Final
Supplemental Environmental Impact Report

Trumark Dumbarton Transit Oriented Development Residential Project

SCH #2010042012

March 2014

Prepared by:

NEWARK
california

In Consultation with:

DAVID J. POWERS & ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS & PLANNERS

PREFACE

This document, together with the Draft Supplemental Environmental Impact Report (Draft SEIR), constitutes the Final Supplemental Environmental Impact Report (FSEIR) for the Trumark Dumbarton Transit Oriented Development Residential Project. The Draft SEIR was circulated to affected public agencies and interested parties for a 45-day review period from December 24, 2013 to February 7, 2014. This volume consists of comments received by the City of Newark on the Draft SEIR during the public review period, responses to those comments, and revisions to the text and figures of the Draft SEIR.

In conformance with the California Environmental Quality Act (CEQA) and the CEQA Guidelines, the FSEIR provides objective information regarding the environmental consequences of the proposed project. The FSEIR also examines mitigation measures and alternatives to the project intended to reduce or eliminate significant environmental impacts. The FSEIR is intended to be used by the City and any Responsible Agencies in making decisions regarding the project. The CEQA Guidelines advise that, while the information in the FSEIR does not control the agency's ultimate discretion on the project, the agency must respond to each significant effect identified in the Draft SEIR by making written findings for each of those significant effects.

According to the State Public Resources Code (Section 21081), no public agency shall approve or carry out a project for which an environmental impact report has been certified which identifies one or more significant effects on the environment that would occur if the project is approved or carried out unless both of the following occur:

> (a) The public agency makes one or more of the following findings with respect to each significant effect:
>
> > (1) Changes or alterations have been required in, or incorporated into, the project which will mitigate or avoid the significant effect on the environment.
> >
> > (2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency.
> >
> > (3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities of highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report.
>
> (b) With respect to significant effects which were subject to a finding under paragraph (3) of subdivision (a), the public agency finds that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment.

ORGANIZATION OF THE FINAL SEIR

This document, which includes responses to comments and text revisions, has been prepared in accordance with Section 15088 of the CEQA Guidelines. The Final SEIR included the following sections:

Section 1.0 List of Agencies, Organizations, and Individuals Who Received the Draft SEIR

The agencies, organizations, and individuals who received copies of the Draft SEIR are listed in this section.

Section 2.0 List of Comment Letters Received on the Draft SEIR

This section contains a list of all parties who submitted written comments on the Draft SEIR.

Section 3.0 Responses to Comments Received on the Draft SEIR

This section contains written comments received on the Draft SEIR and the responses to those comments.

Section 4.0 Revisions to the Text of the Draft SEIR

This section contains text revisions to the Draft SEIR. Text revisions can be made as a result of comments received during the Draft SEIR public review process, corrections or clarifications to the text, or to reflect modifications that have been made to the project to reduce impacts.

Section 5.0 Revisions to the Figures of the Draft SEIR

This section contains revisions to one or more figures contained within the Draft SEIR. Figure revisions can be made as a result of comments received during the Draft SEIR public review process, corrections or clarifications to the figure, or modifications that have been made to the project to reduce impacts.

Section 6.0 Copies of the Comment Letters Received on the Draft SEIR

This section contains copies of the comment letters received.

Section 7.0 Revised Appendices to the Draft SEIR

This section contains revisions to one or more of the technical appendices included in the Draft SEIR.

In accordance with CEQA and the CEQA Guidelines, the FSEIR will be made available to the public prior to consideration of certification of the Supplemental Environmental Impact Report.
All documents referenced in this FSEIR are available for public review online at the City of Newark's website: http://www.ci.newark.ca.us/ and at the following locations:

City of Newark
37101 Newark Boulevard
Newark, CA 94560
(510) 578-4208
Hours available:
Monday - Friday: 8:00 a.m. to 5:00 p.m.
Closed on the following Fridays:
February 28; March 7, 14; April 11, 25

Newark Branch Library
6300 Civic Terrace Avenue
Newark, CA 94560
(510) 795-2627
Hours available: Sunday: 1 p.m. - 5p.m.
Tuesday and Thursday: 1 p.m. - 9 pm.
Wednesday and Friday: 10 a.m. - 6 p.m.
Saturday: 10 a.m. - 5 p.m.

TABLE OF CONTENTS

PREFACE i

SECTION 1.0 LIST OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS WHO RECEIVED THE DRAFT SEIR 1

SECTION 2.0 LIST OF COMMENT LETTERS RECEIVED ON THE DRAFT SEIR 2

SECTION 3.0 RESPONSES TO COMMENTS RECEIVED ON THE DRAFT SEIR 3

SECTION 4.0 REVISIONS TO THE TEXT OF THE DRAFT SEIR 59

SECTION 5.0 REVISIONS TO THE FIGURES OF THE DRAFT SEIR 67

SECTION 6.0 COPIES OF THE COMMENT LETTERS RECEIVED ON THE DRAFT SEIR ... 68

SECTION 7.0 REVISED APPENDICES TO THE DRAFT SEIR 69

SECTION 1.0 LIST OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS WHO RECEIVED THE DRAFT SEIR

Copies of the Draft SEIR and/or Notice of Availability for the Draft EIR were sent to the following agencies, organizations and individuals:

AGENCIES

Alameda County Water District
Union Sanitary District
Alameda County Transportation Commission
Regional Water Quality Control Board, Region 2
California Department of Transportation, District 4
San Francisco Public Utilities Commission
California Department of Fish and Wildlife, Region 3
California Department of Parks and Recreation
California Department of Water Resources
California Department of Toxic Substances Control
California Department of Transportation
California Highway Patrol
California Native American Heritage Commission
California Resources Agency
San Francisco Bay Conservation and Development Commission

SECTION 2.0 LIST OF COMMENT LETTERS RECEIVED ON THE DRAFT SEIR

Shown below is a list of comment letters received on the Draft EIR. This list also identifies the date of the letter received. Complete copies of all the letters are included in *Section 6.0* of this Final SEIR.

A.	San Francisco Bay Regional Water Quality Control Board	February 7, 2014
B.	California Department of Toxic Substances Control	February 7, 2014
C.	Alameda County Water District	February 6, 2014
D.	San Francisco Public Utilities Commission	February 7, 2014
E.	Margaret Lewis	February 7, 2014
F.	CH2M Hill, on behalf of Honeywell International, Inc.	February 7, 2014
G.	Cargill	February 7, 2014

SECTION 3.0 RESPONSES TO COMMENTS RECEIVED ON THE DRAFT SEIR

The following section includes all the comments on the Draft EIR that were received by the City of Newark in letters and emails during the 45-day review period. The comments are organized under headings containing the source of the letter and the date submitted. The specific comments from each of the letters or emails are presented as "Comment" with each response to that specific comment directly following. Each of the letters and emails submitted to the City of Newark are attached in their entirety in *Section 6.0* of this document.

CEQA Guidelines Section 15086 requires that a local lead agency consult with and request comments on a Draft Environmental Impact Report (or Supplemental Environmental Impact Report) prepared for a project of this type from responsible agencies (government agencies that must approve or permit some aspect of the project), trustee agencies for resources affected by the project, adjacent cities and counties, and transportation planning agencies. Section 1.0 of this document lists all of the recipients of the Draft SEIR.

One of the comment letters received is from a public agency that may be a Responsible Agency under CEQA for the proposed project. The CEQA Guidelines require that:

> A responsible agency or other public agency shall only make substantive comments regarding those activities involved in the project that are within an area of expertise of the agency or which are required to be carried out or approved by the responsible agency. Those comments shall be supported by specific documentation. [§15086(c)]

Regarding mitigation measures identified by commenting public agencies, the CEQA Guidelines state that:

> Prior to the close of the public review period, a responsible agency or trustee agency which has identified what the agency considers to be significant environmental effects shall advise the lead agency of those effects. As to those effects relevant to its decisions, if any, on the project, the responsible or trustee agency shall either submit to the lead agency complete and detailed performance objectives for mitigation measures addressing those effects or refer the lead agency to appropriate, readily available guidelines or reference documents concerning mitigation measures. If the responsible or trustee agency is not aware of mitigation measures that address identified effects, the responsible or trustee agency shall so state. [§15086(d)]

The CEQA Guidelines state that the lead agency shall evaluate comments on the environmental issues received from persons who reviewed the Draft SEIR and shall prepare a written response to those comments. The lead agency is also required to provide a written proposed response to a public agency on comments made by that public agency at least 10 days prior to certifying an environmental impact report. This FSEIR contains written responses to all comments made on the Draft EIR received during the advertised 45-day review period.

A. RESPONSE TO COMMENTS FROM SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD (RWQCB), FEBRUARY 7, 2014.

COMMENT A-1: Thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Report (SEIR) for the Trumark Dumbarton TOD Residential Project (Project) for development of Site A and Site B located within the Dumbarton Transit Oriented Development (TOD) Specific Plan Area. The Project proposes 27 homes at Site A (8375 Enterprise Drive) and 217 homes at Site B (8400 Enterprise Drive). As explained below, Sites A and B will require extensive and aggressive environmental cleanup prior to development to protect human health and safety.

As a Responsible Agency under California Environmental Quality Act (CEQA), the Regional Water Board is submitting comments on the SEIR for categories are germane to our agency's statutory responsibilities in connection with this Project. We rely on our Water Code authority to oversee the investigation and cleanup of sites in the Dumbarton TOD Specific Plan Area. We also consider and act on all proposals for case closure (i.e., no further action required).

Specifically, our comments pertain to the significant potential human health impacts posed by hazardous materials present in soil, soil gas, groundwater, airborne dusts and vapors in connection with this Project and the extensive volume of contaminated soil that has to be excavated from the site and transported offsite through City streets to the appropriate disposal facility. Additionally, we are commenting on cumulative impacts that were not considered in this SEIR, associated with similar cleanup projects for other contaminated sites in the Dumbarton TOD Specific Plan Area. These include: Gallade (Honeywell), Torian, FMC, Ashland, Romic, Newark Sportsmans' Club, and Cargill, where similar cleanup activities are needed prior to development.

The attached Regional Water Board comments are intended to guide the City of Newark and ensure that the environmental documentation adequately addresses the pollution in the Project area to protect human health and the environment.

Our past correspondence to the City of Newark regarding soil and groundwater cleanup issues in the Dumbarton TOD Specific Plan Area is listed below.

- May 22, 2008, Letter to City of Newark Regarding the Approved Conceptual Land Concept for the Area 2 Specific Plan.
- April 30, 20 l 0, Letter to City of Newark, NOP for Dumbarton TOD Specific Plan.
- June 30, 2011, Email to City of Newark, Draft EIR for Dumbarton TOD Specific Plan.
- July 27, 2011, Letter to City of Newark, Dumbarton TOD Specific Plan Final EIR.
- February 13, 2013, Letter to City of Newark, NOP for Newark General Plan Tune Up.
- March 8, 20 l3, Letter to City of Newark, NOP for Supplemental EIR for Dumbarton TOD Trumark Residential Project.
- September 27, 2013, Letter to City of Newark, General Plan Tune Up. Draft EIR for the City of Newark dated August 13, 2013.

If you have any questions regarding our comments, please contact Cherie McCaulou

(cmccaulou@.waterboards.ca.gov) in our Toxics Cleanup Division at (510) 622-2342.

RESPONSE A-1: This introductory cover letter identifies the San Francisco Bay Regional Water Board as a Responsible Agency and summarizes several points and issues raised in more detail in comments provided as attachments. Detailed responses to these issues are provided below responding to each specific comment. The comment concludes by listing a number of prior communications by the Regional Water Board to the City of Newark pertaining to the Dumbarton TOD Specific Plan and the two Trumark development sites that are the subject of the current SEIR, and these communications are on file with the City and available during normal business hours.

COMMENT A-2: Site A - Site Conditions

Please note the following clarifications for Site A site conditions.

- Development at Site A at 8375 Enterprise Drive, Newark, is dependent on successful soil and groundwater cleanup efforts by Honeywell International, Inc. (Honeywell). The Site Cleanup Requirements Order No. R2-2007-0005 adopted by the Regional Water Board requires Honeywell to remove soil, soil gas, and groundwater contamination originating at 8333 Enterprise Drive (current location of Gallade), which is the property immediately to the east of Site A and immediately west of residential homes on Aleppo Drive. The contamination is attributable to former hazardous waste facility operations by Baron-Blakeslee Inc. at 8333 Enterprise Drive.

- The contamination caused a significant groundwater plume, containing trichoroethene (TCE), tetrachoroethene (PCE) and other volatile organic compounds (VOCs) that has migrated from 8333 Enterprise Drive to the west and northwest, in particular Site A, Parcels F and G owned by FMC Corporation, and several existing single-family residences on Chestnut and Juniper Streets. The plume has also migrated easterly to the homes on Aleppo Drive that share a property line with the chemical plant.

- A land use covenant has been recorded against the title of 8333 Enterprise Drive which prohibits use of the property until the pollution has been abated. This industrial parcel would be redeveloped as a public park under the Dumbarton TOD Specific Plan. The land use covenant restricts the use of the property for commercial and industrial purposes only. A human health risk assessment for a park scenario has not been performed.

- Honeywell submitted a human health risk assessment for Site A in May 2013, which concluded excessive and unacceptable risks for residential use due to elevated TCE and PCE concentrations. This risk assessment may need to re-evaluate construction worker risks. Honeywell submitted an August 2013 Alternate Cleanup Plan consisting of: (1) shallow groundwater in-situ biodegradation, in lieu of in-situ chemical oxidation which failed; (2) vapor barriers to mitigate the excess risks of vapors coming from the groundwater as well as

other sources (contaminated soil and the neighboring parcel); and (3) soil excavation prior to development.

- A second human health risk assessment (September 2013) was performed by Honeywell for the existing residents on Aleppo Drive, Juniper Street and Chestnut Street. The assessment found no unacceptable risks to the existing residents. Staff has not yet concurred with the health risk assessment.

To mitigate the Significant Impact at Site A, the draft SEIR (on page 88) proposes amending Mitigation Measure 4.7-la of the *Dumbarton TOD Specific Plan EIR*, to address the specific conditions of Site A, as follows:

MM HAZ-1: *Prior to the issuance of grading permits or building permits for development of Site A, a remediation plan and a risk management plan must be prepared and submitted for review by the RWQCB. The RWQCB will review the plans to confirm that implementation of the plans would achieve Cal-EPA approved risk management standards for residential use of risk less than 10-6 and health hazard index of less than 1.*

Regional Water Board Staff cannot confirm that implementation of remediation plan(s) would achieve the above referenced standards, unless the remediation plan is fully implemented and demonstrated to be effective. The final SEIR should add language (presented on the last page) that requires the remediation plan be implemented and completed, and demonstrated to be effective based on post-remedial monitoring that shows a significant reduction of VOC concentrations that are cause of the human health exposure risks. A risk management approach is suitable only after the Regional Water Board has determined that the vapor intrusion threats have been significantly reduced and water quality objectives will be met in a reasonable time period.

RESPONSE A-2: The commenter asks the City to note certain facts regarding Site A conditions. These comments do not state specific concerns about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, these comments have been noted for the record and will be provided to the Planning Commission and City Council for consideration.

The commenter also summarizes its view of the contents of a health risk assessment and alternative cleanup plan submitted by Honeywell independent of the Trumark Dumbarton TOD Residential Project SEIR process. This comment does not state a specific concern about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, this comment has been noted for the record and will be provided to the Planning Commission and City Council for consideration. The City notes that the August 2013 Honeywell Alternate Cleanup Plan (ACP) does include listed item (1), enhanced in-situ bioremediation [not biodegradation] at Site A, and listed item (3), soil excavation at 8333 Enterprise Drive. However, the ACP does <u>not</u> include listed item (2), vapor barriers. Instead, vapor barriers

and other measures are proposed in Honeywell's December 20, 2013 Conceptual Risk Management Plan.

The commenter also summarizes the current status of a second health risk assessment prepared by Honeywell independent of the Draft SEIR for the Trumark project. This comment does not state a specific concern about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, this comment has been noted for the record and will be provided to the Planning Commission and City Council for consideration. In sum, the commenter's bulleted notes generally provide additional detail regarding environmental conditions and remediation efforts within the Specific Plan area that do not alter the conclusions of the Draft SEIR.

The commenter also requests that Draft SEIR hazard mitigation measures be revised to require, among other things, that a remediation plan be implemented and completed and demonstrated to be effective prior to the issuance of grading or building permits. The City does not interpret this comment to request changes to the 2011 TOD Specific Plan EIR mitigation measures, but rather the mitigation measures crafted specifically for remediation of Site A and Site B and presented in the 2013 Draft SEIR. On April 30, 2010, the Regional Board provided comments on proposed mitigation measures for hazardous materials for the TOD Specific Plan EIR. Among other things, these comments requested that risk assessments be prepared, remediation and risk management plans be required. In response to these comments, the City revised Mitigation Measure 4.7.1a. (Final TOD EIR Response to Comment 5-3.) The commenter made no further requests for revisions after the City provided the commenter its proposed response in the Final TOD EIR prior to the City certifying the TOD EIR. Please see Response A-25 to Comment A-25 below for an explanation of the revisions that will be made to the SEIR mitigation measures.

The commenter further states specifically that "Regional Water Board Staff cannot confirm that implementation of remediation plan(s) would achieve the above-referenced standards, unless the remediation plan is fully implemented and demonstrated to be effective." Mitigation Measure HAZ -1 has been revised to not restrict the risk management standards that the Regional Water Board Staff could apply to Site A. The City also notes that the commenter appears to be identifying an issue with the wording of MM HAZ-1: arguably, Regional Water Board Staff cannot confirm with 100% certainty that future implementation of remediation plan(s) would achieve the above-referenced standards. Rather, Regional Water Board Staff presumably can only confirm that remediation plans and risk management plans appear to be appropriately designed to meet a given performance standard. Accordingly, MM HAZ-1 is amended with the deletion of the word "would" and the insertion of "should" in its place. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR**.

This commenter further states that "A risk management approach is suitable only after the Regional Water Board has determined that the vapor intrusion threats have been significantly reduced and water quality objectives will be met in a reasonable time period." This comment's use of the terms "significant reduction" and "reasonable time period" appears to be citing RWQCB policies regarding site closure. However, the City notes that site closure is not being sought at this time. Further, this comment is inconsistent with the Cal/EPA DTSC Vapor Intrusion Mitigation Advisory, Oct. 2011 (attached as Appendix G to this FSEIR), which allows implementation of a risk management approach concurrently with remedial activities.

COMMENT A-3: Site A - Soil Contamination

The draft SEIR did not address the substantial soil contamination at 8333 Enterprise Drive, as discussed below:

- Soil contamination underlying Gallade's existing buildings and structures at 8333 Enterprise is required to be excavated prior to development, pursuant to Task C.6 of the Order R2-2007-0005. Removing this pollution source will prevent air impacts due to volatilization of chemical vapors from soil, leaching of contaminants to groundwater, and will reduce overall contaminant mass migrating offsite. A soil excavation work plan for this remedial task has not yet been submitted; however, such a work plan will be required pursuant to Task C.5 of the Order. The excavation of contaminated soil can only be performed after the Gallade buildings are demolished.

The final SEIR should mention the inevitable demolition of Gallade's buildings, and removal of contaminated soil considered a continuing source for adverse impacts to the neighborhood which persists at 8333 Enterprise (the property immediately to the east of Site A and immediately west of the single family homes on Allepo Drive).

The final SEIR needs to consider these potential impacts to existing residents when this work is carried out. Additionally, avoidance and mitigation measures including, air monitoring for toxic volatile vapors and dusts are needed to protect the existing residences and occupants from air quality impacts that will arise during soil removal.

RESPONSE A-3: The Commenter states that the Gallade Parcel must be excavated prior to development consistent with Order R2-2007-0005 and notes the environmental benefits of such excavation. Comment noted. The commenter also states that a work plan for such excavation will be required of the responsible party (neither the City nor Site A applicant Trumark) but has not yet been submitted. Comment noted. The commenter also states that excavation will require demolition of the structures on Gallade. Comment noted.

The commenter also requests that the SEIR mention the demolition of structures on the Gallade Parcel and the removal of contaminated soil from that site. As discussed on SEIR page 30, on September 8, 2011, the City of Newark certified

the Final Program Environmental Impact Report for the Dumbarton Transit Oriented Development Specific Plan (TOD EIR). The SEIR explains it is "intended to supplement the Dumbarton TOD EIR by evaluating impacts specifically from Trumark Homes' project within the Specific Plan Area." Impacts related to the potential development of Gallade Parcel, as well as the other parcels within the Specific Plan Area, are analyzed in the TOD EIR. The appropriate level of additional CEQA review related to those parcels will occur prior to approval of discretionary actions permitting development on those parcels. (See SEIR p. 44, CEQA Guidelines §§ 15152 (c), 15168(c).) As authorized by CEQA Guidelines § 15168(d)(3), the SEIR focuses on impacts unique to the applications presently under consideration (i.e. residential development on Sites A and B). (SEIR p. 50) The SEIR informs readers that it is not intended as a stand-alone document addressing all topics, issues and impacts, and is only intended to disclose new information developed subsequent to the certification of the TOD EIR. The commenter should review the TOD EIR for information related to the impacts related to the potential redevelopment of the Gallade Parcel as a public park and for cumulative impacts related to development activities throughout the Specific Plan Area.

The TOD EIR discloses that the Specific Plan area includes the Gallade Parcel and the Specific Plan land use plan designates the Gallade Parcel for "Park & Recreational Open Space" uses. (Specific Plan Exhibit 4.1.) The TOD EIR analyzes the development of the Gallade Parcel at the same level of detail as other properties within the Specific Plan area and imposes mitigation measures to address the potential environmental impacts associated with development within the Specific Plan area.

The TOD EIR recognized that the adoption of the Specific Plan would facilitate the development of new uses including park and recreational open space uses. (TOD EIR at 4.2-17.) The TOD EIR concluded that due to the extent of the development allowed under the Specific Plan, and the amount of earthwork that would be involved, construction emissions would have the potential to be significant. The TOD EIR recommended detailed mitigation measures applicable to all projects within the Specific Plan Area to address construction related emissions and concluded that after imposition of these mitigation measures, the impact related to construction emissions would be less than significant. (TOD EIR at 4.2-21.)

Likewise, the TOD EIR concluded that operational emissions related to Specific Plan development would be less than significant after the imposition of mitigation that would be imposed at the building permit stage. (TOD EIR at 4.2-24.) The TOD EIR also concluded implementation of the Specific Plan would not conflict with regional plans. (TOD EIR 4.2-29.) The TOD EIR reaches similar conclusions for related cumulative impacts.

The TOD EIR provided extensive detail on the environmental conditions found on the Gallade Parcel and the plans to remediate it, including soil excavation in the former process building area upon completion of building demolition and slab removal. (TOD EIR at 4.7-14-16.) This analysis also generally described the requirements of RWQCB Order No. R2-2007-0005 related to the eventual remediation of the Gallade Parcel. The TOD EIR disclosed that there are eight properties, including the Gallade Parcel, in the TOD Specific Plan Area that are known to have contaminated groundwater and soils including VOCs, petroleum and gasoline, phosphorous, various metals, arsenic, PCB PAHs, and other chemicals. The TOD EIR concluded that the impact from a significant hazard to the public or the environment from these eight properties was potentially significant.

The TOD EIR recommended mitigation measures on future development in the Specific Plan area to address this potential risk. These measures include the requirement that a property owner of a contaminated parcel: 1) summarize available information regarding the magnitude and extent of soil and groundwater contamination at the subject property; 2) perform a data gap analysis; 3) based on the results of the data gap analysis, determine whether any additional investigation is needed to fill data gaps and, if so, propose and perform such investigation with the approval of the Oversight Agency; 4) provide either a Health Risk Assessment (HRA) or Feasibility Study (FS) containing an HRA to summarize potential risks to human health and the environment posed by the contamination with respect to the proposed development; 5) based on the HRA or as set forth in the FS, develop remedial options to address the identified risks based upon the proposed development, which remedial option may include engineering or institutional controls, and tentatively select the most appropriate remedial option to ensure that the proposed development will not present an unacceptable risk to human health or the environment as required by applicable environmental laws, as well as procedures for proper management of contaminated soil and groundwater that may be encountered during development; and 6) submit a report to the Oversight Agency for review and regulatory approval of the proposed remedial plan, including engineering and/or institutional controls, under applicable environmental laws. (TOD EIR 4.7-29.)

The TOD EIR concluded that after implementation of these mitigation measures and compliance with applicable Federal, State and local standards, the impact related to these eight properties would be less than significant. (TOD EIR at 4.7-28.) These mitigation measures would be imposed on all development within the Specific Plan Area, including the Gallade Parcel, unless they are revised during subsequent environmental review. The TOD EIR also considered whether the development permitted by the Specific Plan would result in cumulatively considerable impacts related to hazards and hazardous materials. (TOD EIR at 4.7-34-35.) The TOD EIR concludes that "[c]ompliance with Federal, State, and local regulations would ensure that potential contamination or exposure to hazardous substances is avoided or controlled to minimize the risks to the public

on a case-by-case basis, as the cumulative projects are implemented. Impacts in this regard would be less than significant with implementation of recommended mitigation measures and compliance with applicable Federal State, and local regulations." (TOD EIR at 4.7-24-35.)

At the Gallade Parcel, the majority of the mitigation measures imposed by the TOD EIR have already been implemented by Honeywell, as successor to the former operator at the property, Baron Blakeslee, Inc. However, the RWQCB or other oversight agency may request updating of some items near the time that final approval of remedial plans in relation to park development is sought. For example, an HRA has been performed in relation to risks under the current uses of the Gallade Parcel. After park plans are developed, the HRA will need to be updated to include an assessment of park-related uses. In addition, while the RWQCB Order requires Honeywell to submit a workplan for excavation of impacted soil in the vicinity of the Former Process Building and the Former Mixing Room, the workplan is not due until such time as the Gallade Parcel is redeveloped, and thus the workplan remains to be completed.

In August 2013 Honeywell submitted to the RWQCB an Alternate Cleanup Plan (ACP) that proposed a remediation plan for shallow groundwater at the downgradient (western) edge of the Gallade Parcel and beneath Site A. The ACP was approved by the RWQCB in late August 2013. While implementation of the ACP is primarily intended to remediate groundwater at Site A (the Trumark Enterprise Parcel), it should also result in some remediation of groundwater at the Gallade Parcel. Enhanced in situ bioremediation (EISB) will be used to remediate VOC impacts at the downgradient edge of the Gallade Parcel and to the Enterprise Parcel to achieve residential ESLs, as specified in the approved ACP. EISB treatment involves the injection of an electron donor (a food source for microorganisms) through injection wells to stimulate microbial growth and ultimately dechlorinate PCE and TCE contaminants. Dechlorination would reduce PCE and TCE to their basic elements and render them non-toxic.

Construction and operation of the EISB system would involve drilling a series of injection wells at the downgradient edge of the Gallade Parcel and on the Enterprise Parcel, installing well equipment and the placement of a network of pipes and hoses connecting the wells with pumps and similar equipment. With the exception of the wells, equipment would likely be located above ground on temporary platforms or trailers. The set up and operation of the EISB system would involve a moderate amount of excavation and other construction which was analyzed in the Trumark Dumbarton TOD Residential Project SEIR.

As noted above, the TOD EIR requires that the agency with regulatory oversight of the project - in this case the RWQCB - review and approve the proposed remediation plan, prior to the issuance of grading or building permits for the project. The City of Newark would implement this requirement by requiring RWQCB approval of the remediation plan prior to issuing such permits. Further,

the addition of the mixing room footprint to potential excavation areas does not substantially increase the impacts identified in the TOD EIR.

The City also notes that the Gallade Parcel is subject to a DTSC covenant that limits the use of the Gallade Parcel to industrial and commercial uses. A variance to the covenant or removal of the covenant must be obtained pursuant to Health and Safety Code §§ 25223-25224 prior to the Gallade Parcel use as a park. These sections require DTSC to find that the proposed change in use would not result in (1) the creation or increase of significant present or future hazards to public health; (2) A significant diminution of the ability to mitigate any significant potential or actual hazard to public health; or (3) A long-term increase in the number of humans or animals exposed to significant hazards that affect the health, well-being, or safety of the public. For the covenant to be removed, DTSC must conclude that the hazardous waste that caused the land to be restricted or designated has since been removed or altered in a manner that precludes any significant existing or potential hazard to present or future public health.

The City also notes that the anticipated remedial activities for the Gallade Parcel required by RWQCB Order No. R2-2007-0005 have undergone CEQA review (by the RWCQB acting as lead agency) as part of the approval process for that order. (RWQCB Order No. R2-2007-0005, finding 17.) In that order, the commenter found that the activities required by Order No. R2-2007-0005 met the requirements of CEQA Guidelines Categorical Exemption Class 21. That finding required the commenter to conclude that its actions would not result in a significant effect due to unusual circumstances or in any cumulative impacts resulting from similar activities, i.e. the remediation of other parcels within the Specific Plan Area. CEQA Guidelines § 15300.2(b)-(c). As described above, the City reached similar conclusions in the TOD EIR.

There have been no project changes, changes in circumstances, or new information related to cumulative impacts or the Gallade Parcel that would meet the thresholds of CEQA Guideline Section 15162. Therefore, there is no need for further environmental review of these topics in the current SEIR for the Trumark residential project.

The commenter also suggests that additional mitigation measures should be required to protect existing residents from conditions on the Gallade parcel. Please see Responses A-2 and A-25 regarding revisions to the SEIR's hazard mitigation measures.

COMMENT A-4: Site A - Vapor Intrusion Risks

The very high TCE concentrations in groundwater underlying Site A pose a significant risk via vapor intrusion to any structures constructed above the plume, which adds to the vapor intrusion risk from soil gas due to vaporization from contaminated soil as long as that source is not removed. Recent

scientific evidence compiled by U.S. EPA indicates that exposing pregnant women to very low concentrations of TCE for just a few days dramatically increases the risk of fetal heart malformations. Therefore, the Regional Water Board has concerns over developing the property for residential use at this time.

The Regional Water Board recommends that significant groundwater remediation must be implemented and its success must be demonstrated with post remediation monitoring that includes collection of soil gas and groundwater samples for a period of time prior to occupancy of new buildings on the property. Previous attempts at remediation have not achieved remedial action levels for protection of vapor intrusion. In 2007, the remedial strategy, *in-situ chemical oxidation technology* was adopted in the Order (Task C.1) and implemented in 2007, but was deemed unsuccessful in 2011, despite promising results during initial pilot tests.

RESPONSE A-4: The commenter notes concerns regarding development of Site A for residential use at this time, due to high concentrations of TCE in groundwater underlying Site A. The Commenter also recommends that significant groundwater remediation be implemented and its success demonstrated prior to occupancy of new buildings at Site A. The City notes that a screening level Human Health Risk Assessment report regarding Site A was issued in May 2013 (included in the Draft SEIR as Appendix D-3), reporting vapor intrusion risks for potential future buildings in the range of $2x10^{-8}$ to $3x10^{-4}$, and an HI ranging from 0.0002 to 35 (with both ranges depending on location). The HHRA indicated that as a result, vapor intrusion mitigation measures should be considered for any future buildings on Site A. The City also notes that the 2011 Cal/EPA DTSC Vapor Intrusion Mitigation Advisory (VIMA), included as a new Appendix G to the SEIR, states that where risks are in excess of $1x10^{-4}$ (as they are at Site A in certain locations), vapor intrusion mitigation and source remediation are needed. Vapor intrusion mitigation is proposed for Site A in the December 2013 Honeywell Conceptual Risk Management Plan. Source remediation is being conducted pursuant to the 2007 Order and the August 2013 Alternate Cleanup Plan. Accordingly, it appears that activities consistent with the VIMA are being conducted. Further, the RWQCB has not provided new information indicating that the current and proposed activities are inconsistent with the VIMA or that when the proposed residences are built, risks will not be reduced below applicable thresholds. As a result, the City respectfully disagrees with the recommendation that significant groundwater remediation be implemented and its success demonstrated prior to occupancy of new buildings at Site A. Instead, according to the VIMA, vapor intrusion mitigation in conjunction with source remediation have been endorsed by the Cal/EPA as an appropriate means of addressing potential risk, and thus can be proposed by the parties in relation to the project sites.

COMMENT A-5: <u>Site A – Offsite Groundwater Plume Remediation</u>

We recently approved an August 2013 Alternate Cleanup Plan for in-situ biodegradation to remediated the offsite shallow groundwater plume. Pilot testing is underway to evaluate the likelihood of its success. We are looking forward to receiving the results to assess the feasibility of

this approach to remediate the TCE and PCB plume in a timely manner. There is no guarantee that the approved Alternate Cleanup Plan will lead to significant reductions in the pollutant concentrations, and meet the standards stated in MM-HAZ-1. Furthermore, the proposed remedial action has the potential to generate toxic or hazardous byproducts including methane. Methane in the subsurface can create pressure to push dangerous and explosive vapors along preferential pathways, including utility corridors such as the San Francisco Public Utilities Commission Hetch Hetchy pipeline or utility corridors serving the structures at the site, into the buildings. As long as the property remains undeveloped, the methane can simply move upward and vent into open air. Structures on the property along with their underground utilities could cause adverse effects of vapors. It is also possible that the plume may degrade into vinyl chloride, which is more carcinogenic than TCE.

RESPONSE A-5: The commenter notes that there is no guarantee that the August 2013 Alternate Cleanup Plan (prepared and submitted by Honeywell, independent of the Trumark project SEIR process) will lead to significant reductions in the pollutant concentrations, and meet the standards stated in MM HAZ-1. The City notes that while no remediation plan can guarantee significant reductions in pollutant concentrations, the RWQCB must have found the Alternate Cleanup Plan adequate; otherwise, the RWQCB presumably would not have approved the Plan. Moreover, the City notes that MM HAZ-1 includes both a remediation plan and a risk management plan. Hence, it is anticipated that a combination of remediation and risk management will be undertaken to meet the standards stated in MM HAZ-1. Please also see Response to Comment A-25 regarding revisions to the SEIR's hazard mitigation measures.

The commenter also notes concerns regarding potential risk of explosions due to potential methane generation and buildup as a result of groundwater remediation. The commenter has not provided new information, such as potential rate and mass of methane generation, or information regarding methane generation from TCE/PCE remediation at any other site, thus the City views such an impact as speculative. (See e.g. Parker Shattuck Neighbors v. Berkeley City Council (2013) 222 Cal.App.4th 768, 786 [commenter requests for further investigation of hazard impact without also providing evidence of such impact not substantial evidence of impact].) Nevertheless, in response to the commenter's concerns, MM HAZ-1 and MM HAZ-3 will be revised as stated in Response A-25 to clarify potential techniques that would be used to address methane vapor migration. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

The commenter also speculates regarding potential generation of vinyl chloride as a result of groundwater remediation. The commenter has provided no evidence to support such a concern, such as potential rate and mass of vinyl chloride generation, or information regarding vinyl chloride generation from TCE/PCE remediation at any other site. The City notes that the Alternate Cleanup Plan approved by the RWQCB states that once the enhanced in-situ bioremediation remedy has been implemented, cis-1,2-DCE and vinyl chloride concentrations are expected to increase, although only vinyl chloride may increase in concentration

above its remedial action level (4 ug/L), possibly for several years, if the necessary microbial organisms are present in sufficient number. The City notes that the 4 ug/L remedial action level is close to the screening level for which such concentrations in groundwater should be evaluated for the potential to pose a risk to indoor air at future residential buildings (1.8 ug/L). The City further notes that such screening levels overestimate risk by orders of magnitude at sites where vapor intrusion mitigation measures, such as those proposed in the December 2013 Conceptual Risk Management Plan, are implemented. Further, Mitigation Measure HAZ-1 requires a risk management plan for Site A, which should reduce any risk to levels below that the RWQCB considers appropriate for residential land use. Thus, the City concludes that any risk from vinyl chloride generation is speculative and would be less than significant.

COMMENT A-6: Site A – Post Remediation Monitoring

Evaluating the effectiveness of the proposed in-situ biodegradation will require several years after full-scale implementation of the remedy. The uncertainty caused by past failures of remedial actions at the site, combined with the potential for the proposed treatment system to generate hazardous byproducts, such as methane, raises the concern that the proposed remedy may not be adequately protective. While the Regional Board has approved the Alternate Cleanup Plan, its success has yet to be determined. If the remedial action fails to perform as proposed, revisions to the cleanup plan and additional remedial actions may be required by the Regional Board.

Full restoration of the beneficial uses of groundwater in the TOD will take years, or possibly decades. Only after remediation has significantly reduced pollution concentrations and a demonstration has been made that concentrations will meet cleanup goals in a reasonable timeframe would it be appropriate to consider residential construction with vapor mitigation systems. The time frame needed to demonstrate the effectiveness of the remedial action may be substantially longer than currently envisioned by the developer.

RESPONSE A-6: The commenter notes concerns about the efficacy of the approved Alternate Cleanup Plan, and states that only after remediation has significantly reduced pollution concentrations and a demonstration has been made that concentrations will meet cleanup goals in a reasonable timeframe would it be appropriate to consider residential construction with vapor mitigation systems. The City notes that, as discussed in Response A-4, the Cal/EPA DTSC Vapor Intrusion Mitigation Advisory calls for vapor intrusion mitigation and source remediation to address risks calculated to be in the range calculated for Site A. The RWQCB has not provided new information indicating that the current and proposed activities are inconsistent with the VIMA or that when the proposed residences are built, risks will not be reduced below applicable thresholds, nor why the Cal/EPA DTSC Vapor Intrusion Mitigation Advisory guidance is not substantial evidence supporting the conclusion that vapor mitigation system may be appropriate for Site A. The City notes that the remediation and risk management plans for Site A will be reviewed by the commenter as a requirement of MM HAZ 1.

COMMENT A-7: Site B – Background

Development at Site B, the former Jones-Hamilton site at 8400 Enterprise Drive, is dependent on successful cleanup to residential standards. Thus far, cleanup actions and soil cleanup standards were based on continued commercial/industrial in accordance with Site Cleanup Requirements Order No. R2-2001-054 adopted by the Regional Water Board for this site. There is currently a land use restriction that prohibits residential use of the property. This Order has not yet been revised to reflect the new proposed land use. To support single-family housing at this site, the proposed cleanup includes extensive soil excavation and soil management to remove dioxins, furans, PCBs, pentachlorophenol, tetrachlorophenol, and several VOCs, in particular 1,2- dichloroethane (1,2-DCA), arsenic and other contaminants in order to reduce the human health risks for site future occupants.

RESPONSE A-7: The commenter summarizes the current status of the anticipated remediation of Site B and the current status of the groundwater plume under that site and adjoining property. These comments do not state specific concerns about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, these comments have been noted for the record and will be provided to the Planning Commission and City Council for consideration.

COMMENT A-8: Site B – Groundwater Contamination

A groundwater solvent plume also underlies Site B and poses vapor intrusion threats which will be reevaluated after soil removal actions are completed. The groundwater plume from Site B has also migrated offsite in a westerly direction, into the public right-of-way on Willow Street and onto 37555 Willow Street (location of Torian property and residential development). Groundwater cleanup standards have not been achieved. After development long-term monitoring, ongoing groundwater cleanup and environmental land use restrictions will be needed to protect human health and safety.

RESPONSE A-8: The commenter states that a groundwater contamination plume that underlies Site B has migrated offsite in a westerly direction, into the public right-of-way on Willow Street and onto 37555 Willow Street. The City notes that these comments do not state specific concerns about the adequacy of the draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore a response is not required. However, these comments have been noted for the record and will be provided to the Planning Commission and City Council for consideration. The City also notes that no document conclusively demonstrating such plume origin and migration has been identified. RWQCB Cleanup Order 01-054 for Site B states that the source of the DCA in groundwater at and near Site B is not clear because the Jones-Hamilton Company had no documented use of DCA, and because DCA was detected at higher concentrations on adjacent sites. In addition, the December 2012 Revised Remedial Actions and Cleanup Standards Report (RAW) [SEIR Appendix D-1] states that the DCA detected in the shallow ground water may be from off-site sources, based on the ground water grab

sample results collected near Willow Street in November 2012 on Site B, and the reported ground water flow direction at 37555 Willow Street at that time. The commenter further states that after development, additional actions will be required. Comment noted. The City also notes that the remediation and risk management plans for Site B will be reviewed by the commenter as a requirement of MM HAZ-1, among other oversight activities by the commenter.

COMMENT A-9: Site B – Soil Contamination

Recent testing for dioxins and related chemicals led to the discovery of significant pollution with these very toxic chemicals at Site B. Some of these contaminants may also be present at other properties within the Dumbarton TOD Specific Plan area, based on the new data collected at the adjacent Torian property at 37555 Willow Street. The magnitude and extent of the dioxin contamination is not yet known. All property owners in the TOD Specific Plan area will be required to conduct special studies to determine the source(s), extent and magnitude of these highly toxic contaminants. Dioxins are considered to be among the most toxic man-made chemicals. Until the contamination with dioxins and related chemicals is fully characterized, which would provide a better understanding of the likely sources and fate and transport mechanisms, the assumptions regarding the extent and toxicity of the contamination are necessarily conservative.

Air impacts from airborne dusts during soil excavation, profiling and trucking contaminated soil offsite do not seem to be adequately addressed. Additional mitigation measures are needed, including a requirement for a Certified Industrial Hygienist to monitor the cleanup site and vicinity for toxins associated with the cleanup actions.

RESPONSE A-9: The commenter summarizes the current testing status for dioxins on Site B. As anticipated by the TOD EIR, further characterization of contamination on Specific Plan parcels was anticipated and the remediation plan that will be approved by the commenter will ensure any risks from dioxins are reduced to a less than significant level, including appropriate data gap analysis. Please see Response A-19 below.

The commenter also suggests that a Certified Industrial Hygienist be required to monitor the cleanup site and vicinity. The City notes that according to the RWQCB Fact Sheet regarding Site B, a Community Protection Plan, signed by a certified industrial hygienist, will be required to present measures serving to protect the local residents and the environment from potential hazardous airborne contaminants and volatile vapors associated with the cleanup plan. The Plan will address all Site chemicals of concern, all potential exposure pathways, dust control, perimeter dust and air monitoring; storm water runoff management, emergency procedures, preparedness, and contingency plans. The Health and Safety Plan (HASP) included with the December 2012 Revised Remedial Actions and Cleanup Standards Report (RAW), referenced on page 93 of the Trumark project SEIR, addresses both on-site and off-site exposure risks, and provides that a Project Certified Industrial Hygienist (CIH) shall have the following responsibilities:

- Health surveillance of all site employees
- Assuring that safety procedures in effect are in compliance with all appropriate federal, state, and local regulations
- Maintaining personnel exposure and perimeter air monitoring records
- Ensuring that appropriate personal protective equipment is used
- Assuring that site control zones are enforced for all personnel
- Assuring that all personnel follow site rules
- The C.I.H. will maintain a safety log, which will be kept for all site activities. This log will include safety meeting topics, training records, air monitoring information, and any incidents related to employee or contractor health and safety. The C.I.H. has responsibility for implementing and enforcing all aspects of the HASP.

The commenter does not provide evidence that such requirements will be inadequate to prevent potential significant impacts related to remediation and construction activities or why the additional requirement that a certified industrial hygienist must be present on-site during each day of remediation activity to reduce impacts to a less than significant level. Further, MM HAZ 4 requires a health and safety plan meeting applicable regulatory standards to protect the safety of workers and the general. The City concludes that substantial evidence supports its determination that hazard risks will reduced to a less than significant level through implementation of the SEIR and TOD EIR hazard mitigation measures. Therefore the City concludes no further mitigation is required. Please also see Responses A-12, A-19 and A 25 below.

COMMENT A-10: Site B – Vapor Intrusion

The December 2012 Human Health Risk Assessment in Appendix D-1 of the SEIR found an unacceptable human health risk (3.1×10^{-4}) for vapor intrusion driven primarily by 1,2-dichloroethane and vinyl chloride. Vapor intrusion risks will be reevaluated upon completion of the proposed soil cleanup plan.

RESPONSE A-10: The commenter summarizes certain components of a human health risk assessment and states it will reevaluate vapor intrusion risks up completion of the proposed soil cleanup plan. These comments do not state specific concerns about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, these comments have been noted for the record and will be provided to the Planning Commission and City Council for consideration.

COMMENT A-11: Site B – Proposed Remediation

The responsible party has proposed to remove the concrete-asphalt cap that covers the two surface impoundments and to conduct an extensive soil excavation across the 21-acre site. The excavation poses potential risks for workers and for nearby residents. In addition, there are some concerns about proper risk mitigation while moving such a large volume of contaminated soil containing highly

toxic chemicals (dioxins, furans, PCP, etc.). Proposed soil cleanup for Site B includes the following: 44,000 cubic yards of soil excavation from the former detention pond area; 35,000 cubic yards of soil excavation in the vacant and undeveloped areas; and an estimated 30,000 cubic yards of soil excavation in the former facility area. Soil will be placed into 500 cubic yard stockpiles. All stockpiled soil must comply with Bay Area Air Quality Management District regulations and requirements. A total of 109,000 cubic yards of soil or 13,625 truckloads could be transported offsite for disposal from Site B.

Across the street at the adjacent Torian property at 37555 Willow Street, an additional 50,000 cubic yards of soil excavation will add an additional 6,250 truckloads for transport and offsite disposal, and at the Gallade Chemical site at 8333 Enterprise Drive an estimated 20,000 cubic yards of contaminated soil (720 truckloads) will be transported for offsite disposal. The Final SEIR should assess the additive and cumulative impacts to residents for soil excavations at 8333 Enterprise Drive and 37555 Willow Street. There will also be soil cleanups at FMC, Romic, Ashland, and possibly the Newark Sportsmans' Club and Cargill properties.

RESPONSE A-11: The commenter summarizes the proposed remediation plan and regulatory requirements for Site B. These comments do not state specific concerns about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, these comments have been noted for the record and will be provided to the Planning Commission and City Council for consideration.

The commenter states that 109,000 cubic yards of soil or 13,625 truckloads could be transported offsite for disposal from Site B. The commenter is correct that the SEIR identifies 109,000 cubic yards as a “worst case” scenario. The SEIR also informs readers that the current best estimate is 60,350 cubic yards to be transported offsite for disposal from Site B. This is a similar estimate to the estimate found in the commenter’s February 2014 Fact Sheet regarding Site B contains an updated estimate of 61,000 cubic yards of soil to be transported offsite for disposal from Site B.

The commenter also states that the Trumark project SEIR should analyze the cumulative impacts associated with the remediation of the other properties in the Specific Plan Area in addition to Trumark’s Site A and Site B. The cumulative impacts associated with such activities were analyzed in the TOD EIR in its Air Quality and Hazard impacts chapters which consider implementation of the entire Specific Plan. Please also see Response A-3.

COMMENT A-12: <u>Summary – Significant Impacts and Mitigation and Avoidance</u>

Air Quality (associated with hazardous materials contaminated soil) Page iv.
The Final SEIR should include language for Mitigation and Avoidance Measures similar to those listed under the Noise Category, in order to protect citizens from hazardous dusts, fumes, vapors, odors that occurs during soil excavation and off-hauling of contaminated soil.

