CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. R2-2018-0043

UPDATED SITE CLEANUP REQUIREMENTS and RESCISSION of ORDER No. 90-072 for:

JCI JONES CHEMICALS, INC.
100 SUNNY SOL BOULEVARD
CALEDONIA, NEW YORK 14423

for the property located at:

985 MONTAGUE EXPRESSWAY
MILPITAS, SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Regional Water Board), finds that:

1. **Site Location**: The former JCI Jones (Jones) facility was located at 985 Montague Expressway, Milpitas, as shown on Figure 1. For purposes of this Order, this location is considered the "source property" where an unauthorized release of contamination occurred to the environment. That contamination has subsequently migrated in the subsurface beyond the source property's boundaries. Therefore, the overall "Site" is defined as all properties affected by the extent of the contamination related to the unauthorized release from the former Jones facility.

   For consistency with historic information, the Site has been separated into the areas shown on Figure 2. These include On-Site Areas, a Near-Site Area, and Off-Site Areas. For historic reasons, the On-Site Areas included two sub-areas (On-Site Areas 1 and 2), and the Off-Site Areas included four sub-areas (Off-Site Areas 1–4). However, following review of historic groundwater monitoring data, there is no evidence that Off-Site Area 4 was ever affected by contamination from the former Jones facility. As such, it is not considered part of the Site and the requirements of this Order do not apply to it. Following is a more detailed description of the On-Site, Near-Site, and Off-Site Areas and the individual properties that comprise them.

   <u>On-Site Areas 1 and 2</u>
   These are located immediately east of South Milpitas Boulevard and encompass the former 4.6-acre Jones facility. These properties are currently owned by El Camino MV Holdings, LLC, and AE Montague, LLC, and are being redeveloped for commercial land use with slab-on-grade buildings for use as the Bay Rock Storage mini-storage facility.

   <u>Near-Site Area</u>
   The Near-Site Area is located immediately west of the On-Site Areas. It includes an approximate 1,100-foot stretch of Berryessa Creek, three small lots ranging in size from half an acre to two acres, and a rail spur. The Santa Clara Valley Water District owns the

smallest lot at the corner of South Milpitas Boulevard and Montague Expressway and has a 60-foot easement along Berryessa Creek. The Union Pacific Railroad owns the other two lots and the rail spur.

Off-Site Areas 1–3
These are located west of the Near-Site Area, within the City of Milpitas' Milpitas Transit Area (MTA) as defined by the June 2008 MTA Specific Plan (Figure 3). Note that the On-Site and Near-Site Areas abut the MTA boundary to the east but are outside its boundary.

2. **Site History**: JCI Jones Chemical, Incorporated, operated a chemical packaging and distribution facility at the Milpitas location (i.e., On-Site Areas 1 and 2, 985 Montague Expressway) from the early 1960s through 1999. Historically, the facility received bulk chemicals, including chlorine gas, sulfur dioxide, anhydrous ammonia, various acids and bases, and volatile organic compounds (VOCs) by rail or tank truck and repackaged these chemicals into cylinders or drums. On February 3, 1982, an aboveground storage tank containing an estimated 2,000 to 4,000 gallons of chlorinated solvent, including the chlorinated VOCs trichloroethene (TCE) and tetrachloroethene (PCE), exploded, releasing its contents to the ground, to Berryessa Creek via a storm drain, and to both On-Site and Off-Site Areas' groundwater. Initial cleanup of the release involved pumping and disposing of liquid from the storm drain and creek and excavating approximately 280 cubic yards of sediment from the creek bed. Since that time, Jones has been engaged in ongoing groundwater investigations, cleanup, and monitoring.

   Over the past 35 years, Jones has performed soil, soil-vapor, and groundwater investigation and remediation activities, all approved by the Regional Water Board. The Regional Water Board approved closure of the On-Site soil-vapor extraction and treatment system (SVETS) in December 1997 because soil cleanup goals had been achieved. The Regional Water Board also agreed to halting operation of the groundwater extraction and treatment system (GWETS) in 2002, after years of successful operation, due to diminishing returns.

