APPENDIX FEIR-1

Draft EIR Comment Letters

DEPARTMENT OF TRANSPORTATION
DISTRICT 7- OFFICE OF REGIONAL PLANNING
100 S. MAIN STREET, SUITE 100
LOS ANGELES, CA 90012
PHONE (213) 266-3574
FAX (213) 897-1337
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

December 30, 2020

Jivar Afshar
City of Los Angeles, Department of City Planning
221 North Figueroa Street, Suite 1350
Los Angeles, CA 90012

RE: 676 Mateo Street Project – Draft Environmental Impact Report (DEIR)
SCH# 2018021068
GTS# 07-LA-2018-03446
Vic. LA-10 PM 17.708

Dear Jivar Afshar:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The Project would involve the demolition of the existing warehouse and surface parking lot, and the construction of an up to 197,355-square-foot mixed-use building including up to 185 live/work units, approximately 15,320 square feet of open space for residents, up to 23,380 square feet of art-production and commercial space, and associated parking facilities. Eleven percent of the units (20 live/work units) would be deed-restricted for Very Low-Income households. The Project also proposes the ability to implement an "Increased Commercial Flexibility Option" (Flexibility Option) that would provide the Project the flexibility to increase the commercial square footage and, in turn, reduce the overall amount of live/work units from 185 live/work units to 159 live/work units, with a commensurate reduction in deed-restricted Very Low Income units. 1

The nearest State facility to the proposed project is Interstate 10. After reviewing the DEIR, Caltrans has the following comments:

Caltrans acknowledges and supports infill development that provides a mix of land uses which allow a neighborhood to meet their needs for housing, work, and services, like the proposed Project aims to facilitate. Caltrans also applauds the inclusion of deed restricted low-income housing and concurs with Project Design Feature (PDF) TR-2, which reduces car parking and creates additional bike parking. Since the intention of PDF TR-2 is to reduce car parking, based on the Project's location and land use context, Caltrans recommends reducing the amount of car parking to the smallest number of spaces possible. Research looking at the relationship between land-use, parking, and transportation indicates that car parking prioritizes driving above all other travel modes and undermines a community's ability to choose public transit and active modes of transportation. For any community or city to better support all modes of transportation and reduce vehicle miles traveled, we recommend the implementation of Transportation Demand Management (TDM) measures as an alternative to requiring car parking. 2

If the car parking must be built, it should be designed in a way that is conducive to adaptive reuse. They should contain flat floors with ramps on the exterior edge, so that they can be more easily converted to beneficial uses in the future. 3

Caltrans does not expect project approval to result in a direct adverse impact to the existing State transportation facilities. Additionally, any transportation of heavy construction equipment and/or materials which requires use of oversized-transport vehicles on State highways will need a Caltrans transportation permit. We recommend large size truck trips be limited to off-peak commute periods. 4

If you have any questions, please contact project coordinator Anthony Higgins, at anthony.higgins@dot.ca.gov and refer to GTS# 07-LA-2018-03446. 5

Sincerely,

Miya Edmonson

MIYA EDMONSON
IGR/CEQA Branch Chief
cc: Scott Morgan, State Clearinghouse

Los Angeles Unified School District

Office of Environmental Health and Safety

AUSTIN BEUTNER
Superintendent of Schools

CARLOS A. TORRES
Director, Environmental Health and Safety

JENNIFER FLORES
Deputy Director, Environmental Health and Safety

January 20, 2021

Jivar Afshar
Los Angeles Department of City Planning
221 N. Figueroa St., Suite 1350
Los Angeles, CA 90012

PROJECT LOCATION: 668-678 S Mateo Street, 669-679 S. Imperial Street
PROJECT: 676 Mateo Street Project

Presented below are comments submitted on behalf of the Los Angeles Unified School District (LAUSD) regarding the subject project located at 668-678 S Mateo Street, 669-679 S. Imperial Street. LAUSD is concerned about the potential negative impacts of the project on our students, staff and parents traveling to and from Metropolitan High School since the project site is approximately from 620 feet from the school. While COVID-19 has caused LAUSD to implement remote learning for the time being, we request that these comments apply when LAUSD clears students to return to campus. 1

Based on the extent/location of the proposed development, it is our opinion that environmental impacts on the surrounding community (traffic, pedestrian safety) may occur. Since the project may have an environmental impact on LAUSD schools, recommended conditions designed to help reduce or eliminate potential impacts are included in this response.

Traffic/Transportation
LAUSD's Transportation Branch **must be contacted** at (213) 580-2950 regarding the potential impact upon existing school bus routes. The Project Manager or designee will have to notify the LAUSD Transportation Branch of the expected start and ending dates for various portions of the project that may affect traffic within nearby school areas. To ensure that effective conditions are employed to reduce construction and operation related transportation impacts on District sites, including the net increase of 1000 or more daily vehicle trips, we ask that the following language be included in the recommended conditions for traffic impacts:

- School buses must have unrestricted access to schools. 2
- During the construction phase, truck traffic and construction vehicles may not cause traffic delays for our transported students.
- During and after construction changed traffic patterns, lane adjustment, traffic light patterns, and altered bus stops may not affect school buses' on-time performance and passenger safety.
- Construction trucks and other vehicles are required to stop when encountering school buses using red-flashing-lights must-stop-indicators per the California Vehicle Code.
- Contractors must install and maintain appropriate traffic controls (signs and signals) to ensure vehicular safety.

- Contractors must maintain ongoing communication with LAUSD school administrators, providing sufficient notice to forewarn children and parents when existing vehicle routes to school may be impacted.

- Parents dropping off their children must have access to the passenger loading areas.

2 cont.

Pedestrian Safety

Construction activities that include street closures, the presence of heavy equipment and increased truck trips to haul materials on and off the project site can lead to safety hazards for people walking in the vicinity of the construction site. To ensure that effective conditions are employed to reduce construction and operation related pedestrian safety impacts on District sites, we ask that the following language be included in the recommended conditions for pedestrian safety impacts:

- Contractors must maintain ongoing communication with LAUSD school administrators, providing sufficient notice to forewarn children and parents when existing pedestrian routes to school may be impacted.

- Contractors must maintain safe and convenient pedestrian routes to all nearby schools. The District will provide School Pedestrian Route Maps upon your request.

- Contractors must install and maintain appropriate traffic controls (signs and signals) to ensure pedestrian and vehicular safety.

- Haul routes are not to pass by ***any*** school, except when school is ***not*** in session.

- No staging or parking of construction-related vehicles, including worker-transport vehicles, will occur on or adjacent to a school property.

- Funding for crossing guards at the contractor's expense is required when safety of children may be compromised by construction-related activities at impacted school crossings.

- Barriers and/or fencing must be installed to secure construction equipment and to minimize trespassing, vandalism, short-cut attractions, and attractive nuisances.

- Contractors are required to provide security patrols (at their expense) to minimize trespassing, vandalism, and short-cut attractions.

3

The District's charge is to protect the health and safety of students and staff, and the integrity of the learning environment. The comments presented above identify potential environmental impacts related to the proposed project that must be addressed to ensure the welfare of the students attending Metropolitan High School their teachers and the staff, as well as to assuage the concerns of the parents of these students. However, due to COVID - 19 the school is currently closed, and health and safety concerns are minimized. Therefore, the recommended conditions set forth in these comments should be adopted as conditions of project approval to offset environmental impacts on the affected school students and staff when school is in session.

4

Thank you for your attention to this matter. If you need additional information, please contact me at (323) 286-7377.

Regards,



Alex Campbell
Assistant CEQA Project Manager

 Comment Letter No. 3

Connect Create Collaborate

Jivar Afshar <jivar.afshar@lacity.org>

ENV-2016-3691-EIR

1 message

M G Lord <marylord@usc.edu> Sat, Jan 2, 2021 at 12:45 PM
To: jivar.afshar@lacity.org
Cc: "M. G. Lord" <m.g.lord.writes@gmail.com>

Dear Jivar Afshar:

What is the proposed date for demolition to begin on this project? **1**

I live in a loft that I own on the second floor of the Biscuit Company Lofts. It looks out onto 676 Mateo Street, directly opposite the address where demolition will occur. As you know, because of the surge in corona virus cases in Southern California, we are under safer-at-home work orders until the summer. If demolition and construction begin this spring, THIS WILL DESTROY MY WORK LIFE AND RUIN ME FINANCIALLY.

Here is the situation: I am an associate professor in the English Department at the University of Southern California. Beginning the week after next, I need to teach classes from my home via Zoom on Monday, Tuesday and Thursday each week. Because of my health and my age, I have been ordered not to return to campus. (Most of the campus is closed anyway: I can no longer access the building where the office that I share with another professor is housed.) **2**

If I had had warning that demolition--with its monstrous amount of noise--would begin during the spring semester, I could have petitioned last fall for a place other than my locked office from which to teach. Obtaining such a workspace is now out-of-the-question.

The letter we received about the project recognizes "significant and unavoidable" impacts related to "Noise and Vibration." Last April, the noise from minor renovations of a one-story factory building next to 676 Mateo made Zoom-teaching from my loft very difficult. I know that a full-on demolition will prevent me from teaching. I will have to find an office to rent (which I cannot afford) or take an unpaid leave of absence (which would not only cripple me financially but derail any future promotions). **3**

Please consider postponing demolition until at least June. THE STAY-AT-HOME ORDER HAS MADE THIS A UNIQUE TIME THAT CALLS FOR UNIQUE ARRANGEMENTS AROUND NOISE-GENERATING CONSTRUCTION.

Everyone I know on my floor works from home. The pandemic has clobbered us financially. Because of the presence of the Biscuit and Toy lofts on Mateo Street, the neighborhood is no longer "industrial;" it is residential. And--at least for a few months--it needs the protection from noise afforded to residential neighborhoods.

Alternatively, perhaps the developer should compensate us for the destruction of our livelihoods during the stay-at-home period. **4**

Thank you for taking these unique circumstances into consideration.
And again, would you please let me know the current demolition schedule?

Yours sincerely,
M.G. Lord
--
M.G. Lord
Associate Professor of English (Practice)
University of Southern California
marylord@usc.edu
m.g.lord.writes@gmail.com
323-352-8499

Jivar Afshar <jivar.afshar@lacity.org> Mon, Jan 4, 2021 at 9:32 AM
To: "M. G. Lord" <m.g.lord.writes@gmail.com>

Hello,

Thank you for your comments, we have included them in our records. The demolition activities are anticipated to start in 2021. Please keep in mind that the exact month of demolition has not been anticipated.

Best Regards,
Jivar
[Quoted text hidden]
--

LOS ANGELES CITY PLANNING

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org
E-NEWS

M. G. Lord <m.g.lord.writes@gmail.com> Mon, Jan 4, 2021 at 9:52 AM
To: Jivar Afshar <jivar.afshar@lacity.org>

Dear Jivar,
Thank you for acknowledging receipt of my concerns about what month in 2021 the demolition at 676 Mateo Street will begin.

Over the weekend I encountered new concerns. This morning in the LA Times headline email I read: "In Los Angeles County, now a national hot spot of the coronavirus crisis, the statistics are hard to process. A person is dying every 10 minutes. And Mayor **Eric Garcetti** said a person is getting infected every six seconds."

Every six seconds! It's astonishing. And it further suggests that FORCING hundreds of live/work residents (who have been in strict compliance with the work-from-home order) to leave their safe homes for dangerous unknown work spaces could create a vast public health problem in the coming months.

As I mentioned earlier, this is not an issue with the project going forward. It is an issue with the timing of its start. THE PANDEMIC HAS CREATED A UNIQUE SITUATION. Any policy implemented now will not set a precedent, because these are unprecedented times.

Please consider deferring the start of demolition until the fall (or even late summer) of 2021. This will give the hundreds of live-work residents across the street from the demolition time to secure safe alternative workspaces for the two years of construction that will follow.

It's not even safe to LOOK AT OFFICES NOW: Realtors don't want to visit the spaces in person, either.

5

Again, thank you very much for your consideration.

Yours sincerely,
M.G.

M.G. Lord

Associate Professor (Practice)
Department of English
University of Southern California
marylord@usc.edu

[Quoted text hidden]

M. G. Lord <m.g.lord.writes@gmail.com> Tue, Jan 5, 2021 at 11:04 AM
To: Jivar Afshar <jivar.afshar@lacity.org>

Hi, Jivar.
I'm sure everyone in your office reads the Times and Laist.

But I wanted officially (as a comment on ENV-2016-3691-EIR) to bring to your attention yesterday's story on SAG-AFTRA pushing
for a halt to film production here until later in the year.
The story mentions that EVERY SIX SECONDS someone in Los Angeles is infected with coronavirus: https://laist.com/latest/post/20210104/sag-aftra-production-hold-covid-los-angeles
This is really not the time to force people following the safe-at-home order out of the safety of their homes.
Things might be better later in 2021, possibly in June or July.
Thank you for your consideration.

6

Yours sincerely, M.G.

M.G. Lord
Associate Professor of English (Practice)
University of Southern California

[Quoted text hidden]

 Comment Letter No. 4

Connect Create Collaborate

Jivar Afshar <jivar.afshar@lacity.org>

ENV-2016-3691-EIR

5 messages

Matt Cluett <cluett@gmail.com> Tue, Dec 29, 2020 at 11:10 AM
To: jivar.afshar@lacity.org

Hi Jivar,

In response to ENV-2016-3691-EIR

What is the proposed construction date for this project? **1**

I live at the Biscuit Company Lofts. My unit is on the second floor directly facing Mateo and the proposed construction site. This project would turn my life upside down. We are under *safer at home* work orders until next summer, but outside of Covid many of us work from home here. In fact, all of us who face Mateo on the 2nd floor do.

In building another work / live space this project would take away our ability to work from home. None of us can afford to rent office spaces, we have all been hit hard by the pandemic.

It would be absolutely devastating and we would be forced to move or sell - but this project would also make our units impossible to rent or sell during the 2 year construction. **2**

We barely survived 2 renovations (in the space of 36 months) at the restaurant beneath us (former church & state).

I cannot understand this location choice when Mateo & Santa Fe are practically empty between 7th & 8th. They could build there without disrupting anyone. **3**

Our window sills have to be cleaned every other day just from other construction nearby. I can't imagine what this build would do to our lungs. My wife has asthma.

Please reconsider. There is so much space and other areas nearby that need to be revitalized. **4**

We are all devastated by this proposal. We've had a devastating year and now we are facing losing our home.

Thanks for your re-consideration,

Matt Cluett

Jivar Afshar <jivar.afshar@lacity.org> Wed, Dec 30, 2020 at 9:32 AM
To: Matt Cluett <cluett@gmail.com>

Hello Matt,

We have received your comments and added to our records. Thank you for your comments.
In regards to the duration of the construction period please refer to Chapter II-Project description of the DEIR.

Best Regards,
Jivar
[Quoted text hidden]
--

LOS ANGELES CITY PLANNING

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012

Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org



Matt Cluett <cluett@gmail.com> Wed, Dec 30, 2020 at 9:49 AM
To: Jivar Afshar <jivar.afshar@lacity.org>

Thanks will do. Can you confirm the proposed start date?

Sent from my iPhone
(213) 952-6090

> On Dec 30, 2020, at 09:32, Jivar Afshar <jivar.afshar@lacity.org> wrote:
>
> [Quoted text hidden]

Jivar Afshar <jivar.afshar@lacity.org> Wed, Dec 30, 2020 at 10:13 AM
To: Matt Cluett <cluett@gmail.com>

The demolition activities are anticipated to start in 2021.
[Quoted text hidden]

Matt Cluett <cluett@gmail.com> Wed, Dec 30, 2020 at 12:30 PM
To: Jivar Afshar <jivar.afshar@lacity.org>

Hi Jivar, thanks for the response. Could you tell us what month? I am for certain not returning to work until July earliest.

Thanks,

Matt
[Quoted text hidden]

Connect Create Collaborate

Comment Letter No. 5

Jivar Afshar <jivar.afshar@lacity.org>

NEW COMMENT ON ENV-2016-3691-EIR

2 messages

M. G. Lord <m.g.lord.writes@gmail.com> Fri, Jan 8, 2021 at 3:04 PM
To: Jivar Afshar <jivar.afshar@lacity.org>

Hi, Jivar.
I'd like to add another thought to the comments that influence the city's decision to permit construction to begin on this project on Mateo Street.
Los Angeles County has extended eviction protection for tenants until the end of February: https://laist.com/2021/01/05/eviction-moratorium-extends-LA-county-February.php
The county recognizes that forcing residents out of their homes during a stay-at-home order is not a judicious or humane course of action. **1**

I would argue that forcing people who work at home from their safe home offices because of excessive noise is also injudicious and inhumane.
This would be another reason to DELAY demolition until later in the year. By the summer, one hopes there will be greater vaccine availability and possibly a cessation in the infection surge that we're now seeing. **2**

Please consider postponing demolition until the stay-at-home order has been lifted and residents near the construction site have time to secure alternative work spaces. **3**
Thank you for your time and consideration,
M.G.

M.G. Lord
Associate Professor of English (Practice)
University of Southern California
marylord@usc.edu

Jivar Afshar <jivar.afshar@lacity.org> Thu, Jan 21, 2021 at 9:25 AM
To: "M. G. Lord" <m.g.lord.writes@gmail.com>

Hello,

Thank you for your comments. I have added your comment to our records.

Best regards,
Jivar
[Quoted text hidden]
--

LOS ANGELES CITY PLANNING

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org
E-NEWS

ADAMS BROADWELL JOSEPH & CARDOZO
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
601 GATEWAY BOULEVARD, SUITE 1000
SOUTH SAN FRANCISCO, CA 94080-7037
TEL: (650) 589-1660
FAX: (650) 589-5062
khartmann@adamsbroadwell.com

SACRAMENTO OFFICE
520 CAPITOL MALL, SUITE 350
SACRAMENTO, CA 95814-4721
TEL: (916) 444-6201
FAX: (916) 444-6209

DANIEL L. CARDOZO
CHRISTINA M. CARO
THOMAS A. ENSLOW
ANDREW J. GRAF
TANYA A. GULESSERIAN
KENDRA D. HARTMANN*
KYLE C. JONES
RACHAEL E. KOSS
AIDAN P. MARSHALL
WILLIAM C. MUMBY

MARC D. JOSEPH
Of Counsel

**Not admitted in California. Licensed in Colorado.*

January 25, 2021

Via Email and Overnight Mail

Jivar Afshar, Planning Assistant
City of Los Angeles
Department of City Planning
221 N. Figueroa St., Suite 1350
Los Angeles, CA 90012
Email: jivar.afshar@lacity.org

Via Email Only
Vince Bertoni, Director of Planning
Email: vince.bertoni@lacity.org

Re: Preliminary Comments on the Draft Environmental Impact Report – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Dear Ms. Afshar and Mr. Bertoni:

We are writing on behalf of Coalition for Responsible Equitable Economic Development ("CREED LA") to provide these preliminary comments on the Draft Environmental Impact Report ("DEIR") prepared for the 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV 2016-3691-EIR) ("Project"), proposed by District Centre, LP, & District Centre-GPA, LP (collectively, "Applicant"). The Project proposes the demolition of the existing warehouse and surface parking lot, and the construction of an up-to 197,355-square-foot mixed-use building, including up to 185 live/work units, approximately 15,320 square feet of open space for residents, up to 23,380 square feet of art-production and commercial space, and associated parking facilities. The Project site is located at 668-678 S. Mateo Street and 669-679 S. Imperial Street in the Central City North community of the City of Los Angeles, and consists of eight contiguous lots associated with Assessor Parcel Number 5164-020-021. 1

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This letter contains the preliminary comments of CREED LA and its technical consultants based on an initial review of the DEIR. As discussed below, the City failed to provide CREED LA with timely access to the DEIR reference documents, as required by the California Environmental Quality Act[1] ("CEQA"). The City also declined CREED LA's January 20, 2021 request to extend the formal public comment period to allow additional time for the public to review DEIR reference documents that were provided just days before the end of the DEIR's current public comment period.[2] Due to the limited time provided for public comment, and CREED LA's limited access to documents underlying the DEIR's analysis, we have not had adequate time to fully review and comment on the DEIR. We reserve the right to supplement supplemental comments on the DEIR by February 8, 2021, and at any and all later proceedings related to this Project.[3]

Based on our initial review, it is clear that the DEIR fails to comply with CEQA[4] in several respects. As explained more fully below, the DEIR fails to accurately disclose the extent of the Project's potentially significant impacts on air quality, greenhouse gases ("GHG"), public health, and noise; fails to support its findings with substantial evidence; and fails to properly mitigate the Project's potentially significant impacts. The City cannot approve the Project until the errors in the DEIR are remedied and a revised DEIR is circulated for public review and comment.

We reviewed the DEIR and its appendices with the assistance of highly qualified technical consultants, including air quality consultant James Clark, Ph.D.[5] and acoustics expert Neil A. Shaw, FASA, FAES.[6] The attached expert comments require separate responses under CEQA.[7]

1 cont.

[1] Pub. Resources Code ("PRC") §§ 21000 et seq.; 14 Cal. Code Regs. ("CCR") §§ 15000 et seq.; PRC § 21092(b)(1); 14 CCR § 15087(c)(5).
[2] The City has provided CREED LA an informal extension to February 8, 2021 to submit its DEIR comments, but declined to extend the existing CEQA public comment period, which ends on January 25, 2021.
[3] Gov. Code § 65009(b); PRC § 21177(a); *Bakersfield Citizens for Local Control v. Bakersfield* ("*Bakersfield*") (2004) 124 Cal. App. 4th 1184, 1199-1203; see *Galante Vineyards v. Monterey Water Dist.* (1997) 60 Cal. App. 4th 1109, 1121.
[4] Pub. Resources Code ("PRC") §§ 21000 et seq.; 14 Cal. Code Regs. ("CCR") §§ 15000 et seq.
[5] Mr. Clark's technical comments and curriculum vitae are attached hereto as **Exhibit A** (hereinafter Clark Comments).
[6] Mr. Shaw's technical comments and curriculum vitae are attached hereto as **Exhibit B** (hereinafter Shaw Comments).
[7] 14 CCR § 15088(a), (c).

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I. STATEMENT OF INTEREST

CREED LA is an unincorporated association of individuals and labor organizations that may be adversely affected by the potential public and worker health and safety hazards, and the environmental and public service impacts of the Project. The coalition includes the Sheet Metal Workers Local 105, International Brotherhood of Electrical Workers Local 11, Southern California Pipe Trades District Council 16, and District Council of Iron Workers of the State of California, along with their members, their families, and other individuals who live and work in the City of Los Angeles.

Individual members of CREED LA and its member organizations include John Ferruccio, Jorge L. Aceves, John P. Bustos, Gerry Kennon, and Chris S. Macias. These individuals live, work, recreate, and raise their families in the City of Los Angeles and surrounding communities. Accordingly, they would be directly affected by the Project's environmental and health and safety impacts. Individual members may also work on the Project itself. They will be first in line to be exposed to any health and safety hazards that exist onsite.

In addition, CREED LA has an interest in enforcing environmental laws that encourage sustainable development and ensure a safe working environment for its members. Environmentally detrimental projects can jeopardize future jobs by making it more difficult and more expensive for business and industry to expand in the region, and by making the area less desirable for new businesses and new residents. Continued environmental degradation can, and has, caused construction moratoriums and other restrictions on growth that, in turn, reduce future employment opportunities.

2

II. LEGAL BACKGROUND

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in certain limited circumstances).[8] The EIR is the very heart of CEQA.[9] "The foremost principle in interpreting CEQA is that the Legislature intended the act to be read so

3

[8] See, e.g., PRC § 21100.
[9] *Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652.

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as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language."[10]

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project.[11] "Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR 'protects not only the environment but also informed self-government.'"[12] The EIR has been described as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return."[13]

Second, CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures.[14] The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced."[15] If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns."[16]

3 cont.

While the courts review an EIR using an "abuse of discretion" standard, "the reviewing court is not to 'uncritically rely on every study or analysis presented by a project proponent in support of its position. *A clearly inadequate or unsupported study is entitled to no judicial deference.*"[17] As the courts have explained, "a prejudicial abuse of discretion occurs "if the failure to include relevant information precludes informed decision making and informed public participation, thereby

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[10] *Comtys. for a Better Env' v. Cal. Res. Agency* (2002) 103 Cal. App.4th 98, 109 ("*CBE v. CRA*").
[11] 14 CCR § 15002(a)(1).
[12] *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 564.
[13] *Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs.* (2001) 91 Cal. App. 4th 1344, 1354 ("*Berkeley Jets*"); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.
[14] 14 CCR§ 15002(a)(2) and (3); *see also Berkeley Jets*, 91 Cal.App.4th at 1354; *Citizens of Goleta Valley*, 52 Cal.3d at 564.
[15] 14 CCR §15002(a)(2).
[16] PRC § 21081; 14 CCR § 15092(b)(2)(A) & (B).
[17] *Berkeley Jets*, 91 Cal. App. 4th 1344, 1355 (emphasis added), *quoting, Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 391 409, fn. 12.

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thwarting the statutory goals of the EIR process."[18] "The ultimate inquiry, as case law and the CEQA guidelines make clear, is whether the EIR includes enough detail 'to enable who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project.'"[19]

3 cont.

III. THE CITY FAILED TO PROVIDE TIMELY ACCESS TO DOCUMENTS REFERENCED AND INCORPORATED BY REFERENCE IN THE DEIR

The City violated CEQA and improperly truncated the DEIR public comment period by failing to make all documents referenced or relied on in the DEIR available for public review during the Project's public comment period.[20] As a result, CREED LA was unable to complete its review and analysis of the DEIR and its supporting evidence during the current public comment period, which ends on January 25. Our request that the City extend the public comment period was denied. We therefore provide these initial comments on the DEIR and reserve our right to submit supplemental comments on the DEIR at a future date.

Access to all of the documents referenced in the DEIR is necessary to conduct a meaningful review of its analyses, conclusions, and mitigation measures and to assess the Project's potential environmental impacts. CEQA requires that "all documents referenced" and "incorporated by reference" in the draft environmental impact report be available for review and "***readily accessible***" during the entire comment period.[21] The courts have held that the failure to provide even a few pages of a CEQA document for a portion of the review and comment period invalidates the entire CEQA process, and that such a failure must be remedied by permitting additional public comment.[22] It is also well-settled that a CEQA document may not rely on hidden studies or documents that are not provided to the public.[23]

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[18] *Berkeley Jets*, 91 Cal.App.4th at 1355; *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 722; *Galante Vineyards v. Monterey Peninsula Water Management Dist.* (1997) 60 Cal.App.4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 946.

[19] *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 516, *quoting Laurel Heights*, 47 Cal.3d at 405.

[20] *See* PRC § 21092(b)(1); 14 CCR § 15087(c)(5).

[21] PRC § 21092(b)(1) (emphasis added); 14 CCR § 15087(c)(5).

[22] See *Ultramar v. South Coast Air Quality Man. Dist.* (1993) 17 Cal.App.4th 689, 699.

[23] *Santiago County Water Dist. V. County of Orange* (1981) 118 Cal.App.3d 818, 831 ("Whatever is required to be considered in an EIR must be in that formal report; what any official might have known from other writings or oral presentations cannot supply what is lacking in the report.").

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On December 22, 2020, we submitted a request for immediate access to documents referenced in the DEIR seeking "any and all documents referenced, incorporated by reference, and relied upon" by the City in its preparation of the DEIR.[24]

On January 6, 2021, we were told during a phone conversation with City staff that we could have access to two CDs containing all of the documents referenced in the DEIR and its appendices.[25] On January 13, 2021, we received the two CDs. The CDs, however, did not include any DEIR reference documents that we did not previously have access to.

On January 19, 2021, at the City's request, we submitted a list of the missing DEIR reference documents to the City.[26] In response, the City informed us that our January 19, 2021 list was considered a new request pursuant to the California Public Records Act ("PRA"), a misunderstanding on the City's part.[27] We responded by clarifying that our January 19 email was a follow up to CREED LA's original December 22, 2020 DEIR reference document request made pursuant to CEQA.[28]

4 cont.

On January 21, 2021, we received an email from the City providing partial access to the missing documents. The email indicated that access to the remainder of the documents would be provided "in the near future."[29] In response to our reply email, which requested a response to our letter seeking an extension as well as clarification on when we could expect the remainder of the documents, the City responded on January 22, 2021 by providing access to the remainder of the DEIR reference documents, one business day before the close of the comment period.[30] Despite its late document production, the City declined CREED LA's request to

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[24] Letter from Adams, Broadwell, Joseph & Cardozo ("ABJC") to the City of Los Angeles re "Request for Immediate Access to Documents Referenced in the Draft Environmental Impact Report – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)" (Dec. 22, 2020).
[25] Personal communication between Kendra Hartmann and Jivar Afshar, January 19, 2021
[26] **Attachment A:** Email from ABJC to City re "676 Mateo Street Project - List of Missing DEIR Ref Docs" (Jan. 19, 2021).
[27] Email from City to ABJC re "676 Mateo Street Project - List of Missing DEIR Ref Docs" (Jan. 20, 2021).
[28] Email from ABJC to City re ""676 Mateo Street Project – List of Missing DEIR Docs" (Jan. 20, 2021).
[29] **Attachment B:** Email from City to ABJC re "676 Mateo Street Project - List of Missing DEIR Ref Docs" (Jan. 21, 2021).
[30] **Attachment C:** Email from City to ABJC re "676 Mateo Street Project - List of Missing DEIR Ref Docs" (Jan. 22, 2021).
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extend the public comment period. The City cited CEQA Guidelines Section 15105 as support for its denial, which states that "[t]he public review period for a draft EIR shall not be less than 30 days nor should it be longer than 60 days *except in unusual circumstances*."[31] The City's inability to provide access to all of the DEIR reference documents during the DEIR's public comment period constituted unusual circumstances warranting an extension.[32] The City ultimately agreed to provide CREED LA with an informal two-week extension to February 8, 2021 to provide comments on the DEIR, but did not extend the comment period.[33]

CEQA requires that all documents referenced, incorporated by reference, and relied upon in a DEIR be readily available to the public during the entire CEQA public comment period. Despite CREED LA's month-long efforts to obtain "immediate access" to all materials referenced in the DEIR, the City granted access these materials in an untimely, piecemeal fashion over a period of more than 30 days, then declined to extend the public comment period. The City's actions flout CEQA's disclosure requirements.[34] By failing to make all documents referenced and incorporated by reference in the DEIR "readily accessible" to the public during the entire comment period, the City violated the clear procedural mandates of CEQA, to the prejudice of CREED LA and other members of the public.

4 cont.

IV. THE DEIR FAILS TO ADEQUATELY DESCRIBE THE PROJECT

The DEIR does not meet CEQA requirements because it fails to include a complete and accurate project description, rendering the entire impact analysis unreliable. An accurate and complete project description is necessary to perform an evaluation of the potential environmental effects of a proposed project.[35] Without a complete project description, the environmental analysis will be impermissibly narrow, thus minimizing the project's impacts and undercutting public review.[36] The courts have repeatedly held that "an accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient [CEQA

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[31] 14 C.C.R. § 15105(a) (emphasis added).
[32] See *Ultramar*, 17 Cal.App.4th at 699.
[33] Email from City to ABJC re "676 Mateo Street Project - List of Missing DEIR Ref Docs" (Jan. 22, 2021).
[34] *Id.*; Gov. Code § 6253(a) (requires public records to be "open to inspection at all times during the office hours of the state or local agency" and provides that "every person has a right to inspect any public record.").
[35] *See, e.g., Laurel Heights,* 47 Cal.3d 376.
[36] *See ibid.*

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document]."[37] "Only through an accurate view of the project may affected outsiders and public decision makers balance the proposal's benefit against its environmental costs."[38]

CEQA Guidelines Section 15378 defines "project" to mean "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment."[39] "The term 'project' refers to the activity which is being approved and which may be subject to several discretionary approvals by governmental agencies. The term project does not mean each separate governmental approval."[40] Courts have explained that for a project description to be complete, it must address not only the immediate environmental consequences of going forward with the project, but also all "*reasonably foreseeable* consequence[s] of the initial project."[41] Accordingly, CEQA requires that the project description contain a brief statement of the intended uses of an EIR, including a list of agencies which will use the EIR, along with the permits and approvals required for implementation of a proposed project.[42]

5 cont.

A. The DEIR Fails to Adequately Describe the Project's Activities that May Result in Significant Noise Impacts

The DEIR fails to adequately describe the Project's specifics regarding construction activities, particularly as relates to the approximately 74,500 cubic yards of soil that the City anticipates will be hauled off the Project site. No description is provided of the location for the staging of the haul trucks or the size of the haul trucks to be used in the export of the soil. A description of the hours during which trucks will make haul trips and how many trips they will make per day is likewise absent from the DEIR. This information is crucial to determine the level of the noise the trucks will emit and the hours during which residents and neighbors will be affected.

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[37] *County of Inyo,* 71 Cal.App.3d at p. 193.
[38] *Id.* at 192-193.
[39] CEQA Guidelines § 15378.
[40] *Id.* § 15378(c).
[41] *Laurel Heights*, 47 Cal.3d at p. 396 (emphasis added); *see also Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 449-50.
[42] CEQA Guidelines § 15124(d).

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Furthermore, though the DEIR's Project Description section states that requests for permits for the sale and consumption of alcohol on the premises are anticipated, descriptions of the accompanying activities, such as live or recorded music, are not included in the DEIR.[43] As Mr. Shaw explains, noise from boisterous patrons and music being played at the rooftop pool area and businesses will likely have an impact on the residences to the west of the Project site, and could impact homes' interiors since windows do not have good low-frequency attenuation.[44] The resulting noise from these activities may require mitigation to reduce adverse impacts to neighboring residents. The DEIR fails to disclose whether the Project anticipates the use of sound systems, alcohol use in the pool area, and other sources of significant noise impacts, thus failing to disclose a potentially significant operational noise impact.[45] 7

The DEIR's failure to adequately describe the operational components of the Project renders the analysis that follows incomplete and underestimates the impacts the Project is likely to have on the ambient environment and surrounding residences. Mitigation measures, such as retrofitting windows at impacted residential properties, may be necessary to reduce these impacts, but are absent from the DEIR. The DEIR's conclusion that the Project will result in less than significant operational noise impacts, with no mitigation required, is not supported by substantial evidence.[46] 8

V. THE DEIR FAILS TO ADEQUATELY ANALYZE, QUANTIFY, AND MITIGATE THE PROJECT'S POTENTIALLY SIGNIFICANT IMPACTS

An EIR must fully disclose all potentially significant impacts of a Project and implement all feasible mitigation to reduce those impacts to less than significant levels. The lead agency's significance determination with regard to each impact must be supported by accurate scientific and factual data.[47] An agency cannot conclude that an impact is less than significant unless it produces rigorous analysis and concrete substantial evidence justifying the finding.[48] 9

[43] DEIR Section II. Project Description, p. II-40.
[44] Shaw Comments, p. 5.
[45] Shaw Comments, p. 1.
[46] See DEIR, Page IV.H-33.
[47] 14 CCR § 15064(b).
[48] *Kings Cty. Farm Bur. v. Hanford* (1990) 221 Cal.App.3d 692, 732.

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Moreover, the failure to provide information required by CEQA is a failure to proceed in the manner required by CEQA.[49] Challenges to an agency's failure to proceed in the manner required by CEQA, such as the failure to address a subject required to be covered in an EIR or to disclose information about a project's environmental effects or alternatives, are subject to a less deferential standard than challenges to an agency's factual conclusions.[50] In reviewing challenges to an agency's approval of an EIR based on a lack of substantial evidence, the court will 'determine de novo whether the agency has employed the correct procedures, scrupulously enforcing all legislatively mandated CEQA requirements.'[51]

Even when the substantial evidence standard is applicable to agency decisions to certify an EIR and approve a project, reviewing courts will not 'uncritically rely on every study or analysis presented by a project proponent in support of its position. A clearly inadequate or unsupported study is entitled to no judicial deference.'"[52]

9 cont.

A. The DEIR Fails to Adequately Disclose and Mitigate the Project's Significant Noise Impacts

The CEQA Guidelines require an EIR to consider "whether a project would result in…[g]eneration of a substantial temporary or periodic increase in ambient noise levels in the vicinity of the project . . ."[53] The DEIR's noise analysis fails to accurately disclose the Project's noise impacts for several reasons.

i. The DEIR's Noise Analysis Contains Inadequate Baseline Data

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The DEIR's Noise Report fails to accurately calculate the baseline ambient noise at the Project site. An accurate baseline is necessary to assess the significance of the Project's two-year construction noise on sensitive receptors in the vicinity of the Project site.[54]

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[49] *Sierra Club v. State Bd. Of Forestry* (1994) 7 Cal.4th 1215, 1236.
[50] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 435.
[51] *Id., Madera Oversight Coal., Inc. v. County of Madera* (2011) 199 Cal. App. 4th 48, 102.
[52] *Berkeley Jets*, 91 Cal.App.4th at 1355.
[53] CEQA Guidelines, Appendix G, Sec. XII(d).
[54] 14 CCR § 15125;.*Comtys. For A Better Env't v. South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.4th 310, 328 (accurate description of the affected environment is essential because it establishes the baseline physical conditions against which a lead agency can then determine whether an impact

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To establish ambient noise levels at the Project site, the DEIR relies on two, 15-minute, on-site noise measurements conducted on a single day: July 5, 2017. One measurement was west of the Project site, near the Toy Factory Lofts and National Biscuit Company residential sensitive receptors, while the other measurement was taken at the northeast corner of the Project site, near the Amp Factory Lofts.[55] The recorded noise levels at those site visits were 66.4 dBA L_{EQ} and 69.3 dBA L_{EQ}, respectively.[56] These isolated measurements are inadequate to establish existing ambient noise levels at all relevant areas in the vicinity of the Project site. Furthermore, as Mr. Shaw points out, the DEIR does not disclose environmental conditions present when the measurements were taken.[57] Certain conditions, such as the time of day the measurements were taken or the presence of other construction activities or wind, could result in significantly inconsistent acoustical values.[58] The DEIR's failure to disclose these conditions, and its reliance on overly limited noise data, makes an accurate analysis of the DEIR's conclusions of noise impacts impossible.

10 cont.

ii. The DEIR Underestimates and Inadequately Mitigates the Project's Noise Impacts

CEQA does not set a numeric threshold for determining the significance of ambient noise increases. Lead agencies may select their own thresholds. The agency's selection of a threshold of significance must be supported by substantial evidence.[59] As explained by Mr. Shaw in his comments, the threshold chosen to determine whether the Project's noise impacts will be significant does not consider the actual distance of the Project's construction activities to nearby sensitive receptors.[60] In addition, the DEIR fails to address potentially significant noise impacts from the Project's construction activities, both underestimating some impacts and failing to disclose others.

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is significant); *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 952; *Galante Vineyards v. Monterey Peninsula Water Management Dist.* (1997) 60 Cal. App 4th 1109, 1121-22

[55] DEIR Section IV.H Noise, p. IV.H-17.

[56] *Id.*

[57] Shaw Comments, p. 1.

[58] *Id.*

[59] 14 CCR § 15064(b); *King & Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 884.

[60] DEIR Section IV.H Noise p. IV.H-13: "LAMC Section 112.05 sets a maximum noise level for construction equipment of 75 dBA at a distance of 50 feet when operated within 500 feet of a residential zone." The closest sensitive receptors will be closer than 50 feet from the noise sources.

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Moreover, the DEIR underestimates the noise levels from construction activities, such as the distance of trucks hauling soil and other construction debris from sensitive receptors near the Project site and the number of trips those trucks will make to and from the site.[61] Table IV.H-8, which estimates the noise range of Project construction equipment, measures the sound levels at 50 feet from the noise source. As Mr. Shaw clarifies, however, the actual distance of haul trucks making incoming trips to the Project is 30 feet from the closest sensitive receptors—the Biscuit Company and Toy Factory lofts—while the outgoing route of the trucks is only 15 feet from the Biscuit Company Lofts.[62] The DEIR's noise measurements were therefore conducted using inaccurate and unsupported distances. When accurate distances are used, noise levels increase by 4.4 dBA and 10.4 dBA higher, respectively, over the levels cited in the DEIR. The DEIR therefore fails to accurately disclose the distance of sensitive receptors to the Project site, resulting in inadequate analyses of impacts on these receptors and incorrect conclusions about the nature and severity of the Project's impacts.

11 cont.

Furthermore, the DEIR states that "peak construction noise levels at all sensitive receptors would be below the 75 dBA construction noise threshold defined by the Section 41.40 of the [Los Angeles Municipal Code ("LAMC").]"[63] As Mr. Shaw explains, however, LAMC Section 41.40 includes no such threshold.[64] Regardless, based on the estimated 142 haul truck trips per day (71 inbound and 71 outbound) stated in the DEIR, Mr. Shaw calculates that noise levels will exceed any such threshold. Mr. Shaw's calculations demonstrate that 75 dBA will be exceeded every 6.4 minutes if the trucks are making haul trips for 15 hours a day (from, for example, 7 a.m. to 10 p.m.) or every 3.6 minutes if they are hauling for 10 hours a day (such as between the hours of 7 a.m. and 5 p.m.).[65] This is a significant noise impact which the DEIR fails to disclose.

The courts have held that compliance with regulations, including noise ordinances, is not an adequate significance threshold because it does not foreclose

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[61] Shaw Comments, p. 3.
[62] Shaw Comments, p. 2.
[63] DEIR Section IV.H Noise, p. IV.H-27.
[64] Los Angeles Municipal Code, available at https://codelibrary.amlegal.com/codes/los_angeles/latest/lamc/0-0-0-128777#JD_41.40 (last accessed Jan. 20, 2021).
[65] Shaw Comments, p. 3.

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the possibility of significant impacts.[66] Similarly, here, compliance with any LAMC threshold does not assure that noise impacts will be less than significant. As Mr. Shaw states, "If the number of trips per day is greater than stated, noise impacts will be more frequent and could become almost continuous."[67]

11 cont.

Finally, though the DEIR includes in its mitigation measures the installation of an 8-foot barrier to be erected during demolition and excavation/grading activities,[68] the barrier will do nothing to combat the noise impacts to multi-story residential buildings on either side of the Project site.[69] The noise impacts to these receptors, both from construction and operation of the Project once completed, will be substantial.[70] The mitigation offered by the DEIR is wholly insufficient. This is a separate CEQA violation. The DEIR concludes that construction noise impacts are significant and unavoidable. Therefore, the DEIR must adopt all feasible mitigation measures to reduce construction noise impacts to the greatest extent feasible.[71]

12

An additional, potentially feasible mitigation measure for this impact would be to include Plexiglass balcony barriers on the higher levels of the adjacent residential buildings. This is a measure that is often used on residential balconies which abut noisy roadways. Installation of heavy Plexiglass or other clear panels around the edges of the residential balconies would as sound barriers without affecting residents' light or view. The DEIR should adopt the recommended mitigation measure or explain why, based on substantial evidence, the proposed measure is infeasible before it can consider approving the Project.[72]

B. The DEIR Fails to Adequately Disclose and Mitigate the Project's Significant Air Quality Impacts

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Under CEQA, a project has significant impacts if it "[v]iolate[s] any air quality standard or contribute[s] substantially to an existing or projected air quality

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[66] *Keep our Mountains Quiet v. Santa Clara* (2015) 236 Cal.App.4th 714, 733; *CBE v. CRA* (2002) 103 Cal.App.4th 98, 115-16; *King & Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 893, as modified on denial of reh'g (Mar. 20, 2020)
[67] Shaw Comments, p. 4.
[68] MM NOI-1, DEIR Section IV.H Noise, p. IV.H-34.
[69] DEIR Section II. Project Description, p. II-1.
[70] Shaw Comments, p. 1.
[71] *Covington v. Great Basin Unified Air Pollution Control Dist.* (2019) 43 Cal.App.5th 867, 883.
[72] *Id.*

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violation."[73] The South Coast Air Quality Management District ("SCAQMD" or "Air District") maintains thresholds of significance for criteria air pollutants that are to be used in determining the significance of a project's air quality impacts under CEQA.[74] The DEIR failed to accurately analyze and mitigate the Project's construction emissions by using an unsupported qualitative threshold to analyze project emissions, by improperly concluding that GHG emissions are insignificant, by improperly disguising mitigation measures as Project design features, and by relying on ineffective mitigation which is unenforceable and speculative. Furthermore, the DEIR failed to evaluate the cancer risk impacts resulting from exposure to toxic diesel particulate matter ("DPM") emissions generated during Project construction and operation. As a result, the DEIR's conclusions that the Project's air quality and health risk impacts from emissions generated during Project construction and operation will be less than significant are unsupported and inaccurate. **13 cont.**

a. The DEIR Fails to Disclose and Analyze Air Quality Impacts from Construction and Operation

i. The DEIR's Analysis of GHG Emissions Relies on an Unsupported Threshold

Under the CEQA Guidelines, a lead agency must analyze a project's impacts on GHG emissions.[75] The Guidelines allow for several approaches to this analysis, both qualitative and quantitative. The Guidelines explicitly mandate, however, that the "analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes."[76] In determining the significance of GHG emissions impacts, the agency must consider the "extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions."[77] **14**

The City has not adopted a numerical significance threshold for assessing impacts related to GHG emissions and has not formally adopted a local plan for

[73] CEQA Appendix G.
[74] See SCAQMD Thresholds, available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2.
[75] 14 CCR §15064.4.
[76] 14 CCR §15064.4(b)
[77] 14 C.C.R. § 15064.4(b)(3).

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reducing GHG emissions. The DEIR concludes that the Project's GHG impacts would be less than significant based on the Project's consistency with the goals and actions to reduce GHG emissions found in the City's Green New Deal, the Southern California Association of Governments 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy ("SCAG RTP/SCS"), and the 2008 California Climate Change Scoping Plan.[78]

Though the DEIR outlines a few ways in which the Project will comply with these plans, the majority of its strategies for assuring consistency are ambiguous at best, and are not supported by substantial evidence. Many of these strategies delegate to other agencies and departments the responsibility of determining compliance with the plans, while others make conclusory statements regarding the Project's compliance with particular strategies for reducing emissions without providing any support for these conclusions. For example, the DEIR asserts that the Project does not conflict with strategies that propose adopting vehicle efficiency measures in order to reduce GHG emissions included in the AB 32 Scoping Plan because it is required to comply with them.[79] Likewise, the DEIR claims that it will be required to comply with CARB's measures to reduce hydrofluorocarbon emissions, so it will therefore comply with the Scoping Plan's strategies to reduce emissions of gases with high global warming potential.[80] These—and several other claims made by the DEIR regarding its compliance with state and regional plans and policies—offer no meaningful analysis of how the Project would specifically comply with these strategies. **14 cont.**

Additionally, the DEIR claims its consistency with the SCAG RTP/SCS supports the conclusion that the Project will not result in significant GHG emissions. Its analysis, however, consists of stating that the Project "would accommodate increases in population, households, employment, and travel demand," and that because the Project site is located in close proximity to public transit stops, it would result in reduced vehicle-miles traveled ("VMT"), "as compared to a project of similar size and land uses at a location without close and walkable access to off-site destinations and public transit stops."[81] The DEIR further asserts that the Project will contribute to a reduction in GHG emissions due to the Project's addition of compact housing and jobs close to public transit, as well

[78] DEIR Section IV.D Greenhouse Gases, p. IV.D-27.
[79] *Id.*, p. 45.
[80] *Id.*
[81] *Id.*, p. IV.D-49.

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as the construction of biking and walking infrastructure.[82] It inexplicably ignores, however, other strategies aimed at reducing GHG emissions included in the SCAG RTP/SCS, such as adaptive reuse of existing structures, an approach with which the Project's demolition of existing structures and construction of new ones is in direct contradiction.[83]

The DEIR's statements cannot qualify as analyses of consistency with local, state, and regional plans because they lack any discussion of the plans' goals and policies as they apply to the Project. An agency cannot conclude that an impact is less than significant unless it produces rigorous analysis and concrete substantial evidence justifying the finding.[84] The DEIR's discussion fails to meet this standard.

14 cont.

ii. The DEIR Attempts to Conceal Potentially Significant GHG Emissions by Disguising Mitigation Measures as Project Design Features

The DEIR concludes that its consistency with local, state, and regional plans signifies that Project GHG emissions cannot be considered significant. As Dr. Clark explains, however, the DEIR's own calculations of GHG emissions demonstrate that emissions will, in fact, be significant. Without the incorporation of design features meant to reduce emissions, Project-related GHG emissions will increase exponentially, to more than 8 times their current level, from 546 MTCO2e to 4,445 MTCO2e. Even with the incorporation of such design features, they are still projected to increase to more than 6 times their current level, to 3,394 MTCO2e.[85]

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The DEIR appears to acknowledge the significance of this increase with the inclusion of several measures designed to minimize adverse impacts—such as from emissions of GHG and other pollutants—while simultaneously concluding that the Project will not result in significant impacts in these areas of concern. However, the DEIR does not mandate the use of the GHG reduction measures as binding mitigation.

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[82] *Id.*
[83] 2016-2040 SCAG RTP/SCS, p. 78.
[84] *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 516, 520; *Kings County Farm Bureau*, 221 Cal.App.3d at 732.
[85] Clark Comments, p. 10; DEIR Section IV.D Greenhouse Gases, p. IV.D-37; the City chose to quantify Project GHG emissions to satisfy CEQA Guidelines Section 15064.4(a), though it relies only on a qualification threshold to analyze the significance of emissions.

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Under CEQA, it is improper to attempt to disguise mitigation measures as part of the project's design if this obfuscates the potential significance of environmental impacts.[86] In *Lotus v. Department of Transportation*, an EIR prepared by the California Department of Transportation ("CalTrans") contained measures to help minimize potential stress on redwood trees during highway construction, such as restorative planting, invasive plant removal, watering, and use of an arborist and specialized excavation equipment.[87] The Court of Appeal held that the EIR improperly compressed the analysis of impacts and mitigation measures into a single issue because the EIR did not designate the measures as mitigation and concluded that because of the measures, no significant impacts were anticipated.[88] The Court explained that a significance determination must be made independent of mitigation first, then mitigation can be incorporated, and the effectiveness of those measures can be evaluated.[89] "Absent a determination regarding the significance of the impacts to the root systems of the old growth redwood trees, it is impossible to determine whether mitigation measures are required or to evaluate whether other more effective measures than those proposed should be considered."[90]

15 cont.

For example, though the DEIR concludes that GHG emissions from the Project will not be significant, it also states that emissions would be reduced through measures such as "technological improvements and additions to California's renewable resource portfolio."[91] "Anticipated deployment of improved vehicle efficiency, zero emission technologies, lower carbon fuels, and improvement of existing transportation systems" will further reduce Project emissions.[92] "Enhancements in water conservation technologies" and future improvements in waste management will likewise reduce Project impacts.[93]

Additionally, these measures are a further indication of the DEIR's violations of CEQA by offering only unenforceable and speculative mitigation. The DEIR

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[86] *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 658 (compression of mitigation measures into project design without acknowledging potentially significant impact if effects were not mitigated violates CEQA)
[87] *Id.* at 650.
[88] *Id.* at 656.
[89] *Id.* at 654–656.
[90] *Id.* at 656.
[91] DEIR Section IV.D Greenhouse Gases, p. IV.D-42.
[92] *Id.*
[93] *Id.*

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provides no analysis of how or to what extent emissions will be reduced by its reliance on unknown future technological advances or actions. The DEIR does not disclose what construction equipment it used to model construction emissions, so its presumption that emissions will be lowered over time—assuming that as older equipment is retired from use, newer, more efficient equipment will replace it—is unreliable. The DEIR provides no guarantee that older, less efficient equipment will not be used in construction.

By failing to make a significance determination about air quality impacts independent of mitigation before incorporating emissions reductions measures into the calculations, the DEIR commits the same fatal error found in *Lotus*. Just as use of specialized equipment and practices to limit impacts to the roots of redwood trees should have been classified as mitigation measures, so too should the incorporation of myriad measures to reduce emissions. The City's failure to acknowledge the significance of impacts to air quality from pollutant emissions prevents the public from properly evaluating the effectiveness of the mitigation measures proposed.

15 cont.

C. The DEIR Fails to Disclose and Analyze Health Risks from Construction and Operational Emissions and Failed to Conduct a Quantified Health Risk Analysis

An agency must support its findings of a project's potential environmental impacts with concrete evidence, with "sufficient information to foster informed public participation and to enable the decision makers to consider the environmental factors necessary to make a reasoned decision."[94] A project's health risks "must be 'clearly identified' and the discussion must include 'relevant specifics' about the environmental changes attributable to the Project and their associated health outcomes."[95]

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Courts have held that an environmental review document must disclose a project's potential health risks to a degree of specificity that would allow the public to make the correlation between the project's impacts and adverse effects to human health.[96] In *Bakersfield*, the court found that the EIRs' description of health risks were insufficient and that after reading them, "the public would have no idea of the health consequences that result when more pollutants are added to a

[94] *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 516.
[95] *Id.* at 518.
[96] *Id.* at 518–520; *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184.

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nonattainment basin."[97] Likewise in *Sierra Club*, the California Supreme Court held that the EIR's discussion of health impacts associated with exposure to the named pollutants was too general and the failure of the EIR to indicate the concentrations at which each pollutant would trigger the identified symptoms rendered the report inadequate.[98] Some connection between air quality impacts and their direct, adverse effects on human health must be made. As the Court explained, "a sufficient discussion of significant impacts requires not merely a determination of whether an impact is significant, but some effort to explain the nature and magnitude of the impact."[99] CEQA mandates discussion, supported by substantial evidence, of the nature and magnitude of impacts of air pollution on public health.[100]

The failure to provide information required by CEQA makes meaningful assessment of potentially significant impacts impossible and is presumed to be prejudicial.[101] Challenges to an agency's failure to proceed in the manner required by CEQA, such as the failure to address a subject required to be covered in an EIR or to disclose information about a project's environmental effects or alternatives, are subject to a less deferential standard than challenges to an agency's factual conclusions.[102] Courts reviewing challenges to an agency's approval of a CEQA document based on a lack of substantial evidence will "determine de novo whether the agency has employed the correct procedures, scrupulously enforcing all legislatively mandated CEQA requirements."[103]

16 cont.

Claiming that emissions of toxic air contaminants ("TACs") will be less than significant, the DEIR fails to include a health risk analysis to disclose the adverse health impacts that will be caused by exposure to TACs from the Project's construction and operational emissions. As a result, the DEIR fails to disclose the potentially significant risk posed to nearby residents and children from TACs, and fails to mitigate it. Because the DEIR fails to support its conclusion that the Project will not have significant health impacts from diesel particulate matter ("DPM")

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[97] *Id.* at 1220.
[98] *Sierra Club*, at 521.
[99] *Id.* at 519, citing *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 514–515.
[100] *Sierra Club*, 6 Cal.5th at 518–522.
[101] *Sierra Club v. State Bd. Of Forestry* (1994) 7 Cal.4th 1215, 1236–1237.
[102] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 435.
[103] *Id.* (internal quotations omitted).

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emissions with the necessary analysis, this finding is not supported by substantial evidence.

One of the primary emissions of concern regarding health effects for land development projects is DPM, which can be released during Project construction and operation. The DEIR acknowledges that the greatest potential for TAC emissions during construction would be related to DPM emissions associated with heavy-duty equipment during excavation and grading activities.[104] However, the DEIR failed to perform a quantitative assessment of the Project's DPM emissions, instead concluding that the Project's cancer risk from exposure to DPM would be less than significant based on the DEIR's conclusion that the Project's *criteria pollutant* emissions are less than significant.

The DEIR's health risk conclusion is unsupported for three reasons. First, DPM is not a criteria pollutant like PM_{10} and $PM_{2.5}$. Therefore, the DEIR relies on an analysis of the wrong pollutants to analyze health risk. DPM is a toxic air contaminant ("TAC") that is recognized by state and federal agencies, and atmospheric scientists, as causing severe respiratory disease, lung damage, cancer, and premature death. Air districts have recently recognized that "TACs present an even greater health risk than previously thought."[105] By contrast, standard criteria pollutants, which include both PM_{10} and $PM_{2.5}$, are defined under both federal and state laws as "criteria pollutants."[106] PM alone does not contain toxic chemicals. PM is simply defined as "very small solid or liquid particles that can be suspended in the atmosphere."[107] TACs, by contrast, are defined as "air pollutant[s] which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. Unlike regular particulate matter, DPM contains toxic chemicals which are not evaluated in a criteria pollutant analysis. The DEIR's attempt to rely on its criteria pollutant analysis to conclude that DPM emissions are insignificant is therefore a major error, and one which fails to provide any support for the DEIR's conclusion that the health risk posed by exposure to DPM is insignificant.

16 cont.

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[104] DEIR Section IV.A Air Quality, p. IV.A-49.
[105] *California Bldg. Industry Assn. v. Bay Area Air Quality Management Dist.* (2015) 62 Cal.4th 369, 379.
[106] The seven criteria air pollutants are: ozone (O3); carbon monoxide (CO); nitrogen dioxide (NO2); sulfur dioxide (SO2); PM10; PM2.5; and lead (Pb).
[107] *CURE v. Mojave Desert Air Qual. Mgm't Dist.* (2009) 178 Cal. App. 4th 1225, 1231-32; see 40 C.F.R. § 50.6(c).

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Second, the DEIR's failure to quantify the health risk from DPM exposure is unsupported. CEQA expressly requires that an EIR to discuss, inter alia, "health and safety problems caused by the physical changes" resulting from the project.[108] When a project results in exposure to toxic contaminants, this analysis requires a "human health risk assessment."[109] OEHHA[110] guidance also sets a recommended threshold for preparing an HRA of a construction period of two months or more.[111] Construction of the instant Project will last at least 24 months.

Third, the DEIR's conclusion that health risk is less than significant is unsupported by its own inclusion of mitigation measures to minimize the impacts from TAC emissions. The DEIR indicates that the Project would comply with the CARB Air Toxics Control Measure, which limits diesel-powered equipment and vehicle idling to no more than 5 minutes at a location, as well as with the CARB In-Use Off-Road Diesel Vehicle Regulation. Compliance with these measures "would minimize emissions of TACs during construction" to less than significant levels.[112] Because these measures are designed to reduce impacts, their function in the Project is as mitigation measures.[113] The DEIR fails to describe the extent of the Project's impacts prior to implementation of these measures, in violation of CEQA.[114] Since the DEIR relies on these measures to reduce adverse impacts, they must be also included as binding mitigation measures.[115] By ensuring compliance with such a measure in order to avoid significant impacts, the City is acknowledging that impacts from TAC emissions will be significant without mitigation. A health risk analysis is necessary to determine how significant those impacts will be and if mitigation measures are sufficient to avoid risks to public health.

16 cont.

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[108] 14 CCR § 15126.2(a).
[109] *Sierra Club,* 6 Cal.5th at 520; *Berkeley Keep Jets Over the Bay Com. v. Bd. of Port Comrs.* ("*Berkeley Jets*") (2001) 91 Cal.App.4th 1344, 1369; *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1219–1220 (CEQA requires that there must be some analysis of the correlation between the project's emissions and human health impacts).
[110] OEHHA is the organization responsible for providing recommendations and guidance on how to conduct health risk assessments in California. See OEHHA organization description, available at http://oehha.ca.gov/about/program.html.
[111] See "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html ("OEHHA Guidance"), p. 8-18.
[112] DEIR Section IV.A Air Quality, p. IV.A-50.
[113] PRC §§ 21002.1(a)(b), 21100(b)(3); 14 CCR § 15126.4.
[114] *Id.; Lotus v. Dep't of Transp.* (2014) 223 Cal. App. 4th 645, 651-52.
[115] *Id.*

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a. Substantial Evidence Shows that Operational Emissions Will Result in Potentially Significant Impacts to Public Health

Despite the DEIR's claim that Project operations will not result in any significant health risks from TAC emissions, the potential cancer risk from diesel exhaust emitted by the Project is significant and unmitigated.

Dr. Clark performed his own analysis using the DEIR's CalEEMod estimated emissions of 0.5046 lbs per day of fugitive $PM_{2.5}$ exhaust for the Project and 0.4615 lbs per day of fugitive $PM_{2.5}$ exhaust for the Project alternative.[116] His conclusions are at remarkable odds to those of the DEIR:

> These emissions are equivalent to DPM emissions of 169.5 lbs per year to 184.2 lbs per year. Since the City has not attempted to assess what those impacts would be on the local community and in particular the impacts to the adjacent residences, I have prepared a screening assessment of the operational impacts reported in the CALEEMOD analyses for the project. Using the Bay Area Air Quality Management District's (BAAQMD) Health Risk Calculator, which calculates the adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions, it is possible to quickly assess the impacts from the project on the adjacent neighbors. The model refines the screening values for cancer risk and $PM_{2.5}$ concentrations found in the BAAQMD's Stationary Source Screening Analysis Tool for permitted facilities which contain diesel internal combustion engines (primary source of DPM). The model is recommended by BAAQMD to assess the impacts from facilities where a comprehensive risk screening assessment has not been completed.
>
> For the preferred project design, operational emissions of 0.5046 lbs per day of Fugitive $PM_{2.5}$ exhaust would result in cancer risks of 568 in 1,000,000, well in excess of BAAQMD's CEQA Air Quality Guidelines threshold of 10 in 1,000,000.[117] Operational emissions of 0.4615 lbs per day of Fugitive $PM_{2.5}$ exhaust would result in cancer

17

[116] Clark Comments, p. 8.
[117] BAAQMD CEQA Air Quality Guidelines May 2017, p. 2-5.

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risks of 519 in 1,000,000, also well in excess of BAAQMD's threshold of 10 in 1,000,000.[118]

The DEIR provides no substantial evidence in support of its claims that health risks from operational emissions are insignificant. Dr. Clark's analysis, meanwhile, uses data from the DEIR's own modeling files to show that cancer risks resulting from the Project would significantly exceed some agency thresholds.[119]

17 cont.

VI. THE DEIR FAILS TO CONSIDER AND ANALYZE CUMULATIVE IMPACTS

CEQA requires an evaluation of cumulative impacts, defined as "two or more individual effects which, when considered together, are considerable."[120] Such impacts may "result from individually minor but collectively significant projects taking place over a period of time."[121] Lead agencies must consider whether a project's potential impacts, although individually limited, are cumulatively considerable.[122] "Cumulatively considerable" under CEQA means that "the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."[123]

18

CEQA Guidelines section 15130(b)(1) provides two options for analyzing cumulative impacts: (A) list "past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or" (B) summarize "projection contained in an adopted local, regional or statewide plan, or related planning document that describes or evaluates conditions contributing to the cumulative effect."[124] "When relying on a plan, regulation or program, the lead agency should explain how implementing the particular requirements in the plan, regulation or program ensure that the project's

[118] Clark Comments, pp. 7–8; see Clark Exhibits 1 & 2.
[119] BAAQMD's threshold is more appropriate than SCAQMD's in this instance because SCAQMD's Health Risk Calculator does not include diesel particulate matter, a major contributor of
[120] 14 C.C.R. § 15355; see also Staff Report, Attachment 10, pp. 894–896 (explaining IS/MND's failure to analyze cumulative impacts from habitat loss).
[121] 14 C.C.R. § 15355(b).
[122] PRC § 21083(b); 14 CCR §§ 15064(h)(1), 15065(a)(3).
[123] CEQA Guidelines §15064(h)(1).
[124] 14 C.C.R. § 15130(b)(1).

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incremental contribution to the cumulative effect is not cumulatively considerable."[125]

This analysis necessarily requires the identification of other projects that will be constructed and/or operating over the same time period as the subject project and the analysis of these projects together with the project being reviewed. The DEIR fails to analyze the impacts the Project will have when considered with the more than 30 other projects within the vicinity that are planned, have been completed, or are under construction.[126] **18 cont.**

A. The DEIR Fails to Disclose, Analyze, and Mitigate Cumulative Impacts to Air Quality

The DEIR's list of 20 projects within the Project site's vicinity[127] omits more than 10 other projects, amounting to more than 3,000,000 square feet of nearby projects. The DEIR's failure to account for all of the proposed and active construction projects in the Project's vicinity reveals the erroneous existing baseline from which the DEIR's entire analysis of cumulative air quality impacts follows.

Furthermore, the DEIR declines to perform any analysis of cumulative impacts from GHG emissions, stating that "the proximity of the Project to other GHG emission generating activities is not directly relevant to the determination of a cumulative impact because climate change is a global condition."[128] It goes on to reason that, because the CAPCOA holds that GHG emissions are always cumulative due to the global nature of climate change, any analysis it has performed is necessarily a cumulative one, and any further analysis is unnecessary.[129] It concludes that "[d]ue to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, there is no basis for concluding that the Project's increase in annual GHG emissions would cause a measurable change in global GHG emissions necessary to influence global climate change."[130] The DEIR's statement that "[t]he GHG emissions of the Project alone **19**

[125] *Id.*; *see id.* § 15130(a) (stating that the lead agency shall describe its basis for concluding that an incremental effect is not cumulatively considerable).
[126] Clark Comments, p. 2; https://downtownla.com/maps/development/in-the-pipeline/arts-district/all (last accessed Jan. 22, 2021).
[127] DEIR Appendix L.1 Traffic Study, pp. 41–42.
[128] DEIR Section IV.D Greenhouse Gases, p. IV.D-55.
[129] *Id.*
[130] DEIR Section IV.D Greenhouse Gases, p. IV.D-43.

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would not likely cause a direct physical change in the environment"[131] is a direct violation of the CEQA Guidelines' mandate that a lead agency explain that the project's "incremental contribution to the cumulative effect is not cumulatively considerable."[132] Moreover, CEQA describes GHG impacts as inherently cumulative impacts, and does not excuse the lead agency from addressing these impacts as cumulative impacts.[133] Merely stating that a project's impacts are not significant because it is "unlikely" that they are is not sufficient to support that conclusion.

19 cont.

The provision of the CEQA Guidelines that permitted agencies to conclude air emissions would be cumulatively insignificant because they are small in the grand scheme of things has been struck down by the Courts. Indeed, as was recognized in *CBE v. CRA* and *Kings County Farm Bureau*, the relevant analysis is not the relative amount of emissions from the Project compared with other emissions, but "whether any additional amount of precursor emissions should be considered significant in light of the serious nature of the ozone problems in this air basin."[134] As Dr. Clark explained in his comment letter, the Project's emissions are significant and, when considered along with those from nearby projects, will contribute heavily to impacts to air quality and public health.[135]

20

VII. CONCLUSION

An EIR "protects not only the environment but also informed self-government" by informing the public and its responsible officials of the environmental consequences of government decisions before they are made.[136] The DEIR fails to fulfill CEQA's informational and procedural requirements in multiple ways, including in its description of crucial Project details and establishing an accurate existing baseline, as well as from all analyses, conclusions, and proposed mitigation derived therefrom. As such, the extent of the Project's adverse

21

[131] *Id.*
[132] 14 CCR §§ 15130(a); (b)(1); 15064.4(b).
[133] 14 CCR § 15064.4(b).
[134] *Id.* at 118–121; *Kings County Farm Bureau*, 221 Cal.App.3d at 718.
[135] Clark Comments, pp. 3–4; https://downtownla.com/maps/development/in-the-pipeline/arts-district/all (last accessed Jan. 22, 2021).
[136] *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564; see also e.g., Pub. Resources Code, § 21061 ("The purpose of an [EIR] is to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which in the significant effects of such a project might be minimized; and to indicate alternatives to such a project.")

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environmental impacts is hidden from public view. The City cannot rely on the document to determine if the Project's benefits outweigh its environmental impacts or if those impacts have been lessened or avoided to the extent feasible. **21 cont.**

The DEIR must be revised and recirculated, consistent with CEQA's Legislative intent and substantive requirements.

Sincerely,



Kendra Hartmann

KDH:acp

Enclosures

This Attachment in its entirety is Comment 22

ATTACHMENT A

Sheila M. Sannadan

From: Sheila M. Sannadan
Sent: Tuesday, January 19, 2021 1:44 PM
To: Jivar Afshar
Cc: Kimberly Henry; Kendra Hartmann
Subject: 676 Mateo Street Project - List of Missing DEIR Ref Docs
Attachments: 4987 DEIR Reference Documents.pdf

Good Afternoon Jivar,

We have compiled a list of the documents referenced or relied upon in the DEIR that are missing. Please see list below. I have also attached a pdf of the list (see attached). Could you please advise when the documents will be available for our review?

1. South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993 ("The numeric indicators of significance, below, are the most recently adopted indicators in the SCAQMD *Air Quality Handbook* for determining the significance of operational emissions. The SCAQMD has established numerical indicators as significance thresholds based, in part, on Section 182(e) of the CAA, which sets 10 tons per year of VOC as a significance level for stationary source emissions in extreme non-attainment areas for ozone. As shown in **Table IV.B-2**, the Air Basin is designated as extreme non-attainment for ozone. The SCAQMD converted this significance level to pounds per day for ozone precursor emissions (10 tons per year 2,000 pounds per ton 5 days per year = 55 pounds per day). The numeric indicators for other pollutants are also based on federal stationary source significance levels. SCAQMD's numeric emission indicators are based on the recognition that the Air Basin is a distinct geographic area with a critical air pollution problem for which ambient air quality standards have ben promulgated to protect public health.") IV.A. Air Quality, pdf pgs. 21-22.
    a. Not available online; available only by ordering copy of hard cover
2. White Paper on Regulatory Options for Addressing Cumulative Impacts from Air Pollution Emissions, SCAQMD Board Meeting, September 5, 2003, Agenda No. 29, Appendix D, p. D-3. (IV.A. Air Quality, pdf pg. 41.
3. 10th Edition ITE Trip Generation Manual (only available for purchase) (IV.D. Greenhouse Gases, pdf pg. 33).
4. Orswell & Kasman, Inc., Phase I Environmental Site Assessment Report, Two-Unit Industrial Building, 676 Mateo Street 677 Imperial Street, February 10, 2016 (IV.E. Hazards, pdf pg. 13).
5. Highway Capacity Manual, Transportation Research Board, 2010 (References list).
6. City of Los Angeles, Board of Public Works, Bureau of Sanitation, "Solid Waste Generation," 1981. (References list).
7. California Department of Transportation, Technical Noise Supplement, October 1998. (References list).
8. Supplemental Traffic Review Memorandum for 850. S. Hill Street Project, The Mobility Group, January 2016. (References list).
9. Traffic Study for 8th and Spring Residential, LSA Associates, October 2014. (References).
10. Traffic Study for the City Market of Los Angeles, The Mobility Group, October 2013. (References).

11. Traffic Study for the Metro Emergency Security Operations Center (ESOC), AECOM, August 2015.
12. Traffic Study Memorandum of Understanding for 1024 Mateo Street, LLG Engineers, 2017.
13. Traffic Study Memorandum of Understanding for 1100 E. 5th Street, LLG Engineers, 2017.
14. Written correspondence with Darry Ford, Senior Management Analyst I, Planning, Maintenance and Construction Branch, City of Los Angeles Department of Recreation and Parks, August 14, 2017.
15. Written correspondence with Rena Perez, Director of Master Planning & Demographics, LAUSD, July 12, 2017.
16. Written correspondence with Tom Jung, Management Analyst II, LAPL, October 2017.

Thank you for your assistance.

Regards,
Sheila

Sheila Sannadan
Legal Assistant
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062
ssannadan@adamsbroadwell.com

From: Kendra Hartmann <khartmann@adamsbroadwell.com>
Sent: Friday, January 8, 2021 9:47 AM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kimberly Henry <kimberly.henry@lacity.org>
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hi Jivar,

We are still going to collect the CDs, just so we have a copy of what is available to the public. We will contact the Records Office and coordinate an appointment to send someone to pick them up.

Thank you,

Kendra

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Thursday, January 7, 2021 11:50 AM
To: Kendra Hartmann <khartmann@adamsbroadwell.com>
Cc: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kimberly Henry <kimberly.henry@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Kendra,

I double checked our website and can confirm that everything that you are looking for is already posted on our website and the CDs contain the same information. Please let me know if you still would like to pick up a copy of the CDs or if you have questions.

Best Regards,
Jivar

On Thu, Jan 7, 2021 at 11:40 AM Kendra Hartmann <khartmann@adamsbroadwell.com> wrote:

> Hello Jivar,
>
> Per our conversation yesterday, I was under the impression that the CDs contain material that is not included in the City's website (https://planning.lacity.org/development-services/eir/676-mateo-street-project-0) where the DEIR sections and appendices can be found. We have already located the reference documents that are available on the website. Do the CDs in fact have other reference documents that are not in the appendices?
>
> Thank you,
>
> Kendra
>
> ---
>
> **From:** Jivar Afshar <jivar.afshar@lacity.org>
> **Sent:** Thursday, January 7, 2021 11:31 AM
> **To:** Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
> **Cc:** Kimberly Henry <kimberly.henry@lacity.org>; Kendra Hartmann <khartmann@adamsbroadwell.com>; Planning Records Management <planning.recordsmgmt@lacity.org>
> **Subject:** Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)
>
> Hello Sheila,
>
> Please contact Records Management at 213-847-3753 to make an appointment to pick up the CDs. There are two CDs, one is titled Draft EIR which contains digital copies of the DEIR sections and references list. The second CD is titled Draft EIR Appendices and contains a digital copy of the appendices which include all the technical reports and calculations. For example, the Traffic Study is included in appendix L and the CalEEMod calculations are in appendix B .
>
> Please keep in mind that some of the references can simply be found by copy pasting the links in a search engine. Please let me know if you have any questions.

Best Regards,

Jivar

On Wed, Jan 6, 2021 at 6:39 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

Thank you Jivar.

You mentioned that the DEIR reference documents are on a CD. You said that we can get a copy of the CD for $7 and that we have to pick it up. We understand that you are going to send us a follow up email by the end of the day this Friday to confirm whether or not the CD does contain all of the DEIR reference documents. However, Kendra and I discussed this with our supervising attorney after our phone conference today, and we have decided to also have Godfrey pick up a copy of the CD *as soon as possible*. Could you please let us know what dates and times he is allowed to go back to the Planning Records Management office to pick up a copy of the CD? Below is his availability.

- 1/7/21 (Thursday): 8:00 a.m. - 10.30 am, or After 1:00 p.m.
- 1/8/21 (Friday): Any time after 11:00 a.m.
- 1/12/21 (Tuesday) through 1/15/21 (Friday): Any time

As discussed, we are working on the following in the meantime: 1) Compile a list of what documents we know are <u>not provided</u> in the City's 12/29/20 production per Kendra's review so far, and 2) Compile a comprehensive list of the <u>specific documents</u> that we need.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Wednesday, January 6, 2021 12:22 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kendra Hartmann <khartmann@adamsbroadwell.com>
Cc: Kimberly Henry <kimberly.henry@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila and Kendra,

Please see below links for the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006):

https://rosap.ntl.bts.gov/view/dot/8895

https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Best Regards,

Jivar

On Tue, Jan 5, 2021 at 6:44 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Hello Jivar,

We are available for conference call at 12 p.m. on Wednesday (1/6/21). Please send a calendar invite to Kendra Hartmann khartmann@adamsbroadwell.com and myself. Kendra is CC'd here on this email.

Thank you!

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Tuesday, January 5, 2021 4:28 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

The dates/times below are also available:

Thursday 1/7 at 3pm

Friday 1/8 at 12 noon

As soon as you confirm the date/time I will send a calendar invite with a call in number for a conference call. If you like, send me the email of the attorney so I can add her to the invitation as well.

Best,

Jivar

On Tue, Jan 5, 2021 at 4:18 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Hello Jivar,
>
> 12 noon tomorrow (1/6/21) works for me, but I am also checking with the attorney who is assigned to reviewing this project at my firm for her availability as well. What other times besides 12 noon tomorrow (1/6/21) work for you? Also, is there a number we can call in for a conference call?
>
> Thank you.
>
> Regards,
>
> Sheila
>
> Sheila Sannadan
>
> Legal Assistant
>
> Adams Broadwell Joseph & Cardozo
> 601 Gateway Boulevard, Suite 1000
> South San Francisco, CA 94080
> Phone (650) 589-1660
> Fax (650) 589-5062
>
> ssannadan@adamsbroadwell.com
>
> **From:** Jivar Afshar <jivar.afshar@lacity.org>
> **Sent:** Tuesday, January 5, 2021 4:05 PM

To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

Would you be available for a phone call tomorrow at 12 noon?

On Tue, Jan 5, 2021 at 3:49 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Good Afternoon Jivar,
>
> I left you a voice message earlier today. I would like to follow up on my last 2 emails below.
>
> I am aware that comments on the DEIR for the 676 Mateo Street Project are due by January 25, 2021. Could you please tell me when will the DEIR reference documents be made available to us so that we can conduct a meaningful review on the DEIR? For your reference, I am resending you our December 22, 2020 letter requesting immediate access to any and all documents referenced, incorporated by reference, and relied upon in the DEIR (see attached).
>
> As I mentioned in my email below, Godfrey Wachira of CREED LA duplicated the documents from the case file of the 676 Mateo Street Project that were provided to him on 12/29/20 at the City. However, the DEIR reference documents for the project were not included in the City's production on 12/29/20.
>
> Per my email below, the attorney who is assigned to reviewing this project at my firm informed me that though the appendices of the DEIR do include some reference material (for example, the Traffic Study and the CalEEMod calculations), the majority of the reference documents aren't included in the appendices and are not in the City's production from 12/29/20 (such as the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006), both cited in the Noise Calculations (Appendix I).
>
> Please respond to this email or call me on my cell phone at (650) 580-4288 as I am working remotely.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Sheila M. Sannadan
Sent: Thursday, December 31, 2020 11:13 AM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Morning Jivar,

Godfrey Wachira of CREED LA duplicated the documents from the case file of the 676 Mateo Street Project that were provided to him last Tuesday (12/29/20) at the City. However, the DEIR reference documents for the project were not included in the City's production on 12/29/20. Was that a mistake? Could you please tell me when will the DEIR reference documents be made available to us?

The attorney who is assigned to reviewing this project at my firm informed me that though the appendices of the DEIR do include a lot of reference material (for example, the Traffic Study and the CalEEMod calculations), there are some that aren't included in the appendices and are not in the City's production from 12/29/20 (such as the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006), both cited in the Noise Calculations (Appendix I).

As I mentioned in my email below, I can be reached on my cell phone at (650) 580-4288 if you would like to discuss this over the phone as I am working remotely.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Sheila M. Sannadan
Sent: Thursday, December 24, 2020 5:14 PM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Jivar,

Thank you for the link to the "IX. References" section, which shows a list of reference documents of the DEIR. However, we need the *actual* reference documents. I see that many of the documents listed under the References section don't have websites cited.

Per the instructions in the Notice of Availability (NOA), we are asking to review and copy all of the documents referenced in the DEIR. This request includes the documents listed in the "IX. References" section, as well as all other documents referenced in the body and in the appendices of the DEIR.

As stated in the NOA, *"The Draft EIR and the documents referenced in the Draft EIR are available for public review, by appointment only, at City Planning offices located at 221 N Figueroa Street, Suite 1350, Los Angeles, CA 90012. Please contact the Staff Planner listed below to schedule an appointment."*

NOA:
https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Sections/_DEIR_NOCA_(676%20Mateo).pdf

Please let me know if you have any questions. If you would like to discuss this over the phone, I can be reached on my cell phone at (650) 580-4288 as I am working remotely.

Thank you.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Wednesday, December 23, 2020 4:21 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

Thank you for your email. To clarify all documents referenced, incorporated by reference, and relied upon in the DEIR are included in the reference library which can be found on our website here: https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Sections/XIX.%20References%20%28676%20Mateo%29.pdf

Could you please clarify what exactly you are looking for?

Best regards,

Jivar

On Wed, Dec 23, 2020 at 3:11 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Christine – Thank you for scheduling Godfrey Wachira of CREED LA to review the case file boxes for the 676 Mateo Street Project on Tuesday (12/29/20), at 1:15 p.m. He is aware of the appointment and the location (221 Figueroa St., 14th floor, Room # 1450, Los Angeles, CA 90012).
>
> Jivar – Just to clarify, my office submitted 2 different requests. The request that my office submitted yesterday (12/22/20) is pursuant to the California Environmental Quality Act and is a request for immediate access to any and all documents referenced, incorporated by reference, and relied upon in the DEIR prepared for the 676 Mateo Street Project. That request excludes the DEIR and its Appendices since those are available on the City's website. The request that we submitted today (12/23/20) is pursuant to the Public Records Act and is a request for immediate access to any and all public records referring or related to the project. Could you please confirm whether the case file boxes that will be provided to Godfrey for his review on 12/29/20 contain documents responsive to both requests?

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: christine.hernandez@lacity.org <christine.hernandez@lacity.org> **On Behalf Of** Planning Records Management
Sent: Wednesday, December 23, 2020 2:09 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Beatrice Pacheco <beatrice.pacheco@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Afternoon Sheila,

Records Management has receive your email. This is a confirmation email we have scheduled appointment for;

Godfrey Wachira of CREED LA

Appointment; Tuesday (12/29/20) at 1:15 p.m.

Address; 221 Figueroa St. 14th floor, Room # 1450 Los Angeles, CA 90012

Thank you and have a great week.

Records Management Unit
Los Angeles City Planning

221 N. Figueroa St., Room 1450
Los Angeles, CA. 90012
Planning.recordsmgmt@lacity.org
T: (213) 847-3753 | F: (213) 269-4127

ssannadan@adamsbroadwell.com> wrote:

Good Afternoon Christine,

Godfrey Wachira of CREED LA is available to review the documents on Tuesday (12/29/20) at 1:15 p.m.

Please confirm this appointment. Also, please provide the address and room number of where the documents are located.

I am working remotely, so I can be reached on my cell phone at (650) 580-4288.

Thank you.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000

South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: christine.hernandez@lacity.org <christine.hernandez@lacity.org> **On Behalf Of** Planning Records Management
Sent: Wednesday, December 23, 2020 11:57 AM
To: Alisha C. Pember <apember@adamsbroadwell.com>
Cc: jivar.afshar@lacity.org; vince.bertoni@lacity.org; beatrice.pacheco@lacity.org; Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Morning Alisha,

Records Management has already spoken to Sheila Sannadan. She has been made aware that the case for 676 Mateo Street project is now in our office. she mentioned that she was going to get in contact with her colleges and will call us back to schedule the appointment.

Records Management Unit
Los Angeles City Planning

221 N. Figueroa St., Room 1450
Los Angeles, CA. 90012
Planning.recordsmgmt@lacity.org
T: (213) 847-3753 | F: (213) 269-4127

On Wed, Dec 23, 2020 at 11:41 AM Alisha C. Pember <apember@adamsbroadwell.com> wrote:

Good morning,

Please see the attached correspondence.

If you have any questions, please contact Sheila Sannadan.

Thank you.

Alisha Pember

Alisha C. Pember
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
(650) 589-1660 voice, Ext. 24
apember@adamsbroadwell.com

_____
This e-mail may contain material that is confidential, privileged and/or attorney work product for the sole use of the intended recipient. Any review, reliance or distribution by others or forwarding without express permission is strictly prohibited. If you are not the intended recipient, please contact the sender and delete all copies.

--

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Planning4LA.org
T: (213) 732-6101 | E: jivar.afshar@lacity.org

--

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
Jiv 221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org

--

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
Jiv 221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org

--

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects

Los Angeles City Planning

221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Jiv Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org

--

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
Jiv 221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org

--

Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Jiv Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org

This Attachment in its entirety is Comment 23

ATTACHMENT B

Kendra Hartmann

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Thursday, January 21, 2021 10:13 AM
To: Sheila M. Sannadan
Cc: Kimberly Henry; Kendra Hartmann; Beatrice Pacheco
Subject: Re: 676 Mateo Street Project - List of Missing DEIR Ref Docs
Attachments: AQMD CEQA Handbook pages 6-1 and 6-2.pdf

Hello Sheila,

Please see below most of the documents you requested. The rest of the documents will be provided to you in near future.

1. Please see attached. AQMD hand book pages 6-1 and 6-2
2. Will be provided
3. Will be provided
4. Please refer to Appendix F.1 (Phase I Assessment Report) page 21 https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Appendices/Appendix%20F.1.%20Phase%20I%20ESA%20(676%20Mateo).pdf
5. You may download the Pdf: https://www.pdfdrive.com/highway-capacity-manual-2010-d157782591.html
6. Will be provided
7. https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/f0008617-traffic-noise-protocol-oct1998-a11y.pdf
8. to 13. will be provided
14. DEIR, Appendix K, page 14
https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Appendices/Appendix%20K.%20Service%20Agency%20Letters%20(676%20Mateo).pdf

15. DEIR, Appendix K, page 58
https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Appendices/Appendix%20K.%20Service%20Agency%20Letters%20(676%20Mateo).pdf
16. DEIR, Appendix K, page 50
https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Appendices/Appendix%20K.%20Service%20Agency%20Letters%20(676%20Mateo).pdf

Best Regards,
Jivar

On Tue, Jan 19, 2021 at 1:44 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Good Afternoon Jivar,
>
> We have compiled a list of the documents referenced or relied upon in the DEIR that are missing. Please see list below. I have also attached a pdf of the list (see attached). Could you please advise when the documents will be available for our review?

1. South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993 ("The numeric indicators of significance, below, are the most recently adopted indicators in the SCAQMD *Air Quality Handbook* for determining the significance of operational emissions. The SCAQMD has established numerical indicators as significance thresholds based, in part, on Section 182(e) of the CAA, which sets 10 tons per year of VOC as a significance level for stationary source emissions in extreme non-attainment areas for ozone. As shown in **Table IV.B-2**, the Air Basin is designated as extreme non-attainment for ozone. The SCAQMD converted this significance level to pounds per day for ozone precursor emissions (10 tons per year × 2,000 pounds per ton ÷ 365 days per year = 55 pounds per day). The numeric indicators for other pollutants are also based on federal stationary source significance levels. SCAQMD's numeric emission indicators are based on the recognition that the Air Basin is a distinct geographic area with a critical air pollution problem for which ambient air quality standards have ben promulgated to protect public health.") IV.A. Air Quality, pdf pgs. 21-22.
    a. Not available online; available only by ordering copy of hard cover
2. White Paper on Regulatory Options for Addressing Cumulative Impacts from Air Pollution Emissions, SCAQMD Board Meeting, September 5, 2003, Agenda No. 29, Appendix D, p. D-3. (IV.A. Air Quality, pdf pg. 41.
3. 10th Edition ITE Trip Generation Manual (only available for purchase) (IV.D. Greenhouse Gases, pdf pg. 33).
4. Orswell & Kasman, Inc., Phase I Environmental Site Assessment Report, Two-Unit Industrial Building, 676 Mateo Street 677 Imperial Street, February 10, 2016 (IV.E. Hazards, pdf pg. 13).
5. Highway Capacity Manual, Transportation Research Board, 2010 (References list).
6. City of Los Angeles, Board of Public Works, Bureau of Sanitation, "Solid Waste Generation," 1981. (References list).
7. California Department of Transportation, Technical Noise Supplement, October 1998. (References list).
8. Supplemental Traffic Review Memorandum for 850. S. Hill Street Project, The Mobility Group, January 2016. (References list).
9. Traffic Study for 8th and Spring Residential, LSA Associates, October 2014. (References).
10. Traffic Study for the City Market of Los Angeles, The Mobility Group, October 2013. (References).
11. Traffic Study for the Metro Emergency Security Operations Center (ESOC), AECOM, August 2015.
12. Traffic Study Memorandum of Understanding for 1024 Mateo Street, LLG Engineers, 2017.
13. Traffic Study Memorandum of Understanding for 1100 E. 5th Street, LLG Engineers, 2017.
14. Written correspondence with Darry Ford, Senior Management Analyst I, Planning, Maintenance and Construction Branch, City of Los Angeles Department of Recreation and Parks, August 14, 2017.
15. Written correspondence with Rena Perez, Director of Master Planning & Demographics, LAUSD, July 12, 2017.
16. Written correspondence with Tom Jung, Management Analyst II, LAPL, October 2017.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Kendra Hartmann <khartmann@adamsbroadwell.com>
Sent: Friday, January 8, 2021 9:47 AM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kimberly Henry <kimberly.henry@lacity.org>
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hi Jivar,

We are still going to collect the CDs, just so we have a copy of what is available to the public. We will contact the Records Office and coordinate an appointment to send someone to pick them up.

Thank you,

Kendra

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Thursday, January 7, 2021 11:50 AM
To: Kendra Hartmann <khartmann@adamsbroadwell.com>
Cc: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kimberly Henry <kimberly.henry@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Kendra,

I double checked our website and can confirm that everything that you are looking for is already posted on our website and the CDs contain the same information. Please let me know if you still would like to pick up a copy of the CDs or if you have questions.

Best Regards,

Jivar

On Thu, Jan 7, 2021 at 11:40 AM Kendra Hartmann <khartmann@adamsbroadwell.com> wrote:

> Hello Jivar,
>
> Per our conversation yesterday, I was under the impression that the CDs contain material that is not included in the City's website (https://planning.lacity.org/development-services/eir/676-mateo-street-project-0) where the DEIR sections and appendices can be found. We have already located the reference documents that are available on the website. Do the CDs in fact have other reference documents that are not in the appendices?
>
> Thank you,
>
> Kendra
>
> ---
>
> **From:** Jivar Afshar <jivar.afshar@lacity.org>
> **Sent:** Thursday, January 7, 2021 11:31 AM
> **To:** Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
> **Cc:** Kimberly Henry <kimberly.henry@lacity.org>; Kendra Hartmann <khartmann@adamsbroadwell.com>; Planning Records Management <planning.recordsmgmt@lacity.org>
> **Subject:** Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)
>
> Hello Sheila,
>
> Please contact Records Management at 213-847-3753 to make an appointment to pick up the CDs. There are two CDs, one is titled Draft EIR which contains digital copies of the DEIR sections and references list. The second CD is titled Draft EIR Appendices and contains a digital copy of the appendices which include

all the technical reports and calculations. For example, the Traffic Study is included in appendix L and the CalEEMod calculations are in appendix B .

Please keep in mind that some of the references can simply be found by copy pasting the links in a search engine. Please let me know if you have any questions.

Best Regards,

Jivar

On Wed, Jan 6, 2021 at 6:39 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

Thank you Jivar.

You mentioned that the DEIR reference documents are on a CD. You said that we can get a copy of the CD for $7 and that we have to pick it up. We understand that you are going to send us a follow up email by the end of the day this Friday to confirm whether or not the CD does contain all of the DEIR reference documents. However, Kendra and I discussed this with our supervising attorney after our phone conference today, and we have decided to also have Godfrey pick up a copy of the CD *as soon as possible*. Could you please let us know what dates and times he is allowed to go back to the Planning Records Management office to pick up a copy of the CD? Below is his availability.

- 1/7/21 (Thursday): 8:00 a.m. - 10.30 am, or After 1:00 p.m.
- 1/8/21 (Friday): Any time after 11:00 a.m.
- 1/12/21 (Tuesday) through 1/15/21 (Friday): Any time

As discussed, we are working on the following in the meantime: 1) Compile a list of what documents we know are <u>not provided</u> in the City's 12/29/20 production per Kendra's review so far, and 2) Compile a comprehensive list of the <u>specific documents</u> that we need.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Wednesday, January 6, 2021 12:22 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kendra Hartmann <khartmann@adamsbroadwell.com>
Cc: Kimberly Henry <kimberly.henry@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila and Kendra,

Please see below links for the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006):

https://rosap.ntl.bts.gov/view/dot/8895

https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Best Regards,

Jivar

On Tue, Jan 5, 2021 at 6:44 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

Hello Jivar,

We are available for conference call at 12 p.m. on Wednesday (1/6/21). Please send a calendar invite to Kendra Hartmann khartmann@adamsbroadwell.com and myself. Kendra is CC'd here on this email.

Thank you!

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Tuesday, January 5, 2021 4:28 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

The dates/times below are also available:

Thursday 1/7 at 3pm

Friday 1/8 at 12 noon

As soon as you confirm the date/time I will send a calendar invite with a call in number for a conference call. If you like, send me the email of the attorney so I can add her to the invitation as well.

Best,

Jivar

On Tue, Jan 5, 2021 at 4:18 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Hello Jivar,
>
> 12 noon tomorrow (1/6/21) works for me, but I am also checking with the attorney who is assigned to reviewing this project at my firm for her availability as well. What other times besides 12 noon tomorrow (1/6/21) work for you? Also, is there a number we can call in for a conference call?
>
> Thank you.
>
> Regards,
>
> Sheila
>
> Sheila Sannadan
>
> Legal Assistant
>
> Adams Broadwell Joseph & Cardozo
> 601 Gateway Boulevard, Suite 1000
> South San Francisco, CA 94080
> Phone (650) 589-1660
> Fax (650) 589-5062
>
> ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Tuesday, January 5, 2021 4:05 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

Would you be available for a phone call tomorrow at 12 noon?

On Tue, Jan 5, 2021 at 3:49 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Good Afternoon Jivar,
>
> I left you a voice message earlier today. I would like to follow up on my last 2 emails below.
>
> I am aware that comments on the DEIR for the 676 Mateo Street Project are due by January 25, 2021. Could you please tell me when will the DEIR reference documents be made available to us so that we can conduct a meaningful review on the DEIR? For your reference, I am resending you our December 22, 2020 letter requesting immediate access to any and all documents referenced, incorporated by reference, and relied upon in the DEIR (see attached).
>
> As I mentioned in my email below, Godfrey Wachira of CREED LA duplicated the documents from the case file of the 676 Mateo Street Project that were provided to him on 12/29/20 at the City. However, the DEIR reference documents for the project were not included in the City's production on 12/29/20.
>
> Per my email below, the attorney who is assigned to reviewing this project at my firm informed me that though the appendices of the DEIR do include some reference material (for example, the Traffic Study and the CalEEMod calculations), the majority of the reference documents aren't included in the appendices and are not in the City's production from 12/29/20 (such as the Federal Transit

Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006), both cited in the Noise Calculations (Appendix I).

Please respond to this email or call me on my cell phone at (650) 580-4288 as I am working remotely.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Sheila M. Sannadan
Sent: Thursday, December 31, 2020 11:13 AM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Morning Jivar,

Godfrey Wachira of CREED LA duplicated the documents from the case file of the 676 Mateo Street Project that were provided to him last Tuesday (12/29/20) at the City. However, the DEIR reference documents for the project were not included in the City's production on 12/29/20. Was that a mistake? Could you please tell me when will the DEIR reference documents be made available to us?

The attorney who is assigned to reviewing this project at my firm informed me that though the appendices of the DEIR do include a lot of reference material (for example, the Traffic Study and the CalEEMod calculations), there are some that aren't included in the appendices and are not in the City's production from 12/29/20 (such as the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006), both cited in the Noise Calculations (Appendix I).

As I mentioned in my email below, I can be reached on my cell phone at (650) 580-4288 if you would like to discuss this over the phone as I am working remotely.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Sheila M. Sannadan
Sent: Thursday, December 24, 2020 5:14 PM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco

<beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Jivar,

Thank you for the link to the "IX. References" section, which shows a list of reference documents of the DEIR. However, we need the *actual* reference documents. I see that many of the documents listed under the References section don't have websites cited.

Per the instructions in the Notice of Availability (NOA), we are asking to review and copy all of the documents referenced in the DEIR. This request includes the documents listed in the "IX. References" section, as well as all other documents referenced in the body and in the appendices of the DEIR.

As stated in the NOA, *"The Draft EIR and the documents referenced in the Draft EIR are available for public review, by appointment only, at City Planning offices located at 221 N Figueroa Street, Suite 1350, Los Angeles, CA 90012. Please contact the Staff Planner listed below to schedule an appointment."*

NOA:
https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Sections/_DEIR_NOCA_(676%20Mateo).pdf

Please let me know if you have any questions. If you would like to discuss this over the phone, I can be reached on my cell phone at (650) 580-4288 as I am working remotely.

Thank you.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Wednesday, December 23, 2020 4:21 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

Thank you for your email. To clarify all documents referenced, incorporated by reference, and relied upon in the DEIR are included in the reference library which can be found on our website here: https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Sections/XIX.%20References%20%28676%20Mateo%29.pdf

Could you please clarify what exactly you are looking for?

Best regards,

Jivar

On Wed, Dec 23, 2020 at 3:11 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Christine – Thank you for scheduling Godfrey Wachira of CREED LA to review the case file boxes for the 676 Mateo Street Project on Tuesday (12/29/20), at 1:15 p.m. He is aware of the appointment and the location (221 Figueroa St., 14th floor, Room # 1450, Los Angeles, CA 90012).

Jivar – Just to clarify, my office submitted 2 different requests. The request that my office submitted yesterday (12/22/20) is pursuant to the California Environmental Quality Act and is a request for immediate access to any and all documents referenced, incorporated by reference, and relied upon in the DEIR prepared for the 676 Mateo Street Project. That request excludes the DEIR and its Appendices since those are available on the City's website. The request that we submitted today (12/23/20) is pursuant to the Public Records Act and is a request for immediate access to any and all public records referring or related to the project. Could you please confirm whether the case file boxes that will be provided to Godfrey for his review on 12/29/20 contain documents responsive to both requests?

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: christine.hernandez@lacity.org <christine.hernandez@lacity.org> **On Behalf Of** Planning Records Management
Sent: Wednesday, December 23, 2020 2:09 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Beatrice Pacheco <beatrice.pacheco@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Afternoon Sheila,

Records Management has receive your email. This is a confirmation email we have scheduled appointment for;

Godfrey Wachira of CREED LA

Appointment; Tuesday (12/29/20) at 1:15 p.m.

Address; 221 Figueroa St. 14th floor, Room # 1450 Los Angeles, CA 90012

Thank you and have a great week.

Records Management Unit

Los Angeles City Planning
221 N. Figueroa St., Room 1450

Los Angeles, CA. 90012

Planning.recordsmgmt@lacity.org

T: (213) 847-3753 | F: (213) 269-4127

ssannadan@adamsbroadwell.com> wrote:

Good Afternoon Christine,

Godfrey Wachira of CREED LA is available to review the documents on Tuesday (12/29/20) at 1:15 p.m.

Please confirm this appointment. Also, please provide the address and room number of where the documents are located.

I am working remotely, so I can be reached on my cell phone at (650) 580-4288.

Thank you.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: christine.hernandez@lacity.org <christine.hernandez@lacity.org> **On Behalf Of** Planning Records Management
Sent: Wednesday, December 23, 2020 11:57 AM
To: Alisha C. Pember <apember@adamsbroadwell.com>
Cc: jivar.afshar@lacity.org; vince.bertoni@lacity.org; beatrice.pacheco@lacity.org; Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Morning Alisha,

Records Management has already spoken to Sheila Sannadan. She has been made aware that the case for 676 Mateo Street project is now in our office. she mentioned that she was going to get in contact with her colleges and will call us back to schedule the appointment.

Records Management Unit

Los Angeles City Planning

This Attachment in its entirety is Comment 24

ATTACHMENT C

Kendra Hartmann

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Friday, January 22, 2021 3:18 PM
To: Sheila M. Sannadan
Cc: Kimberly Henry; Kendra Hartmann; Beatrice Pacheco
Subject: Re: 676 Mateo Street Project - List of Missing DEIR Ref Docs

Hello Sheila,

Please see below the rest of the documents:

2. https://www.aqmd.gov/nav/about/groups-committees/ciwg
Both the white paper and its appendices are listed on the website.
3. Provided in the google drive link below:
https://drive.google.com/drive/folders/1tJ-RVgeFipiRciLpIUXpGy75SYQqVg-7?usp=sharing
6. As shown in Tables IV.M.3-3 and IV.M.3-4 of the DEIR, the source of generation rates used in the analysis of the solid waste impacts of the Mateo project was the 2006 LA CEQA Thresholds Guide. The 1981 BOS report was not used in the DEIR analysis in any way. This will be corrected in the FEIR.
8 to 13. Provided in the google drive link:
https://drive.google.com/drive/folders/1tJ-RVgeFipiRciLpIUXpGy75SYQqVg-7?usp=sharing

Please let me know if you have any questions.

Best Regards,
Jivar

On Thu, Jan 21, 2021 at 10:12 AM Jivar Afshar <jivar.afshar@lacity.org> wrote:

> Hello Sheila,
>
> Please see below most of the documents you requested. The rest of the documents will be provided to you in near future.
>
> 1. Please see attached. AQMD hand book pages 6-1 and 6-2
> 2. Will be provided
> 3. Will be provided
> 4. Please refer to Appendix F.1 (Phase I Assessment Report) page 21 https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Appendices/Appendix%20F.1.%20Phase%20I%20ESA%20(676%20Mateo).pdf
> 5. You may download the Pdf: https://www.pdfdrive.com/highway-capacity-manual-2010-d157782591.html
> 6. Will be provided
> 7. https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/f0008617-traffic-noise-protocol-oct1998-a11y.pdf
> 8. to 13. will be provided
> 14. DEIR, Appendix K, page 14
> https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Appendices/Appendix%20K.%20Service%20Agency%20Letters%20(676%20Mateo).pdf
> 15. DEIR, Appendix K, page 58
> https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Appendices/Appendix%20K.%20Service%20Agency%20Letters%20(676%20Mateo).pdf

16. DEIR, Appendix K, page 50
https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Appendices/Appendix%20K.%20Service%20Agency%20Letters%20(676%20Mateo).pdf

Best Regards,
Jivar

On Tue, Jan 19, 2021 at 1:44 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

Good Afternoon Jivar,

We have compiled a list of the documents referenced or relied upon in the DEIR that are missing. Please see list below. I have also attached a pdf of the list (see attached). Could you please advise when the documents will be available for our review?

1. South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993 ("The numeric indicators of significance, below, are the most recently adopted indicators in the SCAQMD *Air Quality Handbook* for determining the significance of operational emissions. The SCAQMD has established numerical indicators as significance thresholds based, in part, on Section 182(e) of the CAA, which sets 10 tons per year of VOC as a significance level for stationary source emissions in extreme non-attainment areas for ozone. As shown in **Table IV.B-2**, the Air Basin is designated as extreme non-attainment for ozone. The SCAQMD converted this significance level to pounds per day for ozone precursor emissions (10 tons per year × 2,000 pounds per ton ÷ 365 days per year = 55 pounds per day). The numeric indicators for other pollutants are also based on federal stationary source significance levels. SCAQMD's numeric emission indicators are based on the recognition that the Air Basin is a distinct geographic area with a critical air pollution problem for which ambient air quality standards have ben promulgated to protect public health.") IV.A. Air Quality, pdf pgs. 21-22.
    a. Not available online; available only by ordering copy of hard cover
2. White Paper on Regulatory Options for Addressing Cumulative Impacts from Air Pollution Emissions, SCAQMD Board Meeting, September 5, 2003, Agenda No. 29, Appendix D, p. D-3. (IV.A. Air Quality, pdf pg. 41.
3. 10th Edition ITE Trip Generation Manual (only available for purchase) (IV.D. Greenhouse Gases, pdf pg. 33).
4. Orswell & Kasman, Inc., Phase I Environmental Site Assessment Report, Two-Unit Industrial Building, 676 Mateo Street 677 Imperial Street, February 10, 2016 (IV.E. Hazards, pdf pg. 13).
5. Highway Capacity Manual, Transportation Research Board, 2010 (References list).
6. City of Los Angeles, Board of Public Works, Bureau of Sanitation, "Solid Waste Generation," 1981. (References list).
7. California Department of Transportation, Technical Noise Supplement, October 1998. (References list).
8. Supplemental Traffic Review Memorandum for 850. S. Hill Street Project, The Mobility Group, January 2016. (References list).
9. Traffic Study for 8th and Spring Residential, LSA Associates, October 2014. (References).
10. Traffic Study for the City Market of Los Angeles, The Mobility Group, October 2013. (References).
11. Traffic Study for the Metro Emergency Security Operations Center (ESOC), AECOM, August 2015.
12. Traffic Study Memorandum of Understanding for 1024 Mateo Street, LLG Engineers, 2017.
13. Traffic Study Memorandum of Understanding for 1100 E. 5th Street, LLG Engineers, 2017.
14. Written correspondence with Darry Ford, Senior Management Analyst I, Planning, Maintenance and Construction Branch, City of Los Angeles Department of Recreation and Parks, August 14, 2017.
15. Written correspondence with Rena Perez, Director of Master Planning & Demographics, LAUSD, July 12, 2017.

16. Written correspondence with Tom Jung, Management Analyst II, LAPL, October 2017.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Kendra Hartmann <khartmann@adamsbroadwell.com>
Sent: Friday, January 8, 2021 9:47 AM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kimberly Henry <kimberly.henry@lacity.org>
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hi Jivar,

We are still going to collect the CDs, just so we have a copy of what is available to the public. We will contact the Records Office and coordinate an appointment to send someone to pick them up.

Thank you,

Kendra

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Thursday, January 7, 2021 11:50 AM
To: Kendra Hartmann <khartmann@adamsbroadwell.com>
Cc: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kimberly Henry <kimberly.henry@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Kendra,

I double checked our website and can confirm that everything that you are looking for is already posted on our website and the CDs contain the same information. Please let me know if you still would like to pick up a copy of the CDs or if you have questions.

Best Regards,

Jivar

On Thu, Jan 7, 2021 at 11:40 AM Kendra Hartmann <khartmann@adamsbroadwell.com> wrote:

> Hello Jivar,
>
> Per our conversation yesterday, I was under the impression that the CDs contain material that is not included in the City's website (https://planning.lacity.org/development-services/eir/676-mateo-street-project-0) where the DEIR sections and appendices can be found. We have already located the reference documents that are available on the website. Do the CDs in fact have other reference documents that are not in the appendices?
>
> Thank you,
>
> Kendra

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Thursday, January 7, 2021 11:31 AM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Kimberly Henry <kimberly.henry@lacity.org>; Kendra Hartmann <khartmann@adamsbroadwell.com>; Planning Records Management <planning.recordsmgmt@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

Please contact Records Management at 213-847-3753 to make an appointment to pick up the CDs. There are two CDs, one is titled Draft EIR which contains digital copies of the DEIR sections and references list. The second CD is titled Draft EIR Appendices and contains a digital copy of the appendices which include all the technical reports and calculations. For example, the Traffic Study is included in appendix L and the CalEEMod calculations are in appendix B .

Please keep in mind that some of the references can simply be found by copy pasting the links in a search engine. Please let me know if you have any questions.

Best Regards,

Jivar

On Wed, Jan 6, 2021 at 6:39 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Thank you Jivar.
>
> You mentioned that the DEIR reference documents are on a CD. You said that we can get a copy of the CD for $7 and that we have to pick it up. We understand that you are going to send us a follow up email by the end of the day this Friday to confirm whether or not the CD does contain all of the DEIR reference documents. However, Kendra and I discussed this with our supervising attorney after our phone conference today, and we have decided to also have Godfrey pick up a copy of the CD *as soon as possible*. Could you please let us know what dates and times he is allowed to go back to the Planning Records Management office to pick up a copy of the CD? Below is his availability.

- 1/7/21 (Thursday): 8:00 a.m. - 10.30 am, or After 1:00 p.m.
- 1/8/21 (Friday): Any time after 11:00 a.m.
- 1/12/21 (Tuesday) through 1/15/21 (Friday): Any time

As discussed, we are working on the following in the meantime: 1) Compile a list of what documents we know are not provided in the City's 12/29/20 production per Kendra's review so far, and 2) Compile a comprehensive list of the specific documents that we need.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Wednesday, January 6, 2021 12:22 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>; Kendra Hartmann <khartmann@adamsbroadwell.com>
Cc: Kimberly Henry <kimberly.henry@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila and Kendra,

Please see below links for the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006):

https://rosap.ntl.bts.gov/view/dot/8895

https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Best Regards,

Jivar

On Tue, Jan 5, 2021 at 6:44 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Hello Jivar,
>
> We are available for conference call at 12 p.m. on Wednesday (1/6/21). Please send a calendar invite to Kendra Hartmann khartmann@adamsbroadwell.com and myself. Kendra is CC'd here on this email.
>
> Thank you!
>
> Sheila
>
> Sheila Sannadan
>
> Legal Assistant
>
> Adams Broadwell Joseph & Cardozo
> 601 Gateway Boulevard, Suite 1000
> South San Francisco, CA 94080
> Phone (650) 589-1660
> Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Tuesday, January 5, 2021 4:28 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

The dates/times below are also available:

Thursday 1/7 at 3pm

Friday 1/8 at 12 noon

As soon as you confirm the date/time I will send a calendar invite with a call in number for a conference call. If you like, send me the email of the attorney so I can add her to the invitation as well.

Best,

Jivar

On Tue, Jan 5, 2021 at 4:18 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Hello Jivar,
>
> 12 noon tomorrow (1/6/21) works for me, but I am also checking with the attorney who is assigned to reviewing this project at my firm for her availability as well. What other times besides 12 noon tomorrow (1/6/21) work for you? Also, is there a number we can call in for a conference call?
>
> Thank you.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Tuesday, January 5, 2021 4:05 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

Would you be available for a phone call tomorrow at 12 noon?

On Tue, Jan 5, 2021 at 3:49 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

> Good Afternoon Jivar,
>
> I left you a voice message earlier today. I would like to follow up on my last 2 emails below.
>
> I am aware that comments on the DEIR for the 676 Mateo Street Project are due by January 25, 2021. Could you please tell me when will the DEIR reference documents be made available to us so

that we can conduct a meaningful review on the DEIR? For your reference, I am resending you our December 22, 2020 letter requesting immediate access to any and all documents referenced, incorporated by reference, and relied upon in the DEIR (see attached).

As I mentioned in my email below, Godfrey Wachira of CREED LA duplicated the documents from the case file of the 676 Mateo Street Project that were provided to him on 12/29/20 at the City. However, the DEIR reference documents for the project were not included in the City's production on 12/29/20.

Per my email below, the attorney who is assigned to reviewing this project at my firm informed me that though the appendices of the DEIR do include some reference material (for example, the Traffic Study and the CalEEMod calculations), the majority of the reference documents aren't included in the appendices and are not in the City's production from 12/29/20 (such as the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006), both cited in the Noise Calculations (Appendix I).

Please respond to this email or call me on my cell phone at (650) 580-4288 as I am working remotely.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Sheila M. Sannadan
Sent: Thursday, December 31, 2020 11:13 AM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Morning Jivar,

Godfrey Wachira of CREED LA duplicated the documents from the case file of the 676 Mateo Street Project that were provided to him last Tuesday (12/29/20) at the City. However, the DEIR reference documents for the project were not included in the City's production on 12/29/20. Was that a mistake? Could you please tell me when will the DEIR reference documents be made available to us?

The attorney who is assigned to reviewing this project at my firm informed me that though the appendices of the DEIR do include a lot of reference material (for example, the Traffic Study and the CalEEMod calculations), there are some that aren't included in the appendices and are not in the City's production from 12/29/20 (such as the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA RCNM User's Guide (2006), both cited in the Noise Calculations (Appendix I).

As I mentioned in my email below, I can be reached on my cell phone at (650) 580-4288 if you would like to discuss this over the phone as I am working remotely.

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Sheila M. Sannadan
Sent: Thursday, December 24, 2020 5:14 PM
To: Jivar Afshar <jivar.afshar@lacity.org>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: RE: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Jivar,

Thank you for the link to the "IX. References" section, which shows a list of reference documents of the DEIR. However, we need the *actual* reference documents. I see that many of the documents listed under the References section don't have websites cited.

Per the instructions in the Notice of Availability (NOA), we are asking to review and copy all of the documents referenced in the DEIR. This request includes the documents listed in the "IX. References" section, as well as all other documents referenced in the body and in the appendices of the DEIR.

As stated in the NOA, *"The Draft EIR and the documents referenced in the Draft EIR are available for public review, by appointment only, at City Planning offices located at 221 N Figueroa Street, Suite 1350, Los Angeles, CA 90012. Please contact the Staff Planner listed below to schedule an appointment."*

NOA:
https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Sections/_DEIR_NOCA_(676%20Mateo).pdf

Please let me know if you have any questions. If you would like to discuss this over the phone, I can be reached on my cell phone at (650) 580-4288 as I am working remotely.

Thank you.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: Jivar Afshar <jivar.afshar@lacity.org>
Sent: Wednesday, December 23, 2020 4:21 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Planning Records Management <planning.recordsmgmt@lacity.org>; Beatrice Pacheco <beatrice.pacheco@lacity.org>; vince.bertoni@lacity.org
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Hello Sheila,

Thank you for your email. To clarify all documents referenced, incorporated by reference, and relied upon in the DEIR are included in the reference library which can be found on our website here: https://planning.lacity.org/eir/676_mateo/deir/DEIR%20Sections/XIX.%20References%20%28676%20Mateo%29.pdf

Could you please clarify what exactly you are looking for?

Best regards,

Jivar

On Wed, Dec 23, 2020 at 3:11 PM Sheila M. Sannadan <ssannadan@adamsbroadwell.com> wrote:

Christine – Thank you for scheduling Godfrey Wachira of CREED LA to review the case file boxes for the 676 Mateo Street Project on Tuesday (12/29/20), at 1:15 p.m. He is aware of the appointment and the location (221 Figueroa St., 14th floor, Room # 1450, Los Angeles, CA 90012).

Jivar – Just to clarify, my office submitted 2 different requests. The request that my office submitted yesterday (12/22/20) is pursuant to the California Environmental Quality Act and is a request for immediate access to any and all documents referenced, incorporated by reference, and relied upon in the DEIR prepared for the 676 Mateo Street Project. That request excludes the DEIR and its Appendices since those are available on the City's website. The request that we submitted today (12/23/20) is pursuant to the Public Records Act and is a request for immediate access to any and all public records referring or related to the project. Could you please confirm whether the case file boxes that will be provided to Godfrey for his review on 12/29/20 contain documents responsive to both requests?

Thank you for your assistance.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: christine.hernandez@lacity.org <christine.hernandez@lacity.org> **On Behalf Of** Planning Records Management
Sent: Wednesday, December 23, 2020 2:09 PM
To: Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Cc: Beatrice Pacheco <beatrice.pacheco@lacity.org>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Afternoon Sheila,

Records Management has receive your email. This is a confirmation email we have scheduled appointment for;

Godfrey Wachira of CREED LA

Appointment; Tuesday (12/29/20) at 1:15 p.m.

Address; 221 Figueroa St. 14th floor, Room # 1450 Los Angeles, CA 90012

Thank you and have a great week.

Records Management Unit

Los Angeles City Planning
221 N. Figueroa St., Room 1450

Los Angeles, CA. 90012

Planning.recordsmgmt@lacity.org

T: (213) 847-3753 | F: (213) 269-4127

ssannadan@adamsbroadwell.com> wrote:

> Good Afternoon Christine,
>
> Godfrey Wachira of CREED LA is available to review the documents on Tuesday (12/29/20) at 1:15 p.m.

Please confirm this appointment. Also, please provide the address and room number of where the documents are located.

I am working remotely, so I can be reached on my cell phone at (650) 580-4288.

Thank you.

Regards,

Sheila

Sheila Sannadan

Legal Assistant

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
Phone (650) 589-1660
Fax (650) 589-5062

ssannadan@adamsbroadwell.com

From: christine.hernandez@lacity.org <christine.hernandez@lacity.org> **On Behalf Of** Planning Records Management
Sent: Wednesday, December 23, 2020 11:57 AM
To: Alisha C. Pember <apember@adamsbroadwell.com>
Cc: jivar.afshar@lacity.org; vince.bertoni@lacity.org; beatrice.pacheco@lacity.org; Sheila M. Sannadan <ssannadan@adamsbroadwell.com>
Subject: Re: Request for Immediate Access to Public Records – 676 Mateo Street Project (SCH No. 2018021068; Case No. ENV-2016-3691-EIR)

Good Morning Alisha,

Records Management has already spoken to Sheila Sannadan. She has been made aware that the case for 676 Mateo Street project is now in our office. she mentioned that she was going to get in contact with her colleges and will call us back to schedule the appointment.

Records Management Unit

Los Angeles City Planning
221 N. Figueroa St., Room 1450

Los Angeles, CA. 90012

Planning.recordsmgmt@lacity.org

T: (213) 847-3753 | F: (213) 269-4127

On Wed, Dec 23, 2020 at 11:41 AM Alisha C. Pember <apember@adamsbroadwell.com> wrote:

> Good morning,
>
> Please see the attached correspondence.
>
> If you have any questions, please contact Sheila Sannadan.
>
> Thank you.
>
> Alisha Pember
>
> Alisha C. Pember
> Adams Broadwell Joseph & Cardozo
> 601 Gateway Boulevard, Suite 1000
> South San Francisco, CA 94080

(650) 589-1660 voice, Ext. 24
apember@adamsbroadwell.com

_____

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--

Jivar Afshar

Preferred Pronouns: She, Her, Her

Major Projects

Jiv

Los Angeles City Planning
221 N. Figueroa St., Room 1350

Los Angeles, CA. 90012

Planning4LA.org

T: (213) 732-6101 | E: jivar.afshar@lacity.org

--

Jivar Afshar

Preferred Pronouns: She, Her, Her

Major Projects

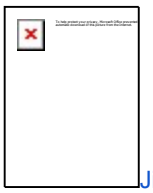
Jiv

Los Angeles City Planning
221 N. Figueroa St., Room 1350

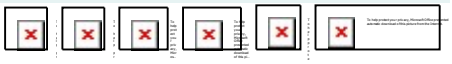
Los Angeles, CA. 90012

Planning4LA.org

T: (213) 847-3630| E: jivar.afshar@lacity.org



221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org



Jiv

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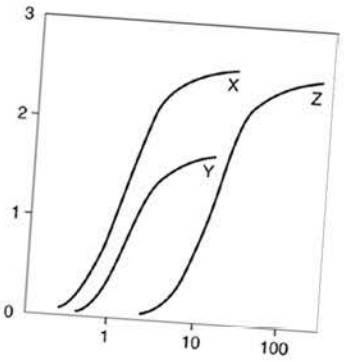


Jivar Afshar
Preferred Pronouns: She, Her, Her
Major Projects
Los Angeles City Planning
221 N. Figueroa St., Room 1350
Los Angeles, CA. 90012
Planning4LA.org
T: (213) 847-3630| E: jivar.afshar@lacity.org



Jiv

EXHIBIT A



Clark & Associates
Environmental Consulting, Inc.

OFFICE
12405 Venice Blvd
Suite 331
Los Angeles, CA 90066

PHONE
310-907-6165

FAX
310-398-7626

EMAIL
jclark.assoc@gmail.com

January 25, 2021

Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080

Attn: Ms. Kendra Hartmann

Subject: Comment Letter on Draft Environmental Impact Report (DEIR) for 676 Mateo Street Project, Los Angeles, CA 2017051068

Dear Ms. Hartmann:

At the request of Adams Broadwell Joseph & Cardozo (ABJC), Clark and Associates (Clark) has reviewed materials related to the 2020 City of Los Angeles Draft Environmental Impact Report (DEIR) of the above referenced project.

Clark's review of the materials in no way constitutes a validation of the conclusions or materials contained within the plan. If we do not comment on a specific item this does not constitute acceptance of the item.

Project Description:

25

The Project is located at 668-678 S. Mateo Street and 669-679 S. Imperial Street (Project Site) within the Central City North Community Plan area of the City in Los Angeles County. Regional access to the area of the Project Site is provided by the Santa Monica Freeway (I-10) via Alameda Street approximately 0.84-mile to the southwest and the Hollywood Freeway (US-101) via E. 7th Street approximately 0.63-mile to the east. The Los Angeles County Metropolitan Transportation Authority (Metro) provides local bus service in the Project Site area. Metro runs multiple bus lines, including local and rapid lines, along E. 6th Street, E. 7th Street, Alameda Street, and Santa Fe Avenue in the area.

The Project Site consists of approximately 44,800 square feet (1.03 acres), and is bounded by Mateo Street to the west, Imperial Street to the east, a one-story warehouse building that has been converted into a small grocery/market use, associated surface parking lot and Jesse Street to the north, and single-story industrial and commercial buildings, associated surface parking lots, and E. 7th Street to the south.

The Project would involve the demolition of the existing warehouse and surface parking lot, and the construction of an up to 197,355-square-foot mixed-use building including up to 185 live/work units, approximately 15,320 square feet of open space for residents, up to 23,380 square feet of art-production and commercial space, and associated parking facilities, resulting in a 4.74:1 FAR. Eleven percent of the units (20 live/work units) would be deed-restricted for Very Low Income households. The proposed building would be up to 116'-0" to the top of the parapet and 110'-0" to the top of the roof (8 above-ground levels) plus three levels of subterranean parking. The Project has been designed to incorporate specific design standards to address the Arts District's unique urban form and architectural characteristics. The Project also proposes the ability to implement an increased commercial option that would provide the Project the flexibility to increase the commercial square footage provided by the Project from 23,380 square feet to 45,873 square-feet within the same building parameters (i.e., 197,355-square-foot, 116'-0" to the top of the parapet and 110'- 0" to the top of the roof with eight-aboveground levels achieving a 4.74:1 FAR and three level subterranean parking structure) and, in turn, reduce the overall amount of live/work units from 185 live/work units to 159 live/work units. The Project proposes between 159 and 185 live/work units and between 45,873 and 23,380 square feet of commercial space.

25 cont.

General Comments:

The proposed project is located in a heavily impacted portion of Los Angeles, where there are currently more than 30 projects[1] (not the 20 listed the DEIR) within the area of influence of the proposed project that are planned, have been completed, or are under consideration. The City has an obligation under CEQA to ensure that the cumulative impacts from all of these projects are quantified so appropriate mitigation measures (including delaying projects) can be considered. Finally, the DEIR fails to

26

[1] https://downtownla.com/maps/development/in-the-pipeline/arts-district/all.

accurately disclose or mitigate the Project's potentially significant health risks from exposure to toxic air contaminants (TACs). The City must conduct a proper analysis of health risks as they relate to the significant impacts from construction and operational emissions in order to accurately evaluate these impacts. **26 cont.**

Specific Comments:

1. The DEIR Fails to Assess The Cumulative Air Quality Impacts From The Project and Existing/Proposed Projects In The Surrounding Community.

The DEIR fails to accurately assess the cumulative air quality impacts and existing or proposed projects within the immediate vicinity of the Proposed Project. Rather than quantify emissions and assess the impacts from each existing/proposed project, the City chooses to list the number of "related projects" near the Proposed Project in lieu of the needed quantitative assessment. This qualitative assessment fails to describe the individual and the collective impacts of each of the related projects and fails to provide a numerical threshold against which a determination of cumulative impacts may be assessed.

The method utilized by the City fails to meet the basic requirements for a cumulative air quality analysis as outlined by the SCAQMD's L.A. CEQA Threshold Guide (2006). A cumulative impact analysis would include a review of the list of related projects and identify those that would have pollutant or odor emissions. Such an analysis would determine the potential impacts of all such projects, together with the proposed project, using the methodology to evaluate the Proposed Project's pollutant impacts. This significance methodology includes: **27**

- The type, number of pieces, and usage of equipment;
- Rate, quantity, and type of fuel consumption;
- Emission factors, assuming implementation of applicable rules and regulations;
- Type(s) and size(s) of land uses, including location of vehicle driveways and parking facilities; and
- The location and usage of equipment or processes that may emit odors.

The City's air quality cumulative analysis is clearly deficient and must be revised in a Revised Draft Environmental Impact Report (R-DEIR).

2. The DEIR Fails To Accurately Describe The Number And Types Of Construction Projects In The Vicinity of The Proposed Project.

The City's DEIR fails to accurately describe the number and types of proposed and active projects in the vicinity of the Proposed Project. The City's analysis includes the following projects (see table below) but fails to include more than 3,000,000 square feet of proposed projects within the vicinity of the Proposed Project (see second table below). The City must update their assessment in a R-DEIR to include the additional projects and determine the cumulative impacts of the projects on the community.

ID	Status	Address	Land Use	Size
1	Under Construction	2051 E. 7th Street 695 S. Santa Fe Avenue	Apartments Retail Restaurant	320 du 15,000 sf 5,000 sf
2	Proposed	826 S. Mateo Street	Apartments Retail Restaurant	90 du 11,000 sf 5,600 sf
3	Proposed	527 S. Colyton Street 1147 E. Palmetto Street	Apartments Retail Production Space	275 du 11,375 sf 11,375 sf
4	Proposed	540 Santa Fe Avenue	Office	89,825 sf
5	Approved	1525 E. Industrial Street	Apartments Creative Office Retail Restaurant	328 du 27,300 sf 6,400 sf 5,700 sf
6	Proposed	2130 E. Violet Street	Office Retail Restaurant	94,000 sf 3,500 sf 4,000 sf
7	Approved	1800 E. 7th Street	Apartments Retail Office Restaurant	122 du 3,245 sf 2,700 sf 4,605 sf
8	Under Construction	520 S. Mateo Street	Apartments Retail Office Restaurant Museum	600 du 15,000 sf 110,000 sf 15,000 sf 10,000 sf

28

ID	Status	Address	Land Use	Size
9	Approved	668 S. Alameda Street 1562 Industrial Street	Live-Work Apartments Live-Work Office Specialty Retail Office Restaurant Supermarket	475 du 25,200 sf 17,500 sf 7,900 sf 16,300 sf 15,300 sf
10	Under Construction	640 S. Santa Fe Avenue	Office Retail Restaurant	91,185 sf 9,430 sf 6,550 sf
11	Proposed	1206-1278 E. 6th Street 640 S. Alameda Street	Apartments Condominiums Hotel Quality Restaurant High-Turnover Restaurant Retail Office Art Museum Warehouse School	1,305 du 431 du 514 rooms 22,639 sf 22,639 sf 82,332 sf 253,514 sf 22,429 sf 316,632 sf 300 students
12	Proposed	1005 S. Mateo Street	Industrial Park	94,849 sf
13	Approved	2110 Bay Street	Apartments Retail Creative Office	110 du 43,657 sf 113,350 sf
14	Proposed	1101-1129 E. 5th Street 445 S. Colyton Street	Apartments Retail Hotel Quality Restaurant High-Turnover Restaurant Fast-Food Restaurant Art Gallery Design Incubator	129 du 26,979 sf 113 rooms 15,197 sf 13,634 sf 2,888 sf 10,341 sf 3,430 sf
15	Proposed	641 S. Imperial Street	Apartments Retail Office	140 du 7,375 sf 7,375 sf
16	Proposed	2117-2143 E. Violet Street	Apartments Retails Office	347 du 21,858 sf 187,374 sf
17	Proposed	670 S. Mesquit Street	Apartments Retail Hotel Restaurant Event Space Gym Grocery Creative Office	308 du 79,240 sf 236 rooms 89,576 sf 93,617 sf 62,148 sf 56,912 sf 944,055 sf

28 cont.

ID	Status	Address	Land Use	Size
18	Proposed	1024 Mateo Street	Live-Work Apartments Live-Work Office Retail Office Restaurant	106 du 2,250 sf 13,979 sf 92,740 sf 13,126 sf
19	Proposed	2159 E. Bay Street	Office Meeting Space Quality Restaurant High-Turnover Restaurant	202,954 sf 3,235 sf 10,860 sf 10,860 sf
20	Proposed	1100 E. 5th Street	Live-Work Apartments Live-Work Office Office Retail Restaurant	220 du 4,350 sf 17,810 sf 19,609 sf 9,129 sf

Table Notes: sf = square-feet; du = dwelling units
Source: Linscott, Law & Greenspan, Engineers, Transportation Assessment Report, 676 Mateo Street Project, City of Los Angeles, California, February 18, 2020.

28 cont.

Projects Missing From City's Related Projects List[2]

ID	Status	Address	Land Use	Size
1	Proposed	2nd and Vignes/Challenge Cream Butter Building	Mixed Use	190,165 sf
2	Proposed	2057 East 7th Street	Hotel	Addition of 53,353 sf of new floor area to building
3	Proposed	234 North Central		
4	Proposed	330 South Alameda	Apartment Retail	190,000 sf 22,000 sf
5	Proposed	405 South Hewitt Street	Office Retail	255,000 sf 15,000 sf
6	Proposed	400 South Alameda St	Hotel	Development of 66 hotel rooms
7	Proposed	1211 Wholesale Street (6AM Project)	Hotel	2,439,000 sf
8	Proposed	360 South Alameda (Alameda and 4th Lofts)	Apartments	55,719 sf
9	Proposed	454 Seaton Street	8 Story Building	

29

[2] https://downtownla.com/maps/development/in-the-pipeline/arts-district/all

ID	Status	Address	Land Use	Size
10	Proposed	1000 South Mateo Street	106 live/work Apartments Retail Restaurant	120,000 sf 14,000 sf 13,000 sf
11	Proposed	1340 East 6th Street	193 live/work Apartments	
12	Proposed	1800 East 7th Street	Apartments Commercial	28,999 sf

29 cont.

3. The DEIR Fails to Assess The Significant Health Risks As They Relate To The Operational Emissions Of The Proposed Project And The Project Alternative.

The DEIR fails to address the health risks for residents in adjacent properties (less than 25 meters away from the property boundary) from Toxic Air Contaminants (TACs) that will be released during the operational phase of the project. The City's air quality analysis ignores the potential cancer risk from diesel exhaust emitted by the project.

Based on the CALEEMOD analyses provided in the Appendix B of the DEIR, the operational phase of the project will emit 0.5046 lbs per day of Fugitive $PM_{2.5}$ exhaust (equal to DPM) for the proposed project and 0.4615 lbs per day of Fugitive $PM_{2.5}$ exhaust (equal to DPM) for the proposed project alternative. These emissions are equivalent to DPM emissions of 169.5 lbs per year to 184.2 lbs per year. Since the City has not attempted to assess what those impacts would be on the local community and in particular the impacts to the adjacent residences, I have prepared a screening assessment of the operational impacts reported in the CALEEMOD analyses for the project. Using the Bay Area Air Quality Management District's (BAAQMD) Health Risk Calculator, which calculates the adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions, it is possible to quickly assess the impacts from the project on the adjacent neighbors. The model refines the screening values for cancer risk and $PM_{2.5}$ concentrations found in the BAAQMD's Stationary Source Screening Analysis Tool for permitted facilities which contain diesel internal combustion engines (primary source of DPM). The model is recommended by BAAQMD to assess the impacts from facilities where a comprehensive risk screening assessment has not been completed.

30

The results are attached as **Exhibit 1 and 2** to this letter. For the preferred project design, operational

emissions of 0.5046 lbs per day of Fugitive $PM_{2.5}$ exhaust would result in cancer risks of 568 in 1,000,000, well in excess of BAAQMD's CEQA Air Quality Guidelines threshold of 10 in 1,000,000.[3] Operational emissions of 0.4615 lbs per day of Fugitive $PM_{2.5}$ exhaust would result in cancer risks of 519 in 1,000,000, also well in excess of BAAQMD's threshold of 10 in 1,000,000.

30 cont.

4. The DEIR Fails To Include A Proper Analysis Of Health Risks As They Relate To The Significant Impacts From Construction And Operational Emissions.

The City's DEIR states that the Project would not result in any substantial emission of TACs during the construction or operational phases without any quantification of the known releases that will occur on site. CARB[4] defines diesel exhaust as a complex mixture of inorganic and organic compounds that exist in gaseous, liquid, and solid phases. CARB and U.S. EPA identify 40 components of the exhaust as suspected human carcinogens, including formaldehyde, 1,3-butadiene, and benzo[a]pyrene. The inhalation unit risk factor identified by OEHHA for use in risk assessments is for the particulate matter (DPM) fraction of diesel exhaust and not the vapor phase components identified by CARB and U.S. EPA.

