would have the same operational water quality impacts as the proposed project. Both the proposed project and the

Reduced Intensity Alternative would have the potential to affect water quality due to dry weather flows (sanitary sewage only), wet weather flows (sanitary sewage and stormwater), discharges from the Southeast Water Pollution Control Plant (SEWPCP), stormwater runoff and drainage discharges, and litter. However, in all cases, given the reduced gross square footage of the development under the No Project Alternative compared to that of the proposed project (which would be expected to result in a reduced volume of sanitary sewage), all water quality impacts would be essentially the same as those described in Chapter 5, Section 5.9. All discharges to the Bay, whether sanitary sewage, stormwater, or a combination of both, would be treated as required by the San Francisco Regional Water Quality Control Board (RWQCB), and all discharges would be in compliance with applicable National Pollutant Discharge Elimination System (NPDES) permits that have been issued by the RWQCB for the express purpose of protecting water quality. Potential impacts related to effluent discharges from the SEWPCP would be *less than significant with mitigation*, assuming implementation of FSEIR Mitigation Measure K.2 which requires implementation of measures to ensure that businesses that discharge pollutants that are not typically associated with most wastewater discharges to the City's combined sewer system do not cause a violation of the NDPES permit for the SEWPCP.

Operational Impacts—Sea Level Rise. Like the proposed project, it would be expected that operation of the Reduced Intensity Alternative would not expose people or structures to a significant risk of loss, injury, or death involving flooding associated with sea level rise. As described in Chapter 5, Section 5.9, the project site could be temporarily flooded at depths of up to 2.5 feet with 36 inches of sea level rise in combination with 100-year storm surge by 2100. The proposed project would be designed and constructed to resist flood damage and provide for the safety of occupants and visitors in the event of flooding, and it is assumed that this alternative would be designed similarly. Therefore, like the proposed project, this impact would be *less than significant* and no mitigation would be required.

Hazards and Hazardous Materials

All impacts related to hazards and hazardous materials would be identical for the Reduced Intensity Alternative to those identified for the proposed project, since all impacts would result from the conversion of a vacant parcel to a mixed-use development on Blocks 29-32, regardless of the design or size of the development. Like the proposed project, the Reduced Intensity Alternative would not impair implementation or physically interfere with an adopted emergency response plan or expose people or structures to a significant risk involving fires; these impacts would be *less than significant* and no mitigation would be required.

The Reduced Intensity Alternative would be required to implement all required measures in compliance with applicable hazardous materials and hazardous waste regulations such that impacts related to routine use, transport, and disposal of hazardous materials would be less than significant; however, like the proposed project, because the future uses are currently unknown, there is a potential that future uses could involve handling of biohazardous materials, but implementation of mitigation measures identified in the Mission Bay FSEIR would reduce potential health and safety impacts to less than significant. Similarly, potential impacts related to encountering naturally occurring asbestos during construction could be reduced to less than significant with implementation of Mitigation Measure M-HZ-1b (Geologic Investigation and Dust Mitigation Plan for Naturally Occurring Asbestos). Furthermore, impacts related to excavation and construction on a site with identified hazardous waste contamination would be reduced *to less than significant with mitigation* measures previously identified in the Mission Bay FSEIR.

Mineral and Energy Resources

Like the proposed project, the Reduced Intensity Alternative would not result in the use of large amounts of fuel, water, or energy, or use of these materials in a wasteful manner. These impacts would be *less than significant* with compliance with applicable regulations, including the San Francisco Green Building Code, and no mitigation would be required.

Agricultural and Forest Resources

As described for the proposed project, Blocks 29-32 does not contain agricultural or forest resources, and development under the Reduced Intensity Alternative would have *no impact* on these resources.

7.3.2.4 Reduced Intensity Alternative — Conclusions

The Reduced Intensity Alternative would meet all of the basic project objectives. It would generally have the same environmental impacts as those of the proposed project identified in Chapter 5 of this SEIR and in Appendix NOP-IS. Key differences in the impact conclusions for the Reduced Alternative compared to the impact conclusions of the proposed project are summarized below.

The Reduced Intensity Alternative would not avoid or substantially lessen any of the significant and unavoidable impacts that were identified for the proposed project. Nor would the Reduced Intensity Alternative result in any changes to the significance determinations identified for the proposed project, and all mitigation measures would apply to this alternative.

However, the Reduced Intensity Alternative would have ***similar but slightly less severe*** significant impacts than the proposed project (i.e., the significance determination would be the same but the severity, magnitude and/or frequency of the impact would be notably less) with respect to:

- Traffic impacts during the weekday p.m. peak hour at the intersection of Seventh/Mississippi/16th (Impact would remain SUM, but the magnitude of the delay would be less and the intersection would remain at LOS E, compared to LOS F for the project.)

- Cumulative traffic noise levels on Illinois Street between Mariposa and 20th Street during Saturday evening period (Impact would remain SUM, but unlike the proposed project, the Reduced Intensity Alternative would not result in a cumulatively considerable noise increase along this same roadway segment during the weekday p.m. peak hour.)

- Construction air quality impacts associated with emissions of ROG and NOx (Impact would remain SUM, but under the proposed project, ROG and NOx emissions would be 59 and 226 pounds per day, respectively, and would be reduced to 49 and 203 pounds per day, respectively, under the Reduced Intensity Alternative. With implementation of mitigation under the proposed project and the Reduced Intensity Alternative, NOx emissions would still exceed these thresholds.)

- Operational air quality impacts associated with emissions of ROG and NOx (Impact would remain SUM, but under the proposed project, ROG and NOx emissions would be 79 and 124 pounds per day, respectively, and would be reduced to 64 and 105 pounds per day, respectively, under the Reduced Intensity Alternative).
- Wastewater demand requiring construction or expansion of wastewater treatment facilities (Impact would remain SU, but there would be reduced wastewater demand and potentially reduced construction or expansion of wastewater facilities.)
- Wastewater demand resulting in the determination by the SFPUC that it has inadequate capacity to serve the project (Impact would remain SUM, but there would be reduced wastewater demand.)

Overall, the Reduced Intensity Alternative would result in somewhat less severe environmental impacts than the proposed project, while achieving most of the basic objectives of the project.

With the exception of the event center, the Reduced Intensity Alternative reduces the scale of development at the site. The project sponsor has indicated that this reduction may affect the economic feasibility of the project. Based on current information, however, this alternative is considered potentially feasible. The feasibility of this alternative (based on economic or other considerations) will be determined at the time OCII decides whether to approve the project or an alternative to the project.

7.3.3 Alternative C: Off-site Alternative at Piers 30-32 / Seawall Lot 330

As described in Chapter 2, Introduction, the project sponsor previously proposed to construct a multi-purpose event center, event hall, public open space, maritime uses, fire station, a parking facility, and visitor-serving retail and restaurant uses on Piers 30-32 along the San Francisco waterfront, south of the Bay Bridge, in conjunction with a residential and hotel mixed-use development across The Embarcadero on Seawall Lot 330. For the purposes of this SEIR, this alternative would be essentially the same as that previous proposal, although without the fire station, since the San Francisco Fire Department has proceeded with a different plan for upgrading its waterfront facilities.

7.3.3.1 Description of Off-site Alternative at Piers 30-32 / Seawall Lot 330

Site Description

Piers 30-32 and Seawall Lot 330 are located along The Embarcadero, between Bryant Street and Brannan Street, just south of the Bay Bridge, and within the jurisdictional boundary of the Port of San Francisco (Port). Piers 30-32 is an approximately 12.7-acre rectangular-shaped concrete pier structure that extends east from the bulkhead wharf into the San Francisco Bay. With the exception of Red's Java House, located on the northwest corner of the piers, Piers 30-32 has no existing on-deck structures and is used for surface parking and an occasional berthing location for cruise ships and other large vessels. Substantial areas of Piers 30-32 are in poor structural condition and can no longer safely support heavy loads such as trucks or large crowds. Seawall Lot 330 is an approximately 2.3-acre paved inland site, located directly across The Embarcadero from Piers 30-32, and currently operates as a surface parking lot. The site is within the City's Rincon Point-South Beach neighborhood adjacent to several existing residential uses. Piers 30-32 is within an area subject to the San Francisco Bay Conservation and Development Commission (BCDC) San Francisco Waterfront Special Area Plan. In addition, Piers 30-32 is within the purview of the State Lands Commission as part of its stewardship of state-owned lands, waterways, and resources and subject to public trust considerations under the Burton Act.

Alternative Description

This alternative assumes the same design and programming as the project sponsor's previously proposed project at this location, with the only exception being the removal of the fire house and associated San Francisco Fire Department facilities; the conceptual site plan is depicted in **Figure 7-3**. The Off-site Alternative at Piers 30-32 and Seawall Lot 330 would have an event center on Piers 30-32 with the same basketball seating capacity as the currently proposed project (18,064 seats), totaling 694,944 gsf (including the GSW offices), plus an event hall covering 25,946 gsf. Also located on Piers 30-32, this off-site alternative would include about 90,000 gsf of retail/restaurant uses, 13,172 gsf for services, about 252,554 gsf for parking and loading, and 1,820 gsf for Red's Java House, for a total building area of about 1,078,436 gsf. The height of the event center would be 128 feet high, with seven arena levels, height of the retail buildings 32 to 58 feet, with 1 to 3 levels, and the parking would be 31 feet high, with 3 levels. Red's Java House would be relocated from its current location in the northwest corner of Piers 30-32 to near the southwest corner, and relocation would be conducted consistent with the Port of San Francisco Building Code requirements and the Secretary of the Interior's Standards for the Treatment of Historic Properties. Other proposed facilities on Piers 30-32 would include a water taxi dock, a "dolphin" berthing structure[4], and over 7 acres of public open space on Piers 30-32. There would be 500 parking spaces at Piers 30-32. Vehicular access would be at one midblock access point on The Embarcadero, between Bryant and Brannan Streets. Maritime uses include a water taxi dock on the north side and berthing for deep water vessels on the east side.

Seawall Lot 330 would be developed with a combination of residential, hotel, and retail uses (including restaurants and parking) and would be designed to architecturally connect to the development at Piers 30-32. A total of 534,890 gsf of building development is proposed at Seawall Lot 330, consisting of 208,844 gsf of residential, 178,406 gsf of hotel, 29,854 gsf of retail, 106,339 gsf parking, and 11,447 gsf of shared support areas. The development would include a four-story building (ground level plus three podium levels containing a combination of retail, residential,

[4] A "dolphin" berthing structure would provide an extended berthing point for large deep water vessels on the east side of Piers 30-32. The structure was proposed to be located south of the southeast corner of Piers 30-32, and would consist of an above-water concrete platform (approximately 36 square feet in surface area) with a single mooring post, attached to the seabed.

SOURCE: Snøhetta, Manica Architecture, BAR Architects, 2014

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E:
Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 7-3
Off-Site Alternative at Piers 30-32 and
Seawall Lot 330 Conceptual Site Plan

hotel and parking uses) above which a 13-story residential tower would be developed in the south portion of the site (i.e., 17 stories total) and a 7-story hotel tower in the north portion of the site. The tallest structure on Seawall Lot 330 would be the proposed residential tower, which would measure approximately 175 feet at its building rooftop. The hotel would consist of two building wings connected by a multi-level glass bridge, approximately 105 feet in height. The podium building would vary in height, ranging from 20 to 50 feet depending on location, and would incorporate rooftop open space areas. The Seawall Lot 330 development would contain multiple ground-level vehicular and pedestrian/bicycle access points to the site, and a pedestrian/bicycle pathway through the development connecting Main Street and The Embarcadero. A total of 259 vehicle parking spaces are proposed on Seawall Lot 330.

Operations under this alternative are assumed to be essentially the same as those of the proposed project at Mission Bay, with the same year-round schedule and types of events at the event center, and typical operational schedules for the hotel, residential, and retail uses.

Construction of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would require approximately 32 months for the entire development, about 6 months longer than the construction schedule for the proposed project. Unlike the proposed project, extensive in-water construction activities would be required in the vicinity of Piers 30-32 due to the seismic and structural upgrades to the pier structure that would be required. At or in the vicinity of Piers 30-32, construction activities would include: demolition of portions of the existing Piers 30-32 pier deck; removal and/or disconnection of existing pier piles; installation of new pier piles and reconstruction of the pier deck; dredging within a portion of the Pier 28-30 open water area; strengthening of the seawall and sections of the bulkhead wharf adjacent to Piers 30-32 along The Embarcadero promenade; construction of all above-deck Piers 30-32 development, including foundations, event center structure, retail buildings, parking and loading structure, and open space features; installation of associated on-site utilities; interior finishing, exterior hardscaping and landscaping improvements; installation of floating dock facilities along the north side of Piers 30-32; and installation of frontage improvements along The Embarcadero.

At Seawall Lot 330, construction activities would include: site demolition, clearing and excavation; pile installation and foundation construction; construction of all proposed Seawall Lot 330 development, including podium structure and residential and hotel towers; installation of associated on-site utilities; interior finishing; exterior hardscaping and landscaping improvements; and installation of frontage improvements along The Embarcadero and Bryant and Beale Streets.

This alternative would require numerous federal and state permits and approvals, including approvals from the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Services, National Marine Fisheries Service, California State Lands Commission, San Francisco Bay Conservation and Development Commission, and California Department of Fish and Wildlife. Local approvals would be required from the San Francisco Planning Commission, San Francisco Port Commission, and the San Francisco Board of Supervisors as well as the San Francisco voters.

It should be noted that this alternative includes a different mix of uses than that of the proposed project, including new residential and hotel uses and substantially less office uses. Because of these differences, this alternative would result in impacts that would not occur for the proposed project, particularly due to the residential uses. However, the program for this alternative is based on the previous proposal by the project sponsor for this site, and was determined to be the most viable mix of uses for this site at that time.

Under the Off-site Alternative, development at Blocks 29-32 at Mission Bay would not be precluded. Development of the Off-site Alternative, could occur concurrently with development of Blocks 29-32 per the Mission Bay Plan, potentially contributing to localized impacts at both sites. See the analysis of the No Project Alternative for the impacts associated with development at Blocks 29-32, in Section 7.3.1 above.

7.3.3.2 Ability of the Off-site Alternative to Meet Project Objectives

The Off-site Alternative at Piers 30-32 and Seawall Lot 330 would meet most of the basic project objectives, although like the Reduced Intensity Alternative, the current financial feasibility is unknown. Presumably, based on the previous conceptual design at this site, this alternative would meet all of the project objectives related to providing a venue for sporting events, entertainment, and convention purposes. In addition, this alternative would meet the objectives related to optimizing public transit, pedestrian, and bicycle access, provision of adequate parking, developing a year-round visitor-serving destination; and promoting environmental sustainability.

7.3.3.3 Impacts of the Off-site Alternative

Land Use

Similar to the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not physically divide an established community, conflict with applicable land use plans, or have a substantial impact upon the existing character of the vicinity. The conceptual design would occur within the boundaries of the existing lot lines and does not include any physical barriers or obstacles to circulation that would restrict existing patterns of movement between the site and adjacent neighborhoods. This alternative would require a rezoning of the project site to increase the height limit, but these changes would not result in an environmental effect under CEQA, as modified by SB 743. This alternative would require approval by San Francisco Bay Conservation and Development Commission (BCDC), the Port of San Francisco (Port), the San Francisco Planning Commission, and other relevant regulatory agencies as part of their project approval process. In addition, the State Lands Commission would need to make a determination with regard to its consistency of the proposed uses with the public trust.[5] These agencies would determine whether, on balance, the alternative would be consistent with their applicable plans. The development on Piers 30-32 and Seawall Lot 330 would generally represent an intensification of land uses already

5 Assembly Bill No. 1273 was approved in September 2013, which authorizes the State Lands Commission to approve a mixed-use development on the San Francisco waterfront at Piers 30-32, which would include a multipurpose venue for events and public assembly, if the State Lands Commission finds at a properly noticed public meeting, that specified conditions are met.

present in the project vicinity and would complement the existing character of the vicinity. Thus, all land use impacts would be *less than significant* and no mitigation would be required.

Aesthetics

Like the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would be on an infill site, within a transit priority area, and an employment center, therefore under Public Resources Code Section 21099, aesthetics are not to be considered in determining significant environmental effects.

Population and Housing

Similar to the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not induce substantial population growth, displace housing units, create substantial demand for additional housing, or displace substantial numbers of people. Employment projections for both construction and operation would be similar to or less than that for the proposed project, based on the reduced gross square footage of development, and could be met by the local and regional labor force. No housing would be displaced, considering that this alternative would include new residential uses, and housing needs would be met by residents already living in the region. All population and housing impacts would be *less than significant* and no mitigation would be required.

Cultural and Paleontological Resources

Like the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not destroy a unique paleontological resource or unique geological feature, and not disturb any human remains, assuming compliance with applicable regulations; these impacts would be *less than significant* and no mitigation would be required. Similar to the proposed project, this alternative would not affect the significance of a historic resource, even though unlike the proposed project where there are no historic resources, historic resources are present at and near this off-site location at Piers 30-32, including Red's Java House, sections of the bulkhead wharf, and the Seawall. However, it is assumed that design and construction of a project at this location would be consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties as well as comply with Port of San Francisco requirements for alterations to historic resources; therefore, impacts on historic resources, like the proposed project, would be *less than significant* and no mitigation would be required.

However, this alternative could result in a potentially significant impact on historic resources in the project vicinity (e.g., sections of the bulkhead wharf) due to the potential effects of groundborne vibration during construction on nearby historic resources, although feasible mitigation measures to conduct pre-construction assessments and implement a vibration monitoring and management plan would reduce this impact to less than significant. This impact would not occur under the proposed project.

This alternative, like the proposed project, could cause a substantial adverse change in the significance of an archaeological resource that could be mitigated to less than significant. Ground disturbance associated with grading and foundation work at Seawall Lot 330 could affect unidentified archaeological resources, and the same mitigation measures, Mitigation Measure M-CP-2a, Archaeological Testing, Monitoring and/or Data Recovery Program, and Mitigation Measure M-CP-2b, Accidental Discovery of Archaeological Resource, would be applicable to this alternative and would make this impact *less than significant with mitigation*.

Transportation and Circulation

The Off-site Alternative at Piers 30-32 and Seawall Lot 330 would be located about 1.3 miles north of the project site in Mission Bay, closer to the downtown core, and therefore a direct comparison of transportation impacts of the Off-site Alternative to the proposed project is not possible. Thus, the assessment of potential transportation impacts is based on preliminary analyses conducted for the Event Center and Mixed-Use Development at Piers 30-32 and Seawall Lot 330 project in 2013 and 2014 prior to the proposed project's relocation to the Mission Bay site. The Off-site Alternative would include an event center, similar to the proposed project, and would include about 120,500 gsf of retail/restaurant uses, 35,600 gsf of office uses, 176 residential units, and 227 hotel rooms (compared to 125,000 gsf of retail/restaurant uses, 605,000 gsf of office uses, and an event center for the proposed project).

Similar to the proposed project, the Off-site Alternative would include a TMP for events that would manage vehicular access to the site, facilitate travel to/from an event by non-auto modes, minimize conflicts between vehicles and pedestrians or bicycles, and ensure emergency vehicle access to the site.

Under the Off-site Alternative, about 500 on-site vehicle parking spaces would be provided on Piers 30-32 and 260 vehicle spaces on Seawall Lot 330. Vehicular ingress and egress from the proposed event center parking garage would be from The Embarcadero. Similar to the proposed project on-site loading spaces would be provided within the buildings on both Pier 30-32 and Seawall Lot 330. Passenger loading/unloading for the event center would be located on The Embarcadero between Bryant and Brannan Streets.

Because the Off-site Alternative would be located closer to the downtown core, with multiple transit routes within walking distance, the auto mode share for the Off-site Alternative would be less than for the proposed project. For example, for the Basketball Game scenario during the weekday p.m. peak hour, the estimated auto mode share for all trips (i.e., all uses, including the event center, residential, hotel, retail/restaurant, and office uses) would be 35 percent for the Off-site Alternative, compared to 43 percent for the proposed project, and for the post-game late evening peak hour, the auto mode share for all trips would be 36 percent the Off-site Alternative, compared to 53 percent for the proposed project. See **Appendix TR** for additional details.

As indicated in **Table 7-3**, above**,** for conditions without an event at the site, the number of weekday p.m. and Saturday evening person trips and vehicle trips generated by the Off-site Alternative would be less than with the proposed project. The Off-site Alternative would generate 1,787 person trips by all modes, compared to 2,796 person trips for the proposed project (i.e., 1,009 fewer person trips) during the weekday p.m. peak hour, and 2,680 person trips for the Off-site Alternative compared to 3,130 person trips for the proposed project (i.e., 450 fewer person trips) during the Saturday evening peak hour.