3. **Site Use and Redevelopment:** The MTA Specific Plan describes the redevelopment of 437 acres that historically included several industrial properties near the Great Mall shopping center (Figure 3). It includes approximately 7,100 residential units, 340 hotel rooms, 994,000 square feet of office space, and 290,000 square feet of retail space around the Milpitas BART station. Consistent with the MTA Specific Plan, many of the properties within the Off-Site Areas have or are undergoing redevelopment for residential and commercial use. As a result, the potential risks posed by the contamination beneath the properties comprising the Off-Site Areas have changed. One specific concern is the potential vapor intrusion risk to occupants of planned or recently constructed residential and commercial buildings in the Off-Site Areas. To address this, buildings are designed and constructed (or retrofitted) with vapor intrusion mitigation systems (VIMS). Regional Water Board staff evaluate if and when VIMS are needed and may request that their necessity be recorded in a property deed (i.e., a "deed restriction").

Tables 1a through 1e describe the location, owner, and current or planned development/use for each property within the On-Site, Near-Site, and Off-Site Areas. The tables also describe if buildings on each property have or are required to have VIMS for protection of current or future building occupants and if such requirements have been recorded as deed restrictions.

Table 1a: Properties within the On-Site Areas

Location	Property Owner	Development/Use	Development Status	Vapor Intrusion Mitigation?	Deed Restrictions?
985 Montague Expressway	El Camino MV Holdings, LLC, and AE Montague, LLC	Bay Rock Storage, commercial use	Completed - unoccupied	Yes. Water Board staff have required a passive VIMS for commercial use buildings.	No

Table 1b: Properties within the Near-Site Areas

Location	Property Owner	Development/Use	Development Status	Vapor Intrusion Mitigation?	Deed Restrictions?
Lot with rail spur	Union Pacific Corporation	Recreational parks and trails	Completed - unoccupied	No. There are no habitable buildings constructed or planned.	No
Open Lot	Union Pacific Corporation	Recreational parks and trails	Completed - unoccupied	No. There are no habitable buildings constructed or planned.	No
Open Lot near Montague Expwy. and Milpitas Boulevard	Santa Clara Valley Water District	Unknown	Completed-unoccupied	No. There are no habitable buildings constructed or planned.	No

Table 1c: Properties within Off-Site Area 1

Location	Property Owner	Development/Use	Development Status	Vapor Intrusion Mitigation?	Deed Restrictions?
1401 S. Milpitas Boulevard	Pulte Home Company, LLC, and Metro Owners Association	Town, Rows, and Flats at Metro, 12.5-acre developments consisting of 257 single-family condominiums	Completed-occupied	Yes. Water Board staff have required an active VIMS for residential use buildings.	Yes
1256 Piper Drive	KB Home South Bay, Inc.	Piper Tower and Piper Townhomes, multi-family residential and high density/commercial space; 210 apartments, 2,900 square feet of commercial space, and 98 townhome units	Planned -under construction	Yes. Passive VIMS are planned for residential and commercial use buildings. Water Board staff are evaluating the need to upgrade the passive VIMS to active for residential and commercial use buildings.	Unknown
737 Montague Expressway	Lago Vista, Milpitas LLC SCS Development Co., 404 Saratoga Ave., Ste. 100, Santa Clara, CA 95050	High-density 4-acre residential development	Planned	No. Water Board staff are evaluating the need for an active VIMS for residential use buildings.	No
783 Montague Expressway	Jin & Yu, LLC 2868 Bruce Drive, Freemont, 94539	Planned residential development	Planned	No. Water Board staff are evaluating the need for an active VIMS for residential use buildings.	No
901/905 Montague Expwy., 1583/1589 S. Milpitas Boulevard	Russel Winslow 905 Montague Expressway, Milpitas	Planned high-density 2-acre residential development	Planned	No. Water Board staff are evaluating the need for a VIMS for residential use buildings.	No