31

The City attempts to argue that it is not required to analyze the health risk from operational exposure to TAC emissions based on the numeric threshold for fine particulate matter ($PM_{2.5}$). However, there is notable precedent requiring a quantitative analysis of all the TACs from diesel exhaust in DEIRs submitted for the approval of projects under CEQA. Moreover, the absence of this analysis renders the City's DEIR incomplete. In a 2017 Air Quality Technical Report[5] submitted in support of a Draft

[3] BAAQMD CEQA Air Quality Guidelines May 2017, p. 2-5.

[4] CARB. 1998. Report to the Air Resources Board on the Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Part A, Public Exposure To, Sources and Emissions of Diesel Exhaust In California. April 22, 1998. Pg A-1.

[5] Ramboll Environ. 2017. Air Quality Technical Report Turk Island Landfill Consolidation And Residential Subdivision Project. Prepared For City of Union City, Union City, CA. Prepared by Ramboll Envion US Corporation, San Francisco, CA August, 2017. https://www.unioncity.org/DocumentCenter/View/1867/Turk-Island---App-D---AQ-Emissions-Report?bidId=

EIR for the Turk Island Landfill Consolidation and Residential Subdivision[6], proponents accounted for the gaseous phase of diesel emission and detailed the speciated diesel total organic gas (TOG) emissions along with the DPM emissions for all construction equipment. The speciated diesel TOG emissions and DPM emissions were utilized in dispersion modeling to identify the maximally exposed individual sensitive receptor (MEISR) of the project to determine the health risks associated with all sources of air toxins from the construction phase of the project.

Here, the City's analysis ignores the presence of TACs being emitted with diesel exhaust during the construction and operational phases of the project without making any attempt to quantify the impacts. As noted in Comment 3 above, there are substantial health impacts from the operational phase of the project for the adjacent neighbors from the emissions associated with the project that must be addressed. This omission is a continuing flaw that must be addressed by the City. The results should then be presented in a recirculated DEIR.

31 cont.

5. The DEIR Fails To Address The Considerable Increase In Greenhouse Gas (GHG) Emissions From The Existing Site Structures And Fails To Meet The City's Own Commitment To Reduce GHG Emissions From All New Projects

Since the City does not have a numerical threshold against which projects may be compared, they can use the convoluted logic in the DEIR to claim a level of non-significance for GHG emissions from the project. According to the City, since there is no applicable adopted or accepted numerical threshold of significance for GHG emissions, the methodology for evaluating the Project's impacts related to GHG emissions focuses on its consistency with statewide, regional and local plans adopted for the purpose of reducing and/or mitigating GHG emissions. The City notes that the significance of the Project's GHG emission impacts is not based on the amount of GHG emissions resulting from the Project. This statement alone is a clear indication that the City is not prepared to actually assess what the true impacts of the GHG emissions from the Project will be.

32

[6] Union City. 2018. Draft Environmental Impact Report (DEIR) Turk Island Landfill Consolidation And Residential Subdivision Project. SCH Number 20008112107. Dated 3/15/2018. https://www.unioncity.org/DocumentCenter/View/1863/Turk-Island-DEIR?bidId=

The City's GHG analysis of the proposed project ignores the substantial increase (a factor of 7 to 9) in GHG emissions from the existing site to the proposed project (546 metric tons CO_2e ($MTCO_2e$) for the existing site to an estimated 3,394.35 to 4,444.80 $MTCO_2e$ for the proposed project).[7] The single greatest factor in the increase in GHG emissions is from mobile sources associated with the project (49%-55%), followed by energy usage (35%-42%).[8]

The City claims that a 26.9 percent reduction via mitigation measures comes from "utilizing low-flow fixtures that would reduce indoor water demand by 20 percent per CalGreen Standards, using water-efficient irrigation systems on-site per City requirements, recycling programs that reduces waste to landfills by a minimum of 75 percent (per AB 341); use of Energy Star® appliances on-site, installation of energy efficient LED lighting, energy efficient glazing and energy efficient window frames; incorporation of the CAPCOA-based land use and site enhancement reduction measures: LUT-1 Increased Density, LUT-3 Increased Diversity, LUT-6 Integrate Below Market Housing Rate[54], PDT-1 Limit Parking Supply, and PDT-2 Unbundle Parking Costs."[9] **32 cont.**

While the measures appear to provide some measure of reduction they do not address the critical issue of the substantial impact that increasing the GHG emissions 7 to 9 times will have on the environment. The environmental "cost" of the extra 2,900 $MTCO_2e$ to 3,400 $MTCO_2e$ is not addressed by the City in its analysis.

Conclusion

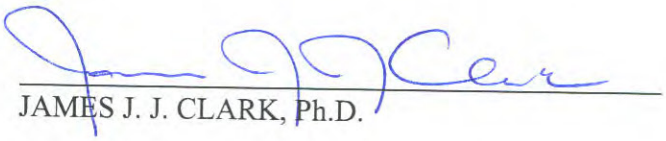
The facts identified and referenced in this comment letter lead me to reasonably conclude that the Project could result in significant unmitigated impacts and that the City should re-evaluate the impacts in a recirculated/revised DEIR. **33**

Sincerely,

[7] DEIR Section IV.D Greenhouse Gases, p. IV.D-37.

[8] DEIR Section IV.D Greenhouse Gases, p. IV.D-37.

[9] DEIR Section IV.D Greenhouse Gases, p. IV.D-36.



JAMES J. J. CLARK, Ph.D.

EXHIBIT 1

Comment 34 in its entirety

Step 1:

Plant Name	676 Mateo Street
Plant No.	

Step 4: Specify Source Type

Does facility have only diesel backup generators?	no
Is this analysis for a gas station?	no

Note: Default generic distance multiplier used if source is not a generator or gas station.

Step 2: Estimate Distance

What is the distance (m) from the facility boundary to the MEI?	25

Step 5: Read Estimates

Total Cancer Risk	519.728	per 1,000,000
Total Chronic Hazard	0.140	
Total PM2.5 Concentration	0.697	µg/m³

Step 3: Enter Emissions Data

Chemical Name	CAS No. (dashes removed)	Rate (lb/day)	Risk (# / 1,000,000)	Hazard (index)	Concentration (µg/m3)
Fine Particulate Matter (PM2.5)		4.62E-01			0.87
1,1,1-Trichloroethane	71556	0.00E+00			
1,1,2,2-Tetrachloroethane	79345	0.00E+00			
1,1,2-Trichloroethane	79005	0.00E+00			
1,1-Dichloroethane	75343	0.00E+00			
1,1-Dichloroethylene	75354	0.00E+00			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268879	0.00E+00			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001020	0.00E+00			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00			
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00			
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673897	0.00E+00			
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00			
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00			
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653857	0.00E+00			
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00			
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00			
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00			
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00			
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00			
1,2-Dibromo-3-chloropropane	96128	0.00E+00			
1,2-Dibromoethane	106934	0.00E+00			
1,2-Dichloroethane	107062	0.00E+00			
1,2-Epoxybutane	106887	0.00E+00			
1,3-Butadiene	106990	0.00E+00			
1,3-Propane sultone	1120714	0.00E+00			
1,4-Dichlorobenzene	106467	0.00E+00			
1,4-Dioxane	123911	0.00E+00			
1,6-Dinitropyrene	42397648	0.00E+00			
1,8-Dinitropyrene	42397659	0.00E+00			
1-Nitropyrene	5522430	0.00E+00			
2',3,4,4',5-PeCB	65510443	0.00E+00			
2,3',4,4',5,5'-HxCB	52663726	0.00E+00			
2,3',4,4',5-PeCB	31508006	0.00E+00			
2,3,3',4,4',5'-HxCB	69782907	0.00E+00			
2,3,3',4,4',5,5'-HpCB	39635319	0.00E+00			
2,3,3',4,4',5-HxCB	38380084	0.00E+00			
2,3,3',4,4'-PeCB	32598144	0.00E+00			
2,3,4,4',5-PeCB	74472370	0.00E+00			
2,3,4,6,7,8-hexachlorodibenzofuran	60851345	0.00E+00			
2,3,4,7,8-Pentachlorodibenzofuran	57117314	0.00E+00			
2,3,7,8-Tetrachlorodibenzo-p-dioxin and related com	1746016	0.00E+00			
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00			
2,4,6-Trichlorophenol	88062	0.00E+00			
2,4-Diaminoanisole	615054	0.00E+00			
2,4-Diaminotoluene	95807	0.00E+00			
2,4-Dinitrotoluene	121142	0.00E+00			
2-Aminoanthraquinone	117793	0.00E+00			
2-Nitrofluorene	607578	0.00E+00			
3,3',4,4',5,5'-HxCB	32774166	0.00E+00			
3,3',4,4',5-PeCB	57465288	0.00E+00			
3,3',4,4'-TCB	32598133	0.00E+00			
3,3-Dichlorobenzidine	91941	0.00E+00			
3,4,4'5-TCB	70362504	0.00E+00			
3-Methylcholanthrene	56495	0.00E+00			
4,4-Methylene bis(2-chloroaniline)	101144	0.00E+00			
4,4-Methylenedianiline	101779	0.00E+00			
4-Chloro-ortho-phenylenediamine	95830	0.00E+00			
4-Dimethylaminoazobenzene	60117	0.00E+00			
4-Nitropyrene	57835924	0.00E+00			
5-Methylchrysene	3697243	0.00E+00			
5-Nitroacenaphthene	602879	0.00E+00			
6-Nitrochrysene	7496028	0.00E+00			
7,12-Dimethylbenz(a)anthracene	57976	0.00E+00			
7H-dibenzo(c,g)carbazole	194592	0.00E+00			
Acetaldehyde	75070	0.00E+00			
Acetamide	60355	0.00E+00			
Acrolein	107028	0.00E+00			
Acrylamide	79061	0.00E+00			
Acrylic Acid	79107	0.00E+00			
Acrylonitrile	107131	0.00E+00			
Allyl chloride	107051	0.00E+00			
Ammonia	7664417	0.00E+00			
Aniline	62533	0.00E+00			
Arsenic	7440382	0.00E+00			
Arsine	7784421	0.00E+00			
Asbestos [1/(100 PCM fibers/m^3)]^-1	1332214	0.00E+00			
Benz(a)anthracene	56553	0.00E+00			
Benzene	71432	0.00E+00			

Benzidine	92875	0.00E+00			
Benzo(a)pyrene	50328	0.00E+00			
Benzo(b)fluoranthene	205992	0.00E+00			
Benzo(j)fluoranthene	205823	0.00E+00			
Benzo(k)fluoranthene	207089	0.00E+00			
Benzyl Chloride	100447	0.00E+00			
Beryllium	7440417	0.00E+00			
Bis(2-chloroethyl) Ether	111444	0.00E+00			
Bis(2-chloromethyl) Ether	542881	0.00E+00			
Cadmium	7440439	0.00E+00			
Caprolactam	105602	0.00E+00			
Carbon Disulfide	75150	0.00E+00			
Carbon Monoxide	630080	0.00E+00			
Carbon Tetrachloride	56235	0.00E+00			
Carbonyl Sulfide	463581	0.00E+00			
Chlorinated paraffins (Avg. chain length C12; approx.	108171262	0.00E+00			
Chlorine	7782505	0.00E+00			
Chlorine Dioxide	10049044	0.00E+00			
Chlorite	7758192	0.00E+00			
Chlorobenzene	108907	0.00E+00			
Chlorodibromomethane	124481	0.00E+00			
Chloroethane (Ethyl Chloride)	75003	0.00E+00			
Chloroform	67663	0.00E+00			
Chloropicrin	76062	0.00E+00			
Chromic Trioxide	1333820	0.00E+00			
Chromium-hexavalent	18540299	0.00E+00			
Barium chromate2	10294403	0.00E+00			
Calcium chromate2	13765190	0.00E+00			
Lead chromate2	7758976	0.00E+00			
Sodium dichromate2	10588019	0.00E+00			
Strontium chromate2	7789062	0.00E+00			
CHROMIC TRIOXIDE (as chromic acid mist)	1333820	0.00E+00			
Chrysene	218019	0.00E+00			
Copper	7440508	0.00E+00			
Copper and Copper Compounds	7440508	0.00E+00			
Cresol Mixtures	1319773	0.00E+00			
Cupferron	135206	0.00E+00			
Cyanide	57125	0.00E+00			
Di(2-ethylhexyl)phthalate	117817	0.00E+00			
Dibenz(a-h)acridine	226368	0.00E+00			
Dibenz(a-h)anthracene	53703	0.00E+00			
Dibenz(a-j)acridine	224420	0.00E+00			
Dibenzo(a-e)pyrene	192654	0.00E+00			
Dibenzo(a-h)pyrene	189640	0.00E+00			
Dibenzo(a-i)pyrene	189559	0.00E+00			
Dibenzo(a-l)pyrene	191300	0.00E+00			
Diesel Exhaust Particulate	85105	4.62E-01	6.49E+02	1.74E-01	
Diethanolamine	111422	0.00E+00			
Dimethylformamide	68122	0.00E+00			
Direct Black 38 (Technical Grade)	1937377	0.00E+00			
Direct Blue 6 (Technical Grade)	2602462	0.00E+00			
Direct Brown 95 (Technical Grade)	16071866	0.00E+00			
Epichlorohydrin	106898	0.00E+00			
Ethylbenzene	100414	0.00E+00			
Ethylene Glycol	107211	0.00E+00			
Ethylene Glycol Monobutyl Ether	111762	0.00E+00			
Ethylene Glycol Monoethyl Ether	110805	0.00E+00			
Ethylene Glycol Monoethyl Ether Acetate	111159	0.00E+00			
Ethylene Glycol Monomethyl Ether	109864	0.00E+00			
Ethylene Glycol Monomethyl Ether Acetate	110496	0.00E+00			
Ethylene Oxide	75218	0.00E+00			
Ethylene Thiourea	96457	0.00E+00			
Fluorides	1101	0.00E+00			
Formaldehyde (gas)	50000	0.00E+00			
Glutaraldehyde	111308	0.00E+00			
Hexachlorobenzene	118741	0.00E+00			
Hexachlorocyclohexane (Technical Grade)	608731	0.00E+00			
Hexachlorocyclohexane- Alpha Isomer	319846	0.00E+00			
Hexachlorocyclohexane- Beta Isomer	319857	0.00E+00			
Hexachlorocyclohexane- Gamma Isomer	58899	0.00E+00			
Hydrazine	302012	0.00E+00			
Hydrogen Chloride	7647010	0.00E+00			
Hydrogen Cyanide	74908	0.00E+00			
Hydrogen Fluoride	7664393	0.00E+00			
Hydrogen Selenide	7783075	0.00E+00			
Hydrogen Sulfide	7783064	0.00E+00			
Indeno(1-2-3-c-d)pyrene	193395	0.00E+00			
Isophorone	78591	0.00E+00			
Isopropyl Alcohol	67630	0.00E+00			
Lead Acetate	301042	0.00E+00			
Lead and Lead Compounds	7439921	0.00E+00			
Lead Phosphate	7446277	0.00E+00			
Lead Subacetate	1335326	0.00E+00			
m-CRESOL	108394	0.00E+00			
m-XYLENE	108383	0.00E+00			
Maleic Anhydride	108316	0.00E+00			
Manganese & Manganese Compounds	7439965	0.00E+00			
Mercury (Inorganic)	7439976	0.00E+00			
Mercuric chloride	7487947	0.00E+00			
Methanol	67561	0.00E+00			
Methyl Bromide	74839	0.00E+00			
Methyl Ethyl Ketone	78933	0.00E+00			
Methyl Isocyanate	624839	0.00E+00			
Methyl Tertiary Butyl Ether	1634044	0.00E+00			
Methylene Chloride (Dichloromethane)	75092	0.00E+00			
Methylene Diphenyl Isocyanate (MDI)	101688	0.00E+00			

Michlers Ketone	90948	0.00E+00			
n-Hexane	110543	0.00E+00			
n-Nitroso-n-methylethylamine	10595956	0.00E+00			
n-Nitrosodi-n-Butylamine	924163	0.00E+00			
n-Nitrosodi-n-Propylamine	621647	0.00E+00			
n-Nitrosodiethylamine	55185	0.00E+00			
n-Nitrosodimethylamine	62759	0.00E+00			
n-Nitrosodiphenylamine	86306	0.00E+00			
n-Nitrosomorpholine	59892	0.00E+00			
n-Nitrosopiperidine	100754	0.00E+00			
n-Nitrosopyrrolidine	930552	0.00E+00			
Naphthalene	91203	0.00E+00			
Nickel and Nickel Compounds	7440020	0.00E+00			
Nickel acetate	373024	0.00E+00			
Nickel carbonate	3333673	0.00E+00			
Nickel carbonyl	13463393	0.00E+00			
Nickel hydroxide	12054487	0.00E+00			
Nickelocene	1271289	0.00E+00			
Nickel Oxide	1313991	0.00E+00			
Nickel Refinery Dust	1146	0.00E+00			
Nickel Subsulfide	12035722	0.00E+00			
Nitric Acid	7697372	0.00E+00			
Nitrogen Dioxide	10102440	0.00E+00			
o-CRESOL	95487	0.00E+00			
o-XYLENE	95476	0.00E+00			
Oleum	8014957	0.00E+00			
Ozone	10028156	0.00E+00			
p-Chloro-o-toluidine	95692	0.00E+00			
p-Cresidine	120718	0.00E+00			
p-CRESOL	106445	0.00E+00			
p-Nitrosodiphenylamine	156105	0.00E+00			
p-XYLENE	106423	0.00E+00			
Pentachlorophenol	87865	0.00E+00			
Perchloroethylene	127184	0.00E+00			
Phenol	108952	0.00E+00			
Phosgene	75445	0.00E+00			
Phosphine	7803512	0.00E+00			
Phosphoric Acid	7664382	0.00E+00			
Phthalic Anhydride	85449	0.00E+00			
Polychlorinated Biphenyls	1336363	0.00E+00			
Potassium Bromate	7758012	0.00E+00			
Propylene	115071	0.00E+00			
Propylene Glycol Monomethyl Ether	107982	0.00E+00			
Propylene oxide	75569	0.00E+00			
Selenium	7782492	0.00E+00			
Selenium sulfide	7446346	0.00E+00			
Silica (crystalline, respirable)	7631869	0.00E+00			
Sodium hydroxide	1310732	0.00E+00			
Styrene	100425	0.00E+00			
Sulfates	9960	0.00E+00			
Sulfur Dioxide	7446095	0.00E+00			
Sulfuric Acid	7664939	0.00E+00			
Sulfur Trioxide	7446719	0.00E+00			
Tertiary-butyl acetate	540885	0.00E+00			
Tetrachloroethylene	127184	0.00E+00			
Thioacetamide	62555	0.00E+00			
Toluene	108883	0.00E+00			
Toluene Diisocyanates	26471625	0.00E+00			
Toluene Diisocyanates (2,4 and 2, 6)	584849	0.00E+00			
Toluene Diisocyanates (2,4 and 2, 6)	91087	0.00E+00			
Trichloroethylene	79016	0.00E+00			
Triethylamine	121448	0.00E+00			
Urethane	51796	0.00E+00			
Vanadium pentoxide	1314621	0.00E+00			
Vinyl acetate	108054	0.00E+00			
Vinyl chloride	75014	0.00E+00			
Xylenes (technical mixture of m, o, p-isomers)	1330207	0.00E+00			
Vanadium	7440622	0.00E+00			
	TOTAL UNADJUSTED Risk Values		**649.186**	**0.174**	**0.871**

EXHIBIT 2

Comment 35 in its entirety

Step 1:

Plant Name	676 Mateo Street
Plant No.	

Step 4: Specify Source Type

Does facility have only diesel backup generators?	no
Is this analysis for a gas station?	no

Note: Default generic distance multiplier used if source is not a generator or gas station.

Step 2: Estimate Distance

What is the distance (m) from the facility boundary to the MEI?	25

Step 5: Read Estimates

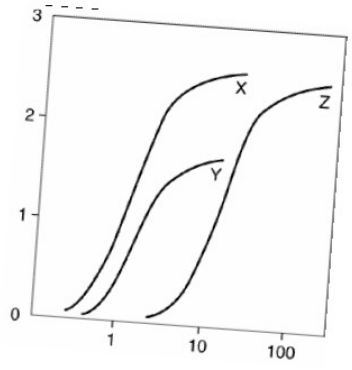
Total Cancer Risk	568.266	per 1,000,000
Total Chronic Hazard	0.153	
Total PM2.5 Concentration	0.763	µg/m³

Step 3: Enter Emissions Data

Chemical Name	CAS No.	Rate	Risk	Hazard	Concentration
	(dashes removed)	(lb/day)	(# / 1,000,000)	(index)	(µg/m3)
Fine Particulate Matter (PM2.5)		5.05E-01			0.95
1,1,1-Trichloroethane	71556	0.00E+00			
1,1,2,2-Tetrachloroethane	79345	0.00E+00			
1,1,2-Trichloroethane	79005	0.00E+00			
1,1-Dichloroethane	75343	0.00E+00			
1,1-Dichloroethylene	75354	0.00E+00			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268879	0.00E+00			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001020	0.00E+00			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	0.00E+00			
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	0.00E+00			
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673897	0.00E+00			
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227286	0.00E+00			
1,2,3,4,7,8-Hexachlorodibenzofuran	70648269	0.00E+00			
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653857	0.00E+00			
1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	0.00E+00			
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408743	0.00E+00			
1,2,3,7,8,9-Hexachlorodibenzofuran	72918219	0.00E+00			
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	0.00E+00			
1,2,3,7,8-Pentachlorodibenzofuran	57117416	0.00E+00			
1,2-Dibromo-3-chloropropane	96128	0.00E+00			
1,2-Dibromoethane	106934	0.00E+00			
1,2-Dichloroethane	107062	0.00E+00			
1,2-Epoxybutane	106887	0.00E+00			
1,3-Butadiene	106990	0.00E+00			
1,3-Propane sultone	1120714	0.00E+00			
1,4-Dichlorobenzene	106467	0.00E+00			
1,4-Dioxane	123911	0.00E+00			
1,6-Dinitropyrene	42397648	0.00E+00			
1,8-Dinitropyrene	42397659	0.00E+00			
1-Nitropyrene	5522430	0.00E+00			
2',3,4,4',5-PeCB	65510443	0.00E+00			
2,3',4,4',5,5'-HxCB	52663726	0.00E+00			
2,3',4,4',5-PeCB	31508006	0.00E+00			
2,3,3',4,4',5'-HxCB	69782907	0.00E+00			
2,3,3',4,4',5,5'-HpCB	39635319	0.00E+00			
2,3,3',4,4',5-HxCB	38380084	0.00E+00			
2,3,3',4,4'-PeCB	32598144	0.00E+00			
2,3,4,4',5-PeCB	74472370	0.00E+00			
2,3,4,6,7,8-hexachlorodibenzofuran	60851345	0.00E+00			
2,3,4,7,8-Pentachlorodibenzofuran	57117314	0.00E+00			
2,3,7,8-Tetrachlorodibenzo-p-dioxin and related com	1746016	0.00E+00			
2,3,7,8-Tetrachlorodibenzofuran	51207319	0.00E+00			
2,4,6-Trichlorophenol	88062	0.00E+00			
2,4-Diaminoanisole	615054	0.00E+00			
2,4-Diaminotoluene	95807	0.00E+00			
2,4-Dinitrotoluene	121142	0.00E+00			
2-Aminoanthraquinone	117793	0.00E+00			
2-Nitrofluorene	607578	0.00E+00			
3,3',4,4',5,5'-HxCB	32774166	0.00E+00			
3,3',4,4',5-PeCB	57465288	0.00E+00			
3,3',4,4'-TCB	32598133	0.00E+00			
3,3-Dichlorobenzidine	91941	0.00E+00			
3,4,4'5-TCB	70362504	0.00E+00			
3-Methylcholanthrene	56495	0.00E+00			
4,4-Methylene bis(2-chloroaniline)	101144	0.00E+00			
4,4-Methylenedianiline	101779	0.00E+00			
4-Chloro-ortho-phenylenediamine	95830	0.00E+00			
4-Dimethylaminoazobenzene	60117	0.00E+00			
4-Nitropyrene	57835924	0.00E+00			
5-Methylchrysene	3697243	0.00E+00			
5-Nitroacenaphthene	602879	0.00E+00			
6-Nitrochrysene	7496028	0.00E+00			
7,12-Dimethylbenz(a)anthracene	57976	0.00E+00			
7H-dibenzo(c,g)carbazole	194592	0.00E+00			
Acetaldehyde	75070	0.00E+00			
Acetamide	60355	0.00E+00			
Acrolein	107028	0.00E+00			
Acrylamide	79061	0.00E+00			
Acrylic Acid	79107	0.00E+00			
Acrylonitrile	107131	0.00E+00			
Allyl chloride	107051	0.00E+00			
Ammonia	7664417	0.00E+00			
Aniline	62533	0.00E+00			
Arsenic	7440382	0.00E+00			
Arsine	7784421	0.00E+00			
Asbestos [1/(100 PCM fibers/m^3)]^-1	1332214	0.00E+00			
Benz(a)anthracene	56553	0.00E+00			
Benzene	71432	0.00E+00			

	Benzidine	92875	0.00E+00				
	Benzo(a)pyrene	50328	0.00E+00				
	Benzo(b)fluoranthene	205992	0.00E+00				
	Benzo(j)fluoranthene	205823	0.00E+00				
	Benzo(k)fluoranthene	207089	0.00E+00				
	Benzyl Chloride	100447	0.00E+00				
	Beryllium	7440417	0.00E+00				
	Bis(2-chloroethyl) Ether	111444	0.00E+00				
	Bis(2-chloromethyl) Ether	542881	0.00E+00				
	Cadmium	7440439	0.00E+00				
	Caprolactam	105602	0.00E+00				
	Carbon Disulfide	75150	0.00E+00				
	Carbon Monoxide	630080	0.00E+00				
	Carbon Tetrachloride	56235	0.00E+00				
	Carbonyl Sulfide	463581	0.00E+00				
	Chlorinated paraffins (Avg. chain length C12; approx.	108171262	0.00E+00				
	Chlorine	7782505	0.00E+00				
	Chlorine Dioxide	10049044	0.00E+00				
	Chlorite	7758192	0.00E+00				
	Chlorobenzene	108907	0.00E+00				
	Chlorodibromomethane	124481	0.00E+00				
	Chloroethane (Ethyl Chloride)	75003	0.00E+00				
	Chloroform	67663	0.00E+00				
	Chloropicrin	76062	0.00E+00				
	Chromic Trioxide	1333820	0.00E+00				
	Chromium-hexavalent	18540299	0.00E+00				
	Barium chromate2	10294403	0.00E+00				
	Calcium chromate2	13765190	0.00E+00				
	Lead chromate2	7758976	0.00E+00				
	Sodium dichromate2	10588019	0.00E+00				
	Strontium chromate2	7789062	0.00E+00				
	CHROMIC TRIOXIDE (as chromic acid mist)	1333820	0.00E+00				
	Chrysene	218019	0.00E+00				
	Copper	7440508	0.00E+00				
	Copper and Copper Compounds	7440508	0.00E+00				
	Cresol Mixtures	1319773	0.00E+00				
	Cupferron	135206	0.00E+00				
	Cyanide	57125	0.00E+00				
	Di(2-ethylhexyl)phthalate	117817	0.00E+00				
	Dibenz(a-h)acridine	226368	0.00E+00				
	Dibenz(a-h)anthracene	53703	0.00E+00				
	Dibenz(a-j)acridine	224420	0.00E+00				
	Dibenzo(a-e)pyrene	192654	0.00E+00				
	Dibenzo(a-h)pyrene	189640	0.00E+00				
	Dibenzo(a-i)pyrene	189559	0.00E+00				
	Dibenzo(a-l)pyrene	191300	0.00E+00				
	Diesel Exhaust Particulate	85105	5.05E-01	7.10E+02	1.91E-01		
	Diethanolamine	111422	0.00E+00				
	Dimethylformamide	68122	0.00E+00				
	Direct Black 38 (Technical Grade)	1937377	0.00E+00				
	Direct Blue 6 (Technical Grade)	2602462	0.00E+00				
	Direct Brown 95 (Technical Grade)	16071866	0.00E+00				
	Epichlorohydrin	106898	0.00E+00				
	Ethylbenzene	100414	0.00E+00				
	Ethylene Glycol	107211	0.00E+00				
	Ethylene Glycol Monobutyl Ether	111762	0.00E+00				
	Ethylene Glycol Monoethyl Ether	110805	0.00E+00				
	Ethylene Glycol Monoethyl Ether Acetate	111159	0.00E+00				
	Ethylene Glycol Monomethyl Ether	109864	0.00E+00				
	Ethylene Glycol Monomethyl Ether Acetate	110496	0.00E+00				
	Ethylene Oxide	75218	0.00E+00				
	Ethylene Thiourea	96457	0.00E+00				
	Fluorides	1101	0.00E+00				
	Formaldehyde (gas)	50000	0.00E+00				
	Glutaraldehyde	111308	0.00E+00				
	Hexachlorobenzene	118741	0.00E+00				
	Hexachlorocyclohexane (Technical Grade)	608731	0.00E+00				
	Hexachlorocyclohexane- Alpha Isomer	319846	0.00E+00				
	Hexachlorocyclohexane- Beta Isomer	319857	0.00E+00				
	Hexachlorocyclohexane- Gamma Isomer	58899	0.00E+00				
	Hydrazine	302012	0.00E+00				
	Hydrogen Chloride	7647010	0.00E+00				
	Hydrogen Cyanide	74908	0.00E+00				
	Hydrogen Fluoride	7664393	0.00E+00				
	Hydrogen Selenide	7783075	0.00E+00				
	Hydrogen Sulfide	7783064	0.00E+00				
	Indeno(1-2-3-c-d)pyrene	193395	0.00E+00				
	Isophorone	78591	0.00E+00				
	Isopropyl Alcohol	67630	0.00E+00				
	Lead Acetate	301042	0.00E+00				
	Lead and Lead Compounds	7439921	0.00E+00				
	Lead Phosphate	7446277	0.00E+00				
	Lead Subacetate	1335326	0.00E+00				
	m-CRESOL	108394	0.00E+00				
	m-XYLENE	108383	0.00E+00				
	Maleic Anhydride	108316	0.00E+00				
	Manganese & Manganese Compounds	7439965	0.00E+00				
	Mercury (Inorganic)	7439976	0.00E+00				
	Mercuric chloride	7487947	0.00E+00				
	Methanol	67561	0.00E+00				
	Methyl Bromide	74839	0.00E+00				
	Methyl Ethyl Ketone	78933	0.00E+00				
	Methyl Isocyanate	624839	0.00E+00				
	Methyl Tertiary Butyl Ether	1634044	0.00E+00				
	Methylene Chloride (Dichloromethane)	75092	0.00E+00				
	Methylene Diphenyl Isocyanate (MDI)	101688	0.00E+00				

Michlers Ketone	90948	0.00E+00			
n-Hexane	110543	0.00E+00			
n-Nitroso-n-methylethylamine	10595956	0.00E+00			
n-Nitrosodi-n-Butylamine	924163	0.00E+00			
n-Nitrosodi-n-Propylamine	621647	0.00E+00			
n-Nitrosodiethylamine	55185	0.00E+00			
n-Nitrosodimethylamine	62759	0.00E+00			
n-Nitrosodiphenylamine	86306	0.00E+00			
n-Nitrosomorpholine	59892	0.00E+00			
n-Nitrosopiperidine	100754	0.00E+00			
n-Nitrosopyrrolidine	930552	0.00E+00			
Naphthalene	91203	0.00E+00			
Nickel and Nickel Compounds	7440020	0.00E+00			
Nickel acetate	373024	0.00E+00			
Nickel carbonate	3333673	0.00E+00			
Nickel carbonyl	13463393	0.00E+00			
Nickel hydroxide	12054487	0.00E+00			
Nickelocene	1271289	0.00E+00			
Nickel Oxide	1313991	0.00E+00			
Nickel Refinery Dust	1146	0.00E+00			
Nickel Subsulfide	12035722	0.00E+00			
Nitric Acid	7697372	0.00E+00			
Nitrogen Dioxide	10102440	0.00E+00			
o-CRESOL	95487	0.00E+00			
o-XYLENE	95476	0.00E+00			
Oleum	8014957	0.00E+00			
Ozone	10028156	0.00E+00			
p-Chloro-o-toluidine	95692	0.00E+00			
p-Cresidine	120718	0.00E+00			
p-CRESOL	106445	0.00E+00			
p-Nitrosodiphenylamine	156105	0.00E+00			
p-XYLENE	106423	0.00E+00			
Pentachlorophenol	87865	0.00E+00			
Perchloroethylene	127184	0.00E+00			
Phenol	108952	0.00E+00			
Phosgene	75445	0.00E+00			
Phosphine	7803512	0.00E+00			
Phosphoric Acid	7664382	0.00E+00			
Phthalic Anhydride	85449	0.00E+00			
Polychlorinated Biphenyls	1336363	0.00E+00			
Potassium Bromate	7758012	0.00E+00			
Propylene	115071	0.00E+00			
Propylene Glycol Monomethyl Ether	107982	0.00E+00			
Propylene oxide	75569	0.00E+00			
Selenium	7782492	0.00E+00			
Selenium sulfide	7446346	0.00E+00			
Silica (crystalline, respirable)	7631869	0.00E+00			
Sodium hydroxide	1310732	0.00E+00			
Styrene	100425	0.00E+00			
Sulfates	9960	0.00E+00			
Sulfur Dioxide	7446095	0.00E+00			
Sulfuric Acid	7664939	0.00E+00			
Sulfur Trioxide	7446719	0.00E+00			
Tertiary-butyl acetate	540885	0.00E+00			
Tetrachloroethylene	127184	0.00E+00			
Thioacetamide	62555	0.00E+00			
Toluene	108883	0.00E+00			
Toluene Diisocyanates	26471625	0.00E+00			
Toluene Diisocyanates (2,4 and 2, 6)	584849	0.00E+00			
Toluene Diisocyanates (2,4 and 2, 6)	91087	0.00E+00			
Trichloroethylene	79016	0.00E+00			
Triethylamine	121448	0.00E+00			
Urethane	51796	0.00E+00			
Vanadium pentoxide	1314621	0.00E+00			
Vinyl acetate	108054	0.00E+00			
Vinyl chloride	75014	0.00E+00			
Xylenes (technical mixture of m, o, p-isomers)	1330207	0.00E+00			
Vanadium	7440622	0.00E+00			
	TOTAL UNADJUSTED Risk Values		**709.814**	**0.191**	**0.953**



Clark & Associates
Environmental Consulting, Inc

OFFICE
12405 Venice Blvd.
Suite 331
Los Angeles, CA 90066

PHONE
310-907-6165

FAX
310-398-7626

EMAIL
jclark.assoc@gmail.com

James J. J. Clark, Ph.D.

Principal Toxicologist

Toxicology/Exposure Assessment Modeling

Risk Assessment/Analysis/Dispersion Modeling

Education:

Ph.D., Environmental Health Science, University of California, 1995

M.S., Environmental Health Science, University of California, 1993

B.S., Biophysical and Biochemical Sciences, University of Houston, 1987

Professional Experience:

Dr. Clark is a well recognized toxicologist, air modeler, and health scientist. He has 20 years of experience in researching the effects of environmental contaminants on human health including environmental fate and transport modeling (SCREEN3, AEROMOD, ISCST3, Johnson-Ettinger Vapor Intrusion Modeling); exposure assessment modeling (partitioning of contaminants in the environment as well as PBPK modeling); conducting and managing human health risk assessments for regulatory compliance and risk-based clean-up levels; and toxicological and medical literature research.

Significant projects performed by Dr. Clark include the following:

LITIGATION SUPPORT

Case: James Harold Caygle, et al, v. Drummond Company, Inc. Circuit Court for the Tenth Judicial Circuit, Jefferson County, Alabama. Civil Action. CV-2009

Client: Environmental Litgation Group, Birmingham, Alabama

Dr. Clark performed an air quality assessment of emissions from a coke factory located in Tarrant, Alabama. The assessment reviewed include a comprehensive review of air quality standards, measured concentrations of pollutants from factory, an inspection of the facility and detailed assessment of the impacts on the community. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: Rose Roper V. Nissan North America, et al. Superior Court of the State Of California for the County Of Los Angeles – Central Civil West. Civil Action. NC041739

Client: Rose, Klein, Marias, LLP, Long Beach, California

Dr. Clark performed a toxicological assessment of an individual occupationally exposed to multiple chemicals, including benzene, who later developed a respiratory distress. A review of the individual's medical and occupational history was performed to prepare an exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to respiratory irritants. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: O'Neil V. Sherwin Williams, et al. United States District Court Central District of California

Client: Rose, Klein, Marias, LLP, Long Beach, California

Dr. Clark performed a toxicological assessment of an individual occupationally exposed to petroleum distillates who later developed a bladder cancer. A review of the individual's medical and occupational history was performed to prepare a quantitative exposure assessment. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Summary judgment for defendants.

Case: Moore V., Shell Oil Company, et al. Superior Court of the State Of California for the County Of Los Angeles

Client: Rose, Klein, Marias, LLP, Long Beach, California

Dr. Clark performed a toxicological assessment of an individual occupationally exposed to chemicals while benzene who later developed a leukogenic disease. A review of the individual's medical and occupational history was performed to prepare a quantitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to refined petroleum hydrocarbons. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: Raymond Saltonstall V. Fuller O'Brien, KILZ, and Zinsser, et al. United States District Court Central District of California

Client: Rose, Klein, Marias, LLP, Long Beach, California

Dr. Clark performed a toxicological assessment of an individual occupationally exposed to benzene who later developed a leukogenic disease. A review of the individual's medical and occupational history was performed to prepare a quantitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to refined petroleum hydrocarbons. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: Richard Boyer and Elizabeth Boyer, husband and wife, V. DESCO Corporation, et al. Circuit Court of Brooke County, West Virginia. Civil Action Number 04-C-7G.

Client: Frankovitch, Anetakis, Colantonio & Simon, Morgantown, West Virginia.

Dr. Clark performed a toxicological assessment of a family exposed to chlorinated solvents released from the defendant's facility into local drinking water supplies. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to chlorinated solvents. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: JoAnne R. Cook, V. DESCO Corporation, et al. Circuit Court of Brooke County, West Virginia. Civil Action Number 04-C-9R

Client: Frankovitch, Anetakis, Colantonio & Simon, Morgantown, West Virginia.

Dr. Clark performed a toxicological assessment of an individual exposed to chlorinated solvents released from the defendant's facility into local drinking water supplies. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to chlorinated solvents. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: Patrick Allen And Susan Allen, husband and wife, and Andrew Allen, a minor, V. DESCO Corporation, et al. Circuit Court of Brooke County, West Virginia. Civil Action Number 04-C-W

Client: Frankovitch, Anetakis, Colantonio & Simon, Morgantown, West Virginia.

Dr. Clark performed a toxicological assessment of a family exposed to chlorinated solvents released from the defendant's facility into local drinking water supplies. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to chlorinated solvents. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: Michael Fahey, Susan Fahey V. Atlantic Richfield Company, et al. United States District Court Central District of California Civil Action Number CV-06 7109 JCL.

Client: Rose, Klein, Marias, LLP, Long Beach, California

Dr. Clark performed a toxicological assessment of an individual occupationally exposed to refined petroleum hydrocarbons who later developed a leukogenic disease. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to refined petroleum hydrocarbons. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: Constance Acevedo, et al., V. California Spray-Chemical Company, et al., Superior Court of the State Of California, County Of Santa Cruz. Case No. CV 146344

Dr. Clark performed a comprehensive exposure assessment of community members exposed to toxic metals from a former lead arsenate manufacturing facility. The former manufacturing site had undergone a DTSC mandated removal action/remediation for the presence of the toxic metals at the site. Opinions were presented regarding the elevated levels of arsenic and lead (in attic dust and soils) found throughout the community and the potential for harm to the plaintiffs in question.

Case Result: Settlement in favor of defendant.

Case: Michael Nawrocki V. The Coastal Corporation, Kurk Fuel Company, Pautler Oil Service, State of New York Supreme Court, County of Erie, Index Number I2001-11247

Client: Richard G. Berger Attorney At Law, Buffalo, New York

Dr. Clark performed a toxicological assessment of an individual occupationally exposed to refined petroleum hydrocarbons who later developed a leukogenic disease. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated against the

known outcomes in published literature to exposure to refined petroleum hydrocarbons. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Judgement in favor of defendant.

SELECTED AIR MODELING RESEARCH/PROJECTS

Client – Confidential

Dr. Clark performed a comprehensive evaluation of criteria pollutants, air toxins, and particulate matter emissions from a carbon black production facility to determine the impacts on the surrounding communities. The results of the dispersion model will be used to estimate acute and chronic exposure concentrations to multiple contaminants and will be incorporated into a comprehensive risk evaluation.

Client – Confidential

Dr. Clark performed a comprehensive evaluation of air toxins and particulate matter emissions from a railroad tie manufacturing facility to determine the impacts on the surrounding communities. The results of the dispersion model have been used to estimate acute and chronic exposure concentrations to multiple contaminants and have been incorporated into a comprehensive risk evaluation.

Client – Los Angeles Alliance for a New Economy (LAANE), Los Angeles, California

Dr. Clark is advising the LAANE on air quality issues related to current flight operations at the Los Angeles International Airport (LAX) operated by the Los Angeles World Airport (LAWA) Authority. He is working with the LAANE and LAX staff to develop a comprehensive strategy for meeting local community concerns over emissions from flight operations and to engage federal agencies on the issue of local impacts of community airports.

Client – City of Santa Monica, Santa Monica, California

Dr. Clark is advising the City of Santa Monica on air quality issues related to current flight operations at the facility. He is working with the City staff to develop a comprehensive strategy for meeting local community concerns over emissions from flight operations and to engage federal agencies on the issue of local impacts of community airports.

Client: Omnitrans, San Bernardino, California

Dr. Clark managed a public health survey of three communities near transit fueling facilities in San Bernardino and Montclair California in compliance with California Senate Bill 1927. The survey included an epidemiological survey of the effected communities, emission surveys of local businesses, dispersion modeling to determine potential emission concentrations within the communities, and a comprehensive risk assessment of each community. The results of the study were presented to the Governor as mandated by Senate Bill 1927.

Client: Confidential, San Francisco, California

Summarized cancer types associated with exposure to metals and smoking. Researched the specific types of cancers associated with exposure to metals and smoking. Provided causation analysis of the association between cancer types and exposure for use by non-public health professionals.

Client: Confidential, Minneapolis, Minnesota

Prepared human health risk assessment of workers exposed to VOCs from neighboring petroleum storage/transport facility. Reviewed the systems in place for distribution of petroleum hydrocarbons to identify chemicals of concern (COCs), prepared comprehensive toxicological summaries of COCs, and quantified potential risks from carcinogens and non-carcinogens to receptors at or adjacent to site. This evaluation was used in the support of litigation.

Client – United Kingdom Environmental Agency

Dr. Clark is part of team that performed comprehensive evaluation of soil vapor intrusion of VOCs from former landfill adjacent residences for the United Kingdom's Environment

Agency. The evaluation included collection of liquid and soil vapor samples at site, modeling of vapor migration using the Johnson Ettinger Vapor Intrusion model, and calculation of site-specific health based vapor thresholds for chlorinated solvents, aromatic hydrocarbons, and semi-volatile organic compounds. The evaluation also included a detailed evaluation of the use, chemical characteristics, fate and transport, and toxicology of chemicals of concern (COC). The results of the evaluation have been used as a briefing tool for public health professionals.

EMERGING/PERSISTENT CONTAMINANT RESEARCH/PROJECTS

Client: Ameren Services, St. Louis, Missouri

Managed the preparation of a comprehensive human health risk assessment of workers and residents at or near an NPL site in Missouri. The former operations at the Property included the servicing and repair of electrical transformers, which resulted in soils and groundwater beneath the Property and adjacent land becoming impacted with PCB and chlorinated solvent compounds. The results were submitted to U.S. EPA for evaluation and will be used in the final ROD.

Client: City of Santa Clarita, Santa Clarita, California

Dr. Clark is managing the oversight of the characterization, remediation and development activities of a former 1,000 acre munitions manufacturing facility for the City of Santa Clarita. The site is impacted with a number of contaminants including perchlorate, unexploded ordinance, and volatile organic compounds (VOCs). The site is currently under a number of regulatory consent orders, including an Immanent and Substantial Endangerment Order. Dr. Clark is assisting the impacted municipality with the development of remediation strategies, interaction with the responsible parties and stakeholders, as well as interfacing with the regulatory agency responsible for oversight of the site cleanup.

Client: Confidential, Los Angeles, California

Prepared comprehensive evaluation of perchlorate in environment. Dr. Clark evaluated the production, use, chemical characteristics, fate and transport, toxicology, and remediation of perchlorate. Perchlorates form the basis of solid rocket fuels and have recently been detected in water supplies in the United States. The results of this research

were presented to the USEPA, National GroundWater, and ultimately published in a recent book entitled *Perchlorate in the Environment.*

Client – Confidential, Los Angeles, California

Dr. Clark is performing a comprehensive review of the potential for pharmaceuticals and their by-products to impact groundwater and surface water supplies. This evaluation will include a review if available data on the history of pharmaceutical production in the United States; the chemical characteristics of various pharmaceuticals; environmental fate and transport; uptake by xenobiotics; the potential effects of pharmaceuticals on water treatment systems; and the potential threat to public health. The results of the evaluation may be used as a briefing tool for non-public health professionals.

PUBLIC HEALTH/TOXICOLOGY

Client: Brayton Purcell, Novato, California

Dr. Clark performed a toxicological assessment of residents exposed to methyl-tertiary butyl ether (MTBE) from leaking underground storage tanks (LUSTs) adjacent to the subject property. The symptomology of residents and guests of the subject property were evaluated against the known outcomes in published literature to exposure to MTBE. The study found that residents had been exposed to MTBE in their drinking water; that concentrations of MTBE detected at the site were above regulatory guidelines; and, that the symptoms and outcomes expressed by residents and guests were consistent with symptoms and outcomes documented in published literature.

Client: Confidential, San Francisco, California

Identified and analyzed fifty years of epidemiological literature on workplace exposures to heavy metals. This research resulted in a summary of the types of cancer and non-cancer diseases associated with occupational exposure to chromium as well as the mortality and morbidity rates.

Client: Confidential, San Francisco, California

Summarized major public health research in United States. Identified major public health research efforts within United States over last twenty years. Results were used as a briefing tool for non-public health professionals.

Client: Confidential, San Francisco, California

Quantified the potential multi-pathway dose received by humans from a pesticide applied indoors. Part of team that developed exposure model and evaluated exposure concentrations in a comprehensive report on the plausible range of doses received by a specific person. This evaluation was used in the support of litigation.

Client: Covanta Energy, Westwood, California

Evaluated health risk from metals in biosolids applied as soil amendment on agricultural lands. The biosolids were created at a forest waste cogeneration facility using 96% whole tree wood chips and 4 percent green waste. Mass loading calculations were used to estimate Cr(VI) concentrations in agricultural soils based on a maximum loading rate of 40 tons of biomass per acre of agricultural soil. The results of the study were used by the Regulatory agency to determine that the application of biosolids did not constitute a health risk to workers applying the biosolids or to residences near the agricultural lands.

Client – United Kingdom Environmental Agency

Oversaw a comprehensive toxicological evaluation of methyl-*tertiary* butyl ether (M*t*BE) for the United Kingdom's Environment Agency. The evaluation included available data on the production, use, chemical characteristics, fate and transport, toxicology, and remediation of M*t*BE. The results of the evaluation have been used as a briefing tool for public health professionals.

Client – Confidential, Los Angeles, California

Prepared comprehensive evaluation of *tertiary* butyl alcohol (TBA) in municipal drinking water system. TBA is the primary breakdown product of M*t*BE, and is suspected to be the primary cause of M*t*BE toxicity. This evaluation will include available information on the production, use, chemical characteristics, fate and transport in the environment, absorption, distribution, routes of detoxification, metabolites, carcinogenic potential, and remediation of TBA. The results of the evaluation were used as a briefing tool for non-public health professionals.

Client – Confidential, Los Angeles, California

Prepared comprehensive evaluation of methyl *tertiary* butyl ether (MTBE) in municipal drinking water system. MTBE is a chemical added to gasoline to increase the octane

rating and to meet Federally mandated emission criteria. The evaluation included available data on the production, use, chemical characteristics, fate and transport, toxicology, and remediation of MTBE. The results of the evaluation have been were used as a briefing tool for non-public health professionals.

Client – Ministry of Environment, Lands & Parks, British Columbia

Dr. Clark assisted in the development of water quality guidelines for methyl tertiary-butyl ether (MTBE) to protect water uses in British Columbia (BC). The water uses to be considered includes freshwater and marine life, wildlife, industrial, and agricultural (e.g., irrigation and livestock watering) water uses. Guidelines from other jurisdictions for the protection of drinking water, recreation and aesthetics were to be identified.

Client: Confidential, Los Angeles, California

Prepared physiologically based pharmacokinetic (PBPK) assessment of lead risk of receptors at middle school built over former industrial facility. This evaluation is being used to determine cleanup goals and will be basis for regulatory closure of site.

Client: Kaiser Venture Incorporated, Fontana, California

Prepared PBPK assessment of lead risk of receptors at a 1,100-acre former steel mill. This evaluation was used as the basis for granting closure of the site by lead regulatory agency.

RISK ASSESSMENTS/REMEDIAL INVESTIGATIONS

Client: Confidential, Atlanta, Georgia

Researched potential exposure and health risks to community members potentially exposed to creosote, polycyclic aromatic hydrocarbons, pentachlorophenol, and dioxin compounds used at a former wood treatment facility. Prepared a comprehensive toxicological summary of the chemicals of concern, including the chemical characteristics, absorption, distribution, and carcinogenic potential. Prepared risk characterization of the carcinogenic and non-carcinogenic chemicals based on the exposure assessment to quantify the potential risk to members of the surrounding community. This evaluation was used to help settle class-action tort.

Client: Confidential, Escondido, California

Prepared comprehensive Preliminary Endangerment Assessment (PEA) of dense non-aqueous liquid phase hydrocarbon (chlorinated solvents) contamination at a former printed circuit board manufacturing facility. This evaluation was used for litigation support and may be used as the basis for reaching closure of the site with the lead regulatory agency.

Client: Confidential, San Francisco, California

Summarized epidemiological evidence for connective tissue and autoimmune diseases for product liability litigation. Identified epidemiological research efforts on the health effects of medical prostheses. This research was used in a meta-analysis of the health effects and as a briefing tool for non-public health professionals.

Client: Confidential, Bogotá, Columbia

Prepared comprehensive evaluation of the potential health risks associated with the redevelopment of a 13.7 hectares plastic manufacturing facility in Bogotá, Colombia The risk assessment was used as the basis for the remedial goals and closure of the site.

Client: Confidential, Los Angeles, California

Prepared comprehensive human health risk assessment of students, staff, and residents potentially exposed to heavy metals (principally cadmium) and VOCs from soil and soil vapor at 12-acre former crude oilfield and municipal landfill. The site is currently used as a middle school housing approximately 3,000 children. The evaluation determined that the site was safe for the current and future uses and was used as the basis for regulatory closure of site.

Client: Confidential, Los Angeles, California

Managed remedial investigation (RI) of heavy metals and volatile organic chemicals (VOCs) for a 15-acre former manufacturing facility. The RI investigation of the site included over 800 different sampling locations and the collection of soil, soil gas, and groundwater samples. The site is currently used as a year round school housing approximately 3,000 children. The Remedial Investigation was performed in a manner

that did not interrupt school activities and met the time restrictions placed on the project by the overseeing regulatory agency. The RI Report identified the off-site source of metals that impacted groundwater beneath the site and the sources of VOCs in soil gas and groundwater. The RI included a numerical model of vapor intrusion into the buildings at the site from the vadose zone to determine exposure concentrations and an air dispersion model of VOCs from the proposed soil vapor treatment system. The Feasibility Study for the Site is currently being drafted and may be used as the basis for granting closure of the site by DTSC.

Client: Confidential, Los Angeles, California

Prepared comprehensive human health risk assessment of students, staff, and residents potentially exposed to heavy metals (principally lead), VOCs, SVOCs, and PCBs from soil, soil vapor, and groundwater at 15-acre former manufacturing facility. The site is currently used as a year round school housing approximately 3,000 children. The evaluation determined that the site was safe for the current and future uses and will be basis for regulatory closure of site.

Client: Confidential, Los Angeles, California

Prepared comprehensive evaluation of VOC vapor intrusion into classrooms of middle school that was former 15-acre industrial facility. Using the Johnson-Ettinger Vapor Intrusion model, the evaluation determined acceptable soil gas concentrations at the site that did not pose health threat to students, staff, and residents. This evaluation is being used to determine cleanup goals and will be basis for regulatory closure of site.

Client –Dominguez Energy, Carson, California

Prepared comprehensive evaluation of the potential health risks associated with the redevelopment of 6-acre portion of a 500-acre oil and natural gas production facility in Carson, California. The risk assessment was used as the basis for closure of the site.

Kaiser Ventures Incorporated, Fontana, California

Prepared health risk assessment of semi-volatile organic chemicals and metals for a fifty-year old wastewater treatment facility used at a 1,100-acre former steel mill. This evaluation was used as the basis for granting closure of the site by lead regulatory agency.

ANR Freight - Los Angeles, California

Prepared a comprehensive Preliminary Endangerment Assessment (PEA) of petroleum hydrocarbon and metal contamination of a former freight depot. This evaluation was as the basis for reaching closure of the site with lead regulatory agency.

Kaiser Ventures Incorporated, Fontana, California

Prepared comprehensive health risk assessment of semi-volatile organic chemicals and metals for 23-acre parcel of a 1,100-acre former steel mill. The health risk assessment was used to determine clean up goals and as the basis for granting closure of the site by lead regulatory agency. Air dispersion modeling using ISCST3 was performed to determine downwind exposure point concentrations at sensitive receptors within a 1 kilometer radius of the site. The results of the health risk assessment were presented at a public meeting sponsored by the Department of Toxic Substances Control (DTSC) in the community potentially affected by the site.

Unocal Corporation - Los Angeles, California

Prepared comprehensive assessment of petroleum hydrocarbons and metals for a former petroleum service station located next to sensitive population center (elementary school). The assessment used a probabilistic approach to estimate risks to the community and was used as the basis for granting closure of the site by lead regulatory agency.

Client: Confidential, Los Angeles, California

Managed oversight of remedial investigation most contaminated heavy metal site in California. Lead concentrations in soil excess of 68,000,000 parts per billion (ppb) have been measured at the site. This State Superfund Site was a former hard chrome plating operation that operated for approximately 40-years.

Client: Confidential, San Francisco, California

Coordinator of regional monitoring program to determine background concentrations of metals in air. Acted as liaison with SCAQMD and CARB to perform co-location sampling and comparison of accepted regulatory method with ASTM methodology.

Client: Confidential, San Francisco, California

Analyzed historical air monitoring data for South Coast Air Basin in Southern California and potential health risks related to ambient concentrations of carcinogenic metals and volatile organic compounds. Identified and reviewed the available literature and calculated risks from toxins in South Coast Air Basin.

IT Corporation, North Carolina

Prepared comprehensive evaluation of potential exposure of workers to air-borne VOCs at hazardous waste storage facility under SUPERFUND cleanup decree. Assessment used in developing health based clean-up levels.

Professional Associations

American Public Health Association (APHA)
Association for Environmental Health and Sciences (AEHS)
American Chemical Society (ACS)
California Redevelopment Association (CRA)
International Society of Environmental Forensics (ISEF)
Society of Environmental Toxicology and Chemistry (SETAC)

Publications and Presentations:

Books and Book Chapters

Sullivan, P., **J.J. J. Clark,** F.J. Agardy, and P.E. Rosenfeld. (2007). *Synthetic Toxins In The Food, Water and Air of American Cities.* Elsevier, Inc. Burlington, MA.

Sullivan, P. and **J.J. J. Clark**. 2006. *Choosing Safer Foods, A Guide To Minimizing Synthetic Chemicals In Your Diet.* Elsevier, Inc. Burlington, MA.

Sullivan, P., Agardy, F.J., and **J.J.J. Clark**. 2005. *The Environmental Science of Drinking Water.* Elsevier, Inc. Burlington, MA.

Sullivan, P.J., Agardy, F.J., **Clark, J.J.J.** 2002. *America's Threatened Drinking Water: Hazards and Solutions.* Trafford Publishing, Victoria B.C.

Clark, J.J.J. 2001. "TBA: Chemical Properties, Production & Use, Fate and Transport, Toxicology, Detection in Groundwater, and Regulatory Standards" in *Oxygenates in the Environment.* Art Diaz, Ed.. Oxford University Press: New York.

Clark, J.J.J. 2000. "Toxicology of Perchlorate" in *Perchlorate in the Environment.* Edward Urbansky, Ed. Kluwer/Plenum: New York.

Clark, J.J.J. 1995. Probabilistic Forecasting of Volatile Organic Compound Concentrations At The Soil Surface From Contaminated Groundwater. UMI.

Baker, J.; **Clark, J.J.J.**; Stanford, J.T. 1994. Ex Situ Remediation of Diesel Contaminated Railroad Sand by Soil Washing. Principles and Practices for Diesel Contaminated Soils, Volume III. P.T. Kostecki, E.J. Calabrese, and C.P.L. Barkan, eds. Amherst Scientific Publishers, Amherst, MA. pp 89-96.

Journal and Proceeding Articles

Tam L. K.., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008) A Statistical Analysis Of Attic Dust And Blood Lipid Concentrations Of Tetrachloro-p-Dibenzodioxin (TCDD) Toxicity Equialency Quotients (TEQ) In Two Populations Near Wood Treatment Facilities. Organohalogen Compounds, Volume 70 (2008) page 002254.

Tam L. K.., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008) Methods For Collect Samples For Assessing Dioxins And Other Environmental Contaminants In Attic Dust: A Review. Organohalogen Compounds, Volume 70 (2008) page 000527

Hensley A.R., Scott, A., Rosenfeld P.E., **Clark, J.J.J.** (2007). "Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility." *Environmental Research.* 105:194-199.

Rosenfeld, P.E., **Clark, J. J.,** Hensley, A.R., and Suffet, I.H. 2007. "The Use Of An Odor Wheel Classification For The Evaluation of Human Health Risk Criteria For Compost Facilities" Water Science & Technology. 55(5): 345-357.

Hensley A.R., Scott, A., Rosenfeld P.E., **Clark, J.J.J.** 2006. "Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility." The 26th International Symposium on Halogenated Persistent Organic Pollutants – DIOXIN2006, August 21 – 25, 2006. Radisson SAS Scandinavia Hotel in Oslo Norway.

Rosenfeld, P.E., **Clark, J. J.** and Suffet, I.H. 2005. "The Value Of An Odor Quality Classification Scheme For Compost Facility Evaluations" The U.S. Composting Council's 13th Annual Conference January 23 - 26, 2005, Crowne Plaza Riverwalk, San Antonio, TX.

Rosenfeld, P.E., **Clark, J. J.** and Suffet, I.H. 2004. "The Value Of An Odor Quality Classification Scheme For Urban Odor" WEFTEC 2004. 77th Annual Technical Exhibition & Conference October 2 - 6, 2004, Ernest N. Morial Convention Center, New Orleans, Louisiana.

Clark, J.J.J. 2003. "Manufacturing, Use, Regulation, and Occurrence of a Known Endocrine Disrupting Chemical (EDC), 2,4-Dichlorophnoxyacetic Acid (2,4-D) in California Drinking Water Supplies." National Groundwater Association Southwest Focus Conference: Water Supply and Emerging Contaminants. Minneapolis, MN. March 20, 2003.

Rosenfeld, P. and **J.J.J. Clark**. 2003. "Understanding Historical Use, Chemical Properties, Toxicity, and Regulatory Guidance" National Groundwater Association Southwest Focus Conference: Water Supply and Emerging Contaminants. Phoenix, AZ. February 21, 2003.

Clark, J.J.J., Brown A. 1999. Perchlorate Contamination: Fate in the Environment and Treatment Options. In Situ and On-Site Bioremediation, Fifth International Symposium. San Diego, CA, April, 1999.

Clark, J.J.J. 1998. Health Effects of Perchlorate and the New Reference Dose (RfD). Proceedings From the Groundwater Resource Association Seventh Annual Meeting, Walnut Creek, CA, October 23, 1998.

Browne, T., **Clark, J.J.J.** 1998. Treatment Options For Perchlorate In Drinking Water. Proceedings From the Groundwater Resource Association Seventh Annual Meeting, Walnut Creek, CA, October 23, 1998.

Clark, J.J.J., Brown, A., Rodriguez, R. 1998. The Public Health Implications of MtBE and Perchlorate in Water: Risk Management Decisions for Water Purveyors. Proceedings of the National Ground Water Association, Anaheim, CA, June 3-4, 1998.

Clark J.J.J., Brown, A., Ulrey, A. 1997. Impacts of Perchlorate On Drinking Water In The Western United States. U.S. EPA Symposium on Biological and Chemical Reduction of Chlorate and Perchlorate, Cincinnati, OH, December 5, 1997.

Clark, J.J.J.; Corbett, G.E.; Kerger, B.D.; Finley, B.L.; Paustenbach, D.J. 1996. Dermal Uptake of Hexavalent Chromium In Human Volunteers: Measures of Systemic Uptake From Immersion in Water At 22 PPM. Toxicologist. 30(1):14.

Dodge, D.G.; **Clark, J.J.J.**; Kerger, B.D.; Richter, R.O.; Finley, B.L.; Paustenbach, D.J. 1996. Assessment of Airborne Hexavalent Chromium In The Home Following Use of Contaminated Tapwater. Toxicologist. 30(1):117-118.

Paulo, M.T.; Gong, H., Jr.; **Clark, J.J.J.** (1992). Effects of Pretreatment with Ipratroprium Bromide in COPD Patients Exposed to Ozone. American Review of Respiratory Disease. 145(4):A96.

Harber, P.H.; Gong, H., Jr.; Lachenbruch, A.; **Clark, J.**; Hsu, P. (1992). Respiratory Pattern Effect of Acute Sulfur Dioxide Exposure in Asthmatics. American Review of Respiratory Disease. 145(4):A88.

McManus, M.S.; Gong, H., Jr.; Clements, P.; **Clark, J.J.J.** (1991). Respiratory Response of Patients With Interstitial Lung Disease To Inhaled Ozone. American Review of Respiratory Disease. 143(4):A91.

Gong, H., Jr.; Simmons, M.S.; McManus, M.S.; Tashkin, D.P.; Clark, V.A.; Detels, R.; **Clark, J.J.** (1990). Relationship Between Responses to Chronic Oxidant and Acute

Ozone Exposures in Residents of Los Angeles County. American Review of Respiratory Disease. 141(4):A70.

Tierney, D.F. and **J.J.J. Clark.** (1990). Lung Polyamine Content Can Be Increased By Spermidine Infusions Into Hyperoxic Rats. American Review of Respiratory Disease. 139(4):A41.

EXHIBIT B

MENLO SCIENTIFIC ACOUSTICS, INC.
Consultants in Acoustics and Communication Technologies

25 January 2021

Ms. Christina Caro
Adams Broadwell Joseph & Cardozo
601 Gateway Blvd., Suite 1000
South San Francisco, California 94080

Subject: **676 Mateo Street Project**
ENV-2016-3691-EIR - Noise Impact Review Memo

Dear Ms. Caro,

Per Ms. Kendra Hartmann's request Menlo Scientific Acoustics, Inc. (MSAI), reviewed the Project Definition (II) chapter as well as the Noise Environmental Impact Analysis (IV.H) and the Transportation/Traffic sections of the subject Draft Environmental Impact Report. The discussion below provides a summary of our review. The items discussed below indicate some of the ways in which the DEIR does not adequately describe the project noise impacts, presents the impression the impacts are not significant, and omits potential noise sources and their impacts. 36

I. The DEIR Fails to Provide an Adequate Project Definition

The DEIR fails to provide the details necessary to review the Project's impacts and assess the mitigation needed to minimize them. The project description lacks information critical for the reviewing public to meaningfully assess the DEIR's conclusions in several ways, including:

a. DEIR Section 2, *Environmental Setting*, includes in its descriptions and figures makes brief mention of the multi-story residential buildings to the west across Mateo Street and, to a much lesser extent, the multi-story residential building to the east across Imperial Street. The description of the Project site's surroundings is an inadequate baseline from which to analyze Project impacts. The impacts during construction for residential units above ground level (note all units are above ground level) in the neighboring buildings, despite a mitigation offered by an eight-foot-high barrier, is neither disclosed nor discussed. This impact is substantial. 37

b. DEIR Section 4, *Construction*, admits that the project will require the net export of approximately 74,500 cubic yards of soil. No mention is made of the location for the staging of the haul trucks and the size of the haul trucks to be used. This information is necessary to analyze the noise impacts from the haul trucks' daily trips on the adjacent residential units. 38

c. DEIR Section 6, *Discretionary Actions and Approvals*, notes the anticipated request for approval to serve a full line of alcoholic beverages on-site. This could have significant implications for the Project's operational noise impacts, none of which are disclosed or discussed. These potential impacts include those resulting from boisterous patrons in open seating areas; noise from the interior of an establishment if it has windows and doors that open to the outside; noise impacts from sound systems for recorded or live sound. The noise level from these can exceed the criteria in LAMC Chapter 12.08, Noise Control. The DEIR, however, does not include a description of any of these potentialities. 39

II. The Existing Baseline Established by the Noise Impact Analysis is Inadequate and the Data Presented to Analyze Noise Impacts is Inaccurate and Incomplete

Table IV.H-7 in DEIR Section IV.H Noise presents some noise measurements made at the Project site. Absent from the DEIR or its analyses are details critical to support its conclusions regarding the existing baseline at the Project site. The time(s) of day, for example, at which these measurements were taken is not disclosed. No description of the environmental conditions in the vicinity, such as the current or former presence of construction and other activities near the measurement locations or other environmental conditions such as wind that could affect the noise baseline measurements. The DEIR's baseline ambient noise measurements fail to establish existing noise levels at relevant noise-sensitive receptors in the vicinity of the Project site and the DEIR likewise fails to assess the temporary increase in ambient noise levels at those receptors accurately. Table IV.H-9 presents data that is confusing and misleading. Figures, for example, in that the column labeled "Estimated Peak Construction Noise Levels (dBA Leq)" refer both to "peak" and "L_{eq}." These values, however, measure different energy noise levels. "Peak sound level" is defined by ANSI AS S1.1, *Acoustical Terminology*, as the "*greatest absolute* value of instantaneous sound pressure within a specified time interval within a stated time interval to the square of the reference value for sound pressure. E*quivalent continuous sound level, or Leq,* meanwhile, is defined as "Ten times the logarithm to the base ten of the ratio of *time-mean-square* frequency-weighted sound pressure signal, during a stated time interval T, to the square of the reference value for sound pressure," or the average acoustic energy content of noise for a stated period of time. A peak level in a given time period is always greater than an average sound level for a given time period. These inconsistencies and errors make a precise analysis of noise impacts impossible.

40

Page IV.H-27 states "peak construction noise levels at all sensitive receptors would be below the 75 dBA construction noise threshold defined by the Section 41.40 of the LAMC." Section 41.40, however, makes no mention of a noise threshold of 75 dBA.[a]

- Further, peak levels are not defined nor referenced in LAMC Chapter XI, *Noise Regulation*. Sound level is defined in section 111.01. *Definitions*, sub section (k) "Sound Level" (Noise level) in decibels (dB) is the sound measured with the "A" weighting and slow response by a sound level meter; except for impulsive or rapidly varying sounds, the fast response shall be used."
- Per ANSI/ASA S1.1 section 3.12 the slow response time period is 1000 ms (one thousand milli-seconds = 1 second) and the fast response time period is 125 ms (1/8 second). For time-varying noise the shorter the time period the greater the measured sound level and the longer the time period the more the sound level decreases.

III. The DEIR's Conclusions Regarding Noise Impacts Are Inaccurate and Underestimated

CEQA does not set a uniform standard for determining the significance of a project's noise impacts. Lead agencies may select their own method but must support the method with evidence and analysis. The City

41

[a] https://codelibrary.amlegal.com/codes/los_angeles/latest/lamc/0-0-0-128777#JD_41.40

The estimated peak construction noise levels at the nearest sensitive receptors, the National Biscuit Company Lofts and the Toy Factory Lofts, is projected to be 66.4 dBA.[b] This analysis is not supported by substantial evidence for several reasons. First, the analysis did not specify the

construction equipment used in the estimation, a crucial datapoint.[c] Secondly, the analysis uses a threshold set forth in Los Angeles Municipal Code Section 112.05, which "prohibits any powered equipment or powered hand tool from producing noise levels that exceed 75 dBA at a distance of 50 feet from the noise source within 500 feet of a residential zone."[d] The distance of the haul trucks route to the sensitive receptors, however, is less than 50 feet. For incoming haul trucks, the distance to the Biscuit Company building will be approximately 30 feet, while outgoing trucks will pass about 15 feet from the building.[e] The noise levels, therefore, will be considerably higher—4.4 dBA higher for incoming trips and 10.4 dBA higher for outgoing.



41 cont.

A considerable increase in noise levels such as these for each haul truck trip equates to an exponentially more significant impact when considering the number of trips per day and the hours during which they are completed. If there will be, as stated, 71 trips per day for both incoming and outgoing trips[f] from 7 am to 10 pm (15 hours) then:

[b] DEIR Section IV.H Noise, Table IV.H-9, p. IV.H-27.
[c] https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm.
[d] https://codelibrary.amlegal.com/codes/los_angeles/latest/lamc/0-0-0-128777#JD_112.05.
[e] See Google Earth image, below.
[f] DEIR Section IV.H Noise, p. IV.H-28.

- 4.7 incoming trips/hr (every 12.8 minutes) will be 80.4 dBA
- 4.7 outcoming trips/hr (every 12.8 minutes) will be 86.4 dBA

So, each trip can exceed the 75 dBA criteria every 6.4 minutes!

If there will be 71 trips in and out/day from 7 am to 5 pm (10 hours) then:

- 7.1 incoming trips/hr (every 7.1 minutes) will be 80.4 dBA
- 7.1 outcoming trips/hr (every 7.1 minutes) will be 86.4 dBA

So, each trip can exceed the 75 dBA criteria every 3.6 minutes!

41 cont.

Since the trucks will be accelerating and decelerating the levels can be higher than those noted above and the time of exceedance depends on the time it takes for each truck to arrive and depart. Further, as noted above, if the truck noise level found in Table IV.H-8 are underestimated, the noise impact will be even greater. If the number of trips per day is greater than the 71 incoming and outgoing that the DEIR projects, noise impacts will be more frequent and could become almost continuous.

IV. Construction Noise Mitigation is Inadequate

Lastly, the measures proposed by the DEIR to mitigate noise impacts are woefully inadequate. In order to help minimize adverse noise impacts at the National Biscuit Company and Toy Factory lofts, an eight-foot-high barrier will be installed along the western boundary of the Project site during demolition and excavation/grading. This barrier, which stands at a much lower height than any residential units in both buildings, will provide no mitigation. It will neither dampen noise at the site due to its low profile, nor will it protect residents at either residential building from the haul truck construction noise impact as the haul truck route will pass down Mateo Street with no barrier or other mitigation between the trucks and the residential units.

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Furthermore, nowhere are impacts from music or loud (and potentially inebriated) patrons on the ground discussed. Permits for live music or music playback on or at the roof area pool and spa, yoga deck, and private terraces are anticipated, but the impacts of these is neither disclosed nor discussed in the DEIR. Music, especially the low frequency sounds present in many music genres, can be a nuisance and impact the residential units in close proximity. Music can impact the interior of the residences since windows do not have good low-frequency attenuation. Potential mitigation measures for reducing these impacts can include limiting music or sound levels, including not allowing music at the pool and spa, yoga deck, and private terraces, as well as retrofitting windows at impacted existing residential properties, similar to that implemented at LAX.

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Please contact me to discuss at your convenience. Thank you for the opportunity to be of service.

Sincerely,
MENLO SCIENTIFIC ACOUSTICS, INC.

Neil A. Shaw

Neil A. Shaw, FASA, FAES

NAS:sk

RESUME - NEIL A. SHAW

Education:

University of California, Los Angeles
B. S. Engineering, 1977, cum laude
M. S. Engineering, 1977

Cooper Union, New York, 1968 - 1970

Honors:

Kenward S. Oliphant Memorial Fellowship in Acoustical Engineering (awarded by Consulting Engineers Association of California)
Tau Beta Pi

Experience:

Menlo Scientific Acoustics, Inc., Topanga

Designer and manager for acoustic design projects including audio-visual systems, sound reinforcement systems, television and radio production systems, architectural room acoustics, electromagnetic compatibility system design and criteria development, electroacoustic and electronic signal processing equipment product performance criteria development, product design and development, environmental noise surveys and analysis, noise and vibrations control, sound isolation, and machine noise control.
1992 to present.
Principal.

University of Southern California, Thornton School of Music
2008 - 2010.

Southern California Institute of Architecture, Los Angeles
2003.

WEAL, Santa Monica

Design and construction services for sound reinforcement systems, television systems, A/V systems, paging systems, and masking noise systems for various production facilities, convention centers, airport terminals, auditoriums, places of worship, concert halls, athletic facilities, courtrooms, multipurpose rooms, gymnasiums, museums, banquet halls, lecture rooms and other facilities. Transportation ambient noise surveys and analysis, construction site noise measurements, and field STC and NIC measurements per ASTM E 336-84. Lead member of team to install, run and maintain database manager computer software for company projects and clients. Part of design, implementation and enhancement team for computer controlled laboratory data acquisition and processing for laboratory tests performed per ASTM E 90-85 and ASTM C 423-84a.
1975 to 1992.

Aero-acoustics Laboratory, UCLA

Responsibilities include computer programming, aero-acoustic measurements, acoustic measurements, database search and statistical processing, A/D anti-aliasing filter design and prototyping, multi-channel data acquisition and processing, post processing and display.
1978 to 1984.

Affiliations:

Fellow, Acoustical Society of America
Chairman, Los Angeles Chapter, 1991 to 2001.
Organizer and Co-Chair, Joint ASA/ASJ meeting 1996, Auralization Special Session.
Organizer and Chair, ASA meeting, 1997, Engineering Acoustics Special Session.
Organizer and Co-Chair, ASA meeting, 1999, Engineering Acoustics Special Session.
Organizer and Co-Chair, ASA meeting, 2000, Student Loudspeaker Design Competition.
Chairman, ASA meeting, 2001, Architectural Acoustics Modeling and Imaging Special Session.
Organizer and Chair, ASA meeting, 2001, Architectural Acoustics Cruise Ship Acoustics Special Session.
Tutorial on Architectural Acoustics, Joint ASA/ICA/MCA Cancun meeting, December 2002.
Invited Paper, November 2003 ASA meeting, "Sound Quality and Loudspeakers," Special Session on Sound Quality - When Sound is the Essential Quality.
Organizer and Co-Chair, ASA meeting, 2004, Special Session on the Bell Laboratories and Acoustics.
Invited Paper, June 2004 ASA meeting, "Textbooks on Acoustics," On the Occasion of His 90th Birthday, To Honor the Contributions of Leo L. Beranek to Acoustics and Teaching Special Session sponsored by all the Technical Committees and ASA Committees.
Chairman, June 2004 ASA meeting, General Topics in Architectural Acoustics
Invited Paper, June 2005 ASA meeting, "Barnum Hall - The Continuing Renovation of a Streamline Moderne Theater," Special Session on Preserving Acoustical Integrity in the Course of Renovation.
Invited Paper, Winter 2007 ASA meeting, "Sound Systems for Large Scale Venues," with John Monitto, Special session on Sound Systems in Large Rooms and Stadia
Member, Technical Committee on Architectural Acoustics, 1996 - 2010
Member, Technical Committee on Engineering Acoustics, 1998 - 2010
Member, Technical Committee on Physical Acoustics, 2000 - 2010
Member, Books+ Committee, 1996 - present

Fellow, Audio Engineering Society
Member, Technical Committee on Acoustics and Sound Reinforcement, 1988 to 2005.
Chairman, Large Array Systems Session and Special JAES issue, 1987
Chairman, Workshop on Auralization, 1993
Co-Chairman, Workshop on Weather-Related Issues in Outdoor Sound Reinforcement, 1998
Tutorial on Loudness, Los Angeles Chapter, March 2003

Senior Member, Institute of Electrical and Electronic Engineers

Member, Society of Motion Picture and Television Engineers
Member, Standards Community TC-20F Film, TC-20F-30 WG Film Audio, TC-20F-40 Theatrical Projection, ST-SG Theater B-chain 1990 to present.

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Member, Institute of Noise Control Engineering

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EIT, CA #37673

Publications: Preface to the Reprint Edition, "Principles and Applications of Room Acoustics", Lothar Cremer and Helmut A. Muller (translated by Theodore J. Shultz), Peninsula Publishers, Los Altos Hills, CA, reprint edition, to be re-published.

Patent reviews, Journal of the Acoustical Society of America, 2004 -present.

Shaw, Neil A, "Up in Knudsen's Attic: Some Private papers of Vern O. Knudsen," Acoustics Today, 7(1), 29ff, January 2011

Shaw, Neil A., "Seeing, Hearing & Listening - Part II", Live Sound International, 17(4), 58ff, April 2008

Shaw, Neil A., "Seeing, Hearing & Listening - Part I", Live Sound International, 17(3), 12ff, March 2008

Shaw, Neil A., "The Pre-history and Early History of Loudspeakers", part 4 of 4, Live Sound International, 16(8), 66ff, August 2007

Shaw, Neil A., "The Pre-history and Early History of Loudspeakers", part 3 of 4, Live Sound International, 16(7), 54ff, July 2007

Shaw, Neil A., "The Pre-history and Early History of Loudspeakers", part 2 of 4, Live Sound International, 15(12), 12ff, December 2006

Shaw, Neil A., "An Early History of Modern Power Amplifiers," Live Sound International, 15(2), 10ff, February 2006

Shaw, Neil A., "The Pre-history and Early History of Loudspeakers", part 1 of 4, Live Sound International, 14(4), 38ff, November 2005

"Audio" monthly column, Club System International magazine, 2000 - 2003.

Shaw, Neil A.., "The Pre-History and Early History of Loudspeakers", Sound and Communications, 41(4), 118ff, April 1995.

Shaw, Neil A.., "Acoustical Design and Auralization", Sound and Communications, 40(8), 44ff, August 1994.

Shaw, Neil A., Klapholz, Jesse and Gander, Mark R., "Books and Acoustics, Especially Wallace Clement Sabine's Collected Papers on Acoustics," Proceedings of the Sabine Centennial Symposium, Acoustical Society of America, Cambridge, MA, June 1994.

Shaw, Neil A., "Digital Delays, Part Three - Real World Applications for Real World Delay Units," Sound and Communications, 39(10), 16ff, October 1993.

Shaw, Neil A., "Digital Delays, Part Two - Testing Specific Products for Specific Uses," Sound and Communications, 39(5), 62ff, May 1993.

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Shaw, Neil A., "Digital Delays, Part One - Reviewing the Basics," Sound and Communications, 393(4), 96ff, March 1993.

Meecham, W. C. and Shaw, Neil, "Increase in Disease Mortality Rates Due to Aircraft Noise", Proceedings of the International Symposium on Noise and Disease, Berlin, 1991

Meecham, W. C. and Shaw, Neil, "Increase in Disease Mortality Rates Due to Aircraft Noise," Proceedings of the 5th International Congress on Noise as a Public Health Problem, Stockholm, 351-356, 1988

Shaw, Neil A., "A Historical Profile: Stereophonic Sound Systems, Part Two," Sound and Communications, 33(7), 24ff, July 1987.

Shaw, Neil A., "A Historical Profile: Stereophonic Sound Systems, Part One," Sound and Communications, 33(6), 22ff, June 1987.

Shaw, Neil A., "Exhibit Hall and Theater Sound Reinforcement Systems at the Metro Toronto Convention Center," Proceedings 12th International Congress of Acoustics, E9-5.1 - E9-5.2, 1986.

Meecham, W. C. and N. A. Shaw, "Jet Plane Noise Effects on Mortality Rates," Proceedings Internoise 86 Progress in Noise Control, Volume II, 1451-1455, 1986.

Shaw, N. A., "Effects of Jet Noise on Mortality Rates," Los Angeles County Department of Health, The Effects of Aircraft Noise on Health, June, 1981

Meecham, W. C. and N. A. Shaw, "Effects of Jet Noise On Mortality Rates," British Journal of Audiology, 13, 77-80, 1979.

Book Reviews:

"Acoustical Engineering," Harry F. Olson - Journal of the Audio Engineering Society, Vol. 40, No. 5, May 1992, Sound and Communications, Vol. 38, No. 4, April 27, 1992.

"Concert Sound - Tours, Technologies and Techniques," David Trubitt - Journal of the Audio Engineering Society.

"Hearing - An Introduction to Psychological and Physiological Acoustics," Stanley A. Gelfand - Sound and Communications, Vol. 37, No. 3, March 22, 1991.

"Room Acoustics," Henrich Kuttruff - Sound and Communications, Vol. 38, No. 2, February 28, 1992.

"The Science of Sound," Thomas D. Rossing - Sound and Communications, Vol. 37, No. 10, October 22, 1991.

"AIP Handbook of Condenser Microphones," George S. K. Wong and Tony F. W. Embleton, Editors - Journal of the Audio Engineering Society, Vol. 43, No. 6, June 1995.

"The ASA Edition of Speech and Hearing in Communication", Harvey Fletcher - Sound and Communication, Vol. 41, No. 9, September 25, 1995.

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"The Nature and Technology of Acoustic Space", Mikio Tohyama, Hideo Suzuki and Yoichi Ando - Journal of the Audio Engineering Society, Vol. 44, No. 3, March 1996.

"Concert and Opera Halls - How They Sound", Leo Beranek - Journal of the Audio Engineering Society, Vol. 44, No. 9, September 1996.

"Acoustics and Noise Control Handbook for Architects and Builders", Leland K. Irvine and Roy L. Richards - Journal of the Audio Engineering Society, Vol. 46, No. 5, May 1998.

"Encyclopedia of Acoustics", Edited by Malcolm J. Crocker - Journal of the Audio Engineering Society, Vol. 46, No. 9, September 1998.

"The New Stereo Soundbook, Ron Streicher and Alton Everest - Journal of the Acoustical Society of America, Vol. 105, No. 6, June 1999.

"Introduction to Electroacoustics and Audio Amplifier Design," W. Marshall Leach, Jr. - Journal of the Audio Engineering Society, Vol. 47, No. 7/8, July/August 1999, Sound and Communications, Vol. 45, No. 9, September 20, 1999.

"Architectural Acoustics - Principles and Design," Madan Mehta, Jim Johnson, and Jorge Rocafort - Journal of the Audio Engineering Society, Vol. 47, No. 10, October 1999.

"Architectural Acoustics: Blending Sound Sources, Sound Fields, and Listening," Yoichi Ando - Journal of the Audio Engineering Society, Vol. 48, No. ½, January/February 2000.

"Fundamental of Physical Acoustics," David T. Blackstock - Journal of the Audio Engineering Society, Vol. 48, No. 9, September 2000.

"The Science and Applications of Acoustics," Daniel R. Raichel - Journal of the Audio Engineering Society, Vol. 48, No. 10, October 2000.

"Sounds of Our Times," Robert T. Beyer - Journal of the Audio Engineering Society, Vol. 48, No. 11, November 2000.

"Acoustics: Basic Physics, Theory and Methods," Paul Filippi, Dominique Habalt, Jean-Pierre Lefebvre and Aime Bergassoli - Journal of the Audio Engineering Society, Vol. 49, No. 1+2, January/February 2001.

"Active Noise Control Primer," Scott D. Snyder - Journal of the Audio Engineering Society, Vol. 49, No. 5, May 2001.

"The Microphone Book," John Eargle - Sound & Communications, November 2001.

"Computer Speech Recognition, Compression, Synthesis," Manfred R. Schroeder - Journal of the Audio Engineering Society, Vol. 49, No. 12, December 2001.

"Audio Engineering For Sound Reinforcement," John Eargle and Chris Foreman - Journal of the Audio Engineering Society. Vol. 50, No. 12,

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December 2002.

"Pro Audio Reference," Dennis Bohn - Journal of the Audio Engineering Society, Vol. 51, No. 7/8, July/August 2003.

"Concert Halls and Opera Houses - Music, Acoustics, and Architecture," Leo L. Beranek - Journal of the Audio Engineering Society, Vol. 52, No. 5, May 2004

"Acoustic Absorbers and Diffusers - Theory, Design and Application," Trevor J. Cox and Peter D'Antonio - Journal of the Audio Engineering Society, Volume 53, No. 10, October 2005

"Formulas of Acoustics," F. P. Mechel - Journal of the Audio Engineering Society, Volume 53, No. 12, December 2005

"Communication Acoustics," Jens Blauert (editor) - Journal of the Audio Engineering Society, Volume 54, No.½, January/February 2006

"Acoustics and Psychoacoustics," David M. Howard and Jamie Angus - Journal of the Audio Engineering Society, Volume 54, No. 11, November 2006

"Pro Audio Reference," Second Edition, Dennis Bohn, Journal of the Audio Engineering Society - Journal of the Audio Engineering Society, Volume 54, No. 4, April 2007

"Worship, Acoustics, and Architecture," Ettore Cirillo and Francesco Martellotta - Journal of the Audio Engineering Society, Journal of the Audio Engineering Society, Volume 55, No. 11, November 2007

"Sound FX Unlocking the Creative Potential of Recording Studio Effects," Alexander U. Case - Journal of the Audio Engineering Society, Volume 55, No. 12, December 2007

"Surround Sound Up and Running," Tomlinson Holman - Journal of the Audio Engineering Society, Volume 56, No. 9, September 2008

"Sound Reproduction Loudspeakers and Rooms," Floyd E. Toole - Journal of the Audio Engineering Society, Volume 57, No.½, January/February 2009

"Handbook for Sound Engineers," 4th Edition, Glenn Ballou - Journal of the Audio Engineering Society, Volume 57, No. 7/8, July/August 2009

"Acoustics and the Performance of Music Manual for Acousticians, Audio Engineers, Musicians, Architects and Musical Instrument Makers," 5th Edition Jürgen Meyer (translated by Uwe Hanson) - Journal of the Audio Engineering Society, Volume 58, No. 3, March 2010

"Sound for Film and Television" 3rd Edition, Tomlinson Holman - Journal of the Audio Engineering Society, Volume 58, No. 11, November 2010

"The Acoustics of Performance Halls Spaces for Music from Carnegie Hall to the Hollywood Bowl," J. Christopher Jaffe - Journal of the Audio Engineering Society, Volume 59, No. 4, April 2011

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"Acoustics and Audio Technology," Mendel Kleiner - Journal of the Audio Engineering Society, to be published

"Grounds for Grounding," Elya B. Joffee and Kai-Sang Lock - Journal of the Audio Engineering Society, to be published

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Selected Product Development Projects - Neil A. Shaw

Aura Systems	1992 - 2005 Technical support for audio projects using inherently shielded neodymium speakers.
Peavey	1995 - 1997 Loudspeaker engineering for professional woofers and compression drivers, out-sourcing of electronics and speaker manufacturing, joint venture liaison.
Armstrong World Industries	1999 - 2002 Conception and product definition for active acoustic initiative. Product definition and development of ceiling tile speaker, and other projects.
Microsoft	1999 - 2000 Headset and headset element design for voice recognition product.
Cisco	1999 - 2000 Telephone and speaker-phone design for Internet telephone.
Intel	2000 Internet appliance sound system product
RPG	2001 - 2020 Technical and marketing support for this vendor of acoustical devices for architectural spaces.
Bohlender-Graebener	2001 - 2004 Technical support and loudspeaker engineering for planar diaphragm loudspeaker products.
Johns Manville	2002 Strategic product and market research and analysis.
Tri-path	2002 - 2006 Technical support and system engineering for digital audio power amplifiers.
Extron	2002 - 2003 Technical and material support for loudspeaker development and research.
Microsoft	2003 - 2006 Anechoic chamber design. Electroacoustic product testing protocol development.
University of Illinois	2008 - 2009 Transducer and power amplifier design and selection for food industry processing equipment.
Microsoft	2008 - 2009 Anechoic chamber design. Electroacoustic product testing protocol development.
KLA-Tencor	2010 Vibration isolation engineering for scanning electron microscope semiconductor wafer inspection equipment.
Microsoft	2011 Acoustic measurement and analysis for Kinect manufacturing end-of-line 100% test chamber.
ETC	2011 Noise analysis and noise control for electrically operated variable speed theater hoist equipment.

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Selected Projects - Neil A. Shaw:

Arcadia City Council Chambers	Arcadia, California
Grossmont Civic Auditorium	El Cajon, California
Center for Faith and Life, Luther College	Decorah, Iowa
Concert Hall, University of Kentucky	Lexington, Kentucky
Swimming Pool, University of Riyad	Riyad, Saudi Arabia
Oakland-Piedmont Municipal Courts	Oakland, California
2500 seat Auditorium, 700 seat Auditorium, 250 seat Library Hall, Mosque and Minaret, Gymnasium, Fine Arts Recital Hall, 100 seat Museum Hall, 500 seat Lecture Rooms, 250 seat Lecture Rooms, 1000 seat Banquet Hall, 200 seat Meeting Rooms, 100 seat Meeting Rooms, University of Riyad	Riyad, Saudi Arabia
Des Moines Civic Auditorium	Des Moines, Iowa
California School For the Blind	Hayward, California
South Coast Air Quality Management District Hearing Room	El Monte, California
First United Methodist Church	Santa Monica, California
George R. Moscone Convention Center	San Francisco, California
H. J. Kaiser Convention Center	Oakland, California
Carson Community Center	Carson, California
LAX Terminal One	Los Angeles, California
Crocker Bank Auditorium	Los Angeles, California
Wilshire Auditorium, Fullerton College	Fullerton, California
Salt Palace Convention Center Expansion	Salt Lake City, Utah
Metro Toronto Convention Center and Theater	Toronto, Ontario
Orpheum Theater Restoration	Davenport, Iowa
Athanaeum, Claremont College	Claremont, California
San Jose Federal Office Building	San Jose, California
Fairmont Hotel	San Jose, California
LAX Terminal Five	Los Angeles, California
First Presbyterian Church	Upland, California
Royal Saudi Air Force Hush Houses	Saudi Arabia
NCO Training Facility, March AFB	Riverside, California
Veterans Administration Out Patient Clinic	Los Angeles, California
Lied Center for the Performing Arts, University of Nebraska	Lincoln, Nebraska
MaMaison Hotel	Los Angeles, California
Escondido City Council Chambers	Escondido, California
Mercy Hospital	San Diego, California
Mercy Hospital	Sacramento, California
Jain Bhavan Worship Center	Santa Ana, California
Ojai Valley Inn	Ojai, California
Simon Wiesenthal Center and Holocaust Museum	Los Angeles, California
New Otani Hotel	Los Angeles, California
Oceanside City Council Chambers	Oceanside, California
Santa Monica Beach Hotel	Santa Monica, California
Greenwood Racetrack	Toronto, Ontario
Woodbine Racetrack	Toronto, Ontario
Mohawk Racetrack	Campbellville, Ontario
Toyota Training Center	Torrance, California
Fresno Art Center	Fresno, California
McLaren Children's Center	Los Angeles, California

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Lindbergh Field West Terminal Expansion	San Diego, California
Richard M. Nixon Presidential Library	Yorba Linda, California
Carnation Headquarters	Glendale, California
Los Angeles County Bar Association	Los Angeles, California
Los Angeles Federal Office Building	Los Angeles, California
Intercontinental Hotel	Los Angeles, California
Lake Avenue Congregational Church	Pasadena, California
Hewlett Packard Presentation Center	North Hollywood, California
Dance Recital Hall and Auditorium, California State University	Long Beach, California
Inyo County Superior Court	Independence, California
Adele Platt Conference Center, City of Hope Medical Center	Duarte, California
Los Angeles County Emergency Operation Center	Los Angeles, California
Antonio B Won Pat International Airport	Tamuning, Guam
Temple Adat Sholam	Westwood, California
Sound Stage 29/30, Paramount Pictures	Hollywood, California
Executive Screening Room, Theater, Dubbing Theater, Metro-Goldwyn-Mayer	Santa Monica, California
Lakeview Terrace Rehabilitation Facility, Phoenix House of Los Angeles	Lakeview Terrace, California
Physiological Acoustics Research Facility, UCLA Medical Center	Westwood, California
Performing Arts Center	Lancaster, California
Crystal Harmony, Crystal Cruise Lines	Los Angeles, California
Integrated Service Facility, NASA/Dryden Research Facility	Edwards, California
Theater, Metro-Goldwyn-Mayer	New York, New York
Santa Ana Theater	Santa Ana, California
Sammy Davis Jr. Festival Plaza	Las Vegas, Nevada
City Hall, Council Chamber	Santa Monica, California
Video Conference Facility, Sony Music	New York, New York
Legend of the Seas, Royal Caribbean Cruise Lines	Miami, Florida
Orange County Branch Library	Aliso Viejo, California
Screening Room, Warner Brothers Animation	Glendale, California
Screening Room, Turner Feature Animation	Glendale, California
Las Vegas Motor Speedway	North Las Vegas, Nevada
Large Screening Room, Metro-Goldwyn-Mayer	Santa Monica, California
Japanese American National Museum	Los Angeles, California
Carson City Courthouse	Carson City, Nevada
St. Mel Parish Center	Woodland Hills, California
Congregation Ner Tamid	Rancho Palos Verdes, California
Old Town Temecula Streetscape	Temecula, California
Grandeur of the Seas, Royal Caribbean Cruise Lines	Miami, Florida
Disney Magic, Disney Cruise Lines	Orlando, Florida
Coral Sky Amphitheater	West Palm Beach, Florida
First Chinese Baptist Church	Los Angeles, California
St. Mark Coptic Orthodox Church	Los Angeles, California
C-17 Assembly Facility, Douglas Aircraft Division, The Boeing Corporation	Long Beach, California
Crisci's Restaurant	Brooklyn, New York
JamSync Studios	Nashville, Tennessee
New Standard Post	Hollywood, California
Media Artists, Pty	Madras, India
The Lobster	Santa Monica, California

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International Rectifier	Tijuana, Baja California, Mexico
Antelope Valley Courthouse	Lancaster, California
Fe Bland Forum, Santa Barbara City College	Santa Barbara, California
Arizona Humane Society	Phoenix, Arizona
Cartoon Network	Glendale, California
Santa Monica High School	Santa Monica, California
Malibu High School	Malibu, California
Barnum Hall Auditorium	Santa Monica, California
Sobrato High School	Morgan Hill, California
Temple Beth El	Aliso Viejo, California
Sacramento East End Project	Sacramento, California
Gold Circle Films	Beverly Hills, California
Denver City Hall Extension	Denver, Colorado
Fullerton City Hall	Fullerton, California
Union Station Improvement	Los Angeles, California
Intimate Theater, California State University	Los Angeles, California
San Diego Convention Center, Sails Pavilion	San Diego, California
Temple Shir Ha-Ma'A Lot	Irvine, California
United States Courthouse	Fresno, California
Department of Education Office Complex, State of California	Sacramento, California
MGM Constellation Headquarters	Century City, California
Ketchum Advertising	Venice, California
Orange County Register	Santa Ana, California
28th Church of Christ, Scientist	Westwood, California
Temple Solel	Escondido, California
NT Audio Mixing and QC Rooms	Santa Monica, California
River Cats Restaurant	Sacramento, California
Caltrans District 7 Headquarters	Los Angeles, California
1221 Ocean Avenue	Santa Monica, California
Memorial Assembly Hall	Manhattan Beach, California
City of Manhattan Beach Annex	Manhattan Beach, California
Twohy Building	San Jose, California
Widget Post Production	Culver City, California
1st Church of Christ, Scientist	Beverly Hills, California
Sunrise Assisted Living	Pacific Palisades, California
Sunrise Assisted Living	Santa Monica, California
Sunrise Assisted Living	Woodland Hills, California
Academy of Motion Picture Arts and Sciences Boardroom	Beverly Hills, California
Getty Villa Outdoor Amphitheater	Los Angeles, California
Ressler Residence	Beverly Hills, California
American Honda	Torrance, California
Community Baptist Church	Manhattan Beach, California
Bernard Hodes Agency	Marina Del Ray, California
Houston's Restaurant	Santa Monica, California
Café R&D	Newport Beach, California
Getty Center Auditorium	Los Angeles, California
Mid-City Police Station	Los Angeles, California
College of Humanities, Arts, and Social Sciences Instruction and Research Facility, University of California	Riverside, California
Genomics Research Facility, University of California	Riverside, California
Panasonic Hollywood Laboratory	Universal City, California

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Sports Spectrum Club	Pacific Palisades, California
Sunrise Assisted Living	Simi Valley, California
Rose Bowl	Pasadena, California
First Presbyterian Church	Santa Monica, California
Los Angeles Fire Department Headquarters	Los Angeles, California
New York City Transit No. 7 Line Extension	New York, New York
Los Angeles County Metropolitan Transportation Authority Goldline	Los Angeles, California
South Lawn Project, University of Virginia	Charlottesville, Virginia
Shangri-La Hotel	Santa Monica, California
Pacific Star, Princess Cruise Lines	Santa Clarita, California
Allied Post	Santa Monica, California
Jet Propulsion Laboratory von Karman Auditorium	Pasadena, California
Self Realization Fellowship	Los Angeles, California
Temple Beth Am	Los Angeles, California
Broome Library, California State University, Channel Islands	Camarillo, California
California High-Speed Train Project	State of California
Morongo Band of Mission Indians Administrative Complex	Banning, California
The Buddy Group	Irvine, California
Café R&D	Santa Monica, California
Club 7969	West Hollywood, California
Brent's Deli	Westlake Village, California
Santa Cruz County Criminal Justice Complex	Nogales, Arizona
Porto's Bakery	Burbank, California
Microsoft Hardware Group Audio Test Laboratories	Redmond, Washington
University of California, Irvine, Arts Building	Irvine, California
Los Angeles Unified School District High School No. 9	South Gate, California
Notre Dame High School	Sherman Oaks, California
St. Mark Presbyterian Church	Newport Beach, California
Fame Academy Poly High School	Sun Valley, California
FAA Sonic Boom Simulator (with the Pennsylvania State University)	State College, Pennsylvania
Metropolitan Transit District Hearing Room	Los Angeles, California
St. Peter and St. Paul Coptic Church	Santa Monica, California
Lifehouse Properties	Pacific Palisades, California
Wilson Well No.2	San Gabriel, California
Habitat for Humanity Lynwood Housing	Lynwood, California
Whole Foods Plaza	Malibu, California
Habitat for Humanity Burbank Housing	Burbank, California
The Cork	Los Angeles, California
Cove Way Residence	Beverly Hills, California
Habitat for Humanity Lawndale Housing	Lawndale, California
Forest Lawn Chapel	Cypress, California
Rodney Bay and Gros Islet Villages	St. Lucia
Panasonic Avionics	Lake Forest, California
Capitol Records	Hollywood, California
Art of Living Foundation	Los Angeles, California
Conexant Corporation	Newport Beach, California
University of California, Santa Barbara Faculty Center	Santa Barbara, California
Bill and Melinda Gates Foundation	Seattle, Washington
J Restaurant and Lounge	Los Angeles, California
Newcom	Santa Monica, California

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American School in Vietnam	Hanoi, Vietnam
Apple Yellowstone Anechoic Chamber Facility	Cupertino, California
Barnum Hall Continuing Renovation	Santa Monica, California
Malibu High School Auditorium Renovation	Malibu, California
John Adams Middle School Auditorium Renovation	Santa Monica, California
Westminster Presbyterian Church	Newbury Park, California
American School in Bombay	Mumbai, India
Temple Judea	Tarzana, California
Holy Angel Church	San Marino, California
Kroc Institute for Peace and Justice University of San Diego	San Diego, California

7 June 2012

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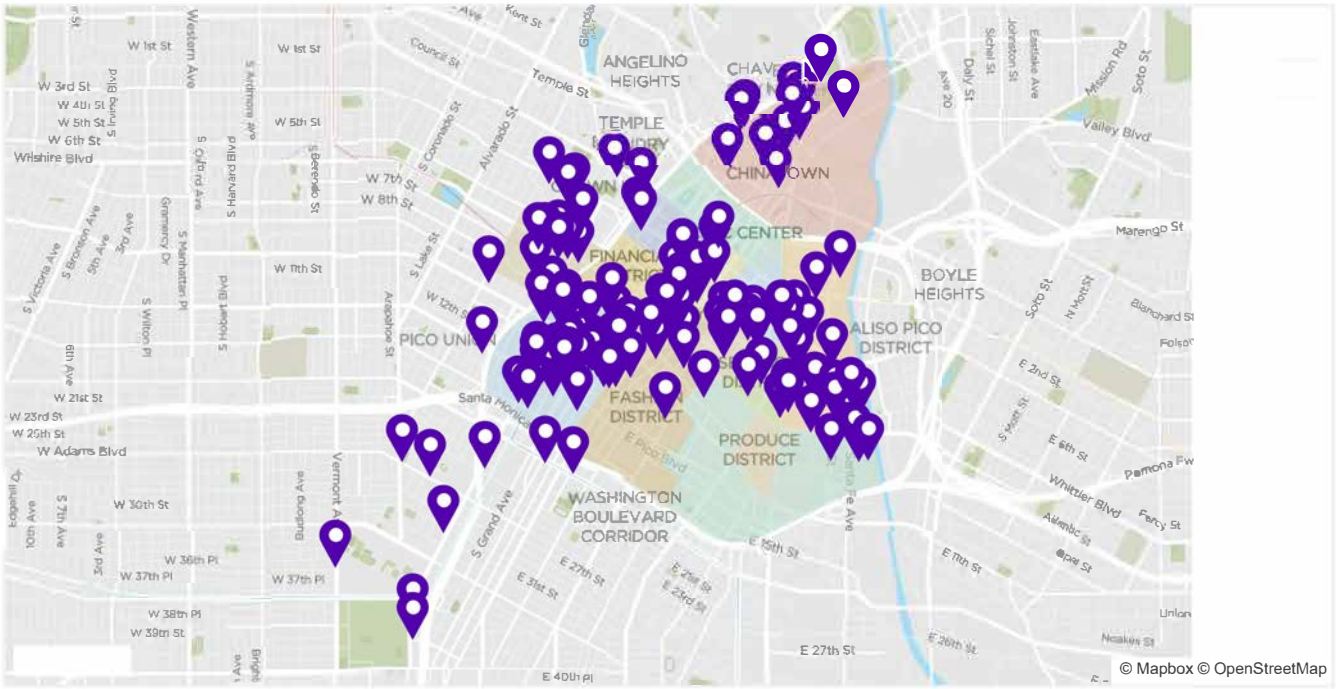
IN THE PIPELINE

Coming Soon to a Location Near You

Hundreds of projects are vying to be part of the next wave of Downtown LA's transformation. Luxury residential, efficient office, high-tech research, and spacious studios are all positioned to take advantage of DTLA's dynamic landscape. See what's in the mix with our interactive map and get details about project specifications, property contact, nearby businesses, and more.

ALL NEIGHBORHOODS

CLEAR FILTERS



SOUTH PARK

ARTS DISTRICT

This Attachment in its entirety is Comment 44

1000 S Hill St

1000 S Hill St
Los Angeles, CA 90015

CITY WEST

1000 S Mateo

1000 Mateo St
Los Angeles, CA 90021

SOUTH PARK

1018 W Ingraham St

1018 W Ingraham St
Los Angeles, CA 90017

SOUTH PARK

1020 S Figueroa (PROPOSED)

1020 S Figueroa St
Los Angeles, CA 90015

SOUTH PARK

1045 S Olive St

1045 S Olive St
Los Angeles, CA 90015

FASHION DISTRICT

1099 S. Grand

S Grand Ave
Los Angeles, CA 90015

SOUTH PARK

1100 S Main St

1100 S Main St
Los Angeles, CA 90015

SOUTH PARK

1111 S Hill St

1111 S Hill St
Los Angeles, CA 90015

SOUTH PARK

1115 S Olive St (Mack Urban Phase 3)

1115 S Olive St
Los Angeles, CA 90015

SOUTH PARK

1120 S Olive St (Mack Urban Phase 3)

1120 S Olive St
Los Angeles, CA 90015

SOUTH PARK

1130 S. Hope St.

S Hope St
Los Angeles, CA 90015

CITY WEST

1138 S Broadway

1138 S Broadway
Los Angeles, CA 90015

SOUTH PARK

1150 Wilshire Blvd (PROPOSED)

1150 Wilshire Blvd
Los Angeles, CA 90017

CHINATOWN

1155 S Olive St

1155 S Olive St
Los Angeles, CA 90015

SOUTH PARK

1201 N Broadway

1201 N Broadway
Los Angeles, CA 90012

CITY WEST

1219-1221 S Hope St

1219-1221 S Hope St
Los Angeles, CA 90015

CITY WEST

1230 W. Ingraham St.

1218-1232 W Ingraham St
Los Angeles, CA 90017

SOUTH PARK

1246 W 2nd St (PROPOSED)

1240-1262 W 2nd St
Los Angeles, CA 90026

SOUTH PARK

1320 S Flower St

1320 S Flower St
Los Angeles, CA 90015

SOUTH PARK

1323-1331 S. Flower St.

1323 S Flower St
Los Angeles, CA 90015

SOUTH PARK

1334 S Flower St

1334-1356 S Flower St
Los Angeles, CA 90015

ARTS DISTRICT

1335 S Grand Ave

1335 S Grand Ave
Los Angeles, CA 90015

CITY WEST

1340 E 6th St

1340 E 6th St
Los Angeles, CA 90021

SOUTH PARK

136 S Beaudry Ave

136 S Beaudry Ave
Los Angeles, CA 90012

CHINATOWN

1410 S Flower St

1370-1418 S Flower St
Los Angeles, CA 90015

SOUTH PARK

1435-1465 N Main St

1435 N Main St
Los Angeles, CA 90012

ARTS DISTRICT

1600 S Figueroa (PROPOSED)

1800 E. 7th St.

1600 S Figueroa St
Los Angeles, CA 90015

ARTS DISTRICT

1800 E 7th St
Los Angeles, CA 90021

CHINATOWN

2057 E 7th St

2057 E 7th St
Los Angeles, CA 90021

ARTS DISTRICT

211 W Alpine St

211 W Alpine St
Los Angeles, CA 90012

ARTS DISTRICT

2110 Bay St

2110 Bay St
Los Angeles, CA 90021

ARTS DISTRICT

2117 E Violet

2117-2143 E Violet St
Los Angeles, CA 90021

ARTS DISTRICT

2130 E. Violet St.

2130 E. Violet St
Los Angeles, CA 90021

2159 E Bay St

2159 E Bay St
Los Angeles, CA 90021

FASHION DISTRICT

220 E Washington Blvd

220 E Washington Blvd
Los Angeles, CA 90015

FIGUEROA CORRIDOR

HISTORIC DOWNTOWN

222 W 2nd St (PROPOSED)

222 W 2nd St
Los Angeles, CA 90012

ARTS DISTRICT

2222 S Figueroa

2222 S Figueroa St
Los Angeles, CA 90007

FIGUEROA CORRIDOR

234 N Center

234 Center St
Los Angeles, CA 90012

ARTS DISTRICT

2600 S Hoover

2600 S Hoover St
Los Angeles, CA 90007

FIGUEROA CORRIDOR

2nd & Vignes / Challenge Cream Butter Building

929 E 2nd St
Los Angeles, CA 90012

ARTS DISTRICT

3031 S Figueroa

3031 S Figueroa St
Los Angeles, CA 90007

BUNKER HILL

330 S Alameda

330 S Alameda St
Los Angeles, CA 90013

CITY WEST

333 S Figueroa (PROPOSED)

333 S Figueroa St
Los Angeles, CA 90071

FIGUEROA CORRIDOR

366 S Loma Drive

366 S Loma Dr
Los Angeles, CA 90017

FIGUEROA CORRIDOR

3685 S Vermont Ave

3685 S Vermont Ave
Los Angeles, CA 90007

ARTS DISTRICT

3800 S Figueroa

3800 S Figueroa St
Los Angeles, CA 90037

ARTS DISTRICT

400 S Alameda St

400 S Alameda St
Los Angeles, CA 90013

CENTRAL CITY EAST

405 S Hewitt St

405 S Hewitt St
Los Angeles, CA 90013

LITTLE TOKYO

407 E 5th St

407 E 5th St
Los Angeles, CA 90013

HISTORIC DOWNTOWN

414 S. Crocker St.

414 S Crocker St
Los Angeles, CA 90013

ARTS DISTRICT

433 S Main St

433 S Main St
Los Angeles, CA 90013

CITY WEST

440 Seaton St

440 Seaton St
Los Angeles, CA 90013

BUNKER HILL

495 S Hartford Ave

495 S Hartford Ave
Los Angeles, CA 90017

ARTS DISTRICT

4th & Hill

340 S Hill St
Los Angeles, CA 90013

ARTS DISTRICT

4th Place & Hewitt

321 S Hewitt St
Los Angeles, CA 90013

ARTS DISTRICT

4th St & Hewitt

940 E 4th St
Los Angeles, CA 90013

FINANCIAL DISTRICT

520 Mateo

520 S Mateo St
Los Angeles, CA 90013

CENTRAL CITY EAST

5th and Hill

319-323 W 5th St
Los Angeles, CA 90013

CENTRAL CITY EAST

600 S San Pedro St

600 S San Pedro St
Los Angeles, CA 90021

ARTS DISTRICT

609-623 E 5th St

609-623 E 5th St
Los Angeles, CA 90013

CHINATOWN

641

641 S Imperial St
Los Angeles, CA 90021

ARTS DISTRICT

643 N Spring St

643 N Spring St
Los Angeles, CA 90012

ARTS DISTRICT

670 Mesquit St.

670 Mesquit St
Los Angeles, CA 90021

ARTS DISTRICT

676 Mateo

676 Mateo St
Los Angeles, CA 90021

CENTRAL CITY EAST

6AM

1211 Wholesale St
Los Angeles, CA 90021

6th at Central

601 S Central Ave
Los Angeles, CA 90021

CENTRAL CITY EAST

CHINATOWN

6th Street Place

401 E 6th St
Los Angeles, CA 90014

CHINATOWN

708 N Hill St

708 N Hill St
Los Angeles, CA 90012

CHINATOWN

708 New Depot St

708 New Depot St
Los Angeles, CA 90012

CENTRAL CITY EAST

720 W Cesar E Chavez Ave

720 W Cesar E Chavez Ave
Los Angeles, CA 90012

CENTRAL CITY EAST

787 S Towne Ave

785-799 S Towne Ave
Los Angeles, CA 90021

CITY WEST

803 E. 5th St.

803-821 E 5th St
Los Angeles, CA 90013

FIGUEROA CORRIDOR

804 S Garland

804 S Garland Ave
Los Angeles, CA 90017

FASHION DISTRICT

806 W Adams

806 W Adams Blvd
Los Angeles, CA 90007

FINANCIAL DISTRICT

823 S Los Angeles St

823 S Los Angeles St
Los Angeles, CA 90014

CHINATOWN

845 S Olive St

845 S Olive St
Los Angeles, CA 90014

FINANCIAL DISTRICT

849 N Bunker Hill

849 N Bunker Hill Ave
Los Angeles, CA 90012

FINANCIAL DISTRICT

8th, Hope & Grand

754 S Hope St
Los Angeles, CA 90017

CHINATOWN

949 S Hope St

949 S Hope St
Los Angeles, CA 90015

ARTS DISTRICT

995 N Broadway

995 N Broadway
Los Angeles, CA 90012

SOUTH PARK

Alameda & 4th Lofts

360 S Alameda St
Los Angeles, CA 90013

HISTORIC DOWNTOWN

The Albany (PROPOSED)

1330 Pico Blvd
Los Angeles, CA 90015

BUNKER HILL

The Alexan

850 S Hill St
Los Angeles, CA 90014

SOUTH PARK

Angels Landing

361 S Hill St
Los Angeles, CA 90014

ARTS DISTRICT

Arris

1201 S Grand Ave
Los Angeles, CA 90015

ARTS DISTRICT

Arts District Center

1101 E 5th St
Los Angeles, CA 90013

CITY WEST

AVA Arts District

668 S Alameda St
Los Angeles, CA 90021

CITY WEST

Bixel Residences

675 S Bixel St
Los Angeles, CA 90017

FASHION DISTRICT

The Bricks (Trademark Hotels)

1543 W Olympic Blvd
Los Angeles, CA 90015

SOUTH PARK

Broadway Lofts

955 S Broadway
Los Angeles, CA 90015

HISTORIC DOWNTOWN

Broadway Square Los Angeles

1900-1933 S Broadway
Los Angeles, CA 90007

CHINATOWN

Brooks Building

644 S Broadway
Los Angeles, CA 90014

SOUTH PARK

Buena Vista

1251 N Spring St
Los Angeles, CA 90012

CENTRAL CITY EAST

Cambria Hotel

926 James M Wood Blvd
Los Angeles, CA 90015

HISTORIC DOWNTOWN

The Catalina (PROPOSED)

443 S San Pedro St
Los Angeles, CA 90013

CHINATOWN

The Chelsea

218 W 5th St
Los Angeles, CA 90013

FASHION DISTRICT

Chinatown Station

City Market of Los Angeles

924 N Spring St
Los Angeles, CA 90012

HISTORIC DOWNTOWN

1057 South San Pedro Street
Los Angeles, CA 90015

CENTRAL CITY EAST

Continental Building (PROPOSED)

408 S Spring St
Los Angeles, CA 90013

SOUTH PARK

Drake Hotel

675 Kohler St
Los Angeles, CA 90021

FIGUEROA CORRIDOR

The Eden (PROPOSED)

1340 S Hill St
Los Angeles, CA 90015

FASHION DISTRICT

Exposition Landing

3900 S Figueroa St
Los Angeles, CA 90037

SOUTH PARK

Fashion District Residences

222 E 7th St
Los Angeles, CA 90014

SOUTH PARK

Fig + Pico

1260 S Figueroa St
Los Angeles, CA 90015

CHINATOWN

Figueroa Centre

911-927 S Figueroa St
Los Angeles, CA 90015

CITY WEST

Harmony

942 N Broadway
Los Angeles, CA 90012

HISTORIC DOWNTOWN

Hartford Villas

459 S Hartford Ave
Los Angeles, CA 90017

HISTORIC DOWNTOWN

Hill Street Lofts

920 S Hill St
Los Angeles, CA 90015

ARTS DISTRICT

The Hill

940 S Hill St
Los Angeles, CA 90015

SOUTH PARK

Industrial Street Lofts

1525 Industrial St
Los Angeles, CA 90021

BUNKER HILL

JW Marriott (Proposed Expansion)

900 W Olympic Blvd
Los Angeles, CA 90015

FASHION DISTRICT

L.A. World Trade Center - PROPOSED

350 S Figueroa St
Los Angeles, CA 90071

CITY WEST

The Lane Building

206 W 8th St
Los Angeles, CA 90014

LITTLE TOKYO

Lifan Tower

1247 W 7th St
Los Angeles, CA 90017

FASHION DISTRICT

Little Tokyo Galleria

333 S Alameda St
Los Angeles, CA 90013

FASHION DISTRICT

Main Street Tower

1123-1161 S Main St
Los Angeles, CA 90015

HISTORIC DOWNTOWN

Mart South Hotel

124 E Olympic Blvd
Los Angeles, CA 90015

SOUTH PARK

Medallion 2.0

329 S. Main St.
Los Angeles, CA 90013

SOUTH PARK

Morrison Hotel

1246 S Hope St
Los Angeles, CA 90015

SOUTH PARK

Olympia

1001 W Olympic Blvd
Los Angeles, CA 90015

CIVIC CENTER

Olympic Tower

813 W Olympic Blvd
Los Angeles, CA 90015

SOUTH PARK

Onni Times Square

100 S Broadway
Los Angeles, CA 90012

ARTS DISTRICT

Onyx Phase II

1301 S Hope St
Los Angeles, CA 90015

ARTS DISTRICT

Palmetto Colyton

527 Colyton St
Los Angeles, CA 90013

CITY WEST

Produce LA

640 S Santa Fe Ave
Los Angeles, CA 90021

HISTORIC DOWNTOWN

Sapphire (PROPOSED)

1111 W 6th St
Los Angeles, CA 90017

ARTS DISTRICT

SB Omega

601 S Main St
Los Angeles, CA 90014

CITY WEST

Seaton & Fifth Building (PROPOSED)

454 Seaton St
Los Angeles, CA 90013

SOUTH PARK

The Seven

South Park Towers (PROPOSED)

1135 W 7th St
Los Angeles, CA 90057

FASHION DISTRICT

1600 S Flower St
Los Angeles, CA 90015

HISTORIC DOWNTOWN

Southern California Flower Market

755 Wall St
Los Angeles, CA 90014

HISTORIC DOWNTOWN

Spring St. Tower

525 S Spring St
Los Angeles, CA 90013

SOUTH PARK

Spring Street Hotel

633 S Spring St
Los Angeles, CA 90014

SOUTH PARK

Trical Hotel (PROPOSED)

1300 S Figueroa St
Los Angeles, CA 90015

CENTRAL CITY EAST

Vara

1233 S Grand Ave
Los Angeles, CA 90015

Weingart Tower

554 S San Pedro St
Los Angeles, CA 90013

MAPS

GETTING AROUND

- FIND A BUSINESS
- PARKING

HOSPITALITY

- HOTELS

DINING & DRINKS

- DINING
- NIGHTLIFE

SHOPPING

- SHOPPING
- HEALTH & WELLNESS

ARTS & ENTERTAINMENT

- SPORTS
- THEATER & MUSIC
- MUSEUMS & GALLERIES
- PARKS & GREEN SPACES

BUILDINGS

- OFFICE BUILDINGS
- RESIDENTIAL BUILDINGS
- RETAIL BUILDINGS

DEVELOPMENT

- UNDER CONSTRUCTION
- IN THE PIPELINE

BUSINESS IMPROVEMENT DISTRICTS

- DCBID BOUNDARIES
- DOWNTOWN LA BIDS

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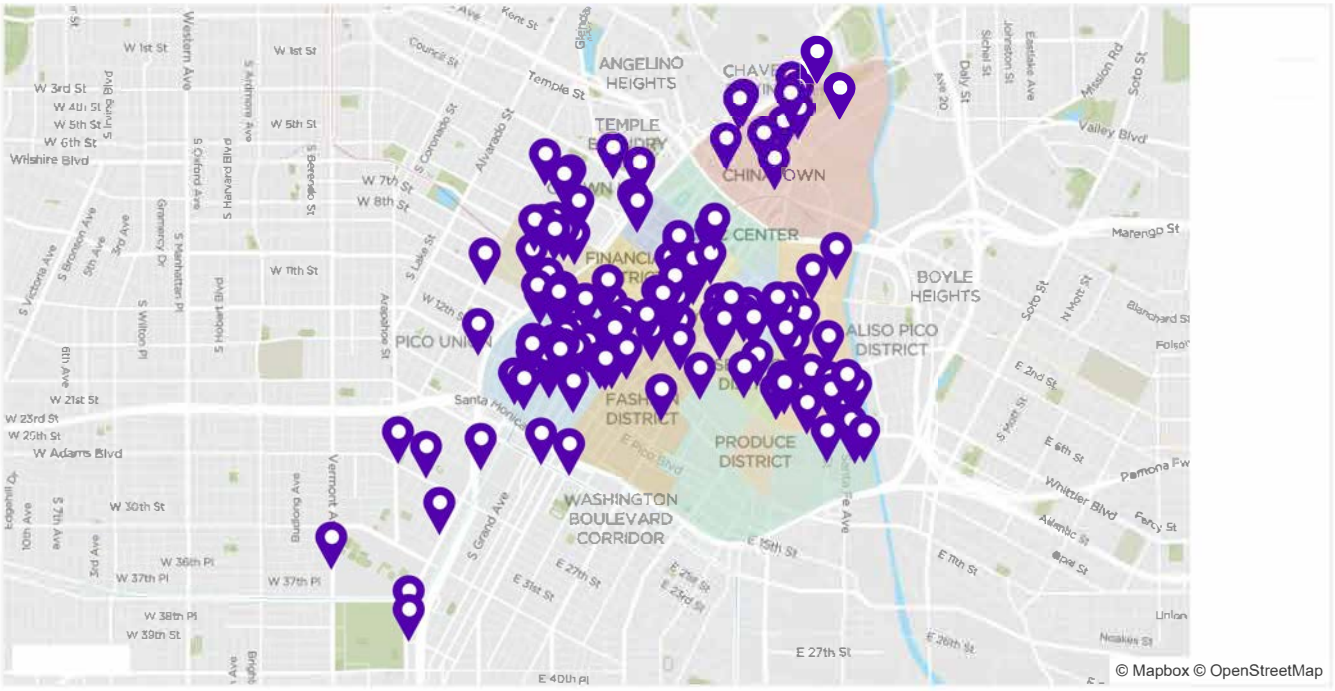
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1000 S Hill St
Los Angeles, CA 90015

CITY WEST

1000 S Mateo

1000 Mateo St
Los Angeles, CA 90021

SOUTH PARK

1018 W Ingraham St

1018 W Ingraham St
Los Angeles, CA 90017

SOUTH PARK

1020 S Figueroa (PROPOSED)

1020 S Figueroa St
Los Angeles, CA 90015

SOUTH PARK

1045 S Olive St

1045 S Olive St
Los Angeles, CA 90015

FASHION DISTRICT

1099 S. Grand

S Grand Ave
Los Angeles, CA 90015

SOUTH PARK

1100 S Main St

1100 S Main St
Los Angeles, CA 90015

SOUTH PARK

1111 S Hill St

1111 S Hill St
Los Angeles, CA 90015

SOUTH PARK

1115 S Olive St (Mack Urban Phase 3)

1115 S Olive St
Los Angeles, CA 90015

SOUTH PARK

1120 S Olive St (Mack Urban Phase 3)

1120 S Olive St
Los Angeles, CA 90015

SOUTH PARK

1130 S. Hope St.

S Hope St
Los Angeles, CA 90015

CITY WEST

1138 S Broadway

1138 S Broadway
Los Angeles, CA 90015

SOUTH PARK

1150 Wilshire Blvd (PROPOSED)

1150 Wilshire Blvd
Los Angeles, CA 90017

CHINATOWN

1155 S Olive St

1155 S Olive St
Los Angeles, CA 90015

SOUTH PARK

1201 N Broadway

1201 N Broadway
Los Angeles, CA 90012

CITY WEST

1219-1221 S Hope St

1219-1221 S Hope St
Los Angeles, CA 90015

CITY WEST

1230 W. Ingraham St.

1218-1232 W Ingraham St
Los Angeles, CA 90017

SOUTH PARK

1246 W 2nd St (PROPOSED)

1240-1262 W 2nd St
Los Angeles, CA 90026

SOUTH PARK

1320 S Flower St

1320 S Flower St
Los Angeles, CA 90015

SOUTH PARK

1323-1331 S. Flower St.

1323 S Flower St
Los Angeles, CA 90015

SOUTH PARK

1334 S Flower St

1334-1356 S Flower St
Los Angeles, CA 90015

ARTS DISTRICT

1335 S Grand Ave

1335 S Grand Ave
Los Angeles, CA 90015

CITY WEST

1340 E 6th St

1340 E 6th St
Los Angeles, CA 90021

SOUTH PARK

136 S Beaudry Ave

136 S Beaudry Ave
Los Angeles, CA 90012

CHINATOWN

1410 S Flower St

1370-1418 S Flower St
Los Angeles, CA 90015

SOUTH PARK

1435-1465 N Main St

1435 N Main St
Los Angeles, CA 90012

ARTS DISTRICT

1600 S Figueroa (PROPOSED)

1800 E. 7th St.

1600 S Figueroa St
Los Angeles, CA 90015

ARTS DISTRICT

1800 E 7th St
Los Angeles, CA 90021

CHINATOWN

2057 E 7th St

2057 E 7th St
Los Angeles, CA 90021

ARTS DISTRICT

211 W Alpine St

211 W Alpine St
Los Angeles, CA 90012

ARTS DISTRICT

2110 Bay St

2110 Bay St
Los Angeles, CA 90021

ARTS DISTRICT

2117 E Violet

2117-2143 E Violet St
Los Angeles, CA 90021

ARTS DISTRICT

2130 E. Violet St.

2130 E. Violet St
Los Angeles, CA 90021

2159 E Bay St

2159 E Bay St
Los Angeles, CA 90021

FASHION DISTRICT

220 E Washington Blvd

220 E Washington Blvd
Los Angeles, CA 90015

FIGUEROA CORRIDOR

HISTORIC DOWNTOWN

222 W 2nd St (PROPOSED)

222 W 2nd St
Los Angeles, CA 90012

ARTS DISTRICT

2222 S Figueroa

2222 S Figueroa St
Los Angeles, CA 90007

FIGUEROA CORRIDOR

234 N Center

234 Center St
Los Angeles, CA 90012

ARTS DISTRICT

2600 S Hoover

2600 S Hoover St
Los Angeles, CA 90007

FIGUEROA CORRIDOR

2nd & Vignes / Challenge Cream Butter Building

929 E 2nd St
Los Angeles, CA 90012

ARTS DISTRICT

3031 S Figueroa

3031 S Figueroa St
Los Angeles, CA 90007

BUNKER HILL

330 S Alameda

330 S Alameda St
Los Angeles, CA 90013

CITY WEST

333 S Figueroa (PROPOSED)

333 S Figueroa St
Los Angeles, CA 90071

FIGUEROA CORRIDOR

366 S Loma Drive

366 S Loma Dr
Los Angeles, CA 90017

FIGUEROA CORRIDOR

3685 S Vermont Ave

3685 S Vermont Ave
Los Angeles, CA 90007

ARTS DISTRICT

3800 S Figueroa

3800 S Figueroa St
Los Angeles, CA 90037

ARTS DISTRICT

400 S Alameda St

400 S Alameda St
Los Angeles, CA 90013

CENTRAL CITY EAST

405 S Hewitt St

405 S Hewitt St
Los Angeles, CA 90013

LITTLE TOKYO

407 E 5th St

407 E 5th St
Los Angeles, CA 90013

HISTORIC DOWNTOWN

414 S. Crocker St.

414 S Crocker St
Los Angeles, CA 90013

ARTS DISTRICT

433 S Main St

433 S Main St
Los Angeles, CA 90013

CITY WEST

440 Seaton St

440 Seaton St
Los Angeles, CA 90013

BUNKER HILL

495 S Hartford Ave

495 S Hartford Ave
Los Angeles, CA 90017

ARTS DISTRICT

4th & Hill

340 S Hill St
Los Angeles, CA 90013

ARTS DISTRICT

4th Place & Hewitt

321 S Hewitt St
Los Angeles, CA 90013

ARTS DISTRICT

4th St & Hewitt

940 E 4th St
Los Angeles, CA 90013

FINANCIAL DISTRICT

520 Mateo

520 S Mateo St
Los Angeles, CA 90013

CENTRAL CITY EAST

5th and Hill

319-323 W 5th St
Los Angeles, CA 90013

CENTRAL CITY EAST

600 S San Pedro St

600 S San Pedro St
Los Angeles, CA 90021

ARTS DISTRICT

609-623 E 5th St

609-623 E 5th St
Los Angeles, CA 90013

CHINATOWN

641

641 S Imperial St
Los Angeles, CA 90021

ARTS DISTRICT

643 N Spring St

643 N Spring St
Los Angeles, CA 90012

ARTS DISTRICT

670 Mesquit St.

670 Mesquit St
Los Angeles, CA 90021

ARTS DISTRICT

676 Mateo

676 Mateo St
Los Angeles, CA 90021

CENTRAL CITY EAST

6AM

1211 Wholesale St
Los Angeles, CA 90021

6th at Central

601 S Central Ave
Los Angeles, CA 90021

CENTRAL CITY EAST

CHINATOWN

6th Street Place

401 E 6th St
Los Angeles, CA 90014

CHINATOWN

708 N Hill St

708 N Hill St
Los Angeles, CA 90012

CHINATOWN

708 New Depot St

708 New Depot St
Los Angeles, CA 90012

CENTRAL CITY EAST

720 W Cesar E Chavez Ave

720 W Cesar E Chavez Ave
Los Angeles, CA 90012

CENTRAL CITY EAST

787 S Towne Ave

785-799 S Towne Ave
Los Angeles, CA 90021

CITY WEST

803 E. 5th St.

803-821 E 5th St
Los Angeles, CA 90013

FIGUEROA CORRIDOR

804 S Garland

804 S Garland Ave
Los Angeles, CA 90017

FASHION DISTRICT

806 W Adams

806 W Adams Blvd
Los Angeles, CA 90007

FINANCIAL DISTRICT

823 S Los Angeles St

823 S Los Angeles St
Los Angeles, CA 90014

CHINATOWN

845 S Olive St

845 S Olive St
Los Angeles, CA 90014

FINANCIAL DISTRICT

849 N Bunker Hill

849 N Bunker Hill Ave
Los Angeles, CA 90012

FINANCIAL DISTRICT

8th, Hope & Grand

754 S Hope St
Los Angeles, CA 90017

CHINATOWN

949 S Hope St

949 S Hope St
Los Angeles, CA 90015

ARTS DISTRICT

995 N Broadway

995 N Broadway
Los Angeles, CA 90012

SOUTH PARK

Alameda & 4th Lofts

360 S Alameda St
Los Angeles, CA 90013

HISTORIC DOWNTOWN

The Albany (PROPOSED)

1330 Pico Blvd
Los Angeles, CA 90015

BUNKER HILL

The Alexan

850 S Hill St
Los Angeles, CA 90014

SOUTH PARK

Angels Landing

361 S Hill St
Los Angeles, CA 90014

ARTS DISTRICT

Arris

1201 S Grand Ave
Los Angeles, CA 90015

ARTS DISTRICT

Arts District Center

1101 E 5th St
Los Angeles, CA 90013

CITY WEST

AVA Arts District

668 S Alameda St
Los Angeles, CA 90021

CITY WEST

Bixel Residences

675 S Bixel St
Los Angeles, CA 90017

FASHION DISTRICT

The Bricks (Trademark Hotels)

1543 W Olympic Blvd
Los Angeles, CA 90015

SOUTH PARK

Broadway Lofts

955 S Broadway
Los Angeles, CA 90015

HISTORIC DOWNTOWN

Broadway Square Los Angeles

1900-1933 S Broadway
Los Angeles, CA 90007

CHINATOWN

Brooks Building

644 S Broadway
Los Angeles, CA 90014

SOUTH PARK

Buena Vista

1251 N Spring St
Los Angeles, CA 90012

CENTRAL CITY EAST

Cambria Hotel

926 James M Wood Blvd
Los Angeles, CA 90015

HISTORIC DOWNTOWN

The Catalina (PROPOSED)

443 S San Pedro St
Los Angeles, CA 90013

CHINATOWN

The Chelsea

218 W 5th St
Los Angeles, CA 90013

FASHION DISTRICT

Chinatown Station

City Market of Los Angeles

924 N Spring St
Los Angeles, CA 90012

HISTORIC DOWNTOWN

1057 South San Pedro Street
Los Angeles, CA 90015

CENTRAL CITY EAST

Continental Building (PROPOSED)

408 S Spring St
Los Angeles, CA 90013

SOUTH PARK

Drake Hotel

675 Kohler St
Los Angeles, CA 90021

FIGUEROA CORRIDOR

The Eden (PROPOSED)

1340 S Hill St
Los Angeles, CA 90015

FASHION DISTRICT

Exposition Landing

3900 S Figueroa St
Los Angeles, CA 90037

SOUTH PARK

Fashion District Residences

222 E 7th St
Los Angeles, CA 90014

SOUTH PARK

Fig + Pico

1260 S Figueroa St
Los Angeles, CA 90015

CHINATOWN

Figueroa Centre

911-927 S Figueroa St
Los Angeles, CA 90015

CITY WEST

Harmony

942 N Broadway
Los Angeles, CA 90012

HISTORIC DOWNTOWN

Hartford Villas

459 S Hartford Ave
Los Angeles, CA 90017

HISTORIC DOWNTOWN

Hill Street Lofts

920 S Hill St
Los Angeles, CA 90015

ARTS DISTRICT

The Hill

940 S Hill St
Los Angeles, CA 90015

SOUTH PARK

Industrial Street Lofts

1525 Industrial St
Los Angeles, CA 90021

BUNKER HILL

JW Marriott (Proposed Expansion)

900 W Olympic Blvd
Los Angeles, CA 90015

FASHION DISTRICT

L.A. World Trade Center - PROPOSED

350 S Figueroa St
Los Angeles, CA 90071

CITY WEST

The Lane Building

206 W 8th St
Los Angeles, CA 90014

LITTLE TOKYO

Lifan Tower

1247 W 7th St
Los Angeles, CA 90017

FASHION DISTRICT

Little Tokyo Galleria

333 S Alameda St
Los Angeles, CA 90013

FASHION DISTRICT

Main Street Tower

1123-1161 S Main St
Los Angeles, CA 90015

HISTORIC DOWNTOWN

Mart South Hotel

124 E Olympic Blvd
Los Angeles, CA 90015

SOUTH PARK

Medallion 2.0

329 S. Main St.
Los Angeles, CA 90013

SOUTH PARK

Morrison Hotel

1246 S Hope St
Los Angeles, CA 90015

SOUTH PARK

Olympia

1001 W Olympic Blvd
Los Angeles, CA 90015

CIVIC CENTER

Olympic Tower

813 W Olympic Blvd
Los Angeles, CA 90015

SOUTH PARK

Onni Times Square

100 S Broadway
Los Angeles, CA 90012

ARTS DISTRICT

Onyx Phase II

1301 S Hope St
Los Angeles, CA 90015

ARTS DISTRICT

Palmetto Colyton

527 Colyton St
Los Angeles, CA 90013

CITY WEST

Produce LA

640 S Santa Fe Ave
Los Angeles, CA 90021

HISTORIC DOWNTOWN

Sapphire (PROPOSED)

1111 W 6th St
Los Angeles, CA 90017

ARTS DISTRICT

SB Omega

601 S Main St
Los Angeles, CA 90014

CITY WEST

Seaton & Fifth Building (PROPOSED)

454 Seaton St
Los Angeles, CA 90013

SOUTH PARK

The Seven

South Park Towers (PROPOSED)

1135 W 7th St
Los Angeles, CA 90057

FASHION DISTRICT

1600 S Flower St
Los Angeles, CA 90015

HISTORIC DOWNTOWN

Southern California Flower Market

755 Wall St
Los Angeles, CA 90014

HISTORIC DOWNTOWN

Spring St. Tower

525 S Spring St
Los Angeles, CA 90013

SOUTH PARK

Spring Street Hotel

633 S Spring St
Los Angeles, CA 90014

SOUTH PARK

Trical Hotel (PROPOSED)

1300 S Figueroa St
Los Angeles, CA 90015

CENTRAL CITY EAST

Vara

1233 S Grand Ave
Los Angeles, CA 90015

Weingart Tower

554 S San Pedro St
Los Angeles, CA 90013

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APPENDIX 3 This Attachment in its entirety is Comment 46

Construction Noise Handbook

9.0 Construction Equipment Noise Levels and Ranges

9.1 Equipment Type Inventory and Related Emission Levels

Noise levels generated by individual pieces of construction equipment and specific construction operations form the basis for the prediction of construction-related noise levels. A variety of information exists related to sound emissions related to such equipment and operations. This data transcends the period beginning in the 1970s thru 2006. This information exists for both stationary and mobile sources and for steady, intermittent, and impulse type generators of noise.