Construction Impacts. Construction-related ground transportation impacts would be similar to the proposed project, even though the duration of construction would be 6 months longer, and impacts would be less than significant. Improvement Measure I-TR-1: Construction Management Plan and Public Updates, identified for the proposed project, would also be applicable to this alternative.

Traffic Impacts. The Off-site Alternative would generate fewer vehicle trips than the proposed project, although as described below, traffic impacts would be significant and unavoidable. During the weekday p.m. peak hour for the No Event scenario, the Off-site Alternative would generate about 355 vehicle trips compared to 702 vehicle trips for the proposed project (i.e., 347 fewer vehicle trips), while during the Saturday evening peak hour, the Off-site Alternative would generate 435 vehicle trips compared to 785 vehicles for the proposed project (i.e., 350 fewer vehicle trips). **Table 7-19** and **Table 7-20** present the intersection LOS for the No Event and Basketball game scenarios for the Off-site Alternative for existing and existing plus Off-site Alternative conditions for the weekday p.m. and Saturday evening peak hours, respectively. As indicated in **Table 7-19**, during the weekday p.m. peak hour, a greater proportion of the study intersections in the vicinity of the Off-site Alternative currently operate at LOS E or LOS F conditions (i.e., 13 of the 26 study intersections for the Off-site Alternative, compared to 4 of the 22 study intersections for the proposed project). During the Saturday evening peak hour, all study intersections operate at LOS D or better, similar to the study intersections for the proposed project.

During the weekday p.m. peak hour for the No Event scenario, the Off-site Alternative would result in project-specific impacts (i.e., from LOS D or better to LOS E or LOS F, or from LOS E to LOS F) at six intersections, and would contribute considerably to existing LOS E or LOS F conditions at two intersections (i.e., traffic impacts at eight intersections, compared to one intersection for the proposed project). Under the Basketball Game scenario, the Off-site Alternative would result in eight project-specific impacts and contribute considerably to existing LOS E or LOS F conditions at four intersections (i.e., traffic impacts at 12 intersections, compared to 10 intersections for the proposed project). As shown in **Table 7-20**, for Saturday evening peak hour conditions, the Off-site Alternative would result in significant traffic impacts at one intersection for the No Event scenario, and at seven intersections for the Basketball Game scenario.

During overlapping evening events at AT&T Park, the magnitude and number of significant traffic impacts at intersections would increase due to the greater congestion levels at the same nearby intersections, and use of similar access routes and ramps to and from the I-80 and I-280 freeways. Mitigation measures similar to those identified for the proposed project but focused on conditions in the vicinity of Piers 30-32 (i.e., Mitigation Measure M-TR-2b: Additional Strategies to Reduce Transportation Impacts, Mitigation Measure M-TR-11a: Additional PCOs during Overlapping Events, Mitigation Measure M-TR-11b: Participation in the Ballpark/Mission Bay Transportation Coordinating Committee, and Mitigation Measure M-TR-11c: Additional Strategies to Reduce Transportation Impacts of Overlapping Events), would be applicable to the Off-site Alternative, and would serve to lessen the severity of significant traffic impacts. However, similar to the proposed project, the Off-site Alternative's traffic impacts would be *significant and unavoidable with mitigation*.

TABLE 7-19
OFF-SITE ALTERNATIVE AT PIERS 30-32 AND SWL 330 –
INTERSECTION LEVEL OF SERVICE - EXISTING PLUS PROJECT CONDITIONS –
WITHOUT A SF GIANTS GAME – WEEKDAY PM PEAK HOUR

					Existing plus Off-site Alternative			
			Existing		No Event		Basketball Game	
#	**Intersection Location**		**Delay[a]**	**LOS[a]**	**Delay**	**LOS**	**Delay**	**LOS**
1	Broadway	The Embarcadero	36.7	D	36.9	D	37.4	D
2	Washington St	The Embarcadero	30.5	C	31.5	C	38.0	D
3	Mission Street	The Embarcadero	**79.5**	**E**	**> 80**	**F**	**> 80**	**F**
4	Howard Street	The Embarcadero	**> 80**	**F**	**> 80**	**F**	**> 80**	**F**
5	Folsom Street	The Embarcadero	**61.9**	**E**	**66.8**	**E**	**> 80**	**F**
6	Harrison Street	The Embarcadero	**71.0**	**E**	**> 80**	**F**	**> 80**	**F**
7	Bryant Street	The Embarcadero	**> 80**	**F**	**> 80**	**F**	**> 80**	**F**
8	Brannan Street	The Embarcadero	39.1	D	37.6	D	42.4	D
9	Townsend Street	The Embarcadero	**58.1**	**E**	**62.6**	**E**	**70.4**	**E**
10	King Street	Second Street	**55.8**	**E**	**59.6**	**E**	**63.1**	**E**
11	King Street	Third Street	**72.7**	**E**	**> 80**	**F**	**> 80**	**F**
12	King Street	Fourth Street	51.9	D	**56.0**	**E**	**59.5**	**E**
13	King/Fifth Streets	I-280 ramps	**59.2**	**E**	**56.0**	**E**	**72.8**	**E**
14	Harrison Street	Main Street	**> 80**	**F**	**> 80**	**F**	**> 80**	**F**
15	Bryant Street	Main Street	21.2	C	32.5	C	24.2	C
16	Mission Street	Beale Street	33.8	C	37.1	D	41.8	D
17	Bryant Street	Beale Street	54.0	D	**> 80**	**F**	**> 80**	**F**
18	Harrison Street	Fremont Street	32.4	C	34.4	C	38.8	D
19	Folsom Street	Fremont Street	53.6	D	54.0	D	**> 80**	**F**
20	Harrison Street	First Street	**> 80**	**F**	**> 80**	**F**	**> 80**	**F**
21	Howard Street	Fourth Street	52.2	D	53.1	D	54.4	D
22	Harrison Street	Fourth Street	41.8	D	42.0	D	44.5	D
23	Bryant Street	Fourth Street	**> 80**	**F**	**> 80**	**F**	**> 80**	**F**
24	Harrison/Fifth St	I-80 WB off-ramp	48.4	D	**60.9**	**E**	**> 80**	**F**
25	Brannan Street	Second Street	20.2	C	21.3	C	28.2	C
26	Bryant Street	Second Street	**> 80**	**F**	**> 80**	**F**	**> 80**	**F**

NOTES:
[a] Delay presented in seconds per vehicle.
[b] Intersections operating at LOS E or LOS F conditions highlighted in **bold**. Significant project impacts shaded.

SOURCE: Adavant Consulting/Fehr & Peers/LCW Consulting, 2015.

TABLE 7-20
OFF-SITE ALTERNATIVE AT PIERS 30-32 AND SWL 330 –
INTERSECTION LEVEL OF SERVICE - EXISTING PLUS PROJECT CONDITIONS –
WITHOUT A SF GIANTS GAME – SATURDAY EVENING PEAK HOUR

					Existing plus Off-site Alternative			
			Existing		No Event		Basketball Game	
#	**Intersection Location**		**Delay[a]**	**LOS[a]**	**Delay**	**LOS**	**Delay**	**LOS**
1	Broadway	The Embarcadero	26.1	C	26.4	C	29.2	C
2	Washington St	The Embarcadero	31.4	C	31.9	C	33.3	C
3	Mission Street	The Embarcadero	12.8	B	13.0	B	12.9	B
4	Howard Street	The Embarcadero	38.3	D	46.0	D	**> 80**	**F**
5	Folsom Street	The Embarcadero	21.3	C	21.2	C	54.9	D
6	Harrison Street	The Embarcadero	21.0	C	23.9	C	25.1	C
7	Bryant Street	The Embarcadero	22.9	C	**> 80**	**F**	**> 80**	**F**
8	Brannan Street	The Embarcadero	23.9	C	26.2	C	33.4	C
9	Townsend Street	The Embarcadero	19.1	B	23.1	C	27.0	C
10	King Street	Second Street	33.9	C	36.8	D	39.4	D
11	King Street	Third Street	26.6	C	32.5	C	39.8	D
12	King Street	Fourth Street	22.6	C	30.8	C	**56.8**	**E**
13	King/Fifth Streets	I-280 ramps	< 10	A	< 10	A	**76.1**	**E**
14	Harrison Street	Main Street	22.0	C	22.5	C	51.1	D
15	Bryant Street	Main Street	< 10	A	< 10	A	< 10	A
16	Mission Street	Beale Street	12.0	B	12.1	B	13.2	B
17	Bryant Street	Beale Street	26.8	C	50.2	D	**63.6**	**E**
18	Harrison Street	Fremont Street	18.0	B	17.6	B	34.5	C
19	Folsom Street	Fremont Street	30.2	C	30.2	C	54.2	D
20	Harrison Street	First Street	28.3	C	36.3	D	**79.4**	**E**
21	Howard Street	Fourth Street	28.7	C	28.8	C	29.5	C
22	Harrison Street	Fourth Street	21.8	C	21.9	C	23.1	C
23	Bryant Street	Fourth Street	27.1	C	27.1	C	32.9	C
24	Harrison/Fifth St	I-80 WB off-ramp	29.2	C	29.0	C	**55.2**	**E**
25	Brannan Street	Second Street	10.7	B	11.2	B	15.3	B
26	Bryant Street	Second Street	25.9	C	28.3	C	38.5	D

NOTES:
a Delay presented in seconds per vehicle.
b Intersections operating at LOS E or LOS F conditions highlighted in **bold**. Significant project impacts shaded.

SOURCE: Adavant Consulting/Fehr & Peers/LCW Consulting, 2015.

Transit Impacts. The Off-site Alternative would be located in an area with multiple Muni and regional routes nearby, and the majority of transit riders would be expected to walk between the Muni and regional transit stops. Under the No Event scenario, the Off-site Alternative would generate 514 transit trips compared to 881 transit trips for the proposed project (i.e., 367 fewer transit trips) during the weekday p.m. peak hour, and 792 transit trips compared to 673 transit trips for the proposed project (i.e., 119 more transit trips) during the Saturday evening peak hour.

Under the basketball game scenario, the Off-site Alternative would not require provision of the Muni Special Event Transit Service Plan included as part of the proposed project. Event attendees taking transit would be distributed among numerous routes, and similar to the proposed project, impacts on Muni transit operations would be *less than significant*. However, because the number of regional transit trips traveling to and from the event center under the Off-site Alternative would be greater than for the proposed project, the significant and unavoidable impact on regional transit (i.e., Caltrain and North Bay Ferry and Bus Service) would also occur. This regional transit impact, similar to the proposed project, would be *significant and unavoidable with mitigation*. Mitigation Measure M-TR-5a: Additional Caltrain Service and Mitigation Measure M-TR-5b: Additional North Bay Ferry and Bus Service would also be applicable to the Off-site Alternative.

On days when a basketball game overlaps with a SF Giants evening game, the Off-site Alternative would require additional Muni transit service along The Embarcadero, and the Off-site Alternative would result in *less than significant* impacts *with mitigation* on Muni transit, the same as the proposed project, and a mitigation measure similar to Mitigation Measure M-TR-13, Additional Muni Transit Service during Overlapping Events, would be required. Similar to the proposed project, on days with overlapping evening events, additional capacity would be required to accommodate the combined BART East Bay transit demand. Therefore, similar to the proposed project, on days when a basketball game overlaps with a SF Giants evening game, the Off-site Alternative would result in a significant impact on one additional regional transit service provider (i.e., BART). Implementation of Mitigation Measure M-TR-14: Additional BART Service to the East Bay during Overlapping Events would reduce or minimize the severity of the transit impact, however, since the provision of additional East Bay, South Bay, and North Bay transit service is uncertain and full funding for the service has not been identified, the Off-site Alternative’s significant impacts to BART, Caltrain, Golden Gate Transit and WETA would be, similar to the proposed project, *significant and unavoidable with mitigation*.

Pedestrian Impacts. The Off-site Alternative would result in a reduced number of person trips accessing Piers 30-32 and Seawall Lot 330 than the proposed project for Mission Bay Blocks 29-32. Pedestrians would be accommodated in The Embarcadero promenade and on nearby streets providing access to transit stops and nearby off-street parking facilities. The nearby sidewalks and crosswalks would accommodate the additional pedestrians, with the crosswalks at the intersection of The Embarcadero/Bryant experiencing the greatest increase in pedestrian trips. During large events, the north and south crosswalks across The Embarcadero would operate at LOS E or LOS F conditions, particularly during overlapping evening events at AT&T Park, and this would be considered a significant impact. Implementation of mitigation measures that are similar in nature to the proposed project Mitigation Measure M-TR-6: Active Management of Pedestrian Flows at the

Intersection of Third/South would mitigate pedestrian impacts during events, and similar to the proposed project, pedestrian impacts would be *less than significant with mitigation*.

Bicycle Impacts. Under the Off-site Alternative, similar to the proposed project, it is anticipated that the existing, planned, and proposed bicycle facilities in the vicinity of Pier 30-32 and Seawall Lot 330 would be well utilized, and it is not expected that the additional vehicle, bicycle or pedestrian trips associated with the Off-site Alternative would result in significant impacts on bicyclists. Because the Off-site Alternative includes the event center adjacent to the bicycle lane on The Embarcadero, vehicular access to Piers 30-32 and passenger loading/unloading activities could conflict with northbound bicycle travel. The TMP developed for the event center at Piers 30-32 would include provisions for providing a temporary bicycle lane, delineated with cones or other methods, which would provide a clear path of travel for bicyclist traveling northbound on The Embarcadero. Thus, similar to the proposed project, it is possible that increased congestion associated with the proposed project, particularly during post-event conditions, could result in an increased potential for vehicular-bicycle and pedestrian-bicycle conflicts, however, it would not increase to a level that would adversely affect bicycle facilities in the area. Therefore, similar to the proposed project, the impacts of the Off-site Alternative on bicycle facilities and circulation would be *less than significant.*

Loading Impacts. Similar to the proposed project, the Off-site Alternative would include on-site commercial loading spaces on both Piers 30-32 and Seawall Lot 330 to accommodate the loading demand. Because the Off-site Alternative would provide commercial loading spaces, the loading demand would be accommodated, and loading impacts under this alternative, similar to the proposed project, would be *less than significant*. Improvement Measure I-TR-8: Truck and Service Vehicle Loading Operations Plan, identified for the proposed project, would also be applicable to the Off-site Alternative.

Emergency Vehicle Access Impacts. The Off-site Alternative would not change the configuration or capacity of the travel lanes adjacent to the project site. During events that may require closure of one or more lanes on The Embarcadero post-event, a TMP would be implemented to ensure that emergency vehicle access to the project site and vicinity is maintained. Therefore, similar to the proposed project, the impact of the Off-site Alternative on emergency vehicle access would be *less than significant*. In addition, given its location, the Off-site Alternative would have notably less effects on emergency access to the UCSF Hospital compared to the proposed project.

Cumulative Impacts. The Off-site Alternative's contribution to 2040 cumulative impacts in the vicinity of Piers 30-32 and Seawall Lot 330 would be similar to the proposed project. Similar to the proposed project, the Off-site Alternative would not contribute considerably to significant cumulative construction-related ground transportation impacts, and the Off-site Alternative's cumulative impacts related to bicycle, loading, and emergency vehicle access would be less than significant. Similar to the proposed project, the Off-site Alternative's pedestrian impacts and cumulative Muni transit impacts during overlapping events at AT&T Park would be *less than significant with mitigation*, while cumulative regional transit impacts would be *significant and unavoidable with mitigation*. Under 2040 cumulative conditions, it is anticipated that due to development in the Transbay Transit Center and South of Market areas, additional study intersections would operate at LOS E or LOS F conditions, particularly during the weekday p.m. peak hour, and the Off-site Alternative would contribute considerably to a portion of the additional intersections operating at LOS E or LOS F. Thus, similar to the proposed project, the Off-site Alternative would result in *significant and unavoidable with mitigation* cumulative traffic impacts.

Helipad Safety. The Off-site Alternative at Piers 30-32 and Seawall Lot 330 would *avoid* the potentially significant impacts on helipad safety that were identified for the proposed project, with respect to construction effects associated with the temporary obstruction of the UCSF helipad airspace surfaces and the potential operational effect of specialized outdoor lighting associated with the event center. Even though these helipad impacts could be reduced to less than significant for the proposed project, there would be *no impact* for this alternative because this location is not in proximity to any private or public helipad or other air safety risks.

Noise

Construction Impacts. Unlike the proposed project, which would have less-than-significant construction noise impacts, construction of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would result in *significant and unavoidable* noise impacts. As described in Chapter 5, Section 5.3, construction of the proposed project would result in temporary increases in noise levels that would be noticeable but below significance thresholds, due in part because piles would be cast in place into augured holes and would not require use of an impact or vibratory pile driver. For the Off-site Alternative at this location, not only would the construction duration be longer (32 months over a four-year period compared to 26-months total for the proposed project), but construction activities at both Piers 30-32 and Seawall Lot 330 would be more intensive and require prolonged pile-driving activities in proximity to sensitive receptors, resulting in substantial increases in noise levels over ambient levels even with implementation of best available noise controls and noise-reducing techniques, including exceeding the Federal Transit Administration (FTA) criterion for residential exposure to construction due to construction at Seawall Lot 330. Thus, this impact would be *significant and unavoidable with mitigation*, and would be a *substantially more severe* impact than would occur under the proposed project.

Also, unlike the proposed project, which would have less-than-significant construction vibration impacts, construction of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would result in *significant and unavoidable* groundborne vibration impacts. Under the proposed project, use of rapid impact compaction during construction at the project site would not result in excessive vibration levels that would result in structural damage or human annoyance at nearby structures or at residential or hospital receptors, and all other construction activity would generate diminished vibration levels such that vibration-related impacts due to project construction would be less than significant. In contrast, under this off-site alternative, pile driving activities for construction at Seawall Lot 330 would be as close as 25 feet to existing residential uses, and vibration from construction could have potentially significant effects on both people and structures. With implementation of feasible mitigation measures, vibration effects on structures could be reduced to less than significant, but the magnitude and duration of vibration effects combined with the proximity to sensitive receptors would be *significant and unavoidable*, even *with mitigation* with respect to human annoyance. Thus, this impact would be a *substantially more severe* impact than would occur under the proposed project.

However, like the proposed project, construction of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not expose people to or generate noise levels in excess of applicable standards; and this impact would be *less than significant*.

Cumulative construction noise and vibration impacts in the vicinity of Piers 30-32 and Seawall Lot 330 would be speculative to determine at this time, given the hypothetical nature of this off-site alternative and the non-existent construction schedule, and it is unknown to what extent there would be other construction activities in the project vicinity overlapping with construction activities at Piers 30-32 and Seawall Lot 330. However, since this alternative would result in significant and unavoidable construction noise and vibration impacts, if other construction activities were to be occurring in the vicinity, it is likely that this alternative's contribution to cumulative adverse noise and vibration impacts would be *significant and unavoidable* due to the magnitude of the construction activities and the proximity to sensitive receptors. On the other hand, the proposed project was determined to have a less-than-significant with mitigation contribution to cumulative construction noise impacts.

Operational Impacts. Operational noise impacts are discussed with respect to the potential exposure to or generation of noise levels in excess of standards; increased vehicular traffic noise; and crowd noise.

Exposure to or Generation of Noise Levels in Excess of Standards. Like the proposed project, operation of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 could result in exposure of persons to or generate noise levels in excess of established standards, but this impact would be *less than significant with mitigation*. In both cases, use of amplified sound equipment at the event center would have the potential to result in noise levels in excess of standards, but implementation of a noise control plan for outdoor amplified sound would reduce this impact to less than significant.

However, unlike the proposed project, the Off-site Alternative would introduce new sensitive receptors (proposed residential units) to an area that is already impacted by high noise levels from vehicle traffic on The Embarcadero and the overhead span of the San Francisco-Oakland Bay Bridge as well as from operations of the Muni light rail line. Thus, this alternative would have the potential to expose these sensitive uses to noise levels exceeding acceptable standards, but implementation of the state code requirements of Title 24 and recently adopted amendments to the San Francisco Building Code would ensure that interior noise levels within habitable rooms would not exceed 45 dBA, Ldn. Consequently, even though this potential impact would not occur under the proposed project, the interior noise impact to future residential users would be *less than significant*, with compliance with existing regulatory requirements (Building Code Sections 1207.5–1207.8).