Suggested language is listed below:

- "A certified/licensed industrial hygienist will develop and oversee implementation of an air monitoring program to ensure air quality standards are met throughout the duration of the Project, to ensure protection of human health and safety, for workers and existing residents, and visitors to the Project."

- "Public notices sent to the residents pertaining to the scheduled soil removal and offhauling days, and instructions for residents to minimize exposure to toxic airborne dusts, fumes, vapors, odors, etc."

- "A Procedure and phone numbers for notifying the City Building Inspection Division staff during regular construction hours and off-hour."

- "A sign posted on site pertaining the permitted construction days and hours, complaint procedures, and who to notify in the event of a problem."

- "The designation of an onsite construction compliance and enforcement manager for the project. The manager shall act as a liaison between the project and its neighbors to ensure compliance with air quality standards and nuisance conditions."

RESPONSE A-12: The commenter proposes additional detail for the Air Quality mitigation measures in the SEIR related to hazardous dusts, fumes, vapors, odors that may occur during soil excavation and off-hauling. The City understands this comment as addressing Site B, as the comment addresses issues potentially resulting from soil excavation and off-hauling, which is not planned for Site A. The SEIR contains a detailed analysis of construction-related air impacts on pages 54 through 58 of the SEIR. The air quality analysis conservatively assumes a worst case 109,850 cubic yards of soil would be exported from Site B. The SEIR concludes that criteria pollutants would be less than significant, therefore no mitigation is required. The SEIR also analyzes the health impacts associated with dust emissions related to remediation, grading and constrictions activities. The SEIR concludes that TOD EIR Mitigation Measure 4.2-1a and 4.2-1b, which require, among other things, dust control measures such as surface watering, material covering, road cleaning, and speed limits, ceasing activities under high wind conditions, truck tire washing, and limiting total construction activities occurring on a single day, will reduce impacts to less than significant levels. These mitigation measures also include measures similar to those proposed by the commenter. The developer will be required to post a publically visible sign with the 24-hour telephone number and person to contact at the construction firm regarding dust complaints. This person is required to respond and take corrective action within 48 hours. The Air District's phone number must also be posted to ensure compliance with applicable regulations. The commenter does not explain why such measures will be ineffective in addressing air quality impacts related to dusts, fumes, vapors, odors that may occur during soil excavation and off-

hauling. The City concludes that substantial evidence supports its conclusion that construction-related air quality impacts will be less than significant after mitigation and that no further mitigation is required. The City notes that the RWQCB Fact Sheet for Site B provides general notice regarding the planned soil removal and off-haul. Further, the City understands that shortly prior to the soil removal, the RWQCB and/or the Applicant may issue an additional fact sheet or notice regarding same. Please also see Responses A-2, A-9, A-19 and A-25.

COMMENT A-13: Section 1.0. Page 30. Introduction

The draft SEIR addresses only two parcels (Site A and Site B totaling 23.5 acres) in the 233-acre Dumbarton TOD Specific Plan Area. Additional cleanup actions will occur at Gallade (2-acres), Torian (42-acres), FMC (47-acres), Ashland (10-acres), SHH, LLC (6-acres), and possibly at Cargill (54.5 acres). There will be additive and cumulative impacts to citizens and residents as other contaminated properties in the TOD initiate cleanup activities, causing nuisance conditions associated with dusts, fumes, vapors, odors, and trucks hauling contaminated soil on the public streets all over again.

RESPONSE A-13: The commenter states that the SEIR addresses only two parcels and that citizens and residents will be impacted by cleanup activities in a serial fashion as the Specific Plan Area is developed. The SEIR is explains it is "intended to supplement the Dumbarton TOD EIR by evaluating impacts *specifically from Trumark Homes' project within the Specific Plan Area.*" Impacts related to the potential development of other parcels within the Specific Plan Area are analyzed in the TOD EIR. The appropriate level of additional CEQA review related to those parcels will occur prior to approval of discretionary actions permitting development on those parcels. (See CEQA Guidelines § 15168(c).) As authorized by CEQA Guidelines § 15168(d)(3), the SEIR focuses on impacts unique to the application (i.e. Trumark's proposed development of Site A and Site B) presently under consideration. (SEIR p. 50) The SEIR informs readers that it is not intended as a stand-alone document addressing all topics, issues and impacts, and is only intended to disclose new information developed subsequent to the certification of the TOD EIR. The commenter should review the TOD EIR for information regarding cumulative impacts related to development activities throughout the Specific Plan Area. Please also see Response A-3.

COMMENT A-14: Section 2.7, Page 33, 34. Project Related Approvals

Add the following agencies for Project related approvals:

- RWQCB for approval of proposals for cleanup and monitoring of hazardous materials, storm water construction permits, 401 and 404 Certifications.
- Union Sanitation District for permits to discharge contaminated groundwater.
- BAAQMD for excavation and aeration of contaminated soils.

RESPONSE A-14: The Commenter requests that certain agencies be added to the list of agencies for Project related approvals. The SEIR has been revised in response to this comment. However, the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ) does not require RWQCB approval, rather a Notice of Intent is filed. The SEIR describes the project's potential impacts on wetlands for which a 404 permit may be required (thereby requiring 401 certification from the RWQCB) and noted that the project would obtain permits from the RWQCB and USACE as necessary. Therefore, these items are not were not included in the revision. Refer to **Section 4, Revisions to the Text of the Draft SEIR.**

COMMENT A-15: Section 3.2, Page 38. Project Location and Section 3.5.3 Page 44, Residential Development

The draft SEIR states, *"the industrial property at 8333 Enterprise Drive (current location of Gallade Chemical,) adjacent to Site A would be redeveloped as a public park. Use of this property as a public park was evaluated in the Specific Plan EIR only at a program level given the final cleanup activities to allow use of the site as a park were not sufficiently defined."*

The Final SEIR should recognize that there is a land use covenant on the proposed park parcel at 8333 Enterprise Drive, which restricts the use of the property for commercial and industrial purposes only. In addition to groundwater remediation, the contaminated soil under the buildings is required to be excavated pursuant to Task C.5 and C.6 of the Order R2-2007-0005. The Alternate Cleanup Plan referenced in the draft SEIR was submitted specifically to comply with Task C.1 to cleanup contamination in shallow groundwater zone, and it did not propose tasks for address site-wide contamination and soil excavation. The final SEIR should address the impacts to the nearby residents that will be exposed to hazardous dusts, vapors fumes, noise, etc. during the facility closure, building demolition, and cleanup actions for soil and groundwater at 8333 Enterprise Drive.

RESPONSE A-15: The commenter requests that the SEIR recognize that there is a land use covenant on the Gallade Parcel that restricts its use to commercial and industrial purposes only and that the use of the parcel as a public park would require remediation activities including excavation. Comment noted. The TOD EIR analyzed the potential redevelopment of the Gallade Parcel as a public park. Further, as noted by the commenter, Order R2-2007-0005 requires excavation and the ACP acknowledges such excavation is required. No further analysis of remediation activities on the Gallade Parcel is required in the Trumark project SEIR. Please see Response A-3.

The commenter also requests that the Trumark project SEIR address impacts related to the remediation of the Gallade Parcel. Please see Response A-3.

COMMENT A-16: 3.5.2, Page 40. Pollutant Remediation and Site Preparation

The draft SEIR states, *"The proposed project would include vapor intrusion engineering controls (e.g. vapor barriers, sub-slab depressurization, etc.) beneath the buildings for Site A to protect future development from vapor intrusion."*

The final SEIR should recognize that none of the sites in the Specific Plan Area have been remediated to safe levels for residential use. Many have shallow groundwater impacts and vapor intrusion threats, including Site B, which has not yet evaluated the vapor intrusion threats. The entire northern half of the Dumbarton TOD Specific Plan Area will also likely require vapor intrusion engineering controls, due to extensive groundwater pollution and very high levels of VOCs (e.g., including TCE, PCE, ethylene dibromide [EDB], 1,2-DCA, vinyl chloride, etc.) that pose vapor intrusion risks.

RESPONSE A-16: The commenter requests that the SEIR should note that none of the parcels within the Specific Plan Area have completed remediation activities for residential use and that portions of the Specific Plan Area may require vapor intrusion controls. Comment noted. The TOD EIR discusses the contamination issues associated with each parcel within the Specific Plan Area and discloses that remediation will be required for such parcels. Please also see Response A-3 and A-22.

COMMENT A-17: <u>3.5.2.1, Page 41. Site A – Trumark Property</u>

The draft SEIR states, *"Removal and disposal of large amounts of contaminated soil from the site (Site A) is not anticipated. Approval by the RWQCB of the methods of remediating VOC impacts to the site and post-remediation requirements for residential use of the property would be required prior to development of Site A with residential uses."*

The final SEIR should recognize that large amounts of contaminated soil will be removed at the adjacent Gallade Chemical, 8333 Enterprise Drive, prior to development, pursuant to Site Cleanup Requirements Order No. R2-2007-0005.

RESPONSE A-17: The commenter requests that the SEIR address impacts related to the remediation of the adjacent Gallade Parcel. Please see Response A-3.

COMMENT A-18: <u>3.5.2.2, Page 41. Site B – Jones-Hamilton</u>

The draft SEIR states that the *"implementation of the RAP and preparation of the site for subsequent development is expected to take six to twelve months."*

The final SEIR should recognize that the RAP is purely a soil cleanup plan and additional tasks related to vapor intrusion risks and cleanup of underlying groundwater pollution will be required to prepare the site for development.

RESPONSE A-18: The commenter requests the SEIR clarify that further action beyond soil remediation will be required. Page 41 of the SEIR is revised to state "<u>After soil removal, further vapor intrusion controls and/or groundwater remediation may be</u>

required to prepare the site for residential development." Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

COMMENT A-19: 3.5.2.2 Page 42. Removal of Soil Containing Dioxin

The draft SEIR does not thoroughly address human health risks related to the removal and transportation of soil containing dioxins.

Air monitoring and prevailing wind studies conducted by a certified industrial hygienist will be crucial elements of the project to demonstrate that potentially significant human health impacts have been properly addressed and mitigated.

RESPONSE A-19: The Commenter states that the SEIR does not thoroughly address human health risks related to the removal and transportation of soil containing dioxins, and suggests air monitoring and prevailing wind studies conducted by a certified industrial hygienist. The City respectfully disagrees. The SEIR thoroughly addresses the health risk associated with the disturbance and transport of soils on pages 43-44, 55-57, and 90-92. Mitigation Measure HAZ-4 addresses the risks to both workers and the general public during remediation activities. Remediation activities associated with dioxins are specifically discussed on pages 89 and 91 of the SEIR. The SEIR discloses that up to 35,000 cubic yards of soil could be removed from Site B to address dioxin contamination. Please also see Responses A-9,A-12, and A-25.

COMMENT A-20: Section 4.1.2.2, Pages 54, 55. Construction-Related Impacts and Dust Emissions and Section 4.1.2.2, Page 57. Community Health Risk

The draft SEIR *states that dust would be generated during remediation, grading and construction activities (at Sites A and B).*

The Final SEIR should assess the added significant impacts to sensitive receptors during building demolition and soil cleanup at 8333 Enterprise and at Torian at 37555 Willow Street, in addition to the proposed activities at Sites A and B. There will be additive and cumulative impacts to citizens and residents as other contaminated properties in the TOD initiate cleanup activities, causing nuisance conditions associated with dusts, fumes, vapors, odors, and trucks hauling contaminated soil on the public streets all over again. In order to ensure public health and safety, air monitoring throughout the project should be conducted under the supervision of a certified industrial hygienist, given the toxicity of TCE and dioxins.

The draft SEIR states that *the air quality analysis was based on the assumption that up to 109,850 cubic yards of soil could be exported from Site B and up to 59,000 cubic yards could be imported to the site.*

The final SEIR should also include exported soil volumes for the Torian property at 37555 Willow Street and at Gallade at 8333 Enterprise Drive.

RESPONSE A-20: The commenter requests that the SEIR analyze the impacts to sensitive receptors for remediation activities at the Gallade and Torian Parcels. The SEIR explains it is "intended to supplement the Dumbarton TOD EIR by evaluating impacts *specifically from Trumark Homes' project within the Specific Plan Area.*" Impacts related to the potential development of other parcels within the Specific Plan Area are analyzed in the TOD EIR. The appropriate level of additional CEQA review related to those parcels will occur prior to approval of discretionary actions permitting development on those parcels. (See CEQA Guidelines §§ 15152 (c), 15168(c).) As authorized by CEQA Guidelines § 15168(d)(3), the SEIR focuses on impacts unique to the application (i.e. Trumark's proposed development of Site A and Site B) presently under consideration. (SEIR p. 50) The SEIR informs readers that it is not intended as a stand-alone document addressing all topics, issues and impacts, and is only intended to disclose new information developed subsequent to the certification of the TOD EIR. The commenter should review the TOD EIR for information regarding cumulative impacts related to development activities throughout the Specific Plan Area. Please also see Response A-3.

The commenter also requests that an industrial hygienist supervise air quality during construction. Please see Responses A-2, A-9, A-19 and A-25.

COMMENT A-21: <u>Section 4.5, Page 82. Hazards and Hazardous Materials</u>

The draft SEIR indicates that this section is based on part on the *Final Site Cleanup Requirements Order No 98-067*. This referenced Order was rescinded when Order No. 01-054 for the Jones Hamilton Site was adopted in 2001. The most recent Orders for all the sites in the Dumbarton TOD are noted below:

- FMC Corporation, 8787 Enterprise Drive, SCR Order R2-2002-0060
- Ashland Inc., 8610 Enterprise Drive, SCR Order R2-2005-0038
- SHH, LLC (Former Romic), 37445 Willow Street, SCR Order R2-2008-0081
- Jones-Hamilton, 8400 Enterprise Drive, SCR Order R2-2001-0054,
- Honeywell (Former Baron-Blakeslee), 8333 Enterprise, SCR Order R2-2005-0004

The cleanup standards approved for these sites (except Honeywell) were based on continued industrial and commercial land and not residential use. Revised cleanup standards and amended Orders will have to be adopted by the Water Board.

RESPONSE A-21: The commenter identifies the most recent orders applicable to the parcels within the Specific Plan Area. Comment noted. Order No. R2-2001-0054 was included as Appendix D-4 to the Draft SEIR.

COMMENT A-22: <u>Section 4.5.1.1, Page 82. Background</u>

The draft SEIR references eight *'Hazardous Materials Sites' within the Dumbarton TOD*

Specific Plan Area, and states that "remediation of contamination on the sites has been or is currently underway on most of the sites".

This in an incorrect statement. None of the sites in the Specific Plan Area have been remediated to safe levels for residential use. Many have shallow groundwater impacts and vapor intrusion threats. Torian has submitted soil cleanup plans 37555 Willow Street. SHH plans to excavate impacted soil, pending data gap investigations at 37445 Willow Street. As stated above (individual sites (i.e., Ashland, Romic, FMC, Newark Sportsmans Club, Cargill) begin cleanup efforts, the hazards and hazardous materials associated with cleanup and grading activities will pose additional impacts to the citizens living near the Specific Plan Area. The final SEIR should address cumulative and additive impacts posed by all the necessary soil excavation planned in the TOD Specific Plan Area.

RESPONSE A-22: The commenter states that it is incorrect that remediation of contamination on the eight sites within the Specific Plan Area has been or is currently underway on most of sites. The commenter supports this statement by the fact that remediation has not been completed at any of the eight sites to residential levels. The City sees no inconsistency between the SEIR and commenter's statements. Remediation is in at least the planning phases for all sites within the Specific Plan Area. Nonetheless, the SEIR text has been revised to clarify that remediation has not been completed at any of the sites.

Page 82 is revised is follows: "Remediation of contamination on the sites ~~has been~~ is either in the planning phases or currently underway on most of the sites, though no site has completed remediation activities to residential levels to date. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

The commenter also states that the SEIR should address the cumulative impacts posed by all necessary soil remediation/excavation within the Specific Plan Area. The commenter states that SEIR should analyze the cumulative impacts associated with the remediation of the other properties in the Specific Plan Area than Site A and Site B. The cumulative impacts associated with such activities were analyzed in the TOD EIR in its Air Quality and Hazard impacts chapters. Please also see Response A-3.

COMMENT A-23: Section 4.5.1.1, Page 83. Transport and Use of Hazardous Materials

The draft SEIR does not adequately address the traffic impacts posed by thousands of trucks hauling contaminated and non-contaminated soil along Willow Drive, Enterprise Drive, and Thornton Avenue. There appears to be no Phasing Plan for all the soil remediation and development activities to coordinate traffic and transporting of hazardous materials for all the sites in the Dumbarton TOD Specific Plan Area.

RESPONSE A-23: The commenter states that the SEIR does not adequately address traffic impacts associated with construction activities. The City respectfully disagrees.

The developer will be required to obtain encroachment permits from the City associated with project development. Existing City policy requires that depending on the complexity and location of the traffic issues raised by a project, site-specific traffic control plans may be required with the permit application. Further, the City requires all temporary traffic controls must be implemented in accordance with Chapter 6 of the California Manual on Uniform Traffic Control Devices. City Municipal Code § 10.32.010 also requires that vehicles exceeding three gross tons take direct routes to designated truck routes to minimize impacts City residents and businesses. These existing policies and regulations, in addition to the temporary nature of construction impacts would result in construction traffic impacts being less than significant.

Additionally, as described in previous responses, the SEIR is not to be read in isolation as a stand-alone document, rather it supplements information in the certified 2011 TOD EIR. The TOD Specific Plan would result in the development of 168 single-family dwelling units, 1,902 townhomes, 430 apartment units, 35,000 square feet of neighborhood commercial retail, and 195,000 square feet of general office uses. The TOD EIR's traffic analysis estimated the Specific Plan at buildout would generate a total of 16,481 daily trips, including 1,241 AM peak-hour trips (471 inbound/770 outbound) and 1,523 PM peak-hour trips (836 inbound/687 outbound). Out of the 16,481 daily trips, 14,131 daily trips would travel externally into the surrounding roadway network, including 1,165 AM peak-hour trips (416 inbound/738 outbound) and 1,320 PM peak-hour trips (720 inbound/600 outbound). Under Project Conditions, the Specific Plan would have a significant project- specific impact at the following four intersections:

- Willow Street/Thornton Avenue
- Cedar Boulevard/Thornton Avenue
- Willow Street/Enterprise Drive
- Cherry Street/Mowry Avenue

Implementation of TOD EIR Mitigation Measure 4.14-1 would reduce impacts at three of the four intersections. However, no feasible mitigation is available for the intersection of Cedar Boulevard/Thornton Avenue. Therefore, the impact would be significant and unavoidable.

The simultaneous construction of all parcels within the Specific Plan Area is speculative, and the commenter presents no evidence that construction traffic impacts would be substantially increased from that resulting in the contemplated development in the TOD EIR. Even in such an unlikely scenario, the City's policy of requiring traffic control plans when appropriate would avoid any significant construction traffic impacts. Finally, there is no evidence that the construction traffic generated by the various TOD Specific Plan development sites, even in the unlikely event they were all simultaneously under construction, would approach the total daily (16,481) and peak hour volumes (1,241 AM, 1,523

PM) studied in the TOD EIR, and therefore, the traffic impacts from construction activity would be less than the operations of the Specific Plan upon development, and have been adequately disclosed. No further traffic analysis, therefore, was necessary as part of the Trumark project SEIR.

COMMENT A-24: Section 4.5.1.1, Page 83. Sites Impaired by Hazardous Materials

The draft SEIR is a piecemeal environmental review. It only assesses the impacts at two sites in the Dumbarton TOD Specific Plan Area, and as noted above it fails to address the cumulative impacts associated with cleanup activities at six or more other sites in this TOD area.

RESPONSE A-24: The commenter states that the SEIR consists of piecemeal environmental review because it only analyzes two sites within the Specific Plan Area. The City respectfully disagrees. As discussed on SEIR page 30, on September 8, 2011, the City of Newark certified the TOD EIR. The SEIR explains it is "intended to supplement the Dumbarton TOD EIR by evaluating impacts *specifically from Trumark Homes' project within the Specific Plan Area*." Impacts related to the potential development of other parcels within the Specific Plan Area are analyzed in the TOD EIR. The appropriate level of additional CEQA review related to those parcels will occur prior to approval of discretionary actions permitting development on those parcels. (See SEIR p. 44, CEQA Guidelines §§ 15152 (c), 15168(c).) Thus, the City avoided any piecemeal review of environmental impacts associated with development within the Specific Plan Area by preparing and certifying the program TOD EIR. As stated in CEQA Guidelines § 15168, the advantage of such a program EIR is the "consideration of cumulative impacts that might be slighted in a case-by-case basis." The City is currently considering whether to make project-level approvals for Site A and Site B. Thus, CEQA Guidelines § 15168 instructs that the City would determine whether making such approvals would result in impacts not examined in the TOD EIR. The City determined that an SEIR should be prepared, and, as authorized by CEQA Guidelines § 15168(d)(3), the SEIR is focuses on impacts unique to the Trumark development applications presently under consideration. (SEIR p. 50.) Cumulative impacts associated with remedial activities were previously considered by the TOD EIR, therefore the City may properly rely on such analysis when making project-level approvals for Site A and Site B. (CEQA Guidelines §§ 15163(b); 15168(d)(3).)

The SEIR informs readers that it is not intended as a stand-alone document addressing all topics, issues and impacts, and is only intended to disclose new information developed subsequent to the certification of the TOD EIR. The commenter should review the TOD EIR for information related to development activities throughout the Specific Plan Area.

COMMENT A-25: Section 4.5.1.2, Page 85. Specific Plan EIR Mitigation Measures Applicable to the project, and Summary Table

The draft SEIR references the mitigation measures 4.7-1a – 1c identified in the Dumbarton TOD Specific Plan EIR that would apply to the proposed project. The mitigation measure 4.7-la falls short of the steps needed to properly investigate and remediated a property prior approving permits to grade or build on a particular parcel in the TOD Specific Plan Area. Additional mitigation and avoidance measures are needed to ensure that the proposed and approved cleanup activities are fully implemented, post-remedial monitoring is performed that demonstrates the remediation was effective at reducing site contaminants before grading or building permits are issued.

Suggested language to be incorporated into Mitigation Measure 4.7-1a is listed below:

- Prior to issuance of grading or building permits for Site A, excavation of contaminated soil at the adjacent property at 8333 Enterprise must be implemented, pursuant to the Order R2-2007-0005. If the soil excavation is not completed, the effectiveness of the proposed in-situ remedial actions at Site A is likely to be limited.
- Prior to issuance of grading or building permits for Site A and Site B, the following items should be completed (a) Implementation of the RWQCB approved remediation plan; (b) submission a start-up report to RWQCB; (c) submission of monthly progress reports to RWQCB; (d) submission of post-remediation monitoring reports to RWQCB until such time as a demonstration is made that cleanup standards will be met within a reasonable timeframe; (g) implementation of a risk management plan including engineered controls to mitigate residual pollutions as an interim measure, to protect human health and safety. Additional remediation and reporting will be required until residential cleanup standards are met or until the remediation is no longer cost-effective. If cleanup standards cannot be met in a reasonable timeframe, a revised human health risk assessment to evaluate the risks posed by residual contaminants in soil, soil vapor and groundwater and amended Remedial Action Plan should be submitted to the RWQCB for review and approval.
- Prior to issuance of grading or building permits, mitigation and avoidance measures are needed to ensure that utility corridors and public right of ways for Site A and Site B that may contain hazardous levels of VOCs and other hazardous contaminants are proper investigated, remediated, and prevented from acting as preferential pathways for vapor and groundwater migration.
- Post-construction mitigation measures are needed to ensure that future homeowners are protected from underlying residual pollution and financial responsibilities associated with any residual pollution. Mitigation measures should comply with DTSC's Vapor Intrusion Mitigation Advisory guidance document (Sections 6 and 7), and address the following:

i. Long-term risk management of pollution, long after the development is constructed;
ii. Inspection and monitoring of any engineered vapor mitigation systems to ensure the system are working effectively;
iii. Long-term groundwater monitoring, sampling, and reporting continues until the cleanup goals are reached;
iv. Proper abandonment of wells after the cleanup goal are reached; and

v. Periodic indoor air monitoring of buildings that are constructed over plumes with elevated levels of volatile organic compounds.

vi. Include measures to ensure protection of public utility corridors for abating hazardous vapors and for long-term treatment of contaminated groundwater, as appropriate.

vii. Create a system for community notification such as a website (see "www.Redfieldsite.org")

RESPONSE A-25: The commenter states that "The mitigation measure 4.7-1a falls short of the steps needed to properly investigate and remediated (sic) a property prior (sic) approving permits to grade or build on a particular parcel in the TOD Specific Plan Area", and that "Additional mitigation and avoidance measures are needed…" Please see Response A-2.

The commenter also provides specific requests for revisions to the SEIR's mitigation measures for hazards.

The commenter requests that the SEIR require that excavation of the Gallade Parcel be completed prior to issuance of any grading or building permits for Site A. The City respectfully disagrees this is an appropriate revision to MM HAZ-1. The timing of the remediation of the Gallade Parcel is uncertain, and not currently under the direct control of the City or the applicant. The construction activities on Site A are not dependent on remediation of the Gallade Parcel. The suggested text revision would also preclude the implementation of a remediation plan and risk management plan for Site A until an unknown future date as the plans will require grading and/or building permits. The remediation plan and risk management plan for Site A will address whether excavation of Gallade is required prior to occupancy to address any hazard risks to future occupants. The City concludes that occupancy of Site A would not occur until after the light industrial use on the Gallade Parcel has ceased operations. . Therefore, MM HAZ-1 is revised to require a condition of approval that occupancy of Site A will be delayed until the Gallade Parcel has ceased industrial operations. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

The commenter proposes several suggested revisions to the hazard mitigation measures applicable to Site A and/or Site B. The commenter requests that these items be completed prior to the issuance of building or grading permits. Though the City has determined the *timing* requested is infeasible (for reasons provided above and below), the City will consider each subcomponent of the comment as a potential component of the plans currently required by the proposed mitigation.

(a). The Commenter requests that RWQCB approved remediation plans should be implemented prior to issuance of grading and building permits. The City notes that as to Site A, implementation of RWQCB approved remediation plans has been underway for several years, and implementation of an additional RWQCB approved remediation plan, Honeywell's August 2013 Alternate Cleanup Plan, has been underway for several months. Further, implementation of Honeywell's

December 2013 Conceptual Risk Management Plan (pending approval from the RWQCB) will require the issuance of building and/or grading permits.

As to Site B, adoption of the proposed mitigation measure – making grading permits contingent on "implementation" of a RWQCB approved remediation plan – would make any remediation impossible, because a grading permit is required to implement the proposed remediation plan, which consists mainly of excavation of impacted soil and replacement with imported fill soil. Therefore, the City concludes such a revision is infeasible. However, the City will revise the proposed mitigation measures to clarify that the required remediation plan and risk management plan construction phase components (as opposed to ongoing monitoring and reporting requirements) be implemented prior to occupancy. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

(b.) The commenter requests that a "start-up report" be submitted. The City is unaware what would meet the definition of a "start-up report" but the remediation plans and risk management plans submitted to the commenter will include reporting and monitoring requirements. These requirements would presumably include submittals meeting the requirements of a "start up report". Mitigation Measure HAZ 1 is clarified to note that the remediation and risk management plans will contain monitoring and reporting requirements. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

(c) and (d) The commenter requests monthly progress reports and post-remediation monitoring reports should be submitted to the RWQCB. Since the project sites are undergoing remediation and monitoring under RWQCB oversight, monthly progress reports are within the scope of RWQCB's authority to request from responsible parties. The commenter has not cited any inability of the RWQCB to require monthly progress reports. The City will revise the proposed mitigation measures to clarify that the required plans will include monitoring and reporting requirements. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

(e) (designated "g" in letter). Commenter requests that prior to issuance of grading and building permits, a risk management plan including engineered controls be implemented. However, most or all engineered controls are integral to buildings, and thus cannot be implemented until after building permits are issued. Accordingly, adoption of the suggested revised mitigation measure would make the proposed mitigation infeasible, and would render the project infeasible, at least as to any location where "residual pollutions" are present (any remediation plan would likely permit "residual pollutions" at a certain level to remain in place so long as risks to human health are addressed). The City will revise the proposed mitigation measures to clarify that the required remediation plan and risk management plan construction phase components (as opposed to ongoing monitoring and reporting requirements) be implemented prior to occupancy. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

The commenter states that "Additional mitigation and avoidance measures are needed to ensure that the proposed and approved cleanup activities are fully implemented, post-remedial monitoring is performed and demonstrates the remediation was effective at reducing site contaminants." The City will revise the proposed mitigation measures to clarify that the required remediation plan and risk management plan construction phase components (as opposed to ongoing monitoring and reporting requirements) be implemented prior to occupancy as they may be amended. The mitigation measures will also clarify that any amendments to such plans will require the same level of review and approval as the original plans. The mitigation measures will also clarify that the developer will be required to document the effectiveness of mitigation prior to occupancy. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

The commenter states that mitigation measures are needed to ensure that utility corridors and public rights of way are investigated, remediated, and prevented from acting as preferential pathways for vapor and groundwater migration. The commenter does not propose any mitigation measures or explain why the TOD EIR and SEIR mitigation measures are inadequate. The City concludes that SEIR Mitigation measures MM HAZ 1 and 3 would apply to work associated with development of Site A and Site B, including any ancillary work in public rights of way and utility corridors. Because Site A and Site B are infill projects, neither Site A nor Site B requires major infrastructure improvements, such as a new water main, and work across parcel lines would be limited to utility connections and storm water drainage. Site A will require storm water, sanitary sewer and water connections to existing utilities on Enterprise Drive. Site B will require one storm water connection to the storm drain located on Willow Street near the southwest corner of the site, a sanitary sewer tie-in on Willow Street near the property boundary, and a water line lateral that will extend across Willow Street. There will also be one water connection on Enterprise Drive. The water line will be relatively shallow, with an approximately 6 foot deep trench. The RWQCB will review and approve the remediation plan and risk management plans for the projects. The City concludes that MM HAZ 1 through HAZ 5 will ensure that the limited utility connections in public rights of way or through adjacent private property will not result in significant hazard impacts and no further mitigation is required. The City also notes that offsite utility connections will be conducted by developer's contractors who will be subject to the health and safety plans meeting state and federal requirements.

The commenter suggests that post-construction mitigation measures are needed, and that they should comply with DTSC's Vapor Intrusion Mitigation Advisory (Section 6 and 7). The City notes that the particular suggested measures are within the purview and authorities of the commenter. Nevertheless MM HAZ-1 and MM-HAZ-3 are amended to clarify that prior to issuance of occupancy permits, a risk management plan consistent with DTSC's Vapor Intrusion

Mitigation Advisory shall be approved by the RWQCB or other oversight agency. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

The commenter also requests that post-construction mitigation measures address seven specific items, some of which can be characterized as remediation-related, and some of which fall under the category of risk management. A response to each is provided below.

i. Long-term risk management of pollution, long after the development is constructed;

A risk management plan will be adopted for each of Site A and Site B. Long-term management of residual pollution is governed at Site A by the RWQCB's Final Site Cleanup Requirements Order No. R22007-0005, and at Site B by the RWQCB's Final Site Cleanup Requirements Order No. 00-54. The RWQCB has stated that it intends to adopt a new order governing Site B; such order would entail groundwater monitoring, sampling, and reporting until cleanup goals are reached.

ii. Inspection and monitoring of any engineered vapor mitigation systems to ensure the system are [sic] working effectively

This measure is consistent with DTSC's Vapor Intrusion Mitigation Advisory and inspection and monitoring requirements will be included in a risk management plan.

iii. Long-term groundwater monitoring, sampling, and reporting continues until the cleanup goals are reached;

Long-term groundwater monitoring, sampling, and reporting until cleanup goals are reached is required at Site A by the RWQCB's Final Site Cleanup Requirements Order No. R22007-0005, and at Site B by the RWQCB's Final Site Cleanup Requirements Order No. 01-54. The RWQCB has stated that it intends to adopt a new order governing Site B; such order would entail groundwater monitoring, sampling, and reporting until cleanup goals are reached.

iv. Proper abandonment of wells after the cleanup goals are reached;

Proper abandonment of wells is required by law and by RWQCB practice. No additional mitigation is necessary.

v. Periodic indoor air monitoring of buildings that are constructed over plumes with elevated levels of volatile organic compounds;

This measure is consistent with DTSC's Vapor Intrusion Mitigation Advisory and inspection and monitoring requirements will be included in a risk management plan.

vi. Include measures to ensure protection of public utility corridors for abating hazardous vapors and for long-term treatment of contaminated groundwater, as appropriate

This measure is consistent with DTSC's Vapor Intrusion Mitigation Advisory. In addition, the Honeywell Conceptual Risk Management Plan for Site A and the Remedial Action Workplan for Site B require installation of low-permeability plugs adjacent to residences to address the potential migration of vapors laterally along utility conduits and into residences. Potential hazardous vapors migrating along public utility corridors would be addressed by the same measures. MM HAZ-1 and MM HAZ-3 are amplified with the following:

Such plans shall address the potential migration of vapors laterally along utility conduits and into residences through physical controls. The extent of such physical controls shall be determined in response to soil vapor data generated prior to construction and designed to control migration of vapors to avoid significant risk to human health or structures. Such physical controls could include the installation of low-permeability backfill "plugs" adjacent to residences and along subsurface utilities beneath Sites A, or through an equally effective technique. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

vii. Create a system for community notification such as a website (see www.Redfieldsite.org)

This measure is consistent with DTSC's Vapor Intrusion Mitigation Advisory and a system for community notification will be included in the risk management plans.

B. RESPONSE TO COMMENTS FROM THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC), FEBRUARY 7, 2014.

COMMENT B-1: Please consider the following comments from the Department of Toxic Substances Control (DTSC) in response to the Administrative Draft Supplemental Environmental Impact Report (Draft SEIR), Trumark Dumbarton Transit Oriented Development Residential Project, dated December 2013 (State Clearinghouse No. 2010042012).

Our comments support our sister agency, the San Francisco Regional Water Quality Control Board (RWQCB) on application of two DTSC guidance documents to the project: Vapor Intrusion Guidance (VIG; DTSC, 2011a) and Vapor Intrusion Mitigation Advisory (VIMA; DTSC, 2011b). The RWQCB is the lead regulatory agency for remediation of the former Baron Blakeslee site that is adjacent to the Trumark parcel, while DTSC is the lead agency for the post-closure permit at the former Baron Blakeslee site.

Our comments on Section 4.5 that pertain to the Trumark parcel (Site A) are as follows:

1) Based on information presented in the Draft SEIR, Human Health Risk Assessment (HHRA; CH2M Hill, 2013b), and Alternate Cleanup Plan (ACP; AMEC, 2013), it is not clear if remediation proposed in the ACP will be completed before construction of single-family homes at the Trumark parcel. In addition, contamination will remain in place even if the ACP achieves its target remedial action levels, as the remedial action levels in the ACP were developed for the former Baron Blakeslee site, not the Trumark parcel. The ACP and associated remedial action levels do not account for future land use scenarios at the Trumark parcel. Therefore, before construction of residential homes at the Trumark parcel, the human health risks should be re-evaluated to ensure that public health is protected. Additional remediation at the Trumark parcel, along with vapor intrusion (VI) mitigation, may be necessary to ensure that remaining contamination does not present a threat.

RESPONSE B-1: The commenter states that it is not clear if remediation proposed in the ACP will be completed before construction of homes on Site A. The commenter also recommends that human health risks should be re-evaluated before construction of homes at Site A, and suggests that additional remediation and vapor intrusion mitigation may be necessary. Honeywell's December 20, 2013 Conceptual Risk Management Plan provides that construction of homes on Site A can proceed prior to reaching remedial goals for impacted soil and groundwater, and provides multiple vapor intrusion mitigation measures. MM HAZ-1 requires the RWQCB to review and approve remediation and risk management plans prior to issuance of building or grading permits that are designed to be protective of human health and risks to human health will be reevaluated at that time.

COMMENT B-2:

2) VI mitigation is not intended to be a sole remedial alternative for a VOC contaminated site. In accordance with the VIMA, mitigation measures are an interim step that allow building occupancy concurrent with subsurface remediation. Monitoring of the mitigation systems will be necessary to

demonstrate the protection of public health while the cleanup activities transpire. Once the subsurface has been restored to appropriate health based concentrations, building mitigation can be terminated.

RESPONSE B-2: The commenter states that vapor intrusion mitigation is not intended to be a sole remedial alternative for a VOC contaminated site, and that monitoring of mitigation systems is required. Comment noted. The City notes that under the August 2013 Alternative Cleanup Plan, groundwater remediation is to be conducted at Site A, and that the VIMA calls for monitoring of various aspects of vapor intrusion mitigation systems. Please also see Responses A-4 and A-25.

COMMENT B-3:

3) Section 4.5.1.1, Presence of Hazardous Material Sites, page 83, states that "the analysis of hazards and hazardous materials impacts contained in this SEIR is limited to the potential environmental impacts from … development of Site A [the Trumark Parcel] with residential uses and engineered controls to mitigate impacts to the site from an adjacent property…" The Draft SEIR discusses remediation of Site B (the former Jones Hamilton site) but does not address remediation of the Trumark Parcel. Given current soil gas and groundwater concentrations present at Site A and the adjacent former Baron Blakeslee site, remediation is a necessary component of redevelopment and should be included. The text should acknowledge remediation under the ACP and potential additional remediation plans.

RESPONSE B-3: The commenter suggests that the SEIR should discuss remediation activities at Site A. The SEIR discusses proposed remediation activities on Site A on SEIR pages 86 through 88 in the section entitled "Remediation Actions/Preparation for Residential Development." This discussion includes information regarding remediation techniques proposed in the ACP to achieve residential ESLs, including bio remediation. Further detail regarding proposed remediation activities may be found in the August 2013 Alternative Cleanup Plan, approved by the RWQCB in August 2013.

COMMENT B-4:

4) Section 4.5.2.1, third paragraph, page 86, states that tetrachloroethene (PCE) and trichloroethene (TCE) are the primary constituents of concern (COCs) in soil at the Trumark Parcel, and that TCE is the primary COC in groundwater. Please add that PCE and TCE are the primary COCs in soil gas at the Trumark parcel.

RESPONSE B-4: The commenter notes that PCE and TCE have been identified as the primary constituents of concern in soil gas at Site A instead of in soil. The SEIR is revised as follows on page 86: "Based on the frequency of detection, the concentrations detected, and the toxicity, PCE and TCE are considered the primary COCs in soil on Site A, PCE and TCE are considered the primary COCs in soil vapor, and TCE is considered the primary COC in the ground water beneath the site." Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

COMMENT B-5:

5) Section 4.5.2.1, second paragraph on page 88, states that "the project proposes to install engineered vapor barrier controls as part of residential development of Site A [the Trumark Parcel] to mitigate risks to future residents until groundwater remediation is complete." As indicated in VIMA, vapor barrier controls are not able to completely eliminate vapor intrusion due to the likelihood of punctures, perforations, tears, and incomplete seals. Thus, vapor barriers by themselves are not an acceptable vapor intrusion mitigation system for the protection of public health. Instead, a sub-slab depressurization system (SSD) should be proposed, in accordance with VIMA. Be advised that SSDs require an operation and maintenance plan including inspections, a contingency plan, performance metrics, and on-going monitoring. Please see VIMA for a complete description of additional conditions to protect public health. In addition, mitigation measures will be necessary until monitoring indicates protective concentrations of soil gas and indoor air have been achieved, and the subsurface contaminants no longer poses a threat to occupants of overlying buildings.

RESPONSE B-5: The commenter states that engineered vapor barriers are not considered adequate to completely eliminate potential vapor intrusion, and that per the VIMA, additional mitigation measures, such as a sub-slab depressurization system, are needed. Honeywell's December 20, 2013 Conceptual Risk Management Plan provides for multiple layers of mitigation, including engineered vapor barriers and a sub-slab depressurization system. The SEIR also requires the RWQCB to confirm that the proposed remediation and risk management plans are designed to meet applicable residential use risks. The SEIR is revised to clarify that engineered vapor barriers are not the sole technology proposed to address vapor intrusion.

SEIR page 88 is revised to state "The project proposes to install multiple layers of mitigation, including engineered vapor barriers and a sub-slab depressurization system." Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

COMMENT B-6:

6) In Section 4.5.2.1, page 88, the Draft SEIR proposes to revise Mitigation Measure (MM) HAZ-1 to read "Prior to the issuance of grading permits or building permits for development of Site A [Trumark Parcel], a remediation plan and a risk management plan must be prepared and submitted for review by the RWQCB. The RWQCB will review the plans to confirm that implementation of the plans would achieve Cal-EPA approved risk management standards for residential use of risk less than 10^{-6} and health hazard index of less than 1." Review and approval of the plans is not sufficient to ensure a less than significant impact. Grading or building permits should not be issued until the RWQCB certifies that target risks and hazard quotients have been achieved for future residents on the Trumark Parcel, through mitigation and/or remediation.

RESPONSE B-6: The commenter suggests that grading and building permits should not be issued until the RWQCB certifies that target risks and hazard quotients have been achieved for future residents on Site A, through mitigation and/or remediation. Please see Responses A-2 and A-25.

COMMENT B-7:

7) Section 4.5.2.1, page 88, text references preparation of a risk management plan. The risk management plan should be prepared in accordance with VIMA so that design, implementation, monitoring, operation and maintenance, contingency planning, public participation, and roles and responsibilities are clearly defined for the life of VI mitigation measures.

RESPONSE B-7: The commenter suggests that the risk management plan be prepared in accordance with the VIMA. Please see Responses A-4 and A-25.

COMMENT B-8:

8) The draft SEIR does not account for the findings of the Additional Site Investigation Report (ASIR; CH2M Hill, 2013a) that identified impacts to the Newark Aquitard and Newark Aquifer beneath the Trumark parcel. The SEIR should consider how the proposed pilot study and remediation activities for the Newark Aquitard and Newark Aquifer will be impacted by redevelopment of the Trumark parcel.

RESPONSE B-8: The commenter suggests that a proposed pilot study and remediation activities for the Newark Aquitard and Newark Aquifer beneath Site A could be affected by the proposed development of Site A. The implementation of EISB in shallow ground water beneath the Site A is expected to reduce concentrations of VOCs in the upper portion of the Newark Aquitard as a result of back-diffusion of VOCs from soil to ground water. As noted in the ACP, additional injections of electron donor into the shallow ground water for continuation EISB are possible after development. With respect to the VOCs detected in Newark Aquifer ground water, monitored natural attenuation (MNA) is being performed in accordance with the current site cleanup order and will be compatible with the planned development of Site A. Therefore, remedial activities for the Newark Aquitard and Aquifer are not expected to be significantly impacted by the planned redevelopment of Site A.

C. RESPONSE TO COMMENTS FROM THE ALAMEDA COUNTY WATER DISTRICT (ACWD), FEBRUARY 6, 2014.

COMMENT C-1: The Alameda County Water District (ACWD) wishes to thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Report (SEIR.) for the Dumbarton Transit-Oriented Development (TOD) Trumark Residential Development.

ACWD has reviewed the Draft SEIR and would appreciate your consideration of the following comments:

1. Water System Infrastructure: As ACWD commented on the Draft Environmental Impact Report for the Dumbarton TOD Specific Plan and on the Notice of Preparation for this SEIR, in order to extend the public water distribution system to meet water service requirements of the Dumbarton TOD Project and adequately integrate the project into ACWD' s water system, significant public water system improvements will be required. At least one additional water main connection between the North side of the existing railroad right-of-way and the project site at either Willow Street or Hickory Street will be required. Based on the information provided in the draft Specific Plan for the Dumbarton TOD, it appears that a connection within Willow Street is most likely. Whichever particular development within the Dumbarton TOD Project area performs improvement work adjacent to the railroad right-of-way at either Willow Street or Hickory Street will be responsible for installing this water main connection and obtaining any necessary permits and approvals from the railroad. In addition, one or more new water mains will need to be constructed across the existing San Francisco Public Utilities Commission (SFPUC) right-of-way. Similarly, those particular developments within the Dumbarton TOD Project area performing improvement work adjacent to the SFPUC right-of-way will be responsible for installing the water main connection(s) crossing SFPUC right-of-way and obtaining any necessary permits and approvals from SPFUC.

   Given the location and proposed development of Site "A" shown on the Figure 3-4 of the Draft SEIR, the District will require the project to install both a water main extension crossing of the SFPUC right-of-way and a water main connection extending from the project into Willow Street to connect to the existing 16-inch water main within Willow Street on the North side of the railroad right-of-way. In lieu of the requirement for both water mains to be installed for system looping, the District may consider requiring only one connection across either SFPUC or railroad right-of-way if the project proponents can secure a perpetual, irrevocable easement dedicated to ACWD for the water system across either right-of-way.

   The construction of such railroad and SFPUC crossings will require significant trenching, excavation and dewatering and may result in impacts to the environment stemming from pumping and discharge of contaminated groundwater (including the effects of plume migration resulting from such pumping), production and handling of contaminated excavation spoils, construction noise, dust and other factors. **The SEIR should address any associated environmental impacts that may arise from construction of these required connections.**

Other onsite and offsite water system extensions and/or improvements may similarly be required in order to meet fire flow requirements or other ACWD standards and requirements. Any public water system extensions necessary to serve developments within the Dumbarton TOD Project area must meet ACWD public water system installation and design standards, including ACWD' s *Standard Specifications for Water Main Installation and Development Specifications for Public Water System Extensions*. ACWD requests that the City and project proponents coordinate closely with ACWD throughout the planning and development of the Dumbarton TOD Project.

RESPONSE C-1: The commenter informs the City of anticipated water supply connections to Site A and Site B. This comment does not state a specific concern about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. The City has not determined the specific locations where utility connections will occur because construction-level drawings have not yet been prepared or reviewed, however, the SEIR project description generally discloses that utility improvements will be made as part of the development of both Site A and Site B. (See e.g., SEIR p. 44 [“utility connections would be included in the project.”) As discussed in response to comment A-25, the project applicant/developer for Sites A and B will install off-site utility connections, and mitigation measures have been adopted regarding potential environmental impacts that may arise from construction of off-site utility connections. Further, the TOD EIR disclosed that new utility infrastructure, including utility connections, would be required as part of development within the Specific Plan Area. (See, e.g., TOD EIR pp. 4.12-18 through 21.) The commenter does not explain why the analysis and mitigations of impacts and development within the Specific Plan Area, including the 20 acres of public rights of way, is inadequate to address standard utility connections from Site A and Site B. See responses to comments A-25 and C-2.