9.1.1 Stationary Equipment

Stationary equipment consists of equipment that generates noise from one general area and includes items such as pumps, generators, compressors, etc. These types of equipment operate at a constant noise level under normal operation and are classified as non-impact equipment. Other types of stationary equipment such as pile drivers, jackhammers, pavement breakers, blasting operations, etc., produce variable and sporadic noise levels and often produce impact-type noises. Impact equipment is equipment that generates impulsive noise, where impulsive noise is defined as noise of short duration (generally less than one second), high intensity, abrupt onset, rapid decay, and often rapidly changing spectral composition. For impact equipment, the noise is produced by the impact of a mass on a surface, typically repeating over time.

9.1.2 Mobile Equipment

Mobile equipment such as dozers, scrapers, graders, etc., may operate in a cyclic fashion in which a period of full power is followed by a period of reduced power. Other equipment such as compressors, although generally considered to be stationary when operating, can be readily relocated to another location for the next operation.

9.2 Sources of Information

Construction-related equipment and operation noise level data may be provided by numerous sources, including suppliers, manufacturers, agencies, organizations, etc. Some information is included in this document, and many web-based links are given for equipment manufacturers.

9.3 Specifics of Construction Equipment and Operation Noise Inventories

Details included in each specific inventory of construction equipment and operation noise emission levels are often variable in terms of how data is represented. Some inventories include ranges of noise levels while others present single numbers for each equipment type. Others provide levels for specific models of each type of construction equipment. Often, different noise descriptors are used, such as L_{Aeq}, L_{max}, L_{10}, sound power level, etc. As such, the array of data does not readily lend itself to being combined into a single table or easily compared. As such, this Handbook attempts to summarize a variety of such inventories and provide links to each, thereby providing the reader with a variety of sources from which to choose the appropriate levels for use in his or her respective analysis.

9.4 Summaries of Referenced Inventories

Included below are examples of several inventories of construction-related noise emission values. These and additional inventories are included on the companion CD-ROM.

9.4.1 RCNM Inventory

Equipment and operation noise levels in this inventory are expressed in terms of L_{max} noise levels and are accompanied by a usage factor value. They have been recently updated and are based on extensive measurements taken in conjunction with the Central Artery/Tunnel (CA/T) Project. Table 9.1 summarizes the equipment noise emissions database used by the CA/T Project. While these values represent the "default" values for use in the RCNM, user-defined equipment and corresponding noise levels can be added.

Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors.

Equipment Description	Impact Device?	Acoustical Usage Factor (%)	Spec. 721.560 L_{max} @ 50 feet (dBA, slow)	Actual Measured L_{max} @ 50 feet (dBA, slow) (Samples Averaged)	Number of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	N/A	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	N/A	0
Blasting	Yes	N/A	94	N/A	0

Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	N/A	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS Signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	N/A	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydraulic Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	N/A	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarifier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/Chipping Gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (single nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Sheers (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	N/A	0
Tractor	No	40	84	N/A	0
	No	40	85	85	149

Vacuum Excavator (Vac-Truck)					
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder/Torch	No	40	73	74	5

For each generic type of equipment listed in Table 9.1, the following information is provided:

- an indication as to whether or not the equipment is an impact device;
- the acoustical usage factor to assume for modeling purposes;
- the specification "Spec" limit for each piece of equipment expressed as an L_{max} level in dBA "slow" at a reference distance of 50 foot from the loudest side of the equipment;
- the measured "Actual" emission level at 50 feet for each piece of equipment based on hundreds of emission measurements performed on CA/T work sites; and
- the number of samples that were averaged together to compute the "Actual" emission level.

A comparison of the "Spec" emission limits against the "Actual" emission levels reveals that the Spec limits were set, in general, to realistically obtainable noise levels based on the equipment used by contractors on the CA/T Project. When measured in the field, some equipment such as pile drivers, sand blasting, demolition shears, and pumps tended to exceed their applicable emission limit. As such, these noisy devices needed to have some form of noise mitigation in place in order to comply with the Spec emission limits. Other equipment, such as clamshell shovels, concrete mixer trucks, truck-mounted drill rigs, man-lifts, chipping guns, ventilation fans, pavers, dump trucks, and flatbed trucks, easily complied. Therefore, the Spec emission limits for these devices could have been reduced somewhat further. It is recommended that the user review the RCNM User's Guide contained in Appendix A for detailed guidance regarding application of values contained in Table 9.1.

9.4.2 FHWA Special Report Inventories

Appendix A of the 1977 Handbook provides tables of construction equipment noise levels and ranges. The majority of the data were provided by the American Road Builders Association. These data were taken during a 1973 survey in which member contractors were asked to secure readings of noise exposure to operators of various types of equipment. Additionally, the contractors were asked to take readings at 50 feet from the machinery. These 50-foot peak readings are provided in Tables 9.2 through 9.8. Though the data were produced under varying conditions and degrees of expertise, the values are relatively consistent.

Table 9.2 Construction Equipment Noise Levels Based on Limited Data Samples - Cranes.

Manufacturer	Type or Model	Peak Noise Level (dBA)	Remarks
Northwestern	80D	77	Within 15m 1958 mod
Northwestern	8	84	Within 15m 1940 mod
Northwestern	6	72	Within 15m 1965 mod
American	7260	82	Within 15m 1967 mod
American	599	76	Within 15m 1969 mod
American	5299	70	Within 15m 1972 mod
American	4210	82	Within 15m 1968 mod
Buck Eye	45C	79	Within 15m 1972 mod
Buck Eye	308	74	Within 15m 1968 mod
Buck Eye	30B	73	Within 15m 1965 mod
Buck Eye	30B	70	Within 15m 1959 mod
Link Belt	LS98	76	Within 15m 1956 mod
Manitowoc	4000	94	Within 15m 1956 mod
Grove	RF59	82	Within 15m 1973 mod
Koehr	605	76	Within 15m 1967 mod
Koehr	435	86	Within 15m 1969 mod
Koehr	405	84	Within 15m 1969 mod

Table 9.3 Construction Equipment Noise Levels Based on Limited Data Samples - Backhoes.

Manufacturer	Type or Model	Peak Noise Level (dBA)	Remarks
Link Belt	4000	92	Within 15m 1971 mod
John Deere	609A	85	Within 15m 1971 mod
Case	680C	74	Within 15m 1973 mod
Drott	40 yr.	82	Within 15m 1971 mod
Koehr	1066	81 & 84	Within 15m 2 tested

Table 9.4 Construction Equipment Noise Levels Based on Limited Data Samples - Front Loaders.

Manufacturer	Type or Model	Peak Noise Level (dBA)	Remarks
Caterpillar	980	84	Within 15m 1972 mod
Caterpillar	977K	79	Within 15m 1969 mod
Caterpillar	977	87	Within 15m 1971 mod
Caterpillar	977	94	Within 15m 1967 mod
Caterpillar	966C	84	Within 15m 1973 mod
Caterpillar	966C	85	Within 15m 1972 mod
Caterpillar	966	81	Within 15m 1972 mod
Caterpillar	966	77	Within 15m 1972 mod
Caterpillar	966	85	Within 15m 1966 mod
Caterpillar	955L	90	Within 15m ;1973 mod
Caterpillar	955K	79	Within 15m 1969 mod
Caterpillar	955H	94	Within 15m 1963 mod
Caterpillar	950	78 & 80	Within 15m 1972 mod
Caterpillar	950	75	Within 15m 1968 mod
Caterpillar	950	88	Within 15m 1967 mod
Caterpillar	950	86	Within 15m 1965 mod
Caterpillar	944A	80	Within 15m 1965 mod
Caterpillar	850	82	Within 15m 1968 mod
Michigan	75B	90	Within 15m 1969 mod
Michigan	475A	96	Within 15m 1967 mod
Michigan	275	85	Within 15m 1971 mod
Michigan	125	87	Within 15m 1967 mod
Hough	65	82	Within 15m 1971 mod
Hough	60	91	Within 15m 1961 mod
Hough	400B	94	Within 15m 1961 mod
Hough	H90	86	Within 15m 1961 mod
Trojan	3000	85	Within 15m 1956 mod
Trojan	RT	82	Within 15m 1965 mod
Payloader	H50	85	Within 15m 1963 mod

Table 9.5 Construction Equipment Noise Levels Based on Limited Data Samples - Dozers.

Manufacturer	Type or Model	Peak Noise Level (dBA)	Remarks
Caterpillar	D5	83	Within 15m 1967 mod
Caterpillar	D6	85	Within 15m 1967 mod
Caterpillar	D6	86	Within 15m 1964 mod
Caterpillar	D6	81	Within 15m 1967 mod
Caterpillar	D6B	83	Within 15m 1967 mod
Caterpillar	D6C	82	Within 15m 1962 mod
Caterpillar	D7	85	Within 15m 1956 mod

Caterpillar	D7	86	Within 15m 1969 mod
Caterpillar	D7	84	Within 15m 1969 mod
Caterpillar	D7	78	Within 15m 1970 mod
Caterpillar	D7	78	Within 15m 1972 mod
Caterpillar	D7E	86	Within 15m 1965 mod
Caterpillar	D7E	78	Within 15m 1970 mod
Caterpillar	D7E	84	Within 15m 1973 mod
Caterpillar	D7F	80	Within 15m 1972 mod
Caterpillar	D8	92	Within 15m 1954 mod
Caterpillar	D8	95	Within 15m 1968 mod
Caterpillar	D8	86	Within 15m 1972 mod
Caterpillar	D8H	88	Within 15m 1966 mod
Caterpillar	D8H	82	Within 15m 1972 mod
Caterpillar	D9	85	Within 15m 1972 mod
Caterpillar	D9	94	Within 15m 1972 mod
Caterpillar	D9	90	Within 15m 1963 mod
Caterpillar	D9	87	Within 15m 1965 mod
Caterpillar	D9	90	Within 15m 1965 mod
Caterpillar	D9	88	Within 15m 1968 mod
Caterpillar	D9	92	Within 15m 1972 mod
Caterpillar	D9G	85	Within 15m 1965 mod
Allis Chambers	HD41	93	Within 15m 1970 mod
International	TD15	79	Within 15m 1970 mod
International	TD20	87	Within 15m 1970 mod
International	TD25	90	Within 15m 1972 mod
International	TD8	83	Within 15m 1970 mod
Case	1150	82	Within 15m 1972 mod
John Deer	350B	77	Within 15m 1971 mod
John Deer	450B	65	Within 15m 1972 mod
Terex	8230	70	Within 15m 1972 mod
Terex	8240	93	Within 15m 1969 mod

Michigan	280	85	Within 15m 1961 mod
Michigan	280	90	Within 15m 1962 mod
Caterpillar	824	90	Within 15m 1968 mod

Table 9.6 Construction Equipment Noise Levels Based on Limited Data Samples - Graders.

Manufacturer	Type or Model	Peak Noise Level (dBA)	Remarks
Caterpillar	16	91	Within 15m 1969 mod
Caterpillar	16	86	Within 15m 1968 mod
Caterpillar	140	83	Within 15m 1970 mod
Caterpillar	14E	84	Within 15m 1972 mod
Caterpillar	14E	85	Within 15m 1971 mod
Caterpillar	14C	85	Within 15m 1971 mod
Caterpillar	14B	84	Within 15m 1967 mod
Caterpillar	12F	82	Within 15m 1961-72 mod
Caterpillar	12F	72-92	Within 15m 1961-72 mod
Caterpillar	12E	81.3	Within 15m 1959-67 mod
Caterpillar	12E	80-83	Within 15m 1959-67 mod
Caterpillar	12	84.7	Within 15m 1960-67 mod
Caterpillar	12	82-88	Within 15m 1960-67 mod
Gallon	T500	84	Within 15m 1964 mod
Allis Chambers		87	Within 15m 1964 mod

Table 9.7 Construction Equipment Noise Levels Based on Limited Data Samples - Scrapers.

Manufacturer	Type or Model	Peak Noise Level (dBA)	Remarks
Caterpillar	660	92	Within 15m
Caterpillar	641B	85	Within 15m 1972 mod
Caterpillar	641B	86	Within 15m 1972 mod
Caterpillar	641	80 & 84	Within 15m 1972 mod
Caterpillar	641	83 & 89	Within 15m 1965 mod
Caterpillar	637	87	Within 15m 1971 mod
Caterpillar	633	87	Within 15m 1972 mod
Caterpillar	631C	89	Within 15m 1973 mod
Caterpillar	631C	83	Within 15m 1972 mod
Caterpillar	631B	94	Within 15m 1969 mod
Caterpillar	631B	84-87	Within 15m 1968 mod
Caterpillar		85 avg.	Within 15m 1968 mod
Caterpillar	621	90	Within 15m 1970 mod
Caterpillar	621	86	Within 15m 1967 mod
Caterpillar	613	76	Within 15m 1972 mod
Terex	TS24	87	Within 15m 1972 mod
Terex	TS24	84-91	
Terex	TS24	82	Within 15m 1971 mod
Terex	TS24	81-83	Within 15m 1971 mod
Terex	TS24	94	Within 15m 1966 mod
Terex	TS24	92-98	Within 15m 1966 mod
Terex	TS24	94.7	Within 15m 1963 mod
Terex	TS24	94-95	Within 15m 1963 mod
Terex	TS14	82	Within 15m 1969 mod

Terex	S35E	84	Within 15m 1971 mod

Table 9.8 Noise Levels of Standard Compressors.

Manufacturer	Model	Silenced or Standard	Type Eng.	Type Comp.	Test Avg. Cond. (cfm.psi)	Avg. Cond. Noise Lev. (cfm.psi) (dBA) at 7m*
Atlas	ST-48	Standard	Diesel	Reciprocal	160,100	83.6
Atlas	ST-95	Standard	Diesel	Reciprocal	330,105	80.2
Atlas	VSS-170Dd	Silenced	Diesel	Reciprocal	170,850	70.2
Atlas	VT-85M	Standard	Gas	Reciprocal	85,100	81.4
Atlas	VS-85Dd	Silenced	Gas	Reciprocal	85,100	75.5
Atlas	VSS-125Dd	Silenced	Diesel	Reciprocal	125,100	70.1
Atlas	STS-35Dd	Silenced	Diesel	Reciprocal	125,100	73.5
Atlas	VSS-170Dd	Silenced	Diesel	Reciprocal	170,100	
Gardner-Denver	SPWDA/2	Silenced	Diesel	Rotary-Screw	1200,000	73.3
Gardner-Denver	SPQDA/2	Silenced	Diesel	Rotary-Screw	750,000	78.2
Gardner-Denver	SPHGC	Silenced	Gas	Rotary-Screw	185,000	77.1
Ingersoll-Rand	DXL 1200	Standard	Diesel	Rotary-Screw	1200,125	92.6
Ingersoll-Rand	DXL 1200 (doors open)	Standard	Diesel	Rotary-Screw	1200,125	
Ingersoll-Rand	DXL 900S	Silenced	Diesel	Rotary-Screw	900,125	76.0
Ingersoll-Rand	DXL 900S	Silenced	Diesel	Rotary-Screw	900,125	75.1
Ingersoll-Rand	DXLCU1050	Standard	Diesel	Rotary-Screw	1050,125	90.2
Ingersoll-Rand	DXL 900S	Silenced	Diesel	Rotary-Screw	900,125	75.3
Ingersoll-Rand	DXL 900S	Silenced	Diesel	Rotary-Screw	900,125	75.0
Ingersoll-Rand	DXL 900	Standard	Diesel	Rotary-Screw	900,125	89.9
Ingersoll-Rand	DXL 750	Standard	Diesel	Rotary-Screw	750,125	87.7
Jaeger	A	Standard	Gas	Rotary-Screw	175,100	88.2
Jaeger	A(doors open)	Standard	Gas	Rotary-Screw	175,100	
Jaeger	E	Standard	Gas	Vane	85,100	81.5
Jaeger	E(doors open)	Standard	Gas	Vane	85,100	
Worthington	60 G/2Qt	Silenced	Gas	Vane	160,100	74.2
Worthington	750-QTEX	Silenced	Diesel	Rotary-Screw	750,100	74.7

*Data taken from EPA Report - EPA 550/9-76-004.

9.4.3 FTA Noise and Vibration Assessment Procedure

Chapter 12 of the FTA Transit Noise and Vibration Guidance Handbook discusses construction noise evaluation methodology and contains the noise emission levels for construction equipment displayed in Table 9.9.

Table 9.9 FTA Construction Equipment Noise Emission Levels.

Equipment	Typical Noise Level (dBA) 50 ft from Source*
Air Compressor	81

Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane Derrick	88
Crane Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile Driver (Impact)	101
Pile Driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

*Table based on EPA Report, measured data from railroad construction equipment taken during Northeast Corridor improvement project and other measured data.

9.5 Links to Equipment Manufacturers

Table 9.10 contains web-based links to manufacturers of construction equipment. While few of these links contain noise-related data associated with the equipment, they provide descriptions and/or specifications related to the equipment, as well as sources for possibly obtaining additional information related to the equipment. Information in this table is by no means all-inclusive and does not represent any type of endorsement of the manufacturers, suppliers, or equipment. Users are hereby advised that the referenced websites may have certain restrictions, copyrights, etc., associated with any use of data contained therein.

Table 9.10 Equipment Manufacturers and Websites.

Equipment	Manufacturer	Website Address
Arrow Boards		
	North Star	http://northstar-traffic.com/index.cfm?SC=14&PT=1
	Trafcom	http://www.trafcon.com
	Allmand	http://www.allmand.com/MB%20AB%20page.htm
Articulated Trucks		
	Case	http://www.casece.com/products/products.asp?RL=NAE&id=196
	Hitachi	http://www.hitachi-c-m.com/global/products/articulate/index.html

	Terex	http://www.terex.com/main.php
	Caterpillar	http://www.cat.com/cda/layout?m=37840&x=7
	Volvo	http://www.volvo.com/constructionequipment/na/en-us/products/articulatedhaulers/
Asphalt Saws		
	Allied	http://www.alliedcp.com/products/rotocut.asp
Augers - See Drills / Augers		
Backhoes - See Loaders/Backhoes		
Boring Equipment - See Pile Drivers/Boring Equipment		
Compaction Equipment		
	Allied	http://www.alliedcp.com/products/compactor.asp
Compressors		
	Sullair	http://www.sullair.com/corp/details/0,10294,CLI1_DIV61_ETI5714,00.html
	Compair	http://www.compair.com/Products/Portable_Compressors.aspx
Concrete and Asphalt Batch/Mixing Plants and Equipment		
	Con-E-Co	http://www.con-e-co.com/products.cfm
	Terex	http://www.terex.com/main.php
	Gunter & Zimmerman	http://www.guntert.com/concrete_mobilebatching.asp
	Rex Con	http://www.rexcon.com
Concrete Breakers/ Hydraulic Hammers/Hydraulic Breakers		
	Drillman	http://www.drillmanindia.com/concrete-breaker.html
	Hydro Khan	http:/www.sangi.co.kr/english/e_product1_2.php
	Stanley	http://www.stanley-hydraulic-tools.com/Hand%20Held/NoAmbreakers.htm
	Lynx	http://www.stanley-hydraulic-tools.com/Lynx/breakers.htm
Concrete Chain Saws		
	Lynx	http://www.stanley-hydraulic-tools.com/Lynx/concrete-saws.htm
Concrete Core Drilling Machines		
	Multiquip	http://www.multiquip.com/multiquip/318_ENU_HTML.htm
Concrete Cutters		
	Vermeer	http://www.vermeermfg.com/vcom/TrenchingEquipment/Line.jsp?PrdlnID=3618
Concrete/Material Pumps		
	Multiquip	http://www.multiquip.com/multiquip/309_ENU_HTML.htm
	Reed	http://www.reedpumps.com/
Concrete Mixer Trucks		
	Oshkosh	http://www.oshkoshtruck.com/concrete/products~overview~home.cfm
	London	http://www.lmi.ca/mixers.cfm
	Terex/Advance	http://www.advancemixer.com
Concrete Saws		
	Multiquip	http://www.multiquip.com/multiquip/315_ENU_HTML.htm
	Diamond Core Cut	http://www.diamondproducts.com/dp_home.htm
Concrete Screeds		
	Multiquip	http://www.multiquip.com/multiquip/317_ENU_HTML.htm
Concrete Vibrators		
	Multiquip	http://www.multiquip.com/multiquip/313_ENU_HTML.htm
	Sullair	http://www.sullair.com/corp/details/0,10294,CLI1_DIV61_ETI5722,00.html
Cranes		
	Malcolm Drilling	www.malcolmdrilling.com
	Link-Belt	http://www.linkbelt.com/lit/products/frameproducthome.htm
	Casagrande	http://www.casagrandegroup.com

	Liebherr	http://www.liebherr.com/em/en/35381.asp
	Terex	http://www.terex.com/main.php
Crawler Tractors - See Dozers/Crawler Tractors		
Crushing and Screening Equipment		
	Cedarapids	http://www.cedarapids.com/crushscr.htm
	Hitachi	http://www.hitachi-c-m.com/
	Komatsu	http://www.komatsu.com/ce/products/mobile_crushers.html
	Terex	http://www.terex.com/main.php
Crushers/Pulverizers		
	Hydro Khan	http://www.sangi.co.kr/english/e_product3.php
Cutoff Saws		
	Multiquip	http://www.multiquip.com/multiquip/309_ENU_HTML.htm
	Lynx	http://www.stanley-hydraulic-tools.com/Lynx/cutoff%20saw.htm
Dozers/CrawlerTractors		
	John Deere	http://www.deere.com/en_US/cfd/construction/deere_const/crawlers/deere_dozer_selection.html
	Caterpillar	http://www.cat.com/cda/layout?m=37840&x=7
	Case	http://www.casece.com/products/products.asp?RL=NAE&id=2
	Komatsu	http://www.komatsu.com/ce/products/crawler_dozers.html
Dewatering Pumps		
	Multiquip	http://www.multiquip.com/multiquip/371_ENU_HTML.htm
Drills / Augers		
	Malcolm Drilling	www.malcolmdrilling.com
	Casagrande	www.casagrandegroup.com
	Soilmec	http://www.soilmec.com/_vti_g1_techno.aspx?rpstry=4_
	Terex	http://www.terex.com/main.php
Excavators		
	Hitachi	http://www.hitachi-c-m.com/global/products/excavator/index.html
	Caterpiller	http://www.cat.com/cda/layout?m=37840&x=7
	Volvo	http://www.volvo.com/constructionequipment/na/en-us/products/compactexcavators/
		http://www.volvo.com/constructionequipment/na/en-us/products/wheeledexcavators/
		http://www.volvo.com/constructionequipment/na/en-us/products/crawlerexcavators/
	John Deere	http://www.deere.com/en_US/cfd/construction/deere_const/excavators/deere_excavator_selection.html
	Liebherr	http://www.liebherr.com/em/en/18891.asp
	Soilmec	http://www.soilmec.com/_vti_g1_t02.aspx?rpstry=29_
	Gehl	http://www.gehl.com
	Case	http://www.casece.com/products/products.asp?RL=NAE&id=216
	Komatsu	http://www.komatsu.com/ce/products/crawler_excavators.html
		http://www.komatsu.com/ce/products/wheel_excavators.html
	Terex	http://www.terex.com/main.php
	Link-Belt	http://www.lbxco.com/lx_series.asp
	Gradall	http://www.gradall.com/
	Badger Daylighting	http://www.badgerinc.com/
Fork Lifts - See Lifts / Variable Reach Fork Lifts/ Material Handlers		
Generators		
	Terex	http://www.terex.com/main.php
	Multiquip	http://www.multiquip.com/multiquip/212_ENU_HTML.htm
	Sullair	http://www.sullair.com/corp/details/0,10294,CLI1_DIV61_ETI5714,00.html
	Baldor	http://www.baldor.com/products/generators/ts.asp
Graders		

	Case	http://www.casece.com/products/products.asp?RL=NAE&id=190
	Volvo	http://www.volvo.com/constructionequipment/na/en-us/products/MotorGraders/
	Komatsu	http://www.komatsu.com/ce/products/motor_graders.html
	Terex	http://www.terex.com/main.php
Hand Compaction Equipment		
	Terex	http://www.terex.com/main.php
	Multiquip	http://www.multiquip.com/multiquip/56_ENU_HTML.htm
Hydraulic Hammers/Hydraulic Breakers - See Concrete Breakers/ Hydraulic Hammers/Hydraulic Breakers		
Jackhammers - See Rock Drilling Equipment/Jackhammers		
Lifts / Variable Reach Fork Lifts/ Material Handlers		
	Genie Lift	www.genielift.com
	Sky Track	www.kirby-smith.com/
	Ingersol-Rand	www.ingersollrand.com
	Terex	http://www.terex.com/main.php
	Roadtec	http://www.roadtec.com/www/docs/102/mtv-material-transfer-vehicle/
Light Towers		
	Baldor	http://www.baldor.com/products/generators/mlt.asp
	Multiquip	http://www.multiquip.com/multiquip/293_ENU_HTML.htm
	Allmand	http://www.allmand.com/Night%20Lite%20Pro%20page.htm
Loaders/Backhoes		
	Case	http://www.casece.com/products/products.asp?RL=NAE&id=54
	Caterpillar	http://www.cat.com/cda/layout?m=37840&x=7
	Volvo	http://www.volvo.com/constructionequipment/na/en-us/products/backhoeloaders/
	John Deere	http://www.deere.com/en_US/cfd/construction/deere_const/backhoes/deere_backhoe_selection.html
	Komatsu	http://www.komatsu.com/ce/products/backhoe_loaders.html
Material Handlers - See Lifts / Variable Reach Fork Lifts/ Material Handlers		
Milling Machines		
	Wirtgen	http://www.wirtgenamerica.com/en-us/
Mining Trucks - See Rigid Dump Trucks/Mining Trucks		
Pans - See Scrapers/Pans		
Pavers/Paving Equipment		
	Caterpillar/ Barber Greene	http://www.cat.com/cda/layout?m=37840&x=7
	Rosco	http://www.leeboy.com/rosco/
	Bomag	http://www.bomag.com/americas/index.aspx?&Lang=478
	Gehl	http://www.gehl.com/const/prodpg_ap.html
	Leeboy	http://www.leeboy.com/leeboy/
	Terex	http://www.terex.com/main.php
	Ingersoll-Rand	http://www.road-development.irco.com/Default.aspx?MenuItemID=12
	Vogele	http://www.vogeleamerica.com/noflash.html
	GOMACO	http://www.gomaco.com/index.html
	Roadtec	http://www.roadtec.com
Pile Drivers/Boring Equipment		
	Soilmec	http://www.soilmec.com/_vti_g1_t09.aspx?rpstry=29_
	Leffer	http://www.leffer.com/hme.html
	Bauer	http://www.bauer.de/en/maschinenbau/produkte/drehbohrgeraete/bg_reihe/usbg15h.htm
Pipelayers/Trenchers		
	Liebherr	http://www.liebherr.com/em/en/18908.asp
	Caterpillar	http://www.cat.com/cda/layout?m=37840&x=7
	Case	http://www.casece.com/products/products.asp?RL=NAE&id=28&archived=1

	Vermeer	http://www.vermeermfg.com/vcom/TrenchingEquipment/trenching-equipment.htm
	Ditchwitch	http://www.ditchwitch.com/dwcom/Product/ProductView/115
	Eagle	http://www.guntert.com/trenchers_home.asp
Profilers - See Roadway Planers/Profilers		
Rammers		
	Multiquip	http://www.multiquip.com/multiquip/56_ENU_HTML.htm
Rebar Benders/Cutters		
	Multiquip	http://www.multiquip.com/multiquip/1316_ENU_HTML.htm
Recyclers - See Stabilizers/Recyclers		
Rigid Dump Trucks/Mining Trucks		
	Hitachi	http://www.hitachi-c-m.com/global/products/rigid/index.html
	Caterpillar	http://www.cat.com/cda/layout?m=37840&x=7
	Liebherr	http://www.liebherr.com/em/en/18898.asp
	Komatsu	http://www.komatsu.com/ce/products/dump_trucks.html
	Terex	http://www.terex.com/main.php
Roadway Planers/Profilers		
	Terex	http://www.terex.com/main.php
	Roadtec	http://www.roadtec.com/products/cold_planers/default.htm
Rock Drilling Equipment/Jackhammers		
	Drillman	http://www.drillmanindia.com/rock-drilling-machine.html
	Whaker	http://www.wackergroup.com/webapp/wcs/stores/servlet/
	Sullair	http://www.sullair.com/corp/details/0,10294,CLI1_DIV61_ETI5721,00.html
	Allied	http://www.alliedcp.com/products/hammers.asp
Rollers - See Tampers/Rollers		
Scrapers/Pans		
	Terex	http://www.terex.com/main.php
Screening Equipment - See Crushing and Screening Equipment		
Slabbuster		
	Allied	http://www.alliedcp.com/products/slabbuster.asp
Slip Form Pavers		
	Huron	http://www.huronmanufacturing.com/
	Guntert & Zimmerman	http://www.guntert.com/concreteSlipformPavers.asp
Stabilizers/Recyclers		
	Bomag	http://www.bomag.com/americas/index.aspx?&Lang=478
	Komatsu	http://www.komatsu.com/ce/products/mobile_crushers.html
	Terex	http://www.terex.com/main.php
	Wirtgen	http://www.wirtgenamerica.com/en-us/
	Roadtec	http://www.roadtec.com
Sweepers		
	Elgin	http://www.elginsweeper.com
	Johnston	http://www.johnstonsweepers.com/
Tampers/ Rollers		
	Bomag	http://www.bomag.com/americas/index.aspx?&Lang=478
	Komatsu	http://www.komatsu.com/ce/products/vibratory_rollers.html
	Whaker	http://www.wackergroup.com/webapp/wcs/stores/servlet/
	Lynx	http://www.stanley-hydraulic-tools.com/Lynx/tamper.htm
	Multiquip	http://www.multiquip.com/multiquip/181_ENU_HTML.htm
	Ingersoll-Rand	http://www.road-development.irco.com/Default.aspx?MenuItemID=15
Trenchers - See Pipelayers/Trenchers		

Trucks - See Articulated Trucks, Concrete Mixer Trucks, Rigid Dump Trucks/Mining Trucks		
Vacuum Units		
	Advanced Recycling Systems	www.arsrecycling.com/
	Vacmasters	http://www.vacmasters.com/airsystm.htm
	Vector	http://www.vector-vacuums.com/
Variable Message Signs		
	Allmand	http://www.allmand.com/MB%20only%20page.htm
	North Star	http://northstar-traffic.com/index.cfm?SC=13&PT=1
	Trafcom	http://www.trafcon.com
	Daktronics	http://www.daktronics.com/vms_prod/dak_vms_products.cfm
Vibratory Rammers		
	Whaker	http://www.wackergroup.com/webapp/wcs/stores/servlet/
Welders/Welding Equipment		
	Airgas	www.airgas.com
	Multiquip	http://www.multiquip.com/multiquip/408_ENU_HTML.htm
	Miller	http://www.millerwelds.com/products/
	Lincoln	http://www.mylincolnelectric.com/Catalog/equipmentseries.asp?browse=101|400|
Wheel Loaders		
	Hitachi	http://www.hitachi-c-m.com/global/products/loader/index.html
	Case	http://www.casece.com/products/products.asp?RL=NAE&id=30
	Caterpillar	http://www.cat.com/cda/layout?m=37840&x=7
	Volvo	http://www.volvo.com/constructionequipment/na/en-us/products/wheelloaders/
	Terex	http://www.terex.com/main.php
	Komatsu	http://www.komatsu.com/ce/products/wheel_loaders.html
	TCM	http://www.tcmglobal.net/products/main02.html

APPENDIX 4

APPENDIX D

EMISSIONS AND HEALTH RISK ASSESSMENT RESULTS

This Attachment in its entirety is Comment 47

Prepared for
City of Union City
Union City, CA

Prepared By
Ramboll Environ US Corporation
San Francisco, California

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AIR QUALITY TECHNICAL REPORT

TURK ISLAND LANDFILL CONSOLIDATION AND RESIDENTIAL SUBDIVISION PROJECT

RAMBOLL ENVIRON

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FIGURES

Figure 1: Project Boundary and Modeling Extent

Figure 2: Modeled Emission Sources

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APPENDIX

Appendix A –CalEEMod® Output Files

Appendix B - Soil Sampling Data

Appendix C – LandGEM Output File

Appendix D – LFG Sampling Data

Appendix E - AERMOD Modeling Files

Appendix F – HARP Log Files

Appendix G – Average Daily Traffic Volume for Nearby Roadways

ACRONYMS AND ABBREVIATIONS

AB2588	Air Toxics Hot Spots Program
AERMET	Atmospheric Meteorological Data Processor
AERMOD	Atmospheric Dispersion Modeling System
AP-42	Compilation of Air Pollutant Emission Factors
AQTR	Air Quality Technical Report
ARB	Air Resources Board
aREL	Acute Reference Exposure Level
ASF	Age Sensitivity Factor
BAAQMD	Bay Area Air Quality Management District
CalEEMod®	California Emission Estimator Model
Cal/EPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officer's Association
CAPs	Criteria Air Pollutants
CEQA	California Environmental Quality Act
CO	Carbon Monoxide
CPF	Cancer Potency Factor
cREL	Chronic Reference Exposure Level
CY	Cubic Yards
DPM	Diesel Particulate Matter
EMFAC2014	Emissions Estimator Model
g/s	Gram Per Second
HARP	Hotspots Analysis and Reporting Program
HHDT	Heavy-Heavy Duty Trucks
HIs	Hazard Indices
HRA	Health Risk Assessment
HQ	Hazard Quotient
IARC	International Agency for Research on Cancer
ISCST3	Industrial Source Complex Short Term 3
LFG	Landfill Gas
lbs	Pounds
KOAK	Oakland International Airport

KHWD	Hayward Executive Airport
KOAK	Oakland International Airport
KM	Kilometer
MEISR	Maximally Exposed Individual Sensitive Receptor
NED	National Elevation Dataset
NO_X	Nitrogen Oxides (NO + NO_2)
NSR	New Source Review
NWS	National Weather Service
OEHHA	Office of Environmental Health Hazard Assessment
$PM_{2.5}$	Particulate Matter Less Than 2.5 Micrometers in Aerodynamic Diameter
PM_{10}	Particulate Matter Less Than 10 Micrometers in Aerodynamic Diameter
REL	Reference Exposure Level
ROG	Reactive Organic Gas
TACs	Toxic Air Contaminants
TOG	Total Organic Gases
TSD	Technical Support Document
USEPA	US Environmental Protection Agency
USGS	United States Geological Survey
VMT	Vehicle Mile Traveled
VDEC	Verified Diesel Emissions Control Strategy
VOC	Volatile Organic Compounds
WHO	World Health Organization
WRAP	Western Regional Air Partnership
$\mu g/m^3$	Microgram per Cubic Meter

EXECUTIVE SUMMARY

The Proposed Project includes "clean closure" of a 6.3-acre landfill that is part of the Turk Island Landfill and subsequent construction of a residential development that would be located between Seabreeze Park and Westport Way, just west of Carmel Way in the City of Union City. This 6.3 acre portion of the landfill was closed and capped in 1974. Approximately 175,000 cubic yards (cy) of landfill debris would be removed from the 6.3-acre landfill site and transferred to the adjacent, closed 47-acre landfill. The 6.3-acre site would then be backfilled with 80,000 cy of clean, engineered fill. The Proposed Project would include 33 single-family homes, ranging in size from approximately 2,500 square feet to 3,000 square feet.

Construction activities associated with the Proposed Project would result in emissions of criteria pollutants, such as nitrogen oxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), and particulate matter (PM) of aerodynamic diameter less than 10 micrometers (PM_{10}) or less than 2.5 micrometers ($PM_{2.5}$), and greenhouse gases (GHG). This report summarizes the emissions and associated health impacts that would result from "clean closure" activities and construction of the residential development and compares them to the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) thresholds of significance.

As outlined in **Section 5.1** controlled emissions from construction are below the BAAQMD 2011 CEQA significance thresholds for criteria pollutants. BAAQMD does not have construction thresholds for GHG emissions so emissions were compared to the stationary source threshold of 10,000 metric tons per year (MT/yr) as the bulk of the emissions result from temporary decommissioning of the landfill gas flare which is a stationary source. Maximum annual GHG emissions associated with the Proposed Project are less than 10,000 MT/yr and are thus not considered to be significant.

As detailed in **Section 5.2**, off-site cancer risks, chronic and acute hazard indices (HI), and annual average $PM_{2.5}$ concentrations are all below the corresponding BAAQMD 2011 CEQA significance thresholds for health risks and hazards from project-only construction sources.

As noted in **Section 6**, the Proposed Project is less than significant for localized CO impacts from motor vehicle traffic. In addition, as shown in **Section 7**, cumulative impacts associated with Proposed Project construction, nearby major roadways, and the Turk Island landfill gas (LFG) flare are below the applicable BAAQMD 2011 CEQA significance thresholds.

1. INTRODUCTION

At the request of the Lamphier-Gregory under the direction of the City of Union City Planning Department, Ramboll Environ US Corporation ("Ramboll Environ" formerly ENVIRON International Corporation) prepared this Air Quality Technical Report (AQTR) to analyze criteria air pollutants (CAPs) and toxic air contaminants (TACs), as well as local health impacts, associated with the "clean closure" of the 6.3-acre Turk Island Landfill and subsequent construction of the proposed residential development that will be located between Seabreeze Park and Westport Way, just west of Carmel Way in the City of Union City (referred to hereafter as "the Proposed Project"). This analysis is being performed to support the Proposed Project's California Environmental Quality Act (CEQA) documentation. This report comprises the complete Health Risk Assessment (HRA) documentation to satisfy City of Union City and Bay Area Air Quality Management District (BAAQMD) requirements for CEQA analyses.

This report discusses the emission sources, methodology for calculating emissions, and methodology for calculating the health risk.

1.1 Project Understanding

The Proposed Project is a residential development that would be located between Seabreeze Park and Westport Way, just west of Carmel Way, on a 6.3-acre plot that is currently part of the Turk Island Landfill. This 6.3 acre portion of the landfill was closed and capped in 1974. Approximately 175,000 cubic yards (cy) of landfill debris would be removed from the 6.3-acre landfill site and transferred to the adjacent, closed 47-acre landfill. The 6.3-acre site would then be backfilled with 80,000 cy of clean, engineered fill. The Proposed Project would include 33 single-family homes, ranging in size from approximately 2,500 square feet to 3,000 square feet.

Additional site improvements have been proposed for the adjacent closed 47-acre landfill, including a public trail featuring small observation areas with benches, trash containers and possibly a small parking lot. Construction activities associated with these additional improvements are expected to be minimal and are not quantitatively evaluated.

1.1.1 Construction

The Proposed Project would involve removal of 175,000 cy of landfill debris from the 6.3-acre landfill site and subsequent construction of the residential development, with construction occurring in one continuous phase. All construction materials would be accommodated on site.

Construction would occur over a consecutive 18 month period, with approximately 381 working days[1] during which construction activities using off-road and on-road equipment would be conducted as shown below and in **Table 1**.

Year 1	January – December 2018	12 months of construction
Year 2	January – June 2019	6 months of construction

The methods for executing the clean closure of the 6.3-acre landfill would be consistent with those that have already been demonstrated to be successful for the adjacent 3-acre landfill which was previously remediated. Single-family homes were also constructed over this 3-

[1] The construction would typically occur 5 days per week.

acre parcel. Methods would involve comprehensive health and safety planning and air monitoring, implementation of temporary site access restrictions, careful construction sequencing and controls, odor minimizing practices, and extensive verification sampling and documentation with special efforts implemented to reduce noise, dust, and traffic per the Clean Closure/Remediation Plan (Remediation Group 2016). Experienced personnel would be on-site at all times to monitor the construction activities and immediately address any environmental concerns that may arise.

1.1.2 Operations

The Proposed Project would not include any stationary sources of air pollution (i.e., no emergency generators). Proposed Project operations would include sources of land use emissions, for example on-site natural gas usage and landscaping, as well as mobile-source emissions from vehicle traffic. Project operations are expected to begin in March 2018 ("Project build-out"). Based on the size of the residential development (33 single-family homes), the Project falls below the CEQA Operational GHG Screening Size (56 dwelling units) so operational GHG emissions were not quantified.

No new waste material will be added to the existing landfill, only relocation of material from one area to another; therefore, an overall increase in emissions from the landfill is not expected as a result of the Proposed Project. Emissions from the 6.3-acre landfill are currently uncontrolled and upon relocation of this material to the 47-acre landfill, emissions will be controlled by the existing LFG capture system and flare. As such, a reduction in overall emissions (including GHG) is expected as a result of the Proposed Project with effective implementation of the Clean Closure/Remediation Plan and operation of the landfill.

In general, operational emissions (both criteria pollutant and GHG) are expected to decrease over time as emissions from passenger vehicles are reduced. Additionally, per the Clean Closure/Remediation Plan (Remediation Group 2016), measured total LFG generation at the 47-acre landfill is currently at approximately 60 percent of its peak production over ten years ago due to the age of the refuse. The quantity of LFG will continue to decrease over time and thus GHG emissions from the landfill will continue to decrease.

1.2 Objective

The purpose of the air quality analysis is to assess potential criteria pollutant and health impacts that would result from construction and operation of the Proposed Project, consistent with guidelines and methodologies from the Bay Area Air Quality Management District (BAAQMD), California Air Resources Board (ARB), California Office of Environmental Health Hazard Assessment (OEHHA), and the United States Environmental Protection Agency (USEPA). Consistent with the methodology recommended in these guidelines, the HRA evaluated the estimated excess lifetime cancer risk, non-cancer chronic and acute hazard indices (HIs), and concentrations of particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$) associated with diesel exhaust that would be emitted by on-site construction activities associated with hauling and off-road equipment, and TACs associated with emissions from fugitive dust and fugitive landfill gas (LFG).[2] Although BAAQMD does not have construction thresholds for greenhouse gas (GHG) emissions, these were quantified as well, consistent with BAAQMD recommendations.

[2] All construction related emissions from on-road and off-road mobile sources are assumed to be from diesel combustion.

Due to the small scale of the Proposed Project and the fact that it will not include any stationary sources of air emissions (i.e., no emergency generators), operational emissions are expected to be below CEQA thresholds and are not explicitly evaluated.

The cumulative analysis evaluates the excess lifetime cancer risks, chronic HI, and $PM_{2.5}$ concentrations from existing known sources of air pollution that are attributable to other mobile and stationary sources within the "zone of influence" in addition to effects from the Proposed Project.

In accordance with CEQA requirements, this AQTR evaluates:

1. Mass emissions of CAPs from construction sources;
2. Excess lifetime cancer risk, chronic and acute HIs, and $PM_{2.5}$ concentrations from construction on off-site receptors; and
3. Cumulative excess lifetime cancer risk, chronic HI, and $PM_{2.5}$ concentrations resulting from construction and other nearby sources on off-site receptors.

The BAAQMD CEQA Guidelines recommends analyses of carbon monoxide (CO) localized impact and odor impact from the Proposed Project. Localized CO impacts are addressed as part of this AQTR and odor impacts are addressed under separate cover.

1.3 Methodology

The Proposed Project would have off-road and on-road-related construction emissions resulting from diesel combustion as well as fugitive emissions associated with dust and LFG. Ramboll Environ evaluated cancer risks and non-cancer HIs from TACs, including Diesel Particulate Matter (DPM), speciated diesel total organic gases (TOG), and speciated fugitive dust and LFG, in addition to $PM_{2.5}$ concentrations.[3] All on-road and off-road construction vehicles were assumed to be diesel-fueled. In addition to DPM, speciated diesel TOG, and $PM_{2.5}$ emissions from on-road and off-road construction equipment, there are fugitive TAC emissions associated with haul trucks traveling over unpaved areas of the Turk Island Landfill. Landfill soil contains trace amounts of various TACs. Soil samples from the 6.3-acre landfill were taken in November of 2000 and laboratory analyses show the presence of low levels of pesticides, semi-volatile organic compounds, and metals (Remediation Group 2016).

The HRA was conducted consistent with the following guidance:

- Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2015);
- BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards (BAAQMD 2012a);
- BAAQMD CEQA Air Quality Guidelines (BAAQMD 2012b);
- BAAQMD Health Risk Assessment Guidelines. Air Toxics New Source Review (NSR) program (BAAQMD 2016a); and
- California Air Pollution Control Officer's Association (CAPCOA) Health Risk Assessment for Proposed Land Use Projects (CAPCOA 2009).

[3] For construction, DPM was evaluated for cancer risk and chronic HI and speciated TOG from diesel exhaust was used to estimate acute HI.

2. EMISSIONS ESTIMATION METHODS

Ramboll Environ quantified CAP, GHG, and TAC emissions associated with clean closure of the 6.3-acre portion of the Turk Island Landfill and construction of the proposed residential development. **Table 2** describes the methodologies used for calculating emissions.

CAP, GHG, and TAC emissions associated with construction were estimated using version 2016.3.1 of the California Emission Estimator Model (CalEEMod®), the land-use model recommended by the BAAQMD for CEQA analyses. Sources of general construction emissions include off-gassing from architectural coating, exhaust from off-road and on-road equipment, and fugitive emissions associated with excavation of debris from the 6.3-acre site.[4] Fugitive emissions from haul trucks traveling on unpaved areas of the landfill were quantified based on AP-42 Chapter 13.2.2, Unpaved Roads (USEPA 2006). Soil analyses taken at the 6.3-acre landfill in November 2000 (Remediation Group 2016) were then used to speciate fugitive particulate emissions from unpaved roads and grading activities for use in the HRA. Although additional LFG will not be generated by the excavation activities, removal of the cover from the 6.3-acre landfill may result in the release of fugitive LFG emissions; therefore, these emissions are also included in the analysis. Additionally, the LFG capture system and flare which controls emissions from the 47-acre landfill will be shut down temporarily during relocation of material from the 6.3-acre site to the 47-acre site. The additional quantity of GHG emissions released during this period was also quantified.

2.1 Construction Emissions

2.1.1 Architectural Coating

Reactive Organic Gas (ROG) off-gassing emissions from architectural coating in CalEEMod® are based on default CalEEMod® square footage of materials to be coated. CalEEMod® assumes the volatile organic compound (VOC) content of the paint is consistent with the limits set in BAAQMD Regulation 8, Rule 3 (BAAQMD 2009).

2.1.2 Off-road Equipment

Construction equipment was based on default CalEEMOD® equipment as the basis for the off-road equipment emissions estimates (**Appendix A**). Default values were used as project-specific data was not available at the time of this analysis. Uncontrolled emissions were calculated assuming fleet average equipment, meaning the emission factors used reflect the fleet predicted to be in use in the OFFROAD2011 model. Uncontrolled and controlled CAP, GHG, and TAC emissions are presented in **Tables 3 and 4**, respectively. Controlled emissions are calculated assuming Tier 2 engines equipped with an ARB Level 3 Verified Diesel Emissions Control Strategy (VDECS) on all equipment.

Fugitive emissions associated with excavation activities are also quantified by CalEEMod. The grading activities were separated into two phases. The first grading phase, "Landfill Debris", represents the removal and transfer of the landfill debris from the 6.3-acre site to the 47-acre site and the second phase, "Clean Fill", represents the import of clean fill from off-site to the 6.3-acre site. Soil analyses indicate the presence of various TACs within the soil on the 6.3-acre site. Fugitive PM_{10} emissions from grading, as calculated by CalEEMod, were

[4] CalEEMod quantified fugitive dust associated with grading and truck loading. Per the CalEEMod User's Guide, fugitive dust emissions quantified specifically for grading include dust from dozers moving dirt around, dust from graders or scrapers leveling the land, and loading or unloading the dirt into haul trucks.

multiplied by the speciated concentration of TACs within the soil to yield an estimated emission rate for each soil-based TAC as explained in Section 2.1.4 below.

CalEEMod also quantifies emissions of ROG from off-road construction equipment exhaust, which were then converted to TOG based on USEPA Conversion Factors for Hydrocarbon Emission Components (USEPA 2010). Since there is no acute REL for DPM, EPA diesel speciation profiles (**Table 5**) were used to speciate diesel TOG emissions from on-road and off-road vehicles for calculation of acute HI. Speciated diesel TOG emission rates are provided in **Table 6**.

2.1.3 Construction On-road Haul Trucks, Delivery Trucks and Vans

The worker, vendor, and hauling trip generation were based on default CalEEMod® version 2016.3.1 trip generation rates (see **Appendix A**) for the building construction, architectural coating, and paving phases. Hauling trip counts for the grading phases were based on the amount of landfill debris that would be relocated (cubic yards) and quantity of clean fill that would be brought to the site (cubic yards). The default trip lengths in CalEEMod® were used for worker, vendor, and haul truck trips, with the exception of haul trips associated with the "Landfill Debris" grading phase, which was updated based on the actual trip length for trucks traveling across the landfill parcels. The worker fleet was assumed to be 50% Light-Duty Automobiles, 25% Light-Duty Trucks 1 and 25% Light Duty Trucks 2 in CalEEMod®. Likewise, the vendor fleet was assumed to be 50% Medium Heavy Duty Trucks and 50% Heavy-Heavy Duty Trucks (HHDT) in CalEEMod®. Hauling trips were assumed to be 100% HHDT in CalEEMod®. The emission factors used by CalEEMod® for construction of the Proposed Project cover the years 2018 and 2019, the anticipated years of construction.

The emission factors for running emissions of criteria pollutants in CalEEMod® are from 2014 Emissions Estimator Model (EMFAC2014). This version reflects the emissions benefits of ARB regulations including on-road diesel fleet rules and the Pavley Clean Car Standards. The model also includes updated information on California's car and truck fleets and travel activity.

For the HRA, Ramboll Environ included DPM, speciated diesel TOG, and $PM_{2.5}$ emissions from on-road construction-related vehicle activity within 1,000 feet of the Proposed Project site because health risks are localized. Ramboll Environ estimated cancer risk and chronic HI associated with diesel-fueled construction equipment and acute HI associated with speciated diesel TOG as part of the HRA. CAP emissions from on-road trucks take into account total exhaust emissions from worker, vendor, and haul truck activity and are included in **Tables 3 and 4**. TAC emissions from on-road vehicles are included in **Table 6**.

On-road emissions quantified using CalEEMod were converted to units of grams of pollutant emitted per vehicle mile traveled (VMT) or trip using the daily VMT or trips. The methodology used to calculate emissions is presented in **Table 2.**

2.1.4 Fugitive Emissions from On-road and Off-road Sources

Fugitive PM_{10} emissions from trucks traveling on unpaved surfaces on-site were quantified based on emission factors from EPA's AP-42 Chapter 13.2.2 Unpaved Roads (USEPA 2006) and are presented in **Table 7**. Vehicles weights were estimated as 11.1 tons on average based on manufacturer data for empty and full trucks capable of hauling 12-13 cubic yards of soil.[5] Due to a lack of site-specific data, the mean silt content for municipal solid waste landfills from AP-42 was assumed to be representative of conditions at the Turk Island Landfill (6.4%). Per the Clean Closure/Remediation Plan for the 6.3-acre landfill

[5] http://www.877joebark.com/delivery_guidelines/about_our_dump_trucks

(Remediation Group 2016), water and chemicals will be utilized to minimize fugitive emissions. A control efficiency of 84% was applied to emissions from haul trucks traveling on unpaved surfaces (WRAP 2006). Truck-mounted equipment and/or hoses will be utilized to wet the soil prior to excavation and will continue during removal of the cover and refuse material. A control efficiency of 84% for watering and application of chemical dust/odor suppressant was also applied to fugitive PM_{10} emissions from excavation which were quantified by CalEEMod. Fugitive PM_{10} emissions from on-road and off-road sources were speciated based on the soil analyses from November 2000 (Remediation Group 2016). A copy of the soil analysis is provided in **Appendix B** of this AQTR. The soil analyses contain several parts per million (by weight) values for TACs present in the soil. Fugitive TAC emission rates were conservatively estimated by multiplying fugitive PM_{10} emissions by maximum concentrations of each TAC from the soil analysis. These emissions are presented in **Tables 8 and 9**.

2.1.5 LFG Fugitive Emissions

Fugitive LFG emissions associated with disturbance of the 6.3-acre landfill were estimated using USEPA's LandGEM model. LandGEM was run based on refuse amounts and model parameters obtained from the Clean Closure/Remediation Plan (Remediation Group 2016). The landfill was modeled as opened in 1969, closed in 1970, with 31,620 tons of waste accepted per year. The methane generation rate and potential methane generation capacity were modeled as 0.040 and 100 cubic meters per year (m^3/year), respectively. Methane content was modeled as 50% by volume. Total LFG emissions were then speciated based on LFG sampling data for the 6.3-acre landfill from November 2000 (Remediation Group 2016). To estimate a fugitive LFG emission rate for each TAC, the estimated 2017 LFG emissions were scaled using the maximum concentrations in parts per million by volume (ppmv) for each TAC. Speciated LFG emissions are shown in **Table 10**. Although additional LFG will not be generated by the excavation activities, removal of the cover from the 6.3-acre landfill may result in the release of fugitive LFG emissions; therefore, these emissions are included in the analysis. LandGEM output files and LFG sampling data are provided in **Appendices C and D**, respectively.

2.1.6 Landfill Emissions

As previously described, the LFG capture system and flare which controls emissions from the 47-acre landfill will be shut down temporarily during relocation of material from the 6.3-acre site to the 47-acre site. A temporary increase in fugitive GHG emissions will occur during this period due to the Project and these emissions were thus quantified. The projected methane generation rate for the 47-acre landfill for 2018 was obtained from the Clean Closure/Remediation Plan (Remediation Group 2016). The LFG capture system and flare were assumed to be down during the duration of grading activities, consistent with the durations used in the CalEEMod run. A small increase in fugitive TAC emissions would also occur during this period; however, given the magnitude and duration of these emissions they are expected to have a negligible contribution to cancer risk which is primarily driven by DPM emissions from off-road construction equipment and on-road vehicles. A significant portion of the LFG is methane (40%) which is not considered in the health risk calculations (i.e., there is no cancer potency factor or reference exposure level for methane).

2.1.7 Summary of Project Construction CAP and GHG Emissions

Emissions from each construction year for the Proposed Project were added and then averaged over the number of work days in the construction period. **Tables 3 and 4** provide uncontrolled and controlled construction criteria pollutant and GHG emissions by year and for

the total construction period, respectively. CalEEMod output files are included in **Appendix A**.

2.2 Calculation Methodologies for Off-site TAC Emissions

BAAQMD screening tools were used for major roadways, as described in the sections below. TAC emission rates for the LFG flare were obtained from Appendix F of the Clean Closure/Remediation Plan for the 6.3-acre landfill (Remediation Group 2016) and $PM_{2.5}$ emissions were quantified based on AP-42 Chapter 2.4 Municipal Solid Waste Landfills (USEPA 1998).

3. AIR CONCENTRATION ESTIMATION METHODS

The air toxics analysis evaluated impacts associated with excess lifetime cancer risks, chronic and acute HI, and $PM_{2.5}$ concentrations from the Proposed Project on the surrounding community. The methodologies used were based on the most recent BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards (BAAQMD 2012a).

3.1 Chemical Selection

The excess lifetime cancer risk analysis in the HRA was based on DPM emissions from diesel off-road equipment, on-road vehicles, TACs in fugitive dust and LFG, and the existing Turk Island Landfill LFG flare.[6]

Diesel exhaust, a complex mixture that includes hundreds of individual constituents (California Environmental Protection Agency [Cal/EPA] 1998), is identified by the State of California as a known carcinogen (Cal/EPA 2016). Under California 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 (Cal/EPA 2016). Cal/EPA and other proponents of using the surrogate approach to quantifying excess lifetime cancer risks associated with the diesel mixture indicate that this method is preferable to use of a component-based approach because it provides a protective approach to estimating health risks. A component-based approach involves estimating risks for each of the individual components of a mixture. Critics of the component-based approach believe it will underestimate the risks associated with diesel as a whole mixture because the identity of all chemicals in the mixture may not be known and/or exposure and health effects information for all chemicals identified within the mixture may not be available. Furthermore, Cal/EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will exceed the multi-pathway cancer risk from the speciated components (OEHHA 2003)." These analyses were based on the surrogate approach, as recommended by Cal/EPA.

There is currently no acute non-cancer toxicity value available for DPM. Thus, speciated components of diesel TOGs with acute toxicity values were included in the acute non-cancer hazard analysis. The speciation profile for diesel TOG exhaust is shown in **Table 7**.[7]

3.2 Model Selection and Parameters

Near-field air dispersion modeling for the Proposed Project construction sources was conducted using the USEPA's atmospheric dispersion modeling system (AERMOD).

As mentioned previously, other sources included in the cumulative analysis are BAAQMD permitted stationary sources and major roadways. The BAAQMD Roadway Screening Analysis Calculator (BAAQMD 2015) was used to estimate impacts from nearby roadways with average daily traffic volume greater than 10,000 vehicles per day. Hence, the major roadways were not modeled and are not discussed further in this section. The Turk Island LFG flare was modeled using AERMOD and associated concentrations of TACs were evaluated as part of the cumulative HRA.

[6] Toxicity values for DPM as well as the individual components speciated from diesel TOGs from construction equipment as provided by the BAAQMD are included in **Table 7**.

[7] USEPA Speciation Profile 3161 (with the exception of acrolein, per BAAQMD guidance (BAAQMD 2016a)).

The most recent version of the American Meteorological Society/Environmental Protection Agency regulatory air dispersion model (AERMOD, Version 16216r[8]) was used to determine concentrations of DPM, $PM_{2.5}$, TACs from fugitive dust and LFG, and speciated diesel TOG at off-site receptors. For each receptor location, the model generates air concentrations (or air dispersion factors as unit emissions) that result from emissions from multiple sources.

Air dispersion models such as AERMOD require a variety of inputs including source parameters, meteorological parameters, topographical information, and receptor parameters. When site-specific information was unknown, Ramboll Environ used default parameter sets that are designed to produce conservative (i.e., overestimates of) air concentrations.

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 this analysis, meteorological data from the Hayward Executive Airport (KHWD) National Weather Service (NWS) station for years 2011-2012 and 2014-2016 were used. The year 2013 was not utilized in the analysis due to limited data collection in the fourth quarter of the year. Upper air data was obtained from the Oakland International Airport (KOAK). The data were processed using the latest versions of AERMET (Version 16216[9]) and associated preprocessors. A detailed analysis of monthly precipitation was performed in accordance with BAAQMD guidelines for developing a monthly land use profile.[10]

Ramboll Environ ran AERSURFACE in the creation of the five year meteorological data set. As part of the AERSURFACE analysis, a precipitation analysis comparing the five year modeling period to historical data is performed to determine whether it is wetter, drier, or average compared to 30 years of historical data. As per BAAQMD guidance, each month was estimated separately. The monthly AERSUFACE output surface parameter file was compiled using three AERSURFACE runs for each precipitation category (wet, average, or dry). The meteorological site is located at airport, and no seasonal snow cover was assumed. The surface roughness calculations were split into 12 sectors with a 1.0 kilometer (km) radius.

Terrain considerations: Elevation data (1 arc-second) was imported from the National Elevation Dataset (NED) maintained by the United States Geological Survey (USGS).

Emission rates: Construction emitting activities were modeled to reflect the assumed hours of construction, from 8 am to 4 pm. Emissions were modeled using the χ/Q ("chi over Q") method, such that each phase had unit emission rates (i.e., 1 gram per second [g/s] for volume sources or 1 g/s per square meter [m^2] for area sources), and the model estimated dispersion factors (with units of microgram per cubic meter per gram per second, [$\mu g/m^3$]/[g/s]).

For acute non-cancer hazard analyses, the 1-hour maximum dispersion factor estimates for each receptor were used. These dispersion factors were multiplied by the maximum 1-hour emission rate.

[8] https://www3.epa.gov/scram001/dispersion_prefrec.htm

[9] https://www3.epa.gov/ttn/scram/metobsdata_procaccprogs.htm#aermet

[10] https://www.ncdc.noaa.gov/cdo-web/

For cancer risk and non-cancer hazard analyses, the annual average ambient air concentrations were determined by multiplying the annual average dispersion factors from AERMOD ($\mu g/m^3$) by the annual average emission rates (g/s).

For simplicity, the model assumed a constant emission rate for every day of the year.

Source parameters: Source location and parameters are necessary to model the dispersion of air emissions. **Table 8** summarizes the modeled source parameters for all sources included in the analysis.

3.3 Modeled Sources

For construction, the duration of the construction period is anticipated to be 18 months. At any given time there will be multiple emission sources associated with construction equipment within the construction zone. The construction area was modeled as an area source encompassing the entire 6.3-acre site. The Proposed Project boundary and modeling extent are shown in **Figure 1**. A release height of 5 meters was used, with an initial vertical dimension of 1.4 meters, consistent with previous analyses completed under the jurisdiction of BAAQMD (see **Table 8**). Additionally, fugitive LFG emissions were modeled assuming identical release parameters as the construction sources, with the exception of release height (0 meters).

Fugitive emissions associated with haul trucks traveling on-site were modeled as a series of adjacent volume sources as shown in **Figure 2**. Source locations and modeling parameters were based on EPA Haul Road Workgroup guidance (USEPA 2012). Typical haul truck parameters specified within the guidance were used: 3 meter vehicle height, width, and 10 meter vehicle length. Based on these typical parameters and the equations within the guidance, the width of the plume (and thus source separation) and release height were modeled as 9 meters and 2.55 meters, respectively. The haul truck routes were determined based on a review of the Clean Closure/Remediation Plan (Remediation Group 2016).

The existing LFG flare parameters were obtained from Appendix F of from the Clean Closure/Remediation Plan (Remediation Group 2016). The flare effective diameter was calculated based on the following (TCEQ 2015):

$$D = (10^{-6} * q_n)^{0.5.}$$

Where

D = effective stack diameters in meters

q_n = net heat release in calories per second

Receptors: In order to evaluate health impacts to off-site receptors, Ramboll Environ modeled a nested grid of receptors with 25 meter and 50 meter spacing. Receptors were modeled at locations within 1,000 meters of the Proposed Project site using 25 meter resolution, and within 2,000 meters of the Proposed Project using 50 meter resolution. Off-site receptors were modeled at a height of 1.8 meters above terrain height (i.e., the default breathing height for ground-floor receptors). As discussed previously, maximum average annual dispersion factors were estimated for each receptor location. Modeled receptors are

shown in **Figure 1**. **Figure 3** shows the off-site sensitive receptors modeled for construction.[11]

The AERMOD files for the Proposed Project construction and LFG flare modeling are included in **Appendix E**.

[11] Sensitive receptors were identified based on the City of Union City Zoning Map and a detailed review of aerial imagery using Google Earth. Zoning map available at: http://www.cityofsanmateo.org/DocumentCenter/Home/View/578

4. RISK CHARACTERIZATION METHODS

In February 2015, OEHHA released the updated Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015), which combines information from previously-released and adopted technical support documents to delineate OEHHA's revised risk assessment methodologies based on current science. This updated Guidance Manual supersedes the 2003 Guidance Manual (OEHHA 2003) that previously provided methodologies for conducting health risk assessments under the Air Toxics Hot Spots Program (AB2588). The BAAQMD recently adopted the OEHHA 2015 Guidance Manual (BAAQMD 2016a) for the purposes of New Source Review Permitting. As such, this evaluation utilized the OEHHA 2015 methodology.

Modeled health risks were estimated for the Proposed Project based on methods and tools outlined in the OEHHA Guidance. Specific steps taken to complete the HRA, such as hazard identification, exposure assessment, dose-response, and risk characterization are described in more detail below.

4.1 Sources Evaluated

Ramboll Environ evaluated excess lifetime cancer risks, non-cancer HIs, and $PM_{2.5}$ concentrations for the listed emission sources, which reflect the largest estimated impacts from Proposed Project construction. These emissions include both TACs in fugitive dust and LFG and diesel exhaust.

1. Use of construction equipment from June 2017 to September 2018.
2. Construction traffic emissions, which includes worker, vendor, and material hauling trips during the duration of construction activities. Project-specific trip counts were used where available.[12]
3. Fugitive LFG from the 6.3 acre site.
4. Existing LFG flare located on the 47-acre parcel.[13]

4.2 Risk Assessment Procedures

As prescribed in the OEHHA Guidance, the most recent Hotspots Analysis Reporting Program Version 2 (HARP2) model, dated 17052, was used to estimate the potential impacts to human health in the vicinity of the Proposed Project. The results from AERMOD were imported into the Risk Analysis module of HARP2 via the HARP On-Ramp tool, developed by ARB, to calculate the potential cancer risk, potential chronic HI, and potential acute HI at off-site sensitive receptors.

For carcinogens, cancer potency factors (CPF) were used for computing cancer risk. For non-cancer health effects, reference exposure levels (REL) were used. The non-carcinogenic hazard indices were computed for chronic and acute exposures with their respective toxicological endpoints. For multi-pathway TACs, oral doses, oral CPFs, and/or non-inhalation RELs were used as appropriate.

[12] CalEEMod® default values were used with the exception of haul trips in the grading phases.

[13] The LFG flare is not associated with the Proposed Project and was included in the cumulative HRA only.

4.2.1 HARP On-Ramp

HARP was developed to include the Industrial Source Complex Short Term 3 (ISCST3) air dispersion model, the precursor to AERMOD, which is the air dispersion model currently recommended for regulatory applications. With the advent of AERMOD, which generates output files in a different format than ISCST3, ARB developed the On-Ramp program to integrate AERMOD output files into the risk analysis module of HARP. Rather than running the older ISCST3 model inside the HARP interface, as HARP was designed, ARB created the On-Ramp program to allow results, specifically plot files, from AERMOD to be integrated into HARP.

4.3 Exposure Assessment

The USEPA (1989) defines exposure as "the contact with a chemical or physical agent" and defines the magnitude of exposure as "the amount of an agent available at human exchange boundaries (i.e., lungs, gut, skin) during a specified time." The components of the exposure assessment include the identification of potentially exposed populations, the estimation of exposure point concentrations, the identification of exposure pathways, and the selection of exposure assumptions and exposure analysis methods to quantify chemical intakes that may result from potential construction-related emissions.

The methodology under OEHHA 2015 Hot Spots Guidelines is as follows:

Potentially Exposed Populations: This analysis evaluated off-site resident children commencing at the time of the Proposed Project based on OEHHA 2015 Hot Spots Guidelines.

Exposure Pathways: The exposure pathways evaluated in the HRA were selected in accordance with the OEHHA Guidance. The inhalation pathway must be evaluated for all chemicals. In addition, the OEHHA Guidance also requires the evaluation of non-inhalation exposure pathways, referred to as a multi-pathway analysis, for specific chemicals.

Selection of the additional pathways for a multi-pathway analysis is specific to the chemical and land use in the area surrounding the Proposed Project and was based on the recommendations in the OEHHA Guidance. The chemicals that must be evaluated in a multi-pathway analysis are shown in Table 5.1 of the OEHHA Guidance and are programmed into HARP2. As discussed above, HARP2, which complements the OEHHA Guidance with respect to exposure pathway selection, was used to estimate potential cancer risks and potential non-cancer hazards for this HRA.

Consistent with the OEHHA Guidance for conducting a multi-pathway analysis, it was assumed that residents may be exposed to construction emissions via inhalation, dermal absorption, incidental ingestion of soil, ingestion of homegrown produce, and mother's milk. A deposition rate of 0.02 meters per second (m/s) was used per OEHHA Guidelines (OEHHA 2015).

Since the Proposed Project is located in an urban area with no agricultural areas (*e.g.*, cattle grazing areas or dairy farms) in the vicinity, the HRA does not include an evaluation of potential exposures via ingestion of meat, dairy, or eggs. However, potential exposures to chemicals in homegrown produce were evaluated for a resident because it is possible that residents in the area may have small vegetable gardens exclusively for personal use. The default home-grown produce parameters for urban settings were used in HARP2, including the default value of 13.7 percent for the fraction of homegrown fruits and vegetables

consumed. Nearby drinking water reservoirs were not identified within the modeled zone of impact, therefore the drinking water pathway was not included.

Exposure Assumptions: For all pathways, default exposure assumptions built into HARP2 were used in the risk calculations. The exposure assumptions in HARP2 are consistent with OEHHA Guidance. However, the specific exposure assumptions applied to calculate risks are dependent on the exposure analysis method selected to calculate risks.

HARP2 allows a user to select from a series of exposure analysis methods. Each method in HARP2 utilizes exposure assumptions differently, depending on the requirements of a specific regulation (*e.g.*, compliance with CARB's Air Toxics Hot Spots Program) or project need (*e.g.*, provide point estimates for risk management decisions). That is, HARP2 will select the dominant pathway(s) and assign exposure assumptions depending on the exposure analysis method identified by the user.

Consistent with HARP2 and OEHHA Guidance, potential cancer risks for residential populations were calculated using the Derived (Adjusted) Analysis Method. This method applies conservative exposure assumptions to the two dominant exposure pathways for each chemical. The remaining pathways are evaluated using average exposure assumptions. If inhalation is one of the two dominant exposure pathways, then it is evaluated using the 80th percentile breathing rate for age bins 2 to 70 years (ARB 2008). This approach is consistent with BAAQMD guidance (BAAQMD 2016a).

It was assumed that a resident may be exposed to construction emissions 1.3 years, consistent with the actual duration of the Proposed Project. Per BAAQMD guidance, actual construction duration should be used for short-term projects (BAAQMD 2016a).

As discussed previously, it was assumed that individuals residing in the vicinity of the Proposed Project may ingest produce obtained from vegetable gardens grown at their homes. Ingestion of homegrown produce is estimated by applying a default parameter of 13.7 percent of produce ingested by individuals in an urban setting that is homegrown and is comprised of four categories including exposed, leafy, protected, and root vegetables (OEHHA 2015). This is the default setting in HARP2.

The (OEHHA) Analysis method was used to calculate chronic HIs for residents. This method utilizes high-end exposure assumptions to evaluate the two dominant pathways for each chemical. The remaining pathways are evaluated using average exposure assumptions.

4.4 Dose Response Assessment

The dose-response assessment (also referred to as the toxicity assessment) examines the potential for a chemical to cause adverse health effects in exposed individuals (as modeled). Toxicity values that are used to estimate the likelihood of adverse effects occurring in humans are identified in this component of the risk assessment process. Toxicity factors in the latest HARP Health Database,[14] integrated into the HARP2 program (Version 17052), were used in the HRA. The HARP2 program contains the most up-to-date listing of available inhalation and oral CPFs, chronic inhalation and oral RELs, and acute RELs approved by California Environmental Protection Agency (Cal/EPA). **Table 13** shows the CPFs and RELs used for the speciated components in this analysis.

[14] The latest version of HARP2 and supporting documentation from February 2017 is available from ARB at: https://www.arb.ca.gov/toxics/harp/rast.htm

The dose-response assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories – cancer and non-cancer endpoints. Toxicity values that are used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a risk assessment.

For cancer risk and chronic HI calculations Ramboll Environ used the applicable toxicity values for DPM. For the calculation of acute HI, Ramboll Environ used the toxicity values for the individual constituents based on the speciation profiles of diesel TOG for on-road and off-road vehicles.

4.5 Risk Characterization

4.5.1 Estimation of Cancer Risks

Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific CPF. For carcinogenic chemicals, both inhalation and non-inhalation pathways must be considered, using the CPFs in HARP2. Total risk is the sum of risks attributable to each chemical considered by each pathway.

The equation used to calculate the potential excess cancer risk from inhalation for each carcinogenic chemical is:

$$Risk_i = Inhalation\ \ Dose_i \times Cancer\ \ Potency\ \ Factor_i$$

Where:

$Risk_i$	=	Lifetime excess cancer risk from exposure to $chemical_i$
Inhalation $Dose_i$	=	Inhalation dose of $chemical_i$ (mg/kg-day)
CPF_i	=	Inhalation CPF for $chemical_i$ $(mg/kg\text{-}day)^{-1}$

A similar equation, using oral dose and the oral CPF, is used to calculate risks from oral exposure. In the HRA, oral cancer risks include dermal absorption, incidental ingestion of soil, ingestion of homegrown produce, and mother's milk. HARP default exposure parameters were used, as described in Section 4.5.2.

4.5.2 Estimation of Chronic and Acute Non-cancer Hazard Quotients/Indices

Chronic HQ

The potential for exposure to result in adverse chronic non-cancer effects is evaluated by comparing the estimated annual average air concentration (which is equivalent to the average daily air concentration) to the non-cancer chronic reference exposure level (cREL) for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient (HQ). To evaluate the potential for adverse chronic non-cancer health effects from simultaneous exposure to multiple chemicals, the HQs for all chemicals that will affect the same target organ are summed, yielding a HI.

$$HQ_i = C_i / cREL_i$$

$$HI = \sum HQ_i$$

Where:

HQ_i	=	Chronic hazard quotient for chemical$_i$
HI	=	Hazard index
C_i	=	Annual average concentration of chemical$_i$ (µg/m^3)
$cREL_i$	=	Chronic non-cancer reference exposure level for chemical$_i$ (µg/m^3)

Estimation of non-inhalation chronic health effects uses a similar method, but the annual average air concentration is replaced by the dose calculated by HARP2 using the exposure parameters mentioned above, and the appropriate non-inhalation REL is used.

Estimation of an HI for each target organ (also referred to as a segregation of HI by target organ analysis) is recommended by OEHHA because the non-cancer effects of chemicals with different target organs are generally not additive. For the HRA, a segregation of hazard indices analysis was performed for the modeled MEISR.

Acute HI

The potential for exposure to result in adverse acute effects is evaluated by comparing the estimated one-hour maximum air concentration of chemical to the acute reference exposure level (aREL) within the HARP2 program for each chemical evaluated in this analysis. When calculated for a single chemical, the comparison yields an HQ. To evaluate the potential for adverse acute health effects from simultaneous exposure to multiple chemicals, the HQs for all chemicals that affect a target organ are summed, yielding a HI.

$$HQ_i = C_i / aREL_i$$

$$HI = \sum HQ_i$$

Where:

HQ_i	=	Acute hazard quotient for chemical$_i$
HI	=	Hazard index
C_i	=	One-hour maximum concentration of chemical$_i$ (µg/m^3)
$aREL_i$	=	Acute reference exposure level for chemical$_i$ (µg/m^3

The acute HI presented in this HRA conservatively overestimates the true one hour maximum at any one time because one hour maximum air concentrations were summed regardless of time of occurrence (i.e., hour of year) which can differ by source.

The controlled off-site risks, chronic HI, acute HI and $PM_{2.5}$ concentration are shown in **Table 14**.

4.6 Screening Analyses

BAAQMD provides screening tools to facilitate the review of health impacts of off-site sources. The tools present conservative estimates of impacts from these sources. BAAQMD's roadway screening tables were used in this analysis.

4.6.1 Roadway Sources

BAAQMD's roadway screening analysis calculator (BAAQMD 2015) was used to estimate $PM_{2.5}$ and TAC concentrations from the major roadways with greater than 10,000 vehicles per day within 1,000 feet of the Proposed Project, consistent with BAAQMD guidance.[15] The BAAQMD screening tool does not provide specific estimates for chronic HI.

Per BAAQMD guidance, the cancer risk values were scaled to consider the 2015 OEHHA guidance. Cancer risk and $PM_{2.5}$ concentration from the roadways were estimated at the MEISR from Project construction, in accordance with BAAQMD Guidance. Roadway screening health impacts are shown in **Table 15**.

4.6.2 Stationary Sources

Based on a search of the most recent BAAQMD stationary source database (BAAQMD 2012b), there are no stationary sources within 1,000 feet of the Proposed Project. There is, however, an LFG flare located at the 47-acre parcel of Turk Island Landfill. To evaluate the contribution to risk, chronic HI, and $PM_{2.5}$ from the flare, the flare's contribution was assessed in HARP2 at the Project MEISR and was added to the contribution from the roadway screening analysis at the MEISR. Refined modeling was conducted for the LFG flare using release parameters and emissions data from Appendix F of the Clean Closure/Remediation Plan (Remediation Group 2016), as discussed in Section 3.3.[16] Estimated residential health impacts from the flare at the off-site MEISR are presented in **Table 16**.

[15] Traffic volumes were provided by the City of Union City and are included in Appendix G.

[16] AERMOD input and output files are provided in Appendix E.

5. RESULTS FROM PROJECT ANALYSIS

This Section presents the Proposed Project construction emissions as well as Proposed Project impacts on off-site residents. Emission calculation methodologies were discussed in Section 2 above.

5.1 CAP and GHG Emissions from Construction Sources

The BAAQMD 2011 CEQA significance thresholds for criteria air pollutants from project-only sources are:

- 54 lb/day of ROG;
- 54 lb/day of NO_X;
- 82 lb/day of PM_{10} (exhaust); and
- 54 lb/day of $PM_{2.5}$ (exhaust).

Tables 3 and 4 summarizes uncontrolled and controlled construction emissions. As discussed above, uncontrolled construction emissions are based on default CalEEMod® tiers for all pieces of equipment and controlled emissions are based on Tier 2 equipment with ARB Level 3 VDECS. As shown in **Table 4**, average daily controlled construction emissions are predicted to equal the following: 3.5 pounds/day (lb/day) ROG; 33 lb/day nitrogen oxides (NO_x); 0.15 lbs/day PM_{10} exhaust; and 0.15 lb/day $PM_{2.5}$ exhaust. Controlled emissions from construction are below the BAAQMD 2011 CEQA thresholds.

Although BAAQMD does not have construction thresholds for GHG emissions, they recommend that these be quantified. GHG emissions from construction of the Proposed Project are estimated to be 8,058 metric tons. The majority of these emissions result from fugitive LFG emissions released by the 47-acre landfill during the period when the LFG capture system and flare will be shut down. The GHG emissions from the fugitive LFG are high because a significant portion of the LFG is methane, which has a high global warming potential. Since the BAAQMD does not have a construction threshold for GHG emissions, for purposes of a significance determination the maximum annual GHG emissions from construction (7,931 MT in 2018) are being compared to the stationary source threshold of 10,000 MT/yr as the LFG flare is regulated by the BAAQMD as a stationary source. Temporary GHG emissions during construction associated with the Proposed Project will be less than 10,000 MT/yr and are thus not considered significant.

5.2 Off-site Risk, Hazard, and $PM_{2.5}$ Results

The BAAQMD 2011 CEQA significance thresholds for health risks and hazards from project-only sources are:

- An excess lifetime cancer risk level of more than 10 in one million;
- A non-cancer (chronic or acute) HI greater than 1.0; and
- An incremental increase in the annual average $PM_{2.5}$ of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$).

As discussed above, this analysis looked at risk associated with the Proposed Project construction. The controlled off-site risks, chronic HI, acute HI and $PM_{2.5}$ concentration are shown in **Table 14**. **Figure 4** shows the location of the MEISRs.

The cancer risk at the off-site MEISR is 9.1 in a million. The chronic HI is 0.027 and the acute HI is 0.14. The maximum $PM_{2.5}$ concentration from construction would occur in 2018 and is 0.039 $\mu g/m^3$. Health risks and hazards from project-only sources are all below the BAAQMD 2011 CEQA significance thresholds

6. LOCALIZED CO IMPACTS FROM MOTOR VEHICLE TRAFFIC

According to the BAAQMD's screening criteria for CO (BAAQMD 2012a), projects are considered less than significant if:

1. The project is consistent with an applicable congestion management program established by the county's congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.
2. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
3. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

Peak hourly traffic volumes for roadways within 1,000 feet of the Proposed Project were provided by Union City and are shown in **Appendix H**. The traffic volume on these roads is much less than 24,000 vehicles per hour. Thus, the Proposed Project will not increase traffic volumes at any intersection to over 44,000 or 24,000 vehicles per hour. Therefore, the Proposed Project is less than significant for CO.

7. RESULTS FROM CUMULATIVE ANALYSIS

7.1 Cumulative Risks and Hazards

The cumulative analysis is conducted at the MEISR identified for the Proposed Project construction. Results at the MEISR are compared to the BAAQMD 2011 CEQA significance thresholds for cumulative impacts:

- An excess lifetime cancer risk level of more than 100 in one million;
- A chronic non-cancer HI greater than 10; and
- An incremental increase in the annual average $PM_{2.5}$ of greater than 0.8 µg/m^3.

The incremental cancer risk, chronic HI, and $PM_{2.5}$ MEISR for the Proposed Project construction was identified as a residential location within 1,000 feet of the Proposed Project; therefore, emissions from all identified sources within 1,000 feet of the Proposed Project were evaluated at this single location and added to the results from the Proposed Project's single source evaluation. The impacts from the Proposed Project construction are summarized in **Section 5.2.1**. As previously discussed, the off-site sources within the 1,000 feet of the Proposed Project include major roadways and the Turk Island LFG flare.

7.1.1 Off-site Risks, Hazards, and $PM_{2.5}$ Concentrations

Table 16 shows the off-site resident MEISR cancer risks, chronic HI, and $PM_{2.5}$ concentrations. The total cumulative cancer risk is 14 in a million, the chronic HI is 0.027, and the total cumulative $PM_{2.5}$ concentration is 0.11 µg/m^3.

8. UNCERTAINTIES

The following sections summarize the critical uncertainties associated with the emissions estimation, air dispersion modeling, and risk estimation components of the risk assessment.

Estimation of Emissions: There are uncertainties associated with the estimation of emissions from construction equipment, LFG, and traffic. Where Project-specific data are not available, CalEEMod® default assumptions were used. These assumptions result in a conservative estimate of overall construction emissions.

Estimation of Exposure Concentrations: In addition to uncertainty associated with emission estimates, there is also uncertainty associated with the estimated exposure concentrations. The limitations of the air dispersion model provide a source of uncertainty in the estimation of exposure concentrations. According to USEPA, errors of ±10 percent to 40 percent are typical for the highest estimated concentrations due to the limitation of the algorithms implemented in AERMOD (USEPA 2005). Ramboll Environ's methodologies consistently produce conservative results; thus predicted exposure concentrations are likely to be at or above actual exposure concentrations.

Source Representation: The source parameters used to model emission sources add uncertainty. For all emission sources, Ramboll Environ used source parameters that are either recommended as defaults or expected to produce more conservative (i.e., overestimation of) results. Discrepancies might exist between the actual emissions characteristics of a source and its representation in the model; exposure concentrations used in this assessment represent approximate exposure concentrations.

Exposure Assumptions: Numerous assumptions must be made in order to estimate human exposure to chemicals. These assumptions include parameters such as breathing rates, exposure time and frequency, exposure duration, and human activity patterns. While a mean value derived from scientifically defensible studies is the best estimate of central tendency, many of the exposure variables used in this HRA under the 2015 OEHHA guidelines are high-end estimates. For example, although OEHHA 2015 guidance recommends assuming a period of time spent out of the home each day, this analysis conservatively makes the same 24-hour daily exposure assumption as under OEHHA 2003 guidance. Additionally, it is assumed that residential receptors are exposed 260 days per year to Project construction emissions for the entire construction duration. These are highly conservative assumptions since most residents do not remain in their homes all day, every day, for these periods of time. The combination of several high-end estimates used as exposure parameters may substantially overestimate chemical intake. The excess lifetime cancer risks calculated in this assessment are therefore likely to be overestimated.

Toxicity Assessment: Standard CPFs established by Cal/EPA were used to estimate potential carcinogenic and non-cancer health effects from exposures to DPM emitted from the Proposed Project site. This value is derived by applying conservative assumptions and are intended to protect the most sensitive individuals in the potentially exposed populations.

To derive the toxicity values, Cal/EPA makes several assumptions that tend to overestimate the actual hazard or risk to human health. CPFs used to estimate carcinogenic risk are also typically derived based on data from animal studies. These data are based on studies in which high doses of a test chemical were administered to laboratory animals, and the reported response is extrapolated to the much lower doses typical of human exposure. Very

little experimental data are available on the nature of the dose-response relationship at low doses, such as whether a threshold exists or if the dose-response curve passes through the origin. Because of this uncertainty, a conservative model is used to estimate the low-dose relationship, and uses an upper bound estimate (the 95 upper confidence limit of the slope predicted by the extrapolation model) as the CPF. With this factor, an upper-bound estimate of potential cancer risks is obtained.

The Cal/EPA CPF for DPM is used to estimate cancer risks associated with exposure to DPM from the Proposed Project construction. However, the CPF derived by Cal/EPA for DPM is highly uncertain in both the estimation of response and dose. In the past, due to inadequate animal test data and epidemiology data on diesel exhaust, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization (WHO), had classified DPM as Probably Carcinogenic to Humans (Group 2); the USEPA had also concluded that the existing data did not provide an adequate basis for quantitative risk assessment (USEPA 2002). However, based on two recent scientific studies (Attfield 2012, Benbrahim-Tallaa 2012, Silverman 2012), IARC has re-classified DPM as Carcinogenic to Humans to Group 1 (IARC 2012), which means that the agency has determined that there is "sufficient evidence of carcinogenicity" of a substance in humans and represents the strongest weight-of-evidence rating in IARC's carcinogen classification scheme. This determination by the IARC may provide additional impetus for the USEPA to identify a quantitative dose-response relationship between exposure to DPM and cancer.

Risk Calculations: The USEPA notes that the conservative assumptions used in a risk assessment are intended to assure that the estimated risks do not underestimate the actual risks posed by a source and that the estimated risks do not necessarily represent actual risks experienced by populations at or near a site (USEPA 1989).

The estimated risks in this HRA are based primarily on a series of conservative assumptions related to predicted environmental concentrations, exposure, and chemical toxicity. The use of conservative assumptions tends to produce upper-bound estimates of risk. Although it is difficult to quantify the uncertainties associated with all the assumptions made in this risk assessment, the use of conservative assumptions is likely to result in substantial overestimates of exposure, and hence, risk. BAAQMD acknowledges this uncertainty by stating: "the methods used [to estimate risk] are conservative, meaning that the real risks from the source may be lower than the calculations, but it is unlikely that they will be higher" (BAAQMD 2016b).

9. REFERENCES

ARB. 2008. ARB Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk – Frequently Asked Questions. July. Available online: http://www.arb.ca.gov/toxics/harp/rmpolicyfaq.htm

Attfield MD, Schleiff PL, Lubin JH, Blair A, Stewart PA, Vermeulen R, Coble JB, Silverman DT. 2012. The Diesel Exhaust in Miners Study: A Nested Case-Control Study of Lung Cancer and Diesel Exhaust. J Natl Cancer Inst.

BAAQMD. 2009. Regulation 8 Organic Compounds Rule 3 Architectural Coatings. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Rules%20and%20Regs/reg%2008/rg0803_0709.ashx?la=en

BAAQMD. 2012a. California Environmental Quality Act Air Quality Guidelines. May. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en

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

BAAQMD. 2015. Roadway Screening Analysis Calculator for Alameda County. Available at: http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools

BAAQMD. 2016a. Health Risk Assessment Guidelines. Air Toxics NSR program. January. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en

BAAQMD. 2016b. Frequently Asked Questions – Toxic Air Contaminants. Available at: http://hank.baaqmd.gov/pmt/air_toxics/faq.htm

Benbrahim-Tallaa, L. et al. 2012. Carcinogenicity of Diesel-engine and Gasoline-engine Exhausts and Some Nitroarenes, Lancet Oncology. July 2012

California Air Pollution Control Officers Association (CAPCOA). 2009. Health Risk Assessment for Proposed Land Use Projects.

CAPCOA. 2016. CalEEMod User's Guide. Available at: http://www.caleemod.com

California Environmental Protection Agency (Cal/EPA), Office of Environmental Health Hazard Assessment (OEHHA). 1998. Findings of the Scientific Review Panel on The Report on Diesel Exhaust, as adopted at the Panel's April 22, 1998, meeting.

Cal/EPA. 2009. Technical Support Document for Cancer Potency Factors: Methodologies for Derivation, Listing of Available Values, and Adjustment to Allow for Early Life Stage Exposures. May. Available at: http://oehha.ca.gov/air/hot_spots/2009/TSDCancerPotency.pdf . Accessed February 2013.

Cal/EPA. 2016. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. March. http://www.arb.ca.gov/toxics/healthval/contable.pdf.

International Agency for Research on Cancer (IARC). 2012. Press Release No. 213. IARC: Diesel Engine Exhaust Carcinogenic. June. Available at: http://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf

OEHHA. 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August. Available at: http://www.oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf

OEHHA. 2015. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August. Available at: http://www.oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf

The Remediation Group, Inc. 2016. Clean Closure/Remediation Plan. 6.3 Acre/Closed Turk Island Landfill. Union City, CA.

Silverman DT, Samanic CM, Lubin JH, Blair AE, Stewart PA, Vermeulen R, Coble JB, Rothman N, Schleiff PL, Travis WD, Ziegler RG, Wacholder S, Attfield MD. 2012. The Diesel Exhaust in Miners Study: A Cohort Mortality Study with Emphasis on Lung Cancer. J Natl Cancer Inst.

TCEQ. 2015. Air Quality Modeling Guidelines. APDG 6232. April 2015. Available at: https://www.tceq.texas.gov/assets/public/permitting/air/Modeling/guidance/airquality-mod-guidelines6232.pdf

USEPA. 1989. Risk Assessment Guidance for Superfund Human Health Risk Assessment: U.S. EPA Region IX Recommendations (Interim Final). San Francisco, CA. December.

USEPA. 1998. AP-42 Chapter 2.4. Municipal Solid Waste Landfills. November. Available at: https://www3.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf

USEPA. 2002. Health Assessment Document for Diesel Engine Exhaust. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. EPA/600/8-90/057F. May. Available at: http://www.cdc.gov/niosh/nas/RDRP/appendices/chapter6/a6-110.pdf

USEPA. 2004. User's Guide for the AMS/EPA Regulatory Model - AERMOD. September. Available at: http://www.epa.gov/scram001/dispersion_prefrec.htm.

USEPA. 2005. Guideline on Air Quality Models (Revised). 40 Code of Federal Regulations, Part 51, Appendix W. Office of Air Quality Planning and Standards. November. Available at: https://www.epa.gov/ttn/scram/guidance_permit.htm#appw

USEPA. 2006. AP-42 Chapter 13.2.2. Unpaved Roads. November. Available at: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

USEPA. 2010. Conversion Factors for Hydrocarbon Emission Components. EPA-420-R-10-015. July. Available at: https://www3.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10015.pdf

USEPA. 2012. Haul Road Workgroup Final Report Submission to EPA-OAQPS. March. Available at: https://www3.epa.gov/ttn/scram/reports/Haul_Road_Workgroup-Final_Report_Package-20120302.pdf

United States Geological Survey (USGS). 2013. National Elevation Dataset. Available at: http://viewer.nationalmap.gov/viewer/.

WRAP. 2006. WRAP Fugitive Dust Handbook. September. Available at: https://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

TABLES

Table 1
Project Construction Phasing
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Phase Name	Phase Start Date	Phase End Date
Grading - Landfill Debris	1/1/2018	4/13/2018
Grading - Clean Fill	4/14/2018	6/4/2018
Building Construction	6/5/2018	4/22/2019
Architectural Coating	4/23/2019	5/20/2019
Paving	5/21/2019	6/17/2019

Notes:

[1.] The project construction schedule is based on CalEEMod® defaults, except for the grading phases, which are defined by the Clean Closure/Remediation Plan.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

References:

CalEEMod 2016.3.1. Available at: http://www.caleemod.com/

The Remediation Group, Inc. 2016. Clean Closure/Remediation Plan. 6.3 Acre/Closed Turk Island Landfill. Union City, CA.

Table 2
Emissions Calculation Methodology
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Type	Source	Methodology and Formula	Reference
Construction Equipment	Off-Road Equipment	CalEEMod® 2016.3.1	CalEEMod® 2016.3.1
Construction On-Road Mobile Sources	On-Road Vehicles	CalEEMod® 2016.3.1	CalEEMod® 2016.3.1
Fugitive Landfill Gas	Landfill	LandGEM 3.02	LandGEM 3.02
Flare	Flare	E = G * CE * MC * EF * F	USEPA AP-42 Chapter 2.4 ($PM_{2.5}$)
		TAC emissions obtained from Clean Closure/Remediation Plan - Appendix F	Remediation Group 2016 (TACs)
Landfill Debris - Haul Trucks	On-Road Vehicles	E = EF * VMT	USEPA AP-42 Chapter 13.2.2 Unpaved Roads

Notes:

1. E: Flare $PM_{2.5}$ Emissions (lb)
   G: LFG Generation Rate
   CE: Collection Efficiency (%)
   MC: Methane Content of LFG (%)
   EF: Emission Factor ($lb/10^6$ dscm methane)
   F: dry standard cubic meters (dscm) methane

2. E: Haul Trucks - Unpaved Roads - PM_{10} Emissions (lb)
   EF: fugitive emission factor (lb/mile)
   VMT: Distance Traveled (miles)

Abbreviations:

CalEEMod® - California Emissions Estimator Model
dscm - Dry Standard Cubic Meters
EF - Emission Factor
lb - Pound
LandGEM - Landfill Gas Emissions Model
LFG - Landfill Gas
TAC - Toxic Air Contaminant
USEPA - United States Environmental Protection Agency
VMT - vehicle miles traveled

References:

CalEEMod 2016.3.1. Available at: http://www.caleemod.com/

USEPA. 2006. AP-42 Chapter 13.2.2. Unpaved Roads. November. Available at: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

USEPA. 1998. AP-42 Chapter 2.4. Municipal Solid Waste Landfills. November. Available at: https://www3.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf

The Remediation Group, Inc. 2016. Clean Closure/Remediation Plan. 6.3 Acre/Closed Turk Island Landfill. Union City, CA.

Table 3
Uncontrolled Construction CAP and GHG Emissions[1]
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Total CAP and GHG Emissions						
Year	Source	Emissions[2]				
		ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$	CO_2e
		lbs/year				MT/year
Year 1- 2018	Off-road Equipment and Architectural Coatings	710	6,913	397	370	331
Year 2 -2019		1,060	2,028	122	115	118
Year 1- 2018	On-road Trucks and Vehicles	108	3,618	9.6	9.1	340
Year 2 -2019		6.4	45	0.34	0.32	9.0
Year 1- 2018[3]	Landfill	--	--	--	--	7,260
Total Emissions (lbs)		**1,884**	**12,604**	**529**	**494**	--
Total Emissions (MT)		--	--	--	--	**8,058**

Average Daily Emissions				
Total Length of Construction for the Project[4] (days)	381			
Daily Emissions Averaged Over Construction Period (lb/day)	**ROG**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
	4.9	33	1.4	1.3

Notes:

1. "Uncontrolled" emissions shown here represent emission using default CalEEMod® off-road construction equipment tiers based on the equipment type and calendar year being modeled.
2. Emissions were estimated in CalEEMod®. CalEEMod® defaults were used for construction equipment list and hours of operation for each piece of equipment; however, hauling trips for the grading phases were based on the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill.
3. The LFG capture system and flare will be temporarily shut down during grading activities. The increase in fugitive GHG emissions associated with this period were quantified. The duration of control equipment downtime was assumed to be consistent with the duration of the two grading phases in CalEEMod®. The methane generation rate for 2018 for the 47-acre landfill was obtained from the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill.
4. Construction duration is expected to be 18 months with a schedule from January 2018 through June 2019 per the CalEEMod® default, with the exception of the grading phases, were based on the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill. This averaging conservatively assumes 5 workdays per week.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CalEEMod® - California Emissions Estimator Model
CAP - criteria air pollutant
CEQA - California Environmental Quality Act
lb - pound
MT - metric tons
NO_x - nitrogen oxide compounds (NO + NO_2)
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns or less
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
ROG - reactive organic gas

References:

BAAQMD. 2011. CEQA Air Quality Guidelines. May. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_May%202011_5_3_11.ashx.

California Air Pollution Control Officers Association (CAPCOA). 2016. CalEEMod. Available at: http://www.caleemod.com.

The Remediation Group, Inc. 2016. Clean Closure/Remediation Plan. 6.3 Acre/Closed Turk Island Landfill. Union City, CA.

Table 4
Controlled Construction CAP and GHG Emissions[1]
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Total CAP and GHG Emissions						
Year	Source	Emissions[2]				
		ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$	CO_2e
		lbs/year				MT/year
Year 1- 2018	Off-road Equipment and Architectural Coatings	274	6,450	33	33	331
Year 2 -2019		944	2,334	13	13	118
Year 1- 2018	On-road Trucks and Vehicles	108	3,618	9.6	9.1	340
Year 2 -2019		6.4	45	0.34	0.32	9.0
Year 1- 2018[3]	Landfill	--	--	--	--	7,260
Total Emissions (lbs)		**1,332**	**12,446**	**56**	**56**	--
Total Emissions (MT)		--	--	--	--	**8,058**

Average Daily Emissions				
Total Length of Construction for the Project[3] (days)	381			
Daily Emissions Averaged Over Construction Period (lb/day)	**ROG**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
	3.5	33	0.15	0.15

Notes:

1. "Controlled" emissions shown here represent emissions using CalEEMod® default off-road construction equipment with Level 3 Diesel Particulate Filters (DPF).
2. Emissions were estimated in CalEEMod®. CalEEMod® defaults were used for construction equipment list and hours of operation for each piece of equipment; however, hauling trips for the grading phases were based on the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill.
3. The LFG capture system and flare will be temporarily shut down during grading activities. The increase in fugitive GHG emissions associated with this period were quantified. The duration of control equipment downtime was assumed to be consistent with the duration of the two grading phases in CalEEMod®. The methane generation rate for 2018 for the 47-acre landfill was obtained from the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill.
4. Construction duration is expected to be 18 months with a schedule from January 2018 through June 2019 per the CalEEMod® default, with the exception of the grading phases, were based on the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill. This reflects 5 workdays per week.
5. CalEEMod assumes an 85% reduction in PM when DPFs are used on off-road construction equipment.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CalEEMod® - California Emissions Estimator Model
CAP - criteria air pollutant
CEQA - California Environmental Quality Act
DPF - Diesel Particulate Filter
lb - pound
MT - metric tons
NO_x - nitrogen oxide compounds (NO + NO_2)
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns or less
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
ROG - reactive organic gas

References:

BAAQMD. 2011. CEQA Air Quality Guidelines. May. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_May%202011_5_3_11.ashx.
California Air Pollution Control Officers Association (CAPCOA). 2016. CalEEMod. Available at: http://www.caleemod.com.

Table 5
Diesel TOG Speciation Profiles[1]
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Chemical	CAS Number	Fraction of TOG	
		Off-Road Equipment[2]	On-Road Vehicles[3]
Acetaldehyde	75070	0.0735	0.15942
Benzene	71432	0.02	0.01045
1,3-Butadiene	106990	0.0019	--
Formaldehyde	50000	0.1471	0.08505
Methanol	67561	0.0003	--
Methyl ethyl ketone	78933	0.0148	0.0286
Styrene	100425	0.0006	--
Toluene	108883	0.0147	0.01518
m-Xylene	108383	0.0061	--
o-Xylene	95476	0.0034	0.00317
p-Xylene	106423	0.001	--
m&p-Xylene	106423	--	0.00889

Notes:

1. Compounds presented in this table are only those air toxic contaminants with toxicity values from Cal/EPA (2015) evaluated in the health risk assessment.
2. Diesel Off-Road Exhaust, TOG: ARB 818 / EPA Speciation Profile 3161
3. Diesel On-Road Exhaust, TOG: EPA Speciation Profile 4674

Abbreviations:

ARB - California Air Resources Board
BAAQMD - Bay Area Air Quality Management District
Cal/EPA - California Environmental Protection Agency
CAS - Chemical Abstracts Service
TOG - total organic gas
USEPA - United States Environmental Protection Agency

References:

ARB. Speciation Profiles Used in ARB Modeling. Available online at: http://www.arb.ca.gov/ei/speciate/speciate.htm#specprof
BAAQMD. 2011. Recommended Methods for Screening and Modeling Local Risks and Hazards. May.
Cal/EPA. 2015. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. May 13.
USEPA. SPECIATE 4.3. Available online at: http://cfpub.epa.gov/si/speciate/

Table 6
Speciated Diesel TOG Emissions
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Off-Road Construction Sources			
CAS #	**Pollutant**	**Annual Emissions (lbs/yr)**	**Hourly Emissions (lbs/hr)**
75070	Acetaldehyde	2.05E+01	9.82E-03
71432	Benzene	5.58E+00	2.67E-03
106990	1,3-Butadiene	5.30E-01	2.54E-04
50000	Formaldehyde	4.10E+01	1.96E-02
67561	Methanol	8.36E-02	4.01E-05
78933	Methyl ethyl ketone	4.13E+00	1.98E-03
100425	Styrene	1.67E-01	8.01E-05
108883	Toluene	4.10E+00	1.96E-03
108383	m-Xylene	1.70E+00	8.15E-04
95476	o-Xylene	9.48E-01	4.54E-04
106423	p-Xylene	2.79E-01	1.34E-04

On-Road Construction Sources			
CAS #	**Pollutant**	**Annual Emissions (lbs/yr)**	**Hourly Emissions (lbs/hr)**
75070	Acetaldehyde	1.38E-01	6.63E-05
71432	Benzene	9.08E-03	4.35E-06
50000	Formaldehyde	7.39E-02	3.54E-05
78933	Methyl ethyl ketone	2.48E-02	1.19E-05
108883	Toluene	1.32E-02	6.31E-06
95476	o-Xylene	2.75E-03	1.32E-06
106423	m-& p-Xylene	7.72E-03	3.70E-06

Off-Road Haul Trucks					
CAS #	**Pollutant**	**Northern Route Annual Emissions (lbs/yr)**	**Northern Route Hourly Emissions (lbs/hr)**	**Southern Route Annual Emissions (lbs/yr)**	**Southern Route Hourly Emissions (lbs/hr)**
75070	Acetaldehyde	1.08E+00	1.80E-03	4.53E+00	7.55E-03
71432	Benzene	7.09E-02	1.18E-04	2.97E-01	4.95E-04
50000	Formaldehyde	5.77E-01	9.62E-04	2.42E+00	4.03E-03
78933	Methyl ethyl ketone	1.94E-01	3.23E-04	8.13E-01	1.35E-03
108883	Toluene	1.03E-01	1.72E-04	4.31E-01	7.19E-04
95476	o-Xylene	2.15E-02	3.59E-05	9.01E-02	1.50E-04
106423	m-& p-Xylene	6.03E-02	1.01E-04	2.53E-01	4.21E-04

Notes:

1. Off-road diesel speciated emissions based on EPA Speciation Profile 4674 (see Table 5) and TOG estimates from CalEEMod® outputs.
2. On-road diesel speciated emissions based on EPA Speciation Profile 3161 (see Table 5) and TOG estimates from CalEEMod® outputs.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CAS - Chemical Abstracts Service
EPA - Environmental Protection Agency
hr - hour
lbs - pounds
TOG - total organic gas
yr - year

References:

ARB. Speciation Profiles Used in ARB Modeling. Available online at: http://www.arb.ca.gov/ei/speciate/speciate.htm#specprof
BAAQMD. 2011. Recommended Methods for Screening and Modeling Local Risks and Hazards. May.
Cal/EPA. 2015. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. May 13.
USEPA. SPECIATE 4.3. Available online at: http://cfpub.epa.gov/si/speciate/

Table 7
Fugitive Emissions from On-Site Hauling: Unpaved Roads
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Estimated Operational Constants								
Average Truck Weight (tons)	Truck Trips per Day	Truck Trips Per Year	Hours per Day of Operation	Northern Haul Route Length (miles)	Southern Haul Route Length (miles)	Northern Percentage Of Total VMT [2]	Southern Percentage Of Total VMT [2]	Watering Control Efficiency (%)
11.1	200	15,000	8	0.45	0.20	19%	81%	84%

Emission Calculations						
Source	PM_{10} Emission Rate[1] (lb/VMT)	VMT per day	VMT per year	PM_{10} Emissions (lb/hour)	PM_{10} Emissions (lb/day)	PM_{10} Emissions (lb/yr)
North Haul Route	0.25	8.7	654	0.27	2.1	160
South Haul Route	0.25	36	2,736	1.1	9.0	672

Notes:

1. Emission rate of PM_{10} per VMT based on AP-42 Equation 13.2.2 (Unpaved Roads): $E=k(s/12)^a(W/3)^b$. A silt content of 6.4% was used based on average municipal solid waste landfill data as provided in AP-42, Section 13.2.2.
2. Of the estimated 175,000 cubic yards of soil to be displaced, approximately 17,000 cubic yards will go to the northern portion of the 43 acre landfill and 158,000 cubic yards will go to the southern portion. Distances for the haul truck trips for each pathway were calculated, and the percentage of total VMT for the North and South routes was apportioned according to how much of the fill will go to each area on an annual basis.

Abbreviations:

hr - hour
lb - pound
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
VMT - vehicle miles traveled
yr - year

References:

USEPA. 2006. AP-42 Chapter 13.2.2. Unpaved Roads. November. Available at: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

Table 8
Speciated Fugitive Emissions: Unpaved Roads
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Speciated Fugitive Hourly Emissions[1,2]			
CAS #	**Pollutant**	**Northern Route Emissions (lbs/hr)**	**Southern Route Emissions (lbs/hr)**
101804	4,4'-Diaminodiphenyl ether	2.67E-09	1.12E-08
7440382	Arsenic	1.66E-06	6.94E-06
7440393	Barium	7.22E-05	3.02E-04
50328	Benzo[a]pyrene	4.28E-07	1.79E-06
205992	Benzo[b]fluoranthene	5.35E-07	2.24E-06
191242	Benzo[g,h,i]perylene	3.21E-07	1.34E-06
207089	Benzo[k]fluoranthene	2.67E-07	1.12E-06
56553	Benz[a]anthracene	2.11E-07	8.85E-07
7440417	Beryllium	9.90E-08	4.14E-07
117817	Di(2-ethylhexyl) phthalate	1.42E-07	5.94E-07
7440439	Cadmium	7.76E-07	3.25E-06
7440473	Chromium	1.69E-05	7.06E-05
218019	Chrysene	3.48E-07	1.46E-06
7440484	Cobalt	2.94E-06	1.23E-05
7440508	Copper	1.26E-05	5.26E-05
60571	Dieldrin	1.74E-08	7.28E-08
206440	Fluoranthene	1.66E-07	6.94E-07
193395	Indeno[1,2,3-cd]pyrene	2.94E-07	1.23E-06
7439921	Lead	1.71E-05	7.17E-05
7439976	Mercury	6.15E-08	2.58E-07
7440020	Nickel	2.41E-05	1.01E-04
129000	Pyrene	1.74E-07	7.28E-07
7782492	Selenium	1.55E-07	6.50E-07
7440280	Thallium	3.48E-07	1.46E-06
7440622	Vanadium	9.90E-06	4.14E-05
7440666	Zinc	3.74E-05	1.57E-04

Table 8
Speciated Fugitive Emissions: Unpaved Roads
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Speciated Fugitive Annual Emissions[1,3]			
CAS #	**Pollutant**	**Northern Route Emissions (lbs/yr)**	**Southern Route Emissions (lbs/yr)**
101804	4,4'-Diaminodiphenyl ether	1.60E-06	6.72E-06
7440382	Arsenic	9.95E-04	4.17E-03
7440393	Barium	4.33E-02	1.81E-01
50328	Benzo[a]pyrene	2.57E-04	1.08E-03
205992	Benzo[b]fluoranthene	3.21E-04	1.34E-03
191242	Benzo[g,h,i]perylene	1.93E-04	8.06E-04
207089	Benzo[k]fluoranthene	1.60E-04	6.72E-04
56553	Benz[a]anthracene	1.27E-04	5.31E-04
7440417	Beryllium	5.94E-05	2.49E-04
117817	Di(2-ethylhexyl) phthalate	8.51E-05	3.56E-04
7440439	Cadmium	4.65E-04	1.95E-03
7440473	Chromium	1.01E-02	4.23E-02
218019	Chrysene	2.09E-04	8.74E-04
7440484	Cobalt	1.77E-03	7.39E-03
7440508	Copper	7.54E-03	3.16E-02
60571	Dieldrin	1.04E-05	4.37E-05
206440	Fluoranthene	9.95E-05	4.17E-04
193395	Indeno[1,2,3-cd]pyrene	1.77E-04	7.39E-04
7439921	Lead	1.03E-02	4.30E-02
7439976	Mercury	3.69E-05	1.55E-04
7440020	Nickel	1.44E-02	6.05E-02
129000	Pyrene	1.04E-04	4.37E-04
7782492	Selenium	9.31E-05	3.90E-04
7440280	Thallium	2.09E-04	8.74E-04
7440622	Vanadium	5.94E-03	2.49E-02
7440666	Zinc	2.25E-02	9.41E-02

Notes:

1. Fugitive PM_{10} emissions from Table 7 were speciated based on soil sampling data for the 6.3-acre Turk Island Landfill from November 2000.
2. For use in evaluating acute HI.
3. For use in evaluating cancer risk and chronic HI.

Abbreviations:

CAS - Chemical Abstracts Service
hr - hour
lbs - pounds
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
TAC - toxic air contaminant
yr - year

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Table 9
Speciated Fugitive Emissions: Off-road Equipment
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

CAS #	Pollutant	Speciated Fugitive Hourly Emissions[1,2] (lbs/hr)
101804	4,4'-Diaminodiphenyl ether	5.50E-10
7440382	Arsenic	3.41E-07
7440393	Barium	1.49E-05
50328	Benzo[a]pyrene	8.81E-08
205992	Benzo[b]fluoranthene	1.10E-07
191242	Benzo[g,h,i]perylene	6.61E-08
207089	Benzo[k]fluoranthene	5.50E-08
56553	Benz[a]anthracene	4.35E-08
7440417	Beryllium	2.04E-08
117817	Di(2-ethylhexyl) phthalate	2.92E-08
7440439	Cadmium	1.60E-07
7440473	Chromium	3.47E-06
218019	Chrysene	7.16E-08
7440484	Cobalt	6.06E-07
7440508	Copper	2.59E-06
60571	Dieldrin	3.58E-09
206440	Fluoranthene	3.41E-08
193395	Indeno[1,2,3-cd]pyrene	6.06E-08
7439921	Lead	3.52E-06
7439976	Mercury	1.27E-08
7440020	Nickel	4.95E-06
129000	Pyrene	3.58E-08
7782492	Selenium	3.19E-08
7440280	Thallium	7.16E-08
7440622	Vanadium	2.04E-06
7440666	Zinc	7.71E-06

CAS #	Pollutant	Speciated Fugitive Annual Emissions[1,3] (lbs/yr)
101804	4,4'-Diaminodiphenyl ether	1.15E-06
7440382	Arsenic	7.13E-04
7440393	Barium	3.10E-02
50328	Benzo[a]pyrene	1.84E-04
205992	Benzo[b]fluoranthene	2.30E-04
191242	Benzo[g,h,i]perylene	1.38E-04
207089	Benzo[k]fluoranthene	1.15E-04
56553	Benz[a]anthracene	9.08E-05
7440417	Beryllium	4.25E-05
117817	Di(2-ethylhexyl) phthalate	6.09E-05
7440439	Cadmium	3.33E-04
7440473	Chromium	7.24E-03
218019	Chrysene	1.49E-04
7440484	Cobalt	1.26E-03
7440508	Copper	5.40E-03
60571	Dieldrin	7.47E-06
206440	Fluoranthene	7.13E-05
193395	Indeno[1,2,3-cd]pyrene	1.26E-04
7439921	Lead	7.36E-03
7439976	Mercury	2.64E-05
7440020	Nickel	1.03E-02
129000	Pyrene	7.47E-05
7782492	Selenium	6.67E-05
7440280	Thallium	1.49E-04
7440622	Vanadium	4.25E-03
7440666	Zinc	1.61E-02

Table 9
Speciated Fugitive Emissions: Off-road Equipment
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Notes:

1. Fugitive PM_{10} emissions from off-road equipment, as calculated by CalEEMod, were speciated based on soil sampling data for the 6.3-acre Turk Island Landfill from November 2000. Refer to Appendix A for CalEEMod output.
2. For use in evaluating acute HI.
3. For use in evaluating cancer risk and chronic HI.

Abbreviations:

CAS - Chemical Abstracts Service
hr - hour
lbs - pounds
PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
TAC - toxic air contaminant
yr - year

Table 10
Speciated Fugitive Emissions: Landfill Gas
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

CAS #	Pollutant	Molecular Weight (g/gmol)	Concentration[1] (ppmv)	Volume of TAC[2,3] (m^3/yr)	Annual Emissions[3] (lbs/yr)	Hourly Emissions[3] (lbs/hr)
71556	1,1,1-Trichloroethane	133.41	0.001	7.03E-05	8.46E-04	9.66E-08
79345	Tetrachloroethane	167.85	0.001	7.03E-05	1.06E-03	1.22E-07
75343	1,1-DiChloroethane	98.97	0.001	7.03E-05	6.28E-04	7.17E-08
540590	1,2-Dichloroethylene	96.94	0.002	1.41E-04	1.23E-03	1.40E-07
107062	Ethylene Dichloride	98.96	0.001	7.03E-05	6.28E-04	7.16E-08
78875	1,2-Dichloropropane	112.99	0.001	7.03E-05	7.17E-04	8.18E-08
67630	Isopropyl Alcohol	60.11	14.44	1.02E+00	5.50E+00	6.28E-04
67641	Acetone	58.08	0.36	2.53E-02	1.33E-01	1.51E-05
107131	Acrylonitrile	53.06	0.01	7.03E-04	3.37E-03	3.84E-07
71432	Benzene	78.11	0.196	1.38E-02	9.71E-02	1.11E-05
75274	Bromodichloromethane	163.83	0.5769	4.06E-02	5.99E-01	6.84E-05
75150	Carbon Disulfide	76.13	0.01	7.03E-04	4.83E-03	5.51E-07
56235	Carbon Tetrachloride	153.84	0.002	1.41E-04	1.95E-03	2.23E-07
463581	Carbonyl Sulfide	60.07	0.086	6.05E-03	3.28E-02	3.74E-06
108907	Chlorobenzene	112.56	0.003	2.11E-04	2.14E-03	2.44E-07
75456	Chlorodifluoromethane	86.47	1.3	9.14E-02	7.13E-01	8.14E-05
75003	Ethyl Chloride	64.52	0.00005	3.52E-06	2.05E-05	2.34E-09
67663	Chloroform	119.39	0.002	1.41E-04	1.51E-03	1.73E-07
74873	Methyl Chloride	50.49	0.00005	3.52E-06	1.60E-05	1.83E-09
106467	p-Dichlorobenzene	147	0.063	4.43E-03	5.87E-02	6.70E-06
75718	Dichlorodifluoromethane	120.91	0.004	2.81E-04	3.07E-03	3.50E-07
75434	Dichlorofluoromethane	102.92	2.62	1.84E-01	1.71E+00	1.95E-04
75092	Methylene Chloride	84.94	0.002	1.41E-04	1.08E-03	1.23E-07
100414	Ethyl Benzene	106.16	0.623	4.38E-02	4.19E-01	4.79E-05
106934	Ethylene Dibromide	187.88	0.06824	4.80E-03	8.13E-02	9.28E-06
75694	Trichlorofluoromethane	137.38	0.002	1.41E-04	1.74E-03	1.99E-07
110543	Hexane	86.18	0.281	1.98E-02	1.54E-01	1.75E-05
7783064	Hydrogen Sulfide	34.08	0.25	1.76E-02	5.40E-02	6.17E-06
7439976	Mercury	200.61	0.000292	2.05E-05	3.72E-04	4.24E-08
78933	Methyl Ethyl Ketone (MEK)	72.11	0.00005	3.52E-06	2.29E-05	2.61E-09
108101	Methyl Isobutyl Ketone	100.16	0.00005	3.52E-06	3.18E-05	3.63E-09
91203	Naphthalene	128.1705	0.307	2.16E-02	2.50E-01	2.85E-05
127184	Perchloroethylene	165.83	0.012	8.44E-04	1.26E-02	1.44E-06
100425	Styrene	104.15	0.002	1.41E-04	1.32E-03	1.51E-07
108883	Toluene	92.14	0.131	9.21E-03	7.66E-02	8.74E-06
79016	Trichloroethylene	131.4	0.002	1.41E-04	1.67E-03	1.90E-07
25551137	Trimethylbenzenes	120.19	0.032	2.25E-03	2.44E-02	2.78E-06
75014	Vinyl Chloride	62.5	0.033	2.32E-03	1.31E-02	1.49E-06
1330207	Xylenes	106.16	2.119	1.49E-01	1.43E+00	1.63E-04

Notes:

1. Concentrations obtained from the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill.
2. Calculations based on methane output from LandGEM for 2017 (35,169.22 m^3/yr) for the 6.3-acre landfill.
3. Volume of gas and emission calculations based on AP-42, Section 2.4, Equations 3 and 4. Assumed methane content of LFG is 50%, per LandGEM.

Abbreviations:

CAS - Chemical Abstracts Service
g - gram
gmol - gram-mole
hr - hour
lbs - pounds
m^3 - cubic meters
ppmv - parts per million by volume
TAC - toxic air contaminant
yr - year

References:

The Remediation Group, Inc. 2016. Clean Closure/Remediation Plan. 6.3 Acre/Closed Turk Island Landfill. Union City, CA.
USEPA. 1998. AP-42 Chapter 2.4. Municipal Solid Waste Landfills. November. Available at: https://www3.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf

Table 11
Modeling Parameters
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Source	Source Type[1]	Number of Sources	Release Height[1] (m)	Velocity (m/s)	Temperature (K)	Initial Vertical Dimension[1] (m)	Initial Lateral Dimension[2] (m)	Stack Diameter[3] (m)
Construction Equipment	Area	1	5	--	--	1.40	--	--
On-site Haul Trucks	Volume	116	2.55	--	--	2.37	4.19	--
Fugitive LFG	Area	1	0	--	--	1.40	--	--
LFG Flare	Point	1	27.1	20	1,273	--	--	0.68

Notes:

1. Source parameters were modeled consistent with BAAQMD recommendations and other recent projects in Alamada County.
2. The width of the volume sources is consistent with the Haul Road Work Group Final Report (USEPA 2012). The vehicle width is assumed to be 3 meters with an additional 6 meters added (3 meters to both sides) to account for the mechanical turbulence from moving vehicles. According to the USEPA AERMOD User's Guide, initial lateral dimension of adjacent volume sources is the length of the side divided by 2.15.
3. The flare's effective stack diameter was calculated based on the methodology in TCEQ's Air Quality Modeling Guidelines (TCEQ 2015). Release height, velocity, and temperature were obtained from Appendix F of the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CRRP - Community Risk Reduction Plan
HRA - Health Risk Assessment
LFG - Landfill Gas
m - meter
m^2 - square meters
USEPA - United States Environmental Protection Agency
TCEQ - Texas Commission on Environmental Quality

References:

BAAQMD. 2012. *The San Francisco Community Risk Reduction Plan: Technical Support Documentation, V9.*

TCEQ. 2015. Air Quality Modeling Guidelines. APDG 6232. April 2015. Available at: https://www.tceq.texas.gov/assets/public/permitting/air/Modeling/guidance/airquality-mod-guidelines6232.pdf

USEPA. 2004. User's Guide for the AMS/EPA Regulatory Model - AERMOD. September.
Available online at: http://www.epa.gov/scram001/dispersion_prefrec.htm.

USEPA. 2012. Haul Road Workgroup Final Report Submission to EPA-OAQPS. March.
Available online at: https://www3.epa.gov/ttn/scram/reports/Haul_Road_Workgroup-Final_Report_Package-20120302.pdf

Table 12
Turk Island LFG Flare Modeled Emission Rates
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

CAS #	Pollutant	Emission Rate From Clean Closure Remediation Plan[1] (g/s)	Annual Emission Rate[2] (lbs/yr)	Hourly Emission Rate[2] (lbs/hr)
71556	1,1,1-Trichloroethane	2.97E-06	2.06E-01	2.36E-05
67630	Isopropyl Alcohol	1.43E-05	9.94E-01	1.13E-04
71432	Benzene	1.86E-06	1.29E-01	1.48E-05
67663	Chloroform	5.99E-08	4.16E-03	4.75E-07
106467	p-Dichlorobenzene	1.02E-06	7.09E-02	8.10E-06
75092	Methylene Chloride	2.49E-05	1.73E+00	1.98E-04
100414	Ethyl Benzene	8.29E-06	5.76E-01	6.58E-05
106934	Ethylene Dibromide	1.41E-06	9.80E-02	1.12E-05
75718	Dichlorodifluoromethane	5.77E-08	4.01E-03	4.58E-07
110543	Hexane	1.77E-05	1.23E+00	1.40E-04
7647010	Hydrogen Chloride	4.10E-03	2.85E+02	3.25E-02
7439976	Mercury	9.67E-10	6.72E-05	7.67E-09
91203	Naphthalene	6.48E-07	4.51E-02	5.14E-06
127184	Perchloroethylene	4.30E-05	2.99E+00	3.41E-04
108883	Toluene	8.87E-06	6.17E-01	7.04E-05
79016	Trichloroethylene	1.29E-05	8.97E-01	1.02E-04
25551137	Trimethylbenzenes	6.37E-08	4.43E-03	5.06E-07
75014	Vinyl Chloride	1.51E-05	1.05E+00	1.20E-04
1330207	Xylenes	5.91E-06	4.11E-01	4.69E-05
--	$PM_{2.5}$[3]	-	1.16E+03	1.32E-01

Notes:

1. Emissions Rates obtained from the Clean Closure/Remediation Plan for the 6.3-acre Turk Island Landfill.
2. Flare assumed to operate continuously (24 hours/day, 365 days/year).
3. $PM_{2.5}$ estimated using the emission factor for particulate matter from AP-42 Chapter 2.4, Table 2.4-5. It is conservatively assumed that all PM is $PM_{2.5}$. Volume of landfill gas obtained from data in Appendix F of the Clean Closure/Remediation Plan: 305 scfm landfill gas, 50% of landfill gas is methane, and 85% of landfill gas is directed to the flare.

Abbreviations:

CAS - Chemical Abstracts Service
cfm - cubic feet per minute
g - gram
hr - hour
lbs - pounds
s - second
TAC - toxic air contaminant
yr - year

References:

The Remediation Group, Inc. 2016. Clean Closure/Remediation Plan. 6.3 Acre/Closed Turk Island Landfill. Union City, CA.
USEPA. 1998. AP-42 Chapter 2.4. Municipal Solid Waste Landfills. November. Available at: https://www3.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf

Table 13
Toxicity Values
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Chemical[1]	CAS Number	Cancer Potency Factor (CPF)[2] [mg/kg-day]$^{-1}$	Chronic Reference Exposure Level (REL)[2] (µg/m^3)	Acute Reference Exposure Level (REL)[2] (µg/m^3)	Source(s) of Chemical			
					Exhaust	Flare	Fugitive Dust	LFG
1,1,1-Trichloroethane	71556	--	--	68000		X		X
1,1-DiChloroethane	75343	0.0057	--	--				X
1,3-Butadiene	106990	--[3]	--[3]	660	X			
Acetaldehyde	75070	--[3]	--[3]	470	X			
Acrylonitrile	107131	1	--	--				X
Arsenic	7440382	12	0.0000035	0.2			X	
Benz[a]anthracene	56553	0.39	--	--			X	
Benzene	71432	0.1	--	27	X	X		X
Benzo[a]pyrene	50328	3.9	--	--			X	
Benzo[b]fluoranthene	205992	0.39	--	--			X	
Benzo[k]fluoranthene	207089	0.39	--	--			X	
Beryllium	7440417	8.4	0.002	--			X	
Cadmium	7440439	15	0.0005	--			X	
Carbon Disulfide	75150	--	--	6200				X
Carbon Tetrachloride	56235	0.15	--	1900				X
Chloroform	67663	0.019	--	150		X		X
Chrysene	218019	0.039	--	--			X	
Copper	7440508	--	--	100			X	
Di(2-ethylhexyl) phthalate	117817	0.0084	--	--			X	
DPM	9901	1.1	--	--	X			
Ethyl Benzene	100414	0.0087	--	--		X		X
Ethylene Dibromide	106934	0.25	--	--		X		X
Ethylene Dichloride	107062	0.072	--	--				X
Formaldehyde	50000	--[3]	--[3]	55	X			
Hydrogen Chloride	7647010	--	--	2100		X		
Hydrogen Sulfide	7783064	--	--	42				X
Indeno[1,2,3-cd]pyrene	193395	0.39	--	--			X	
Isopropyl Alcohol	67630	--	--	3200		X		X
Lead	7439921	0.042	--	--			X	
Mercury	7439976	--	0.00016	0.6		X	X	X
Methanol	67561	--[3]	--[3]	28000	X			
Methyl Ethyl Ketone (MEK)	78933	--	--	13000	X			X
Methylene Chloride	75092	0.0035	--	14000		X		X
m-Xylene	108383	--[3]	--[3]	22000	X			
Naphthalene	91203	0.12	--	--		X		X
Nickel	7440020	0.91	0.011	0.2			X	

Table 13

Toxicity Values

Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Chemical[1]	CAS Number	Cancer Potency Factor (CPF)[2] [mg/kg-day]$^{-1}$	Chronic Reference Exposure Level (REL)[2] (µg/m^3)	Acute Reference Exposure Level (REL)[2] (µg/m^3)	Source(s) of Chemical			
					Exhaust	Flare	Fugitive Dust	LFG
o-Xylene	95476	--[3]	--[3]	22000	X			
p-Dichlorobenzene	106467	0.04	--	--		X		X
Perchloroethylene	127184	0.021	--	20000		X		X
p-Xylene	106423	--[3]	--[3]	22000	X			
Selenium	7782492	--	0.005	--			X	
Styrene	100425	--	--	21000	X			X
Tetrachloroethane	79345	0.2	--	--				X
Toluene	108883	--	--	37000	X	X		X
Trichloroethylene	79016	0.007	--	--		X		X
Vanadium	7440622	--	--	30			X	
Vinyl Chloride	75014	0.27	--	180000		X		X
Xylenes	1330207	--	--	22000		X		X

Notes:

1. Values presented in this table reflect values used in this analysis. Only constituents which have a cancer potency factor, chronic reference level, or acute reference level are shown.
2. The cancer potency factors, chronic reference levels, and acute reference levels were obtained from Cal/EPA 2016.
3. This chemical may have a cancer potency factor and/or chronic reference level; however, it is not presented here because the chemical is included in the analysis as part of diesel particulate matter. Cancer risk and chronic hazard index are calculated using the cancer potency factor and chronic reference level from DPM instead of the individual chemicals in the speciation profile for diesel emissions. The DPM surrogate approach is utilized as recommended by Cal/EPA (2016).

Abbreviations:

Cal/EPA: California Environmental Protection Agency
CPF: cancer potency factor
DPM: diesel particulate matter
kg: kilogram
m^3: cubic meter
mg: milligram
REL: reference exposure level
µg: microgram
USEPA: United States Environmental Protection Agency

References:

Cal/EPA. 2016. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. March. Available at: http://www.arb.ca.gov/toxics/healthval/contable.pdf Accessed June 2016.

Table 14
Project Excess Lifetime Cancer Risk, Chronic HI, Acute HI, and $PM_{2.5}$ Concentration at Off-site MEISR with Mitigation[1]
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Source Category	UTM Northing (m)	UTM Easting (m)	Lifetime Excess Cancer Risk (in a million)	Acute HI [2]	Chronic HI	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Construction	581,125	4,159,175	-	-	-	0.039
	581,100	4,159,150	9.1	-	0.027	-
	580,900	4,159,300	-	0.14	-	-
		Threshold	**10**	**1**	**1**	**0.3**
		Above Threshold?	**No**	**No**	**No**	**No**

Notes:

1. Off-site Project MEISR was identified as the off-site sensitive receptor location with the maximum excess lifetime cancer risk, Acute HI, chronic HI, and $PM_{2.5}$ concentration attributed to the emissions associated with the Project off-road construction equipment, fugitive dust, fugitive LFG emissions, and traffic.