Table 1d: Properties within Off-Site Area 2

Location	Property Owner	Development/Use	Development Status	Vapor Intrusion Mitigation?	Deed Restrictions?
1425 South Milpitas Boulevard	Metro Owners Association	Villas at Metro, 2.5-acre development of 46 single-family condominiums	Completed-occupied	Yes. Water Board staff have required an active VIMS for residential use buildings.	Yes
556 Barcelona Loop	Palazzo Owner's Association	Palazzo at Montague Village, 3.5-acre development of 94 townhomes	Completed-occupied	Yes. Water Board staff have required a passive VIMS for residential use buildings and are evaluating the need to upgrade the passive VIMS to active for residential use buildings.	Yes
1251 Merry Loop	Owned by current residents, managed by SCS Development Co., 404 Saratoga Ave., Ste. 100 Santa Clara, CA 95050	Amalfi Apartments, 4-acre development of 378 apartments	Completed-occupied	Yes. Water Board staff have required a passive VIMS for residential use buildings and are evaluating the need to upgrade the passive VIMS to active for residential use buildings.	Yes
Bob McGuire Park	City of Milpitas	Bob McGuire Park, 2.7-acre recreational use, one occupied structure	Completed-occupied	No. Water Board staff are evaluating the need for a VIMS for the recreational use building.	Unknown
PG&E substation	PG&E	Industrial use	Completed-unoccupied	No. There are no habitable buildings constructed or planned.	No
652 Amalfi Loop	Landsea Homes	Siena Townhomes, 3-acre development of 73 townhomes	Under construction	Yes. Water Board staff have required an active VIMS for residential use buildings.	Yes

Table 1e: Properties within Off-Site Area 3

Location	Property Owner	Development/Use	Development Status	Vapor Intrusion Mitigation?	Deed Restrictions?
The Great Mall of the Bay Area	The Simon Property Group	Commercial retail, approximately 200 stores	Completed-occupied	No. Water Board staff have determined that no VIMS is necessary.	No

4. **Named Discharger**: Jones is named as the Discharger because it owned and operated the On-Site Area when the discharge of chlorinated solvents occurred, affecting soil, soil vapor, and groundwater beneath the On-Site and Off-Site Areas, as described above, and potentially affecting the surface water of Berryessa Creek. The same pollutants used and discharged from Jones' operation are present in soil in the immediate vicinity of the release at the On-Site Areas as well as in soil vapor and groundwater beneath the On-Site Areas and downgradient of the Off-Site Areas. Jones had knowledge of the discharge or the activities that caused the discharge; legal control over the property from which the discharge occurred; and the ability to clean up and abate the discharge and/or prevent migration of the discharge to groundwater and the Off-Site Areas.

   Naming Additional Parties to this Order

   Tables 1a through 1e identify the properties affected by contamination from Jones. Owners of properties overlying contamination are routinely named as dischargers in cleanup orders to ensure access to contaminated property. Given the expanse of the contamination from the former Jones source property, the ongoing delineation, the urgency to adopt cleanup requirements to get remedial action started, and the number of properties impacted, the Regional Water Board is not naming these Off-Site owners as dischargers at this time. Regional Water Board staff has been in communication with many Off-Site property owners and expects that they will allow access to their property, as necessary, so that the Discharger can comply with the requirements of this Order. The Regional Water Board will consider amendments to this Order as necessary.

   The Regional Water Board also will consider amending this Order to name additional parties as dischargers if it obtains information indicating that other parties caused or permitted any waste to be discharged on the Site where it entered or could have entered waters of the state.

5. **Regulatory History**: Jones has been subject to the following Regional Water Board orders:

   Waste Discharge Requirements (Order No. 86-074)

   In 1986, the Regional Water Board adopted Order No. 86-074 requiring Jones to contain, cleanup, and monitor the contaminated groundwater plume and to monitor the effectiveness of its groundwater extraction containment system. The groundwater extraction system was pumping 20,000 to 50,000 gallons per day, which was treated and discharged to Berryessa Creek under National Pollutant Discharge Elimination System (NPDES) Permit CA0029771. At the time in 1986, the contaminated groundwater plume contained VOCs as high as 200 micrograms per liter (ug/L) TCE and extended approximately 1,200 feet downgradient to the northwest.