COMMENT C-2:

2. <u>Hazards and Hazardous Materials:</u> The installation, long-term operation, and maintenance of utilities to serve the project may include, but is not limited to, significant dewatering, disposal of groundwater, deep soil excavation, transportation and disposal of excavated soil, utilities submerged in groundwater, and worker exposure to soil and groundwater. The Draft SEIR does not adequately identify the hazards or hazardous materials sites remaining within the project area, after remediation activities are completed, that may continue to pose a risk to the health and safety of workers during the installation, long-term operation, or maintenance of all utilities required to serve the project. **This analysis should be included in the SEIR.** The ability to install a public water system within the project area would be conditioned upon confirmation that the soil or groundwater does not pose a risk to the health and safety of workers either during installation of the public water system or during long-term routine operation and maintenance of such a system. **Any mitigation required to eliminate such hazards or potential hazards, such that that the soil or groundwater does not pose a risk to the health and safety of workers during installation, and during long-term routine operation and maintenance of utility systems, must be identified and described in the**

SEIR. The proposed mitigation should not rely on extraordinary measures by the utility to protect worker health and safety, such as unusual personal protective equipment, unusual soil or groundwater treatment or disposal requirements, or decontamination of tools and equipment required for potable water system maintenance. If specific measures are to be identified in a Risk Management Plan, the SEIR should require ACWD approval of the plan as part of the mitigation.

RESPONSE C-2: The commenter states that the Draft SEIR does not adequately identify the hazards or hazardous materials sites remaining within the project area, after remediation activities in relation to Site A and Site B are complete, in relation to worker health and safety during the installation, long-term operation, or maintenance of utilities, and suggests additional analysis in the SEIR. The City understands this comment as related to utility corridors and public rights of way adjacent to Site A and Site B. As an initial matter, CEQA caselaw indicates that worker safety is not a significant effect on the environment that must be addressed in an EIR or other CEQA document. (*Parker Shattuck Neighbors v. Berkeley City Council* (2013) 222 Cal.App.4th 768, 782 [“we note that it is far from clear that adverse effects confined only to the people who build or reside in a project can ever suffice to render significant the effects of a physical change”].) Nonetheless, the City notes that there are currently utility corridors and utilities in the project area, which presumably must be maintained regardless of the project, and employers, such as the commenter, are required by state and federal law to provide adequate protection to their employees.

The City notes that each contractor shall be responsible for the health and safety of their employees as well as for compliance with all applicable federal, state, and local laws and guidelines (see e.g. 29 C.F.R. 1910.120.) OSHA guidance explains:

“Workers, such as utility workers, who must perform duties at a hazardous waste site that has not yet been characterized but where contamination is expected, do fall under the scope of 29 CFR 1910.120. These workers must work under the direction of an on-site supervisor and a site-specific safety and health plan, and must be fully trained and protected pursuant to the HAZWOPER standard. When additional information becomes available through site characterization which verifies that there is minimal or no risk of employee exposure to hazardous substances, a lesser degree of PPE and worker training may be acceptable.

When site characterization shows that the area to be serviced by workers is free of potential exposure, or the proposed work assignments would not expose any of the work crew to hazardous substances, the activity can be carried out as a normal maintenance or construction operation.

... The utility contractor is bound to provide at least the minimum number of training hours specified. On a hazardous waste site that has many site specific peculiarities the employer may need to train employees beyond the 40 or 24 hour minimum set by the standard. Employees must be provided training that prepares them for their job functions and responsibilities, as stated in the general requirements in 29 CFR 1910.120(e)."[1]

The City further notes that the project applicant/developer for Sites A and B will install off-site utility connections (see Response A.25 on this topic). Accordingly, the City does not anticipate that project development will entail work by the ACWD personnel or contractors. Nevertheless, Mitigation Measures HAZ-1 through HAZ-3 are amended to clarify that construction risk management plans will be required for on-site and off-site utility work. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

Management of soil and ground water during installation of utilities on-site and off-site by the developer will be performed in accordance with the required Construction Risk Management Plans (RMP) at Sites A and B, and also in accordance with the RAW and Addenda at Site B. The RMPs are required to present protocols for the handling, evaluation and appropriate disposal of excavated soil and pumped water, and worker health and safety measures, in accordance with regulatory agency requirements, and will be provided to ACWD for its review as to areas in which ACWD personnel or contractors will perform work. The City concludes that substantial evidence supports its conclusion that compliance with MM HAZ-1 through HAZ-3 and applicable federal, state, and local laws and regulations will reduce risk associated with existing contamination on Site A and B, and adjacent rights of way where utility connections would be made, to a less than significant level. Please see also Response A-25.

In addition, the City notes that the TOD EIR addressed hazardous substance issues in the Specific Plan area as a whole, including the off-site areas cited in the comment, and proposed mitigation measures to address hazardous impacts in both the TOD EIR and SEIR. The commenter also does not explain why MM HAZ-1 through MM HAZ-4 are inadequate to address the commenter's concerns.

COMMENT C-3:

3. <u>Well Protection/Destruction:</u> Reference is made to Section 3.5.2, Pollutant Remediation and Site Preparation (pages 40 thru 43). ACWD's records indicate the existence of 47 wells in Site A and 24 in Site B (not 22 as reported in the SDEIR). **Therefore, ACWD requests a mitigation measure that requires project proponents to develop a plan for the protection or destruction of wells that must be reviewed and approved by ACWD prior**

[1] (Frequently Asked Questions: HAZWOPER available at https://www.osha.gov/html/faq-hazwoper.html#faq1)

to issuance of grading permits to ensure compliance with ACWD Ordinance No. 2010-01.

In order to protect the groundwater basin, each well located within the property must be in compliance with ACWD Ordinance No. 2010-01. If the well(s) are to remain, a letter so indicating must be sent to ACWD and will require a permit for inactive classification if the wells will not be used for a period of twelve (12) months. If the well(s) are: 1) no longer required by any regulatory agency; 2) no longer monitored on a regular basis; or 3) damaged, lost, or the surface seal is jeopardized in any way during the construction process, the well must be destroyed in compliance with ACWD Ordinance No. 2010-01.

RESPONSE C-3: The commenter suggests that mitigation measures are needed to govern protection or destruction of wells in relation to the project. The City notes that project development plans call for mass grading at both Site A and Site B, and thus that all existing wells will require proper destruction and replacement under RWQCB and ACWD oversight, and that permits from ACWD will be required for such activities. To that end, the SEIR (pg.34, SEIR Section 2.7 Project-Related Approvals) indicates that well decommissioning permit(s) will be needed from the ACWD, and on pg.92 describes that wells would be decommissioned in accordance with ACWD standards, and that a plan for destruction and replacement of the wells is included in the RAP. The destruction of wells would also be regulated by Newark Municipal Code Chapter 13.04, which regulates the destruction of wells so that such wells "will not cause pollution or contamination of groundwater or otherwise jeopardize the health, safety or welfare of the people of the city." TOD EIR and SEIR also require RWQCB approval of remediation plans, which would include proper well destruction and replacement. Accordingly, no further mitigation is required.

COMMENT C-4:

4. Climate Action Plan: Reference is made to the City of Newark's Climate Action Plan, January 2010 Initial Framework. ACWD agrees with the City that planning related to sea level rise is important for the region and for ACWD. **ACWD recommends the SEIR more thoroughly address the potential impacts of sea level rise and adaptation.**

RESPONSE C-4: The commenter requests that the SEIR more thoroughly address the potential impacts of seal level rise and adaptation. The TOD EIR Section 4.6 addressed potential future sea level rise, and determined that the City's municipal code flood elevation standards would protect against potential future sea level rise consistent with FEMA forecast ranges. The commenter does not explain how the analysis in the TOD EIR is deficient or identify any information that would implicate the thresholds found in CEQA Guidelines § 15162 that would require further environmental review of this topic. The City notes that the project elevations are compliant with the City's municipal code flood elevation standards and concludes that substantial evidence supports its

determination that no further environmental review is required for sea level rise and adaptation. See also Response A.3.

COMMENT C-5:

5. ACWD Contacts: The following ACWD contacts are provided so that the City can coordinate with ACWD as needed during the CEQA process:

- Steven Inn, Groundwater Resources Manager at (510) 668-4441, or by e-mail at steven.inn@acwd.com, for coordination regarding ACWD's groundwater resources.

- Rangarajan Sampath, Groundwater Resources Engineer at (510) 668-4411, or by e-mail at rangarajan.sarnpath@acwd.com, for coordination regarding cleanup sites.

- Michelle Myers, Well Ordinance Supervisor, at (510) 668-4454, or by e-mail at michelle.myers@acwd.com, for coordination regarding groundwater wells and drilling permits.

- Ed Stevenson, Development Services Manager, at (510) 668-4472, or by e-mail at ed.stevenson@acwd.com, for coordination regarding public water systems and water services.

RESPONSE C-5: The commenter provides contact information. Comment noted

D. RESPONSE TO COMMENTS FROM THE SAN FRANCISCO PUBLIC UTILITIES COMMISSION (SFPUC), FEBRUARY 7, 2014.

COMMENT D-1: As a Responsible Agency under the provisions of Section 15096 of the CEQA Guidelines, the San Francisco Public Utilities Commission (SFPUC) submits its comments regarding the Dumbarton Transit Oriented Development for the Trumark Residential Project Supplemental Environmental Impact Report (SEIR).

The SFPUC commented on the Notice of Preparation for the SEIR in a letter dated March 7, 2013. That letter is attached. We stated that the SEIR should list the SFPUC as a Responsible Agency and cited the SFPUC Pipeline Right of Way (ROW) Requirements which we provided with the letter. We commented that the SFPUC does not permit any structures on our ROW, nor does the SFPUC allow the ROW to be used as the sole access to any development as this creates future access problems in the event our pipelines require repair or replacement. The SEIR has not addressed our comments as the site plans for the development still show the only access road on the SFPUC ROW. Furthermore the SEIR does not include a Utilities and Services section, as required in subsection XVII of Appendix G of the CEQA Guidelines. This section should be included in the SEIR and potential Impacts to the SFPUC's ability to maintain and repair its pipelines should be analyzed in this section.

RESPONSE D-1: The Commenter states that it is a responsible agency. The commenter is listed as a responsible agency on SEIR page 31-32, 34. The City notes that the developer has provided both the City and the commenter evidence of its property rights to obtain access over the commenter's property in the form of a 45 foot wide access and utility easement; therefore no right of way approval appears to be required for access. The developer will be required to obtain approval from the commenter for the installation of landscaping and other frontage improvements outside of the 45 foot easement area. The commenter has concerns that the site plan indicates an access road will be provided over the commenter's right of way. The commenter does not explain with any specificity how a single public access to Site A could result in a significant impact on the physical environment. The commenter states that it does not permit sole access because it creates future access concerns. As explained above, the developer holds an access easement, therefore no permit is required. Commenter will be required to not substantially interfere with future resident and visitors access to Site A during maintenance activities, and any logistical difficulty in avoiding such interference is an economic and business concern outside the scope of CEQA. Commenter is correct that access over the commenter's right of way within the developer's access easement area will be the sole public access to Site A unless at some future time secondary public access is provided through adjoining private property. The City notes that an Emergency Vehicle Access (EVA) that will not be available to the general public will be provided over the adjacent FMC Parcel (to the west) and Figure 3-4 has been revised to show such access. Refer to **Section 5.0 Revisions to the Figures of the Draft SEIR.**

Commenter states that the SEIR is required to contain a utilities and services section. That is incorrect. The City has determined that there is no new information, changes in circumstances, or changes in the Specific Plan project that would result in new or substantially increased environmental impacts related to utilities than analyzed in the TOD Specific Plan EIR. (CEQA Guidelines § 15162.) Please also see Response A-3. The TOD EIR thoroughly analyzes impacts to utilities and services in Chapter 4.12 and concludes such impacts would be less than significant after mitigation. The proposed development within Site A and Site B is consistent with the Specific Plan and such development potential impacts to utilities and services falls within the scope of impacts analyzed in the TOD EIR. The commenter cites no evidence that new information, project refinements or other changes in circumstances would alter the conclusions in the TOD EIR. The commenter requests that the SEIR analyze the commenter's ability to maintain and repair its pipelines. The commenter provides no evidence that such concerns are environmental rather than economic in nature, which is outside the scope of CEQA, or if environmental in nature that there is any evidence that the project would result in significant impacts to the environment. For example, the City is unaware of any evidence that providing access to Site A from Enterprise Drive would require major infrastructure that would result in significant physical impacts to the environment through its installation. Therefore, the City concludes that substantial evidence supports its decision to not include a utilities and services section in the SEIR. Please also see Response A-25 for its discussion of utility work associated with the project.

COMMENT D-2: The developer's representative presented the proposed project in a formal SFPUC Project Review meeting on June 14, 2013 and stated that the developer was seeking an emergency vehicle access (EVA) across an adjacent property but such an EVA is not shown in the SEIR. Also since that meeting, the project site plan, as shown in the SEIR, has been changed. The developer should schedule a presentation of the revised project at a future Project Review meeting. The contact for Project Review arrangements is Ms. Joanne Wilson at jwilson@sfwater.org.

RESPONSE D-2: The commenter states that an EVA access is not shown in the SEIR. Figure 3-4 has been revised to show such access. The commenter requests a project review meeting. This comment does not state a specific concern about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, this comment has been noted for the record and will be provided to the Planning Commission and City Council for consideration. The City anticipates that the developer will have further meetings with the SFPUC to address any outstanding issues. Refer to **Section 5.0 Revisions to the Figures of the Draft SEIR.**

COMMENT D-3: We reiterate that while a January 1974 Parcel Map No. 1317 depicts a crossover right over SFPUC property this does not grant the property owner the right to construct a road and related improvements across our fee owned-property without a Land Engineering Permit from the SFPUC, and this will not be granted without provision of an EVA, among other conditions, which

will be determined after the project is presented at Project Review. The SEIR should show a revised project site plan including an EVA. Please contact Brian Morelli, Right of Way Manager, at (415) 554-1545 or bmorelli@sfwater.org for any questions regarding our specific ROW requirements.

The SFPUC appreciates the opportunity to comment on the Supplemental Environmental Impact Report for the Dumbarton Transit Oriented Development Trumark Residential Project as a Responsible Agency under CEQA. Please feel free to contact me at (415) 554-3232 or itorrey@sfwater.org or Ms. YinLan Zhang at 415-487-5201 or vzhang@sfwater.org if you have questions about our comments.

RESPONSE D-3: The commenter states that it will not issue a land engineering permit unless an EVA access is provided. As noted in Response D-2, an EVA that will not be available to the general public will be provided over the adjacent FMC Parcel (to the west) and Figure 3-4 has been revised to show such access. This comment does not state a specific concern about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, this comment has been noted for the record and will be provided to the Planning Commission and City Council for consideration. The City notes that the commenter's July 2, 2013 project review minutes confirm that the developer will obtain approval from commenter to conduct testing to determine SFPUC's location and depth and that the developer will submit plans to the SFPUC for review. The minutes also indicate that the developer will need to obtain authorization to maintain landscaping and sidewalks on the commenter's right of way. The City anticipates that the developer will have further meetings with the commenter to address any outstanding issues as requested by commenter. Refer to **Section 5.0 Revisions to the Figures of the Draft SEIR.**

E. RESPONSE TO COMMENTS FROM MARGARET LEWIS, FEBRUARY 7, 2014.

COMMENT E-1: I have a few comments to make on the supplemental EIR for the proposed Trumark development on Area 2 AKA Dumbarton TOD.

Page 43 of the document states that contaminated soils could be transported to the nearest Class 2 disposal facility, one of which could be the Dumbarton Landfill. Where is the Dumbarton Landfill? I cannot find it on a list of landfills in Alameda County or anywhere for that matter. Is this a typo or is the city intending to open a new landfill in Newark?

RESPONSE E-1: The commenter asks if references to the "Dumbarton Landfill" is a clerical error or if a new landfill is planned. The reference is a clerical error and has been corrected in the Final SEIR by removing reference to a "Dumbarton Landfill". Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

COMMENT E-2: None of the maps showing the proposed development of the two sections of the Trumark property contain a vehicle access point for Site A which is adjacent to Gallade Chemical. It appears that when development occurs on the parcel to the west of Site A that a street coming off of Willow and heading east would provide vehicle access to Site A. But until that parcel is developed, Site A is landlocked with no access. Is this what the city intends to happen?

RESPONSE E-2: The commenter requests clarity regarding vehicular access to Site A. Please see response to comment D.1. Vehicular access will be provided from Enterprise Drive and an Emergency Vehicle Access provided from Willow Street, as shown on Figure 3-4, as revised. Refer to **Section 5.0 Revisions to the Figures of the Draft SEIR.**

COMMENT E-3: In only giving approvals for small sections of Area 2 there is no coordinated cleanup of contaminated soils and groundwater. It is done in a piecemeal fashion that puts future residents and the public at risk of exposure from soil and groundwater contamination. This document states that part of the Trumark site is on the Cortese List of Hazardous Waste sites. This is also known as the California Superfund list. Does the city really believe the highest and best use of a Superfund site is residential? If so, this is alarming and irresponsible planning.

RESPONSE E-3: The commenter states that approving projects on Site A and Site B results in the piecemeal environmental review. Please see responses to comments A.3 and A.24. The commenter notes the status of Site A as a Cortese List of Hazardous Waste Site and asks if residential is the highest and best use of the site. This comment does not state a specific concern about the adequacy of the Draft SEIR or otherwise comment on the contents of the Draft SEIR. Therefore, a response is not required. However, this comment has been noted for the record and will be provided to the Planning Commission and City Council for consideration. The City notes that the policy decision to permit residential development on Site A was made with the adoption of the Dumbarton TOD Specific Plan and the

potential hazard impacts associated with residential development on this site are thoroughly addressed in the TOD EIR and SEIR.

COMMENT E-4: The reasons for stating no alternative location exists because housing must be built on Area 2 makes no sense. The city claims there will be rail service and thus this is a transit development. No rail service is planned in the foreseeable future. Neither is bus service planned to serve future residents. Therefore Area 2 is not a transit development. The city should look at the NewPark Mall Master Plan area where the city wants to bring in residential of various densities. The mall area is not a Superfund site and has easy freeway access. Shopping is already in place. There are also the vacant lots across from the Newark post office as well as the Ruschin school site which the school district has up for immediate sale.

RESPONSE E-4: The commenter states that Area 2 is not a transit development due to lack of rail and bus service and suggests areas outside the Specific Plan Area that the commenter believes are more appropriate for residential development. The policy decision to permit residential development on Site A and B was made with the adoption of Dumbarton TOD Specific Plan. The commenter does not identify any new information, changes in circumstances, or project changes that would require the City to revisit this policy decision under CEQA Guidelines § 15162. (See *Bowman v. City of Petaluma* (1993) 185 Cal.App.3d 1065, 1082-1083.) Therefore, the SEIR properly rejects an alternative outside the Specific Plan Area for being infeasible for policy reasons. In addition to the reasons stated in the SEIR, an alternative outside the Specific Plan area would be infeasible for policy reasons because an alternative outside the Specific Plan area would not effectuate the City of Newark's General Plan and other applicable planning and zoning goals, policies, and objectives for the Specific Plan Area. Further, an alternative outside the Specific Plan Area would not foster compact, connected, safe and walkable neighborhoods with convenient access to a future, planned transit station along the Dumbarton Rail Corridor, parks and open space, and commercial services within the Specific Plan Area. As stated in the TOD EIR on page 3-21, the "vision of the proposed Dumbarton TOD Specific Plan is to create a livable community that integrates a wide variety of housing types and densities with a neighborhood retail center, employment opportunities and connectivity to parks, open space, the future transit station and commercial services." As part of the Specific Plan approval, Site A and Site B were designated in the Specific Plan's land use plan for residential use. The commenter appears to question this policy decision made in 2011, however, such policy disagreement does not implicate the adequacy of the SEIR related to project-level approvals on the land previously designated residential. The City notes that, though the timing of future transit improvements is uncertain, it remains City policy to serve the Specific Plan Area with improved transit services, including improved interim bus service prior to construction of the transit center.

F. RESPONSE TO COMMENTS FROM CH2M HILL, ON BEHALF OF HONEYWELL INTERNATIONAL, INC., FEBRUARY 7, 2014.

COMMENT F-1: Page xx, table summarizing significant environmental impacts and associated mitigation measures

There is no clear basis for the document's use of an increased lifetime cancer risk of one-in-one million (10^{-6}) as a threshold of significant impact for VOCs in soil and groundwater at Site A. Use of this risk threshold is not consistent with other regulatory guidance, including the BAAQMD guidelines for assessing significance of public health impacts referenced in the SEIR, DTSC's 2011 Vapor Intrusion Mitigation Advisory, and language in the 2007 Site Cleanup Requirements for the Gallade facility. The threshold of significance for cancer risks associated with VOCs in soil and groundwater should be stated in a manner consistent with the applicable regulatory guidance.

RESPONSE F-1: The commenter suggests that the threshold of significance should be stated in a manner consistent with the applicable regulatory guidance. In a related comment at the closing of the letter, the commenter notes that the DTSC Vapor Intrusion Mitigation Advisory refers to a risk management range of 1x10-6 to 1x10-4, rather than a single target risk level of 1x10-6 as stated in the Draft SEIR. The City acknowledges that applicable regulatory guidance such as the DTSC Vapor Intrusion Mitigation Advisory refers to a risk management range of 1x10-6 to 1x10-4 and a health hazard index of less than 1. However, the City notes that environmental oversight agencies have substantial discretion, and that risk management decision-making can be complex and that environmental oversight agency risk assessment and risk management practices are evolving and subject to change. Accordingly, the City revises MM HAZ-1, in part, as follows (Refer to **Section 4.0 Revisions to the Text of the Draft SEIR)**:

Prior to the issuance of grading permits or building permits for development of Site A, a remediation plan and a risk management plan, with monitoring and reporting requirements, must be prepared and submitted for review by the RWQCB. The RWQCB will review the plans to confirm that implementation of the plans ~~would~~ should achieve ~~Cal-EPA approved~~ risk management standards <u>applied by the RWQCB</u> for residential use ~~of risk less than 1x10-6 and health hazard index of less than 1~~. RWQCB will also review any amendment of such plans to confirm that implementation of the plans should achieve ~~Cal-EPA approved~~ risk management standards <u>applied by the RWQCB</u> for residential use ~~of risk less than 1x10-6 and health hazard index of less than 1.~~

COMMENT F-2: Page xxvi, 2nd to last paragraph

The description of the FMC properties should be more specific as to which particular FMC parcels would be used for the Location Alternative. The statement "*It is likely that the remediation action needed to prepare these sites for residential development would involve similar remediation as the project proposes for Site B.*" may not apply to each of the FMC parcels.

RESPONSE F-2: The commenter states that the Location Alternative should be more specific regarding which FMC parcels would be involved. The SEIR states the Location Alternative could be located on any parcel with a medium density designation. This includes the FMC parcels with APN 092-0100-004-02 and 092-0101-001. No text revision is required.

COMMENT F-3: Page 33, Section 2.5, Assessor's Parcel Numbers

There is a discrepancy in the parcel number for Site A between the parcel number in this paragraph, 092-0140- 008, and the parcel number in Figure 3-2, 092-0140-006.

RESPONSE F-3: The commenter notes a discrepancy between the parcel number for Site A identified in the text on Page 33 and as identified in Figure 3-2. The discrepancy is a clerical error (APN 092-0140-006 is correct) and has been corrected in the Final SEIR. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

COMMENT F-4: Page 40, Section 3.5.2, Pollutant Remediation and Site Preparation

The text states "*The extent of work necessary to prepare Site A for development will depend on the success of remediation of the adjoining property.*" Given that the residential development of Site A will include the installation of pre-emptive vapor intrusion mitigation systems, the extent of work necessary to prepare Site A for development should not be strictly dependent on remediation efforts at adjoining properties.

RESPONSE F-4: The commenter states that the extent of work is not "strictly" dependent on the extent of remediation on adjoining property. Comment noted. The City agrees that multiple factors are involved in designing remediation and risk management plans, including the extent of remediation on adjoining properties. Please see Response A.4**.**

COMMENT F-5: Page 40, Section 3.5.2.1, Pollutant Remediation and Site Preparation, Site A – Trumark

The first sentence states "*…that groundwater contamination beneath the Site A would be sufficiently remediated to allow development of the site with residential uses.*" Given that vapor intrusion mitigation systems will be installed in each of the residential structures to be constructed at Site A, the residential development of Site A should be allowed to proceed after the start of groundwater remediation. We believe this action is correctly stated on Page 88, 2nd paragraph "*The project*

proposes to install engineered vapor barrier controls as part of residential development of Site A to mitigate risks to future residents until groundwater remediation is complete."

RESPONSE F-5: The commenter requests a text revision related to the extent of groundwater remediation on Site A required prior to development. Please see response to comment A4. No text revision is required

COMMENT F-6: In addition, the vapor intrusion engineering controls associated with the proposed project are described in further detail in a conceptual risk management plan for the development of the Trumark parcel, submitted in draft to the RWQCB on December 20, 2013, in accordance with Mitigation Measure 4.7-1a in the Dumbarton Transit Oriented Development Specific Plan EIR (City of Newark, 2011). A statement acknowledging that a draft conceptual risk management plan for the Trumark parcel has been submitted to the RWQCB should be included in the SEIR. The fundamentals of the conceptual risk management plan were discussed among Trumark, Honeywell, and the RWQCB, and an agreement was reached in concept.

RESPONSE F-6: The commenter suggests that a statement acknowledging that a draft conceptual risk management plan for Site A has been submitted to the RWQCB should be included in the SEIR. The Conceptual Risk Management Plan that was submitted on December 20, 2013 by Honeywell to the RWQCB is described in Response A-4, which is a part of the Final SEIR.

COMMENT F-7: Page 44, Section 3.5.3, Pollution Remediation and Site Preparation, Residential Development

The third paragraph states *"A new public park will be located immediately to the east of Site A [the Trumark parcel] at the current location of the Gallade Chemical Company facility."* The SEIR does not specify the timing for development of Site A in relation to the new public park. Specifically, will building and grading permits for Site A development be approved by the City, prior to the development of Gallade as a public park?

RESPONSE F-7: The commenter raises a question regarding whether the building and grading permits for Site A will be approved by the City prior to the development of the Gallade property as a public park. Building and grading permits may be issued prior to the development of the Gallade property as a public park as the timing of redevelopment of the Gallade property is uncertain. Mitigation Measure HAZ-1 requires that remediation and risk management plans be approved for Site A prior to issuance of a building or grading permit. Such plans will analyze the extent of remediation required on the Gallade Parcel prior to development. As stated in Response A-25, the City concludes that occupancy of Site A would not occur until after the light industrial use on the Gallade Parcel has ceased operations. .. Please see Response A-25.

COMMENT F-8: Page 88, Section 4.5.2.1, Impacts, Site A – Trumark Property

The statement, *"[t]he project proposes to install engineered vapor barrier controls as part of residential development of Site A to mitigate risks to future residents until groundwater remediation is complete,"* appropriately reflects Cal-EPA's approach to addressing vapor intrusion risks associated with future development, as outlined in the California Department of Toxic Substances Control (DTSC) Vapor Intrusion Mitigation Advisory.

The approach to the engineering controls for vapor intrusion has been provided to the RWQCB as part of the conceptual risk management plan. A brief description of those engineering controls should be incorporated into this section.

The mitigation measure for HAZ-1 identifies a target increased lifetime cancer risk of less than 1×10^{-6} as representing a less than significant impact. While this is described as a Cal-EPA approved risk management standard, the regulatory basis for this risk threshold has not been defined or documented in this SEIR. It is inconsistent with the vapor intrusion risk management framework outlined in DTSC's *Vapor Intrusion Mitigation Advisory*, and is inconsistent with language presented in the 2007 Site Cleanup Requirements (see page 6), both of which refer to the risk management range of 1×10^{-6} to 1×10^{-4} for making cleanup decisions. In addition, the SEIR refers to the BAAQMD's risk management threshold of a 1×10^{-5} as a target risk level. The cancer risk level being used as a threshold of significance requires more justification than is currently provided in the document.

RESPONSE F-8: The commenter suggests that a summary of Honeywell's Conceptual Risk Management Plan be incorporated into Section 4.5.2.1 of the SEIR. A summary is provided in Response A-4 and A-25, which is part of the Final SEIR. The final part of this comment involving the appropriate target risk level threshold is addressed in Response F-1.

G. RESPONSE TO COMMENTS FROM CARGILL, FEBRUARY 7, 2014.

COMMENT G-1: On behalf of Cargill, Incorporated ("Cargill"), thank you for the opportunity to comment on the Administrative Draft - Supplemental Environmental Impact Report – Trumark Dumbarton Transit Oriented Development Residential Project dated December 2013 ("SEIR"). Cargill wishes to offer the following comments to correct a few inaccuracies contained in the SEIR.

Namely, the SEIR identifies Cargill Parcel 1 of Tentative Parcel Map 9873 (see Figure 3-2 of the SEIR) (the "Cargill Site") as a potential alternative site for the residential project analyzed in the SEIR, as well as property owned by FMC Corporation. In so doing, the SEIR states that:

> As noted in the Dumbarton TOD Specific Plan EIR, these sites are known to be impaired by hazardous materials, generally in the form of soil and/or groundwater contamination. It is likely that the remediation actions needed to prepare these sites for residential development would involve similar remediation as the project proposes for Site B.

SEIR at page 119.

As discussed below, this statement is factually inaccurate and does not represent the conditions of the Cargill Site.

The Dumbarton TOD Specific Plan EIR ("Specific Plan EIR") analyzes four limited areas of the Cargill Site for potential impacts from hazards and hazardous materials in connection with buildout of the Dumbarton TOD Specific Plan: (1) the former Newark Sportsman's Club (Hickory Street), (2) the Newark Police Pistol Range (Hickory Street), (3) the Leslie Salt/FMC Magnesia Waste Pile Site (Hickory Street), and (4) the Hill Parcel (Hickory Street). See Specific Plan EIR at pages 4.7-6 through 4.7-11.

<u>Former Newark Sportsman's Club - Remediated and No further Action Necessary</u>

With respect to the former Newark Sportsman's Club (approximately 18 acres located west of Hickory Street which was leased by the Club from Cargill from 1969 through 1995), the Specific Plan EIR notes that use as a recreational outdoor shooting range resulted in "surficial and shallow soil deposition of lead shot, residual total lead, and clay pigeon debris containing elevated levels of polycyclic aromatic hydrocarbons (PAHs)." Specific Plan EIR at page 4.7-6. After the discovery of "very little contamination" below 0.5 feet of soil depth and "limited" debris, Cargill performed a voluntary Remedial Action Workplan consisting of soil excavation and confirmation sampling in 2002 and 2003. On March 10, 2004, the Regional Water Quality Control Board issued a letter certifying that soil remediation activities had achieved cleanup objectives and that *no additional remedial action was necessary."* Specific Plan EIR at page 4.7-7 (emphasis added).

<u>Newark Police Pistol Range - Small and limited (405 tons) clean-up required</u>

Next, the Specific Plan EIR analyzed potential impacts from a small portion of the Cargill Site leased by the City of Newark from Cargill for use as a pistol range for the Newark Police Department. In

2001, the City conducted a Phase II Soil and Groundwater Investigation which identified lead concentrations in shallow soils exceeding State hazardous waste criteria. "As the depth of contamination was limited," the investigation concluded that excavation and removal of the upper three feet of impacted soil was the most cost effective remedy. See Specific Plan EIR at page 4.7-8. The amount of soil estimated to be removed is approximately 405 tons, in contrast with the estimated 91,000 tons of soil which will need to be removed from Site B for the project analyzed in the SEIR. See SEIR at page 43. In other words, the soil to be removed from the Newark Police Pistol Range site is 0.45 percent of the soil which will need to be removed from Site B.

Leslie Salt/FMC Magnesia Waste Pile Site - Remediated and Clean-up Completed According to Remedial Action Plan

As the Specific Plan EIR notes, FMC and its predecessor Westvaco deposited certain waste materials from their adjacent facility onto a portion of the Cargill Site, which was leased from Cargill from 1929 to 1969, resulting in a magnesia waste pile containing concentrations of heavy metals. After a series of investigations and removal actions conducted by FMC and Cargill, the Department of Toxic Substance Control ("DTSC") certified that all hazardous waste had been removed from this area. In 2002, the City of Newark issue a case closure for the site after the majority of non-hazardous waste magnesia material was removed. Only "scattered piles" of non-hazardous magnesia material remain at a total quantity of approximately 500 to 1000 cubic yards, in contrast with the 60,350 cubic yards of soil which must be removed from Site B of the SEIR project. See Specific Plan EIR at pages 4.7-9, -10 and SEIR at page 43.

Hill Parcel - Serpentine Rock -Naturally occurring materials

Finally, the Specific Plan EIR describes an investigation of a portion of the Cargill Site known as the "Hill Parcel" (west of Hickory Street) which contains serpentine bedrock and naturally occurring asbestos ("NOA"). The investigation concluded that "[t]hese naturally occurring materials are not regulated as a hazard if left in place." At the most, if and when the Hill Parcel is developed for residential use, "all earthmoving and trenching should be performed in compliance with regulatory requirements then in effect." There is no present hazard posed by the Hill Parcel.

In sum, the Cargill Site contains very limited areas of soil impacted by lead (approximately 405 tons), naturally occurring asbestos which must be properly managed if and when the site is developed and no evidence of groundwater contamination. The Cargill Site bears no resemblance whatsoever to the Site B analyzed in the SEIR.

Based upon this evidence, the SEIR cannot reasonably conclude that the Cargill Site is "impaired by hazardous materials," contains "groundwater contamination" and that "it is likely that the remediation actions needed to prepare [the Cargill Site] for residential development would involve similar remediation as the project proposes for Site B." The potential impacts of removing 91,000 tons of soil are not similar to the potential impacts of removing 450 tons of soil. This statement in the SEIR should therefore be removed, at least as it pertains to the Cargill Site. Or, alternatively, this statement in the SEIR should be revised, at least as to the Cargill Site, as follows:

As noted in the Dumbarton TOD Specific Plan EIR, the Cargill ~~se~~ site~~s~~ contains limited areas of soils impacted by lead from a shooting range utilized by the Newark Police Department and naturally occurring asbestos ~~are known to be impaired by hazardous materials, generally in the form of soil and/or groundwater contamination~~. Although nowhere near the scale of the removal which would be required for Site B, it is therefore possible that development of the Cargill Site for medium density residential use would entail some limited removal of soils, estimated to be approximately 450 tons of lead impacted soil versus the estimated 91,000 tons of soil which would need to be removed from Site B. ~~It is likely that the remediation actions needed to prepare these sites for residential development would involve similar remediation as the project proposes for Site B.~~

RESPONSE G-1: The Location Alternative discussion focused on two other sites in the Dumbarton TOD Specific as potential location alternatives, the Cargill property and the FMC property, see SEIR Section 7.2.3 Location Alternative. This comment concerns the SEIR's discussion of the Cargill site. The quoted text from the SEIR concerning the need for soil and/or groundwater remediation was addressing both sites (Cargill and FMC), and intended to convey that each site would need some amount of remediation prior to development with residential uses as contemplated by the TOD Specific Plan.

Figure 4-2, Note 2 is based on information in the certified 2011 Dumbarton TOD Specific Plan EIR, and as discussed in more detail in the TOD Specific Plan EIR, past uses of the Cargill site resulted in contamination, and naturally-occurring asbestos is present in the South Hill area. As stated in the prior comment (Comment G-1), remedial activities have been conducted on certain portions of the Cargill site, although as noted in the prior response (Response G-1), it is unclear to the City whether the actions were designed to achieve residential standards. As stated in Comment A-22, according to the RWQCB, none of the sites in the Specific Plan Area have been remediated to safe levels for residential use. Therefore, it is premature to state, as requested in the revised text provided in the comment, that the various portions of the Cargill site have been remediated and closed for residential use. That determination will be made in the context of the City's review and approval of residential development application(s) for the Cargill site consistent with the TOD Specific Plan, and in compliance with the TOD EIR's mitigation measures pertaining to investigating and remediating sites with soil and/or ground water contaminants.

The comment takes issue with the SEIR's generalized discussion of the Cargill site, and provides much more detailed information concerning the specific conditions and past remedial actions taken on several of the portions of the Cargill property. It is not clear from the comment whether the various remedial actions taken for the noted Cargill site areas were designed to achieve residential standards, although that is considered unlikely given the actions predated the adoption of the Specific Plan, when the site was first designated for residential use.

The commenter is correct that there is the *potential* for remediation activities associated for preparing the Cargill site for residential use may be lower than for Site B, but the City cannot conclude at this time that the Location Alternative *would* have lower remediation obligations. As has happened with the Trumark parcels, the nature and magnitude of activity will be determined, in coordination with the property owners and regulatory agencies, at the time residential applications are filed, additional site investigations are performed specifically addressing the proposed residential use, and site conditions are compared against then-current regulatory standards for residential use. The SEIR has been clarified its discussion of the Location Alternative. Refer to **Section 4.0 Revisions to the Text of the Draft SEIR.**

COMMENT G-2: <u>Figure 4-2</u>

Similarly, Figure 4-2 of the SEIR depicts the Cargill Site as containing a number of hazardous substances, including "lead, polycyclic aromatic hydrocarbons, magnesia, heavy metals and naturally-occurring asbestos." As noted above, the Cargill Site no longer contains polycyclic aromatic hydrocarbons, and the remaining, limited areas containing magnesia at the Hill Parcel consist of non-hazardous material. The reference to PAHs within Figure 4-2 should therefore be stricken.

Figure 4-2 also contains the following Note 2 which is highly misleading and inaccurate:

> Portions of the Cargill property supported various land uses that resulted in site contamination, including the Newark Police Pistol Range (Lead), Newark Sportsman's Club (Lead, PAHs) and Leslie Salt/FMC (Metals, magnesia). The Cargill property also includes naturally-occurring asbestos in the South Hill area.

In light of the actual current and environmental status of these areas, discussed above, we request that Note 2 of Figure 4-2 be revised as follows:

> Portions of the Cargill property <u>historically</u> supported various land uses that resulted in <u>limited</u> site contamination, including the Newark Police Pistol Range (Lead), Newark Sportsman's Club (Lead, PAHs) <u>(site remediated and closed)</u> and Leslie Salt/FMC (Metals, magnesia) <u>(site remediated and completed according to RAP)</u>. The Cargill property also includes <u>non-hazardous</u>, naturally-occurring asbestos in the South Hill area.

RESPONSE G-2: Figure 4-2, Note 2 is based on information in the certified 2011 Dumbarton TOD Specific Plan EIR, and as discussed in more detail in the TOD Specific Plan EIR, past uses of the Cargill site resulted in contamination, and naturally-occurring asbestos is present in the South Hill area. As stated in the prior comment (Comment G-1)**,** remedial activities have been conducted on certain portions of the Cargill site, although as noted in the prior response (Response G-1), it is unclear whether the actions were designed to achieve residential standards. As stated in Comment A-22, according to the RWQCB,

none of the sites in the Specific Plan Area have been remediated to safe levels for residential use. Therefore, it is premature to state, as requested in the revised text provided in the comment, that the various portions of the Cargill site have been remediated and closed for *residential* use. That determination will be made in the context of the City's review and approval of residential development application(s) for the Cargill site consistent with the TOD Specific Plan, and in compliance with the TOD EIR's mitigation measures pertaining to investigating and remediating sites with soil and/or ground water contaminants.

COMMENT G-3:

Finally, Cargill wishes to point out that the proponent of the project analyzed in the SEIR does not own or control the Cargill Site, as the SEIR itself notes. See SEIR at page 120.

***

Thank you again for the opportunity to comment on the draft SEIR. Should you have any questions regarding any of the comments contained in this letter, please do not hesitate to contact me.

RESPONSE G-3 This comment concurs with the SEIR's statement that the project proponent (Trumark) does not own or control the Cargill site. No further response is required.

SECTION 4.0 REVISIONS TO THE TEXT OF THE DRAFT SEIR

This section contains revisions to the text of the *Draft Supplemental Environmental Impact Report, Trumark Dumbarton Transit Oriented Development Residential Project*, dated December 2013. Revised or new language is underlined. All deletions are shown with a ~~line through the text~~.

Page xx, ***Summary of Significant Impacts and Mitigation Measures***; Mitigation Measure HAZ-1 is revised as follows:

Prior to the issuance of grading permits or building permits for development of Site A, a remediation plan and a risk management plan, with monitoring and reporting requirements, must be prepared and submitted for review by the RWQCB. The RWQCB will review the plans to confirm that implementation of the plans ~~would~~ should achieve ~~Cal-EPA approved~~ risk management standards applied by the RWQCB for residential use ~~of risk less than 1x10-6 and health hazard index of less than 1~~. RWQCB will also review any amendment of such plans to confirm that implementation of the plans should achieve ~~Cal-EPA approved~~ risk management standards applied by the RWQCB for residential use ~~of risk less than 1x10-6 and health hazard index of less than 1.~~

In addition, a Construction Risk Management Plan (CRMP) with protocols for the handling, evaluation and appropriate disposal of excavated soil and pumped water in accordance with regulatory agency requirements, and protocols governing worker health and safety, will be either integrated into other plans or will be developed as a stand-alone document, and will address on-site and off-site development and maintenance of utilities. The CRMP shall be provided to RWQCB, City and ACWD for review and comment. The City shall provide the CRMP to all contractors performing subsurface work in the areas covered by the CRMP.

Also, remediation plan and risk management plan construction phase components (as opposed to ongoing monitoring and reporting requirements) shall be implemented prior to occupancy. Prior to issuance of occupancy permits, a risk management plan consistent with DTSC's Vapor Intrusion Mitigation Advisory shall be approved by the RWQCB or other oversight agency.

Such plans shall address the potential migration of vapors laterally along utility conduits and into residences through physical controls. The extent of such physical controls shall be determined in response to soil vapor data generated prior to construction and designed to control migration of vapors to avoid significant risk to human health or structures. Such physical controls could include the installation of low-permeability backfill "plugs," or through an equally effective technique, adjacent to residences and along subsurface utilities beneath Sites A.

Certificates of Occupancy for the residences will not be issued until the developer submits to RWQCB documentation on the installation and performance testing of vapor intrusion mitigation measures and the light industrial uses on the Gallade Parcel have ceased operations. **(Less Than Significant Impact with Mitigation)**

Page xx, ***Summary of Significant Impacts and Mitigation Measures***; Mitigation Measure HAZ-2 is revised as follows:

MM HAZ – 2: Prior to the issuance of building permits for development of Site B, all pre-construction elements of the Remedial Action Plan conditionally approved by the RWQCB

on July 30, 2013, as it may be amended, and any addenda, must be met, including required pre-construction contingent submittals listed in the RWQCB conditional approval. **(Less Than Significant Impact with Mitigation)**

Page xx, *Summary of Significant Impacts and Mitigation Measures*; Mitigation Measure HAZ-3 is revised as follows:

MM HAZ – 3: Prior to the issuance of building permits for development of Site B, all pre-construction elements of the Remedial Action Plan conditionally approved by the RWQCB on July 30, 2013, as it may be amended, and any addenda, must be met, including required pre-construction contingent submittals listed in the RWQCB conditional approval. Prior to issuance of occupancy permits, a risk management plan consistent with DTSC's Vapor Intrusion Mitigation Advisory shall be approved by the RWQCB or other oversight agency. Such plan shall address the potential migration of vapors laterally along utility conduits and into residences through physical controls. The extent of such physical controls shall be determined in response to soil vapor data generated prior to construction and designed to control migration of vapors to avoid significant risk to human health or structures. Such physical controls could include the installation of low-permeability backfill "plugs," or through an equally effective technique, adjacent to residences and along subsurface utilities beneath Sites B.

In addition, a Construction Risk Management Plan (CRMP) with protocols for the handling, evaluation and appropriate disposal of excavated soil and pumped water in accordance with regulatory agency requirements, and protocols governing worker health and safety, will be either integrated into other plans or will be developed as a stand-alone document, and will address on-site and off-site development and maintenance of utilities. The CRMP shall be provided to RWQCB, City and ACWD for review and comment. The City shall provide the CRMP to all contractors performing subsurface work in the areas covered by the CRMP. **(Less Than Significant Impact with Mitigation)**

Page 33, *Section 2.5 Assessor's Parcel Numbers* is revised as follows:

The project would be located on APN 092-0140-~~008~~ 006 (Site A) and APNs 092-0116-060, -058, and -059 (Site B).

Page 33-34, *Section 2.7*; Project Related Approvals is revised as follows:

Regional Water Quality Control Board

- Approval of proposals for remediation, mitigation, cleanup and monitoring of hazardous substances

Union Sanitation District

- Discharge permit

Bay Area Air Quality Management District

- Authority to Construct and Permit to Operate

Page 41, *Section 3.5.2.2 Project Description*; Pollutant Remediation and Site Preparation on Site B, is revised as follows:

Implementation of the RAP and preparation of the site for subsequent development is expected to take six to twelve months and would involve the following corrective actions, which are described in detail below:

- Removal of Capped Soil exceeding residential cleanup goals in Former Evaporation Pond
- Removal of Soil exceeding residential cleanup goals in the vacant/undeveloped portions of the site
- Soil Excavation at Location of Former Chemical Production Plant, testing the soil and removing soil that does not meet residential standards
- Groundwater Management and Groundwater Well Replacement

After soil removal, further vapor intrusion controls and/or groundwater remediation may be required to prepare the site for residential development.

Page 43-44, *Section 3.5.2.2;* Transport and Disposal of Contaminated Soil, is revised as follows:

The nearest Class 2 ~~facilities are the Dumbarton Landfill and~~ facility is the Altamont Landfill in eastern Alameda County.

Page 44, *Section 3.5.3*; Residential Development on Site A, is revised as follows:

The proposed project would construct twenty-seven single family homes on Site A. The new residences would be arranged in blocks of four or five homes each, with access provided by three lanes extending east from a new street perpendicular to Enterprise Drive. The average lot size would be approximately 1,925 square feet. Sidewalks, landscaping and utility connections would be included in the project. An Emergency Vehicle Access (EVA) lane would provide secondary access to Site A for emergency and public utility vehicles from Willow Street, via a controlled access point. The EVA lane would be located within an easement crossing the adjoining parcel to the west (the FMC parcel; APN 092-0100-004-02). The conceptual location for the EVA is shown on Figure 3-4. Construction of the approximately 20 foot wide EVA is expected to occur prior to development of the FMC site with residential uses, as planned for under the Specific Plan. The EVA could be reconfigured by future development plans for the FMC property, or integrated into residential development on the site. As such, the EVA would be compatible with, and in the range of development anticipated for the FMC site and the environmental impacts of constructing the EVA are encompassed in the TOD EIR's analysis of constructing residential uses on that property consistent with the Specific Plan. Site-specific surveys as required by the TOD EIR will be

completed prior to the City's approval of the specific EVA alignment, and what is depicted in Figure 3-4 is conceptual, and as noted above, subject to change. See Figure 3-4, as revised.

Page 82, *Section 4.5*; Hazards and Hazardous Material is revised as follows:

This section is based ~~o~~in part on the *Dumbarton TOD Specific Plan EIR*, the *Revised Remedial Actions and Cleanup Standards Report* prepared by Cornerstone Earth Group in December, 2012, the *Environmental Evaluation and Remedial Action Summary, 2.1 Acre Enterprise Drive Parcel, Newark, California* by Cornerstone Earth Group, December, 2012, the *Human Health Risk Assessment for the Trumark Parcel, Former Baron Blakeslee, Inc. facility, Newark, California,* prepared by CH2M HILL, May, 2013, San Francisco Bay Regional Water Quality Control Board *Final Site Cleanup Requirement Order No.* ~~98-067~~ R2-2001-054, and San Francisco Bay Regional Water Quality Control Board *Conditional Approval of Revised Remedial Action and Cleanup Standards Report*, May 2013, and the *Alternate Cleanup Plan, Former Baron Blakeslee, Inc. Facility, 8333 Enterprise Drive, Newark California* by AMEC Environmental and Infrastructure, Inc., August 2013, and *Approval of Alternate Cleanup Plan, former Baron Blakeslee Facility, 8333 Enterprise Drive, Newark, Alameda County*, San Francisco Bay Regional Water Quality Control Board, August 29, 2013. There reports are included in Appendices D-1 – D-7.