Increased Vehicular Traffic Noise. Both the Off-site Alternative and the proposed project would introduce permanent, new mobile noise sources to their respective project vicinities; these noise sources include increased vehicular traffic noise and crowd noise associated with visitors/patrons/attendees at the event center. The Off-site Alternative location has greater access to regional transit including BART and therefore would generate fewer vehicles than under the proposed project. Like the proposed project, the increased traffic levels would increase weekday traffic noise levels, but the incremental increase would be considered less than significant, as shown in **Table 7-21**. For the weekday 4 to 6 p.m. peak hour, these roadway noise impacts would be comparable to those under the proposed project (shown in Chapter 5, Table 5.3-9). For both the proposed project and the Off-site Alternative, the increased noise levels at all modeled roadway segments would be *less than significant* during this time period.

TABLE 7-21
MODELED TRAFFIC NOISE LEVELS, OFF-SITE ALTERNATIVE[a]

Roadway Segment	Existing (2014)	Existing plus Convention Off-site Alternative	dBA Difference	Significant Increase?
Weekday Peak Hour Noise Levels (4 PM – 6 PM)				
The Embarcadero between Harrison Street and Bryant Street	69.4	69.6	0.2	No
The Embarcadero between Brannan and Townsend Streets	69.1	69.2	0.1	No
Brannan Street from Delancey Street to Embarcadero	61.1	61.4	0.3	No
Bryant Street from Rincon Street to Embarcadero	60.7	61.8	1.1	No
Roadway Segment	**Existing (2014)**	**Existing plus Basketball Game Off-site Alternative**	**dBA Difference**	**Significant Increase?**
Weekday Late Hour Noise Levels (9 PM – 11 PM)				
The Embarcadero between Harrison Street and Bryant Street	67.2	69.1	1.9	No
The Embarcadero between Brannan and Townsend Streets	67.4	68.0	0.6	No
Brannan Street from Delancey Street to Embarcadero	55.0	55.9	0.9	No
Bryant Street from Rincon Street to Embarcadero	56.9	56.7	-0.2	No
Roadway Segment	**Existing (2014)**	**Existing plus Basketball Game Off-site Alternative**	**dBA Difference**	**Significant Increase?**
Saturday Evening Noise Levels (6 PM – 8 PM)				
The Embarcadero between Harrison Street and Bryant Street	67.6	68.1	0.5	No
The Embarcadero between Brannan and Townsend Streets	67.7	68.8	1.1	No
Brannan Street from Delancey Street to Embarcadero	58.2	59.8	1.6	No
Bryant Street from Rincon Street to Embarcadero	58.1	57.8	-0.3	No

NOTES:
[a] Road center to receptor distance is assumed to be 50 feet for values shown in this table. Noise levels were determined using the Federal Highway Administration (FHWA) traffic noise model. The average speed on these segments is assumed to be 25 or 30 miles per hour, depending on the roadway. For all other assumptions, refer to Appendix NO. In an existing ambient noise environment of 65 dBA or greater, an incremental increase is considered significant if the noise increase is equal to or greater than 3.0 dBA. In an existing ambient noise environment below 65 dBA, an incremental increase is considered significant if the noise increase is equal to or greater than 5.0 dBA.

SOURCE: ESA 2015

Under the proposed project, as shown in Chapter 5, Table 5.3-9, roadside noise levels at multi-family receptors adjacent to Illinois Street and Terry A. Francois Boulevard would exceed significance thresholds under several scenarios: weekday late night 9 to 11 p.m. period due to post-basketball game traffic at Illinois Street and at Terry Francois Boulevard; and on Saturday evening 6 to 8 p.m. period due to basketball game traffic at Illinois Street. As described in Chapter 5, Section 5.3, Noise, these impacts are considered a significant and unavoidable permanent increase in noise levels, even with mitigation. However, under the Off-site Alternative, modeled increases in roadway noise levels would not exceed significance thresholds along any of the roadway segments during the weekday late night 9 to 11 p.m. period or the Saturday evening 6 to 8 p.m. period. Thus, the roadway noise impact under the Off-site Alternative would be *less than significant*, which is substantially less severe than the roadway noise impacts identified for the proposed project. Similarly, under cumulative conditions, the Off-site Alternative's contribution to significant roadway noise increases along all roadways analyzed would likely be *less than significant* Therefore, the Off-site Alternative would have a substantially less severe, cumulative roadway noise impacts than the proposed project.

Crowd Noise. With respect to crowd noise, increased noise levels above ambient conditions could occur, particularly during the evening and nighttime hours and at the end of scheduled events. Because of its location approximately five blocks from the Embarcadero BART station, it may reasonably be assumed that substantially fewer patrons of the event center under the Off-site Alternative would take Muni light rail, opting instead to walk to the BART station. Notwithstanding this reduction, it is likely that after each event upwards of 1,000 patrons would board the Muni light rail at the platform at The Embarcadero and Brannan Street. Similar to the proposed project, the nearest Muni platform to the Off-site Alternative is also directly in from of an existing residential land use (Delancey Street Housing at 600 Embarcadero). Noise levels from departing crowds after an event were estimated by monitoring of crowd egress to the Muni T-Line platform after a San Francisco Giants baseball game. Monitored noise levels during the egress period when the game ended averaged 69 dBA, L_{90}. These noise levels may be compared to the existing noise level that was monitored in 2013 during the 10:00 p.m. hour at the Off-site Alternative location receptors (with no game at AT&T Park), which was 62 dBA, L_{90}. The L_{90} data indicate that existing noise levels at the Off-site Alternative residential receptor during quieter periods would be increased by crowds gathering to board northbound Muni service on event days by about 7 dBA, which would be a clearly perceptible increase. Consequently, like the proposed project, the noise impact of the Off-site Alternative resulting from the increase in noise levels from crowds gathering at the Muni T-Line platform during quieter nighttime periods would be *significant and unavoidable*. As described in Chapter 5, Section 5.3, impacts from crowd noise under the proposed project would be significant and unavoidable, due to anticipated noise levels from crowds gathering at the Muni platform adjacent to the UCSF Hearst Tower housing building during the evening hours when patrons would be departing from basketball games or concerts at the event center. Therefore, the Off-site Alternative and the proposed project would result in comparable significant and unavoidable impacts related to crowd noise at a Muni platform adjacent to a sensitive receptor.

Air Quality

Construction Impacts. Like the proposed project, construction emissions of criteria air pollutants under the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would be significant and unavoidable with mitigation. As described in Chapter 5, Section 5.4, Air Quality, estimated construction-related emissions of ROG and NOx for the project would be 59 and 226 pounds per day, respectively, which would exceed the applicable significance thresholds. Even with implementation of Mitigation Measure M-AQ-1 (Construction Emissions Minimization), NOx levels would exceed the significance threshold, at 144 pounds per day, assuming the minimum level of compliance (Tier 2 with NOx VDECS). Similarly, as shown in **Table 7-22**, the construction-related criteria air pollutant emissions for the Off-site Alternative would exceed the thresholds for emissions of ROG and NOx, and even with mitigation, as shown in **Table 7-23**, emissions of NOx under the Off-site Alternative would still be significant with implementation of Mitigation Measure M-AQ-1. Thus, similar to the proposed project, an offset emissions mitigation measure would be required to provide for reduction of levels of ozone precursors exceeding the significance thresholds through implementation of pollution reduction programs elsewhere in the air basin. Consequently, like the proposed project, construction-related criteria pollutant emissions under the Off-site Alternative would be *significant and unavoidable with mitigation*.

TABLE 7-22
AVERAGE DAILY CONSTRUCTION-RELATED EMISSIONS
FOR THE OFF-SITE ALTERNATIVE

	Average Daily Construction Emissions (pounds/day)			
	ROG	NOx	PM_{10}	$PM_{2.5}$
Off-road Equipment Emissions	14	204	7.6	7.6
Truck and Vehicle Emissions	5.1	30	0.51	0.47
Marine Vessel Emissions	6.9	60	3.4	3.4
Architectural Coating Emissions	29	0	0	0
Total[a]	**55**	**295**	12	11
Significance Threshold	54	54	82	54
Above Threshold?	**Yes**	**Yes**	No	No

NOTES:

[a] The total emissions may not sum precisely due to rounding of subtotals.

SOURCE: ENVIRON, 2015

TABLE 7-23
MITIGATED AVERAGE DAILY CONSTRUCTION-RELATED EMISSIONS FOR THE OFF-SITE ALTERNATIVE

	Average Daily Construction Emissions (pounds/day)			
	ROG	NOx	PM10	PM2.5
Off-road Equipment Emissions	0.88	157	1.1	1.1
Truck and Vehicle Emissions	5.1	30	0.51	0.47
Marine Vessel Emissions	2.1	11	0.25	0.25
Architectural Coating Emissions	29	0	0	0
Total[a]	37	**199**	1.9	1.8
Significance Threshold	54	54	82	54
Above Threshold?	No	**Yes**	No	No

NOTES:

[a] The total emissions may not sum precisely due to rounding of subtotals.

SOURCE: ENVIRON, 2015

Operational Impacts. Unlike the proposed project, operational air quality impacts of the Off-site Alternative would be less than significant, compared to a significant and unavoidable impact for the proposed project. As described in Chapter 5, Section 5.4, Air Quality, estimated operational emissions of ROG and NOx under the proposed project would be 79 and 124 pounds per day, respectively, exceeding significance thresholds. As shown in **Table 7-24,** the Off-site Alternative would result in operational criteria air pollutant emissions of ROG and NOx emissions substantially lower than those for the proposed project, at levels that would be below the applicable significance thresholds. The primary reason for this difference is that the Off-site Alternative is located in Superdistrict 1 which, because of its proximity to major regional transit connections results in lower vehicle trip rates compared to the proposed project. Consequently, mitigation measures would not apply to the Off-site Alternative for operational emissions of criteria air pollutants. Therefore, the operational air quality impacts of the Off-site Alternative would be *less than significant.*

Toxic Air Contaminant Impacts – Existing Receptors. Similar to the proposed project, construction and operation of the Off-site Alternative would generate toxic air contaminants (TAC), including diesel particulate matter. However, unlike the proposed project, the Off-site Alternative would occur within an Air Pollutant Exposure Zone (APEZ) and consequently would be subject to more stringent significance thresholds. Specifically, because air quality in an APEZ already exceed the cumulative exposure thresholds of the City, projects within an APEZ are assessed by the individual contribution of the project to this cumulative impact (project and existing).

TABLE 7-24
AVERAGE DAILY AND MAXIMUM ANNUAL OPERATIONAL EMISSIONS FOR THE OFF-SITE ALTERNATIVE

	Average Daily Emissions (pounds/day)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile Sources (Alternative – GSW Trips)	12	17	4.9	2.2
Standby Diesel Generators (assumes 5)	0.26	0.81	0.03	0.03
Boilers (assumes 4 at Piers 30-32, 10 at SWL 330)	3.3	23	4.6	4.6
Area Sources	29	0.10	0.04	0.04
Marine Sources	1.1	7.4	0.28	0.28
Total	**46**	**48**	**10**	**7.1**
Significance Threshold	54	54	82	54
Above Threshold?	No	No	No	No
	Maximum Annual Emissions (short tons/year)			
	ROG	**NOx**	**PM10**	**PM2.5**
Emission Source				
Mobile Sources (Alternative – GSW Trips)	2.2	3.2	0.89	0.40
Standby Diesel Generators (assumes 5)	0.05	0.15	<0.01	<0.01
Boilers (assumes 4 at Piers 30-32, 10 at SWL 330)	0.60	4.1	0.83	0.83
Area Sources	5.3	0.02	<0.01	<0.01
Marine Sources	0.20	1.3	0.05	0.05
Total	**8.3**	**8.8**	**1.8**	**1.3**
Significance Threshold	10	10	15	10
Above Threshold?	No	No	No	No

SOURCE: ENVIRON, 2015

For those locations already meeting the Air Pollutant Exposure Zone criteria, a lower significance standard is required to ensure that a proposed project's contribution to existing health risks would not be significant. In these areas a proposed project's contribution to $PM_{2.5}$ concentrations above 0.2 µg/m3 or a contribution to excess cancer risk greater than 7.0 per million would be considered a significant impact[6].

6 An increase of 0.2 µg/m3 in PM2.5 would result in a 0.28 percent increase in non-injury mortality or an increase of about twenty-one excess deaths per 1,000,000 population per year from non-injury causes in San Francisco. This information is based on Jerrett M et al. 2005. *Spatial Analysis of Air Pollution and Mortality in Los Angeles*. Epidemiology. 16:727-736. The excess cancer risk has been proportionally reduced to result in a significance criterion of 7 per million persons exposed.

Similar to the proposed project, the Off-site Alternative would require operation of off-road and on-road diesel construction equipment. Unlike the project, however, the Off-site Alternative would have a significant construction-related impact from $PM_{2.5}$ emissions resulting from contributions to $PM_{2.5}$ concentrations at off-site receptor locations above the applicable significance threshold in an APEZ (see **Table 7-25**). Even with mitigation, as shown in Table 7-25, concentrations of $PM_{2.5}$ under the Off-site Alternative would still be significant. Consequently, this impact would be *significant and unavoidable with mitigation*.

TABLE 7-25
ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS AT OFF-SITE RECEPTORS FOR THE OFF-SITE ALTERNATIVE

	$PM_{2.5}$ Concentration (μg/m^3, Annual Average)	
Source	**Residential Receptor with Highest Project Impact**	**Residential Receptor with Highest Background Impact**
Construction		
Background at the receptor	9.1	10.1
Unmitigated Construction Contribution	1.8	0.13
Mitigated (Tier 3 + NOx VDECS) Construction Contribution	0.29	0.02
Total Cumulative $PM_{2.5}$ Concentration (Unmitigated/Mitigated)	11 / 9.4	10 / 10
Project Total (Unmitigated/Mitigated)	1.8 / 0.29	0.13 / 0.021
Project Contribution Significance Threshold	0.2	0.2
Above Threshold? (Unmitigated/Mitigated)	**Yes/Yes**	No/No
Operation		
Background at the maximally impacted receptor	9.1	10.1
Project Operations – Generators	0.055	0.055
Project Operations – Mobile	0.32	0.32
Project Operations - Marine	0.08	0.04
Total Cumulative $PM_{2.5}$ Concentration	9.6	10
Project Total	0.45	0.41
Project Contribution Significance Threshold	0.2	0.2
Above Threshold?	**Yes**	**Yes**

NOTES:
[a] The total concentrations may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

Similar to the proposed project, the Off-site Alternative would generate TAC emissions from construction as well as from operation of back-up diesel generators during project operation, which have the potential to increase cancer risks. Unlike the proposed project, however, the Off-site Alternative would have a significant impact from increased cancer risk contributions at off-site receptor locations above the applicable significance threshold in an APEZ (see **Table 7-26**). This increased cancer risk impact would persist even with implementation of Mitigation Measure M-AQ-1 which represents all feasible mitigation to address risks from construction. Operational emissions from generators and vehicles would further contribute to this significant impact.

TABLE 7-26
LIFETIME EXCESS CANCER RISK AT OFF-SITE RECEPTORS
FOR THE OFF-SITE ALTERNATIVE

	Excess Cancer Risk (in one million)	
Source	**Residential Receptor with Highest Project Impact**	**Residential Receptor with Highest Background Impact**
Background at the receptor	113	560
Unmitigated Construction Contribution	285	17
Mitigated (Tier 3 + NOx VDECS) Construction Contribution	44	2.7
Project Operations – Generators	30	30
Project Operations – Mobile Sources	7.2	7.2
Project Operations - Marine Sources	44	23
Cumulative Cancer Risk (Unmitigated/Mitigated)	479 / 238	637 / 622
Project Total (Unmitigated/Mitigated)	366 / 125	77 / 62
Project Contribution Significance Threshold	7	7
Above Threshold? (Unmitigated/ Mitigated)	**Yes/Yes**	**Yes/Yes**

NOTES:
[a] The total risks may not sum precisely due to rounding of subtotals.

SOURCE: Ramboll Environ, 2015

Consequently, unlike the proposed project, the impact of the Offsite Alternative with regard to exposure of sensitive receptors to increased $PM_{2.5}$ concentrations and cancer risk due to air pollutant concentrations would be *significant and unavoidable with mitigation*.

Toxic Air Contaminant Impacts – Proposed Receptors. Unlike the proposed project, the Off-site Alternative would introduce new sensitive receptors (proposed residential units) to an area that is within an APEZ. For projects proposing new sensitive uses, the threshold of significance used to evaluate exposure and hazard is based on whether the project would locate these uses within an APEZ. However, Health Code Article 38 requires that residential uses located within an APEZ include air filtration measures to reduce the potential exposure of future residents. Therefore, implementation of protective measures in compliance with this regulation would reduce impacts to new sensitive receptors to less-than-significant levels, and although not an impact under the proposed project, this impact would be *less than significant*.

Consistency with Clean Air Plan. Like the proposed project, impacts related to consistency with the Clean Air Plan for the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would be less than significant with mitigation. This alternative would be consistent with the 2010 CAP by virtue of incorporation of mitigation measures which would include maximum feasible control measures, and offsetting emissions to below significance thresholds. Additionally, the Off-site Alternative would be consistent with the 2010 CAP by virtue of incorporation of control measures of the CAP, including land use/local impact measures and energy/climate measures now required through the various components of the City's Greenhouse Gas Reduction Strategy as well as the transportation demand management measures that would be assumed to part of this alternative, similar to those for the proposed project. The Off-site Alternative would also not hinder implementation of the 2010 CAP. Therefore, the Off-site Alternative would not conflict with, or obstruct implementation of the *2010 Clean Air Plan*, and this impact would be *less than significant with mitigation*.

Odors. Like the proposed project, this alternative would not create objectionable odors that would affect a substantial number of people.

Cumulative Air Quality Impacts. Similar to the proposed project, the cumulative construction-related criteria air pollutant impacts of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would be significant and unavoidable with mitigation. Like the proposed project, the Off-site Alternative would result in construction emissions of NOx exceeding the applicable significance threshold. Therefore, the alternative's contribution to cumulative construction air quality impacts is considered *significant and unavoidable, even with mitigation*. Mitigation measures similar to those identified for the proposed project would be required, including construction emissions minimization measures (Mitigation Measure M-AQ-1) and offset emissions measures (Mitigation Measure M-AQ-2b).

However, unlike the proposed project, which would result in significant and unavoidable operational criteria air pollutant impacts and thus contribute considerably to cumulative criteria air pollutant impacts, operation of the Off-site Alternative would not result in significant cumulative criteria air pollutant impacts because this alternative's project-level emissions would not exceed the project-level significance thresholds. Thus, operational emissions from the Off-site Alternative would not result in a cumulatively considerable contribution to regional criteria air pollutants. Therefore, with respect to cumulative, operational air quality impacts, the Off-site Alternative would have a *less-than-significant* impact and have substantially less severe impacts than the project.

On the other hand, the Off-site Alternative would have substantially greater and more severe impacts than the proposed project with respect to cumulative health risk. Because this alternative is located in an APEZ and would result in exposure of sensitive receptors to increased $PM_{2.5}$ concentrations and cancer risk due to air pollutant concentrations that exceed the significance thresholds, the alternative's contribution to cumulative impacts would be considered *significant and unavoidable with mitigation*, as compared to the proposed project, which would have a less than significant impact with mitigation.

Overall, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would result in significant and unavoidable air quality impacts after implementation of feasible mitigation measures, and consequently, would result in a cumulatively considerable contribution to regional and local air quality impacts. Therefore, this impact would be *significant and unavoidable with mitigation*.

Greenhouse Gas Emissions

Similar to the proposed project, construction and operation of the Off-site Alternative would generate GHG emissions, but also similar to the proposed project, it can be assumed that the Off-site Alternative would be designed and operated such that it would qualify as an environmental leadership project under AB 900. As described in Chapter 5, Section 5.5, the proposed project is a certified environmental leadership project under AB 900 and CARB has determined that the proposed project would result in no net increase in GHG emissions based on the AB 900 application which includes voluntary acquisition of carbon credits by the project sponsor. Therefore, it is assumed that the Off-Site Alternative would be designed and constructed to the same green building and sustainability standards as the proposed project, and would include strategies to reduce GHG emissions that would be consistent with the City's GHG Reduction Strategy and the associated AB 900 application that would be submitted for this alternative. Thus, given the assumptions that this alternative would be designed and constructed to the same green building and sustainability standards as the project and would also qualify as an environmental leadership project under AB 900, the Off-site Alternative would result in no net increase in GHG emissions, like the proposed project. Therefore, impacts related to GHG emissions would be *less than significant* and no mitigation is required.