   Site Cleanup Requirements (Order No.89-162)

   In 1989, the Regional Water Board adopted Order No. 89-162, rescinding Order No.86-074. Order No. 89-162 required Jones to implement and evaluate a pilot study for soil vapor extraction and prepare a workplan for implementing final remedial actions. These tasks were required to contain further migration of the existing contamination and to

provide a substantive technical basis for designing and evaluating the effectiveness of the cleanup actions. At the time, the contaminated groundwater plume extended approximately 2,000 feet downgradient beneath the North American Transformer Site, Milpitas Business Park, and the former Ford Motor Company facility (now the Great Mall of the Bay Area). Order No. 89-162 set cleanup levels at 1 part-per-million (ppm) for total VOCs in soil and either the then-Department of Health Services (DHS) drinking water Action Level or the Maximum Contaminant Level (MCL) for groundwater.

Site Cleanup Requirements (Order No. 90-072)
In 1990, the Regional Water Board adopted Order No. 90-072, rescinding Order No. 89-162. Order No. 90-072 required Jones to evaluate the effectiveness of the soil vapor extraction, submit an Off-Site soil and groundwater sampling plan, implement interim plume containment and final remedial actions, and assess the effectiveness of plume containment. These tasks were necessary to address the threat posed by further migration of the existing soil and groundwater contamination and provide a substantive technical basis for designing and evaluating the effectiveness of the final cleanup actions. Order No. 90-072 set cleanup levels at 1 ppm for total VOCs in soil and either the then-DHS drinking water Action Level or the MCL for groundwater.

6. **Site Hydrogeology**: The Site is underlain by interbedded alluvial sediments composed of sand, gravel, silt, and clay. The uppermost 5 to 10 feet of the subsurface consists of fill material, which is composed of clay, gravely clay, sand, and gravel. Sediments underlying the fill material predominantly consist of clay, silty clay, and sandy clay, with variable amounts of sand and gravel. The clays encountered in soil borings contain intervals of sand ranging in thickness from several inches to approximately 11 feet. Sediments encountered in the borings from On-Site deeper-zone monitoring wells, which have total depths greater than approximately 70 feet below ground surface (bgs), indicate a relatively thick (between approximately 10- to 30-foot) layer of silty clay below a depth of about 65 feet bgs. The depth to groundwater beneath the Site is approximately 12 to 15 feet bgs. The subsurface has been divided into three water-bearing zones:

   - Shallow, extending to approximately 30 to 35 feet bgs
   - Intermediate, extending from approximately 50 to 65 feet bgs
   - Deep, greater than 75 to 95 feet bgs to at least 105 feet bgs

   Historical groundwater elevation data indicate that shallow groundwater generally flows toward the west-northwest. This is consistent with the ground surface topography. A consistent upward or downward vertical gradient between the shallow- and intermediate-depth wells has not been observed from groundwater elevation measurements. However, an upward gradient exists between the deeper and intermediate groundwater zones. The upward gradient has inhibited the migration of contaminants from the intermediate to the deep zone.

7. **Remedial Investigation**: The 1982 chlorinated solvent release at the former Jones facility impacted groundwater and soil vapor beneath the On-Site, Near-Site, and Off-Site Areas and the surface water and sediment within Berryessa Creek. Historically, the VOCs

detected in groundwater exceeding MCLs were 1,1,1-trichloroethane (1,1,1-TCA), PCE, TCE, and 1,1-dichloroethene (1,1-DCE). From 2007 to 2017, the highest groundwater sample VOC concentrations occurred in the Near-Site Area and Off-Site Area 1. Figure 4 shows that the extent of contaminants in groundwater exceeding MCLs extends from the On-Site Areas approximately 3,350 feet to the northwest beneath residential developments in the Off-Site Areas. Figure 5 shows the extent of potential TCE soil vapor contamination. Appendix A Tables A1, B1, C1, and D1 summarize the maximum concentrations of VOCs and in soil, soil vapor, and groundwater for the On-Site Areas, Off-Site Area 1, Off-Site Area 2, and Off-Site Areas 3 and 4, respectively.

On-Site and Near-Site Areas

Groundwater: Groundwater samples collected from 2014 to 2017 from On-Site Areas 1 and 2 and the Near-Site Area shallow-zone contained concentrations of PCE, TCE, cis-1,2 dichloroethene (cis-1,2-DCE), trans-1,2- dichloroethene (trans-1,2-DCE), 1,1-dichloroethane (1,1-DCA), vinyl chloride, and 1,1-DCE exceeding MCLs and/or the Regional Water Board's groundwater vapor intrusion Environmental Screening Levels (ESLs[1]). Additionally, groundwater samples in the vicinity of Berryessa Creek contained concentrations of PCE, TCE, 1,1-DCA, and 1,1-DCE exceeding freshwater habitat ESLs.