2. The acute HI reflects the risks to the maximally affected system/organ.

Abbreviations:

HI - Hazard Index
LFG - Landfill Gas
m - meter
m^3 - cubic meter
µg - microgram
MEISR - Maximally Exposed Individual Sensitive Receptor
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
UTM - Universal Transverse Mercator

Table 15
Roadway Screening Analysis: Excess Lifetime Cancer Risk and $PM_{2.5}$ Concentration at Off-Site MEISR
Using Roadway Screening Analysis Calculator
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

Road Segment	Distance from Roadway to Cancer MEISR[1] (ft)	Distance from Roadway to $PM_{2.5}$ MEISR[1] (ft)	Reported Average Daily Traffic[2] (vehicles/day)	Roadway Direction[3]	Direction to Resident from Roadway[3]	Cancer Risk Scaling Factor[4]	BAAQMD Screening Impacts[5]	
							Lifetime Excess Cancer Risk (in a million)	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Union City Blvd between Dyer St. and Delores Dr.	371	282	15,508	North-South	West	1.37	3.1	0.039
Dyer St. between Union City Blvd and Alvarado Blvd	748	643	9,484	North-South	West		1.9	0.024
Total							**5.0**	**0.062**

Notes:

1. For a screening assessment, the table provides health impacts to residential areas within 1,000 ft of the Project. Distances presented represent the minimum distance from the cancer and $PM_{2.5}$ MEISRs to the road segment.
2. Average daily traffic volumes (ADT) for roads within 1,000 feet of the project boundary were based on 2010-2013 data for major roadways in Union City as provided by the City of Union City.
3. The BAAQMD Roadway Screening Analysis Calculator (BAAQMD 2015) assumes roadways run N-S and E-W. The Dyer Street road segment runs SW-NE rather than N-S or E-W and the MEISR is located to the SW. Based on roadway orientation and to provide a conservative estimate of impacts, impacts for this road segment were evaluated for N-S road direction with resident to the west and E-W road direction with resident to the south. The roadway and resident direction with the highest impacts are presented in this table.
4. BAAQMD screening tool calculated impacts are based on previous OEHHA guidance. Per BAAQMD recommendations, cancer risks were conservatively scaled by a factor of 1.37 to account for the updated exposure parameters and calculation methodologies in OEHHA 2015 guidance.
5. Screening estimates of health impacts were estimated with the BAAQMD Roadway Screening Analysis Calculator (BAAQMD 2015) for Alameda County. The cancer risk scaling factor was applied to the BAAQMD screening impacts for lifetime excess cancer risk.

Abbreviations:

ADT - Average Daily Traffic
E-W - east-west
ft - feet
m^3 - cubic meter
MEISR - Maximally Exposed Individual Sensitive Receptor
µg - microgram
OEHHA - Office of Environmental Health Hazard Assessment
N-S - north-south
NW-SE - northwest-southeast
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
SW-NE - southwest-northeast

References:

BAAQMD. 2015. Roadway Screening Analysis Calculator. April. Available online at : http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/screeningcalculator_4_16_15-xlsx.xlsx?la=en

Cal/EPA. 2015. Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program. Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 16
Cumulative Excess Lifetime Cancer Risk, Chronic HI, and $PM_{2.5}$ Concentration at Off-site MEISR[1]
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

UTM Easting (m)	UTM Northing (m)	Source Category	Lifetime Excess Cancer Risk (in a million)	Chronic HI	$PM_{2.5}$ Concentration ($\mu g/m^3$)
581,100	4,159,150	Project Construction	9.1	0.027	--
		LFG Flare	5.3E-04	2.0E-04	--
		Roadway Screening[3,4]	5.0	--	--
581,125	4,159,175	Project Construction	--	--	0.039
		LFG Flare	--	--	0.0092
		Roadway Screening[3,4]	--	--	0.062
Cumulative Total			**14**	**0.027**	**0.11**
BAAQMD Significance Threshold			**100**	**10**	**0.80**
Above Threshold?			**No**	**No**	**No**

Notes:

1. Off-site Project MEISR was identified as the off-site sensitive receptor location with the maximum excess lifetime cancer risk, chronic HI, and $PM_{2.5}$ concentration attributed to the emissions associated with Project construction.
2. Screening estimates of health impacts were estimated with the BAAQMD Roadway Screening Analysis Calculator (BAAQMD 2015) for Alameda
3. BAAQMD screening tool calculated impacts are based on previous OEHHA guidance. Per BAAQMD recommendations, cancer risks were conservatively scaled by a factor of 1.37 to account for the updated exposure parameters and calculation methodologies in OEHHA 2015 guidance.
4. The LFG flare is the only stationary source within 1,000 feet based on data provided by BAAQMD.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
HI - Hazard Index
LFG - Landfill Gas
m - meter
m^3 - cubic meter
µg - microgram
OEHHA - Office of Environmental Health Hazard Assessment
MEISR - Maximally Exposed Individual Sensitive Receptor
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
UTM - Universal Transverse Mercator

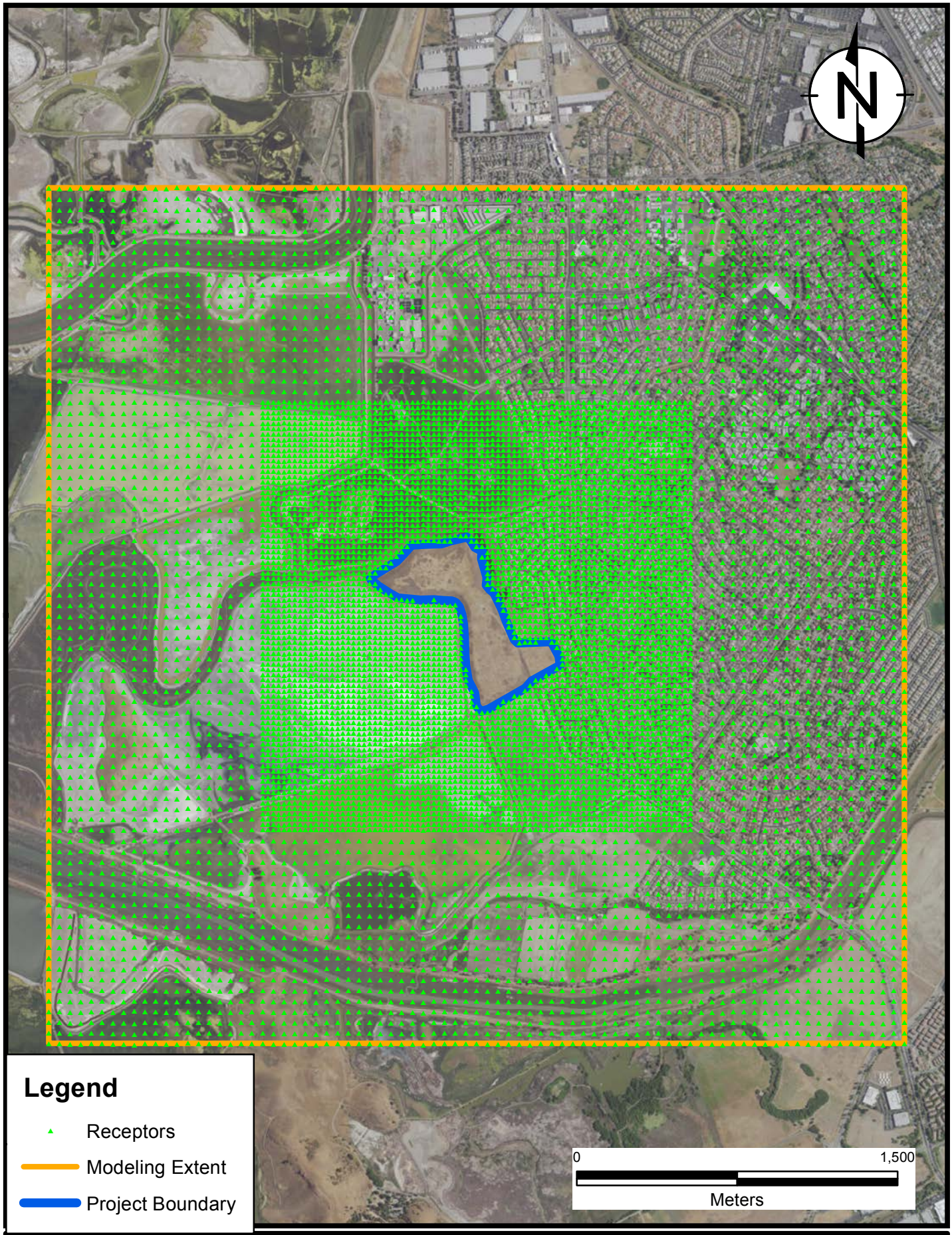
References:

BAAQMD. 2015. Roadway Screening Analysis Calculator. April. Available online at : http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/screeningcalculator_4_16_15-xlsx.xlsx?la=en

BAAQMD. 2012. Stationary Source Screening Analysis Tool. May. Available online at: http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools

Cal/EPA, 2015. Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program. Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

FIGURES



RAMBOLL ENVIRON

Project Boundary and Modeling Extent
Turk Island Landfill Consolidation and Residentail Subdivision Project
Union City, California

FIGURE
1

DRAFTED BY: SCW | DATE: 3/31/2017 | Project: 03-41225A

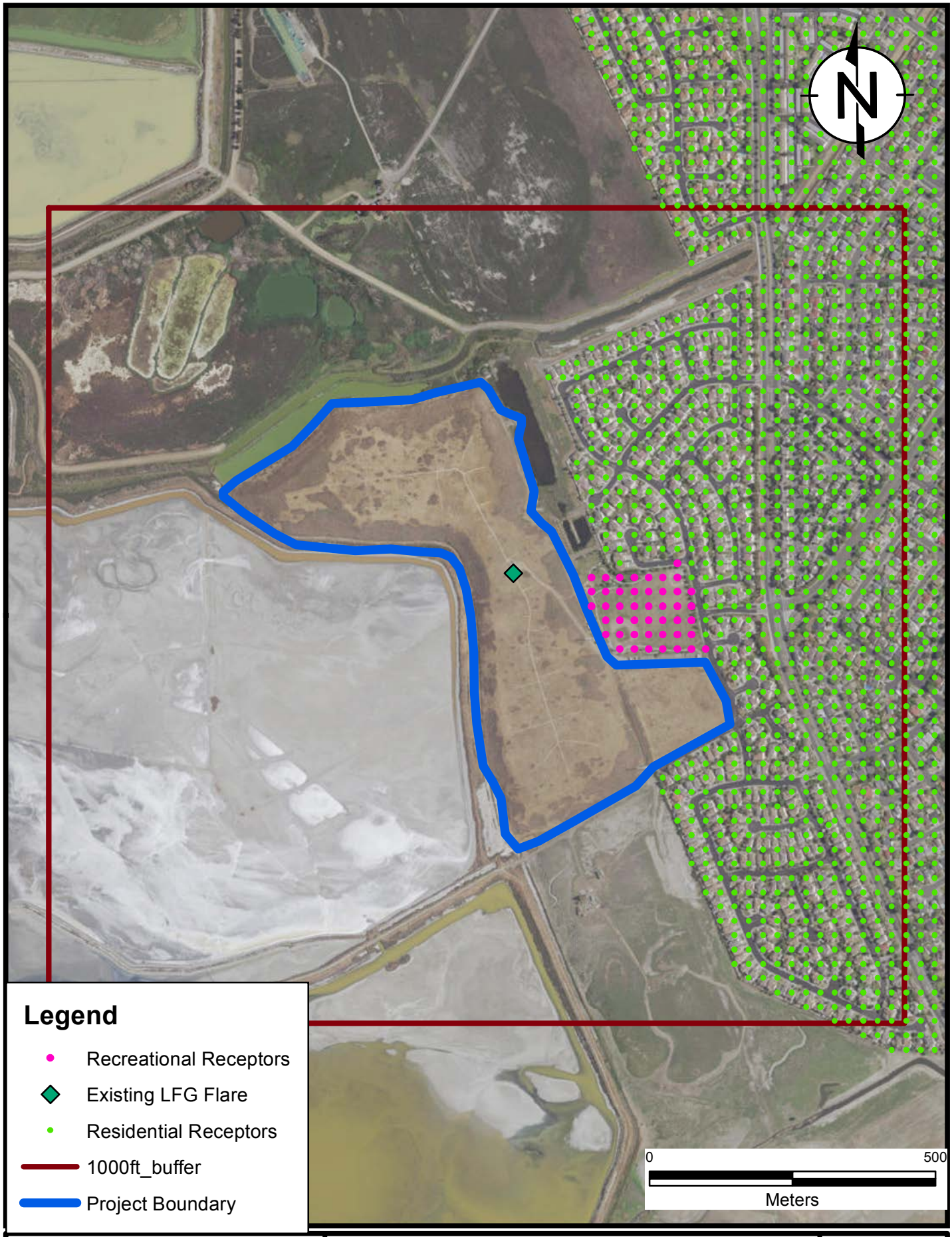


RAMBOLL ENVIRON

Modeled Construction Sources
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

FIGURE
2

DRAFTED BY: SCW | DATE: 3/31/2017 | Project: 03-41225A



RAMBOLL ENVIRON

Sensitive Receptors
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

FIGURE
3

DRAFTED BY: SCW | DATE: 4/21/2017 | Project: 03-41225A



RAMBOLL ENVIRON

Maximally Exposed Individual Sensitive Receptors (MEISRs)
Turk Island Landfill Consolidation and Residential Subdivision Project
Union City, California

FIGURE
4

DRAFTED BY: SCW | DATE: 4/21/2017 | Project: 03-41225A

APPENDIX A
CALEEMOD® OUTPUT FILES

Turk Island Landfill Consolidation

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	33.00	Dwelling Unit	6.30	59,400.00	94

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	434.91	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Turk Island Landfill Consolidation - Alameda County, Annual

Project Characteristics - Actual most recent PGE Intensity Factor

Land Use - Lot acreage from project description - 33 single family homes

Construction Phase - Grading separated into two phases - clean fill being imported and landfill debris being removed. Length of phases from RAP

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Equipment pulled from Previous CalEEMod Run

Off-road Equipment -

Off-road Equipment -

Trips and VMT - Landfill debris transported to Turk Island Landfill - Trip Length reflects maximum trip length onsite

Grading - Graded acres based on site size

Energy Use - Reduction of Title 24 Intensity from 2013 Default Standards
Single Family Home 11.7% for Electricity, 21.1% for Natural Gas
Multifamily - 15.1% for Electricity, 30.7% for Natural Gas

Construction Off-road Equipment Mitigation - Tier 2 and DPM Filter Level 3

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

Turk Island Landfill Consolidation - Alameda County, Annual

tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	NumDays	20.00	36.00

tblGrading	AcresOfGrading	37.50	10.00
tblGrading	AcresOfGrading	18.00	10.00
tblGrading	MaterialExported	0.00	175,000.00
tblGrading	MaterialImported	0.00	80,000.00
tblLandUse	LotAcreage	10.71	6.30
tblProjectCharacteristics	CO2IntensityFactor	641.35	434.91
tblProjectCharacteristics	OperationalYear	2018	2020
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripNumber	21,875.00	15,000.00
tblTripsAndVMT	HaulingTripNumber	10,000.00	5,800.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.4088	5.2654	2.5689	7.2000e-003	0.4274	0.2034	0.6307	0.2057	0.1895	0.3952	0.0000	667.8059	667.8059	0.1216	0.0000	670.8463
2019	0.5330	1.0363	0.8751	1.4300e-003	6.1900e-003	0.0613	0.0675	1.6700e-003	0.0575	0.0592	0.0000	126.0465	126.0465	0.0300	0.0000	126.7965
Maximum	**0.5330**	**5.2654**	**2.5689**	**7.2000e-003**	**0.4274**	**0.2034**	**0.6307**	**0.2057**	**0.1895**	**0.3952**	**0.0000**	**667.8059**	**667.8059**	**0.1216**	**0.0000**	**670.8463**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.1910	5.0338	2.7248	7.2000e-003	0.4274	0.0214	0.4487	0.2057	0.0212	0.2269	0.0000	667.8055	667.8055	0.1216	0.0000	670.8459
2019	0.4750	1.1892	0.9297	1.4300e-003	6.1900e-003	6.7300e-003	0.0129	1.6700e-003	6.7200e-003	8.3900e-003	0.0000	126.0464	126.0464	0.0300	0.0000	126.7964
Maximum	**0.4750**	**5.0338**	**2.7248**	**7.2000e-003**	**0.4274**	**0.0214**	**0.4487**	**0.2057**	**0.0212**	**0.2269**	**0.0000**	**667.8055**	**667.8055**	**0.1216**	**0.0000**	**670.8459**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**29.28**	**1.25**	**-6.11**	**0.00**	**0.00**	**89.38**	**33.88**	**0.00**	**88.71**	**48.23**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2018	3-31-2018	1.7783	1.5804
2	4-1-2018	6-30-2018	2.1175	1.9613
3	7-1-2018	9-30-2018	0.8776	0.8305
4	10-1-2018	12-31-2018	0.8782	0.8311
5	1-1-2019	3-31-2019	0.7733	0.8117
6	4-1-2019	6-30-2019	0.7962	0.8527
		Highest	2.1175	1.9613

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4758	7.1100e-003	0.5287	6.0000e-004		0.0421	0.0421		0.0421	0.0421	4.1947	1.4302	5.6248	8.3200e-003	2.4000e-004	5.9042
Energy	9.4100e-003	0.0804	0.0342	5.1000e-004		6.5000e-003	6.5000e-003		6.5000e-003	6.5000e-003	0.0000	148.6883	148.6883	5.4900e-003	2.4700e-003	149.5627
Mobile	0.0984	0.6335	1.0806	3.6500e-003	0.2693	4.4200e-003	0.2737	0.0724	4.1700e-003	0.0766	0.0000	336.0165	336.0165	0.0154	0.0000	336.4016
Waste						0.0000	0.0000		0.0000	0.0000	8.0141	0.0000	8.0141	0.4736	0.0000	19.8546
Water						0.0000	0.0000		0.0000	0.0000	0.6821	3.2310	3.9131	0.0703	1.7000e-003	6.1763
Total	**0.5836**	**0.7211**	**1.6435**	**4.7600e-003**	**0.2693**	**0.0531**	**0.3224**	**0.0724**	**0.0528**	**0.1252**	**12.8909**	**489.3659**	**502.2568**	**0.5731**	**4.4100e-003**	**517.8993**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4758	7.1100e-003	0.5287	6.0000e-004		0.0421	0.0421		0.0421	0.0421	4.1947	1.4302	5.6248	8.3200e-003	2.4000e-004	5.9042
Energy	9.4100e-003	0.0804	0.0342	5.1000e-004		6.5000e-003	6.5000e-003		6.5000e-003	6.5000e-003	0.0000	148.6883	148.6883	5.4900e-003	2.4700e-003	149.5627
Mobile	0.0984	0.6335	1.0806	3.6500e-003	0.2693	4.4200e-003	0.2737	0.0724	4.1700e-003	0.0766	0.0000	336.0165	336.0165	0.0154	0.0000	336.4016
Waste						0.0000	0.0000		0.0000	0.0000	8.0141	0.0000	8.0141	0.4736	0.0000	19.8546
Water						0.0000	0.0000		0.0000	0.0000	0.6821	3.2310	3.9131	0.0703	1.7000e-003	6.1763
Total	**0.5836**	**0.7211**	**1.6435**	**4.7600e-003**	**0.2693**	**0.0531**	**0.3224**	**0.0724**	**0.0528**	**0.1252**	**12.8909**	**489.3659**	**502.2568**	**0.5731**	**4.4100e-003**	**517.8993**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading - Landfill Debris	Grading	1/1/2018	4/13/2018	5	75	
2	Grading - Clean Fill	Grading	4/14/2018	6/4/2018	5	36	
3	Building Construction	Building Construction	6/5/2018	4/22/2019	5	230	
4	Paving	Paving	4/23/2019	5/20/2019	5	20	
5	Architectural Coating	Architectural Coating	5/21/2019	6/17/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 120,285; Residential Outdoor: 40,095; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Turk Island Landfill Consolidation - Alameda County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	1	8.00	158	0.38
Demolition	Graders	1	8.00	187	0.41
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading - Landfill Debris	Excavators	1	8.00	158	0.38
Grading - Landfill Debris	Graders	1	8.00	187	0.41
Grading - Landfill Debris	Rubber Tired Dozers	1	8.00	247	0.40
Grading - Landfill Debris	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading - Clean Fill	Excavators	1	8.00	158	0.38
Grading - Clean Fill	Graders	1	8.00	187	0.41
Grading - Clean Fill	Rubber Tired Dozers	1	8.00	247	0.40
Grading - Clean Fill	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading - Landfill Debris	6	15.00	0.00	15,000.00	10.80	7.30	0.50	LD_Mix	HDT_Mix	HHDT
Grading - Clean Fill	6	15.00	0.00	5,800.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	12.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

3.2 Grading - Landfill Debris - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2410	0.0000	0.2410	0.1262	0.0000	0.1262	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1040	1.1502	0.6216	1.1100e-003		0.0582	0.0582		0.0535	0.0535	0.0000	101.6508	101.6508	0.0317	0.0000	102.4419
Total	**0.1040**	**1.1502**	**0.6216**	**1.1100e-003**	**0.2410**	**0.0582**	**0.2992**	**0.1262**	**0.0535**	**0.1797**	**0.0000**	**101.6508**	**101.6508**	**0.0317**	**0.0000**	**102.4419**

3.2 Grading - Landfill Debris - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0176	0.8148	0.1072	9.5000e-004	3.3300e-003	8.2000e-004	4.1500e-003	9.3000e-004	7.8000e-004	1.7100e-003	0.0000	91.3983	91.3983	0.0182	0.0000	91.8539
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3600e-003	1.8500e-003	0.0185	5.0000e-005	4.4500e-003	3.0000e-005	4.4800e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	4.2027	4.2027	1.3000e-004	0.0000	4.2060
Total	**0.0199**	**0.8167**	**0.1257**	**1.0000e-003**	**7.7800e-003**	**8.5000e-004**	**8.6300e-003**	**2.1100e-003**	**8.1000e-004**	**2.9200e-003**	**0.0000**	**95.6010**	**95.6010**	**0.0184**	**0.0000**	**96.0599**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2410	0.0000	0.2410	0.1262	0.0000	0.1262	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0379	0.9855	0.7122	1.1100e-003		4.3500e-003	4.3500e-003		4.3500e-003	4.3500e-003	0.0000	101.6507	101.6507	0.0317	0.0000	102.4418
Total	**0.0379**	**0.9855**	**0.7122**	**1.1100e-003**	**0.2410**	**4.3500e-003**	**0.2454**	**0.1262**	**4.3500e-003**	**0.1306**	**0.0000**	**101.6507**	**101.6507**	**0.0317**	**0.0000**	**102.4418**

3.2 Grading - Landfill Debris - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0176	0.8148	0.1072	9.5000e-004	3.3300e-003	8.2000e-004	4.1500e-003	9.3000e-004	7.8000e-004	1.7100e-003	0.0000	91.3983	91.3983	0.0182	0.0000	91.8539
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3600e-003	1.8500e-003	0.0185	5.0000e-005	4.4500e-003	3.0000e-005	4.4800e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	4.2027	4.2027	1.3000e-004	0.0000	4.2060
Total	**0.0199**	**0.8167**	**0.1257**	**1.0000e-003**	**7.7800e-003**	**8.5000e-004**	**8.6300e-003**	**2.1100e-003**	**8.1000e-004**	**2.9200e-003**	**0.0000**	**95.6010**	**95.6010**	**0.0184**	**0.0000**	**96.0599**

3.3 Grading - Clean Fill - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1182	0.0000	0.1182	0.0608	0.0000	0.0608	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0499	0.5521	0.2984	5.3000e-004		0.0279	0.0279		0.0257	0.0257	0.0000	48.7924	48.7924	0.0152	0.0000	49.1721
Total	**0.0499**	**0.5521**	**0.2984**	**5.3000e-004**	**0.1182**	**0.0279**	**0.1461**	**0.0608**	**0.0257**	**0.0865**	**0.0000**	**48.7924**	**48.7924**	**0.0152**	**0.0000**	**49.1721**

3.3 Grading - Clean Fill - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0276	0.9478	0.1570	2.3500e-003	0.0491	3.5800e-003	0.0527	0.0135	3.4200e-003	0.0169	0.0000	226.6488	226.6488	0.0120	0.0000	226.9475
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1300e-003	8.9000e-004	8.8700e-003	2.0000e-005	2.1300e-003	2.0000e-005	2.1500e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	2.0173	2.0173	6.0000e-005	0.0000	2.0189
Total	**0.0287**	**0.9487**	**0.1658**	**2.3700e-003**	**0.0512**	**3.6000e-003**	**0.0548**	**0.0141**	**3.4300e-003**	**0.0175**	**0.0000**	**228.6661**	**228.6661**	**0.0120**	**0.0000**	**228.9664**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1182	0.0000	0.1182	0.0608	0.0000	0.0608	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0182	0.4730	0.3418	5.3000e-004		2.0900e-003	2.0900e-003		2.0900e-003	2.0900e-003	0.0000	48.7923	48.7923	0.0152	0.0000	49.1721
Total	**0.0182**	**0.4730**	**0.3418**	**5.3000e-004**	**0.1182**	**2.0900e-003**	**0.1203**	**0.0608**	**2.0900e-003**	**0.0629**	**0.0000**	**48.7923**	**48.7923**	**0.0152**	**0.0000**	**49.1721**

3.3 Grading - Clean Fill - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0276	0.9478	0.1570	2.3500e-003	0.0491	3.5800e-003	0.0527	0.0135	3.4200e-003	0.0169	0.0000	226.6488	226.6488	0.0120	0.0000	226.9475
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1300e-003	8.9000e-004	8.8700e-003	2.0000e-005	2.1300e-003	2.0000e-005	2.1500e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	2.0173	2.0173	6.0000e-005	0.0000	2.0189
Total	**0.0287**	**0.9487**	**0.1658**	**2.3700e-003**	**0.0512**	**3.6000e-003**	**0.0548**	**0.0141**	**3.4300e-003**	**0.0175**	**0.0000**	**228.6661**	**228.6661**	**0.0120**	**0.0000**	**228.9664**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2010	1.7543	1.3185	2.0200e-003		0.1125	0.1125		0.1057	0.1057	0.0000	178.3254	178.3254	0.0437	0.0000	179.4177
Total	**0.2010**	**1.7543**	**1.3185**	**2.0200e-003**		**0.1125**	**0.1125**		**0.1057**	**0.1057**	**0.0000**	**178.3254**	**178.3254**	**0.0437**	**0.0000**	**179.4177**

3.4 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4900e-003	0.0404	9.2400e-003	8.0000e-005	1.9700e-003	2.9000e-004	2.2600e-003	5.7000e-004	2.8000e-004	8.5000e-004	0.0000	8.0460	8.0460	5.1000e-004	0.0000	8.0589
Worker	3.7700e-003	2.9600e-003	0.0296	7.0000e-005	7.1200e-003	5.0000e-005	7.1700e-003	1.8900e-003	5.0000e-005	1.9400e-003	0.0000	6.7242	6.7242	2.1000e-004	0.0000	6.7295
Total	**5.2600e-003**	**0.0434**	**0.0388**	**1.5000e-004**	**9.0900e-003**	**3.4000e-004**	**9.4300e-003**	**2.4600e-003**	**3.3000e-004**	**2.7900e-003**	**0.0000**	**14.7703**	**14.7703**	**7.2000e-004**	**0.0000**	**14.7884**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0811	1.7666	1.3405	2.0200e-003		0.0102	0.0102		0.0102	0.0102	0.0000	178.3252	178.3252	0.0437	0.0000	179.4175
Total	**0.0811**	**1.7666**	**1.3405**	**2.0200e-003**		**0.0102**	**0.0102**		**0.0102**	**0.0102**	**0.0000**	**178.3252**	**178.3252**	**0.0437**	**0.0000**	**179.4175**

3.4 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4900e-003	0.0404	9.2400e-003	8.0000e-005	1.9700e-003	2.9000e-004	2.2600e-003	5.7000e-004	2.8000e-004	8.5000e-004	0.0000	8.0460	8.0460	5.1000e-004	0.0000	8.0589
Worker	3.7700e-003	2.9600e-003	0.0296	7.0000e-005	7.1200e-003	5.0000e-005	7.1700e-003	1.8900e-003	5.0000e-005	1.9400e-003	0.0000	6.7242	6.7242	2.1000e-004	0.0000	6.7295
Total	**5.2600e-003**	**0.0434**	**0.0388**	**1.5000e-004**	**9.0900e-003**	**3.4000e-004**	**9.4300e-003**	**2.4600e-003**	**3.3000e-004**	**2.7900e-003**	**0.0000**	**14.7703**	**14.7703**	**7.2000e-004**	**0.0000**	**14.7884**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0945	0.8432	0.6866	1.0800e-003		0.0516	0.0516		0.0485	0.0485	0.0000	94.0417	94.0417	0.0229	0.0000	94.6144
Total	**0.0945**	**0.8432**	**0.6866**	**1.0800e-003**		**0.0516**	**0.0516**		**0.0485**	**0.0485**	**0.0000**	**94.0417**	**94.0417**	**0.0229**	**0.0000**	**94.6144**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0205	4.5300e-003	4.0000e-005	1.0500e-003	1.3000e-004	1.1800e-003	3.0000e-004	1.3000e-004	4.3000e-004	0.0000	4.2620	4.2620	2.6000e-004	0.0000	4.2686
Worker	1.8200e-003	1.3900e-003	0.0140	4.0000e-005	3.8000e-003	3.0000e-005	3.8200e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.4814	3.4814	1.0000e-004	0.0000	3.4839
Total	**2.5400e-003**	**0.0219**	**0.0185**	**8.0000e-005**	**4.8500e-003**	**1.6000e-004**	**5.0000e-003**	**1.3100e-003**	**1.5000e-004**	**1.4600e-003**	**0.0000**	**7.7434**	**7.7434**	**3.6000e-004**	**0.0000**	**7.7524**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0432	0.9422	0.7150	1.0800e-003		5.4200e-003	5.4200e-003		5.4200e-003	5.4200e-003	0.0000	94.0416	94.0416	0.0229	0.0000	94.6143
Total	**0.0432**	**0.9422**	**0.7150**	**1.0800e-003**		**5.4200e-003**	**5.4200e-003**		**5.4200e-003**	**5.4200e-003**	**0.0000**	**94.0416**	**94.0416**	**0.0229**	**0.0000**	**94.6143**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.2000e-004	0.0205	4.5300e-003	4.0000e-005	1.0500e-003	1.3000e-004	1.1800e-003	3.0000e-004	1.3000e-004	4.3000e-004	0.0000	4.2620	4.2620	2.6000e-004	0.0000	4.2686
Worker	1.8200e-003	1.3900e-003	0.0140	4.0000e-005	3.8000e-003	3.0000e-005	3.8200e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.4814	3.4814	1.0000e-004	0.0000	3.4839
Total	**2.5400e-003**	**0.0219**	**0.0185**	**8.0000e-005**	**4.8500e-003**	**1.6000e-004**	**5.0000e-003**	**1.3100e-003**	**1.5000e-004**	**1.4600e-003**	**0.0000**	**7.7434**	**7.7434**	**3.6000e-004**	**0.0000**	**7.7524**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0145	0.1524	0.1467	2.3000e-004		8.2500e-003	8.2500e-003		7.5900e-003	7.5900e-003	0.0000	20.4752	20.4752	6.4800e-003	0.0000	20.6371
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0145**	**0.1524**	**0.1467**	**2.3000e-004**		**8.2500e-003**	**8.2500e-003**		**7.5900e-003**	**7.5900e-003**	**0.0000**	**20.4752**	**20.4752**	**6.4800e-003**	**0.0000**	**20.6371**

3.5 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7000e-004	4.3000e-004	4.3700e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0879	1.0879	3.0000e-005	0.0000	1.0887
Total	**5.7000e-004**	**4.3000e-004**	**4.3700e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0879**	**1.0879**	**3.0000e-005**	**0.0000**	**1.0887**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3100e-003	0.2012	0.1730	2.3000e-004		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	20.4752	20.4752	6.4800e-003	0.0000	20.6371
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.3100e-003**	**0.2012**	**0.1730**	**2.3000e-004**		**1.0000e-003**	**1.0000e-003**		**1.0000e-003**	**1.0000e-003**	**0.0000**	**20.4752**	**20.4752**	**6.4800e-003**	**0.0000**	**20.6371**

3.5 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7000e-004	4.3000e-004	4.3700e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0879	1.0879	3.0000e-005	0.0000	1.0887
Total	**5.7000e-004**	**4.3000e-004**	**4.3700e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0879**	**1.0879**	**3.0000e-005**	**0.0000**	**1.0887**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4181					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.6600e-003	0.0184	0.0184	3.0000e-005		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	2.5533	2.5533	2.2000e-004	0.0000	2.5587
Total	**0.4208**	**0.0184**	**0.0184**	**3.0000e-005**		**1.2900e-003**	**1.2900e-003**		**1.2900e-003**	**1.2900e-003**	**0.0000**	**2.5533**	**2.5533**	**2.2000e-004**	**0.0000**	**2.5587**

3.6 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	6.0000e-005	5.8000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1451	0.1451	0.0000	0.0000	0.1452
Total	**8.0000e-005**	**6.0000e-005**	**5.8000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1451**	**0.1451**	**0.0000**	**0.0000**	**0.1452**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4181					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1400e-003	0.0235	0.0183	3.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	2.5533	2.5533	2.2000e-004	0.0000	2.5586
Total	**0.4193**	**0.0235**	**0.0183**	**3.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**2.2000e-004**	**0.0000**	**2.5586**

3.6 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	6.0000e-005	5.8000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1451	0.1451	0.0000	0.0000	0.1452
Total	**8.0000e-005**	**6.0000e-005**	**5.8000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1451**	**0.1451**	**0.0000**	**0.0000**	**0.1452**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0984	0.6335	1.0806	3.6500e-003	0.2693	4.4200e-003	0.2737	0.0724	4.1700e-003	0.0766	0.0000	336.0165	336.0165	0.0154	0.0000	336.4016
Unmitigated	0.0984	0.6335	1.0806	3.6500e-003	0.2693	4.4200e-003	0.2737	0.0724	4.1700e-003	0.0766	0.0000	336.0165	336.0165	0.0154	0.0000	336.4016

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	314.16	327.03	284.46	720,033	720,033
Total	314.16	327.03	284.46	720,033	720,033

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	55.5676	55.5676	3.7100e-003	7.7000e-004	55.8887
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	55.5676	55.5676	3.7100e-003	7.7000e-004	55.8887
NaturalGas Mitigated	9.4100e-003	0.0804	0.0342	5.1000e-004		6.5000e-003	6.5000e-003		6.5000e-003	6.5000e-003	0.0000	93.1207	93.1207	1.7800e-003	1.7100e-003	93.6740
NaturalGas Unmitigated	9.4100e-003	0.0804	0.0342	5.1000e-004		6.5000e-003	6.5000e-003		6.5000e-003	6.5000e-003	0.0000	93.1207	93.1207	1.7800e-003	1.7100e-003	93.6740

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.74502e+006	9.4100e-003	0.0804	0.0342	5.1000e-004		6.5000e-003	6.5000e-003		6.5000e-003	6.5000e-003	0.0000	93.1207	93.1207	1.7800e-003	1.7100e-003	93.6740
Total		**9.4100e-003**	**0.0804**	**0.0342**	**5.1000e-004**		**6.5000e-003**	**6.5000e-003**		**6.5000e-003**	**6.5000e-003**	**0.0000**	**93.1207**	**93.1207**	**1.7800e-003**	**1.7100e-003**	**93.6740**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.74502e+006	9.4100e-003	0.0804	0.0342	5.1000e-004		6.5000e-003	6.5000e-003		6.5000e-003	6.5000e-003	0.0000	93.1207	93.1207	1.7800e-003	1.7100e-003	93.6740
Total		**9.4100e-003**	**0.0804**	**0.0342**	**5.1000e-004**		**6.5000e-003**	**6.5000e-003**		**6.5000e-003**	**6.5000e-003**	**0.0000**	**93.1207**	**93.1207**	**1.7800e-003**	**1.7100e-003**	**93.6740**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	281680	55.5676	3.7100e-003	7.7000e-004	55.8887
Total		**55.5676**	**3.7100e-003**	**7.7000e-004**	**55.8887**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	281680	55.5676	3.7100e-003	7.7000e-004	55.8887
Total		**55.5676**	**3.7100e-003**	**7.7000e-004**	**55.8887**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4758	7.1100e-003	0.5287	6.0000e-004		0.0421	0.0421		0.0421	0.0421	4.1947	1.4302	5.6248	8.3200e-003	2.4000e-004	5.9042
Unmitigated	0.4758	7.1100e-003	0.5287	6.0000e-004		0.0421	0.0421		0.0421	0.0421	4.1947	1.4302	5.6248	8.3200e-003	2.4000e-004	5.9042

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0418					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2320					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1945	4.2600e-003	0.2828	5.8000e-004		0.0408	0.0408		0.0408	0.0408	4.1947	1.0299	5.2246	7.9300e-003	2.4000e-004	5.4942
Landscaping	7.4900e-003	2.8400e-003	0.2458	1.0000e-005		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003	0.0000	0.4003	0.4003	3.9000e-004	0.0000	0.4100
Total	**0.4758**	**7.1000e-003**	**0.5287**	**5.9000e-004**		**0.0421**	**0.0421**		**0.0421**	**0.0421**	**4.1947**	**1.4302**	**5.6248**	**8.3200e-003**	**2.4000e-004**	**5.9042**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0418					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2320					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1945	4.2600e-003	0.2828	5.8000e-004		0.0408	0.0408		0.0408	0.0408	4.1947	1.0299	5.2246	7.9300e-003	2.4000e-004	5.4942
Landscaping	7.4900e-003	2.8400e-003	0.2458	1.0000e-005		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003	0.0000	0.4003	0.4003	3.9000e-004	0.0000	0.4100
Total	**0.4758**	**7.1000e-003**	**0.5287**	**5.9000e-004**		**0.0421**	**0.0421**		**0.0421**	**0.0421**	**4.1947**	**1.4302**	**5.6248**	**8.3200e-003**	**2.4000e-004**	**5.9042**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.9131	0.0703	1.7000e-003	6.1763
Unmitigated	3.9131	0.0703	1.7000e-003	6.1763

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	2.15008 / 1.35549	3.9131	0.0703	1.7000e-003	6.1763
Total		**3.9131**	**0.0703**	**1.7000e-003**	**6.1763**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	2.15008 / 1.35549	3.9131	0.0703	1.7000e-003	6.1763
Total		**3.9131**	**0.0703**	**1.7000e-003**	**6.1763**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	8.0141	0.4736	0.0000	19.8546
Unmitigated	8.0141	0.4736	0.0000	19.8546

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	39.48	8.0141	0.4736	0.0000	19.8546
Total		**8.0141**	**0.4736**	**0.0000**	**19.8546**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	39.48	8.0141	0.4736	0.0000	19.8546
Total		**8.0141**	**0.4736**	**0.0000**	**19.8546**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B
SOIL SAMPLING DATA

TABLE 1 - SUMMARY OF COVER SOIL ANALYSES
6.3 Acre Landfill, Union City, California
(concentrations in parts per million) [2]

	ANALYTES	SAMPLE IDENTIFICATION			
		TP-8@1.5	TP-9@2.5	Composite TP- 7, 8, & 10 depth 1 - 1.5'	Composite TP- 6 & 9 depth = 2.5'
Volatile Organic Compounds (EPA 8260)	1,2,4- Trimethylbenzene	ND	ND	NA	NA
	Acetone	ND	ND	NA	NA
	Benzene	ND	ND	NA	NA
	Chlorobenzene	ND	ND	NA	NA
	Ethylbenzene	ND	ND	NA	NA
	Isopropylbenzene	ND	ND	NA	NA
	Naphthalene	ND	ND	NA	NA
	n-Butylbenzene	ND	ND	NA	NA
	para-Isopropyl Toluene	ND	ND	NA	NA
	Propylbenzene	ND	ND	NA	NA
	sec-Butylbenzene	ND	ND	NA	NA
		TP-8@1.5	**TP-9@2.5**	**TP- 7, 8, & 10**	**TP- 6 & 9**
PCBs/ Pesticides (EPA 8080)	Dieldrin	NA	NA	0.013	0.065
	4,4- DDE	NA	NA	0.010	ND
	4,4-DDD	NA	NA	ND	ND
		TP-8@1.5	**TP-9@2.5**	**TP- 7, 8, & 10**	**TP- 6 & 9**
Semi-volatile Organic Compounds (EPA 8270)	2,4-Dimethylphenol	NA	NA	ND	ND
	bis (2-Ethylhexyl) phthalate	NA	NA	0.53	ND
	Benzo(a|) anthracene	NA	NA	0.79	ND
	Benzo (b) fluoranthene	NA	NA	2.0	ND
	Benzo (k) fluoranthene	NA	NA	1.0	ND
	Benzo (a) pyrene	NA	NA	1.6	ND
	Benzo (g,h,i) perylene	NA	NA	1.2	ND
	Chrysene	NA	NA	1.3	ND
	Di-n-butylphthalate	NA	NA	ND	ND
	Indeno (1,2,3-cd) pyrene	NA	NA	1.1	ND
	Fluoranthene	NA	NA	0.62	ND
	Naphthalene	NA	NA	ND	ND
	Pyrene	NA	NA	0.65	ND
		TP-8@1.5	**TP-9@2.5**	**TP- 7, 8, & 10**	**TP- 6 & 9**
Inorganic Coompounds (EPA 6000/7000 series)	Arsenic	NA	NA	6.2	5.7
	Barium	NA	NA	140	200
	Beryllium	NA	NA	0.33	0.37
	Cadmium	NA	NA	2.8	2.9
	Chromium (total)	NA	NA	50	63
	Chromium (hexavalent)	NA	NA	NA	NA
	Cobalt	NA	NA	9.8	11
	Copper	NA	NA	42	47
	Lead	NA	NA	64	49
	Mercury	NA	NA	0.17	0.23
	Molybdenum	NA	NA	1.6	ND
	Nickel	NA	NA	64	82
	Selenium	NA	NA	0.34	ND
	Thallium	NA	NA	1	0.72
	Vanadium	NA	NA	34	37
	Zinc	NA	NA	140	120
		TP-8@1.5	**TP-9@2.5**	**TP- 7, 8, & 10**	**TP- 6 & 9**
Miscellaneous	Total Extractable Hydrocarbons	NA	NA	25 to 200 [(5)]	NA

Notes:

1 The listed analytes were detected in at least one sample of either cover soil, water, or native soil; all other analytes associated with the specified test method were not detected above the reporting limit, except for hexavalent chromium which was listed for completeness.

2 Concentrations in parts per million (ppm) unless otherwise noted.

3 NA = Not analyzed

4 ND = None detected above reporting limit (refer to the attached certified laboratory reports for reporting limit)

5 Discrete sample analyses: TP-7@1= 200ppm, TP-8 @1.5 = 25 ppm, TP-10@1 = 160 ppm as motor oil (C24 to C36).

TABLE 2 - SUMMARY OF NATIVE SOIL ANALYSES
6.3 Acre Landfill, Union City, California
(concentrations in parts per million) [2]

	ANALYTES	SAMPLE IDENTIFICATION				
		TP-4 @ 14.5	TP-6 @18.5	TP-7@18.5	TP-8@18	TP-9@20
Volatile Organic Compounds (EPA 8260)	1,2,4- Trimethylbenzene	ND	ND	ND	ND	ND
	Acetone	ND	ND	ND	ND	20 [(3)]
	Benzene	ND	ND	ND	ND	ND
	Chlorobenzene	ND	ND	ND	ND	ND
	Ethylbenzene	ND	ND	ND	ND	ND
	Isopropylbenzene	ND	ND	ND	ND	ND
	Naphthalene	ND	ND	ND	ND	ND
	n-Butylbenzene	ND	ND	ND	ND	ND
	para-Isopropyl Toluene	ND	ND	ND	ND	ND
	Propylbenzene	ND	ND	ND	ND	ND
	sec-Butylbenzene	ND	ND	ND	ND	ND
		TP-4 @ 14.5	**TP-6 @18.5**	**TP-7@18.5**	**TP-8@18**	**TP-9@20**
PCBs/ Pesticides (EPA 8080)	Dieldrin	NA	ND	ND	ND	ND
	4,4- DDE	NA	ND	ND	ND	ND
	4,4-DDD	NA	ND	ND	ND	ND
		TP-4 @ 14.5	**TP-6 @18.5**	**TP-7@18.5**	**TP-8@18**	**TP-9@20**
Semi-Volatile Organic Compounds (EPA 8270)	2,4-Dimethylphenol	NA	ND	ND	ND	ND
	bis (2-Ethylhexyl) phthalate	NA	ND	ND	ND	ND
	Benzo(a|) anthracene	NA	ND	ND	ND	ND
	Benzo (b) fluoranthene	NA	ND	ND	ND	ND
	Benzo (k) fluoranthene	NA	ND	ND	ND	ND
	Benzo (a) pyrene	NA	ND	ND	ND	ND
	Benzo (g,h,i) perylene	NA	ND	ND	ND	ND
	Chrysene	NA	ND	ND	ND	ND
	Di-n-butylphthalate	NA	ND	ND	ND	ND
	Indeno (1,2,3-cd) pyrene	NA	ND	ND	ND	ND
	Fluoranthene	NA	ND	ND	ND	ND
	Naphthalene	NA	ND	ND	ND	ND
	Pyrene	NA	ND	ND	ND	ND
		TP-4 @ 14.5	**TP-6 @18.5**	**TP-7@18.5**	**TP-8@18**	**TP-9@20**
Inorganic Compounds (EPA 6000/7000 series)	Arsenic	NA	5.1	3.5	4.1	4.3
	Barium	NA	67	120	270	110
	Beryllium	NA	0.3	0.32	0.34	0.34
	Cadmium	NA	2.4	1.9	2.1	2.1
	Chromium (total)	NA	47	47	53	58
	Chromium (hexavalent)	NA	ND	ND	ND	ND
	Cobalt	NA	10	8.8	9.6	10
	Copper	NA	21	19	21	19
	Lead	NA	5.6	4.8	5.5	5.3
	Mercury	NA	0.095	0.043	ND	0.032
	Molybdenum	NA	ND	ND	ND	ND
	Nickel	NA	77	75	78	90
	Selenium	NA	ND	0.58	ND	0.53
	Thallium	NA	0.85	0.99	0.54	1.3
	Vanadium	NA	25	21	27	23
	Zinc	NA	40	37	38	40
		TP-4 @ 14.5	**TP-6 @18.5**	**TP-7@18.5**	**TP-8@18**	**TP-9@20**
Miscellaneous	pH (in Standard Units)	7.9	8.9	9.0	9.2	8.9
	Total Extractable Hydrocarbons	28 to 35 [(6)]	NA	NA	NA	NA

Notes:

1 The listed analytes were detected in at least one sample of either cover soil, water, or native soil; all other analytes associated with the specified test method were not detected above the reporting limit, except for hexavalent chromium which was listed for completeness.

2 Concentrations in parts per million (ppm) unless otherwise noted.

3 The presence of acetone is likely attributable to contamination introduced at the laboratory where it is commonly utilized as an equipment cleaning solvent.

4 NA = Not analyzed

5 ND = None detected above reporting limit (refer to the attached certified laboratory reports for reporting limit)

6 diesel to oil range hydrocarbons (diesel fuel pattern does not resemble standard)

APPENDIX C
LANDGEM OUTPUT FILE



Summary Report

Landfill Name or Identifier:

Date: Friday, April 21, 2017

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH4} = annual methane generation in the year of the calculation ($m^3/year$)

i = 1-year time increment

n = (year of the calculation) - (initial year of waste acceptance)

j = 0.1-year time increment

k = methane generation rate ($year^{-1}$)

L_o = potential methane generation capacity (m^3/Mg)

M_i = mass of waste accepted in the ith year (Mg)

t_{ij} = age of the jth section of waste mass M_i accepted in the ith year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**1969**	
Landfill Closure Year (with 80-year limit)	**1970**	
Actual Closure Year (without limit)	***1970***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity		*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.040**	*year $^{-1}$*
Potential Methane Generation Capacity, L_o	**100**	*m^3/Mg*
NMOC Concentration	**4,000**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	**Total landfill gas**
Gas / Pollutant #2:	**Methane**
Gas / Pollutant #3:	**Carbon dioxide**
Gas / Pollutant #4:	**NMOC**

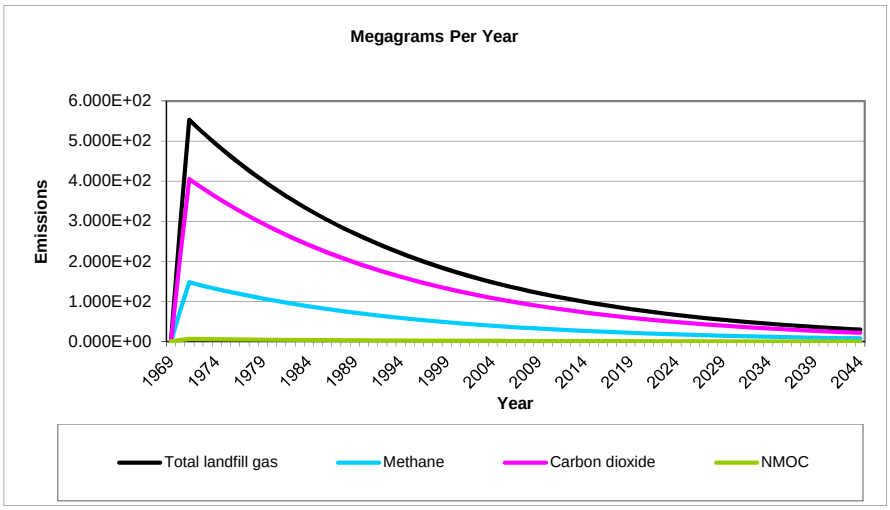
WASTE ACCEPTANCE RATES

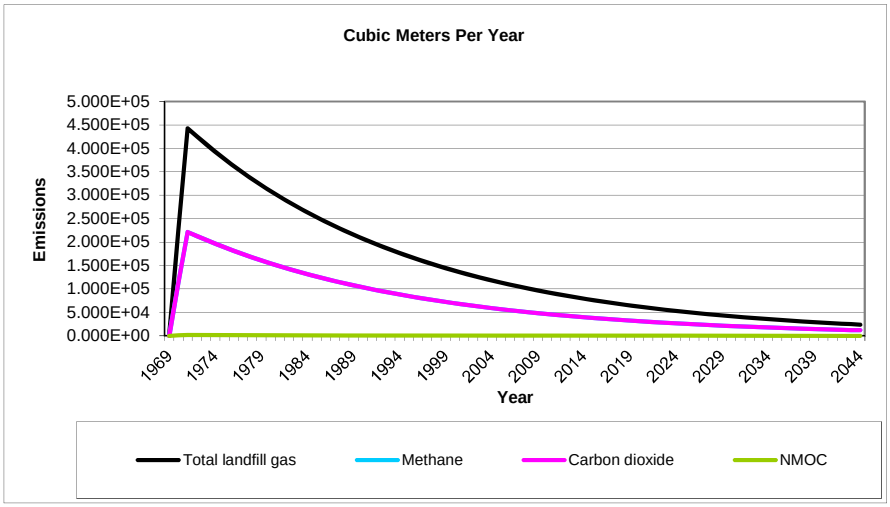
Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1969	28,745	31,620	0	0
1970	28,745	31,620	28,745	31,620
1971	0	0	57,490	63,239
1972	0	0	57,490	63,239
1973	0	0	57,490	63,239
1974	0	0	57,490	63,239
1975	0	0	57,490	63,239
1976	0	0	57,490	63,239
1977	0	0	57,490	63,239
1978	0	0	57,490	63,239
1979	0	0	57,490	63,239
1980	0	0	57,490	63,239
1981	0	0	57,490	63,239
1982	0	0	57,490	63,239
1983	0	0	57,490	63,239
1984	0	0	57,490	63,239
1985	0	0	57,490	63,239
1986	0	0	57,490	63,239
1987	0	0	57,490	63,239
1988	0	0	57,490	63,239
1989	0	0	57,490	63,239
1990	0	0	57,490	63,239
1991	0	0	57,490	63,239
1992	0	0	57,490	63,239
1993	0	0	57,490	63,239
1994	0	0	57,490	63,239
1995	0	0	57,490	63,239
1996	0	0	57,490	63,239
1997	0	0	57,490	63,239
1998	0	0	57,490	63,239
1999	0	0	57,490	63,239
2000	0	0	57,490	63,239
2001	0	0	57,490	63,239
2002	0	0	57,490	63,239
2003	0	0	57,490	63,239
2004	0	0	57,490	63,239
2005	0	0	57,490	63,239
2006	0	0	57,490	63,239
2007	0	0	57,490	63,239
2008	0	0	57,490	63,239

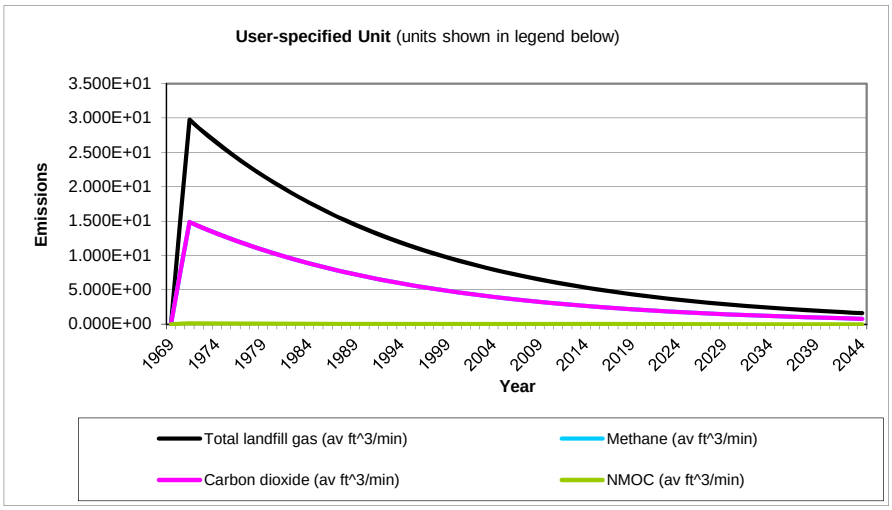
WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2009	0	0	57,490	63,239
2010	0	0	57,490	63,239
2011	0	0	57,490	63,239
2012	0	0	57,490	63,239
2013	0	0	57,490	63,239
2014	0	0	57,490	63,239
2015	0	0	57,490	63,239
2016	0	0	57,490	63,239
2017	0	0	57,490	63,239
2018	0	0	57,490	63,239
2019	0	0	57,490	63,239
2020	0	0	57,490	63,239
2021	0	0	57,490	63,239
2022	0	0	57,490	63,239
2023	0	0	57,490	63,239
2024	0	0	57,490	63,239
2025	0	0	57,490	63,239
2026	0	0	57,490	63,239
2027	0	0	57,490	63,239
2028	0	0	57,490	63,239
2029	0	0	57,490	63,239
2030	0	0	57,490	63,239
2031	0	0	57,490	63,239
2032	0	0	57,490	63,239
2033	0	0	57,490	63,239
2034	0	0	57,490	63,239
2035	0	0	57,490	63,239
2036	0	0	57,490	63,239
2037	0	0	57,490	63,239
2038	0	0	57,490	63,239
2039	0	0	57,490	63,239
2040	0	0	57,490	63,239
2041	0	0	57,490	63,239
2042	0	0	57,490	63,239
2043	0	0	57,490	63,239
2044	0	0	57,490	63,239
2045	0	0	57,490	63,239
2046	0	0	57,490	63,239
2047	0	0	57,490	63,239
2048	0	0	57,490	63,239

Graphs


Megagrams Per Year
Emissions
6.000E+02
5.000E+02
4.000E+02
3.000E+02
2.000E+02
1.000E+02
0.000E+00
1969
1974
1979
1984
1989
1994
1999
2004
2009
2014
2019
2024
2029
2034
2039
2044
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
5.000E+05
4.500E+05
4.000E+05
3.500E+05
3.000E+05
2.500E+05
2.000E+05
1.500E+05
1.000E+05
5.000E+04
0.000E+00
1969
1974
1979
1984
1989
1994
1999
2004
2009
2014
2019
2024
2029
2034
2039
2044
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
3.500E+01
3.000E+01
2.500E+01
2.000E+01
1.500E+01
1.000E+01
5.000E+00
0.000E+00
1969
1974
1979
1984
1989
1994
1999
2004
2009
2014
2019
2024
2029
2034
2039
2044
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1969	0	0	0	0	0	0
1970	2.821E+02	2.259E+05	1.518E+01	7.535E+01	1.129E+05	7.588E+00
1971	5.531E+02	4.429E+05	2.976E+01	1.477E+02	2.214E+05	1.488E+01
1972	5.314E+02	4.255E+05	2.859E+01	1.419E+02	2.128E+05	1.430E+01
1973	5.106E+02	4.088E+05	2.747E+01	1.364E+02	2.044E+05	1.373E+01
1974	4.905E+02	3.928E+05	2.639E+01	1.310E+02	1.964E+05	1.320E+01
1975	4.713E+02	3.774E+05	2.536E+01	1.259E+02	1.887E+05	1.268E+01
1976	4.528E+02	3.626E+05	2.436E+01	1.210E+02	1.813E+05	1.218E+01
1977	4.351E+02	3.484E+05	2.341E+01	1.162E+02	1.742E+05	1.170E+01
1978	4.180E+02	3.347E+05	2.249E+01	1.117E+02	1.674E+05	1.125E+01
1979	4.016E+02	3.216E+05	2.161E+01	1.073E+02	1.608E+05	1.080E+01
1980	3.859E+02	3.090E+05	2.076E+01	1.031E+02	1.545E+05	1.038E+01
1981	3.707E+02	2.969E+05	1.995E+01	9.903E+01	1.484E+05	9.974E+00
1982	3.562E+02	2.852E+05	1.917E+01	9.515E+01	1.426E+05	9.583E+00
1983	3.422E+02	2.741E+05	1.841E+01	9.142E+01	1.370E+05	9.207E+00
1984	3.288E+02	2.633E+05	1.769E+01	8.783E+01	1.317E+05	8.846E+00
1985	3.159E+02	2.530E+05	1.700E+01	8.439E+01	1.265E+05	8.499E+00
1986	3.035E+02	2.431E+05	1.633E+01	8.108E+01	1.215E+05	8.166E+00
1987	2.916E+02	2.335E+05	1.569E+01	7.790E+01	1.168E+05	7.845E+00
1988	2.802E+02	2.244E+05	1.508E+01	7.485E+01	1.122E+05	7.538E+00
1989	2.692E+02	2.156E+05	1.448E+01	7.191E+01	1.078E+05	7.242E+00
1990	2.587E+02	2.071E+05	1.392E+01	6.909E+01	1.036E+05	6.958E+00
1991	2.485E+02	1.990E+05	1.337E+01	6.638E+01	9.950E+04	6.685E+00
1992	2.388E+02	1.912E+05	1.285E+01	6.378E+01	9.560E+04	6.423E+00
1993	2.294E+02	1.837E+05	1.234E+01	6.128E+01	9.185E+04	6.171E+00
1994	2.204E+02	1.765E+05	1.186E+01	5.888E+01	8.825E+04	5.929E+00
1995	2.118E+02	1.696E+05	1.139E+01	5.657E+01	8.479E+04	5.697E+00
1996	2.035E+02	1.629E+05	1.095E+01	5.435E+01	8.146E+04	5.474E+00
1997	1.955E+02	1.565E+05	1.052E+01	5.222E+01	7.827E+04	5.259E+00
1998	1.878E+02	1.504E+05	1.011E+01	5.017E+01	7.520E+04	5.053E+00
1999	1.805E+02	1.445E+05	9.709E+00	4.820E+01	7.225E+04	4.855E+00
2000	1.734E+02	1.388E+05	9.329E+00	4.631E+01	6.942E+04	4.664E+00
2001	1.666E+02	1.334E+05	8.963E+00	4.450E+01	6.670E+04	4.481E+00
2002	1.601E+02	1.282E+05	8.611E+00	4.275E+01	6.408E+04	4.306E+00
2003	1.538E+02	1.231E+05	8.274E+00	4.108E+01	6.157E+04	4.137E+00
2004	1.477E+02	1.183E+05	7.949E+00	3.947E+01	5.916E+04	3.975E+00
2005	1.420E+02	1.137E+05	7.638E+00	3.792E+01	5.684E+04	3.819E+00
2006	1.364E+02	1.092E+05	7.338E+00	3.643E+01	5.461E+04	3.669E+00
2007	1.310E+02	1.049E+05	7.050E+00	3.500E+01	5.247E+04	3.525E+00
2008	1.259E+02	1.008E+05	6.774E+00	3.363E+01	5.041E+04	3.387E+00
2009	1.210E+02	9.687E+04	6.508E+00	3.231E+01	4.843E+04	3.254E+00
2010	1.162E+02	9.307E+04	6.253E+00	3.104E+01	4.653E+04	3.127E+00
2011	1.117E+02	8.942E+04	6.008E+00	2.983E+01	4.471E+04	3.004E+00
2012	1.073E+02	8.591E+04	5.772E+00	2.866E+01	4.296E+04	2.886E+00
2013	1.031E+02	8.254E+04	5.546E+00	2.753E+01	4.127E+04	2.773E+00
2014	9.904E+01	7.931E+04	5.329E+00	2.645E+01	3.965E+04	2.664E+00
2015	9.516E+01	7.620E+04	5.120E+00	2.542E+01	3.810E+04	2.560E+00
2016	9.143E+01	7.321E+04	4.919E+00	2.442E+01	3.660E+04	2.459E+00
2017	8.784E+01	7.034E+04	4.726E+00	2.346E+01	3.517E+04	2.363E+00
2018	8.440E+01	6.758E+04	4.541E+00	2.254E+01	3.379E+04	2.270E+00

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2019	8.109E+01	6.493E+04	4.363E+00	2.166E+01	3.247E+04	2.181E+00
2020	7.791E+01	6.238E+04	4.192E+00	2.081E+01	3.119E+04	2.096E+00
2021	7.485E+01	5.994E+04	4.027E+00	1.999E+01	2.997E+04	2.014E+00
2022	7.192E+01	5.759E+04	3.869E+00	1.921E+01	2.879E+04	1.935E+00
2023	6.910E+01	5.533E+04	3.718E+00	1.846E+01	2.767E+04	1.859E+00
2024	6.639E+01	5.316E+04	3.572E+00	1.773E+01	2.658E+04	1.786E+00
2025	6.379E+01	5.108E+04	3.432E+00	1.704E+01	2.554E+04	1.716E+00
2026	6.128E+01	4.907E+04	3.297E+00	1.637E+01	2.454E+04	1.649E+00
2027	5.888E+01	4.715E+04	3.168E+00	1.573E+01	2.357E+04	1.584E+00
2028	5.657E+01	4.530E+04	3.044E+00	1.511E+01	2.265E+04	1.522E+00
2029	5.435E+01	4.352E+04	2.924E+00	1.452E+01	2.176E+04	1.462E+00
2030	5.222E+01	4.182E+04	2.810E+00	1.395E+01	2.091E+04	1.405E+00
2031	5.018E+01	4.018E+04	2.700E+00	1.340E+01	2.009E+04	1.350E+00
2032	4.821E+01	3.860E+04	2.594E+00	1.288E+01	1.930E+04	1.297E+00
2033	4.632E+01	3.709E+04	2.492E+00	1.237E+01	1.854E+04	1.246E+00
2034	4.450E+01	3.563E+04	2.394E+00	1.189E+01	1.782E+04	1.197E+00
2035	4.276E+01	3.424E+04	2.300E+00	1.142E+01	1.712E+04	1.150E+00
2036	4.108E+01	3.289E+04	2.210E+00	1.097E+01	1.645E+04	1.105E+00
2037	3.947E+01	3.161E+04	2.124E+00	1.054E+01	1.580E+04	1.062E+00
2038	3.792E+01	3.037E+04	2.040E+00	1.013E+01	1.518E+04	1.020E+00
2039	3.643E+01	2.918E+04	1.960E+00	9.732E+00	1.459E+04	9.801E-01
2040	3.501E+01	2.803E+04	1.883E+00	9.350E+00	1.402E+04	9.417E-01
2041	3.363E+01	2.693E+04	1.810E+00	8.984E+00	1.347E+04	9.048E-01
2042	3.231E+01	2.588E+04	1.739E+00	8.632E+00	1.294E+04	8.693E-01
2043	3.105E+01	2.486E+04	1.670E+00	8.293E+00	1.243E+04	8.352E-01
2044	2.983E+01	2.389E+04	1.605E+00	7.968E+00	1.194E+04	8.025E-01
2045	2.866E+01	2.295E+04	1.542E+00	7.656E+00	1.148E+04	7.710E-01
2046	2.754E+01	2.205E+04	1.482E+00	7.355E+00	1.103E+04	7.408E-01
2047	2.646E+01	2.119E+04	1.423E+00	7.067E+00	1.059E+04	7.117E-01
2048	2.542E+01	2.035E+04	1.368E+00	6.790E+00	1.018E+04	6.838E-01
2049	2.442E+01	1.956E+04	1.314E+00	6.524E+00	9.778E+03	6.570E-01
2050	2.347E+01	1.879E+04	1.262E+00	6.268E+00	9.395E+03	6.312E-01
2051	2.255E+01	1.805E+04	1.213E+00	6.022E+00	9.027E+03	6.065E-01
2052	2.166E+01	1.735E+04	1.165E+00	5.786E+00	8.673E+03	5.827E-01
2053	2.081E+01	1.667E+04	1.120E+00	5.559E+00	8.333E+03	5.599E-01
2054	2.000E+01	1.601E+04	1.076E+00	5.341E+00	8.006E+03	5.379E-01
2055	1.921E+01	1.538E+04	1.034E+00	5.132E+00	7.692E+03	5.168E-01
2056	1.846E+01	1.478E+04	9.931E-01	4.930E+00	7.390E+03	4.966E-01
2057	1.773E+01	1.420E+04	9.542E-01	4.737E+00	7.101E+03	4.771E-01
2058	1.704E+01	1.364E+04	9.168E-01	4.551E+00	6.822E+03	4.584E-01
2059	1.637E+01	1.311E+04	8.808E-01	4.373E+00	6.555E+03	4.404E-01
2060	1.573E+01	1.260E+04	8.463E-01	4.201E+00	6.298E+03	4.231E-01
2061	1.511E+01	1.210E+04	8.131E-01	4.037E+00	6.051E+03	4.065E-01
2062	1.452E+01	1.163E+04	7.812E-01	3.878E+00	5.813E+03	3.906E-01
2063	1.395E+01	1.117E+04	7.506E-01	3.726E+00	5.585E+03	3.753E-01
2064	1.340E+01	1.073E+04	7.211E-01	3.580E+00	5.366E+03	3.606E-01
2065	1.288E+01	1.031E+04	6.929E-01	3.440E+00	5.156E+03	3.464E-01
2066	1.237E+01	9.908E+03	6.657E-01	3.305E+00	4.954E+03	3.329E-01
2067	1.189E+01	9.519E+03	6.396E-01	3.175E+00	4.760E+03	3.198E-01
2068	1.142E+01	9.146E+03	6.145E-01	3.051E+00	4.573E+03	3.073E-01
2069	1.097E+01	8.787E+03	5.904E-01	2.931E+00	4.394E+03	2.952E-01

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2070	1.054E+01	8.443E+03	5.673E-01	2.816E+00	4.221E+03	2.836E-01
2071	1.013E+01	8.112E+03	5.450E-01	2.706E+00	4.056E+03	2.725E-01
2072	9.733E+00	7.794E+03	5.237E-01	2.600E+00	3.897E+03	2.618E-01
2073	9.351E+00	7.488E+03	5.031E-01	2.498E+00	3.744E+03	2.516E-01
2074	8.985E+00	7.195E+03	4.834E-01	2.400E+00	3.597E+03	2.417E-01
2075	8.632E+00	6.912E+03	4.644E-01	2.306E+00	3.456E+03	2.322E-01
2076	8.294E+00	6.641E+03	4.462E-01	2.215E+00	3.321E+03	2.231E-01
2077	7.969E+00	6.381E+03	4.287E-01	2.129E+00	3.190E+03	2.144E-01
2078	7.656E+00	6.131E+03	4.119E-01	2.045E+00	3.065E+03	2.060E-01
2079	7.356E+00	5.890E+03	3.958E-01	1.965E+00	2.945E+03	1.979E-01
2080	7.068E+00	5.659E+03	3.803E-01	1.888E+00	2.830E+03	1.901E-01
2081	6.790E+00	5.437E+03	3.653E-01	1.814E+00	2.719E+03	1.827E-01
2082	6.524E+00	5.224E+03	3.510E-01	1.743E+00	2.612E+03	1.755E-01
2083	6.268E+00	5.019E+03	3.373E-01	1.674E+00	2.510E+03	1.686E-01
2084	6.023E+00	4.823E+03	3.240E-01	1.609E+00	2.411E+03	1.620E-01
2085	5.786E+00	4.634E+03	3.113E-01	1.546E+00	2.317E+03	1.557E-01
2086	5.560E+00	4.452E+03	2.991E-01	1.485E+00	2.226E+03	1.496E-01
2087	5.342E+00	4.277E+03	2.874E-01	1.427E+00	2.139E+03	1.437E-01
2088	5.132E+00	4.110E+03	2.761E-01	1.371E+00	2.055E+03	1.381E-01
2089	4.931E+00	3.948E+03	2.653E-01	1.317E+00	1.974E+03	1.326E-01
2090	4.738E+00	3.794E+03	2.549E-01	1.265E+00	1.897E+03	1.274E-01
2091	4.552E+00	3.645E+03	2.449E-01	1.216E+00	1.822E+03	1.224E-01
2092	4.373E+00	3.502E+03	2.353E-01	1.168E+00	1.751E+03	1.176E-01
2093	4.202E+00	3.365E+03	2.261E-01	1.122E+00	1.682E+03	1.130E-01
2094	4.037E+00	3.233E+03	2.172E-01	1.078E+00	1.616E+03	1.086E-01
2095	3.879E+00	3.106E+03	2.087E-01	1.036E+00	1.553E+03	1.043E-01
2096	3.727E+00	2.984E+03	2.005E-01	9.954E-01	1.492E+03	1.003E-01
2097	3.581E+00	2.867E+03	1.926E-01	9.564E-01	1.434E+03	9.632E-02
2098	3.440E+00	2.755E+03	1.851E-01	9.189E-01	1.377E+03	9.254E-02
2099	3.305E+00	2.647E+03	1.778E-01	8.829E-01	1.323E+03	8.892E-02
2100	3.176E+00	2.543E+03	1.709E-01	8.483E-01	1.271E+03	8.543E-02
2101	3.051E+00	2.443E+03	1.642E-01	8.150E-01	1.222E+03	8.208E-02
2102	2.932E+00	2.347E+03	1.577E-01	7.830E-01	1.174E+03	7.886E-02
2103	2.817E+00	2.255E+03	1.515E-01	7.523E-01	1.128E+03	7.577E-02
2104	2.706E+00	2.167E+03	1.456E-01	7.228E-01	1.083E+03	7.280E-02
2105	2.600E+00	2.082E+03	1.399E-01	6.945E-01	1.041E+03	6.994E-02
2106	2.498E+00	2.000E+03	1.344E-01	6.673E-01	1.000E+03	6.720E-02
2107	2.400E+00	1.922E+03	1.291E-01	6.411E-01	9.610E+02	6.457E-02
2108	2.306E+00	1.847E+03	1.241E-01	6.160E-01	9.233E+02	6.203E-02
2109	2.216E+00	1.774E+03	1.192E-01	5.918E-01	8.871E+02	5.960E-02

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1969	0	0	0	0	0	0
1970	2.067E+02	1.129E+05	7.588E+00	3.239E+00	9.035E+02	6.071E-02
1971	4.054E+02	2.214E+05	1.488E+01	6.350E+00	1.772E+03	1.190E-01
1972	3.895E+02	2.128E+05	1.430E+01	6.101E+00	1.702E+03	1.144E-01
1973	3.742E+02	2.044E+05	1.373E+01	5.862E+00	1.635E+03	1.099E-01
1974	3.595E+02	1.964E+05	1.320E+01	5.632E+00	1.571E+03	1.056E-01
1975	3.454E+02	1.887E+05	1.268E+01	5.411E+00	1.510E+03	1.014E-01
1976	3.319E+02	1.813E+05	1.218E+01	5.199E+00	1.450E+03	9.745E-02
1977	3.189E+02	1.742E+05	1.170E+01	4.995E+00	1.394E+03	9.363E-02
1978	3.064E+02	1.674E+05	1.125E+01	4.799E+00	1.339E+03	8.996E-02
1979	2.943E+02	1.608E+05	1.080E+01	4.611E+00	1.286E+03	8.643E-02
1980	2.828E+02	1.545E+05	1.038E+01	4.430E+00	1.236E+03	8.304E-02
1981	2.717E+02	1.484E+05	9.974E+00	4.257E+00	1.188E+03	7.979E-02
1982	2.611E+02	1.426E+05	9.583E+00	4.090E+00	1.141E+03	7.666E-02
1983	2.508E+02	1.370E+05	9.207E+00	3.929E+00	1.096E+03	7.365E-02
1984	2.410E+02	1.317E+05	8.846E+00	3.775E+00	1.053E+03	7.077E-02
1985	2.315E+02	1.265E+05	8.499E+00	3.627E+00	1.012E+03	6.799E-02
1986	2.225E+02	1.215E+05	8.166E+00	3.485E+00	9.722E+02	6.533E-02
1987	2.137E+02	1.168E+05	7.845E+00	3.348E+00	9.341E+02	6.276E-02
1988	2.054E+02	1.122E+05	7.538E+00	3.217E+00	8.975E+02	6.030E-02
1989	1.973E+02	1.078E+05	7.242E+00	3.091E+00	8.623E+02	5.794E-02
1990	1.896E+02	1.036E+05	6.958E+00	2.970E+00	8.285E+02	5.567E-02
1991	1.821E+02	9.950E+04	6.685E+00	2.853E+00	7.960E+02	5.348E-02
1992	1.750E+02	9.560E+04	6.423E+00	2.741E+00	7.648E+02	5.139E-02
1993	1.681E+02	9.185E+04	6.171E+00	2.634E+00	7.348E+02	4.937E-02
1994	1.615E+02	8.825E+04	5.929E+00	2.531E+00	7.060E+02	4.744E-02
1995	1.552E+02	8.479E+04	5.697E+00	2.431E+00	6.783E+02	4.558E-02
1996	1.491E+02	8.146E+04	5.474E+00	2.336E+00	6.517E+02	4.379E-02
1997	1.433E+02	7.827E+04	5.259E+00	2.244E+00	6.262E+02	4.207E-02
1998	1.377E+02	7.520E+04	5.053E+00	2.156E+00	6.016E+02	4.042E-02
1999	1.323E+02	7.225E+04	4.855E+00	2.072E+00	5.780E+02	3.884E-02
2000	1.271E+02	6.942E+04	4.664E+00	1.991E+00	5.554E+02	3.731E-02
2001	1.221E+02	6.670E+04	4.481E+00	1.913E+00	5.336E+02	3.585E-02
2002	1.173E+02	6.408E+04	4.306E+00	1.838E+00	5.127E+02	3.445E-02
2003	1.127E+02	6.157E+04	4.137E+00	1.766E+00	4.926E+02	3.309E-02
2004	1.083E+02	5.916E+04	3.975E+00	1.696E+00	4.732E+02	3.180E-02
2005	1.040E+02	5.684E+04	3.819E+00	1.630E+00	4.547E+02	3.055E-02
2006	9.996E+01	5.461E+04	3.669E+00	1.566E+00	4.369E+02	2.935E-02
2007	9.604E+01	5.247E+04	3.525E+00	1.505E+00	4.197E+02	2.820E-02
2008	9.227E+01	5.041E+04	3.387E+00	1.446E+00	4.033E+02	2.710E-02
2009	8.866E+01	4.843E+04	3.254E+00	1.389E+00	3.875E+02	2.603E-02
2010	8.518E+01	4.653E+04	3.127E+00	1.334E+00	3.723E+02	2.501E-02
2011	8.184E+01	4.471E+04	3.004E+00	1.282E+00	3.577E+02	2.403E-02
2012	7.863E+01	4.296E+04	2.886E+00	1.232E+00	3.436E+02	2.309E-02
2013	7.555E+01	4.127E+04	2.773E+00	1.183E+00	3.302E+02	2.218E-02
2014	7.259E+01	3.965E+04	2.664E+00	1.137E+00	3.172E+02	2.131E-02
2015	6.974E+01	3.810E+04	2.560E+00	1.092E+00	3.048E+02	2.048E-02
2016	6.700E+01	3.660E+04	2.459E+00	1.050E+00	2.928E+02	1.968E-02
2017	6.438E+01	3.517E+04	2.363E+00	1.009E+00	2.814E+02	1.890E-02
2018	6.185E+01	3.379E+04	2.270E+00	9.690E-01	2.703E+02	1.816E-02

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2019	5.943E+01	3.247E+04	2.181E+00	9.310E-01	2.597E+02	1.745E-02
2020	5.710E+01	3.119E+04	2.096E+00	8.945E-01	2.495E+02	1.677E-02
2021	5.486E+01	2.997E+04	2.014E+00	8.594E-01	2.398E+02	1.611E-02
2022	5.271E+01	2.879E+04	1.935E+00	8.257E-01	2.304E+02	1.548E-02
2023	5.064E+01	2.767E+04	1.859E+00	7.933E-01	2.213E+02	1.487E-02
2024	4.866E+01	2.658E+04	1.786E+00	7.622E-01	2.126E+02	1.429E-02
2025	4.675E+01	2.554E+04	1.716E+00	7.323E-01	2.043E+02	1.373E-02
2026	4.491E+01	2.454E+04	1.649E+00	7.036E-01	1.963E+02	1.319E-02
2027	4.315E+01	2.357E+04	1.584E+00	6.760E-01	1.886E+02	1.267E-02
2028	4.146E+01	2.265E+04	1.522E+00	6.495E-01	1.812E+02	1.217E-02
2029	3.984E+01	2.176E+04	1.462E+00	6.240E-01	1.741E+02	1.170E-02
2030	3.827E+01	2.091E+04	1.405E+00	5.996E-01	1.673E+02	1.124E-02
2031	3.677E+01	2.009E+04	1.350E+00	5.761E-01	1.607E+02	1.080E-02
2032	3.533E+01	1.930E+04	1.297E+00	5.535E-01	1.544E+02	1.037E-02
2033	3.395E+01	1.854E+04	1.246E+00	5.318E-01	1.484E+02	9.968E-03
2034	3.261E+01	1.782E+04	1.197E+00	5.109E-01	1.425E+02	9.577E-03
2035	3.134E+01	1.712E+04	1.150E+00	4.909E-01	1.369E+02	9.202E-03
2036	3.011E+01	1.645E+04	1.105E+00	4.716E-01	1.316E+02	8.841E-03
2037	2.893E+01	1.580E+04	1.062E+00	4.531E-01	1.264E+02	8.494E-03
2038	2.779E+01	1.518E+04	1.020E+00	4.354E-01	1.215E+02	8.161E-03
2039	2.670E+01	1.459E+04	9.801E-01	4.183E-01	1.167E+02	7.841E-03
2040	2.566E+01	1.402E+04	9.417E-01	4.019E-01	1.121E+02	7.534E-03
2041	2.465E+01	1.347E+04	9.048E-01	3.861E-01	1.077E+02	7.238E-03
2042	2.368E+01	1.294E+04	8.693E-01	3.710E-01	1.035E+02	6.954E-03
2043	2.275E+01	1.243E+04	8.352E-01	3.565E-01	9.945E+01	6.682E-03
2044	2.186E+01	1.194E+04	8.025E-01	3.425E-01	9.555E+01	6.420E-03
2045	2.100E+01	1.148E+04	7.710E-01	3.291E-01	9.180E+01	6.168E-03
2046	2.018E+01	1.103E+04	7.408E-01	3.162E-01	8.820E+01	5.926E-03
2047	1.939E+01	1.059E+04	7.117E-01	3.038E-01	8.474E+01	5.694E-03
2048	1.863E+01	1.018E+04	6.838E-01	2.918E-01	8.142E+01	5.471E-03
2049	1.790E+01	9.778E+03	6.570E-01	2.804E-01	7.823E+01	5.256E-03
2050	1.720E+01	9.395E+03	6.312E-01	2.694E-01	7.516E+01	5.050E-03
2051	1.652E+01	9.027E+03	6.065E-01	2.588E-01	7.221E+01	4.852E-03
2052	1.588E+01	8.673E+03	5.827E-01	2.487E-01	6.938E+01	4.662E-03
2053	1.525E+01	8.333E+03	5.599E-01	2.389E-01	6.666E+01	4.479E-03
2054	1.465E+01	8.006E+03	5.379E-01	2.296E-01	6.405E+01	4.303E-03
2055	1.408E+01	7.692E+03	5.168E-01	2.206E-01	6.154E+01	4.135E-03
2056	1.353E+01	7.390E+03	4.966E-01	2.119E-01	5.912E+01	3.972E-03
2057	1.300E+01	7.101E+03	4.771E-01	2.036E-01	5.680E+01	3.817E-03
2058	1.249E+01	6.822E+03	4.584E-01	1.956E-01	5.458E+01	3.667E-03
2059	1.200E+01	6.555E+03	4.404E-01	1.880E-01	5.244E+01	3.523E-03
2060	1.153E+01	6.298E+03	4.231E-01	1.806E-01	5.038E+01	3.385E-03
2061	1.108E+01	6.051E+03	4.065E-01	1.735E-01	4.841E+01	3.252E-03
2062	1.064E+01	5.813E+03	3.906E-01	1.667E-01	4.651E+01	3.125E-03
2063	1.022E+01	5.585E+03	3.753E-01	1.602E-01	4.468E+01	3.002E-03
2064	9.823E+00	5.366E+03	3.606E-01	1.539E-01	4.293E+01	2.885E-03
2065	9.438E+00	5.156E+03	3.464E-01	1.479E-01	4.125E+01	2.771E-03
2066	9.068E+00	4.954E+03	3.329E-01	1.421E-01	3.963E+01	2.663E-03
2067	8.713E+00	4.760E+03	3.198E-01	1.365E-01	3.808E+01	2.558E-03
2068	8.371E+00	4.573E+03	3.073E-01	1.311E-01	3.658E+01	2.458E-03
2069	8.043E+00	4.394E+03	2.952E-01	1.260E-01	3.515E+01	2.362E-03

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2070	7.727E+00	4.221E+03	2.836E-01	1.211E-01	3.377E+01	2.269E-03
2071	7.424E+00	4.056E+03	2.725E-01	1.163E-01	3.245E+01	2.180E-03
2072	7.133E+00	3.897E+03	2.618E-01	1.117E-01	3.117E+01	2.095E-03
2073	6.854E+00	3.744E+03	2.516E-01	1.074E-01	2.995E+01	2.013E-03
2074	6.585E+00	3.597E+03	2.417E-01	1.032E-01	2.878E+01	1.934E-03
2075	6.327E+00	3.456E+03	2.322E-01	9.911E-02	2.765E+01	1.858E-03
2076	6.079E+00	3.321E+03	2.231E-01	9.522E-02	2.657E+01	1.785E-03
2077	5.840E+00	3.190E+03	2.144E-01	9.149E-02	2.552E+01	1.715E-03
2078	5.611E+00	3.065E+03	2.060E-01	8.790E-02	2.452E+01	1.648E-03
2079	5.391E+00	2.945E+03	1.979E-01	8.446E-02	2.356E+01	1.583E-03
2080	5.180E+00	2.830E+03	1.901E-01	8.114E-02	2.264E+01	1.521E-03
2081	4.977E+00	2.719E+03	1.827E-01	7.796E-02	2.175E+01	1.461E-03
2082	4.782E+00	2.612E+03	1.755E-01	7.491E-02	2.090E+01	1.404E-03
2083	4.594E+00	2.510E+03	1.686E-01	7.197E-02	2.008E+01	1.349E-03
2084	4.414E+00	2.411E+03	1.620E-01	6.915E-02	1.929E+01	1.296E-03
2085	4.241E+00	2.317E+03	1.557E-01	6.643E-02	1.853E+01	1.245E-03
2086	4.075E+00	2.226E+03	1.496E-01	6.383E-02	1.781E+01	1.196E-03
2087	3.915E+00	2.139E+03	1.437E-01	6.133E-02	1.711E+01	1.150E-03
2088	3.761E+00	2.055E+03	1.381E-01	5.892E-02	1.644E+01	1.104E-03
2089	3.614E+00	1.974E+03	1.326E-01	5.661E-02	1.579E+01	1.061E-03
2090	3.472E+00	1.897E+03	1.274E-01	5.439E-02	1.517E+01	1.020E-03
2091	3.336E+00	1.822E+03	1.224E-01	5.226E-02	1.458E+01	9.796E-04
2092	3.205E+00	1.751E+03	1.176E-01	5.021E-02	1.401E+01	9.412E-04
2093	3.079E+00	1.682E+03	1.130E-01	4.824E-02	1.346E+01	9.043E-04
2094	2.959E+00	1.616E+03	1.086E-01	4.635E-02	1.293E+01	8.688E-04
2095	2.843E+00	1.553E+03	1.043E-01	4.453E-02	1.242E+01	8.348E-04
2096	2.731E+00	1.492E+03	1.003E-01	4.279E-02	1.194E+01	8.020E-04
2097	2.624E+00	1.434E+03	9.632E-02	4.111E-02	1.147E+01	7.706E-04
2098	2.521E+00	1.377E+03	9.254E-02	3.950E-02	1.102E+01	7.404E-04
2099	2.422E+00	1.323E+03	8.892E-02	3.795E-02	1.059E+01	7.113E-04
2100	2.327E+00	1.271E+03	8.543E-02	3.646E-02	1.017E+01	6.834E-04
2101	2.236E+00	1.222E+03	8.208E-02	3.503E-02	9.773E+00	6.566E-04
2102	2.148E+00	1.174E+03	7.886E-02	3.366E-02	9.390E+00	6.309E-04
2103	2.064E+00	1.128E+03	7.577E-02	3.234E-02	9.022E+00	6.062E-04
2104	1.983E+00	1.083E+03	7.280E-02	3.107E-02	8.668E+00	5.824E-04
2105	1.906E+00	1.041E+03	6.994E-02	2.985E-02	8.328E+00	5.596E-04
2106	1.831E+00	1.000E+03	6.720E-02	2.868E-02	8.001E+00	5.376E-04
2107	1.759E+00	9.610E+02	6.457E-02	2.756E-02	7.688E+00	5.165E-04
2108	1.690E+00	9.233E+02	6.203E-02	2.648E-02	7.386E+00	4.963E-04
2109	1.624E+00	8.871E+02	5.960E-02	2.544E-02	7.097E+00	4.768E-04

APPENDIX D
LFG SAMPLING DATA

TABLE 4.
SUMMARY OF ANALYTICAL DATA FOR
CHEMICAL CONSTITUENTS IN LANDFILL GAS
TURK ISLAND LANDFILL, 6.3-ACRE SITE, UNION CITY, CALIFORNIA

Toxic Air Contaminants[1]	AP-42 Default Concentrations	SCS California Average[2]	Average LFG Concentration from 47-Acre Site	LFG Sample 0329 from 07/23/95	LFG Sample 0352 from 07/23/96	LFG Sample from 12/2000	Average LFG Concentration from Samples	Representative Concentration in LFG[3]
					(ppmv)			
1,1,1-Trichloroethane (methyl chloroform)	0.480	0.156	0.202	ND	ND	0.001	0.001	0.001
1,1,2,2-Tetrachloroethene	1.110	0.08539	3.E-04	ND	ND	0.001	0.001	0.001
1,1-Dichloroethane	2.350	1.401	5.E-05	ND	ND	0.001	0.001	0.001
1,1-Dichloroethene	0.200	0.1496	5.E-05	ND	ND	0.002	0.002	0.002
1,2-Dichloroethane	0.410	0.1613	0.040	ND	ND	0.001	0.001	0.001
1,2-Dichloroethene	2.840	0.423	5.E-05	ND	ND	0.002	0.002	0.002
1,2-Dichloropropane	0.180	0.09508	--	--	--	0.001	0.001	0.001
2-Propanol (isopropyl alcohol)	50.100	14.44	--	--	--	--	--	14.440
4-ethyl-toluene	--	0.6297	--	--	--	0.002	0.002	0.002
Acetone	7.010	6.159	0.360	ND	ND	--	--	0.360
Acrylonitrile	6.330	0.00225		ND	ND	0.010	0.010	0.010
Benzene	11.100	1.548	1.443	0.278	0.287	0.022	0.196	0.196
Bromodichoromethane	3.130	0.5769	--	--	--	--	--	0.577
Butane	5.030	--	1.347	--	--	--	--	1.347
Carbon Disulfide	0.580	0.2588	0.001	--	--	0.010	0.010	0.010
Carbon Tetrachloride	0.004	0.04645	0.002	ND	ND	0.002	0.002	0.002
Carbon Sulfide	0.490	0.2102	--	--	--	0.086	0.086	0.086
Chlorobenzene	0.250	1.368	5.E-05	ND	ND	0.003	0.003	0.003
Chloroethane (ethyl chloride)	1.250	--	5.E-05	--	--	0.002	--	5.E-05
Chloroform	0.030	0.06455	0.005	ND	ND	0.002	0.002	0.002
Chloromethane (Methyl Chloride)	1.210	0.5495	5 E-05	--	--	0.002	--	5.E-05
Dichlorobenzene (1,2, 1,3, and 1,4)	0.210	6.396	--	0.118	0.065	0.007	0.063	0.063
Dichloromethane (Methylene Chloride)	14.300	5.974	2.665	--	--	0.002	0.002	0.002
Dimethyl Sulfide	7.820	5.448	0.700	--	--	0.025	0.025	0.025
Ethane	889.000	--	2.500	--	--	--	--	2.500
Ethanol	27.200	229	--	--	--	--	--	27.20
Ethyl mercaptan	2.280	0.2299	--	--	--	0.035	0.035	0.035
Ethylbenzene	4.610	3.798	4.733	0.862	0.933	0.075	0.623	0.623
Ethylene Dibromide (Dibromoethane)	0.001	0.06824	--	--	--	--	--	0.068
Freon 12 (Dichlorodifluoromethane)	15.700	2.153	--	--	--	0.004	0.004	0.004
Freon 11 (Fluorotrichloromethane)	0.760	3.012	--	--	--	0.002	0.002	0.002
Freon 22 (Chlorodifluoromethane)	1.300	--	--	--	--	--	--	1.300
Freon 114 (Chlorodifluoromethane)	--	--	--	--	--	0.002	0.002	0.002
Hexane	6.570	6.283	1.867	0.276	0.286	--	0.281	0.281
Hydrogen Sulfide	35.500	30	--	--	--	0.250	0.250	0.250
Mercury	2.92E-04	--	--	--	--	--	--	2.92E-04
Methyl ethyl ketone	7.090	17.064	5.E-05	ND	ND	--	--	5.E-05
Methyl isobutyl ketone	1.870	1.161	5.E-05	ND	ND	--	--	5.E-05
Methyl mercaptan	2.490	1.010	--	--	--	0.045	0.045	0.045
Napthalene		--	--	0.451	0.162	--	0.307	0.307
Pentane	3.290	--	1.447	--	--	--	--	1.447
Perchloroethylene (tetrachloroethylene)	3.730	1.238	2.355	0.021	0.014	0.002	0.012	0.012
Propane	44.090	--	2.500	--	--	--	--	2.500
Styrene		0.39	0.001	ND	ND	0.002	0.002	0.002
Toluene	165.000	20.660	5.833	0.208	0.166	0.020	0.131	0.131
Trichloroethylene	2.820	0.599	0.891	ND	ND	0.002	0.002	0.002
Trimethylbenzene (1,3,5 and 1,2,4)	--	1.416	--	--	--	0.032	0.032	0.032
Vinyl chloride	7.340	1.159	2.194	0.036	0.061	0.003	0.033	0.033
Xylenes	12.100	12.290	3.373	2.937	3.178	0.242	2.119	2.119

NOTES:

(1) Toxic air contaminants include landfill gas constituents detected in LFG, as determined from site-specific analytical data and a list in AP-42 Tables 2.4-1 ("Uncontrolled Landfill Gas Concentrations") and 2.4-2

(2) SCS California Averages represent average results from a database of Source Tests conducted at 41 landfill sites located throughout California.

(3) The representative concentration of compounds in LFG was calculated by using the maximum value from site-specific data, where available. If no site-specific data was available, available data from the adjacent site (either the 47- or 6.3-acre sites) were used. Where site specific data on eiyther site was unavailable, SCS California Averages were used (See note 2), and where no California Average value was available, AP-42 default concentrations were used from Table 2.4-1

Shaded values indicate results which were not detected. 1/2 of the detection limit was used for these samples for risk assessment purposes

APPENDIX E
AERMOD MODELING FILES

APPENDIX F
HARP LOG FILES

HARP2 - HRACalc (dated 17023) 3/31/2017 4:48:48 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: All
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 1.3

Exposure Duration Bin Distribution
3rd Trimester Bin: 0.25
0<2 Years Bin: 1.3
2<9 Years Bin: 0
2<16 Years Bin: 0
16<30 Years Bin: 0
16 to 70 Years Bin: 0

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: True
Water: False
Fish: False
Homegrown crops: True
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: RMP

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
3rd Trimester to 16 years: OFF
16 years to 70 years: ON

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.02
Soil mixing depth (m): 0.01
Dermal climate: Mixed

```
**********
HOMEGROWN CROP PATHWAY SETTINGS

Household type: HouseholdsthatGarden
Fraction leafy: 0.137
Fraction exposed: 0.137
Fraction protected: 0.137
Fraction root: 0.137

**********
TIER 2 SETTINGS

Tier2 adjustments were used in this assessment.  Please see the input file for
details.
Tier2 - What was changed: ED or start age changed|
Calculating cancer risk
Cancer risk breakdown by pollutant and receptor saved to:
X:\LG_Turk_Island\HARP_Stuff\Project_Cancer_Chronic\hra\HGProduce_Cumulative_Cancer_
ChronicCancerRisk.csv
Cancer risk total by receptor saved to:
X:\LG_Turk_Island\HARP_Stuff\Project_Cancer_Chronic\hra\HGProduce_Cumulative_Cancer_
ChronicCancerRiskSumByRec.csv
Calculating chronic risk
Chronic risk breakdown by pollutant and receptor saved to:
X:\LG_Turk_Island\HARP_Stuff\Project_Cancer_Chronic\hra\HGProduce_Cumulative_Cancer_
ChronicNCChronicRisk.csv
Chronic risk total by receptor saved to:
X:\LG_Turk_Island\HARP_Stuff\Project_Cancer_Chronic\hra\HGProduce_Cumulative_Cancer_
ChronicNCChronicRiskSumByRec.csv
Calculating acute risk
Acute risk breakdown by pollutant and receptor saved to:
X:\LG_Turk_Island\HARP_Stuff\Project_Cancer_Chronic\hra\HGProduce_Cumulative_Cancer_
ChronicNCAcuteRisk.csv
Acute risk total by receptor saved to:
X:\LG_Turk_Island\HARP_Stuff\Project_Cancer_Chronic\hra\HGProduce_Cumulative_Cancer_
ChronicNCAcuteRiskSumByRec.csv
HRA ran successfully
```

APPENDIX G
TRAFFIC VOLUME DATA



CITY-WIDE ADT DATA - YEARS 2010-2013

APPENDIX 5

Turk Island Landfill Consolidation and Residential Subdivision Project

Draft Environmental Impact Report

SCH No. 2008112107



City of Union City
Economic and Community Development Department
34009 Alvardo-Niles Road
Union City, CA 94587

This Attachment in its entirety is Comment 48

March 2018

LAMPHIER - GREGORY
URBAN PLANNING, ENVIRONMENTAL ANALYSIS & PROJECT MANAGEMENT | 510.535.6690

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1

INTRODUCTION

PURPOSE OF THE ENVIRONMENTAL IMPACT REPORT

The California Environmental Quality Act and the Guidelines promulgated thereunder (together "CEQA") require an Environmental Impact Report (EIR) be prepared for any project which may have a significant impact on the environment. An EIR is an informational document, the purposes of which, according to CEQA are "to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project." The information contained in this EIR is intended to be objective and impartial, and to enable the reader to arrive at an independent judgment regarding the significance of the environmental impacts resulting from the proposed project.

This EIR evaluates the potential environmental impacts that may be associated with the Turk Island Landfill Consolidation and Residential Subdivision Project at the intersection of Carmel Way and Westport Way in Union City, California and off-site recreational improvements (collectively, the "Project") .

ENVIRONMENTAL IMPACT REPORT REVIEW PROCESS

This Draft EIR, together with the Final EIR (discussed below) will constitute the EIR for the proposed Project. The EIR is intended to enable City decision makers, public agencies and interested citizens to evaluate the environmental issues associated with the proposed Project.

The Draft EIR will be circulated for a public review period of at least 45 days. In reviewing the Draft EIR, readers should focus on the sufficiency of the document in identifying and analyzing the possible impacts the proposed development of the Project site may have on the environment and on ways in which the significant impacts associated with the Project might be avoided or mitigated. As indicated in CEQA Guidelines, Section 15151:

> *"An Environmental Impact report should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure."*

During the review period for this Draft EIR, interested individuals, organizations and agencies may offer their comments on its evaluation of Project impacts and alternatives. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate significant environmental impacts. Reviewers should explain the basis for their comments and, whenever possible, should submit data or references in support of their comments.

The Draft EIR will be available for review online at https://www.unioncity.org/347/Planning-Documents, and as a hard copy at the Planning Division of the City of Union City, Economic and Community Development Department, 34009 Alvarado-Niles Road, Union City, and at the Union City Library, 34007 Alvarado-Niles Rd, Union City. Copies of the Draft EIR may be obtained through the City of Union City at the address below. Comments on the Draft EIR may be submitted in writing until 5:00 P.M. PST on the last day of the public review period to:

Carmela Campbell
City of Union City
Economic and Community Development Department
34009 Alvarado-Niles Road
Union City, CA 94587-4497
Telephone: (510) 675-5316
TurkIslandEIR@unioncity.org

The comments received during the public review period will be compiled and presented together with responses to those comments in the Final EIR. Any minor revisions to the Draft EIR will also be included in the Final EIR.

The City of Union City Planning Commission and the City Council will review the EIR documents and will determine whether or not the EIR provides a full and adequate appraisal of the Project and its alternatives. After reviewing this Draft EIR and the Final EIR, and after reviewing the recommendation of the City of Union City Planning Commission regarding the certification of the EIR as adequate and complete, the City Council will be in a position to determine whether or not the EIR should be certified. An EIR does not control the agency's ultimate discretion on the Project. However, as required under CEQA, the agency must respond to each significant effect identified in the EIR by making findings and, if necessary, by making a statement of overriding considerations for any significant and unavoidable impacts. In accordance with California law, the EIR on the Project must be certified before any action on the Project can be taken. Once the EIR is certified, the City of Union City can then consider whether the Project as currently proposed should be approved, revised, or rejected.

CONTENT AND ORGANIZATION OF THE DRAFT EIR

A Notice of Preparation (NOP) was issued in October 2016 to solicit comments from public agencies and the public regarding the scope of the environmental evaluation for the proposed Project. The NOP and all written responses to the NOP are presented in **Appendix A**. These comments were taken into consideration during the preparation of the Draft EIR.

An Executive Summary follows this introduction as **Chapter 2.** This summary presents an overview of the Project and the potentially significant environmental impacts which may be associated with the Project, including a listing of recommended mitigation measures and a discussion of those impacts which would remain significant and unavoidable even following mitigation.

The Draft EIR presents a description of the Project in **Chapter 3**. **Chapters 4** through **14** present environmental analysis of the Project, focusing on the following issues:

4. Aesthetics
5. Air Quality
6. Biological Resources
7. Geology and Soils

8. Hazards and Hazardous Materials
9. Hydrology and Water Quality
10. Land Use/Planning
11. Noise
12. Traffic/Transportation
13. Utilities/Service Systems
14. Greenhouse Gas Emissions

The following additional topic areas are straightforward due to the nature of the Project, so are covered in **Chapter 15**:

- Agricultural Resources
- Cultural Resources
- Mineral Resources
- Population/Housing
- Public Services
- Recreation
- Also included in Chapter 15 is a discussion of significant and irreversible modifications in the environment, growth inducing impacts, and cumulative impacts.

Chapter 16 presents an evaluation of the environmental effects which may be associated with the proposed Project and three alternatives evaluated: the "No Project" alternative, the “Carmel Way Access” alternative and the “Full Consistency” alternative.

Chapter 17 lists the persons who prepared the Draft EIR, identifies those persons and organizations contacted during the preparation of the document, and lists the reference materials used.

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EXECUTIVE SUMMARY

INTRODUCTION AND PROJECT OVERVIEW

This report, together with its appendices, constitutes the Draft Environmental Impact Report (EIR) on the Turk Island Landfill Consolidation and Residential Subdivision Project, located west and south of Sea Breeze Park at Carmel Way and Westport Way (APNs: 482-0053-004; 482-0040-008-02 and -05; 482-0050-010-06). The Lead Agency is the City of Union City.

The Project site is separated into two parcels that currently contain landfill debris. The site proposed for residential development was known as Parcel "C" of the Turk Island Landfill, which began operating in 1962 and was closed in 1974. The adjacent main 47-acre Turk Island Landfill stopped accepting fill in 1986 and was closed under regulatory agency oversight receiving formal administrative closure in 1988. A landfill gas collection and destruction system was also installed in 1988 and it continues to operate under permit with the local air quality control board, the Bay Area Air Quality Management District. The Turk Island Landfill has also been subject to a groundwater quality monitoring program under the jurisdiction of the local Regional Water Quality Control Board since its closure.

As a part of the Project, all of the existing approximately 175 thousand cubic yards of landfill debris will be removed from Parcel "C". That debris will then be placed on top of the adjacent closed Turk Island Landfill (without exposing or disturbing the existing debris in the primary Turk Island Landfill) and capped using engineered controls under the supervision of State, regional, and local regulatory agencies. Parcel "C" will then be backfilled with approximately 70 to 80 thousand cubic yards of clean, imported, engineered fill and developed with a 33-unit single-family detached residential subdivision that is intended to conform to the site's residential General Plan designation (3-6 units/acre) and residential Zoning designation of 511 Area District (511) and be compatible with surrounding neighborhoods.

Off-site improvements to the adjacent Sea Breeze Park are also proposed, including a new play structure, an interpretive trail adjacent to the existing stormwater retention ponds, expansion of the parking lot, and improvements to/refurbishment of some existing facilities.

The Project applicant is requesting City approval of a Planned Unit Development (PUD), Tentative Parcel Map (TPM) and Site Development Review (SD) to enable the landfill consolidation and development of the 33-unit residential subdivision and would also require regulatory agency approval for consolidation activities, as detailed in the Project Description.

SUMMARY OF CONCLUSIONS

SIGNIFICANT AND UNAVOIDABLE IMPACTS

The following Project-related impacts have been identified as significant and unavoidable:

Excavation/Consolidation-Related Odor Impacts

Disturbance of a landfill site during the excavation and consolidation activities, especially disturbance of previously landfilled refuse, could result in odor emissions into the neighborhoods and park adjacent to the site. While analysis confirms that odors are expected to be below detection thresholds at nearby receptors and mitigation measures will be put in place to minimize the possibility of unexpected odor events, because of the unknown nature of non-homogenous landfill waste and possibility for unexpected events that may be discernable as response measures are put into place, the impact would be considered ***significant and unavoidable***.

Construction Noise (Including Excavation/Consolidation and Backfill Activities)

Construction activities generate noise. Excavation/consolidation and backfill activities require heavy equipment that generates high noise levels such as excavators, dump trucks and graders as well as heavy truck trips to and from the site. While construction activities will follow regulations related to timing of activities and allowable construction noise levels at sensitive receivers (some as close as 65 feet from the Project boundary) and additional noise control and reduction measures will be implemented (Mitigation Noise-1), resultant construction noise would significantly increases noise over ambient levels (at least 5 dBA L_{eq}) at nearby residential receivers at levels that could be disruptive of normal residential use (60 dBA L_{eq}) consistently for a period of approximately six months (consolidation and backfill), and intermittently over the next year to year and a half (subdivision development). Therefore, the Project would result in a substantial temporary noise level increase at neighboring residential properties that cannot be reduced to less than significant levels through implementation of feasible reduction measures and the impact related to construction noise would remain ***significant and unavoidable***. While this impact is considered significant and unavoidable, it can be noted that such an impact could occur with any construction project including excavation and/or of substantial size near residences. The vehicles and equipment proposed are standard construction vehicles and equipment and are not innately noisier than those used in other construction projects. The duration of the excavation/backfill portion of the Project is longer than it could be to allow for excavation to occur in successive cross-sections to minimize the surface area of the exposed debris and therefore minimize the potential for odors. The trade-off for this longer schedule to address odor considerations is the longer duration of construction noise assessed above.

POTENTIALLY SIGNIFICANT IMPACTS AND MITIGATION MEASURES

All potentially significant impacts and the identified mitigation measure to reduce those impacts are included in **Table 2.1**.

Potentially significant impacts are largely limited to construction activities (primarily excavation/consolidation and backfill) including the potential for fugitive dust and emissions of criteria air pollutants, and toxic air contaminants; potential disturbance of burrowing owls; erosion and contaminated runoff; accidental release of hazardous materials; roadway and force main damage; and the temporary degradation of the visual quality and noise and odor environments.

Following completion of the Project, potentially significant impacts relate to the potential for contamination of the reclaimed site and migration of landfill gases to the new residential units as well as potential hazards resulting from strong seismic ground-shaking and related soil failures.

With the exception of the two significant and unavoidable impacts discussed above (Impacts Air-2 and Noise-1), the potentially significant impacts shall be reduced to less than significant levels through implementation of the identified mitigation measures.

ALTERNATIVES

Three alternatives to the Project were evaluated in this EIR, including:

- The **"No Project" Alternative** represents a scenario in which the existing uses at the Project site remain in place.
- The **"Carmel Way Access" Alternative** representing a scenario with access to Parcel "C" provided from Carmel Way instead of Westport Way (and resultant reduction in units by 15% to 28).
- The **"Full Consistency" Alternative** would be fully consistent with all development standards (without requiring Planned Use Development approval) under the existing zoning, which would result in fewer residential units being built at Parcel "C" (a reduction of 42% to 19 units).

The "No Project" alternative was identified as the environmentally superior alternative, since it would avoid significant and unavoidable noise and odor impacts related to disturbance of excavation/consolidation and backfill of Parcel "C". However, this alternative does not meet any of the Project objectives and does not correct settlement issues at the Turk Island Landfill or add currently uncontrolled emissions at Parcel "C" to the landfill gas collection and flare system.

Under CEQA, when the "No Project" alternative has been identified as the environmentally superior alternative, it is necessary to identify another alternative that would represent the environmentally superior alternative in the absence of the "No Project" Alternative. The CEQA Guidelines require a consideration of whether alternatives "avoid or substantially lessen" significant impacts of the proposed Project. While the "Carmel Way Access" Alternative and the "Full Consistency" Alternative would both marginally reduce effects related to development and operation of residential units, the impacts it would marginally reduce are already less than significant (or reduced to that level through mitigation) under the proposed Project and would not be substantially lessened or avoided by the alternatives. Impacts related to excavation/consolidation and backfill would not be able to be reduced under any alternative proposing development on Parcel "C" as the landfill site would first need to be fully reclaimed through this process even for reduced development intensities. In the absence of the "No Project" alternative, the proposed Project, the "Carmel Way Access" Alternative, and the "Full Consistency" Alternative are equal in regard to level of impacts and would be substantially equivalent as the environmentally superior alternative. Although the "Carmel Way Access" Alternative and the "Full Consistency" Alternative would otherwise be feasible, it should be noted that the Applicant has questioned the financial feasibility of these Alternatives, as the private residential development would need to fund the excavation/consolidation and landfill improvement activities as well as off-site recreational improvements. A financial feasibility assessment would need to be submitted to support assertions of financial infeasibility.

TABLE 2-1:
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
Significant and Unavoidable Impacts		
Impact Air-2: Waste Odors. Disturbance of a landfill site during the excavation and consolidation activities, especially disturbance of previously landfilled refuse, could result in odor emissions into the neighborhood and park directly adjacent to the Parcel "C" location. While odor are generally expected to be below detection thresholds at nearby receptors and measures will be put in place to minimize the possibility of odor events, because of the unknown nature of non-homogenous landfill waste and possibility for unexpected events that may be discernable as response measures are put into place, the impact would be considered significant and unavoidable.	**Air-2a: Preventing Odors.** Reasonable odor control measures shall be used at all times during excavating and reconstitution activities. These shall include at a minimum: 1. The working face of the landfill shall be kept as small as possible and the Applicant shall make an effort to minimize any extra or unnecessary disturbances to Parcel "C" or the Turk Island Landfill. 2. The working face shall be covered daily with an impermeable barrier (e.g. tarp) or at least six inches of non-odorous soil. 3. Odorous loads of reclaimed material that are being transported from Parcel "C" to the Turk Island Landfill shall be covered with an impermeable barrier (e.g., tarp) or at least six inches of non-odorous soil. 4. A temporary plywood noise barrier shall be constructed, as feasible, around the north, east and south sides of Parcel "C" during consolidation and backfill (as required by Mitigation Measure Noise-1), which will also act as a wind and visual barrier to mitigate potential odor impacts. **Air-2b: Monitoring for High Odor Situations.** The Applicant shall implement procedures for monitoring for intense and/or offensive odors for the duration of landfill excavation and consolidation activities that shall include, at a minimum, the following: 1. The Applicant shall implement a public outreach program, providing contact information to neighborhood residents and instructions for how to report an odor. The Applicant shall also post a sign at the construction site with a telephone number for people to call in case they want to report an odor. 2. The Applicant shall conduct odor patrol using a portable dynamic olfactometer (e.g., Nasal Ranger field olfactometer from St. Croix Sensory). The odor patrol shall be conducted in the surrounding neighborhood as well as onsite. Odor patrol shall be conducted periodically throughout each day as well as whenever changes in odors are observed and/or when complaints are received. When odors are found with a dilution to threshold greater than 4:1 at the property boundary or 1,000:1 at the odor emission point, additional odor controls shall be put in place to mitigate the odors per Mitigation Measures Air-2c and/or Air-2d, as appropriate. Since some field olfactometers have an upper limit on the dilution to threshold ratio (e.g., 60), alternative methods may be needed in order to collect odor readings near the source (e.g.,	Significant and Unavoidable

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	BAAQMD Source Test Method ST-12 for Collection of Odorous Samples.) 3. The odor measurements shall be clearly document and provided to the City on a bi-weekly basis, including: a. Date, time, and location of the odor monitoring b. Equipment name/type c. Odor characteristics (i.e., offensiveness, intensity, odor type/description, duration) d. Weather conditions, including wind speed and wind direction e. Dilution to threshold measured f. Activities occurring onsite during the odor monitoring If odor monitoring indicates odors at the property boundary with a dilution to threshold reading greater than 4:1 (consistent with BAAQMD Regulation 7-302), or odor complaints are generated and confirmed to be associated with Project construction, the Applicant shall implement additional odor controls to mitigate the odors per Mitigation Measures Air-2c and/or Air-2d, as appropriate. **Air-2c: Mitigating High Odor Situations.** If odor monitoring under Mitigation Measure Air-2b indicates a high odor situation, the Applicant shall implement the following odor controls to supplement those outlined in Mitigation Measure Air-2a until the source of the high odor event has been addressed: 1. More stringent odor mitigation measures shall be used at the landfill working face such as temporary covers throughout the day to help reduce/eliminate offsite odors. 2. The Applicant shall evaluate the use of non-toxic odor masking or odor reactant agents, such as covering foams and/or odor neutralizers for perimeter misting systems (see Odor Management and Air Quality/Odor Monitoring Plans for examples). The efficacy of such agents shall be evaluated, taking into considering the specific type of the odors and the possibility that their success may be limited by the short amount of time that the odor comes into contact with the agents. 3. The Turk Island Landfill's landfill gas extraction and control system helps to reduce odors by capturing and flaring landfill gases. Portions of the gas extraction system would be temporarily shut down to facilitate the placement of the relocated refuse fill materials and to allow for reconfiguring and burying the extraction well manifold system. If high odors are observed when the system is shut down, other odor generating activities shall be minimized or ceased until the system can be restarted.	

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	4. If the above measures fail, the Applicant shall stop all work activities until the odor source can be identified and mitigated. If odor situations are frequent and/or prolonged (characterized by receipt of ten or more complaints filed with the hotline in a 90-day period), the Applicant shall also implement additional odor controls per Mitigation Measure Air-2d, as appropriate. **Air-2d: Odor Control Measures for Prolonged and/or Frequent Odors.** Since the Applicant will establish an odor complaint "hotline", odor complaints may not reach BAAQMD, so Regulation 7 limitations may not be triggered. Therefore, if high odors are frequent and/or prolonged, as characterized by receipt of ten or more complaints filed with the hotline in a 90-day period, as a protective step, the Applicant shall implement the following measures consistent with BAAQMD Regulation 7: 1. Locate all odor sources with dilution to thresholds measurements greater than 1,000:1 using the odor panel sampling and evaluation procedures in BAAQMD Regulation 7, section 7-400 through 7-405. 2. Temporarily enclose the odor source(s) identified in (1) above and vent the emissions to an odor control device, such as activated carbon. Be sure all air permitting has been completed for the installation. 3. Complete work during periods when meteorological conditions cause the minimum odor impacts to the surrounding neighborhood. 4. If the above measures fail, stop all work activities until additional odor source controls can be designed and implemented. Note that if ten or more odor complaints are logged with the Air Pollution Control Officer (APCO), BAAQMD will have regulatory authority that supersedes these mitigation measures.	
Impact Air-3: Cumulative Construction Odors Impacts. Disturbance of the landfill site during the excavation and consolidation activities could result in odor emissions into the neighborhood and park that would be considered a cumulatively considerable impact.	**Mitigation Measures Air-2a** through **Air-2d** would reduce Impact Air-3 as feasible through implementation of odor monitoring, control, and reduction measures, but would not be able to reduce impacts below significance levels.	Significant and Unavoidable
Impact Noise-1: Construction Noise. The Project site is bordered by existing residential land uses to the south and east. The nearest noise-sensitive land uses are located approximately 65 feet from the Project site. Noise generated by construction activities associated with the Project would substantially increase noise levels at residential land uses in the vicinity of the Project site. This would be a	**Noise-1: Construction Noise Control and Reduction Measures.** To reduce the noise effects of Project construction activities, the following measures shall be implemented: • Noise-generating activities at the construction site or in areas adjacent to the construction site associated with the Project shall be restricted to the hours of 8:00 AM to 6:00 PM, Monday through Friday, and 9:00 AM to 6:00 PM on Saturdays. No	Significant and Unavoidable

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
significant impact.	work will be performed on Sundays or holidays. These hours are in compliance with and more restrictive than the Union City Municipal Code requirements. • In accordance with City of Union City Municipal Code, the construction noise level at the nearest residential property line shall not exceed 86 dBA. Alternatively, no individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible. • Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment. • Unnecessary idling of internal combustion engines shall be strictly prohibited. • Locate stationary noise generating equipment, such as air compressors or portable power generators, as far as feasible from sensitive receptors. • Construct temporary noise barriers to screen stationary noise generating equipment when located within 100 feet of sensitive land uses. • Utilize "quiet" air compressors and other stationary noise sources where technology exists. • Route all construction traffic to and from the Project site via designated truck routes where possible. Prohibit construction-related heavy truck traffic in residential areas, where feasible. • Control noise from construction workers' radios to a point that they are not audible at existing residences near the Project site. • If approved by OSHA, per requirements of Title 8, Section 1592 of the California Administrative Code, use spotters or flaggers instead of backup beepers to direct the backup operation of mobile equipment. • Erect temporary plywood noise barriers around the north, east and south sides of Parcel "C" during excavation/consolidation and backfill, as feasible, to shield adjacent uses. • The contractor shall prepare a detailed construction noise control plan that identifies the schedule for major noise-generating construction activities and specific procedures for reducing noise levels at residential land uses near the site during major noise generating construction activities to minimize noise disturbance. Major noise generating construction activities include work occurring along the north, east and south sides of Parcel "C" during excavation/consolidation and backfill. • Designate a "disturbance coordinator" who would be responsible for responding to any local	

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule. A record of complaints received, determined cause, and responses implemented shall be provided to the City upon request.	
Impact Noise-2: Cumulative Construction Noise Impacts. Noise generated by construction activities associated with the Project would substantially increase noise levels at residential land uses in the vicinity of the Project site during construction activities, which would be a cumulative considerable impact.	**Mitigation Measure Noise-1** would reduce Impact Noise-2 as feasible through implementation of noise control and reduction measures, but would not be able to reduce impacts below significance levels.	Significant and Unavoidable
Less than Significant Impacts After Mitigation		
Impact Visual-1: Temporary Degradation of Visual Character. Consolidation activities will involve exposure and excavation of landfill debris. This represents a substantial, though temporary, degradation of the existing visual character or quality of the site and its surroundings.	**Mitigation Measure:** Implementation of Mitigation Measure Noise-1, requiring the applicant to erect a temporary plywood noise barrier around the north, east and south sides of Parcel "C" during excavation/consolidation and backfill, as feasible, will also shield adjacent uses from potential aesthetic impacts.	Less than Significant
Impact Air-1: Construction Period Dust and Emissions. Construction of the Project would result in temporary emissions of dust and criteria pollutants that may result in both nuisance and health impacts. Without appropriate measures to control these emissions, these impacts would be considered significant.	**Air-1: Basic Construction Management Practices.** The Project shall demonstrate proposed compliance with all applicable regulations and operating procedures prior to issuance of demolition, building or grading permits, including implementation of the following BAAQMD "Basic Construction Mitigation Measures". • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations. **Mitigation Measure:** Implementation of Mitigation Measure Noise-1, requiring the applicant to erect a temporary plywood noise barrier around the north, east and south sides of Parcel "C" during consolidation and backfill, as feasible, will also act as a wind break to help mitigate potential impacts related to particulate matter.	
Impact Bio-1: Burrowing Owl Disturbance. Excavation, consolidation, and other forms of construction disturbance could result in the direct loss or injury to burrowing owls or the forced evacuation from their burrows.	**Bio-1: Burrowing Owl Survey.** Within 30 days prior to any ground-disturbing activities, the Project applicant shall retain a qualified biologist to conduct a pre-construction survey to determine if any burrowing owls are occupying the Project site (Parcel "C" and the main Turk Island Landfill). The surveys shall be conducted in accordance with the California Department of Fish and Wildlife (CDFW) Staff Report on Burrowing Owl Mitigation. If occupied burrows are found, the biologist shall consult with the California Department of Fish and Wildlife to establish appropriate avoidance measures until such time as the owls are no longer occupying the site. Such avoidance measures may include: • Avoid disturbing occupied burrows during the nesting period, from February 1 through 31 August (the breeding season). • Halting all construction around occupied burrows and for a certain distance around the burrows until such time as the birds abandon the burrow, as determined through monitoring. • Implementing passive relocation measures developed in consultation with CDFW to encourage owls to move from occupied burrows to alternate natural or artificial burrows placed away from the impact zone. • Develop and implement a worker awareness program to increase the on-site worker's recognition of and commitment to burrowing owl protection. • Place visible markers near burrows to ensure that equipment and other machinery does not collapse burrows.	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	• Do not fumigate, use treated bait, or other means of poisoning nuisance animals in areas where burrowing owls are known or suspected to occur (e.g., sites observed with nesting owls, designated use areas). • Conduct Burrow Exclusion. If avoidance of burrowing owl or their burrows is not possible, prior to the first ground-disturbing activities, the project applicant, in consultation with the California Department of Fish and Wildlife, shall prepare a Burrowing Owl Relocation Plan as indicated and following the CDFW 2012 Staff Report. Monitoring of the excluded owls shall be carried out as per the California Department of Fish and Game 2012 Staff Report. • Prepare and Implement a Mitigation Plan. If avoidance of burrowing owl or their burrows is not possible and Project activities may result in impacts to nesting, occupied, and satellite burrows and/or burrowing owl habitat, the project applicant shall consult with the CDFW and develop a detailed mitigation plan such that the habitat acreage, number of burrows, and burrowing owl impacted are replaced. The mitigation plan shall be based on the requirements set forth in Appendix A of the CDFW 2012 Staff Report on Burrowing Owl Mitigation and the Plan shall be reviewed and accepted by CDFW prior to the first ground-disturbing activities.	
Impact Geo-1: Seismic Ground Shaking. There is a high probability that the proposed development will be subjected to strong to violent ground shaking from an earthquake during its design life.	**Geo-1a: Compliance with California Building Code.** Project development shall meet requirements of the California Building Code, including the International Building Code published by the International Conference of Building Officials, and as modified by the amendments, additions and deletions as adopted by the City of Union City, California in effect at time of building permit application. **Geo-1b: Preparation and Compliance with a Design-Level Geotechnical Investigation Report prepared by a Registered Civil or Geotechnical Engineer and with Structural Design Plans as Prepared by a Registered Structural Engineer.** Proper foundation engineering and construction for the residential units on Parcel "C" shall be performed in accordance with the recommendations of a registered Civil Engineer with expertise in geotechnical engineering and a Registered Structural Engineer subject to review and approval by the City. **Geo-1c: Building Permit Issuance.** The Project applicant shall obtain a building permit through the Union City Building Division. Final structural design of planned buildings and structures shall be completed by a licensed engineer and comply with all applicable mitigation measures and regulatory standards. **Geo-1d: Compliance with Closure Requirements for Solid Waste Landfills.** Regulations for closure and post-closure maintenance of solid waste landfills	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	prescribe seismic criteria and slope stability requirements that must be met to mitigate the effects of the maximum probable earthquake (Title 27 Division 2 Chapter 4 Section 21750(f)(5)) and the prompt repair of any damage that may result from a major earthquake (Chapter 3 Subchapter 5 Section 21090). The SFRWQCB and other regulatory agencies including ACEH, BAAQMD, CalRecycle will review and approve some or all of the following documents: the Project Clean Closure/Remediation Plan, Plan Set, and Geotechnical Exploration Report ("Technical Documents"), including project design, work and control plans. Prior to construction, evidence documenting approval of the Technical Documents, including closure requirements and any additional conditions that may be imposed by these agencies to further mitigate geological impacts, shall be provided to the City of Union City before issuance of grading permits. Once approved, the project design, work and control plans shall be fully implemented for the Project.	
Impact Geo-2: Seismic-Related Ground Failure. According to the California Geological Survey Seismic Hazard Zone Map of the 7.5 Minute Newark Quadrangle, the Project site is located within a liquefaction hazard zone.	**Geo-2: Compliance with Recommendations of a Geotechnical Investigation and Conformance with Structural Design Plans.** The Geotechnical Exploration Report was prepared for the proposed residential development aspect of the Project under the direction of a California Registered Geotechnical Engineer (Geotechnical Engineer) and includes an analysis for liquefaction potential of the underlying sediments. Proper foundation engineering and construction shall be performed in accordance with the recommendations of the Geotechnical Investigation. The Geotechnical Exploration Report shall be reviewed and approved by the City's Engineer or the City's expert Consultant. A Registered Structural Engineer shall prepare Project structural design plans. Structures shall be designed to minimize the effects of anticipated seismic shaking and settlements. The Geotechnical Engineer shall review the Structural Design Plans and provide approval for the Geotechnical elements of the plans. The Structural Design Plans shall include specific mitigation measures identified in the Geotechnical Exploration Report to reduce the potential adverse effects of liquefaction. Recommended mitigation measures include, but are not limited to, excavation and replacement as engineered fill and construction PT mat foundations to support the proposed single-family residential structures. **Mitigation Measures Geo-1a** through **Geo-1d** would also help reduce Impact Geo-2 as they provided regulatory review of analysis and recommendation for seismically induced ground failure, including liquefaction and ground surface settlement.	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
Impact Geo-3: Slope Failure and Settlement due to Liquefaction. The Project is in an area identified as having a high potential for liquefaction and the materials in the main landfill portion of the Project are susceptible to settlement (subsidence), lateral spreading and slope failure resulting from static conditions following placement of additional fill and/or due to a seismic event (see Impact Geo-2). Slope failure could result in exposure of landfill waste materials, damage to existing utilities along the east side of the primary landfill and to structures in the areas of potential failure.	**Mitigation Measures Geo-1b** and **Geo-2** will require the applicant to conform to geotechnical recommendations and design plans for the Parcel "C" residential development that minimize the potential for settlement on Parcel "C" and Mitigation Measure Geo-1d requires compliance with closure plans and conditions imposed through regulatory-agency review and approval of the Technical Documents including those related to stability of the main Turk Island Landfill and will reduce Impact Geo-3.	Less than Significant
Impact Geo-4: Subsurface Expansive Soils. Expansive soils including clayey soils are present in the subsurface at Parcel "C". Expansive soils could cause cracking and heaving of concrete slabs.	**Mitigation Measure Geo-1b** would reduce Impact Geo-4 to less than significant levels through requiring compliance with the geotechnical report recommendations including the requirement for engineered fill on Parcel "C".	Less than Significant
Impact Geo-5: Cumulative Geology and Soils Impacts. Strong seismic ground shaking, liquefaction and densification during seismic ground shaking, and soil erosion during Project construction and post construction are common impacts to projects located in the vicinity. Because the Project also includes placement of fill and landfill wastes on an existing landfill that is up to approximately 46 feet above surrounding street elevations (54 feet above mean sea level), there is a potential for slope instability due to landfill material slopes as compared to natural hill slopes. The proposed Project is within an area of relatively recent residential development and contributes to a cumulative increase in sites facing these impacts.	**Mitigation Measures Geo-1a** through **Geo-1d** and **Geo-2** would also reduce Impact Geo-5 to less than significant levels as they require compliance with technical plans and recommendations to minimize geology and soil hazards.	Less than Significant
Impact Haz-1: Development of a Landfill Site that may Contain Waste Materials, Soil or Groundwater with Hazardous Constituents. Parcel "C" of the Project site is the location of a closed landfill, whose wastes could contain hazardous substances. These hazardous substances could create a significant hazard to the public or the environment during excavation and consolidation, as well as future risk to residents and users of the site if mitigation measures are not implemented to reduce the uncertainty associated with disturbance of landfill materials. The Turk Island Landfill also contains gases that are generated from the degradation of landfill waste materials. A primary landfill gas is methane. Methane is a flammable gas that can become a hazard if it migrates underground away from the landfill or up through the top or sides of the landfill at concentrations that make it explosive or flammable.	**Haz-1a: Implementation of the Regulatory Agency-approved CC/RP**. The RWQCB and other regulatory agencies including ACDEH, ACWD, BAAQMD, CalRecycle (collectively, "regulatory agencies") have reviewed, commented and conditionally approved the Project Applicant's proposed CC/RP, including its project design, implementation and control plans, including the following: • Health and Safety Plan that conforms with FED/OSHA 29 CFR 1910.120 and 18 CCR 5144 regulations and includes such measures as: o Personal Protection Equipment (e.g. TyvekTM overalls and gloves) for construction workers to mitigate dermal contact with soil; o work zone and perimeter air monitoring for landfill gases, vapors and particulates; o controlling potential ignition sources; o security measures to control access to the site; and,	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	o training in safety equipment and contingency response procedures. • Dewatering Discharge Controls that conform with National Pollutant Discharge Elimination System permits NO. CAS000002, General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities; and NO. CAG912002 General Waste Discharge Requirements for Discharge or Reuse of Extracted and Treated Groundwater. • Construction Quality Assurance Program including testing and observations to ensure the cover system meets engineering design and geotechnical requirements, which are expected to include a two foot thick soil foundation layer over the landfill materials and a geosynthetic clay layer covered with a vegetative soil layer that will be planted with grasses to control erosion and infiltration. Prior to construction, the CC/RP, including any amendments, shall be approved by the agencies and proof of these approvals, including any additional conditions that may be imposed by these agencies to further mitigate hazardous impacts, shall be provided to the City of Union City before issuance of a grading permit. The final CC/RP shall be fully implemented for the Project. **Haz-1b: Demonstration that Verification Samples Meet Regulatory Requirements for Residential Reuse.** The Project Applicant shall submit verification sampling results and other documentation requested by those regulatory agencies that ultimately approve the CC/RP, and shall obtain approval that the site conditions, proposed detailed design, and any proposed institutional controls make the site suitable for residential development. Sampling results at or below residential environmental screening levels (ESLs) stipulated by the RWQCB will be used to obtain approval that site conditions are suitable for residential use. Submittal of the above results and documentation of site conditions shall include a request for a closure or no further action letter including agency approval of the submittal. **Haz-1c: Evaluation of and Provisions to Address Landfill Gas Migration and Monitoring.** Removal of landfill materials from Parcel "C" will mitigate some of the potential impacts associated with landfill gas at Parcel "C". Two monitoring probes are proposed to be installed at the boundary of Parcel "C" and the main Turk Island Landfill to assess potential gas migration toward Parcel "C". Potential preferential gas migration pathways such as the Union Sanitary District sewer force mains shall be considered in the monitoring plans. The protocols and procedures for installing the probes, sampling, and evaluating analytical results will be described in a work plan. The work plan will be subject to the review and approval of the ACDEH Office of Solid Waste Management and the City of Union City.	