Wind and Shadow

Wind. Piers 30-32, and to a lesser extent, Seawall Lot 330, are fully exposed to winds that approach over the Bay. Northwest winds approach Piers 30-32 along the Bay and the open Embarcadero roadway and pier buildings. Seawall Lot 330 is less exposed to the northwest winds, since it is partially sheltered by Rincon Hill and upwind buildings along Beale Street. The west southwest and west winds must approach Piers 30-32 and Seawall Lot 330 over the City's hills and substantial core of tall buildings in the downtown and Rincon Hill areas. Piers 30-32 currently contains no buildings, except for Red's Java House; and Seawall Lot 330 contains no buildings. Existing structures adjacent to and upwind of the project site at Seawall Lot 330 include the 22-story Watermark building located at the west corner of the city block containing Seawall Lot 330, the mid-level (8-story) Portside building located across Bryant Street to the northwest, and the 4-story Bayside Village buildings located across Beale Street to the southwest.

Similar to the project site in Mission Bay, the standards of City Planning Code Section 148 do not apply to Piers 30-32 and Seawall Lot 330. However, the Planning Department uses wind standards set forth in Section 148 as an appropriate methodology and criteria for the analysis of potential wind effects at Piers 30-32 at Seawall Lot 330. Consequently, a project's exceedance of the Section 148 wind hazard criterion would be a significant environmental impact for development at Piers 30-32 and Seawall Lot 330

A wind tunnel test was conducted by ESA in April 2014 for the sponsor's previously-proposed project at Piers 30-32 and Seawall Lot 330. Since, as discussed above, the previously-proposed project at Piers 30-32 and Seawall Lot 330 is identical in design to the Off-site Alternative considered in this SEIR; the results of that wind study are representative of the Off-site Alternative. Similar to the wind study conducted for the proposed project at Blocks 29-32 in Mission Bay, the wind study for the previously-proposed project at Piers 30-32 and Seawall Lot 330 assessed the pedestrian wind environment under existing, existing plus project, and project-plus-cumulative scenario for the same four prevailing wind directions.

The wind study for the previously-proposed project at Piers 30-32 and Seawall Lot 330 revealed that under existing conditions, existing-plus-project and cumulative conditions, the wind hazard criterion was not exceeded at any of the off-site pedestrian study locations in the Piers 30-32/ Seawall Lot 330 vicinity. Based on these results, the wind hazard impact for the Off-site Alternative would be *less than significant*, and this alternative would avoid a significant and unavoidable project wind hazard that would occur under the proposed project at Mission Bay Blocks 29-32.

Shadow. As discussed above, there are no buildings on Piers 30-32 (except for Red's Java House) and Seawall Lot 330. Consequently, the only notable shadows currently created from this site are from the approximate 13-acre footprint of the Piers 30-32 deck on the Bay water beneath it. Existing structures adjacent to the project site include the 22-story Watermark building (west corner of Seawall 330), the 8-story Portside building (across Bryant Street to the northwest), and the 4-story Bayside Village buildings (across Beale Street to the southwest). Of these buildings, only the Watermark building creates prominent shadows on Seawall Lot 330; these occur in the afternoon.

Public open space within the vicinity of the project site includes the newly constructed Brannan Street Wharf located on The Embarcadero between Piers 30-32 and Pier 38. The Herb Caen Way promenade extends along The Embarcadero between Piers 30-32 and Seawall Lot 330. The Rincon Hill Dog Park is located at the northwest corner of Bryant and Beale Streets, approximately 260 feet from Seawall Lot 330. Other open spaces in the immediate area includes privately-owned open space, such as inner courtyards and plazas located within the residential development of Bayside Village, and small unnamed parks at the corners of The Embarcadero and Bryant and Brannan Streets. In addition, Rincon Park and South Beach Park are located on The Embarcadero approximately ¼-mile north and south of the project site, respectively, however, are of sufficient distance from Piers 30-32/Seawall Lot 330 that they would not be affected by any shading from the Off-site Alternative.

Section 295 of the San Francisco Planning Code, the Sunlight Ordinance, protects public open space under the jurisdiction of the Recreation and Park Commission from shadow created by new structures. The nearest park under the jurisdiction of the Recreation and Parks Commission and protected by Section 295 is South Park, located one-third mile southwest of the project site.

This park is also of sufficient distance from Piers 30-32/Seawall Lot 330 that it would not be affected by any shading from the Off-site Alternative.

A shadow analysis was conducted to evaluate the potential shadow effects of the Off-site Alternative on surrounding parks and open space. The representative periods selected were the winter solstice (approximately December 21), summer solstice (approximately June 21) and the fall equinox (approximately September 21); the fall equinox is similar to the spring equinox.

- During the winter solstice, the Piers 30-32 development would cast shadow on the small park at the corner of The Embarcadero/Bryant Streets in the early morning (before 9:00 a.m.), on portions of The Embarcadero promenade until approximately noon, and on portions of the Bay throughout the day. The Seawall Lot 330 development would cast shadow on portions of the small park at the corner of The Embarcadero/Bryant Street in the midday (10:00 a.m. to 3:00 p.m.), and on portions of The Embarcadero promenade throughout the afternoon (noon to sunset).

- During the summer solstice, the Piers 30-32 development would cast shadow on the northernmost corner of the Brannan Street Wharf and adjacent Bay in the early morning (before 8:00 a.m.), on portions of The Embarcadero promenade until approximately noon, and on portions of the Bay to the east after 3:00 p.m. The Seawall Lot 330 development would cast shadow on portions of The Embarcadero from early afternoon (approximately 1:00 p.m.) to sunset; and on the northernmost corner of the Brannan Street Wharf and adjacent Bay in the late afternoon (after 4:00 p.m.).

- During the spring/fall equinox, the Piers 30-32 development would cast shadow on portions of The Embarcadero promenade in the early morning (before 9:00 a.m.), and on portions of the Bay after 2:00 p.m. The Seawall Lot 330 development would cast shadow on a portion of the small park at the corner of The Embarcadero/Bryant Street in the midday (10:00 a.m. to 3:00 p.m.), and on portions of The Embarcadero promenade throughout the afternoon (1:00 p.m. to sunset).

Based on these results, the Off-site Alternative would not be expected cast new shadow in a manner that would substantially affect outdoor recreation facilities or other public areas, and the shadow impact for the Off-site Alternative would be *less than significant*, similar to the significance of the shadow impact of the proposed project, and no mitigation would be required.

Recreation

Like the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not substantially increase the use of existing recreational facilities or require the construction or expansion of recreational facilities. Employment under this scenario would be less than or similar to that for the proposed project, based on the overall reduced gross square footage, and recreational demands would be met by existing and planned parks and open space located adjacent to and nearby this location. Furthermore, this alternative would include extensive new recreational and open space opportunities as part of the development on Piers 30-32. Thus, all recreation impacts would be *less than significant* and no mitigation would be required.

Utilities and Service Systems

Similar to the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not require new or expanded water supply resources, require construction of new water treatment facilities, and would be served by existing landfills for solid waste disposal. Given the reduced gross square footage of uses, projected demands for water supply resources, water treatment facilities, and solid waste disposal would be less than that of the proposed project. These impacts would be *less than significant* and no mitigation would be required. This alternative would also not require construction of new stormwater drainage facilities, as the existing facilities have adequate capacity, and similar to the proposed project, this impact would be *less than significant.*

However, unlike the proposed project, this alternative would result in wastewater flows that could be served within the existing capacity of wastewater facilities and would not require construction or expansion of wastewater facilities. Furthermore, this wastewater flows generated under this alternative would not cause the SFPUC's combined sewer system to exceed wastewater treatment requirements of the RWQCB. Therefore, under the Off-site Alternative at Piers 30-32 and Seawall Lot 330, utilities impacts associated with wastewater treatment capacity would be *less than significant*, and this alternative would *avoid* the significant and unavoidable utilities impact that was identified for the proposed project with respect to the need to construct new or expanded wastewater treatment facilities. Similarly, under this alternative, it would not be expected for the SFPUC to determine that it has inadequate treatment capacity to serve the project's wastewater demand, and therefore, this impact would be *less than significant*, which would be substantially less severe impact than the significant and unavoidable impact identified for the proposed project.

Public Services

Schools, Public Health, Childcare, Library, and Street Maintenance Services. Like the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not result in increased demand for governmental public services, including public health, childcare, library, street maintenance, and emergency medical that would require construction of new facilities, the construction of which could cause significant environmental impacts. As indicated in the Population and Housing assessment, employment projections for both construction and operation would be expected to be met by the existing local and regional labor force. Furthermore, the proposed residential development at Seawall Lot 330 would be to subject to Senate Bill 50 School Impact Fees, which would be deemed to constitute full and complete mitigation for school impacts. Thus, like the proposed project, impacts of this alternative on schools, public health, childcare, library, and street maintenance services would be *less than significant* and no mitigation would be required.

Fire Protection and Emergency Medical Services. Like the proposed project, construction and operation of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not result in the need for new or physically altered governmental facilities for fire protection and emergency medical services. The population increases associated with the project would be minimal in comparison to the population served by the existing fire stations in the project area. The increase in calls for fire protection and medical emergency response would not be substantial in light of the existing demand and capacity for fire protection and emergency medical services in the City. The project site is located in an existing urban area and would not extend demand of the San Francisco Fire Department (SFFD) beyond the current limits of its service area. The proposed development would neither adversely affect SFFD service standards nor require an increase in SFFD staff that would require the construction of new fire protection facilities. Furthermore, as part of project operations for games and large events at Piers 30-32, the Warriors or other event sponsors would provide on-site medical services, including a first aid station and on-site medical personnel to provide first aid to game/event patrons or employees that may require medical assistance, which would further reduce potential effects on general emergency medical response providers. This impact would therefore be *less than significant* and no mitigation would be required.

Law Enforcement Services. Like the proposed project, construction and operation of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not result in the need for new or physically altered governmental facilities for law enforcement services. The project site is located within the San Francisco Police Department's (SFPD) Southern District, which is headquartered at the new Public Safety Building in Mission Bay, approximately one-mile from the project site. Similar to the proposed project, as described in Chapter 5, Section 5.8, the SFPD would provide increased police protection for sports games and adequate police protection services would be available and provided for the games/events at the project site; such services would not detract from other SFPD police operations within the City. Furthermore, the event center, residential tower, hotel and retail uses would also provide their own on-site private security personnel similar to other mixed use developments in the City. This impact would therefore be *less than significant* and no mitigation would be required.

Biological Resources

Unlike the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would have the potential to affect marine biological resources due to the extensive in-water construction activities required for the seismic upgrade and strengthening of the pier structure. While impacts on marine birds, roosting bats, and critical fish habitat would be less than significant, construction impacts on critical fish habitat and on migratory corridors for marine wildlife would be potentially significant, although feasible mitigation measures are available (e.g., water quality and construction best management practices) that could reduce these impacts to less than significant. In addition, impacts on marine biological resources due to trash and littering during both construction and operation would be potentially significant, but mitigable with appropriate trash management programs. However, most importantly, pile driving required for project construction of improvements to the pier structure would produce high underwater sound levels that could adversely affect special-status fish and marine mammals. This would be a *significant and unavoidable impact, with mitigation*, because even with implementation of the best available sound attenuation systems for noise reduction for impact hammer and pile driving activities and establishment of safety zones around the construction area, acute and chronic effects on special-status fish could still occur.

However, like the proposed project, this alternative would not have an effect on federally protected wetlands, riparian habitat or other sensitive natural community, or conflict with any local policies protecting biological resources; these impacts would be *less than significant* and no mitigation would be required.

Similar to the proposed project, under the Off-site Alternative at Piers 30-32 and Seawall Lot 330, potential impacts on breeding birds which may be nesting within the project site could be mitigated to less than significant with implementation of Mitigation Measure M-BI-4a (Preconstruction Surveys for Nesting Birds), and this impact would be *less than significant with mitigation*.

Unlike the proposed project which is not subject to the same requirements, potential impacts related to avian collisions with buildings or night lighting would be *less than significant* because this project site would be subject to the from City's *Standards for Bird Safe Buildings*, compliance with which would avoid and minimize impacts on birds during their migrations due to lighting and glare effects under both nighttime and daytime conditions. The proposed project includes mitigation consistent with City's Standards for *Bird Safe Buildings,* and thus this impact under the proposed project would be less than significant with mitigation.

Thus, overall, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would have *more severe significant* impacts on biological resources than the proposed project. The proposed project at Mission Bay Blocks 29-32 would have no impacts on marine biological resources, while this off-site alternative would have significant impacts, including significant and unavoidable impacts on fish and marine mammals during project construction. All other impacts on biological resources would be comparable for this alternative and the proposed project.

Geology and Soils

Similar to the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not expose people or structures to substantial earthquake or landslide hazards, result in erosion or loss of top soil, be located on a geologic unit that could become unstable, be located on corrosive or expansive soils, substantially change the topography, or affect any unique geologic features. These impacts would be *less than significant* with implementation of protective measures required by applicable regulations, and no mitigation would be required.

Hydrology and Water Quality

Construction Impacts. Unlike the proposed project, construction of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 could result in potentially significant water quality impacts due to the extensive in-water construction activities that would be required at Piers 30-32. However, there are feasible mitigation measures requiring best management practices during construction that would reduce this impact to *less than significant with mitigation*. Construction of the proposed project, on the other hand, would have less than significant impacts with implementation of protective measures required by applicable regulations, and no mitigation would be required. However, construction water quality impacts of this alternative would be more severe than those of the proposed project; due to extent of in-water construction, there would be greater potential for adverse effects on water quality to occur, as well as more complex mitigation requirements.

Operational Impacts—Groundwater, Drainage, Flooding, and Inundation by Seiche or Tsunami. Similar to the proposed project, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not deplete groundwater supplies or interfere with groundwater recharge; would not alter existing drainage pattern that would result in erosion, siltation, or flooding; expose people, housing, or structures to substantial risk of loss due to flooding risks; redirect or impede flood flows; or expose people or structures to significant risk involving inundation by seiche or tsunami. These impacts would be *less than significant* with compliance with applicable regulations, and no mitigation would be required.

Operational Impacts—Water Quality. Similar to the proposed project, operation of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would have the potential to affect water quality due to dry weather flows (sanitary sewage only), wet weather flows (sanitary sewage and stormwater), discharges from the Southeast Water Pollution Control Plant (SEWPCP), stormwater runoff and drainage discharges, and litter. However, given the reduced total gross square footage of the development under this alternative compared to that of the proposed project (which would be expected to result in a reduced volume of sanitary sewage), water quality impacts would generally be the same or less severe than those described in Chapter 5, Section 5.9. Under both the proposed project and this alternative, all discharges to the Bay, whether sanitary sewage, stormwater, or a combination of both, would be treated as required by the San Francisco Regional Water Quality Control Board (RWQCB), and all discharges would be in compliance with applicable National Pollutant Discharge Elimination System (NPDES) permits that have been issued by the RWQCB for the express purpose of protecting water quality.

There would be two differences in operational water quality impacts of this alternative compared to the proposed project. One differences would be that under this alternative, potential water quality impacts associated with littering would be more severe, due to the proximity to the Bay and the Bay's designation as in impaired water body for litter; however, there is feasible mitigation available, such as trash management planning and training, that would reduce this impact to *less than significant with mitigation*. Conversely, the other difference would be that this alternative would not include research and development land uses and wastewater discharges would be typical of municipal wastewater; implementation of FSEIR Mitigation Measure K.2 would not be required for the Off-site Alternative (this measure would ensure that businesses that discharge pollutants that are not typically associated with most wastewater discharges to the City's combined sewer system do not cause a violation of the NDPES permit for the SEWPCP).

Operational Impacts—Sea Level Rise. Like the proposed project, it would be expected that operation of the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would not expose people or structures to a significant risk of loss, injury, or death involving flooding associated with sea level rise. As described in Chapter 5, Section 5.9, the proposed project would be designed and constructed to resist flood damage and provide for the safety of occupants and visitors in the event of flooding. Although there is only a conceptual design for the Off-site Alternative, it is assumed that all structures under this alternative at both Piers 30-32 and Seawall Lot 330 would be designed and constructed to the same standards as the proposed project with respect to flood protection. In addition to being subject to San Francisco's Floodplain Management requirements, an alternative at Piers 30-32 is within the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC), and structures would be required to be consistent with the climate change policies of the San Francisco Bay Plan, including preparation of a sea level rise risk assessment and adaptation plan. Therefore, like the proposed project, this impact would be *less than significant* for the Off-site Alternative because the alternative would include appropriate provisions to resist flood damage and provide for the safety of occupants and visitors in the event of flooding.

Hazards and Hazardous Materials

Unlike the proposed project, all impacts related to hazards and hazardous materials for the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would be less than significant with implementation of protective measures required by applicable regulations, and no mitigation would be required. This alternative would not create a significant hazard through routine transport, use, or disposal of hazardous materials; would not result in a substantial risk of upset involving the release of hazardous materials; would not impair implementation or physically interfere with an adopted emergency response plan or expose people or structures to a significant risk involving fires. Compliance with existing regulations and implementation of required measured during construction and operation of this alternative would adequately address these potential effects, and these impacts would be *less than significant* and no mitigation would be required.

As described in the Initial Study for the proposed project (see Appendix NOP-IS), the proposed project could result in potentially significant impacts related to the potential for uses that would handle biohazardous materials, but those impacts would be reduced to less than significant with implementation of mitigation measures identified in the Mission Bay FSEIR would reduce potential health and safety impacts to less than significant. Similarly, potential impacts related to encountering naturally occurring asbestos during construction could be reduced to less than significant with implementation of Mitigation Measure M-HZ-1b (Geologic Investigation and Dust Mitigation Plan for Naturally Occurring Asbestos). Neither of these impacts would occur under the Off-site Alternative, and consequently, neither of these mitigation measures would be required.

Thus, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would result in less severe hazardous materials impacts than those identified for the proposed project.

Mineral and Energy Resources

Like the proposed project, the Off-site Alternative would not result in the use of large amounts of fuel, water, or energy, or use of these materials in a wasteful manner. These impacts would be *less than significant* with compliance with applicable regulations, including the San Francisco Green Building Code, and no mitigation would be required.

Agricultural and Forest Resources

As for the proposed project site in Mission Bay, Piers 30-32 and Seawall Lot 330 do not contain agricultural or forest resources, and development under the Off-site Alternative would have *no impact* on these resources.

7.3.3.4 Off-site Alternative — Conclusions

The Off-site Alternative at Piers 30-32 would meet most of the basic project objectives, although the financial feasibility at this time is unknown. It would avoid or lessen some of the impacts of the proposed project identified in this SEIR, but it would also result in different significant impacts—including significant and unavoidable impacts—that would not occur under the proposed project. Key differences in the impact conclusions for the Off-site Alternative compared to the impact conclusions of the proposed project are summarized below.

The Off-site Alternative would ***avoid*** or ***substantially lessen*** the significant and unavoidable impacts that were identified for the proposed project (i.e., the significance determination would change from SU or SUM to LS or NI) with respect to:

- Vehicular traffic noise on local roadways during the weekday late night period and the Saturday evening period, both direct and cumulative impacts (Impact would change from SUM to LS.)
- Operational criteria air pollutant impacts and the alternative's contribution to cumulative regional criteria air pollutant impacts. (Impact would change from SUM to LS.)
- Wind hazard impacts at off-site pedestrian locations (Impact would change from SUM to LS.)
- Utilities impacts requiring the construction or expansion of wastewater treatment facilities, the construction of which could result in environmental impacts (Impact would change from SU to LS.)
- Utilities impact regarding the determination by the SFPUC that there is currently inadequate wastewater treatment capacity to serve the project's wastewater demand (Impact would change from SUM to LS.)

The Off-site Alternative would have ***less severe*** significant impacts than the proposed project (i.e., the significance determination would change from LSM to LS or NI) with respect to:

- Helipad safety impacts during construction and operation (Impact would change from LSM to NI.)
- Biological resources impacts due to potential avian collisions with buildings (Impact would change from LSM to LS, although the residual impact would be essentially the same.)
- Water quality impact on discharges at the SEWPCP due to atypical wastewater discharges from research and development uses (Impact would change from LSM to NI.)
- Hazardous materials impacts due to the potential for future uses to handle biohazardous materials (Impact would change from LSM to NI.)

- Hazardous materials impacts due to the potential to encounter naturally-occurring asbestos during construction (Impact would change from LSM to LS.)

The Off-site Alternative would have ***different less-than-significant*** impacts that were not identified for the proposed project (i.e., new impacts would be LS and no new mitigation measures would be required) with respect to:

- Potential exposure of new sensitive receptors (residential uses) to noise levels in excess of acceptable standards would be reduced to less than significant with implementation of applicable regulatory requirements for interior noise levels within habitable room. (Impact would be LS.)