Page 82, *Section 4.5.1*; Background is revised as follows:

The Specific Plan EIR identified eight different "Hazardous Materials Sites" within the specific plan area that had hazardous material impacts or hazardous natural features (e.g. naturally occurring asbestos). Most of these properties were impacted by previous businesses operating on the site that stored and processed chemicals. Figure 4.2 identifies properties in the Specific Plan area with a history of hazardous materials contamination. Remediation of contamination on the sites ~~has been~~ is either in the planning phases or is currently underway on most of the sites, though no site has completed remediation activities to residential levels to date. For the purposes of this SEIR, hazards and hazardous materials impacts affecting Site A and Site B only were evaluated.

Page 86, *Section 4.5.2.1*; Site Conditions is revised as follows:

Based on the frequency of detection, the concentrations detected, and the toxicity, PCE and TCE are considered the primary COCs in soil on Site A, PCE and TCE are considered the primary COCs in soil vapor, and TCE is considered the primary COC in the ground water beneath the site. Dissolved VOCs are present in both the shallow ground water zone of the affected area and, to a lesser extent, the underlying Newark Aquifer.

Page 88, *Section 4.5.2.1*; Impacts, Site A is revised as follows:

Groundwater remediation would continue on adjacent parcels after initiation and completion of the ACP. The project proposes to install multiple layers of mitigation including engineered vapor barriers and a sub-slab depressurization system ~~controls~~ as part of

residential development of Site A to mitigate risks to future residents until groundwater remediation is complete.

Page 88*, Section 4.5.2*; Impacts; Site A; Mitigation Measure HAZ-1 is revised as follows:

MM HAZ-1: Prior to the issuance of grading permits or building permits for development of Site A, a remediation plan and a risk management plan, with monitoring and reporting requirements, must be prepared and submitted for review by the RWQCB. The RWQCB will review the plans to confirm that implementation of the plans would should achieve ~~Cal-EPA approved~~ risk management standards applied by the RWQCB for residential use ~~of risk less than 1x10-6 and health hazard index of less than 1~~. RWQCB will also review any amendment of such plans to confirm that implementation of the plans should achieve ~~Cal-EPA approved~~ risk management standards applied by the RWQCB for residential use ~~of risk less than 1x10-6 and health hazard index of less than 1.~~

In addition, a Construction Risk Management Plan (CRMP) with protocols for the handling, evaluation and appropriate disposal of excavated soil and pumped water in accordance with regulatory agency requirements, and protocols governing worker health and safety, will be either integrated into other plans or will be developed as a stand-alone document, and will address on-site and off-site development and maintenance of utilities. The CRMP shall be provided to RWQCB, City and ACWD for review and comment. The City shall provide the CRMP to all contractors performing subsurface work in the areas covered by the CRMP.

Also, remediation plan and risk management plan construction phase components (as opposed to ongoing monitoring and reporting requirements) shall be implemented prior to occupancy. Prior to issuance of occupancy permits, a risk management plan consistent with DTSC's Vapor Intrusion Mitigation Advisory shall be approved by the RWQCB or other oversight agency.

Such plans shall address the potential migration of vapors laterally along utility conduits and into residences through physical controls. The extent of such physical controls shall be determined in response to soil vapor data generated prior to construction and designed to control migration of vapors to avoid significant risk to human health or structures. Such physical controls could include the installation of low-permeability backfill "plugs," or through an equally effective technique, adjacent to residences and along subsurface utilities beneath Sites A.

Certificates of Occupancy for the residences will not be issued until the developer submits to the RWQCB documentation on the installation and performance testing of vapor intrusion mitigation measures and the light industrial uses on the Gallade Parcel have ceased operations. **(Less Than Significant Impact with Mitigation)**

Page 92, *Section 4.5.2.2*; Impacts; Site B; Mitigation Measure HAZ-2 is revised as follows:

> **MM HAZ – 2:** Prior to the issuance of building permits for development of Site B, all pre-construction elements of the Remedial Action Plan conditionally approved by the RWQCB on July 30, 2013, as it may be amended, and any addenda, must be met, including required pre-construction contingent submittals listed in the RWQCB conditional approval. **(Less Than Significant Impact with Mitigation)**

Page 92, *Section 4.5.2.2*; Impacts; Site B; Mitigation Measure HAZ-3 is revised as follows:

> **MM HAZ – 3:** Prior to the issuance of building permits for development of Site B, all pre-construction elements of the Remedial Action Plan conditionally approved by the RWQCB on July 30, 2013, as it may be amended, and any addenda, must be met, including required pre-construction contingent submittals listed in the RWQCB conditional approval. Prior to issuance of occupancy permits, a risk management plan consistent with DTSC's Vapor Intrusion Mitigation Advisory shall be approved by the RWQCB or other oversight agency. Such plan shall address the potential migration of vapors laterally along utility conduits and into residences through physical controls. The extent of such physical controls shall be determined in response to soil vapor data generated prior to construction and designed to control migration of vapors to avoid significant risk to human health or structures. Such physical controls could include the installation of low-permeability backfill "plugs," or through an equally effective technique, adjacent to residences and along subsurface utilities beneath Sites B.
>
> In addition, a Construction Risk Management Plan (CRMP) with protocols for the handling, evaluation and appropriate disposal of excavated soil and pumped water in accordance with regulatory agency requirements, and protocols governing worker health and safety, will be either integrated into other plans or will be developed as a stand-alone document, and will address on-site and off-site development and maintenance of utilities. The CRMP shall be provided to RWQCB, City and ACWD for review and comment. The City shall provide the CRMP to all contractors performing subsurface work in the areas covered by the CRMP. **(Less Than Significant Impact with Mitigation)**

Page 119-120, *Section 7.2.3* Location Alternative is revised as follows:

> Under the Location Alternative, the project would be developed on either the Cargill or FMC properties (Figure 3-2). As noted in the *Dumbarton TOD Specific Plan EIR*, these sites are known to be impaired by hazardous materials, generally in the form of soil and/or groundwater contamination. It is unknown what assessment and ~~likely that the~~ remediation actions would be needed to prepare these sites for residential development ~~would involve similar remediation as the project proposes for Site B~~, though future review by an oversight agency consistent with TOD EIR MM 4.7-1a may determine that such impacts would be lower. As noted in the Specific Plan EIR, portions of the FMC and Cargill site support wetland plant communities, and have the potential to also contain Condon's tarplant and other biotic resources. These sites may also support special status species such as Western Burrowing Owl, or Salt Marsh Harvest Mouse. Given the extensive site work typically

associated with remediation and site development, it is unlikely that implementation of the project on one of these alternative sites would avoid potential impacts to biotic resources present on these sites, although impacts on Site A and Site B would be avoided.

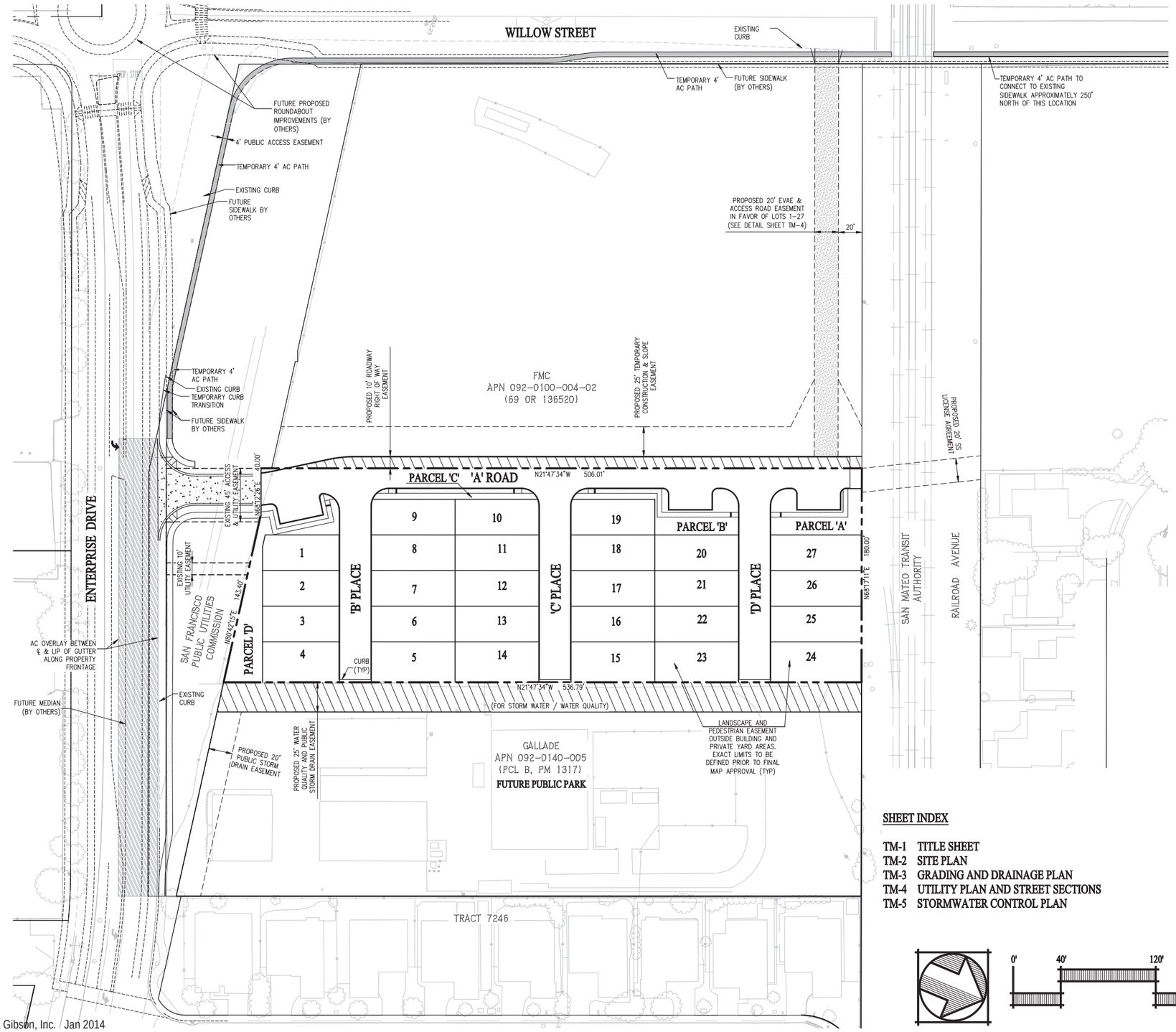
The Location Alternative would reduce the potential exposure of future residents to airborne hazardous substances in the event of an accidental release from either of two facilities located in the vicinity of the project. As described in Section 4.4, *Hazards and Hazardous Materials*, under the alternative accidental release scenario (the accidental release of a portion of a hazardous substance as compared to a total release), the area of exposure to toxic levels of Nitrogen Dioxide would not extend to the FMC or Cargill properties (See Figure 4.4).

Thus, the Location Alternative would avoid the significant unavoidable impact under an alternative hazardous substance release scenario. Under a worst-case release scenario, the Location Alternative sites would be subject to a significant unavoidable impact from the potential exposure of future residents to airborne hazardous substances (See Figure 4.5).

~~While d~~ Development of the project on either the Cargill or FMC properties would result in a reduced risk from the accidental release of hazardous substances.~~, all other impacts would be similar to those of the proposed project~~. None of the potential alternative locations, however, are controlled by the project proponent, therefore implementation of the project on an alternative location would not be feasible unless and until controlled by the applicant. Finally, the City determined in 2011 that Site A and Site B should be developed with residential uses. Thus, the Location Alternative would potentially delay certain impacts, but many of the impacts associated with the proposed project would likely eventually occur as development applications are submitted in the future to implement the policy goals contained in the TOD Specific Plan.

SECTION 5.0 REVISIONS TO THE FIGURES OF THE DRAFT SEIR

This section contains a revised Figure 3-4 to the *Draft Supplemental Environmental Impact Report, Trumark Dumbarton Transit Oriented Development Residential Project*, dated December 2013.



Source: Carlson, Barbee & Gibson, Inc. Jan 2014

GENERAL NOTES:

1. OWNER: ENTERPRISE DRIVE, LLC
   4135 BLACKHAWK PLAZA, SUITE# 180
   DANVILLE, CA 94506
2. DEVELOPER: TRUMARK HOMES
   4185 BLACKHAWK PLAZA, SUITE 200
   DANVILLE, CA 94506
   CONTACT: VERONICA VARGAS
   (925) 648-8300 (925) 648-3130 (FAX)
3. ENGINEER: CARLSON, BARBEE & GIBSON, INC.
   2633 CAMINO RAMON, SUITE 350
   SAN RAMON, CA 94583
   CONTACT: GREG MILLER
   (925) 866-0322
4. SOILS ENGINEER: CORNERSTONE EARTH
   1270 SPRINGBROOK ROAD, SUITE 101
   WALNUT CREEK, CA, 94597
   CONTACT: PETER LANGTRY
   (925) 988-9500
5. EXISTING USE: LIGHT INDUSTRIAL
6. ASSESSORS PARCEL NUMBERS: 092-0140-006
7. EXISTING SITE AREA: 2.14± AC

   PROPOSED PRIVATE STREETS
   ('A' ROAD, 'B' PLACE, 'C' PLACE, 'D' PLACE): 24,101 SF (WITHIN EXISTING BOUNDARY)
   PROPOSED COMMON PARCELS (A, B, C & D): 10,341 SF
   PROPOSED TOTAL LOT AREAS: 58,791 SF
   TOTAL EXISTING SITE AREA: 93,233 SF (2.14 AC)
8. OWNERSHIP AND MAINTENANCE: ALL PRIVATE STREETS AND COMMON PARCELS TO BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION ESTABLISHED WITH THE PROJECT.
9. NUMBER OF LOTS: 27 – 3 STORY DETACHED UNITS
10. MINIMUM LOT SIZE: 1,924 SF (LOTS 1)
    MAXIMUM LOT SIZE: 2,602 SF (LOT 24)
    AVERAGE LOT SIZE: 2,177 SF
11. THIS PROPERTY LIES IN THE JURISDICTION OF:
    - FIRE PROTECTION: ALAMEDA COUNTY FIRE DEPARTMENT
    - DOMESTIC WATER: ALAMEDA COUNTY WATER DISTRICT (ACWD)
    - SANITARY SEWER: UNION SANITARY DISTRICT (USD)
    - STORM DRAIN WITHIN PUBLIC STREET/EASEMENT: CITY OF NEWARK (SDE)
    - STORM DRAIN WITHIN PRIVATE YARDS: PRIVATELY MAINTAINED BY HOMEOWNERS ASSOCIATION (PSDE)
    - GAS & ELECTRIC SERVICE: PACIFIC GAS & ELECTRIC
    - TELEPHONE SERVICE: AT&T
12. BENCHMARK: CITY OF NEWARK OFFICIAL BENCHMARK NO. 62, ALSO BEING AN ALAMEDA COUNTY BENCHMARK, THE TOP OF CURB AT STORM WATER INLET AT THE NORTH-EAST CORNER OF THORNTON AVENUE AT WILLOW STREET, ELEVATION TAKEN AS 11.39 (NAVD 88) (8.661 NGVD 29 PER CITY OF NEWARK RECORDS).
13. BASIS OF BEARINGS: THE BASIS OF BEARINGS FOR THIS BOUNDARY IS DETERMINED BY FOUND NGS MONUMENTS W1446 PID HT2440 AND FILBERT DG6883, THE BEARING BEING N30°19'32"W (CALCULATED).
14. TOPOGRAPHY: PREPARED BY AEROMETRIC SURVEYS, DATED MAY 23, 2011
15. FLOOD ZONE: ZONED X (UNSHADED)
    FLOOD INSURANCE RATE MAP (FIRM) – ALAMEDA COUNTY, CA
    PANEL: 443 OF 725
    MAP NUMBER: 06001C0443G
    EFFECTIVE DATE: AUGUST 3, 2009
16. ALL BUILDINGS SHALL BE EQUIPPED WITH AN AUTOMATIC FIRE SPRINKLER SYSTEM AS REQUIRED BY CHAPTER 15.09.020.G OF THE NEWARK MUNICIPAL CODE.

SHEET INDEX

TM-1 TITLE SHEET
TM-2 SITE PLAN
TM-3 GRADING AND DRAINAGE PLAN
TM-4 UTILITY PLAN AND STREET SECTIONS
TM-5 STORMWATER CONTROL PLAN

0' 40' 120' 160'

SITE "A" DEVELOPMENT PLAN

FIGURE 3-4

SECTION 6.0 COPIES OF THE COMMENT LETTERS RECEIVED ON THE DRAFT SEIR

This section contains copies of the comment letters received on the Draft SEIR.

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

San Francisco Bay Regional Water Quality Control Board

February 7, 2014
RB File Nos. 01S0157, 01S0294

Terrence Grindall
(terrence.grindall@newark.org)
Community Development Director
City of Newark
37101 Newark Boulevard
Newark, CA, 94560

Subject: **Comments on Draft Supplemental Environmental Impact Report (SEIR) dated December 2013 for Trumark Dumbarton Transit Oriented Development (TOD) Residential Project (SCH #2010042012)**

Dear Mr. Grindall:

Thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Report (SEIR) for the Trumark Dumbarton TOD Residential Project (Project) for development of Site A and Site B located within the Dumbarton Transit Oriented Development (TOD) Specific Plan Area. The Project proposes 27 homes at Site A (8375 Enterprise Drive) and 217 homes at Site B (8400 Enterprise Drive). As explained below, Sites A and B will require extensive and aggressive environmental cleanup prior to development to protect human health and safety.

A-1

As a Responsible Agency under California Environmental Quality Act (CEQA), the Regional Water Board is submitting comments on the SEIR for categories are germane to our agency's statutory responsibilities in connection with this Project. We rely on our Water Code authority to oversee the investigation and cleanup of sites in the Dumbarton TOD Specific Plan Area. We also consider and act on all proposals for case closure (i.e., no further action required).

Specifically, our comments pertain to the significant potential human health impacts posed by hazardous materials present in soil, soil gas, groundwater, airborne dusts and vapors in connection with this Project and the extensive volume of contaminated soil that has to be excavated from the site and transported offsite through City streets to the appropriate disposal facility. Additionally, we are commenting on cumulative impacts that were not considered in this SEIR, associated with similar cleanup projects for other contaminated sites in the Dumbarton TOD Specific Plan Area. These include: Gallade (Honeywell), Torian, FMC, Ashland, Romic, Newark Sportsmans' Club, and Cargill, where similar cleanup activities are needed prior to development.

The attached Regional Water Board comments are intended to guide the City of Newark and ensure that the environmental documentation adequately addresses the pollution in the Project area to protect human health and the environment.

Our past correspondence to the City of Newark regarding soil and groundwater cleanup issues in the Dumbarton TOD Specific Plan Area is listed below.

A-1

- May 22, 2008, Letter to City of Newark Regarding the Approved Conceptual Land Concept for the Area 2 Specific Plan.
- April 30, 2010, Letter to City of Newark, NOP for Dumbarton TOD Specific Plan.
- June 30, 2011, Email to City of Newark, Draft EIR for Dumbarton TOD Specific Plan.
- July 27, 2011, Letter to City of Newark, Dumbarton TOD Specific Plan Final EIR.
- February 13, 2013, Letter to City of Newark, NOP for Newark General Plan Tune Up.
- March 8, 2013, Letter to City of Newark, NOP for Supplemental EIR for Dumbarton TOD Trumark Residential Project.
- September 27, 2013, Letter to City of Newark, General Plan Tune Up. Draft EIR for the City of Newark dated August 13, 2013.

If you have any questions regarding our comments, please contact Cherie McCaulou (cmccaulou@waterboards.ca.gov) in our Toxics Cleanup Division at (510) 622-2342.

Sincerely,

Digitally signed by Stephen Hill
Date: 2014.02.07 15:34:48
-08'00'

Bruce Wolfe
Executive Officer

Attachment A – Staff Comments on Hazardous Materials Impacts for Site A and Site B
Attachment B – Specific Comments on the SEIR
cc w/ attach:

- City of Newark, Building Division, Attn: Ray Collier (ray.collier@newark.org)
- Alameda County Water District, Attn: Steven Inn (steven.inn@acwd.com)
- Department of Toxic Substances Control, Attn: Lora Jameson (lora.jameson@dtsc.ca.gov
- DTSC, Attn: Michael Esaghian (mesaghian@dtsc.ca.gov)
- Bay Area Air Quality Management District, Attn: Jaclyn Winkel (Jwinkel@baaqmd.gov
- Ashland, Inc., Attn: Michael Dever (mbdever@ashland.com)
- SHH LLC, Attn: Peter Schneider (pds5000@aol.com)
- FMC Corporation, Attn: James Bodamer (jbodamer@fmc.com)
- Cargill, Inc., Attn: Penny Streff (penny_streff@cargill.com)
- Jones-Hamilton Co., Attn: Gerry Meyer (gmeyer@jones-hamilton.com)
- Trumark Commerical, Attn: Jessica Roseman (jrose@trumark-co.com)
- Honeywell International Inc., Attn: Benny DeHigh (benny.dehghi@honeywell.com)
- Integral Communities, Attn: Glenn Brown (gbrown@integralcommunities.com)

Attachment A
General Comments on Hazardous Materials Impacts at Site A and Site B
By Regional Water Quality Control Board (Toxics Cleanup Division)
For the
Draft Supplemental EIR on the Trumark Dumbarton TOD

COMMENTS ON 8375 ENTERPRISE DRIVE (SITE A)

Site A – Site Conditions

Please note the following clarifications for Site A site conditions.

- Development at Site A at 8375 Enterprise Drive, Newark, is dependent on successful soil and groundwater cleanup efforts by Honeywell International, Inc. (Honeywell). The Site Cleanup Requirements Order No. R2-2007-0005 adopted by the Regional Water Board requires Honeywell to remove soil, soil gas, and groundwater contamination originating at 8333 Enterprise Drive (current location of Gallade), which is the property immediately to the east of Site A and immediately west of residential homes on Aleppo Drive. The contamination is attributable to former hazardous waste facility operations by Baron-Blakeslee Inc. at 8333 Enterprise Drive.

- The contamination caused a significant groundwater plume, containing trichoroethene (TCE), tetrachoroethene (PCE) and other volatile organic compounds (VOCs) that has migrated from 8333 Enterprise Drive to the west and northwest, in particular Site A, Parcels F and G owned by FMC Corporation, and several existing single-family residences on Chestnut and Juniper Streets. The plume has also migrated easterly to the homes on Aleppo Drive that share a property line with the chemical plant.

A-2

- A land use covenant has been recorded against the title of 8333 Enterprise Drive which prohibits use of the property until the pollution has been abated. This industrial parcel would be redeveloped as a public park under the Dumbarton TOD Specific Plan. The land use covenant restricts the use of the property for commercial and industrial purposes only. A human health risk assessment for a park scenario has not been performed.

- Honeywell submitted a human health risk assessment for Site A in May 2013, which concluded excessive and unacceptable risks for residential use due to elevated TCE and PCE concentrations. This risk assessment may need to re-evaluate construction worker risks. Honeywell submitted an August 2013 Alternate Cleanup Plan consisting of: (1) shallow groundwater in-situ biodegradation, in lieu of in-situ chemical oxidation which failed; (2) vapor barriers to mitigate the excess risks of vapors coming from the groundwater as well as other sources (contaminated soil and the neighboring parcel); and (3) soil excavation prior to development.

- A second human health risk assessment (September 2013) was performed by Honeywell for the existing residents on Aleppo Drive, Juniper Street and Chestnut Street. The assessment found no unacceptable risks to the existing residents. Staff has not yet concurred with the health risk assessment.

To mitigate the Significant Impact at Site A, the draft SEIR (on page 88) proposes amending Mitigation Measure 4.7-1a of the *Dumbarton TOD Specific Plan EIR*, to address the specific conditions of Site A, as follows:

> MM HAZ-1: *Prior to the issuance of grading permits or building permits for development of Site A, a remediation plan and a risk management plan must be prepared and submitted for review by the RWQCB. The RWQCB will review the plans to confirm that implementation of the plans would achieve Cal-EPA approved risk management standards for residential use of risk less than 10-6 and health hazard index of less than 1.*

A-2

Regional Water Board Staff cannot confirm that implementation of remediation plan(s) would achieve the above referenced standards, unless the remediation plan is fully implemented and demonstrated to be effective. The final SEIR should add language (presented on the last page) that requires the remediation plan be implemented and completed, and demonstrated to be effective based on post-remedial monitoring that shows a significant reduction of VOC concentrations that are cause of the human health exposure risks. A risk management approach is suitable only after the Regional Water Board has determined that the vapor intrusion threats have been significantly reduced and water quality objectives will be met in a reasonable time period.

The following sections provide supporting information for our above recommendation.

Site A - Soil Contamination

The draft SEIR did not address the substantial soil contamination at 8333 Enterprise Drive, as discussed below:

- Soil contamination underlying Gallade's existing buildings and structures at 8333 Enterprise is required to be excavated prior to development, pursuant to Task C.6 of the Order R2-2007-0005. Removing this pollution source will prevent air impacts due to volatilization of chemical vapors from soil, leaching of contaminants to groundwater, and will reduce overall contaminant mass migrating offsite. A soil excavation work plan for this remedial task has not yet been submitted; however, such a work plan will be required pursuant to Task C.5 of the Order. The excavation of contaminated soil can only be performed after the Gallade buildings are demolished.

A-3

The final SEIR should mention the inevitable demolition of Gallade's buildings, and removal of contaminated soil considered a continuing source for adverse impacts to the neighborhood which persists at 8333 Enterprise (the property immediately to the east of Site A and immediately west of the single family homes on Allepo Drive).

The final SEIR needs to consider these potential impacts to existing residents when this work is carried out. Additionally, avoidance and mitigation measures including, air monitoring for toxic volatile vapors and dusts are needed to protect the existing residences and occupants from air quality impacts that will arise during soil removal.

Site A - Vapor Intrusion Risks

The very high TCE concentrations in groundwater underlying Site A pose a significant risk via vapor intrusion to any structures constructed above the plume, which adds to the vapor intrusion risk from soil gas due to vaporization from contaminated soil as long as that source is not removed. Recent scientific evidence compiled by U.S. EPA indicates that exposing pregnant women to very low concentrations of TCE for just a few days dramatically increases the risk of fetal heart malformations. Therefore, the Regional Water Board has concerns over developing the property for residential use at this time.

A-4

The Regional Water Board recommends that significant groundwater remediation must be implemented and its success must be demonstrated with post remediation monitoring that includes collection of soil gas and groundwater samples for a period of time prior to occupancy of new buildings on the property. Previous attempts at remediation have not achieved remedial action levels for protection of vapor intrusion. In 2007, the remedial strategy, *in-situ chemical oxidation technology* was adopted in the Order (Task C.1) and implemented in 2007, but was deemed unsuccessful in 2011, despite promising results during initial pilot tests.

Site A - Offsite Groundwater Plume Remediation

We recently approved an August 2013 Alternate Cleanup Plan for *in-situ biodegradation* to remediated the offsite shallow groundwater plume. Pilot testing is underway to evaluate the likelihood of its success. We are looking forward to receiving the results to assess the feasibility of this approach to remediate the TCE and PCE plume in a timely manner. There is no guarantee that the approved Alternate Cleanup Plan will lead to significant reductions in the pollutant concentrations, and meet the standards stated in MM-HAZ-1. Furthermore, the proposed remedial action has the potential to generate toxic or hazardous byproducts including methane. Methane in the subsurface can create pressure to push dangerous and explosive vapors along preferential pathways, including utility corridors such as the San Francisco Public Utilities Commission Hetch Hetchy pipeline or utility corridors serving the structures at the site, into the buildings. As long as the property remains undeveloped, the methane can simply move upward and vent into open air. Structures on the property along with their underground utilities could cause adverse effects of vapors. It is also possible that the plume may degrade into vinyl chloride, which is more carcinogenic than TCE.

A-5

Site A - Post Remediation Monitoring

Evaluating the effectiveness of the proposed in-situ biodegradation will require several years after full-scale implementation of the remedy. The uncertainty caused by past failures of remedial actions at the site, combined with the potential for the proposed treatment system to generate hazardous byproducts, such as methane, raises the concern that the proposed remedy may not be adequately protective. While the Regional Board has approved the Alternate Cleanup Plan, its success has yet to be determined. If the remedial action fails to perform as proposed, revisions to the cleanup plan and additional remedial actions may be required by the Regional Board.

A-6

Full restoration of the beneficial uses of groundwater in the TOD will take years, or possibly decades. Only after remediation has significantly reduced pollution concentrations and a demonstration has been made that concentrations will meet cleanup goals in a reasonable

A-6 timeframe would it be appropriate to consider residential construction with vapor mitigation systems. The timeframe needed to demonstrate the effectiveness of the remedial action may be substantially longer than currently envisioned by the developer.

COMMENTS ON 8400 ENTERPRISE DRIVE (SITE B)

A-7 Site B - Background
Development at Site B, the former Jones-Hamilton site at 8400 Enterprise Drive, is dependent on successful cleanup to residential standards. Thus far, cleanup actions and soil cleanup standards were based on continued commercial/industrial in accordance with Site Cleanup Requirements Order No. R2-2001-054 adopted by the Regional Water Board for this site. There is currently a land use restriction that prohibits residential use of the property. This Order has not yet been revised to reflect the new proposed land use. To support single-family housing at this site, the proposed cleanup includes extensive soil excavation and soil management to remove dioxins, furans, PCBs, pentachlorophenol, tetrachlorophenol, and several VOCs, in particular 1,2-dichloroethane (1,2-DCA), arsenic and other contaminants in order to reduce the human health risks for site future occupants.

A-8 Site B - Groundwater Contamination
A groundwater solvent plume also underlies Site B and poses vapor intrusion threats which will be reevaluated after soil removal actions are completed. The groundwater plume from Site B has also migrated offsite in a westerly direction, into the public right-of-way on Willow Street and onto 37555 Willow Street (location of Torian property and residential development). Groundwater cleanup standards have not been achieved. After development long-term monitoring, ongoing groundwater cleanup and environmental land use restrictions will be needed to protect human health and safety.

A-9 Site B – Soil contamination
Recent testing for dioxins and related chemicals led to the discovery of significant pollution with these very toxic chemicals at Site B. Some of these contaminants may also be present at other properties within the Dumbarton TOD Specific Plan area, based on the new data collected at the adjacent Torian property at 37555 Willow Street. The magnitude and extent of the dioxin contamination is not yet known. All property owners in the TOD Specific Plan area will be required to conduct special studies to determine the source(s), extent and magnitude of these highly toxic contaminants. Dioxins are considered to be among the most toxic man-made chemicals. Until the contamination with dioxins and related chemicals is fully characterized, which would provide a better understanding of the likely sources and fate and transport mechanisms, the assumptions regarding the extent and toxicity of the contamination are necessarily conservative.

Air impacts from airborne dusts during soil excavation, profiling and trucking contaminated soil offsite do not seem to be adequately addressed. Additional mitigation measures are needed, including a requirement for a Certified Industrial Hygienist to monitor the cleanup site and vicinity for toxins associated with the cleanup actions.

A-10

Site B – Vapor Intrusion

The December 2012 Human Health Risk Assessment in Appendix D-1 of the SEIR found an unacceptable human health risk (3.1×10^{-4}) for vapor intrusion driven primarily by 1,2-dichloroethane and vinyl chloride. Vapor intrusion risks will be reevaluated upon completion of the proposed soil cleanup plan.

A-11

Site B – Proposed remediation

The responsible party has proposed to remove the concrete-asphalt cap that covers the two surface impoundments and to conduct an extensive soil excavation across the 21-acre site. The excavation poses potential risks for workers and for nearby residents. In addition, there are some concerns about proper risk mitigation while moving such a large volume of contaminated soil containing highly toxic chemicals (dioxins, furans, PCP, etc.). Proposed soil cleanup for Site B includes the following: 44,000 cubic yards of soil excavation from the former detention pond area; 35,000 cubic yards of soil excavation in the vacant and undeveloped areas; and an estimated 30,000 cubic yards of soil excavation in the former facility area. Soil will be placed into 500 cubic yard stockpiles. All stockpiled soil must comply with Bay Area Air Quality Management District regulations and requirements. A total of 109,000 cubic yards of soil or 13,625 truckloads could be transported offsite for disposal from Site B.

Across the street at the adjacent Torian property at 37555 Willow Street, an additional 50,000 cubic yards of soil excavation will add an additional 6,250 truckloads for transport and offsite disposal, and at the Gallade Chemical site at 8333 Enterprise Drive an estimated 20,000 cubic yards of contaminated soil (720 truckloads) will be transported for offsite disposal. The Final SEIR should assess the additive and cumulative impacts to residents for soil excavations at 8333 Enterprise Drive and 37555 Willow Street. There will also be soil cleanups at FMC, Romic, Ashland, and possibly the Newark Sportsmans' Club and Cargill properties.

Attachment B
Specific Comments to the Draft SEIR on the Trumark Dumbarton TOD By Regional Water Quality Control Board (Toxics Cleanup Division)

A-12

Summary - Significant Impacts and Mitigation and Avoidance

Air Quality (associated with hazardous materials contaminated soil) Page iv.

The Final SEIR should include language for Mitigation and Avoidance Measures similar to those listed under the Noise Category, in order to protect citizens from hazardous dusts, fumes, vapors, odors that occurs during soil excavation and off-hauling of contaminated soil.

Suggested language is listed below:

- "A certified/licensed industrial hygienist will develop and oversee implementation of an air monitoring program to ensure air quality standards are met throughout the duration of the Project, to ensure protection of human health and safety, for workers and existing residents, and visitors to the Project."
- "Public notices sent to the residents pertaining to the scheduled soil removal and off-hauling days, and instructions for residents to minimize exposure to toxic airborne dusts, fumes, vapors, odors, etc."
- "A Procedure and phone numbers for notifying the City Building Inspection Division staff during regular construction hours and off-hours".
- "A sign posted on site pertaining the permitted construction days and hours, complaint procedures, and who to notify in the event of a problem."
- "The designation of an onsite construction compliance and enforcement manager for the project. The manager shall act as a liaison between the project and its neighbors to ensure compliance with air quality standards and nuisance conditions".

A-13

Section 1.0, Page 30. Introduction

The draft SEIR addresses only two parcels (Site A and Site B totaling 23.5 acres) in the 233-acre Dumbarton TOD Specific Plan Area. Additional cleanup actions will occur at Gallade (2-acres), Torian (42-acres), FMC (47-acres), Ashland (10-acres), SHH, LLC (6-acres), and possibly at Cargill (54.5 acres). There will be additive and cumulative impacts to citizens and residents as other contaminated properties in the TOD initiate cleanup activities, causing nuisance conditions associated with dusts, fumes, vapors, odors, and trucks hauling contaminated soil on the public streets all over again.

A-14

Section 2.7, Page 33, 34. Project Related Approvals

Add the following agencies for Project related approvals:

- RWQCB for approval of proposals for cleanup and monitoring of hazardous materials, storm water construction permits, 401 and 404 Certifications.
- Union Sanitation District for permits to discharge contaminated groundwater.

A-14

- BAAQMD for excavation and aeration of contaminated soils.

Section 3.2, Page 38. Project Location and Section 3.5.3 Page 44. Residential Development
The draft SEIR states, *"the industrial property at 8333 Enterprise Drive (current location of Gallade Chemical,) adjacent to Site A would be redeveloped as a public park. Use of this property as a public park was evaluated in the Specific Plan EIR only at a program level given the final cleanup activities to allow use of the site as a park were not sufficiently defined."*

A-15

The Final SEIR should recognize that there is a land use covenant on the proposed park parcel at 8333 Enterprise Drive, which restricts the use of the property for commercial and industrial purposes only. In addition to groundwater remediation, the contaminated soil under the buildings is required to be excavated pursuant to Task C.5 and C.6 of the Order R2-2007-0005. The Alternate Cleanup Plan referenced in the draft SEIR was submitted specifically to comply with Task C.1 to cleanup contamination in shallow groundwater zone, and it did not propose tasks for address site-wide contamination and soil excavation. The final SEIR should address the impacts to the nearby residents that will be exposed to hazardous dusts, vapors fumes, noise, etc. during the facility closure, building demolition, and cleanup actions for soil and groundwater at 8333 Enterprise Drive.

3.5.2, Page 40. Pollutant Remediation and Site Preparation
The draft SEIR states, *"The proposed project would include vapor intrusion engineering controls (e.g. vapor barriers, sub-slab depressurization, etc.) beneath the buildings for Site A to protect future development from vapor intrusion".*

A-16

The final SEIR should recognize that none of the sites in the Specific Plan Area have been remediated to safe levels for residential use. Many have shallow groundwater impacts and vapor intrusion threats, including Site B, which has not yet evaluated the vapor intrusion threats. The entire northern half of the Dumbarton TOD Specific Plan Area will also likely require vapor intrusion engineering controls, due to extensive groundwater pollution and very high levels of VOCs (e.g., including TCE, PCE, ethylene dibromide [EDB], 1,2-DCA, vinyl chloride, etc.) that pose vapor intrusion risks.

3.5.2.1, Page 41. Site A – Trumark Property
The draft SEIR states, *"Removal and disposal of large amounts of contaminated soil from the site (Site A) is not anticipated. Approval by the RWQCB of the methods of remediating VOC impacts to the site and post-remediation requirements for residential use of the property would be required prior to development of Site A with residential uses".*

A-17

The final SEIR should recognize that large amounts of contaminated soil will be removed at the adjacent Gallade Chemical, 8333 Enterprise Drive, prior to development, pursuant to Site Cleanup Requirements Order No. R2-2007-0005.

3.5.2.2, Page 41. Site B – Jones-Hamilton

A-18

The draft SEIR states that the *"implementation of the RAP and preparation of the site for subsequent development is expected to take six to twelve months".*

A-18 The final SEIR should recognize that the RAP is purely a soil cleanup plan and additional tasks related to vapor intrusion risks and cleanup of underlying groundwater pollution will be required to prepare the site for development.

3.5.2.2 Page 42. Removal of Soil Containing Dioxin

The draft SEIR does not thoroughly address human health risks related to the removal and transportation of soil containing dioxins.

A-19 Air monitoring and prevailing wind studies conducted by a certified industrial hygienist will be crucial elements of the project to demonstrate that potentially significant human health impacts have been properly addressed and mitigated.

Section 4.1.2.2, Pages 54, 55. Construction-Related Impacts and Dust Emissions and Section 4.1.2.2, Page 57. Community Health Risk

The draft SIER *states that dust would be generated during remediation, grading and construction activities (at Sites A and B).*

A-20 The Final SEIR should assess the added significant impacts to sensitive receptors during building demolition and soil cleanup at 8333 Enterprise and at Torian at 37555 Willow Street, in addition to the proposed activities at Sites A and B. There will be additive and cumulative impacts to citizens and residents as other contaminated properties in the TOD initiate cleanup activities, causing nuisance conditions associated with dusts, fumes, vapors, odors, and trucks hauling contaminated soil on the public streets all over again". In order to ensure public health and safety, air monitoring throughout the project should be conducted under the supervision of a certified industrial hygienist, given the toxicity of TCE and dioxins.

The draft SEIR states that *the air quality analysis was based on the assumption that up to 109,850 cubic yards of soil could be exported from Site B and up to 59,000 cubic yards could be imported to the site.*

The final SEIR should also include exported soil volumes for the Torian property at 37555 Willow Street and at Gallade at 8333 Enterprise Drive.

Section 4.5, Page 82. Hazards and Hazardous Materials

The draft SEIR indicates that this section is based on part on the *Final Site Cleanup Requirements Order No 98-067.* This referenced Order was rescinded when Order No. 01-054 for the Jones Hamilton Site was adopted in 2001. The most recent Orders for all the sites in the Dumbarton TOD are noted below:

A-21

- FMC Corporation, 8787 Enterprise Drive, SCR Order R2-2002-0060
- Ashland Inc., 8610 Enterprise Drive, SCR Order R2-2005-0038
- SHH, LLC (Former Romic), 37445 Willow Street, SCR Order R2-2008-0081
- Jones-Hamilton, 8400 Enterprise Drive, SCR Order R2-2001-0054,

- Honeywell (Former Baron-Blakeslee), 8333 Enterprise, SCR Order R2-2005-0004

A-21 The cleanup standards approved for these sites (except Honeywell) were based on continued industrial and commercial land and not residential use. Revised cleanup standards and amended Orders will have to be adopted by the Water Board.

Section 4.5.1.1, Page 82. Background

The draft SEIR references eight *'Hazardous Materials Sites" within the Dumbarton TOD Specific Plan Area, and states that "remediation of contamination on the sites has been or is currently underway on most of the sites".*

A-22 This in an incorrect statement. None of the sites in the Specific Plan Area have been remediated to safe levels for residential use. Many have shallow groundwater impacts and vapor intrusion threats. Torian has submitted soil cleanup plans 37555 Willow Street. SHH plans to excavate impacted soil, pending data gap investigations at 37445 Willow Street. As stated above (individual sites (i.e., Ashland, Romic, FMC, Newark Sportsmans Club, Cargill) begin cleanup efforts, the hazards and hazardous materials associated with cleanup and grading activities will pose additional impacts to the citizens living near the Specific Plan Area. The final SEIR should address cumulative and additive impacts posed by all the necessary soil excavation planned in the TOD Specific Plan Area.

Section 4.5.1.1, Page 83. Transport and Use of Hazardous Materials

A-23 The draft SEIR does not adequately address the traffic impacts posed by thousands of trucks hauling contaminated and non-contaminated soil along Willow Drive, Enterprise Drive, and Thornton Avenue. There appears to be no Phasing Plan for all the soil remediation and development activities to coordinate traffic and transporting of hazardous materials for all the sites in the Dumbarton TOD Specific Plan Area.

Section 4.5.1.1, Page 83. Sites Impaired by Hazardous Materials

A-24 The draft SEIR is a piecemeal environmental review. It only assesses the impacts at two sites in the Dumbarton TOD Specific Plan Area, and as noted above it fails to address the cumulative impacts associated with cleanup activities at six or more other sites in this TOD area.

Section 4.5.1.2, Page 85. Specific Plan EIR Mitigation Measures Applicable to Project, and Summary Table

A-25 The draft SEIR references the mitigation measures 4.7-1a – 1c identified in the Dumbarton TOD Specific Plan EIR that would apply to the proposed project. The mitigation measure 4.7-1a falls short of the steps needed to properly investigate and remediated a property prior approving permits to grade or build on a particular parcel in the TOD Specific Plan Area. Additional mitigation and avoidance measures are needed to ensure that the proposed and approved cleanup activities are fully implemented, post-remedial monitoring is performed that demonstrates the remediation was effective at reducing site contaminants before grading or building permits are issued.

Suggested language to be incorporated into Mitigation Measure 4.7-1a is listed below:

- Prior to issuance of grading or building permits for Site A, excavation of contaminated soil at the adjacent property at 8333 Enterprise must be implemented, pursuant to the Order R2-2007-0005. If the soil excavation is not completed, the effectiveness of the proposed in-situ remedial actions at Site A is likely to be limited.

- Prior to issuance of grading or building permits for Site A and Site B, the following items should be completed (a) Implementation of the RWQCB approved remediation plan; (b) submission a start-up report to RWQCB; (c) submission of monthly progress reports to RWQCB; (d) submission of post-remediation monitoring reports to RWQCB until such time as a demonstration is made that cleanup standards will be met within a reasonable timeframe; (g) implementation of a risk management plan including engineered controls to mitigate residual pollutions as an interim measure, to protect human health and safety. Additional remediation and reporting will be required until residential cleanup standards are met or until the remediation is no longer cost-effective. If cleanup standards cannot be met in a reasonable timeframe, a revised human health risk assessment to evaluate the risks posed by residual contaminants in soil, soil vapor and groundwater and amended Remedial Action Plan should be submitted to the RWQCB for review and approval.

- Prior to issuance of grading or building permits, mitigation and avoidance measures are needed to ensure that utility corridors and public right of ways for Site A and Site B that may contain hazardous levels of VOCs and other hazardous contaminants are proper investigated, remediated, and prevented from acting as preferential pathways for vapor and groundwater migration.

A-25

- Post-construction mitigation measures are needed to ensure that future homeowners are protected from underlying residual pollution and financial responsibilities associated with any residual pollution. Mitigation measures should comply with DTSC's Vapor Intrusion Mitigation Advisory guidance document (Sections 6 and 7), and address the following:

  i. Long-term risk management of pollution, long after the development is constructed;
  ii. Inspection and monitoring of any engineered vapor mitigation systems to ensure the system are working effectively;
  iii. Long-term groundwater monitoring, sampling, and reporting continues until the cleanup goals are reached;
  iv. Proper abandonment of wells after the cleanup goal are reached; and
  v. Periodic indoor air monitoring of buildings that are constructed over plumes with elevated levels of volatile organic compounds.
  vi. Include measures to ensure protection of public utility corridors for abating hazardous vapors and for long-term treatment of contaminated groundwater, as appropriate.
  vii. Create a system for community notification such as a website (see "www.Redfieldsite.org")

From: TERRENCE GRINDALL
To: Michael Rhoades
Subject: Fwd: DTSC comments on Draft SEIR, Trumark Dumbarton TOD
Date: Friday, February 07, 2014 9:26:23 AM

Terrence Grindall
Assistant City Manager
510-578-4208

Begin forwarded message:

From: "Jameson, Lora@DTSC" <Lora.Jameson@dtsc.ca.gov<mailto:Lora.Jameson@dtsc.ca.gov>>
Date: February 7, 2014 at 9:06:01 PST
To: "'terrence.grindall@newark.org<mailto:terrence.grindall@newark.org>'"
<terrence.grindall@newark.org<mailto:terrence.grindall@newark.org>>
Cc: "Eshaghian, Mike@DTSC" <Mike.Eshaghian@dtsc.ca.gov<mailto:Mike.Eshaghian@dtsc.ca.gov>>,
"MCcaulou, Cherie@Waterboards"
<Cherie.MCcaulou@waterboards.ca.gov<mailto:Cherie.MCcaulou@waterboards.ca.gov>>, "Dehghi, Benny
(benny.dehghi@honeywell.com<mailto:benny.dehghi@honeywell.com>)"
<benny.dehghi@honeywell.com<mailto:benny.dehghi@honeywell.com>>,
"vvargas@trumarkco.com<mailto:vvargas@trumarkco.com>"
<vvargas@trumarkco.com<mailto:vvargas@trumarkco.com>>,
"rwinter@trumark.com<mailto:rwinter@trumark.com>" <rwinter@trumark.com<mailto:rwinter@trumark.com>>
Subject: DTSC comments on Draft SEIR, Trumark Dumbarton TOD

Dear Mr. Grindall,

Please consider the following comments from the Department of Toxic Substances Control (DTSC) in response to the Administrative Draft Supplemental Environmental Impact Report (Draft SEIR), Trumark Dumbarton Transit Oriented Development Residential Project, dated December 2013 (State Clearinghouse No. 2010042012).