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	Thresholds for acceptable methane levels shall be based on Cal-EPA DTSC advisory screening levels for methane assessment, as described in the 2005 and 2012 publications. If monitoring results indicate the presence of methane above threshold levels and therefore identifies the potential for methane migration toward Parcel "C", then a landfill gas protection system for the residential development shall be installed, subject to the approval of the ACDEH Office of Solid Waste Management and the City of Union City prior to issuance of a building permit. A protection system may include a gas extraction trench along the boundary between the primary landfill and Parcel "C". The protection system shall include provisions for mitigating potential landfill gas migration outside of the perimeter of the main landfill and for monitoring landfill gas between the primary landfill and Parcel "C" residential units. In addition, an evaluation of the existing landfill gas collection system at the main landfill shall be performed as part of the design of the cover system and undergrounding of the gas collection system at the landfill. This evaluation shall address the potential for higher gas volumes or concentrations due to the addition of Parcel "C" materials and construction of the new cover. The adequacy of the existing landfill gas collection system in all areas of the primary landfill shall be determined. If needed, additional gas collection wells or trenches shall be installed to address the potential for fires, releases or migration of landfill gas. **Haz-1d: Disclosures and Institutional Controls.** Regulatory agencies may require Institutional controls for future excavation or other activities because some waste materials potentially remain beneath Parcel "C". The nature and scope of the institutional controls will depend on site conditions following removal of material from Parcel "C". Disclosures to residents of the homes on Parcel "C" shall be part of the lease or property sale agreement. Institutional controls shall be imposed in the form of an Activities and Use Limitation Deed Restriction, recorded with the County of Alameda Recorder's Office. The Deed Restriction would describe subsurface conditions and any prohibitions, maintenance and management requirements necessary during future use and activities at the property. The disclosures and institutional controls shall be provided to the City of Union City for review prior to issuance of the first certificate of occupancy for the residential uses. **Haz-1e: Implementation of Revised Waste Discharge Requirements for Turk Island Landfill and Post-Closure Maintenance.** The primary regulatory mechanism for closed landfills is the issuance of a WDR. Because the Project will result in changes to the existing landfill and changes in use, the RWQCB will issue a revised WDR. Implementing a revised WDR shall provide a regulatory basis for the Project Applicant to protect residential users of the	

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	Project site and recreational users of Sea Breeze Park from the potential longer-term effects of the main Turk Island Landfill, such as the potential for release of landfill gas without treatment (or flaring). The Project Applicant shall develop provisions for implementing changes in existing or additional WDRs. These provisions may include protocols and procedures for maintenance and operation of the landfill gas collection system, monitoring of groundwater quality around the perimeter of the main Turk Island Landfill, monitoring of landfill gas around the perimeter of the landfill, inspection of the landfill cover conditions, settlement and slope inspections, reporting and any other requirements deemed necessary by the regulatory agencies to mitigate the potential exposure of residents to hazardous conditions and substances in the landfill. The Project Applicant shall obtain approval of revised WDR(s) prior to issuance of the first certificate of occupancy for the residential uses and shall implement all of its requirements. **Haz-1f: Preparation and Implementation of a Post-Closure Plan for Monitoring and Maintenance.** The Project Applicant shall prepare a Post-Closure Maintenance and Monitoring Plan (PCMM) that is an update of the current plan implemented as part of the existing WDR. The PCMM shall include provision for the main Turk Island Landfill under Mitigation Measure Haz-1e. The Project Applicant shall implement the requirements of the PCMM. The PCMM shall include provisions for maintenance and operation of the landfill gas collection system, monitoring of groundwater quality around the perimeter of the landfill, monitoring of landfill gas around the perimeter of the landfill, inspection of the landfill cover conditions, settlement and slope inspections, reporting and any other requirements deemed necessary by the regulatory agencies to mitigate the potential exposure of recreational users and residents to hazardous conditions and substances in the landfill.	
Impact Haz-2: Accidental Release of Hazardous Materials to the Environment. During excavation and handling of landfill materials, potentially hazardous materials could be released to the environment through the air, water or soil. During construction, hazardous materials may be released through spills and leaks from construction equipment and materials that could flow into storm drains and infiltrate site soils. As a result of a landslide or slope failure landfill materials could be released.	**Haz-2a: Environmental Training and Monitoring Program.** An environmental training program shall be established to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures and storm water pollution prevention BMPs to all field personnel. The training program shall emphasize site-specific physical conditions to improve hazard prevention (e.g. identification of potential hazardous substances and discovery of potentially hazardous items such as a buried drum) and shall include review of all site-specific plans, including but not limited to the Project documents: • HSP including a Work Zone and Perimeter Air Monitoring Plan; • Spill Prevention, Control, Countermeasure (SPCC) Plan;	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	• Stormwater Pollution Prevention Plan (SWPPP); • Dust and Odor Control Plan; and • Soil Sampling and Analyses Plan. The Project SWPPP shall identify BMPs including material management, erosion, sediment and dust control measures Observations and monitoring shall also be implemented to ensure that the plans are followed throughout the period of construction. Best Management Practices, as identified in the Project SWPPP shall also be implemented during the Project to minimize the risk of an accidental release and provide the necessary information for emergency response. **Haz-2b: Hazardous Materials Trained Contractor and Construction Crew.** A California-licensed hazardous materials contractor and hazardous material trained staff shall perform construction activities involving the handling of landfill waste materials. All site personnel engaged in work that disturbs site soils shall be current in 40-hour hazardous waste operations and emergency response training per CAL/OSHA CCR Title 8 section 5192 and FED/OSHA 29 CFR 1910.120 regulation. Records of such training shall be available for review by the City upon request. **Haz-2c: Project Control Plans.** The CC/RP shall include Project Control Plans, such as the SWPPP, subject to regulatory agency approval, to prevent accidental releases and in the event a release does occur how it will be contained, communicated and cleaned up. Project Control Plans shall include provisions for preventing and responding to accidental releases related to transportation, groundwater handling and dewatering, air emissions, dust and litter control, odor control, stormwater control and erosion control. The Plans shall include mitigation measures for odor and litter control such as limiting the area of exposed waste materials, applying odor control foam, or spraying odor control liquids. Transportation and groundwater dewatering controls are examples of activities that will need approval per the City of Union City and NPDES permit requirements, respectively. **Haz-2d: Public Communication Plan.** A Public Communication Plan shall be prepared to notify nearby residents and park visitors in the event of an accidental release of hazardous substances. The Communication Plan shall include information on how residents or recreational users should communicate any observed releases to the owner during and after construction. The Communication Plan will be introduced to the community as part of the community relations program described in the CC/RP during a public meeting and via a liaison with the City of Union City. **Haz-2e: Spill Prevention, Control, Countermeasure (SPCC) Plan.** A SPCC Plan subject to regulatory agency approval shall be prepared, including preparations for quick and safe cleanup of	

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	accidental spills, per Title 40 CFR Chapter I Subchapter D Part 112 regulation for storage of petroleum fuels in excess of 1,320 gallons. The SPCC plan shall include, but not be limited to, the following standards: limiting the speed of construction equipment, requiring loads to be evenly distributed within the trucks, and requiring the outside of trucks be free of soil or waste materials. This plan should also include provisions in the event of a fire resulting from buried combustible materials or pockets of methane gas. This plan will be incorporated as an addendum to the CC/RP. **Haz-2f: Protection of Union Sanitary District Force Mains.** The Project Applicant shall have a geotechnical engineer evaluate the potential for damage to the existing waste water force main system that runs along western edge of Parcel "C" prior to any grading or other construction activities. The applicant shall implement recommended measures to protect the pipelines against damage and the potential for releases of sewage. These protections may include but are not limited to: • A temporary bridge over the force mains for heavy traffic, and/or • Maximum weight restrictions on the weight of heavy equipment crossing the force mains. **Haz-2g: Implementation of Regulatory Agency-Approved Plans, Permits and Notifications.** The Project Applicant shall implement the approved CC/RP and all required Project Control Plans. In addition to the required approval of the CC/RP by regulatory agencies, the Project Applicant shall perform all appropriate notifications and obtain all appropriate permits including but not limited to: • Grading Permit from City of Union City; • Notification of Excavation sent to BAAQMD; • Confirmation letter from PG&E stating all gas and electric utilities have been removed and/or cleared; • Confirmation letter from the Union Sanitary District with any required plan sign-off; and • Any necessary permits for dewatering, discharge and/or treatment of excavation water from the RWQCB. Implementation of design elements and control plans will be subject to regulatory agency oversight during consolidation and prior to allowing residential uses.	
Impact Hydro-1: Potential Discharge of Polluted Stormwater. Improperly designed, sized or maintained stormwater treatment measures would not maximize pollutant removal and meet water quality requirements and could result in inadequate treatment and discharge of polluted stormwater.	**Hydro-1a: Stormwater Treatment System Design and Sizing.** The pervious paver and bio-retention areas shall be designed in accordance with MRP and ACCWP technical guidance sizing recommendations for stormwater treatment measures whose primary mode of action depends on flow capacity. The bio-retention shall be designed/selected to provide treatment for a flow-based stormwater runoff criteria equal to either (1) the flow runoff produced by a rain event equal to or at least two times the 85th percentile	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	hourly rainfall intensity for the Project site, based on historical records of hourly rainfall depths; or (2) the flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity; or (3) 10% of the 50-year peak flow rate. The surface area of bio-retention areas should be equal to 4% of the effective impervious area of the drainage management area (DMA). The effective impervious area multiplied by 0.04 sizing factor will equal the footprint of the bio-retention area. For sizing purposes, the footprint of the bio-retention area is defined as the area that achieves the required ponding depth and that is underlain with 18 inches of the bio-retention soil mix. Side slopes of the bio-retention area should not exceed 3:1. The surface ponding depth may range from 6 to 12 inches. The inlet to the overflow catch basin should be at least 6 inches above the low point of the bio-retention planting area. If the native soil has a saturated hydraulic conductivity > 1.6 in/hr, a bio-infiltration area may be sized as described above without an underdrain. Otherwise, the applicant shall use an underdrain. In addition to the flow-based design criteria described above, the City Engineer may consider other Numeric Sizing Criteria for Stormwater Treatment Systems, as allowed by the MRP. The design of each layer of the pervious pavers must be determined by the likely traffic loadings and the layers' required operational life. The subgrade should be ungraded in-situ material with a minimum percolation rate of 5 - inches per hour, or based on hydrologic analysis, an underdrain should be installed to remove detained flows within the pervious paving and base. Final calculations and sizing criteria for the proposed stormwater treatment measures shall be submitted and approved by the City prior to issuance of a grading permit for the project. **Hydro-1b: Stormwater Treatment System Maintenance Plan.** A maintenance plan shall be prepared by the applicant's engineer that describes the type and frequency of ongoing maintenance required for proper operation of all post-construction permanent stormwater treatment measures on the Project site. This plan shall be submitted to and must be approved by the Union City Public Works Department prior to first certificate of occupancy.	
Impact Hydro-2: Potential Discharge of Polluted Groundwater to Waters of the State. If dewatering is required during construction as described above, it may contain elevated levels of pollutants that may be discharged to nearby receiving waters.	**Hydro-2a: Compliance with the NPDES Construction General Permit Order 2009-0009-DWQ (CGP).** The CGP allows certain non-stormwater discharges that are necessary for the completion of construction projects. Such authorized non-stormwater discharges include uncontaminated ground water dewatering. These authorized non-stormwater discharges shall (1) be infeasible to eliminate, (2) comply with BMPs as described in the Project SWPPP, and (3) not cause or contribute to a	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	violation of water quality standards. Additionally, these discharges may be required to be permitted by the San Francisco Bay RWQCB. Compliance with these permits may require pre-discharge treatment and testing of the groundwater. **Hydro-2b: Compliance with the NPDES Permit Order R2-2012-0012 NPDES NO. CAG912002 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).** The VOC and Fuel General Permit allows for extraction from cleanup sites and treatment of polluted groundwater for the removal of volatile organic compounds (VOCs) and fuel related pollutants prior to discharges to surface waters including flood control channels or San Francisco Bay. These discharges are required to be permitted by the San Francisco Bay RWQCB. Compliance with this permit requires pre-discharge treatment and testing of the treated groundwater. Alternatively, the Project applicant, may obtain a Groundwater Discharge Permit with the Union City Sanitary District (USD) for the discharge of treated groundwater from dewatering into the sanitary sewer. Under its groundwater program the USD issues permits for groundwater from contaminated site cleanup. Compliance with the USD permit may require filing a permit application, pre-discharge treatment, and testing of the treated groundwater.	
Impact Hydro-3: Soil Erosion. Project grading and other construction activities will disturb site soils and the landfill waste potentially leading to erosion and sedimentation impacts to ACFCD Channel J-3, other adjacent drainages, and the San Francisco Bay.	**Hydro-3a: Preparation and Implementation of Project SWPPP.** Pursuant to NPDES CGP requirements, the Project Applicant shall develop and implement a SWPPP to protect water quality during construction. The SWPPP shall be submitted to the SWRCB via Storm Water Multiple Application and Report Tracking System (SMARTS) as part of the Notice of Intent (NOI) and the Union City Public Works Department for review and approval. The Project SWPPP shall include, but is not limited to, the following mitigation measures for the construction period: • Description of potential sources of erosion and sediment at the Project site and significant materials and chemicals that could be present at the site during construction. • Identification of temporary BMPs to be implemented at the Project site to prevent water pollution during construction (e.g. perimeter silt fences, straw wattles, stormdrain inlet protection such filter fabric inserts). • Erosion control/soil stabilization techniques such as straw mulching, erosion control blankets, erosion control matting, and hydro-seeding, shall be utilized, in accordance with CGP requirements and CASQA guidelines for Erosion and Sediment Control Measures. Sediment control techniques such as silt fences used in combination with fiber	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	rolls shall be installed down slope of all graded slopes. • BMPs for preventing the discharge of landfill waste and other construction-related pollutants in addition to sediment (i.e., paint, concrete, etc.) to downstream waters. • The SWPPP shall describe the locations and the BMPs to be used to control potential stormwater pollution from runoff at vehicle and equipment staging areas, portable restrooms, mobilization areas, and planned access routes. • During and at the completion of construction activities, all drainage facilities shall be inspected for accumulated sediment and landfill wastes, and these drainage structures shall be cleared of debris and sediment. **Hydro-3b: Preparation of Post-Construction Stormwater Monitoring and Maintenance Plan.** Long-term mitigation measures shall be detailed in a Post-Construction Monitoring and Maintenance Plan for the primary Turk Island Landfill in accordance with the CGP. Long-term maintenance of the Parcel "C" BMPs are discussed above under Stormwater BMP Maintenance Plan (Hydro-1b). The Post-Construction Stormwater Monitoring and Maintenance Plan for the primary Turk Island Landfill shall include, but are not limited to, the following: • Description of areas potentially subject to erosion and significant materials and chemicals that could be present at the site after construction. • Development of a monitoring and implementation plan. Maintenance requirements and frequency shall be carefully described including vector control, clearing of clogged or obstructed inlet or outlet structures, vegetation/landscape maintenance, replacement of media filters, etc. Wastes removed from BMPs may be hazardous; therefore, provisions to address contaminated waste, disposal at a proper site, and maintenance plan and costs must be included. • The monitoring and maintenance program shall be conducted at the frequency agreed upon by the RWQCB, the Alameda County Public Works Agency, and the Union City Public Works Department (local oversight agency). Monitoring and maintenance shall be recorded and submitted annually to the SWRCB. • The Project Applicant shall prepare informational literature and guidance on BMPs to minimize pollutant contributions from the proposed development. This information shall be distributed to all facility personnel at the Project site. At a minimum, the information shall cover: a) proper disposal of cleaning chemicals; b) proper use of landscaping chemicals; c) clean-up and appropriate disposal of hazardous materials and chemicals; and d) prohibition of any washing and dumping of materials and chemicals into storm drains.	

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	• The Post-Construction Stormwater Monitoring and Maintenance Plan for the primary Turk Island Landfill must be submitted to the City's Public Works Department prior to issuance of first certification of occupancy.	
Impact Hydro-4: Proposed Residential Units within a Flood Hazard Zone. Parcel "C" is currently within a designated 100-year flood hazard zone. While proposed finish grade of the residential development seems to be above the elevation at which a 100-year flood hazard risk would occur, this has not yet been confirmed through amendment to the flood hazard risk map.	**Hydro-4: Obtain a Letter of Map Amendment.** To demonstrate that proposed development of Parcel "C" would not result in impacts related to a flood hazard zone, the Applicant shall obtain a Letter of Map Amendment from FEMA to amend flood map FIRM 06001C0429G showing Parcel C outside the 100-year flood hazard area Zone AE based on survey data prior to issuance of the first Certificate of Occupancy.	Less than Significant
Impact Hydro-5: Proposed Residential Units within an Area Protected by Levees. The Project site is west of Union City Boulevard in Union City, which is an area protected from flooding by a system of levees and could therefore be subject to flooding due to levee failure.	**Hydro-5: Obtain Confirmation of Levee Stability.** Per General Plan policy HS-B.1.1a, the applicant shall coordinate with ACFCD to confirm stability of levees in the area or implement measures to address levee hazards. Confirmation from ACFCD shall be provided to the City prior to issuance of building permits.	Less than Significant
Impact Plan-1: Potential Inconsistency with Development Standards for Development Near the Turk Island Landfill. The Project applicant has proposed specific landfill gas monitoring and utility exclusion measures but not has not yet reached final determination whether additional protection provisions would be required. The implementation of protection measures or determination that these would not be required is required to ensure consistency with Municipal Code section 18.100.070. This would be considered a potentially significant impact.	**Mitigation Measures Haz-1a** through **Haz-1f** require implementation of an approved Clean Closure / Remediation Plan and the control plans contained therein, including installation of proposed landfill gas monitoring probes between the main Turk Island Landfill and Parcel "C", and determination of required provisions to prevent migration of landfill gas between Parcel "C" and the main Turk Island Landfill (such as the proposed utility exclusion measures to prevent migration along utility lines and potentially also installation of a landfill gas extraction trench if the possibility of landfill gas migration through the soil cannot be determined not to be a risk through data from the new monitoring wells).	Less than Significant
Impact Traf-1: Roadway Damage. Repetitive heavy-vehicle presence on roadways may cause cracking, deterioration, rutting, and ultimately failure of roadway pavement, which can create hazards for motorists and bicyclists.	**Traf-1: Pavement Analysis or Documentation.** Before backfilling of Parcel "C" begins, in coordination with the City, the applicant shall: 1. Identify Truck Routes – Identify the truck routes for the Project. Truck routes shall be one of the routes discussed in this section consisting of roadways between the Project site and nearby freeways and other streets in the vicinity of the Project that would likely be used by heavy trucks. 2. Conduct Baseline Pavement Conditions Surveys – Before the start of Project construction, conduct a survey to document the pavement conditions along the approved truck routes. 3. Conduct Post-Project Pavement Conditions Surveys – Using the same methodologies used in the baseline surveys, document the pavement conditions along the approved truck routes after completion of the Project. 4. Repair Damaged Pavement Sections – Compare the baseline and the post-Project pavement conditions surveys to identify the damaged	Less than Significant

Potentially Significant Impacts	Mitigation Measures	Resulting Level of Significance
	pavement sections. The Project applicant shall be responsible for repairing the damaged sections caused by the Project and ensuring that the damaged streets would be restored to their condition prior to the Project and subject to City oversight.	
Impact Utilities-1: Potential Damage to Force Mains. The transport of 175,000 cubic yards of material in heavy vehicles over and across the on-site force mains could cause pipe movement/pipe joint separation resulting in the release of raw sewage and interruption of sewer service on a regional level. This represents a potentially significant impact.	**Mitigation Measure: Haz-2f** will reduce this impact to a less than significant level by requiring an evaluation of the potential for damage to the existing force mains and provisions to protect against such damage.	Less than Significant
Impact Culture-1: Disturbance of Previously Unknown Cultural Resources or Human Remains. During earth-moving activities that would disturb native soils, it is possible that previously unknown cultural resources or human remains could be uncovered and disturbed.	**Culture-1a: Halt Construction Activity, Evaluate Find and Implement Mitigation.** In the event that any previously unidentified cultural resources are uncovered during site preparation, excavation or other construction activity, all such activity shall cease until these resources have been evaluated by a qualified archaeologist (or other qualified specialist as appropriate) and specific mitigation measures can be implemented to protect these resources. **Culture-1b: Halt Construction Activity, Evaluate Find and Take Appropriate Action in Coordination with Native American Heritage Commission.** In the event that any human remains are uncovered during site preparation, excavation or other construction activity, all such activity shall cease until these resources have been evaluated by the County Coroner, and appropriate action taken in coordination with the Native American Heritage Commission.	Less than Significant

Less than Significant Impacts (No Mitigation Required)
Less than Significant Impact Statements
(Aesthetic Impact Thresholds 1 and 2) The Project would not result in a substantial adverse effect on a scenic vista or scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway (less than significant impact).
(Aesthetic Impact Threshold 3) The Project would increase the height of the main Turk Island Landfill lobes but would not change the general character of that site, which already rises above surrounding development, and would change the character of the Parcel "C" site from a mounded landfill site to residential development consistent with surrounding development, which would not be considered a negative character. The Project would have a less than significant impact related to substantial permanent degradation of the existing visual character or quality of the site and its surroundings.
(Aesthetic Impact Threshold 4) The Project would have a less than significant impact related to the creation of a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.
(Aesthetic Impact Threshold 5) The Project would not result in aesthetic impacts that are individually limited, but cumulatively considerable (less than significant).

(Air Quality Impact Threshold 3) The Project would not substantially increase odors during construction of the residential subdivision or during operation of the residences and landfill (less than significant impact).
(Air Quality Impact Thresholds 4 and 5) The Project would have a less-than-significant impact related to potential to expose sensitive receptors or the general public to substantial levels of toxic air contaminants or accidental releases of acutely hazardous substances.
(Air Quality Impact Threshold 6) The Project would have a less-than-significant cumulative air quality impact except in the topic of construction-period odors.
(Biological Resources Impact Threshold 1) The Project would have a less than significant impact, both directly and through habitat modification, to all sensitive species with the exception of the burrowing owl.
(Biological Resources Impact Thresholds 2 and 3) The Project would not result in a substantial adverse effect on any riparian habitat, wetlands, or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USWFS (less than significant impact).
(Biological Resources Impact Threshold 4) The Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (less than significant impact).
(Biological Resources Impact Threshold 7) The Project would not result in significant impacts to biological resources that are individually limited, but cumulatively considerable (less than significant impacts).
(Geology and Soils Impact Threshold 1) The Project would have a less than significant impact related to the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving rupture of a known earthquake fault.
(Hazards and Hazardous Materials Impact Threshold 1) The Project would have a less-than-significant impact related to the routine transport, use, or disposal of hazardous materials.
(Hazards and Hazardous Materials Impact Threshold 3) The Project would have a less-than-significant impact related to production of hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
(Hazards and Hazardous Materials Impact Threshold 7) The Project would have a less-than-significant impact related to interference with an adopted emergency response plan or emergency evacuation plan.
(Hazards and Hazardous Materials Impact Threshold 9) The Project would have a less-than-significant impact related to cumulative hazards and hazardous materials impacts with incorporation of mitigation measures.
(Hydrology and Water Quality Impact Thresholds 4 and 5) The Project would be required under existing regulations to address changes in stormwater volumes on-site and will not have the potential to substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site and create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (less than significant).
(Hydrology and Water Quality Impact Thresholds 9 and 10) The Project would have a less than significant impact related to the potential to cause inundation by seiche, tsunami, or mudflow or flooding related to dam failure.
(Hydrology and Water Quality Impact Threshold 11) The Project would have a less-than-significant impact related to cumulative hydrology and water quality impacts.
(Noise Impact Threshold 1) The Project would have a less than significant impact related to the 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.

(Noise Impact Threshold 2) The Project would have a less than significant impact related to the exposure of persons to, or generation of excessive groundborne vibration or groundborne noise levels.
(Noise Impact Threshold 3) The Project would have a less than significant impact related to a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project.
(Noise Impact Threshold 7) The Project would have a less than significant impact related to cumulative operational noise impacts.
(Transportation Impact Thresholds 1 and 2) The Project would have a less than significant impact related to increased traffic, and level of service standards.
(Transportation Impact Thresholds 3 and 4) The Project would not result in a substantial adverse effect related to hazards due to a design feature or inadequate emergency access (less than significant).
(Transportation Impact Threshold 6) The Project would have a less than significant impact related to contribution to cumulative traffic.
(Utilities Impact Thresholds 1, 2, and 5) The Project would have a less than significant impact related to increased wastewater.
(Utilities Impact Thresholds 2 and 4) The Project is consistent with site development assumptions and therefore consistent with the adopted Urban Water Management Plan and would have a less than significant impact related to increased water demand.
(Utilities Impact Threshold 3) The Project would be required under existing regulations to address changes in stormwater volumes on-site and will not have the potential to require or result in the construction of new off-site storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (less than significant).
(Utilities Impact Thresholds 6 and 7) The Project would comply with federal, state, and local statutes and regulations related to solid waste and would have a less than significant impact related to solid waste disposal needs.
(Utilities Impact Threshold 8) The Project would not require or result in the construction of gas or electricity generation facilities, the construction of which could cause significant environmental effects and would have a less than significant impact related to increased demand for gas and electric service.
(Energy) The Project would have an incremental increase in energy usage. However, the Project includes elements to increase efficiency of energy use during construction and operation, complies with all applicable energy standards and regulations, and would not use energy in a wasteful, inefficient, or unnecessary manner. The Project would have a less than significant impact relating to energy consumption with no mitigation warranted.
(Greenhouse Gas Emissions Impact Threshold 1 and 2) The Project would generate greenhouse gas emissions during both construction and operation, but the Project would be consistent with the Union City Climate Action Plan (the applicable GHG Reduction Plan) and below thresholds for impacts related to landfill construction emissions, and would not increase operational landfill emissions (less than significant).
(Population and Housing Impact Thresholds) The Project would not displace people or housing and would have a less than significant impact with respect to population growth.
(Public Services Impact Thresholds) The Project would marginally increase demand for public services but would not require new or altered governmental facilities and the impact to public services would be less than significant.
(Recreation Impact Thresholds) The Project would marginally increase demand for parks and other recreational facilities, but would not substantially contribute to deterioration or require new or altered governmental facilities beyond the off-site improvements proposed as part of the Project (less than significant).

3

PROJECT DESCRIPTION

For easy locating, **Figures 3-1 through 3-10** are included together at the end of this chapter (pages 3-7 through 3-25).

PROJECT APPLICANT

The Project Applicant is Nuvera Homes.

PROJECT OBJECTIVES

The City of Union City has identified the following objectives for the Turk Island Landfill Consolidation and Residential Subdivision Project in coordination with the applicant:

1. To develop housing on an infill site in an economically feasible manner on an underutilized parcel consistent with the quality and aesthetics of the surrounding neighborhood.
2. To enhance neighborhood amenities with improvements to Sea Breeze Park and to provide a trail link along the storm detention ponds to the park.
3. To correct settlement issues and reestablish the effectiveness of the final cover of the Turk Island Landfill.

LOCATION AND VICINITY OF THE PROJECT

PROJECT SITE

The Project site is located in Union City, California, in southern Alameda County, located near the intersection of Carmel Way and Westport Way (see **Figures 3-1** and **3-2**).

As shown on **Figure 3-1**, the Turk Island Landfill formerly consisted of three distinct adjacent areas: a primary 47-acre parcel (Turk Island Landfill proper, referred to in this document as "Turk Island Landfill", APN 482-50-10-6 and 482-40-8-5), the 6.3-acre Parcel "C" (APN 482-53-4), and a 3.2-acre parcel just to the east of Parcel "C".

Turk Island Landfill (Primary 47-acre Parcels): The Turk Island landfill received waste from 1962 through 1986, and is currently designated as a closed Class III municipal solid waste landfill. The landfill was officially closed under regulatory authority in 1988 and follows post-closure monitoring and maintenance.[1] The final cover, or cap, was originally graded to promote surface runoff; however,

[1] A "closed" landfill site is one that is no longer accepting waste, has a physical cover (usually involving soil or clay) to contain waste, and follows an approved post-closure plan to maintain the site, minimize and/or

as is common with landfills, long-term settlement has reduced these grades and the cover's integrity has been partially compromised by animal burrowing and minor tensile tearing produced by settlement of the underlying refuse. These conditions have combined to result in depressions, reduced grades, and reduced effectiveness of the cover in certain areas.

A landfill gas collection and destruction system was installed at the site in 1988 to extract and destroy landfill gasses. As shown on **Figure 3-3**, the system consists of 32 extraction wells, above-grade collection piping, two blowers, and a flare. Underground piping also extends to a dormant landfill gas extraction trench around Parcel "C". The provisional trench was installed as a condition of the adjacent Sea Breeze development in 1998 but has never been activated due to the lack of landfill gas detections in the perimeter probes.

Parcel "C": Debris at the 6.3-acre Parcel "C" were initially deposited directly on the native clay surface and eventually capped with approximately four feet of cover soil. Parcel "C" received primarily construction waste mixed with some municipal refuse during the landfill's operation from about 1963 until early 1970. The site was officially closed in 1974 following placement of the existing earthen cover. The final grading resulted in a raised, relatively flat, ground surface elevated above surrounding development. Overhead PG&E power lines just west of Parcel "C" and two underground sanity sewer forcemains run in an easement along the west side of Parcel "C". Parcel "C" is the site of the currently proposed residential subdivision.

3.2-acre Parcel: The 3.2-acre Parcel was used primarily for stockpiling soil/slag fill until about 1970. In 1998, most of the soil/slag fill on the 3.2-acre parcel was removed and taken to an offsite disposal facility and the parcel was backfilled with clean, imported soil. New homes, part of the "Sea Breeze" development, were then built on the parcel. The 3.2-acre parcel is no longer regulated as part of the Turk Island Landfill and is not a part of the Project site.

Project Site Definition: In this document, the term "Project site" refers to both the main Turk Island Landfill and Parcel "C".

The Turk Island Landfill and Parcel "C" are generally covered with grasses and unimproved, with the few site enhancements consisting of the landfill gas extraction and flare system, a network of groundwater and gas monitoring wells, and unpaved perimeter and top-deck access roads. Both the Turk Island Landfill and Parcel "C" are currently fenced for security.

PROJECT CONTEXT

As shown in **Figure 3-2**, land uses surrounding the Project site include the Sea Breeze development to the east consisting of single-family homes, Sea Breeze Park immediately to the north of Parcel "C", and stormwater retention ponds and wetland areas to the north of the park. Farther north is an Alameda County Flood Control District channel (J-3) and a wetlands area. To the south is the Bay Colony single-family residential development and a seasonal wetland. To the west is a shallow stream channel, former salt evaporator ponds, the Coyote Hills Regional Park, and the San Francisco Bay.

The Project site is located within the 511 Area, a 905.6-acre area between Union City Boulevard and the San Francisco Bay identified in a 1987 Specific Plan[2] for its unique opportunity for residential

monitor continued acceptable containment of waste and related potential contamination, and/or remediate contaminants. Post-closure plans and the ongoing requirements vary by site and the nature of the waste. As discussed below, the post-closure plan for this site is the Clean Closure/Remediation Plan.

[2] City of Union City, *511 Area Specific Plan,* September 14, 1987.

development because of availability of utilities and convenience to new commercial areas and state highways. The site zoning is "511 Area," indicating development must be consistent with the 511 Area Specific Plan. Consistent with that plan, the 47-acre Turk Island Landfill is designated OS – Open Space in the General Plan, while Parcel "C" has a land use designation of R3-6 – Residential (3 to 6 dwelling units per acre).

DESCRIPTION OF THE PROJECT

The Project involves relocation of landfill debris from the 6.3-acre Parcel "C" to the adjacent Turk Island Landfill followed by backfill of Parcel "C" with clean imported soil and subsequent development as a 33-unit residential subdivision.

EXCAVATION, LANDFILL CONSOLIDATION AND RECONSTRUCTION, AND BACKFILL

The Project proposes excavation of a total of approximately 170,000 to 175,000 cubic yards of material from Parcel "C" that would be transported to the adjacent Turk Island Landfill for consolidation. This includes approximately:

- 30,000 cubic yards of existing soil cover,
- 130,000 cubic yards of landfill debris, and
- 10,000 to 15,000 cubic yards (at least six inches depth) of underlying native soils that have the potential to contain elevated contaminant levels from landfill leachate.

The expected depth of the excavation would vary from approximately five feet (at the edges) to eighteen feet in the middle of the landfill. The actual final depth of the excavation would be determined during construction due to the expected irregular surface of the underlying native clay layer, similar to that found after excavation of the 3.2-acre parcel. Excavation would proceed using a large excavator to dig out one cross-section of the Parcel "C" site at a time to minimize the working face and associated potential refuse odors. Dump trucks would be used for transport of the materials from Parcel "C" to the Turk Island Landfill.

Samples of the Parcel "C" underlying native soil and excavation sidewalls would be collected and analyzed to verify the successful completion of debris removal activities. Analysis of the samples against residential Environmental Screening Levels established by the Regional Water Quality Control Board (RWQCB) would determine if additional remediation and/or excavation of underlying soils is required.

Based on the test pit data from the site, the bottom of the refuse in the middle of Parcel "C" is sometimes in contact with groundwater. The Project proposes to stage the excavation when the groundwater level is expected to be below the bottom of the excavation. If this proves to be the case, no excavation of groundwater is anticipated to be necessary. If, however, substantial groundwater is encountered such that dewatering is necessary to complete construction activities, such water evacuation would occur with the appropriate testing, treatment, and discharge permits that would be issued by the RWQCB.

The effective portion of the existing cover on the Turk Island Landfill would remain intact and in place throughout the consolidation process. Landfill debris currently in the primary Turk Island Landfill would not be exposed at any point in the process. Materials excavated from Parcel "C" would be incorporated into the Turk Island Landfill by placing and compacting them on top of the

existing landfill cover (to be left intact and in place) in the locations shown on **Figures 3-3 and 3-4**, then subsequently adding an additional cover over the resulting fill of clean, imported, low permeability soil in accordance with applicable engineering controls and regulations. The reconfiguration resulting from consolidation and reconstruction will also serve to remove depressed areas subject to ponding during precipitation events and improve site drainage.

Work on the Turk Island Landfill would also include reconditioning (moisture conditioning and recompacting in place) the cover over the entire landfill, reconstructing and undergrounding the landfill gas extraction system, and reestablishing original drainage grades, which have been degraded due to normal settlement of landfill debris over time. In compliance with the Bay Area Air Quality Management District's Regulation 8,Rule 34, Section 115 or under a permit modification, phased portions of the Turk Island Landfill's landfill gas extraction system would be temporarily shut down to facilitate the placement of the relocated refuse fill materials and to allow for reconfiguring and burying the extraction well manifold system.

During excavation and consolidation, dump trucks would travel directly between Parcel "C" and the Turk Island Landfill. The applicant has preliminarily estimated movement of the up to 175,000 cubic yards of material would take approximately 75 working days assuming 10 dump trucks with 12 cubic yard capacity making 20 cycles each day. If the contractor uses additional dump trucks or those with a greater capacity, the timespan and/or number of trips could be reduced. However, these assumptions are reasonable and conservative for purposes of this analysis.

As excavation of the site proceeds, locations where excavation is completed will be backfilled with clean soil. Approximately 70,000 to 80,000 cubic yards of clean engineered fill soil would be imported to Parcel "C" to raise the resulting surface grade to match the surrounding improved grades as shown in **Figure 3-5**. The source for the clean fill has not yet been finalized, but would be off site and require use of public roads. Analyses have used area average distances to fill locations and considered the possibility of different truck routes depending on the location ultimately chosen. For a conservative analysis, it has been assumed that relatively low-capacity trucks (slightly more than 10 cubic yards) would be used, requiring up to 7,910 trips over the backfill period. The applicant has noted that trucks with capacities of 12 to 15 cubic yards are often used instead and would reduce the number of trips required. As noted above, fill will occur partially concurrently with excavation, and both are expected to be completed within a six month total timeframe. This analysis assumes the excavation only would occur for the first 2 months, both excavation and fill would occur during the next 1.75 months, and fill only would be completed during the final 2.25 months.

Groundwater and landfill gas monitoring wells/probes are currently located along the perimeter of the Turk Island Landfill and Parcel "C" consistent with the closure requirements and post-closure plan for the Project site. As part of the Project, the monitoring wells between Parcel "C" and surrounding residential and park development (probes MP-1 through MP-5) will be decommissioned and replaced with two new probes to be located between the proposed residential development on Parcel "C" and the primary Turk Island Landfill. This relocation of the probe network is consistent with post-closure requirements to maintain monitoring between areas with landfill refuse and other development.

RESIDENTIAL SUBDIVISION AND SEA BREEZE PARK IMPROVEMENTS

Following excavation and backfill, Nuvera Homes has proposed a subdivision of 33 two-story single-family detached residential homes on the reclaimed Parcel "C" as shown in the lotting plan in **Figure 3-6**. The preliminary landscape plan and site plan included as **Figure 3-7** shows additional detail. Lots would average 56.3 feet wide (ranging from 50.5 to 74.5), 94.9 feet deep (ranging from 84 to 109), with an average area of 5,322 square feet (ranging from 4,680 to 7,286).

Access to the proposed residential units would be provided by a new looped road off Westport Way, labeled "Street A" on **Figures 3-6 and 3-7**. The majority of homes would front onto this new street, with a row of seven homes fronting on Carmel Way. Homes would include two- and three- car garages providing up to 95 vehicle spaces in garages. Parking in private driveways and on the public Street A are estimated to provide 66 and 50 additional vehicle parking spaces respectively.

The Project has been designed to be consistent with the site's residential General Plan designation (3-6 units/acre) and residential Zoning designation of 511 Area District (511) and be compatible with surrounding neighborhoods.

As indicated on **Figure 3-6**, Parcel B along the northern boundary of the Project site has been used as public vehicle access to the adjacent Sea Breeze Park and would be dedicated to the City for continuation of that use. Parcel A along the boundary with the Turk Island Landfill has PG&E power lines and an East Bay Dischargers Authority pipeline and would include landscaping to be maintained by the subdivision's Homeowners' Association (HOA).

The Project would include a public pedestrian connection to provide direct access along the proposed street between Westport Way and Sea Breeze Park. Because the street would not connect through to the parking lot, the last leg of the pedestrian access runs to the side of one of the residential lots (lot 1).

To reduce potential disturbance of future Project residences from nearby recreational users, a seven foot tall soundwall is proposed between the Sea Breeze Park parking lot and adjacent Project lots (lots 1-7 and 33) as well as along the western side of lot 1 adjacent to the pedestrian connection.

Off-site improvements to the adjacent Sea Breeze Park are also proposed, including a new play structure, an interpretive trail adjacent to the stormwater retention ponds, expansion of the parking lot for the park, and improvements to/refurbishment of some existing facilities as shown in **Figures 3-8, 3-9, and 3-10**.

CONSTRUCTION SCHEDULE

Excavation, landfill consolidation and reconstruction, and backfill are estimated to occur over a 6 month period. Site preparation and home construction for the residential subdivision, as well as off-site improvements, would occur after that, with completion assumed approximately one year to a year and a half later.

At the time of preparation of the analyses for this document, excavation activities were expected to be initiated in January 2018 with occupancy of residential units on the site expected to begin in 2019 or 2020. While the target dates of initiation are now expected to be later and would be dependent on timing of approvals, the delayed initiation does not otherwise change the construction activities or schedule and would not change conclusions in this EIR.

PROJECT APPROVALS

The Project sponsor is requesting the following discretionary City approvals:

- Site Development Review (SD) of the landfill consolidation and proposed development on Parcel "C"

- Approval of a Tentative Tract Map (TTM) to subdivide Parcel "C" into 33-unit residential lots.

- Approval of a Conditional Use Permit (UP) for a planned unit development (PUD) to average lot standards and setbacks across the development for residential development of Parcel "C"

If the proposed Project is approved, development of the Project site as proposed may first require discretionary approvals and/or permits from the following public agencies:

- Approval of the Clean Closure/Remediation Plan for the landfill consolidation from the San Francisco Regional Water Quality Control Board, the Bay Area Air Quality Management District, Alameda County Department of Environmental Health, Alameda County Water District, and the California Environmental Protection Agency Department of Resources Recycling and Recovery, Waste Permitting, Compliance, & Mitigation Division (CalRecycle)

- Bay Area Air Quality Management District determination that modification and temporary shutdown fall under the Bay Area Air Quality Management District's Regulation 8,Rule 34, Section 115 or approval of modification of the existing permit to operate a landfill gas collection system.

- Regional Water Quality Control Board issuance of revised Waste Discharge Requirements, including updated Post-Closure Maintenance and Monitoring Plan.

In addition, those providing utility service to the Project site (e.g., the Alameda County Water District, the Union Sanitary District and Pacific Gas and Electric Company) would review and sign-off on development plans to ensure that the development can be adequately served, and the City of Union City would require receipt of "will serve" letters or other documentation (as appropriate) prior to issuance of building permits, as a condition of Project approval.

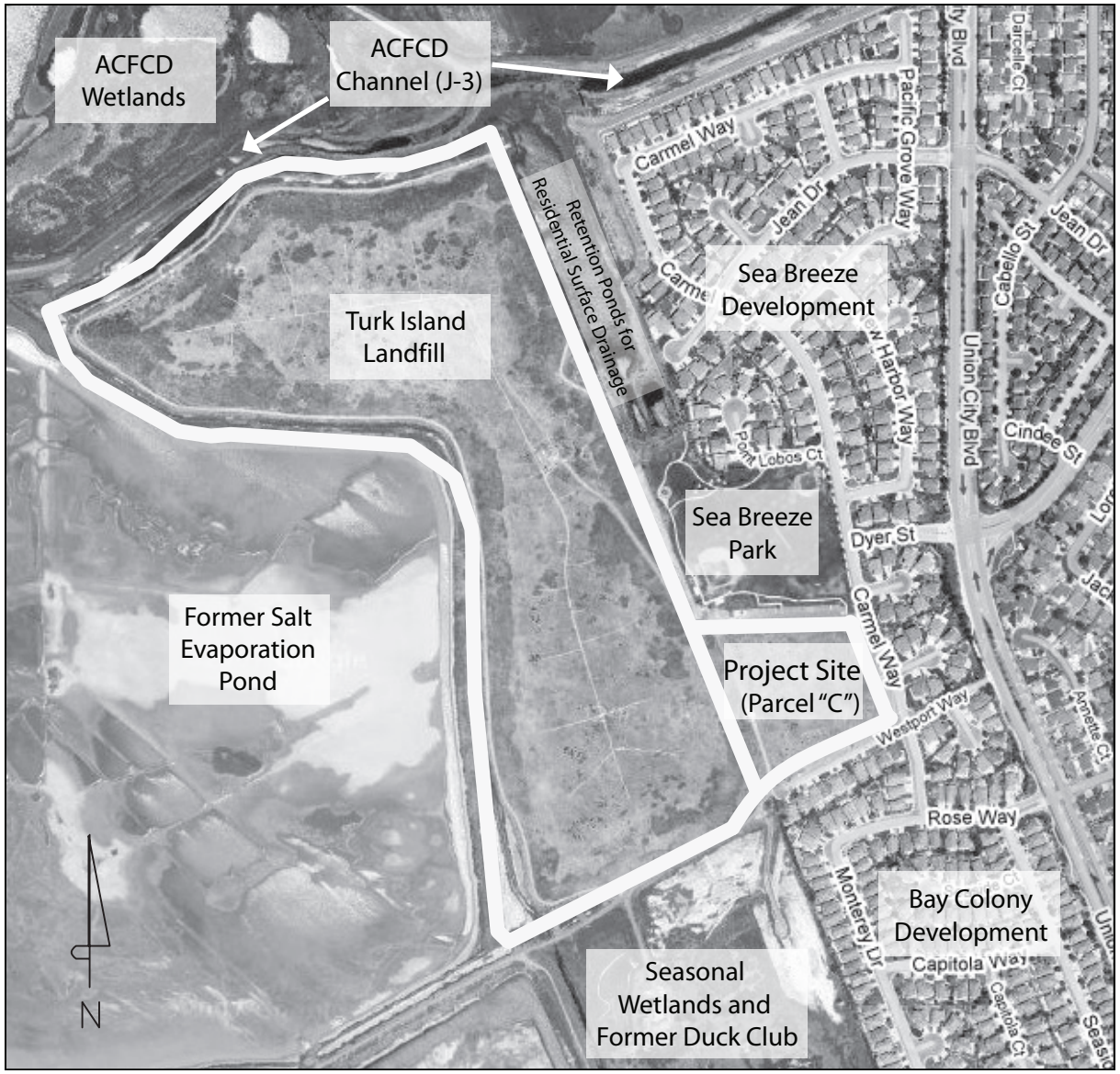


Figure 3-1: Project Site Location
Source: GoogleMaps as annotated by Lamphier-Gregory

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Figure 3-2: Project Vicinity
Source: GoogleMaps as annotated by Lamphier-Gregory

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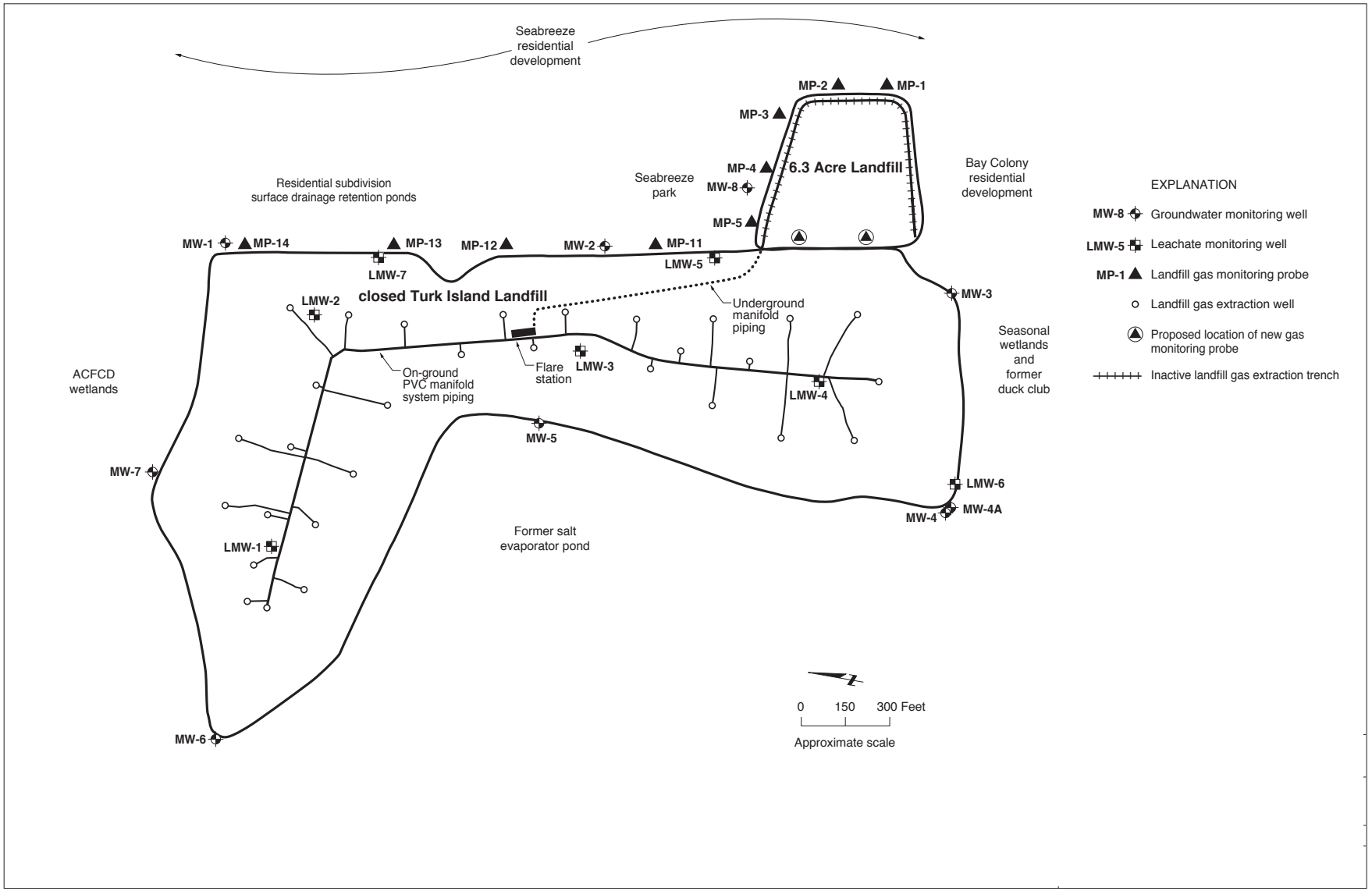


Figure 3-3: Landfill Facilities
Source: The Remediation Group, Inc.

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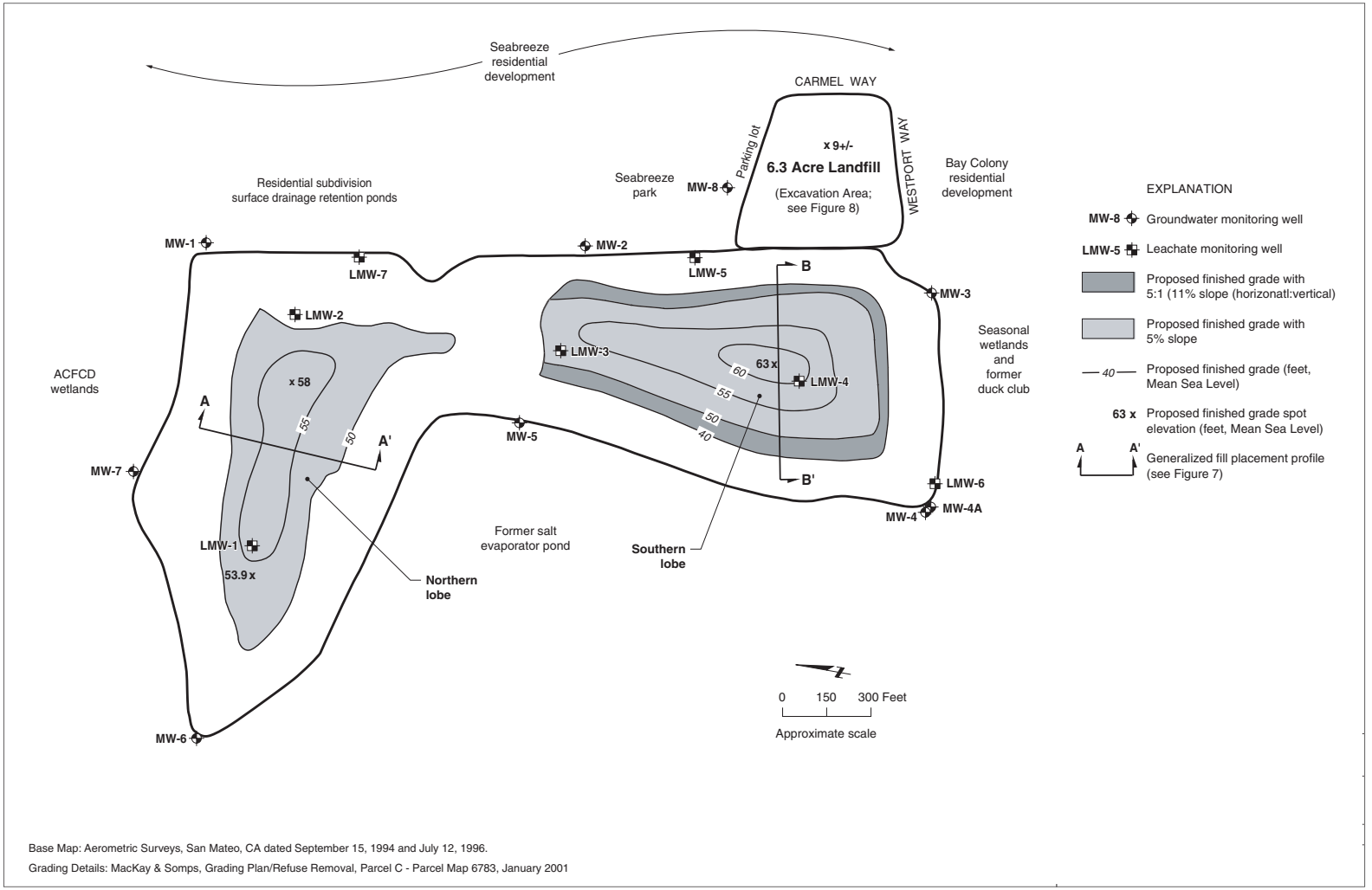


Figure 3-4: Preliminary Grading Plan
Source: The Remediation Group, Inc.

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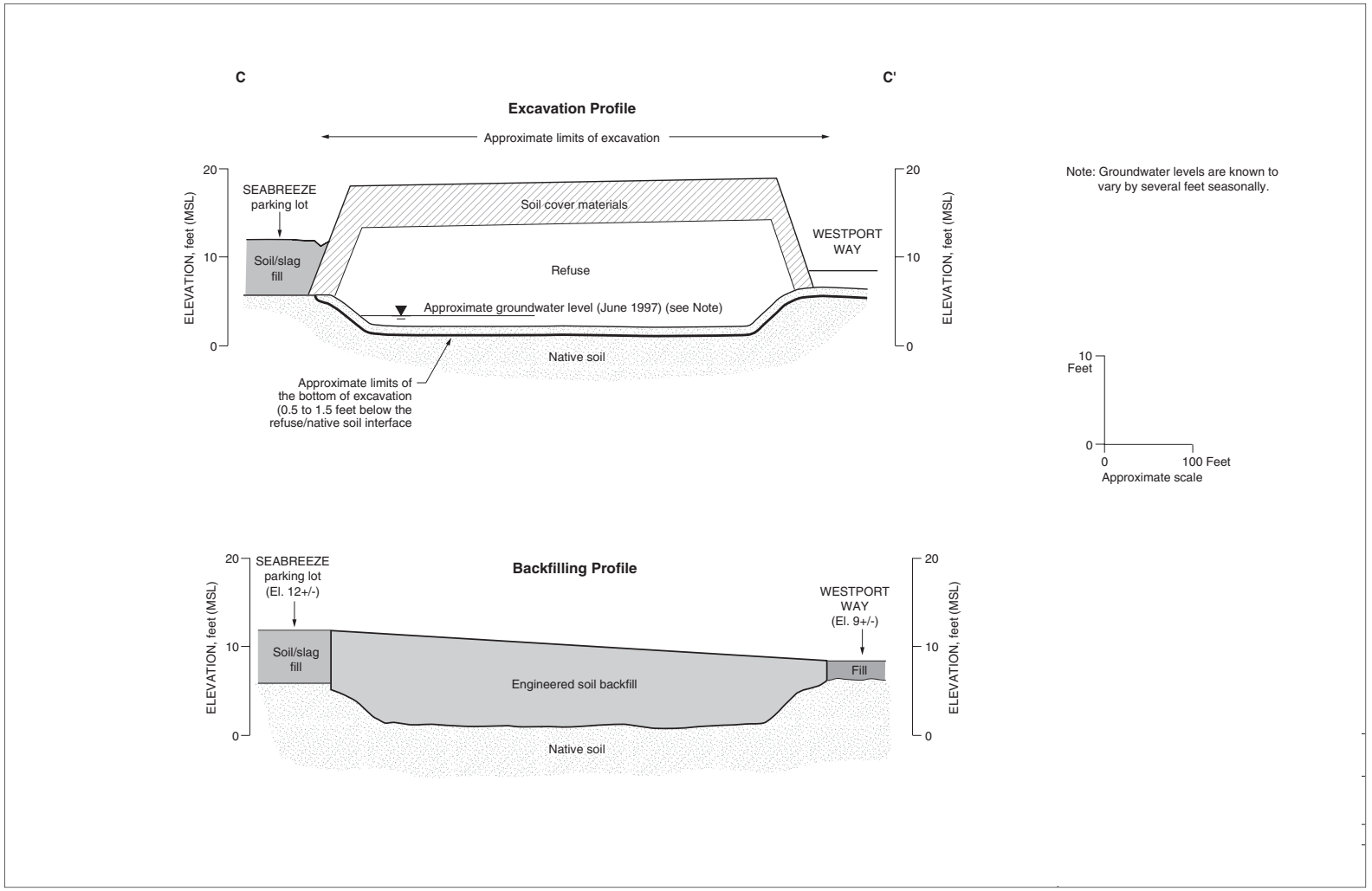


Figure 3-5: Excavation and Backfill Profiles
Source: The Remediation Group, Inc.

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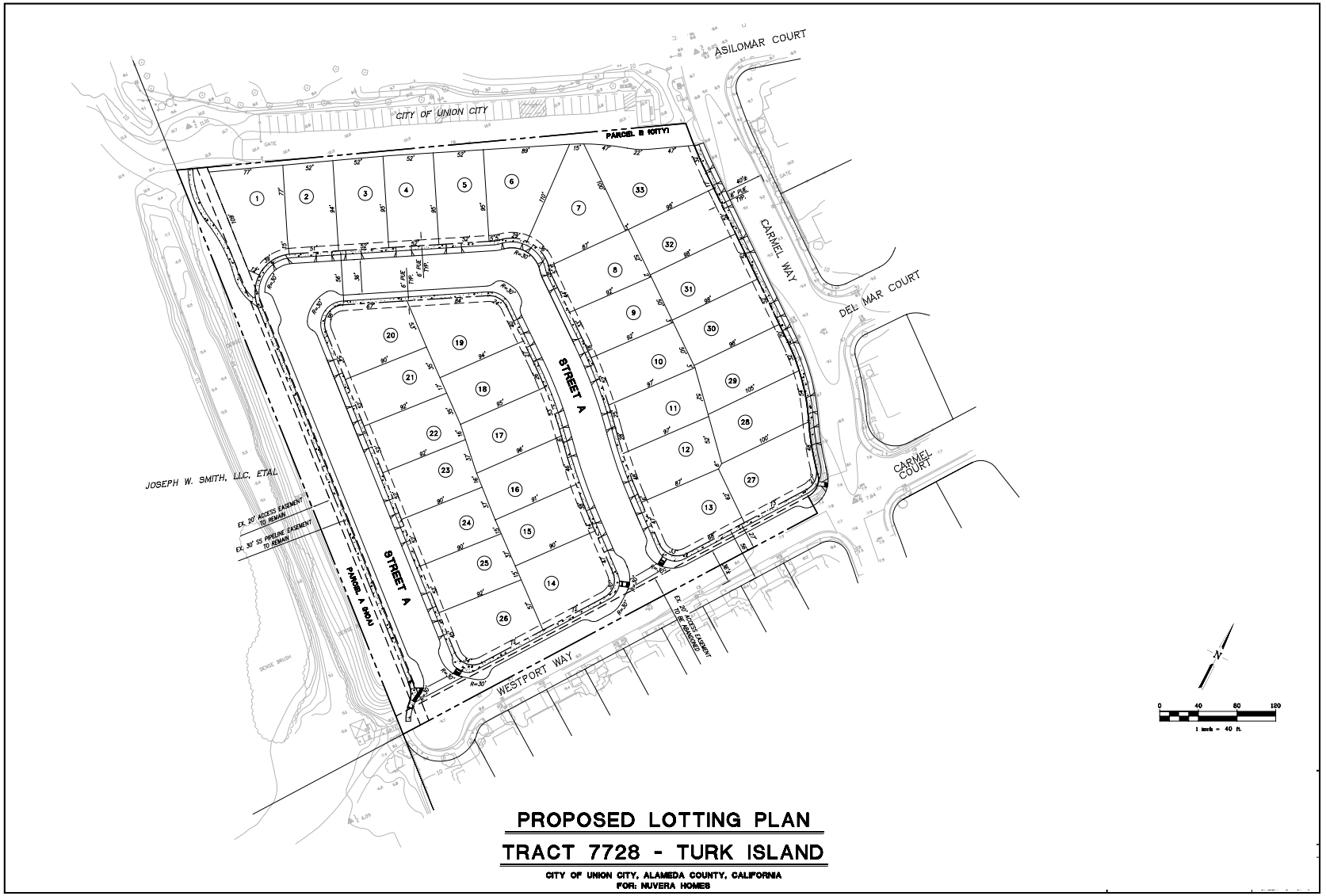


Figure 3-6: Proposed Lotting Plan
Source: Ruggeri, Jensen, Azar
December 2016

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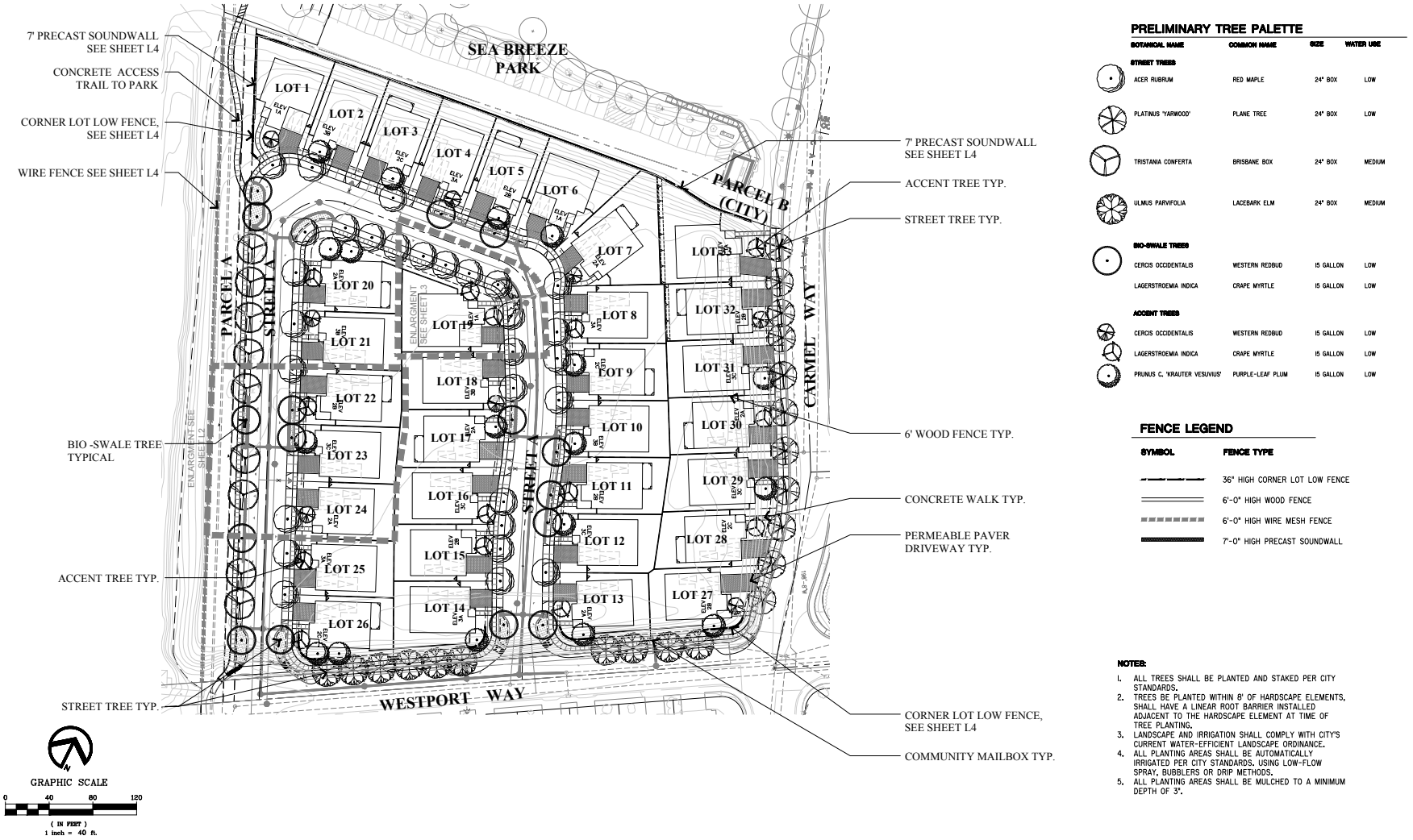


Figure 3-7: Preliminary Landscape Plan
Source: Ripley Design
June 2017

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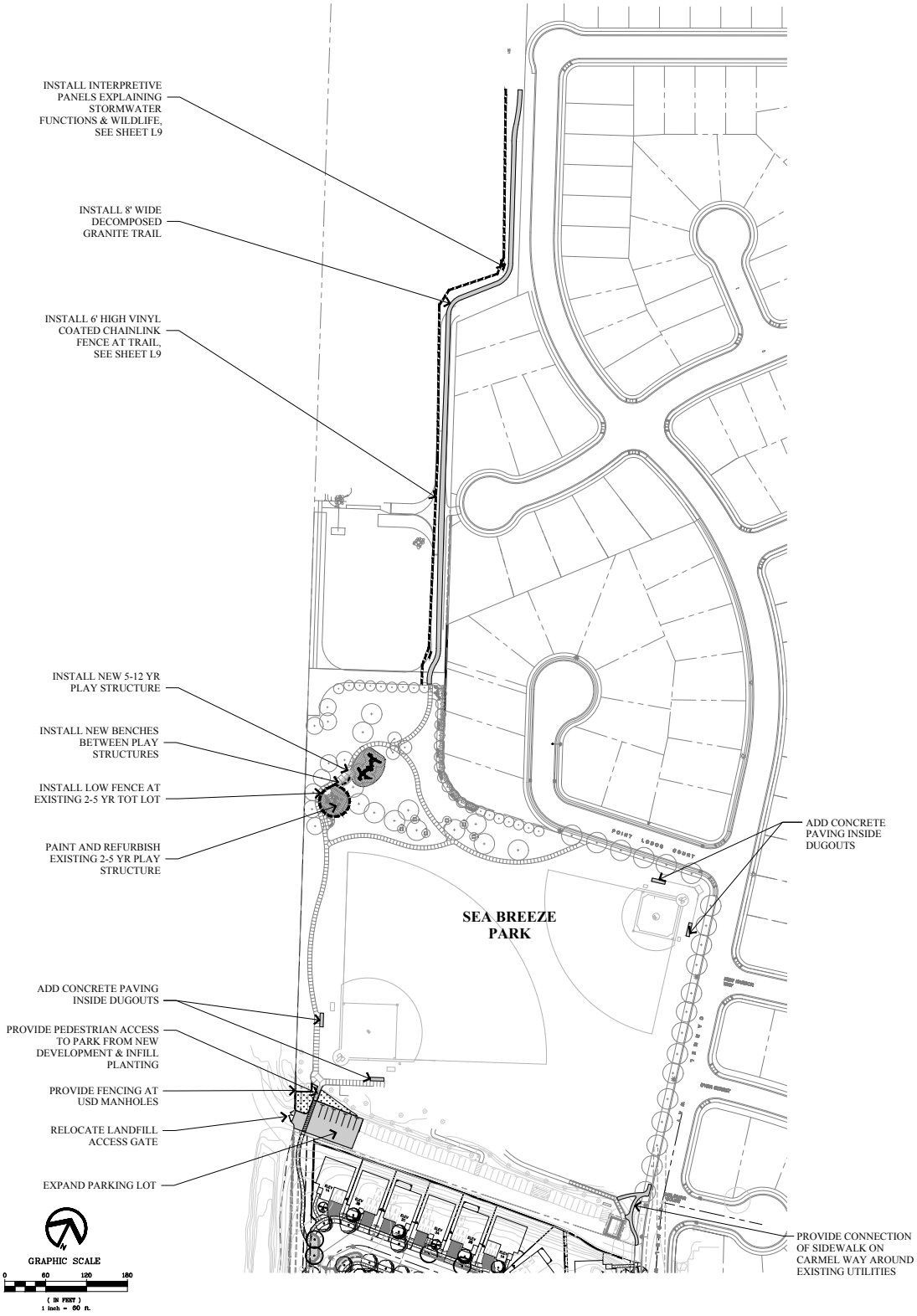


Figure 3-8: Offsite Improvement Plan
Source: Ripley Design
June 2017

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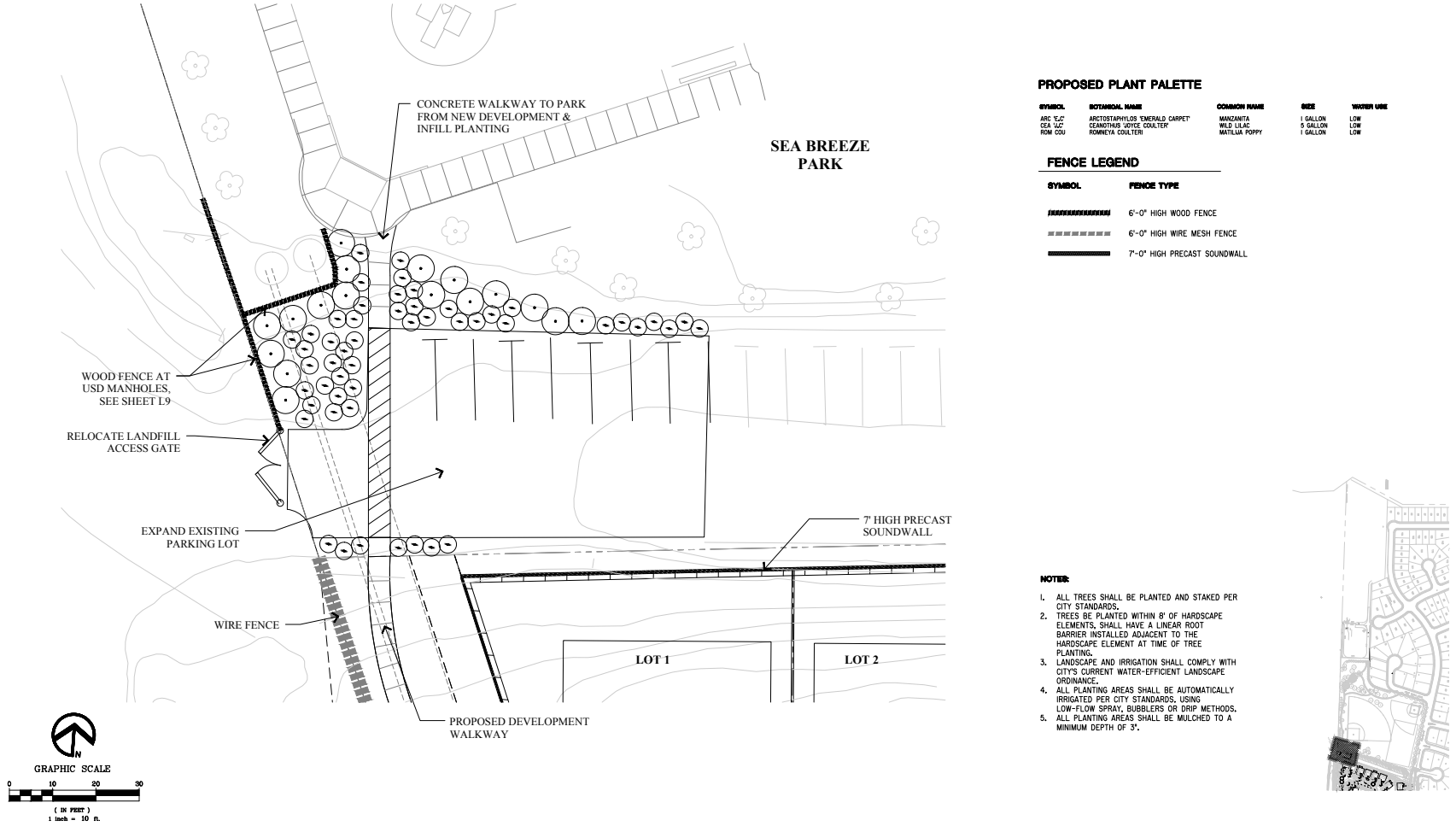


Figure 3-9: Offsite Improvements – Parking Expansion
Source: Ripley Design
June 2017

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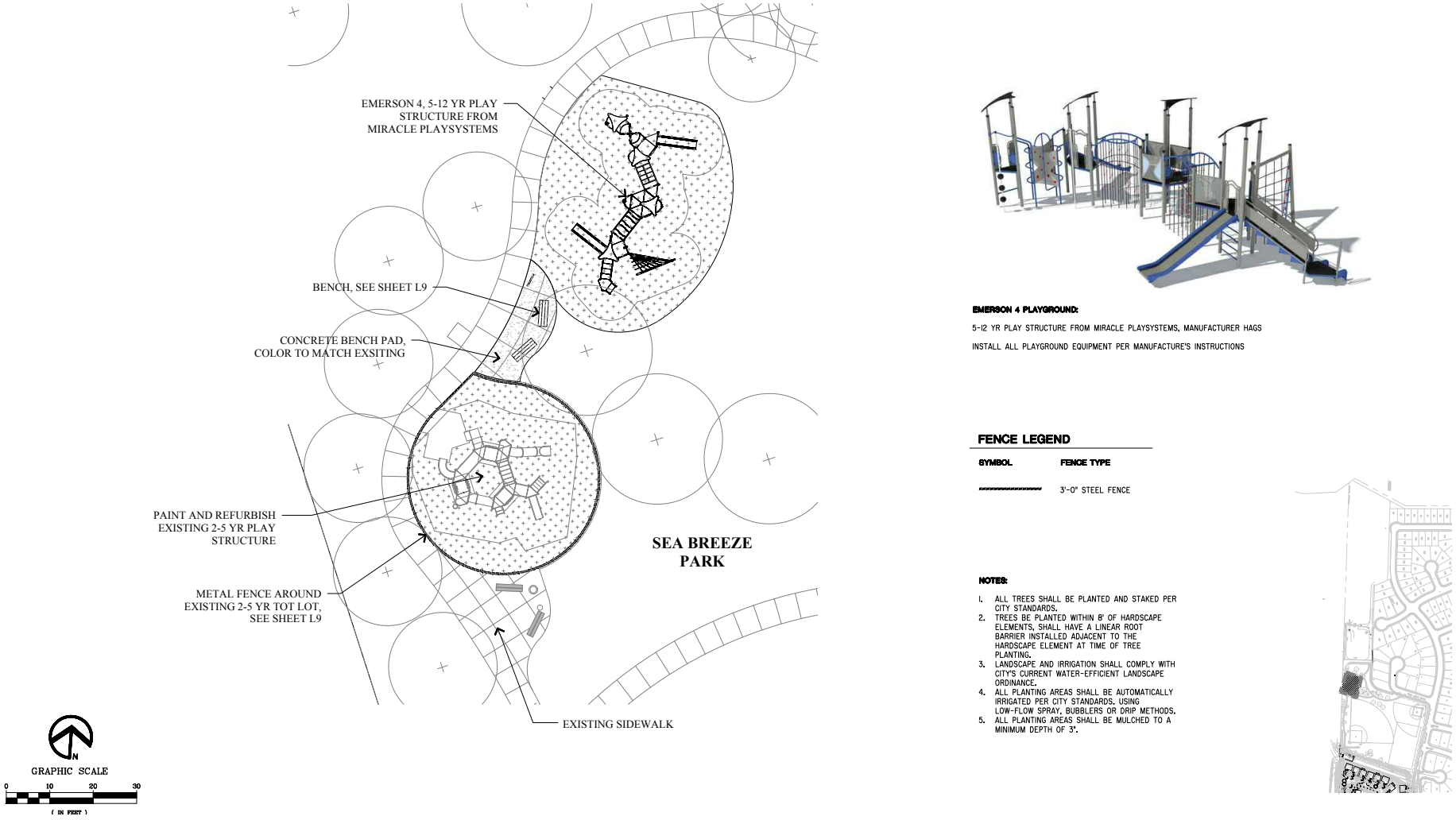


Figure 3-10: Offsite Improvements – Playground
Source: Ripley Design
June 2017

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4

AESTHETICS

INTRODUCTION

New development has the potential to substantially change the visual qualities and characteristics of a neighborhood.

The visual value of any given feature is subject to personal sensibilities and variations in subjective reaction to the features of a developed area. Objective or commonly agreed upon standards are difficult to establish, but an extensive body of literature is devoted to the subject of urban design and visual aesthetics.

This analysis of significance of the impacts of the proposed Project is based on the CEQA Environmental Checklist criteria contained within Appendix G of the CEQA Guidelines. In general, a project would be considered to have a significant aesthetic impact if it would result in substantial changes to visual resources considered to have aesthetic value. Such changes include visible alteration of landforms, significant structures, visual clutter or disorder, or substantial disruption of the surrounding visual context, especially if such changes were to have more than temporary duration.

SETTING

Land uses surrounding the Project include the Seabreeze development to the east consisting of single-family homes, Sea Breeze Park, and the associated three stormwater retention ponds and wetland areas. To the south is the Bay Colony single-family residential development and a seasonal wetland. North of the Project site is a "cutoff" water storage basin known as North Basin, an Alameda County Flood Control District channel (J-3), and a wetlands area. To the west is a shallow channel, former salt evaporator ponds, the Coyote Hills Regional Park, and the San Francisco Bay.

The Project site consists of two areas, Parcel "C" from which landfill debris will be removed and a residential subdivision developed, and the primary Turk Island Landfill, to which landfill debris from Parcel "C" will be consolidated. Additional off-site recreational improvements are planned at Sea Breeze Park and the trail along the stormwater basins.

Both Project site areas are former landfills that are now closed, with existing topographic elevations created by placement of landfill debris and cover materials. Thick vegetation covers both areas consisting predominately of annual grasses with a scattering of weedy plants and shrubs, as is typical of disturbed conditions in the vicinity.

Parcel "C" is mounded to a height of approximately 10 feet above the surrounding street elevation. The site is surrounded by a security fence on the north, east and south property lines and connected to the fenced Turk Island Landfill on the west side. The Turk Island Landfill proper reaches approximately 46 feet above the surrounding street elevation (up to 54 feet above mean sea level). There is a landfill gas flare, associated with the landfill gas extraction system, on the top deck of the landfill. See the existing views of and across the site in **Figures 4.1**, **4.2**, and **4.3**.

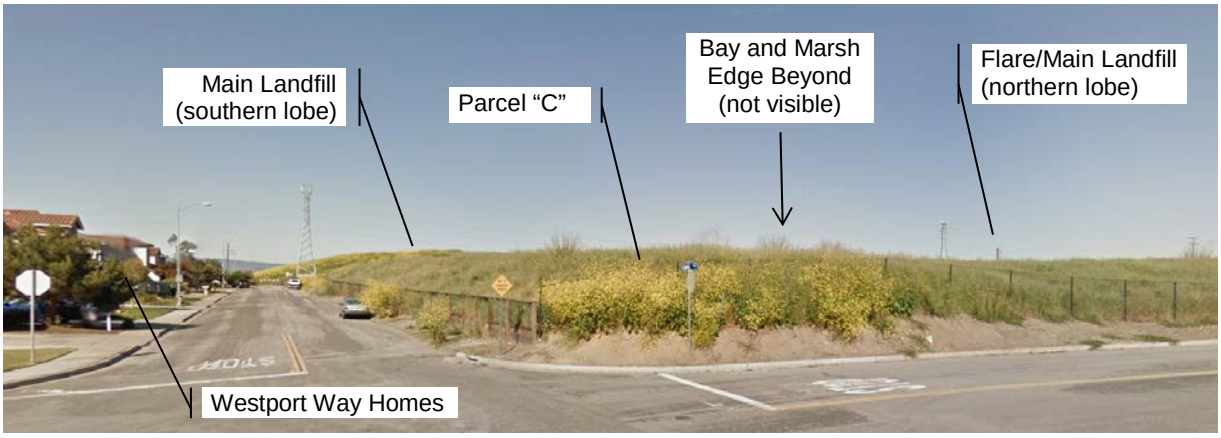


Figure 4.1: View from Westport Way and Carmel Way

Source: GoogleEarth

The above picture shows a view of Parcel "C" facing northwest from the intersection of Carmel Way and Westport Way. The mounding of the Parcel "C" site above street level, security fencing, and vegetation can be seen. To the left side of this picture are existing homes on Westport Way facing the Parcel "C" site.

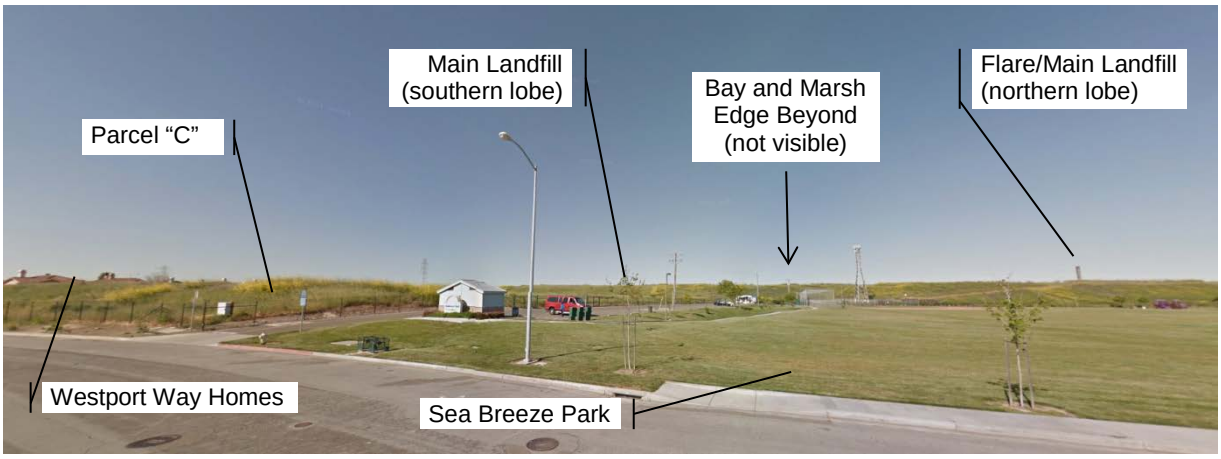


Figure 4.2: View from Carmel Way at Asilomar Court

Source: GoogleEarth

The above picture shows a view southwest across Sea Breeze Park from Carmel Way. Parcel "C" is to the left of the paved Seabreeze Park parking area in this photograph. The Turk Island Landfill can be seen rising in the background, with a callout indicating the location of the landfill gas flare.



Figure 4.3: View Northwest from the West End of Westport Way

Source: Photo taken by City Staff

The above picture shows a view of Parcel “C” facing northwest from near the western terminus of Westport Way. The photo was taken from the sidewalk in front of existing homes on Westport Way and shows the mounding of the Parcel “C” site above street level, security fencing, and vegetation. To the right side of this picture, the roof of a home at the corner of Del Mar Court and Carmel Way can be seen above the mounding of Parcel “C”.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if it were to result in:

1. A substantial adverse effect on a scenic vista;
2. Substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
3. Substantial degradation of the existing visual character or quality of the site and its surroundings;
4. The creation of a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area; or
5. Aesthetic impacts that are individually limited, but cumulatively considerable (i.e., the incremental effects of the project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).

SCENIC VISTAS OR RESOURCES

*1., 2. The Project would not result in a substantial adverse effect on a scenic vista or scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway (**less than significant impact**).*

There are no designated or eligible state scenic highways in the vicinity of the Project.[1] Union City's General Plan does not specifically identify scenic resources or scenic vistas, but does include a goal to provide visual and physical access to the Bay marsh edge (Goal CD-E.2)[2] which could be considered indication of a scenic vista/resource.

Potential views of the Bay marshes from the surrounding areas are obstructed under existing conditions by the existing main Turk Island Landfill, which rises to approximately 54 feet above mean sea level between the Bay marsh edge and development to the east. The adjacent Sea Breeze Park is at a considerably lower elevation of approximately 8 to 14 feet above mean sea level, and views to the Bay marsh edge would be fully obstructed under the existing condition. Single family residential homes in the area are generally at or below the 30 feet height limit for single family residential development (which is the height at the rooftop, with windows at lower levels) and are located at elevations similar to Sea Breeze Park, so are also well below the level of the existing main Turk Island Landfill. Views to the Bay marsh edge from existing residential development to the east would be obstructed by the main Turk Island Landfill under existing conditions.

Consolidation of landfill material onto the Turk Island Landfill will increase the height of the landfill by approximately 4 feet on the southern lobe and 10 feet on the northern lobe. This increase in height would not materially affect views of the Bay marshes from Sea Breeze Park or surrounding residential homes because these views are already obstructed by the main Turk Island Landfill at the existing height.

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[1] California Department of Transportation Scenic Highway Program website: http://www.dot.ca.gov/hq/LandArch/scenic_highways/.

[2] City of Union City, 2002 General Plan Policy Document, February 2002.

Parcel "C" is surrounded by residential development on the east and south sides, Union City's recreational Sea Breeze Park to the north, and the main Turk Island Landfill to the west. The mounded landfill on the existing Parcel "C" is currently at a height of approximately 20 feet above mean sea level. While it may be possible for some homes to see over and across Parcel "C" from second-story windows under the existing condition, any views of Bay marsh edges from residential locations would be obstructed by the main Turk Island Landfill which is between Parcel "C" and the Bay marsh edges.

Following removal of debris from Parcel "C", the site would be backfilled to a ground height of approximately 10 feet above mean sea level, consistent with the ground level of surrounding development. Residential homes proposed on Parcel "C" are various styles and heights but would all be at or below the maximum height of 30 feet, consistent with surrounding residential development. While residential development would reach taller heights than the existing mounded ground level, there are no views across the Parcel "C" site to the Bay marsh edges under existing conditions, as these are obstructed by the main Turk Island Landfill to the west even if not obstructed by the mounding on Parcel "C". (The site itself is not considered a scenic resource, and views of the site itself are discussed in more detail under Visual Character below.) Residential development on Parcel "C" would not disrupt visual or physical access to the Bay marsh edge because the access and view is already obstructed by the existing main Turk Island Landfill. (***less than significant impact***).

VISUAL CHARACTER

*3. The Project would have the potential to result in a substantial temporary degradation of the existing visual character or quality of the site and its surroundings. This potentially **significant impact** can be mitigated to a less than significant level by erecting a plywood barrier during consolidation and backfill.*

*The Project would increase the height of the main Turk Island Landfill lobes but would not change the general character of that site, which already rises above surrounding development, and would change the character of the Parcel "C" site from a mounded landfill site to residential development consistent with surrounding development, which would not be considered a negative character. The Project would have a **less than significant** impact related to substantial permanent degradation of the existing visual character or quality of the site and its surroundings.*

Construction Activities

Prior to the development of the residential portion of the Project, landfill debris will be excavated from Parcel "C" and consolidated with the adjacent Turk Island Landfill then Parcel "C" will be backfilled to create a lot for residential development. The process from beginning of consolidation to completion of backfill is anticipated to span approximately 6 months.

Impact Visual-1: **Temporary Degradation of Visual Character.** Consolidation activities will involve exposure and excavation of landfill debris. This represents a substantial, though temporary, degradation of the existing visual character or quality of the site and its surroundings.

Construction impacts would be short-term and would cease upon Project completion. However, given the proximity of existing residential development and the nature of the site, these impacts could be potentially significant.

Mitigation Measure: Implementation of **Mitigation Measure Noise-1**, requiring the applicant to erect a temporary plywood noise barrier around the north, east and south

sides of Parcel "C" during excavation/consolidation and backfill, as feasible, will also shield adjacent uses from potential aesthetic impacts.

The implementation of the temporary plywood noise barrier measure in Mitigation Measure Noise-1 would result in a ***less than significant*** impact with respect to temporary degradation of visual character at the site. Subsequent construction of the residential subdivision would not involve landfill debris or otherwise be considered demonstrably negative so the barrier would not be necessary for that portion of construction.

Landfill Consolidation

Consolidation of debris from Parcel "C" to the main Turk Island Landfill will increase the height of the landfill by approximately 4 feet on the southern lobe and 10 feet on the northern lobe. The main Turk Island Landfill is already taller than surrounding development (at up to 54 feet above mean sea level compared to surrounding development at ground levels of about 10 feet above mean sea level) and increases in height of the lobes would not change the character of the site (***less than significant impact***).

Residential Development

The proposed Project would ultimately result in the construction of new residential homes with a character consistent with that of the surrounding residential development. Project elevations show two-story homes in various styles including Coastal (Cape Cod), Hampton Shingle, and Spanish Monterey. While this residential development would be a noticeable visual change from the landfill site that is currently mounded to about 10 feet above street level and fenced for security, such a change would be consistent with the character of surrounding development and would not be considered a "substantial degradation" of the existing visual character (***less than significant impact***).

LIGHT AND GLARE

*4. The Project would have a **less than significant** impact related to the creation of a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.*

Construction activities will comply with City requirements, and will not include substantial construction activities at night. The construction period is temporary and any lighting used during the construction period will comply with applicable standards for security lighting, which would result in similar conditions to existing nighttime light conditions in the surrounding community.. The Project will not cause significant light and glare impacts during the construction period.

The Project site is currently a closed landfill site and otherwise unused and vacant. No changes are proposed to the lighting on the main Turk Island Landfill during or after construction. The proposed Project would introduce new sources of lighting on Parcel "C" in the form of residential homes and usage. These sources include lighting for streetlights, entryway lighting, interior building lighting, aesthetic, architectural, and landscape lighting. Automobiles entering and leaving the Project site after dark would also generate a new source of light. However, prior to issuance of building permits, the City will review the proposed exterior lighting and materials to ensure new light and glare sources would be consistent with existing residential uses in the Project vicinity. Therefore, the development proposed at the Project site would not result in substantial light or glare that would adversely affect day or nighttime views in the area (***less than significant***).

CUMULATIVE AESTHETIC IMPACTS

5. *The Project would not result in aesthetic impacts that are individually limited, but cumulatively considerable* ***(less than significant)****.*

This Project would result in an infill residential development in an area with no other undeveloped parcels identified for development in the immediate vicinity. The Project would not have the potential to make a considerable contribution to cumulative aesthetic impacts (***less than significant***).

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5

AIR QUALITY AND ODORS

INTRODUCTION

This chapter discusses the potential impacts of the implementation of the proposed Project on the local and regional air quality. Residential development projects generally contribute to air quality pollutants through construction-phase emissions and dust and operational emissions including vehicle emissions. Additionally, since this Project involves disturbance of landfill materials near existing residential homes, the possibility for odor impacts is a known concern.

The discussion of criteria pollutants and toxic air contaminants in this chapter is based on the Air Quality Technical Report prepared for this EIR by Ramboll Environ US Corporation and included in Appendix D.

The discussion of odors in this chapter is based on the Odor Impact Assessment prepared for this EIR by Ramboll Environ US Corporation and included in Appendix E.

SETTING[1]

METEOROLOGY

The Project site is located in the Southwestern Alameda County subregion of the San Francisco Bay Area Air Basin. This generally flat area encompasses the southeast side of San Francisco Bay, from Dublin canyon to north of Milpitas, and is bordered to the east by the East Bay hills and to the west by San Francisco Bay.

This subregion is indirectly affected by marine air flow. Marine air entering through the Golden Gate is blocked by the East Bay hills, forcing the air to diverge into northerly and southerly paths. The southern flow is directed down the bay, parallel to the hills, where it eventually passes over southwestern Alameda County. These sea breezes are strongest in the afternoon. The further from the ocean the marine air travels, however, the more the ocean's effect is diminished. Thus, although the climate in this region is affected by sea breezes, it is affected less so than the regions closer to the Golden Gate.

The climate of southwestern Alameda County is also affected by its proximity to San Francisco Bay. The bay cools the air with which it comes in contact during warm weather, while during cold weather the bay warms the air. The normal northwest wind pattern carries this air onshore. Bay breezes push cool air onshore during the daytime and draw air from the land offshore at night.

Winds are predominantly out of the northwest during the summer months. In the winter, winds are equally likely to be from the east. Easterly-southeasterly surface flow into southern Alameda County passes through three major gaps: Hayward/Dublin Canyon, Niles Canyon and Mission Pass. Areas

[1] Setting information is based on Bay Area Air Quality Management District CEQA Guidelines, May 2017.

north of the gaps experience winds from the southeast, while areas south of the gaps experience winds from the northeast. Wind speeds are moderate in this subregion, with annual average wind speeds close to the Bay at about 7 mph, while further inland they average 6 mph.

Air temperatures are moderated by the subregion's proximity to the bay and to the sea breeze. Temperatures are slightly cooler in the winter and slightly warmer in the summer than East Bay cities to the north. During the summer months, average maximum temperatures are in the mid-70's. Average maximum winter temperatures are in the high-50's to low-60's. Average minimum temperatures are in the low 40's in winter and mid-50's in the summer. On average, rainfall occurs from November through April, but is negligible in the summer/early fall months.

Pollution potential is relatively high in this subregion during the summer and fall. When high pressure dominates, low mixing depths and bay and ocean wind patterns can concentrate and carry pollutants from other cities to this area, adding to the locally emitted pollution mix. The polluted air is then pushed up against the East Bay hills. In the wintertime, the air pollution potential in southwestern Alameda County is moderate. The main air pollution sources in the area include light and heavy industry, and motor vehicles. Increasing motor traffic and congestion in the subregion is expected to be the main source of increased Southwestern Alameda County pollution as well as that of its neighboring subregions.

CRITERIA AIR POLLUTANTS

Ambient air quality standards have been established by state and federal environmental agencies for specific air pollutants most pervasive in urban environments. These pollutants are referred to as criteria air pollutants because the standards established for them were developed to meet specific health and welfare criteria set forth in the enabling legislation. The criteria air pollutants emitted by development, traffic and other activities anticipated under the proposed project include ozone, ozone precursors oxides of nitrogen and reactive organic gases (NO_x and ROG), carbon monoxide (CO), nitrogen dioxide (NO_2), and suspended particulate matter (PM_{10} and $PM_{2.5}$). Other criteria pollutants, such as lead and sulfur dioxide (SO_2), would not be substantially emitted by the proposed development or traffic, and air quality standards for them are being met throughout the Bay Area. A brief description of adverse health impacts is provided below.

Ozone and Ozone Precursors Oxides of Nitrogen (NO_x) and Reactive Organic Gasses (ROG)

While ozone serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation potentially harmful to humans, when it reaches elevated concentrations in the lower atmosphere it can be harmful to the human respiratory system and to sensitive species of plants. Ozone concentrations build to peak levels during periods of light winds, bright sunshine, and high temperatures. Short-term ozone exposure can reduce lung function in children, make persons susceptible to respiratory infection, and produce symptoms that cause people to seek medical treatment for respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. Sensitivity to ozone varies among individuals, but about 20 percent of the population is sensitive to ozone, with exercising children being particularly vulnerable.

Ozone is not generally emitted directly into the environment, but is formed in the atmosphere by a complex series of photochemical reactions between "ozone precursors" that are two families of pollutants: NO_x and ROG. While state and national ambient air quality standards relate to ozone levels, ozone levels are regulated indirectly through regulation of its precursors NO_x and ROG. NO_x and ROG are emitted from a variety of stationary and mobile sources, with vehicle emissions being the single largest source of ozone precursors. Other than NO_2, an oxide of nitrogen, which is discussed below, the health effects of NO_x and ROG are indirect, relating to the formation of ozone and its potential health effects (discussed above).

Carbon Monoxide (CO)

CO is an odorless, colorless gas formed by the incomplete combustion of fuels. The single largest source of CO in the Bay Area is motor vehicles. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. Even healthy people exposed to high CO concentrations can experience headaches, dizziness, fatigue, unconsciousness, and even death. People with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses, are even more sensitive to high concentrations of CO.

Emission controls placed on automobiles and the reformulation of vehicle fuels have resulted in a sharp decline in CO levels, especially since 1991.

Nitrogen Dioxide (NO_2)

NO_2 is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. High concentration of NO_2 can irritate airways in the respiratory system. Such exposure over short periods can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections such as colds, flu, and bronchitis. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO_2.

NO_2, along with other NO_x, is an ozone precursor compound and contributes indirectly to health impacts related to ozone, as discussed above. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels, potentially reducing visibility.

Particulate Matter (PM)

Respirable particulate matter, PM_{10}, and fine particulate matter, $PM_{2.5}$, consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled and cause adverse health effects. PM_{10} and $PM_{2.5}$ are a health concern, particularly at levels above the federal and State ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health because minute particles are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Children are more susceptible to the health risks of $PM_{2.5}$ because their immune and respiratory systems are still developing. Very small particles of certain substances (e.g., sulfates and nitrates) can also directly cause lung damage or can contain absorbed gases (e.g., chlorides or ammonia) that may be injurious to health.

Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as mining and demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. In addition to health effects, particulates also can damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is more easily filtered by human breathing passages. This type of dust is considered more of a soiling nuisance rather than a health hazard.

In 1983, the California Air Resources Board (CARB) replaced the standard for "suspended particulate matter" with a standard for suspended PM_{10} or "respirable particulate matter." This standard was set at 50 $\mu g/m^3$ for a 24-hour average and 30 $\mu g/m^3$ for an annual average. CARB revised the annual PM_{10} standard in 2002, pursuant to the Children's Environmental Health Protection Act. The revised PM_{10} standard is 20 $\mu g/m^3$ for an annual average. $PM_{2.5}$ standards were first promulgated by the EPA in 1997, and were recently revised to lower the 24-hour $PM_{2.5}$ standard to 35 $\mu g/m^3$ for 24-hour exposures and revoked the annual PM_{10} standard due to lack of scientific evidence correlating long-term exposures of ambient PM_{10} with health effects. CARB has adopted an annual average $PM_{2.5}$ standard, which is set at 12 $\mu g/m^3$ and is more stringent than the Federal standard of 15 µg/m3.

TOXIC AIR CONTAMINANTS (TACS)

Besides the "criteria" air pollutants, there is another group of substances found in ambient air referred to as Hazardous Air Pollutants under the Federal Clean Air Act and Toxic Air Contaminants (TACs) In California, TACs are defined by CARB as air pollutants that "may cause or contribute to an increase in deaths or in serious illness, or which may pose a present or potential hazard to human health."[2] To date, the CARB has identified more than 21 TACs and adopted the U.S. Environmental Protection Agency's (EPA's) list of hazardous air pollutants (HAPs) as TACs.[3] The EPA defines HAPs as "pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects." Currently, there are 187 identified HAPs.[4]

The nature and magnitude of the potential health effects of TACs depends on the substance, concentration, and period of exposure. Some TACs cause effects in response to short-term (acute) exposure, while others cause effects only after sustained exposures over weeks, months, or years. The effects of acute exposure may be minor, such as watery eyes or respiratory irritation, or they may involve major damage, e.g., to the reproductive or nervous system. If exposure to a sufficient concentration occurs for a sufficient period, individuals may have an increased risk of developing cancer or a greater likelihood of experiencing non-carcinogenic chronic adverse effects. Chronic non-carcinogenic health effects may be minor, e.g., nasal rhinitis or respiratory irritation, or they may be serious, involving long-term damage to the immune, neurological, reproductive, respiratory, or other systems.[5]

Significant sources of TACs in the environment include industrial processes such as petroleum refining, chemical manufacturing, electric utilities, metal mining/refining, and chrome plating; commercial operations such as gasoline stations and dry cleaners; and transportation activities, particularly diesel-powered vehicles, including trains, buses, and trucks. In 1998, the CARB identified particulate matter from diesel-powered engines as a TAC. Diesel particulate matter (DPM) emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk. Statewide, the average potential cancer risk associated with these emissions is 500+ potential cases per million.[6]

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[2] California Air Resources Board (CARB), 2013. Glossary of Air Pollution Terms. Available at: http://www.arb.ca.gov/html/gloss.htm#T, accessed August 24, 2013.

[3] California Air Resources Board (CARB), 2011a. Toxic Air Contaminant Identification List. Available at: http://www.arb.ca.gov/toxics/id/taclist.htm, accessed August 24, 2013.

[4] United States Environmental Protection Agency (EPA), 2013. Toxic Air Pollutants. Available at: http://www.epa.gov/oar/toxicair/newtoxics.html, accessed August 24, 2013.

[5] Ibid.

[6] California Air Resources Board (CARB), 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. Stationary Source Division and Mobile Source Division. October.

Unlike criteria pollutants, the concentrations of individual TACs are not regulated directly; however, concentrations of TACs may be regulated indirectly based on results from a health risk assessment (HRA). An HRA is a scientifically based tool used to determine if exposure to chemical(s) pose a significant risk to human health. The concentration of TACs indicates the potential for adverse health impacts resulting from breathing ambient air and represents baseline conditions related to TACs.

According to the California Almanac of Emissions and Air Quality,[7] most of the estimated health risk from TACs in ambient air are attributed to relatively few compounds, predominantly exhaust from diesel-fueled engines (DPM).

DPM is a complex mixture of hydrocarbons, particulates, gases, and other compounds. DPM is emitted by diesel-fueled internal combustion engines, the composition of which varies depending on engine type, operating conditions, fuel composition, lubricating oil, and presence/absence of an emission control system. Both the California Office of Environmental Health Hazard Assessment (OEHHA) and the EPA consider DPM to be a carcinogen. The cancer potency factor derived by the California Environmental Protection Agency (Cal/EPA) for DPM is highly uncertain in both the estimation of response and the dose. In the past, due to inadequate animal test data and epidemiology data on diesel exhaust, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization, had classified DPM as Probably Carcinogenic to Humans (Group 2); the EPA had also concluded that the existing data did not provide an adequate basis for quantitative risk assessment.[8] However, based on two more recent scientific studies,[9, 10] the IARC has reclassified DPM as Carcinogenic to Humans, placing it in Group 1.[11] This classification means that the IARC has determined that there is "sufficient evidence of carcinogenicity" of a substance in humans; it represents the strongest weight-of-evidence rating in the IARC's carcinogen classification scheme. The EPA, OEHHA, and IARC also recognize that exposure to DPM may cause non-cancer effects such as changes in lung function and airway inflammation.[12, 13, 14] DPM is a component of PM, and recent scientific data have linked prolonged exposure to PM to premature mortality, respiratory effects, and cardiovascular disease.

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[7] California Air Resources Board (CARB), 2009a. The California Almanac of Emissions and Air Quality, Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants. Available at: https://www.arb.ca.gov/aqd/almanac/almanac09/chap409.htm, accessed July 2017.

[8] United States Environmental Protection Agency (EPA), 2002. Health Assessment Document for Diesel Engine Exhaust. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. EPA/600/8-90/057F. May.

[9] Silverman D.T., C.M. Samanic, J.H. Lubin, A.E. Blair, P.A. Stewart, R. Vermeulen, J.B. Coble, N. Rothman, P.L. Schleiff, W.D. Travis, R.G. Ziegler, S. Wacholder, M.D. Attfield, 2012. The Diesel Exhaust in Miners Study: A Nested Case-Control Study of Lung Cancer and Diesel Exhaust. J Natl Cancer Inst. October.

[10] Attfield, M.D., P.L. Schleiff, J.H. Lubin, A. Blair, P.A. Stewart, R. Vermeulen, J.B. Coble, and D.T. Silverman, 2011. The Diesel Exhaust in Miners Study: A Cohort Mortality Study With Emphasis on Lung Cancer. J Natl Cancer Inst. October 21.

[11] International Agency for Research on Cancer (IARC), 2012. Press Release No. 213. IARC: Diesel Engine Exhaust Carcinogenic. June 12.

[12] Office of Environmental Health Hazard Assessment (OEHHA), 1998. Findings of the Scientific Review Panel on The Report on Diesel Exhaust, as adopted at the Panel's April 22, 1998, meeting. April 22.

[13] Office of Environmental Health Hazard Assessment (OEHHA), 2002. Air Toxics Hot Spots Program Risk Assessment Guidelines: Part II Technical Support Document for Describing Available Cancer Potency Factors. California Environmental Protection Agency. December.

[14] United States Environmental Protection Agency (EPA), 2011. Integrated Risk Information System (IRIS). Available at: http://www.epa.gov/iris/.

Based on available data, the other 10 TACs that pose the greatest risk from breathing ambient air in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, ethylbenzene, chloroform, formaldehyde, methylene chloride, and perchloroethylene.[15] Based on sampling data for the Turk Island landfill, the landfill gas does contain benzene, carbon tetrachloride, ethylbenzene and chloroform, as well as other volatile organic compounds (VOC) which are considered TACs. Soil samples also show various metals present at the site. While these TACs are included in the analysis of health risks for the Project, given their relative low level, the primary contributor to health risk from construction of the proposed Project will be DPM emitted by onroad and offroad vehicles. Note that landfill gas also contains components that can be flammable or explosive even if they do not pose health risks related to inhallation. The potential for site hazards related to flammable or explosive landfill gas conditions is assessed in Chapter 8: Hazards and Hazardous Materials.

ODORS

Odor refers to the perception or sensation experienced when one or more volatilized chemical compounds come in contact with receptors on the olfactory nerves. Odorant refers to any volatile chemical in the air that is part of the perception of odor by a human. The difference in sensory and physical responses experienced by individuals is responsible for the significant variability in the individual sensitivity to the quality and intensity of an odorant.

Some land uses commonly associated with odors include agriculture, wastewater treatment plants, food processing and rendering facilities, chemical plants, composting facilities, landfills, waste transfer stations, and dairies. In addition, the occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause any physical harm, they can still be unpleasant, leading to distress and often generating citizen complaints to local governments and regulatory agencies.

Landfill Odorants

As noted above, landfills can lead to the generation of foul odors. Landfill odors are typically associated with the generation of landfill gas, which is created due to microbiological decomposition of organic refuse that has been placed in the landfill. Landfill gas consists mostly of methane and carbon dioxide, which are both odorless gases. However, the balance of landfill gas can include hundreds of other compounds, such as nitrogen, oxygen, and trace non-methane organic compounds (NMOCs). Landfill gas can be generated at both active and closed landfills.

According to the federal Agency for Toxic Substances and Disease Registry (ATSDR), the most common sources of odors at landfills include sulfides, ammonia, and certain NMOCs (if present at high enough concentrations). Additional details on each of these chemical classes is provided below:

Sulfides: Hydrogen sulfide, dimethyl sulfide, and mercaptans are the three most common sulfides responsible for landfill odors. These gases produce a very strong rotten-egg smell, even at very low concentrations. Of these three sulfides, hydrogen sulfide is typically emitted from landfills at the highest rates and concentrations. Humans are very sensitive to hydrogen sulfide odors. Some people can smell such odors at concentrations as low as 0.04 parts per billion (ppb), but generally the odor detection level is closer to 0.5 to 1 ppb. At levels approaching 50 ppb, people can find the odor

[15] California Air Resources Board (CARB), 2009a. The California Almanac of Emissions and Air Quality, Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants. Available at: https://www.arb.ca.gov/aqd/almanac/almanac09/chap409.htm, accessed July 2017.

offensive. Average concentrations in ambient air range from 0.11 to 0.33 ppb. The concentration of hydrogen sulfide in ambient air around a landfill is usually close to 15 ppb.[16, 17]

Ammonia: Ammonia is another odorous landfill gas that is produced by the decomposition of organic matter in the landfill. Ammonia is common in the environment and an important compound for maintaining plant and animal life. People are exposed daily to low levels of ammonia in the environment from the natural breakdown of manure and dead plants and animals. Because ammonia is commonly used as a household cleaner, most people are familiar with its distinct smell. Humans are much less sensitive to the odor of ammonia than they are to sulfide odors. The odor detection level for ammonia is between approximately 43 and 60,000 ppb. Landfill gas has been reported to contain between 1,000,000 and 10,000,000 ppb of ammonia, or 0.1% to 1% ammonia by volume. Concentrations in ambient air at or near landfill sites are expected to be much lower.[18]

NMOCs: Some NMOCs, such as vinyl chloride and hydrocarbons, may also cause odors. In general, however, NMOCs are emitted at very low concentrations at landfills and are unlikely to pose a severe odor problem.

Table 5-1 lists some common landfill gas components and their odor detection levels. An odor detection level is the lowest concentration of a gas or vapor that can be detected by the human sense of smell. It does not necessarily correspond to something that people find objectionable, as that will depend on the nature of the odorant and the individual's association with those odors. As sensitivity to odors can vary from one person to the next, a range of odor detection levels is reported in the literature, as shown in **Table 5-1**.

REGULATORY FRAMEWORK

UNITED STATES

In 1990, the federal Clean Air Act Amendments (CAAA) established a number of requirements, including new deadlines for attaining clean air standards and the development of State Implementation Plans (SIPs). The EPA administers the CAAA, and has established National Ambient Air Quality Standards (NAAQS) for several air pollutants on the basis of human health and welfare criteria. To date, NAAQS have been established for CO, O_3, SO_2, NO_2, PM_{10}, $PM_{2.5}$ and Pb (lead).

CALIFORNIA

Under the California Clean Air Act (CCAA), the CARB is responsible for research activities, the establishment of California Ambient Air Quality Standards (CAAQS), guidelines for air quality management, and the regulation of both stationary and mobile emission sources. The CAAQS are generally more stringent than corresponding federal standards.

[16] ATSDR, Toxicological Profile for Hydrogen Sulfide, Atlanta: U.S. Department of Health and Human Services. July 1999.

[17] CTDPH, Fact Sheet: Municipal Solid Waste Landfill Gases and Reproductive Health and the Danbury Landfill. January, 1997. Available at: http://www.ct.gov/dph/lib/dph/environmental_health/eoha/atsdr/danburylandfillgasfactsheet.pdf. Last accessed June 2, 2017.

[18] ZWA, Landfill Emissions, 2017. Available at: http://zerowasteamerica.org. Last accessed June 2, 2017.

Table 5-1: Common Landfill Gas Components and Associated Odor Detection Levels

Component	Odor Description	Range of Odor Detection Levels (parts per billion)
Hydrogen Sulfide	Strong rotten egg smell	0.04 to 1,400
Ammonia	Pungent acidic odor	43 to 60,300
Benzene	Paint-thinner-like odor, aromatic, sweet, solvent; gasoline-like	470 to 313,000
Dichloroethylene	Sweet, slightly acrid odor	85 to 277,000
Dichloromethane	Sweet, pleasant odor	1,200 to 440,000
Ethylbenzene	Aromatic, oily solvent-like odor similar to benzene	2 to 18,000
Toluene	Sour, burnt odor	21 to 157,000
Trichloroethylene	Sweet, solvent odor	500 to 167,000
Tetrachloroethylene	Chlorinated solvent odor	767 to 71,000
Vinyl Chloride	Faintly sweet odor	10,000 to 356,000

Sources:

The odor detection levels presented in this table correspond to the range of values presented in the following comprehensive studies:

ATSDR, Landfill Gas Primer - An Overview for Environmental Health Professionals, November 2001. Available at: https://www.atsdr.cdc.gov/HAC/landfill/html/toc.html.

AIHA, Odor Thresholds for Chemicals with Established Occupational Health Standards, Second Edition, 2013.

Amoore, J. E. and Hautala, E., Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution. J. Appl. Toxicol., 3: 272–290. doi:10.1002/jat.2550030603, 1983.

In July 2007, the CARB adopted the In-Use Off-Road Diesel Vehicle Regulation and amended it in December 2011.[19,20] The regulation requires owners of off-road mobile equipment powered by diesel engines 25 horsepower or larger to meet the fleet average or BACT requirements for NOX and PM emissions by January 1 of each year. The regulation also establishes idling restrictions, limitations on buying/selling of older off-road diesel vehicles (Tier 0), reporting requirements, and retrofit and replacement requirements. The requirements and compliance dates vary by fleet size, with performance requirements for large fleets beginning in 2014, medium fleets in 2017, and small fleets in 2019.

STATE OF CALIFORNIA AND FEDERAL AIR QUALITY STANDARDS

Both the California Air Resource Board and the U.S. Environmental Protection Agency have established ambient air quality standards for common pollutants, including ozone, CO, NO_2, PM_{10} and $PM_{2.5}$. These ambient air quality standards represent levels that avoid specific adverse health effects associated with each pollutant. Individuals vary widely in their sensitivity to air pollutants, and standards are set to protect more pollution-sensitive populations (e.g., children and the elderly). National and state standards are reviewed and updated periodically based on new health studies.

[19] California Air Resources Board (CARB), 2011b. Regulation for In-Use Off-Road Diesel-Fueled Fleets. Title 13, California Code of Regulations, Section 2449.

[20] California Air Resources Board (CARB), 2012. In-Use Off-Road Diesel Vehicle Regulation.

California ambient standards tend to be at least as protective as national ambient standards, and are often more stringent. National and California ambient air quality standards are shown in **Table 5-2**.

Table 5-2: Health-Based Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	National Standard
Ozone	1 Hour	0.09 ppm	---
	8 Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	1 Hour	20 ppm	35 ppm
	8 Hour	9.0 ppm	9 ppm
Nitrogen Dioxide	1 Hour	0.18 ppm	0.100 ppm
	Annual	0.030 ppm	0.053 ppm
Particulates	24 Hour	50 µg/m^3	150 µg/m^3
< 10 microns	Annual	20 µg/m^3	---
Particulates	24 Hour	---	35 µg/m^3
< 2.5 microns	Annual	12 µg/m^3	12 µg/m^3

Concentrations: ppm = parts per million µg/m^3 = micrograms per cubic meter

Source: Bay Area Air Quality Management District, Bay Area Pollution Summary, last updated 1/5/2017, available at http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status.

SAN FRANCISCO BAY AREA

For planning purposes, regions like the San Francisco Bay Area are given an air quality status designation by the federal and state regulatory agencies. Areas with monitored pollutant concentrations that are lower than ambient air quality standards are designated "attainment" on a pollutant-by-pollutant basis. When monitored concentrations exceed ambient standards within an air basin, it is designated "nonattainment" for that pollutant.

In general, the Bay Area experiences low concentrations of most pollutants when compared to federal and state standards. The Bay Area is considered "attainment" (or unclassified) for all of the national standards, with the exception of ozone and the 24-hour $PM_{2.5}$ standard. For State air quality standards, the Bay Area is considered "nonattainment" for all averaging times for ozone and particulate matter (PM_{10} and $PM_{2.5}$).[21]

Clean Air Plan

In 1991, the BAAQMD, MTC and ABAG prepared the Bay Area 1991 Clean Air Plan or CAP. This air quality plan addresses the California Clean Air Act. The plans were meant to demonstrate progress toward meeting the more stringent 1-hour ozone CAAQS. The latest update to the plan, which was adopted in April 2017, is referred to as the 2017 Clean Air Plan.[22] The 2017 Clean Air Plan includes a multi-pollutant strategy represented by 85 control strategies to simultaneously reduce emissions and ambient concentrations of ozone, fine particulate matter, toxic air contaminants, as well as greenhouse gases that contribute to climate change.

The CAP includes the Bay Area's first-ever comprehensive Regional Climate Protection Strategy (RCPS), which identifies potential rules, control measures, and strategies that the BAAQMD can pursue to reduce GHG in the Bay Area. Measures of the 2017 CAP addressing the transportation

[21] BAAQMD, Ambient Air Quality Standards and Bay Area Attainment, via website http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.htm , accessed February 27, 2009.

[22] Bay Area Air Quality Management District, *Clean Air Plan 2017: Spare the Air, Cool the Climate*, Adopted April 2017.

sector are in direct support of Plan Bay Area, which was prepared by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) and includes the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan. Highlights of the Draft 2017 Clean Air Plan control strategy include:

- Limit Combustion: Develop a region-wide strategy to improve fossil fuel combustion efficiency at industrial facilities, beginning with the three largest sources of industrial emissions: oil refineries, power plants, and cement plants.
- Stop Methane Leaks: Reduce methane emissions from landfills and oil and natural gas production and distribution.
- Reduce Exposure to Toxics: Reduce emissions of toxic air contaminants by adopting more stringent limits and methods for evaluating toxic risks at existing and new facilities.
- Put a Price on Driving: Implement pricing measures to reduce travel demand.
- Advance Electric Vehicles: Accelerate the widespread adoption of electric vehicles.
- Promote Clean Fuels: Promote the use of clean fuels and low or zero carbon technologies in trucks and heavy-duty vehicles.
- Accelerate Low Carbon Buildings: Expand the production of low-carbon, renewable energy by promoting on-site technologies such as rooftop solar and ground-source heat pumps.
- Support More Energy Choices: Support community choice energy programs throughout the Bay Area.
- Make Buildings More Efficient: Promote energy efficiency in both new and existing buildings.
- Make Space and Water Heating Cleaner: Promote the switch from natural gas to electricity for space and water heating in Bay Area buildings.

To achieve the goals of the CAP, it identifies 85 emissions control measures for implementation by BAAQMD in collaboration with local government agencies, the business community, and Bay Area residents. The control measures target the following emissions sources:

- Stationary sources (40 measures);
- Transportation (23 measures);
- Energy (2 measures);
- Buildings (4 measures);
- Agriculture (4 measures);
- Natural and working lands (3 measures);
- Waste management (4 measures);
- Water (2 measures);
- Super-GHGs (3 measures); and
- Further study (miscellaneous stationary, building, and agriculture sources) (11 measures).

BAAQMD Guidelines

BAAQMD also provides a document titled *California Environmental Quality Act Air Quality Guidelines* ("BAAQMD Guidelines"), which provides guidance for consideration by lead agencies, consultants, and other parties evaluating air quality impacts in the San Francisco Bay Area Air Basin

conducted pursuant to CEQA. The document provides guidance on evaluating air quality impacts of development projects and local plans, determining whether an impact is significant, and mitigating significant air quality impacts. The most recent version of the Guidelines is dated May 2017.[23]

CITY OF UNION CITY GENERAL PLAN

City-wide goals and related policies applicable to the Project include:

General Land Use and Community Development

- Goal HS-D.1. To prevent the deterioration of and to improve air quality within the Union City Planning Area.
    - Policy HS-D.1.1 The City shall cooperate with the Bay Area Air Quality Management District to implement the Air Quality Plan.
    - Policy HS-D.1.2 The City shall implement measures to protect air quality that may be required to mitigate the effects of population growth in the Planning Area.
    - Policy HS- D.1.3 The City shall encourage development designs for city circulation systems that conserve air quality and minimize direct and indirect emissions of air pollutants.
    - Policy HS-D.1.4 The City shall encourage a reduction in vehicle-trips through Transportation Systems Management (TSM), Bay Area Air Quality Management district (BAAQMD) Transportation Congestion Management (TCM) and the use of non-polluting forms of transportation, including electric hybrid buses, vans, city vehicles, bicycles and walking.
    - Policy HS-D.1.5 The City shall encourage developers of large projects to install fueling stations for alternative energy vehicles.
    - Policy HS-D.1.6 The City shall require all businesses, in particularly fast food and manufacturing, to minimize odors generated by the business so that the odors are not detectable off-site.

SENSITIVE RECEPTORS

Sensitive receptors are facilities that house or attract a concentration of children, the elderly, people with illnesses or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, and convalescent facilities are examples of sensitive receptors. Per the BAAQMD guidelines, consideration should be given to other land uses where people may congregate such as recreational facilities, worksites, and commercial areas.

The closest sensitive receptors in the vicinity are the surrounding residential neighborhoods including Sea Breeze Park. While other sensitive uses, such as schools and day care facilities, are located farther away from the Project site, the adjacent neighborhood and park represent the highest potential for exposure and impact so have been assessed in this analysis.

ODOR REGULATIONS

Odors are commonly regarded as a form of public nuisance, and in the United States many states and localities have adopted regulations to limit odors generated by odorous operations. In California, odors are regulated through California Health and Safety Code (HSC) Section 41700, which states: "A person shall not discharge from any source whatsoever such quantities of air contaminants or

[23] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2017.

other material which cause injury, determent, nuisance, or annoyance to any considerable number of people." The regulation does not contain guidance on how to define or determine a violation. As a result, local agencies are typically responsible for establishing enforcement criteria.

California State Odor Regulations

The State of California has established an ambient air quality standard for hydrogen sulfide. The ambient air standard was established as a health standard and an odor standard. Breathing hydrogen sulfide at levels above the standard will result in exposure to a strong rotten egg odor. In 1962, the California Board of Public Health adopted an air quality standard at the "adverse" level for hydrogen sulfide of 0.1 ppm (100 ppb) for one hour. In 1969, the California Air Resources Board adopted a standard for hydrogen sulfide of 0.03 ppm (30 ppb) for a one-hour average.

BAAQMD Regulation 7: Odorous Substances

BAAQMD' primary regulation for controlling odors—Regulation 7 (Odorous Substances)—establishes the odor standards listed below. However, as per Regulation 7-102, the limitations of odorous compounds in Regulation 7 (summarized below) are not applicable until the Air Pollution Control Officer (APCO) has received odor complaints from ten or more complainants within a 90-day period.

- 7-301 General Limit on Odorous Substances: A person shall not discharge any odorous substance which remains odorous after dilution with odor-free air as specified in **Table 5-3**.
- 7-302 Limit on Odorous Substances at or Beyond the Property Line: A person shall not discharge any odorous substance which causes the ambient air at or beyond the property line of such person to be odorous and to remain odorous after dilution with four parts of odor-free air.
- 7-303 Limit on Odorous Compounds: A person shall not discharge concentrations of odorous compounds in excess of those specified in **Table 5-4**, except that this Section shall not apply to kraft mills.

Table 5-3: Dilution Rates Associated with BAAQMD Regulation 7

Elevation of Emission Point above Grade in Meters (Feet)	Dilution Volume (Volumes of Odor-Free Air Per Volume of Source Sample)
Less than 9 (30)	1,000
9 to 18 (30 to 60)	3,000
18 to 30 (60 to 100)	9,000
30 to 55 (100 to 180)	30,000
Greater than 55 (180)	50,000
Source: BAAQMD, Regulation 7: Odorous Substances, March 17, 1982. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/reg-07/rg0700.pdf?la=en. Last accessed June 2, 2017.	

Table 5-4: Maximum Allowable Emission Concentrations Associated with BAAQMD Regulation 7 (parts per million)

Compound or Family of Compounds	Concentration (ppm)
Dimethylsulfide - $(CH_3)_2S$	0.05
Ammonia - NH_3	2,500
Mercaptans calculated as methylmercaptan - CH_3SH	0.1
Phenolic compounds calculated as phenol - C_6H_5ON	2.5
Trimethylamine - $(CH_3)_3N$	0.02
Source: BAAQMD, Regulation 7: Odorous Substances, March 17, 1982. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/reg-07/rg0700.pdf?la=en. Last accessed June 2, 2017. Note: The concentrations presented in this table correspond to a type 'B' sample point, which is generally understood to be anything other than an emission source with a stack. Only type 'B' sources are expected to be potential new odor sources during Project construction and as such, are the only values shown here.	

BAAQMD Regulation 9: Inorganic Gaseous Pollutants

BAAQMD also indirectly regulates odors by establishing ground level concentration limits for sulfur dioxide and hydrogen sulfide in Regulation 9, Rules 1 and 2, respectively. The relevant standards from this regulation are cited below:

- 9-1-301 Limitations on Ground Level Concentrations [of Sulfur Dioxide]: A person shall not emit from sources other than ships, sulfur dioxide in quantities which result in ground level concentrations in excess of 0.5 ppm [parts per million] continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours.
- 9-2-301 Limitations on Hydrogen Sulfide: A person shall not emit during any 24 hour period, hydrogen sulfide in such quantities as to result in ground level concentrations in excess of 0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes.

BAAQMD Regulation 2 Rule 1: General Requirements

BAAQMD's Regulation 2 Rule 1 (General Requirements) establishes nuisance requirements as a catch-all to address potential odor nuisance situations that may not otherwise be covered under other regulations:

- 2-1-317 Public Nuisance Sources: Notwithstanding any exemption contained in Section 2-1-103 or Section 114 through 128, any new or modified source meeting any of the following criteria shall be subject to the requirements of Regulation 2, Rule 1, Section 301 [Authority to Construct] and/or 302 [Permit to Operate]. If any exempt source receives two or more public nuisance violations, under Regulation 1, Section 301 or Section 41700 of the California Health & Safety Code, within any consecutive 180-day period, then the source shall be subject to the requirements of Section 2-1-301 and 302. Such a source will be treated as loss of exemption source under Section 2-1-414, and will be subject to the annual permit to operate fee specified in Regulation 3. This section does not apply to a source that is exempt per section 2-1-113.

BAAQMD CEQA Guidelines Odor Threshold

The BAAQMD CEQA Guidelines contain procedures for evaluating odors for projects subject to CEQA. While BAAQMD has not specified CEQA significance thresholds for odors generated as a result of project construction, the Guidelines specify an operational threshold of five confirmed complaints per year averaged over three years. In addition, the Guidelines establish procedures for evaluating odor impacts—including an evaluation of odor parameters, odor screening distances, and odor complaint history—and contain a list of possible mitigation measures for a variety of source types, including landfills.

Union City Nuisance Regulations

The 511 Area Zoning District regulations do not specify an odor nuisance limit. However, the administrative portion of the Zoning Ordinance (section 18.52.060) does stipulate that proposed new uses "will not create more odor, dust, dirt, smoke, noise, vibration, illumination, glare, unsightliness or any other objectionable influence than the amount normally created by any of the uses allowed in the district". Local governments such as Union City typically rely on the public to notify them of persistent nuisance conditions.

CURRENT AND HISTORICAL AIR QUALITY AND ODOR SETTING

Air Quality Monitoring

BAAQMD monitors air quality at several locations within the San Francisco Air Basin, although none are located in Union City. The monitoring site closest to the Project site is located in Hayward. **Table 5-5** presents a summary of air quality trends in the Union City area between 2014 and 2016 represented as the number of days air quality standards were exceeded at the Hayward monitoring station and throughout the Bay area. The table shows that ambient air quality standards are generally met in the Bay area, with a few days of exceedances, especially related to $PM_{2.5}$ and ozone.

Odor Complaints

In May 2017, Ramboll Environ submitted a public records request to BAAQMD to obtain copies of all odor complaints occurring near the Facility (i.e., within two miles) over the last three years. BAAQMD responded by providing a list of odor complaints occurring within the boundary of Union City for the time period January 1, 2014 through May 25, 2017. The odor complaint data is summarized in **Table 5-6**.

Based on the odor complaint data provided by BAAQMD, which covers slightly more than three years, there was a single confirmed odor complaint and seven unconfirmed odor complaints in Union City. The confirmed odor complaint is for a "toxic" odor associated with an industrial building located near Western Avenue and Lewis Avenue, which is over three miles northeast of the Project site.

Most of the unconfirmed odor complaints are associated with odors that are not consistent with the Project site, including: burning rubber, burnt metal, burning plastic, and paint. One of the unconfirmed odor complaints described a "chemical" odor, which could describe possible odors from the Project site, but that unconfirmed odor was observed near Rapid Displays, Inc. (33195 Lewis Avenue), which operates in an industrial park that is located over three miles to the northeast of the Project site, near the confirmed complaint, so it seems unlikely that it would be associated with the Project site.

Table 5-5: Summary of Criteria Air Pollution Monitoring Data

Pollutant	Standard	Monitoring Site	Days Standard Exceeded		
			2014	2015	2016
Ozone	State 1-Hour	Hayward	1	2	0
		SF Bay Area Air	3	7	6
Ozone	Federal 8-Hour	Hayward	0	2	0
		SF Bay Area Air	5	12	1
Ozone	State 8-Hour	Hayward	4	2	0
		SF Bay Area Air	10	12	1
PM_{10}	Federal 24-Hour	Hayward	-	-	-
		SF Bay Area Air	0	0	0
PM_{10}	State 24-Hour	Hayward	-	-	-
		SF Bay Area Air	2	1	0
$PM_{2.5}$	Federal 24-Hour	Hayward	-	-	-
		SF Bay Area Air	3	9	0
Carbon Monoxide	State/Federal 8-Hour	Hayward	-	-	0
		SF Bay Area Air	0	0	0
Nitrogen Dioxide	Federal 1-Hour	Hayward	-	-	-
		SF Bay Area Air	0	1	0
Nitrogen Dioxide	State 1-Hour	Hayward	-	-	-
		SF Bay Area Air	0	0	0

Notes:
Dash (-) indicates pollutant is not monitored at that site.
Source: Bay Area Air Quality Management District Air Pollution Summaries (http://www.baaqmd.gov/about-air-quality/air-quality-summaries)

Table 5-6: Summary of Odor Complaints in Union City (January 1 2014 – May 25 2017)

BAAQMD ID	Date of Odor Event	Time of Odor Event	Complaint Description	Alleged Odor Location	Alleged Odor Source	Site Alleged	Status
216546	3/21/2014	0:00	Toxic	Western Ave & Lewis Ave	Industrial Building	W4784	Confirmed
217489	8/22/2014	0:01	Burning rubber	N/A	N/A	N4043	Unconfirmed
217546	9/4/2014	16:00	Burnt metal	1295 Whipple Road	US Pipe	W8003	Unconfirmed
221525	6/9/2015	12:15	Burning plastic	N/A	N/A	X3275	Unconfirmed
224715	2/16/2015	23:51	Paint	N/A	N/A	X8047	Unconfirmed
225948	4/19/2016	9:00	Garbage/ sewage	N/A	N/A	X9401	Unconfirmed
227250	7/22/2016	11:10	Burning rubber	N/A	N/A	Y1432	Unconfirmed
230863	3/23/2017	12:00	Chemical	33195 Lewis Avenue	Rapid Displays, Inc.	E0557	Unconfirmed

Notes:
1) Odor complaints on file with BAAQMD that occurred in Union City from January 1, 2014 through May 25, 2017.
2) N/A = not available

Another unconfirmed complaint described a "garbage/sewage" odor at 9am on April 19, 2016. While the odor reportedly occurred in Union City, the exact location is unknown. As noted earlier, Union City has at least one water treatment plant (Union Sanitary District's Alvarado Wastewater Treatment Plant), and there are several other waste management facilities in the general vicinity (e.g., Waste Management Tri Cities Landfill and Transfer Station in Fremont, CA; Hayward Transfer Station in Hayward, CA). Thus, it is unknown if this odor was associated with the Project site.

Odor Site Reconnaissance

On May 23, 2016, Ramboll Environ conducted a site visit including an inspection of the entire Project site including the existing gas extraction system and flare. Water was bailed from the two monitoring wells nearest Parcel "C", and had either no noticeable odor or a slight musty odor. At the time of the site visit, no other ambient odors were noted. Ramboll Environ also did not notice any ambient odors at any of the other nearby offsite locations visited, including near the fenceline of the Union Sanitary District (USD) Alvarado Wastewater Treatment Plant located at 5072 Benson Road in Union City, California.

Previous Developments and Odor Evaluations

According to the CC/RP, a number of studies and investigations have been conducted at the site over the last couple of decades. Additional details on these investigations as they relate to potential odors from construction are summarized below.

Bay Colony Development

In April 1996, the southern face of Parcel "C" was accidently exposed by grading activities performed during development of the Bay Colony subdivision, which is located south of the landfill. According to observations at the time, the exposed wastes were not typical municipal refuse, but instead consisted of construction debris with a significant amount of wood and other "cellulose-type" material. Evidence of leachate or landfill gas was not observed, and no discernible landfill odors were reported.

Prior to disposal, the waste was characterized by collecting 12 samples, which were analyzed for semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), total petroleum hydrocarbons, gas, diesel, heavy metals, PCBs, pesticides, and herbicides. With the exception of low levels of some oils and greases (580 ppm average total petroleum hydrocarbons) and several trace metals (ranging from not detected to 170 ppm), no other compounds were detected above the reporting limit.

Sea Breeze Development

From 1998 through 2000, the former 3.2 acre landfill parcel east of Parcel "C" and parts of the nearby ball field area were remediated by excavating and off-hauling and/or encapsulating the underlying fill, which consisted mostly of soil/slag. The remedial action was expanded to include Sea Breeze Park-related parcels including the northern and southern ball field areas, the restroom area, the landfill access road, the parking area, and certain nearby landscaped areas.

Work was performed under the provisions of a Remedial Action Plan (RAP) and Health and Safety Plan (HSP). The RAP provided a planning and guidance document which outlined the specific provisions of the planned remedial actions, and the RAP specifically addressed engineering controls and measures for testing, checking, and continually evaluating the work, with a specific emphasis on controlling potential fugitive airborne dust and on verifying and documenting the remediation activities. Similar procedures are proposed for the clean closure of Parcel "C", including:

- Health and safety monitoring and mitigation measures for construction workers and potential offsite receptors;
- Excavation and disposal procedures;
- Groundwater extraction and disposal guidelines;
- Soil backfilling requirements; and
- Verification sampling and chemical analytical procedures.

Parcel "C" Site Investigation Test Pits

In June 1997 and November 2000, a total of ten test pits (TP-1 through TP-10) were excavated in Parcel "C" to assess the conditions of the cover, underlying refuse, native soil, and groundwater. The test pits revealed that cover soil was approximately four feet thick and consisted of sand and clay mixtures with occasional concrete, tires, and plastic. Chemical analyses of cover soil samples detected low levels of pesticides, SVOCs, and metals, and one of the composite samples indicated the presence of hydrocarbons.

Beneath the cover, refuse was encountered to depths ranging from approximately 14 to more than 20.5 feet. The refuse consisted of soil, wood, concrete, paper, plastic sheeting, tires, and other types of typical household or commercial, non-industrial wastes. Photographs of the excavated refuse indicate considerable heterogeneity in the mixture of materials and their relative state of decomposition. As noted above, test results obtained during construction of the Bay Colony development revealed that only low levels of oil and grease and metals were detected in refuse samples; no VOCs or SVOCs were found above the reporting limits. Slight to moderate odors were noted in the refuse waste fraction of nearly all the test pits. Most of the perimeter test pits had slight or very slight odors, while the pits in the central portion of Parcel "C" and those closer to Sea Breeze Park tended to have moderate odors.