The Off-site Alternative would have ***different significant but mitigable*** impacts that were not identified for the proposed project (i.e., new impacts would be LSM and would require implementation of different mitigation measures not required for the proposed project) with respect to:

- Construction impacts on nearby historic resources due to groundborne vibration (Impact would be LSM.)
- Construction impacts on marine habitats and special-status and managed fish (Impact would be LSM.)
- Construction impacts on critical fish habitat and migratory corridors of fish and marine mammals (Impact would be LSM.)
- Marine biological resources impacts associated with trash and littering (Impact would be LSM.)

The Off-site Alternative would have ***slightly more severe*** impacts than were identified for the proposed project (i.e., impact determination would change from LS to LSM and would require implementation of additional mitigation measures not required for the proposed project) with respect to:

- Construction water quality impacts (Impact would change from LS to LSM. There would be greater potential for adverse effects on water quality to occur, as well as more complex mitigation requirements.)
- Water quality impacts associated with trash and littering (Impact would change from LS to LSM.)

The Off-site Alternative would have ***substantially more severe*** significant impacts than were identified for the proposed project (i.e., impact determination would change from LS or LSM to SU or SUM and would require implementation of additional and/or different mitigation measures not required for the proposed project) with respect to:

- Construction noise levels substantially higher than ambient levels, exceeding FTA criterion for residential exposure to construction. (Impact would change from LS to SUM.)

- Construction vibration impacts exceeding thresholds for human annoyance at nearby sensitive receptors (Impact would change from LS to SUM.)
- Cumulatively considerable contribution to construction noise and vibration impacts, assuming other construction activities in the vicinity were to overlap with the construction activities. (Impact would change from LSM to SUM.)
- Exposure of sensitive receptors to increased PM2.5 concentrations and cancer risk from toxic air contaminant concentrations during construction and operation and associated contribution to cumulative impacts. (Impact would change from LSM to SUM.)

The Off-site Alternative would have ***different significant and unavoidable*** impacts that were not identified for the proposed project (i.e., new SU or SUM impact and would require implementation of different mitigation measures not required for the proposed project) with respect to:

- Traffic impacts at different intersections than those identified for the proposed project. The number of intersections with significant traffic impacts would increase, and these impacts would occur under a greater number of scenarios. Even though the Off-site Alternative would generate fewer vehicle trips than the proposed project, traffic impacts would be substantially greater due to its more central and congested location closer to downtown. (Impact would be SUM.)
- Construction noise impacts on special-status fish and marine mammals (Impact would be SUM.)

Overall, the Off-site Alternative at Piers 30-32 and Seawall Lot 330 would avoid and substantially lessen several of the environmental impact identified for the proposed project in Mission Bay, but it would also result in new and different significant environmental impacts that would not occur under the proposed project. This alternative would achieve all of the basic project objectives.

The Off-site Alternative at Piers 30-32 and Seawall Lot 330 is considered potentially feasible for the purposes of this SEIR due in large part to the previous investigations and studies that were conducted in 2012-2013 for the previously proposed project at this site, and the potential economic viability of that project at that time. However, that process also indicated that there remain uncertainties with regard to the acquisition of all the necessary permits and approvals required for this site, including permits from the U.S. Army Corps of Engineers, State Lands Commission, San Francisco Bay Conservation and Development Commission (BCDC), Port of San Francisco, and voter approval under Proposition B (see Table 7-1 above for the complete list). Furthermore, the financial feasibility of a project at this site is currently unknown.

7.4 Comparison of Alternatives and Environmentally Superior Alternative

The CEQA Guidelines require the identification of an environmentally superior alternative to the proposed project (Section 15126.6[e]). If it is determined that the "no project" alternative would be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives (Section 15126.6[3]).

As described above in Section 7.3.1, the No Project Alternative would result in substantially less severe environmental impacts than the proposed project. However, the No Project Alternative would not meet the project sponsor's most basic objective, which is construction of an event center to serve the Golden State Warriors basketball team. Furthermore, per CEQA Guidelines Section 15126.6[3], the "no project" alternative cannot be selected as the environmentally superior alternative.

The three remaining alternatives consist of the Reduced Intensity Alternative, the Off-site Alternative at Piers 30-32 and Seawall Lot 330, and the Third Street Plaza Variant (see Chapter 8 for a description of this variant and its environmental impacts compared to those of the proposed project). All three of these alternatives would achieve most of the basic project objectives. The Reduced Intensity Alternatives would result in somewhat less severe environmental impacts than the proposed project across a broad range of environmental resources, including transportation, noise, air quality, and wastewater demand; however, this alternative would not avoid or substantially lessen any of the significant and unavoidable impacts that were identified for the proposed project. The Off-site Alternative at Piers 30-32 and Seawall Lot 330 would more effectively avoid and substantially reduce the severity of a number of significant impacts related to noise, air quality, wind, and utilities that were identified for the proposed project; however, this alternative would result in substantially more severe significant impacts related to noise, vibration, and air quality, and also introduce new significant and unavoidable adverse impacts related to transportation and biological resources that would not occur under the proposed project. The Third Street Plaza Variant would have all of the same significant impacts as the proposed project, save one: wind impacts at off-site public areas. This impact, though determined to be significant and unavoidable for the proposed project due to current unknowns in the project design, can be expected to be mitigated to less than significant prior to project implementation with appropriate design refinements.

Therefore, overall, the Reduced Intensity Alternative is considered the environmentally superior alternative, because it would reduce the severity of adverse environmental effects across a broad range of environmental resources and would not result in any new significant environmental impacts.

Table 7-27 compares the significant impacts of the No Project, Reduced Intensity, and Off-site Alternatives with those of the proposed project; please see Chapter 8 for the impacts of the Third Street Plaza Variant (as described in Chapter 8, the Third Street Plaza Variant would have all the same significant impacts as the proposed project except that Impact WS-1, regarding wind hazards at off-site public areas would be less than significant instead of significant and unavoidable with mitigation). Table 7-27 lists only the significant impact of the project and alternatives (with significant and unavoidable impacts noted in bold italic type); less-than-significant impacts are not shown on this table since they are not considered in the alternatives analysis.

TABLE 7-27
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Land Use	All impacts less than significant.	All impacts would be the same as or similar to those of the project.	All impacts would be the same as those of the project.	All impacts would be the same as or similar to those of the project.
Population and Housing	All impacts less than significant.	All impacts would be the same as or less than those of the project due to reduced development.	All impacts would be the same as or less than those of the project due to reduced development.	All impacts would be the same as or similar to those of the project.
Cultural and Paleontological Resources	Impact CP-2: The project could cause a substantial adverse change in the significance of an archaeological resource. Identified mitigation would reduce this impact to less than significant.	Impact and mitigation would be the same or very similar to that of the project due to similar excavation requirements.	Impacts and mitigation would be the same or very similar to that of the project due to similar excavation requirements.	Impact and mitigation would be the same or very similar to that of the project due to similar excavation requirements.
	Impact C-CP-1: The project's contribution to cumulative impacts on archaeological resources could be cumulatively considerable. Identified mitigation would reduce this impact to less than significant.	Impact and mitigation would be the same or very similar to that of the project due to similar excavation requirements.	Impact and mitigation would be the same or very similar to that of the project due to similar excavation requirements.	Impact and mitigation would be the same or very similar to that of the project due to comparable excavation requirements at Seawall Lot 330.
	No impact on historic resources.	No impact on historic resources.	No impact on historic resources.	Potentially significant impact on nearby historic resources during construction due to groundborne vibration, which could be reduced to less than significant with feasible mitigation.
Transportation and Circulation	Impact TR-2: Proposed project would result in ***significant and unavoidable with mitigation***, traffic impacts at multiple intersections that would operate at LOS E or LOS F under conditions without a SF Giants game at AT&T Park.	***Significant and unavoidable*** traffic impacts at one study intersection, similar to the proposed project for the No Event scenario; less than significant impacts for event scenarios.	***Significant and unavoidable with mitigation*** traffic impacts at one study intersection for the No Event scenario, similar to the proposed project, but intersection would remain at LOS E compared to LOS F for the project. ***Significant and unavoidable with mitigation*** traffic impacts same as proposed project for event scenarios.	***Significant and unavoidable with mitigation*** traffic impacts at multiple intersections in the vicinity of Piers 30-32 and Seawall Lot 330, which would be substantially more severe than the traffic impacts of the proposed project.
	Impact TR-3: Proposed project would result in ***significant and unavoidable with mitigation***, traffic impacts at one freeway ramp that would operate at LOS E or LOS F under conditions without a SF Giants game at AT&T Park.	Traffic impacts at freeway ramps less than significant.	Traffic impacts at freeway ramps ***significant and unavoidable with mitigation***, similar to proposed project.	Similar to the proposed project, traffic impacts at freeway ramps in the vicinity of Piers 30-32 and Seawall Lot 330 would be ***significant and unavoidable with mitigation.***

TABLE 7-27 (Continued)
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Transportation and Circulation (cont.)	Impact TR-5: Proposed project would result in ***significant and unavoidable with mitigation***, transit impacts on regional transit service under conditions without a SF Giants game at AT&T Park.	Transit impacts less than significant.	Transit impacts on regional service providers ***significant and unavoidable with mitigation***, similar to the proposed project for event scenarios.	Similar to the proposed project, transit impacts on regional transit service would be ***significant and unavoidable with mitigation*** for event scenarios**.**
	Impact TR-6: Proposed project could result in pedestrian impacts under conditions without a SF Giants game at AT&T Park, but identified mitigation would reduce this impact to less than significant.	Pedestrian impacts less than significant.	Pedestrian impacts same as the proposed project.	Pedestrian impacts similar to the proposed project.
	Impact TR-9: Project construction could temporarily obstruct helipad airspace surfaces, and specialized outdoor lighting as part of event center operations could affect helipad flight operations. Identified mitigation would reduce this impact to less than significant.	Impacts related to construction effects on helipad airspaces surfaces would be the same as or less severe than the proposed project, and the same mitigation would apply. No impact related to event center lighting.	Impacts related to construction effects on helipad airspaces surfaces would be the same as or less severe than the proposed project, and the same mitigation would apply. Impacts related to specialized outdoor lighting as part of event center operations would be the same as the proposed project, and the same mitigation measure would apply.	No helipad safety impacts.
	Impact TR-11: Proposed project would result in ***significant and unavoidable with mitigation***, traffic impacts at multiple intersections that would operate at LOS E or LOS F under conditions with an overlapping SF Giants game at AT&T Park.	No overlapping events, so no impact.	Traffic impacts at multiple intersections ***significant and unavoidable with mitigation***, similar to proposed project.	Similar to the proposed project, traffic impacts at multiple intersections in the vicinity of Piers 30-32 and Seawall Lot 330 would be ***significant and unavoidable with mitigation***.
	Impact TR-12: Proposed project would result in ***significant and unavoidable with mitigation***, traffic impacts at 3 freeway ramp that would operate at LOS E or LOS F under conditions with an overlapping SF Giants game at AT&T Park.	No overlapping events, so no impact.	Traffic impacts at freeway ramps ***significant and unavoidable with mitigation***, similar to proposed project.	Similar to the proposed project, traffic impacts at freeway ramps in the vicinity of Piers 30-32 and Seawall Lot 330 would be ***significant and unavoidable with mitigation.***
	Impact TR-13: Proposed project could result in significant transit impacts on Muni transit service under conditions with an overlapping SF Giants game at AT&T Park, but identified mitigation would reduce this impact to less than significant.	No overlapping events, so no impact.	Transit impacts on Muni, same as the proposed project.	Transit impacts on Muni less than significant.

TABLE 7-27 (Continued)
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Transportation and Circulation (cont.)	Impact TR-14: Proposed project would result in ***significant and unavoidable with mitigation***, transit impacts on regional transit service under conditions with an overlapping SF Giants game at AT&T Park.	No overlapping events, so no impact.	Transit impacts on regional service providers ***significant and unavoidable***, similar to the proposed project.	Similar to the proposed project, transit impacts on regional transit service would be ***significant and unavoidable with mitigation.***
	Impact TR-15: Proposed project could result in pedestrian impacts under conditions with an overlapping SF Giants game at AT&T Park, but identified mitigation would reduce this impact to less than significant.	No overlapping events, so no impact.	Pedestrian impacts same as the proposed project.	Pedestrian impacts similar to the proposed project.
	Impact TR-18: Proposed project would result in ***significant and unavoidable with mitigation***, traffic impacts at multiple intersections that would operate at LOS E or LOS F under conditions without the Muni Special Event Transit Service Plan.	Muni Special Event Transit Service Plan not applicable, so no impact.	Impact would be ***significant and unavoidable with mitigation***, same as the proposed project.	Muni Special Event Transit Service Plan not applicable, so no impact.
	Impact TR-19: Proposed project would result in ***significant and unavoidable with mitigation***, traffic impacts at freeway ramps that would operate at LOS E or LOS F under conditions without the Muni Special Event Transit Service Plan.	Muni Special Event Transit Service Plan not applicable, so no impact.	Impact would be ***significant and unavoidable with mitigation***, same as the proposed project.	Muni Special Event Transit Service Plan not applicable, so no impact.
	Impact TR-20: Proposed project would result in ***significant and unavoidable with mitigation***, transit impacts on Muni transit capacity under conditions without the Muni Special Event Transit Service Plan.	Muni Special Event Transit Service Plan not applicable, so no impact.	Impact would be ***significant and unavoidable with mitigation***, same as the proposed project.	Muni Special Event Transit Service Plan not applicable, so no impact.
	Impact TR-21: Proposed project would result in ***significant and unavoidable with mitigation***, transit impacts on regional transit capacity under conditions without the Muni Special Event Transit Service Plan.	Muni Special Event Transit Service Plan not applicable, so no impact.	Impact would be ***significant and unavoidable with mitigation***, same as the proposed project.	Muni Special Event Transit Service Plan not applicable, so no impact.
	Impact TR-22: Proposed project could result in pedestrian impacts under conditions without the Muni Special Event Transit Service Plan, but identified mitigation would reduce this impact to less than significant.	Muni Special Event Transit Service Plan not applicable, so no impact.	Impact would be ***significant and unavoidable with mitigation***, same as the proposed project.	Muni Special Event Transit Service Plan not applicable, so no impact.

TABLE 7-27 (Continued)
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Transportation and Circulation (cont.)	Impact C-TR-2: Proposed project would result in ***significant and unavoidable with mitigation***, cumulative traffic impacts at multiple intersections under 2040 cumulative conditions.	***Significant and unavoidable*** cumulative traffic impact at two intersections.	***Significant and unavoidable with mitigation*** cumulative traffic impact at multiple intersections, same as the proposed project	***Significant and unavoidable with mitigation*** cumulative traffic impact at multiple intersections, similar to the proposed project.
	Impact C-TR-3: Proposed project would result in ***significant and unavoidable with mitigation***, cumulative traffic impacts at multiple freeway ramps under 2040 cumulative conditions.	Cumulative traffic impacts at freeway ramps less than significant.	***Significant and unavoidable with mitigation*** cumulative traffic impacts on freeway ramps same as the proposed project.	***Significant and unavoidable with mitigation*** cumulative traffic impacts on freeway ramps similar to the proposed project.
	Impact C-TR-4: Proposed project could result in significant transit impacts on Muni service under 2040 cumulative conditions, but identified mitigation measures would reduce impacts to less than significant.	Cumulative transit impacts less than significant.	Cumulative transit impacts on Muni service same as the proposed project.	Cumulative transit impacts on Muni less than significant.
	Impact C-TR-5: Proposed project would result in ***significant and unavoidable with mitigation***, cumulative transit impacts on regional transit capacity under 2040 cumulative conditions.	Cumulative transit impacts less than significant.	***Significant and unavoidable with mitigation*** cumulative transit impacts on regional providers same as the proposed project.	***Significant and unavoidable with mitigation*** cumulative transit impacts on regional providers similar to the proposed project.
	Impact C-TR-6: Proposed project could result in significant pedestrian impacts under 2040 cumulative conditions, but identified mitigation measures would reduce impacts to less than significant.	Cumulative pedestrian impacts less than significant.	Cumulative pedestrian impacts same as the proposed project.	Cumulative pedestrian impacts similar to the proposed project.
Noise and Vibration	Construction noise impacts less than significant.	Construction noise impacts less than significant.	Construction noise impacts less than significant.	Construction noise would be a substantial increase over ambient levels and would be ***significant and unavoidable with mitigation.***
	Construction vibration impacts less than significant.	Construction vibration impacts less than significant.	Construction vibration impacts less than significant.	Construction groundborne vibration would exceed threshold for human annoyance and would be ***significant and unavoidable with mitigation.***

TABLE 7-27 (Continued)
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Noise and Vibration (cont.)	Impact NO-4: Project operations could include use of amplified sound equipment in outdoor areas that could result in noise levels violating the noise ordinance, and there is the potential for leakage of interior concert/event noise to affect sensitive land uses. Identified mitigation would reduce this impact to less than significant.	No impacts related to amplified sound equipment, and no mitigation required.	Impacts and mitigations would be the same as those of the project.	Impacts and mitigations would be the same as or similar to those of the project.
	Impact NO-5: Noise levels from increased traffic on local roadways would be ***significant and unavoidable*** at Illinois St under weekday late evenings and Saturday evenings and on Terry Francois Blvd under on weekday late evenings, even with implementation of transportation mitigation measures to reduce traffic.	Increased roadway noise levels in the project vicinity would be less than significant under all modeled scenarios.	Impact of traffic noise would be ***significant and unavoidable with mitigation***, similar to the proposed project, at Illinois St under weekday late evenings and Saturday evenings and on Terry Francois Blvd under on weekday late evenings, though the increases would be slightly less than the project but still exceed significance thresholds.	Roadway noise levels would be less than significant.
	Impact NO-5: Increased noise levels due to crowd noise at the Muni T-Line platform in the nighttime when event patrons are departing would be a ***significant and unavoidable*** impact on nearby residential uses.	No impact related to crowd noise.	***Significant and unavoidable*** impact related to crowd noise would be the same as for the proposed project.	***Significant and unavoidable*** impact related to crowd noise would be the same as or similar to those of the proposed project.
	Impact C-NO-1: The project's contribution to cumulative impacts on construction noise could be cumulatively considerable. Identified mitigation would reduce this impact to less than significant.	Cumulative construction noise impacts would be similar to those of the project. Identified mitigation would reduce this impact to less than significant.	Cumulative construction noise impacts would be the same as those of the project. Identified mitigation would reduce this impact to less than significant.	Cumulative construction noise would be ***significant and unavoidable with mitigation***, assuming there would be concurrent construction activities in the site vicinity.
	Impact C-NO-2: The project's contribution to cumulative impacts on traffic noise levels would ***significant and unavoidable*** at Illinois St during weekday peak hour and Saturday evenings and at Mariposa during Saturday evenings, even with implementation of transportation mitigation measures to reduce traffic.	Cumulative impact of traffic noise would be less than significant on local roadways under all modeled scenarios.	Cumulative impact of traffic noise would be ***significant and unavoidable with mitigation***, at Illinois St during Saturday evenings, similar to the proposed project, but unlike the project, the cumulative noise impact at this location on weekday peak hours would be less than significant.	Contribution to cumulative roadway noise levels would be less than significant.

TABLE 7-27 (Continued)
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Air Quality	Impact AQ-1: Construction emissions of ROG and NOx would exceed BAAQMD thresholds, and impacts would be ***significant and unavoidable with mitigation***, even with implementation of an emission offset mitigation measure.	Construction emissions would be less than significant.	Construction emissions would be similar to that of the project, assuming comparable construction scenario, and would be ***significant and unavoidable with mitigation***.	Construction emissions would be similar to that of the project, and would be ***significant and unavoidable with mitigation***.
	Impact AQ-2: Operational emissions of ROG and NOx would exceed BAAQMD thresholds and impacts would be ***significant and unavoidable with mitigation***, even with implementation of an emission offset mitigation measure.	Operational emissions would be less than significant	Operational emissions would be similar to that of the project, and would be ***significant and unavoidable with mitigation***.	Operational emissions would be similar to that of the project, and would be ***significant and unavoidable with mitigation***.
	Impact AQ-3: Construction and operation would generate toxic air contaminants that could exceed significance thresholds for cancer risk, but identified mitigation would reduce the risk to less than significant.	Impacts related to toxic air contaminants would be less than significant and no mitigation required.	Impacts related to cancer risk of toxic air contaminants would be the same as that identified for the proposed project and the same mitigation measures would reduce impacts to less than significant.	Significant construction-related impact from PM2.5 emissions could be reduced to less than significant with feasible measures ***Significant and unavoidable with mitigation*** construction-related impact from increased cancer risk contributions at off-site receptors.
	Impact AQ-4: The project with implementation of identified air quality mitigation measures would be consistent with the 2010 Clean Air Plan, and this impact is less than significant with mitigation.	Impacts related to consistency with the Clean Air Plan would be less than significant and no mitigation required.	Impacts related to consistency with the Clean Air Plan would be the same as that identified for the proposed project and the same mitigation measures would reduce impacts to less than significant.	Impacts related to consistency with the Clean Air Plan would be the same as that identified for the proposed project and the same mitigation measures would reduce impacts to less than significant.
	Impact C-AQ-1: The project's contribution to cumulative construction and operational ROG and NOx emissions could be cumulatively considerable, and impacts would be ***significant and unavoidable with mitigation***, even with implementation of and emission offset mitigation measure.	Cumulative air quality impacts would be less than significant.	Cumulative air quality impacts would be the same as that identified for the proposed project and the same mitigation measures apply, and the impact would be ***significant and unavoidable with mitigation***.	Cumulative air quality impacts would be similar to that identified for the proposed project and the same mitigation measures apply, and the impact would be ***significant and unavoidable with mitigation***.
	Impact C-AQ-2: The project's contribution to cumulative impacts on exposure to toxic air contaminants could exceed significance thresholds for cancer risk, but identified mitigation would reduce the risk to less than significant.	Impact would be less than significant.	Impact would be the same as the proposed project, less than significant with mitigation.	Cumulative air quality impacts related to health risks would be ***significant and unavoidable with mitigation*** because this location is within an Air Pollution Exposure Zone.