Our comments support our sister agency, the San Francisco Regional Water Quality Control Board (RWQCB) on application of two DTSC guidance documents to the project: Vapor Intrusion Guidance (VIG; DTSC, 2011a) and Vapor Intrusion Mitigation Advisory (VIMA; DTSC, 2011b). The RWQCB is the lead regulatory agency for remediation of the former Baron Blakeslee site that is adjacent to the Trumark parcel, while DTSC is the lead agency for the post-closure permit at the former Baron Blakeslee site.

B-1 Our comments on Section 4.5 that pertain to the Trumark parcel (Site A) are as follows:

1) Based on information presented in the Draft SEIR, Human Health Risk Assessment (HHRA; CH2M Hill, 2013b), and Alternate Cleanup Plan (ACP; AMEC, 2013), it is not clear if remediation proposed in the ACP will be completed before construction of single-family homes at the Trumark parcel. In addition, contamination will remain in place even if the ACP achieves its target remedial action levels, as the remedial action levels in the ACP were developed for the former Baron Blakeslee site, not the Trumark parcel. The ACP and associated remedial action levels do not account for future land use scenarios at the Trumark parcel. Therefore, before construction of residential homes at the Trumark parcel, the human health risks should be re-evaluated to ensure that public health is protected. Additional remediation at the Trumark parcel, along with vapor intrusion (VI) mitigation, may be necessary to ensure that remaining contamination does not present a threat.

B-2 2) VI mitigation is not intended to be a sole remedial alternative for a VOC contaminated site. In accordance

B-2 with the VIMA, mitigation measures are an interim step that allow building occupancy concurrent with subsurface remediation. Monitoring of the mitigation systems will be necessary to demonstrate the protection of public health while the cleanup activities transpire. Once the subsurface has been restored to appropriate health-based concentrations, building mitigation can be terminated.

B-3 3) Section 4.5.1.1, Presence of Hazardous Material Sites, page 83, states that "the analysis of hazards and hazardous materials impacts contained in this SEIR is limited to the potential environmental impacts from … development of Site A [the Trumark Parcel] with residential uses and engineered controls to mitigate impacts to the site from an adjacent property…" The Draft SEIR discusses remediation of Site B (the former Jones Hamilton site) but does not address remediation of the Trumark Parcel. Given current soil gas and groundwater concentrations present at Site A and the adjacent former Baron Blakeslee site, remediation is a necessary component of redevelopment and should be included. The text should acknowledge remediation under the ACP and potential additional remediation plans.

B-4 4) Section 4.5.2.1, third paragraph, page 86, states that tetrachloroethene (PCE) and trichloroethene (TCE) are the primary constituents of concern (COCs) in soil at the Trumark Parcel, and that TCE is the primary COC in groundwater. Please add that PCE and TCE are the primary COCs in soil gas at the Trumark parcel.

B-5 5) Section 4.5.2.1, second paragraph on page 88, states that "the project proposes to install engineered vapor barrier controls as part of residential development of Site A [the Trumark Parcel] to mitigate risks to future residents until groundwater remediation is complete." As indicated in VIMA, vapor barrier controls are not able to completely eliminate vapor intrusion due to the likelihood of punctures, perforations, tears, and incomplete seals. Thus, vapor barriers by themselves are not an acceptable vapor intrusion mitigation system for the protection of public health. Instead, a sub-slab depressurization system (SSD) should be proposed, in accordance with VIMA. Be advised that SSDs require an operation and maintenance plan including inspections, a contingency plan, performance metrics, and on-going monitoring. Please see VIMA for a complete description of additional conditions to protect public health. In addition, mitigation measures will be necessary until monitoring indicates protective concentrations of soil gas and indoor air have been achieved, and the subsurface contaminants no longer poses a threat to occupants of overlying buildings.

B-6 6) In Section 4.5.2.1, page 88, the Draft SEIR proposes to revise Mitigation Measure (MM) HAZ-1 to read "Prior to the issuance of grading permits or building permits for development of Site A [Trumark Parcel], a remediation plan and a risk management plan must be prepared and submitted for review by the RWQCB. The RWQCB will review the plans to confirm that implementation of the plans would achieve Cal-EPA approved risk management standards for residential use of risk less than 10-6 and health hazard index of less than 1." Review and approval of the plans is not sufficient to ensure a less than significant impact. Grading or building permits should not be issued until the RWQCB certifies that target risks and hazard quotients have been achieved for future residents on the Trumark Parcel, through mitigation and/or remediation.

B-7 7) Section 4.5.2.1, page 88, text references preparation of a risk management plan. The risk management plan should be prepared in accordance with VIMA so that design, implementation, monitoring, operation and maintenance, contingency planning, public participation, and roles and responsibilities are clearly defined for the life of VI mitigation measures.

B-8 8) The draft SEIR does not account for the findings of the Additional Site Investigation Report (ASIR; CH2M Hill, 2013a) that identified impacts to the Newark Aquitard and Newark Aquifer beneath the Trumark parcel. The SEIR should consider how the proposed pilot study and remediation activities for the Newark Aquitard and Newark Aquifer will be impacted by redevelopment of the Trumark parcel.

REFERENCES

AMEC. 2013. Alternate Cleanup Plan, Former Baron Blakeslee, Inc. Facility, 8333 Enterprise Drive, Newark, California. Prepared for Honeywell International, Inc. August 2013. Includes October 2 and 3, 2013 email correspondence between AMEC and RWQCB.

CH2M Hill. 2013a. Additional Site Investigation Report, Former Baron Blakeslee, Inc., Facility, 8333 Enterprise Drive, Newark, California. April 2013.

CH2M Hill. 2013b. Human Health Risk Assessment for the Trumark Parcel, Former Baron Blakeslee, Inc., Facility, 8333 Enterprise Drive, Newark, California. May 2013.

DTSC. 2011a. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). Final. October 2011.

DTSC. 2011b. Vapor Intrusion Mitigation Advisory. Final, Revision 1. October 2011.

If you have any questions, please contact me at 916-266-6523 or Mike Eshaghian at 818-717-6679.
Thank you,
Lora

Lora Jameson, P.G.
Sacramento Geological Services Unit
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826
916-255-6523
Lora.Jameson@dtsc.ca.gov<mailto:Lora.Jameson@dtsc.ca.gov>

ALAMEDA COUNTY WATER DISTRICT

43885 SOUTH GRIMMER BOULEVARD • P.O. BOX 5110, FREMONT, CALIFORNIA 94537-5110
(510) 668-4200 • FAX (510) 770-1793 • www.acwd.org

DIRECTORS

PAUL SETHY
President

MARTIN L. KOLLER
Vice President

JAMES G. GUNTHER

JUDY C. HUANG

JOHN H. WEED

MANAGEMENT

WALTER L. WADLOW
General Manager

ROBERT SHAVER
Assistant General Manager-Engineering

SHELLEY BURGETT
Manager of Finance

STEVE PETERSON
Manager of Operations and Maintenance

February 6, 2014

Terrence Grindall
Community Development Director
City of Newark
37101 Newark Boulevard
Newark, CA 94560-3796

Dear Mr. Grindall:

Subject: Draft Supplemental Environmental Impact Report for the Dumbarton Transit-Oriented Development Trumark Residential Development

The Alameda County Water District (ACWD) wishes to thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Report (SEIR) for the Dumbarton Transit-Oriented Development (TOD) Trumark Residential Development.

ACWD has reviewed the Draft SEIR and would appreciate your consideration of the following comments:

C-1

1. Water System Infrastructure: As ACWD commented on the Draft Environmental Impact Report for the Dumbarton TOD Specific Plan and on the Notice of Preparation for this SEIR, in order to extend the public water distribution system to meet water service requirements of the Dumbarton TOD Project and adequately integrate the project into ACWD's water system, significant public water system improvements will be required. At least one additional water main connection between the North side of the existing railroad right-of-way and the project site at either Willow Street or Hickory Street will be required. Based on the information provided in the draft Specific Plan for the Dumbarton TOD, it appears that a connection within Willow Street is most likely. Whichever particular development within the Dumbarton TOD Project area performs improvement work adjacent to the railroad right-of-way at either Willow Street or Hickory Street will be responsible for installing this water main connection and obtaining any necessary permits and approvals from the railroad. In addition, one or more new water mains will need to be constructed across the existing San Francisco Public Utilities Commission (SFPUC) right-of-way. Similarly, those particular developments within the Dumbarton TOD Project area performing improvement work adjacent to the SFPUC right-of-way will be responsible for installing the water main connection(s) crossing SFPUC right-of-way and obtaining any necessary permits and approvals from SPFUC.

   Given the location and proposed development of Site "A" shown on the Figure 3-4 of the Draft SEIR, the District will require the project to install both a water main extension crossing of the SFPUC right-of-way and a water main connection extending from the project into Willow Street to connect to the existing 16-inch water main within Willow Street on the North side of the railroad right-of-way. In lieu of the requirement for both water mains to be installed for system looping, the District

RECYCLED PAPER

may consider requiring only one connection across either SFPUC or railroad right-of-way if the project proponents can secure a perpetual, irrevocable easement dedicated to ACWD for the water system across either right-of-way.

The construction of such railroad and SFPUC crossings will require significant trenching, excavation and dewatering and may result in impacts to the environment stemming from pumping and discharge of contaminated groundwater (including the effects of plume migration resulting from such pumping), production and handling of contaminated excavation spoils, construction noise, dust and other factors. **The SEIR should address any associated environmental impacts that may arise from construction of these required connections.** C-1

Other onsite and offsite water system extensions and/or improvements may similarly be required in order to meet fire flow requirements or other ACWD standards and requirements. Any public water system extensions necessary to serve developments within the Dumbarton TOD Project area must meet ACWD public water system installation and design standards, including ACWD's *Standard Specifications for Water Main Installation* and *Development Specifications for Public Water System Extensions*. ACWD requests that the City and project proponents coordinate closely with ACWD throughout the planning and development of the Dumbarton TOD Project.

2. Hazards and Hazardous Materials: The installation, long-term operation, and maintenance of utilities to serve the project may include, but is not limited to, significant dewatering, disposal of groundwater, deep soil excavation, transportation and disposal of excavated soil, utilities submerged in groundwater, and worker exposure to soil and groundwater. The Draft SEIR does not adequately identify the hazards or hazardous materials sites remaining within the project area, after remediation activities are completed, that may continue to pose a risk to the health and safety of workers during the installation, long-term operation, or maintenance of all utilities required to serve the project. **This analysis should be included in the SEIR.** The ability to install a public water system within the project area would be conditioned upon confirmation that the soil or groundwater does not pose a risk to the health and safety of workers either during installation of the public water system or during long-term routine operation and maintenance of such a system. **Any mitigation required to eliminate such hazards or potential hazards, such that that the soil or groundwater does not pose a risk to the health and safety of workers during installation, and during long-term routine operation and maintenance of utility systems, must be identified and described in the SEIR.** The proposed mitigation should not rely on extraordinary measures by the utility to protect worker health and safety, such as unusual personal protective equipment, unusual soil or groundwater treatment or disposal requirements, or decontamination of tools and equipment required for potable water system maintenance. If specific measures are to be identified in a Risk Management Plan, the SEIR should require ACWD approval of the plan as part of the mitigation. C-2

3. Well Protection/Destruction: Reference is made to Section 3.5.2, Pollutant Remediation and Site Preparation (pages 40 thru 43). ACWD's records indicate the existence of 47 wells in Site A and 24 in Site B (not 22 as reported in the SDEIR). **Therefore, ACWD requests a mitigation measure that requires project proponents to develop a plan for the protection or destruction of wells that must be reviewed and approved by ACWD prior to issuance of grading permits to ensure compliance with ACWD Ordinance No. 2010-01.** C-3

In order to protect the groundwater basin, each well located within the property must be in compliance with ACWD Ordinance No. 2010-01. If the well(s) are to remain, a letter so indicating must be sent to ACWD and will require a permit for inactive classification if the wells will not be used for a period of twelve (12) months. If the well(s) are: 1) no longer required by any regulatory agency; 2) no longer monitored on a regular basis; or 3) damaged, lost, or the surface seal is

C-3 jeopardized in any way during the construction process, the well must be destroyed in compliance with ACWD Ordinance No. 2010-01.

C-4 4. Climate Action Plan: Reference is made to the City of Newark's Climate Action Plan, January 2010 Initial Framework. ACWD agrees with the City that planning related to sea level rise is important for the region and for ACWD. **ACWD recommends the SEIR more thoroughly address the potential impacts of sea level rise and adaptation.**

C-5 5. ACWD Contacts: The following ACWD contacts are provided so that the City can coordinate with ACWD as needed during the CEQA process:

- Steven Inn, Groundwater Resources Manager at (510) 668-4441, or by e-mail at steven.inn@acwd.com, for coordination regarding ACWD's groundwater resources.
- Rangarajan Sampath, Groundwater Resources Engineer at (510) 668-4411, or by e-mail at rangarajan.sampath@acwd.com, for coordination regarding cleanup sites.
- Michelle Myers, Well Ordinance Supervisor, at (510) 668-4454, or by e-mail at michelle.myers@acwd.com, for coordination regarding groundwater wells and drilling permits.
- Ed Stevenson, Development Services Manager, at (510) 668-4472, or by e-mail at ed.stevenson@acwd.com, for coordination regarding public water systems and water services.

Thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Report for the Dumbarton Transit-Oriented Development Trumark Residential Project at this time.

Sincerely,

Robert Shaver
Assistant General Manager - Engineering

la/ps
cc: Steven Inn, ACWD
Ed Stevenson, ACWD
Michelle Myers, ACWD
Leonard Ash, ACWD

San Francisco
Water Power Sewer
Operator of the Hetch Hetchy Regional Water System

Bureau of Environmental Management
525 Golden Gate Avenue, 6th Floor
San Francisco, CA 94102
T 415.934-5700
F 415.934-5750

Date: February 7, 2014

Mr. Terrence Grindall
Community Development Director
City of Newark
37101 Newark Boulevard
Newark, CA 94560

RE: Supplemental Environmental Impact Report for Dumbarton Transit Oriented Development Trumark Residential Project

Dear Mr. Grindall:

As a Responsible Agency under the provisions of Section 15096 of the CEQA Guidelines, the San Francisco Public Utilities Commission (SFPUC) submits its comments regarding the Dumbarton Transit Oriented Development for the Trumark Residential Project Supplemental Environmental Impact Report (SEIR).

D-1 The SFPUC commented on the Notice of Preparation for the SEIR in a letter dated March 7, 2013. That letter is attached. We stated that the SEIR should list the SFPUC as a Responsible Agency and cited the SFPUC Pipeline Right of Way (ROW) Requirements which we provided with the letter. We commented that the SFPUC does not permit any structures on our ROW, nor does the SFPUC allow the ROW to be used as the sole access to any development as this creates future access problems in the event our pipelines require repair or replacement. The SEIR has not addressed our comments as the site plans for the development still show the only access road on the SFPUC ROW. Furthermore the SEIR does not include a Utilities and Services section, as required in subsection XVII of Appendix G of the CEQA Guidelines. This section should be included in the SEIR and potential Impacts to the SFPUC's ability to maintain and repair its pipelines should be analyzed in this section.

D-2 The developer's representative presented the proposed project in a formal SFPUC Project Review meeting on June 14, 2013 and stated that the developer was seeking an emergency vehicle access (EVA) across an adjacent property but such an EVA is not shown in the SEIR. Also since that meeting, the project site plan, as shown in the SEIR, has been changed. The developer should schedule a presentation of the revised project at a future Project Review meeting. The contact for Project Review arrangements is Ms. Joanne Wilson at jwilson@sfwater.org.

Edwin M. Lee
Mayor

Vince Courtney
President

Ann Moller Caen
Vice President

Francesca Vietor
Commissioner

Anson Moran
Commissioner

Art Torres
Commissioner

Harlan L. Kelly, Jr.
General Manager

We reiterate that while a January 1974 Parcel Map No.1317 depicts a crossover right over SFPUC property this does not grant the property owner the right to construct a road and related improvements across our fee owned-property without a Land Engineering Permit from the SFPUC, and this will not be granted without provision of an EVA, among other conditions, which will be determined after the project is presented at Project Review. The SEIR should show a revised project site plan including an EVA. Please contact Brian Morelli, Right of Way Manager, at (415) 554-1545 or bmorelli@sfwater.org for any questions regarding our specific ROW requirements.

The SFPUC appreciates the opportunity to comment on the Supplemental Environmental Impact Report for the Dumbarton Transit Oriented Development Trumark Residential Project as a Responsible Agency under CEQA. Please feel free to contact me at (415) 554-3232 or itorrey@sfwater.org or Ms. YinLan Zhang at 415-487-5201 or yzhang@sfwater.org if you have questions about our comments.

D-3

Sincerely,

Irina P. Torrey, AICP, Bureau Manager
Bureau of Environmental Management

Enclosure

Comment letter on NOP

Cc: Rosanna Russell, Real Estate Director, SFPUC
Brian Morelli, Right of Way Manager, SFPUC
Joanne Wilson, Senior Land Resources Planner

Attachment

San Francisco Water Power Sewer
Operator of the Hetch Hetchy Regional Water System

Bureau of Environmental Management
525 Golden Gate Avenue, 6th Floor
San Francisco, CA 94102
T (415) 934-5700
F (415) 934-5750

March 7, 2013

Terrence Grindall
Community Development Director
City of Newark
37101 Newark Boulevard
Newark, CA 94560

RE: Notice of Preparation for Dumbarton Transit Oriented Development Trumark Residential Project; Supplemental Environmental Impact Report

Dear Mr. Grindall:

Under the provision of Section 15082 of the CEQA guidelines, the San Francisco Public Utilities Commission (SFPUC) hereby submits its comments regarding the Notice of Preparation for the Dumbarton Transit Oriented Development for the Trumark Residential Project; Supplemental Environmental Impact Report (SEIR).

The SEIR should list the SFPUC as a Responsible Agency and specify the location of the SFPUC Right of Way (ROW) in relation to the project and cite the SFPUC Pipeline Right of Way Requirements, which are enclosed. Please note that the SFPUC does not permit any structures on our ROW, nor does the SFPUC allow the ROW to be used as the sole access to any development. The project sponsor must obtain prior approval from the SFPUC for any development on our ROW. Please contact Brian Morelli, Right of Way Manager, at (415) 554-1545 or Bmorelli@sfwater.org regarding our specific requirements.

The SFPUC appreciates the opportunity to comment on the Notice of Preparation of the Supplemental Environmental Impact Report for the Dumbarton Transit Oriented Development Trumark Residential Project. Please contact YinLan Zhang at 415-487-5201 you have any questions about our comments.

Sincerely,

Irina Torrey, AICP, Manager
Bureau of Environmental Management

Enclosure

Cc: Rosanna Russell, Real Estate Director, SFPUC
Brian Morelli, Right of Way Manager, SFPUC

Edwin M. Lee
Mayor

Art Torres
President

Vince Courtney
Vice President

Ann Moller Caen
Commissioner

Francesca Vietor
Commissioner

Anson Moran
Commissioner

Harlan L. Kelly, Jr.
General Manager

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

San Francisco Public Utilities Commission
Pipeline Right of Way Requirements

- *Utilities*
  - No utility may be installed along, rather than across, the Right of Way. Only perpendicular crossings are permitted.
  - No aerial utility crossing over the Right of Way is permitted except in city streets.
- *Land Use, Structures, and Accessibility*
  - *Structures on the Right of Way are strictly prohibited*. No one shall construct or place any temporary or permanent structure or improvement in, on, under or about the Right of Way. For the SFPUC's purposes, asphalt, concrete and cementitious concrete driveways, sidewalks and parking areas, and fences are deemed "improvements," and are subject to SFPUC review and approval.
  - No use is permitted that would restrict access to Right of Way at any time by SFPUC staff, construction equipment or vehicles. This means that structures on adjacent property must be setback at least 10 feet from the Right of Way.
  - An adjacent property owner or tenant may not use the Right of Way fulfill its open space, setback, emergency access or other development requirements.
  - Any use where the Right of Way would provide an adjacent owner, tenant or licensee with its sole emergency access to the tenant or licensee's property is prohibited.
  - No use that would cause ponding on the Right of Way is permitted.
  - Any use that cannot effectively be displaced in a timely manner upon the SFPUC's request is disfavored.
  - Any use that may contaminate with hazardous materials the soils, water or natural habitat of SFPUC property is prohibited.

Edwin M. Lee
Mayor

Art Torres
President

Vince Courtney
Vice President

Ann Moller Caen
Commissioner

Francesca Vietor
Commissioner

Anson Moran
Commissioner

Harlan L. Kelly, Jr.
General Manager

- Any use that would increase the SFPUC's potential liability or diminish its security is disfavored.

- Any use inconsistent with any existing or future policies adopted by the SFPUC, as they may be amended or modified from time to time, is disfavored.

- *Restoration*

  The SFPUC is not responsible for restoring or replacing any vegetation or improvement on the Right of Way damaged or demolished so that the SFPUC may access, maintain or repair its pipelines. The SFPUC will restore the ground with soil compacted to SFPUC standards. The vegetation or improvement owner is responsible any additional work or the restoration.

- *Vegetation*

  No trees or large shrubs may be planted within the Right of Way. Other vegetation may only be installed with the SFPUC's prior written consent. For a list of plants that may be permitted in the Right of Way, please refer to SFPUC Integrated Vegetation Management Policy Section 13.005 at http://www.sfwater.org/index.aspx?page=431. The tenant or licensee is responsible for vegetation maintenance and removal.

- *Right of Way Loading Restrictions*

  The maximum loading on the Right of Way should not exceed traffic loading HS-20 on the paved surfaces when the pipeline has a minimum four-foot cover. Overburdened or additional live or dead loads such as load-bearing footings, pole foundations, or large boulders within the influence line of the pipe trench is prohibited.

- *Right of Way Cover Requirements*

  To prevent damage to the PUC's underground pipelines, an adjacent owner or tenant's use of vehicles and equipment within twenty feet (20') of each side of the centerline of the PUC's pipelines (measured on the surface) are subject to the restrictions stated in Exhibit B.

7 February, 2014

Terrence Grindall
Community Development Director
City of Newark
37101 Newark Blvd.
Newark CA 94560

Re: Supplemental EIR for Dumbarton Trumark (Sent via email; signed hard copy to follow)

Dear Mr. Grindall,

I have a few comments to make on the supplemental EIR for the proposed Trumark development on Area 2 AKA Dumbarton TOD.

E-1 Page 43 of the document states that contaminated soils could be transported to the nearest Class 2 disposal facility, one of which could be the Dumbarton Landfill. Where is the Dumbarton Landfill? I cannot find it on a list of landfills in Alameda County or anywhere for that matter. Is this a typo or is the city intending to open a new landfill in Newark?

E-2 None of the maps showing the proposed development of the two sections of the Trumark property contain a vehicle access point for Site A which is adjacent to Gallade Chemical. It appears that when development occurs on the parcel to the west of Site A that a street coming off of Willow and heading east would provide vehicle access to Site A. But until that parcel is developed, Site A is landlocked with no access. Is this what the city intends to happen?

E-3 In only giving approvals for small sections of Area 2 there is no coordinated cleanup of contaminated soils and groundwater. It is done in a piecemeal fashion that puts future residents and the public at risk of exposure from soil and groundwater contamination. This document states that part of the Trumark site is on the Cortese List of Hazardous Waste sites. This is also known as the California Superfund list. Does the city really believe the highest and best use of a Superfund site is residential? If so, this is alarming and irresponsible planning.

E-4 The reasons for stating no alternative location exists because housing must be built on Area 2 makes no sense. The city claims there will be rail service and thus this is a transit development. No rail service is planned in the foreseeable future. Neither is bus service planned to serve future residents. Therefore Area 2 is not a transit development. The city should look at the NewPark Mall Master Plan area where the city wants to bring in residential of various densities. The mall area is not a Superfund site and has easy freeway access. Shopping is already in place. There are also the vacant lots across from the Newark post office as well as the Ruschin school site which the school district has up for immediate sale.

Sincerely,

Margaret Lewis
36102 Spruce St.
Newark CA 94560

CH2M HILL
155 Grand Avenue
Suite 800
Oakland, CA
94612
Tel 510.251.2426
Fax 510.893.8205

February 7, 2014

City of Newark
37101 Newark Boulevard
Newark, CA 94560

Attn: Mr. Terrence Grindall

Subject: Comments on Trumark Dumbarton Transit Oriented Development Residential Project
Draft Supplemental Environmental Impact Report

Dear Mr. Grindall:

CH2M HILL is submitting the attached comments on the subject document on behalf of Honeywell International, Inc.

Should you require any clarification on these comments, please call me at (503) 327-8277 or Mr. John Lowe, our Vapor Intrusion Technical Consultant at (509) 464-7325.

Sincerely,

Tim Graves
Project Manager
CH2M HILL

cc: Benny Dehghi/Honeywell
John Lowe/CH2M HILL
Veronica Vargas/Trumark Homes
Cherie McCaulou/RWQCB

Page xx, table summarizing significant environmental impacts and associated mitigation measures

F-1 There is no clear basis for the document's use of an increased lifetime cancer risk of one-in-one million (10^{-6}) as a threshold of significant impact for VOCs in soil and groundwater at Site A. Use of this risk threshold is not consistent with other regulatory guidance, including the BAAQMD guidelines for assessing significance of public health impacts referenced in the SEIR, DTSC's 2011 Vapor Intrusion Mitigation Advisory, and language in the 2007 Site Cleanup Requirements for the Gallade facility. The threshold of significance for cancer risks associated with VOCs in soil and groundwater should be stated in a manner consistent with the applicable regulatory guidance.

Page xxvi, 2nd to last paragraph

F-2 The description of the FMC properties should be more specific as to which particular FMC parcels would be used for the Location Alternative. The statement "*It is likely that the remediation action needed to prepare these sites for residential development would involve similar remediation as the project proposes for Site B*." may not apply to each of the FMC parcels.

Page 33, Section 2.5, Assessors Parcel Numbers

F-3 There is a discrepancy in the parcel number for Site A between the parcel number in this paragraph, 092-0140-008, and the parcel number in Figure 3-2, 092-0140-006.

Page 40, Section 3.5.2, Pollutant Remediation and Site Preparation

F-4 The text states "*The extent of work necessary to prepare Site A for development will depend on the success of remediation of the adjoining property*." Given that the residential development of Site A will include the installation of pre-emptive vapor intrusion mitigation systems, the extent of work necessary to prepare Site A for development should not be strictly dependent on remediation efforts at adjoining properties.

Page 40, Section 3.5.2.1, Pollutant Remediation and Site Preparation, Site A – Trumark

F-5 The first sentence states "…*that groundwater contamination beneath the Site A would be sufficiently remediated to allow development of the site with residential uses*." Given that vapor intrusion mitigation systems will be installed in each of the residential structures to be constructed at Site A, the residential development of Site A should be allowed to proceed after the start of groundwater remediation. We believe this action is correctly stated on Page 88, 2nd paragraph "*The project proposes to install engineered vapor barrier controls as part of residential development of Site A to mitigate risks to future residents until groundwater remediation is complete*."

F-6 In addition, the vapor intrusion engineering controls associated with the proposed project are described in further detail in a conceptual risk management plan for the development of the Trumark parcel, submitted in draft to the RWQCB on December 20, 2013, in accordance with Mitigation Measure 4.7-1a in the Dumbarton Transit Oriented Development Specific Plan EIR (City of Newark, 2011). A statement acknowledging that a draft conceptual risk management plan for the Trumark parcel has been submitted to the RWQCB should be included in the SEIR. The fundamentals of the conceptual risk management plan were discussed among Trumark, Honeywell, and the RWQCB, and an agreement was reached in concept.

Page 44, Section 3.5.3, Pollution Remediation and Site Preparation, Residential Development

F-7 The third paragraph states *"A new public park will be located immediately to the east of Site A [the Trumark parcel] at the current location of the Gallade Chemical Company facility."* The SEIR does not specify the timing for development of Site A in relation to the new public park. Specifically, will building and grading permits for Site A development be approved by the City, prior to the development of Gallade as a public park?

Page 88, Section 4.5.2.1, Impacts, Site A – Trumark Property

The statement, "*[t]he project proposes to install engineered vapor barrier controls as part of residential development of Site A to mitigate risks to future residents until groundwater remediation is complete*," appropriately reflects Cal-EPA's approach to addressing vapor intrusion risks associated with future development, as outlined in the California Department of Toxic Substances Control (DTSC) *Vapor Intrusion Mitigation Advisory*.

F-8 The approach to the engineering controls for vapor intrusion has been provided to the RWQCB as part of the conceptual risk management plan. A brief description of those engineering controls should be incorporated into this section.

The mitigation measure for HAZ-1 identifies a target increased lifetime cancer risk of less than 1×10^{-6} as representing a less than significant impact. While this is described as a Cal-EPA approved risk management standard, the regulatory basis for this risk threshold has not been defined or documented in this SEIR. It is inconsistent with the vapor intrusion risk management framework outlined in DTSC's *Vapor Intrusion Mitigation Advisory*, and is inconsistent with language presented in the 2007 Site Cleanup Requirements (see page 6), both of which refer to the risk management range of 1×10^{-6} to 1×10^{-4} for making cleanup decisions. In addition, the SEIR refers to the BAAQMD's risk management threshold of a 1×10^{-5} as a target risk level. The cancer risk level being used as a threshold of significance requires more justification than is currently provided in the document.

February 7, 2014

VIA EMAIL

Mr. Terrance Grindall (terrence.grindall@newark.org)
Community Development Director
City of Newark
37101 Newark Blvd.
Newark, California 94560

Re: Cargill Comments on SEIR – Trumark DTOD Residential Project (SCH #2010042012)

Dear Mr. Grindall:

On behalf of Cargill, Incorporated ("Cargill"), thank you for the opportunity to comment on the Administrative Draft - Supplemental Environmental Impact Report – Trumark Dumbarton Transit Oriented Development Residential Project dated December 2013 ("SEIR"). Cargill wishes to offer the following comments to correct a few inaccuracies contained in the SEIR.

Namely, the SEIR identifies Cargill Parcel 1 of Tentative Parcel Map 9873 (see Figure 3-2 of the SEIR) (the "Cargill Site") as a potential alternative site for the residential project analyzed in the SEIR, as well as property owned by FMC Corporation. In so doing, the SEIR states that:

G-1

> As noted in the *Dumbarton TOD Specific Plan EIR*, these sites are known to be impaired by hazardous materials, generally in the form of soil and/or groundwater contamination. It is likely that the remediation actions needed to prepare these sites for residential development would involve similar remediation as the project proposes for Site B.

SEIR at page 119.

As discussed below, this statement is factually inaccurate and does not represent the conditions of the Cargill Site.

The Dumbarton TOD Specific Plan EIR ("Specific Plan EIR") analyzes four limited areas of the Cargill Site for potential impacts from hazards and hazardous materials in connection with buildout of the Dumbarton TOD Specific Plan: (1) the former Newark Sportsman's Club (Hickory Street), (2) the Newark Police Pistol Range (Hickory Street), (3) the Leslie Salt/FMC Magnesia Waste Pile Site (Hickory Street), and (4) the Hill Parcel (Hickory Street). See Specific Plan EIR at pages 4.7-6 through 4.7-11.

7220 Central Avenue
Newark, CA 94560-4205

Tel (510) 797-1820
Tel (800) 321-1458
Fax (510) 790-8189

Former Newark Sportsman's Club - Remediated and No further Action Necessary

With respect to the former Newark Sportsman's Club (approximately 18 acres located west of Hickory Street which was leased by the Club from Cargill from 1969 through 1995), the Specific Plan EIR notes that use as a recreational outdoor shooting range resulted in "surficial and shallow soil deposition of lead shot, residual total lead, and clay pigeon debris containing elevated levels of polycyclic aromatic hydrocarbons (PAHs)." Specific Plan EIR at page 4.7-6. After the discovery of "very little contamination" below 0.5 feet of soil depth and "limited" debris, Cargill performed a voluntary Remedial Action Workplan consisting of soil excavation and confirmation sampling in 2002 and 2003. On March 10, 2004, the Regional Water Quality Control Board issued a letter certifying that soil remediation activities had achieved cleanup objectives and that *no additional remedial action was necessary*." Specific Plan EIR at page 4.7-7 (emphasis added).

Newark Police Pistol Range - Small and limited (405 tons) clean-up required

Next, the Specific Plan EIR analyzed potential impacts from a small portion of the Cargill Site leased by the City of Newark from Cargill for use as a pistol range for the Newark Police Department. In 2001, the City conducted a Phase II Soil and Groundwater Investigation which identified lead concentrations in shallow soils exceeding State hazardous waste criteria. "As the depth of contamination was limited," the investigation concluded that excavation and removal of the upper three feet of impacted soil was the most cost effective remedy. See Specific Plan EIR at page 4.7-8. The amount of soil estimated to be removed is approximately 405 tons, in contrast with the estimated 91,000 tons of soil which will need to be removed from Site B for the project analyzed in the SEIR. See SEIR at page 43. In other words, the soil to be removed from the Newark Police Pistol Range site is 0.45 percent of the soil which will need to be removed from Site B.

G-1

Leslie Salt/FMC Magnesia Waste Pile Site - Remediated and Clean-up Completed According to Remedial Action Plan

As the Specific Plan EIR notes, FMC and its predecessor Westvaco deposited certain waste materials from their adjacent facility onto a portion of the Cargill Site, which was leased from Cargill from 1929 to 1969, resulting in a magnesia waste pile containing concentrations of heavy metals. After a series of investigations and removal actions conducted by FMC and Cargill, the Department of Toxic Substance Control ("DTSC") certified that all hazardous waste had been removed from this area. In 2002, the City of Newark issue a case closure for the site after the majority of non-hazardous waste magnesia material was removed. Only "scattered piles" of non-hazardous magnesia material remain at a total quantity of approximately 500 to 1000 cubic yards, in contrast with the 60,350 cubic yards of soil which must be removed from Site B of the SEIR project. See Specific Plan EIR at pages 4.7-9, -10 and SEIR at page 43.

Hill Parcel - Serpentine Rock -Naturally occurring materials

Finally, the Specific Plan EIR describes an investigation of a portion of the Cargill Site known as the "Hill Parcel" (west of Hickory Street) which contains serpentine bedrock and naturally occurring asbestos ("NOA"). The investigation concluded that "[t]hese naturally occurring materials are not regulated as a hazard if left in place." At the most, if and when the Hill Parcel is developed for residential use, "all earthmoving and trenching should be performed in compliance with regulatory requirements then in effect." There is no present hazard posed by the Hill Parcel.

In sum, the Cargill Site contains very limited areas of soil impacted by lead (approximately 405 tons), naturally occurring asbestos which must be properly managed if and when the site is developed and no evidence of groundwater contamination. The Cargill Site bears no resemblance whatsoever to the Site B analyzed in the SEIR.

G-1

Based upon this evidence, the SEIR cannot reasonably conclude that the Cargill Site is "impaired by hazardous materials," contains "groundwater contamination" and that "it is likely that the remediation actions needed to prepare [the Cargill Site] for residential development would involve similar remediation as the project proposes for Site B." The potential impacts of removing 91,000 tons of soil are not similar to the potential impacts of removing 450 tons of soil. This statement in the SEIR should therefore be removed, at least as it pertains to the Cargill Site. Or, alternatively, this statement in the SEIR should be revised, at least as to the Cargill Site, as follows:

> As noted in the *Dumbarton TOD Specific Plan EIR*, the Cargill ~~se~~ site~~s~~ contains limited areas of soils impacted by lead from a shooting range utilized by the Newark Police Department and naturally occurring asbestos.~~are known to be impaired by hazardous materials, generally in the form of soil and/or groundwater contamination.~~ Although nowhere near the scale of the removal which would be required for Site B, it is therefore possible that development of the Cargill Site for medium density residential use would entail some limited removal of soils, estimated to be approximately 450 tons of lead impacted soil versus the estimated 91,000 tons of soil which would need to be removed from Site B.~~It is likely that the remediation actions needed to prepare these sites for residential development would involve similar remediation as the project proposes for Site B.~~

Figure 4-2

G-2

Similarly, Figure 4-2 of the SEIR depicts the Cargill Site as containing a number of hazardous substances, including "lead, polycyclic aromatic hydrocarbons, magnesia, heavy metals and naturally-occurring asbestos." As noted above, the Cargill Site no longer contains polycyclic aromatic hydrocarbons, and the remaining, limited areas containing magnesia at the Hill Parcel consist of non-hazardous material. The reference to PAHs within Figure 4-2 should therefore be stricken.

Figure 4-2 also contains the following Note 2 which is highly misleading and inaccurate:

> Portions of the Cargill property supported various land uses that resulted in site contamination, including the Newark Police Pistol Range (Lead), Newark Sportsman's Club (Lead, PAHs) and Leslie Salt/FMC (Metals, magnesia). The Cargill property also includes naturally-occurring asbestos in the South Hill area.

G-2

In light of the actual current and environmental status of these areas, discussed above, we request that Note 2 of Figure 4-2 be revised as follows:

> Portions of the Cargill property historically supported various land uses that resulted in limited site contamination, including the Newark Police Pistol Range (Lead), Newark Sportsman's Club (Lead, PAHs) (site remediated and closed) and Leslie Salt/FMC (Metals, magnesia) (site remediated and completed according to RAP). The Cargill property also includes non-hazardous, naturally-occurring asbestos in the South Hill area.

G-3

Finally, Cargill wishes to point out that the proponent of the project analyzed in the SEIR does not own or control the Cargill Site, as the SEIR itself notes. See SEIR at page 120.

***

Thank you again for the opportunity to comment on the draft SEIR. Should you have any questions regarding any of the comments contained in this letter, please do not hesitate to contact me.

Sincerely

Paul Shepherd

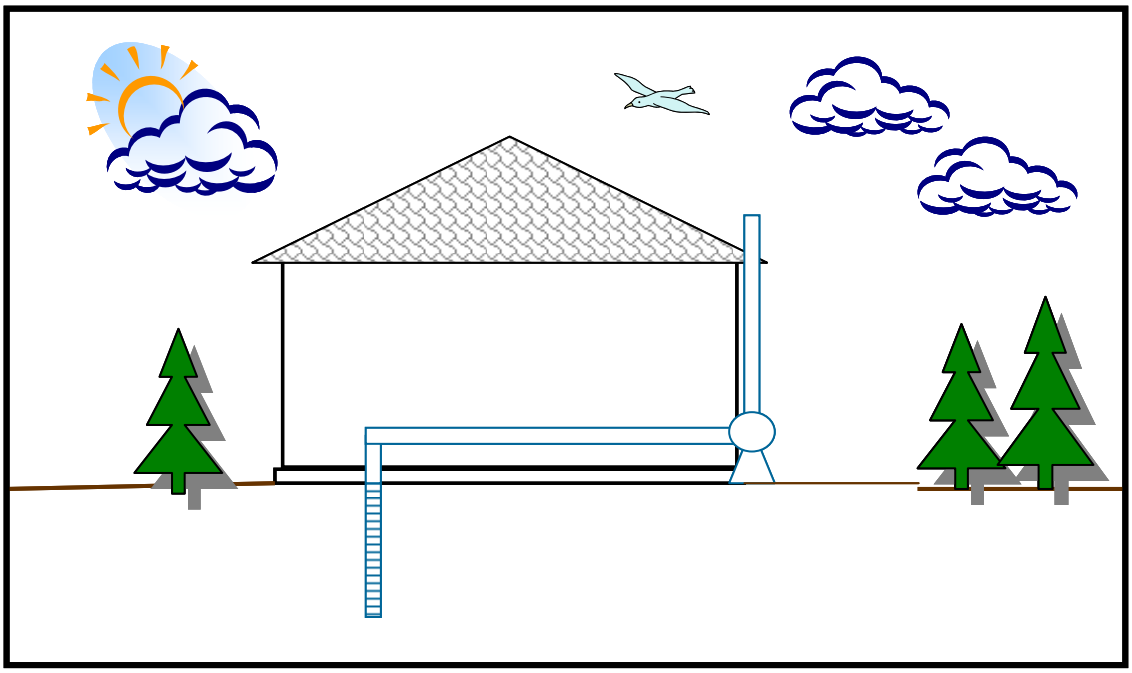
Paul Shepherd
Cargill, Incorporated

SECTION 7.0 REVISED APPENDICES TO THE DRAFT SEIR

This section contains an additional Appendix to the *Draft Supplemental Environmental Impact Report, Trumark Dumbarton Transit Oriented Development Residential Project*, dated December 2013:

Appendix G: *Vapor Intrusion Mitigation Advisory*, Department of Toxic Substances Control /California Environmental Protection Agency, October 2011.

VAPOR INTRUSION MITIGATION ADVISORY



FINAL

REVISION 1

Department of Toxic Substances Control
California Environmental Protection Agency

October 2011

FOREWORD

The California Department of Toxic Substances Control (DTSC) is issuing this *Vapor Intrusion Mitigation Advisory* (VIMA or Advisory) for use on sites that may be impacted by soil vapor intrusion into indoor air. The mitigation alternatives described in the Advisory are response actions designed to interrupt or monitor the vapor intrusion pathway and to ensure public safety until the source of volatile chemical concentrations causing the vapor intrusion risk has been restored to concentrations at or below levels considered safe for human exposure.

DTSC developed the *Vapor Intrusion Mitigation Advisory* primarily as a guide for DTSC staff. Other agencies, environmental consultants, responsible parties, community groups, and property developers may find the Advisory useful.

Originally issued in April 2009, VIMA was available for public comment until November 30, 2009. DTSC reviewed the comments received and has incorporated appropriate changes into this revision. DTSC fully expects that users of the Advisory will continue to identify areas for improvement. Additionally, new and innovative technologies may result in developing mitigation approaches not anticipated at the time of publication. DTSC will update the Advisory as determined to be appropriate.

Please submit comments and suggestions for improvement of the *Vapor Intrusion Mitigation Advisory* to:

Ms. Dot Lofstrom, P.G., Senior Engineering Geologist
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826
dlofstro@dtsc.ca.gov

ACKNOWLEDGMENTS

A document of this nature is never written in a vacuum. In preparing this document, the authors relied extensively on pre-existing documents for content and design. Rather than burden the reader with endless referrals within the text to other documents, the most often-used reference materials include the following:

Interstate Technology and Regulatory Council – Vapor Intrusion Team. 2007. *Vapor Intrusion – A Practical Guide*.

Massachusetts Department of Environmental Protection. 1995. *Guidelines for the Design, Installation and Operation of Sub-Slab Depressurization Systems*.

United States Environmental Protection Agency. 2008a. *Brownfields Technology Primer: Vapor Intrusion Considerations for Redevelopment*.

United States Environmental Protection Agency. 2008b. *Engineering Issue: Indoor Air Vapor Intrusion Mitigation Approaches*.

New York State Department of Health. 2006. *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

Colorado Department of Public Health and Environment. 2004. *Draft Indoor Air Guidance*.

The following individuals had primary responsibility for preparing the Advisory:

Dr. William Bosan, Sr. Toxicologist
Dr. Kate Burger, PG, Sr. Engineering Geologist
Ms. Lorraine Larsen-Hallock, Sr. Hazardous Substances Engineer
Ms. Dot Lofstrom, PG, Sr. Engineering Geologist

This Advisory has benefited greatly from input provided by several sources, including:

- VIMA-at-large members, an internal technical advisory group focused on vapor intrusion mitigation
- DTSC's Proven Technologies and Remedies Team
- Director's Brownfields Revitalization Advisory Group
- Internal and external reviewers of draft versions of the Advisory

In particular, the authors wish to thank the following DTSC individuals for their contributions to the development of this Advisory: Mr. Stewart Black, Mr. Paul Carpenter, Mr. Dan Gallagher, Dr. Debbie Oudiz, Mr. Roger Paulson, Mr. Tim Patenaude, Mr. Chris Siembab, Mr. Jesus Sotelo, and Ms. Kathaleen Reed.