Soil Vapor: The most recent shallow soil vapor samples collected during 2006 contained concentrations of PCE, TCE, 1,1-DCA, vinyl chloride, and 1,1,1-TCA at or exceeding soil vapor ESLs for residential and commercial vapor intrusion exposure risk.

Off-Site Areas

Groundwater: Remedial investigations in the Off-Site Areas began in 1984. Results indicated that VOC-affected groundwater was present in a distribution pattern consistent with a plume emanating from the 1982 chlorinated solvent release at the former Jones facility. In 2002, a semiannual groundwater monitoring program was initiated to monitor VOC concentrations in groundwater following substrate injection events. This monitoring program is ongoing, and the compounds detected most frequently and at the highest concentrations to date have been 1,1,1-TCA, TCE, PCE, 1,1-DCE, and 1,1-DCA.

In December 2014 and May 2016, two membrane interface probe (MIP) investigations occurred. A total of thirteen MIP borings were installed within the On-Site and Near-Site Areas and Off-Site Area 1. The MIP borings targeted multiple depths from 16 to 34 feet bgs at the On-Site Area, from 13 to 41 feet bgs at the Near-Site Area, and from 14 to 34 feet bgs at the Off-Site Area 1. Results from Off-Site Area 1 indicated that multiple VOCs exceeded their respective MCLs.

[1] February 2016, Environmental Screening Levels, California Regional Water Quality Control Board, San Francisco Bay Region. The Environmental Screening Levels (ESL) provide conservative screening levels for over 100 chemicals commonly found at sites with contaminated soil and groundwater. They are intended to help expedite the identification and evaluation of potential environmental concerns at contaminated sites. ESLs address a range of media (soil, groundwater, soil gas, and indoor air) and a range of concerns (e.g., impacts to drinking water, vapor intrusion, and impacts to aquatic life).

Soil Vapor: In July and August 2009, a soil vapor survey was conducted to obtain data to assess if VOCs were off-gassing in the soil vapor beneath the Off-Site Area. Vapor samples were collected from depths of 5 and 10 feet bgs. Results indicated that soil vapor contained numerous VOCs. The presence and distribution of these VOCs in soil vapor were consistent with the groundwater VOC distribution in the Off-Site Area.

In May 2014, 6 additional soil vapor monitoring points were installed to approximate depths of 5 feet bgs on the Off-Site Areas. Soil vapor samples were collected from 12 monitoring points previously installed in 2009 and from the 6 new monitoring points. Like the 2009 sampling event, numerous VOCs were detected in samples. The majority of PCE and TCE concentrations detected exceeded their respective ESLs for the evaluation of potential vapor intrusion exposure risk under both the residential and commercial land use scenarios.

Results from the December 2014 and May 2016 MIP investigations also indicated that concentrations of PCE, TCE, cis-1,2-DCE, 1,1-DCE, and vinyl chloride exceeded their respective ESLs for the evaluation of potential vapor intrusion exposure risk under both residential and commercial land use scenarios.

8. **Screening Level Risk Assessment**:

a. **Screening Levels:** A screening level risk assessment (SLRA) was carried out to assess risks and threats to public health, safety, and the environment, identify potential data gaps, and evaluate the need for additional remedial action and/or risk management measures. The SLRA addressed contaminants found in groundwater, soil, and soil vapor. Contaminants of Concern (COCs) evaluated in the SLRA included PCE, TCE, 1,1-DCA, cis 1,2-DCE, trans 1,2-DCE, vinyl chloride, 1,1-DCE, 1,1,1-TCA, and 1,2-DCA.

Site data were compared to screening levels in Appendix A Tables A2 to A4, B2 and B3, C2 and C3, and D2. The 2016 Regional Water Board ESLs were used for all potential exposure pathways. However, for evaluation of potential risks to building occupants from the vapor intrusion pathway from contaminants in soil vapor and groundwater, soil gas screening levels are based on the 2016 residential and commercial/industrial indoor air ESLs divided by the U.S. EPA-recommended soil gas attenuation factor of 0.03 and groundwater attenuation factor of 0.001 (U.S. EPA, 2015[2]). Regional Water Board staff agree that this methodology is more protective of building occupants given the current understanding of the vapor intrusion pathway. This methodology is consistent with the expected revision to the 2016 ESLs.