TABLE 7-27 (Continued)
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Greenhouse Gas Emissions	Impact is less than significant.	Impact would be similar to that of the project.	Impact would be the same as that of the project.	Impact would be similar to that of the project.
Wind and Shadow	Impact WS-1: The project would alter wind in a manner that would substantially increase the number of wind hazard hours at off-site public areas. Due to the currently unknown wind effects that would occur under the final design refinements, this impact would be ***significant and unavoidable, with mitigation***.	Wind hazard impacts could be the same as or less than that of the project, but in the absence of wind tunnel testing, the specific change in wind conditions cannot be quantified.	Wind hazard impacts could be the same as or less than that of the project, but in the absence of wind tunnel testing, the specific change in wind conditions cannot be quantified.	Wind hazard impacts would be less than significant based on wind tunnel testing conducted for the previous design proposal at this location.
Recreation	All impacts less than significant.	All impacts would be the same or similar to those of the project.	All impacts would be the same or similar to those of the project.	All impacts would be the same or similar to those of the project.
Utilities and Service Systems	Impact C-UT-2: The project in combination with past, present, and foreseeable future projects would require construction of new or upgraded wastewater facilities, the construction of which could have significant environmental effect. This impact is ***significant and unavoidable***, with no mitigation available to the project sponsor.	Impacts related to wastewater treatment capacity would be the same as the proposed project, and would be ***significant and unavoidable***.	Impacts related to wastewater treatment capacity would be the same as the proposed project, and would be ***significant and unavoidable***.	Impact would be less than significant, no mitigation required because of adequate capacity of existing wastewater facilities at this location.
	Impact C-UT-4: The SFPUC has determined that it has inadequate capacity to serve the project's wastewater demand in addition to its existing commitments. This impact is ***significant and unavoidable***, even ***with mitigation*** by the project sponsor to contribute its fair share to the construction of capacity improvements.	Impacts related to wastewater demand would be similar to the proposed project, though wastewater demand would be somewhat reduced, but the impact would still be ***significant and unavoidable with mitigation***.	Impacts related to wastewater demand would be similar to the proposed project, though wastewater demand would be somewhat reduced, but the impact would still be ***significant and unavoidable with mitigation***.	Impact would be less than significant, no mitigation required.
Public Services	All impacts less than significant.	All impacts would be the same or similar to those of the project.	All impacts would be the same or similar to those of the project.	All impacts would be similar to those of the project.
Biological Resources	Impact BI-4: Project construction could affect breeding birds, and project operations could adversely affect birds due to increased risk of collisions with buildings. Identified mitigation would reduce this impact to less than significant.	Impacts and mitigation would be the same or very similar to those of the project due to similar construction effects and similar maximum heights of structures.	Impacts and mitigation would be the same or very similar to those of the project due to similar construction effects and similar maximum heights of structures.	Same impact and mitigation with respect to breeding birds; less-than-significant impact with respect to avian collisions with buildings.

TABLE 7-27 (Continued)
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Biological Resources (cont.)	No impacts on marine biological resources.	No impacts on marine biological resources.	No impacts on marine biological resources.	***Significant and unavoidable*** impact on special-status fish and marine mammals due to construction noise. Construction impacts on critical fish habitat and on migratory corridors for marine wildlife could be reduced to less than significant with feasible mitigation measures. Construction and operational impacts on marine biological resources due to trash and littering could be reduced to less than significant with feasible mitigation measures.
Geology and Soils	All impacts less than significant.	All impacts would be the same as or similar to those of the project.	All impacts would be the same as or similar to those of the project.	All impacts would be similar to those of the project.
Hydrology and Water Quality	Impact HY-6: Impacts related to dry and wet weather flows and combined sewer discharges would be less than significant, but effluent discharges from the SEWPCP could be affected due to unknown nature of future business and research uses. Identified mitigation from the Mission Bay FSEIR would reduce this impact to less than significant.	Impact would be same as the proposed project.	Impact would be same as the proposed project.	No impact, because future uses would generate typical municipal wastewater.
	No impact because no in-water construction.	No impact because no in-water construction.	No impact because no in-water construction.	Potentially significant construction impacts on water quality of the Bay due to extensive in-water construction activities could be reduced to less than significant with implementation of complex though feasible mitigation measures.
	Littering impact determined to be less than significant with implementation of required trash control and management programs.	Impact would be same as or similar to that of the proposed project.	Impact would be same as that of the proposed project.	Potential water quality impact associated with littering due to proximity to the Bay could be reduced to less than significant with feasible mitigation measures.

TABLE 7-27 (Continued)
COMPARISON OF SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Environmental Resource	Proposed Project	Alternative A: No Project	Alternative B: Reduced Intensity	Alternative C: Off-site at Piers 30-32 and Seawall Lot 330
Hazards and Hazardous Materials	Impact HZ-1: Project operations could include uses that handle biohazardous materials, which could have health and safety impacts; project construction could encounter naturally-occurring asbestos. Identified mitigation would reduce this impact to less than significant.	Impacts would be same as or similar to those of the proposed project.	Impacts would be same as or similar to those of the proposed project.	No impact related to use of biohazardous materials because of different uses would be expected at this location, and impact associated with the potential to encounter naturally-occurring asbestos would be less than significant based on available data on subsurface materials.
	Impact HZ-2: Project operations could include child-care centers that could expose a sensitive population to hazardous materials. Identified mitigation would reduce this impact to less than significant.	Impact would be same as or similar to that of the proposed project.	Impact would be same as or similar to that of the proposed project.	Impact would be less than significant, no mitigation required.
Mineral and Energy Resources	All impacts less than significant.	All impacts would be the same or similar to those of the project.	All impacts would be the same or similar to those of the project.	All impacts would be the same or similar to those of the project.
Agriculture and Forest Resources	No impacts.	No impacts, same as the project.	No impacts, same as the project.	No impacts, same as the project.

7.5 Alternatives Considered but Rejected

In developing the proposed project and the alternatives analyzed in this SEIR, the project sponsor considered multiple alternative locations as well as alternative concepts/designs at the project site. The OCII, as CEQA lead agency, and with the assistance of the Planning Department, reviewed these alternative concepts and locations as potential strategies for reducing or avoiding the significant adverse impacts that were identified for the proposed project. In some cases, the alternative concepts were incorporated into the Reduced Intensity Alternative analyzed in this chapter as Alternative B or into a mitigation measure recommended for the proposed project. However, in other cases, alternative concepts or locations were determined to either be infeasible or to result in the same or more severe environmental impacts compared to those of the project. The alternatives considered and the reasons they have been rejected from further analysis are described below.

7.5.1 Alternatives Identified During Scoping

During the scoping process for the SEIR, one individual raised a concern regarding the need to consider alternatives to the proposed project as summarized in Chapter 2, Table 2-1. This suggestion is for a modified site plan at Blocks 29-32 that would incorporate design changes to reduce transportation and circulation impacts. This suggestion has been incorporated into the project design for the proposed project, as discussed and analyzed in Chapter 5, Section 5.2, Transportation and Circulation. In addition, as described in Chapter 2, Introduction, public scoping was conducted on a previous proposal by the project sponsor to construct an event center at Piers 30-32 in San Francisco (described in Section 7.5.2.1, below), and comments from that scoping process regarding alternatives were also considered for the currently proposed project.

7.5.2 Alternatives Considered but Rejected

As described above in Section 7.2.3, several alternative strategies were considered as part of the alternatives screening and selection process for this SEIR. The alternative strategy to reduce the size/scale of the event center was rejected because not only would it fail to meet most of the basic project objectives, reducing the size/scale of the event center would likely not substantially avoid or lessen significant and unavoidable transportation impacts, and consequently, associated air quality and noise impacts. Please see discussion above in Section 7.2.3 for further discussion.

An additional alternative strategy that was considered but rejected was a "no build" alternative at the project site at Blocks 29-32. This no build strategy assumes that the site would remain in its current state as a parking lot and undeveloped site for the foreseeable future. While such a strategy would avoid all identified significant impacts of the proposed project, it would not meet any of the project objectives. It would also not be consistent with the Mission Bay South Redevelopment Plan and would in fact undermine the Plan, because OCII would lose the ability to construct affordable housing as well as certain infrastructure improvements within the Plan area. Furthermore, a no build alternative at this location is not reasonably foreseeable for financial reasons, given the active development currently occurring on the surrounding parcels.

The last category of alternatives considered but rejected is alternative site locations. The project sponsor has explored numerous alternative locations for developing an event center and mixed-use development in San Francisco. As described in Chapter 2, Introduction, and in Section 7.3.3 above, in 2012, the project sponsor proposed to construct a multi-purpose event center, event hall, public open space, maritime uses, fire station, a parking facility, and visitor-serving retail and restaurant uses on Piers 30-32 in conjunction with a residential and hotel mixed-use development on Seawall Lot 330. The San Francisco Planning Department published a Notice of Preparation of an EIR for this previous project, received extensive public comment on that proposal, and conducted preliminary analysis of potential impacts of that proposal. As a part of the preliminary environmental review for this previous proposal, the Planning Department also examined two alternative site locations, Seawall Lot 337 and the Former Potrero Power Plant site (described below in Table 7-28), as possible ways to avoid or lessen significant environmental impacts of that previous project. At that time, the currently proposed project site at Blocks 29-32 in Mission Bay was not available, as the site owner, salesforce.com, was in the process of developing the site with a mix of commercial/industrial/retail uses as allowed under the Mission Bay South Redevelopment Plan. However, due to the changes in circumstances since that time (including the availability of Blocks 29-32 due to the withdrawal of salesforce.com of its development proposal for Blocks 29-32), the GSW as project sponsor withdrew its application for an event center and mixed uses at Piers 30-32 and Seawall Lot 330, and replaced it with the currently proposed project at Blocks 29-32 in Mission Bay.

Nevertheless, as a part of the preliminary environmental review for the previous proposal, numerous alternative sites in San Francisco were considered for an event center. Many of these alternative sites were raised by the public and agencies during scoping for the proposal to construct the event center at Piers 30-32. Currently, the OCII, as the CEQA lead agency for the proposed project, has considered these alternative sites as potentially applicable as alternatives to the proposed project at Mission Bay Blocks 29-32. The alternative sites considered are listed and described in **Table 7-28**, along with OCII's reasons for rejecting these options.

TABLE 7-28
ALTERNATIVE LOCATIONS CONSIDERED BUT REJECTED

Alternative Location	Description	Reason for Rejection
Seawall Lot 337	Seawall Lot 337 is a 16-acre parcel located directly south of China Basin, between Third Street and Terry A. Francois Boulevard, about one third mile north of Blocks 29-32. This site is adjacent to the northeast side of the Mission Bay South Plan area but outside of the Plan boundary. It is currently used for surface parking.	Seawall Lot 337 is within the jurisdiction of the Port of San Francisco. However, this site is part of the proposed Mission Rock mixed-use project (see Chapter 5, Section 5.1, for description), and the Seawall Lot 337 LLC, an affiliate of the San Francisco Giants, is currently collecting signatures to qualify for a ballot measure for the November 2015 election to approve height increases for a proposed development at Seawall Lot 337. The project sponsor would not reasonably be able to acquire, control, or otherwise have access to this site for the purpose of pursuing such alternative location. Furthermore, an event center and mixed use development at this site would be expected to have the same or similar significant and unavoidable impacts as the proposed project, particularly with respect to transportation impacts and overlapping events with AT&T Park.
Former Potrero Power Plant Site	This site, also known as the Mirant site, is located between 22nd and 23rd Streets, along Illinois Street, about 200 feet from the Bay shoreline. This site contains many built features of the former power generation facilities and is directly adjacent to former power plant structures and facilities that are expected to be removed as part of ongoing site remediation activities. It is part of a 34-acre site that is currently undergoing various stages of environmental investigation and remediation by the RWQCB due to its long history of industrial uses since the mid-1800s.	This site is less well served by transit and due to its remote location, would not meet the project objectives to locate the event center within walking distance to local and regional transit hubs. Therefore, an event center at this location would likely have the same or more severe transportation-related impacts as the proposed project, including significant and unavoidable traffic, transit, air quality, and noise impacts. There are also concerns regarding site suitability and feasibility of project construction because of the ongoing hazardous materials remediation activities at this site. It is unknown if the project sponsor would reasonably be able to acquire, control, or otherwise have access to this site.
Pier 50	Pier 50 is located on the Bay waterfront, south of China Basin, east of Terry A. Francois Boulevard, about one half mile northeast of the project site. The 20-acre site on the Bay has four existing shed structures. Current uses include harbor services, deep draft vessel berthing, and the Port's maintenance facility.	Pier 50 is under both Port of San Francisco and BCDC jurisdiction, subject to a public trust easement. Pier 50 is the Port's maintenance center for the entire Port of San Francisco waterfront, an essential trust use. Pier 50 is also a deep water permanent berthing facility, designated a Port priority facility in BCDC's Seaport Plan. Therefore, an event center at this site would displace maritime uses currently on Pier 50 and conflict with the Seaport Plan. Construction would require extensive seismic and structural upgrades to the pier, which would result in potentially significant and unavoidable impacts on marine wildlife, which would not occur under the proposed project. Significant and unavoidable transportation, air quality, and noise impacts would likely be the same as or similar to the proposed project, particularly with respect to transportation impacts and overlapping events with AT&T Park. In addition, no seismic or engineering feasibility studies have been conducted for construction of a large development like the proposed project on Pier 50, so, site suitability of Pier 50 is unknown.

TABLE 7-28 (Continued)
ALTERNATIVE LOCATIONS CONSIDERED BUT REJECTED

Alternative Location	Description	Reason for Rejection
Pier 80 or India Basin Area	Pier 80 is located on the Bay waterfront, on the north side of Islais Creek Channel at the eastern terminus of Cesar Chavez Street and adjoins the City's Potrero Hill/Dogpatch and Bayview-Hunters Point neighborhoods. Pier 80 is a 69-acre facility and one of the Port of San Francisco's primary cargo terminals, operated by Metropolitan Stevedore Company (Metro Ports).	Pier 80 is under both Port of San Francisco and BCDC jurisdiction and is subject to a public trust easement. Pier 80 is one of the Port's two major cargo terminals, and is designated as a Port priority facility in BCDC's Seaport Plan, which calls for Pier 80 to be retained to support cargo operations Construction of an event center at Pier 80 would displace maritime-dependent cargo handling and industrial uses that are not available or feasible elsewhere in San Francisco, and would conflict with the Seaport Plan. In addition, constructing an event center would require seismic and structural upgrades to the pier, which would result in significant in-water construction impacts on water quality and biological resources. Construction would require extensive seismic and structural upgrades to the pier, which would result in potentially significant and unavoidable impacts on marine wildlife, which would not occur under the proposed project. The site is less well served by Muni and regional transit, and access would primarily be via auto, and the roadway network serving Pier 80 is less developed with narrower cross-sections (i.e., fewer travel lanes). Therefore, transportation and associated air quality and noise impacts would likely be the same or potentially more severe than those under the proposed project. Due to its remote location, this site would not meet the project objectives to locate the event center within walking distance to local and regional transit hubs.
Candlestick Point and Hunters Point Shipyard	Candlestick Point and Hunters Point Shipyard covers approximately 702 acres along the southeastern waterfront of San Francisco, consisting of 281 acres at Candlestick Point (Candlestick) and 421 acres at Hunters Point Shipyard (HPS Phase II). Both areas are under the jurisdiction of the San Francisco Office of Community Investment and Infrastructure (OCII), successor agency to the San Francisco Redevelopment Agency.	Candlestick Point and the Hunters Point Shipyard are approved for redevelopment of both areas with a major mixed-use project including open space, housing, commercial (office, regional retail, and neighborhood retail) uses, research and development, artist space, a marina, new infrastructure, community uses, and entertainment venues. The site is less well served by Muni and regional transit. Due to its remote location, this site would not meet the project objectives to locate the event center within walking distance to local and regional transit hubs. The site is actively being developed, and is not available. The project sponsor would not reasonably be able to acquire, control, or otherwise have access to this site for the purpose of pursuing such alternative location.

TABLE 7-28 (Continued)
ALTERNATIVE LOCATIONS CONSIDERED BUT REJECTED

Alternative Location	Description	Reason for Rejection
Schlage Lock site	About 20-acre now-vacant former industrial site wedged between the residential neighborhoods of Visitacion Valley and Little Hollywood along the City's southern border. The site is located east of Tunnel Avenue, across Bayshore Boulevard, and extends roughly along Leland Avenue to just beyond Rutland Street. The former site of Schlage Lock factory that closed in 1999, this location is considered a brownfield site with contaminated soil and groundwater identified at the site, but with an approved Remedial Action Plan. The site is potentially a historic site with historic resources.	The site is within the Visitacion Valley Redevelopment project area and is programmed for mixed-use development, including approximately 1,250 residential units. The City has approved a development agreement (Ordinance No. 149-14) and has recently approved a tentative subdivision map. The site is less well served by Muni and regional transit, and because access would primarily be via auto, would require substantial nearby parking supplies. Due to its remote location, this site would not meet the project objectives to locate the event center within walking distance to local and regional transit hubs. Given that the Schlage Lock Project has been approved and is moving forward to its implementation phase, the project sponsor would not reasonably be able to acquire, control, or otherwise have access to this site.
Bill Graham Civic Auditorium	This site is an existing multi-purpose arena located in the Civic Center area, on Grove Street, between Larkin and Polk Streets. It holds 6,000 people, and is the former home of the Golden State Warriors from 1964 to 1966.	The size of this site is not adequate to accommodate an event center and would fail to meet most of the project objectives. It is unknown if the project sponsor would reasonably be able to acquire, control, or otherwise have access to this site.
The Presidio	The Presidio is a park and former military base on the northern tip of the San Francisco Peninsula in San Francisco, and is part of the Golden Gate National Recreation Area. The park is identified as a California Historical Landmark and a National Historic Landmark.	Development within the Presidio is subject to the Presidio Trust Management Plan, and an arena would be incompatible with the plan. Even if a site were available and desirable for an event center, development at the Presidio would require approval by the National Park Service. Furthermore, the area is less well served by Muni and regional transit, and auto usage would require substantial nearby parking supply. Transportation and associated air quality and noise impacts would likely be the same or potentially more severe than those under the proposed project. Due to its remote location, this site would not meet the project objectives to locate the event center within walking distance to local and regional transit hubs. Also because of the extent of undisturbed land at the Presidio, there would be a greater potential for impacts on biological resources that would not occur under the proposed project.
Cow Palace	This site is an existing indoor, multi-purpose arena located in Daly City on Geneva Avenue, just south of the City border and Visitacion Valley. Built in 1941, the Cow Palace currently houses the rodeo, circus, boat show, dog show, and a wide variety of events. The San Francisco Warriors played at the Cow Palace from 1962 to 1964 and again from 1966 to 1971.	The Cow Palace is under control of 1-A District Agricultural Association, a State agency of the California Department of Food and Agriculture's Division of Fairs and Expositions, and it is within the City of Daly City's jurisdiction. This site is less well served by Muni and regional transit. Transportation and associated air quality and noise impacts would likely be the same or potentially more severe than those under the proposed project. Due to its remote location, this site would not meet the

TABLE 7-28 (Continued)
ALTERNATIVE LOCATIONS CONSIDERED BUT REJECTED

Alternative Location	Description	Reason for Rejection
Cow Palace (cont.)		project objectives to locate the event center within walking distance to local and regional transit hubs. This site would have no advantages over the proposed site with respect to avoiding or lessening significant environmental impacts. It is unknown if the project sponsor could reasonably be able to acquire, control, or otherwise have access to the Cow Palace site for the purpose of pursuing such alternative location.
On top of the new Transbay Terminal	Downtown San Francisco, roughly bounded by Mission, Howard, Beale and Second Streets.	This alternative location is technically infeasible, because an event center has not been incorporated into the design and approval of the Transbay Terminal, which is currently under construction. Even if the development of an event center on top of another structure were to be technically feasible, the project sponsor would not reasonably be able to acquire, control, or otherwise have access to this site for the purpose of pursuing such alternative location.
Land beneath the northern section of Interstate 280 (I-280) should it be demolished (King Street Caltrain yard and railroad right-of-way north of the Mariposa exit)	The Planning Department is currently conducting the Railyard Alternatives and I-280 Boulevard Feasibility Study (RAB) to study transportation and land use alternatives within southeast San Francisco. The RAB is made up of five distinct components of analysis: (1) Reconfigure and/or relocate portions of the Fourth/King railyard storage and maintenance functions (service to Fourth/King would remain) (2) Verify and/or potentially modify the proposed Downtown Rail Extension, (3) Create a loop track out of the east side of the Transbay Transit Center, (4) Replace the elevated portion of I-280 north of Mariposa or 16th Streets with a surface boulevard, similar to The Embarcadero or Octavia Boulevard, including improved circulation and connections throughout the area, and (5) Create opportunities for new public spaces, housing, and jobs at the Railyard and along the freeway/rail alignment between Townsend and Mariposa Streets, including the potential to raise additional revenue to realize the transportation infrastructure. The Phase I feasibility assessment of options for each of the components is currently underway, and the Phase II alternatives development phase will focus on developing and defining alternatives from those options. A substantial amount of additional discussion and analysis is	This site is currently unavailable and will not be in the foreseeable future. Furthermore, the project sponsor would not reasonably be able to acquire, control, or otherwise have access to this site for the purpose of pursuing such alternative location.