TABLE OF CONTENTS

Page

Foreword i
Acknowledgments ii
Table of Contents iii
Acronyms and Abbreviations vi
Executive Summary vii

1.0 INTRODUCTION 1
1.1 Purpose and Objectives 1
1.2 Scope and Applicability 2
1.3 VIMA Relationship to Other Guidance Documents 4
1.4 DTSC Regulatory Authority 5
1.5 Preemptive Applications of Vapor Intrusion Mitigation Approaches 5
1.6 Overview and Organization 6

2.0 RISK-BASED DECISION MAKING FOR VAPOR INTRUSION SITES 7
2.1 Evaluation of Vapor Intrusion Pathway 7
2.2 Response Actions at Vapor Intrusion Sites 7
2.3 Risk Management Considerations for Existing Buildings 9
2.3.1 Off-site Sources of Volatile Chemical Contamination 9
2.3.2 Ambient/Background Air Sources of Volatile Organic Compounds 9
2.3.3 New Building Indoor Air Sources of Volatile Chemicals 10
2.3.4 Residential Sources of Volatile Organic Compounds 10
2.4 Risk Management Considerations for Future Buildings 10
2.4.1 Re-evaluate Indoor Air Risk Using Site-Specific Soil Parameters 10
2.4.2 Adjust Development Plans to Avoid Vapor Intrusion Issue 10
2.4.3 Evaluate Whether Monitoring Alone Would Sufficient 11
2.4.4 Off-site Sources of Volatile Chemical Contamination 11

3.0 PUBLIC PARTICIPATION 11

4.0 VAPOR INTRUSION MITIGATION METHODS 11
4.1 Conceptual Model of Vapor Intrusion 12
4.2 Overview of Mitigation Technologies 12
4.3 Sub-Slab Venting and Sub-Slab Depressurization Systems 13
4.3.1 Sub-Slab Venting Systems 13
4.3.2 Sub-Slab Depressurization Systems 15
4.4 Additions and Alternatives to Sub-Slab Venting and Sub-Slab Depressurization Systems 16

5.0 EVALUATION OF VAPOR INTRUSION MITIGATION APPROACHES 21
5.1 Screening of Vapor Intrusion Mitigation Alternatives 21
5.2 Detailed Analysis of Mitigation Alternatives 21
5.3 Documentation of Detailed Analysis Results 23
5.4 California Environmental Quality Act 24

TABLE OF CONTENTS (Continued)

Page

6.0 VAPOR INTRUSION MITIGATION SYSTEM DESIGN 26
6.1 Design Considerations 26
6.1.1 Overall Building Design 26
6.1.2 Monitoring Devices and Alarms 27
6.1.3 Back Drafting and Short Circuiting 27
6.1.4 Integration of Mitigation and Subsurface Remediation Systems ... 28
6.1.5 Incidental Removal Effects of SSD Systems 28
6.1.6 Safety and Environmental Hazards 28
6.1.7 Existing Buildings 29
6.1.8 Other Design Considerations 30
6.2 Construction Quality Assurance / Quality Control Testing 30
6.3 Design Documents 31
6.3.1 Design Document Content 31
6.3.2 Supporting Documents 33
6.3.3 Response Action Implementation Report 33
6.3.4 Licensure Requirements 34

7.0 VAPOR INTRUSION MITIGATION IMPLEMENTATION CONSIDERATIONS... 34
7.1 Property Owner/Occupant Impacts, Concerns and Responsibilities 34
7.2 Operation and Maintenance 34
7.2.1 General Performance Goals 34
7.2.2 Performance Measures 34
7.2.3 General Guidelines for Monitoring 35
7.2.4 General O&M Requirements 38
7.2.5 Contingency Plan 38
7.3 Implementation Considerations for Sub-Slab Venting Systems 38
7.3.1 Operation and Maintenance 38
7.3.2 Monitoring 39
7.4 Implementation Considerations for Active Sub-Slab Depressurization Systems 39
7.4.1 Operation and Maintenance 39
7.4.2 Monitoring 39
7.5 Document Submittals 39
7.5.1 Sampling and Analysis Plans 40
7.5.2 Design Document 40
7.5.3 Interim Measure Construction/Final Installation Reports 40
7.5.4 Periodic Monitoring Reports 40
7.6 Inspections 41
7.7 Five-Year Reviews 41
7.8 Enforceable Mechanisms 42
7.9 Financial Assurance 42
7.10 Access Agreements 43
7.11 Land Use Covenants and Institutional Controls 43

TABLE OF CONTENTS (Continued)

Page

7.12 Emissions and Discharges 44
7.13 Coordination with Other Agencies 44
7.14 California Environmental Quality Act 45
7.15 Commingled Contaminants/Plumes 45
7.16 Multiple Responsible Parties 46
7.17 Termination of Building Controls 46

8.0 REFERENCES AND ADDITIONAL RESOURCES 47

GLOSSARY 49

Appendix A Example Design Basis/Criteria for Sub-Slab Depressurization Systems

Appendix B Example of Design and Installation Requirements for Sub-Slab Depressurization Systems

Appendix C Diagnostic Testing of Air Flow Characteristics Beneath Existing Buildings

Table 1 Risk Management Matrix for Vapor Intrusion 7

Table 2 Overview of Selected Vapor Intrusion Mitigation Technologies 19

Table 3 State and Federal Guidelines for Alternatives Evaluation 22

Table 4 Qualitative Comparison of Selected Vapor Intrusion Mitigation Technologies 25

Figure ES-1 VIMA Overview viii

Figure 1 Steps in DTSC Vapor Intrusion Guidance Process 3

Figure 2 Key DTSC Resources for Identifying and Mitigating Risk of Associated With Vapor Intrusion Into Indoor Air 5

Figure 3 Vapor Intrusion Mitigation Technologies 18

ACRONYMS AND ABBREVIATIONS

AB 422	California Assembly Bill 422
APCD	Air Pollution Control District
AQMD	Air Quality Management District
ASTM	ASTM International (formerly known as American Society of Testing and Materials)
Cal/EPA	California Environmental Protection Agency
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHHSL	California Human Health Screening Level
CMS	corrective measures study
CSM	conceptual site model
DTSC	California Department of Toxic Substances Control
EE/CA	engineering evaluation/cost analysis
EIR	environmental impact report
FS	feasibility study
HI	hazard index
HSAA	Hazardous Substance Account Act
HSC	California Health and Safety Code
HVAC	heating, ventilation, and air conditioning
HWCL	Hazardous Waste Control Law
IC	institutional control
IM	interim measure
ITRC	Interstate Technology and Regulatory Council
LARWQCB	Regional Water Quality Control Board, Los Angeles Region
LEL	lower explosive limit
LUC	land use covenant
NFPA	National Fire Prevention Association
O&M	operation and maintenance
PCE	tetrachloroethene
QA	quality assurance
QC	quality control
RAP	remedial action plan
RAW	removal action workplan
RCRA	Resource Conservation and Recovery Act
RWQCB	Regional Water Quality Control Board
SMD	submembrane depressurization
SSD	sub-slab depressurization
SSP	sub-slab pressurization
SSV	sub-slab venting
TCE	trichloroethene
USEPA	U.S. Environmental Protection Agency
VI	vapor intrusion
VIMA	*Vapor Intrusion Mitigation Advisory*
VOC	volatile organic compound

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (USEPA) defines vapor intrusion (VI) as the migration of volatile chemicals from the subsurface into overlying buildings (USEPA, 2002). The California Department of Toxic Substances Control (DTSC) developed this *Vapor Intrusion Mitigation Advisory* (VIMA or Advisory) to assist with selecting, designing, and implementing appropriate response actions for sites where a potential VI risk has been identified for occupants of existing or future buildings. The VIMA draws on: DTSC's experience with response actions that involve mitigation of VI risk at sites with methane and other volatile chemicals in the subsurface; industry mitigation standards for radon; and the experiences of other agencies with VI.

This Advisory assumes that the steps in the *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion into Indoor Air* (Vapor Intrusion Guidance; DTSC, 2011) have been followed, and mitigation measures have been recommended to protect human health. Thus, the project would currently be at Step 11 which is "*mitigate indoor air exposure, monitoring, and implementation of engineering controls*." Hence, DTSC staff, stakeholders, and responsible parties may use the VIMA when 1) risk accorded to VI has been estimated by modeling or indoor air sampling; and 2) mitigation has been proposed as part of a response action.

The goal of a VI mitigation system is to mitigate the intrusion of subsurface contaminant vapors to indoor air and prevent human exposure at unacceptable levels. A VI mitigation system is implemented to reduce contaminant entry into the building until the subsurface contamination is remediated or no longer poses a significant risk to human health. Remediation and mitigation are complementary components of a volatile chemical response action, addressing cleanup of subsurface contamination and impacts to the human receptor via the VI pathway, respectively. DTSC does not consider a VI mitigation system as a means of remediating the source of the subsurface contamination.

Scope and Objectives

As illustrated in Figure ES-1, the VIMA provides a framework that guides the reader through the decision process for 1) determining if mitigation is appropriate for the project site, 2) selecting a mitigation system that is protective of human health, and 3) ensuring that implementation is sustainable for the duration of mitigation. The objectives of the VIMA are to:

- Summarize the risk management framework where VI mitigation decisions are made with technical soundness and consistency;
- Provide descriptions of various mitigation technologies to assist in response action selection;
- Describe the mitigation technologies most likely to be chosen (sub-slab depressurization [SSD] or sub-slab venting [SSV] systems);

- Provide guidance and design detail for installation of SSD and SSV systems and other mitigation technologies;
- Provide guidance for establishing operation and maintenance (O&M) requirements for VI mitigation technologies; and
- Provide guidance for implementation measures and other considerations.

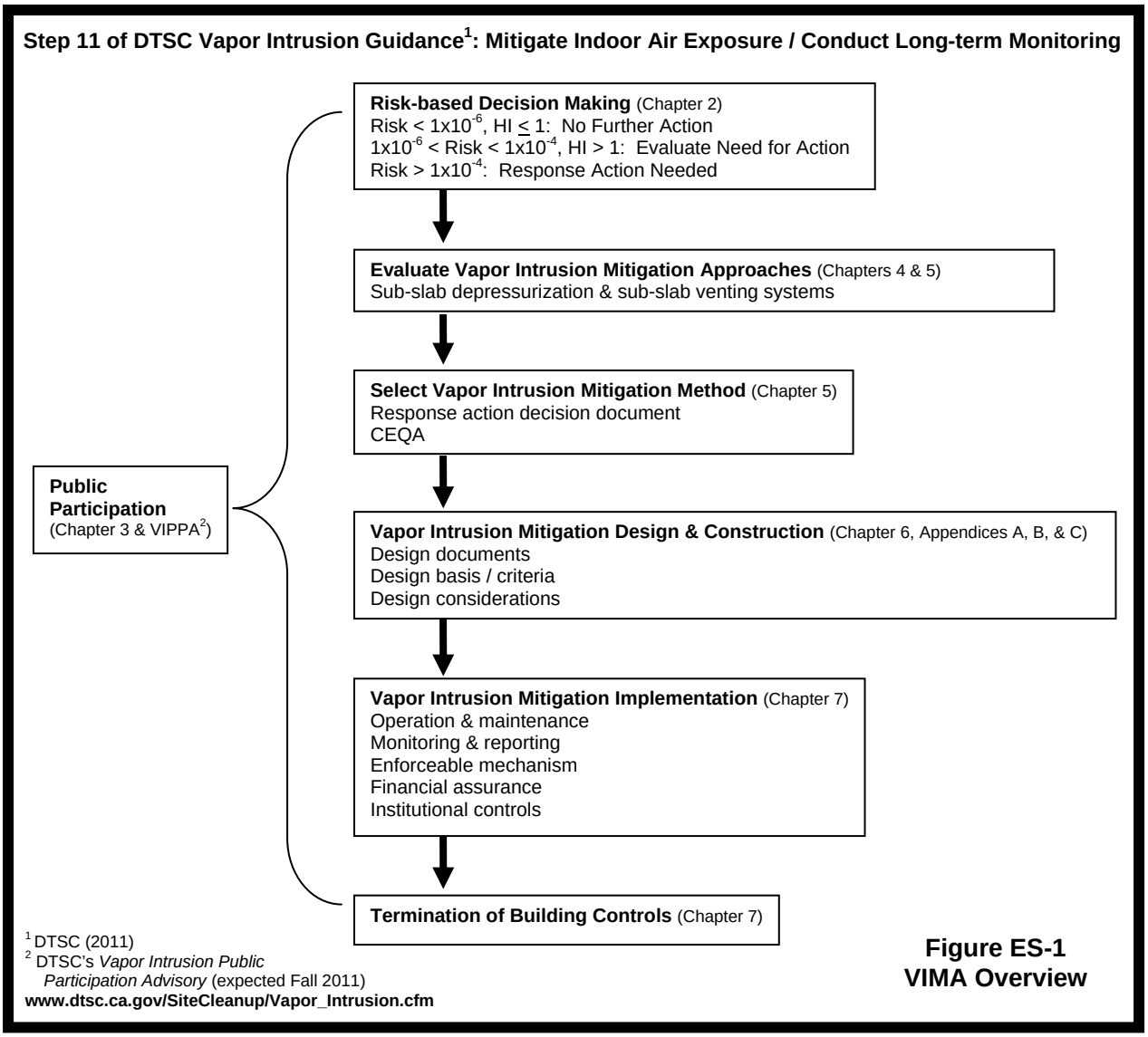


Figure ES-1
VIMA Overview

Risk-Based Decision Making

The specific action(s) taken to address VI from a subsurface source will depend on the estimated risk and hazard levels. The VIMA identifies potential response actions, based on the risk and hazard levels, to address the VI pathway. The need for a specific response action should be made on a case-by-case basis using multiple lines of evidence, as established in the Vapor Intrusion Guidance.

No Further Action (Risk < $1x10^{-6}$; HI $\leq$ 1). If the estimated cancer risk is less than $1x10^{-6}$ and the noncancer hazard index (HI) is less 1, no further action is necessary under the DTSC cleanup process.

Risk Management Decision ($1x10^{-6}$ < Risk < $1x10^{-4}$; HI > 1). The point of departure for risk management decisions for cancer risk is $1x10^{-6}$ and for noncancer hazard is an HI greater than 1. Sites with risk or hazard from volatile chemicals in excess of these points of departure will require a response action and long-term environmental care. Potential response actions could include: continued monitoring (e.g., soil gas, sub-slab or crawl space vapor, indoor air quality), installation of a VI mitigation system (such as a SSV or SSD system), and source remediation.

Mitigation/Source Remediation (Risk > $1x10^{-4}$). If the measured or predicted volatile chemical concentrations in indoor air, as contributed by subsurface VI, are estimated to pose a potential risk to human health above $1x10^{-4}$, both source remediation and VI mitigation may be needed. The timing of this response action will depend on whether it is an existing building or if future development will proceed before remedial goals are met. The decision to implement a mitigation action should be based on multiple lines of evidence to evaluate potential human health risks from VI. DTSC must approve an appropriate response action decision document for any mitigation action (see Chapter 5).

The specific action(s) taken to address VI will also depend on site-specific considerations, such as:

- off-site sources of volatile chemical contamination
- ambient/background air[1] sources
- new building indoor air sources
- flexibility for proposed building placement or building use
- the results of a detailed evaluation of the VI pathway using site-specific parameters and multiple lines of evidence

[1] For the purposes of the VIMA, ambient air is used to refer to the outdoor air in the neighborhood or community. The glossary of terms provides a more detailed definition of ambient air.

Public Participation Considerations

More extensive outreach typically is necessary for VI-impacted sites than may be needed for sites affected by other exposure pathways. The communication process should continue after a VI mitigation system is installed in a building and throughout its operation. DTSC's *Public Participation Policy and Procedures Manual* (DTSC, 2001; revision pending) should be followed. Additionally, DTSC's *Vapor Intrusion Public Participation Advisory* provides guidance specific to VI-impacted sites. Discussions of public participation considerations can be found in Chapter 3 (briefly) and in DTSC's *Vapor Intrusion Public Participation Advisory*.

Vapor Intrusion Mitigation Methods

Although several mitigation methods are available (see Chapter 4), the most commonly accepted mitigation techniques are systems that dilute contamination by ventilation (SSV) and systems that reduce contamination by lowering pressure (SSD systems) (USEPA,2008b).

- A SSV system is typically designed to function by venting sub-slab soil gases or providing a pathway to allow soil gas to migrate to the exterior of the building rather than entering a building. SSV systems function by drawing in outside air to the sub-slab area, which dilutes and reduces volatile chemical concentrations.
- A SSD system is designed to function by continuously creating a lower pressure directly underneath a building floor relative to the pressure within a building. The resulting negative pressure beneath the slab prevents soil gases from flowing into the building, thus reducing entry of volatile chemicals into the building.

Although these two systems are the focus of this document, the VIMA encourages innovation and the implementation of new, more effective and more sustainable approaches to VI mitigation, as they become available.

Evaluation of Vapor Intrusion Mitigation Approaches

A range of mitigation approaches should be evaluated to determine which is the most feasible. The screening, detailed analysis and selection of the VI mitigation technologies should be documented in an appropriate response action selection document (e.g., feasibility study, corrective measures study, remedial action plan, removal action workplan). DTSC prepares necessary documents to meet the requirements of the California Environmental Quality Act (CEQA) concurrently with the response action selection document.

Vapor Intrusion Mitigation System Design

All VI mitigation systems should be designed in conformance with standard engineering principles and practices. The responsible party should submit design documents for the VI mitigation system to DTSC for review and approval. Several factors should be considered in the mitigation system design, including:

- Coordination with active site remediation efforts;
- Source concentrations and type of volatile contaminants;
- Subsurface physical conditions (e.g., depth to water, soil properties, presence of utilities corridors);
- Integration of the system into the overall building design;
- Incorporation of monitoring devices and alarms;
- Potential for back drafting and short circuiting with SSD systems;
- Potential safety and environmental hazards (such as physical hazards to occupants, concentrations above the lower explosive limit, presence of asbestos);
- Assumptions and criteria to be met by VI mitigation;
- Construction quality assurance/quality control testing;
- Long-term maintenance and management requirements;
- Installation of sampling ports for sub-slab and/or crawl space vapor monitoring;
- For existing buildings, inspection of the building foundation for points of entry and quantification of building air flow characteristics; and
- For future developments, provisions to prevent the migration of vadose zone soil gas through utility trenches and channels.

Vapor Intrusion Mitigation Implementation

Implementation of a VI mitigation system has multiple considerations.

Operation and Maintenance. The VI mitigation system should have an effective O&M Plan. Key elements of this plan include: performance goals and measures; routine monitoring of volatile chemical concentrations and operational parameters; periodic indoor air monitoring; and a contingency plan.

Reporting. The responsible party should submit VI mitigation documents to DTSC for review and approval. Examples of these documents include design and construction/installation reports, sampling and analysis plans, a completion report, and periodic monitoring reports.

Inspections. Routine inspections should be conducted to ensure that site conditions have not changed and that the mitigation system components have not degraded. The inspection frequency is selected based on site-specific considerations.

Enforceable Mechanism. For O&M, DTSC will enter into an enforceable mechanism to address DTSC oversight and cost recovery. Examples of enforceable mechanisms include a corrective action consent agreement, consent order, consent agreement, voluntary cleanup agreement, and an O&M agreement.

Financial Assurance. The responsible party or site owner/operator should establish and maintain a financial assurance mechanism for costs associated with implementation of the VI mitigation response action, O&M activities, land use covenant (LUC) compliance, five-year reviews, and DTSC oversight.

Access Agreement. An access agreement is obtained prior to entering a building for testing and/or construction. For future buildings, access issues should be addressed in the LUC.

Institutional Controls. DTSC identifies institutional controls in the "Covenant to Restrict Use of Property, Environmental Restriction" (often referred to as a LUC). The responsible party should utilize a LUC with prescribed notifications, prohibitions, and engineering controls to ensure O&M and disclosure to future buyers and occupants.

Emissions and Discharges. The need for air permits and/or exhaust gas controls for the VI mitigation method should be determined on a site-specific basis.

Coordination with Other Agencies. Coordination with one or more other state and local agencies that have jurisdiction will be needed for most sites requiring VI mitigation.

Five-Year Reviews. Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and state law, five-year reviews are required for a response action that results in hazardous substances remaining at the site above levels that would preclude unrestricted land use. The purpose of the five-year review is to ensure that the response action 1) remains protective of human health and the environment, 2) is functioning as designed, and 3) is maintained with appropriate O&M activities.

Termination of Building Controls. Subsurface remediation efforts will eventually reduce volatile chemical concentrations in soil, soil gas, and/or groundwater to levels that no longer require mitigation. At this point, the VI mitigation system could be shutdown and/or removed and O&M requirements would cease. The implementation plan for the VI mitigation system should include specific provisions for determining that subsurface remediation is complete and that the VI mitigation system is no longer needed. A confirmation sampling and analysis plan for soil, soil gas, and/or groundwater should be a part of these provisions.

1.0 INTRODUCTION

The California Department of Toxic Substances Control (DTSC) developed this *Vapor Intrusion Mitigation Advisory* (VIMA or Advisory) to assist with selecting appropriate mitigation and implementation measures for sites with a vapor intrusion (VI) risk. The Advisory is to be used when mitigation for VI has been proposed to address regulatory requirements. The Advisory discusses the approach which is applicable at any site where there is a VI risk to occupants of existing or future buildings.

The United States Environmental Protection Agency (USEPA) defines VI as the migration of volatile chemicals from the subsurface into buildings (USEPA, 2002). Volatile chemicals may include gases, volatile organic compounds (VOCs), select semivolatile organic compounds, select polychlorinated biphenyls, and some inorganic analytes (such as elemental mercury and hydrogen sulfide). For the remainder of the VIMA, all of these compounds will be collectively referred to as volatile chemicals. If the primary constituent of concern is methane, the DTSC's *Advisory on Methane Assessment and Common Remedies at School Sites* (DTSC, 2005) should be consulted rather than the VIMA document.

Vapor intrusion should be evaluated initially by developing a conceptual site model (CSM) and investigating and characterizing a site. An essential part of all site investigations, the CSM provides a conceptual understanding of the potential for exposure to hazardous chemicals at a site based on the sources of contamination, release mechanisms, transport media, and exposure pathways. A well-developed CSM should include all potential exposure pathways at the site, and should not be specifically limited to VI. The *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion into Indoor Air* (Vapor Intrusion Guidance; DTSC, 2011) provides the investigative steps for completing an initial VI analysis, including guidance on developing a CSM.

1.1 PURPOSE AND OBJECTIVES

The VIMA provides the decision-making guidance needed to effectively mitigate the intrusion of subsurface contaminant vapors to indoor air, and thus prevent human exposure at unacceptable levels. To that end, the VIMA draws on DTSC's experience with mitigating VI risk at sites with methane and volatile chemicals in the subsurface, as well as industry mitigation standards developed for radon in the 1980s. The VIMA also encourages innovation and the implementation of new, more effective and more sustainable approaches to VI mitigation, as they become available.

DTSC developed the VIMA primarily as a guide for DTSC staff, but other agencies, environmental consultants, responsible parties, community groups, and property developers may use the Advisory. The VIMA assists the project team with making informed, technically-sound decisions. The Advisory offers guidance in selecting appropriate technologies in consultation with engineering and risk management

professionals. VIMA provides generally applicable engineering details rather than detailed engineering protocols.

The objectives of the VIMA are to:

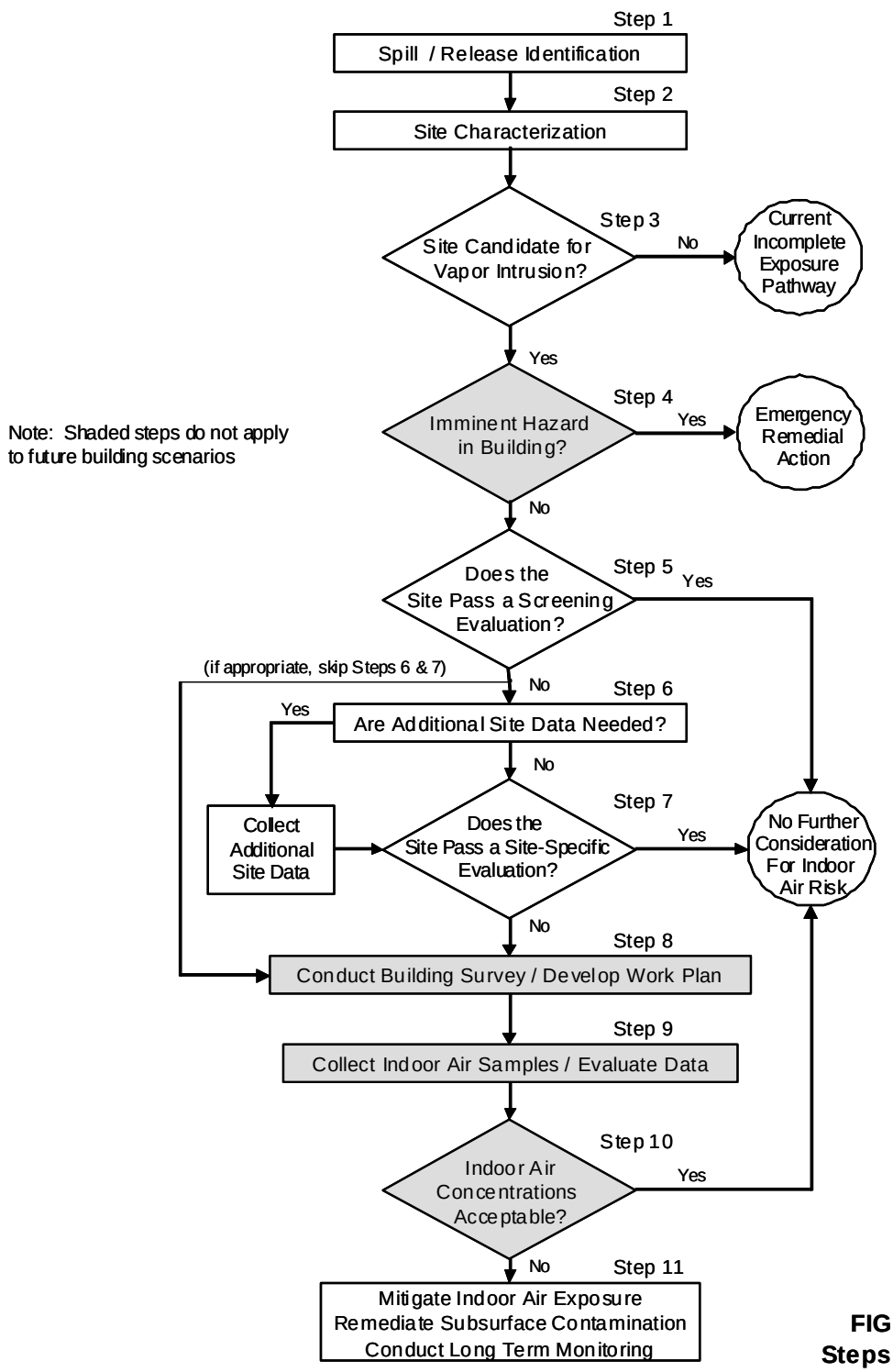
- Summarize the risk management framework where VI mitigation decisions are made with technical soundness and consistency;
- Provide descriptions of various mitigation technologies to assist in response action selection;
- Describe the mitigation technology most likely to be chosen (sub-slab depressurization [SSD] or sub-slab venting [SSV] systems);
- Provide guidance and design detail for installation of SSD and SSV systems and other mitigation technologies;
- Provide guidance for establishing operation and maintenance (O&M) requirements for VI mitigation technologies; and
- Provide guidance for implementation measures and other considerations.

1.2 SCOPE AND APPLICABILITY

This Advisory assumes that the steps in the Vapor Intrusion Guidance have been followed, and mitigation measures have been recommended to protect human health. Thus, the project would currently be at Step 11 (see Figure 1) of the Vapor Intrusion Guidance which is "*mitigate indoor air exposure, monitoring, and implementation of engineering controls*." The VIMA provides a framework that guides the reader through the decision process for 1) determining if mitigation is appropriate for the project site, 2) selecting a mitigation system that is protective of human health, and 3) ensuring implementation is sustainable for the duration of the exposure.

The reader should keep in mind the distinction between "mitigation" and "remediation" as used in this Advisory. The VIMA uses "remediation" to refer to those parts of a response action that address cleanup of the subsurface to response action-based goals, either by *in situ* or *ex situ* techniques. The purpose of remediation is to reduce the level of contamination in the environmental medium that is acting as a source of indoor air vapors. In contrast, "mitigation" as used in this Advisory, is applied to actions that reduce contaminant entry into building structures or remove contaminants after they have entered a building. See Chapter 4 for a discussion of current mitigation strategies. This Advisory also addresses a third approach, which is to impose a land use covenant (LUC) in order to restrict residential use of a site.

It is important to keep two other points in mind when using this Advisory. First, "response action", as used herein, means hazardous waste facility closure, corrective action, remedial or removal action, or other response action to be undertaken pursuant to division 20 of the California Health and Safety Code. Other agencies, such as the Regional Water Quality Control Board (RWQCB), will conduct response actions in accordance with their particular regulations, such as the Water Code. Second, the term



*From DTSC (2011)
www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm

FIGURE 1
Steps in DTSC Vapor Intrusion Guidance Process*

"buildings" includes any structure in which current or future occupants could potentially contact contaminated indoor air.

The VIMA provides technically defensible and consistent approaches for mitigating VI to indoor air, based upon current understanding of the exposure pathway. The VIMA is not regulation, nor does it impose any requirements or obligations on the regulated community. Rather, it provides a technical framework and reference for addressing VI mitigation. Other technically equivalent procedures exist, or may be developed, and this Advisory is not intended to exclude alternative approaches or the implementation of new, more effective approaches to VI mitigation. Hence, users of the VIMA are free to apply other technically sound approaches that may not be included in this document.

1.3 VIMA RELATIONSHIP TO OTHER GUIDANCE DOCUMENTS

Numerous guidance documents, both state and national, are available to assist in VI evaluation. The VIMA is one of several Cal/EPA documents pertaining to VI evaluation. The following documents are available as guidance for investigating soil gas, evaluating the potential for VI, and remediating sources of volatile chemicals:

- *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion into Indoor Air* (Vapor Intrusion Guidance)
- *Advisory – Active Soil Gas Investigations*
- *Vapor Intrusion Mitigation Advisory*
- *Vapor Intrusion Public Participation Advisory*
- *Proven Technologies and Remedies Guidance -- Remediation of Chlorinated VOCs in Vadose Zone Soil*

Figure 2 illustrates where the Cal/EPA documents apply to the process identified in the Vapor Intrusion Guidance.

In addition, the California Environmental Protection Agency (Cal/EPA) developed California Human Health Screening Levels (CHHSLs) for volatile chemicals in soil gas that might migrate to indoor air. The CHHSLs are described in *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties* (Cal/EPA, 2005) and are available on the Cal/EPA web-site. The CHHSLs were based on practical modeling for estimating indoor air concentrations from soil gas concentrations, standard exposure assumptions, and chemical toxicity values published by the USEPA and the Cal/EPA.

The documents described above will provide an overall conceptual understanding of the VI exposure pathway. Responsible parties involved in investigating or evaluating sites with VI concerns are encouraged to review these documents. Chapter 8 includes a list of other useful resources and website links.

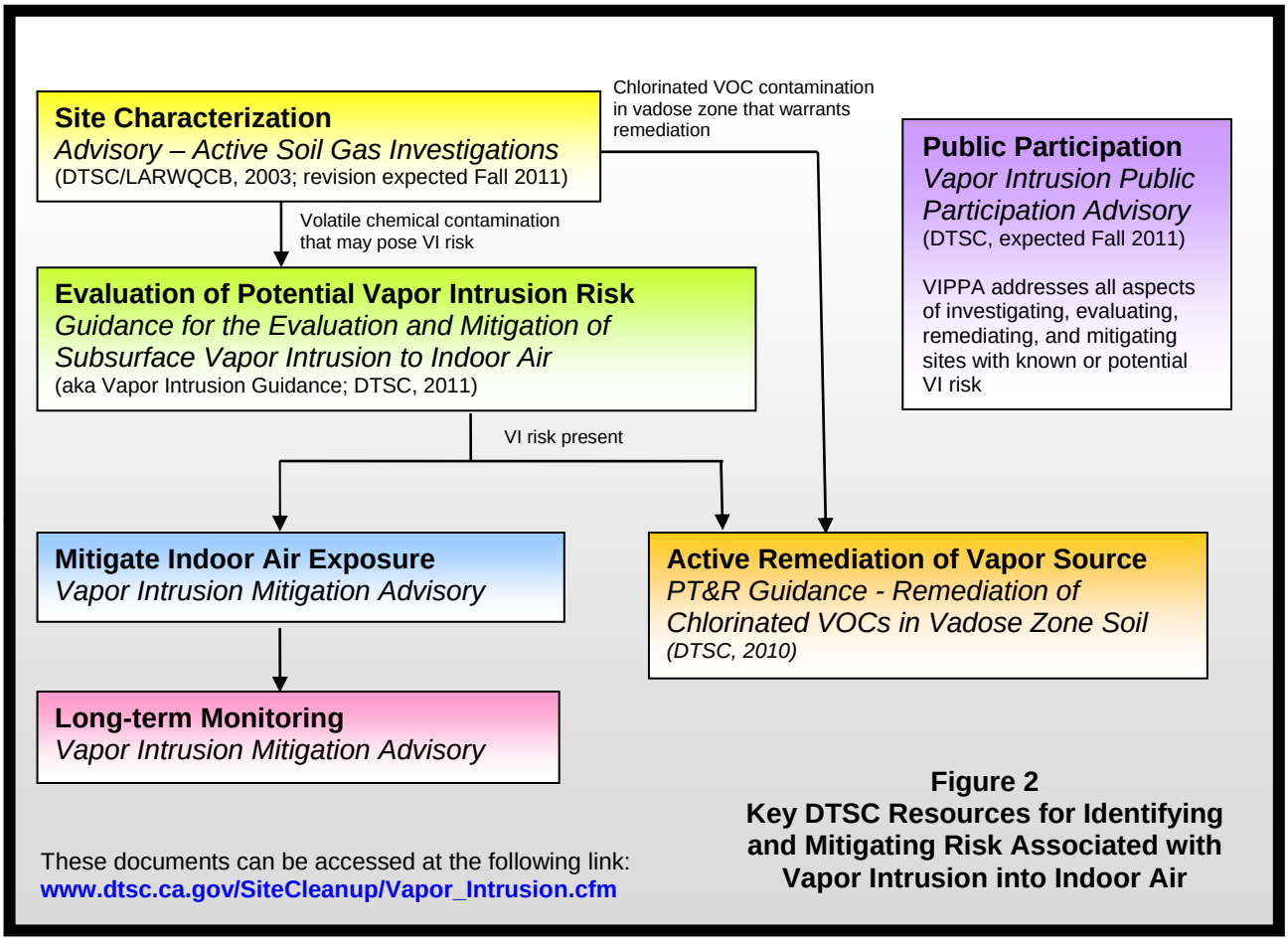


Figure 2
Key DTSC Resources for Identifying and Mitigating Risk Associated with Vapor Intrusion into Indoor Air

1.4 DTSC REGULATORY AUTHORITY

The California legislature passed Assembly Bill 422 (AB 422) in October 2007, amending Section 25356.1.5 of the California Health and Safety Code, and adding Section 13304.2 to the Water Code. AB 422 requires that the exposure assessment of any health or ecological risk assessment prepared in conjunction with a response action taken or approved pursuant to the California Superfund Act include the development of reasonable maximum estimates of exposure to volatile chemicals that may enter structures that are on the site, or that are proposed to be constructed on the site, and may cause exposure due to accumulation of volatile chemicals in the indoor air of these structures.

1.5 PREEMPTIVE APPLICATIONS OF VAPOR INTRUSION MITIGATION APPROACHES

The responsible party may propose VI mitigation as a preemptive solution for a perceived rather than actual threat, even in cases where DTSC is not requiring mitigation. The following scenarios provide examples in which preemptive solutions might be applied:

- A site where no building yet exists and fate and transport modeling indicates an acceptable risk (determined to be at or less than a 1×10^{-6} risk level or a hazard index (HI) of 1) to future building occupants. However, as a prudent measure, a developer is interested in installing VI mitigation measures despite the apparent low risk.
- An existing building overlies, or is in close proximity to, subsurface contamination, but the calculated risk level is less than or equal to 1×10^{-6} or a HI less than or equal to 1, and DTSC does not require mitigation.
- A site that is currently not impacted by a groundwater plume, but that may be impacted in the future.

In these instances, the project proponent may choose to follow the DTSC remedial process discussed in Chapter 5, even though the project does not involve DTSC review. Additionally, much of the information provided in the Advisory is general in nature, and may be helpful in the design and implementation of preemptive VI mitigation measures. However, for such preemptive applications, DTSC will neither approve nor enforce the mitigation, and will not be involved in the O&M for the mitigation system.

1.6 OVERVIEW AND ORGANIZATION

The VIMA provides a framework for selecting an appropriate mitigation approach at sites with a VI risk. This document includes questions as well as recommendations that should lead to logical and informed decisions resulting in the protection of human health.

Chapter 2 is a discussion of managing risk to current and future building occupants from VI.

Chapter 3 provides a brief introduction to public participation considerations for VI-impacted sites and directs the reader to DTSC's *Vapor Intrusion Public Participation Advisory*.

Chapter 4 discusses VI mitigation methods with a focus on SSV and SSD systems.

Chapter 5 describes the process for evaluating and selecting an appropriate mitigation system.

Chapter 6 describes design considerations for VI mitigation approaches.

Chapter 7 is a discussion of various aspects to consider during implementation, such as institutional controls, O&M, inspections, five-year reviews, financial assurance, and termination of building controls.

Chapter 8 includes a list of technical resources available for additional study and the references cited in the VIMA.

2.0 RISK-BASED DECISION MAKING FOR VAPOR INTRUSION SITES

If volatile chemical contamination is suspected at the site, the early stages of project scoping should address the potential for VI. This chapter discusses the risk management considerations associated with evaluating and responding to potential VI.

2.1 EVALUATION OF VAPOR INTRUSION PATHWAY

If volatile chemicals are present in the subsurface at a site, the VI pathway should be evaluated using the step-wise approach described in the Vapor Intrusion Guidance. As illustrated in Figure 1, different steps apply to existing and proposed buildings. Refer to the Vapor Intrusion Guidance for a detailed discussion of Steps 1 through 10. The VIMA provides detailed discussion of Step 11.

2.2 RESPONSE ACTIONS AT VAPOR INTRUSION SITES

Table 1 summarizes the basic decision logic used: 1) to evaluate subsurface contaminant data (e.g., soil gas and/or shallow groundwater) and/or indoor air sampling data at potential VI sites; and 2) to identify an appropriate response action. The need for a specific response should be made on a case-by-case basis using multiple lines of evidence, as established in the Vapor Intrusion Guidance.

Table 1. Risk Management Matrix for Vapor Intrusion

VAPOR INTRUSION RISK / HAZARD[1]	RISK MANAGEMENT DECISION	ACTIVITIES
Risk < $1x10^{-6}$ Hazard Index $\leq$ 1.0	No Further Action	• None
$1x10^{-6}$ < Risk < $1x10^{-4}$ Hazard Index > 1.0	Evaluate Need for Action	Possible Actions: • Additional Data Collection • Monitoring • Additional Risk Characterization • Mitigation[2] • Source Remediation[2]
Risk > $1x10^{-4}$	Response Action Needed	• Vapor Intrusion Mitigation[3] • Source Remediation[3]

[1] Estimated based on multiple lines of evidence, as established in the Vapor Intrusion Guidance.

[2] Mitigation is intended to reduce the entry of volatile chemicals from a subsurface source into building air and, as feasible, should be conducted in conjunction with source remediation. DTSC does not consider a VI mitigation system as a means of remediating the source of the subsurface contamination. However, mitigation may be used as a long-term measure for lower risk sites.

[3] Both VI mitigation and source remediation should be implemented for sites in this risk range. However, site-specific conditions (such as where the source of contamination is located off-site) may necessitate use of mitigation as the long-term measure.

No Further Action (Risk < $1x10^{-6}$; HI $\leq$ 1). The point of departure for risk management decisions for cancer risk is 1×10^{-6} and for noncancer health hazards is a HI of 1. If the estimated cancer risk and hazard are less than these points of departure, as indicated by multiple lines of evidence, no further action is necessary. See Section 1.5 for discussion of sites that choose to apply VI mitigation as a preemptive measure.

Risk Management Decision ($1x10^{-6}$ < Risk < $1x10^{-4}$; HI > 1). Sites with a risk or hazard from volatile chemicals in excess of the point of departure require a response action and long-term environmental care. Potential actions taken based on a risk management decision could include:

- continued soil vapor monitoring,
- continued indoor air quality monitoring,
- mitigation, and
- volatile chemical source remediation.

DTSC makes risk management decisions on a site-by-site basis with consideration of appropriate input from the project proponent. The decision takes into account both site-specific and chemical-specific data. Multiple lines of evidence, such as collection of additional site-specific data, are used to decrease the uncertainty in evaluating VI at a site. Experience has shown that much of this uncertainty may arise from spatial and temporal variability in the data set and that this uncertainty can be reduced by additional data collection. Chemical-specific information to be evaluated would include 1) toxicity endpoints and target-organs affected for noncarcinogenic chemicals; 2) whether a chemical is a known human carcinogen or a suspected carcinogen; and 3) the uncertainties associated with the derivation of the toxicity criteria. The above considerations will allow for a better-informed risk management decision process.

Mitigation and Source Remediation (Risk > $1x10^{-4}$). Mitigation and source remediation will be needed if the potential long-term risk to human health, as contributed by VI, is estimated to be above 1×10^{-4}. The timing of this response action will depend on whether there is an existing building or if future development will proceed before remedial goals are met. Chapters 4, 5, 6 and 7 discuss various aspects of mitigation actions to address the VI pathway. For any mitigation action conducted as part of the cleanup process, the responsible party should submit an appropriate response action decision document to DTSC for review and approval (see Chapter 5). The decision to implement a mitigation action should be based on sufficient site characterization data to evaluate potential human health risks from VI.

Vapor intrusion mitigation is intended to minimize entry of volatile chemicals from the subsurface into the indoor air of overlying buildings. Vapor intrusion mitigation is not intended to be a sole remedial alternative for a volatile chemical contaminated site. For most sites in this risk range, remediation will be required to address the subsurface source of vapor contamination. However, based on site-specific considerations, mitigation may become the long-term measure, especially where removal of volatile

chemicals may not be technically feasible (such as where the volatile chemical source is located off-site).

2.3 RISK MANAGEMENT CONSIDERATIONS FOR EXISTING BUILDINGS

2.3.1 Off-Site Sources of Volatile Chemical Contamination

Soil gas plumes may be the result of off-site sources of volatile chemical contamination in soil gas or shallow groundwater. The off-site source may be part of a larger, regional contamination. The off-site source of contamination may or may not currently be under the oversight of a regulatory agency for investigation and management. If the soil gas plume originates from off-site sources, incorporating VI mitigation into the existing building may be the only viable option, especially if the off-site source is regional in nature and remediation of off-site sources is impractical or not achievable in the near future.

Migration of the off-site plume onto the site may also be a concern. While the off-site plume may not currently have adversely affected the site, the plume may pose a future VI risk. In this case, incorporating VI mitigation into existing or future buildings may be prudent. Additionally, the plume should be evaluated using appropriate plume modeling techniques and/or groundwater monitoring.

2.3.2 Ambient/Background Air Sources of Volatile Organic Compounds

For urban areas, many VOCs are ubiquitous in ambient, outdoor air. Common VOCs in ambient air include benzene, trichloroethene (TCE), and tetrachloroethene (PCE). While measured indoor air concentrations may pose a potential long-term health risk, these concentrations may also be identical to ambient levels. Therefore, source removal or VI mitigation may not reduce the indoor air concentrations of such ubiquitous volatile chemicals.

Consistent with the Vapor Intrusion Guidance, ambient/background air samples should be collected to determine if ubiquitous volatile chemicals are contributing to the measured indoor air concentrations. A sufficient number of outdoor air samples should be collected to provide a meaningful comparison between indoor air and outdoor air concentrations. This comparison should also be considered in terms of the cumulative indoor air risk associated with the target volatile chemicals. Specific risk considerations would include the exposure scenario being evaluated (e.g., residential, industrial/commercial, school-based) and the risk associated with target volatile chemicals measured in outdoor air for the appropriate exposure scenario.

In addition to collecting background air samples, evaluating the ratio between concentrations of volatile chemicals in the subsurface and concentrations of volatile chemicals in indoor air may help in distinguishing contributions from background air versus VI from the subsurface. Air quality data collected from monitoring stations within a local air management district provides secondary evidence for distinguishing VI from other sources.

Because of the high cost associated with conducting indoor air studies, sufficient numbers of samples may not be available to conduct rigorous statistical evaluations. Given such data limitations, the comparison may often be qualitative in nature and will require a risk management decision regarding the need for further action or mitigation.

2.3.3 New Building Indoor Air Sources of Volatile Chemicals

Volatile chemical concentrations measured in indoor air could originate from off-gassing of building materials rather than from VI. For example, DTSC conducted an indoor air quality investigation at a newly constructed school building overlying a TCE plume. Elevated levels of vinyl chloride (a potential degradation product of TCE) were detected in most of the classrooms and ultimately were determined to be from unidentified indoor sources.

2.3.4 Residential Sources of Volatile Organic Compounds

In addition to ambient air and building materials, other sources of VOCs indoors include consumer products (such as household cleaning materials and dry cleaned clothing). To help put these background sources of VOCs into perspective, EPA recently published a technical report evaluating measured concentrations of VOCs in the indoor air of thousands of residences in the U.S. from sources other than VI (USEPA, 2011).

2.4 RISK MANAGEMENT CONSIDERATIONS FOR FUTURE BUILDINGS

2.4.1 Re-evaluate Indoor Air Risk Using Site-Specific Soil Parameters

Additional data collection may be required 1) to better define the lateral and vertical extent of volatile chemical contamination and 2) to refine the predicted indoor air risk based on site-specific soil parameters. Site-specific soil parameters are particularly important because they can reduce the predicted indoor air risk compared to the risk estimated using screening-level default parameters. Refer to the Vapor Intrusion Guidance for further details.

2.4.2 Adjust Development Plans to Avoid Vapor Intrusion Issue

If sufficient data exists, soil gas isoconcentration contours and geologic cross-sectional diagrams may be constructed for the planned building location. If the soil gas plume is well characterized spatially, the development plans may be adjusted so that buildings are not constructed immediately over the plume, and instead are constructed a sufficient distance away from the plume, thus eliminating the VI pathway. In some cases, risk isopleths constructed from concentration data may better illustrate areas where inhalation health risks should preclude building construction or sensitive land uses.

Building designs may also be adjusted, to include intrinsically safe designs (such as podium construction) in which the ground level of a building is maintained as a well-ventilated space not intended for human occupation.

2.4.3 Evaluate Whether Monitoring Alone Would Be Sufficient

If the volatile chemical plume does not impact or only impacts a fraction of the proposed building foundation, the estimated indoor air risks may not be significant and only continued soil gas monitoring may be required. This circumstance is best evaluated by considering the site plans and layout of proposed structures together with the plume maps (for example, volatile chemical isoconcentration contours, geologic cross-sectional diagrams). Additionally, a passive VI mitigation system that can be converted to an active system may be an appropriate cautionary approach in these cases where indoor air risks are minimal.

2.4.4 Off-Site Sources of Volatile Chemical Contamination

The same off-site plume issues pertaining to existing buildings (Section 2.3.1) also apply to future buildings. If the soil gas plume is coming from off-site sources, incorporating VI mitigation as part of the building design is prudent, especially if the off-site source is regional in nature and source remediation is impractical or not achievable in the near future.

3.0 PUBLIC PARTICIPATION

Public concerns associated with VI will typically be greater than those associated with other media contamination because 1) simple avoidance techniques (such as elimination of exposure pathways) are not an option for impacts to the air people breathe and 2) involuntary exposure in one's home, workplace, or school is potentially unsettling. Hence, more extensive outreach is generally necessary for VI-impacted sites than may be needed for sites affected by other exposure pathways. Face-to-face meetings with those stakeholders who live, work, or otherwise occupy the buildings with known or potential VI issues are often necessary. On-going regular communication with affected community members and building occupants is important during all phases of a VI project, including during the selection, design, installation and O&M of a VI mitigation system.

As with any contaminated site, DTSC's *Public Participation Policy and Procedures Manual* (DTSC, 2001; revision pending) should be followed. Additionally, DTSC's *Vapor Intrusion Public Participation Advisory* provides guidance specific to VI-impacted sites.

4.0 VAPOR INTRUSION MITIGATION METHODS

DTSC recommends that VI mitigation be implemented as an interim response action until volatile chemical concentrations in soil, soil gas, or groundwater are confirmed to be at acceptable levels. The goal of a VI mitigation system is to interrupt the pathway between the source of the vapors and building occupants until remedial goals in the

subsurface are met. As discussed in Section 1.2, remediation of the subsurface is the primary means by which remedial goals are achieved at a site, rather than the VI mitigation system. Nonetheless, there are instances where source removal is impracticable and the use of engineering controls would be the most feasible response action. For most sites, remediation and mitigation are complementary components of a volatile chemical response action, addressing cleanup of subsurface contamination and impacts to the human receptor, respectively. Where source removal is impracticable, the use of engineering controls may be the most feasible long-term response action (see Chapter 2). The response action decision document should clearly describe the integration of the remediation and mitigation components (see Chapter 5).

4.1 CONCEPTUAL MODEL OF VAPOR INTRUSION

The air pressure within a building is typically somewhat less than the atmospheric pressure surrounding the building. This difference in pressure is caused by thermal differences between indoor air and surrounding soils, wind and barometric changes, and stack effects of chimneys and flues. Thus, the negative pressure differential present in most buildings may cause vapor-phase contaminants to migrate from the subsurface into the structure, and it is this pathway that needs to be interrupted. Volatile chemicals can enter a building through entry points such as cracks or perforations in slabs or basement floors and walls, openings around sump pumps, elevator shafts, or where pipes and electrical wires go through the foundation.