Beneath the refuse layer, native clay was encountered in five of the test pits at depths ranging from 14 to 19 feet; no chemical odors were noticed in samples of the native soil. The analyses of samples collected from test pits TP-4, and TPs- 6 through-9 indicated no VOCs, SVOCs, or pesticides were found above the detection limit with the exception of acetone, a common laboratory contaminant. A sample from the refuse/soil subgrade interface from test pit TP-4 was analyzed and found to contain from 28 to 35 ppm diesel to oil range hydrocarbons, and no benzene, toluene, ethylbenzene, and xylenes or other VOCs above method reporting limits. Test pits TP -1, 2, 3, 5 and 10 did not extend into native soil because of equipment limitations.

Groundwater was encountered at depths ranging from 14 to 16 feet (an elevation of approximately 3 to 4 feet above mean sea level). No discoloration or oily sheens were noted on the groundwater surface. The analyses of water samples collected from test pits TP-4, 6, 7, and 9 generally indicate the presence of low levels of some VOCs, a few SVOCs, and one trace pesticide (4,4-DDD). The highest concentrations were generally detected in the sample from test pit TP-6 where slight chemical odors (also referred to as "diesel" odors) were noted in the excavated refuse.

Perimeter Landfill Gas Monitoring

Landfill gas monitoring probes have been used to monitor both Parcel "C" and the closed Turk Island Landfill for gas migration. Monitoring commenced with five probes around the northern and eastern perimeters of Parcel "C" in 1995, and was expanded in 1997 to include an additional four probes along the northeastern perimeter of Turk Island Landfill. These probes are monitored approximately every month for combustible gas. With few exceptions, generally no gas has been detected. The few detections were at trace levels that are generally considered insignificant in a Bay Mud environment

consisting largely of decaying organics that are indigenous to the surrounding estuarine deposits. These results in Parcel "C" are consistent and reinforce other observations about the generally inert nature of the refuse fill underlying the site.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if the project were to result in affirmative responses to the following:

1. Would the project conflict with or obstruct implementation of the applicable air quality plan?
2. Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?
3. Would the project expose sensitive receptors to substantial pollutant concentrations?
4. Would the project create objectionable odors affecting a substantial number of people?
5. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The CEQA Guidelines state that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. The analysis in this chapter is based on the thresholds presented in the latest BAAQMD Guidelines (May 2017), as detailed under each impact discussion below.

CONSISTENCY WITH CLEAN AIR PLAN

*1. The Project would not conflict with or obstruct implementation of the applicable air quality plan (**no impact**).*

BAAQMD recommends analyzing a project's consistency with current air quality plan primary goals and control measures. The impact would be significant if the Project would conflict with or obstruct attainment of the primary goals or implementation of the control measures.

The primary goals of the 2017 Clean Air Plan are:

- Attain all state and national air quality standards
- Eliminate disparities among Bay Area communities in cancer health risk from toxic air contaminants
- Reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050. [This standard is addressed in the Greenhouse Gas Emissions chapter of this EIR.]

As detailed in Chapter 10: Land Use and Planning, the Project is considered generally consistent with land use designations and applicable goals and policies of the City General Plan and zoning. The Project is consistent with all applicable rules and regulations related to emissions and health risk and would not result in a new substantial source of emissions or TACS, unplanned increase in population, employment, or regional growth in Vehicle Miles Traveled, or otherwise conflict with the primary goals of the 2017 Clean Air Plan.

Many of the Clean Air Plan's control measures are targeted to area-wide improvements, large stationary source reductions, or large employers and these are not applicable to the proposed Project. However, the Project would be consistent with all applicable control measures, as follows:

Energy Control Measure EN1 and Water Control Measure WR2: the Project would meet current standards of energy and water efficiency, which comply with these control measures

Natural and Working Lands Control Measure NW2: the Project proposes planting of street trees consistent with City requirements, which comply with this control measure

Waste Management Control Measures WA3 and WA4: The Project would meet all recycling and green waste requirements, in compliance with this control measure.

Transportation Control Measure TR9: The Project proposes a public connection between Westport Way and Sea Breeze Park for pedestrians and bicycles, consistent with this measure aimed at improving access/connectivity for bicycles and pedestrians.

As described above, the Project is consistent with assumed growth at the site and would be generally consistent with all applicable control measures. Therefore, there would be ***no impact*** in relation to inconsistency with the applicable air quality plan.

AIR QUALITY STANDARDS

2. *The Project would have the potential to violate particulate matter air quality standards during the construction period. This potentially significant impact can be mitigated to a less-than-significant level by implementing dust-control and construction exhaust reduction measures and erecting a plywood barrier during consolidation and backfill.*

For the purpose of assessing impacts of a proposed Project on air quality standards, the BAAQMD-recommended thresholds are:

- Average daily emissions of 54 pounds per day of NOx, ROG or $PM_{2.5}$, and 82 pounds per day of PM_{10} during the construction period.
- Average daily emissions as listed above during the operational period.
- Annual emissions of 10 tons per year of NOx, ROG or $PM_{2.5}$, and 15 tons per year of PM_{10} during the operational period.

Construction Period

Impact Air-1: **Construction Period Dust and Emissions.** Construction of the Project would result in temporary emissions of dust and criteria pollutants that may result in both nuisance and health impacts. Without appropriate measures to control these emissions, these impacts would be considered ***significant***.

Construction emissions for all stages of construction were estimated using version 2016.3.1 of the California Emission Estimator Model (CalEEMod), the land-use model recommended by the BAAQMD for CEQA analyses. Sources of general construction emissions include off-gassing from pavement and architectural coating, exhaust from off-road and on-road equipment, and fugitive emissions associated with excavation of debris from the 6.3-acre site (see full report in Appendix D for detailed methodology, inputs, and results).

Average daily uncontrolled emissions (not factoring in reductions for more modern equipment or other reduction measures) were projected to be 4.9 pounds per day ROG; 33 pounds per day nitrogen oxides (NOx); 0.15 pounds per day PM_{10} exhaust; and 0.15 pounds per day $PM_{2.5}$ exhaust. Emissions from construction are below the BAAQMD thresholds.

Construction-related fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil and the weather. In the absence of mitigation, construction activities may result in significant quantities of dust, and as a result, local visibility and particulate matter concentrations may be adversely affected on a temporary and intermittent basis during the construction period. In addition, the fugitive dust generated by construction would include not only PM_{10} and $PM_{2.5}$, but also larger particles, which would fall out of the atmosphere within several hundred feet of the site and could result in nuisance-type impacts. BAAQMD's approach to analysis of fugitive dust emissions from construction is to emphasize implementation of effective and comprehensive dust control measures rather than detailed quantification of emissions. BAAQMD considers any project's construction related impacts to be less than significant if the required dust-control measures are implemented. Without these measures, the impact is generally considered to be significant, particularly if sensitive land uses are located in the project vicinity. [24] In the case of this Project, residential land uses are located within 100 feet of the Project site. The proposed Project would be subject to measures recommended by the BAAQMD (listed below), to reduce the impact of fugitive dust emissions and equipment exhaust.

Demolition and earth-moving activities can also result in fugitive dust, which contributes to particulate matter levels. Construction-period dust emissions would be greatest during these activities during the first year of the construction period and reach maximum daily emissions of 9.94 $PM_{2.5}$ and 18.34 PM_{10} pounds per day if not mitigated. (See CalEEMod output in Appendix D for details.) BAAQMD does not have a threshold of significance for fugitive dust impacts, but instead regards fugitive dust impacts as mitigated if appropriate management practices are implemented, as included in mitigation measure Air-1.

Mitigation Measure

Air-1: **Basic Construction Management Practices.** The Project shall demonstrate proposed compliance with all applicable regulations and operating procedures prior to issuance of demolition, building or grading permits, including implementation of the following BAAQMD "Basic Construction Mitigation Measures".

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

[24] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2017.

- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Mitigation Measure: Implementation of **Mitigation Measure Noise-1**, requiring the applicant to erect a temporary plywood noise barrier around the north, east and south sides of Parcel "C" during consolidation and backfill, as feasible, will also act as a wind break to help mitigate potential impacts related to particulate matter.

The BAAQMD significance thresholds for construction dust impacts are based on the appropriateness of construction dust controls. With implementation of the Basic Construction Mitigation Measures listed in Mitigation Measure Air-1, as well as Mitigation Measure Noise-1, dust impacts related to construction period would be considered ***less than significant***.

Construction-period criteria pollutant emissions will not exceed applicable significance thresholds. Accordingly, impacts from construction emissions for all stages of the proposed Project are considered ***less than significant*** with no mitigation required. However, Mitigation Measure Air-1 contains measures that will reduce emissions from construction equipment.

Operation

Regional Air Quality

Emissions from operation of the Project could contribute to cumulative increases in criteria air pollutant levels in the region, including for some pollutants that are considered nonattainment on a regional level.

There is no new waste material being added to the landfill, only relocation from one area of the existing landfill to another, so there is not expected to be an overall increase in operational landfill emissions. Emissions from Parcel "C" are currently uncontrolled as there is no collection or flare for Parcel "C", and upon relocation of this material to the main Turk Island Landfill, emissions will subsequently be controlled by the landfill gas flare. As such, emissions from operation of the landfill following the Project would be similar to or reduced from those under existing conditions and the Project impact related to landfill operation emission impacts would be ***less than significant***.

The proposed Project's 33 single-family dwelling units are well below BAAQMD's operational criteria pollutant screening size of 325 single-family dwelling units and therefore not anticipated to result in emissions of criteria pollutants over threshold levels during operations.[25] The screening

[25] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2017, Table 3-1.

levels were set by BAAQMD to conservatively determine the smallest project of a certain type that could exceed applicable significance thresholds. Because the Project size is well below this screening level and would not result in new stationary sources (i.e., no emergency generators), it can be concluded that daily and annual criteria pollutant emissions resulting from operation of the proposed Project are below BAAQMD thresholds. Therefore, operation of the Project would have a ***less than significant*** impact on regional air quality.

Carbon Monoxide Hotspots

Emissions and ambient concentrations of carbon monoxide have decreased greatly in recent years. These improvements are due largely to the introduction of cleaner burning motor vehicle engines and motor vehicle fuels. No exceedances of the State or National CO standard have been recorded at any of the Bay Area's monitoring stations since 1991. The Bay Area has attained the State and National CO standard.

However, elevated CO concentrations are generally fairly localized. Heavy traffic volumes and congestion can lead to high levels of CO, or "hotspots", while concentrations at the closest air quality monitoring station may be within State and National standards.

BAAQMD presents the screening level that localized carbon monoxide concentrations should be studied at affected intersections where traffic is increased to more than 44,000 vehicles per hour (or 24,000 vehicles per hour where mixing is substantially limited, such as in a tunnel). This screening level represents the volume of traffic at which a significant impact related to carbon monoxide would be possible. Based on traffic volumes in the vicinity, which show the highest volume roadways carrying up to 27,700 vehicles the entire day, it is not anticipated the Project would affect intersections of that volume (see Chapter 12 for additional details) and therefore, the impact related to carbon monoxide is ***less than significant***.

ODORS – SENSITIVE RECEPTORS

3. *The Project would have the potential to frequently expose members of the public to objectionable odors during the consolidation period. While implementation of reasonable odor prevention measures will reduce odor impacts as feasible, due to the potential for repeated odor events over a substantial period (six months), the impact would remain* ***significant and unavoidable****.*

   *The Project would not substantially increase odors during construction of the residential subdivision or during operation of the residences and landfill (****less than significant*** *impact).*

Construction Period (Excavation and Consolidation)

As explained earlier, the BAAQMD CEQA Guidelines contain procedures for evaluating odors for projects subject to CEQA. While BAAQMD has not established CEQA significance thresholds for odors generated as a result of project construction, the Guidelines specify an operational threshold of five confirmed complaints per year averaged over three years. In addition, the Guidelines establish procedures for evaluating odor impacts—including an evaluation of odor parameters, odor screening distances, and odor complaint history—and contain a list of possible mitigation measure for a variety of source types, including landfills.

Impact Air-2: **Waste Odors.** Disturbance of a landfill site during the excavation and consolidation activities, especially disturbance of previously landfilled refuse, could result in odor emissions into the neighborhood and park directly adjacent to the Parcel "C" location. While odor are generally expected to be below detection thresholds at nearby receptors and measures will be put in place to minimize the

possibility of odor events, because of the unknown nature of non-homogenous landfill waste and possibility for unexpected events that may be discernable as response measures are put into place, the impact would be considered ***significant and unavoidable***.

The most likely source of odor associated with Project construction is the waste that will be excavated from Parcel "C" and transported to the Turk Island Landfill. As noted earlier, slight to moderate odors were observed downwind of the refuse of nearly all the test pits excavated within Parcel "C". The cover soil in Parcel "C" also had low levels of potential odor compounds (including pesticides and SVOCs), and groundwater under Parcel "C" had low levels of potential odor compounds (including VOCs, SVOCs, and a pesticide), including a "diesel" smell in one of the test pits. In addition, odors may be generated from the reconditioning of the Turk Island Landfill.

Another potential source of onsite odors is landfill gas that could be emitted from Parcel "C" and the main Turk Island Landfill. As noted earlier, landfill gas probes that have been in operation at the site for nearly two decades have rarely detected landfill gas. As previously discussed, portions of the Turk Island Landfill's landfill gas extraction system would be temporarily shut down to facilitate the placement of the relocated refuse fill materials from Parcel "C" and to allow for reconfiguring and burying the extraction well manifold system. As a result, it is possible that landfill gas that is currently being captured and burned by the flare would escape without the benefit of the flare, resulting in odors. Based on a review of historical odor complaints, which indicates there have been less than five confirmed odor complaints per year averaged over three years, routine operations at the landfill including operation of the landfill gas control system and flare are not expected to result in significant odors.

Excavation, landfill consolidation and reconstruction, and backfill is estimated to occur over an approximately 6 month period. Winds in the area are most likely to come from the northwest, which has the potential to disperse odors in the direction of nearby residences.

Air dispersion modeling in the Air Quality Technical Report was used to estimate the concentrations of emissions at the nearest offsite sensitive receptors. Some of the chemicals modeled in that report would also have the potential to cause odors. The 1-hour concentrations for chemicals with potential to cause odor, along with their respective odor detection levels, are summarized in **Table 5-7**. The 1-hour concentrations presented in this table are the maximum 1-hour concentrations corresponding to either the locations for the maximum exposed individual sensitive receptor (MEISR) for chronic impacts (i.e., resident across the street from Parcel "C") or the MEISR for acute impacts (i.e., near ballfield in Sea Breeze Park), whichever is higher, and were selected as representative locations where neighbors may potentially encounter odors.

Table 5-7: Summary of Air Dispersion Modelling Results for Chemicals with Potential to Cause Odors

Chemical	Modelled 1-Hour Concentration	Range of Odor Detection Levels	Modelled Concentration Above Odor Detection Level?
	($\mu g/m^3$)	($\mu g/m^3$)	--
1,1,1-Trichloroethane	0.000064	5,292 - 3,900,946	No
1,1-Dichloroethane	0.000034	198,313 - 5,500,143	No
1,2-Dichloroethylene	0.000066	1,098,234	No
1,2-Dichloropropane	0.000039	1,201 - 40,017	No
1,3-Butadiene	0.064	219 - 168,139	No
Acetaldehyde	3.5	2.7 - 1,801,759	Yes[4]
Acetone	0.0071	950 - 27,899,779	No
Acrylonitrile	0.00018	3,472 - 47,747	No
Benzene	0.71	1,502 - 999,987	No
Carbon Disulfide	0.00026	50 - 99,640	No
Carbon Tetrachloride	0.00011	10,569 - 4,529,404	No
Carbonyl Sulfide	0.0018	140 - 251	No
Chlorobenzene	0.00012	401 - 59,846	No
Chlorodifluoromethane	0.038	708,000,092	No
Chloroform	0.000082	498 - 6,898,503	No
Dichlorodifluoromethane	0.00017	987,984,021	No
Ethyl Benzene	0.023	< 8.7 - 78,160	No
Ethyl Chloride	0.0000011	10,026 - 999,971	No
Ethylene Dibromide	0.0044	< 76,834	No
Ethylene Dichloride	0.000034	17,403 - 3,998,632	No
Formaldehyde	5.2	33 - 11,999,718	No
Hexane	0.0084	5,287 - 874,116	No
Hydrogen Chloride	0.033	89 - 14,911	No
Hydrogen Sulfide	0.0029	0.056 - 1,951	No
Isopropyl Alcohol	0.30	2,458 - 5,400,397	No
Methanol	0.010	3,997 - 260,380,238	No
Methyl Chloride	0.00000086	> 20,650	No
Methyl Ethyl Ketone	0.67	206 - 999,807	No
Methyl Isobutyl Ketone	0.0000017	123 - 65,545	No
Methylene Chloride	0.00024	4,168 - 1,528,339	No
m-Xylene	0.21	52 - 1,372,151	No
Naphthalene	0.013	10 - 5,347	No
o-Xylene	0.12	52 - 1,372,151	No
p-Dichlorobenzene	0.0032	727 - 90,183	No
Perchloroethylene	0.00094	5,202 - 481,522	No
p-Xylene	0.12	52 - 372,151	No
Styrene	0.020	12 - 259,848	No
Tetrachloroethane	0.000057	1,600 - 50,114	No

Chemical	Modelled 1-Hour Concentration	Range of Odor Detection Levels	Modelled Concentration Above Odor Detection Level?
	($\mu g/m^3$)	($\mu g/m^3$)	--
Toluene	0.54	79 - 591,662	No
Trichloroethylene	0.00017	2,687 - 897,497	No
Trichlorofluoromethane	0.000094	28,090 - 123,911,225	No
Trimethylbenzenes	0.0013	29 - 11,798	No
Vinyl Chloride	0.00080	25,562 - 7,668,466	No
Xylenes	0.077	52 - 1,372,151	No

Notes:

1) Modelled concentrations correspond to the maximum 1-hour concentration estimated at either the MEISR chronic or MEISR acute, whichever is higher (Ramboll Environ 2017). Concentrations are presented for chemicals with published odor detection levels in ATSDR 2001, AIHA 2013, or Amoore 1983.

2) The odor detection levels presented in this table correspond to the range of values presented in a few comprehensive studies (see Table 5-2).

3) N/A = not available

4) The maximum modelled 1-hour concentration of acetaldehyde (3.5 $\mu g/m^3$) is slightly above the low end of the odor detection level range reported in AIHA 2013 (2.7 – 1,801,759 $\mu g/m^3$), but is below the odor detection level reported by Amoore 1983 (90 $\mu g/m^3$).

Sources: See Table 5-1; Ramboll Environ 2017

As discussed above, construction associated with the Project may result in significant odors for a variety of reasons: low to moderate odors were observed at monitoring wells and test pits on and around Parcel "C", and based on air dispersion, the concentrations of certain chemicals (i.e., acetaldehyde) may exceed the low end of the odor detection limit. While not everyone may have sensitivity to detect such odors or even find such odors to be objectionable, there is a possibility that some nearby sensitive receptors may consider the odors a nuisance. Furthermore, the predominant winds in the vicinity of the Project blow towards the residential areas located to the east and south of the site, thus increasing the potential for odors to be transported from the construction area to locations where people may reside, recreate, or otherwise enjoy the outdoors. Although this Project does not involve constructing a new landfill, it does involve excavating portions of an existing landfill, and there are a number of sensitive receptors located within BAAQMD's two mile CEQA screening distance for sanitary landfills. Given these circumstances, potential odor generation associated with construction of the Project is considered significant and the following mitigation measure shall be implemented to reduce the potential impact of odors during the excavation, consolidation, and backfill stages of construction and the temporary removal of existing gas control measures.

The CC/RP includes a Dust and Odor Control Plan that outlines the general procedures to monitor emissions during the excavation of waste from Parcel "C" that will be incorporated into the Health and Safety Plan. This plan notes air monitoring will be performed during initial disturbance of debris to confirm test levels followed by use of hand-held devices to detect organic vapors and combustible gasses and implementation of measures if warranted, including:

- Minimizing the amount of refuse exposed, which may include the use of foam to cover exposed wastes.
- Covering the exposed refuse with six inches of soil at the end of each work day.
- Wetting the material, especially the soil cover, to reduce dusts.
- Using odor neutralizers to reduce odor-causing gasses if necessary.

While more detailed procedures are expected in a Health and Safety Plan, these details have not yet been submitted. Therefore, the following measures have been identified to ensure reduction of the potential for odor impacts as feasible.

Mitigation Measure Air-2a: **Preventing Odors.** Reasonable odor control measures shall be used at all times during excavating and reconstitution activities. These shall include at a minimum:

1. The working face of the landfill shall be kept as small as possible and the Applicant shall make an effort to minimize any extra or unnecessary disturbances to Parcel "C" or the Turk Island Landfill.
2. The working face shall be covered daily with an impermeable barrier (e.g. tarp) or at least six inches of non-odorous soil.
3. Odorous loads of reclaimed material that are being transported from Parcel "C" to the Turk Island Landfill shall be covered with an impermeable barrier (e.g., tarp) or at least six inches of non-odorous soil.
4. A temporary plywood noise barrier shall be constructed, as feasible, around the north, east and south sides of Parcel "C" during consolidation and backfill (as required by Mitigation Measure Noise-1), which will also act as a wind and visual barrier to mitigate potential odor impacts.

Mitigation Measure Air-2b: **Monitoring for High Odor Situations.** The Applicant shall implement procedures for monitoring for intense and/or offensive odors for the duration of landfill excavation and consolidation activities that shall include, at a minimum, the following:

1. The Applicant shall implement a public outreach program, providing contact information to neighborhood residents and instructions for how to report an odor. The Applicant shall also post a sign at the construction site with a telephone number for people to call in case they want to report an odor.
2. The Applicant shall conduct odor patrol using a portable dynamic olfactometer (e.g., Nasal Ranger field olfactometer from St. Croix Sensory). The odor patrol shall be conducted in the surrounding neighborhood as well as onsite. Odor patrol shall be conducted periodically throughout each day as well as whenever changes in odors are observed and/or when complaints are received. When odors are found with a dilution to threshold greater than 4:1 at the property boundary or 1,000:1 at the odor emission point, additional odor controls shall be put in place to mitigate the odors per Mitigation Measures Air-2c and/or Air-2d, as appropriate. Since some field olfactometers have an upper limit on the dilution to threshold ratio (e.g., 60), alternative methods may be needed in order to collect odor readings near the source (e.g., BAAQMD Source Test Method ST-12 for Collection of Odorous Samples.)
3. The odor measurements shall be clearly document and provided to the City on a bi-weekly basis, including:
    a. Date, time, and location of the odor monitoring
    b. Equipment name/type

c. Odor characteristics (i.e., offensiveness, intensity, odor type/description, duration)

d. Weather conditions, including wind speed and wind direction

e. Dilution to threshold measured

f. Activities occurring onsite during the odor monitoring

If odor monitoring indicates odors at the property boundary with a dilution to threshold reading greater than 4:1 (consistent with BAAQMD Regulation 7-302), or odor complaints are generated and confirmed to be associated with Project construction, the Applicant shall implement additional odor controls to mitigate the odors per Mitigation Measures Air-2c and/or Air-2d, as appropriate.

Mitigation Measure Air-2c: **Mitigating High Odor Situations.** If odor monitoring under Mitigation Measure Air-2b indicates a high odor situation, the Applicant shall implement the following odor controls to supplement those outlined in Mitigation Measure Air-2a until the source of the high odor event has been addressed:

1. More stringent odor mitigation measures shall be used at the landfill working face such as temporary covers throughout the day to help reduce/eliminate offsite odors.
2. The Applicant shall evaluate the use of non-toxic odor masking or odor reactant agents, such as covering foams and/or odor neutralizers for perimeter misting systems (see Odor Management and Air Quality/Odor Monitoring Plans for examples). The efficacy of such agents shall be evaluated, taking into considering the specific type of the odors and the possibility that their success may be limited by the short amount of time that the odor comes into contact with the agents.
3. The Turk Island Landfill's landfill gas extraction and control system helps to reduce odors by capturing and flaring landfill gases. Portions of the gas extraction system would be temporarily shut down to facilitate the placement of the relocated refuse fill materials and to allow for reconfiguring and burying the extraction well manifold system. If high odors are observed when the system is shut down, other odor generating activities shall be minimized or ceased until the system can be restarted.
4. If the above measures fail, the Applicant shall stop all work activities until the odor source can be identified and mitigated.

If odor situations are frequent and/or prolonged (characterized by receipt of ten or more complaints filed with the hotline in a 90-day period), the Applicant shall also implement additional odor controls per Mitigation Measure Air-2d, as appropriate.

Mitigation Measure Air-2d: **Odor Control Measures for Prolonged and/or Frequent Odors.** Since the Applicant will establish an odor complaint "hotline", odor complaints may not reach BAAQMD, so Regulation 7 limitations may not be triggered. Therefore, if high odors are frequent and/or prolonged, as characterized by receipt of ten or more complaints filed with the hotline in a 90-day period, as a protective step, the

Applicant shall implement the following measures consistent with BAAQMD Regulation 7:

1. Locate all odor sources with dilution to thresholds measurements greater than 1,000:1 using the odor panel sampling and evaluation procedures in BAAQMD Regulation 7, section 7-400 through 7-405.
2. Temporarily enclose the odor source(s) identified in (1) above and vent the emissions to an odor control device, such as activated carbon. Be sure all air permitting has been completed for the installation.
3. Complete work during periods when meteorological conditions cause the minimum odor impacts to the surrounding neighborhood.
4. If the above measures fail, stop all work activities until additional odor source controls can be designed and implemented.

Note that if ten or more odor complaints are logged with the Air Pollution Control Officer (APCO), BAAQMD will have regulatory authority that supersedes these mitigation measures.

The range of mitigation measures identified above, implemented in conjunction with the Applicant's Odor Management and Air Quality/Odor Monitoring Plans, will help to reduce potential odor impacts associated with Project construction. However, the nature and intensity of the odors that could result from Project construction remains uncertain, primarily due to the fact that the material to be excavated is heterogeneous and is under various states of decay. Thus, even though odors would be confined to the excavation, consolidation, and backfill phases of construction and therefore temporary (approximately 6 months), and even after implementation of odor mitigation measures Air-2a, Air-2b, Air-2c and Air-2d, which would reduce the potential impacts of odors generated by the Project, the potential remains for more than five high odor events to occur during the year the excavation of Parcel "C" occurs, which, if reported, would exceed BAAQMD's threshold levels for odor impacts and therefore, the impact related to odors would be considered ***significant and unavoidable***.

Residential Construction

Construction of the residential subdivision would occur only after completion of the excavation, consolidation, and backfill activities and so would not involve disturbance of landfill debris or the potential for odor impacts or need for odor mitigation as described above. During development of the residential subdivision, diesel-powered vehicles and equipment would create odors, however, these odors would be temporary and not likely to be noticeable much beyond the Project site's boundaries. The Project would result in ***less than significant impacts*** on adjacent sensitive receptors related to objectionable odors caused by the Project during construction of the residential subdivision.

Landfill Operation

There is no new waste material being added to the landfill, only relocation from one area of the existing landfill to another, so there is not expected to be an overall increase in operational landfill odor emissions. Emissions from Parcel "C" are currently uncontrolled as there is no collection or flare for Parcel "C", and upon relocation of this material to the main Turk Island Landfill, emissions will subsequently be controlled by the landfill gas flare. As such, odors from operation of the landfill following the Project would be similar to or reduced from those under existing conditions and the Project impact related to landfill operation odor impacts would be ***less than significant***.

Residential Operation

Once operational, residential uses are also not considered a significant source of objectionable odors. Therefore, there would be ***a less than significant impact*** on adjacent sensitive receptors related to objectionable odors caused by the Project during construction of the residential subdivision (construction activities that do not involve disturbance of landfill debris) or operations.

Future residents at the Project site would reside near the closed Turk Island Landfill. Based on the odor complaint records obtained from BAAQMD as part of the Odor Impact Assessment, odors from operation of the landfill are not significant and would not be expected to affect future residents at the Project site. The primary Turk Island Landfill has not been zoned for or otherwise identified as a site with development potential and there are no known projects being contemplated that would substantially disturb landfill debris following development of the proposed Project. As discussed above, operational landfill odors would be similar or reduced from existing conditions with the proposed Project. Therefore, there would be no environmental impacts related to siting new receptors at the site.

TOXIC AIR CONTAMINANTS

4., 5. The Project would have a less-than-significant impact related to potential to expose sensitive receptors or the general public to substantial levels of toxic air contaminants or accidental releases of acutely hazardous substances.

For the purpose of assessing impacts of a proposed Project on exposure of receptors to risks and hazards, the BAAQMD-recommended threshold of significance is exceeded when the Project-specific cancer risk exceeds 10 in one million, the non-cancer risk exceeds a Hazard Index of 1.0 (or cumulative risk of 100 in one million or a Hazard Index of 10.0 respectively is exceeded), and/or the annual average $PM_{2.5}$ concentration would exceed 0.3 $\mu g/m^3$ (or 0.8 $\mu g/m^3$ cumulatively).

A stand-alone health risk assessment (HRA) report (Air Quality Technical Report) was prepared by Ramboll Environ for the Project and is provided for reference in Appendix D. The HRA provides detailed methodology and modeling assumptions. The information from the HRA is summarized below.

Construction Period

The proposed Project would have off-road and on-road-related construction emissions resulting from diesel combustion as well as fugitive emissions associated with dust and landfill gas. Health risks evaluated in the HRA include cancer risks and non-cancer Hazard Indices from TACs, including Diesel Particulate Matter (DPM), diesel total organic gases (TOG), and fugitive dust and landfill gas, in addition to $PM_{2.5}$ concentrations (see full report in Appendix D for detailed methodology).

Health risks and hazards from Project-only sources during construction for the maximum exposed individual, including an age sensitivity factor to account for the most sensitive population, the inhalation cancer risk would be 9.1 in 1 million (compared to a threshold of 10.0 in 1 million), the maximum chronic hazard index would be 0.027 (compared to a threshold of 1.000) and the annual average $PM_{2.5}$ concentration would be 0.039 $\mu g/m^3$ (compared to the threshold of 0.300 $\mu g/m^3$). The modeled health risks resulting from construction activities of the Project are all below BAAQMD significance thresholds.

Cumulatively, other off-site sources of health risk in the vicinity (approximately 1,000 feet) include the landfill gas flare at the Turk Island Landfill and vehicle emissions from major roadways in the area. Health risks and hazards from cumulative sources including Project construction for the

maximum exposed individual, including an age sensitivity factor to account for the most sensitive population, the inhalation cancer risk would be 14 in 1 million (compared to a threshold of 100 in 1 million), the maximum chronic hazard index would be 0.027 (compared to a threshold of 10.000) and the annual average $PM_{2.5}$ concentration would be 0.11 $\mu g/m^3$ (compared to the threshold of 0.800 $\mu g/m^3$). The modeled health risks resulting from construction activities of the Project are all below BAAQMD significance thresholds for cumulative impacts.

As discussed above, construction-related cancer risks, chronic and acute hazard indices, and annual average $PM_{2.5}$ concentrations are all below the corresponding BAAQMD significance thresholds for health risks and hazards. Impacts related to health risk during site preparation and construction activities would be ***less than significant***.

Landfill Operation

There is no new waste material being added to the landfill, only relocation from one area of the existing landfill to another, so there is not expected to be an overall increase in operational landfill TAC emissions. Emissions from Parcel "C" are currently uncontrolled as there is no collection or flare for Parcel "C", and upon relocation of this material to the main Turk Island Landfill, emissions will subsequently be controlled by the landfill gas flare. As such, TACs from operation of the landfill following the Project would be similar to or reduced from those under existing conditions and the Project impact related to landfill operation TAC impacts would be ***less than significant***.

Residential Operation

As a residential development, operation of the Project would not involve new substantial stationary sources of TACs and would not generate substantial truck trips such that mobile emissions of DPM would be significant. Operation of the Project would have a ***less than significant*** impact related to TACs.

Future residents at the Project site would reside near the flare at the closed Turk Island Landfill and major roadways. As assessed as part of the cumulative analysis for construction emissions above, these sources would combine to a total health risk for receptors in the area of 4.9 in 1 million, the maximum chronic hazard index would be 0.000 and the annual average $PM_{2.5}$ concentration would be 0.071 $\mu g/m^3$. Though these thresholds would not strictly apply to new receptors under CEQA, it can be noted that the modeled health risks for future residents of the site are all below BAAQMD significance thresholds. Therefore, the impacts are ***less than significant***.

CUMULATIVE AIR QUALITY IMPACTS

6. The Project would have a less-than-significant cumulative air quality impact except in the topic of construction-period odors.

The Project would have a significant and unavoidable cumulative impact related to construction-period odors.

Impact Air-3: **Cumulative Construction Odors Impacts**. Disturbance of the landfill site during the excavation and consolidation activities could result in odor emissions into the neighborhood and park that would be considered a cumulatively considerable impact.

Mitigation Measures Air-2a through Air-2d would reduce Impact Air-3 as feasible through implementation of odor monitoring, control, and reduction measures, but would not be able to reduce impacts below significance levels.

The BAAQMD CEQA Guidelines state that for any project that does not individually have significant operational air quality impacts, the determination of significant cumulative impact should be based on an evaluation of the consistency of the project with the local general plan and of the general plan with the regional air quality plan, which would be the most recently adopted Clean Air Plan. As indicated above, the Project would be consistent with the Clean Air Plan and would not have any significant project-specific operational air quality impacts. Therefore, operational cumulative impacts would also be ***less than significant***.

The potentially significant impacts identified in this chapter are related to construction-period only and are mitigated to less than significant except in the case of odors related to landfill excavation and consolidation. There are no other known substantial construction projects in the immediate vicinity that would result in substantial cumulative construction air quality impacts. Cumulative construction period health risk was quantified in the analysis above and found to be below significance thresholds. Therefore, the Project cumulative construction-period emissions impacts, with the exception of odors, would not contribute substantially to cumulative impacts (***less than significant***). However, because Project construction-period odor impacts are considered significant, the impact is also considered cumulatively considerable and the Project's cumulative construction-period odor impacts would be considered ***significant and unavoidable***.

A discussion of Greenhouse Gas Emissions is included separately as Chapter 14.

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6

BIOLOGICAL RESOURCES

INTRODUCTION

This chapter provides information on biological resources in the Project area. The chapter also presents a discussion of federal, state, and local laws, policies, and regulations that influence the protection of such biological resources. The chapter identifies impacts on biological resources that may result from excavation/consolidation, and development and operation of a residential subdivision at the Project site. The chapter also identifies mitigation measures to avoid, minimize, or compensate for potential significant impacts to biological resources.

This chapter is based on the Assessment of Potential Biological Impacts prepared for this EIR by Zander Associates and included as Appendix F. Information used in the preparation of this assessment was obtained from the California Department of Fish and Wildlife's California Natural Diversity Database (CNDDB), California Native Plant Society Electronic Inventory, USDA Soil Survey for Alameda County, U.S. Fish and Wildlife Service National Wetland Inventory, and previous biological reports for the Project site. A field visit to describe existing biological resources present on and surrounding the site, including Parcel C" and the man Turk Island Landfill, was conducted November 11, 2016.

REGULATORY SETTING

This section describes the local, state, and federal plans, policies, and laws that are relevant to biological resources and that are applicable to the Project.

FEDERAL GOVERNMENT

Federal Endangered Species Act (FESA)

Federally listed threatened and endangered species and their habitats are protected under provisions of the FESA. "Take" under FESA includes activities that would harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect listed species. Harm specifically includes significant habitat modification or degradation of habitat of a listed species. The US Fish and Wildlife Service (USFWS) regulates activities that may result in "take" of individuals. Candidates and species proposed for listing also receive special attention from federal agencies during their review.

Clean Water Act Section 404

The U.S. Army Corps of Engineers (Corps) has jurisdiction over Waters of the U.S. under Section 404 of the Clean Water Act and navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act of 1899. Waters of the U.S. (jurisdictional waters) under Section 404 include all waters used, or potentially used, for interstate commerce. Such waters include wetlands, tidal waters, tributary waters, and other waters such as lakes. Wetlands include marshes, meadows, swamps, bogs, floodplains, basins, and seeps. Wetlands may also include less obvious areas such as seasonal ponds, seasonally wet pastures, or seasonal meadows. Navigable waters of the U.S. subject to Corps

jurisdiction under Section 10 include all lands below mean high water. Project activities that would result in placement of fill, dredging, destruction, or alteration of Waters of the U.S. must be in compliance with permit requirements of the Corps. A Water Quality Certification pursuant to Section 401 of the Clean Water Act is required for Federal Section 404 permit actions. If applicable, construction would also require a request for Water Quality Certification (or Waiver thereof) from the Regional Water Quality Control Board (RWQCB).

Federal Migratory Bird Treaty Act (MBTA)

The Federal Migratory Bird Treaty Act (MBTA, 16 U.S.C., Sec. 703, Supp I) prohibits any person to:

> *"pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention ... for the protection of migratory birds ... or any part, nest, or egg of any such bird."*[1]

The list of migratory birds includes almost every native bird in the United States. This law also extends to parts of birds, nests, and eggs. It is therefore a violation of the MBTA to directly kill or destroy an active nest of any bird species. The MBTA is typically applied on domestic projects to prevent injury or death of nesting birds and their chicks.

STATE OF CALIFORNIA

California Endangered Species Act (CESA)

State-listed rare, threatened, and endangered species are protected under provisions of CESA. Activities that may result in take of individuals (e.g., “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill”) are regulated by the California Department of Fish and Game (CDFG). CDFG has interpreted take to include the destruction of nesting and foraging habitat necessary to maintain viable breeding populations of relevant state threatened or endangered species.

California Species of Special Concern

The CDFG recently changed its policy concerning California *Species of Special Concern*. Originally, the CDFG defined species of special concern as those animal species whose California breeding populations may face extirpation (extinction) in the near future. The CDFG has redefined species of special concern as a management designation used to track population trends of certain animal species. Species of special concern do not receive protection under the CESA or any section of the California Fish and Game Code, and do not necessarily meet CEQA Guidelines Section 15380 criteria as rare, threatened, endangered, or of other public concern. Like federal species of concern, the determination of significance for California species of special concern must be made on a case-by-case basis.

California Fully Protected Species

Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code designate certain species as "fully protected." Fully protected species, or parts thereof, cannot be taken or possessed at any time. The California Fish and Game Commission, however, may authorize the collecting of such species for necessary scientific research.

[1] Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712; Ch. 128; July 13,1918; 40 Stat. 755) as amended.

Section 3511 of the California Fish and Game Code may authorize the live capture and relocation of fully protected birds pursuant to a permit for the protection of livestock. Legally imported and fully protected species or parts thereof may be possessed only under a permit issued by CDFG.

California Fish and Game Code – Protection of Raptors

Birds of prey are protected in California under the California Fish and Game Code, §3503.5. Under §3503.5, it is unlawful to take, possess or destroy any raptors including owls, or to take, possess, or destroy the nest or eggs of raptors or owls. The CDGG considers a disturbance that causes nest abandonment or loss of reproductive effort as a "taking." Construction disturbance during the breeding season can result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Any losses of fertile eggs or nesting raptors or any activities resulting in nest abandonment are significant impacts.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, in part, implements the federal Clean Water Act (CWA) to provide a mechanism for protecting the quality of the state's waters through the State Water Quality Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The SWRCB and the San Francisco Bay RWQCB have taken the position that the Porter-Cologne Act and the San Francisco Bay Basin plan developed pursuant to the Act provide independent authority to regulate discharge of fill material to wetlands outside the jurisdiction of the Corps.

California Fish and Game Code Section 1601-1606

Jurisdictional authority of the CDFG over wetland areas and streams is established under Sections 1601-1606 of the Fish and Game Code. This code pertains to activities which would disrupt the natural flow or alter the channel, bed or bank of any lake, river or stream, and requires an agreement identifying appropriate mitigation before any disturbance is allowed by the CDFG.

LOCAL REGULATIONS

The local regulations applicable to biological resources in the site vicinity include the policies of the City of Union City General Plan (Natural and Historical Resource Element) for the protection of watercourses, wetlands, riparian corridors, sensitive habitat, and trees.

- **Policy NHR-A.1.1:** The City shall define the following as sensitive habitat areas: riparian woodland and scrub, freshwater marsh/wetland areas, non-freshwater marsh/wetland areas, and grassland areas.
- **Policy NHR-A.1.2:** The City shall maintain information on biological resources in the Planning Area, including maps that identify the locations of environmentally-sensitive habitats and special status species as reported to the City or available from information published by regulatory agencies. This information shall be used by the City to inform and guide review of proposed development.
- **Policy NHR-A.1.3**: On sites that have the potential to contain critical or sensitive habitats, or special-species, or are within 100 feet of such areas, the City shall require the project applicant to survey the site by a qualified biologist at the proper time of year. A report of the findings of this survey shall be submitted to the city as part of the application process. Appropriate mitigation measures will be incorporated into the project as necessary to protect the resources.
- **Policy NHR-A.1.4:** On sites with the potential to contain wetland resources, the City shall require that wetland delineation be prepared using the protocol defined by the U.S. Army Corps of Engineers. The applicant shall submit a report on the findings of this survey to the City as part

of the application process. Appropriate mitigation measures will be incorporated into the project as necessary to protect the resources.

- **Policy NHR-A.1.5**: Any proposal that would create new parcels or lots shall demonstrate that the resulting parcels/lots provide adequate building space outside of critical biological areas and areas inhabited by special-status species.
- **Policy NHR-A.1.6:** The City shall cooperate actively in regional efforts to restore wetlands ecology and stream and river resources.
- **Policy NHR-A.1.7:** The City shall cooperate with other public agencies and organizations to acquire conservation easements on privately-owned lands in order to preserve important wildlife corridors and to provide protection of State or Federal special-status species and the habitats they occupy and use.
- **Policy NHR-A.1.8**: The City shall work to inform and educate the public about the natural resources in the city and the steps that can be taken to help protect, enhance, restore, and enjoy these resources.
- **Policy NHR-A.1.9:** The City shall help residents understand, value, preserve and restore the unique features within the city that are part of the Bay ecology.
- **Policy NHR-A.1.10:** The City shall design and develop an environmental education center to serve area residents.
- **Policy NHR-A.1.11:** The City shall create compatible points of access for the public to view and understand the importance of the ecosystems of the hills and wetlands.
- **Policy NHR-A.1.12:** The City shall provide signage and strategically locate fences to prevent humans and dogs from adversely affecting wetlands.
- **Policy NHR-A.1.13:** The City shall continue to require a burrowing owl study on all development projects that incorporate vacant, unpaved parcels, or parcels adjacent to possible owl habitat.
- **Policy NHR-A.1.14:** The City shall encourage the Alameda County Flood Control District to enhance the viability of habitat areas along the city's creek system by restoring the natural vegetation and cleaning up trash and debris in coordination with.
- **Policy NHR-A.1.15:** The City shall commit to preservation of significant natural resources including wetlands, bay shores, plant, animal, and fish habitat.

ENVIRONMENTAL SETTING

LOCAL SETTING

Vegetation Cover and Wildlife Habitat

Vegetation on Parcel "C" consists of non-native grasses and forbs including; ripgut brome (Bromus diandrus), soft chess (Bromus hordeaceus), Italian ryegrass (Lolium multiflorum), wild radish (Raphanus sativus), common lipia (Phyla nodiflora), and bindweed (Convovulus arvensis), star thistle (Centaurea solstitialis), tall wheat grass (Elymus ponticus), and perennial peppergrass (Lepidium latifolium). The primary Turk Island Landfill is also dominated by non-native grasses with some dense stands of fennel (Foeniculum vulgare) scattered about the area.

Wildlife expected to be resident on or in the immediate vicinity of the site are those species typically associated with grasslands that are able to adapt to disturbance and residential land uses. This generally includes small mammals, birds, and reptiles. Species observed during the November 11,

2016 site visit included primarily birds: crows (Corvus brachyrhynchos), western meadowlark (Sturnella neglecta), and white crowned sparrow (Zonotrichia leucophrys). No ground squirrels or signs of ground squirrel activity (burrows, runways) were observed on the site and there was no evidence of deer or canids (antlers, scat, etc.). It is possible that shorebirds using the marshland habitat to the west could forage on the site but there appeared to be little if any prey base present.

Special-Status Species

Special-status species are plants and animals legally protected under state and federal endangered species acts (ESAs) or other regulations, or the scientific community considers them sufficiently rare to qualify for such listing. Special-status plants and animals are species in the following categories:

- Species listed or proposed for listing as threatened or endangered under the federal ESA;
- Species that are candidates for possible future listing as threatened or endangered under the federal ESA;
- Species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act;
- Species that meet the definitions of rare or endangered under CEQA;
- Plants listed as rare under the California Native Plant Protection Act;
- Plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California;"
- Plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution, which may be included as special status species on the basis of local significance or recent biological information;
- Animal species of special concern to the California Department of Fish and Game; and
- Animals fully protected in California (Under California Fish and Game Code, Section 3511 (birds), Section 4700 (mammals), and Section 5050 (amphibians and reptiles)).

A list of special status species considered for potential to occur in the project area was generated through review of previous environmental documents prepared for the property, information available for Coyote Hills Regional Park, and a query of the CNDDB. The list is included in full in Table 1 in Appendix F and pertinent information is posted below.

The majority of special status plants considered are known to occur in coastal salt marsh or wetland habitats that are not present on the Project site. One species, Congdon's tarplant, is also found in grassland communities but usually associated with alkaline habitat. This tarplant would have been identifiable at the time of the field survey and was not observed on the Project site.

The only special status animal with potential to use the habitat present on the Project site is the California burrowing owl. This species is a year-round resident of open, dry grasslands. It uses rodent or other burrows for roosting and nesting cover, usually nesting in old burrows of ground squirrels or other small mammals. If small mammal burrows are scarce or absent from an area, burrowing owls may use pipes, culverts, or the nest boxes of other bird species as nests. There are several recorded occurrences of burrowing owl in the vicinity. No burrowing owls or signs of burrowing owl activity (e.g. large mounds with pellets, bones, feathers) were observed on the Project site during the November 11, 2016 site visit. Ground squirrels, small mammal burrows, or other suitable nesting habitat for owls was also not observed on the site.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

The following thresholds for measuring a Project's environmental impacts are based upon Appendix G, CEQA Guidelines thresholds:

1. Would the project result in a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive or special-status species in local or regional plans, policies, or regulations or by CDFG or USFWS;

2. Would the project result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USWFS;

3. Would the project result in a substantial adverse effect on wetlands as defined by the Corps under Section 404 of the Clean Water Act or the Regional Water Quality Control Board under the Porter-Cologne Act through direct removal, filling, hydrological interruption, or other means;

4. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

5. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

6. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

7. Would the project result in impacts to biological resources that are individually limited, but cumulatively considerable (i.e., the incremental effects of the project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

SPECIAL STATUS SPECIES

1. *The Project would have a **less than significant** impact, both directly and through habitat modification, to all sensitive species with the exception of the burrowing owl.*

   *The Project would have the potential to result in a substantial adverse effect, either directly or through habitat modification, to the burrowing owl. This potentially **significant impact** can be mitigated to a less-than-significant level by completing a pre-construction survey and implementing appropriate avoidance measures.*

The Project will result in the removal of approximately 6.3 acres of non-native annual grassland vegetation for residential development on Parcel "C. Up to 20 additional acres of non-native annual grassland on the adjacent main Turk Island Landfill will be temporarily disturbed for the placement and capping of landfill debris excavated from Parcel "C". Non-native grassland communities are relatively common to the region and loss of this habitat is not considered significant unless it supports special status species. As described above, no special status plant species have been found or would be expected to occur in the habitat present on the Project site. One special status animal species, the

California burrowing owl, has the potential to use the habitat on the site, though no owls or signs of owl activity were observed anywhere on the Project site (Parcel "C" and the main Turk Island Landfill) during the November 2016 site survey.

Impact Bio-1: **Burrowing Owl Disturbance.** Excavation, consolidation, and other forms of construction disturbance could result in the direct loss or injury to burrowing owls or the forced evacuation from their burrows.

Although burrowing owls are not currently using the Project site, there is potential for individual owls to move into the area, particularly if construction activities are not initiated prior to the start of the breeding season (February-August). Direct loss or injury to burrowing owls or the forced evacuation from occupied burrows would be a potentially significant impact.

Mitigation Measure

Bio-1: **Burrowing Owl Survey.** Within 30 days prior to any ground-disturbing activities, the Project applicant shall retain a qualified biologist to conduct a pre-construction survey to determine if any burrowing owls are occupying the Project site (Parcel "C" and the main Turk Island Landfill). The surveys shall be conducted in accordance with the California Department of Fish and Wildlife (CDFW) Staff Report on Burrowing Owl Mitigation. If occupied burrows are found, the biologist shall consult with the California Department of Fish and Wildlife to establish appropriate avoidance measures until such time as the owls are no longer occupying the site. Such avoidance measures may include:

- Avoid disturbing occupied burrows during the nesting period, from February 1 through 31 August (the breeding season).
- Halting all construction around occupied burrows and for a certain distance around the burrows until such time as the birds abandon the burrow, as determined through monitoring.
- Implementing passive relocation measures developed in consultation with CDFW to encourage owls to move from occupied burrows to alternate natural or artificial burrows placed away from the impact zone.
- Develop and implement a worker awareness program to increase the on-site worker's recognition of and commitment to burrowing owl protection.
- Place visible markers near burrows to ensure that equipment and other machinery does not collapse burrows.
- Do not fumigate, use treated bait, or other means of poisoning nuisance animals in areas where burrowing owls are known or suspected to occur (e.g., sites observed with nesting owls, designated use areas).
- Conduct Burrow Exclusion. If avoidance of burrowing owl or their burrows is not possible, prior to the first ground-disturbing activities, the project applicant, in consultation with the California Department of Fish and Wildlife, shall prepare a Burrowing Owl Relocation Plan as indicated and following the CDFW 2012 Staff Report. Monitoring of the excluded owls shall be carried out as per the California Department of Fish and Game 2012 Staff Report.
- Prepare and Implement a Mitigation Plan. If avoidance of burrowing owl or their burrows is not possible and Project activities may result in impacts to nesting, occupied, and satellite burrows and/or burrowing owl habitat, the

project applicant shall consult with the CDFW and develop a detailed mitigation plan such that the habitat acreage, number of burrows, and burrowing owl impacted are replaced. The mitigation plan shall be based on the requirements set forth in Appendix A of the CDFW 2012 Staff Report on Burrowing Owl Mitigation and the Plan shall be reviewed and accepted by CDFW prior to the first ground-disturbing activities.

The implementation of these impact avoidance measures would result in a ***less-than-significant impact*** to burrowing owls.

RIPARIAN HABITAT, WETLANDS, OR OTHER SENSITIVE NATURAL COMMUNITY

*2., 3. The Project would not result in a substantial adverse effect on any riparian habitat, wetlands, or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USWFS (**less than significant** impact).*

Neither Parcel "C" not the main Turk Island Landfill contains wetlands or riparian habitats that would be directly affected by Project activities. However, the primary Turk Island Landfill is adjacent to the Alameda County Flood Control wetlands to the north, former salt evaporation ponds to the west, and seasonal wetlands in the former duck club to the south. Additionally, the off-site trail is proposed adjacent to marsh habitat. The potential for indirect effects to these areas are discussed below.

Both of the areas on the Turk Island Landfill receiving debris from Parcel "C" are a minimum of 150 feet away from and higher in elevation than the adjacent wetlands. Parcel "C" is not directly adjacent to nearby wetlands, but near to and at a similar elevation to the seasonal wetlands at the former duck club. The Storm Water Pollution Prevention Plan required for construction activities will require implementation of best practice measures to prevent sediment or contaminants from reaching off-site wetland areas and the Project would not have significant impacts related to construction-period contamination of wetland areas. (See Impact 3 in Chapter 9: Hydrology).

Material excavated from Parcel "C" will be placed on top of the southern and northern lobes of the existing main Turk Island Landfill but would not change the overall footprint or nature of the landfill. Ongoing maintenance activities to re-establish slopes as settlement occurs are anticipated as normal procedures for closed landfills and proposed slopes and run-off levels as a result of the current Project are within design parameters for the landfill. Similarly, the residential development at Parcel "C" and proposed off-site recreational improvements are required to comply with the C.3 requirements in the California Regional Water Quality Control Board Municipal Regional Permit and has been designed with stormwater treatment areas to control runoff and trap pollutants before flow is released into the receiving water. The Project would not result in substantial changes to runoff from off-site recreational improvement areas, Parcel "C," or the main Turk Island Landfill, or the potential for significant impacts to nearby wetlands due to changes in runoff. (See also hydrology information in Chapter 9 of this Draft EIR.)

The offsite trail improvements are adjacent to a stormwater retention basin. This area was surveyed in the November 2016 field survey and is a marsh habitat that is densely vegetated with cattail and could support several bird species known to use bay margin habitats, though none were observed during the field survey. The trail will follow an existing gravel path, which is separated from the retention basins and marsh habitat by a chain-link fence along the western edge. The existing fence is proposed to remain and will continue to prevent access into the basin by trail users and dogs that could otherwise disturb/degrade the marsh habitat and wildlife. With the existing fence to remain in place, the Project would not have the potential to cause significant effects on the marsh habitat in this area.

WILDLIFE MOVEMENT

*4. The Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (**less than significant** impact).*

Wildlife inhabiting the bay margin habitats to the west are not likely to use Parcel "C" as a travel corridor because it is surrounded by development on three sides and is a relatively exposed area providing few shrubs and trees that could provide cover for wildlife. Development on Parcel "C" would not interfere substantially with the movement of wildlife. The main Turk Island Landfill is also very exposed and provides little cover for wildlife. While it is possible that wildlife could use the main Turk Island Landfill for movement, such wildlife could instead use the open grasslands and marshlands to the west, which would be at least as appropriate for such movement. In addition to their being redundant paths of travel, any potential interference with wildlife movement across the main Turk Island Landfill would be temporary and limited to the consolidation period. Therefore, the Project would not have the potential to result in a significant impact related to wildlife movement (***less than significant***).

TREE PRESERVATION ORDINANCE

*5., 6. The Project would not result in conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (**no impact**).*

Chapter 12.16 of the Union City Municipal Code requires a permit to remove "protected trees" from City and private property. There are no trees on the Turk Island Landfill or Parcel "C"; therefore, the Project would not conflict with the City's tree preservation ordinance (***no impact***).

The Project site is not within an area covered by a Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP), or proposed for salt marsh restoration. The proposed Project would not conflict with other wildlife protection or enhancement programs that includes Alameda County, such as the Alameda County Wildlife Friendly Pond Restoration Program, a U.S. Fish & Wildlife Service "Safe Harbor Agreement" for the enhancement of the California red-legged frog and California tiger salamander. There are no ponds on the Project site and no habitat for red-legged frogs or tiger salamanders (***no impact***).

CUMULATIVE BIOLOGICAL RESOURCES IMPACTS

*7. The Project would not result in significant impacts to biological resources that are individually limited, but cumulatively considerable (**less than significant** impacts).*

The Project site does not contain areas that would be considered federally protected wetlands, riparian habitat or other sensitive natural communities, does not constitute a major movement corridor for native wildlife, and does not conflict with any conservations plans or local ordinances.

While the Project has the potential to impact the special status species, burrowing owl, Mitigation Measure Bio-1 would detect use of the site by these owls and require implementation of measures if found to reduce any potentially significant impacts from the Project to less than significant, and would therefore not contribute significantly to cumulative impacts.

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7

GEOLOGY AND SOILS

INTRODUCTION

The following section describes the Geology, Soils and Seismicity of the Project area. The information presented below was drawn from several sources of data, including:

- Clean Closure/Remediation Plan, 6.3 Acre/Closed Turk Island Landfill, Union City, California, The Remediation Group, Inc., February 6, 2016. (Included as Appendix B of this EIR.)
- Tentative Maps, Tract 7728 Turk Island, Union City, California, Ruggeri-Jensen-Azar, December, 2016.
- Geotechnical Exploration Report, Tract 7728, Parcel C, Turk Island, Union City California, ENGEO Incorporated for Nuvera Homes, April 6, 2017. (Included as Appendix G of this EIR.)
- USGS Open File Reports (OFR) of the area, including the Preliminary Geologic Map Emphasizing Bedrock Formations in Alameda County, California: A Digital Database (USGS OFR 96-252, 1996), and Quaternary Geology of Alameda County, and Parts of Contra Costa, Santa Clara, San Mateo, San Francisco, Stanislaus, and San Joaquin Counties, California: A Digital Database (USGS OFR 97-97, 1997); Maps of Quaternary Deposits and Liquefaction Susceptibility in the central San Francisco Bay Region, California (USGS OFR 2006-1037).
- Official California Geological Survey (CGS) (formerly the California Division of Mines and Geology (CDMG)) Maps, including the Newark Quadrangle Alquist-Priolo (A-P) Earthquake Fault Zone Map (1982), Seismic Hazard Zone Maps (2003), and Simplified Fault Activity Map of California (1999, Revised 2002).
- Government websites, including the Association of Bay Area Government's (ABAG) website (www.abag.ca.gov/earthquakes) for a summary of hazards ranging from liquefaction and seismic shaking to landsliding.
- Union City General Plan, Health and Safety Element.

SETTING

REGIONAL SEISMICITY

The Project site is located in a region near the juncture of two crustal plates that are slipping beneath and sliding against each other. This region is tectonically active. Within 25 miles of the site there are five major active faults that display large right-lateral offsets as shown in **Table 7-1**. Seismic activity

in the area has resulted in major earthquakes, such as the 1868 Hayward Earthquake of magnitude 7.0, that occurred nearby on the Hayward fault.[1] The Hayward fault segment located in Union City experienced surface fault rupture during the 1868 event. Seismic events on other regional fault zones have also resulted in strong seismic shaking of the Project site. This includes the 1906 San Andreas Fault earthquake (the Great San Francisco Earthquake) and the 1989 Loma Prieta earthquake.

Table 7-1: Regional Faults and Activity

Fault Name	Distance From Site (Miles)	Direction From Site	Activity	Maximum Credible Earthquake (Moment Magnitude)
Hayward (southern)	4.5	East-northeast	Active	7.3
Calaveras	11	East-southeast	Active	7.0
Monte-Vista Shannon	13	West	Active	6.5
San Andreas	14	West	Active	8.0
Greenville	24	East	Active	7.2

Note: Other faults of lesser significance due to their distance from the Project site include the Concord-Green Valley Fault, San Gregorio, Great Valley, Sargent, Zayante-Vergeles and Rogers Creek faults all of which are greater than 25 miles from the Project site.

REGIONAL GEOLOGY

The Project site is located within the Coast Range geomorphic province at the northernmost extent of the Santa Clara Valley along the eastern margin of southern San Francisco Bay. Subsurface sediments beneath the Project site reflect the transition between San Francisco Bay sediments which are generally fine-grained silts and clays and Niles cone alluvial sediments which are predominantly sands that comprise the Newark aquifer. The regional Project area is characterized by northwest trending mountain ranges and valleys that are oriented sub-parallel to the regional faults of the San Andreas Fault System, and the San Francisco Bay.

In the Union City, Fremont and Hayward region, much of the area located to the west of the Hayward fault is a low-lying alluvial plain. No bedrock is exposed in the area of the Project site, and materials beneath the landfilled waste materials consist predominantly of old marsh and bay mud deposits, with occasional lenses of sands.

PROJECT SITE GEOLOGY AND SOILS

According to the Quaternary Geologic Map of Alameda County, the Project site is underlain by bay mud deposits of Holocene Age and flood basin deposits of clay with carbonate nodules (salt-affected basin deposits in contact with bay mud). Beneath the Younger Bay Muds and flood basin deposits, which extend to depths of 10 to 15 feet relative to mean sea level (MSL), is Older Bay Mud (30 to 45

[1] CDMG, 2000.

feet thick) followed by sands and gravels (20 to 25 feet thick) that comprise the Newark aquifer. Overlying the bay mud and salt pond deposits are landfilled materials consisting of various amounts of municipal, industrial and construction debris wastes. The landfilled waste materials are covered with a soil cap and grasses.

Test pits that were completed to characterize the parcel for proposed residential development (Parcel "C") indicate that the waste materials extend to depths of 14 feet below existing ground at the northwest corner of the site (elevation of 3 feet MSL) to 20 feet below ground surface (elevation of 0 feet MSL) at the southeast corner. The waste is overlain by up to approximately 4 feet of sand with gravel and clay. The waste is underlain by gray clay (bay mud). At the primary Turk Island Landfill, the waste material forms a flat-topped hill with elevations up to approximately 54 feet relative to MSL. The waste materials in this portion of the Project site are estimated to be up to approximately 50 feet thick and are overlain by a soil cover approximately 4 feet thick.

PROJECT SITE LANDSLIDING AND SLOPE STABILITY

Landslides occur when the shear stress of soil or waste materials exceeds its shear strength. Shear stress can be increased by adding to the weight of the soil or waste materials through saturation or loading. Shear strength can be reduced by changes in water content, erosion or grading at the toe of a slope. Failure can occur due to either an increase in shear stress or a decrease in shear strength. The shear strength of soil is variable, especially for soil mixed with landfilled waste materials. Slope steepness is also a dominant factor governing slope stability.

Existing landfill side slopes are generally 3H:1V (3 feet horizontal to 1 foot vertical) and as steep as approximately 2.5H:1V. In the past, the slopes around the primary Turk Island Landfill area have experienced some areas of sloughing and sliding.

PRIMARY SEISMIC HAZARDS - SURFACE FAULT RUPTURE

A number of active and potentially active faults are present in the region. According to criteria of the State of California Geological Survey, active faults have experienced surface rupture within the last 11,000 years (Holocene time). The Alquist-Priolo Earthquake Fault Zoning Act of 1972 initiated a program of mapping active faults (faults with displacement within Quaternary time - the last 1.6 million years). According to the program, active faults must be zoned and development projects within the Earthquake Fault Zones investigated to establish the location and age of any faulting across the development site. Active and potentially active faults in the Project area have undergone extensive investigation in the past to establish the level and recent history of activity. ABAG has summarized results from many of these studies to quantify the potential impact to certain areas, while the California Geological Survey has established Earthquake Fault Zone (EFZ) boundaries. According to the Newark Quadrangle EFZ map, the proposed development is not located within an EFZ. The nearest EFZ boundary is for the Hayward Fault, and is located approximately 4.5 miles east-northeast of the site.

SECONDARY SEISMIC HAZARDS

Ground Shaking

The San Francisco Bay Area is a seismically active region. The site is located in an area of active regional seismicity near active seismic sources.

According to the USGS Uniform California Earthquake Rupture Forecast (UCERF), there is a 63 percent probability that an earthquake of Richter Magnitude 6.7 or greater will strike between 2007

and 2036.[2] The Hayward fault, at a distance of approximately 4.5 miles from the Project site, was assessed to have a 31 percent probability of a magnitude 6.7 earthquake or greater before 2036.

The intensity of ground shaking will vary with the distance and magnitude of the earthquake causing the ground shaking. The maximum intensity ground shaking expected to occur at the site would be a Modified Mercalli intensity level of VIII (very strong) in response to a Magnitude 6.8 earthquake on the Hayward fault. Major earthquakes on more distant faults would result in light to very strong ground shaking, Modified Mercalli intensities of V to VII.[3]

Modified Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions
II	Felt only by a few persons at rest, especially on upper floors of buildings
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	**Light**. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	**Moderate**. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	**Strong**. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	**Very Strong**. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned
IX	**Violent**. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	**Very Violent**. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Seismically Induced Liquefaction

Liquefaction is the temporary transformation of saturated, cohesionless soil into a viscous liquid as a result of ground shaking. According to the *Seismic Hazard Zone Map for the Newark 7.5-Minute*

[2] Working Group on California Earthquake Probabilities (WGCEP), 2002.

[3] Association of Bay Area Governments, 2005, www.abag.ca.gov.

Quadrangle, *Alameda County*, the Project site is located within a Seismic Hazard Zone for liquefaction.[4] According to the ABAG liquefaction hazard map for a maximum magnitude earthquake on the Hayward fault, soils at the Project site have a moderate susceptibility to liquefaction.[5] Liquefaction in flat areas can result in sand boils and settlement. Liquefaction in sloped areas can result in lateral deformation or movement. According to the geotechnical report prepared by ENGEO, the total liquefaction-induced settlements across the site are estimated to be less than 2 inches. Differential settlement during a liquefaction event is expected to be less than 1 inch.[6]

Seismically Induced Densification

Dynamic densification or seismic settlement can occur when dry cohesionless soils collapse as a result of seismic shaking.

Seismically Induced Lurch Cracking and Lateral Spreading

Lurching is the sudden swaying, rolling, or spreading of the ground during a strong earthquake. Lurch cracking is the development of fissures or cracks on slopes overlain by weak soils. Lateral spreading occurs when soils move towards a free face such as a slope or the bank of a creek or stream. According to the geotechnical report prepared by ENGEO, lateral spreading is unlikely at this site since the potential-liquefiable soil layers encountered are localized.

Seismically-induced slope failure is another secondary seismic hazard. During earthquake-induced ground shaking, unstable slopes can fail, causing landslides and debris flows. According to the Seismic Hazard Zone Map of the area, the Project site is not located within an earthquake-induced landslide zone.[7]

REGULATORY SETTING

City of Union City General Plan and Municipal Code

The City of Union City General Plan and Municipal Code provides specific requirements for development within the City of Union City. The General Plan includes provisions to protect the public health and safety and minimize the damage to structures, property, and infrastructure as a result of natural and man-made hazards. General Plan (GP) policies HS-B.1.1 through HS-B.1.12 specifically address the risks associated with geologic and soils hazards. Several of the policies address actions the City needs to take such as continuing to implement updated editions of the Uniform Building Code. The following GP policies specifically apply to the Project:

Soils and Geologic Engineering Report (GP Section HS-B.1.1) – A report for sites within the "Special Seismic Studies Zone"[8] should summarize the results of an investigation by both registered soils engineers and engineering geologists prior to issuing a building permit. The report shall specifically address secondary seismic hazards, especially potential for soil liquefaction, ground shaking, lateral

[4] CGS, 2003.

[5] www.abag.ca.gov.

[6] ENGEO, 2017

[7] CGS, 2003.

[8] Within a Alquist-Priolo Earthquake Fault Zone boundary

spreading, local subsidence and lurch cracking. The report shall be independently evaluated, on behalf of the City, for completeness and accuracy.

Levee Stability Evaluation (GP Section HS-B.1.1a) – Applicants for proposed developments west of Union City Boulevard shall coordinate with Alameda County Flood Control and Water Conservation District to evaluate the stability of all levees in order to identify potential hazards and necessary mitigation measures.[9]

Compliance with International and California Building Codes (GP Section HS-B.1.9) - All structures designed for human occupancy in high risk areas and all critical structures throughout the city shall meet local and State-applied code regulations. The Municipal Code incorporates other applicable regulatory requirements by reference including the International and California Building Codes cited below.

Alquist-Priolo Earthquake Fault Zoning Act

The California Alquist-Priolo Earthquake Fault Zoning Act of 1972 required the mapping and zoning of active faults within the State of California. Under the act, development within zones of active fault displacement is restricted for structures intended for human occupancy. Any development site located within an Earthquake Fault Zone Boundary as delineated on State maps must be studied to determine if an active fault crosses the subject parcel. Setbacks from active faults are required under the Act.

California Seismic Hazards Mapping Act

The California Seismic Hazards Mapping Act of 1990 (California Public Resources Code Sections 2690-2699.6) addresses seismic hazards other than surface rupture, such as liquefaction and seismically induced landslides. The Seismic Hazards Mapping Act specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

International Building Code (2015) and California Building Code (2016)

The International Building Code was developed by the International Conference of Building Officials to provide a set of consistent standards for building of structures. The California Building Code (CBC) was developed to incorporate modifications required by California law and statute and has been adopted by most jurisdictions in California, including the City of Union City, to oversee construction. The CBC uses mapped acceleration parameters, Site Classification (A through F) based on soil properties, and Structure Risk Categories to develop Site Coefficients, Design Spectral Response Acceleration Parameters, and Seismic Design Categories. The earthquake protection law (California Health and Safety Code Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum standards for seismic safety and structural design to meet earthquake protection requirements are set forth in Chapter 16 of the CBC.

[9] Flood control mitigation measures are discussed in the Hydrology chapter under Thresholds of Significance No. 9 related to the failure of a levee or dam.

California Code of Regulations

Title 27 Division 2 of the California Code of Regulations provides requirements applicable to solid waste. These regulations provide for design, operations, closure and post-closure monitoring of solid waste facilities including the Turk Island Landfill. Waste Discharge Requirements (WDRs) issued for the Turk Island Landfill specify the applicable regulatory requirements for the site as well as monitoring and inspection during post-closure and for post-closure redevelopment. The WDRs are periodically updated as conditions change. Any changes to the landfill conditions such as proposed by this development require the review and approval of several agencies including the San Francisco Bay Regional Water Quality Control Board (SFRWQCB), California Department of Resources Recycling and Recovery (CalRecycle), Alameda County Environmental Health (ACEH), and the Bay Area Air Quality Management District (BAAQMD).

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

According to CEQA Guidelines, exposure of people or structures to major geological hazards is considered a significant adverse impact. The potential geologic, soils, and seismic effects of the proposed Project can be considered from two points of view: (1) construction impacts (during excavation, consolidation, backfill, and construction of the residential subdivision); and, (2) geologic hazards to people or structures during operations. The basic criterion applied to the analysis of construction impacts is whether construction of the Project will create unstable geologic conditions that would last beyond the short-term construction period. The analysis of geological hazards is based on the degree to which the site geology could produce hazards to people or structures from earthquakes, ground shaking, ground movement, fault rupture, or other geologic hazards, features or events.

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, geology, soils, and seismicity impacts resulting from the implementation of the proposed Project would be considered significant if it were to result in:

1. The exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;

2. The exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking;

3. The exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction;

4. The exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving landslides;

5. Development located on a geologic unit or soil that is unstable (or that would become unstable as a result of the Project) and which could potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;

6. Development located on expansive soil, as defined in Section 1803.5.3 of the California Building Code, creating substantial risks to life or property;

7. Development in areas where soils are incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;

8. Geology and Soils impacts that are individually limited, but cumulatively considerable (i.e., the incremental effects of the project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).

SURFACE FAULT RUPTURE

1. *The Project would have a **less than significant** impact related to the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving rupture of a known earthquake fault.*

The Project site is not within an Alquist-Priolo Earthquake Fault Zone boundary. Published geologic maps show no faults crossing the Project site, and there is no other indication of faulting on the property. The nearest active fault is the Hayward fault located 4.5 miles to the east-northeast. The potential impact of surface fault rupture is considered ***less than significant***. Therefore, no mitigation is required.

EXPOSURE TO STRONG SEISMIC GROUND SHAKING

2. *The Project would have the potential to result in exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking. This potentially **significant impact** can be mitigated to a less than significant level through compliance with California Building Code, Design-Level Geotechnical Investigation Report, Final Design Review, and Closure Requirements.*

Impact Geo-1: **Seismic Ground Shaking.** There is a high probability that the proposed development will be subjected to strong to violent ground shaking from an earthquake during its design life.

The Project will likely be subjected to strong to violent seismically-induced ground shaking within the design life of the development. Peak ground accelerations for the Project site with a 10 percent probability of being exceeded in a 50-year period are estimated at 0.0.55 of the acceleration due to gravity (g).[10] Actual ground motions resulting from ground acceleration may be amplified or dampened depending on the underlying geologic materials. Deep soft soils tend to amplify waves, whereas shallow soils overlying hard bedrock tends to dampen shaking intensity. With moderately deep soils at the Project site, amplification of seismic waves could occur, but are not predicted by the CGS ground motion program.

Mitigation Measure

Geo-1a: **Compliance with California Building Code.** Project development shall meet requirements of the California Building Code, including the International Building Code published by the International Conference of Building Officials,

[10] CGS web site http://www.quake.ca.gov/gmaps/PSHA/psha_interpolator.html.

and as modified by the amendments, additions and deletions as adopted by the City of Union City, California in effect at time of building permit application.

Mitigation Measure

Geo-1b: **Preparation and Compliance with a Design-Level Geotechnical Investigation Report prepared by a Registered Civil or Geotechnical Engineer and with Structural Design Plans as Prepared by a Registered Structural Engineer.** Proper foundation engineering and construction for the residential units on Parcel "C" shall be performed in accordance with the recommendations of a registered Civil Engineer with expertise in geotechnical engineering and a Registered Structural Engineer subject to review and approval by the City.

The structural engineering design shall incorporate seismic parameters as outlined in the California Building Code as described above. The Geotechnical Exploration Report prepared by ENGEO for Parcel "C" provides recommendations for foundation engineering and construction for Parcel "C" by a registered Geotechnical Engineer. The ENGEO report uses seismic design parameters in accordance with requirements of the California Building Code to evaluate exposure to strong seismic ground shaking and recommends that the proposed single-family residential structures be supported on post-tensioned (PT) mat foundations bearing on prepared engineered fill.[11]

Mitigation Measure

Geo-1c: **Building Permit Issuance.** The Project applicant shall obtain a building permit through the Union City Building Division. Final structural design of planned buildings and structures shall be completed by a licensed engineer and comply with all applicable mitigation measures and regulatory standards.

Mitigation Measure

Geo-1d: **Compliance with Closure Requirements for Solid Waste Landfills.** Regulations for closure and post-closure maintenance of solid waste landfills prescribe seismic criteria and slope stability requirements that must be met to mitigate the effects of the maximum probable earthquake (Title 27 Division 2 Chapter 4 Section 21750(f)(5)) and the prompt repair of any damage that may result from a major earthquake (Chapter 3 Subchapter 5 Section 21090). The SFRWQCB and other regulatory agencies including ACEH, BAAQMD, CalRecycle will review and approve some or all of the following documents: the Project Clean Closure/Remediation Plan, Plan Set, and Geotechnical Exploration Report ("Technical Documents"), including project design, work and control plans. Prior to construction, evidence documenting approval of the Technical Documents, including closure requirements and any additional conditions that may be imposed by these agencies to further mitigate geological impacts, shall be provided to the City of Union City before issuance of grading permits. Once approved, the project design, work and control plans shall be fully implemented for the Project.

Incorporation of seismic construction standards would reduce the potential for catastrophic effects of ground shaking, such as complete structural failure, but not eliminate damage to structures or eliminate the hazard of seismically induced ground shaking. Conformity with mitigation measures

[11] ENGEO, 2017

Geo-1a through Geo-1d would reduce the impact of strong seismic ground shaking to a level considered ***less than significant***.

SEISMICALLY INDUCED GROUND FAILURE, INCLUDING LIQUEFACTION AND GROUND SURFACE SETTLEMENT

*3. The Project would have the potential to result in exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction. This potentially **significant impact** can be mitigated to a less than significant level through compliance with California Building Code (Geo-1a), Design-Level Geotechnical Investigation Report (Geo-1b), Building Permit Issuance (Geo-1c), and Closure Requirements (Geo-1d).*

Impact Geo-2: **Seismic-Related Ground Failure.** According to the California Geological Survey Seismic Hazard Zone Map of the 7.5 Minute Newark Quadrangle, the Project site is located within a liquefaction hazard zone.

The effects of an earthquake on the stability of slopes at the primary landfill have been evaluated as part of the Geotechnical Exploration Report by ENGEO. The analysis concluded that the newly created slopes at the main landfill will be stable in the event of an earthquake. However, impacts due to a large seismic event are difficult to predict, especially due to the large uncertainties associated with landfill material properties; landfill and levee repairs will likely be needed after a large earthquake.

Settlement and the potential effects of liquefaction for the residential development have been evaluated and are discussed in the Geotechnical Exploration Report by ENGEO prepared for the residential development on Parcel "C". It is expected that placement of engineered fill, construction of PT mat foundations and the depth of localized potentially liquefiable layers will mitigate the effects of liquefaction for Parcel "C".

Mitigation Measure

Geo-2: **Compliance with Recommendations of a Geotechnical Investigation and Conformance with Structural Design Plans.** The Geotechnical Exploration Report was prepared for the proposed residential development aspect of the Project under the direction of a California Registered Geotechnical Engineer (Geotechnical Engineer) and includes an analysis for liquefaction potential of the underlying sediments. Proper foundation engineering and construction shall be performed in accordance with the recommendations of the Geotechnical Investigation. The Geotechnical Exploration Report shall be reviewed and approved by the City's Engineer or the City's expert Consultant. A Registered Structural Engineer shall prepare Project structural design plans. Structures shall be designed to minimize the effects of anticipated seismic shaking and settlements. The Geotechnical Engineer shall review the Structural Design Plans and provide approval for the Geotechnical elements of the plans. The Structural Design Plans shall include specific mitigation measures identified in the Geotechnical Exploration Report to reduce the potential adverse effects of liquefaction. Recommended mitigation measures include, but are not limited to, excavation and replacement as engineered fill and construction PT mat foundations to support the proposed single-family residential structures.

Mitigation Measures Geo-1a through **Geo-1d** would also help reduce **Impact Geo-2** as they provided regulatory review of analysis and recommendation for seismically induced ground failure, including liquefaction and ground surface settlement**.**

Implementation of mitigation measures Geo-2, and Geo-1a through Geo-1d would reduce the impact of seismically induced ground failure to a ***less than significant*** level.

LANDSLIDES AND UNSTABLE SOILS

4, 5. The Project would have the potential to result in exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving landslides and/or potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse due to unstable soil. This potentially ***significant impact*** *can be mitigated to a less than significant level through compliance with California Building Code (Geo-1a), Design-Level Geotechnical Investigation Report (Geo-1b), Building Permit Issuance (Geo-1c), and Closure Requirements (Geo-1d).*

Impact Geo-3: **Slope Failure and Settlement due to Liquefaction**. The Project is in an area identified as having a high potential for liquefaction and the materials in the main landfill portion of the Project are susceptible to settlement (subsidence), lateral spreading and slope failure resulting from static conditions following placement of additional fill and/or due to a seismic event (see Impact Geo-2). Slope failure could result in exposure of landfill waste materials, damage to existing utilities along the east side of the primary landfill and to structures in the areas of potential failure.

The Parcel "C" site proposed for residential development will be relatively flat and not have any significant slopes subject to landslides or slope instability however, failure of adjacent slopes at the primary landfill could impact the parcel and liquefaction of underlying materials could cause settlement of residential structures. The primary Turk Island Landfill has existing relatively steep slopes which will be made taller by placement of excavated waste and soil cover materials. The placement of waste and cover materials from Parcel "C" will increase the elevation of the top of the existing landfill by approximately 10 feet. The added materials will be graded at a side-slope gradient of 5H:1V (5 feet horizontal to 1 foot vertical).

Preliminary slope stability analyses were performed to evaluate static (long-term conditions and post-construction) and seismic conditions for the main landfill. Slope stability is evaluated through calculation of a "Factor of Safety", with a Factor of Safety of 1.5 generally considered acceptable for static conditions. The slope stability under long-term Project conditions is estimated to have a factor of safety of 1.9 to 2.3, which exceeds the requirement.[12]

Mitigation Measures Geo-1b and **Geo-2** will require the applicant to conform to geotechnical recommendations and design plans for the Parcel "C" residential development that minimize the potential for settlement on Parcel "C" and Mitigation Measure **Geo-1d** requires compliance with closure plans and conditions imposed through regulatory-agency review and approval of the

[12] ENGEO, 2017

Technical Documents including those related to stability of the main Turk Island Landfill and will reduce Impact Geo-3.

Implementation of mitigation measures Geo-1b, Geo-1d and Geo-2 will ensure the Project complies with geotechnical engineering recommendations for the landfill and residential development and all closure plans and conditions imposed by regulatory agencies through the Technical Documents. This will mitigate the impacts of landslides and unstable soil materials to a ***less than significant*** level.

EXPANSIVE SOILS

*6. The Project is located in an area that is known to have expansive soils and if not properly addressed would have a **potentially significant** impact related to expansive soil.*

Impact Geo-4: **Subsurface Expansive Soils**. Expansive soils including clayey soils are present in the subsurface at Parcel "C". Expansive soils could cause cracking and heaving of concrete slabs.

While the area is indicated as having expansive soils, the site-specific geotechnical investigation summarized in the 2017 ENGEO report indicate that the clayey soils at Parcel "C" have a low expansion potential. Additionally, Parcel "C" will be backfilled with soil that will be engineered to minimize soils hazards such as expansion potential.

Mitigation Measure Geo-1b would reduce **Impact Geo-4** to less than significant levels through requiring compliance with the geotechnical report recommendations including the requirement for engineered fill on Parcel "C".

With implementation of mitigation measure Geo-1b, residential development will occur on engineered fill that complies with geotechnical engineering recommendations to minimize soil hazards including expansive soils, therefore the impact would be reduced to a ***less than significant*** level.

SEPTIC SYSTEMS

*7. The Project would not result in a substantial adverse effect related to septic tanks or alternative wastewater disposal systems as sewers are available for the disposal of wastewater (**no impact**).*

A sewer system is present in the area and septic systems are not required at the site. The Project would have ***no impact*** related to septic systems.

CUMULATIVE GEOLOGY AND SOILS IMPACTS

*8. The Project would have a **potentially significant** impact related to cumulative geology and soils impacts.*

Impact Geo-5: **Cumulative Geology and Soils Impacts.** Strong seismic ground shaking, liquefaction and densification during seismic ground shaking, and soil erosion during Project construction and post construction are common impacts to projects located in the vicinity. Because the Project also includes placement of fill and landfill wastes on an existing landfill that is up to approximately 46 feet above surrounding street elevations (54 feet above mean sea level), there is a potential for slope instability due to landfill material slopes as compared to natural hill slopes. The proposed Project is within an area of relatively recent residential

development and contributes to a cumulative increase in sites facing these impacts.

Mitigation Measures Geo-1a through **Geo-1d** and **Geo-2** would also reduce **Impact Geo-5** to less than significant levels as they require compliance with technical plans and recommendations to minimize geology and soil hazards**.**

As discussed in the impacts above, the proposed Project will result in the potential for geology and soils impacts and require implementation of measures applicable to Parcel "C" and the primary Turk Island Landfill that will reduce potential impacts. The Project-specific contribution would be reduced by identified Project-specific mitigation measures to a ***less than significant*** level with no additional mitigation required. Contributing elements to cumulative impacts are discussed in more detail below.

Exposure to Strong Seismic Ground Shaking

Exposure to strong seismic ground shaking is a common impact to all projects located in the San Francisco Bay region. Development of the Project would increase the number of people exposed to seismic ground shaking in the City of Union City. However, implementation of the identified mitigation measures Geo-1a, Geo-1b, Geo-1d and Geo-2 will reduce the potential cumulative impacts of strong seismic ground shaking to a ***less than significant*** level.

Liquefaction, Densification, and Ground Surface Settlement increase due to the Project development. However, implementation of the identified mitigation measures Geo-1a, Geo-1b, Geo-1d and GEO-2 will reduce the potential cumulative impacts of strong seismic ground shaking to a ***less than significant*** level.

Liquefaction and dynamic densification of soils underlying the site is a common impact with much of the surrounding area. Liquefaction and densification during seismic ground shaking could lead to ground surface settlement of the Project site as well as the surrounding area. The identified mitigation measures Geo-1b, Geo-1d and Geo-2 will reduce the impact to the Project site to less than significant, but impacts to the surrounding area will depend on site specific factors. The cumulative impact of liquefaction, densification, and ground surface settlement is considered ***less than significant*** with the implementation of the above referenced mitigation measures.

Landslides and Slope Failure

The landfill portion of the Project contains slopes up to approximately 46 feet above surrounding street elevations (54 feet above mean sea level). Slope instabilities have occurred in localized areas on the landfill site prior to this proposed Project. Although not all slope failures are predictable, especially due to strong ground shaking of waste materials, conformance with requirements in the Technical Documents as reviewed and approved by the regulatory agencies (Mitigation Measure Geo-1d) will mitigate the impact to a ***less than significant*** level.

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8

HAZARDS AND HAZARDOUS MATERIALS

INTRODUCTION

This section describes the potential hazards and mitigations to public and worker health and safety associated with the construction of the Project and proposed use. This Project includes construction and development at a closed, Class III landfill. There are numerous regulations that govern the operation, handling, closure and post-closure monitoring of landfills as discussed under Regulatory Setting. All landfills have the potential or are known to contain hazardous materials. The California Health and Safety Code section 25501(o) defines hazardous material as follows: "Hazardous material means any material that because of its quantity, concentrations, or physical or chemical characteristics poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include but are not limited to hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment".

The information in this section is based on review of the Clean Closure/Remediation Plan (CC/RP) - 6.3 Acre/Closed Turk Island Landfill, Union City, California, prepared by the Remediation Group, Inc. (Remediation Group) for the Project Applicant, dated February 6, 2016. In addition, a search of available environmental records conducted by Environmental Data Resources, Inc., prepared on January 25, 2017 (EDR Report), was reviewed. Information presented in these reports was used to identify potential impacts and mitigation measures to address landfill materials.

SETTING

The Project site is a closed landfill located along the margins of San Francisco Bay, which currently contains waste materials placed as part of landfill operations from 1962 to 1986. Post-closure landfill operations are currently subject to the Waste Discharge Requirement Order No. 97-026 (WDR 97-026) issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB) and a Permit to Operate and landfill gas collection system issued by the Bay Area Air Quality Management District (BAAQMD).

SITE HISTORY

According to the CC/RP and EDR Report, the Project site was used from approximately 1962 until approximately 1986 for disposal of municipal and commercial wastes. The landfill was owned by the Smith and Reynolds Family Trusts, successors in interest of the deceased original owners of the landfill, Joseph Smith and William Reynolds. The landfill was operated under a lease agreement with the Turk Island Company. The total volume of wastes in the landfill is estimated at between 2 and 2.5 million cubic yards (WDR 97-026). According to the WDR 97-026 the wastes disposed of at the Turk Island Landfill were primarily non-hazardous residential and commercial solid wastes including household wastes, grass cuttings, tree trimmings, animal wastes, metals, construction and demolition wastes and solid industrial debris including auto shredder and paint wastes. During the 1960s, the

Turk Island Company used the adjacent 3.2 acre property for stockpiling soil/slag fill while the 6.3-acre parcel (Parcel "C") was used primarily for construction waste disposal. Specific wastes documented as accepted by the landfill include a polymer sludge from Rohm & Hass, waste fruit disposed of during the Mediterranean Fruit-Fly outbreak in the 1970s, septic sludges and slag from metals production at Pacific States Steel. Available test data indicates that the slag materials are non-hazardous wastes. Test Pits in Parcel "C" indicated that waste materials in this area include tires, metal debris, concrete debris, tree and other green wastes, and plastic sheeting. Relatively minor amounts of household wastes were also visible in the test pits (CC/RP, 2016).

The permitting history of the landfill includes Use Permits from the City of Union City from 1962 to 1982, RWQCB WDRs from 1968 to present; California Integrated Waste Management Board (CIWMB) Solid Waste Facility Permits from 1979 through 1986; and a BAAQMD permit to operate the landfill gas collection system. In 1979 the landfill was listed under the Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERLIS) as having the potential for releasing hazardous substances into the environment. After further assessment by the State the landfill was designated as No Further Remedial Action Planned (NFRAP) and dropped from further consideration as a potential Superfund or National Priority Listed Site. The RWQCB is the lead agency for oversight of the closed Turk Island Landfill. The CIWMB and its local enforcement agency, Alameda County Department of Environmental Health (ACDEH) and the BAAQMD also have regulatory authority pertaining to closed landfills and review and approval of proposed development. Current monitoring and maintenance requirements are specified in WDR 97-026 issued by the RWQCB. In recent years the RWQCB has expressed concern regarding seeps in the landfill side slopes, slough of the side slopes, extensive animal burrows in the cover system and the potential for ponding of rainwater on the cover.

In 1986, the landfill owners began regulatory closure of the primary landfill. Regulatory closure means that the landfill ceased operation (receiving waste materials) and covered or capped the landfill in accordance with applicable regulations. The Closure Plan for the landfill was prepared by Beta Associates in 1986. An As-Built Closure Certification Report prepared in 1988 by Beta Associates is referenced in a Phase I Environmental Assessment by Emcon Associates for the adjacent existing residential development.

In 1988, a landfill gas collection system was installed to collect methane and other gases generated from the waste materials. Landfill gas is collected from approximately 32 vertical wells constructed in the primary landfill. The gas is currently conveyed by above-ground pipes to a BAAQMD-permitted flare system.

The current monitoring program for the landfill is specified in the WDR 97-026 and consists of semi-annual sampling and analysis of groundwater monitoring wells around the primary landfill area and monitoring of landfill gas probes around Parcel "C".

On February 6, 2016, the CC/RP for Parcel "C" was prepared by the Remediation Group on behalf of Nuvera Homes. The CC/RP is a work plan that describes the procedures for clean-closing the 6.3 acre landfill and enhancing the cover of the adjacent larger, 47-acre Turk Island Landfill. Approximately 175,000 cubic yards (cy) of landfill materials will be moved from Parcel "C" and consolidated into the Turk Island Landfill. The consolidated waste will be covered by four feet of materials consisting of a two-foot thick foundation layer, a one-foot thick low-permeability layer, and a one-foot thick vegetation layer. In April 2016, The CC/RP was reviewed by the BAAQMD; ACDEH; Alameda County Water District; and the RWQCB. The agencies provided review comments and conditional approvals of the CC/RP.

The California Environmental Protection Agency (Cal/EPA) Department of Resources Recycling and Recovery, Waste Permitting, Compliance, & Mitigation Division (CalRecycle) reviewed a draft version of the CC/RP dated August 5, 2015. In its January 13, 2016 approval letter, CalRecycle found the submitted draft CC/RP to meet the requirements of Title 27, CCR.

ONSITE HAZARDOUS MATERIALS/SITES

Waste disposal and material handling have occurred at the Project site that could impact soils and/or groundwater in the Project area. Environmental regulatory databases identifying onsite areas and sites with known or potential releases of hazardous materials are listed in the EDR Report. The EDR Report shows the landfill being currently listed in the following federal and state environmental databases:

- Enforcement Action Listing (ENF) of State Water Resources Control Board (SWRCB) enforcement actions;
- Waste Discharge System (WDS) for sites which have been issued waste discharge requirements by SWRCB;
- Waste Management Unit Database System (WMUDS/SWAT) used by the SWRCB for tracking and inventory of waste management units;
- Land Disposal Sites Listing (LDS) on GeoTracker, the SWRCB data management system for sites that impact, or have the potential to impact water quality;
- Solid Waste Facilities/Landfill Sites (SWF/LF) inventory of solid waste disposal facilities or landfills used by the Department of Resources Recycling and Recovery;
- Emissions Inventory Data (EMI) including toxics and criteria pollutant emissions data collected by the California Air Resources Board and the BAAQMD;
- Recovered Government Archive Solid Waste Facilities List (RGA LF) for records that no longer appear in current government lists used by the Department of Resources Recycling and Recovery;
- Facility Index System/Facility Registry System (FINDS) list of facilities monitored or regulated by regulatory agencies; and
- Superfund Enterprise Management System Archive (SEMS-Archive) for sites that have no further interest under the Federal Superfund Program based on available information.

For the time of operation between 1962 until 1986 the landfill is listed in the WDS and WMUDS/SWAT databases as a Class III facility for disposal of nonhazardous solid wastes that posed a moderate threat to water quality. Since the time of closure in 1988 the landfill is listed in the WDS database as an industrial facility with a continuous or seasonal discharge under WDR 97-026 that poses a minor threat to water quality. Review of the above listings did not result in additional or updated information on the facility operation, closure status and impacts to water and air quality.

OFFSITE HAZARDOUS MATERIALS/SITES

Environmental records for parcels within a ¼ mile radius of Parcel "C" (the location of future residences) were reviewed. The main Turk Island Landfill is part of the Project site and would not be considered a sensitive use related to offsite hazardous materials, so was not included as a receptor in this assessment. Sites with known or potential releases of hazardous materials that could impact soils and/or groundwater in the Project area were identified through the review of:

- An environmental regulatory databases search for the surrounding areas within a 0.25 mile radius of the Parcel "C" boundary (EDR, 2016);
- A Geotracker database search for environmental records and data for facilities regulated by the SWRCB (2016), within surrounding areas as described above; and
- A review of historical aerial photographs, topographic maps, and a Sanborn® map (historical fire insurance map) covering adjacent areas.

Following review of records sources and evaluation of known and potential hazardous materials release sites, each identified site was assigned a level of likelihood related to hazardous materials release, and by consequence, potential impacts to the Project. Site specific investigations are required in order to fully evaluate and quantify any potential contaminants of concern. Coordination or consultation with regulatory or local agencies or property owners could be needed, if contaminants are present at adjacent areas. Two sites with environmental records were identified outside, but within 0.25 mile of, Parcel "C". However, the official records for these sites show that the potential for a hazardous materials release is unlikely given the nature of the sites and lack of violations, and therefore, site specific investigations are not warranted. The site name, location, and description of known operations are summarized below.

Table 8-1. Summary of Known and Potential Hazardous Materials Release Sites Located Within 0.25 Mile of Parcel "C"

Site Name and Location[a]	Description	Hazardous Materials Release Site Determination
S & K Auto Repair (0.11 miles northeast)	Former auto maintenance facility; no compliance violations reported. Potential chemical types handled are unknown.	Unlikely release[b]
Alonzos Cleaning System (0.035 miles east-southeast)	Former dry cleaner facility; no compliance violations reported. Potential chemical types handled are unknown.	Unlikely release[b]
Main Turk Island Landfill (adjacent and west of Parcel "C")	Closed, permitted landfill adjacent to Parcel "C" regulated by CalRecycle	Unlikely release

Source: EDR, 2017; SWRCB, 2017

Notes:

[a] Distances and orientation are from the Parcel "C" boundary, which would be the location of sensitive receptors at the Project site.

[b] Official records do not provide additional details related to the determination of likelihood of release of hazards, but the determination is generally based on the nature of the uses at (or formerly at) the site and the history of violations (or lack thereof), as shown in the above table.

CHEMICALS AND MATERIALS OF CONCERN

The potential for health risks could occur due to disturbance of landfill debris and surrounding soils containing contaminants during construction activities or from gases generated from the ongoing degradation of landfill waste materials.

Site Contaminants

Chemicals including metals, volatile organic compounds, semi-volatile organic compounds, pesticides, poly-chlorinated biphenyls and petroleum compounds were reported in soil samples from Parcel "C" and the primary landfill. The concentrations of these chemicals are consistent with the observations that the material in Parcel "C" is primarily construction-type debris and does not classify as hazardous waste according to current laws and regulations. Samples from test pits on Parcel "C"

indicate that the concentrations of chemicals in the soils and debris at Parcel "C" are not likely to pose a significant risk to human health with the possible exception of carcinogens benzo(a)pyrene and benzo(a)fluoranthene, which likely originate from residual paint waste. The health risk associated with these contaminants is addressed in the impact section below. Existing debris/potential contaminants at the main Turk Island Landfill are not proposed to be disturbed, so would not pose a health risk due to construction activities.

The presence of slag material was limited to the 3.2 acre area that was previously remediated by removing this material for off-site disposal. Available test data indicates that the slag materials are non-hazardous wastes and should not be considered a chemical of concern, even if it is encountered during redevelopment of Parcel "C".

Landfill Gases

There is the potential for the ongoing degradation of landfill waste materials to release landfill gases. A primary landfill gas is methane, which is a flammable gas that can become a hazard if it migrates underground away from the landfill or up through the top or sides of the landfill at concentrations that make it explosive or flammable. Other chemicals including hydrogen sulfide and volatile organic compounds can also be present in landfill gas. Some of the materials noted in the test pits in Parcel "C" such as concrete are considered inert, meaning that they do no generate substantial levels of landfill gases.

Landfill gases from the main Turk Island Landfill are collected by a system of wells and conveyed by above-ground pipes to a flare system.

Migration of landfill gas from the Project site is monitored with nine existing landfill gas probes. Four probes are located near the toe of refuse on the northeastern border of the main Turk Island Landfill and five probes surround the northern and eastern perimeters of Parcel "C". These probes have been monitored for combustible gas on a monthly basis since 1995. With few exceptions, generally no gas was detected. The few detections that were at trace levels are generally considered insignificant in a Bay Mud environment that is generally replete with decaying organics that are indigenous to the surrounding estuarine deposits. These monitoring results show there is no recent history of substantial migration of landfill gas from the Turk Island Landfill or Parcel "C".

REGULATORY SETTING

The use of hazardous materials and disposal of hazardous waste are subject to numerous laws and regulations at all levels of government. The following paragraphs contain an overview of pertinent regulations. Federal, state and local laws designed to protect human health and the environment govern the storage, handling, and documentation of hazardous materials and hazardous wastes. Agencies involved in enforcing these regulations include the U.S. EPA, the U.S. Department of Transportation (DOT), the DTSC, the RWQCB, the BAAQMD, the ACDEH, the Union City Environmental Programs Division (EPD), and the Alameda County Fire Department (FD). Regulations governing workplace safety and health are enforced by the U.S. Occupational Safety and Health Administration (OSHA) and by Cal-OSHA.

Federal

Federal regulations are contained primarily in the Resource Conservation and Recovery Act of 1976 (RCRA; 42 USC Section 6901 et seq.), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; 42 USC Chapter 103), the Emergency Planning and Community Right To Know Act (EPCRA; 42 USC Chapter 116), and DOT Hazardous Materials Regulations (Title 49 CFR Parts 100–185). RCRA, CERCLA and EPCRA provide the federal government requirements for

identification of hazardous materials and wastes, remediation of hazardous wastes in soil and groundwater, and reporting. Hazardous and solid waste identification is based on the source of the waste or the physical/chemical nature of the waste. Remediation requirements are determined on a site-specific basis in conjunction with the appropriate state or local agencies, but remediation efforts take into account federal guidance pertaining to minimum acceptable remedial actions. Reporting requirements under these three acts are designed to assure that known releases of hazardous constituents are reported, and that federal agencies participate in the remedial process, either directly or through state or local lead agencies. DOT Hazardous Materials Regulations cover all aspects of hazardous materials packaging, handling, and transportation.

State

State of California regulations pertaining to hazardous materials and hazardous wastes are typically equivalent to, or more stringent than, federal requirements. Some materials and wastes considered hazardous under California law are not regarded as hazardous under federal law. The U.S. EPA has delegated regulatory authority and hazardous waste site oversight to California agencies in most areas. Similarly, the California Division of Occupational Safety and Health (Cal-OSHA) standards are typically more stringent than federal OSHA standards, and OSHA typically delegates responsibility to Cal-OSHA.

California regulations pertaining to solid waste are contained in Title 27 of the California Code of Regulations (27 CCR). California requirements equivalent to RCRA and CERCLA are contained in the California Hazardous Waste Control Law (California Health and Safety Code [HSC] Chapter 6.5 Section 25100 et seq.) and the California Hazardous Substance Account Act (California HSC Chapter 6.8 Section 25300 et seq.) Regulations are contained in 22 CCR.

The DTSC is the Lead Agency for enforcement of California hazardous waste regulations and has been authorized by the U.S. EPA to administer the RCRA program in the state. Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations within the state (CCR Title 8).

CalRecycle is the Lead Agency responsible for solid waste disposal sites subject to landfill closure regulations. In addition to the RWQCB, CalRecycle assesses compliance of plans with the standards for closure/postclosure of disposal sites (CCR Title 27).

The California Office of Emergency Services is the state office responsible for establishing emergency response and spill notification plans related to hazardous materials accidents. Title 26 of the CCR is a compilation of the chapters or titles of the CCR that are applicable to hazardous materials management.

The Porter-Cologne Water Quality Control Act (California Water Code, Division 7) is the provision of the California Water Code that regulates water quality in California and authorizes the SWRCB and nine RWQCBs to implement and enforce the regulations. The RWQCBs regulate discharges under Porter-Cologne primarily through the issuance of waste discharge requirements. Anyone discharging or proposing to discharge materials that could affect water quality must file a report of waste discharge. The SWRCB and the RWQCBs can make their own investigations or may require dischargers to carry out water quality investigations and report on water quality issues. Porter-Cologne provides several means of enforcement, including cease and desist orders, cleanup and abatement orders, administrative civil liability orders, civil court actions, and criminal prosecution. The Project area is under the jurisdiction of the San Francisco Bay RWQCB.

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) was mandated by the State of California in 1993. The Unified Program was created to consolidate, coordinate, and make consistent the administrative requirements, permits, inspections, and enforcement activities for six hazardous materials programs. The Unified Program has six elements:

- Hazardous Waste Generators and Hazardous Waste On-site Treatment;
- Underground Storage Tanks;
- Aboveground Petroleum Storage Act;
- Hazardous Materials Release Response Plans and Inventories;
- California Accidental Release Prevention; and
- Uniform Fire Code Hazardous Materials Management Plans and Hazardous Materials Inventory Statements.

At the local level, this is accomplished by identifying a Certified Unified Program Agency (CUPA) that coordinates all of these activities to streamline the process for local businesses. ACDEH is approved by Cal/EPA as the CUPA for unincorporated Alameda County. The Union City Environmental Programs Division (EPD) is approved by Cal/EPA as the CUPA for Union City.

Regional and Local

The Project site is within the jurisdiction of the San Francisco Bay RWQCB. BAAQMD regulations will apply for the protection of ambient air quality during excavation of soils containing hazardous materials. The Union City EPD is another key agency in implementing State programs at the local level.

The RWQCB has established environmental screening guidelines for residential developments.[1] The environmental screening levels (ESLs) for soil, water and air are applicable for residential sites and are useful as a preliminary indication of potential adverse impacts to human health or the environment.

> *"Use of the ESLs and this document in general is intended to be entirely optional on the part of the regulated facility and subject to the approval of the case manager in the overseeing regulatory agency. The presence of a chemical at concentrations in excess of an ESL does not necessarily indicate that adverse impacts to human health or the environment are occurring; this simply indicates that a potential for adverse risk may exist and that additional evaluation is warranted. ESLs presented for chemicals that are known to be highly biodegradable in the environment may in particular be overly conservative for use as final cleanup levels (e.g., many petroleum-related compounds). Use of the ESLs as cleanup levels should be evaluated in view of the overall site investigation results and the cost/benefit of performing a more site-specific risk assessment."*

[1] San Francisco Bay Regional Water Quality Control Board, Revision to Environmental Screening Levels ("ESLs") Technical Document, 2016.

Union City Hazards and Hazardous Materials Programs

The Union City EPD administers the State-Certified Unified Program, which regulates hazardous materials and hazardous waste, and with the Public Works Department oversees the City's clean water runoff program, which seeks to control or eliminate pollutants from reaching creeks and the Bay from all sources.

Clean Water Program (CWP)

In conjunction with the City's Public Works Department, the EPD staff has an industrial and illicit discharge inspection program. Responsibilities include the review of Storm Water Pollution Prevention Plans and monitoring programs, receiving and investigating complaints of illicit discharges, and conducting surveys and inspections of facilities which may have illicit connections or discharges. Compliance with this program may be considered mitigation for both the hydrology and hazardous materials aspects of proposed projects.

California Fire Code (CFC)

The fire code is designed to reduce fire hazards. Because hazardous materials are often highly flammable and sometimes explosive, enforcement of this code is an important mitigation for hazardous materials. Compliance with the CFC will be important in the design review process for the proposed development, where technical standards contained in the CFC will be checked against the plans to ensure compliance. Current operations at the Project site are also required to be in compliance through chemical inventory evaluation, occupancy classification, field inspections and operational support provided by various staff, requiring inter-jurisdictional support.

JOINT TECHNICAL DOCUMENT – CLEAN CLOSURE/REMEDIATION PLAN (CC/RP)

In accordance with Section 21585 of Title 27 of the CCR, the Project Applicant is required to prepare and implement a workplan (Joint Technical Document [JTD]) for review and approval by the RWQCB, CalRecycle, BAAQMD, Union City Departments of Public Works and EPD, ACWD, and the ACDEH. CalRecycle found the CC/RP to meet the requirements of Title 27 for the required workplan submittal. (The CC/RP is included as Appendix B of this document and regulatory agency comments as Appendix C.) The CC/RP contains the following:

- Description of proposed construction activities including the proposed removal of 175,000 cubic yards of soil and landfill materials from Parcel “C” and consolidation and construction of a new cover system over the landfill materials on top of the primary landfill.
- Description of proposed construction methods and project controls to mitigate the potential for accidental releases of potentially hazardous materials during and after construction.
- A summary of future land-use and engineering controls that may be applicable.
- Supporting control documents including:
    - test pit logs to characterize the types of waste materials in Parcel “C”;
    - Soil Sampling and Analyses Plan;
    - Dust and Odor Control Plan;
    - Construction Quality Assurance Program to be implemented following waste removal at Parcel ‘C”; and
    - Health Risk Assessment Report.

In addition to the above CC/RP construction support documents, a geotechnical report has been prepared for the residential development as required for City grading and building permits (included as Appendix G). Other associated permits will include excavation dewatering and utility permits.

The CC/RP is the key document that provides the requirements and plans that will be followed during and after construction of the Project. The requirements and plans are required by the regulatory agencies to protect human health and the environment from materials contained in the landfill during and after construction. Residential reuse requires the greatest degree of protections including verification soil sampling at Parcel "C" to evaluate hazardous constituents are below ESLs for residential use (RWQCB ESLs, 2016 as updated). Consolidation of waste materials will mean construction of an improved landfill cover system that will contain landfill wastes. Cover systems are necessary to prevent surface water and rainfall from entering waste materials and degrading groundwater, to prevent direct contact with waste materials and to keep landfill gas from affecting air quality or causing a fire hazard. The regulatory agencies reviewed, commented and conditionally approved the CC/RP to make sure regulatory requirements are met and the proposed Project is protective of human health and the environment (regulatory agency comment are included in Appendix C). Implementation of this plan is the primary mechanism to mitigate all potentially significant hazardous and hazardous materials impacts of the Project.

The following section identifies potentially significant hazardous impacts of the Project. Mitigation for these impacts is addressed at least in part in the CC/RP, as noted. Additional mitigation measures are identified when information in the CC/RP is incomplete or absent.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

The following thresholds for measuring a Project's environmental impacts are based upon CEQA Guidelines thresholds:

1. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

2. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

3. Would the project produce hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

4. Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

5. Would the project be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport? Would the project result in a safety hazard for people residing or working in the project area?

6. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

7. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

8. Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

9. Would the project result in impacts related to hazards and hazardous materials that are individually limited, but cumulatively considerable (i.e., the incremental effects of the project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).

HAZARDOUS MATERIALS SITES

*4. The Project site, as a landfill site, has the potential to contain hazardous materials, and as a result, would potentially create a significant hazard to the public or the environment. This potentially **significant impact** can be mitigated to a less-than-significant level through implementation of the CC/RP and Mitigation Measures Haz-1a through Haz-1f.*

Impact Haz-1: **Development of a Landfill Site that may Contain Waste Materials, Soil or Groundwater with Hazardous Constituents.** Parcel "C" of the Project site is the location of a closed landfill, whose wastes could contain hazardous substances. These hazardous substances could create a significant hazard to the public or the environment during excavation and consolidation, as well as future risk to residents and users of the site if mitigation measures are not implemented to reduce the uncertainty associated with disturbance of landfill materials. The Turk Island Landfill also contains gases that are generated from the degradation of landfill waste materials. A primary landfill gas is methane. Methane is a flammable gas that can become a hazard if it migrates underground away from the landfill or up through the top or sides of the landfill at concentrations that make it explosive or flammable.

The potential for health risks to construction workers, nearby residences, and future residents of Parcel "C" related to contamination at the site and/or construction activities has been assessed in the CC/RP health risk assessment and construction-period health risk assessment.[2]

Construction-Period

The construction-period health risk assessment is discussed in more detail in Chapter 5: Air Quality and Odors and Appendix D, and concluded that health risks to off-site residents due to site contaminants, diesel emissions, and other construction activities would be below threshold levels. (see that chapter for additional detail).

The CC/RP health risk assessment concluded that on-site construction workers could experience cancer risk levels above regulatory thresholds, primarily due to dermal contact with the Parcel "C"

[2] Appendix F of the CC/RP is a health risk assessment addressing standards for construction workers and future residents given the contaminants at the site (prepared by SCS Engineers in May 2001), and Appendix D of this document includes the multi-pathway health risk assessment for nearby residents during all construction activities, which also includes diesel emissions from construction equipment (prepared by Ramboll Environ in 2017).

soils containing benzo(a)pyrene and benzo(b)fluoranthene, as described in the setting section above. The California Department of Toxic Substances Control (DTSC) threshold for cancer risk is 1 in 1,000,000, being the probability that an individual will develop cancer over a lifetime as a result of a specific exposure. Cancer risk levels for on-site construction workers were quantified in the CC/RP health risk assessment at a range of 1 in 10,000 to 1 in 1,000,000 and would require appropriate worker safety procedures per OSHA standards as part of the required CC/RP Health and Safety Plan (see Mitigation Measure Haz-1a). All the non-carcinogenic risks were calculated to be below a hazard index of 1, signifying that no adverse acute or chronic non-carcinogenic health risks would be expected to occur.

Migration of Landfill Gases

Landfill gas migration probes at the Project site perimeter have been used since 1995 to monitor both the 6.3 Acre Landfill and the main Turk Island Landfill for gas migration. With few exceptions, no gas was detected. These results reinforce other observations about the generally inert nature of the refuse fill suggesting a low probability for land fill gas migration from the main landfill to Parcel "C". To confirm that these conditions persist and that the existing gas collection system at the main Turk Island Landfill captures any potential gas migration between the two areas, two monitoring probes are proposed to be installed at the boundary between Parcel "C" and the main Turk Island Landfill (see Mitigation Measure Haz-1c). There is a possibility that placing the waste materials from Parcel "C" and constructing the new cap at the main landfill could change the amount, concentration or subsurface pathways of landfill gas. Evaluation and mitigation of potential changes to landfill gas production and the adequacy of the existing gas collection system will be part of Mitigation Measure Haz-1c.

Health Risks to Future Residents

The California Department of Toxic Substances Control and U.S. Environmental Protection Agency threshold for cancer risk is 1 in 1,000,000, being the probability that an individual will develop cancer over a lifetime as a result of a specific exposure. The CC/RP screening-level health risk assessment calculated cancer risk levels for future residents below that range, signifying that no adverse carcinogenic health risks are expected to occur. The non-carcinogenic effects use a hazard index approach where a hazard index less than 1 indicates that no adverse non-carcinogenic health risks are expected to occur. All the non-carcinogenic risks calculated for the Project were below a hazard index of 1, signifying that no adverse non-carcinogenic health risks would be expected to occur. These CC/RP screening-level conclusions are confirmed by the construction-period health risk assessment completed for this EIR, which calculates a background cumulative cancer risk in the vicinity of 4.9 in a million, and a negligible health index.

The CC/RP describes the construction controls and activities proposed to be designed and implemented to reduce exposure to hazards and hazardous materials during Project construction and post- occupancy. While construction support plans including the stormwater pollution prevention plan (SWPPP), Health and Safety Plan (HSP) and other environmental documents including permits have not been finalized, the required regulatory-agency conditional approval of the CC/RP control measures will ensure that these measures are adequate to mitigate the potential impacts of these activities. These activities and controls, which are standard methods for the redevelopment of former landfills in California, include the following specific performance measures:

- *Health and Safety Controls:* Except for the presence of two constituents in soil (benzo(a)pyrene and benzo(a)fluoranthene), samples from test pits on Parcel "C" indicated that concentrations of chemicals in the waste materials are not likely to pose an unacceptable risk to human health. There is a potential that unforeseen hazardous substances exist in the waste materials. The applicant will address the potential impacts of disturbing potentially

hazardous substances or materials through completion, regulatory agency approval, and implementation of a HSP. The CC/RP specifies the requirement for the HSP including such measures as:

- Personal Protection Equipment (e.g. TyvekTM overalls and gloves) for construction workers to mitigate dermal contact with soil;
- work zone and perimeter air monitoring for landfill gases, vapors and particulates;
- controlling potential ignition sources;
- security measures to control access to the site; and,
- training in safety equipment and contingency response procedures.

An HSP that conforms with FED/OSHA 29 CFR 1910.120 and 18 CCR 5144 regulations will be prepared by a Certified Industrial Hygienist (CIH) and filed with the City. Training requirements will include all site personnel engaged in work that disturbs site soils. The personnel must be current in 40-hour hazardous waste operations and emergency response training per CAL/OSHA CCR Title 8 section 5192 and FED/OSHA 29 CFR 1910.120 regulation. Additionally, the CC/RP contains measures to minimize nuisance conditions such as water trucks to control dust; work during daytime hour to limit noise; constructing a litter fence and wetting the soil and landfill materials to control blowing litter; monitoring of odors with provisions to place tarps or foam to cover landfill waste or to spray odor neutralizers in the air around the excavation area.

- *Dewatering Discharge Controls:* The Project Applicant anticipates that removal of groundwater or leachate within the landfill materials will be needed. Dewatering activities will include collection of water samples to assess the chemical and other properties of the water for appropriate handling, treatment and discharge. Depending on the nature of the water, the water may be used for dust suppression in accordance with NPDES permit requirements, disposed off-site, or directly discharged to the flood control channel. The SWRCB regulates the discharge of water generated from construction site dewatering through requirements set forth in the following National Pollutant Discharge Elimination System (NPDES) permits, which the Project shall comply with:
  - ORDER NO. 2010-0014-DWQ, NPDES NO. CAS000002, General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (the Construction General Permit); and
  - ORDER NO. R2-2012-0012, NPDES NO. CAG912002, 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 (the VOC and Fuel General Permit).
- *Excavation and Consolidation Controls:* Excavation will be complete at Parcel "C" when chemical analysis of soil samples collected in the excavation sidewalls and bottom of the excavation confirm that chemical concentrations are below the RWQCB's ESLs for soil. This sampling will provide information to confirm that Parcel "C" will be acceptable for residential use. The confirmation soil sampling will be approved as part of the CC/RP.
- *Landfill Capping:* The Project Applicant will construct a new cover over the landfill materials that are placed at the primary landfill. The CC/RP includes a construction quality assurance program that describes the testing and observations to be performed to ensure the cover system meets engineering design and geotechnical requirements. The preliminary cover design includes a two foot thick soil foundation layer over the landfill materials and a

geosynthetic clay layer covered with a vegetative soil layer that will be planted with grasses to control erosion and infiltration. The final cover design will be developed by a professional engineer registered with the State of California and who is approved by the City. The cover will provide a barrier so that future workers do not come in contact with the waste materials. Parcel "C" will be backfilled with clean fill materials. Regulatory-agency review and CC/RP approval will ensure the design and control measures are adequate to mitigate potential impacts.

- *Landfill Gas Collection:* The existing landfill gas collection piping at the primary landfill will be re-installed in an underground 2-foot deep trench to protect the piping from damage and will collect emissions from the existing primary Turk Island landfill as well as the relocated material from Parcel "C". The existing landfill gas flare system will remain operational with the purpose of controlling the potential for landfill gas migration to offsite areas. The flare system is fenced to control access. While the design of the re-installed landfill gas system has not been finalized, regulatory-agency review and approval will ensure the design and control measures are adequate to mitigate potential impacts. The CC/RP describes a short-term shutdown of the landfill gas collection system. No impacts from shutdown of the system are anticipated. However, the CC/RP includes a provision for air monitoring during construction to mitigate exposure to soil vapors and dust. The CC/RP states that the "existing well network will be able to control any additional gas produced by the relatively thin additional layer of refuse that will be placed around the wells."
- *Parcel "C" Residential*: Following excavation of landfill materials, Parcel "C" will be backfilled with clean fill materials. The CC/RP Sampling and Analyses Plan sets forth confirmation sampling protocols to ensure site conditions following waste removal are appropriate for residential development. Evaluation of landfill gas migration potential will be needed, and appropriate landfill gas controls implemented for the residential development.
- *Post-Closure Maintenance:* Regulatory requirements for landfills require post-closure maintenance and demonstration of financial assurance for post-closure maintenance and monitoring for a period of 30-years. The Project Applicant proposes to submit a Post-Closure Maintenance Plan subject to regulatory-agency approval to mitigate the future effects of the landfill on the Project. The plan will also need to include appropriate institutional controls providing protocols for future excavation below the imported engineered fill at Parcel "C".

Construction controls are needed at a minimum to mitigate the potential hazards during construction, and institutional controls are needed to mitigate potential future hazards. The following mitigation measures are recommended and/or required to ensure appropriate implementation of the proposed construction controls included in the CC/RP, and to further mitigate potential impacts.

Mitigation Measure

Haz-1a: **Implementation of the Regulatory Agency-approved CC/RP.** The RWQCB and other regulatory agencies including ACDEH, ACWD, BAAQMD, CalRecycle (collectively, "regulatory agencies") have reviewed, commented and conditionally approved the Project Applicant's proposed CC/RP, including its project design, implementation and control plans, including the following:

- Health and Safety Plan that conforms with FED/OSHA 29 CFR 1910.120 and 18 CCR 5144 regulations and includes such measures as:
  - Personal Protection Equipment (e.g. TyvekTM overalls and gloves) for construction workers to mitigate dermal contact with soil;

  - work zone and perimeter air monitoring for landfill gases, vapors and particulates;
  - controlling potential ignition sources;
  - security measures to control access to the site; and,
  - training in safety equipment and contingency response procedures.

- Dewatering Discharge Controls that conform with National Pollutant Discharge Elimination System permits NO. CAS000002, General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities; and NO. CAG912002 General Waste Discharge Requirements for Discharge or Reuse of Extracted and Treated Groundwater.
- Construction Quality Assurance Program including testing and observations to ensure the cover system meets engineering design and geotechnical requirements, which are expected to include a two foot thick soil foundation layer over the landfill materials and a geosynthetic clay layer covered with a vegetative soil layer that will be planted with grasses to control erosion and infiltration.

Prior to construction, the CC/RP, including any amendments, shall be approved by the agencies and proof of these approvals, including any additional conditions that may be imposed by these agencies to further mitigate hazardous impacts, shall be provided to the City of Union City before issuance of a grading permit. The final CC/RP shall be fully implemented for the Project.

Mitigation Measure Haz-1b: **Demonstration that Verification Samples Meet Regulatory Requirements for Residential Reuse**. The Project Applicant shall submit verification sampling results and other documentation requested by those regulatory agencies that ultimately approve the CC/RP, and shall obtain approval that the site conditions, proposed detailed design, and any proposed institutional controls make the site suitable for residential development. Sampling results at or below residential environmental screening levels (ESLs) stipulated by the RWQCB will be used to obtain approval that site conditions are suitable for residential use. Submittal of the above results and documentation of site conditions shall include a request for a closure or no further action letter including agency approval of the submittal.

Mitigation Measure Haz-1c: **Evaluation of and Provisions to Address Landfill Gas Migration and Monitoring.** Removal of landfill materials from Parcel "C" will mitigate some of the potential impacts associated with landfill gas at Parcel "C". Two monitoring probes are proposed to be installed at the boundary of Parcel "C" and the main Turk Island Landfill to assess potential gas migration toward Parcel "C". Potential preferential gas migration pathways such as the Union Sanitary District sewer force mains shall be considered in the monitoring plans. The protocols and procedures for installing the probes, sampling, and evaluating analytical results will be described in a work plan. The work plan will be subject to the review and approval of the ACDEH Office of Solid Waste Management and the City of Union City.

Thresholds for acceptable methane levels shall be based on Cal-EPA DTSC advisory screening levels for methane assessment, as described in the 2005 and 2012 publications.[3] If monitoring results indicate the presence of methane above threshold levels and therefore identifies the potential for methane migration toward Parcel "C", then a landfill gas protection system for the residential development shall be installed, subject to the approval of the ACDEH Office of Solid Waste Management and the City of Union City prior to issuance of a building permit.

A protection system may include a gas extraction trench along the boundary between the primary landfill and Parcel "C". The protection system shall include provisions for mitigating potential landfill gas migration outside of the perimeter of the main landfill and for monitoring landfill gas between the primary landfill and Parcel "C" residential units. In addition, an evaluation of the existing landfill gas collection system at the main landfill shall be performed as part of the design of the cover system and undergrounding of the gas collection system at the landfill. This evaluation shall address the potential for higher gas volumes or concentrations due to the addition of Parcel "C" materials and construction of the new cover. The adequacy of the existing landfill gas collection system in all areas of the primary landfill shall be determined. If needed, additional gas collection wells or trenches shall be installed to address the potential for fires, releases or migration of landfill gas.

Mitigation Measure

Haz-1d: **Disclosures and Institutional Controls.** Regulatory agencies may require Institutional controls for future excavation or other activities because some waste materials potentially remain beneath Parcel "C". The nature and scope of the institutional controls will depend on site conditions following removal of material from Parcel "C". Disclosures to residents of the homes on Parcel "C" shall be part of the lease or property sale agreement. Institutional controls shall be imposed in the form of an Activities and Use Limitation Deed Restriction, recorded with the County of Alameda Recorder's Office. The Deed Restriction would describe subsurface conditions and any prohibitions, maintenance and management requirements necessary during future use and activities at the property. The disclosures and institutional controls shall be provided to the City of Union City for review prior to issuance of the first certificate of occupancy for the residential uses.

Mitigation Measure

Haz-1e: **Implementation of Revised Waste Discharge Requirements for Turk Island Landfill and Post-Closure Maintenance**. The primary regulatory mechanism for closed landfills is the issuance of a WDR. Because the Project will result in changes to the existing landfill and changes in use, the RWQCB will issue a revised WDR. Implementing a revised WDR shall provide a regulatory basis for the Project Applicant to protect residential users of the Project site and

[3] Cal-EPA DTSC, 2005. Advisory on Methane Assessment and Common Remedies at School Sites, School Property Evaluation and Cleanup Division, June 16; Cal-EPA DTSC, 2012. Evaluation of Biogenic Methane, March 28.

recreational users of Sea Breeze Park from the potential longer-term effects of the main Turk Island Landfill, such as the potential for release of landfill gas without treatment (or flaring). The Project Applicant shall develop provisions for implementing changes in existing or additional WDRs. These provisions may include protocols and procedures for maintenance and operation of the landfill gas collection system, monitoring of groundwater quality around the perimeter of the main Turk Island Landfill, monitoring of landfill gas around the perimeter of the landfill, inspection of the landfill cover conditions, settlement and slope inspections, reporting and any other requirements deemed necessary by the regulatory agencies to mitigate the potential exposure of residents to hazardous conditions and substances in the landfill. The Project Applicant shall obtain approval of revised WDR(s) prior to issuance of the first certificate of occupancy for the residential uses and shall implement all of its requirements.

Mitigation Measure Haz-1f: **Preparation and Implementation of a Post-Closure Plan for Monitoring and Maintenance.** The Project Applicant shall prepare a Post-Closure Maintenance and Monitoring Plan (PCMM) that is an update of the current plan implemented as part of the existing WDR. The PCMM shall include provision for the main Turk Island Landfill under Mitigation Measure Haz-1e. The Project Applicant shall implement the requirements of the PCMM. The PCMM shall include provisions for maintenance and operation of the landfill gas collection system, monitoring of groundwater quality around the perimeter of the landfill, monitoring of landfill gas around the perimeter of the landfill, inspection of the landfill cover conditions, settlement and slope inspections, reporting and any other requirements deemed necessary by the regulatory agencies to mitigate the potential exposure of recreational users and residents to hazardous conditions and substances in the landfill.

The CC/RP does not currently include final design details nor all the control plans that will be necessary to mitigate the potential impacts of on-site hazardous materials. However, preparation, review and conditional approval of the CC/RP by regulatory agencies shall be completed as required before the Project can proceed (i.e., prior to issuance of any grading or building permits). Implementation of design elements and control plans will be subject to regulatory agency oversight during landfill consolidation and prior to issuance of certificates of occupancy for the residential uses. Implementation of mitigation measures Haz-1a through Haz-1f will ensure that the impact of development adjacent to a landfill that contains waste materials with potentially hazardous constituents will be reduced to a ***less than significant*** level. Mitigation measures Haz-1a through Haz-1f will eliminate potential routes of exposure to hazardous materials by future residents of the Parcel "C" development and recreational users of the nearby Sea Breeze Park.

ACCIDENTAL HAZARDOUS MATERIALS RELEASE

2. *The Project site would potentially create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. This potentially* ***significant impact*** *can be mitigated to a less-than-significant level through implementation of Best Management Practices (BMPs) and protocols in the construction control plans.*

Impact Haz-2: **Accidental Release of Hazardous Materials to the Environment.** During excavation and handling of landfill materials, potentially hazardous materials could be released to the environment through the air, water or soil. During

construction, hazardous materials may be released through spills and leaks from construction equipment and materials that could flow into storm drains and infiltrate site soils. As a result of a landslide or slope failure landfill materials could be released.

In addition to the potential for hazardous materials to be present on the site there is the potential for accidental releases. Accidental releases could occur during excavation of landfill materials that release chemicals to the air when they are exposed, spilling and/or spreading of excavated materials during excavation, transportation and placement from Parcel "C" to the adjacent primary landfill. Hazardous materials could be released from trucks that haul waste materials, overturning of trucks due to non-uniformly distributed loads, or from wind that carries soil or waste materials to other areas. Accidental releases could also occur from temporary fuel tanks or handling of other potentially hazardous materials necessary during construction. In addition, potentially hazardous materials could accidentally be released as a result of a significant earthquake**.** In the event of a major earthquake, the landfill gas collection system could cease to operate or be damaged such that landfill gas is released directly to the air, or landfill side slope failures could occur that would expose waste materials. The CC/RP includes the provisions below to mitigate the potential for accidental releases.

Mitigation Measure

Haz-2a: **Environmental Training and Monitoring Program.** An environmental training program shall be established to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures and storm water pollution prevention BMPs to all field personnel. The training program shall emphasize site-specific physical conditions to improve hazard prevention (e.g. identification of potential hazardous substances and discovery of potentially hazardous items such as a buried drum) and shall include review of all site-specific plans, including but not limited to the Project documents:

- HSP including a Work Zone and Perimeter Air Monitoring Plan;
- Spill Prevention, Control, Countermeasure (SPCC) Plan;
- Stormwater Pollution Prevention Plan (SWPPP);
- Dust and Odor Control Plan; and
- Soil Sampling and Analyses Plan.

The Project SWPPP shall identify BMPs including material management, erosion, sediment and dust control measures Observations and monitoring shall also be implemented to ensure that the plans are followed throughout the period of construction. Best Management Practices, as identified in the Project SWPPP shall also be implemented during the Project to minimize the risk of an accidental release and provide the necessary information for emergency response.

Mitigation Measure

Haz-2b: **Hazardous Materials Trained Contractor and Construction Crew.** A California-licensed hazardous materials contractor and hazardous material trained staff shall perform construction activities involving the handling of landfill waste materials. All site personnel engaged in work that disturbs site soils shall be current in 40-hour hazardous waste operations and emergency response training per CAL/OSHA CCR Title 8 section 5192 and FED/OSHA 29 CFR

1910.120 regulation. Records of such training shall be available for review by the City upon request.

Mitigation Measure
Haz-2c: **Project Control Plans.** The CC/RP shall include Project Control Plans, such as the SWPPP, subject to regulatory agency approval, to prevent accidental releases and in the event a release does occur how it will be contained, communicated and cleaned up. Project Control Plans shall include provisions for preventing and responding to accidental releases related to transportation, groundwater handling and dewatering, air emissions, dust and litter control, odor control, stormwater control and erosion control. The Plans shall include mitigation measures for odor and litter control such as limiting the area of exposed waste materials, applying odor control foam, or spraying odor control liquids. Transportation and groundwater dewatering controls are examples of activities that will need approval per the City of Union City and NPDES permit requirements, respectively.

Mitigation Measure
Haz-2d: **Public Communication Plan.** A Public Communication Plan shall be prepared to notify nearby residents and park visitors in the event of an accidental release of hazardous substances. The Communication Plan shall include information on how residents or recreational users should communicate any observed releases to the owner during and after construction. The Communication Plan will be introduced to the community as part of the community relations program described in the CC/RP during a public meeting and via a liaison with the City of Union City.

Mitigation Measure
Haz-2e: **Spill Prevention, Control, Countermeasure (SPCC) Plan.** A SPCC Plan subject to regulatory agency approval shall be prepared, including preparations for quick and safe cleanup of accidental spills, per Title 40 CFR Chapter I Subchapter D Part 112 regulation for storage of petroleum fuels in excess of 1,320 gallons. The SPCC plan shall include, but not be limited to, the following standards: limiting the speed of construction equipment, requiring loads to be evenly distributed within the trucks, and requiring the outside of trucks be free of soil or waste materials. This plan should also include provisions in the event of a fire resulting from buried combustible materials or pockets of methane gas. This plan will be incorporated as an addendum to the CC/RP.

Mitigation Measure
Haz-2f: **Protection of Union Sanitary District Force Mains.** The Project Applicant shall have a geotechnical engineer evaluate the potential for damage to the existing waste water force main system that runs along western edge of Parcel "C" prior to any grading or other construction activities. The applicant shall implement recommended measures to protect the pipelines against damage and the potential for releases of sewage. These protections may include but are not limited to:

- A temporary bridge over the force mains for heavy traffic, and/or
- Maximum weight restrictions on the weight of heavy equipment crossing the force mains.

Mitigation Measure

Haz-2g: **Implementation of Regulatory Agency-Approved Plans, Permits and Notifications.** The Project Applicant shall implement the approved CC/RP and all required Project Control Plans. In addition to the required approval of the CC/RP by regulatory agencies, the Project Applicant shall perform all appropriate notifications and obtain all appropriate permits including but not limited to:

- Grading Permit from City of Union City;
- Notification of Excavation sent to BAAQMD;
- Confirmation letter from PG&E stating all gas and electric utilities have been removed and/or cleared;
- Confirmation letter from the Union Sanitary District with any required plan sign-off; and
- Any necessary permits for dewatering, discharge and/or treatment of excavation water from the RWQCB.

Implementation of design elements and control plans will be subject to regulatory agency oversight during consolidation and prior to allowing residential uses.

The CC/RP does not currently include the final design detail, construction support documents nor all the control plans that will be necessary to mitigate the potential impacts of accidental releases of hazardous materials. However, completion, review and approval of the CC/RP by regulatory agencies is required before the Project can proceed (i.e., prior to issuance of any grading or building permits). Use of trained personnel will reduce the potential effects of an accidental release because the contractor will be able to appropriately assess the nature of the release and effectively implement appropriate measures to mitigate the release. Implementation of measures identified through regulatory agency review, as well as their oversight requirements outlined in mitigation measures Haz-2a through Haz-2g will ensure that any potentially significant impact from an accidental release of hazardous materials is reduced to a ***less than significant*** level.

HAZARDOUS MATERIALS USE AND TRANSPORT

1. *The Project would have a **less-than-significant** impact related to the routine transport, use, or disposal of hazardous materials.*

Consolidation/Construction

During consolidation/construction, hazardous materials such as petroleum products will be used in construction vehicles and equipment and may be temporarily stored in above ground tanks or fuel trucks. All transportation of hazardous materials to and from the site will be in accordance with Title 49 of the Code of Federal Regulations, US DOT, State of California, and local laws, ordinances and procedures including placards, signs and other identifying information. The routine construction uses and transportation of hazardous or potentially hazardous materials would be ***less than significant*** by compliance with federal, state and local laws, ordinances, and procedures for the safe transport of hazardous materials and hazardous waste.