TABLE 7-28 (Continued)
ALTERNATIVE LOCATIONS CONSIDERED BUT REJECTED

Alternative Location	Description	Reason for Rejection
Land beneath the northern section of Highway 280 should it be demolished (King Street Caltrain yard and railroad right-of-way north of the Mariposa exit) (cont.)	required before the details of the feasibility and potential design and removal of I-280 and construction of California's planned high-speed rail network and related components within San Francisco are developed to a level at which that project's effects on the transportation system in Mission Bay could be understood. Funding has not been secured to study these identified options beyond the Phase II alternatives development phase, or to undertake or implement any aspect of this project.	

CHAPTER 8
Third Street Plaza Variant

8.1 Overview

The GSW Arena LLC (GSW), as the project sponsor, has requested that this SEIR include environmental analysis of a variant to the proposed project described and analyzed in Chapters 3 and 5, respectively. The project variant, the Third Street Plaza Variant, is a minor variation of the proposed project at the same project site at Mission Bay Blocks 29-32, with all of the same objectives, background, and development controls, and with one exception, same approvals as the proposed project. The Third Street Plaza Variant is analyzed in this SEIR at an equal level of detail as the proposed project, and therefore the variant analysis satisfies all California Environmental Quality Act (CEQA) requirements, should this variant be selected for approval. It should be noted that the variant also serves as an alternative to the proposed project, because it would meet all of the project objectives, and as described below, would lessen or avoid a significant environmental impact of the project. Please see Chapter 7 of this SEIR for the description and analysis of all other CEQA alternatives.

The University of California, San Francisco (UCSF) currently maintains a view easement on the project site that extends 100 feet in length east from the Third Street right-of-way, and 68.75 feet in width along the Campus Way axis. As discussed in Chapter 3, Project Description, approval from the University of California would be required under the proposed project to vacate this on-site view easement. The Third Street Plaza Variant was developed with the goal of accommodating the proposed project design to the extent feasible while meeting the *Adjacent Parcels Design Standards*[1] of the view easement. Accordingly, this variant avoids any above-grade structural development within the boundary of the on-site UCSF view easement, with the exception of certain features allowed by the standards, as described below.

Section 8.2 presents the project variant characteristics; and Section 8.3 presents the environmental impacts of the project variant.

1 Amended and Restated Declaration and Agreement of Covenants, Conditions and Restrictions for the UCSF Mission Bay Campus dated 6/24/99, and recorded 7/19/99 as Instrument No. 99-G622193-00.

8.2 Third Street Plaza Variant Description

Under the Third Street Plaza Variant, all aspects of design, uses, programming, construction, and operation would be identical to that of the proposed project with one exception: the area of the proposed Third Street Plaza would be modified to be consistent with the design standards of the UCSF view easement on the project site. Consequently, the area of the project site within the view easement would be part of a proposed at-grade "Main Lower Plaza" with no above-grade structural development (i.e., there would be no elevated plaza or "gatehouse" building within the view easement as is proposed under the project). **Figure 8-1** presents a proposed conceptual site plan for the variant; **Figure 8-2** presents a west building elevation for the variant, looking east from Third Street. The Main Lower Plaza would contain a large open paved area for passive recreational use. The Main Lower Plaza would also contain appropriate subgrade utilities and design features to allow for a variety of temporary alternate at-grade uses, such as an ice rink, basketball court, and/or movie seating.

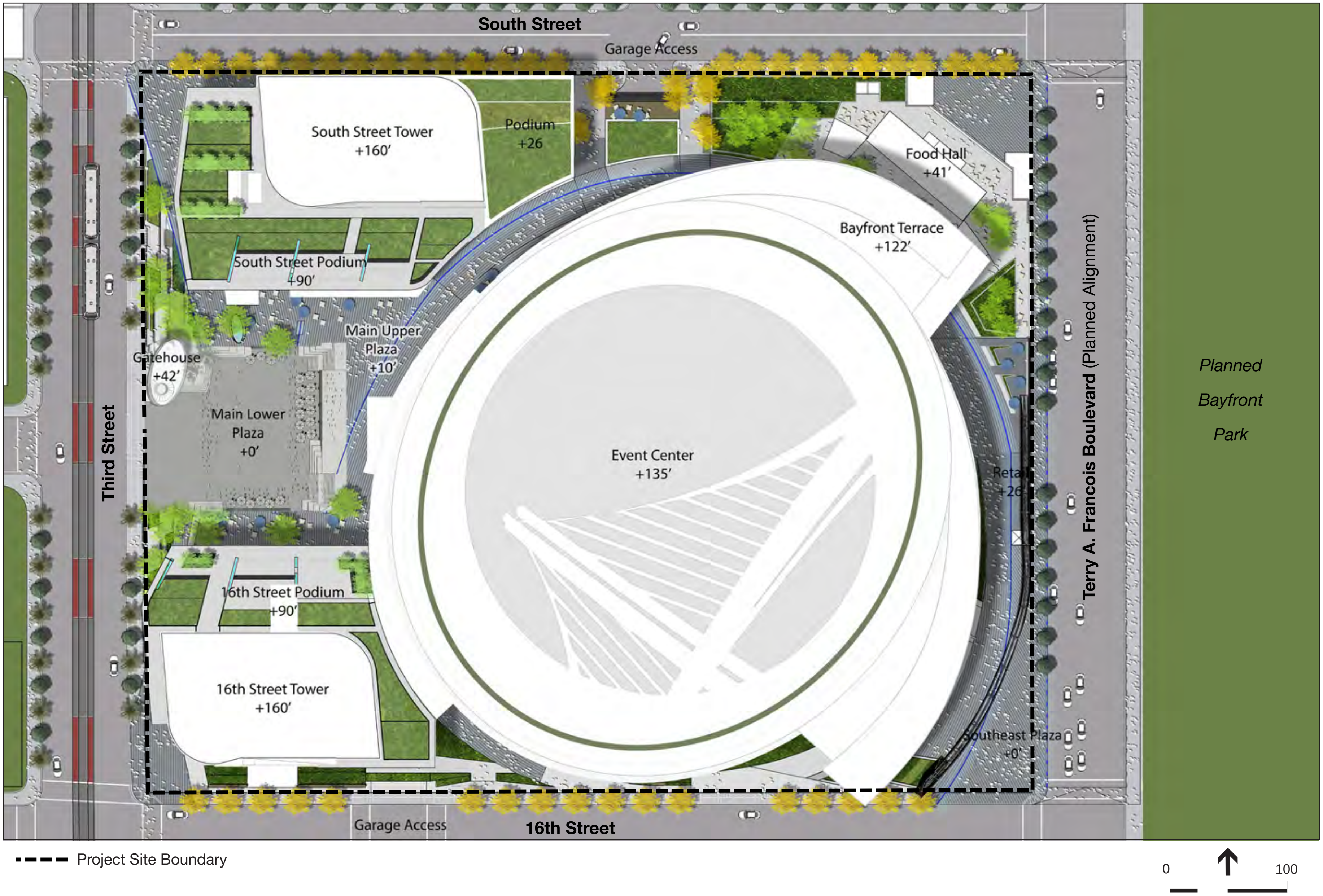
The gatehouse building along Third Street that is included in the proposed project would be relocated to the north, outside the view easement, just off the northwest corner of the variant's Main Lower Plaza. The gatehouse building for the variant would also be smaller in size than the gatehouse building for the proposed project (4,150 gsf vs. 11,550 gsf), although it would be four feet taller (42 feet agl vs. 38 feet agl).[2]

An elevated plaza ("Main Upper Plaza") would extend around the outside of the north, east and south boundaries of the Main Lower Plaza. Several stairways and a series of landscaped terraces would provide pedestrian access, seating, and a visual transition between the Main Lower Plaza and Main Upper Plaza. The Main Upper Plaza, similar to the elevated plaza of the proposed project, would provide pedestrian access to the main event center entrance, the plaza entrances of the office and retail buildings, and the event center exterior perimeter walkways.

Similar to the proposed project, the variant would provide three levels of enclosed, on-site parking (two below grade: Lower Parking Levels 1 and 2, and one at street level: Upper Parking Level). However, because the variant would contain a smaller elevated plaza in which to enclose parking on the Upper Parking Level, it would provide less total on-site parking than the proposed project (875 to 900 parking spaces under the variant vs. 950 parking spaces under the proposed project, or 50 to 75 fewer parking spaces). As under the proposed project, the sponsor would also use 132 existing off-site parking spaces in the 450 South Street parking garage to provide additional parking to serve the project employees. Proposed on-site loading spaces of the variant would be identical to that of the proposed project.

All other respects of the Third Street Plaza Variant design would be the same as the proposed project, including meeting LEED® Gold standards; total building square footage; number of above- and below-grade levels; building shapes, heights and massing; event center seating

2 Heights at the gatehouse building's sloping roof peak.



SOURCE: Manica Architecture, 2015

Note: All building elevations were estimated per *Mission Bay South Design for Development* guidelines; please see text for additional description.

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Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 8-1
Third Street Plaza Variant Conceptual Site Plan

capacity; open space area; pedestrian, bicycle and vehicle facilities and access points; pervious/impervious surfaces; and utilities. All operational aspects of the Third Street Plaza Variant would also be the same as those for the proposed project, including annual number, type and timing of games/events at the event center, site employment, and proposed implementation of a Transportation Management Plan. Moreover, proposed construction characteristics would be the same as the proposed project, including proposed depth of construction, construction techniques, construction equipment, construction employment, and construction duration.

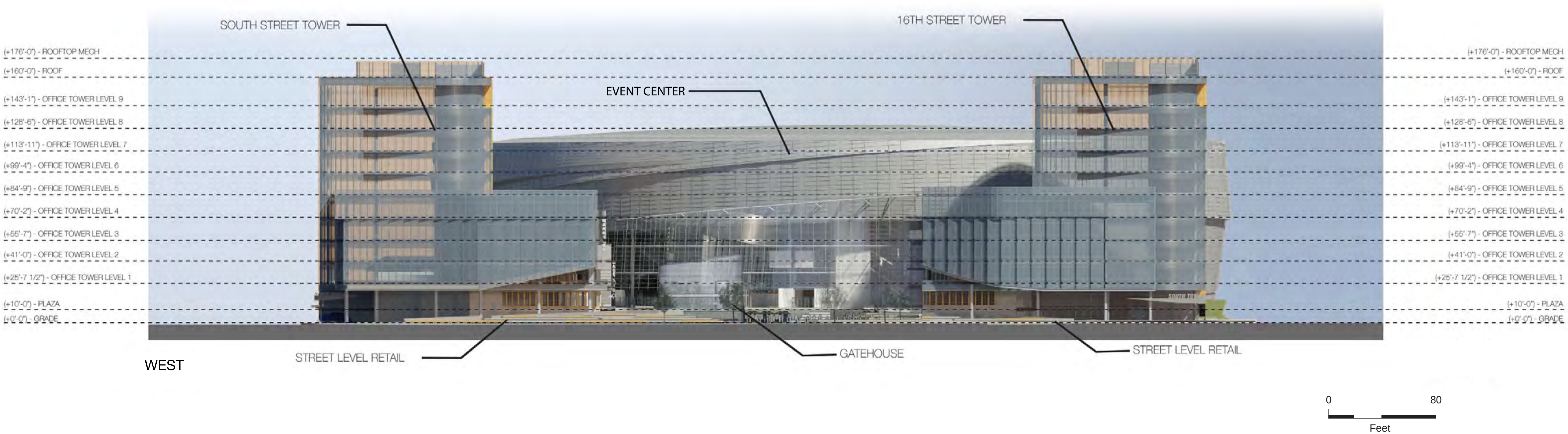
8.3 Impact Evaluation

In essentially all respects, the Third Street Plaza Variant would have the same environmental impacts as those identified for the proposed project in the Initial Study (Appendix NOP-IS) and in Chapters 4 and 5 of this SEIR. The environmental analyses contained and focused out in the Initial Study—Land Use, Aesthetics, Population and Housing, Cultural and Paleontological Resources, Recreation, Biological Resources, Geology and Soils, Hazards/Hazardous Materials, Mineral/Energy Resources, and Agricultural and Forest Resources—apply identically to the Third Street Plaza Variant as they do to the proposed project because the minor design modifications at the Third Street Plaza would not affect any of the identified effects on these resource areas. All identified mitigation measures identified for the proposed project would also apply to the Third Street Plaza Variant. Therefore, no further analyses of these topics is required.

The discussion in Chapter 4, Plans and Policies, also applies to the Third Street Plaza Variant the same as it does to the proposed project because, again, the minor design modifications at the Third Street Plaza would not alter the discussion of consistency with applicable plans and policies. The same design and development controls identified for the proposed project would apply to the variant. When compared to the proposed project, the minor design modifications under the variant would not affect the design controls related to height, towers, bulk, streetwalls, setback, parking, or loading. Therefore, Chapter 4, Plans and Policies, also applies to the Third Street Variant, and no further discussion is required.

Furthermore, the impact analyses in Chapter 5 with respect to Noise and Vibration, Air Quality, Greenhouse Gas Emissions, Shadow, Utilities and Service Systems, Public Services, and Hydrology and Water Quality also apply identically to the Third Street Plaza Variant as they do to the proposed project, and the same mitigation and improvement measures apply. The minor design modifications associated with the Third Street Plaza Variant would not change any of the underlying assumption used in the impact analyses for these resource areas. All assumptions, conditions, setting, impacts, and mitigation measures would be the exactly the same as those identified in Chapter 5 for all of these resource areas, and therefore, all of these sections of Chapter 5 also applies to the Third Street Plaza Variant, and no further discussion is required.

Chapter 5, Section 5.2, Transportation and Circulation also applies to the Third Street Plaza Variant with respect to all aspects of the setting, approach to analysis, impacts, and mitigation and improvement measures. None of the minor design modifications would affect the assumptions used for analyses of traffic, transit, loading, emergency access, or helipad safety



SOURCE: Manica Architecture, 2015

Note: • All building elevations were estimated per *Mission Bay South Design for Development* guidelines; please see text for additional description.

• These drawings show massing for the proposed development, but are not intended to show ideas for building facades, skin or materials

OCII Case No. ER 2014-919-97; Planning Department Case No. 2014.1441E:
Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 8-2

Third Street Plaza Variant West Elevation

For informational purposes/reference only

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under any of the scenarios analyzed. While the modified design of the Main Plazas could result in minor changes to pedestrian and bicycle access to the site from the west side, none of these changes would substantially affect the impact analyses and significance determinations for pedestrians and bicyclists presented in Section 5.2 and no further analysis is required.

The only substantive change in the Third Street Plaza Variant design relevant to the Transportation and Circulation section would be the reduction of on-site parking spaces by 50 to 75 spaces. The reduction in parking supply may result in some drivers seeking parking in other nearby parking facilities, or on-street, during the midday period when parking demand peaks. This effect, however, would not substantially affect the intersection analysis for the analysis hours because the travel paths to the nearby parking facilities (e.g., 450 South Street, UCSF Third Street Garage) would be similar (e.g., 450 South Street, UCSF Third Street garage).

The reduction in parking supply would result in the parking demand exceeding the variant parking supply during the weekday midday period for the No Event, Convention Event, and Basketball Game event. By contrast, the proposed project would result in the parking demand exceeding the proposed project parking supply during the weekday midday period for the Convention Event scenario. During the weekday midday period the unmet parking demand would be between 17 and 42 spaces for the No Event scenario (compared to none for the proposed project), would be between 874 and 899 for the Convention Event scenario (compared to 824 for the proposed project), and would be between 40 and 65 for the Basketball Game scenario (compared to none for the proposed project). In addition, during the weekday and Saturday evenings, the on-site unmet parking demand would increase for the Basketball Game scenario by 50 to 75 spaces. The parking demand that would not be met within the on-site supply would be accommodated in other off-street parking facilities in the study area or in on-street spaces, and would not substantially affect areawide parking conditions. See **Appendix TR**. Parking information is presented for informational purposes, since consistent with SB 743 (see Chapter 2, Introduction), parking effects are not considered significant impacts under CEQA for the proposed project or the variant.

Therefore, the only resource area with potentially different environmental effects from the proposed project is Wind, discussed below. Please see Chapter 5, Section 5.6, for a description of the existing wind conditions and the significance criterion and methodology used in the impact analysis below.

Wind

This section of the SEIR analyzes potential wind impacts that could occur as a result of the proposed variant. The analyses in this section are based in part on a wind study prepared by Rowan Williams Davies & Irwin Inc. (RWDI)[3] (see Appendix WS).

[3] Rowan Williams Davies & Irwin Inc., *Warriors Arena, San Francisco California, Pedestrian Wind Study*, May 15, 2015.

Significance Threshold

As with the project, the variant would have a significant impact related to wind if it were to:

- Alter wind in a manner that substantially affects public areas.

City Planning Code Section 148's wind standards provide an appropriate methodology and criteria for the analysis of wind effects in the Plan area. Consequently, for the purposes of CEQA review, an exceedance of the Planning Code's wind hazard criterion is used in this SEIR as the standard for determining whether the project would alter pedestrian winds in a manner that would substantially alter public areas. Wind effects on on-site publically accessible areas are not considered a significance threshold.

Wind Hazards at Off-site Public Areas

Impact V-WS-1: The variant would not alter wind in a manner that would substantially affect off-site public areas. (Less than Significant)

The proposed variant would include development of an event center, office and retail buildings, and other structures that would have the potential to alter winds off-site, including at pedestrian use areas such as public walkways and public open space in the variant vicinity.

A wind tunnel test was conducted to define the pedestrian wind environment that currently exists, and to determine future wind conditions on public use areas around the variant site with implementation of the variant. **Table 8-1** presents the wind analysis results, namely the 10 percent exceeded equivalent wind speeds and the number of hours per year the wind hazard criterion would be exceeded at 46 off-site study test points located on public walkways along the site perimeter and vicinity for the existing and existing-plus-variant wind scenarios. **Figure 8-3** presents a map showing the location of the off-site wind test points, including the location of wind hazards for the existing-plus-variant scenario.