4.2 OVERVIEW OF MITIGATION TECHNOLOGIES

Well-established techniques, developed for mitigating exposures to radon and methane, are the basis for most VI mitigation technologies. These techniques and associated guidance are appropriate for volatile chemicals because the vapors may enter a building in the same manner as radon and methane. Table 2 identifies various mitigation technologies for addressing VI into buildings as well as the specific applications, advantages, and disadvantages of each technology. Figure 3 illustrates the technologies that are suitable for existing and future buildings and appropriate for the building usage.

Because SSD and SSV systems are the most commonly used mitigation techniques (USEPA, 2008b), the VIMA emphasizes these systems over other technologies. The purpose of this emphasis is to relieve the project proponent of providing an in-depth analysis of all types of mitigation systems, and to easily select either a SSD or SSV system when mitigation is needed. However, the VIMA does not preclude other approaches (such as those described in Section 4.4) from being proposed. Depending on site-specific characteristics, one of the alternate mitigation strategies may be a better fit at an individual site, rather than a SSD or SSV system. Moreover, additional, new technologies may be developed in the future that are consistent with sustainable and modern building design and may prove to have results equal to or better than those garnered by SSD or SSV systems.

4.3 SUB-SLAB VENTING AND SUB-SLAB DEPRESSURIZATION SYSTEMS

The USEPA recommends that the model building standards and techniques for radon control in new residential buildings constructed on basement and slab-on-grade foundations include: installing a layer of permeable sub-slab material; sealing the joints, cracks, and other penetrations of slabs and foundation walls; providing a soil-gas retarder (sub-slab liner) beneath floors; and installing either a SSV or SSD system. As described further below, the distinction between the two systems is that a SSD system is designed to mitigate VI by achieving measurable, continuous sub-slab pressure reduction and a SSV system is designed to reduce or dilute sub-slab volatile chemical concentrations.

Sub-slab liners are used with both SSV and SSD systems. The sub-slab liner is an integral component of a SSV system (as described further in Section 4.3.1). DTSC considers a sub-slab liner to be a safety factor for a SSD system for instances in which the system is shutdown for repair (see Section 4.3.2). Additional discussion of sub-slab liners is provided in Section 4.4.

4.3.1 Sub-Slab Venting Systems

A SSV system is designed to function by venting sub-slab soil gases or providing a pathway to allow soil gas to migrate to the exterior of the building rather than entering a building. SSV systems function by drawing in outside air to the sub-slab area, which dilutes and reduces volatile chemical concentrations. SSV systems typically consist of a layer of venting material (sand or pea gravel) emplaced below a floor slab to allow soil gas to move laterally under natural diffusion or pressure gradients to a collection piping system for discharge to the atmosphere. SSV systems include a sub-slab liner that is installed on top of the venting layer. To the extent that the liner is intact, the sub-slab liner aids venting of sub-slab soil gas via collection pipes rather than upward into the building.

In a SSV system, vapors are directed to the edge of the foundation by perforated collection pipes that are installed in the venting layer, beneath the slab, or at the periphery of the foundation. Usually, the collection pipes are connected to a main header point that runs up through or along the inner or outer building wall and exhausts above the roofline. Installation of a vertical inlet pipe system within or next to the building allows fresh air to enter into the gravel blanket or sub-slab zone, which results in diluted or reduced volatile chemical concentrations.

Because of the extensive foundation work involved in the installation, SSV systems are generally easier to install in new construction rather than existing buildings. SSV systems may not be appropriate in areas with a high groundwater table or surface drainage problems because the venting system will not function properly if continuously saturated with water.

A SSV system may result in the air pressure below the slab being reduced somewhat compared with that of the building interior, particularly near the vent pipe intake in the venting layer and during atmospheric conditions favorable for SSV. However, there is typically no design objective or requirement in a SSV system to maintain a lower pressure of any given magnitude below the floor. Thus, if there are gaps or holes in the liner and floor, it is possible that soil gases could flow into the building whenever pressure conditions favor that flow direction. However, an effective SSV system could remain protective under these circumstances and, in general, by diluting and reducing the volatile chemical concentrations in sub-slab soil gas to a level where minor or intermittent VI does not cause volatile chemical concentrations in indoor air to exceed the indoor air quality goal.

SSV systems are monitored by measuring volatile chemical concentrations in sub-slab soil gas, or by measuring concentrations of indoor air. Thus, a sampling port within the vertical collection pipe or in the horizontal vent pipes below the floor should be included as part of the SSV design. The sampling point should be fitted with a non-restricting, screened rain guard to prevent precipitation and debris from entering the piping system. Measuring volatile chemical concentrations in sub-slab soil gas will verify that the SSV system is providing adequate dilution or removal of sub-slab volatile chemicals such that VI is not occurring at a significant level. To demonstrate SSV effectiveness using sub-slab soil gas testing, a reasonable goal may be to reduce volatile chemical concentrations in sub-slab soil gas to less than 20 times the acceptable indoor air level, based on an attenuation coefficient of 0.05 (DTSC, 2011) between sub-slab soil gas and indoor air in the un-mitigated building.

A different attenuation factor, higher or lower, may be used providing it is justified by supporting data, such as the use of tracer gases or marker chemicals such as radon.

SSV systems may result in less depressurization and lower air flow rates than SSD systems. In most buildings, SSV systems are unlikely to perform as well as SSD systems, and therefore may not be an appropriate technology in areas with high concentrations of contaminant vapors. However, in areas with lower concentrations of contaminant vapors, a SSV system will provide adequate protection and will often be the preferred technology.

SSV systems may be either passive or active (installed fan). Passive SSV systems rely on natural thermal and wind effects to withdraw soil gases from the sub-slab venting layer to dilute and reduce volatile chemical concentrations to a protective level. Active SSV systems use a fan to achieve the same purpose by: 1) withdrawing and venting soil gases; 2) actively blowing ambient air into the venting layer beneath a building (referred to as sub-slab pressurization); or 3) other engineering variations such as including wind-driven fans on riser pipes. SSV systems are commonly used in new construction sites as a preemptive measure against VI (see Section 1.5). All passive SSV systems should be built so that upgrade to an active SSV system is possible at a later date with minimum effort. Prior to construction, criteria should be developed that clearly establish when SSV systems need to be upgraded. These criteria typically are

based on volatile chemical concentrations measured in sub-slab soil gas or indoor air at concentrations above project goals.

4.3.2 Sub-Slab Depressurization Systems

SSD systems are applicable for slab-on-grade building construction. For buildings with crawl spaces, a sub-membrane depressurization (SMD) system is more appropriate than a SSD system, as described below in Section 4.4. A SSD system is designed to function by continuously creating a lower pressure directly underneath a building floor relative to the pressure within a building. The resulting sub-slab negative pressure inhibits soil gases from flowing into the building, thus reducing volatile chemical entry into the building. Volatile chemicals caught in this negative pressure field are collected and piped to an ambient air discharge point. The depressurization under the slab is typically accomplished with a motorized blower. The blower draws air from the soil beneath a building and discharges it to the atmosphere though a series of collection and discharge pipes. *Model Standards and Techniques for Control of Radon in New Residential Buildings* (USEPA, 1994a) defines SSD technology as “a system designed to achieve lower sub-slab air pressure relative to indoor air pressure by use of a fan-powered vent drawing air from beneath the slab.”

In most cases, a sub-slab liner is an appropriate, redundant feature for the conventional SSD system. To the extent that the liner is intact, it would provide some protection in the event that the blower fails. Additionally, the liner may increase the efficiency of the system so that a smaller fan is required. Some SSD systems may not require a liner (such as aerated floor systems). In this case, the project proponent should discuss the proposed design with DTSC, and a site-specific determination made on a case-by-case basis.

The sustained effectiveness of SSD systems can be adequately evaluated by monitoring the blower operation and the reduced pressure beneath the floor, as described in more detail in Chapter 7. Thus, regardless of the mechanism for creating the reduced pressure, a SSD system can be effectively monitored through routine pressure monitoring once an adequate demonstration of the mitigation system effectiveness has been established. The pressure monitoring requirements for a SSD system are generally easier to implement routinely compared to monitoring volatile chemical concentrations in a SSV system.

A SSD system has some of the attributes of a SSV system, in that it may also reduce volatile chemical concentrations in sub-slab soil gas through venting. However, the magnitude of volatile chemical concentration reductions in sub-slab soil gas are less critical than for SSV systems, because the SSD system is designed to mitigate VI by maintaining a lower pressure below the building floor.

In existing structures, active SSD systems entail drilling or cutting one or more holes in the existing slab, removing a quantity of soil from beneath the slab to create an open hole or suction pit, and placing vertical suction pipes into the holes. The suction pipes

are manifolded together and routed to the fan and discharged so that the soil gas can be drawn from just beneath the slab. An operating SSD system will induce indoor air to flow down into the subsurface through entry points such as cracks and openings. Soil gases from beneath the slab are collected and vented to the atmosphere at a height well above the outdoor breathing zone and away from windows and air supply intakes. More details about active SSD systems can be found in various USEPA guidance documents on radon, and in ASTM International (ASTM) guidance documents (ASTM, 2007ab).

4.4 ADDITIONS AND ALTERNATIVES TO SUB-SLAB VENTING AND SUB-SLAB DEPRESSURIZATION SYSTEMS

Other remedies in addition to, or as alternatives to, SSD and SSV systems are available to address site-specific conditions. A project proponent may propose an alternative technology for evaluation by DTSC. The selected alternative technology should achieve a balance between indoor air quality issues and compliance with energy efficiency regulations (Cal. Code Regs., tit. 24, part 6). The project proponent may also propose technologies not specifically described in VIMA for DTSC's consideration. VIMA encourages innovation and the implementation of new, more effective and more sustainable approaches to VI mitigation, as they become available.

Sealing Cracks and Openings. Cracks and openings in the building foundation are the primary routes of vapor entry, rather than diffusion through the concrete slab itself. An exception would be very thin slabs or sites where soil gas concentrations are very high. Thus, an important first step in preventing VI is to seal cracks in the floors and walls of a building, as well as gaps around utilities, floor drains, dry utilities, sumps, elevator shafts, and other piping systems. Sealing cracks and openings should not be considered as a standalone action, but should be completed as a preliminary step in conjunction with other mitigation strategies.

Sub-slab Liners (Passive Membranes or Vapor Barriers). Sub-slab liners are materials or structures installed below a building to block the entry of vapors. These liners have traditionally been used to prevent moisture from accumulating behind drywall walls, thus giving rise to the name "vapor barrier." Sub-slab liners ideally cause soil gas that would otherwise enter the building to migrate laterally beyond the building footprint. However, in practice, sub-slab liners are not able to completely eliminate VI due to the likelihood of punctures, perforations, tears, and incomplete seals. Thus, sub-slab liners by themselves are not an acceptable VI mitigation system to DTSC for indoor air risks greater than or equal to 1×10^{-6} and a HI greater than or equal to 1 (see Chapter 2 for further discussion of the risk management framework). Liners should be used in combination with a SSV, SSD, or SMD system.

Submembrane Depressurization (SMD). For a SMD system, a membrane (liner) is used as a surrogate for a slab to allow depressurization. A membrane covers the exposed dirt surface of a crawl space while the depressurization system withdraws soil gas from beneath the membrane and prevents its intrusion into the overlying space.

The edges of the foundation wall must be well sealed, and the membrane must be loose enough to prevent tearing under stress. Periodic inspection is required because membranes can be easily damaged or lose their seals at the edges. SMD is effective for retrofitting buildings with crawl spaces.

Building Pressurization. Building pressurization involves adjusting the building heating, venting, and air conditioning (HVAC) systems or installing a new system to maintain a positive pressure indoors relative to the sub-slab area. This approach is more commonly used for commercial buildings and can be cost effective if the existing HVAC system already maintains a positive pressure. Having to increase the pressure will result in larger energy costs, particularly if significant heating and cooling is required. Positive pressurization of buildings is practicable only when the building is relatively tight, with few doors or other openings. Therefore, warehouses with large bay doors are not candidates for positive pressurization. DTSC will consider HVAC alteration as a response action for commercial/industrial buildings on a case-by-case basis, particularly if the HVAC system for an existing building was not operating pursuant to current building codes and energy efficient codes and/or requirements (Cal. Code Regs., tit. 24, part 6). DTSC does not consider building pressurization to be an appropriate mitigation technology for residential structures.

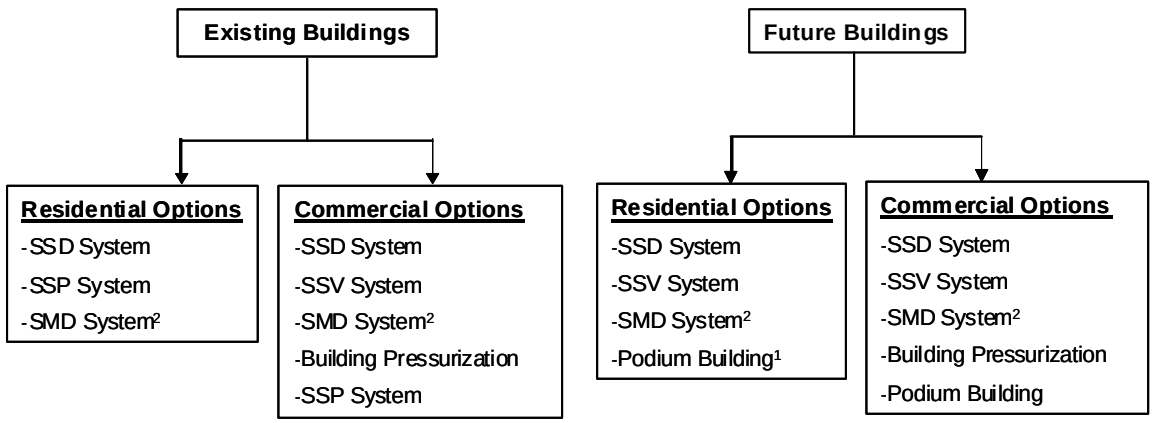
Indoor Air Treatment. This method directs air within the structure to air pollution control equipment to remove toxic air contaminants from the building interior rather than preventing entry into a building. DTSC is critical of this method for several reasons. Indoor treatment is not a proven, developed technology available for widespread application to buildings. Other drawbacks to this method are that it encourages collection of contaminant vapors within the structure and is dependent on uninterrupted performance of the treatment system to protect building occupants. DTSC will consider this technology in some cases, but only if project goals cannot be achieved by engineering controls described elsewhere in this Advisory.

Variations on SSD Systems. The systems described below are all variations of SSD systems. DTSC will consider site-specific variations to the design in order to provide for the most effective system for the site.

- Aerated floor systems are typically constructed using plastic forms over which concrete is poured.
- Block-wall suction systems involve removing vapors that accumulate in basement walls constructed of hollow blocks.
- Drain-tile suction systems apply suction to existing water drainage systems that circle a building in order to remove vapors. This requires a separate dewatering system below the venting system to allow vapors or gases to escape and not be trapped and possibly pressurized due to water in the pipes or vents.
- Sub-slab pressurization (SSP) systems are a specific type of SSV system, except that fans are used to push air into the venting layer below the slab, instead of pulling the air out. This technology may be particularly effective in higher permeability soils. However, active injection of air under a building (to

enhance venting) is not recommended without having an engineering design. SSP systems may force vapors into a building by creating elevated subsurface pressures or force vapors into unprotected neighboring structures. Care should be taken to seal cracks and openings when utilizing a sub-slab pressurization system. Permitting requirements may apply to these systems in some jurisdictions.

Podium-Style Buildings. The risk from VI may be greatly reduced by a building design that utilizes an open air first floor, stilts, or an appropriately ventilated first floor space. An example of such a building design is a well ventilated ground level parking structure. However, all potential vapor conduits to upper floors of the building (particularly utility lines, elevator shafts, and ventilation systems) must be engineered and sealed in a manner that reduces the risk of VI. Such provisions may include construction of the elevator on an exterior wall of the building (rather than having an interior, central entrance), sealing the base of the elevator, possible venting, and increased ventilation of the elevator. If used as an enclosed parking area, additional consideration is needed to achieve ventilation flow rates required to ensure acceptable levels of carbon monoxide and volatile chemical concentration levels. In general, DTSC considers podium-style buildings inappropriate for use with single-family dwellings because of concern that individual home owners may alter or convert their garages to livable space.



Notes:
[1] In general, appropriate for multi-family dwellings only
[2] For buildings with crawl space
SMD is submembrane depressurization
SSD is sub-slab depressurization
SSP is sub-slab pressurization
SSV is sub-slab venting

Figure 3
Vapor Intrusion Mitigation Technologies

Table 2. Overview of Selected Vapor Intrusion Mitigation Technologies
(Modified from ITRC (2007))

TECHNOLOGY	APPLICATION	ADVANTAGES	DISADVANTAGES
Sub-slab Depressurization (SSD)	• New and existing (without liner) slab-on-grade structures • Sumps, drain tiles, and block wall foundations may also be depressurized if present	• Successful track record of performance • Adaptable technology, applicable to a wide variety of site conditions and geology • Simple gauges show whether the system is working • Works well for conditioned crawl spaces with concrete slabs	• Requires periodic maintenance • Building-specific conditions may limit options for suction pit, riser pipe, and blower locations • Long-term energy and maintenance costs • May not be feasible for large, commercial buildings • More expensive to retrofit existing structures (hence it works best for new construction)
Sub-Slab Venting (SSV)	• New slab-on-grade construction • Low soil gas flux sites • Should be convertible to active system if necessary	• Successful track record of performance • Passive systems avoid the long-term O&M costs of systems requiring electricity to operate a fan or blower	• Not as effective as SSD – should only be used when risk is moderately elevated • Ambient temperatures and winds can adversely impact success • Not suitable for existing structures unless very modest concentration reductions are required • Upgrade of passive SSV systems to active SSV systems likely to be necessary for new structures when large reductions in concentrations are required
Submembrane Depressurization (SMD)	• New and existing buildings with crawl spaces	• Similar to SSD • Ideal for enclosed crawl spaces without concrete slabs • Appropriate to retrofit existing buildings with crawl spaces	• Similar to SSD • Liners can be easily damaged and must be well-sealed at edges to prevent leaks • System needs to be periodically inspected to confirm leaks are not present

Table 2 (Continued)

TECHNOLOGY	APPLICATION	ADVANTAGES	DISADVANTAGES
Sub-Slab Pressurization (SSP)	• New and existing slab on grade structures	• May be more efficient in high permeability soils	• More energy intensive than routine SSV and SSD systems • May not be appropriate for low permeability soils
Building Pressurization	• Large commercial structures, new and existing	• Can be applied equally well to both new and existing structures	• Generally more costly than other techniques • Regular maintenance and air balancing needed to maintain consistent, positive pressure • Will require extensive reporting requirements to ensure appropriate building pressure is maintained • Increased energy costs
Indoor Air Treatment	• Specialized cases only	• Results in physical removal and disposal of the air contaminant, not simple redirection	• Not appropriate for widespread application • Less effective than other control methods (when applicable) • Maintenance-intensive and costly to install and operate • System leaks, should they occur, may result in higher exposures than without control • Building owners and occupants may have heightened concern of indoor air contamination • Temporary or permanent relocation may become necessary
Podium-style Building	• New construction, industrial & commercial, multifamily residences	• Low capital costs	• Needs to be monitored and enforced
Aerated Floor Systems	• New construction	• Low capital cost • Can be tested and monitored • Open void space works as a venting feature	• Newer technology unproven within the USA
Land Use Covenants	• New and existing construction	• Low capital cost	• Needs to be monitored and enforced

5.0 EVALUATION OF VAPOR INTRUSION MITIGATION APPROACHES

This chapter describes the process for evaluating the feasibility of VI mitigation approaches and determining which approach (or combination of approaches) is best suited for a particular site. Because VI mitigation is part of a volatile chemical response action, its selection is based on a screening and detailed analysis of alternatives. Whenever possible, the evaluation of VI mitigation approaches should be integrated with the evaluation of remedies to address the subsurface vapor sources.

5.1 SCREENING VAPOR INTRUSION MITIGATION ALTERNATIVES

Development and screening of mitigation alternatives should begin during the investigation phase, or soon thereafter, when response actions have been determined to be necessary. Chapter 4 presents the technologies that are currently available for VI mitigation. The project proponent is encouraged to consider other new, more effective and more sustainable approaches to VI mitigation as they become available. The scope of the screening evaluation for VI mitigation alternatives should reflect site-specific circumstances. Some alternatives may not be screened because they are not appropriate for site conditions or are not feasible because of the planned or potential land use (see considerations for each technology described in Chapter 4). For example, only buildings with crawl space would screen an SMD system.

5.2 DETAILED ANALYSIS OF MITIGATION ALTERNATIVES

The detailed evaluation of VI mitigation approaches involves a comparison of each approach or combination of approaches to a set of evaluation criteria. The criteria[2] for evaluating VI mitigation approaches include:

<u>Threshold Criteria</u>

1) Overall protection of human health and the environment,
2) Compliance with federal/state/local requirements,

<u>Balancing Criteria</u>

3) Long-term effectiveness and permanence,
4) Reduction of toxicity, mobility or volume through treatment,
5) Short-term effectiveness,
6) Implementability based on technical and administrative feasibility,
7) Cost,

<u>Modifying Criteria</u>

8) State and local agency acceptance, and
9) Community acceptance.

The detailed analysis results provide a basis for identifying a preferred mitigation approach and documenting the rationale behind the decision. General or classical engineering evaluation criteria for the detailed evaluation of alternatives have been established for hazardous substance release sites in guidance and regulations (see

[2] Only the effectiveness, implementability, and cost criteria apply to the DTSC Removal Action Workplan process.

Table 3). In addition, there are technology-based considerations which should be used to determine if approaches are feasible and can be carried through to an overall final response action decision that is protective and implementable. Additional data which may be needed to fully evaluate VI include environmental justice issues, ambient air quality, building HVAC operation, and local land use zoning.

Table 3. State and Federal Guidelines for Alternatives Evaluation

LAW	PROCESS	DESCRIPTION	SUGGESTED REFERENCE(S)
HSAA	Remedial Action Plan (RAP)	Process for developing, screening, and detailed evaluation of alternative remedial actions for sites. Response action selection document under HSC §25356.1.	DTSC, 1995
	Removal Action Workplan (RAW)	Prepared when a proposed, non-emergency removal action or a remedial action is projected to cost less than $2,000,000. Response action selection document under HSC §25356.1.	DTSC, 1993, 1998
CERCLA	Feasibility Study (FS)	Process for the development, screening, and detailed evaluation of alternative remedial actions for sites. A FS is not required for the RAW process; however, the RAW should evaluate effectiveness, implementability, and cost of various removal alternatives.	USEPA, 1988, 1999
	Engineering Evaluation/ Cost Analysis (EE/CA)	Analogous to, but more streamlined than, the FS. Identifies the objectives of the removal action and analyzes the effectiveness, implementability, and cost of various alternatives that may satisfy these objectives.	USEPA, 1993
RCRA or HWCL	Corrective Measures Study (CMS)	Mechanism used by the corrective action process to identify, develop, and evaluate potential remedial alternatives.	USEPA, 1991, 1994b, 1997
HSAA, HWCL, RCRA, CERCLA	Interim Measures (IM) or Interim Actions	Actions to control and/or eliminate releases of hazardous waste and/or hazardous constituents from a facility prior to the implementation of a final corrective measure or response action.	

Notes:
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
HSAA – Hazardous Substance Account Act
HWCL – Hazardous Waste Control Law
RCRA – Resource Conservation and Recovery Act

The project proponent should consider site-specific conditions (such as existing versus future building, building type, building use, receptor type, and volatile chemical concentrations) when selecting the most appropriate technology to mitigate the VI pathway. Table 4 provides a qualitative assessment of factors that should be considered in the selection process. As indicated by the table and described in Chapter 4, some technologies are not appropriate for mitigating a higher degree of risk or

hazard. For instance, use of institutional controls as the mitigation approach might only be considered for a low degree of risk or hazard. In addition, depending on the degree of risk or hazard posed by the VI pathway, some technologies are better suited to certain building uses. As an example, DTSC generally recommends use of podium-style buildings for multi-family residences rather than single-family residences. A given mitigation technology may have greater monitoring needs (because it is a less effective technology and/or because of the system design) which leads to higher long-term costs. For example, because SSV system performance is evaluated through chemical analyses (e.g., sub-slab vapor), the monitoring frequency and costs for this technology are relatively high when compared to technologies that have multiple performance metrics (such as SSD systems which are evaluated primarily through pressure measurements). The table also illustrates that some technologies have relatively higher capital costs but lower long-term costs than other technologies (and vice versa).

The following elements should be included with the detailed evaluation of the mitigation alternative.

- Establishment of site-specific performance objectives for the VI mitigation system;
- Recordation of land use covenants;
- Recognition of long-term responsibilities in maintaining financial assurance and compliance with the five-year review requirement;
- Identification of applicable federal/state/local requirements; and
- Evaluation of the mitigation alternatives and the no action alternative against the applicable criteria.

5.3 DOCUMENTATION OF DETAILED EVALUATION RESULTS

Once the evaluation is complete, the project proponent should present the detailed analysis of VI mitigation approaches in an appropriate report (e.g., Feasibility Study, Corrective Measures Study Report). If the report is approved by the appropriate agencies, selection of the mitigation approach should be presented in a decision document such as a Proposed Plan, Record of Decision, Removal Action Workplan, Remedial Action Plan or Statement of Basis. The decision document generally outlines the conceptual plan for remediating the vapor source and mitigating VI. Decision documents are typically released for public comment and, if needed, responses to community, stakeholder, property owner, and responsible party comments are prepared.

After the public comment period and regulatory agency approval of the decision document, the project proponent typically prepares a detailed design of the mitigation approach. The design outlines all specific elements of designing and implementing the mitigation approach. These specific elements include not only the mechanical, electrical and structural elements, but also O&M, monitoring and reporting, financial assurance, implementation schedule, five-year review schedule, and the identification of

who is responsible for conducting these activities. Chapters 6 and 7 provide further discussion of the design and implementation of the mitigation approach.

5.4 CALIFORNIA ENVIRONMENTAL QUALITY ACT

Cleanups for VI must meet all applicable local, state and federal requirements including the California Environmental Quality Act (CEQA). CEQA (Pub. Resources Code, sec. 21000 et seq.) requires public agencies carrying out or approving a project to conduct an environmental analysis to determine if project impacts could have a significant effect on the environment. Public agencies must eliminate or reduce the significant environmental impacts of their decisions whenever it is feasible to do so.

Proposed projects for which DTSC has discretionary decision-making authority are subject to CEQA if they potentially impact the environment. Examples of approval actions which require CEQA review and documentation include: remedial action plans, interim measures, removal action workplans, and corrective actions. As shown by these examples, certain steps described in the VIMA are subject to CEQA. For further information, DTSC's CEQA-related policies and procedures are available on the DTSC internet site.

Table 4. Qualitative Comparison of Selected Vapor Intrusion Mitigation Technologies

Mitigation Technology[1]	Typical Application	Degree of Risk or Hazard Being Mitigated[2]	Monitoring During First Year of VI mitigation Operation		Monitoring During Long-Term VI mitigation Operation		Relative Cost		
			Operational Parameters[3]	Chemical Analyses	Operational Parameters[3]	Chemical Analyses	Capital	O&M	Monitoring
Institutional Control	R, C/I	L	n/a	M	n/a	M	n/a	L	M
Membrane Only	P	VL	n/a	M	n/a	M	L	n/a	M
SSV System	C/I, R	L	n/a	M	n/a	L	L – M	L	L – M
	C/I, R	M				M			M
SSD System	C/I, R	L	M – H	L	M	L	M – H	L – M	L
	C/I, R	M, H		M					
SMD System	C/I, R	L	M – H	M	M	L	M – H	L – M	L
	C/I	M, H							
Building Pressurization	C/I	L	M	L – M	M	L	L	M – H	L
	C/I	M, H	M – H	M		L – M			L – M
Indoor Air Treatment[4]	C/I	L	n/a	L – M	n/a	L – M	L – H	L – H	L – M
	C/I	M, H		M – H		M			M
Podium Building	R[5], C/I	L, M, H	n/a	L	n/a	L	n/a	L	L

Notes:

1 See discussion of these technologies in Chapter 4.
2 Estimated based on multiple lines of evidence as established in the Vapor Intrusion Guidance.
3 e.g., pressure differential, flow rate
4 As discussed in Chapter 4, DTSC will consider for special cases, but only if project goals cannot be achieved by other engineering controls.
5 In general, DTSC recommends use of podium buildings for multi-family residences. See Chapter 4.

C/I commercial/industrial
H high
L low
M moderate
n/a not applicable
P preemptive applications (See Section 1.5)
R residential (single or multi-family dwelling)
SMD sub-membrane depressurization
SSD sub-slab depressurization
SSV sub-slab venting
VI mitigation VI mitigation
VL very low

6.0 VAPOR INTRUSION MITIGATION SYSTEM DESIGN

This chapter focuses on topics related to the general design of VI mitigation systems. It begins with a discussion of design considerations for VI mitigation systems and progresses to recommended design criteria for SSD and SSV systems followed by construction quality assurance/quality control (QA/QC) testing. The chapter closes with a section outlining the preferred content of design documents for a VI mitigation system.

6.1 DESIGN CONSIDERATIONS

This section identifies considerations which may impact, or should be included as part of, the VI mitigation system design. These considerations are appropriate for any proposed mitigation approach unless indicated as being specific to SSD and SSV systems. Appendix A identifies example design considerations for SSD and SSV systems. Appendix B provides additional information regarding other design considerations that DTSC or a local agency might require.

6.1.1 Overall Building Design

Whenever possible, the concerns and needs of current and future building occupants should be considered during the building design process. For existing buildings, building owners and occupants should be asked their opinion about where blowers and piping should be located, what level of blower noise is acceptable, how readable different system-operation gauges and meters are, and what quality of construction craftsmanship is satisfactory. Issues regarding piping routes, blower location or vibration, and noise concerns should also be discussed with building owners and occupants. For example, if the mitigation contractor is considering an attic location for a blower, owners and tenants should be questioned about the current and near-future use of that space. For existing buildings, when there are multiple mitigation options, the advantages and disadvantages associated with each option should be presented to the building owner and occupants, along with an explanation as to what alternative is preferred, and why.

New Buildings. VI mitigation components should be integrated into the overall building design process for new buildings. For example, varying the location of elevator shafts, basements, utility conduits, and even the footprint of the building itself might help reduce the risk of VI. Multiple subcontractors working independently during new building construction may not be aware of the requirements associated with installation of a VI mitigation system, and may unwittingly jeopardize the integrity of the system. The VI mitigation contractor is responsible for working with the prime contractor to ensure that subcontractors are aware of the VI mitigation system and that inadvertent damage to the system is avoided.

Existing Buildings. VI mitigation systems installed in residential buildings should be designed, installed, and operated in a manner that minimizes noise and vibration. This is a particular concern for regenerative blowers and/or units installed in an attic. Special insulation and/or mounting hardware may be necessary in such applications. Blower units should be located as far from sleeping areas as possible and should be readily

accessible for inspection. For building modifications, the responsible party should contact the local municipal building department to determine if any permits are required. Aesthetic impacts (e.g., building appearance) should be considered in the design process.

6.1.2 Monitoring Devices and Alarms for Sub-Slab Depressurization Systems

A SSD system should have some sort of alarm or monitoring device so that building occupants are informed immediately if the system fails. This can be accomplished by installing an in-line pressure gauge or manometer on the SSD system. The gauge or manometer should have clearly marked line(s) showing minimum acceptable vacuum levels. Where appropriate or feasible, in addition to a manometer or gauge, visible and audible alarms should be considered in order to indicate loss of system vacuum or power. In all cases, clear instructions (with the name and phone number of a person to be contacted in such an event) should be placed in a visible location, such as near the gauge or manometer.

6.1.3 Back Drafting and Short Circuiting

The operation of a SSD system may, in some cases, increase the depressurization level of a building to the extent that “back drafting” could occur. Back drafting in association with oil/gas furnaces, wood stoves, and fireplaces means that the appliance is sending smoke or air back into a room, rather than venting the air to the outside. Back drafting can theoretically occur if negative pressures within a building are stronger than the density differential which drives gases associated with combustion appliances up a chimney. In such cases, potentially deadly combustion gases, such as carbon monoxide, could be re-circulated into the building. The *Guide for Assessing Depressurization-Induced Backdrafting* and *Spillage from Vented Combustion Appliances* (ASTM, 1998) may be used as guidance for determining back drafting conditions. If a back drafting potential is identified, the SSD system should not be installed or operated until a qualified HVAC contractor corrects drafting problems. In addition to improvements in appliances and flues, make-up air can be ducted from the outside to provide for combustion and drafting. A carbon monoxide detector should be considered for any home where a SSD system is installed where back drafting is a possibility. Effective July 2, 2011, California law requires carbon monoxide detectors in most residential dwellings.

The presence of a sump in a basement or interior perimeter french drains may ”short circuit” the establishment of a sub-slab negative pressure field. In such cases, an air tight cover should be installed over the sump. If a sump pump is present, the cover should be equipped with appropriate fittings or grommets to ensure an air tight seal around piping and wiring, and the cover itself should be fitted with a gasket to ensure an air-tight seal to the slab while facilitating easy access to the pump (Orange County Fire Authority, Planning, and Development Services, 2008).

6.1.4 Integration of Mitigation and Subsurface Remediation Systems

Consideration should be given to the coordination between site remediation efforts and design of the VI mitigation system, including potential conflicting needs, infrastructure needs, and project schedules for the mitigation and remediation systems.

For existing buildings, any nearby active groundwater, soil gas, or soil remediation system has the potential for soil vapor concentrations to negatively impact indoor air, especially during the startup phase. Chemical oxidation, air sparging, bioremediation, hydrofracturing, bioventing, and other remedial technologies may initially mobilize or elevate concentrations of contaminants in the subsurface, or result in the generation of potentially volatile breakdown products previously not monitored in the building indoor air. These effects should be identified and controlled to prevent potential impacts to indoor air. The frequency of indoor air monitoring and soil gas monitoring may need to be increased during the startup phase of nearby active source remediation.

A perimeter soil gas monitoring system may be needed to evaluate the potential for volatile chemicals to migrate onto, or off of, the site in question and potentially impact additional structures. The soil gas monitoring system should be consistent with the site remediation/characterization goals and the Vapor Intrusion Guidance.

6.1.5 Incidental Removal Effects of Sub-Slab Depressurization Systems

The design objective of a VI mitigation system is to reduce to acceptable levels the risks posed by soil vapors infiltrating the building. Although SSD systems may have some incidental volatile chemical removal effects and benefits, these effects and benefits are minimal and will not have an appreciable impact on site contaminant levels. Thus, installation of a SSD system should not be considered to be equivalent to installation of a soil vapor extraction system. In most cases, remediation of soil, soil gas, and/or groundwater should occur independent of the VI mitigation system.

6.1.6 Safety and Environmental Hazards

Examples of safety and environmental hazards associated with a system design and that may need to be addressed include the following:

Proximity of Building Occupants During System Installation. For existing occupied structures, mitigation system installation will likely be conducted in close proximity to building occupants. Thus, safety concerns should be a priority. Attempts should be made to minimize physical hazards, noise, dust, and other inconveniences to occupants.

Concentrations Above Lower Explosive Limit. For sites where subsurface concentrations are above the lower explosive limit (LEL) of any chemical and a subsurface gas pressure of one pound per square inch or more is present, the site should be carefully evaluated. A deep well pressure relief system or other improvements, which reduce concentrations and pressures to acceptable levels, should

be considered in addition to the building mitigation system. Mitigation of the elevated gas pressures at these sites may be required as a condition of site approval. Additional guidance may be provided in DTSC's *Advisory on Methane Assessment and Common Remedies at School Sites*.

Environmental Hazards. Other potential environmental hazards at the site or within existing structures should be identified and mitigated as part of the design considerations. The presence of other environmental hazards may delay construction activities until the hazard is adequately addressed or the appropriate safeguards are in place. Depending upon the age of the structure, lead or asbestos may be a concern. Generally construction prior to 1980 may have asbestos while construction prior to 1990 may have lead-based paint. Vermin and molds may also be a cause for concern due to potential health impacts from dust disturbance during construction.

6.1.7 Existing Buildings

Design of a VI mitigation system for existing buildings has the following additional considerations.

Building Foundation. An inspection of the building foundation should be conducted to identify all potential entry routes for volatile chemical-contaminated soil gases. Examples of potential entry points include cracks in concrete walls or slabs, gaps in fieldstone walls, construction joints between walls and slabs, annulus space around utility pipes, elevator shafts, and open sumps. Potential entry points should be surveyed with a portable photoionization detector or flame ionization detector. It is often possible to find elevated concentrations of select chemicals at particular points where VI is occurring.

Possible Entry Points. All possible entry routes should be sealed off, as feasible, to prevent volatile chemical entry. If a SSD system is installed, sealing entry routes will enhance the sub-slab negative pressure field. Sealing/caulking materials should not contain volatile chemicals.

Sub-Slab Permeability and Flow Characteristics. The air flow characteristics of the material(s) beneath the slab should be quantitatively determined by diagnostic testing. This is an important step in the SSD design process, and should always be performed prior to the design and installation of a SSD system. The objective of diagnostic testing is to investigate and evaluate the development of a negative pressure field via the induced movement of soil gases beneath the slab. Appendix C provides additional details regarding diagnostic testing.

Residential Homes. For existing residential homes, it may be appropriate to install a relatively standard mitigation system without building-specific designs or pre-mitigation diagnostic tests in order to expedite installation due to risk considerations. Using this 'standard design' approach allows systems to be installed more quickly, which may be important at larger sites with a number of homes requiring mitigation. However, post-mitigation testing will be required to verify that the standard design is adequate for a given home.

Future Inspections. Accommodation and provision for future building and mitigation system inspection needs should be included in the system design as well as management plans.

6.1.8 Other Design Considerations

Other design considerations include the following:

Depth to Water. The responsible party should have ascertained the depth to groundwater during site investigations. In general, the groundwater table should be at a sufficient distance below the building slab to ensure that the water table does not impede the effectiveness of a SSD or SSV system. Seasonal changes in groundwater elevation should be considered when evaluating the feasibility of a SSD or SSV system.

Labeling. The design should include specifications for prominent labeling of the system. Labels should include the purpose of the system, safety warnings, and instructions for keeping piping clear and unblocked. Labels should also include the name, address and telephone number of the entity to contact for questions and repairs. Labels should be printed in English as well as other languages as necessary. See Appendix B (item 6) for further suggestions regarding system labeling.

6.2 CONSTRUCTION QUALITY ASSURANCE / QUALITY CONTROL TESTING

Installation of a VI mitigation system should also include construction QA/QC testing of various components of the system. Typical QA/QC tests include the following:

Liner System. The responsible party should conduct a smoke test of the liner system, as recommended by the liner manufacturer, to ensure no leaks exist at the time of installation. Where leaks are identified, appropriate repairs should be undertaken and smoke testing should be repeated until no leaks are detected.

Proper Function. Testing should be conducted to verify that installed blowers, gauges, alarms, and other system components are functioning properly.

Compliance with Performance Measures. Air quality sampling[3] and/or pressure measurements should be collected to confirm compliance with the performance measures for the system (see Section 7.2.1). Generally this confirmatory sampling should occur about four weeks after system startup. Subsequent sampling should be conducted during the potentially “worst case” months of January/February and June/July (for most locations in California).

Model Home. For proposed future residential developments where the human health risks have been identified as greater than $1x10^{-4}$, a model home could be constructed at

[3] An alternative to indoor air sampling may be considered. One option is the use of slotted piping above the liner (but below the foundation) with sampling port(s) accessible on the outside of the building for baseline and compliance testing. However, this approach should be used cautiously (see further discussion in Section 7.2.3).

one or more locations of the highest potential VI concentration, within proposed development area(s), for the purpose of testing and verifying adequate VI mitigation. QA/QC testing should be conducted as described above. If possible, indoor air sampling should occur prior to the installation of carpeting or other construction features which may contribute to background volatile chemical concentrations.

6.3 DESIGN DOCUMENTS

The responsible party should submit a VI mitigation system design to DTSC for review and approval The design document can be submitted as a single or multiple documents depending on project-specific considerations and process.

6.3.1 Design Document Content

The design document should include the following recommended components, not necessarily in the listed order. The actual content of the design document is a project-specific decision.

Introduction. Identify the project, the purpose of the document, and the regulatory-basis for the VI mitigation system.

Project Background. Identify the rationale for VI mitigation, current and future property land use considerations, volatile chemicals of concern, and other general project considerations. If appropriate, this section should also indicate how the VI mitigation system is integrated with soil, soil gas, and/or groundwater remediation efforts.

Site Conditions Summary. Present the CSM and summarize:

- site geology
- site hydrogeology with emphasis on shallow groundwater in wet and dry seasons
- previous groundwater, soil, soil gas, and indoor air sampling efforts
- volatile chemicals of concern with maximum detected soil gas concentrations that would potentially impact indoor air quality
- remediation efforts and cleanup goals
- potential remediation treatment/degradation by-products
- ambient air quality considerations including predictive point source dispersion modeling or sampling
- estimation of the degree of indoor air impacts (such as Johnson and Ettinger modeling results)
- public participation efforts

This section may reference previous documents. However, an overview of the pertinent information should be provided along with references to other documents.

Existing Building Design Report. For existing buildings, an initial design report detailing the inspection of the building foundation and diagnostic tests should be prepared and submitted with the VI mitigation design document. This report should contain the following elements:

- description and diagram of the building foundation
- methods used in diagnostic testing
- results of the diagnostic tests
- existing HVAC system design and operating parameters

See Section 6.1.7 for more testing recommendations for existing buildings.

Operation and Maintenance Plan. The design document should include an O&M Plan identifying the mitigation goals and objectives, performance measures, and contingencies. The plan should identify how the goals and objectives will be monitored and tested, and may identify general institutional control requirements and/or use restrictions (such as prohibited construction and restricted building modifications). Additional O&M requirements include implementation mechanisms, and responsibilities for tasks and final obligations. See Section 7.2 for a detailed discussion of the O&M Plan content.

Design Basis. Identify the design assumptions and criteria to be met by the VI mitigation system.

Construction Methods. Identify the construction methods to be used once the design has been approved, including:

- construction specifications
- minimum material specifications
- installation procedures
- construction QC procedures
- post-installation testing procedures

Design Calculations and Drawings. Provide the design calculations and drawings for the VI mitigation system.

Conceptual Drawings. Provide conceptual drawings indicating building locations, prescribed building envelopes, streets, driveways, hardscape areas, utility easements, and other infrastructure considerations.

Vapor Intrusion Mitigation Approach. Provide a detailed description of the proposed VI mitigation approach, including phasing (tier approach) concepts and the following information:

- technical basis for the system design
- construction and implementation requirements

- any additional vapor treatment system which may be required
- component specifications and verification of ability to meet performance measures (including long-term sustainability)
- detailed testing procedures including on-the-job instructions
- permit requirements from other agencies (such as a permit to construct and a permit to operate vapor treatment systems)
- reporting requirements
- applicable engineered drawings and system diagrams

Implementation Mechanisms. Identify the LUC requirements and soil management plans.

Financial Assurance. Identify the applicable financial assurance requirements.

Additional Content. Include title and signature pages (with appropriate licensure stamp and signature; see Section 6.3.4), table of contents (with a list of tables and figures), and any other system details or proposal addressing mitigation considerations identified in Chapters 4 or 7. Additional content may be required depending upon site-specific conditions and the subsurface cleanup objectives. A draft plan submittal and agency approval will likely be necessary prior to submittal and approval of the final system engineering plans. The review and approval of the system design may require a phased approach and may include the need for pilot studies, startup testing, and agency review prior to final approval.

6.3.2 Supporting Documents

The design document for the VI mitigation system should include a discussion of other documents that may be required for its proper implementation. These documents may include, but are not limited to, the following:

Health and Safety Plan. The design document may need to include a worker health and safety plan that addresses such topics as worker training requirements, protective gear, and monitoring procedures.

Public Participation Plan. The design document should include a public participation plan that identifies future notification requirements and mechanisms. Refer to Chapter 3 and DTSC's *Vapor Intrusion Public Participation Advisory* for further discussion.

6.3.3 Response Action Implementation Report

A response action implementation report (completion report) should be submitted to DTSC upon completion of construction of the mitigation system. The completion report should include final as-built design drawings, confirmation sampling results, and provisions for determining that the response action is complete, including shut-off criteria.

6.3.4 Licensure Requirements

All VI mitigation systems should be designed, built, installed, operated, and maintained in conformance with standard geologic, engineering, and construction principles and practices using appropriately licensed professionals.

7.0 VAPOR INTRUSION MITIGATION SYSTEM IMPLEMENTATION

This chapter discusses implementation considerations of VI mitigation systems.

7.1 PROPERTY OWNER AND OCCUPANT IMPACTS, CONCERNS AND RESPONSIBILITIES

Responsible parties and stakeholders involved with VI mitigation should always keep in mind that the buildings under discussion will be occupied, or are already occupied, by people living and working within that space. For existing buildings, the owner and/or tenant preferences should be considered during the design phase. Refer to Section 6.1.1 for further discussion.

7.2 OPERATION AND MAINTENANCE

Any proposed VI mitigation should include an O&M Plan. The elements described in the following sections should be included in the O&M Plan.

7.2.1 General Performance Goals

The O&M Plan should identify specific performance goals for the VI mitigation system. Example performance goals include:

- elimination of the exposure pathway between contaminated media and indoor air receptors
- reduction of the indoor air concentrations to an acceptable level

7.2.2 Performance Measures

Performance measures should be established to ensure that the VI mitigation system is operating correctly and preventing unacceptable volatile chemical concentrations from migrating up and into the overlying structure. Performance measures should be developed on a case-by-case basis to reflect site-specific needs and conditions, and should reflect the site-specific risk management considerations discussed in Chapter 2 and indicated in Table 4. The O&M Plan should identify the performance measures for the VI mitigation system within the section that describes the goals and objectives. The plan should state the methods by which the performance goals will be tested and verified. Some examples of performance measures are provided below.

- Collecting vapor samples to demonstrate the effectiveness of the mitigation.[4] Vapor samples may be collected from within the building itself, between the foundation and the sub-slab liner system, below the sub-slab liner system within the sand/gravel blanket, or any combination thereof.
- For SSD systems, collecting pressure data to demonstrate the presence of a negative pressure field below the entire building foundation.[5] (Note: Pressure measurements are collected below a building foundation, usually below the sub-slab liner within the sand/gravel blanket of the SSD system.) A pressure differential of approximately -4 to -10 Pascal or less beneath the sub-slab liner is generally adequate to mitigate VI (USEPA, 2008a).
- For HVAC systems, measuring differential pressures and air exchange rates as well as monitoring of system operations.
- Ensuring continuous operation of the mitigation system.
- Ensuring operation in accordance with the manufacturer's specifications.