Excavation and transport of landfill waste for consolidation would not be considered routine and is assessed under hazardous material sites (Impact Haz-1) and accidental release (Impact Haz-2) above.

Residential

Following development, occupancy by new residents and visitors will require the routine transport and disposal of normal household refuse, some of which may be potentially hazardous. Solid waste collection and disposal services are provided in Union City by Republic Services (formerly Allied Waste) of Alameda County. Garbage and trash for the proposed development will be collected and disposed of in accordance with the Municipal Code.

Household hazardous wastes, including used motor oil, filters, anti-freeze, batteries, paints, and solvents are not permitted in residential waste collection service, but can be disposed of in accordance with the Alameda County Household Hazardous Waste Program. Illegal dumping at the Project site shall be prosecuted in accordance with the law.

Because standard collection and disposal procedures and regulations are in place for wastes and household hazardous goods, impacts related to routine transport, use or disposal of hazardous materials would be ***less than significant*** with no mitigation required.

HAZARDOUS MATERIALS NEAR SCHOOLS

*3. The Project would have a **less-than-significant** impact related to production of hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.*

No schools or childcare facilities have been identified within one-quarter mile of the Project site. The nearest schools are Pioneer Elementary School located approximately 0.6 miles southeast of the Project site and Delaine Eastin Elementary School located approximately 0.7 miles south of the Project site. This is considered a ***less than significant*** impact with no mitigation required.

AIRPORT LAND USE PLAN

*5. and 6. The Project would have **no impact** related to safety hazard for people residing or working at a public airport or public use airport or private airstrip.*

The Project is not located near a public or private airport or airstrip and therefore would not result in a substantial adverse effect related to airport hazards. The Project site is not located within an area covered by an airport land use plan. Therefore, the Project is considered to have ***no impact*** with respect to a public use airport. The nearest airport in the vicinity of the Project site is the Hayward Executive Airport, located approximately 8.7 miles to the northwest. Since the proposed Project would lie outside the Airport Land Use Safety Plan use area (which is within a three-mile radius of the airport), the Project is considered to have ***no impact*** with respect to private airstrips.

ADOPTED EMERGENCY RESPONSE PLAN

*7. The Project would have a **less-than-significant** impact related to interference with an adopted emergency response plan or emergency evacuation plan.*

During the construction phase of the Project, construction traffic and staging would have the potential to impact an emergency response route. However, site access and staging are not proposed to disrupt public roadways and the traffic analysis determined that project traffic would not significantly impact public roadways. As is standard practice, the Project would be required to obtain an encroachment permit from the City of Union City Public Works Department for any work or obstructions located within the street right-of-way, which is reviewed and conditioned by the Alameda County Fire Department (FD). In addition, building permits issued for the project would include details regarding construction staging, which are also reviewed and conditioned by the FD. Compliance with

encroachment and building permits issued for the Project would ensure potential Project-related impacts associated with emergency response plans would be ***less than significant*** with no mitigation required.

Development of the Project site would not interfere with existing emergency response plans, provided the Alameda County FD review construction plans for roadway modifications, and establish temporary alternative emergency routes necessary for the duration of construction. Prior to construction, and in accordance with the normal building permit schedule, the Project Applicant will be required to obtain approval from the FD, which will review site and building plans for adherence to the Fire Code and shall include:

- Fire engine access;
- Adequate water supply;
- Occupancy classification;
- Built-in fire protection;
- Evacuation plans, routes, and signage;
- Life safety systems; and
- Fire alarm and building inspection schedule.

WILDLAND FIRES

*8. The Project would have **no impact** related to exposing people or structures to a significant risk of loss, injury or death involving wildland fires.*

The Project would not result in a substantial adverse effect related to exposure of people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. The Project site is located in an urbanized area, and is not within a State Responsibility Area, where the California Department of Forestry considers wildland fires a major threat. Therefore, any Project-related risk associated with wildland fires is considered minimal (***no impact***).

CUMULATIVE HAZARDS AND HAZARDOUS MATERIALS IMPACTS

*9. The Project would have a **less-than-significant** impact related to cumulative hazards and hazardous materials impacts with incorporation of mitigation measures.*

The proposed Project will result in short-term potential impacts resulting from excavation and consolidation of landfill waste materials. These impacts will be mitigated by construction controls and procedures designed to eliminate potential releases of hazardous materials. Excavated materials that contain potentially hazardous substances will not be transported on public streets. The Project would contribute to a cumulative increase in the potential for exposure to and/or accidental release of hazardous materials during both construction and operations. Releases of hazardous materials could occur during construction if not properly executed, which could have a cumulative effect on the surrounding area. However, the identified project-specific mitigation measures would reduce this potentially significant impact to a ***less than significant*** level.

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HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section describes the existing and future hydrological conditions on and around the proposed Project site, and presents an evaluation of potential Project-related impacts to hydrology and water quality. The discussion is based on a review of Project plans and information provided by the Project Applicant in the following documents:

- Hydrology and Hydraulic Calculations for Tract 7728, Carmel Way/Westport Way Property, Union City, California, Ruggeri-Jensen-Azar, May 6, 2010;
- Clean Closure/Remediation Plan, 6.3 Acre/Closed Turk Island Landfill, Union City, California, The Remediation Group, Inc., February 6, 2016; and
- Tentative Maps, Tract 7728 Turk Island, Union City, California, Ruggeri-Jensen-Azar, December, 2016.

SETTING

CLIMATE AND TOPOGRAPHY

The Project site is located in a relatively flat area west of Interstate 880 in Union City. The regional climate is typical of the San Francisco Bay Area, and is characterized as Mediterranean, with warm summers and mild winters. About 80 percent of the total annual precipitation occurs during the months of November through March, with an average annual precipitation of 14.4 inches. Average monthly temperatures range from a high of 77 degrees Fahrenheit in the summer, to a low of 41 degrees Fahrenheit in the winter.[1]

Ground surface elevations at the main landfill range from 12.7 to 57.2 feet above mean sea level (MSL) while proposed finish elevations at Parcel "C" range from approximately 12.7 to 15.6 feet above MSL. These elevations are based on the NAVD 88 vertical datum, and have been converted from the older NGVD 29 datum elevations reported in some of the technical documents.

REGIONAL HYDROLOGY

The Project site is located within the Alameda Creek watershed. This watershed encompasses approximately 633 square miles, extending from Mount Diablo in the north to Mount Hamilton in the south and from Altamont Pass in the east to the San Francisco Bay in the west. Most of the watershed is undeveloped open range, public lands, and parks.[2] Within the watershed's urban areas, extended portions of Alameda Creek have been channelized for flood control and are commonly referred to as the Alameda Creek Flood Control Channel (ACFCC), which is managed by the Alameda County

[1] Western Regional Climate Center, 2008

[2] ACWD, 2005

Flood Control District (ACFCD). ACFCC Line J-3 lies immediately north of the primary Turk Island Landfill while a shallow unnamed stream channel runs along the west border of the landfill and drains into Line J-3.

The ACFCC is a 200-foot wide, 10-mile long, trapezoidal channel that routes Alameda Creek floodwaters and urban runoff to the San Francisco Bay. Three inflatable rubber dams were installed along the ACFCC. One was removed in 2009. The other two inflatable dams are used to capture water from the channel and divert it to several groundwater recharge ponds serving Fremont, Newark, and Union City. The water provided by these recharge ponds supplies up to 40 percent of the water used in the Tri-City area. The ACFCC also serves as a migratory passage for steelhead trout. [3]

SITE HYDROLOGY

Stormwater runoff from the Project site drains toward ACFCC Line J-3 to the north; a residential stormwater pond, Sea Breeze Park, and Carmel Way to the east; Westport Way and an unnamed access road to the south; and a shallow channel to the west. Storm drain systems exist in Carmel Way and Westport Way that convey storm flows away from the Project site.

GEOLOGY AND SOILS

The permeability and texture of on-site soils influence drainage. Soil permeability is the rate at which water is absorbed and is related to the hydraulic conductivity of the soil. Shallow soil conditions can also influence drainage, particularly when the soils become saturated and prevent further infiltration of surface runoff. Infiltration is the process where surface water enters the ground and moves downward through the unsaturated soil zone.

Local geology and the characteristics of subsurface soils are described in both Chapter 7: Geology and Soils, and in the Clean Closure/Remediation Plan (CC/RP) in Appendix E: Logs of Test Pits. According to the CC/RP, the soils beneath the surface of Parcel "C" generally consist of stiff clays overlain by soft clays typical of San Francisco Bay mud. Landfilled waste has been placed on top of these clays and covered with a cap of clean fill. Tests pits dug as a part of the investigation at Parcel "C" indicate that clays range from 3 to 5 feet below ground surface (bgs) and that refuse exists below that to a depth of approximately 13 to 15 feet. At depths greater than 15 feet, the soils were found to be native Bay mud clays.[4]

GROUNDWATER

The California Department of Water Resources (DWR) defines state groundwater basins based on geologic and hydrogeologic conditions. According to the DWR, the Project site is located within the Niles Cone groundwater basin. The Niles Cone is formed from the alluvial deposits of Alameda Creek as it flows toward the San Francisco Bay from the Diablo Range. Per the San Francisco Regional Water Quality Control Board's (RWQCB's) Comprehensive Groundwater Protection Evaluation for the South San Francisco Bay Basins, Quaternary alluvium, comprised of unconsolidated gravel, sand, silt, and clay, represents the primary water-bearing strata at the Project site.[5]

The Niles Cone is a source of drinking water for the Tri-City area, and is monitored for water quality by the Alameda County Water District (ACWD). According to the ACWD's assessment in 2015, the

[3] Alameda Creek Alliance, 2005

[4] The Remediation Group, 2016

[5] San Francisco Bay RWQCB, May 2003.

quality of drinking water supplied by the basin is in compliance with all federal and state drinking water quality standards.[6]

The tests pits dug on Parcel "C" for the proposed Project included 10 exploratory pits dug to depths of 13 to 21 feet (bgs). Free groundwater was encountered in some of the test pits at depths of 15 to 16 feet.[7]

FLOODING

The Project site is located within the 100-year flood hazard zone of Alameda Creek as delineated by the Federal Emergency Management Agency (FEMA).[8] The 100-year flood hazard zone extends to a base elevation of 10 feet above MSL, while the finish elevation of Parcel "C" would be approximately 12.7 to 15.6 feet above MSL, and therefore above and outside of the flood hazard zone, which would require a flood map amendment. FEMA periodically updates maps and an update is expected in this area. The Project would comply with current maps and would file a Letter of Map Amendment, as discussed in detail below (Impact Hydro-4a).

REGULATORY SETTING

The proposed Project would be constructed in accordance with several regulatory programs, laws, and regulations that aim to protect surface water resources. In some cases, federal laws are administered and enforced by state and local government. In other cases, state and local regulations in California are more restrictive than those imposed by federal law. This section summarizes relevant regulatory programs, laws, and regulations with respect to hydrology and water quality and how they relate to the proposed Project.

FEDERAL LAWS AND REGULATIONS

National Flood Insurance Program

The Federal Emergency Management Agency (FEMA) is responsible for establishing base flood elevations (BFE) and floodplain boundaries based on United States Army Corps of Engineers (USACE), studies. FEMA is also responsible for distributing the Flood Insurance Rate Maps used in the National Flood Insurance Program (NFIP) (42 USC Ch. 50, Section 4102). These maps identify the locations of special flood hazard areas, including 100-year floodplains. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations, enabling the FEMA to require municipalities that participate in the NFIP to adopt certain flood hazard reduction standards for construction and development in 100-year floodplains. FEMA limits residential development in the floodplain. However, a community may obtain a variance from the requirements if the data provided by FEMA disagrees with ground elevations.

Clean Water Act (CWA)

The Clean Water Act (CWA) was enacted by Congress in 1972, and amended several times since inception. It is the primary federal law regulating water quality in the United States, and forms the basis for several state and local laws throughout the country. Its objective is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The CWA prescribed the basic federal laws for regulating discharges of pollutants, as well as set minimum water quality

[6] ACWD, 2015.

[7] *Ibid*. at 4.

[8] FEMA, 2009.

standards for all waters of the United States. Several mechanisms are employed to control domestic, industrial, and agricultural pollution under the CWA. At the federal level, the U.S. Environmental Protection Agency (EPA) administers the CWA. At the state and regional level, the CWA is administered and enforced by the State Water Resources Control Board (SWRCB) and the San Francisco Bay's Regional Water Quality Control Boards (RWQCBs, respectively. The State of California has developed a number of water quality laws, rules, and regulations, in part to assist in the implementation of the CWA and related federally-mandated water quality requirements. In many cases, the laws, rules, and regulations adopted by the state and regional boards are more protective than the federal requirements.

CALIFORNIA LAWS AND REGULATIONS

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act establishes the SWRCB and the RWQCBs as the principal state agencies having primary responsibility in coordinating and controlling water quality in California. The Porter-Cologne Act establishes the responsibility of the RWQCBs for adopting, implementing, and enforcing water quality control plans (Basin Plans), which set forth the state's water quality standards (i.e. beneficial uses of surface waters and groundwater) and the objectives or criteria necessary to protect those beneficial uses.

NPDES General Construction Permit Requirements

Section 402 of the CWA establishes a framework for regulating nonpoint source (NPS) stormwater discharges through the National Pollutant Discharge Elimination System (NPDES). In California, the SWRCB and RWQCBs are responsible for supervising the NPDES program. Under the NPDES Construction General Permit Order 2009-0009-DWQ (CGP), the Project Applicant is required to submit a Notice of Intent (NOI) with the SWRCB Division of Water Quality. The NOI includes general information on the types of construction activities that will occur on the Project site and the project sediment and receiving water risk. The CGP requires the Project Applicant to develop a site-specific plan called Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must be prepared by a certified Qualified SWPPP Developer (QSD) and include a description of appropriate Best Management Practices (BMPs) to minimize the discharge of pollutants from the Project site. It is the responsibility of the Project Applicant to obtain the permit prior to initiating site construction activities.

LOCAL PROGRAMS AND REGULATIONS

San Francisco Bay Water Quality Control Plan (Basin Plan)

In accordance with the Porter-Cologne Act, the San Francisco Bay RWQCB is responsible for the development, adoption, and implementation of the Water Quality Control Plan (Basin Plan) for the San Francisco Bay region. The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the San Francisco Bay Region. The Basin Plan identifies beneficial uses of surface waters and groundwater within its region, and specifies water quality objectives to maintain the continued beneficial uses of these waters. The proposed Project will be required to adhere to all applicable water quality objectives identified in the Basin Plan.

Beneficial Uses of Surface Waters and Groundwater

The Basin Plan defines beneficial uses for surface waters and groundwater in its corresponding jurisdiction. The surface waters that drain to the ACFCC and its tributaries, including the ACFCC channels adjacent to the Project site, are not specifically identified by the Basin Plan as to their beneficial uses. However, beneficial uses of identified water bodies are generally extended to all of

their respective tributaries. In this case, the identified beneficial uses of Alameda Creek would apply. Identified beneficial uses of Alameda Creek are:

Agricultural Water Supply (AGR).

Cold Freshwater Habitat (COLD);

Groundwater Recharge (GWR);

Fish Migration (MIGR);

Water Contact Recreation (REC-1);

Non-water Contact Recreation (REC-2);

Fish Spawning (SPWN);

Warm Freshwater Habitat (WARM); and

Wildlife Habitat (WILD).

Identified beneficial uses of groundwater in the Niles Cone (also referred to as the Alameda Creek Groundwater Basin) are classified as follows:

Municipal and Domestic Supply (MUN);

Industrial Process Water Supply (PROC);

Industrial Service Water Supply (IND); and

Agricultural Water Supply (AGR).

Alameda Countywide Clean Water Program

The Alameda Countywide Clean Water Program (ACCWP) was established in 1991 for the purpose of helping local residents, businesses, and municipalities meet the stormwater quality goals of the CWA. The ACCWP member agencies include Alameda County, the ACFCD, and the Cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro and Union City. As part of the program, each of the member agencies is responsible for complying with the NPDES permit requirements for stormwater discharges. The ACCWP developed the C.3 Stormwater Technical Guidance handbook for use in project applicant's design of stormwater treatment measures including bio-retention areas and pervious pavement.[9]

Alameda Countywide NPDES Municipal Stormwater Permit

The ACCWP coordinates implementation of the NPDES Municipal Regional Stormwater Permit (MRP; Order No. R2-2015-0049 NPDES Permit No. CAS612008) in Alameda County. The Proposed Project is regulated under the MRP requiring the Project Applicant to include onsite treatment in the stormwater control plan for submittal to the Union City Public Works Department. Stormwater treatment shall include source control, site design, and measures to address runoff pollutant discharges and prevent increases in runoff flows through the implementation of low impact development (LID) techniques meeting the requirements of the MRP provision C.3-New Development and Redevelopment. In addition to stormwater treatment, the MRP C.3 provision includes requirements for Hydromodification management. As the Project site is located in a "Tidally Influenced/Depositional" zone, the Hydrograph Modification Standard does not apply. The MRP C.3 provision require projects disturbing more than 10,000 square feet of land to provide permanent water

[9] ACCWP, May 29, 2012

quality treatment for stormwater. The permit requires that maintenance requirements for treatment features be determined prior to finalization of the proposed Project.

City of Union City General Plan and Municipal Code

The City of Union City General Plan and Municipal Code provides specific requirements for development within the City of Union City. The General Plan includes provisions to protect the public health and safety and minimize the damage to structures, property, and infrastructure as a result of natural and man-made hazards. The following GP policy specifically related to hydrology and applies to the Project:

Levee Stability Evaluation (GP Section HS-B.1.1a) – Applicants for proposed developments west of Union City Boulevard shall coordinate with Alameda County Flood Control and Water Conservation District to evaluate the stability of all levees in order to identify potential hazards and necessary mitigation measures.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

The following thresholds for measuring a Project's hydrology impacts are based upon Appendix G, CEQA Guidelines thresholds:

1. Would the project violate any water quality standards or waste discharge requirements?

2. Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

3. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

4. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

5. Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

6. Would the project otherwise substantially degrade water quality?

7. Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

8. Would the project place within a 100-year flood hazard area structures, which would impede or redirect flood flows?

9. Would the project 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?

10. Would the project cause inundation by seiche, tsunami, or mudflow?

11. Would the project result in impacts to hydrology and water quality resources that are individually limited, but cumulatively considerable (i.e., the incremental effects of the project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

The proposed Project will allow for correction of stormwater-collecting depressions that exist on the main landfill due to differential settling and for residential development on Parcel "C". Potential hydrological and water quality impacts from the Project are primarily related to: (1) the potential for pollution of adjacent drainages and downstream receiving waters (San Francisco Bay) by non-point sources; (2) the potential of soil erosion during the construction period; and (3) changes in stormwater flows and runoff pollutant discharges due to conversion of Parcel "C" from undeveloped closed landfill to residential land use and accompanying increase in impervious surfaces.

URBAN NON-POINT SOURCE POLLUTION (NPS) IN RECEIVING WATERS

1., 6. The Project would have the potential to violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality. This potentially ***significant impact*** *can be mitigated to a less-than-significant level through appropriate BMP design, sizing and maintenance.*

Impact Hydro-1: Potential Discharge of Polluted Stormwater. Improperly designed, sized or maintained stormwater treatment measures would not maximize pollutant removal and meet water quality requirements and could result in inadequate treatment and discharge of polluted stormwater.

Non-point source (NPS) pollutants are washed by rainwater from roofs, landscape areas, streets and parking areas into the drainage network. Without proper mitigation, residential development of Parcel "C" could increase the levels of NPS urban pollutants and litter entering ACFCD channel J-3 and the San Francisco Bay. Without proper final stabilization, the reconfiguration of the primary Turk Island landfill could potentially increase the levels of NPS urban pollutants discharges. It should be noted that NPS urban pollutants are typically not associated with sediment discharges from non-urban developments, such as the primary landfill, which will remain fenced from urban uses. However, per the CGP, the area disturbed must be re-established to a uniform vegetative cover equivalent to 70 percent coverage of the preconstruction vegetative conditions to mitigate the risk of sediment discharges. Alternatively, the GCP allows for proof of final stabilization using the Revised Universal Soil Loss Equation (RUSLE). The Project Applicant will prepare a SWPPP that details the final stabilization.

An increase in NPS pollutants could have adverse effects on water quality, wildlife, vegetation, and human health. NPS pollutants could also infiltrate into groundwater and degrade the quality of potential groundwater drinking sources.

Pollutant concentrations in site runoff are dependent on a number of factors including: 1) land use conditions; 2) site drainage conditions; 3) intensity and duration of rainfall; 4) the climatic conditions preceding the rainfall event; and 5) implementation of stormwater treatment measures. Due to the variability of urban runoff characteristics, it is difficult to estimate pollutant loads for NPS pollutants. However, pollutant types from the residential portion of the proposed Project would be consistent with those generally found in suburban residential areas, parking lots, and roads, and would include oil and grease, petroleum hydrocarbons, brake dust, paint, metals, insecticides and possibly fertilizers.

Under the MRP, the proposed Project is required to provide: (1) site design measures, (2) source control measures, and (3) permanent treatment for stormwater to improve runoff water quality. Site design measures have been detailed as part of the stormwater plan for the Project site. The following site design measures have been developed for the Project:

- Pervious paver driveway pavement
- On-Lot bio-retention areas
- Park strip bio-retention areas (in public right-of-way)

The stormwater plan shows the layout of pervious paver driveways, bio-retention and corresponding runoff capture areas and typical cross-sectional standard details (Ruggeri-Jensen-Azar, 2016). Source control measures are included as part of mitigation measures Hydro-1a and -1b described below including preparation of informational literature and guidance on stormwater treatment measure maintenance, respectively.

Pervious paver driveways are proposed on individual lots to infiltrate runoff. Pervious paver types may include pervious concrete or paver blocks. The pervious system is comprised of a load-bearing, durable surface constructed over a subbase/base structure typically consisting of compacted, open-graded aggregate. This layer or layers temporarily stores water prior to infiltration or drainage to a controlled outlet. The porous surface allows water to infiltrate across the entire surface of the material.

The on-lot bio-retention areas located on the individual lots are proposed along the edges of each house to collect the runoff from the lots, including from roof drains. The park strip bio-retention areas would be located at the curbside along the edges of each street in the public right-of-way to collect the runoff from the impervious drainage areas including sidewalk and paved roadway. While each proposed on-lot layout is rectangular the park strip bio-retention areas are designed as linear treatment measures. Both bio-retention areas function as soil and plant-based filtration devices that remove pollutants through a variety of physical, biological, and chemical treatment processes. These measures consist of a ponding area, organic or mulch layer, bio-treatment /planting soil, and plants. Bio-retention areas are designed to distribute stormwater runoff evenly along a ponding area. Percolation of stored water through the bio-retention area's engineered treatment/planting soil with a prescribed rate of infiltration will enter an underlying rock layer, from which some of the water will percolate into the underlying soil and the rest will enter the underdrain connected to the storm drain system and empty the bio-retention area.

The MRP, the California Stormwater Quality Association (CASQA) and the ACCWP recognize pervious pavement and bio-retention areas. According to CASQA siting criteria, the proposed stormwater treatment measures are feasible at the Project site. However, in order to ensure the effectiveness of the proposed stormwater treatment measures, the stormwater treatment measures must be properly designed and sized according to treatment requirements and site-specific conditions. To date, the Project Applicant has provided neither design criteria nor sizing calculations for the proposed stormwater treatment measures. The standards for stormwater treatment measures are included in the required mitigation measure (Hydro-1a and 1b).

The Project Applicant has not included a Stormwater Maintenance Program that incorporates measures for the proper maintenance of the proposed pervious pavers and bio-retention areas. A Stormwater Maintenance Program that includes maintenance agreements or other maintenance assurances shall be prepared in compliance with regulatory standards and Mitigation Measure Hydro-1a and 1b and submitted to the Union City Public Works Department for approval.

Mitigation Measure Hydro-1a: **Stormwater Treatment System Design and Sizing.** The pervious paver and bio-retention areas shall be designed in accordance with MRP and ACCWP technical guidance sizing recommendations for stormwater treatment measures whose primary mode of action depends on flow capacity. The bio-retention shall be designed/selected to provide treatment for a flow-based stormwater runoff criteria equal to either (1) the flow runoff produced by a rain event equal to or at least two times the 85th percentile hourly rainfall intensity for the Project site, based on historical records of hourly rainfall depths; or (2) the flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity; or (3) 10% of the 50-year peak flow rate.

The surface area of bio-retention areas should be equal to 4% of the effective impervious area of the drainage management area (DMA). The effective impervious area multiplied by 0.04 sizing factor will equal the footprint of the bio-retention area. For sizing purposes, the footprint of the bio-retention area is defined as the area that achieves the required ponding depth and that is underlain with 18 inches of the bio-retention soil mix. Side slopes of the bio-retention area should not exceed 3:1. The surface ponding depth may range from 6 to 12 inches. The inlet to the overflow catch basin should be at least 6 inches above the low point of the bio-retention planting area. If the native soil has a saturated hydraulic conductivity > 1.6 in/hr, a bio-infiltration area may be sized as described above without an underdrain. Otherwise, the applicant shall use an underdrain.

In addition to the flow-based design criteria described above, the City Engineer may consider other Numeric Sizing Criteria for Stormwater Treatment Systems, as allowed by the MRP.

The design of each layer of the pervious pavers must be determined by the likely traffic loadings and the layers' required operational life. The subgrade should be ungraded in-situ material with a minimum percolation rate of 5 - inches per hour, or based on hydrologic analysis, an underdrain should be installed to remove detained flows within the pervious paving and base.

Final calculations and sizing criteria for the proposed stormwater treatment measures shall be submitted and approved by the City prior to issuance of a grading permit for the project..

Mitigation Measure Hydro-1b: **Stormwater Treatment System Maintenance Plan**. A maintenance plan shall be prepared by the applicant's engineer that describes the type and frequency of ongoing maintenance required for proper operation of all post-construction permanent stormwater treatment measures on the Project site. This plan shall be submitted to and must be approved by the Union City Public Works Department prior to first certificate of occupancy.

The plan must meet the requirements of the MRP provision C.3.h., Operation and Maintenance of Stormwater Treatment Systems, and include the following:

- Assigning the responsibility for the operations and maintenance of the installed permanent BMPs including pervious pavement system and bio-retention system;

- Detailed description of the Project site and locations of installed permanent stormwater treatment measures;
- Detailed schedule for stormwater treatment system inspections including dates;
- Type of inspection (e.g., installation, annual, follow up, spot);
- Type of pervious systems inspected (e.g., pervious pavers);
- Type of stormwater treatment systems inspected (e.g., bioretention unit);
- Inspection findings or results (e.g., proper installation, proper operation and maintenance, system not operating properly because of plugging, bypass of stormwater because of improper installation or maintenance, maintenance required immediately); and,
- Enforcement action(s) taken, if any (e.g., compliance schedule).

Implementation of mitigation measures Hydro-1a and Hydro-1b will reduce any potentially significant impacts of non-point source pollution from the residential portion of the Project to a level of ***less than significant***. Installation of the proposed stormwater treatment system to meet the sizing criteria set by MRP and ACCWP and a properly designed and implemented stormwater BMP maintenance program will effectively ensure adequate treatment of stormwater to prevent non-point pollutants from entering receiving waters.

GROUNDWATER DEPLETION/RECHARGE AND DEWATERING DISCHARGE

2. *The Project would have the potential to substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This potentially* ***significant impact*** *can be mitigated to a less-than-significant level through compliance with the MRP.*

The existing Project site consists of closed landfills capped with clay soils that likely provide very little infiltration; this is further supported by test pits dug in "Parcel “C” which encountered groundwater at depths below the lowest level of landfill waste within bay muds. Only "Parcel “C” will experience a change in impervious area resulting from Project construction of new pavement and rooftops. This increase in impervious area will occur over a limited portion (approximately 13%) of the site.

Due to increase in impervious surfaces on Parcel “C”, the volume of infiltration of surface waters to groundwater may decrease as a result of the Project. However, this decrease is not substantial due to the limited amount of impervious area to be added and because the existing Parcel is already capped, and effectively impervious. Moreover, due to removal of landfill wastes, any infiltrated water will likely be of a higher quality after construction of the Project. In addition, permanently installed stormwater treatment measures including pervious pavers and bio-retention areas will further improve the quality of infiltrated water. Any infiltrated water will likely be of no less quality after construction. Therefore, once reconsolidation and construction activities are complete and Parcel “C” is developed with residential lots, the proposed Project would be considered to have a ***less than significant*** impact on groundwater levels, recharge and quality, and no mitigation is required.

Impact Hydro-2: Potential Discharge of Polluted Groundwater to Waters of the State. If dewatering is required during construction as described above, it may contain elevated levels of pollutants that may be discharged to nearby receiving waters.

During excavation of landfill waste from Parcel “C” and subsequent grading with engineered fill, dewatering activities may be required depending on local groundwater conditions at the time of

construction. If dewatering is required, Project construction activities will result in removal of groundwater from the site. Because groundwater in the vicinity of the Project site is not used as a drinking water source and is derived from the Bay, the potential to deplete groundwater supplies is considered a less than significant impact and no mitigation is required. However, because dewatering at the site could involve polluted groundwater, the following measure is required to mitigate the potential for increasing pollutant levels to receiving waters.

Mitigation Measure

Hydro-2a: **Compliance with the NPDES Construction General Permit Order 2009-0009-DWQ (CGP).** The CGP allows certain non-stormwater discharges that are necessary for the completion of construction projects. Such authorized non-stormwater discharges include uncontaminated ground water dewatering. These authorized non-stormwater discharges shall (1) be infeasible to eliminate, (2) comply with BMPs as described in the Project SWPPP, and (3) not cause or contribute to a violation of water quality standards. Additionally, these discharges may be required to be permitted by the San Francisco Bay RWQCB. Compliance with these permits may require pre-discharge treatment and testing of the groundwater.

Mitigation Measure

Hydro-2b: **Compliance with the NPDES Permit Order R2-2012-0012 NPDES NO. CAG912002 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).** The VOC and Fuel General Permit allows for extraction from cleanup sites and treatment of polluted groundwater for the removal of volatile organic compounds (VOCs) and fuel related pollutants prior to discharges to surface waters including flood control channels or San Francisco Bay. These discharges are required to be permitted by the San Francisco Bay RWQCB. Compliance with this permit requires pre-discharge treatment and testing of the treated groundwater. Alternatively, the Project applicant, may obtain a Groundwater Discharge Permit with the Union City Sanitary District (USD) for the discharge of treated groundwater from dewatering into the sanitary sewer. Under its groundwater program the USD issues permits for groundwater from contaminated site cleanup. Compliance with the USD permit may require filing a permit application, pre-discharge treatment, and testing of the treated groundwater.

Implementation of Mitigation Measure Hydro-2a and -2b will mitigate this impact to a level of ***less than significant.***

INCREASED EROSION OR SILTATION TO RECEIVING WATERS

3. The Project would have the potential to substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site. This potentially ***significant impact*** *can be mitigated to a less-than-significant level through implementation of a SWPPP and Post-Closure Monitoring and Maintenance Plan.*

Impact Hydro-3: **Soil Erosion.** Project grading and other construction activities will disturb site soils and the landfill waste potentially leading to erosion and sedimentation

impacts to ACFCD Channel J-3, other adjacent drainages, and the San Francisco Bay.

Construction of the proposed Project would involve the excavation and movement of landfill waste, regrading of an existing closed landfill, and development of a 33-unit residential subdivision. Excavation and movement of landfill waste may contribute gross solids and contaminated runoff to adjacent drainages and receiving water bodies. Bare, unprotected site soils would be subjected to the erosional forces of runoff during construction.

Mitigation Measure Hydro-3a: **Preparation and Implementation of Project SWPPP.** Pursuant to NPDES CGP requirements, the Project Applicant shall develop and implement a SWPPP to protect water quality during construction. The SWPPP shall be submitted to the SWRCB via Storm Water Multiple Application and Report Tracking System (SMARTS) as part of the Notice of Intent (NOI) and the Union City Public Works Department for review and approval. The Project SWPPP shall include, but is not limited to, the following mitigation measures for the construction period:

- Description of potential sources of erosion and sediment at the Project site and significant materials and chemicals that could be present at the site during construction.
- Identification of temporary BMPs to be implemented at the Project site to prevent water pollution during construction (e.g. perimeter silt fences, straw wattles, stormdrain inlet protection such filter fabric inserts).
- Erosion control/soil stabilization techniques such as straw mulching, erosion control blankets, erosion control matting, and hydro-seeding, shall be utilized, in accordance with CGP requirements and CASQA guidelines for Erosion and Sediment Control Measures. Sediment control techniques such as silt fences used in combination with fiber rolls shall be installed down slope of all graded slopes.
- BMPs for preventing the discharge of landfill waste and other construction-related pollutants in addition to sediment (i.e., paint, concrete, etc.) to downstream waters.
- The SWPPP shall describe the locations and the BMPs to be used to control potential stormwater pollution from runoff at vehicle and equipment staging areas, portable restrooms, mobilization areas, and planned access routes.
- During and at the completion of construction activities, all drainage facilities shall be inspected for accumulated sediment and landfill wastes, and these drainage structures shall be cleared of debris and sediment.

Mitigation Measure Hydro-3b: **Preparation of Post-Construction Stormwater Monitoring and Maintenance Plan.** Long-term mitigation measures shall be detailed in a Post-Construction Monitoring and Maintenance Plan for the primary Turk Island Landfill in accordance with the CGP. Long-term maintenance of the Parcel "C" BMPs are discussed above under Stormwater BMP Maintenance Plan (Hydro-1b). The Post-Construction Stormwater Monitoring and Maintenance Plan for the primary Turk Island Landfill shall include, but are not limited to, the following:

- Description of areas potentially subject to erosion and significant materials and chemicals that could be present at the site after construction.
- Development of a monitoring and implementation plan. Maintenance requirements and frequency shall be carefully described including vector control, clearing of clogged or obstructed inlet or outlet structures, vegetation/landscape maintenance, replacement of media filters, etc. Wastes removed from BMPs may be hazardous; therefore, provisions to address contaminated waste, disposal at a proper site, and maintenance plan and costs must be included.
- The monitoring and maintenance program shall be conducted at the frequency agreed upon by the RWQCB, the Alameda County Public Works Agency, and the Union City Public Works Department (local oversight agency). Monitoring and maintenance shall be recorded and submitted annually to the SWRCB.
- The Project Applicant shall prepare informational literature and guidance on BMPs to minimize pollutant contributions from the proposed development. This information shall be distributed to all facility personnel at the Project site. At a minimum, the information shall cover: a) proper disposal of cleaning chemicals; b) proper use of landscaping chemicals; c) clean-up and appropriate disposal of hazardous materials and chemicals; and d) prohibition of any washing and dumping of materials and chemicals into storm drains.
- The Post-Construction Stormwater Monitoring and Maintenance Plan for the primary Turk Island Landfill must be submitted to the City's Public Works Department prior to issuance of first certification of occupancy.

Implementation of mitigation measures Hydro-3a and Hydro-3b will reduce the construction and post-development impacts associated with erosion and siltation to a level of ***less than significant***.

CHANGES IN PEAK RUNOFF

*4., 5. The Project would be required under existing regulations to address changes in stormwater volumes on-site and will not have the potential to substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site and create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (**less than significant**).*

Stormwater runoff drains as sheet flow from the Turk Island landfill site. On the site, reconfiguration of the landfill to remove depressed areas subject to ponding during precipitation events and improvements to site drainage would result in a marginal increase in stormwater runoff from that portion of the Project site. This marginal increase would return peak flow to the original land fill runoff conditions. The drainage area, the slope and elevation, the land use, vegetation, and soil type at the reconfigured landfill would not be significantly changed. The runoff coefficient, drainage area, time of concentration resulting in the peak flow volume would not change. Because the character of this portion of the Project site would not be changed, volume and quality of stormwater runoff would not be substantially affected by the Project activities. For these reasons, this is considered a ***less than significant*** impact requiring no mitigation.

Under current conditions, stormwater runoff from the Parcel "C" site infiltrates into soils or flows into adjacent drainages. The Project will increase the impervious area of Parcel "C" in the form of roofs, driveways, and roadways and therefore has the potential to increase stormwater discharges from "Parcel "C" which would be collected and routed to the existing Union City storm drain system adjacent to the parcel on Carmel Way. Hydrology and Hydraulic Calculations for the site demonstrate the project would not exceed the capacity of existing or planned stormwater drainage systems[10].

Bio-retention areas would be placed adjacent to the proposed roadways, in the landscaped strip on the western edge of the site, and on residential lots to promote infiltration of stormwater runoff and detain peak flows. As discussed in the setting, MRP provision C.3 requires that the Project will not increase stormwater flows from the site. Preliminary hydrological calculations demonstrate that the Project will meet C.3 requirements at the site and final hydrological calculations will need to demonstrate that the on-site bio-retention and infiltration areas are adequate to meet this requirement[11]. With compliance with the MRP provision C.3 requirement, impacts related to increases in stormwater runoff volumes would be ***less than significant***.

FLOODING

7., 8., 9. The Project is located within a 100-year flood hazard area and would have a potentially ***significant impact*** *related to placement of housing within a flood hazard area.*

Impact Hydro-4: **Proposed Residential Units within a Flood Hazard Zone.** Parcel "C" is currently within a designated 100-year flood hazard zone. While proposed finish grade of the residential development seems to be above the elevation at which a 100-year flood hazard risk would occur, this has not yet been confirmed through amendment to the flood hazard risk map.

The Project is located within the 100-year flood hazard zone as delineated by the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) dated August 3, 2009 as shown in **Figure 9-1**.[12] The proposed finish elevation of the residential portion of the Project site after backfilling and regrading is approximately 12.7 to 15.6 feet above MSL (NAVD 88 vertical datum), whereas the 100-year flood hazard zone extends to a base elevation of 10 feet above MSL (NAVD 88 vertical datum). Therefore, the Project site would be a minimum of 2.7 feet above the 100-year floodplain and the Project should not result in risks related to housing and flooding, impeding flood flows, or significant risk of loss, injury or death involving flooding. FEMA is considering a map update that would change the base elevation from 10 to 11 feet above MSL. Such a revision would not change the above conclusions.

The NFIP underwrites flood insurance coverage only in those communities that adopt and enforce floodplain regulations that meet or exceed NFIP criteria. If a community does not fulfill its NFIP obligations to the federal government and allows construction in violation of its regulations, Insurance on an improperly constructed building may be very expensive. The NFIP requirements can be found in Chapter 44 of the Code of Federal Regulations (44 CFR). However, a community may obtain a variance from the requirements if the data provided by FEMA disagrees with ground elevations. These situations only apply to the use of flood data for floodplain management purposes.

[10] Hydrology and Hydraulic Calculations, Tract 7728, Carmel Way, Westport Way Property, Union City California. Ruggeri-Jensen-Azar, May 2016.

[11] Ruggeri-Jensen-Azar, December, 2016

[12] The flood map for the selected area is number 06001C0429G that can be found at https://msc.fema.gov/portal or be viewed at http://map1.msc.fema.gov/idms/IntraView.cgi?KEY=4468165&IFIT=1.

Insurance agents and lenders must use the current Flood Insurance Rate Map (FIRM) when setting insurance rates and determining whether flood insurance is required. If a person wants to vary from the current FIRM to obtain different premium rates or to not have to purchase a flood insurance policy, the FIRM must be officially revised or amended.



Figure 9-1: FEMA Flood Map of the Project Area

Source: Excerpted from Federal Emergency Management Agency Flood Insurance Rate Maps 06001C0429G dated August 3, 2009.

The base flood elevations (BFEs) published in the Flood Insurance Study set the level for flood protection purposes. The maps are a graphic portrayal of that information. Since FEMA usually does not have detailed topographic mapping to use in preparing the flood maps, the flood boundaries are interpolated. This can result in inaccuracies in drawing the boundaries on the map. The BFE in relation to the actual ground elevation sets the floodplain limits for regulatory purposes. When ground surveys show that a development site is above the BFE, communities should record the data. Then, if the developer or owner wants the property removed from the Special Flood Hazard Area designation, he or she can request a Letter of Map Amendment, or LOMA. An amendment is used to remove an area that was inadvertently included in the Special Flood Hazard Area (SFHA). Often the ground is higher than depicted on the base map used for the FIRM. FEMA will make map amendments based on the information submitted by the applicant. An amendment does not challenge the FIRM; it simply removes certain areas or buildings from the SFHA because they are higher than the base flood elevation. Note that NFIP maps are not changed or amended based on proposed projects. If a map is required to reflect better ground elevation data, the developer may use one of the FEMA forms MT-1 package at https://www.fema.gov/mt-1-application-forms-instructions. The MT-1 package contains paper application forms and instructions for submitting LOMAs. The forms in this package are to be used to request multiple-lot/multiple-structure LOMAs. Applications and payments (if required) can be submitted online at https://www.fema.gov/mt-1-application-forms-instructions.

Mitigation Measure

Hydro-4: Obtain a Letter of Map Amendment. To demonstrate that proposed development of Parcel "C" would not result in impacts related to a flood hazard zone, the Applicant shall obtain a Letter of Map Amendment from FEMA to amend flood map FIRM 06001C0429G showing Parcel C outside the 100-year flood hazard area Zone AE based on survey data prior to issuance of the first Certificate of Occupancy.

Implementation of mitigation measure Hydro-4 will reduce the potential for impacts related to development of a residential subdivision within a flood hazard area to a level of ***less than significant***.

INUNDATION BY SEICHE, TSUNAMI OR MUDFLOW

*9., 10. The Project would have a **less than significant** impact related to the potential to cause inundation by seiche, tsunami, or mudflow or flooding related to dam failure.*

*The Project is in an area with flood protection provided by a levee system and could be subject to flooding in the event of levee failure. This potentially **significant impact** can be mitigated to a less-than-significant level through coordination with ACFCD to confirm levee stability and/or implementation of measures to address flood risk.*

Impact Hydro-5: Proposed Residential Units within an Area Protected by Levees. The Project site is west of Union City Boulevard in Union City, which is an area protected from flooding by a system of levees and could therefore be subject to flooding due to levee failure.

A seiche is a tide-like rise and drop of the surface of a landlocked body of water (e.g., a lake); its period can vary from a few minutes to several hours. Tsunamis, or tidal waves, are huge sea waves that are caused by seismic activity or other disturbance of the ocean floor.

Neither the primary Turk Island Landfill nor Parcel "C" are located in an area that would expose persons to inundation by seiche, tsunami, mudflow, or dam failure. The primary landfill comprises a mound with steep slopes, though would not represent a risk of landslide or mudflow as discussed in Chapter 9: Geology and Soil Quality. Parcel "C" is nearly level. Both do not lie in close proximity to a large lake or the ocean or dammed water. Although seismically induced waves are a possibility in the Bay, the site elevations are above those considered to be at risk for tsunami wave run-up.[13]

The Project site is located within the vicinity of a levee system to the north, west, and south, which could act to provide flood protection to the Project site.[14] While none of the Project technical documents identify levee failure as a significant risk for flooding at the Project site, per the General Plan policy HS-B.1.1a, the Project is required to confirm this with ACFCD and the following mitigation measure would be applicable.

Mitigation Measure

Hydro-5: Obtain Confirmation of Levee Stability. Per General Plan policy HS-B.1.1a, the applicant shall coordinate with ACFCD to confirm stability of levees in the area or

[13] California Emergency Management Agency, Tsunami Inundation Map for Emergency Planning, Newark Quadrangle/Redwood Point Quadrangle, July 31, 2009.

[14] Pacific Institute, San Francisco Bay Levees, available at https://databasin.org/datasets/ed05b99c85e94df5befb6e619847e378

implement measures to address levee hazards. Confirmation from ACFCD shall be provided to the City prior to issuance of building permits.

The impact related to the potential for flood risk due to levee failure would be reduced to ***less than significant*** through coordination with ACFCD and confirmation of levee stability or implementation of measures to address levee failure flooding hazards as appropriate.

CUMULATIVE HYDROLOGY IMPACT ANALYSIS

*11. The Project would have a **less-than-significant** impact related to cumulative hydrology and water quality impacts.*

Adverse cumulative effects on hydrology and water quality could include construction and operational impacts related to increases in stormwater runoff and pollutant loading to San Francisco Bay. The Project and other future projects in the city would be required to comply with the NPDES Construction General Permit for stormwater discharges associated with construction activities and local drainage and grading ordinances intended to control runoff and regulate water quality at each development site during construction activities. Other new projects would also need to implement permanent controls to address stormwater flow and quality per current regulations. Therefore, potential cumulative hydrology and water quality impacts associated with increased construction activity and new development, including the Project and other foreseeable development in the city, would be mitigated to ***less than significant*** levels with implementation of Project-specific mitigation measures and regulatory requirements.

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10

LAND USE AND PLANNING

INTRODUCTION

This chapter describes existing land uses, adopted General Plan land use classifications, and zoning designations on and around the Project site. This chapter also describes the applicable plans and policies that guide development in the Project area.

SETTING

CITY OF UNION CITY GENERAL PLAN

In the General Plan Land Use Diagram, Parcel "C" is identified as "R3-6: Residential – 3 to 6 Dwelling Units per Acre", with the following description: "The purpose of this designation is to provide areas for single family detached residential uses and activities normally associated with single family neighborhoods. Where found appropriate, innovative single family design alternatives are encouraged. This low density residential designation is the preferred residential land use designation for the City. As a result, it is the "anchor" land use in areas where adequate urban services are available and the City envisions future residential development."[1] The lot size range for this designation is 6,000 to 10,000 square feet, though smaller lots can be conditionally permitted within an overall density of 3 to 6 dwelling units per acre.

City-wide goals and related policies applicable to the Project include:

General Land Use and Community Development

- Goal LU-A.1. To grow in an orderly pattern consistent with the economic, social, and environmental needs of Union City.
    - Policy LU-A.1.1. The City shall promote and support the development of a healthy balance of residential, commercial, open space, institutional, and industrial businesses within the city.
    - Policy LU-A.1.2. The City shall promote infill development and reuse of underutilized parcels, consistent with maintaining or enhancing the positive qualities of the surrounding neighborhoods.
    - Policy LU-A.1.4. The City shall encourage project sites to be designed to increase the convenience, safety, and comfort of people using public transportation, walking, or cycling.
    - Policy LU-A.1.6. The City shall require development project design to reflect and consider natural features, noise exposure of residents, visibility of structures, circulation, access, and the relationship of the project to surrounding uses. Residential densities, building intensities, and lot patterns will be determined by these and other factors.

[1] City of Union City, *2002 General Plan Policy Document*, February 2002

- Policy LU-A.1.8. The City shall plan and design neighborhoods that foster a sense of identity while promoting the effective and efficient provision of city services such as police protection and fire suppression.

- Goal LU-A.2. To create land use patterns that promote the residential character of the community including quality housing development, and balanced, harmonious land use types.
  - Policy LU-A.2.1. The City shall continue to encourage high-quality upscale residential development by promoting opportunities to construct upscale, single-family homes allowing a mix of housing types and densities.
  - Policy LU-A.2.2. The City shall ensure that residential communities are designed with high-quality amenities by:
    a. Taking advantage of proximity to those resources to enhance public access and understanding of the natural environments where not detrimental to the natural resources;
    b. Planning to minimize residents' exposure to nuisances from noise, odors, heavy traffic, and unappealing views;
    c. Encouraging enhanced educational opportunities by locating school facilities near resources or sites that offer unique learning experiences, such as proximate to an outdoor nature laboratory, a wildlife sanctuary, etc.; and
    d. Providing neighborhood parks of sufficient size to adequately meet the recreational needs of residents.
  - Policy LU-A.2.4. The City shall design street patterns, community facilities, and open areas which are easily observable and promotes lawful and wholesome activities in neighborhoods.
  - Policy LU-A.2.5. The City shall promote crime prevention through neighborhood and residential design.
  - Policy LU-A.2.6. The City shall encourage the development of housing for elderly, disabled, and low-income households where compatible with surrounding land uses and where site conditions and service capabilities permit. Sites considered especially appropriate for these uses are those accessible to transit, commercial, and medical services.
  - Policy LU-A.2.8. The City shall continue to require the planting of street trees in all new residential developments to enhance the quality of life and character of the neighborhood.

<u>Parks and Private Recreation Areas</u>

- Goal YFSH-E.1. To provide parks and facilities that serve the diverse needs of the city's growing population.
  - Policy YFSH-E.1.4. The City shall consider Turk Island as a possible park or recreational site.
  - Policy YFSH-E.1.9. The City shall continue to plan for development of new trails and bike paths and the completion of existing facilities.
  - Policy YFSH-E.1.10. The City shall actively pursue methods to finance the development of new facilities through park-in-lieu fees, grants, and residential impact fees.
- Goal YFSH-E.3. To establish collaborations with other agencies and private and non-profit organizations.
  - Policy YFSH-E.3.1. The City shall help residents gain access to programs and facilities throughout Union City.

Community Design

- Goal CD-A.1. To ensure high quality appearance and harmony between existing and new uses, while avoiding monotony in style, height, and mass.
    - Policy CD-A.1.1. The City shall encourage development that is visually and functionally compatible with the surrounding neighborhoods by:
        a. Maintaining a height and density of development that is compatible with adjacent developed neighborhoods;
        b. Accenting entrances to new neighborhoods with varied landscaping, hardscaping, and signage treatment; and
        c. Providing various points where residents can enter the wetland/baylands and access the internal bicycle and pedestrian circulation systems.
    - Policy CD-A.1.2. The City shall ensure that the design of new development is pedestrian-friendly (e.g., sidewalks that are well shaded and safe from automobile traffic) and oriented toward the use of transit.
    - Policy CD-A.1.5. The City shall emphasize Union City's natural features as the visual framework for new development and redevelopment.
    - Policy CD-A.1.6. The City shall ensure that the design of all new residential development achieves a sense of visual integration and orderliness, but shall promote diversity in terms of specific design solutions.
    - Policy CD-A.1.7. While linear elements such as roads, utility corridors, and rail lines create physical boundaries for neighborhoods, the City should make every effort to identify and implement design solutions that will, physically and emotionally link new neighborhoods with other residential neighborhoods and make neighborhood residents feel a part of the larger Union City community.
    - Policy CD-A.1.10. When feasible, the City should encourage new developments to be sited to respond to climatic conditions, such as solar orientation, wind, and shadow patterns.
    - Policy CD-A.1.12. The City shall design residential communities so that they avoid becoming isolated walled enclaves. Gated communities shall be specifically discouraged.
    - Policy CD-A.1.13. The City shall require undergrounding of utility lines in new development and as areas are redeveloped, except where infeasible for operational or financial reasons.
    - Policy CD-A.1.15. The City should require the use of energy efficient and energy conserving design and construction techniques in all types of projects (including new construction and remodeled and rehabilitated structures).
    - Policy CD-A.1.17. The City shall require one-story units in all new residential developments.
- Goal CD-A.2. To encourage site design that is sensitive to residents' and businesses' needs for privacy, security, and buffering from other uses and activities.
    - Policy CD-A.2.1. The City shall require adequate spacing or insulation between buildings so that residents have separation from neighbors and adequate privacy.
    - Policy CD-A.2.2. The City shall design open space areas, bicycle and pedestrian systems, and housing projects so that there is as much informal surveillance by people as possible to deter crime.
    - Policy CD-A.2.3. Whenever possible and appropriate, the City shall avoid backing residences onto trails or recreational facilities to deter crime.

- Goal CD-E.2. To provide visual and physical access to the bay marsh edge.
  - Policy CD-E.2.1. The City shall provide access to views of the salt marshes.
  - Policy CD-E.2.2. The City shall minimize the visual impact of marsh-edge development through the use of buffers such as pedestrian trails, linear parks, and landscaped rights of way.
  - Policy CD-E.2.3. The City shall ensure that new development respects its natural setting by maintaining visual harmony with the wetlands area.

511 AREA SPECIFIC PLAN

The Project site is located within the 511 Specific Plan Area, a 905.6-acre area between Union City Boulevard and the San Francisco Bay identified in a 1987 Specific Plan[2] for its unique opportunity for residential development because of availability of utilities and convenience to new commercial areas and state highways. When the Specific Plan was drafted, more than 90% of the area was undeveloped. Over the intervening years, much of the area has developed, including the adjacent residential Sea Breeze Development (to the north and east) and Bay Colony Development (to the south). Parcel "C" represents one of the last remaining undeveloped residentially-designated sites in the 511 Area.

The goals of the 511 Area Specific Plan that would apply to the Project generally reflect those of the General Plan, including:

- Goal 1: Encourage high-quality residential development in the 511 Area.
- Goal 3: Create a residential community with high-quality amenities.
- Goal 11: Promote development that fosters livability and a sense of place.
- Goal 12: Encourage site design that is sensitive to residents' needs for privacy and security.
- Goal 13: Encourage development that is visually and functionally compatible with the surrounding residential neighborhoods.

511 AREA DISTRICT ZONING

The applicable zoning district for the Project site is "511 Area District"[3], which carries forward the land uses, objectives and regulations of the Specific Plan. The 511 Area District zoning contains specific development standards and requirements for development near the Turk Island landfill that are applicable to the proposed Project in the provisions of Municipal Code section 18.100.070(A), as follows:

- Space to accommodate monitoring wells for methane gas migration within one thousand (1,000) feet from the landfill boundary if no long-term monitoring is provided along the periphery of the landfill;
- Undergrounding of utilities located within one thousand (1,000) feet of the landfill boundary shall be done in such a manner to preclude migration of landfill gas; and
- An evaluation of the need to install a landfill gas protection system for development within Development Area B-2 as identified by the Specific Plan. This evaluation shall be reviewed and

[2] City of Union City, *511 Area Specific Plan*, September 14, 1987.

[3] City of Union City, *Union City Municipal Code*, Section 18.100

accepted by the Office of Solid Waste Management of the Alameda County Division of Environmental Health prior to issuance of a building permit.

The 511 Area District zoning also includes regulations applicable to lot size, lot dimensions, usable open space and off-street parking standards. However, project applications may vary from certain standards, pursuant to the requirements of the City's Planned Unit Development regulations as found in Chapter 18.44 of the Municipal Code.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if it were to result in the following:

1. Would the project result in the physical division of an established community?
2. Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?
3. Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?

Under CEQA, environmental effects must involve an adverse change in *physical* conditions, as opposed to mere inconsistency with existing policies. That the Project might be inconsistent with particular policies in the General Plan, Zoning Ordinance, 511 Area Specific Plan, or other applicable plan, policies or regulations does not necessarily constitute a significant environmental effect.[4] Rather, threshold 2, above, relates not to all potential inconsistencies, but only inconsistencies with current policies that have been adopted *for the purpose of avoiding or mitigating environmental effects*.

The following discussion reviews the Project and its consistency with land use plans and policies of the City of Union City. These plans and policies include the General Plan, zoning, and other land use controls (e.g., the 511 Area Specific Plan and the Affordable Housing Ordinance). Policy language is often subject to varying interpretations. The following conclusions are focused on an analysis of current policies and regulations that might lead to adverse effects on the physical environment. This environmental analysis is not intended to pre-suppose the City's determinations on consistency, or prevent imposition of "conditions of approval" to correct any determined inconsistencies outside of the CEQA forum.

PHYSICAL DIVISION OF AN ESTABLISHED COMMUNITY

*1. The Project would not result in the physical division of an established community (**no impact**).*

Access to the Turk Island Landfill is restricted to landfill personnel and that will not change with development of the Project.

[4] See Baldwin v. City of Los Angeles (1999) 70 Cal. App 4th 819,8420843

The Parcel "C" residential portion of the Project site is currently raised above the level of surrounding residential and park development and fenced to limit access. The proposed Project would bring the site level with the surrounding development and is intended to be compatible with the existing residential neighborhood. A public-use pedestrian connection between Westport Way and Sea Breeze Park is proposed to improve neighborhood connectivity. Therefore, development as proposed would enhance physical connectivity and access between different parts of the community, rather than physically divide it (***no impact***).

CONFLICT WITH LAND USE PLANS

2. *The Project would have the potential to conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project adopted for the purpose of avoiding or mitigating an environmental effect. This potentially* ***significant impact*** *can be mitigated to a less-than-significant level through verification of landfill gas protection and/or periphery monitoring.*

Consistency with General Plan and 511 Area Specific Plan Policy

The Project represents infill development of an underutilized parcel reflective of the character of surrounding residential development, consistent with General Plan Policy LU-A.1-2.

The Project is located on a site designated for residential development and surrounded by similar previous residential development and is therefore consistent with the General Plan Goal LU-A.1 to provide for orderly growth and contributes to a healthy balance of residential and other uses, identified in Policy LU-A.1.1 through consistency with the residential designation for the site.

The Project's subdivision design is intended as a high-quality residential development that will be reflective of the residential character of the neighborhood and community, which is consistent with General Plan Goals LU-A.2 and CD-A.1, and specifically Policies LU-A.2.1, CDA.1.1, CD.A.1.6 and 511 Area Plan Goals 1 and 11.

The Project design is compatible with the standards for development relating to privacy and security including roadway design meeting safety standards and emergency access requirements (see Chapter 12), and inclusion of a sound wall between the residences and the adjacent parking lot for Sea Breeze Park (see Chapter 11), and lots meeting in aggregate average size and setback requirements (see Chapter 3), consistent with General Plan Goal CD-A.2 and Policies LU-A.1.6 and CD-A.2.1 and 511 Area Plan Goals 12 and 13.

The Project is within the General Plan planning area, city limits, and within existing service areas for police protection and fire suppression and adjacent to existing residential neighborhoods to which these services are being provided and is consistent with policies pertaining to efficient provision of city services, pursuant to Policy LU-A.1.8.

The Project includes a pedestrian connection from Westport Way to Sea Breeze Park and off-site improvements to Sea Breeze Park and improvements to the informal gravel path adjacent to the stormwater retention ponds to create a new interpretive trail. The proposed recreational improvements are consistent with General Plan Goals YFSH-E.1, YFSH-E.3 and specifically Policies LU-A.2.2, YFSH-E.1.10, CD-A.1.5 through funding of the improvements and connection as part of a residential development project, and with Goal CD-E.2 and Policies CD-E.2.1, CD-E.2.2, and CD-E.2.3 through improvements to the trail along the marsh habitat/retention ponds, and 511 Area Plan Goal 3. Policy YFSH-E.1.4 calls for consideration of the Turk Island Landfill as a recreational site, but the continued requirement for landfill gas collection and flaring precludes such a consideration at this time. In lieu of providing a public trail on the Turk Island landfill, the applicant is providing improvements to Sea Breeze Park and construction of a new trail.

In summary, the Project is generally consistent with General Plan and 511 Area Goals and regulations intended to avoid or mitigate adverse impacts to the environment (***less than significant***).

Consistency with 511 Area Zoning

The 511 Area District zoning provisions found in Section 18.100.050 of the Municipal Code do include specific standards and requirements relating to lot sizes, setbacks, and heights. However, pursuant to Section 18.100.050(2)(g), applicants may vary from the lot size, lot dimensions, usable open space and off-street parking standards, subject to the requirements of the City's Planned Unit Development ordinance (Chapter 18.44 of the Municipal Code), subject to the following provisions:

i. Lot size, lot dimensions, usable open space and off-street parking shall, in the aggregate, be at least equivalent to the standards prescribed by the regulations for each neighborhood within a planned unit development;

ii. A better or more appropriate design can be achieved by not meeting the standards;

iii. Visual and acoustical privacy is maintained;

iv. Adequate additional amenities are provided to maintain the upscale nature of the development;

v. The character of housing types is maintained in each neighborhood;

vi. All driveways for individual dwelling units shall be twenty (20) feet in length and of sufficient width to park two (2) cars;

vii. Applicable goals, objectives and policies of the Specific Plan are met;

viii. The average population density provisions of Section 18.44.050 shall not apply and the dwelling unit density provisions of the Specific Plan shall be met; and

ix. Height standards for spires, cupolas, chimneys, elevator penthouses, flagpoles, radio, and television aerials and antennas, and necessary mechanical appurtenances may be allowed to a maximum height limit of forty (40) feet; and further provided, that aerials and antennas should be so designed for lateral forces so as not to require the use of guy wires in their construction.

The Project would require a Planned Unit Development permit from the City of Union City. In Union City, a Planned Unit Development is intended to give the flexibility to achieve the purposes of the zoning title by the development of planned units which do not conform in all respects with the land use pattern designated on the zoning map or the district regulations. Standards of site area and dimensions, site coverage, yard spaces, heights of structures, distances between structures, usable open space, off-street parking and off-street loading facilities and landscape areas can deviate from the standards by lot, but in the aggregate must be at least equivalent to the standards prescribed by the regulations for the district in which the planned unit development is located.

The proposed residential portion of the Project would have a density of approximately 5.2 residential units per acre, consistent with the range specified by the General Plan designation. The Project would require a conditional use permit to allow a planned unit development as development standards such as lot sizes and setbacks are met in the aggregate to comply with the "Single Family Detached (Reduced Lot)" standards for the existing 511 Area zoning district although individual lots may deviate from these standards to fit within the site constraints. Lots would average 56.3 feet wide (ranging from 50.5 to 74.5), 94.9 feet deep (ranging from 84 to 109), with an average area of 5,322 square feet (ranging from 4,680 to 7,286). The lots exceed the minimum width of 55' and a minimum depth of 90' in the aggregate and meet or exceed all site area, coverage, and setback requirements in the aggregate.

Impact Plan-1: **Potential Inconsistency with Development Standards for Development Near the Turk Island Landfill.** The Project applicant has proposed specific landfill gas monitoring and utility exclusion measures but not has not yet reached final determination whether additional protection provisions would be required. The implementation of protection measures or determination that these would not be required is required to ensure consistency with Municipal Code section 18.100.070. This would be considered a ***potentially significant*** impact.

Mitigation Measures Haz-1a through **Haz-1f** require implementation of an approved Clean Closure / Remediation Plan and the control plans contained therein, including installation of proposed landfill gas monitoring probes between the main Turk Island Landfill and Parcel "C", and determination of required provisions to prevent migration of landfill gas between Parcel "C" and the main Turk Island Landfill (such as the proposed utility exclusion measures to prevent migration along utility lines and potentially also installation of a landfill gas extraction trench if the possibility of landfill gas migration through the soil cannot be determined not to be a risk through data from the new monitoring wells).

Implementation of Mitigation Measures Haz-1a through Haz-1f will ensure consistency with 511 Area District regulations intended to address the potential for adverse environmental impacts related to landfill gas migration through requirements for monitoring and protection measures and would reduce the potentially significant impact to a ***less than significant*** level.

CONFLICT WITH HABITAT CONSERVATION/NATURAL COMMUNITY CONSERVATION PLANS

*3. The Project would not conflict with any applicable habitat conservation plan or natural community conservation plan (**no impact**).*

There are no existing Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) applicable to the Project area. There are wildlife protection and enhancement programs applicable to the greater area, such as the Alameda County Wildlife Friendly Pond Restoration Program and a U.S. Fish & Wildlife Service "Safe Harbor Agreement" for the enhancement of habitat for the California red-legged frog and California tiger salamander. However, there are no ponds on the Project site and no habitat for red-legged frogs or tiger salamanders (see Chapter 6 of this document, Biology) and the Project would not conflict with or affect these ongoing conservation plans (***no impact***).

11

NOISE

INTRODUCTION

This section of the EIR presents the results of the environmental noise assessment conducted for the Project by Illingworth and Rodkin, Inc.

Noise for this type of Project is generally classified either as temporary *construction* noise, which would include landfill consolidation, backfill, and subsequent subdivision development, or noise resulting from *operations*, which would include noise related to the residents of the residential units and use of the trail following construction.

Noise levels resulting from the construction of the Project were calculated using the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM v. 1.1). FHWA's Traffic Noise Model (TNM v. 2.5) was used to calculate traffic noise levels attributable to construction truck trips. Calculations were also made to estimate noise and vibration levels produced by proposed Project construction activities and Project operations (i.e., park-related noise, increased traffic volumes on the local roadway network).

Included in this section is a brief description of the fundamentals of environmental noise, a summary of the applicable regulatory criteria, and the results of the noise monitoring surveys. Future noise levels at the site and surrounding areas are calculated and summarized. The report then evaluates impacts resulting from the Project in terms of noise and land use compatibility, temporary noise level increases resulting from the Project construction, and permanent noise level increases resulting from the operation of the Project. Mitigation is presented to reduce the potential for adverse effects resulting from the Project.

SETTING

FUNDAMENTALS OF ENVIRONMENTAL NOISE

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. Decibels and other technical terms are defined in **Table 11-1**.

Most of the sounds which we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflects the fact that human hearing is less sensitive at low frequencies and extreme high frequencies. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Typical A-weighted levels measured in the environment and in industry are shown in **Table 11-2** for different types of noise.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which create a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{01}, L_{10}, L_{50}, and L_{90}, are commonly used. They are the A-weighted noise levels equaled or exceeded during 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period. A single number descriptor called the L_{eq} is also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes more noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, L_{dn} (day/night average sound level), was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

REGULATORY SETTING

The State of California and the City of Union City have regulations, plans and policies designed to limit noise exposure at existing and proposed noise sensitive land uses. These plans and policies are established in the following documents: (1) the State CEQA Guidelines, Appendix G, (2) the City of Union City Health and Safety Element of the 2002 General Plan, and (3) the Union City Municipal Code.

California Environmental Quality Act

CEQA requires an evaluation of the significance of potential Project noise impacts. CEQA does not define what noise level increase would be considered substantial. Typically, an increase of 3 dBA CNEL or more caused by the Project would be considered a significant impact when projected noise levels would exceed those considered acceptable for the affected land use. A noise increase of 5 dBA CNEL or more caused by the Project would be considered a significant impact when projected noise levels would remain at or below the noise levels considered acceptable for the affected land use.

City of Union City Health and Safety Element of the 2002 General Plan

The City of Union City has established policies and implementation programs in the Health and Safety Element of the 2002 General Plan in support of the goal of protecting public health and welfare by minimizing excessive noise. The following policies and implementation programs are applicable in the assessment of impacts resulting from the proposed development:

HS-C.1.1 The City shall consider the following land uses to be “noise sensitive”:

- single and multi-family residential;
- group homes;
- hospitals and extended medical facilities;
- schools and other learning institutions;
- libraries; and
- similar uses as may be determined by the City.

Table 11-1: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Table 11-2: Typical Noise Levels in The Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

HS-C.1.2 The City shall use the standards in Table HS-2 [included as **Table 11-3**] as the acceptable limits of noise for various land uses throughout the community. These standards specify the maximum exterior noise levels allowable for developments. For noise sensitive land uses, mitigation shall be included in structural design to reduce interior noise levels to a maximum of 45 dBA CNEL.

HS-C.1.3 For proposed development of new noise sensitive land uses as identified in HS-C.1.1, the City shall require a detailed noise impact analysis in areas where current or future exterior noise levels from transportation sources (i.e., roadway, highway/freeway, rail uses, and aircraft noise), or stationary sources exceed the noise standards contained in Table HS-2. This study shall be prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California with a minimum of three years' experience in acoustics). The study shall include recommendations and evidence to establish mitigation that will reduce noise exposure to an acceptable level.

HS-C.1.4 The City shall require a noise impact evaluation by a qualified acoustical engineer for all new non-residential land uses that have the potential to exceed the City's noise standards for noise sensitive land uses measured at the property line of the noise sensitive use or district. Noise from an intervening transportation source shall be considered as part of the noise evaluation.

HS-C.1.6 To minimize the impacts of transportation-related noise, the City shall:

- Require for new development projects that are impacted by noise or cannot meet the standards specified in Table HS-2, the construction of barriers to mitigate sound emissions where necessary or where feasible.
- Require, where necessary and feasible, the inclusion of noise mitigation measures in the design of new roadway projects in Union City.

HS-C.1.7 To minimize the impacts of stationary noise, the City shall limit construction activities between the hours of eight a.m. and eight p.m. on Monday through Friday, nine a.m. and eight p.m. on Saturdays, and Sundays and holidays, between ten a.m. and six p.m.

HS-C.1.8 The City shall encourage the use of berms and increased building setbacks, or both, in the design of residential or other noise sensitive land uses that are adjacent to major roads, commercial, or industrial areas.

HS-C.1.9 The City shall provide for continued evaluation of truck movements and routes within the city to provide effective separation from residential or other noise sensitive land uses.

HS-C.1.10 The City shall develop a Construction Abatement/Mitigation Plan to reduce adverse noise effects from construction activity.

HS-C.3 The City shall develop a Construction Abatement/Mitigation Plan to reduce adverse noise effects from construction activity. Key elements of the plan shall include but not be limited to the following:

- Construction contractors shall comply with all relevant provisions of applicable local noise policies and ordinances.
- All construction equipment shall have sound-control devices no less effective than those provided on the original equipment. No equipment shall have un-muffled exhaust.

- As directed by the City, the contractor shall implement appropriate additional noise mitigation measures including, but not limited to changing the location of stationary construction equipment, shutting off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, re-routing heavy truck traffic, or installing acoustic barriers around stationary construction noise sources or construction sites.

Union City Municipal Code

Regulations regarding construction and operational noise are established in the Community Noise chapter of the Union City Municipal Code. The following are applicable in the assessment of impacts resulting from the construction and operation of the Project.

9.40.043 Public property noise limits.

A. No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on public property, a noise level more than fifteen dBA above the local ambient at a distance of twenty-five feet or more, unless otherwise provided in this chapter.

B. Sound performances and special events not exceeding eighty dBA measured at a distance of fifty feet are exempt from this chapter when approval therefore has been obtained from the appropriate governmental entity, except as provided elsewhere in this Code.

C. Vehicle horns, or other devices primarily intended to create a loud noise for warning purposes, shall not be used when the vehicle is at rest, or when a situation endangering life, health, or property is not imminent. (Ord. 275-86 § 1, 1986)

9.40.050 Daytime exceptions.

Any noise source which does not produce a noise level exceeding seventy dBA at a distance of twenty-five feet from the noise source under its most noisy condition of use shall be exempt from the provisions of Article 4 between the hours of eight a.m. and eight p.m. daily except Sundays and holidays, when the exemption herein shall apply between ten a.m. and six p.m. (Ord. 275-86 § 1, 1986)

9.40.053 Construction.

Notwithstanding any other provision of this chapter, between the hours of eight a.m. and eight p.m. daily except Saturday, when the exemption herein shall apply between nine a.m. and eight p.m. and Sundays and holidays, when the exemption herein shall apply between ten a.m. and six p.m., construction, alteration, or repair activities which are authorized by valid City permit shall be allowed if they meet at least one of the following noise limitations:

A. No individual piece of equipment shall produce a noise level exceeding eighty-three dBA at a distance of twenty-five feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty-five feet from the equipment as possible

B. The noise level at any point outside the property plane of the project shall not exceed eighty-six dBA.

Table 11-3: City of Union City Maximum Allowable Noise Exposure by Land Use

Table HS-2

Maximum Allowable Noise Exposure by Land Use

	Noise Level (CNEL)						
	0-55	56-60	61-65	66-70	71-75	75-80	>81
Residential - Low Density Single Family, Duplex, Mobile							
Residential - Multiple Family, Group Homes							
Motels/Hotels							
Schools, Libraries, Churches, Hospitals, Extended Care							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arenas, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation,							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

	Normally Acceptable. Specified land use is satisfactory, based on the assumption that any buildings involved are of normal, conventional construction, without any special noise insulation
	Conditionally Acceptable. New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed insulation features
	Normally Unacceptable. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction
	Unacceptable. New construction or development should not be undertaken.

EXISTING NOISE ENVIRONMENT

The Project site is located in the City of Union City, in southern Alameda County, located near the intersection of Carmel Way and Westport Way. The Project site is surrounded by single-family residential land uses to the north, east, and south, and an existing landfill to the west.

Noise measurements were made on February 12, 2009 to quantify typical daytime noise levels at the site and in the Project vicinity. The February 2009 noise monitoring survey included two short-term (ten-minute) measurements at locations shown in **Figure 11-1**.

Short-term measurement (ST-1) was made approximately 33 feet from the property line of the Project site in front of 5157 Westport Way. The ten-minute average noise level during this time period was 46 dBA L_{eq}. An auto traveling along Westport Way produced a maximum instantaneous noise level that reached 64 dBA. Short-term measurement (ST-2) was conducted at a distance of 75 feet from the property line of the Project site on the corner of Del Mar Court and Carmel Way. The ten-minute average noise level during this time period was 50 dBA $L_{eq.}$ An auto traveling along Carmel Way produced a maximum instantaneous noise level that reached 66 dBA.

An additional series of noise measurements were made between May 5, 2017 and May 9, 2017 to quantify the daily trend in noise levels in the Project vicinity and update the prior noise survey. The May 2017 noise monitoring survey included one long-term (96 hour) measurement and two short-term (ten-minute) measurements at locations, also shown in **Figure 11-1**.

Long-term noise measurement (LT-1) was made within Sea Breeze Park, south of single-family residential land uses located along Point Lobos Court. Data collected on Friday, May 5, 2017 and Saturday, May 6, 2017 were influenced by high wind conditions; however, the noise data collected on Sunday, May 7, 2017 and Monday, May 8, 2017 were less affected by high winds and representative of typical springtime conditions. Hourly average noise levels at this location on Sunday and Monday typically ranged from 43 to 56 dBA L_{eq} during the day, and from 35 to 50 dBA L_{eq} at night. The Community Noise Equivalent Level on Sunday and Monday was 53 dBA CNEL. The daily trends in noise levels measured at Site LT-1 are summarized in **Figures 11-2 through 11-6**.

Short-term measurement (ST-3) was made in front of 5309 Asilomar Court, east of the Project site. The ten-minute average noise level during this time period was 44 dBA $L_{eq.}$ Maximum instantaneous noise levels resulting from a jet overflight reached 60 dBA. Short-term measurement (ST-4) was made in front of 5169 Westport Way, south of the Project site. The ten-minute average noise level during this time period was also 44 dBA L_{eq}. Maximum instantaneous noise levels resulting from a jet overflight reached 55 dBA. Measured noise levels in 2017 indicate that the noise environment at the site and in its vicinity remains a fairly quiet suburban setting.

The various short-term measurements show the variation in ambient noise levels in the adjacent residential areas. In all cases, the ambient noise environment is low and characteristic of a suburban residential area.

Figure 11-1: Noise Measurement Locations

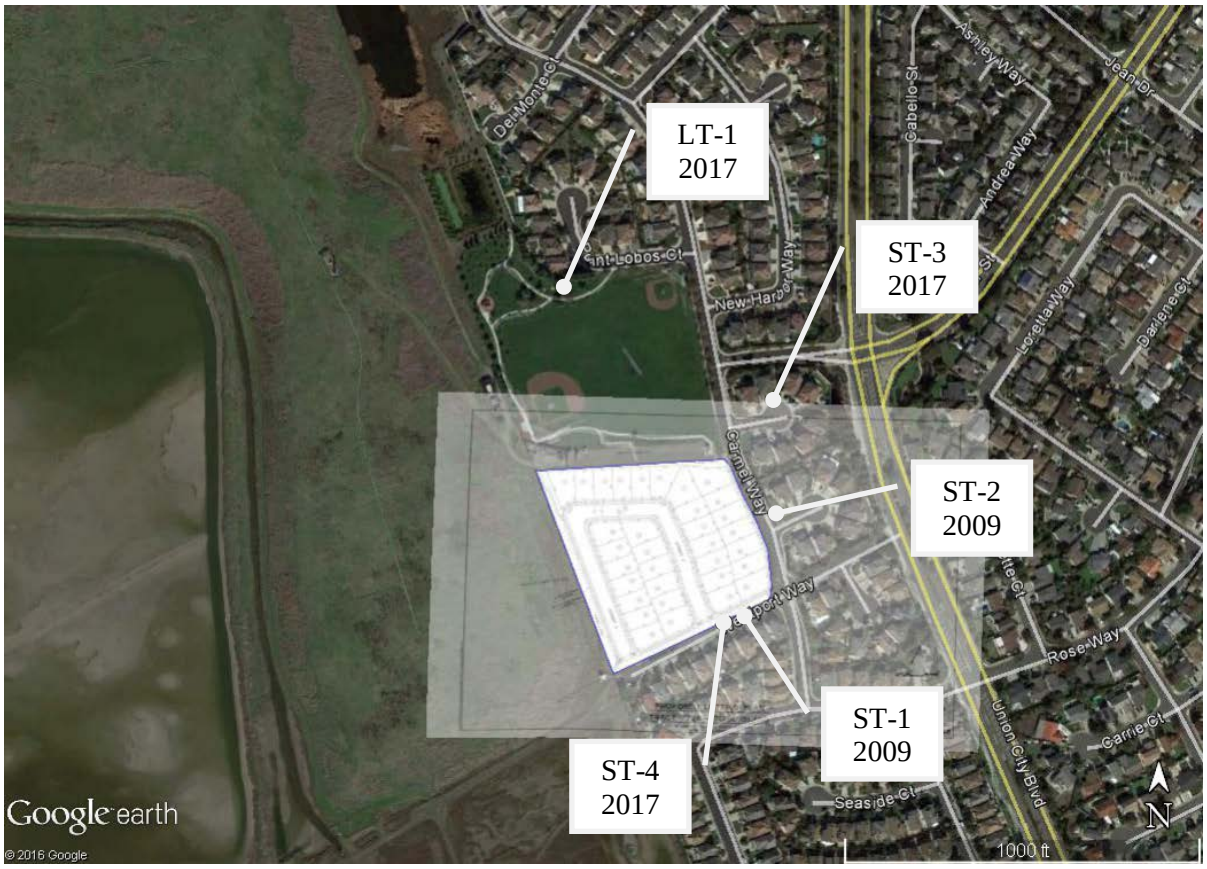


Figure 11-2: Daily Trend in Noise Levels, May 5, 2017

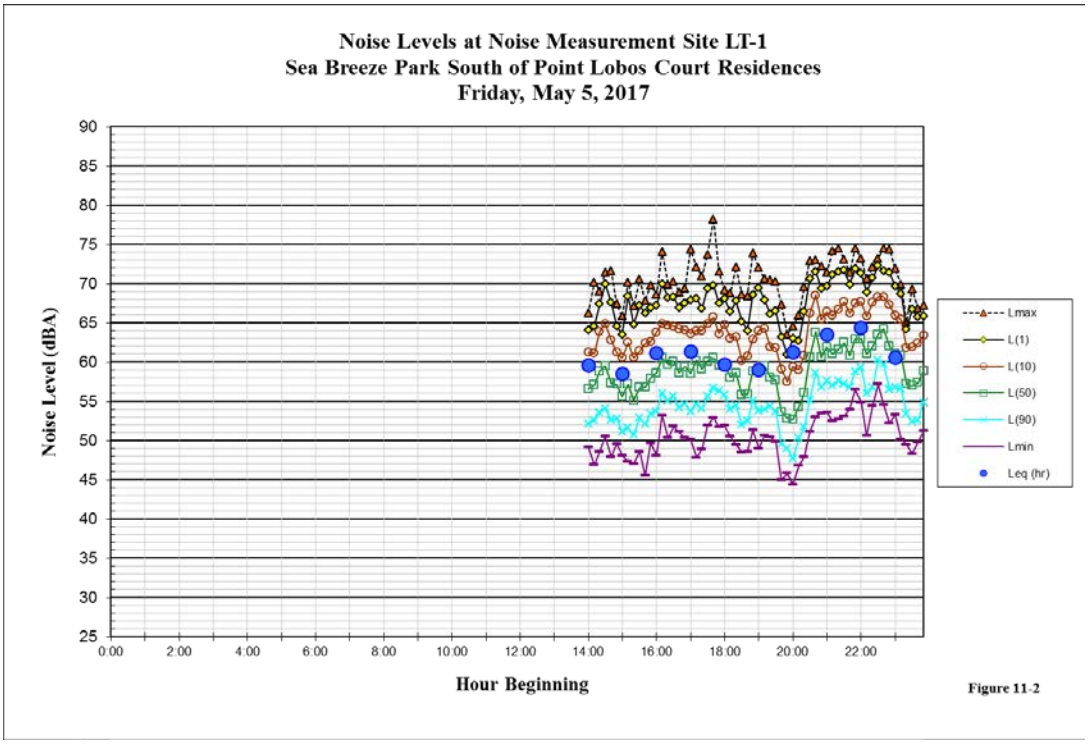


Figure 11-3: Daily Trend in Noise Levels, May 6, 2017

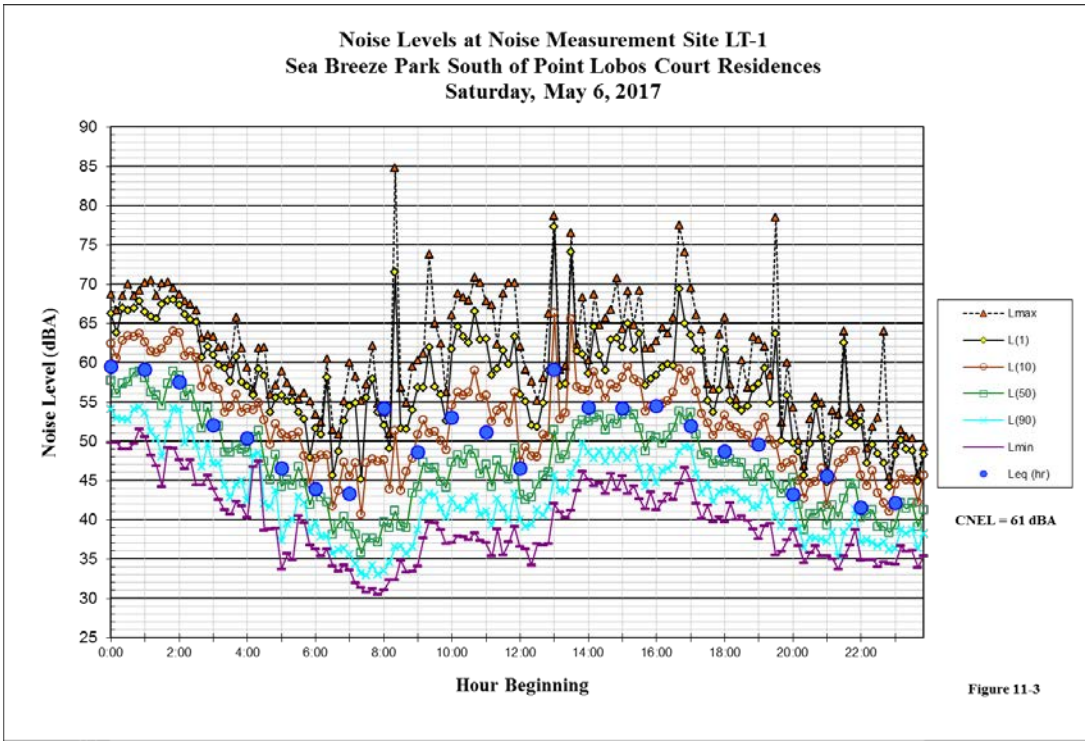


Figure 11-4: Daily Trend in Noise Levels, May 7, 2017

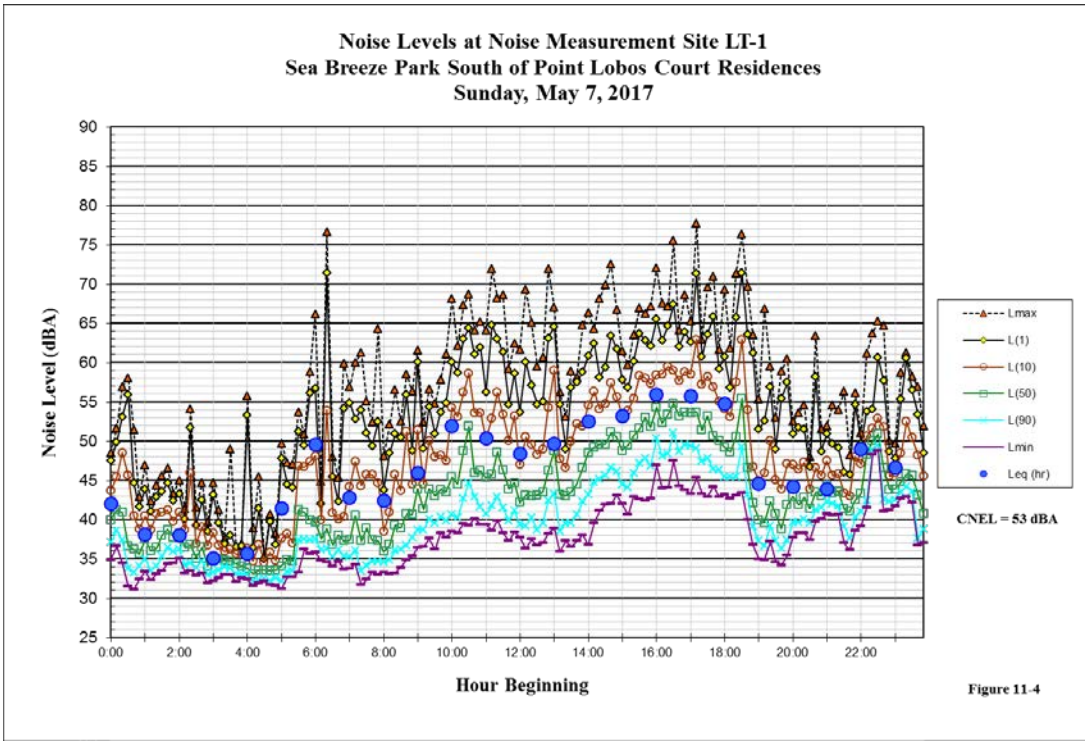


Figure 11-5: Daily Trend in Noise Levels, May 8, 2017

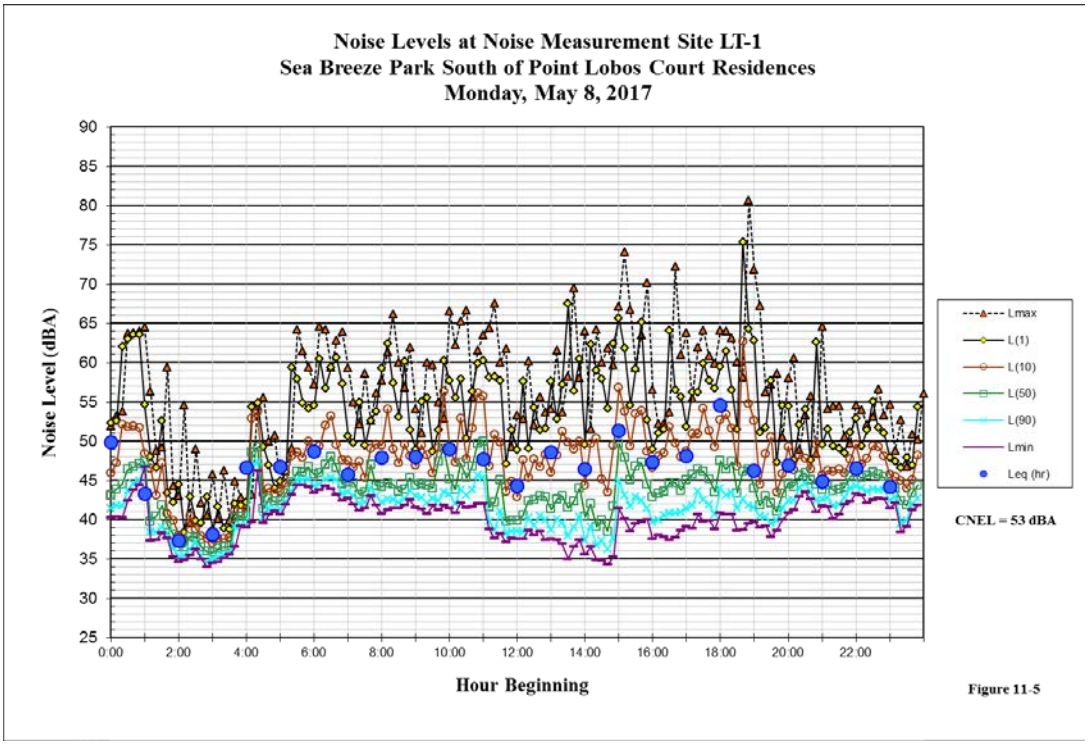
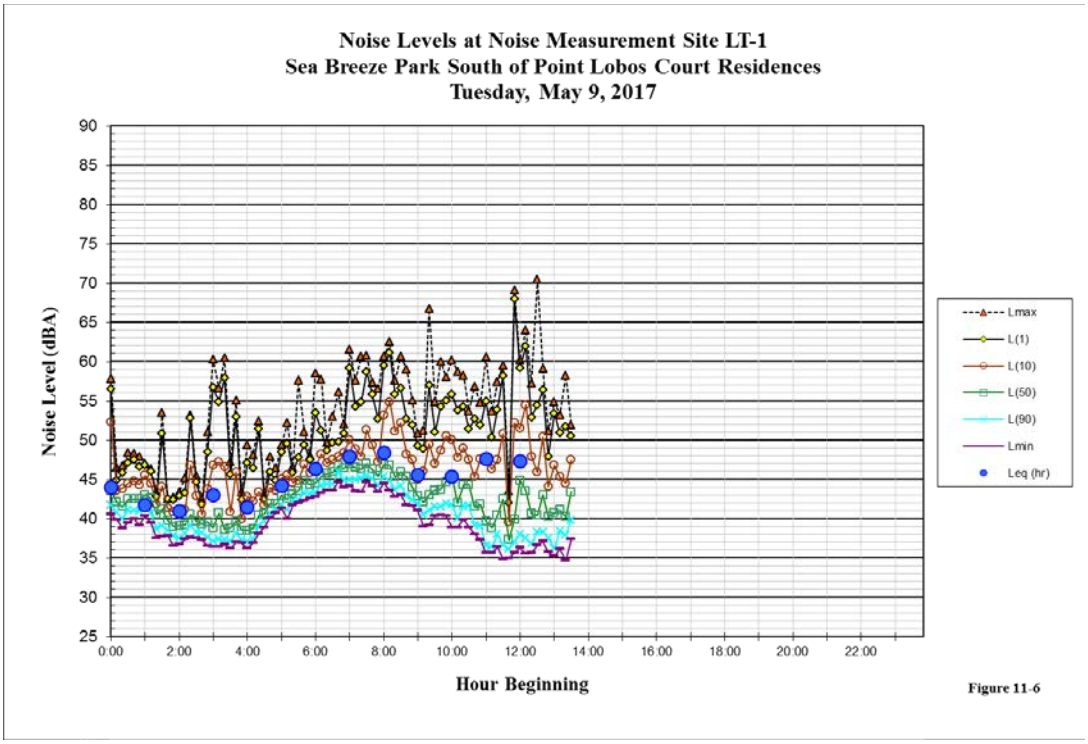


Figure 11-6: Daily Trend in Noise Levels, May 9, 2017



IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

The following thresholds for measuring a Project's environmental impacts are based upon Appendix G of the CEQA Guidelines thresholds:

1. Would the project expose persons to, or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
2. Would the project expose persons to, or generate excessive groundborne vibration or groundborne noise levels?
3. Would the project lead to a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the project?
4. Would the project lead to a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the project?
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?
6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?
7. Would the project result in noise impacts that are individually limited, but cumulatively considerable (i.e., the incremental effects of the project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

NOISE EXPOSURE

*1. The Project would have a **less than significant** impact related to the 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.*

Construction Period

Section 9.40.053 of the Union City Municipal Code regulates noise from construction activity. The applicable portion of this section states that, "…between the hours of eight a.m. and eight p.m. daily except Saturday, when the exemption herein shall apply between nine a.m. and eight p.m. and Sundays and holidays, when the exemption herein shall apply between ten a.m. and six p.m., construction, alteration, or repair activities which are authorized by valid City permit shall be allowed if they meet at least one of the following noise limitations:

A. No individual piece of equipment shall produce a noise level exceeding eighty-three dBA at a distance of twenty-five feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty-five feet from the equipment as possible.

B. The noise level at any point outside the property plane of the project shall not exceed eighty-six dBA."

The Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM v. 1.1) predicts noise levels produced by construction equipment. Construction noise levels predicted with RCNM indicated that noise levels produced by a bulldozer, dump truck, and excavator, assuming all

equipment were operating within 65 feet of the nearest residence, would be 79 dBA L_{eq} or less at the nearest residential property line. While the exact specifics of what equipment will be operating when is not yet scheduled, generic construction noise data for similar projects, adjusted for distance, would result in estimated hourly average noise levels ranging from 79 to 86 dBA L_{eq} at the nearest receptors during the busiest construction periods along the perimeter of the site and during excavation/reconsolidation activities. (Additional discussion of construction noise modeling is included under the subheading "Construction Noise" below.)

Union City Municipal Code requires construction activities to meet at least one of two noise limitations, and as discussed above, the Project construction would meet the listed limitation "B" and would therefore comply with code requirements. With compliance with the Union City Municipal Code construction noise regulations, the impact related to consistency with established standards during construction would be a ***less than significant*** impact. Implementation of Mitigation Measure Noise-1 could further reduce construction-period noise levels.

Operation

Noise Levels Attributable to On-Site Operations

The noise environment at other residential uses near the Project site would not exceed the City's noise level goal for exterior noise (60 dBA CNEL). The future exterior noise environment in the area would continue to result primarily from distant traffic along Union City Boulevard, local roadways and occasional aircraft over-flights. Daily average noise levels would continue to fall below 60 dBA CNEL. Noise generated by residential use at the Project site would be consistent and compatible with the nearby existing residential uses. Existing residential uses would not be exposed to noise levels exceeding the City of Union Municipal Code due to on-site residential development proposed by the Project. The impact related to operational noise increases due to on-site development would be ***less than significant***.

Noise Levels Attributable to Off-Site Improvements

Section 9.40.043 of the Union City Municipal Code states that, "No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on public property, a noise level more than fifteen dBA above the local ambient at a distance of twenty-five feet or more, unless otherwise provided in this chapter."

The off-site improvements proposed as part of the Project include a trail located west of existing residential land uses located along Carmel Way, Del Monte Court, and point Lobos Court, a new play structure within Sea Breeze Park for 5 to 12 year-old children located immediately adjacent to the existing play structure designated for younger children, and several other minor improvements to Sea Breeze Park. The only improvement that would produce noise of any consequence would be the new play structure proposed approximately 110 feet west of the nearest residence along Point Lobos Court.

Based on prior experience with parks, the use varies depending on the season, day (weekday versus weekend or school-year versus summer), the time of day, and the popularity of the park. The play structure would be used throughout the day, but the most intensive use of the play structure would likely occur between the hours of 8:00 a.m. and 8:00 p.m. Sources of noise generated within the play area would primarily include the sounds of children's voices during play. Data contained in Illingworth & Rodkin, Inc. files indicate that maximum noise levels generated by children when shouting could reach 63 to 64 dBA L_{max} at a distance of 110 feet. Hourly average noise levels generated by the park would vary depending on the activities occurring at the park and number of children at play. Worst-case hourly average noise levels could reach 46 dBA L_{eq} at the nearest

receivers, but would typically be 41 dBA L_{eq} or less when three or fewer children are using the park. Based on a review of the noise data collected at Site LT-1, ambient background noise levels are on average 41 dBA L_{90} between the hours of 8:00 a.m. and 8:00 p.m. The predicted average noise levels produced by children at the play structure would not exceed ambient background noise levels by more than 15 dBA, and maximum instantaneous noise levels would fall within the range of existing maximum noise levels attributable to other activities currently occurring within Sea Breeze Park. The rear yards of residences in the vicinity are acoustically shielded from park noise by an existing noise barrier, therefore predicted noise levels in shielded rear yard areas would be expected to be about 5 dBA less than the levels stated above.

Existing residential uses would not be exposed to noise levels exceeding the City of Union Municipal Code due to off-site improvements proposed by the Project. The impact related to operational noise increases due to off-site improvements would be ***less than significant*** with no mitigation required.

Noise Levels at Proposed Residential Land Uses

The noise environment at the Project site would not exceed the City's noise level goal for exterior noise (60 dBA CNEL). The future exterior noise environment along at the Project site would continue to result primarily from distant traffic along Union City Boulevard, local roadways and occasional aircraft over-flights. Daily average noise levels would continue to fall below 60 dBA CNEL. Noise generated by the use of the adjacent Sea Breeze Park would be attenuated by the 7-foot high precast soundwall proposed along the north boundaries of the nearest residential rear yard areas and would not measurably contribute to the future noise environment at the north end of the Project site. Overall noise levels produced by local and distant traffic, as well as park activities, would be compatible with the proposed residential use.

The State of California Building Code and Union City require noise levels within new residential units not exceed 45 dBA CNEL. Exterior noise levels at the facades of proposed residential units adjacent to the local roadways would be expected to be well below 60 dBA CNEL. In buildings of typical construction, with the windows partially open, interior noise levels are approximately 15 dBA lower than exterior noise levels. With windows closed, standard residential construction typically provides 20 to 25 decibels of exterior to interior noise reduction. Where exterior noise levels are less than 60 dBA CNEL the interior noise level can typically be maintained below City Standards (45 dBA CNEL) assuming standard construction methods.

Proposed residential uses would be not be exposed to exterior noise levels greater than 60 dBA CNEL, which complies with the noise and land use compatibility standards presented in the City of Union City's General Plan. Interior noise levels would be expected to be less than 45 dBA CNEL at the Project site without the need for incorporation of noise insulation features into the Project's design.

Noise levels at the proposed residences would be compatible with the proposed residential uses and consistent with relevant requirements. There would be no environmental impact related to noise levels at proposed residences.

GROUNDBORNE VIBRATION

2. *The Project would have a **less than significant** impact related to the exposure of persons to, or generation of excessive groundborne vibration or groundborne noise levels.*

Construction Period

The construction of the Project may generate perceptible vibration when heavy equipment or impact tools are used in the vicinity of nearby sensitive residential land uses. Construction activities that would have the potential to generate groundborne vibration would include the excavation of landfill material at the site, consolidation of those materials at the adjacent Turk Island Landfill, and site preparation work. The proposed Project would not require pile driving, which can cause excessive vibration levels.

For structural damage, the California Department of Transportation (Caltrans) recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern. People can also be adversely affected by excessive vibration levels. The level at which humans begin to perceive vibration is 0.015 inches per second. Vibrations at 0.2 inches per second are considered bothersome to most people, while continuous exposure to long-term PPV is considered unacceptable at 0.12 inches per second.

Table 11-4 presents typical vibration levels that could be expected from construction equipment at distances of 25 feet and 65 feet. The nearest sensitive land uses to the east and south of the Project site are located approximately 65 feet from the site boundary. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, and drilling typically generates vibration levels of 0.090 in/sec PPV at a distance of 25 feet. Vibratory rollers produce vibration levels of 0.210 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Interior construction work and landscaping activities are not anticipated to be sources of substantial vibration with the exception of sporadic events such as dropping of heavy objects, which should be avoided.

Excavation, landfill consolidation, and backfill is estimated to occur over an approximately 6 month period. Site preparation and home construction for the residential subdivision, as well as off-site improvements, would occur after that, with completion approximately one year to a year and a half later, with occupancy of residential units expected to begin in 2019 or 2020. Substantial construction vibration during most of this time is not expected except during certain vibration generating activities. The nearest sensitive land uses to the Project site would be the single-family residences approximately 65 feet to the east of the site opposite Carmel Way and single-family residences approximately 65 feet to the south of the site opposite Westport Way. Of the equipment expected to be used at the site, a vibratory roller would result in the highest vibration levels. At a distance of 65 feet, vibration levels produced by a vibratory roller would be up to 0.073 in/sec PPV, which would be below the 0.3 in/sec PPV threshold used to assess the potential for damage to structures. The vibration levels produced by a vibratory roller would be perceptible, but would not be considered bothersome to most people as levels would be below 0.012 in/sec PPV. However, as with any type of construction, perceptible vibration levels would be anticipated, and given the intermittent and short duration of the phases that have the highest potential of producing vibration (e.g., use of vibratory rollers, jackhammers, and other high power tools), construction of the Project would not subject existing residents to excessive groundborne vibration. This is a ***less than significant*** impact.

Table 11-4: Vibration Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	PPV at 65 ft. Nearest Off-Site Receptors to East and South (in/sec)
Pile Driver (Impact)	upper range	1.158	NA
	typical	0.644	NA
Pile Driver (Sonic)	upper range	0.734	NA
	typical	0.170	NA
Clam shovel drop		0.202	0.071
Hydromill (slurry wall)	in soil	0.008	0.003
	in rock	0.017	0.006
Vibratory Roller		0.210	0.073
Hoe Ram		0.089	0.031
Large bulldozer		0.089	0.031
Caisson drilling		0.089	0.031
Loaded trucks		0.076	0.027
Jackhammer		0.035	0.012
Small bulldozer		0.003	0.001

Operation

There are no known sources of groundborne vibration at or near the Project site and the proposed residential units would not produce groundborne vibration that would affect nearby residential land uses (***less than significant).***

TRAFFIC NOISE

*3. The Project would have a **less than significant** impact related to a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project.*

Operation

Implementation of the proposed Project would increase traffic noise levels along local streets due to residentially-generated traffic from the Project at buildout, as reviewed in the Project's traffic study.[1] Because of the low traffic volumes currently being carried on the residential streets near the Project such as Dyer Street, Carmel Way, and Westport Way, the addition of Project traffic can be anticipated to result in an increase upwards of 35% over what currently exists on these streets. Traffic volumes for area roadways are presented in Chapter 12 of this document. The greatest relative noise level increase would occur on the roadway segments with the lowest existing traffic volume. For example, the Average Daily Traffic (ADT) volume along Carmel Street south of Dyer Street is currently 600 vehicles. Under the existing plus project scenario, ADT volumes along this roadway segment would reach 810 vehicles (a 35% increase in ADT volumes above existing conditions). However, the total traffic volume will remain relatively low, and vehicular traffic noise levels are calculated to increase by

[1] Fehr & Peers, Inc., Turk Island Consolidation and Residential Traffic Impact Analysis-Draft, April 2017.

1 dBA CNEL or less. Such a noise level increase would not be considered to be substantial. The noise increase due to the Project would be less than 1 dBA CNEL along Whipple Road, Union City Boulevard, and Paseo Padre Parkway, where existing ADT volumes are substantially higher. This is a ***less than significant*** impact, as the noise level increase would not be noticeable.

CONSTRUCTION NOISE

4. *The Project would have the potential to lead to a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project during the construction period. This potentially significant impact can be partially mitigated through implementation of measures to reduce construction noise, but would remain* ***significant and unavoidable****.*

Construction Period

Impact Noise-1: **Construction Noise.** The Project site is bordered by existing residential land uses to the south and east. The nearest noise-sensitive land uses are located approximately 65 feet from the Project site. Noise generated by construction activities associated with the Project would substantially increase noise levels at residential land uses in the vicinity of the Project site. This would be a ***significant*** impact.

CEQA does not define what constitutes a temporary substantial increase to noise due to construction. The threshold of significance used for assessment of construction noise in this analysis is based on three primary considerations: the ambient noise environment, how the noise level of construction activities changes the ambient noise environment, and the duration of the effects of construction noise.

The State of California Building Code and Union City specify that noise levels inside of residential units at or below 45 dBA CNEL are appropriate for normal residential use of the units and that this level is generally met when exterior noise levels are less than 60 dBA CNEL.

Small changes in noise levels above 60 dBA CNEL may not be perceptible. If noise levels exceed the 60 dBA CNEL level, an increase of 5 dBA Leq or more would be considered a significant increase.

Again, the timeframe under which a CEQA impact related to construction noise could occur is not specified under CEQA and there are no regulatory standards addressing this. A threshold of one year is often used in environmental analyses as the indication of a long construction period. This timeframe allows for small projects to be constructed assuming a person of normal sensitivity would not be adversely affected by temporary construction noise. Construction durations exceeding one year would be considered significant if construction noise levels exceed the standards presented above.

For purposes of this analysis, where noise from construction activities exceeds 60 dBA L_{eq} and exceeds the ambient noise environment by at least 5 dBA L_{eq} at noise-sensitive uses in the Project vicinity (residences) for an extended duration (i.e., more than one year), the impact would be considered significant.

The highest maximum noise levels generated by Project construction would occur during landfill consolidation and backfill, and would be generated by excavation, dump trucks, and graders. Maximum instantaneous noise levels generated by this equipment could reach 84 to 85 dBA L_{max} at a distance of 50 feet from the noise source. Intermittently, if required, equipment such as concrete saws or hoe rams could produce maximum instantaneous noise levels reaching 90 dBA L_{max} at a distance of 50 feet. Construction-related noise levels are normally less during building framing, finishing, and

landscaping phases. Typical hourly average construction-generated noise levels are about 81 to 88 dBA L_{eq} measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.). There would be variations in construction noise levels on a day-to-day basis depending on the specific activities occurring at the site. Construction generated noise levels drop off at a rate of about 6 dBA per doubling of distance away from the source.

The nearest existing residential receivers are about 65 feet from the Project site. Hourly average noise levels would range from 79 to 86 dBA L_{eq} during the busiest construction periods along the perimeter of the site and during excavation/reconsolidation activities. Reconsolidation activities occurring within the landfill, approximately 500 feet from the nearest existing residences (e.g., residences along Westport Way, Point Lobos Court, and Del Monte Court), would produce noise levels ranging from 61 to 68 dBA L_{eq}. At a distance of 1,000 feet, reconsolidation activities within the landfill would produce noise levels ranging from 56 to 62 dBA L_{eq} (e.g., residences along Carmel Way east of site) Shielding by barriers or buildings would provide an additional 5 to 10 decibels of attenuation at distant receptors.

Approximately 260 vehicle trips (40 passenger vehicles and 220 heavy trucks) would occur per day on roadways serving the site during consolidation and backfill activities. Consistent with the traffic analysis (Chapter 12), this analysis assumes that passenger vehicles would occur during the peak hours when employees arrive and leave for the day and that the truck trips would be evenly distributed throughout the 10-hour workday. During peak commute hours, approximately 20 passenger vehicles would enter or exit the site and during any working hour, up to 22 heavy trucks would enter or exit the site along Dyer Street and Carmel Way. At a distance of 25 feet, these vehicle and truck trips are calculated to produce noise levels of about 61 dBA L_{eq}. Maximum instantaneous noise levels from truck passbys would at times reach 90 dBA L_{max} at 25 feet.

Noise generated during the construction period is anticipated to exceed 60 dBA L_{eq} and the ambient levels by at least 5 dBA L_{eq} at residential receivers to the south and east consistently for a period of approximately six months (consolidation and backfill), and intermittently over the next year to year and a half (subdivision development). The construction of the Project would result in a substantial temporary noise level increase at neighboring noise-sensitive properties.

Mitigation Measure

Noise-1: **Construction Noise Control and Reduction Measures**. To reduce the noise effects of Project construction activities, the following measures shall be implemented:

- Noise-generating activities at the construction site or in areas adjacent to the construction site associated with the Project shall be restricted to the hours of 8:00 AM to 6:00 PM, Monday through Friday, and 9:00 AM to 6:00 PM on Saturdays. No work will be performed on Sundays or holidays. These hours are in compliance with and more restrictive than the Union City Municipal Code requirements.
- In accordance with City of Union City Municipal Code, the construction noise level at the nearest residential property line shall not exceed 86 dBA. Alternatively, no individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible.

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Unnecessary idling of internal combustion engines shall be strictly prohibited.
- Locate stationary noise generating equipment, such as air compressors or portable power generators, as far as feasible from sensitive receptors.
- Construct temporary noise barriers to screen stationary noise generating equipment when located within 100 feet of sensitive land uses.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Route all construction traffic to and from the Project site via designated truck routes where possible. Prohibit construction-related heavy truck traffic in residential areas, where feasible.
- Control noise from construction workers' radios to a point that they are not audible at existing residences near the Project site.
- If approved by OSHA, per requirements of Title 8, Section 1592 of the California Administrative Code, use spotters or flaggers instead of backup beepers to direct the backup operation of mobile equipment.
- Erect temporary plywood noise barriers around the north, east and south sides of Parcel "C" during excavation/consolidation and backfill, as feasible, to shield adjacent uses.
- The contractor shall prepare a detailed construction noise control plan that identifies the schedule for major noise-generating construction activities and specific procedures for reducing noise levels at residential land uses near the site during major noise generating construction activities to minimize noise disturbance. Major noise generating construction activities include work occurring along the north, east and south sides of Parcel "C" during excavation/consolidation and backfill.
- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule. A record of complaints received, determined cause, and responses implemented shall be provided to the City upon request.

Mitigation measure Noise-1 would minimize the occurrences of high instantaneous noise levels, and the temporary noise barrier could reduce noise from excavation and backfill activities on Parcel "C" by an additional 5 to 10 decibels but would not reduce the impact below significance levels. The impact of construction noise would remain ***significant and unavoidable*** as a result of significant increases over ambient noise levels (at least 5 dBA L_{eq}) at nearby residential receivers at levels that could be disruptive of normal residential use (60 dBA L_{eq}) for an extended period of time (i.e., more than one year).

While this impact is considered significant and unavoidable, it can be noted that such an impact could occur with any construction project including excavation and/or of substantial size near residences. The vehicles and equipment proposed are standard construction vehicles and equipment and are not innately noisier than those used in other construction projects. The duration of the excavation/backfill portion of the Project is longer than it could be to allow for excavation to occur in successive cross-sections to minimize the surface area of the exposed debris and therefore minimize the potential for odors. The trade-off for this longer schedule to address odor considerations is the longer duration of construction noise assessed above.

AIRPORTS

*5., 6. The Project is not located near a public or private airport or airstrip and therefore would not result in a substantial adverse effect related to airport noise (**no impact**).*

The Project is not located within an airport land use plan, within two miles of a public use airport, or within the vicinity of a private airstrip. The nearest airports (Hayward Executive Airport, Palo Alto Airport, and San Carlos Airport) are located approximately six to ten miles from the Project site. Oakland International Airport and San Francisco International Airport are located approximately 12 to 16 miles from the project site. The Project site is located well outside the noise contour boundaries developed for each of these airports. While there are occasional aircraft over-flights, aircraft are not a significant contributor to ambient noise levels at the Project site, and daily average noise levels will remain less than 60 dBA and compatible with the proposed residential use, thereby representing ***no impact*** with respect to aircraft noise levels.

CUMULATIVE NOISE IMPACTS

*7. The Project would have a **significant and unavoidable** impact related to cumulative construction-period noise impacts.*

*The Project would have a **less than significant** impact related to cumulative operational noise impacts.*

Impact Noise-2: **Cumulative Construction Noise Impacts**. Noise generated by construction activities associated with the Project would substantially increase noise levels at residential land uses in the vicinity of the Project site during construction activities, which would be a cumulatively considerable impact.

Mitigation Measure Noise-1 would reduce Impact Noise-2 as feasible through implementation of noise control and reduction measures, but would not be able to reduce impacts below significance levels.

The construction of the Project would result in a significant and unavoidable noise impact on residences in the Project vicinity. Although there are no other known substantial construction projects in the immediate vicinity of the Project site, the significant and unavoidable Project impact would be cumulatively considerable and remain ***significant and unavoidable*** as discussed under impact Noise-1 above.

At buildout, the noise levels generated at the proposed residences and off-site improvements would be compatible with nearby existing residential uses and the Project's contribution to cumulative traffic noise level increases would be less than 1 dBA CNEL. This increase in operational noise levels would not be substantial. The cumulative operational noise impact is a ***less than significant***.

12

TRANSPORTATION/TRAFFIC

INTRODUCTION

PURPOSE

This chapter presents the results of the transportation impact study conducted by Fehr and Peers, Inc. for the proposed Project (included as Appendix H). The study was conducted to evaluate impacts of the Project on the surrounding transportation system and to identify measures to mitigate potentially significant impacts.

SETTING

This section describes the existing transportation conditions in the Project study area, including the roadway network and transit, pedestrian, and bicycle facilities in the vicinity of the Project site.

ROADWAY SYSTEM

Access to the Project site is provided by Carmel Way and Westport Way via Union City Boulevard and Dyer Street. Figure 12-1 (page 12-4) shows the roadways in the vicinity and Figure 3-2 (page 3-9) shows the specifics of the streets and lots surrounding the Project site in more detail.

I-880 is a north-south eight-lane freeway between I-80 near the San Francisco/Oakland Bay Bridge and San Jose. Given the location of the Project, it is anticipated that much of the consolidation-related traffic (earth-moving vehicles) would access the site using I-880. Interchanges in the study area include Whipple Road/ Dyer Street, Alvarado-Niles Road, and Fremont Boulevard. The preferred route between I-880 and the Project site is expected to be through the Whipple Road/Dyer Street interchange, using Whipple Road and Union City Boulevard.

Union City Boulevard is a north-south four-lane arterial with a raised center median. Union City Boulevard is a major truck route. It is fronted by a mix of light industrial uses and distribution centers with direct driveway access north of Dyer Street and backed-on single-family residential within the vicinity of the Project site. Union City Boulevard provides bicycle lanes between Alvarado Boulevard and Whipple Road, and provides "Share the Road" signage south of Alvarado Boulevard. The posted speed limit is 45 miles per hour for most of the length of Union City Boulevard, except north of Alvarado Boulevard where the posted speed limit is 35 miles per hour. On-street parking is permitted north of Horner Street, except for commercial vehicles over three tons.

Dyer Street east of Union City Boulevard is a north-south four-lane arterial with a striped center median, except adjacent to the Union Landing Shopping Center, where a raised center median is provided. West of Union City Boulevard, Dyer Street is a collector street and features backed-on single-family residential. The posted speed limit is 35 miles per hour and trucks are prohibited on Dyer Street. Striped bicycle lanes are provided between approximately 600 feet south of Alvarado Boulevard and Whipple Road. On-street parking is permitted south of Alvarado Boulevard.

Whipple Road is an east-west four-lane arterial with a raised center median. Whipple Road features backed-on single-family residential and driveway access for distribution centers within the Project vicinity. The posted speed limit is 40 miles per hour, and on-street parking is permitted, except for

commercial vehicles over three tons. Striped bicycle lanes are provided in both directions of Whipple Road.

Carmel Way is a mostly north-south two-lane residential street with front-on single-family residential within the Project vicinity. There are no posted speed limits, so a 25 mile per hour speed limit is assumed per California Vehicle Code Division 11, Section 22352. Carmel Way accommodates on-street parking on both sides of the street. Carmel Way is the eastern border of the Project site. There are no dedicated bicycle facilities on Carmel Way.

Westport Way is a two-lane east-west residential street within the vicinity of the Project site. There is no posted speed limit, therefore 25 miles per hour has been assumed per *California Vehicle Code Division 11, Section 22352*. Westport Way is wide enough that on-street parking is available to residents. Westport Way serves as the southern border of the Project site and existing single-family homes are located along the south side, facing the Project site across the street. Westport Way is not a through-street. It ends within a block of the intersection with Carmel Way in both directions (via cul-de-sac to the west and gate to the east), without connecting with any other through street.

Roadways further away, including those in the City of Fremont, would have an even lower contribution of Project traffic than those listed above and Project impacts would be negligible on other roadways, which are therefore not further discussed in this analysis.

BICYCLE/PEDESTRIAN NETWORK

The San Francisco Bay Trail is a bicycle/pedestrian trail that rings the San Francisco Bay. There are off-street sections of the trail to the north and south of the saltwater ponds that border the Project to the west. Union City Boulevard between Alvarado Boulevard and Paseo Padre Parkway is designated as a "planned" segment of the San Francisco Bay Trail. No marked bicycle lanes are provided along this segment of Union City Boulevard; bicyclists share the road with automobile traffic, with "Share the Road" signage. The funded Union City Boulevard Class 2 Bike Lanes Gap Closure Project would construct Class 2 bike lanes along this segment of Union City Boulevard from about 600 feet south of Alvarado Boulevard to Fremont City limits to close a two mile gap in the existing Class 2 facilities and would include a two foot wide painted striped buffer between the bike and auto lanes. Pedestrian facilities include sidewalks, crosswalks, and pedestrian signals. Sidewalks are provided on all of the existing roadways in the study area. There are marked crosswalks and pedestrian signal heads at the Union City Boulevard/Dyer Street intersection.

TRANSIT SERVICE

AC Transit

AC Transit provides Transbay service within the Project vicinity. Transbay routes provide commuter service on weekdays between downtown San Francisco and East Bay communities. They typically operate westbound into San Francisco during the morning commute hours and eastbound out of San Francisco during the evening commute hours. Route SB has stops within the Project vicinity on Union City Boulevard at Rose Way and Jean Drive. Route SB operates between 5:30 AM and 8:00 AM during the morning commute and between 4:00 PM and 7:00 PM during the evening commute. Frequency of service is approximately every 20 minutes in the morning and every 30 minutes in the evening. The final bus departs San Francisco at 6:55 PM.

Union City Transit

Union City Transit provides local service exclusively within Union City. Route 1 operates through the Project vicinity along Union City Boulevard, with the nearest stop on Dyer Street at Union City Boulevard. Route 1 provides direct access to the Union City BART station and the Union Landing Shopping Center via Alvarado-Niles Road. Transfers to AC Transit lines 97 and 210 provide

connections to neighboring cities and beyond. Lines 5, 7, and 9 operate along Union City Boulevard and Dyer Street, and provide service to areas to the north, Union City BART, and areas to the south of the Project location via Dyer Street, Union City Boulevard, and Alvarado-Niles Road, respectively.

Union City Transit hours of operation are between 4:30 AM and 9:30 PM on weekdays, 7:00 AM and 7:00 PM on Saturdays, and 8:00 AM and 6:00 PM on Sundays. Service frequency is every 30 minutes during the weekday morning and evening commute hours and hourly during other service periods.

TRAFFIC DATA COLLECTION

Vehicle counts were collected on Wednesday, October 5, 2016 over a 24-hour period. AM peak hour (the hour with the highest traffic volume between 7:00 AM and 9:00 AM), PM peak hour (the hour with the highest traffic volume between 4:00 PM and 6:00 PM), and average daily traffic (ADT) level of service (LOS) were analyzed on study roadways. Vehicle counts were conducted on a weekday while area schools were in normal session in order to capture the typical daily traffic in the area. **Figure 12-1** shows the count locations and the recorded ADT for the following study roadway segments:

1. Whipple Road, west of I-880
2. Union City Boulevard, north of Dyer Street
3. Union City Boulevard, south of Dyer Street
4. Dyer Street, west of Union City Boulevard
5. Dyer Street, east of Union City Boulevard
6. Carmel Way, south of Dyer Street

METHODOLOGY

Alameda County has defined a network of key roadways that carry the majority of the County's traffic. This network, the Congestion Management Plan (CMP) network, was created to monitor roadway performance in relation to established level-of-service (LOS) standards and recommend improvement when LOS is found to be deficient.

The Highway Capacity Manual's (HCM) recommended practice for evaluating urban streets involves calculating free-flow speeds of the roadway and assigning a LOS. Since study roadways are urban streets, average daily traffic (ADT) was used as the operations measure. Because the Project would add very few vehicles to the morning and evening peak hours in relation to existing traffic on congested portions of the roadway system, ADT is sufficient in analyzing potential LOS impacts for this Project and a peak hour analysis was determined not to be warranted.

Table 12-1 presents the volume thresholds for road segment LOS that is applicable for the study roadway network and is used for analysis of the transportation impacts of this Project. For the most part, residential streets have adequate carrying capacity, but residents are concerned about the amount, type, prevailing speed, and generated noise of traffic on the roadways.

EXISTING ROADWAY OPERATIONS

Table 12-2 summarizes the roadway classification and existing road segment LOS (according to **Table 12-1**) for daily and peak hour periods, respectively. Most study roadways currently operate at LOS C or better during daily and both peak hour periods, except northbound Union City Boulevard south of Dyer Street, which operates at LOS D during the PM peak hour. Union City considers LOS A through D as acceptable operation.

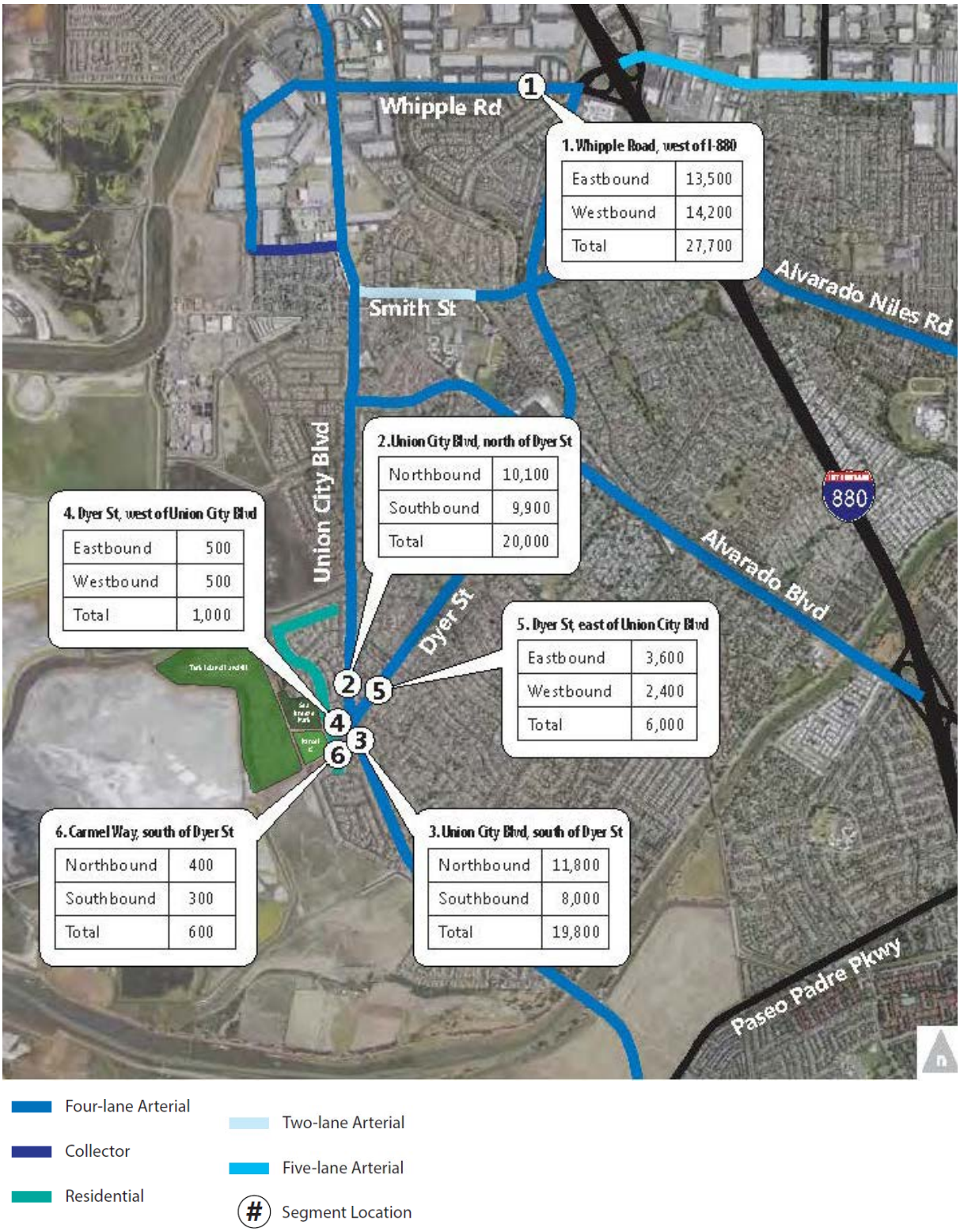


Figure 12-1: Project Vicinity with Existing Traffic Volumes and Count Locations

Source: Fehr and Peers, 2017

TABLE 12-1: LOS DEFINITIONS

Roadway Classification	Number of Lanes	Level-of-Service Capacity Threshold (ADT)					
		A	B	C	D	E	F
Bidirectional Daily Roadway Classifications							
Arterial – Moderate Access Control	4	0 – 21,600	21,600 – 25,200	25,200 – 28,800	28,800 – 32,400	32,400 – 36,000	> 36,000
Collector Street	2	0 – 5,250	5,250 – 6,125	6,125 – 7,000	7,000- 7,875	7,875 – 8,750	> 8,750
Residential Street	2	0 – 3,000	3,000 – 3,500	3,500 – 4,000	4,000 – 4,500	4,500 – 5,000	> 5,000
Peak Hour Directional Roadway Classifications							
Arterial – Moderate Access Control	2	0 – 1,080	1,080 – 1,260	1,260 – 1,440	1,440 – 1,620	1,620 – 1,800	> 1,800
Collector Street	1	0 – 260	260 – 310	310 – 350	350 – 390	390 – 440	> 440
Residential Street	1	0 – 150	150 – 180	180 – 200	200 – 230	230 – 250	> 250

Source: Fehr & Peers, 2017

TABLE 12-2: EXISTING ROADWAY CONDITIONS

Study Roadway Segments	Roadway Classification	Existing Daily Conditions[1]		Existing Peak Conditions[1]				
		ADT	LOS[2]	Peak Hour	NB/EB[3]	LOS[2]	SB/WB[3]	LOS[2]
Whipple Road west of I-880	Arterial – 4 Lanes	27,700	C	AM	630	A	1,410	C
				PM	1,230	B	740	A
Union City Blvd north of Dyer Street	Arterial – 4 Lanes	20,000	A	AM	630	A	1,290	C
				PM	1,360	C	550	A
Union City Blvd south of Dyer Street	Arterial – 4 Lanes	19,800	A	AM	730	A	1,070	A
				PM	1,460	D	590	A
Dyer Street west of Union City Blvd	Collector Street	1,000	A	AM	100	A	20	A
				PM	40	A	50	A
Dyer Street east of Union City Blvd	Arterial – 4 Lanes	6,000	A	AM	230	A	220	A
				PM	550	A	140	A
Carmel Way south of Dyer Street[2]	Residential Street	600	A	AM	60	A	20	A
				PM	30	A	30	A

Notes:
1. Traffic counts collected on October 5, 2016
2. LOS D is acceptable in Union City
3. NB = northbound, EB = eastbound, SB = southbound, WB = westbound

Source: Fehr & Peers, 2017.

CHARACTERIZATION OF PROJECT TRAFFIC

PEAK CONSTRUCTION ACTIVITIES

Trip Generation

Trips generated by the excavation/consolidation activities would mostly remain on-site, as Parcel "C" and the primary Turk Island Landfill are adjacent to each other. The applicant has preliminarily estimated that the transfer of up to 175,000 cubic yards of debris would take approximately 75 days, assuming 10 dump trucks with 12 cubic yards capacity making 20 trips each day. It is assumed heavy machinery used for this process, such as the dump trucks, excavators and bulldozers, would be stored on-site during non-work hours. This analysis conservatively assumes that about 10 dump trucks would travel to and from the site each day to haul debris that cannot be moved by the machinery already on-site.

It is estimated that about 70,000 to 80,000 cubic yard of clean fill would be brought to Parcel "C" to bring it up to grade after excavation and debris transfer. To remain conservative, it is assumed that relatively low-capacity trucks (10 cubic yards) would be used to bring clean fill to the site, requiring approximately 16,000 trips over the backfill period. The applicant has noted that larger capacity trucks are often used, which would lower the number of required trips.

Backfill of Parcel "C" would occur partially concurrently with consolidation and debris transfer, with both activities expected to be completed within an approximately six-month total timeframe. The "peak level of activity" would occur when both processes are occurring concurrently.

Due to the nature of the Project, a significant portion of trips generated would be large and heavy vehicles. A passenger car equivalent (PCE) is used to account for this traffic on study roadways. PCE rates are based on the size and carrying capacity of vehicles. According to the Transportation Research Board's Special Report 223, heavy-vehicles range from 1.5 to 3.7 PCEs. A PCE rate of 3.7 is applied for earth-moving vehicles, dump trucks, and haulers for this study to be conservative. Although the Project would use trucks of different sizes and about half of the trucks would be empty, which would have lower PCE, this analysis assumes the higher PCE because this rate generates more construction trips and represents worst-case traffic conditions.

Table 12-3 shows the estimated daily and peak hour trips to and from the site, which is expected to occur when the debris transfer and backfill activities coincide. The daily trip generation is based on the following assumptions:

- 20 workers or visitors would travel to and from the site each day, including heavy machinery operators, supervisors, and support staff.
- 10 trucks would travel to and from the site each day to haul debris that cannot be moved by machinery already on-site.
- 100 trucks would travel to and from the site each day to bring in clean fill.

TABLE 12-3: VEHICLE TRIP GENERATION, PEAK CONSTRUCTION ACTIVITIES

Vehicle	Daily Vehicle Trips			Peak Hour PCE Trips				
	Vehicle Trips	PCE Rate	PCE Trips	AM		PM		Max. Peak Hour Total
				In	Out	In	Out	
Estimated Passenger Vehicles (Employees) [1]	40	1.0	40	20	0	0	20	40
Debris Removal Vehicles (Transfer Activities) [2,4]	20	3.7	74	4	3	4	3	7
Earth-Moving Vehicles (Fill Activities) [3, 4]	200	3.7	740	37	37	37	37	74
Total	*260*	--	***854***	***61***	***40***	***61***	***40***	***101***

Notes:

1. Passenger vehicle trips account for 20 workers' access to and from the site. To remain conservative, it is assumed worker trips to and from the site would occur during the peak hours.
2. Daily debris removal vehicle trips accounts for dump trucks' access to and from the site.
3. It is assumed the approximate 16,000 clean fill trips would occur over approximately the last four-months of the six-month Debris Removal period, with five-day work weeks.
4. Debris removal and earth-moving vehicles during the peak hours are estimated by assuming that the daily trips would be equally distributed over the ten-hour work day.

Source: Fehr & Peers, 2017.

As shown in **Table 12-3**, the peak level of activity results in 854 PCE daily trips, including 101 PCE peak hour trips, that would be added to the study roadway network.

After backfill of Parcel "C" is complete, the applicant proposes to build single-family residential units on Parcel "C". Off-site traffic during this construction period would not be substantial and would be considerably less than during the peak construction activity.

Trip Distribution

There are two routes by which heavy vehicles could travel to and from the Project site during the consolidation and fill processes:

1. Union City Boulevard/Whipple Road/I-880 (Northbound)
2. Union City Boulevard/Ardenwood Boulevard/SR 84

Figure 12-2 shows the specific truck routes. It has not been determined where the clean fill would come from, therefore the truck route for the Project have not been determined, so both routes are analyzed. Both routes are designated truck routes within Union City and Fremont.