ESLs for groundwater address the following environmental concerns: 1) drinking water impacts (toxicity and taste and odor), 2) impacts to indoor air, and 3)

[2] June 2015 U.S. EPA OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air

migration and impacts to aquatic habitats. ESLs for soil address direct exposure to humans. ESLs for soil vapor address impacts to indoor air.

ESLs for protection of human health due to contaminant exposure in any medium (i.e., soil, soil vapor, and groundwater) are based on an excess cancer risk of one in a million ($1x10^{-6}$) for carcinogens and a hazard quotient (HQ)[3] of greater than one (1.0) for non-carcinogens. Potential human health exposure pathways typically include inhalation, ingestion, and dermal contact. ESLs for the protection of aquatic habitats are based on promulgated surface water standards or other scientific sources.

b. **Screening Level Risk Assessment Results:** The SLRA results are included in Appendix A Tables A2 to A4, B2 and B3, C2 and C3, and D2 and are graphically presented as:

- Figure 4, Extent of Contaminants in Groundwater Exceeding Maximum Contaminant Levels;
- Figure 5, Potential Vapor Intrusion Hazard Due to Short-Term Exposure (TCE Only) Without Effective Vapor Intrusion Mitigation Systems; and
- Figure 6, Potential Vapor Intrusion Risk Due to Long-Term Exposure (All Contaminants) Without Effective Vapor Intrusion Mitigation Systems.

Figures 5 and 6 were prepared using two data sources: 1) the highest soil vapor concentrations from August 2006 for the On-Site Area, as presented in the May 2016 Site Management Plan for the On-Site Area (Arcadis, 2016) under a commercial/industrial-use scenario, and 2) the highest soil vapor concentrations from 2009-2015 presented in the October 2016 Groundwater Investigation and Vapor Extraction Data Summary Report (Arcadis, 2016) for Off-Site Areas under a residential-use scenario. In areas where no soil vapor data were available, the most recent groundwater concentrations were used to assess the potential off-gassing to soil vapor and soil vapor intrusion to indoor air. The highest soil gas results were used in the Off-Site Areas to reflect potential rebound conditions following shut-down of the soil vapor extraction system in 2015.

<u>Key findings from the SLRA:</u>

1) **Impacts to Groundwater Beneficial Uses:** Figure 4 summarizes the most recent COC concentrations in groundwater exceeding MCLs. It shows that concentrations of some COCs exceeding their respective MCLs extend from the source property approximately 3,350 feet downgradient to Off-Site Area 3. It also shows that concentrations of some COCs remain in groundwater beneath

[3] Hazard Quotient (HQ) is the non-carcinogenic ratio of the concentration of contaminant (TCE) divided by its respective ESL. A HQ of 1 or less is generally considered to be without potential adverse health effects. A HQ greater than 1 suggest further evaluation is necessary.

the On-Site Areas up to 100-times their respective MCLs and up to 1000-times their respective MCLs in groundwater beneath Off-Site Area 1.

Concentrations of some COCs in groundwater beneath the Near-Site Area near Berryessa Creek also exceed ESLs based on protection of freshwater habitat.

2) **Potential Vapor Intrusion Hazard Due to Short-Term Exposure:** Figure 5 shows the potential short-term exposure hazard (i.e., non-carcinogenic risk) to residential building occupants in the Off-Site Areas and commercial building occupants in the On-Site Areas from TCE in indoor air if vapor intrusion were to occur. For reference, a Hazard Quotient (HQ) greater than one indicates that COCs could pose an unacceptable health hazard. Non-carcinogenic hazard ESLs are set at the HQ = 1 threshold. TCE was chosen from all COCs detected in soil vapor as the lowest non-cancer hazard based on the short-term toxicity of this chemical (U.S. EPA, 2014)[4]. Figure 5 shows that the potential short-term hazard due to TCE in soil vapor and groundwater exceeds a HQ of 100 over a large portion of the commercial-use On-Site and residential-use Off-Site Areas and exceeds 1000 in some areas; this is equivalent to 100 times or 1000 times the non-carcinogenic ESL for TCE, respectively. The concentrations of TCE in soil vapor and groundwater beneath the On-Site and Off-Site Areas can pose a significant threat to occupants of overlying buildings.