7.2.3 General Guidelines for Monitoring

The O&M Plan should identify the monitoring requirements for the VI mitigation system. These requirements should be developed on a case-by-case basis to reflect site specific needs and conditions. As indicated in Table 4, the monitoring program should consider the degree of risk or hazard being mitigated, the building use (such as residential, school, commercial/industrial), and the technology used to mitigate VI. General considerations for the monitoring program are described below and additional considerations for SSV and SSD systems are described in Sections 7.3.2 and 7.4.2, respectively. Data quality objectives should be established as part of any monitoring or sampling and analysis plan.

Consideration should be given to the potential effects of HVAC system operation on sampling activities, particularly during the hot summer months. For example, operation of an air conditioning system may create positive pressures and inhibit migration of volatile chemicals into the structure. Indoor air samples collected while the air conditioning system is operating may underestimate concentrations of volatile chemical in indoor air.

Establish Baseline Conditions. To establish a baseline for future comparison, the responsible party should conduct vapor sampling of the sub-slab or crawl space immediately after installation of the VI mitigation system for new construction, and immediately before installation, for existing construction. If a depressurization system is installed, the responsible party should also collect baseline pressure measurements. Seasonal variation should be considered when establishing the baseline conditions.

[4] The number and location of samples should be carefully selected to ensure adequate assessment of the mitigation performance goals for the entire building.
[5] The number and location of measurements should be carefully selected to ensure adequate assessment of the mitigation performance goals for the entire building.

Routine Vapor and Pressure Monitoring. Vapor samples should be collected from the sub-slab or crawl space and/or pressure measurements on a routine basis to verify the effectiveness of the mitigation system. These samples are typically collected on a semi-annual basis. Seasonal variation should be considered when establishing the sampling schedule. The considerations identified in Table 4 may assist with establishing the number and frequency of monitoring events necessary to meet the performance goals and measures.

Routine Monitoring of System Operations. The mitigation system should be monitored to ensure that it is operating effectively. For example, if building pressurization is being used to mitigate VI, routine monitoring would include assessment to determine that the HVAC system is operating so as to maintain the desired positive pressure. The O&M Plan should include equipment maintenance requirements to ensure continued operation of the system and integrity of engineering controls.

Indoor Air Quality Monitoring. As indicated in Table 4, the frequency of indoor air quality monitoring should be based on the potential risk posed by VI as well as the effectiveness of the VI mitigation system. Provisions for periodic indoor air sampling should be included in the O&M Plan to demonstrate continued effectiveness of the mitigation system. For example, high risk single family residential structures may warrant sampling every two years whereas for low risk single family residential structures it may be sufficient to sample every five years. For higher risk sites, initial indoor air sampling should be conducted seasonally. DTSC recommends two sampling events per year for the first three years or until consistent verification that the mitigation system is meeting established indoor air performance measures. The sampling frequency may be modified with technical justification and approval from DTSC.

For large or complex buildings (including schools), more frequent and/or systematic indoor air monitoring programs may be advisable depending upon level of risk and performance goals. Large or complex buildings may require a more complex network of vent piping under the building and may pose difficulty in determining pressure measurements or vapor concentrations at the interior locations farther from the outside perimeter. The network of vent piping and monitoring points should include methods to determine the effectiveness at the more interior locations. In some cases, indoor air monitoring may be more effective for determining the mitigation performance, especially in cases of existing buildings where mitigation is a retrofit to the structure.

In lieu of frequent indoor air sampling[6], volatile chemical sampling between the sub-slab liner system and the building slab could be used on a more frequent basis as a potential measure of the reduction of volatile chemical concentrations. This approach should include a CSM of potential leak mechanisms and pathways, and a discussion of how the planned monitoring above the liner would be capable of identifying such leaks.

[6] As discussed in the Vapor Intrusion Guidance, indoor air sampling is not straightforward because contaminants housed in the structure (such as paint, dry cleaning, or gun cleaner) may be contributing to volatile chemical concentrations measured in the indoor air sample.

Verification testing may require sampling from above the sub-slab liner system and within the sand/gravel blanket of the SSD system.

Soil Vapor Monitoring. In some cases, permanent vapor probes to monitor soil gas may need to be installed. Permanent vapor probes, also referred to as monitoring points or soil gas probes, can be used to evaluate the long-term behavior of soil gas adjacent to existing or future buildings. When a soil vapor monitoring program is proposed, a detailed outline of the program should be submitted to DTSC for review and approval. The outline should specify monitoring procedures, locations, frequencies, and equipment.

The design of the volatile chemical monitoring program should consider the following.

- Monitoring of subsurface vapor probes should include measurement of the concentrations of volatile chemicals, gas pressure within the probe, and the barometric pressure at the time of monitoring.
- Monitoring probes should be properly secured, capped and completed to prevent water infiltration, ambient air infiltration, accidental damage, or vandalism. Replacement or repair may be needed due to the conditions of the soil vapor probes or disturbance due to construction activities. For probe surface completions, the following components should be installed: surface seal; utility vault or box with ventilation holes and lock; and gas-tight valve or fitting for capping the sampling tube. The utility vault/box should be placed at a sufficient height to prevent water inundation or should be built to preclude water infiltration.
- Vapor probes should be periodically inspected to ensure degradation has not occurred and they are still functioning properly.

Adjacent Buildings. Buildings adjacent to properties with mitigation systems may also warrant periodic review or monitoring to verify that potential VI exceeding action levels is not occurring. The frequency of monitoring depends on the location of the building within the zone of contamination and its potential to be impacted. This monitoring may consist of soil gas monitoring, sub-slab vapor sampling, and/or indoor air sampling.

Monitoring for Combustible Gases. If the potential exists for combustible gases to be present, monitoring for these gases should be conducted at vapor monitoring points, soil gas monitoring points, along the ground surface in open areas, within crawl spaces beneath a structure, and/or in the interior of a building

7.2.4 General O&M Requirements

General activities that may be required by the O&M Plan include:

- ensuring that site conditions have not changed in a way that will impact the function or measurement of the mitigation system

- inspection of all visible components to ensure that the mitigation system is operating properly, that it has not been modified, and that components have not degraded
- surface sweeps to determine if significant changes in subsurface gas concentrations or pressure have occurred
- monitoring of changes in ownership, tenant, and/or building conditions and potential modification of the enforceable mechanism. DTSC should be notified of applicable changes within 60 days of identification of any changes.

7.2.5 Contingency Plan

The O&M Plan should reference or include a contingency plan to be implemented in the event of failure to meet the predetermined performance goals and specifications identified in the O&M Plan, or in response to monitoring data. The contingency plan should include action levels, a decision flowchart regarding specific actions and identification of the parties responsible for implementing these actions. The flowchart should also include notification requirements, response timeframes, and potential trouble-shooting actions.

7.3 IMPLEMENTATION CONSIDERATIONS FOR SUB-SLAB VENTING SYSTEMS

7.3.1 Operation and Maintenance

In addition to the general O&M activities described in Section 7.2.4, typical O&M activities for SSV systems may include:

- inspection of the area of concern, including all visible components of the venting systems and the multi-stage vapor probes
- monitoring of designated vapor probes, lowest accessible floor of the building, and enclosed areas of the building to ensure there are no potentially significant changes in subsurface gas concentrations or pressure
- for active systems, inspection of blower system to ensure all component parts are functioning
- monitoring of vent risers for flow rates and gas concentrations to confirm that the venting systems are functioning as intended
- other appropriate requirements such as routine maintenance, calibration and testing of functioning components of the venting systems in accordance with the manufacturers' schedule and recommendations, if appropriate

7.3.2 Monitoring

The monitoring program for SSV systems should address the general monitoring requirements described in Section 7.2.3. In addition, more frequent and/or systematic indoor air monitoring programs may be advisable for SSV systems depending upon level of risk and performance goals. Initially, indoor sampling should be conducted

seasonally (twice a year) for the first three years or until consistent verification that the mitigation system is meeting established indoor air performance measures. Sampling frequency may be modified upon technical justification and approval from DTSC.

7.4 IMPLEMENTATION CONSIDERATIONS FOR ACTIVE SUB-SLAB DEPRESSURIZATION SYSTEMS

7.4.1 Operation and Maintenance

Typical O&M activities for SSD systems may include the items discussed in Sections 7.2.4 and 7.3.1. In addition, the blower should be checked to ensure that all components are operating properly and that the blower is drawing a sufficient vacuum.

7.4.2 Monitoring

The monitoring program for SSD systems should address the general monitoring requirements described in Section 7.2.3 as well as the following additional considerations.

Monitoring of Vent Risers. Routine monitoring of vent risers for flow rates and total volatile chemical concentrations should be conducted to confirm that the venting systems are functioning properly. Volatile chemical sampling may need to be for individual chemicals rather than total volatile chemicals to allow for comparison to site remediation soil gas monitoring. Examples where this might be advantageous include cases with unexplained changes in total volatile chemical concentrations or industrial/commercial buildings in which the occupants utilize volatile chemicals.

Indoor Air Sampling. Indoor air quality should be measured periodically, but is unlikely to be directly measured as frequently as vapor samples and pressure measurements. Indoor air quality should be acceptable as long as an adequate negative pressure is maintained below the building foundation and the mitigation system effectiveness has been demonstrated. Thus, one advantage of a SSD system over a SSV system is less frequent sampling of indoor air.

7.5 DOCUMENT SUBMITTALS

Vapor intrusion mitigation plans, reports, and other documents should be submitted to DTSC for review and approval. The level of reporting should be determined on a case-by-case basis. As applicable, documents should be signed and stamped by a registered professional who is responsible for the technical content (see Section 6.3.4).

7.5.1 Sampling and Analysis Plans

Sampling and analysis plans detailing testing, sampling methods, sample analysis, data quality objectives, QA/QC protocols, and frequency of sampling should be submitted to DTSC for review and approval prior to implementation of mitigation measures.

7.5.2 Design Document

A document detailing the VI mitigation system design should be submitted to DTSC for review and approval prior to commencement of system installation. Ideally, this document should be prepared after inspection of the building foundation and diagnostic tests. Section 6.3 provides a detailed outline for a complete mitigation system design submittal.

7.5.3 Interim Measure Construction/Final Installation Report

A report detailing the VI mitigation system installation and operation should be submitted to DTSC for review and approval after system construction. This report should include:

- as-built drawings of all system components including vacuum or sampling monitoring points
- brief account of field activities associated with system installation and startup
- initial post-startup test data and flow readings from the extraction and monitoring points
- description of back draft evaluation
- documentation that back drafting is not occurring
- complete analysis and interpretation of data
- raw data

7.5.4 Periodic Monitoring Reports

Monitoring reports on the operation and testing of the VI mitigation system should include:

- inspection reporting
- pressure test data and flow rate readings
- laboratory and screening results of indoor air and/or discharged vapor samples
- any problems and/or malfunctions (including time frame and schedule of repair)
- repairs or modifications to the system
- any complaints received

7.6 INSPECTIONS

Routine inspections of the VI mitigation system should be conducted to ensure:

- that no significant changes in site conditions have occurred
- that system components have not degraded

- adherence to the engineering controls and/or institutional controls specified in the enforceable mechanism

The inspections should address all mitigation system components, including visible components of venting systems, multi-level gas probes, and blower (if present). If an inspection determines that the building foundation or components of the mitigation system have been modified by the owner or tenant, appropriate testing should be conducted to ensure that performance measures are being met.

The frequency of inspections should be based on site-specific considerations. Annual inspections may be appropriate for some sites whereas other sites may warrant more frequent inspections. Higher inspection frequencies may be appropriate for the first year of system operation followed by a reduced frequency after one year of efficient operation. Inspection reports should be submitted to DTSC for review pursuant to the enforceable mechanism and/or LUC requirements.

7.7 FIVE-YEAR REVIEWS

CERCLA and state law require five-year reviews for a response action that results in hazardous substances remaining at the site at concentrations that would preclude unrestricted land use. The O&M Plan, as well as any regulatory oversight agreement, enforceable mechanism, or LUC, should include provisions for conducting five-year reviews. The purpose of the five-year review is to ensure that the response action remains protective of human health and the environment, is functioning as designed, and is maintained appropriately. The review generally addresses the following questions:

- Are the response action and mitigation system functioning as intended?
- Are the cleanup and/or mitigation objectives, goals, and criteria used at the time of response action determination still valid?
- Have there been significant changes in the distribution or concentrations of volatile chemicals at the site?
- Are modifications needed to make the O&M Plan more effective?

The scope of the five-year review may be outlined in the O&M Plan or in a separate workplan developed for a specific review. The review of the response action and/or mitigation would typically consist of:

- notifying the community that the review is being conducted
- site inspection and review of the response action and mitigation to answer the above questions
- preparing a report that details the findings of the review for regulatory agency approval

The *Comprehensive Five-Year Review Guidance* (USEPA, 2001) may be a useful resource when conducting these reviews.

Depending on site-specific considerations, DTSC and/or the responsible party may conduct the site inspection and/or technical assessment. If the responsible party conducts the inspection or assessment, DTSC staff will review the report and make recommendations to ensure that the response action and mitigation remain effective, to identify milestones toward achieving or improving effectiveness. and to provide a schedule to accomplish necessary tasks.

7.8 ENFORCEABLE MECHANISMS

To address DTSC oversight and cost recovery, mitigation system O&M must occur through a DTSC legal counsel approved enforceable mechanism, such as a corrective action consent agreement, LUC, consent order, O&M agreement, post-closure permit, or other legally binding agreement. Any enforceable mechanism should include the following:

- O&M Plan
- financial assurance requirements (if not part of the O&M Plan)
- closure specifications
- contingency plan (if not part of the O&M Plan)
- applicable contacts
- allowance for DTSC access as necessary
- provisions for enforcement
- DTSC cost estimation with provision for annual updates
- project schedule

7.9 FINANCIAL ASSURANCE

O&M costs should be the responsibility of the responsible party/site owner and identified as such in the enforceable mechanism (Section 7.8). The responsible party/site owner should establish and maintain a sufficient and enforceable financial assurance mechanism for costs associated with implementation of the VI mitigation response action, O&M activities, LUC compliance, five-year reviews, DTSC's oversight, and any other applicable costs associated with the implementation and use of a VI mitigation system.

7.10 ACCESS AGREEMENTS

To address the concerns of affected parties, an access agreement should be executed prior to entering the property for testing and/or construction. Example situations to be addressed in access agreements include:

- property owners and tenants granting access for testing and/or construction
- future liability for landlords

- employees concerned that VI is occurring at their place of business
- disrupting business operations of tenants
- privacy issues for homeowners

Access for O&M purposes should be authorized by the applicable LUC. Typically, such a covenant would require access for DTSC oversight and other activities necessary to protect the public health and safety or the environment. The LUC would also address access for the person or entity responsible for implementing O&M. These access rights are binding on future owners and occupiers of the property. The owner who signs the covenant and all future owners are required to incorporate the covenant by reference into each and every deed, lease, rental agreement, and any other document that creates a right to use or occupy any portion of the property subject to the covenant.

7.11 LAND USE COVENANTS AND INSTITUTIONAL CONTROLS

When VI mitigation at a structure is necessary, whether as an interim response action or in conjunction with a final response action, the mitigation requirement should be included in a LUC (Covenant to Restrict Use of Property, Environmental Restriction). The LUC may include other ICs with prescribed notifications, prohibitions, restrictions and requirements that must be utilized to ensure O&M and disclosure of the risks, restrictions, and requirements to future buyers and occupants.

The following provisions should be included in the LUC:

- notice of the existing conditions known to the environmental agency that may cause potential unacceptable risk from VI
- prohibition against specific uses of the property
- prohibition against interference with the VI mitigation system
- prohibition against activities that will disturb impacted soil without DTSC approval
- right of access to the property for DTSC to inspect, monitor, and perform other activities relative to the VI mitigation system
- right of access to the property for the person responsible for implementing the O&M activities relative to the VI mitigation system
- inspection and reporting requirements for the owner of the property

If existing conditions without mitigation may cause unacceptable future risk to receptors, effective legal notification will be required to be provided to future buyers of the property, and occupants of future developments, or re-developments on the property.

LUCs must be compliant with California Code of Regulations, title 22, Division 4.5, Chapter 39, Section 67391.1, approved by DTSC legal counsel, and publicly

recorded in the county recorder's office. DTSC has an approved model Covenant to Restrict Use of Property, Environmental Restriction that should be utilized when developing a site-specific LUC.

7.12 EMISSIONS AND DISCHARGES

The need for air permits should be determined for all sites in order to comply with applicable state or local air quality control regulations. In certain cases, particularly those that involve large numbers of structures requiring mitigation within a certain area or those where the mitigation creates high vapor flux rates, it is possible that redirection of soil gases from beneath the building to the ambient air may result in unacceptably high cumulative air quality impacts at receptor points within the community. In such cases, it may be necessary to apply emission controls on mitigation systems to reduce the concentrations of volatile chemicals being discharged to the atmosphere. Generally, where unacceptable ambient air impacts exist, a dispersion modeling analysis of the emissions point(s) may be used to estimate whether resulting ambient air quality impacts exceed applicable state toxic thresholds or other health-based standards. Finally, in some instances, a community ambient air monitoring network may be established to demonstrate that the local population is not being exposed to unacceptable levels of air contaminants resulting from the VI mitigation processes.

7.13 COORDINATION WITH OTHER AGENCIES

The responsible party should coordinate with state and local agencies that have jurisdiction for sites requiring VI mitigation. Examples of local agencies that may require coordination efforts are discussed below. Local agency involvement should start early in the mitigation process to alleviate potential construction delays. Where overlapping regulatory authority or requirements are identified, DTSC should come to an agreement with the other applicable agencies to ensure that the project strategies are compatible and requirements can be met. In cases where oversight authority may be overlapping or redundant, an agreement (such as a Memorandum of Understanding) should be made between the applicable entities for designation of a single oversight agency.

Air Discharge Permits. Permits or authorizations from the local air pollution control district (APCD) or air quality management district (AQMD) may be required for venting systems that exhaust to atmosphere. DTSC recommends that the local APCD or AQMD be consulted to confirm their requirements, prior to the submittal of initial designs to DTSC.

Building Codes. The mitigation design criteria need to be compatible with applicable local and state building, electrical, and energy codes. Some building HVAC requirements may impact the mitigation design considerations and, thus, must be considered at the time of building design. The responsible party should coordinate with the applicable local planning and building departments for mitigation system design review concurrent with DTSC's engineering review and approval.

Land Use. Local county and city land use decisions and requirements may impact or influence future use of the project site. Discussions and coordination with local land use

authorities, including redevelopment agencies, should begin as soon as possible once it is determined that vapor phase contaminants are a concern and/or there is a potential for VI.

Fire Departments. The mitigation design criteria need to be compatible with applicable local and state building fire codes. The responsible party should coordinate with the applicable local fire agency on mitigation system design review concurrent with DTSC's engineering review and approval. Coordination with the local fire agency is especially important when methane is present as a volatile chemical of concern to ensure both compatibility and consistency with local agency requirements for methane.

7.14 CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires DTSC to analyze potential environmental impacts for discretionary project decisions, such as DTSC's approval of interim response actions or the proposed final response action. The approval of a VI mitigation system is a discretionary project decision for which a CEQA evaluation would be required. Cumulative impacts of all media, including single and/or multiple points of discharge from system vents, are considered as part of the CEQA evaluation. Project proponents are required to submit all necessary environmental information for DTSC to complete a CEQA evaluation. The DTSC project manager, in conjunction with DTSC CEQA support staff, completes and processes necessary CEQA documents.

As interim responses, most VI mitigation projects are not likely to require a full Environmental Impact Report (EIR) level of analysis or procedure. Generally, it would be expected that a VI mitigation project would qualify under a notice of exemption, negative declaration, or a mitigated negative declaration. Some large scale projects, such as new residential developments, could warrant an EIR.

Generally, a new development proposal (commercial, industrial, or residential) will require an EIR for which the local land use agency would be considered the lead agency. In such cases the VI mitigation proposal can be included as part of the analysis and a separate CEQA evaluation would not be required. In such cases, DTSC would be a responsible agency and would coordinate with and provide input to the lead agency. It is best not to separate the development analysis from the VI mitigation to ensure compatibility and consistency with identified CEQA related mitigation measures.

7.15 COMMINGLED CONTAMINANTS/PLUMES

It is not uncommon to have situations where there are commingled contaminants or plumes. Care should be taken to address all aspects of the commingled contaminants relative to mitigation needs, while coordinating with other agencies as discussed in Section 7.13.

Methane and/or radon are common contaminants which may be commingled with VOC contamination. To ensure compatibly and consistency of mitigation strategies applied to school buildings, DTSC's *Advisory on Methane Assessment and Common Remedies at School Sites* (DTSC, 2005) should be consulted. In addition, local jurisdictions often

have guidance specific to methane and/or radon which should be consulted when developing a mitigation strategy.

7.16 MULTIPLE RESPONSIBLE PARTIES

In cases where multiple responsible parties share in the obligations for the response action, mitigation, and long-term care of a site, the enforceable mechanism (see Section 7.8) should include all designated responsible parties and clearly identify each responsible party's obligations and responsibilities. Coordination with all responsible parties should begin early and continue throughout the process of mitigating the VI risk. This coordination will ensure that applicable considerations are addressed.

7.17 TERMINATION OF BUILDING CONTROLS

Subsurface remediation efforts will eventually reduce volatile chemical concentrations in soil, soil gas, and/or groundwater to levels that no longer require remediation. At this point, VI mitigation systems could be shutdown and/or removed, depending on the preferences of the building owners and obligations of responsible parties. Upon shutdown or removal, O&M requirements would cease.

Early in the decision-making process, stakeholders should consider how to determine when VI mitigation is no longer required. This decision will affect the type of data that will need to be collected during the operating period of the mitigation system (see Section 7.2.3) and should be part of the data quality objective process.

The response action implementation report should include specific provisions for determining that the response action is complete, including the termination of the VI mitigation system(s). A confirmation sampling and analysis plan should be a part of these provisions. The responsible party should conduct subsequent sampling rounds to ensure the absence of contaminant rebounds and to verify the appropriateness of system termination.

The response action completion report should contain the confirmation sampling results and justification for termination of the VI mitigation system. Vapor mitigation should only be terminated when soil, soil gas, and/or groundwater concentrations have achieved and maintained heath-based remediation goals. Responsible parties should not use indoor air sample results alone to justify mitigation termination. Provisions for termination of mitigation systems should include: 1) specific procedures for the notification of owners/tenants, 2) removal of associated LUCs or other ICs, 3) notification of other applicable stakeholders, and 4) instructions regarding the removal of physical system components, if desired by the owner/tenant.

8.0 REFERENCES AND ADDITIONAL RESOURCES

8.1 REFERENCES

American Society of Testing and Materials (ASTM). 1998. Guide for Assessing Depressurization-Induced Backdrafting and Spillage from Vented Combustion Appliances (Annual Book of ASTM Standards, Vol. 04.12).

ASTM. 2007a. ASTM E 2121-03: Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings. May.

ASTM. 2007b. ASTM E 1465-07a: Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings. August.

Colorado Department of Public Health and Environment. 2004. Draft Indoor Air Guidance. September. www.cdphe.state.co.us/HM/indoorair.pdf

California Department of Toxic Substances Control (DTSC). 1993. Memorandum, Removal Action Workplans (RAWs). September. www.dtsc.ca.gov/SiteCleanup/upload/SMP_POL_RAWGuidance.pdf

DTSC. 1995. Official Policy / Procedure, Remedial Action Plan (RAP) Policy, EO-95-007-PP. November. www.dtsc.ca.gov/LawsRegsPolicies/Policies/SiteCleanup/upload/eo-95-007-pp.pdf

DTSC. 1998. Guidance Memorandum, Removal Action Workplans – Senate Bill 1706. September 23. www.dtsc.ca.gov/SiteCleanup/upload/SMP_POL_RAWGuidance.pdf

DTSC. 2001 (revision pending). Updated Public Participation Policy and Procedures Manual. April. www.dtsc.ca.gov/LawsRegsPolicies/Policies/PPP/PublicParticipationManual.cfm

DTSC/LARWQCB. 2003 (revision pending). Advisory – Active Soil Gas Investigations. January. www.dtsc.ca.gov/lawsregspolicies/policies/SiteCleanup/upload/SMBR_ADV_activesoilgasinvst.pdf

DTSC. 2005. Advisory on Methane Assessment and Common Remedies at School Sites. June. www.dtsc.ca.gov/Schools/upload/SMBRP_SCHOOLS_Methane.pdf

DTSC. 2010. Proven Technologies and Remedies Guidance – Remediation of Chlorinated VOCs in Vadose Zone Soil. April. www.dtsc.ca.gov/SiteCleanup/PTandR.cfm

DTSC. 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air. Final. October. www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm

DTSC. pending. Vapor Intrusion Public Participation Advisory. Expected Fall 2011. www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm

California Environmental Protection Agency (Cal/EPA). 2005. Use of California Human Health Screening Levels (CHHSLs) in Evaluating Contaminated Properties. January. www.calepa.ca.gov/Brownfields/documents/2005/CHHSLsGuide.pdf

Interstate Technology and Regulatory Council (ITRC). 2007. Vapor Intrusion Pathway: A Practical Guide. January. www.itrcweb.org/Documents/VI-1.pdf

Massachusetts Department of Environmental Protection. 1995. Guidelines for the Design, Installation, and Operation of Sub-Slab Depressurization Systems. Northeast Regional Office. December. www.mass.gov/dep/cleanup/laws/ssd1e.pdf

New York Department of Health. 2006. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York. October. www.health.state.ny.us/environmental/investigations/soil_gas/svi_guidance/

Orange County Fire Authority, Planning and Development Services. 2008. Combustible Soil Gas Hazard Mitigation. January. www.ocfa.org/_uploads/pdf/guidec03.pdf

U.S. Environmental Protection Agency (USEPA). 1988. Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. EPA/540/G-89/004. OSWER Directive 9355.3-01. October. www.epa.gov/superfund/resources/remedy/pdf/540g-89004-s.pdf

USEPA. 1991. Guidance for RCRA Corrective Action Decision Documents: The Statement of Basis, Final Decision, and Response to Comments. OSWER Directive 9902.6. February.

USEPA. 1993. Guidance for Conducting Non-Time Critical Removal Actions Under CERCLA. EPA 540-R-93-057. August.

USEPA. 1994a. Model Standards and Techniques for Control of Radon in New Residential Buildings. March. www.epa.gov/iaq/radon/pubs/newconst.html

USEPA. 1994b. RCRA Corrective Action Plan. OSWER Directive 9902.3-2A. May. www.epa.gov/epaoswer/hazwaste/ca/resource/guidance/gen_ca/rcracap.pdf

USEPA. 1997. Rules of Thumb for Superfund Remedy Selection. August. www.epa.gov/superfund/resources/rules/rulesthm.pdf

USEPA. 1999. A Guide to Preparing Superfund Proposed Plans, Record of Decisions, and Other Remedy Selection Decision Documents. EPA 540-R-98-031. July. www.epa.gov/superfund/resources/remedy/rods/pdf/sectiona.pdf

USEPA. 2001. Comprehensive Five-Year Review Guidance. EPA 540-R-01-007. June. www.epa.gov/superfund/accomp/5year/guidance.pdf

USEPA. 2002. Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). Office of Solid Waste and Emergency Response. November. www.epa.gov/epawaste/hazard/correctiveaction/eis/vapor.htm

USEPA. 2008a. Brownfields Technology Primer: Vapor Intrusion Considerations for Redevelopment. EPA 542-R-08-001. March. www./brownfieldstsc.org

USEPA. 2008b. Engineering Issue: Indoor Air Vapor Intrusion Mitigation Approaches. EPA/600/R-08/115. October. www.epa.gov/nrmrl/pubs/600r08115/600r08115.htm

USEPA. 2011. Background Indoor Air Concentrations of Volatile Organic Compounds in North American Residences (1990-2005): A Compilation of Statistics for Assessing Vapor Intrusion. EPA 530-R-10-001. June. www.epa.gov/oswer/vaporintrusion/documents/oswer-vapor-intrusion-background-Report-062411.pdf

8.2 ADDITIONAL RESOURCES

New Hampshire Department of Environmental Services. 2006. Vapor Intrusion Guidance. July. des.nh.gov/organization/divisions/waste/hwrb/documents/vapor_intrusion.pdf

New Jersey Department of Environmental Protection. 2005. Vapor Intrusion Guidance. October. www.state.nj.us/dep/srp/guidance/vaporintrusion/

USEPA. 1993. Radon Reduction Techniques for Existing Detached Houses, Technical Guidance for Active Soil Depressurizations Systems. EPA/625/R-93/011.

Wisconsin Division of Public Health. 2003. Guidance for Professionals, Chemical Vapor Intrusion and Residential Indoor Air. February 13. dnr.wi.gov/org/aw/rr/technical/index.htm#vi

GLOSSARY

Ambient air. Refers to outdoor air at a VI site and reflects background air concentrations of volatile chemicals from numerous anthropogenic sources, such as vehicle exhaust, industrial stack emissions, etc.

Background air. See Ambient Air.

Brownfields. Brownfields are properties that are contaminated, or thought to be contaminated, and are underutilized due to perceived remediation costs and liability concerns.

Buildings. Buildings include any structure in which current or future occupants could potentially contact contaminated indoor air.

CERCLA. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980, and amended in 1986, by the Superfund Amendments and Reauthorization Act (SARA). This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified.

CEQA. The California Environmental Quality Act (Public Resources Code, §21000 et seq) requires public agencies to consider and disclose the environmental implications of their decisions, and to eliminate or reduce the significant environmental impacts of their decisions whenever it is feasible to do so.

CHHSLs. Developed by the Office of Environmental Health Hazard Assessment (OEHHA) as a tool to assist in the evaluation of contaminated sites and to estimate the degree of effort that may be necessary to remediate a contaminated property. CHHSLs are concentrations of contaminants in soil gas or indoor air that the Cal/EPA considers to be below thresholds of concern for risks to human health.

Cleanup goal. Contaminant concentration against which the success or completeness of a cleanup effort is evaluated.

Corrective Measures Study. The CMS is the mechanism for the development, screening, and detailed evaluation of alternative corrective actions under the RCRA corrective action process.

Degradation product. Refers to the natural degradation of volatile chemicals in soil, soil gas, or groundwater due to microbial degradation or an abiotic process. As an example, TCE will biodegrade under anaerobic conditions to cis-1,2-DCE and vinyl chloride.

Exposure pathway. The way a chemical comes into contact with a receptor. For VI, volatile chemicals in groundwater will migrate into the air-filled spaces in soil (soil gas); volatile chemicals in soil gas will migrate through the soil column and

through cracks in the building foundation into the indoor air where they can ultimately be inhaled by the building occupants.

Feasibility Study. Under the National Contingency Plan process (used by DTSC under California HSC chapter 6.8), the feasibility study is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions.

Hazard Index. Refers to the cumulative, noncarcinogenic health hazard estimate for a site. The cumulative hazard index is the sum of the hazard quotients for individual chemicals and is defined as:

$$\textit{Hazard Index} = \sum_{i=1}^{n} \frac{inhalation\ dose\ of\ chemical\ i}{reference\ dose\ of\ chemical\ i}$$

HSAA. Hazardous Substances Account Act, Health and Safety Code, division 20, chapter 6.8.

HWCL. Hazardous Waste Control Law, Health and Safety Code, division 20, chapter 6.5.

Institutional Control. Institutional controls are actions, such as legal controls, that help minimize the potential for human exposure to contamination by ensuring appropriate land or resource use.

Interim actions. Interim actions are short-term response actions performed pursuant to CERCLA or HSAA to control on-going risks while site characterization is underway or before a final response action is selected.

Interim measures. Interim measures are short-term response actions performed pursuant to RCRA or HWCA to control on-going risks while site characterization is underway or before a final response action is selected.

Land Use Covenant. Written instruments used to require compliance with certain obligations and restrict use of property. Land use covenants are recorded at the county recorder's office so that they will be found during a title search of the property deed.

Mitigation. Engineering controls taken to reduce the entry of vapors into the building until cleanup goals in the subsurface are met.

Non-time-critical removal action. Non-time-critical removal actions, as defined by CERCLA, are removal actions that the lead agency determines, based on the site evaluation are appropriate, and a planning period of at least six months is available before on-site activities must begin.

RCRA. The Resource Conservation and Recovery Act, an amendment to the Solid Waste Disposal Act to address the huge volumes of municipal and industrial solid waste generated nationwide. Under RCRA, USEPA has the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also sets forth a framework for the management of non-hazardous wastes. [Title 40 of the Code of Federal Regulations, Parts 239 through 282]

Receptor. Refers to the hypothetical (future buildings) or actual person being exposed to volatile chemicals from VI. The amount of exposure will be defined by the land use such as residential, commercial/industrial, school, etc. and how much time a person spends on-site.

Remedial Action Plan. Under the HSAA, the Remedial Action Plan is the response action selection document for a remedial action for which the capital costs of implementation are projected to cost $2 million or more.

Remediation. An action that reduces the level of contamination in environmental media (such as soil, soil gas, and/or groundwater) that are acting as the source of the indoor air vapors.

Removal Action Workplan. Under the HSAA, the Removal Action Workplan is the response action selection document for a nonemergency removal action that is projected to cost less than $2 million at a hazardous substance release site. Typically, these are short-term actions designed to stabilize or cleanup a site posing a threat to human health or the environment, either as an interim action or the final remedy.

Response action. Facility closure, corrective action, remedial action, or other response action to be undertaken pursuant to division 20 of the Health and Safety Code.

Risk assessment. The scientific process used to estimate the likelihood that a chemical detected at a site may be harmful to people and the environment.

Risk management. The process of evaluating alternative regulatory and non-regulatory responses to risk and selecting among them. The selection process necessarily requires the consideration of scientific, legal, economic, political, and social factors.

Source remediation. See Remediation.

APPENDIX A
EXAMPLE DESIGN BASIS/CRITERIA FOR SUB-SLAB DEPRESSURIZATION SYSTEMS

This section identifies example design considerations for SSD systems installed in existing buildings and installed in conjunction with new construction.

A.1 Existing Building Design Requirements (No Sub-Slab Liner)

This section provides more specific design considerations for installation of a SSD system in an existing building with a slab foundation. These retrofit systems will lack sub-slab liners because of the difficulty of installing liners under slabs on existing buildings. This section could also be applied to existing buildings with crawl space foundations. The following recommendations should be considered in the design of a SSD system in an existing building.

Collection Pipe Spacing and Diameter. Soil properties (such as soil gas permeability and diffusion coefficients) should be considered in the design and spacing of the sub-slab collection piping system. When using horizontal pipes, the pipes should be placed such that all points immediately beneath the slab are located within 20 to 25 feet of a manifold pipe. The subsurface gas collection pipes should be perforated and at least two inches in diameter. A low profile collection and venting system may be used as an alternative to round collection pipes. In smaller, single family residences, a single suction point may suffice.

Collection Pipe Layout. Collection piping for existing buildings may be either vertically or horizontally installed. Pipe orientation should be dictated by site-specific conditions. Typically, small buildings (such as single family homes) can be mitigated with vertical collection points where the groundwater table is sufficiently deep, in similar fashion to radon mitigation. For larger buildings, horizontal piping may be warranted. Such piping could be installed through the foundation by trenching or installed beneath the building via horizontal drilling. The horizontal collection piping should extend the full width of the building and be located no more than five feet beneath the slab. The collection/vent piping system should be thread connected, not solvent-welded, unless it can be shown that the solvent does not contain any volatile chemicals of concern. The need for drainage or de-watering improvements to prevent flooding of any portion of the collection/vent piping should be evaluated and suitable improvements should be installed to insure the proper operation of the collection pipe system.

Vent Riser Design. The underground gas collection pipes should be connected to solid vent risers that extend above the building. The vent risers should be equipped with a sampling port and fitted with a non-restricting rain guard to prevent precipitation and debris from entering the piping system. Installation of a turbine as a vent cap may also be applicable. Vent risers should be properly secured (such as enclosed within wall cavities or pipe chases) to prevent damage. A minimum of two vertical vent risers [equivalent two 2-inch diameter] for the first 10,000 square feet of building footprint area and one additional vertical vent riser for each additional 10,000 square feet of building footprint should be provided. Whenever practicable, vent riser pipes should terminate

above the highest roof of the building and above the highest ridge. Vent riser pipes attached to, or penetrating the sides of, buildings should be located at least 10 feet above ground level, at least one foot above the edge of the roof, and at least 10 feet away from any window, door, or other opening (ASTM 2007b). However, the riser pipe position should be selected on a case-by-case basis and should consider the building roof design.

Vent Riser Diameter. At a minimum, each vent riser piping should consist of 2-inch diameter pipes. Where necessary for structural reasons, the size of the vent risers may be reduced to 1.5-inch diameter provided additional vent risers are installed to provide a flow capacity equivalent to the appropriate number of 2-inch diameter vent risers.

Utility Trench. Utility trenches are generally used in large buildings (such as offices, schools, and commercial/industrial) for utility runs and may become conduits for soil vapors to enter the building. Utility trench dams should be installed as a precautionary measure to reduce the potential for soil vapor to migrate beneath a structure through the relatively permeable trench backfill. An impermeable dam or plug constructed of bentonite-soil mixture, or sand-cement slurry (or equivalent) should be installed in all utility trenches that are backfilled with sand or other permeable material for new or replacement utility lines (such as water, sewer, phone, electrical, and cable). These dams should extend for a distance of at least three feet from the perimeter of the structure and from at least six inches above the bottom of the perimeter footing to the base of the trench.

Conduit Seals. Conduit seals should be provided at the termination of all utility conduits to reduce the potential for combustible gas migration along the conduit to the interior of the building. These seals should be constructed of closed cell polyurethane foam, or other inert gas-impermeable material, extending a minimum of six conduit diameters or six inches, whichever is greater, into the conduit. Wye seals should not be used for main electrical feed lines.

Electrical conduits should be provided with seals as required by the appropriate sections of the National Electrical Code (NFPA 70) as presented in Article 500 Hazardous (Classified) Locations Class I, II, and III, Divisions 1 and 2. All NFPA 70 requirements should be met for all work in any classified area, given the specified classifications of the project.

The local APCD or AQMD may require permits or authorizations for a passive volatile chemicals collection and venting system that exhausts to atmosphere. The local APCD or AQMD should be contacted to confirm their requirements.

Volatile Chemical Monitoring Program. All recommendations for a volatile chemical monitoring program (see Chapter 7) are generally applicable.

A.2 New Construction Design Requirements for Sub-Slab Depressurization Systems

This section recommends design requirements for installation of a SSD system and sub-slab liner system concurrent with new construction of buildings or structures. All considerations for the existing structure retrofit mitigation system (see Section A.1) are also generally applicable in a new structure, except as described below.

Pipe Spacing Design. If an appropriate permeable subgrade material is provided for the collection piping (e.g., sand or gravel), evaluation of native soil permeability characteristics may not be necessary for the pipe spacing design.

Sub-slab Liner System. A sub-slab liner system should meet the following requirements:

- Sub-slab liners should be installed by qualified personnel, preferably with manufacturer certification.
- Sub-slab liners should be constructed with approved materials and thicknesses (e.g., 60-mil or 0.060 inch of high-density polyethylene, rubberized asphalt, or equivalent).
- Sub-slab liners should be placed a maximum of one foot below the floor slab and a maximum of six inches above the gas collection piping.
- Sub-slab liners should be anchored to footings.
- Protective layers consisting of sand (at a minimum, two inches or thicker) and/or geotextile (at a minimum, six ounces per square yard) should be laid below and above the sub-slab liner.
- Because of seismic concerns, the sub-slab liner should not pass below footings and/or stiffener beams of the structure without a careful evaluation and confirmation data to support the beneath footing passage.
- Gas tight seals (e.g., boots) should be provided at all pipe or conduit penetrations through the sub-slab liner. Gas tight seals should be provided where the sub-slab liner attaches to interior and perimeter footings.

A.3 New Construction Design Requirements for Active Sub-Slab Venting Systems

Some volatile chemicals may not be adequately vented via passive venting, because of high concentrations, being heavier than air, or other site-specific conditions. In these instances, active venting may be necessary. All considerations for the existing structure retrofit and new construction mitigation systems described in Sections A.1 and A.2 are also generally applicable for an active SSV system with sub-slab liner in a new structure. However, an active SSV system would also include a properly sized blower. An air permit from the local APCD or AQMD may be required for an active SSV system. The APCD or AQMD should be contacted regarding the permit requirements.

APPENDIX B
EXAMPLE OF DESIGN AND INSTALLATION REQUIREMENTS FOR SUB-SLAB DEPRESSURIZATION SYSTEMS

Note: The requirements listed below are extracted from the Orange County Fire Authority Guidance for Combustible Soil Gas Hazard Mitigation (2008), as modified by DTSC. These are reprinted as a design example and are not requirements from DTSC.

SSD systems should be designed and installed in conformance with standard engineering and construction principles and practices (see Section 6.3.4). Installation should be in accordance with applicable Uniform Building, Mechanical, and Plumbing Codes.

1) Ventilation trenches should be placed such that no portion of the foundation is more than 25 feet from a ventilation trench. Trench cross section dimensions should not be less than 12 inches by 12 inches. Ventilation trenches should be back filled with pea gravel approximately 3/8 inch in diameter, or other material of similar size and porosity. A preferred alternative to vent trenches is a continuous gravel blanket with a collection piping arrangement in the same configuration used with the trench design.

2) Ventilation trenches should be provided with perforated pipe of not less than four inches in diameter. The total pipe perforation area should be at least equal to five percent of the total surface area of the pipe. Perforated pipe should be located a minimum of four inches below the foundation.

3) Where piping transitions through building footings, the penetration should be accomplished in compliance with the Uniform Building Code and with the approval of the Building official.

4) Perforated pipe should be connected to vertical ventilation pipe. Vertical ventilation pipe should be not less than 3 inches in diameter and should be constructed of materials specified by the Uniform Plumbing and Mechanical Codes. All joints should be tightly sealed with approved materials. Ventilation pipe may be located within walls/chases or should be similarly protected from physical damage. Ventilation pipes should terminate at a height determined acceptable by the design engineer, but not less than 18 inches above the adjacent level. Ventilation pipes should be located at least three feet from a parapet wall. Ventilation pipes should terminate at a distance of at least ten feet from any building opening or air intake and at least four feet from any property line. Any ventilation pipe located within an open yard should terminate at a height of not less than ten feet above adjacent grade.

5) The vertical collection pipe should be equipped with a sampling port. The discharge point of a ventilation pipe should be provided with a non-restricting screened rain guard to prevent precipitation and debris from entering the piping system. The electrical classification of the area surrounding the discharge point should be taken into account in the overall building design. Termination of all ventilation pipes should

be provided with a “T” connection or other approved rain cap to prevent the intrusion of rainwater.

6) Ventilation pipes should be clearly marked to indicate that the pipe may contain volatile chemicals. This may be accomplished through stencils, labels, or other methods. Pipes should be marked near their termination point and at five-foot intervals along the remainder of the ventilation pipe. This includes sections encased within walls or other enclosures. An example of an acceptable identifier would be the words “Potentially Hazardous Volatile Compounds” printed in two-inch letters.

7) All underground electrical conduits penetrating the slab or foundation of the building should be provided with a seal-off device as normally found on classified electrical installations. For purposes of design, sub-slab areas should be considered a Class 1 Division 2 hazardous area classification (NFPA 70 Article 500).

APPENDIX C
DIAGNOSTIC TESTING OF AIR FLOW CHARACTERISTICS BENEATH EXISTING BUILDINGS

Note: The content of this appendix is modified from the Massachusetts Department of Environmental Protection guidance entitled *Guidelines for the Design, Installation, and Operation of Sub-Slab Depressurization Systems* (1995).

The air flow characteristics and capacity of the material(s) beneath the slab should be quantitatively determined by diagnostic testing, a procedure analogous to conducting a soil vapor extraction pilot test. This is an important step in the SSD design process, and should always be performed prior to the design and installation of a SSD system. The objective of diagnostic testing is to investigate and evaluate the development of a negative pressure field, via the induced air flow beneath the existing building slab. This information is used to determine whether a low pressure/high flow or high pressure/low flow system is necessary, and to determine the number and location of necessary system extraction points.

The scope (or complexity) of the diagnostic testing is a function of the building size and the presence of structures that may interfere with air flow. For larger buildings, such as commercial buildings and school buildings, more extensive and involved sub-slab diagnostics are essential. Structures such as utility tunnel floors and walls, crawl spaces, internal continuous footings, and/or frost walls should be considered in the diagnostic evaluations, as they can impede air flow.

Diagnostic testing is conducted by drilling small diameter holes through a building slab, applying a vacuum to one hole (an extraction hole), and measuring pressure drops at surrounding test holes (observation holes). Extraction and observation holes should be placed in the most unobtrusive locations possible; utility rooms and closets are good choices. Care must be taken to avoid damaging sub-slab utilities or conduits. Generally, the extraction hole should be at least 3/4 inches in diameter and the test holes should be 3/8 to 5/8 inches in diameter. Test holes should be placed at representative locations, such that the size of the effective pressure field under the slab may be evaluated.

Typically, a "shop vacuum" unit is used to evacuate sub-slab air from the extraction hole. During the test, the extraction vacuum and flow rate should not exceed the capacity of potential SSD system fans. The pressure drop and flow rate at this extraction point should be monitored and recorded. Pressure drops at the test holes should be measured quantitatively with a pressure gauge (e.g., a magnehelic gauge).

The vacuum and flow rate of the “shop vacuum” used for testing should be recorded to provide an assessment of the testing parameters in conjunction with the test results. Literature regarding specifications for typical shop vacuums indicates a potential noise level of approximately 75 to 85 decibels. Therefore, the potential noise levels during testing procedures should be considered relative to impacts on building occupants and the need for worker hearing protection. An additional precaution during testing procedures is the consideration of the shop vacuum exhaust emissions. For health and

safety considerations, the shop vacuum exhaust should be directed to and vented outside of the building.

Atmospheric pressure may be of importance at sites where diagnostic testing indicates marginal negative pressure readings. In such cases, barometric pressure data should be obtained and reviewed for the day of testing, and previous several days. A trend of rising barometric pressure tends to promote advection of air into the ground, which may be falsely interpreted as a negative pressure field created during diagnostic tests. Where this concern exists, the testing should be repeated during a time of falling barometric pressures.

Two approaches may be used to monitor and document the development of a negative pressure field: pressure testing and smoke testing. Pressure testing provides a direct and quantitative means to measure a negative pressure field. However, in cases where very permeable fills/subsoils are present, large volumes of air can be moved with relatively little pressure drop, undetectable by even the most sensitive gauge. In these cases, the creation of a negative pressure field can be verified by smoke tests, which demonstrate the advection of smoke (air) into the ground (i.e., through the slab).

Following the test, the diagnostic extraction and test holes (and any leaked areas) should be sealed with a Portland cement grout, although at least one or two holes should be temporarily sealed with a removable sealant, such as caulk, until after installation of the final SSD system, in order to provide points to demonstrate establishment of a negative pressure field.

The diagnostic testing should also address the potential for back drafting both during the testing procedures and in consideration of the mitigation design. See Section 6.1.3 for additional discussion of back drafting considerations.