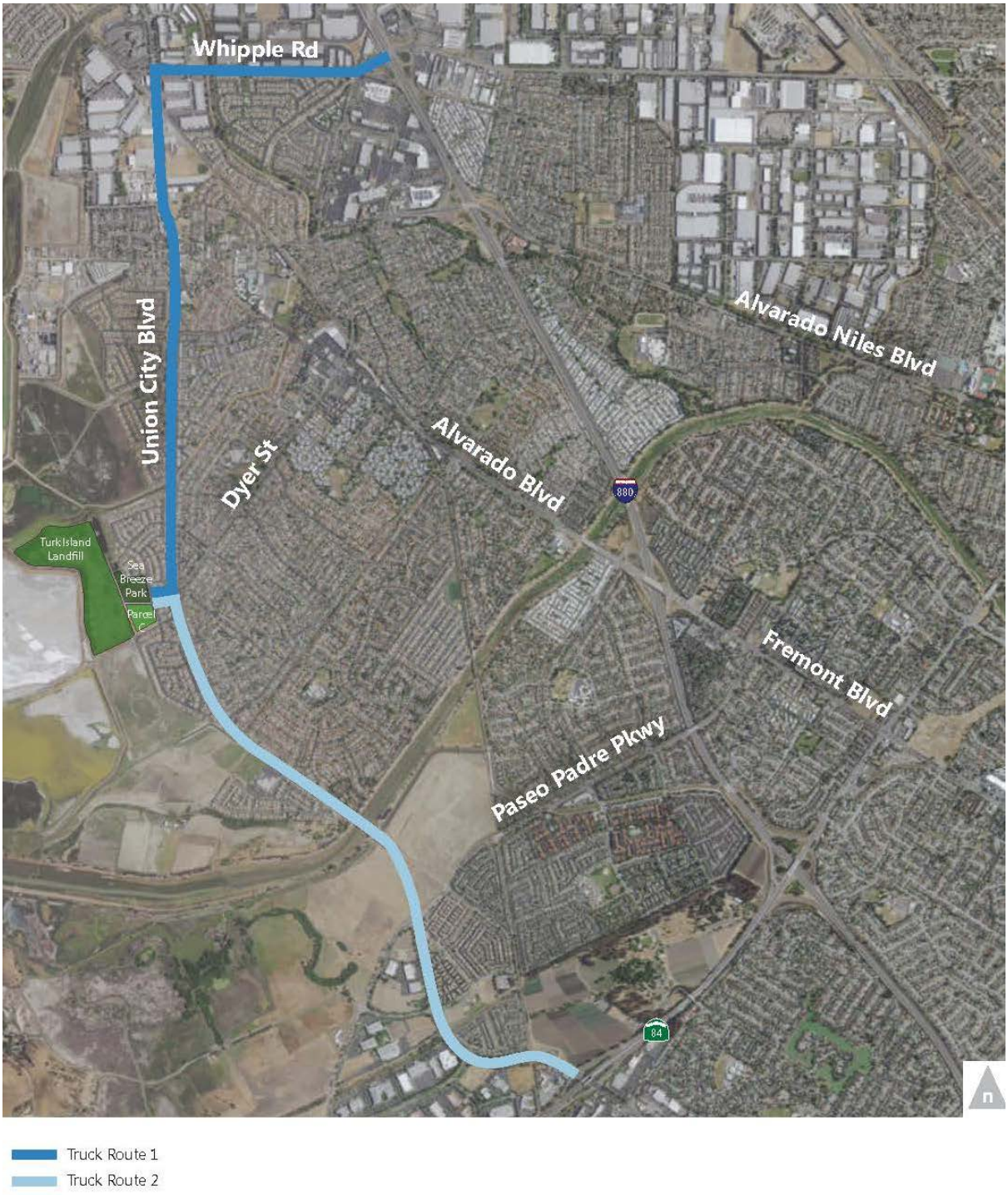


Figure 12-2: Potential Truck Routes

Source: Fehr and Peers

It is assumed staging would occur mostly on Parcel "C" and the vacant area to the west of the Sea Breeze Park parking lot (on-site) would be used for construction parking. Earth-moving vehicles, as well as debris transfer dump trucks, would largely access the site from this area as well. Some limited activity is expected to occur on Carmel Way between the staging area and Westport Way and between Westport Way and Carmel Way.

The majority of the workers traveling to and from the site are expected to use a combination of Union City Boulevard and Dyer Street. It is assumed that approximately one-third would access the site from Union City Boulevard from the north, one-third would use Union City Boulevard from the south, and one-third would use Dyer Street from the east. Workers are likely to use the opposite route departing the site.

RESIDENTIAL OPERATION

Trip Generation

Following construction of the residential units, the residential development would generate 315 daily, 25 AM peak hour, and 33 PM peak hour vehicle trips, as summarized in **Table 12-4**.

TABLE 12-4: VEHICLE TRIP GENERATION, RESIDENTIAL OPERATION

Land Use	Size	Unit	Daily Trips	AM Peak Hour Trips[1]			PM Peak Hour Trips[1]		
				Total	In	Out	Total	In	Out
Single-Family Residential	33	DU[2]	315	25	6	19	33	21	12

Notes:
[1] ITE Trip Generation (9th Edition) land use category 210 (Single-Family Detached Housing - Adj. Streets, 7-9 AM, 4-6 PM):
Daily: T = 9.52*(X)
AM Peak Hour: T = 0.75*(X) (25% in, 75% out)
PM Peak Hour: T = 1.00*(X) (26% in, 74% out)
Where X is the number of dwelling units
[2] DU = Dwelling Units

Source: Fehr & Peers, 2017.

Trip Distribution

Residents of the Parcel "C" development are expected to follow the trip distribution pattern of the existing surrounding neighborhoods. Project generated trips would occur along Carmel Way and either turn left on Union City Boulevard, continue straight onto Dyer Street, or turn right onto Union City Boulevard from Rose Way.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Project impacts to the adjoining transportation network would be significant if the Project were to result in any of the following:

1. An increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestions at intersections)

2. Exceedance, either individually or cumulatively, of a level of service standard established by the county congestion management agency for designated roads or highways;
3. A substantial increase in hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
4. Inadequate emergency access;
5. A conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks);
6. If the project would result in transportation/traffic impacts that are individually limited, but cumulatively considerable (i.e., the incremental effects of the project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).

ROADWAY AND INTERSECTION OPERATIONS

*1., 2. The Project would have a **less than significant** impact related to increased traffic, and level of service standards.*

Peak Construction Activities

Roadway Operations

During peak construction activities (when consolidation and backfilling are occurring concurrently), up to 854 daily, including up to 101 peak hour, PCE vehicle trips would be added to study roadways. The large majority of this traffic would be on Union City Boulevard, Dyer Street, and Carmel Way. **Tables 12-5** and **12-6** summarize the percent increase in vehicles and the level of service on study roadway segments for daily and peak hour trips respectively.

TABLE 12-5: DAILY ROADWAY CONDITIONS, PEAK CONSTRUCTION ACTIVITIES

Study Roadway Segments	Existing		Existing Plus Project					
			Route 1			Route 2		
	ADT	LOS	ADT	%[2]	LOS	ADT	%	LOS
Whipple Road west of I-880	27,700	C	28,470	3%	C	27,720	<1%	C
Union City Boulevard north of Dyer Street	20,000	A	20,790	4%	A	20,030	<1%	A
Union City Boulevard south of Dyer Street	19,800	A	19,830	<1%	A	20,590	4%	A
Dyer Street west of Union City Boulevard	1,000	A	1,850	85%	A	1,850	85%	A
Dyer Street east of Union City Boulevard	6,000	A	6,030	<1%	A	6,030	<1%	A
Carmel Way south of Dyer Street[1]	600	A	1,450	142%	A	1,450	142%	A

Notes:
1. PCE = passenger car equivalent vehicle addition
2. Percent increase in ADT.

Source: Fehr & Peers, 2017.

TABLE 12-6: PEAK HOUR ROADWAY CONDITIONS, PEAK CONSTRUCTION ACTIVITIES

Study Roadway Segments	Peak Hour	Existing				Existing Plus Project											
						Route 1						Route 2					
		NB/EB[1]	LOS	SB/WB[1]	LOS	NB/EB[1]	%[2]	LOS	SB/WB[1]	%[2]	LOS	NB/EB[1]	%[2]	LOS	SB/WB[1]	%[2]	LOS
Whipple Road west of I-880	AM	630	A	1,410	C	667	6%	A	1,465	4%	D[3]	631	<1%	A	1,411	<1%	C
	PM	1,230	B	740	A	1,285	4%	C[3]	777	5%	A	1,231	<1%	B	741	<1%	A
Union City Blvd north of Dyer Street	AM	630	A	1,290	C	667	6%	A	1,345	4%	C	632	<1%	A	1,293	<1%	C
	PM	1,360	C	550	A	1,415	4%	C	587	7%	A	1,363	<1%	C	552	<1%	A
Union City Blvd south of Dyer Street	AM	730	A	1,070	A	733	0%	A	1,072	<1%	A	785	8%	A	1,107	3%	A
	PM	1,460	D	590	A	1,462	0%	D	593	<1%	A	1,497	3%	D	645	9%	A
Dyer Street west of Union City Blvd	AM	100	A	20	A	141	41%	A	81	305%	A	141	41%	A	81	305%	A
	PM	40	A	50	A	101	153%	A	91	82%	A	101	153%	A	91	82%	A
Dyer Street east of Union City Blvd	AM	230	A	220	A	232	1%	A	222	<1%	A	232	<1%	A	222	<1%	A
	PM	550	A	140	A	552	0%	A	142	1%	A	552	<1%	A	142	1%	A
Carmel Way south of Dyer Street[2\]	AM	60	A	20	A	102	70%	A	61	205%	A	102	70%	A	61	205%	A
	PM	30	A	30	A	71	137%	A	72	140%	A	71	137%	A	72	140%	A

Notes:
1. NB = northbound, EB = eastbound, SB = southbound, WB = westbound
2. Percent increase in directional peak hour trips.
3. Grey cells indicate a change in LOS from Existing.

Source: Fehr & Peers, 2017.

Traffic on those study roadways farther removed from the Project site (Whipple Road, Union City Boulevard, and Dyer Street east of Union City Boulevard) would increase by 7 percent or less during peak construction activities.

Greater relative changes in traffic are expected to occur on the residential streets surrounding the Project, particularly Dyer Street from Union City Boulevard to Carmel Way and Carmel Way from Dyer Street to Westport Way. However, the greater relative increase is largely due to the lower volume of these roadways, which will continue to operate with acceptable service levels (LOS A).

LOS for daily and peak hour traffic will remain within that considered acceptable (LOS A through D) on all study roadways and Project traffic would therefore not cause a significant impact on study roadway segments (***less than significant***).

Intersection Operations

During peak construction activities, up to 854 daily, including 101 peak hour, PCE vehicle trips would be added to study roadways. The large majority of this traffic would be on one of two routes, shown on **Figure 12-2**. The following turn movements would be affected most depended on the route used:

Route 1: Dyer Street onto Union City Boulevard, Whipple Road onto Union City Boulevard

Route 2: Union City Boulevard onto Dyer Street, Ardenwood Boulevard onto Union City Boulevard

The addition of Project trips to the surrounding roadway would slightly increase traffic volumes at intersections surrounding the Project site.[1] Traffic generated during peak construction activities would result in most study roadway segments continuing to operate at the same LOS as under Existing conditions during daily operation as well as both AM and PM peak hours. Most study segments would operate at LOS A or LOS B during both AM and PM peak hour, meaning that they would experience little delay. A few segments, such as Whipple Road west of I-880 during the AM peak hour or Union City Boulevard south of Dyer Street during the PM peak hour, would operate at LOS C or LOS D, meaning that they would experience some delay. However, peak construction activities would increase the hourly traffic volume by less than five percent on these delayed roadway segments. Typically, peak hour traffic volumes have a five to ten percent fluctuation on a day-to-day basis. Thus, while some segments operate at levels considered unacceptable, the Project increase in traffic volumes on these roadway segments would not be noticeable above background without-Project conditions, which would not be "substantial in relation to the existing traffic load and capacity of the street system" and would therefore not cause a significant impact at the adjacent major intersections.

Residential Operation

Roadway Operations

After build-out, when residents are living in the proposed homes, 315 daily vehicle trips will be added to study roadways from the residential homes, including 25 in the AM peak hour, and 33 in the PM peak hour. The majority of these trips would be on Union City Boulevard, Dyer Street, Carmel Way, and Westport Way within the immediate study area. **Tables 12-7** and **12-8** summarize the percentage

[1] As noted in the Setting discussion, the low contribution of Project traffic on roadways further away, including those in the City of Fremont, would have a negligible effect on other roadways, which are not further analyzed.

increase in vehicles and level of service on study roadway segments for daily and peak hour trips respectively.

Traffic on those study roadways farther removed from the Project site (Whipple Road, Union City Boulevard, and Dyer Street east of Union City Boulevard) are not expected to increase by more than 5% due to operation of the proposed residential homes. While residential streets surrounding the Project, particularly Dyer Street from Union City Boulevard to Carmel Way and Carmel Way from Dyer Street to Westport Way, would experience greater relative percent increases, these roadways would continue to carry relatively low volumes of vehicles and operate under LOS A conditions.

TABLE 12-7: DAILY ROADWAY CONDITIONS, RESIDENTIAL OPERATION

Study Roadway Segments	Existing		Existing Plus Project		
	ADT	LOS	ADT	%[1]	LOS
Whipple Road west of I-880	27,700	C	27,730	<1%	C
Union City Boulevard north of Dyer Street	20,000	A	20,110	1%	A
Union City Boulevard south of Dyer Street	19,800	A	19,915	1%	A
Dyer Street west of Union City Boulevard	1,000	A	1,210	21%	A
Dyer Street east of Union City Boulevard	6,000	A	6,110	2%	A
Carmel Way south of Dyer Street[1]	600	A	810	35%	A

Notes:
1. Percent increase in ADT.

Source: Fehr & Peers, 2017.

TABLE 12-8: PEAK HOUR ROADWAY CONDITIONS, RESIDENTIAL OPERATION

Study Roadway Segments	Peak Hour	Existing				Existing Plus Project					
		NB/EB[1]	LOS	SB/WB[1]	LOS	NB/EB[1]	%[2]	LOS	SB/WB[1]	%[2]	LOS
Whipple Road west of I-880	AM	630	A	1,410	C	676	<1%	A	1,456	<1%	D[3]
	PM	1,230	B	740	A	1,294	<1%	C[3]	804	<1%	A
Union City Blvd north of Dyer Street	AM	630	A	1,290	C	677	<1%	A	1,337	<1%	C
	PM	1,360	C	550	A	1,425	<1%	C	615	1%	A
Union City Blvd south of Dyer Street	AM	730	A	1,070	A	733	<1%	A	1,073	<1%	A
	PM	1,460	D	590	A	1,462	<1%	D	592	<1%	A
Dyer Street west of Union City Blvd	AM	100	A	20	A	151	12%	A	71	25%	A
	PM	40	A	50	A	111	20%	A	121	28%	A
Dyer Street east of Union City Blvd	AM	230	A	220	A	232	3%	A	222	<1%	A
	PM	550	A	140	A	552	<1%	A	142	5%	A
Carmel Way south of Dyer Street	AM	60	A	20	A	112	20%	A	72	25%	A
	PM	30	A	30	A	81	27%	A	81	47%	A

Notes:
1. NB = northbound, EB = eastbound, SB = southbound, WB = westbound
2. Percent increase in directional peak hour trips.
3. Grey cells indicate a change in LOS from Existing.

Source: Fehr & Peers, 2017.

As shown in **Table 12-8**, one roadway segment (Whipple Road west of I-880) would experience a reduction in peak hour LOS during the westbound AM and eastbound PM peak hours. This is due largely to background traffic conditions, which are near the LOS threshold (see **Table 12-1**). The Project adds a very small amount (less than 1%) of traffic to these roadways. While the peak hour LOS would be reduced on one segment, daily and peak hour roadway LOS of all study roadway segments would remain within acceptable service levels with the addition of Project-generated traffic from residential operations and the impact related to operational residential traffic would be ***less than significant***.

Intersection Operations

The addition of Project trips to the surrounding roadway would slightly increase traffic volumes at intersections surrounding the Project site. As shown in the discussion of roadway conditions above, traffic generated during both construction and operation of the Project would result in most study roadway segments to continue to operate at the same LOS as under Existing conditions during both AM and PM peak hours. Most study segments would operate at LOS A or LOS B during both AM and PM peak hour, meaning that they would experience little delay. A few segments, such as Whipple Road west of I-880 during the AM peak hour or Union City Boulevard south of Dyer Street during the PM peak hour, would operate at LOS C or LOS D, meaning that they would experience some delay. However, construction of the Project would increase the hourly traffic volume by less than five percent and operations would increase the hourly traffic volume by less than one percent on these roadway segment. Typically, peak hour traffic volumes have a five to ten percent fluctuation on a day-to-day basis. Thus, the expected increase in traffic volumes on these roadway segments would

not be noticeable above background fluctuations with or without the Project and would not be high enough volume to be considered "substantial in relation to the existing traffic load and capacity of the street system" or to have the potential to cause a significant impact at the adjacent major intersections (***less than significant)***.

SITE DESIGN HAZARDS AND EMERGENCY ACCESS

3., 4. *The Project would result in a potentially **significant** contribution to roadway damage and related potential hazards due to truck traffic during construction activities, which can be mitigated to a less than significant level through implementation of identified measures*

*The Project would not result in a substantial adverse effect related to hazards due to a design feature or inadequate emergency access (**less than significant**).*

Construction Activities

While excavation/consolidation activities will occur mostly within the boundaries of the Project site, trucks will be used to transport clean fill dirt to the site for backfilling of Parcel "C". The weight of such vehicles, particularly when loaded with fill, has the potential to result in roadway damage on public streets.

Impact Traf-1: **Roadway Damage.** Repetitive heavy-vehicle presence on roadways may cause cracking, deterioration, rutting, and ultimately failure of roadway pavement, which can create hazards for motorists and bicyclists.

Mitigation Measure Traf-1: **Pavement Analysis or Documentation**. Before backfilling of Parcel "C" begins, in coordination with the City, the applicant shall:

1. Identify Truck Routes – Identify the truck routes for the Project. Truck routes shall be one of the routes discussed in this section consisting of roadways between the Project site and nearby freeways and other streets in the vicinity of the Project that would likely be used by heavy trucks.
2. Conduct Baseline Pavement Conditions Surveys – Before the start of Project construction, conduct a survey to document the pavement conditions along the approved truck routes.
3. Conduct Post-Project Pavement Conditions Surveys – Using the same methodologies used in the baseline surveys, document the pavement conditions along the approved truck routes after completion of the Project.
4. Repair Damaged Pavement Sections – Compare the baseline and the post-Project pavement conditions surveys to identify the damaged pavement sections. The Project applicant shall be responsible for repairing the damaged sections caused by the Project and ensuring that the damaged streets would be restored to their condition prior to the Project and subject to City oversight.

Implementation of Mitigation Measure **Traf-1** will mitigate the impact related to damaged roadway hazards to a level of ***less than significant*** through requirements for pavement condition surveys and repair.

Residential Operation

Vehicular access to the Project site will be provided along Westport Way, which connects to Dyer Street and Union City Boulevard via Carmel Way. Access within the site will be provided by a

residential street that will loop from the end of Westport Way through the middle of the site to connect back up with Westport Way. This circulation system is considered adequate access for vehicles including emergency access and would not otherwise create hazards (***less than significant***).

Parking will be provided per City requirements. Each unit would provide two garage spaces, as well as two driveway parking spaces. Additionally, parking lanes along the internal street and Project frontages on Westport Way and Carmel Way could accommodate approximately 68 parked vehicles. While parking is not directly related to a CEQA impact or threshold, the Project proposes parking considered adequate to meet generated demand and would not result in parking deficiencies or indirect parking-related environmental impacts.

ALTERNATIVE TRANSPORTATION

5. *The Project would not conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks) (***no impact***).*

Transit Access

AC Transit and Union City Transit have transit stops approximately one-quarter to one-half mile east of the Project site on Union City Boulevard. A bus pullout and pad are in place directly east of the Project on Union City Boulevard. None of the bus stops provide amenities such as a bench or shelter. Transit access is considered adequate for the Project and would not conflict with adopted policies, plans or programs supporting transit (***no impact***).

Bicycle and Pedestrian Access

Bicycle access to the east and within the proposed residential development is limited to sharing the road right-of-way with vehicular traffic. Due to the low speeds of the surrounding residential streets, this is adequate for the Project needs and would not conflict with adopted policies, plans or programs supporting pedestrian and bicycle access. An off-street trail additionally provides a direct connection to Sea Breeze Park through the Project site (***no impact***).

CUMULATIVE TRAFFIC IMPACTS

6. *The Project would have a* ***less than significant*** *impact related to contribution to cumulative traffic.*

As discussed in this chapter, roadways in the study area operate within design capacity and operational levels considered acceptable and will continue to do so during both the temporary peak construction activities and post-construction residential operations. There are other known projects planned in the immediate vicinity of the Project site, such as the 500 unit Patterson Ranch Project south of the project site in the City of Fremont, which would increase the volume of traffic in the area under cumulative conditions. However, there is a low volume of traffic generated by the Project (25 AM peak hour trips and 33 PM peak hour trips), which contributes less than 5% to congested roadways under exiting conditions. With increases in background traffic under cumulative conditions, the percent contribution of Project traffic would only go down, and the Project trips would not be "substantial in relation to the existing traffic load and capacity of the street system" and would not have the potential to contribute a cumulatively considerable amount of traffic to congested roadways under the cumulative condition (***less than significant***).

13

UTILITIES AND SERVICE SYSTEMS

INTRODUCTION

This chapter describes existing public utilities on and in the vicinity of the Project and evaluates the impact of the proposed Project on the provision of public utilities and possible adverse physical impacts to the environment that could result from constructing expanded facilities.

SETTING

WATER SUPPLY

Alameda County Water District [1]

Water is provided in Union City by the Alameda County Water District (ACWD), which supplies water to a population of over 348,000 in Union City as well as Fremont and Newark. The ACWD supplies water to the Tri-City area from three primary sources: the State Water Project via the South Bay Aqueduct, San Francisco's Regional Water System from the Hetch-Hetchy Aqueduct, and local supplies including fresh and desalinated groundwater and surface water from the Del Valle Reservoir.

ACWD operates two surface water treatment plants that treat State Water Project supplies and local surface water from Del Valle Reservoir. The Newark Desalination Facility treats brackish groundwater, and the Blending Facility blends high quality water from San Francisco's Regional Water System with local fresh groundwater (with higher hardness) to provide a blended supply with lower overall hardness.

During Fiscal Year 2015 – 2016, the average daily water consumption within the ACWD service area was 32.39 million gallons per day (down from 43.47 million gallons per day in Fiscal Year 2012 – 2013). Residential demand accounted for approximately 59 percent of the total water demand within the ACWD service area with a residential per capita use of 55 gallons per capita per day.

There are 12 reservoirs or storage tanks in the ACWD system totaling 85,160,000 million gallons of storage capacity. The Patterson Reservoir (14,400,000 gallons), the Decoto Reservoir (14,800,000 gallons) and the Appian Way Tank (780,000 gallons) are nearest to Union City. The ACWD maintains four water treatment facilities: the Mission San Jose Water Treatment Plant (capacity = 4,000,000 gallons per day); Water Treatment Plant #2 (capacity = 22,000,000 gallons per day), the Newark Desalination Facility (capacity 12,500,000 gallons per day); and the Blending Facility (capacity = 48,000,000 gallons per day).

[1] Information under this header is from: Bay Area Water Supply & Conservation Agency, Alameda County Water District Agency Profile (available at http://bawsca.org/members/profiles/alameda).

Urban Water Management Plan[2]

The ACWD is required by State law to prepare an Urban Water Management Plan (UWMP) to identify existing and projected water supply sources, develop demand projections for its approximately 100-square-mile service area, and identify strategies for ensuring that long-term water supplies are sufficient to meet demand under all future demand conditions, including during single- and multiple-year droughts. The UWMP must be updated every five years. The normal UWMP submittal cycle requires that the plans be prepared and submitted in December of years ending in five and zero.

The District's water supply planning is coordinated with other agencies throughout the San Francisco Bay Area. For example, it has participated with a large group of stakeholders including resource agencies, local governments, and environmental groups in developing a Bay Area Integrated Regional Water Management Plan (Bay Area IRWMP), last updated in 2013. The ACWD also participates in regional Alameda Creek watershed planning efforts.

At the time of preparation of the latest UWMP, California was in the fifth year of a prolonged drought. The State had previously passed the Water Conservation Bill of 2009 (SBX7-7), which requires a Statewide 20-percent reduction in urban per capita water use by 2020. It requires that retail urban water suppliers determine baseline water use and set reduction targets according to specified requirements, and requires agricultural water suppliers to prepare plans and implement efficient water management practices. In further response to the drought, in July 2014 the State Water Resources Control Board (SWRCB) replaced the Statewide reduction target with agency-specific goals based on each agency's average previous residential consumption. The reduction target assigned to ACWD is 16 percent from its baseline use established during select months of 2013.

As the drought persisted, the Governor issued Executive Order B-29-15 on April 1, 2015 that mandated a Statewide reduction in water use of 25 percent from 2013 levels. ACWD has been able to exceed each of the mandated reductions, lowering district-wide consumption in fiscal year (FY) 2014-2015 to 73 percent of the demand in FY2012-2013.

The currently adopted UWMP reported that the total long-term average annual available water supply was estimated to be 73,500 acre-feet[3] per year (AFY) of combined imported and local water supplies. Factoring in implementation of multi-faceted strategies identified in an Integrated Resources Plan (IRP), water demand in ACWD service area was projected to be 62,900 AFY in 2020, when available supply was projected to be 77,200 AFY, leaving excess capacity of 14,300 AFY. By 2040 excess capacity is still projected, though it would be reduced to 6,200 AFY, with demand of 69,800 AFY being met by a supply of 76,000 AFY.

The District's projections for a sustained drought comparable to the most severe five-year drought on record (1987-1991), based on records dating to 1922, indicate that ACWD will have sufficient supplies to withstand a similar long-term drought through 2020, when supply would balance demand. However, during the multi-year design drought, by 2022 demand could exceed supply by 2,900 AFY.

Although District policy is to sustain a shortage of no more than 10 percent during dry and critically dry conditions, it recognizes that severe conditions, such as an earthquake, could result in interruptions to either imported or local water supplies that could result in significantly greater shortages. In such a case, the District would declare a water shortage emergency and enact its Water Shortage Contingency Plan (WSCP) at the appropriate level to address the shortfall. The WSCP is

[2] Information under this header, unless otherwise noted, is from: Alameda County Water District, *Urban Water Management Plan 2015–2020*, June 9, 2016.

[3] An acre-foot is the amount of water necessary to cover 1 acre of land to a depth of 1 foot, and is equivalent to 325,851.43 gallons, or 43,560 cubic feet.

designed to replace the water supply shortage up to a 50-percent shortage. Strategies in the WSCP include drawing on its Semitropic Groundwater Banking System, which currently has over 107,000 AF in storage, and imposing mandatory demand reduction measures, among other strategies. The District would also look to secure additional supplies through purchase of water from a California Department of Water Resources drought bank or similar water purchase/transfer program.

WASTEWATER COLLECTION AND TREATMENT

In Union City, Union Sanitary District (USD) provides wastewater collection and treatment services. USD also serves the cities of Fremont and Newark, with a service area of approximately 60.2 square miles. It maintains 811 miles of pipeline serving a population of approximately 347,000 with 111,579 total connections. In 2015, USD treated an average 21.85 million gallons per day.[4]

Two USD sanitary sewer force mains run through the Project site in a 30-foot wide easement along the western boundary of Parcel "C", adjacent to the Turk Island Landfill proper. These force mains convey wastewater from south Fremont and Newark to the Alvarado Treatment Plant in Union City. The easement and forcemains will remain with development of the Project and is proposed as landscaping and pedestrian access between Westport Way and Sea Breeze Park.

STORM DRAINAGE

The existing Project site consists of closed landfills capped with clay soils that likely provide very little infiltration. Storm water runoff from the Project site drains toward Alameda County Flood Control District channel J-3 to the north; toward a residential stormwater pond, Sea Breeze Park, and Carmel Way to the east; toward Westport Way and an unnamed access road to the south; and toward a shallow channel to the west. Storm drain systems exist in Carmel Way and Westport Way that convey storm flows away from the site.

SOLID WASTE

Solid waste collection and disposal services are provided in Union City by Republic Services (formerly Allied Waste Services) of Alameda County. Tri-CED Community Recycling provides recycling and food/yard waste composting services through joint operating agreements with Republic Services. Waste collected in Union City is brought to the Fremont Recycling and Transfer Station, , located on Boyce Road between Stevenson Road and Auto Mall Parkway in Fremont.[5] There the waste is sorted to remove hazardous waste, reloaded into large-capacity transfer trucks, and transported to the Altamont Landfill, located adjacent to Interstate 580, east of the City of Livermore. Altamont Landfill is permitted for a total refuse capacity of 124,400,000 cubic yards (approximately 14,880,000 tons), with a daily permitted throughput of 11,150 tons/day. As of December 31, 2014, the landfill had 65,400,000 cubic yards of remaining capacity.[6]

The Project would be required to comply with the City's Construction and Demolition Debris (C&DD) Ordinance—which requires the recycling of at least 50 percent of construction and demolition debris generated by a Project and 100 percent of all cement, concrete, asphalt concrete, non-contaminated soils, land-clearing debris, and plant debris. These requirements apply to residential construction and not consolidation activities, which deals with existing landfill debris.

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[4] Union Sanitary District website https://www.unionsanitary.com/about-us, accessed 2/5/09.

[5] Union City website, http://www.ci.union-city.ca.us/departments/going-green/community/garbage-and-recycling.

[6] CalRecycle (formerly California Integrated Waste Management Board), Solid Waste Information System Facility/Site Database, accessed August 22, 2017 at: http://www.calrecycle.ca.gov/SWFacilities/Directory/01-AA-0009/Detail/.

GAS AND ELECTRIC SERVICE

Natural gas and electricity are currently provided within Union City by the Pacific Gas and Electric Company (PG&E). However, in cooperation with PG&E, Alameda County is in the process of rolling out a Community Choice Aggregation (CCA) program, which enables electricity users located in participating Alameda County cities and unincorporated areas, including Union City, to have access to electricity supplies procured or generated by the CCA. The electricity will continue to be distributed and delivered over the electricity infrastructure system owned and managed by PG&E.[7]

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if it were to result in the following:

1. Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?
2. Would the project require substantial expansion or alteration of the City's water or wastewater treatment and collection facilities, the construction of which could cause significant environmental effects?
3. Would the project 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?
4. Would there be insufficient water supplies available to serve the project from existing entitlements and resources?
5. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?
6. Would the project be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?
7. Would the project fail to comply with federal, state, and local statutes and regulations related to solid waste?
8. Would the Project require or result in the construction of gas or electricity generation facilities, the construction of which could cause significant environmental effects?

WATER SUPPLY

2., 4. The Project is consistent with site development assumptions and therefore consistent with the adopted Urban Water Management Plan and would have a ***less than significant*** *impact related to increased water demand.*

Development of the Project site as proposed would result in an increase in demand for water relative to that associated with the existing uses at the site. Construction and occupancy of 33 residential units would require water supplied by the ACWD. At an average use rate of 55 gallons per capita per day (for both interior and exterior use), residents could be expected to use a total of 6,325 gallons of water

[7] https://www.acgov.org/cda/planning/cca/

on an average day. Project demand for water would represent a fraction of a percent of the average daily water consumption within the ACWD service area (32.39 million gallons per day).

Based on ACWD's adopted Urban Water Management Plan, there would be sufficient water supplies to continue serving the needs of Union City with development of the proposed 33 homes. ACWD takes into account existing and projected future land use conditions as identified in the Union City General Plan when making water demand projections for purposes of planning future water supply. The proposed Project is consistent with development designations and densities for the site. Therefore, water demand from the site has been factored into ACWD's water demand projections and the adopted Urban Water Management Plan.

The temporary consumption of water for dust suppression, soil conditioning, washing of equipment, etc. during Project construction would be short-term and would be a minute fraction of the daily water consumption in the area. This short-term water demand would be less than the Project's long-term annual operational demand and would not adversely affect the water supply or require new entitlements.

Based on ACWD's adopted Urban Water Management Plan, there would be sufficient water supplies to continue serving the needs or the Project and Project impacts related to increased water supply would be ***less than significant***.

WASTEWATER COLLECTION AND TREATMENT

*1., 2., 5. The Project would have a **less than significant** impact related to increased wastewater.*

*The substantial truck traffic during consolidation activities could potentially damage the on-site force mains located between Parcel "C" and the primary Turk Island Landfill, which could result in release of wastewater and disruption of service. This potentially **significant impact** can be mitigated to a less than significant level through protection of the force mains.*

Increased Wastewater Generation

As the site is currently undeveloped and not contributing to the wastewater system, development of the Project as proposed would result in the generation of additional wastewater volume to the USD system. USD will be able to provide sanitary sewer service to the proposed 33 residential units on Parcel "C" through connection to the existing 8-inch sanitary sewer lines in Westport Way and Carmel Way. There is substantial excess capacity at the Alvarado Wastewater Treatment Plant, and no potential for the incremental increase in wastewater treatment demand that would be generated by the Project to exceed existing treatment capacity or require the construction of new or expanded treatment facilities. Project-related effects associated with wastewater collection and treatment would be considered ***less than significant***. Capacity fees would be collected once the residential units proposed at the Project site are connected to the USD system. These fees pay for a share of capacity in the existing treatment plant and the sanitary sewer lines, including upsizing, if needed.

On-Site Infrastructure

Impact Utilities-1: Potential Damage to Force Mains. The transport of 175,000 cubic yards of material in heavy vehicles over and across the on-site force mains could cause pipe movement/pipe joint separation resulting in the release of raw sewage and interruption of sewer service on a regional level. This represents a ***potentially significant*** impact.

The on-site USD force mains carry raw sewage and are considered a critical component of the sanitary sewer system. The force mains are made up of single-gasket concrete pipes that were

installed in the late 1970s in underlying native soil that may not be able to support construction traffic and heavy grading without resulting in pipe movement.

Mitigation Measure Haz-2f will reduce this impact to a less than significant level by requiring an evaluation of the potential for damage to the existing force mains and provisions to protect against such damage.

Implementation of Mitigation Measure Haz-2f would reduce potential impacts related to potential damage to existing on-site infrastructure to a ***less-than-significant*** level.

STORM DRAINAGE

*3. The Project would be required under existing regulations to address changes in stormwater volumes on-site and will not have the potential to require or result in the construction of new off-site storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (**less than significant**).*

Under current conditions, stormwater runoff from the Parcel "C" site infiltrates into soils or flows into adjacent drainages. The Project will increase the impervious area of Parcel "C" in the form of roofs, driveways, and roadways and therefore has the potential to increase stormwater discharges from Parcel "C" which would be collected and routed to the existing Union City storm drain system adjacent to the parcel on Carmel Way. Bio-retention areas would be placed in roadway bulb-outs, in portions of the landscaped strip on the western edge of the site, and on residential lots to promote infiltration of stormwater runoff and detain peak flows. As discussed in the setting, MRP provision C.3 requires that the Project will not increase stormwater flows from the site. Preliminary hydrological calculations demonstrate it will be possible to meet C.3 requirements at the site and final hydrological calculations will need to demonstrate that the on-site bio-retention and infiltration areas are adequate to meet this requirement. See Chapter 9: Hydrology and Water Quality for additional discussion of storm drainage. With compliance with the MRP provision C.3 requirement, the Project would not require additional off-site facilities and the impacts related to increases in stormwater runoff volumes would be ***less than significant***.

SOLID WASTE

*6., 7. The Project would comply with federal, state, and local statutes and regulations related to solid waste and would have a **less than significant** impact related to solid waste disposal needs.*

Development of the Project would add 33 residential homes to the Project area, resulting in an increased demand for solid waste disposal at the site. The Project is estimated to generate approximately 0.25 tons of solid waste per day and 92 tons per year, which would be further reduced by participation in required curbside recycling and yard waste programs.[8] This amount represents a very small amount (.00002 percent) of the permitted daily capacity. The Project would not exceed the capacity of solid waste landfill, and is required to comply with statutes and regulations related to solid waste (***less than significant***).

GAS AND ELECTRIC SERVICE

*8. The Project would not require or result in the construction of gas or electricity generation facilities, the construction of which could cause significant environmental effects and would have a **less than significant** impact related to increased demand for gas and electric service.*

[8] Based on an average of 4.38 pounds of solid waste generated per person per day reported by U.S. EPA, http://www.epa.gov/epawaste/nonhaz/municipal/index.htm

Development of the Project site as proposed would result in an increase in population at the Project site and a related increase in the demand for gas and electricity. However, this Project-related demand alone would not be expected to require the development of new sources of gas and/or electricity generation facilities that could have adverse environmental effects. The Project would have a ***less than significant*** impact on the ability of PG&E to provide gas and electric services with existing facilities.

ENERGY

The Project would have an incremental increase in energy usage. However, the Project includes elements to increase efficiency of energy use during construction and operation, complies with all applicable energy standards and regulations, and would not use energy in a wasteful, inefficient, or unnecessary manner. The Project would have a ***less than significant*** *impact relating to energy consumption with no mitigation warranted.*

The CEQA Guidelines recommend assessment of a Project's energy usage. The Project would be considered to have a significant impact related to energy use if it would use energy in a wasteful, inefficient, or unnecessary manner.

The Project would include short-term construction activities that would consume energy, primarily in the form of diesel fuel (e.g., mobile construction equipment) and electricity (e.g., power tools). Energy would also be used for conveyance of water used in dust control, transportation and disposal of construction waste, and energy used in production and transport of construction materials.

While the Project involves excavating material, the transfer of the excavated material to another location on the site, rather than off-haul to an off-site location as can sometimes occur with excavated soils or debris, helps to reduce energy use for the excavation compared to other development projects.

The following elements of the Project increase efficiency of energy use during the construction period:

- Transfer of excavation material on-site rather than off-haul to a more distant location.
- Compliance with the City's Construction and Demolition Debris (C&DD) Ordinance to reduce construction waste and related energy costs associated with such waste.
- Implementation of construction management practices that reduce energy usage. While focused on emissions and dust reduction, the construction management practices outlined in mitigation measure Air-1 also reduce energy consumption through anti-idling measures and proper maintenance of equipment.

Operation of the Project is estimated to increase energy consumption by approximately 282 megawatt hours/year of electricity and 175 million British Thermal Units (MMBTU) of natural gas.[9] PG&E gas and electricity infrastructure would be extended onto the Project site as a part of the Project (though electricity may be provided by CCA using this infrastructure as discussed in the setting). This Project is anticipated to have similar energy requirements as other similar developments in the vicinity and as a relatively small project, would not have a substantial effect on energy supplies or resources. The following elements of the Project would increase efficiency of energy use during operation:

- Compliance with all standards of Title 24 of the California Code of Regulations and CALGreen standards, as applicable, aimed at the incorporation of energy-conserving design and construction.

[9] Electricity and natural gas usage reported by the CalEEMod emissions model utilized for the emissions modeling and included in Appendix B.

- Compliance with the City's Water Efficient Landscape Ordinance (Municipal Code Chapter 18.112) to reduce outdoor water usage.
- Installation of street trees and lot landscaping, which could help shade and reduce building energy costs (per the City's Climate Action Plan measure GI-1.1).
- Inclusion of pedestrian/bicycle improvements (sidewalks and a trail connection) to support reductions in vehicle fuel usage.

The Project's construction or operational activities would comply with all energy standards and regulations that reduce energy consumption and include other measures to reduce energy use. Construction and operation of the Project would not result in the inefficient, wasteful, or unnecessary consumption of energy and the impact related to energy use and conservation would be ***less than significant***.

CUMULATIVE UTILITIES IMPACTS

The geographic context for a discussion of cumulative impacts to utilities is the service area of the utility in question. The cumulative impacts analysis for each utility includes all cumulative growth within its respective service area, as identified by the providers' demand projections. Will serve letters from service providers are required prior to construction and occupancy. The cumulative context has been taken into account in the impact analysis above and there would be no additional cumulative impacts.

14

GREENHOUSE GAS EMISSIONS

INTRODUCTION

The discussion of greenhouse gas emissions in this chapter is based on the Air Quality Technical Report prepared for this EIR by Ramboll Environ US Corporation and included in Appendix D.

SETTING

The overwhelming consensus from scientists around the world is that climate change is a reality, with human activities its primary cause. Due largely to the combustion of fossil fuels, atmospheric concentrations of carbon dioxide (CO_2), the principal anthropogenic greenhouse gas, are at a level unequaled for at least the last 800,000 years. Greenhouse gases from human activities, such as burning of fossil fuels for use in buildings and transportation and methane production from agricultural practices, are trapping more of the sun's heat in the earth's atmosphere and warming the earth. Over the last century, average global temperatures rose by more than 1°F, and some regions warmed by as much as 4°F, with predictions for continued temperature increases in the coming years.[1]

The U.S. EPA has recently concluded that scientists know *with virtual certainty* that:

"Human activities are changing the composition of Earth's atmosphere. Increasing levels of greenhouse gases like CO_2 in the atmosphere since pre-industrial times are well documented and understood.

- The atmospheric buildup of CO_2 and other greenhouse gases is largely the result of human activities such as the burning of fossil fuels.
- A warming trend of approximately 0.7 to 1.5°F occurred during the 20th century. Warming occurred in both the northern and southern hemispheres, and over the oceans.
- The major greenhouse gases emitted by human activities remain in the atmosphere for periods ranging from decades to centuries. It is, therefore, virtually certain that atmospheric concentrations of greenhouse gases will continue to rise over the next few decades. Increasing greenhouse gas concentrations tend to warm the planet."[2] At the same time, there is much uncertainty concerning the magnitude and rate of the warming. Specifically, the U.S. EPA notes that "important scientific questions remain about how much warming will occur; how fast it will occur; and how the warming will affect the rest of the climate system, including precipitation patterns and storms. Answering these questions will require advances in scientific knowledge in a number of areas:

[1] City of Union City, prepared by AECOM, *Union City Climate Action Plan*, November 2010.

[2] U.S. EPA, 2000, op. cit.

- Improving understanding of natural climatic variations, changes in the sun's energy, land-use changes, the warming or cooling effects of pollutant aerosols, and the impacts of changing humidity and cloud cover.
- Determining the relative contribution to climate change of human activities and natural causes.
- Projecting future greenhouse emissions and how the climate system will respond within a narrow range.
- Improving understanding of the potential for rapid or abrupt climate change."[3]

GREENHOUSE GASES

Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, and water vapor (H_2O) are the principal GHGs, and when concentrations of these gases exceed the natural concentrations in the atmosphere, the greenhouse effect may be enhanced. Without these GHGs, Earth's temperature would be too cold for life to exist. CO_2, CH_4, and N_2O occur naturally, as well as through human activity. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely byproducts of fossil fuel combustion, whereas CH_4 results from off gassing associated with agricultural practices and landfills. Human-made GHGs–with much greater heat-absorption potential than CO_2–include fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6), which are byproducts of certain industrial processes.[4]

The Global Warming Potential (GWP) concept is used to compare the ability of each GHG to trap heat in the atmosphere relative to CO_2, which, after water vapor, is the most abundant GHG. CO_2 has a GWP of 1, expressed as CO_2 equivalent (CO_2e). Other GHGs, such as methane and nitrous oxide are commonly found in the atmosphere at much lower concentrations, but with higher warming potentials, having CO_2e ratings of 21 and 310, respectively. Trace gases such as chlorofluorocarbons and hydro chlorofluorocarbons, which are halocarbons that contain chlorine, have much greater warming potential. Fortunately these gases are found at much lower concentrations and many are being phased out as a result of global efforts to reduce destruction of stratospheric ozone. In the United States in 2008, CO_2 emissions account for about 82 percent of the GHG emissions, followed by methane at about 10 percent and nitrous oxide at just under 3 percent, with trace GHGs making up the remainder.[5]

POTENTIAL EFFECTS OF HUMAN ACTIVITY ON GHG EMISSIONS

As mentioned above, the primary GHG generated by human activity is CO_2. Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions (and thus substantial increases in atmospheric concentrations).

Global Emissions. Global estimates are based on country inventories developed as part of

programs of the United Nations Framework Convention on Climate Change (UNFCCC). Worldwide emissions of GHGs in 2004 were 27 billion tons of CO_2e per year.[6]

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[3] U.S. EPA, 2000, op. cit.

[4] CalEPA, 2006b. *Final 2006 Climate Action Team Report to the Governor and Legislature.* Sacramento, CA. April 3.

[5] *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2015*. U.S. EPA. April 15, 2017, Table 2-1: Recent Trends in U.S. Greenhouse Gas Emissions and Sinks.

[6] United Nations Framework Convention on Climate Change (UNFCCC), *Sum of Annex I and Non-Annex I*

U.S. Emissions. In 2010, the United States emitted about 1,633 million metric tons of CO_2e or about 4 metric tons/year/person. Of the four major sectors nationwide—residential, commercial, industrial and transportation—transportation accounts for the highest fraction of GHG emissions (approximately 35 to 40 percent); these emissions are entirely generated from direct fossil fuel combustion.[7]

State of California Emissions. In 2013, California emitted approximately 459 million gross metric tons of CO_2e. Transportation was the source of 37 percent of the state's GHG emissions; followed by industrial sources at 23 percent and electricity generation at 20 percent (CARB, 2015). California has one of the fourth lowest per capita GHG emission rates in the country, due to the success of its energy-efficiency and renewable energy programs and commitments that have lowered the State's GHG emissions rate of growth by more than half of what it would have been otherwise.[8] Another factor that has reduced California's fuel use and GHG emissions is its mild climate compared to that of many other states.

The California EPA Climate Action Team stated in its March, 2006, report that the composition of gross climate change pollutant emissions in California in 2002 (expressed in terms of CO_2 equivalence) were as follows:

- Carbon dioxide (CO_2) accounted for 83.3 percent;
- Methane (CH_4) accounted for 6.4 percent;
- Nitrous oxide (N_2O) accounted for 6.8 percent; and
- Fluorinated gases (HFCs, PFC, and SF_6) accounted for 3.5 percent.[9]

Bay Area Emissions. BAAQMD most recently updated the GHG emission inventory in 2015, as presented in the 2017 Clean Air Plan, with total emissions of 85 million $MTCO_2e$. In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of the Bay Area's GHG emissions, accounting for 41% of the Bay Area's emissions in 2015. Stationary sources were the second largest contributors of GHG emissions with about 26% of total emissions. Buildings account for about 10% of the Bay Area's GHG emissions, and energy production accounted for 14% percent. Emissions related to fugitive gasses, waste, and agriculture make us the remainder with approximately 4%, 3%, and 1% of the total Bay Area 2015 GHG emissions, respectively. [10]

Union City Emissions. For Union City, most GHG emissions come from energy use in buildings and gasoline burnt in cars, with water- and waste- related emissions contributing relatively smaller proportions. Union City emissions were calculated for the year 2010, which determined that emissions levels were 430,700 $MTCO_2e$. Approximately 38% of these emissions came from building energy, and 57% from transportation. [11]

Countries Without Counting Land-Use, Land-Use Change and Forestry (LULUCF). Predefined Queries: GHG total without LULUCF (Annex I Parties). Bonn, Germany, http://unfccc.int/ghg_emissions_data/predefined_queries/items/3814.php.

[7] U.S. EPA, 2000, op. cit.

[8] California Energy Commission (CEC), Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report, publication # CEC-600-2006-013-SF, Sacramento, CA, December 22, 2006; and January 23, 2007 update to that report.

[9] CalEPA, 2006b, op. cit.

[10] Bay Area Air Quality Management District, *Clean Air Plan 2017: Spare the Air, Cool the Climate*, Adopted April 2017.

[11] City of Union City, *2010 Greenhouse Gas Inventory Update*, January 2014.

POTENTIAL EFFECTS OF GLOBAL CLIMATE CHANGE

Global Effects

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming is taking place, including substantial ice loss in the Arctic. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects, according to the IPCC.[12]

- Snow cover is projected to contract, with permafrost areas sustaining thawing.
- Sea ice is projected to shrink in both the Arctic and Antarctic.
- Hot extremes, heat waves, and heavy precipitation events are likely to increase in frequency.
- Future tropical cyclones (typhoons and hurricanes) will likely become more intense.
- Non-tropical storm tracks are projected to move poleward, with consequent changes in wind, precipitation, and temperature patterns. Increases in the amount of precipitation are very likely in high-latitudes, while decreases are likely in most subtropical regions.
- Warming is expected to be greatest over land and at most high northern latitudes, and least over the Southern Ocean and parts of the North Atlantic Ocean.

Potential secondary effects from global warming include global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

Effects on the State of California

According to the California Air Resources Board (CARB), some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years.[13] Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California. These reports acknowledge that climate scientists' understanding of the complex global climate system, and the interplay of the various internal and external factors that affect climate change, remains too limited to yield scientifically valid conclusions on such a localized scale. Substantial work has been done at the international and national level to evaluate climatic impacts, but far less information is available on regional and local impacts. In addition, projecting regional impacts of climate change and variability relies on large-scale scenarios of changing climate parameters, using information that is typically at too general a scale to make accurate regional assessments.[14]

Below is a summary of some of the potential effects reported in an array of studies that could be experienced in California as a result of global warming and climate change:

[12] City of Union City, prepared by AECOM, Union City Climate Action Plan, November 2010

[13] California Air Resources Board (CARB), 2006c. *Public Workshop to Discuss Establishing the 1990 Emissions Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions*, Sacramento, CA. December 1.

[14] Kiparsky, M. and P.H. Gleick, 2003. *Climate Change and California Water Resources: A Survey and Summary of the Literature*. Oakland, CA: Pacific Institute for Studies in Development. July.

- Air Quality – Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. For other pollutants, the effects of climate change and/or weather are less well studied, and even less well understood.[15] If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat related deaths, illnesses, and asthma attacks throughout the State.[16]

- Water Supply – Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. For example, models that predict drier conditions (i.e., parallel climate model [PCM]) suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows.[17]

- Hydrology – As discussed above, climate change could potentially affect the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could also jeopardize California's water supply. In particular, saltwater intrusion would threaten the quality and reliability of the state's major fresh water supply that is pumped from the southern portion of the Sacramento/San Joaquin River Delta. Increased storm intensity and frequency could affect the ability of flood-control facilities (including levees) to handle storm events. Sea levels are projected to rise in the Bay up to an additional 55 inches by the end of the century as global climate change continues. Sea level rise of this magnitude would increasingly threaten California's coastal regions with more intense coastal storms, accelerated coastal erosion, threats to vital levees, and disruption of inland water systems, wetlands, and natural habitats.Residents may also be affected if wastewater treatment is compromised by inundation from rising sea levels, given that a number of treatment plants discharge to the Bay.[18]

- Agriculture – California has a $30 billion agricultural industry that produces half the country's fruits and vegetables. The California Climate Change Center (CCCC) notes that higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the

[15] U.S. EPA, 2007, op. cit.

[16] California Climate Change Center (CCCC), *Our Changing Climate: Assessing the Risks to California*, CEC-500-2006-077, July 2006.

[17] Brekke, L.D., et al, 2004. "Climate Change Impacts Uncertainty for Water Resources in the San Joaquin River Basin, California." *Journal of the American Water Resources Association*. 40(2): 149–164. Malden, MA, Blackwell Synergy for AWRA.

[18] Association of Bay Area Governments and Metropolitan Transportation Commission, *Plan Bay Area 2040*. Adopted July 18, 2013.

time of year that certain crops, such as wine grapes, bloom or ripen, and thus affect their quality.[19]

- Ecosystems and Wildlife – Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. In 2004, the Pew Center on Global Climate Change released a report examining the possible impacts of climate change on ecosystems and wildlife.[20] The report outlines four major ways in which it is thought that climate change could affect plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes such as carbon cycling and storage.

Effects in Alameda County

Models of the potential impact of climate change have primarily been developed at global and regional scales and much uncertainty still exists about the extent of the changes that could be felt due to the incredibly complex interactions at play, particularly at the city level. However, potential impacts may include:

- Temperature rises of 1.8°F and 5.4°F by mid century
- Reduced water supply due to reduced snow pack and impact on summer supplies
- Increased flooding from extreme weather events and sea-level rise
- More wildfires due to increased temperatures, dry conditions, wind
- Habitat loss, species migration, endangerment, and extinction
- Longer growing season but more insect infestations
- Reduced threat from low winter temperatures, but increased irrigation demand due to progressively hot summers. [21]

REGULATORY SETTING

FEDERAL

U.S. Environmental Protection Agency (U.S. EPA)

On December 9, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA, which states that the U.S. EPA Administrator should regulate and develop standards for "emission[s] of air pollution from any class or classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The final rule was effective January 14, 2010. The rule addresses two distinct findings: Endangerment Finding and Cause or Contribute Finding.

Under the Endangerment Finding, the Administrator found that the current and projected concentrations of the six key GHGs (i.e., CO_2, CH_4, N_2O, HFCs, perflurorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future

[19] California Climate Change Center (CCCC), 2006, op. cit.

[20] Parmesan, C. and H. Galbraith, *Observed Impacts of Global Climate Change in the U.S.*, Arlington, VA: Pew Center on Global Climate Change, November 2004.

[21] City of Union City, prepared by AECOM, *Union City Climate Action Plan*, November 2010.

generations. Under the Cause or Contribute Finding, the Administrator found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to GHG pollution which threatens public health and welfare.

To date, the U.S. EPA has not regulated GHGs under the Clean Air Act (discussed above) based on its assertion in *Massachusetts et al. v. EPA et al.*[22] that the "Clean Air Act does not authorize it to issue mandatory regulations to address global climate change and that it would be unwise to regulate GHG emissions because a causal link between GHGs and the increase in global surface air temperatures has not been unequivocally established." However, in the same case (*Massachusetts v. EPA*), the U.S. Supreme Court held that the U.S. EPA can, and should, consider regulating motor-vehicle GHG emissions.

STATE OF CALIFORNIA

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California. There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing CARB to develop actions to reduce GHG emissions, and several state legislative actions related to climate change and GHG emissions have come into play in the past decade.

State of California Executive Orders

Executive Order S-3-05. In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Arnold Schwarzenegger issued Executive Order S-3-05, which set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

Executive Order S-1-07. Executive Order S-1-07, which was signed by then- Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It established a goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020. This order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

On April 23, 2009 CARB approved the proposed regulation to implement the LCFS. The LCFS will reduce GHG emissions from the transportation sector in California by about 16 million metric tons in 2020.

Executive Orders S-14-08 and S-21-09. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33% renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21- 09, which directs CARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33% renewable energy by 2020.

Executive Order S-13-08. Governor Arnold Schwarzenegger signed EO S-13-08 on November 14, 2008. The order called on state agencies to develop California's first strategy to identify and prepare for expected climate impacts. As a result the 2009 California Climate Adaptation Strategy (CAS)

[22] U.S. Supreme Court, *Massachusetts et al. v. EPA et al.* (No. 05-1120, 415F 3d 50), April 2, 2007.

report was developed to summarize the best known science on climate change impacts in the State to assess vulnerability and outline possible solutions that can be implemented within and across State agencies to promote resiliency. The State has also developed an Adaptation Planning Guide[23] to provide a decision-making framework intended for use by local and regional stakeholders to aid in the interpretation of climate science and to develop a systematic rationale for reducing risks caused or exacerbated by climate change. The State's third major assessment on climate change explores local and statewide vulnerabilities to climate change, highlighting opportunities for taking concrete actions to reduce climate-change impacts.

Executive Order B-30-15. Governor Brown signed EO-B-30-15 on April 29, 2015, establishing a statewide GHG reduction target of 40% below 1990 levels by 2030, as an interim target intended to keep the state on track to achieve S-3-05's target of 80% below 1990 levels by 2050.

State of California Legislation

Assembly Bill 1493. In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, in 2004 CARB approved amendments to the California Code of Regulations (CCR) adding GHG emissions standards to California's existing standards for motor vehicle emissions. All mobile sources are required to comply with these regulations as they are phased in from 2009 through 2016.

Assembly Bill 32 – California Global Warming Solutions Act and the Scoping Plan.[24] In September 2006, then-Governor Arnold Schwarzenegger signed the California Global Warming Solutions Act (AB 32; California Health and Safety Code Division 25.5, §§ 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. According to CARB's Climate Change Scoping Plan, the 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2e, or approximately 28.3 percent, from the state's projected 2020 business-as-usual (BAU) emissions level of 596 million metric tons of CO_2e. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as

[23] California Department of Natural Resources, *California's Water- Energy Relationship*, 2012.

[24] California Air Resources Board, *First Update to the Climate Change Scoping Plan: Building on the Framework Pursuant to AB 32*, Published May 2015.

compared to other sectors that are not anticipated to significantly increase emissions. In May 2014, the First Update to the AB 32 Scoping Plan was approved by the Board. This document includes expanded analysis of project alternatives as well as updates the 2020 emission projections in light of the current economic forecasts. Considering the updated 2020 BAU estimate of 509 million metric tons of CO_2e, a 16 percent reduction below the estimated BAU levels would be necessary to return to 1990 levels by 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors, i.e. transportation, electrical power, commercial, residential, industrial etc. CARB is proposing to update the number for the 2020 limit based on the updated GWPs from the IPCC's Fourth Assessment. Then new statewide target, weighting the 1990 emissions with 100-year GWPs is 431 $MTCO_2e$, an approximate 1% increase from the original target of 427 $MTCO_2e$.

CARB's Scoping Plan also breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the state's GHG inventory. CARB's Scoping Plan expects reductions in GHG emissions to be achieved from the following sector-based measures:

- Energy – 25 $MTCO_2e$
- Transportation – 23 $MTCO_2e$
- High GWP – 5 $MTCO_2e$
- Waste – 2 $MTCO_2e$
- Cap and Trade – 23 $MTCO_2e$

CARB has identified a GHG reduction target of 5 million metric tons (of the 174 million metric ton total) for local land use changes (Table 2 of CARB's Scoping Plan).Such reductions may be achieved as Senate Bill (SB) 375 is implemented. CARB's Scoping Plan states that successful implementation of the plan relies on local governments' land use, planning, and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. CARB further acknowledges that decisions on how land is used will have large effects on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. CARB's Scoping Plan does not include any direct discussion about GHG emissions generated by construction activity. CARB's Scoping Plan expands the list of nine Discrete Early Action Measures to a list of 39 Recommended Actions contained in Appendices C and E of CARB's Scoping Plan.

Senate Bills 1078 and 107. SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Senate Bill 97. In 2007, the State Legislature passed SB 97, which required amendment of the CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA. The California Natural Resources Agency adopted these amendments on December 30, 2009. They took effect on March 18, 2010, after review by the Office of Administrative Law and filing with the Secretary of State for inclusion in the California Code of Regulations.

The Guidelines revisions include a new section (§ 15064.4) that specifically addresses the potential significance of GHG emissions. § 15064.4 calls for a "good-faith effort" to "describe, calculate or estimate" GHG emissions. § 15064.4 further states that the analysis of the significance of any GHG impacts should include consideration of the extent to which the project would increase or reduce

GHG emissions; exceed a locally applicable threshold of significance; and comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions." The new guidelines also state that a project may be found to have a less-than-significant impact on GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (Sec. 15064(h)(3)). Importantly, however, the CEQA Guidelines do not require or recommend a specific analytical methodology or provide quantitative criteria for determining the significance of GHG emissions. No quantitative significance threshold is included in the Amendments. The Amendments also include a new Subdivision 15064.7(c) which clarifies that in developing thresholds of significance, a lead agency may appropriately review thresholds developed by other public agencies, or recommended by other experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

Senate Bill 375. Signed into law on October 1, 2008, SB 375 supplements GHG reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, the ARB approved GHG reduction targets in February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). The ARB may update the targets every 4 years and must update them every 8 years. MPOs in turn must demonstrate how their plans, policies and transportation investments meet the targets set by the ARB through Sustainable Communities Strategy. The target reductions for the Bay Area are a regional reduction of per-capita CO_2 emissions from cars and light-duty trucks by 7% by 2020 and by 15% by 2035, compared to a 2005 baseline. ABAG addresses these goals in Plan Bay Area, which identifies Priority Development areas near transit options to reduce use of on-road vehicles.

Senate Bill X 1-2. Senate Bill X1-2, signed by Governor Edmund G. Brown in April 2011, enacted the California Renewable Energy Resources Act. The law obligates all California electricity providers, including investor-owned and publicly-owned utilities, to obtain at least 33% of their energy from renewable resources by the year 2020.

Senate Bill 350. The Clean Energy and Pollution Reduction Act of 2015. SB 350 (Chapter 547, Statutes of 2015) was approved by Governor Brown on October 7, 2015. SB 350 increased the standards of the California Renewable Portfolio Standards (RPS) program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased from 33 percent to 50 percent by December 31. 2030. The Act requires the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in existing electricity and natural gas final end uses of retail customers by January 1, 2030.

Senate Bill 32. In 2016, as a follow-up to AB 32 discussed above, SB 32 codified the target of 40 percent reduction below 1990 levels by 2030 and directed State regulatory agencies to develop rules and regulations to meet the 2030 State target.

CARB has released a proposed 2017 update to the Scoping Plan but has not yet formally adopted the update. Key components of the overall approach of the update include extending the cap-and-trade program through 2030 and reevaluating applicability to support greater direct GHG emissions reductions, targeting a 20 percent reduction in GHG emissions from the refinery sector, continued investment in renewable energy, efforts to reduce emissions of short-lived climate pollutants, and increased focus on zero- and near-zero emission vehicle technologies.

State of California Building Codes

California Building and Energy Efficiency Standards (Title 24). Title 24, Part 6 of the California Code of Regulations (CCR) requires that the design of building shells and building components

conserve energy. These standards are updated periodically to consider and incorporate new energy efficiency technologies and methods. Residential buildings built to 2016 Title 24 Standards, which will go in effect on January 1, 2017, will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating compared to the 2013 Title 24 Standards, which went into effect on January 1, 2014. The 2013 Standards are approximately 24 percent more energy efficient for residential buildings, and 30 percent more energy efficient for nonresidential buildings, compared to the previous 2008 Building and Energy Efficiency Standards.[25]

California Green Building Standards

California Green Buildings Standards Code (CALGreen). On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24, CCR), known as CALGreen. The 2010 edition of the code established voluntary standards on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air quality. The mandatory provisions of the code became effective January 1, 2011. CALGreen refers to the mandatory Building Standards described above, and also includes voluntary Tier 1 and Tier 2 programs for cities and counties that wish to adopt more stringent green building requirements

REGIONAL AND LOCAL

Metropolitan Transportation Commission/Association of Bay Area Governments Sustainable Communities Strategy.

MTC is the federally recognized metropolitan planning organization for the nine county Bay Area, which includes Alameda County and the City of Union City. On July 18, 2013, the Plan Bay Area was jointly approved by ABAG's Executive Board and by MTC. The Plan includes the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan. The Sustainable Communities Strategy lays out how the region will meet GHG reduction targets set by the California Air Resources Board.

CARB's targets call for the region to reduce per capita vehicular GHG emissions seven percent by 2020 and 15 percent by 2035 from a 2005 baseline.

Bay Area Air Quality Management District

The Project site falls within the San Francisco Bay Area Air Basin and therefore under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). BAAQMD provides a document titled *California Environmental Quality Act Air Quality Guidelines* ("Guidelines"), which provides guidance for consideration by lead agencies, consultants, and other parties evaluating air quality impacts in the San Francisco Bay Area Air Basin conducted pursuant to CEQA. The document includes guidance on evaluating and mitigating greenhouse gas emissions impacts. The most recent version of the Guidelines is dated May 2017. The updated CEQA Guidelines revised significance thresholds, assessment methodologies, and mitigation strategies for criteria pollutants, air toxics, odors, and greenhouse gas emissions.

In 1991, BAAQMD, together with MTC and ABAG prepared the Bay Area 1991 Clean Air Plan or CAP. This air quality plan addresses the California Clean Air Act. The 2017 Clean Air Plan includes a multi-pollutant strategy represented by 85 control strategies to simultaneously reduce emissions and

[25] California Energy Commission, *2016 Building Energy Efficiency Standards, CA*, available at http://www.energy.ca.gov/title24/2016standards/.

ambient concentrations of ozone, fine particulate matter, toxic air contaminants, as well as greenhouse gases that contribute to climate change. [26]

The CAP includes the Bay Area's first-ever comprehensive Regional Climate Protection Strategy (RCPS), which identifies potential rules, control measures, and strategies that the BAAQMD can pursue to reduce GHG in the Bay Area. Measures of the 2017 CAP addressing the transportation sector are in direct support of Plan Bay Area, which was prepared by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) and includes the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan. Highlights of the Draft 2017 Clean Air Plan control strategy include:

- Limit Combustion: Develop a region-wide strategy to improve fossil fuel combustion efficiency at industrial facilities, beginning with the three largest sources of industrial emissions: oil refineries, power plants, and cement plants.
- Stop Methane Leaks: Reduce methane emissions from landfills and oil and natural gas production and distribution.
- Reduce Exposure to Toxics: Reduce emissions of toxic air contaminants by adopting more stringent limits and methods for evaluating toxic risks at existing and new facilities.
- Put a Price on Driving: Implement pricing measures to reduce travel demand.
- Advance Electric Vehicles: Accelerate the widespread adoption of electric vehicles.
- Promote Clean Fuels: Promote the use of clean fuels and low or zero carbon technologies in trucks and heavy-duty vehicles.
- Accelerate Low Carbon Buildings: Expand the production of low-carbon, renewable energy by promoting on-site technologies such as rooftop solar and ground-source heat pumps.
- Support More Energy Choices: Support community choice energy programs throughout the Bay Area.
- Make Buildings More Efficient: Promote energy efficiency in both new and existing buildings.
- Make Space and Water Heating Cleaner: Promote the switch from natural gas to electricity for space and water heating in Bay Area buildings.

To achieve the goals of the CAP, it identifies 85 emissions control measures for implementation by BAAQMD in collaboration with local government agencies, the business community, and Bay Area residents. The control measures target the following emissions sources:

- Stationary sources (40 measures);
- Transportation (23 measures);
- Energy (2 measures);
- Buildings (4 measures);
- Agriculture (4 measures);
- Natural and working lands (3 measures);
- Waste management (4 measures);
- Water (2 measures);
- Super-GHGs (3 measures); and
- Further study (miscellaneous stationary, building, and agriculture sources) (11 measures).

Alameda County

Since 2006, Alameda County has been leading an ongoing, coordinated effort to reduce the GHG emissions within all its 14 cities called the *Alameda County Climate Protection Project*. Participant cities, including Union City, work together to focus on key action areas, such as energy efficiency,

[26] Bay Area Air Quality Management District, *Clean Air Plan 2017: Spare the Air, Cool the Climate*, Adopted April 2017.

transportation, and waste reduction, and on projects best addressed by a regional effort, such as collaborative grant applications. In May 2010, the Alameda County Board of Supervisors adopted 16 Commitments to Climate Protection that provide an overarching vision, a goal of 15 percent GHG reductions by 2020, and the Alameda County Climate Action Plan for Government Services and Operations, which includes 80 recommended actions that will enable the County to reach the reduction target. The County is currently in the process of developing a Climate Action Plan for the unincorporated areas of the County. As of 2010, the other 13 Alameda County cities were in the process of developing, adopting or had adopted a Climate Action Plan. [27]

City of Union City General Plan

City-wide goals and related policies related to GHG emissions and sustainability that are directly or indirectly related to the Project include:

- Goal CD-F.1. To create a more environmentally and economically sustainable community.
    - Policy CD-F.1.1 The City shall incorporate as many green building and landscaping practices, technologies, and strategies into new development and redevelopment projects as feasible.
    - Policy CD-F.1.2 The City shall encourage development and construction-related building practices that conserve natural resources, increase energy efficiency, improve indoor air quality, reduce landfill waste, decrease pollution, and minimize operating and maintenance costs.
    - Policy CD-F.1.7 The City should require the use of energy efficient and energy conserving design and construction techniques in all types of projects (including new construction and remodeled and rehabilitated structures).
- Goal ES-A.1. To make Union City a sustainable community and a regional model.
    - Policy ES-A.1.1. The City shall seek participation from residents, businesses, developers, and community organizations in an effort to make Union City sustainable.
    - Policy ES-A.1.2. The City shall encourage the incorporation of sustainable practices in private and public development.
    - Policy ES-A.1.3. The City shall promote sustainability through public education and outreach efforts.
    - Policy ES-A.1.4. The City shall form partnerships within the Bay Area and Tri-City area to unify efforts for a more sustainable region.
    - Policy ES-A.1.5. The City shall expand the use of renewable resources and conserve non-renewable resources for future generations.
    - Policy ES-A.1.6. The City shall modify or add sustainability programs and policies as new technologies emerge.
- Goal ES-A.2. To reduce greenhouse gas emissions that contribute to climate change.
    - Policy ES-A.2.1. The City shall participate in regional efforts to reduce greenhouse gas emissions.

[27] City of Union City, prepared by AECOM, *Union City Climate Action Plan*, November 2010.

  - Policy ES-A.2.2. The City shall participate in the International Council for Local Environmental Initiatives (ICLEI) Climate Protection Project which assists cities in reducing citywide greenhouse gas emissions.
  - Policy ES-A.2.3. The City shall encourage energy conservation and the use of alternative energy sources within the community.
  - Policy ES-A.2.4. The City shall seek to reduce vehicle emissions citywide.
- Goal ES-B.1. To make Union City government more environmentally responsible.
  - Policy ES-B.1.1: The City shall consider sustainability in its decisions and actions in order to minimize the City's ecological footprint.
  - Policy ES-B.1.2: The City shall require that public building and landscaping projects be designed to be energy and resource efficient and reduce operating and maintenance costs.
  - Policy ES-B.1.3: The City shall renovate existing public facilities for improved environmental performance.
  - Policy ES-B.1.4: The City shall incorporate sustainable practices for ongoing maintenance and operations of public facilities.
  - Policy ES-B.1.5: The City shall make public outreach and education programs that promote sustainability a priority.
- Goal ES-D.1. To encourage sustainable site design, building, and landscaping practices in all development.
  - Policy ES-D.1.1 The City shall encourage site design and landscaping that respects the relationship between the built and the natural environment by minimizing the environmental impacts of development on local and regional ecosystems.
  - Policy ES-D.1.2 The City shall encourage new developments to be sited to respond to climatic conditions, such as solar orientation, wind, and shadow patterns.
  - Policy ES-D.1.3 The City shall encourage the incorporation of green building practices, technologies, and strategies into development projects.
  - Policy ES-D.1.4 The City shall encourage retrofits of existing buildings to promote energy efficiency and indoor air quality.
  - Policy ES-D.1.5 The City shall promote tree preservation and planting citywide.
  - Policy ES-D.1.6 The City shall promote the use of alternative energy sources.
- Goal HE-G. To encourage energy efficiency and appropriate weatherization in all new and existing housing.
  - Policy HE-G.1 The City shall continue to encourage new residential construction to exceed State requirements for energy efficiency.
  - Policy HE-G.2 The City should work with local utility companies to promote energy efficiency.
  - Policy HE-G.3 The City shall continue to encourage transit-oriented development as a means for creating walkable, transit-friendly communities that reduce reliance on the automobile.
  - Policy HE-G.4 The City should encourage the increased use of renewable energy in new residential buildings.

- Policy HE-G.5 The City should encourage the use of shade trees in new residential development to reduce residential cooling needs associated with the urban heat island effect, balancing the need to encourage solar access.
- Policy HE-G.6 The City shall continue to require compliance with the Water Efficient Landscape Ordinance and Landscape Standards Policy Statement, which requires the use of water efficient landscaping. The City shall encourage the use of xeriscaping
- Policy HE-G.7 The City shall continue supporting State and regional efforts to develop and grow low-cost PACE financing program to encourage investment in energy-efficiency retrofits.

Union City Climate Action Plan [28]

Union City City Council adopted the City's first Climate Action Plan (Union City CAP) in 2010, with a stated goal to reduce GHG emissions 20% by 2020 (with 2005 levels as a baseline) through implementation of GHG Reduction Measures in six action areas. In addition, the following actions support GHG reduction efforts:

• Preparation of a Pedestrian and Bicycle Master Plan to facilitate walking and biking

• Participation in the Alameda County Safe Routes to Schools (SR2S) program

• Adoption of a Green Building Ordinance

• Adoption of a Water Efficient Landscape Ordinance

• Achievement of a Waste Diversion Goal of 75 percent

• Establishment of a residential curbside composting program

• Establishment of commercial food scrap recycling program

The CAP was developed to serve as the City's qualified GHG Reduction Plan and programmatic tiering document for the purposes of the CEQA for analysis of impacts of GHG emissions and climate change. BAAQMD accepted the CAP as a qualified GHG Reduction Plan on October 6, 2010. In addition, the City has determined that the Reduction Target under the CAP will result in GHG emissions from activities covered by the CAP to be less than cumulatively considerable under CEQA. The City Council adopted a Negative Declaration for the CAP on October 26, 2010.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

The following thresholds are based on Appendix G of the CEQA Guidelines::

1. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
2. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The CEQA Guidelines state that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. The analysis in this chapter is based on the thresholds presented in the latest BAAQMD Guidelines (May 2017), as detailed under each impact discussion below.

[28] City of Union City, prepared by AECOM, *Union City Climate Action Plan*, November 2010.

Horizon Year for Analysis

SB 32 and recent case law address GHG reductions past the 2020 horizon initially required under AB 32. Reduction strategies and thresholds in the City CAP and BAAQMD Guidelines, which are used in the analysis below, address the 2020 horizon year. Specifics of implementation of future horizon years and targets are not yet in place. The Project is proposed to be built in the near term (by approximately 2020) and subsequent changes to thresholds or reduction strategies would not apply retroactively to projects that are already built.

That being said, in general, it is expected that operational GHG emissions will decrease over time as emissions from passenger vehicles are reduced through increasingly stringent regulations. Additionally, landfill gas emissions (including GHG) from closed landfills such as the Turk Island Landfill reduce over time as refuse degrades. The primary landfill is currently producing approximately 60 percent of its peak emissions due to the age of the refuse and that emission rate will continue to decline over time. Therefore, the quantity of GHG emissions from the Project will decrease over time, which will help to meet subsequent more stringent horizon year GHG reduction targets.

Project emissions in horizon years past 2020 and related impact conclusions would be the same or less than those assessed below and are not further quantified in this analysis.. Future GHG emissions from the Project also would be reduced by the implementation of reduction measures as applicable.

GREENHOUSE GAS EMISSIONS AND CLIMATE ACTION PLAN CONSISTENCY

*1., 2. The Project would generate greenhouse gas emissions during both construction and operation, but the Project would be consistent with the Union City Climate Action Plan (the applicable GHG Reduction Plan) and below thresholds for impacts related to landfill construction emissions, and would not increase operational landfill emissions (**less than significant**).*

BAAQMD has determined that GHG emissions and global climate change represent cumulative impacts. No single project could generate enough GHG emissions to noticeably change the global average temperature, but the combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts. In developing thresholds of significance for GHG emissions, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse GHG emissions impacts.[29]

Residential Development of Parcel "C"

The Union City CAP is a qualified GHG Reduction Strategy under CEQA Guidelines section 15183.5 and therefore state law allows cities to analysis of GHG emissions impacts through assessment of consistency with the CAP. According to the Union City CAP, a Project can be determined consistent with the GHG Reduction Plan and the GHG emissions determined to be less than cumulatively considerable if the following standards are met:

- The project supports or includes applicable strategies and measures, or advances the actions identified in the CAP.
- The project is consistent with the ABAG population growth projections, which are the basis of the GHG emissions inventory's projections.

[29] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2017, p. 2-1.

- The project would not substantially interfere with implementation of CAP strategies, measures, or actions.

The Project is consistent with the General Plan designation and zoning for the site and is therefore consistent with population growth projections.

Regarding the CAP's GHG reduction strategies and measures, the majority of measures require implementation by the City and are not directly applicable to new development projects. Additionally, many of the measures are targeted to development in transit-oriented areas or commercial centers, which do not directly apply to the proposed Project. All of the CAP measures, including those requiring implementation by the City as well as those pertaining to new buildings or land uses, were reviewed to identify those potentially relevant to the proposed Project. The Project could participate in or further the City's attainment of the following CAP measures:

Walking and Bicycling Measure T-1.1: Continue build-out (goal of 25 percent build-out), to the extent feasible, of the Pedestrian and Bicycle Master Plan by 2020.

Consistency/Relevance: While a trail is shown as a possibility on the main Turk Island Landfill in the Pedestrian and Bicycle Plan, current continued need for operation of a landfill gas collection system and flare make such a trail infeasible in the foreseeable future. For these reasons, the trail alignment was removed from "Figure TR-6 Existing and Proposed Pedestrian Network" map included in the General Plan and will be updated in the next version of the Pedestrian and Bicycle Plan as well as the Climate Action Plan, which will be completed in the 2019/2020 timeframe. The Project would be supportive of this measure by including required sidewalks and a trail connection between Westport Way and Sea Breeze Park and improving the trail along the retention basins.

Household Appliances Measure E-2.1: Work with PG&E to promote existing household appliance upgrades.

Consistency/Relevance: This measure is designed to encourage voluntary community participation to upgrade home appliances and lighting to be more energy efficient. Any new appliances or lighting in proposed residences will meet or exceed current energy standards, furthering this measure.

Building Performance Standards for New Construction Measure E-4.1: Continue to implement the Green Building Ordinance.

Consistency/Relevance: Since adoption of the Climate Action Plan, the City's Green Building Ordinance was modified to remove references to private development projects as these projects are subject to the California Green Building Standards Code, which are more stringent that the provisions previously listed in the City's Green Building Ordinance. The proposed residences will be required to comply with the California Green Building Standards Code. As such, the Project is consistent with this GHG reduction measure.

Smart Grid Measure E-5.1: Work with PG&E and other cities in Alameda County to accelerate Smart Grid integration in existing and new buildings.

Consistency/Relevance: A smart meter would be installed in new residences, furthering this objective of the City.

Residential Solar Hot Water Measure E-6.1: Develop program to facilitate the installation of solar hot water heaters in existing and new residential development.

Consistency/Relevance: Although solar hot water heaters are not currently proposed, the Project applicant and/or future homeowners could take advantage of future City programs. This measure addresses facilitation of these features and does not require them to be included in new projects. Therefore, the Project does not conflict with this measure.

Solar Power Measure E-7.1: Develop a comprehensive solar photovoltaic program that provides outreach, financing, and other forms of assistance to homeowners.

Consistency/Relevance: Although solar photovoltaic systems are not currently proposed, the Project applicant and/or future homeowners could take advantage of future City programs. This measure addresses facilitation of these features and does not require them to be included in new projects. Therefore, the Project does not conflict with this measure.

Solar Power Measure E-7.3: Develop a "Solar Cities" style public outreach and education platform to promote renewable energy systems for homes and businesses.

Consistency/Relevance: Although renewable energy systems are not currently proposed, the Project applicant and/or future homeowners could take advantage of City programs. This measure addresses promotion of these features and does not require them to be included in new projects. Therefore, the Project does not conflict with this measure.

Waste Reduction Policies Measure WR-1.1: Increase Waste Diversion Target.

Consistency/Relevance: Measure WR-1.1 calls for the City to increase its solid waste reduction and diversion target from 75 percent by 2010 to 90 percent by 2020. By complying with the City's Construction and Demolition Debris (C&DD) Ordinance—which requires the recycling of at least 50 percent of construction and demolition debris generated by a project and 100 percent of all cement, concrete, asphalt concrete, non-contaminated soils, land-clearing debris and plant debris—the Project applicant would assist the City in accomplishing its ultimate goal of 90 percent waste diversion.

Waste Reduction Policies Measure WR-1.2: Strengthen Construction & Demolition Standards.

Consistency/Relevance: As noted above, the Project will comply with the City's Construction and Demolition Debris (C&DD) Ordinance. By complying with this requirement, the Project would support Measure WR-1.2.

Water Conservation Policies Measure WC-1.1: Water Efficient Landscape Ordinance

Consistency/Relevance: Measure WC-1.1 calls for an amendment to the City's Water Efficient Landscape Ordinance (Municipal Code Chapter 18.112) to require new landscape projects of 2,500 square feet or more to reduce water consumption by 50 percent compared to initial requirements for plant installation and establishment. The Project would be required to comply with the water-efficient landscape requirements set forth in the City's Water Efficient Landscape Ordinance, which was recently updated to reflect updates contained in the State Model Water Efficient Landscape Ordinance (per Governor's Executive Order B-29-15 Ordinance). By complying with the plant selection, irrigation system, and other requirements, the water demand for the Project's proposed landscaping would be minimized and the Project would be supportive of CAP Measure WC-1.1.

Water Conservation Policies Measure WC-1.2: Indoor and Outdoor Non-potable Water Systems Program

Consistency/Relevance: Although non-potable water systems are not currently proposed, the Project applicant and/or future homeowners could take advantage of future City programs. This measure addresses promotion of these features and does not require them to be included in new projects. Therefore, the Project does not conflict with this measure.

Carbon Sequestration Measure GI-1.1: Expand the urban forest to sequester carbon and reduce building energy consumption

Consistency/Relevance: The Project will comply with the City's street tree requirements, which would support Measure GI-1.1.

As described above, the Project would support all CAP GHG reduction measures directly applicable to the Project and would help support additional measures that are not directly applicable. The Project would not interfere with implementation of any CAP GHG reduction measures. On that basis, along with its consistency with population growth projections, the residential development of Parcel "C" proposed under the Project would be consistent with the Union City CAP and, therefore, its GHG emissions would have a ***less than significant impact***.

Landfill Consolidation/Backfill and Landfill Emissions

Because landfills are not specifically addressed in the Union City CAP and landfill consolidation/backfill activities, including temporary shut-down of the landfill gas flare, are not usually associated with construction projects, the GHG emissions of these sources have been addressed separately from the CAP assessment above.

The Project's construction-period GHG emissions were calculated using version 2016.3.1 of the California Emission Estimator Model (CalEEMod), as described in Chapter 5, with inputs and outputs detailed in Appendix D. No mitigation was applied to the model for the results presented in this chapter, resulting in a conservative analysis.

The existing landfill gas collection system captures approximately 85% of the landfill gas generated at the main Turk Island Landfill. While testing indicates landfill gas levels are much lower at Parcel "C" due to the generally inert nature of the debris there, there is no landfill gas collection system at Parcel "C". Uncontrolled emissions at the site are currently approximately 3,000 metric tons per year. Landfill gas captured by the collection system is routed to the landfill gas flare, which is 99% effective in reducing GHG emissions and emits approximately 124 metric tons per year. The landfill gas flare at the site is a permitted stationary source emitter, but is well below the BAAQMD's GHG emissions threshold for stationary sources of 10,000 metric tons per year. Following landfill consolidation and reinstitution of the landfill gas collection system, emissions from Parcel "C" debris would no longer be uncontrolled, but would be captured by the collection and flare system and reduced by approximately 85%. Therefore, the Project will result in reduced operational emissions of GHG from landfill debris.

GHG emissions from construction of the proposed Project are estimated to be 8,058 metric tons, consisting of 449 metric tons from off-road equipment and construction activities, 349 from on-road construction-related trucks and vehicles, and 7,260 from fugitive emissions due to disturbance of Parcel "C" and temporary shutdown of the landfill gas collection system and flare (see Table 4 in Appendix D for additional information). The majority of these emissions result from fugitive landfill gas emissions released by the main Turk Island Landfill during the period when the landfill gas capture system and flare will be shut down. The GHG emissions from the fugitive landfill gas are high because a significant portion of the landfill gas is methane, which has a high global warming potential and because this analysis conservatively assumes the entire collection and flare system could be shut down for up to approximately six months during the landfill consolidation activities. The GHG emissions from construction are below the stationary source threshold of 10,000 metric tons per year and are thus not considered significant.

Therefore, there would be ***a less than significant impact*** related to landfill emissions including emissions during construction activities and temporary shut-down of the landfill flare.

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OTHER CEQA TOPICS

INTRODUCTION

This chapter of the Draft EIR contains discussion regarding several CEQA topic areas for which only limited analysis and discussion is required to make significance determinations due to the nature and specifics of the Project. These environmental topic areas are not discussed in separate chapters and include:

- Agricultural Resources
- Cultural Resources
- Mineral Resources
- Population/Housing
- Public Services
- Recreation

Additionally, this chapter includes discussion of:

- Significant Irreversible Modifications In The Environment
- Growth Inducing Impacts
- Cumulative Impacts

AGRICULTURAL RESOURCES

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if it were to result in:

1. Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
2. A conflict with existing zoning for agricultural use, or a Williamson Act contract; or
3. Changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use.

The Project site is currently a closed landfill and is located in an urbanized area near residential developments. No portion of the site has been zoned for agricultural use, and no portion of the site currently supports agricultural operations or operates under a Williamson Act contract. There are currently no agricultural operations in the immediate vicinity of the Project site, and no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance has been identified on or in the immediate vicinity of the Project site. There would be ***no impact*** related to agricultural resources.

CULTURAL RESOURCES

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, a significant impact will occur if the proposed Project would:

1. Cause a substantial adverse change in the significance of a historical resources as defined in CEQA Guidelines Section 15064.5;
2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5;
3. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
4. Disturb any human remains, including those interred outside of formal cemeteries.

A recent addition to CEQA is the Native American Historic Resource Protection Act (Assembly Bill 52), which is intended to minimize conflict between Native American and development interests. AB 52 adds "tribal cultural resources" to the specific cultural resources protected under CEQA. A tribal cultural resource is defined as a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American tribe. The following language is proposed for the revised CEQA Guidelines, and while not yet adopted as part of Appendix G, has been included in this assessment to make clear that tribal cultural resources have been considered as part of the cultural resources in this analysis:

5. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either:
    a. a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, that is listed or eligible for listing on the California Register of Historical Resources, or included in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or
    b. a resource determined by a lead agency, in its discretion and supported by substantial evidence, to be significant according to the historical register criteria in Public Resources Code section 5024.1 (c), and considering the significance of the resource to a California Native American tribe.

The Project site has been previously disturbed and is covered entirely with landfill debris, which are buried below and mounded above original surface levels. This mounding is man-made and would not be considered a unique geologic feature. Construction activities would disturb mostly landfill debris and imported soil covers and would involve little or no disturbance of native soils.

Based on a review of archival cultural resources records, historic-period maps, literature for Alameda County and the Project area, and previous cultural resource studies covering part of the Project site, by the Northwest Information Center (NWIC) at Sonoma State University, part of the California Historical Resources Information System (included in Appendix H), the NWIC confirmed that there are no known cultural resources at the Project site. The NWIC indicated that historic-period development could have existed on the site and vicinity prior to the current use of the site.

The NWIC indicated that at the time of Euroamerican contact, the Native Americans that lived in the area were speakers of the Chochenyo language, part of the Costanoan subfamily of the Utian language family but found no records of Native American resources within or adjacent to the Project site. Based on an evaluation of the environmental setting and features associated with known sites, which have been found near watercourses and bodies of water, the Project site, which is located in a flat marshy area between Alameda Creek and Coyote Hills Slough, the NWIC considers the area to be moderately sensitive for Native American resources.

A search of the Sacred Lands Files by the Native American Heritage Commission (included in Appendix H) resulted in an indication that a tribal cultural place related to the Ohlone Indian Tribe may exist in the vicinity of the Project. The provided contact for the Ohlone Indian Tribe was contacted with Project information via phone and email on August 10, 2017, and with a formal consultation letter sent on August 22. No response has been received. Given the nature of the Project site, minimal amount of disturbance of native soils, the lack of Native American resources identified at or near the site in the NWIC search, and the lack of response to direct coordination, it can be concluded that the Project would not have a significant the potential to impact any Sacred Lands in the vicinity.

While there are no known cultural resources at the Project site, Native Americans were known to have inhabited the region and there is an indication of a tribal cultural place in the vicinity. There are also records of historic-period development in the area. Therefore, disturbance of native soils would be considered to have moderate potential for discovery of Native American resources or historic-period archaeological resources. Similarly, while there is no indication that human remains are present at the Project site, the potential exists for discovery during ground disturbing activities.

Impact Culture-1: Disturbance of Previously Unknown Cultural Resources or Human Remains. During earth-moving activities that would disturb native soils, it is possible that previously unknown cultural resources or human remains could be uncovered and disturbed.

Given the nature of the existing site (landfill) and the limited extent of disturbance to native soils proposed, development of the Project site as proposed would not be expected to result in any substantial adverse effects on any cultural resource. However, any disturbance of native soils carries the possibility that previously unidentified cultural resources or human remains could be uncovered. This potentially significant impact can be mitigated though implementation of the following standard measures.

Mitigation Measure

Culture-1a: Halt Construction Activity, Evaluate Find and Implement Mitigation. In the event that any previously unidentified cultural resources are uncovered during site preparation, excavation or other construction activity, all such activity shall cease until these resources have been evaluated by a qualified archaeologist (or other qualified specialist as appropriate) and specific measures can be implemented to protect these resources in accordance with sections 21083.2 and 21084.1 of the California Public Resources Code.

Mitigation Measure

Culture-1b: Halt Construction Activity, Evaluate Remains and Take Appropriate Action in Coordination with Native American Heritage Commission. In the event that any human remains are uncovered during site preparation, excavation or other construction activity, all such activity shall cease until these resources have been evaluated by the County Coroner, and appropriate action taken in coordination with the Native American Heritage Commission in accordance with section 5097.98 of the California Public Resources Code, and section 7050.5 of the California Health and Safety Code, as applicable.

Incorporation of mitigation measures Culture-1a and Culture-1b will reduce the impacts associated with possible disturbance of unidentified cultural resources or unidentified human remains at the Project site to a level of ***less than significant***.

MINERAL RESOURCES

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if it were to result in:

1. Loss of availability of a known mineral resource that would be of future value to the region and the residents of the state; or.
2. Loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

The Project site is a closed landfill and does not contain mineral resources. The proposed development of the Project site would not result in the loss of availability of any known mineral resources or the loss of availability of any locally important mineral resource recovery site (***no impact***).

POPULATION/HOUSING

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if it were to result in:

1. The inducement of substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or
2. The displacement of substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
3. The displacement of substantial numbers of people, necessitating the construction of replacement housing elsewhere.

*As detailed below, the Project would not displace people or housing and would have a **less than significant** impact with respect to population growth.*

As of January 1, 2016, the California Department of Finance estimated that there were 72,952 people living in the City of Union City, increased from 70,054 in 2010, which is an average population growth rate of about 1 percent per year. 21,464 housing units were reported with about 77% of those single-family homes (the rest being multi-family or mobile homes). The estimated average number of persons per household within Union City was 3.49.[1]

Development of the Project site as proposed would result in the addition of 33 new housing units on an infill site within the City of Union City that is currently designated and zoned for such development. The Project is not expected to foster economic or population growth (or the construction of additional housing) elsewhere, either directly or indirectly, as the City of Union City's General Plan policies and land use designations guide development decisions in the area surrounding the Project site.

Using the average number of persons per household estimated for the City of Union City (3.49), 33 new housing units could be expected to result in approximately 115 new Union City residents. This would represent less than 0.2 percent of the total population of Union City, which is within the 1 percent annual total growth in local population anticipated in a single year, given recent population growth trends.

[1] State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark. Sacramento, California, May 2008.

There are currently no housing units or people living at the Project site that will be displaced by the proposed Project. While 33 new residential units are proposed, the proposed level of population growth in the 511 Area of Union City (an area identified for single-family residential development) would not be regarded as a significant adverse environmental impact, and the proposed Project would not be considered growth inducing (***less than significant***).

PUBLIC SERVICES

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if it were to result in:

1. Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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 of the public services:
   - fire services
   - police services
   - schools
   - parks
   - other public facilities

As detailed below, the Project would marginally increase demand for public services but would not require new or altered governmental facilities and the impact to public services would be ***less than significant****.*

Police and Fire Services

The Alameda County Fire Department provides emergency medical services, fire suppression, hazardous materials response services, fire prevention services, public education and disaster preparedness within Union City. The City of Union City Police Department (UCPD) provides police services.

The Project site is located in an urbanized area that already receives adequate fire and police protection services. Although the proposed Project would result in some increase in the current demand for services, development of the Project site as proposed would not require the development of new police or fire protection facilities in order to continue to provide an adequate level of police protection, fire protection and emergency services within the area (***less than significant***).

Schools

Public schools are provided within Union City and southern Hayward by the New Haven Unified School District (NHUSD), which serves over 12,000 students.[2] While the Project will be expected to generate new students to be served by the New Haven Unified School District, this level of development would not be expected to require the development of new public schools above the level already anticipated in the General Plan (***less than significant***). The Project applicant will be required to pay all applicable school impact mitigation fees established by the NHUSD prior to the issuance of any building permits. Under Government Code Section 65995, the payment of these fees is deemed to be full and complete mitigation for Project-related impacts on school facilities.

[2] NHUSD website, https://www.mynhusd.org.

Library

Alameda County Library provides library services from ten branch libraries in the cities of Albany, Dublin, Fremont, Newark and Union City and the unincorporated communities of Castro Valley and San Lorenzo. Union City Library is a branch of the Alameda County Library located in the Union City Civic Center complex.[3]

The Project site is located in an urbanized area where development has been anticipated under the General Plan. Although the proposed development of the Project site would result in some incremental increase in the demand for public services generally (and for library services in particular), it is unlikely that the level of residential development would require the construction or expansion of existing public facilities (e.g., the Union City Library) above the level already anticipated in the General Plan (***less than significant***).

RECREATION

Under the CEQA Guidelines, Appendix G – Environmental Checklist Form, development of the Project site as proposed would have a significant environmental impact if it were to result in:

1. Increased use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
2. The development of Project-related recreational facilities, or the construction or expansion of public recreational facilities, which might have an adverse physical effect on the environment.

*As detailed below, the Project would marginally increase demand for parks and other recreational facilities, but would not substantially contribute to deterioration or require new or altered governmental facilities beyond the off-site improvements proposed as part of the Project (**less than significant)**.*

The City of Union City maintains a system of parks ranging from small mini-parks (used to provide low-use recreational facilities such as picnic sites and play equipment) to larger community parks (which provide recreational opportunities for more active uses such as tennis courts, multi-use sports fields, and performance areas). The City also has a network of bike routes, pathways and trails that provide opportunities for recreational use in more natural or open-space areas. As a portion of the Project, the applicant proposes off-site improvements to Sea Breeze Park and improvements to the informal gravel path adjacent to the stormwater basins to create a new interpretive trail. The applicant will also pay park in-lieu fees consistent with Chapter 17.30 of the Municipal Code.

Residential development at the Project site as proposed would result in an incremental increase in the number of local residents using local parks and recreational facilities, but would not be expected to result in substantial deterioration of existing facilities. The environmental effects associated with the construction of the proposed off-site recreational improvements have been evaluated as part of the proposed Project in the EIR and the Project would not be expected to require the development of any other new parks or recreational facilities above the level already anticipated in the General Plan or to result in substantial deterioration of existing parks and recreational facilities (***less than significant***).

COMMITMENT OF RESOURCES AND SIGNIFICANT IRREVERSIBLE MODIFICATIONS IN THE ENVIRONMENT

The Project represents reclaiming a landfill site and would not result in a loss of natural lands. Development of the Project site as proposed could result in the commitment of nonrenewable

[3] Alameda County Library website, http://www.aclibrary.org.

resources (e.g., gravel and petroleum products) and slowly renewable resources (e.g., wood products) used in Project construction. However, the resource consumption for construction activities would not result in long-term depletion of non-renewable resources and would not permanently increase reliance on resources that are not renewable.

The operation of residences at the Project site would also require further commitment of resources (e.g., petroleum products for vehicle operations, natural gas and electricity for lighting, heating, and cooling). The use of nonrenewable resources for Project operation would be consistent with the use of such resources by other residential development and is expected to account for a minimal portion of the region's resources and would not substantially affect the availability of these resources for other needs within the region.

Although the Project would result in the irreversible commitment of resources, the impact would not be significant, and the decision by the Lead Agency to commit these resources would meet goals to increase the supply of housing for Union City residents and improve recreational areas.

GROWTH INDUCING IMPACTS

The proposed Project would reclaim a closed landfill site and add 33 new housing units, consistent with the City's General Plan and 511 Area Specific Plan. Development of the Project site as proposed, in an infill area designated for future development, served by existing utilities and adjacent to existing residential development, would not be expected to foster economic or population growth (or the construction of additional housing) elsewhere, either directly or indirectly, as the City of Union City's General Plan policies and land use designations guide development decisions in the area surrounding the Project site. This level of planned growth would not be regarded as a significant adverse environmental impact, and this Project would not be considered growth inducing.

CUMULATIVE IMPACTS

As defined in Section 15355 of the CEQA Guidelines, a cumulative impact consists of an impact that is created as a result of the combination of the Project evaluated in the EIR together with other projects causing related impacts. "Cumulative impacts" refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The cumulative scenario used in this analysis is build-out of the General Plan. The potential for cumulative impacts are discussed in the analysis chapters 4 through 14. In summary, the Project would result in significant and unavoidable cumulative impacts related to construction-period noise and odors. Development of the Project site as proposed would also contribute to a cumulative increase in impacts related to Air Quality, Geology and Soils, Hazardous Materials, Hydrology, Noise, and Transportation/Traffic. However, the Project's contribution to these cumulative effects would be ***less than significant*** or would be reduced to a level of less than cumulatively considerable through implementation of any Project-specific mitigation measures.

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ALTERNATIVES

INTRODUCTION

The California Environmental Quality Act Guidelines (CEQA Guidelines, 1970, as amended, Section 15126.6) require an EIR to include a discussion of a reasonable range of alternatives to the proposed project. The CEQA Guidelines also require that the EIR explain why specific project alternatives considered at one time were rejected in favor of the proposed project. The selection of alternatives is to be guided by the provision of reasonable choices and the promotion of informed decision making and informed public participation. An EIR need not evaluate alternatives that would have effects that cannot be determined, or for which implementation would be remote and speculative.

The Guidelines also require that the EIR specifically evaluate a "no project" alternative within this discussion and that an "environmentally superior" alternative be identified (Section 15126.6 [e]).

The alternatives addressed in this EIR were selected based on the following factors:

1. The extent to which the alternative would accomplish most of the basic project objectives.
2. The extent to which the alternative would avoid or lessen any of the identified significant environmental effects of the project (discussed in Chapters 4 through 15).
3. The potential feasibility of the alternative (as discussed in this Chapter).
4. The extent to which the alternative contributes to a "reasonable range" of alternatives necessary to permit a reasoned choice.

The proposed Project is fully described in Chapter 3 of this EIR (Project Description). The environmental consequences are addressed in Chapters 4 through 15 of this EIR.

PROJECT OBJECTIVES

CEQA requires the analysis of alternatives that 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."[1] Therefore, the stated objectives can be used as a metric against which an alternative can be measured when determining overall feasibility.[2] Additionally, CEQA requires the evaluation of a proposed project to address only impacts to the physical environment; economic and social effects can be analyzed only as one link in a chain of cause and effect from a proposed decision (e.g., physical changes caused, in turn, by economic and social changes).[3] However, economic viability can be considered when determining the feasibility of a project alternative.[4]

The following are the objectives that would be fulfilled by the proposed Project. Alternatives are evaluated in part based on their ability to meet these objectives.

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[1] *CEQA Guidelines*, Section 15126.6 (a)

[2] Ibid., Section 15126.6 (a)

[3] *CEQA Guidelines*, Section 15131.

[4] Ibid., Section 15126.6(f)(1).

1. To develop housing on an infill site in an economically feasible manner on an underutilized parcel consistent with the quality and aesthetics of the surrounding neighborhood.
2. To enhance neighborhood amenities with improvements to Sea Breeze Park and to provide a trail link along the storm detention ponds to the park.
3. To correct settlement issues and reestablish the effectiveness of the final cover of the Turk Island Landfill.

PROJECT IMPACTS

Based on the analysis contained in this EIR, implementation of the Project would result in two impacts considered significant and unavoidable even after the implementation of identified mitigation. Both impacts would occur during the excavation/consolidation and backfill stage of construction and represent the possibility to impact neighbors and park users with noise (Impact Noise-1) and/or odors (Impact Air-2) during this period.

The Project would result in potentially significant impacts that would be reduced to less than significant levels with the implementation of mitigation measures recommended in this document associated with the following topics.

- Aesthetics
- Air Quality
- Biological Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Transportation and Circulation
- Utilities
- Cultural Resources

All other topic areas would have no impact or less than significant impacts only.

A comparison of the alternatives with respect to all the topic areas listed above is included in Table 16.1 at the end of this chapter.

ALTERNATIVES ANALYSIS

The alternatives analysis is presented as a comparative analysis to the proposed Project. A project may have the potential to generate significant impacts, but changes to certain features may also afford the opportunity to avoid or reduce such impacts. The following alternatives analysis compares the potential significant environmental impacts of the alternatives with those of the proposed Project for each of the environmental topics analyzed in detail in Chapters 4 through 15 of the EIR and discusses feasibility of implementation, and ability to meet objectives.

SELECTION OF ALTERNATIVES

Three alternatives to the Project are evaluated in this chapter. Each of the alternatives is located on the Project site.

- The **"No Project" Alternative** represents a scenario in which the existing uses at the Project site remain in place.

- The **"Carmel Way Access" Alternative** representing a scenario with access to Parcel "C" provided from Carmel Way instead of Westport Way (and resultant reduction in units).
- The **"Full Consistency" Alternative** would be fully consistent with all development standards (without requiring Planned Use Development approval) under the existing zoning, which would result in fewer residential units being built at Parcel "C".

These alternatives are described in more detail in the following analysis.

Alternatives Rejected From Further Consideration

As described above, Section 15126.6(c) of the CEQA Guidelines requires an EIR to identify any alternatives that were considered by the lead agency but were rejected as infeasible or for other reasons during the scoping process and briefly explain the reasons underlying the lead agency's determination.

The following alternatives were initially considered, but were rejected from further consideration for the reasons described below.

An off-site alternative was initially considered because it had the potential to reduce or eliminate the impacts related to the removal of landfill materials. However, the current proposal is specific to the Project site and consistent with zoning for the site. The City's Housing Element (adopted in 2015) does not identify other sites that would accommodate a similar single family home project without the need to rezone the site. An off-site alternative would result in the zoned residential units not being developed at the Project site and if moved to a different vacant site, the down-zoning of that site to allow reduced development intensity. Because both of these results would affect the City's ability to meet its share of the Regional Housing Need, and could lead to the City being non-compliant regarding state housing law, an off-site alternative was rejected from further consideration.

Because any residential development of the site would require the full excavation/consolidation and backfill activities to make the site suitable for development, reducing the number of residential units would not substantially change construction-related impacts, which are the source of the significant and unavoidable impacts of the project. Operational impacts of the project are all less than significant or reduced to that level through mitigation and differences in the number of residential units on the site would be expected to have only marginal differences in these already less than significant operational impacts (see assessment of alternatives below). That being said, two alternatives that would reduce the resultant number of residential units have been assessed in this chapter to explore community-requested changes in access and consistency with development standards and provide a reasonable range of reduced density alternatives. The number of units under these alternatives are 28 units and 19 units respectively. While other reduced development options could be devised, they would not substantially add to the reasonable range of alternatives and relative impacts as described above.

It is not possible to fully evaluate every possible alternative to the proposed Project. The assessed alternatives satisfy the requirement to consider and discuss "a range of reasonable alternatives to the project" pursuant to CEQA Guidelines section 15126.6. As discussed in the descriptions above, these alternatives were chosen as reasonable alternatives at this site and no additional alternatives were identified that would substantially contribute to a meaningful evaluation, analysis, and comparison of the Project to possible alternatives.

"NO PROJECT" ALTERNATIVE

Alternative Description

Under the "No Project" Alternative, there would be no new development at Parcel "C", and the Project site, including the Turk Island landfill, would be maintained as a closed landfill.

Impact Summary

Under the "No Project" Alternative, the Project site would remain as it is today. Therefore, the significant and unavoidable project impacts related to construction odors and noise would be avoided or reduced to less than significant levels and other construction-related impacts would also be avoided or marginally reduced. Because there would be no operational changes, the Project's already less than significant operational impacts would also be avoided.

However, existing settlement and related drainage issues at the main Turk Island Landfill would not be corrected under this alternative and existing emissions from debris at Parcel "C" would remain uncontrolled as these would not be added to the collection system and flare operating at the main Turk Island Landfill.

Air Quality and Odors

Because landfill waste materials would not be disturbed under the "No Project" alternative, the potential to expose odor-generating landfill waste during construction would not occur and this significant and unavoidable impact of the Project would be fully avoided.

There would be no new construction or operational emissions and therefore no impacts related to criteria pollutant and toxic air contaminant emissions during construction and operation.

However, under this alternative, existing emissions from debris at Parcel "C" would remain uncontrolled as these would not be added to the collection system and flare operating at the main Turk Island Landfill only.

Noise

Noise levels under the "No Project" Alternative would remain unchanged from current noise levels at the Project site and there would be no impacts related to noise.

Aesthetics

The visual character of the Parcel "C" would remain unchanged under the "No Project" Alternative and there would be no temporary degradation of visual character associated with excavation of the Parcel "C" site.

Biological Resources

There would be no changes to the Project site under the "No Project" Alternative and no impacts related to biological resources.

Geology and Soils

Under this alternative, there would be no change from the current conditions in the exposure of people to potential geologic hazards, as no residential development would take place. This alternative would not correct identified settlement issues at the main Turk Island or reestablished slopes.

Hazards and Hazardous Materials

While this alternative would not result in improvements to Parcel "C", the existing conditions already include fencing to prevent access to landfill sites and monitoring for off-site landfill gas migration and the existing condition does not present significant concerns to the public under current operating conditions. There would be no changes to the existing condition of the Project site under this alternative and therefore no impacts related to hazards and hazardous materials.

Hydrology and Water Quality

There would be no changes in existing drainage patterns of the Project site under this alternative and therefore no impacts related to hydrology.

However, existing settlement and related drainage issues at the main Turk Island Landfill would not be corrected under this alternative.

Land Use/Planning

Retaining the existing uses at the Project site under the "No Project" Alternative would be inconsistent with the ultimate land use anticipated for the Parcel "C" area under the City's General Plan, as this portion of the 511 Area has been identified as a site to support single-family residential development. The "No Project" alternative would also not result in any recreational improvements, park fees, or trail connections. However, allowing the existing uses at the Project site to remain indefinitely would not result in any physical division of an existing community and would not conflict with any formal plans or programs intended to protect habitats so would be considered a less than significant impact. A system is already in place for monitoring landfill gas migration to the surrounding neighborhood and with no conversion of Parcel "C" to residential development, there would be no need for additional monitoring.

Transportation/Traffic

There would be no construction activities and no changes in operational activities under this alternative and therefore no changes in existing traffic patterns or congestion under this alternative (no impact).

Utilities and Service Systems

Demand for utility services would remain unchanged under the "No Project" Alternative, which does not propose any changes to use of the site.

Cultural Resources

With no potential to disturb native soils, there would be no potential to encounter underground cultural resources and no need to the mitigation identified in Chapter 15.

Ability to Accomplish Project Objectives and Feasibility

A "No Project" Alternative would not meet any of the project objectives, as it would not create new housing or recreational improvements or fees.

This alternative represents the possibility that no project is approved on this site. This site is zoned to allow for residential development and the potential for the development in accordance with existing plans and standards is analyzed under the "Full Consistency" Alternative.

"CARMEL WAY ACCESS" ALTERNATIVE

Alternative Description

Under the "Carmel Way Access" Alternative, the development proposed at the Project site would remain generally the same except that access to on-site roadways would be provided from Carmel Way rather than from Westport Way. This alternative was developed to explore the environmental implications of access off Carmel Way in response to stated preferences of existing Westport Way residents. A potential layout for this alternative is included as **Figure 16-1**, and would result in the development of 28 single-family homes at the Parcel "C" site. This represents a reduction of 5 units or 15%.



Figure 16-1: "Carmel Way Access" Alternative Potential Layout

Source: RJA, dated 3/29/2017

Impact Summary

Under the "Carmel Way Access" Alternative, impacts would remain substantially the same as they are under the Project. The bulk of the construction activities (excavation/consolidating and backfill) would still be required, resulting generally the same construction-period impacts, including significant and unavoidable impacts related to waste odors and construction noise. The small (15%) reduction in residential units would not substantially change already less than significant operational impacts.

This alternative was assessed in response to feedback received from neighborhood residents. Westport Way has adequate capacity to accommodate the proposed development from a transportation and site planning perspective. While it doesn't rise to the level of environmental impacts, as both configurations would be considered safe and adequate, the proposed Project is preferable because the "Carmel Way Access" Alternative would reduce access points from two to one and directly access a busier street and at an intersection that would not be all-way stop-controlled.

Aesthetics

This alternative would result in the same temporary visual degradation during excavation of Parcel "C" and same general changes to the visual character resulting in a residential development consistent with the existing character of the surrounding area. There would be no substantial changes in the impacts and mitigation related to aesthetics under the "Carmel Way Access" Alternative.

Air Quality

Air pollutant emissions associated with the residential units under the "Carmel Way Access" Alternative would be marginally less than those associated with the proposed Project, during both construction and operation. Because the bulk of the proposed construction activities (excavation/consolidating and backfill) would still be required under this alternative, impacts related to dust, criteria pollutants, and toxic air contaminant emissions would be the generally same as under the Project, including the significant and unavoidable impact related to odors.

Biological Resources

Impacts to biological resources at the Project site and in the vicinity under this alternative would be identical to those associated with the proposed Project. Disturbance of the site could result in the direct loss or injury to burrowing owls if they are on site, which would be mitigated to a less than significant level through pre-construction evaluation and implementation of appropriate avoidance measures, as identified in Chapter 6: Biology.

Geology and Soils, Hazards and Hazardous Materials, Hydrology and Water Quality

The Project footprint, site preparations, and improvements to the primary landfill would be generally the same under this alternative and would therefore have generally the same impacts related to geology and soils, hazards and hazardous materials, and hydrology and water quality as under the Project. As with the Project, implementation of the mitigation measures identified in Chapters 7, 8, and 9 would reduce impacts in these topics to a level of less than significant.

Land Use/Planning

Although development under the "Carmel Way Access" Alternative would be reduced from that proposed under the Project, it is likely that a Conditional Use Permit for a Planned Unit Development would be required to meet lot size, dimension, and setback requirements in aggregate instead of on each lot.

With Parcel "C" transitioning from a landfill use to a residential use, specific landfill gas monitoring and protection provisions will still need to be implemented as specified in Union City's Municipal Code (See Chapter 10: Land Use and Planning).

Noise

While construction of fewer residential units would shorten the duration of their construction, the majority of impacts would occur during the excavation/consolidation and backfill phase, which would remain unchanged from that proposed under the Project. Mitigation measures identified in Chapter 11: Noise would be employed to reduce impacts, but impacts related to construction noise would remain significant and unavoidable.

Transportation/Traffic

While construction of fewer residential units would shorten the duration of the construction, the majority of construction trips would occur during the excavation/consolidation and backfill phase, which would remain unchanged from that proposed under the Project.

With 15% fewer residential units proposed, there would be a corresponding reduction in the number of new operational trips generated. However, this would result in incremental reductions in already less than significant impacts related to transportation and circulation impacts.

Both the Project and the "Carmel Way Access" Alternative would provide adequate and safe access and circulation. The "Carmel Way Access" Alternative would be generally the same as the Project as it relates to transportation and circulation impacts.

While it doesn't rise to the level of an environmental impact, the proposed Project would be preferable to the circulation shown in the "Carmel Way Access" Alternative because this alternative would reduce access points from two to one, and directly access a busier street and at an intersection that would not be all-way stop-controlled.

Utilities and Service Systems

Under the "Carmel Way Access" Alternative, consolidation materials would be transported across the existing on-site sewer force mains between Parcel "C" and the Turk Island Landfill proper. The potential for damage to these lines due to heavy truck traffic would need to be mitigated as discussed in Chapter 13 and the impact would be similar to the proposed Project.

Ability to Accomplish Project Objectives and Feasibility

The "Carmel Way Access" Alternative would have the following ability to meet Project objectives:

1. The "Carmel Way Access" Alternative would meet to a lesser degree the objective to develop in-fill housing in an economically feasible manner on an underutilized parcel consistent with the quality and aesthetics of the surrounding neighborhood. This alternative would result in 28, rather than 33, residential units.
2. The "Carmel Way Access" Alternative would meet to a lesser degree the objective to enhance neighborhood amenities. As with the Project, this alternative would be required to pay in-lieu park fees, but it is assumed the additional improvements to Sea Breeze Park and the trail connection would not be part of a reduced alternative.
3. The "Carmel Way Access" Alternative would meet the objective to reestablish the effectiveness of the final cover of the Turk Island Landfill. Full excavation/consolidation activities would be required to develop this alternative the same as they would to develop the proposed Project.

The reduced intensity of development under the "Carmel Way Access" Alternative would meet all of the Project Objectives, though some would be to a lesser degree than would the proposed Project. Although this alternative would be otherwise feasible, it should also be noted that the Applicant has questioned the financial feasibility of this Alternative, as the private residential development would need to fund the excavation/consolidation and landfill improvement activities as well as off-site recreational improvements. A financial feasibility assessment would need to be submitted to support assertions of financial feasibility.

"FULL CONSISTENCY" ALTERNATIVE

Alternative Description

Under the "Full Consistency" Alternative, the basic character of the development proposed at the Project site would remain the same, however, it would be assumed to comply with all regulations of the 511 Area zoning district without the need for a Conditional Use Permit for a Planned Unit Development. Lot size, dimension and setback requirements would be met by each lot instead of in the aggregate. It is presumed for this discussion that this alternative would have the same general circulation layout as the proposed Project and to assess a reasonably different alternative, density at the low end of the allowable rage was assumed, which would result in the development of 19 single-family homes on Parcel "C", representing approximately 42% fewer residential units than the Project.

Impact Summary

Under the "Full Consistency" Alternative, impacts would remain substantially the same as they are under the Project. The bulk of the construction activities (excavation/consolidating and backfill) would still be required, resulting in generally the same construction-period impacts, including significant and unavoidable impacts related to waste odors and construction noise. The reduction in residential units would not substantially change already less than significant operational impacts.

This alternative was included to explore the difference in environmental impacts if the Project were held to all development standards for single family detached homes under the existing zoning. While the need for a Conditional Use Permit for a Planned Unit Development would not be required under this alternative, because such an approval process is specifically allowed when a project meets development standards in aggregate instead of on each lot, there is no associated environmental impact related to the need for that approval and therefore no change in the environmental impacts related to land use and planning between this alternative and the proposed Project.

Aesthetics

This alternative would result in the same temporary visual degradation during excavation of Parcel "C" and same general changes to the visual character resulting in a residential development consistent with the existing character of the surrounding area. There would be no substantial changes in the impacts and mitigation related to aesthetics under the "Full Consistency" Alternative.

Air Quality

Air pollutant emissions associated with the residential units under the "Full Consistency" Alternative would be marginally less than those associated with the proposed Project, during both construction and operation. Because the bulk of the proposed construction activities (excavation/consolidating and backfill) would still be required under this alternative, and because the amount of soil removed and then replaced on Parcel "C" remains unchanged between the proposed Project and this alternative, impacts related to dust, criteria pollutants, and toxic air contaminant emissions would be the generally same as under the proposed Project and this alternative, including the significant and unavoidable impact related to odors.

Biological Resources

Impacts to biological resources at the Project site and in the vicinity under this alternative would be identical to those associated with the proposed Project. Disturbance of the site could result in the direct loss or injury to burrowing owls if they are on site, which would be mitigated to a less than significant level through pre-construction evaluation and implementation of appropriate avoidance measures, as identified in Chapter 6: Biology.

Geology and Soils, Hazards and Hazardous Materials, Hydrology and Water Quality

The Project footprint, site preparations, and improvements to the primary landfill would be generally the same under this alternative and would therefore have generally the same impacts related to geology and soils, hazards and hazardous materials, and hydrology and water quality as under the Project. As with the Project, implementation of the mitigation measures identified in Chapters 7, 8, and 9 would reduce impacts in these topics to a level of less than significant.

Land Use/Planning

The "Full Consistency" Alternative would be fully consistent with development standards in the underlying zoning and a Conditional Use Permit for a Planned Unit Development would not be required. However, because such an approval process is specifically allowed when a project meets development standards in aggregate instead of on each lot, there is no associated environmental impact related to the need for that approval and therefore no change in the environmental impacts related to land use and planning between this alternative and the proposed Project.

With Parcel "C" transitioning from a landfill use to a residential use, specific landfill gas monitoring and protection provisions will still need to be implemented as specified in Union City's Municipal Code (See Chapter 10: Land Use and Planning).

Noise

While construction of fewer residential units would shorten the duration of their construction, the majority of impacts would occur during the excavation/consolidation and backfill phase, which would remain unchanged from that proposed under the Project. Mitigation measures identified in Chapter 11: Noise would be employed to reduce impacts, but impacts related to construction noise would remain significant and unavoidable.

Transportation/Traffic

While construction of fewer residential units would shorten the duration of their construction, the majority of construction trips would occur during the excavation/consolidation and backfill phase, which would remain unchanged from that proposed under the Project.

With 42% fewer residential units proposed, there would be a corresponding reduction in the number of new operational trips generated. However, this would result in incremental reductions in already less than significant impacts related to transportation and circulation impacts.

Utilities and Service Systems

Under this alternative, consolidation materials would be transported across the existing on-site sewer force mains between Parcel "C" and the Turk Island Landfill proper. The potential for damage to these lines due to heavy truck traffic would need to be mitigated as discussed in Chapter 13 and impacts would be similar to the proposed Project.

Ability to Accomplish Project Objectives and Feasibility

The "Full Consistency" Alternative would have the following ability to meet the following Project objectives:

4. The "Full Consistency" Alternative would meet to a lesser degree the objective to develop in-fill housing in an economically feasible manner on an underutilized parcel consistent with the quality and aesthetics of the surrounding neighborhood. This alternative would result in 24, rather than 33, residential units.
5. The "Full Consistency" Alternative would meet to a lesser degree the objective to enhance neighborhood amenities. As with the Project, this alternative would be required to pay in-lieu park fees, but it is assumed the additional improvements to Sea Breeze Park and the trail connection would not be part of a reduced alternative.
6. The "Full Consistency" Alternative would meet the objective to reestablish the effectiveness of the final cover of the Turk Island Landfill. Full excavation/consolidation activities would be required to develop this alternative the same as they would to develop the proposed Project.

The reduced intensity of development under the "Full Consistency" Alternative would meet all of the Project Objectives, though some would be to a lesser degree than would the proposed Project. Although this alternative would be otherwise feasible, it should be noted that the Applicant has questioned the financial feasibility of this Alternative, as the private residential development would need to fund the excavation/consolidation and landfill improvement activities as well as off-site recreational improvements. A financial feasibility assessment would need to be submitted to support assertions of financial feasibility.

SUMMARY OF EVALUATION OF ALTERNATIVES

The environmental effects that might be anticipated under each of the proposed alternatives were compared to those associated with the proposed Project by chapter for the environmental topics evaluated in the Draft EIR (Chapters 4 through 15). For the purposes of this evaluation, in those categories where an alternative would have no significant impact, a weight of "0" was assigned in the evaluation matrix. In those categories where the Project as proposed or an alternative would have a less than significant environmental impact, the relative magnitude of the impact is ranked "1". In those categories where the Project as proposed or an alternative would have significant impact that could be reduced through implementation of mitigation measures identified in the Draft EIR, a value of "2" is assigned. Where significant impacts have been identified that could not be reduced to a level of less than significant, a value of "3" would be assigned in the evaluation matrix. Using this system, each of the alternatives was assigned a total score, with the lowest score representing the environmentally superior alternative.

Using this scoring system, the "No Project" alternative was identified as the environmentally superior alternative, since it had the lowest total score (see **Table 16-1**). It should be noted, however, that this alternative does not meet any of the project objectives, and does not correct settlement issues at the Turk Island Landfill or add currently uncontrolled emissions at Parcel "C" to the landfill gas collection and flare system.

Under CEQA, when the "No Project" alternative has been identified as the environmentally superior alternative, it is necessary to identify another alternative that would represent the environmentally superior alternative in the absence of the "No Project" Alternative. The CEQA Guidelines require a consideration of whether alternatives "avoid or substantially lessen" significant impacts of the proposed Project. While the "Carmel Way Access" Alternative and the "Full Consistency" Alternative would both marginally reduce effects related to development and operation of residential units, these impacts are already less than significant under the proposed Project and would not be

substantially lessened or avoided. Impacts related to excavation, consolidation and backfill would not be able to be reduced under any alternative proposing development on Parcel "C" as the landfill site would first need to be fully reclaimed through this process even for reduced development intensities. Based on **Table 16-1** and the scoring system methodology outlined above, in the absence of the "No Project" alternative, the proposed Project, the "Carmel Way Access" Alternative, and the "Full Consistency" Alternative are equal in regard to level of impacts and would be substantially equivalent as the environmentally superior alternative.

Table 16-1: Comparison of the Project and Project Alternatives

Environmental Impact Category	Proposed Project	"No Project"	"Carmel Way Access"	"Full Consistency"
Aesthetics	2	0	2	2
Air Quality	3	0	3	3
Biological Resources	2	0	2	2
Geology and Soils	2	0	2	2
Hazards & Hazardous Materials	2	0	2	2
Hydrology and Water Quality	2	0	2	2
Land Use/Planning	2	0	2	2
Noise	3	0	3	3
Transportation/Traffic	2	0	2	2
Utilities/Service Systems	2	0	2	2
Greenhouse Gas Emissions	1	0	1	1
Other Topics	2	0	2	2
TOTAL	**25**	**0**	**25**	**25**

Key:

0 – No impact
1 – Less than significant impact(s)
2 – Less than significant impact(s) with implementation of mitigation measures
3 – Significant and unavoidable impact(s)

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REPORT PREPARERS AND REFERENCES

REPORT PREPARERS

This Draft EIR was prepared for the City of Union City as Lead Agency by Lamphier-Gregory in affiliation with the technical specialists listed below.

City of Union City
This document was prepared through coordination with Union City Senior Planner Avalon Schultz and other City staff.

Lamphier-Gregory - Primary Report Preparers
1944 Embarcadero
Oakland, CA 94606
510.535.6690
Rebecca Auld, Senior Planner

Ramboll Environ - Air Quality, Greenhouse Gas, and Odor Emissions; Health Risk
Michael Keinath, Principal
Aubrey R. Jones, CCM
Ted Bowie, MS, PE, CIH

Zander Associates - Biology
Leslie Zander, Principal Biologist

Northgate - Geology and Soils, Hazards and Hazardous Materials, Hydrology
Nancy Hendrickson, P.E.
Elizabeth Nixon, P.E.

Illingworth and Rodkin - Noise
Michael S. Thill, Principal

Fehr and Peers - Transportation and Circulation
Sam Tabibnia, P.E.
Ron Ramos, P.E.

REFERENCES

PROJECT DESCRIPTION

City of Union City, 1987. 511 Area Specific Plan, September 14, 1987.

AESTHETICS

California Department of Transportation Scenic Highway Program website: http://www.dot.ca.gov/hq/LandArch/scenic_highways/.

City of Union City, 2002. General Plan Policy Document, February 2002.

AIR QUALITY AND ODORS

AIHA, 2013. Odor Thresholds for Chemicals with Established Occupational Health Standards, Second Edition, 2013.

Amoore, J. E. and Hautala, E., 1983. Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution. J. Appl. Toxicol., 3: 272–290. doi:10.1002/jat.2550030603, 1983.

ATSDR, 1999. Toxicological Profile for Hydrogen Sulfide, Atlanta: U.S. Department of Health and Human Services. July 1999.

_____, 2001. Landfill Gas Primer - An Overview for Environmental Health Professionals, November 2001. Available at: https://www.atsdr.cdc.gov/HAC/landfill/html/toc.html.

Attfield, M.D., P.L. Schleiff, J.H. Lubin, A. Blair, P.A. Stewart, R. Vermeulen, J.B. Coble, and D.T. Silverman, 2011. The Diesel Exhaust in Miners Study: A Cohort Mortality Study With Emphasis on Lung Cancer. J Natl Cancer Inst. October 21.

Bay Area Air Quality Management District Air Pollution Summaries (http://www.baaqmd.gov/about-air-quality/air-quality-summaries)

_____, 1982. Regulation 7: Odorous Substances, March 17, 1982. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/reg-07/rg0700.pdf?la=en. Last accessed June 2, 2017.

_____, 2009. Ambient Air Quality Standards and Bay Area Attainment, via website http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.htm , accessed February 27, 2009.

_____, 2017. Bay Area Pollution Summary, last updated 1/5/2017, available at http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status.

_____, 2017. Clean Air Plan 2017: Spare the Air, Cool the Climate, Adopted April 2017.

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

California Air Resources Board (CARB), 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. Stationary Source Division and Mobile Source Division. October.

_____, 2009. The California Almanac of Emissions and Air Quality, Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants. Available at: https://www.arb.ca.gov/aqd/almanac/almanac09/chap409.htm, accessed July 2017.

_____, 2011a. Toxic Air Contaminant Identification List. Available at: http://www.arb.ca.gov/toxics/id/taclist.htm, accessed August 24, 2013.

_____, 2011b. Regulation for In-Use Off-Road Diesel-Fueled Fleets. Title 13, California Code of Regulations, Section 2449.

_____, 2012. In-Use Off-Road Diesel Vehicle Regulation.

_____, 2013. Glossary of Air Pollution Terms. Available at: http://www.arb.ca.gov/html/gloss.htm#T, accessed August 24, 2013.

CTDPH, 1997. Fact Sheet: Municipal Solid Waste Landfill Gases and Reproductive Health and the Danbury Landfill. January, 1997. Available at: http://www.ct.gov/dph/lib/dph/environmental_health/eoha/atsdr/danburylandfillgasfactsheet.pdf. Last accessed June 2, 2017.

International Agency for Research on Cancer (IARC), 2012. Press Release No. 213. IARC: Diesel Engine Exhaust Carcinogenic. June 12.

Office of Environmental Health Hazard Assessment (OEHHA), 1998. Findings of the Scientific Review Panel on The Report on Diesel Exhaust, as adopted at the Panel's April 22, 1998, meeting. April 22.

_____, 2002. Air Toxics Hot Spots Program Risk Assessment Guidelines: Part II Technical Support Document for Describing Available Cancer Potency Factors. California Environmental Protection Agency. December.

Silverman D.T., C.M. Samanic, J.H. Lubin, A.E. Blair, P.A. Stewart, R. Vermeulen, J.B. Coble, N. Rothman, P.L. Schleiff, W.D. Travis, R.G. Ziegler, S. Wacholder, M.D. Attfield, 2012. The Diesel Exhaust in Miners Study: A Nested Case-Control Study of Lung Cancer and Diesel Exhaust. J Natl Cancer Inst. October.

United States Environmental Protection Agency (EPA), 2002. Health Assessment Document for Diesel Engine Exhaust. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. EPA/600/8-90/057F. May.

_____, 2011. Integrated Risk Information System (IRIS). Available at: http://www.epa.gov/iris/.

_____, 2013. Toxic Air Pollutants. Available at: http://www.epa.gov/oar/toxicair/newtoxics.html, accessed August 24, 2013.

ZWA, 2017. Landfill Emissions. Available at: http://zerowasteamerica.org. Last accessed June 2, 2017.

GEOLOGY AND SOILS

Association of Bay Area Governments, 2005. www.abag.ca.gov.

California Geological Survey. web site http://www.quake.ca.gov/gmaps/PSHA/psha_interpolator.html.

HAZARDS AND HAZARDOUS MATERIALS

Cal-EPA DTSC, 2005. Advisory on Methane Assessment and Common Remedies at School Sites, School Property Evaluation and Cleanup Division, June 16; Cal-EPA DTSC, 2012. Evaluation of Biogenic Methane, March 28.

San Francisco Bay Regional Water Quality Control Board, 2016. Revision to Environmental Screening Levels ("ESLs") Technical Document, 2016.

HYDROLOGY AND WATER QUALITY

California Emergency Management Agency, 2009. Tsunami Inundation Map for Emergency Planning, Newark Quadrangle/Redwood Point Quadrangle, July 31, 2009.

Hydrology and Hydraulic Calculations, 2016. Tract 7728, Carmel Way, Westport Way Property, Union City California. Ruggeri-Jensen-Azar, May 2016.

Pacific Institute, San Francisco Bay Levees, available at https://databasin.org/datasets/ed05b99c85e94df5befb6e619847e378

LAND USE

City of Union City, Union City Municipal Code, Section 18.100

_____, 1987. 511 Area Specific Plan, September 14, 1987.

_____, 2002. General Plan Policy Document, February 2002

NOISE

Fehr & Peers, Inc., 2017. Turk Island Consolidation and Residential Traffic Impact Analysis-Draft, April 2017.

UTILITIES

Alameda County Water District, 2016. Urban Water Management Plan 2015–2020, June 9, 2016.

Bay Area Water Supply & Conservation Agency. Alameda County Water District Agency Profile (available at http://bawsca.org/members/profiles/alameda).

CalRecycle (formerly California Integrated Waste Management Board), 2017. Solid Waste Information System Facility/Site Database, accessed August 22, 2017 at: http://www.calrecycle.ca.gov/SWFacilities/Directory/01-AA-0009/Detail/.

City of Union City. Website: http://www.ci.union-city.ca.us/departments/going-green/community/garbage-and-recycling.

Union Sanitary District, 2009. website https://www.unionsanitary.com/about-us, accessed 2/5/09.

GREENHOUSE GAS EMISSIONS

Association of Bay Area Governments and Metropolitan Transportation Commission, Plan Bay Area 2040. Adopted July 18, 2013.

Bay Area Air Quality Management District, 2017. Clean Air Plan 2017: Spare the Air, Cool the Climate, Adopted April 2017.

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

Brekke, L.D., et al., 2004. "Climate Change Impacts Uncertainty for Water Resources in the San Joaquin River Basin, California." Journal of the American Water Resources Association. 40(2): 149–164. Malden, MA, Blackwell Synergy for AWRA.

California Air Resources Board (CARB), 2006c. Public Workshop to Discuss Establishing the 1990 Emissions Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions, Sacramento, CA. December 1.

_____, 2015. First Update to the Climate Change Scoping Plan: Building on the Framework Pursuant to AB 32, Published May 2015.

California Climate Change Center (CCCC), Our Changing Climate: Assessing the Risks to California, CEC- 500-2006-077, July 2006.

California Energy Commission (CEC), Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report, publication # CEC-600-2006-013-SF, Sacramento, CA, December 22, 2006; and January 23, 2007 update to that report.

_____, 2016. Building Energy Efficiency Standards, CA, available at http://www.energy.ca.gov/title24/2016standards/.

California Department of Natural Resources, 2012. California's Water- Energy Relationship, 2012.

California Environmental Protection Agency, 2006. Final 2006 Climate Action Team Report to the Governor and Legislature. Sacramento, CA. April 3.

City of Union City, 2010. Union City Climate Action Plan, prepared by AECOM,November 2010.

_____, 2014. 2010 Greenhouse Gas Inventory Update, January 2014.

Kiparsky, M. and P.H. Gleick, 2003. Climate Change and California Water Resources: A Survey and Summary of the Literature. Oakland, CA: Pacific Institute for Studies in Development. July.

Parmesan, C. and H. Galbraith, Observed Impacts of Global Climate Change in the U.S., Arlington, VA: Pew Center on Global Climate Change, November 2004.

United Nations Framework Convention on Climate Change (UNFCCC), Sum of Annex I and Non-Annex I Countries Without Counting Land-Use, Land-Use Change and Forestry (LULUCF). Predefined Queries: GHG total without LULUCF (Annex I Parties). Bonn, Germany, http://unfccc.int/ghg_emissions_data/ predefined_queries/items/3814.php.

U.S. EPA, 2017. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2015. U.S. EPA. April 15, 2017, Table 2-1: Recent Trends in U.S. Greenhouse Gas Emissions and Sinks.

U.S. Supreme Court, 2007. Massachusetts et al. v. EPA et al. (No. 05-1120, 415F 3d 50), April 2, 2007.

OTHER CEQA TOPICS

Alameda County Library. Website: http://www.aclibrary.org.

NHUSD. Website: https://www.mynhusd.org.

State of California, Department of Finance, 2008. E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark. Sacramento, California, May 2008.