3) **Potential Vapor Intrusion Risks Due to Long-Term Exposure:** Figure 6 shows the potential long-term exposure health risk (i.e., carcinogenic risk) to building occupants via indoor air due to all chemicals of concern (i.e., cumulative) if vapor intrusion were to occur. For reference, excess cancer risk greater than one in a million ($1x10^{-6}$) indicates that COCs could pose an unacceptable carcinogenic risk for one or more exposure pathways. Cumulative cancer risk is additive, based on each detected constituent. ESLs are typically set at the $1x10^{-6}$ risk threshold. Figure 6 shows that the potential long-term carcinogenic risk, due to all COCs in soil vapor and groundwater based on residential or commercial/industrial use, exceeds one in one thousand (1×10^{-3}) over a large portion of the On-Site and Off-Site Areas and exceeds one in one hundred (1×10^{-2}) in some areas. The concentrations of COCs in soil vapor and groundwater beneath the On-Site and Off-Site Areas pose a significant threat to occupants of overlying buildings.

4) **Potential Health Risks due to Direct Contact Soil Exposure:** Recent On-Site Area soil sampling results contained VOCs both above and below applicable ESLs, and more evaluation of the extent of On-Site Area soil contaminated with VOCs is necessary. Further evaluation is needed to assess risks and threats to public health and to evaluate the need for additional remedial action and/or risk

[4] July 9,2014, U.S. EPA Region 9 Response Action Levels and Recommendations to Address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion

management measures. Based on the conceptual site model, there is no concern for VOCs in shallow soil beneath the Off-Site Areas.

5) **Need for Further Investigation and Cleanup:** The results of the SLRA indicate that further cleanup of groundwater and soil vapor in the On-Site and Off-Site Areas is needed to reduce potential short and long-term risks to occupants of buildings due to the vapor intrusion pathway and to restore groundwater beneficial uses. Furthermore, the high level of potential short and long-term risk in the Off-Site Areas that are undergoing residential redevelopment must be addressed in an accelerated time frame. While Regional Water Board staff are working directly with many of the Off-Site Area property owners to evaluate appropriate vapor intrusion mitigation actions, accelerated investigation and cleanup actions are necessary to reduce exposure uncertainty and lessen reliance on operation, maintenance, and monitoring of VIMS over the long-term. Residential homeowners may not be well-equipped to manage VIMS, and uncertainty exists on their long-term effectiveness.

9. **Data Gap Evaluations for All Areas:** The following are considered data gaps that must be addressed. Without the information, the risks and threats to public health, safety, and the environment cannot be adequately assessed, nor can the need for remedial action and/or risk management measures be effectively evaluated.

Soil: The lateral and vertical extent of concentrations of PCE for On-Site Areas in soil from the 1982 solvent release exceeding ESLs protective of direct exposure to humans and protective of leaching to groundwater are not defined. The On-Site Areas have undergone grading activities during development, potentially redistributing this soil contaminated with VOCs. It is uncertain if stormwater runoff over this contaminated soil is impacting adjacent Berryessa Creek.

Surface Water: Potential impacts to Berryessa Creek from groundwater have not been evaluated. Concentrations of PCE, 1,1-DCA, cis 1,2-DCE, and 1,1-DCE in groundwater near Berryessa Creek exceed ESLs based on the protection of freshwater habitat. It is uncertain if contaminated groundwater is affecting Berryessa Creek or creek sediment, including any impact to freshwater habitat. Given that we know concentrations of VOCs in groundwater near Berryessa Creek exceed ESLs based on the protection of freshwater habitat, additional analyses of the groundwater interaction with the creek must be assessed.

Groundwater: As shown in Figure 4, the extent of groundwater contamination for Off-Site Area 1 exceeding ESLs near the Piper Tower and Townhomes development is not adequately characterized.