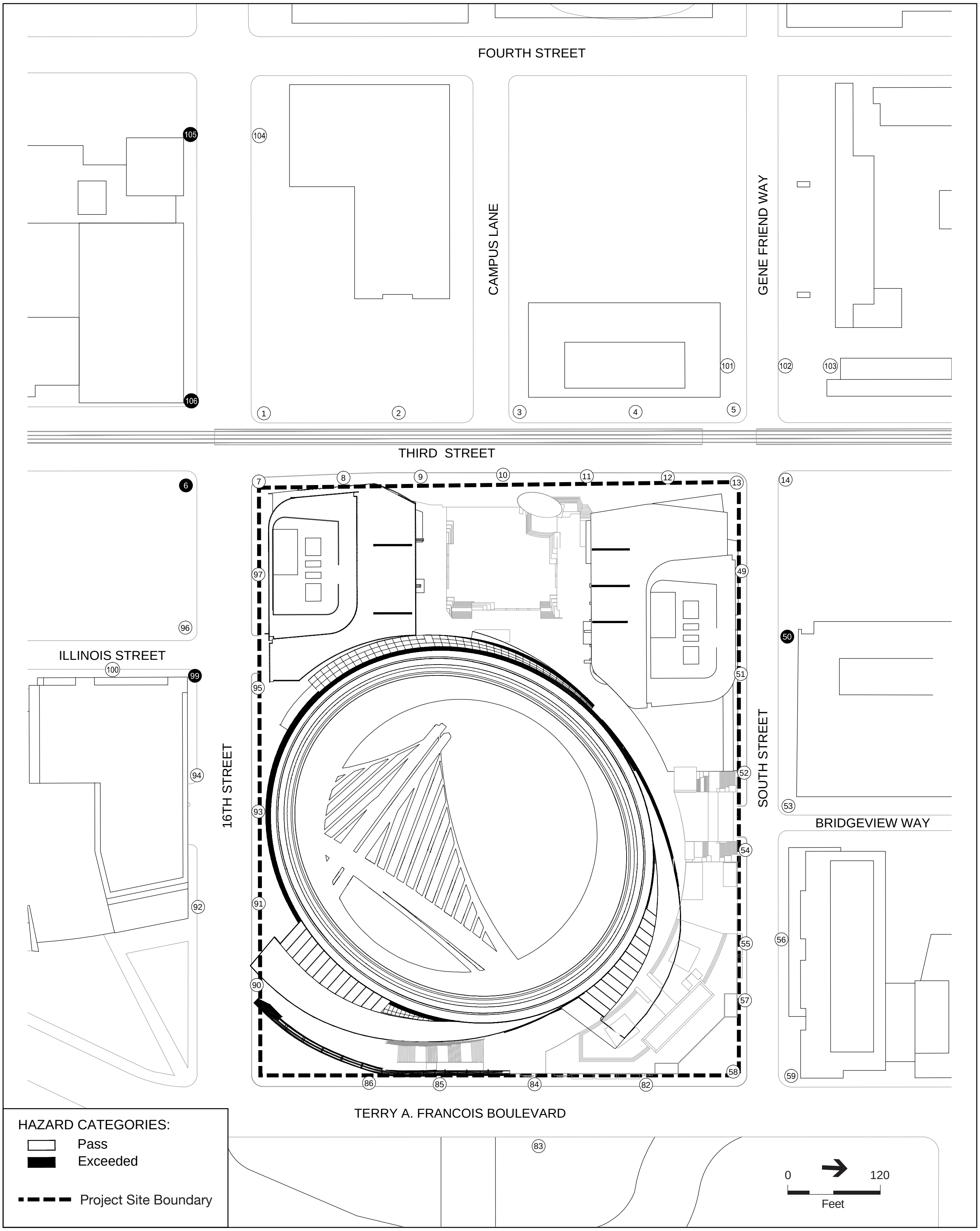
Existing Wind Hazard Conditions. Under existing conditions, the wind hazard criterion is exceeded at seven test locations on public walkways in the project vicinity. Currently, five test locations with wind hazards occur along 16th Street at test points adjacent to, across the street from, or upwind of the project site, one wind hazard location occurs along Gene Friend Way upwind of the project site, and one wind hazard location occurs on South Street adjacent to the project site. The total duration of the existing wind hazards at the seven locations on public walkways in the project vicinity is 106 hours per year, with 101 of those hours occurring at the five test points along 16th Street.

Existing-Plus-Variant Wind Hazard Conditions at Off-site Public Use Areas. Development of the variant would alter wind speeds among individual study test points at off-site public walkways. Under existing-plus-variant conditions, the total net number of off-site study test points at which wind speed would exceed the wind hazard criterion would be reduced from seven to five. There would also be a net decrease in the total duration of wind hazards on the off-site public walkways in the variant vicinity, decreasing from 106 hours per year under existing conditions to 92 hours per year under existing-plus-variant conditions (a decrease of 14 hours per year).

INSERT TABLE 8-1
EXISTING PLUS VARIANT WIND HAZARD CONDITIONS

VARIANT WIND HAZARD ANALYSIS - OFF-SITE STUDY POINTS

References		Existing			Variant			
Wind Test Location Number	Wind Hazard Criterion Speed miles/hour	1-hr./yr. Equivalent Wind Speed miles/hour	Wind Hazard Criterion Exceeded, hours/year	Source	1-hr./yr. Equivalent Wind Speed miles/hour	Wind Hazard Criterion Exceeded, hours/year	Hazard Hours Relative to Existing	Source
1	36	41	13	**e**	28		-13	**-**
2	36	28			22			
3	36	22			18			
4	36	14			19			
5	36	36			28			
6	36	36			42	22	22	**p**
7	36	39	6	**e**	34		-6	**-**
8	36	35			24			
9	36	29			29			
10	36	24			26			
11	36	15			27			
12	36	24			24			
13	36	33			27			
14	36	30			29			
49	36	31			20			
50	36	35			39	3	3	**p**
51	36	34			33			
52	36	31			28			
53	36	23			27			
54	36	38	3	**e**	26		-3	**-**
55	36	29			23			
56	36	22			26			
57	36	30			22			
58	36	19			23			
59	36	21			17			
82	36	31			23			
83	36	31			27			
84	36	34			20			
85	36	31			25			
86	36	32			23			
90	36	29			20			
91	36	34			24			
92	36	32			20			
93	36	31			27			
94	36	29			18			
95	36	35			24			
96	36	29			30			
97	36	34			21			
99	36	40	8	**e**	41	17	9	**p**
100	36	22			20			
101	36	32			27			
102	36	35			31			
103	36	37	1	**e**	34		-1	**-**
104	36	33			30			
105	36	45	70	**e**	42	43	-27	**e**
106	36	39	5	**e**	40	7	2	**p**
Ave 1-hr. Equivalent Wind Speed		**30.7**			**26.7**			
Total Hours Winds Exceeds Criterion			**106**			**92**	**-14**	
Total Exceedances:		**Total:**	**7**			**Total:**	**5**	
Subtotals by type:		*Existing*	7	**e**		*Existing*	1	**e**
						New, or increased time	4	**p**
						New, at new location	0	**n**
						Eliminated by Project	4	**-**



SOURCE: RWDI, 2015

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Event Center and Mixed-Use Development at Mission Bay Blocks 29-32

Figure 8-3
Existing Plus Third Street Variant Wind Hazard Conditions

When considering individual wind test points, the variant would result in the following changes to the wind environment in the variant vicinity compared to existing conditions (see Figure 8-2 for test point locations):

- Create new exceedances of the wind hazard criterion at two test points: at the southeast corner of Third Street and 16th Street (Test Point No. 6: 22 hours per year); and on the north side of South Street between Third Street and Bridgeview Way across from the project site (Test Point No. 50: 3 hours per year);
- Increase the duration of two existing wind hazard exceedances: at the southeast corner of 16th Street and Illinois Street (Test Point No. 99: 9 hour increase per year); and at the southwest corner of Third Street and 16th Street (Test Point No. 106: 2 hour increase per year);
- Decrease the duration of one existing wind hazard: on 16th Street between Third and Fourth Streets (Test Point No. 105: 27 hour decrease per year); and
- Eliminate four existing exceedances of the wind hazard criterion: at the northwest corner of Third Street and 16th Street (Test Point No. 1: 13 hours eliminated per year); at the northeast corner of Third Street and 16th Street (Test Point No. 7: 6 hours eliminated per year); on South Street adjacent to the site (Test Point No. 54: 3 hours eliminated per year); and on Gene Friend Way adjacent to UCSF Hearst Tower (Test Point No. 103: 1 hour eliminated per year).

It should be noted that the wind test results indicate that under existing-plus-variant conditions, no wind hazard exceedances would occur on public walkways located on the east side of the project site. Given that the planned Bayfront Park is located even further east, it can also be inferred from the wind test data that the variant would not cause a new wind hazard within the planned Bayfront Park.

In summary, the variant would result in a net decrease in the total duration of the wind hazard exceedance at off-site public walkways in the variant vicinity. Consequently, the variant would not alter wind in a manner that would substantially affect off-site public areas, and accordingly, the impact would be less than significant and no mitigation would be required.

Mitigation: Not required.

Comparison of Variant Impact V-WS-1 to Proposed Project Impact WS-1

As discussed in Section 5.6, in Impact WS-1, the project would result in a net increase in the total duration of the wind hazard exceedance at off-site public walkways in the project vicinity. Consequently, the project would alter wind in a manner that would substantially affect off-site public areas, and accordingly, Impact WS-1 would be significant. Mitigation Measure M-WS-1 in Section 5.6 identifies potential design measures that would serve to reduce or avoid related project wind hazards, however, given that the project design is not yet finalized, Impact WS-1 is conservatively identified as *significant and unavoidable with mitigation.* Since, as discussed in Impact V-WS-1 above, the variant wind hazard impacts would be less than significant with no mitigation required, the variant would avoid the significant wind hazard impact of the project.

Comparison of Impact V-WS-1 to Mission Bay FSEIR Impact Analysis

As discussed in Chapter 5, Section 5.6, under Summary of Impacts in the Mission Bay FSEIR, the Mission Bay FSEIR reported that proposed buildings 100 feet or higher could generate pedestrian-level wind effects, including increased wind speeds and turbulence. The Mission Bay FSEIR determined that with implementation of Mitigation Measure D.7, which required wind review, including wind tunnel testing, of proposed structures over 100 feet in height, and provided for design-specific analysis of wind hazards and a basis to incorporate design modifications to reduce significant wind hazards, that Mission Bay plan wind impacts would be less than significant.

Consistent with Mission Bay FSEIR Mitigation Measure D.7 (and the South Design for Development *Wind Analysis* standards), wind tunnel testing and analysis was conducted for the variant. As discussed above, variant wind hazard impacts at off-site public areas are determined be less than significant. As a result, the variant would not result in a substantially more severe significant wind impact than was previously identified in the Mission Bay FSEIR.

Supplemental Information – Variant Wind Hazard Effects at On-site Publically Accessible Areas of Substantial Pedestrian Use

The variant would include a variety of privately-owned, publically accessible on-site plazas and exterior walkways that would be located throughout and at varying elevations on the variant site. These proposed publically accessible areas on the variant site would experience wind effects resulting from proposed on-site development and surrounding off-site development in the project vicinity. On-site publically accessible areas that may be subject to periods of high pedestrian use, particularly prior to and following games/events at the event center, include the following:

- *Main Lower Plaza (0 feet el.), Main Upper Plaza (10 feet el.) and Approaches:* This area includes the Main Lower Plaza, the elevated Main Upper Plaza and adjacent on-site pedestrian approaches from Third Street. The primary entrance to the event center is accessed via these plazas.

- *Event Center North Side Pedestrian Path (10 to 26 feet el.):* This proposed walkway would serve as the primary pedestrian pathway around the north side of the event center, and would connect the Third Street Plaza with the bayfront overlook and Southeast Plaza. This proposed walkway would provide access to the secondary entrance to the event center for large events.

- *Event Center Southwest Side Pedestrian Path (0 to 10 feet el.):* This proposed walkway would provide pedestrian access around the southwest side of the event center, and provide access between 16th Street and the Third Street Plaza.

- *Southeast Plaza (0 feet el.)*: This proposed ground-level plaza would be located in the southeast corner of the project site. The primary entrance to the event center for smaller "theater" events, and the secondary entrance for large events, would be via this plaza.

- *Bayfront Overlook (26 feet el.):* This elevated area is located on the east side of the site adjacent to the event center and would overlook the Bay.

As discussed above, wind effects on on-site publically accessible areas are not considered a significance threshold. Nonetheless, project wind effects at on-site publically accessible areas that would be subject to substantial pedestrian use may be of interest to members of the public and to decision-makers, and are therefore presented herein for informational purposes. A discussion of potential wind effects at the on-site areas of substantial pedestrian use identified above is presented herein for informational purposes.

Other outdoor areas within the variant site that may offer private and/or public pedestrian access, include the office and retail building podium roofs (90 foot el.), the food hall roof (41-foot el.), and the event center bayfront terrace (pedestrian deck at approximate 100-foot el.). However, since the event center and/or office and retail building operators would have greater access control over these site areas so as to be able to restrict pedestrian access in the event of hazardous windy conditions, potential variant wind effects at these specific areas are not discussed further.

Under existing-plus-variant conditions, two on-site study test points at the proposed event center on the north side pedestrian path would exceed the wind hazard criterion, for a total of 24 hours per year. One of the Third Street approaches to Main Lower Plaza would also exceed the wind hazard criterion, for a total of 9 hours per year. No exceedances of the wind hazard criterion would occur at any of the other areas of substantial pedestrian use at the variant site.

Cumulative Impact— Wind

Wind Hazards at Off-site Public Areas

Impact V-C-WS-1: The variant, in combination with cumulative development, would not alter wind in a manner that would substantially affect off-site public areas. (Less than Significant)

Under cumulative conditions, past, present, and reasonably foreseeable future buildings 100 feet and taller within the variant vicinity would have the potential to result in localized wind effects that could be adverse. As part of the wind tunnel testing, one test was conducted to evaluate the pedestrian wind environment that would exist with the variant, in combination with reasonably foreseeable cumulative development, on public use areas around the variant site. In the immediate variant vicinity, this included assumed cumulative development on currently undeveloped portions of Blocks 27, 25, X3 and 33, located north, west, southwest and south of the variant site, respectively. Development of the undeveloped portions of these blocks is considered reasonably foreseeable. This scenario is consistent with the scenario used to analyze cumulative impacts for the proposed project.

Cumulative development would alter wind speeds among individual off-site study test points. The off-site wind hazards that would occur under cumulative-plus-variant conditions would be fewer than would occur under both existing conditions (reduced from 7 to 3) and existing-plus-variant conditions (reduced from 5 to 3). Furthermore, the duration of the wind hazards that would occur under cumulative-plus-variant conditions -23 hours – would be less than would occur under existing conditions (106 hours) and existing-plus-variant conditions (92 hours). Consequently, cumulative wind hazard impacts would be *less than significant*.

Mitigation: Not required.

Comparison of Impact WS-1 to Mission Bay FSEIR Impact Analysis. Consistent with Mission Bay FSEIR Mitigation Measure D.7 (and the South Design for Development *Wind Analysis* standards), wind tunnel testing and analysis was conducted for both variant and cumulative conditions. As discussed above, cumulative impacts of wind hazards at off-site public areas would be less than significant. Therefore, the variant would not result in any new or substantially more severe significant cumulative wind hazard impacts than those previously identified in the Mission Bay FSEIR.

Supplemental Information – Cumulative Wind Hazard Effects at On-site Publically Accessible Areas of Substantial Pedestrian Use

As discussed above, wind effects on on-site publically accessible areas are not considered a significance threshold; however, a discussion of potential cumulative wind effects at on-site areas of substantial pedestrian use is presented herein for informational purposes.

Under cumulative-plus-variant conditions, one on-site study test point on the event center north side pedestrian path would exceed the wind hazard criterion, for a total of 12 hours; however, this would be less than the total duration of the exceedances that would occur on this pedestrian path under existing-plus-variant conditions (24 hours). No exceedances of the wind hazard criterion would occur at any of the other areas of substantial pedestrian use at the variant site.

8.4 Other CEQA Issues and Alternatives

As indicated above, the impact analysis for the proposed project, with the exception of the Wind section, applies equally to the Third Street Plaza Variant. Therefore, in addition to the impact evaluation for the resource topics covered in Chapter 5, the discussion of other CEQA issues in Chapter 6 also applies to the variant; these topics include growth inducing impacts, significant and unavoidable impacts, effects found not to be significant, irreversible and irretrievable commitments of resources, and areas of known controversy and issues to be resolved. Furthermore, because implementation of the Third Street Plaza Variant would result in the same significant impacts as the proposed project—with the exception of the wind hazard impact as described above—the alternatives analysis presented in Chapter 7 of this SEIR also applies to the variant and no further analysis is required.

CHAPTER 9

Report Preparers

9.1 SEIR Authors

Office of Community Investment and Infrastructure
(Successor to the San Francisco Redevelopment Agency)
One South Van Ness Avenue
San Francisco, CA 94103

- Executive Director: Tiffany Bohee
- Project Manager: Catherine Reilly
- Associate Planner: Immanuel Bereket

San Francisco Planning Department
Environmental Planning
1650 Mission Street, Suite 400
San Francisco, CA 94103

- Environmental Review Officer (ERO): Sarah Jones
- Former Deputy ERO/Former Deputy Director of Environmental Planning: Viktoriya Wise, AICP, LEED AP
- Senior Environmental Review Coordinator: Chris Kern
- Environmental Review Coordinator: Brett Bollinger
- Senior Transportation Planner: Bill Wycko
- Air Quality Specialist: Jessica Range
- Archaeologist: Randall Dean

Office of the City Attorney
City Hall Room 234
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

- Deputy City Attorney: John Malamut

Office of Economic Workforce and Development
City Hall Room 448
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

- Jennifer Matz
- Adam Van de Water

San Francisco Municipal Transportation Agency
1 South Van Ness Avenue, 7th Floor
San Francisco, CA 94105

- Transportation Planner: Peter Albert
- Transportation Planner: Erin Miller

9.2 SEIR Consultants

Environmental Science Associates
550 Kearny Street, Suite 800
San Francisco, CA 94108

- Principal-in-Charge: Gary Oates
- SEIR Project Director: Brian Boxer, AICP
- SEIR Project Manager: Paul Mitchell
- SEIR Deputy Project Manager: Jonathan Carey, AICP, LEED AP

- Brad Allen
- Rebecca Allen
- Lisa Bautista
- Chuck Bennett
- Brad Brewster
- Sean Burlingame
- Tonya Chapman
- Rachel Danielson
- Danielle Dowler
- Peter Green
- Roman Gutierrez
- Roman Gutierrez
- Karl Heisler
- Chris Lockwood
- Karen Lancelle
- Chris Mueller
- Anthony Padilla
- Chris Rogers
- Logan Sakai
- Chris Sanchez
- Ron Teitel
- Paul Zimmer

Orion Environmental Associates
211 Sutter Street, Suite 803
San Francisco, CA 94108

- Senior Technical Coordinator: Joyce Hsiao
- Mary Lucas McDonald, RG

Hydroconsult Engineers, Inc.
45 Polk Street, 3rd Floor
San Francisco, CA 94102

- Beth Goldstein, PE

Adavant Consulting
200 Francisco Street, 2nd Floor
San Francisco, CA 94133

- José Farrán, PE

LCW Consulting
3990 20th Street
San Francisco, CA 94114

- Luba Wyznyckyj, AICP

Fehr & Peers Transportation Consultants
332 Pine Street
4th Floor
San Francisco, CA 94104

- Chris Mitchell, PE
- Eric Wommeldorff, PE

9.3 Project Sponsors and Consultants

Golden State Warriors
1011 Broadway
Oakland, CA 94607

- David Kelly, Vice President and General Counsel
- David Carlock, Project Executive
- Kate Aufhauser, Project Analyst

Strada Investment Group
100 Spear Street, Suite 2080
San Francisco, CA 94105

- Clarke Miller, Senior Vice President

Gibson Dunn & Crutcher, LLP
555 Mission Street, Suite 3000
San Francisco, CA 94105

- Mary G. Murphy, Counsel to the Golden State Warriors
- Neil H. Sekhri, Counsel to the Golden State Warriors
- Allison Kidd, Counsel to the Golden State Warriors

Remy Moose Manley, LLP
555 Capitol Mall, Suite 800
Sacramento, CA 95814

- Whitman Manley, CEQA Counsel
- Christopher Stiles, CEQA Counsel

Rowan Williams Davies & Irwin Inc.
650 Woodlawn Road West
Guelph, Ontario, Canada
N1K 1B8

- Jill Bond, B.A.Sc., E.I.T., Technical Coordinator
- Dan Bacon, Senior Project Manager / Associate
- Frank Kriksic, B.E.S., C.E.T., LEED AP, Project Director / Principal

Ramboll Environ
201 California Street, Suite 1200
San Francisco, CA 94111

- Michael Keinath, PE
- Catherine Mukai, PE