As shown in Figure 4, the extent of groundwater contamination for Off-Site Area 2 exceeding ESLs near the Urban Villas, Sienna Townhomes, and Amalfi Apartments is not adequately characterized.

Soil Vapor: The extent of soil vapor for On-Site Areas exceeding ESLs based on potential vapor intrusion exposure risk is not defined.

As shown in Figures 5 and 6, the extent of soil vapor contamination for Off-Site Area 1 exceeding ESLs based on potential vapor intrusion exposure risk is not defined beneath 737 Montague Expressway, 775 Montague Expressway, and 901 Montague Expressway.

As shown in Figures 5 and 6, the extent of soil vapor contamination for Off-Site Area 2 exceeding ESLs based on potential vapor intrusion exposure risk beneath the Sienna Townhomes, Amalfi Apartments and Palazzo Townhomes is not defined.

10. **Adjacent Sites**:

Former North American Transformer Facility

Prior to about 2005, much of Off-Site Area 2 was the location of the North American Transformer (NAT) facility (Figure 2) and its successor, Waukesha Electric Systems, Inc. NAT was constructed about 1967, and the property was sold to Citation Homes circa 2005. During that time, the property address was 1200 Piper Drive, Milpitas, and the facility was operated to manufacture and repair transformers and transformer cooling radiators. This overlaps with all or a portion of the properties listed in Table 1d.

NAT was named in a series of Regional Water Board cleanup orders (culminating in Order No. 96-083), because it owned the property when contaminant discharges occurred from the NAT facility. COCs included VOCs, polychlorinated biphenyls, and total petroleum hydrocarbons (TPH) in soil and groundwater. The cleanup orders required investigation and cleanup in the Bay 1 Area and the transformer oil pipeline area, where free-phase TPH was discovered on the groundwater table.

In 2005, a Removal Action Plan was implemented to reduce contaminant concentrations in soil due to a release of transformer oil to cleanup levels based on proposed residential redevelopment plans. Over 5,000 tons of contaminated soil were removed from 17 excavations. Results of bottom-of-excavation confirmation samples from 2 excavations indicated residual TPH-diesel concentrations of 7,500 mg/kg and 13,000 mg/kg and TPH-transformer oil concentrations of 7,800 mg/kg and 12,000 mg/kg. Further excavation was restricted due to the presence of groundwater. Soil samples at the excavation bottom were not analyzed for chlorinated solvents; therefore, the nature and extent of residual chlorinated solvent contamination in soil, soil vapor, and groundwater are unknown.

On September 15, 2005, a Covenant and Environmental Restriction on the Property, signed by Waukesha and the Regional Water Board, was recorded. The deed restriction required vapor intrusion mitigation as part of any future building construction and prohibited extraction, use, and contact with the shallow groundwater at the Site.

Former Ford Motor Company Assembly Plant

The former Ford Motor Company (Ford) assembly plant encompassed approximately 154 acres, which is now, in part, the location of the Great Mall of the Bay Area. Ford purchased the property in 1953 from Western Pacific Railroad. The building that currently exists was formerly used for the assembly plant and now houses the Great Mall of the Bay Area.

Industrial activities at the assembly plant by Ford included the use of solvents, paints and thinners, as well as lube and hydraulic oils. During the operation of the Ford facility, petroleum releases from the Executive Vapor Tank and Pump Number 1 Areas occurred, which impacted shallow groundwater with TPH beneath the property.

Remedial investigation at the property began in 1982 to address two separate hydrocarbon plumes: one originating in the former underground storage tank area from a paint thinner leak, and another originating in the Executive Vapor Tank Area. In addition, low level groundwater pollution was detected in the northeast portion of the property associated with the wastewater lagoons. Ford installed an extraction trench at the downgradient side of the property to insure containment of the hydrocarbon plumes on its property.

11. **Previous Remedial Measures**: From October 1984 to December 2002, a groundwater extraction and treatment system operated at the On-Site and Off-Site Areas. The system extracted and treated approximately 793 million gallons of groundwater, which were treated and discharged to Berryessa Creek pursuant to NPDES Permit CAG912003. In December 2002, the system became inoperable due to vandalism, and, due to concentration reductions and diminishing returns in continued operation of the system, it was shut down and removed. However, significant concentrations of VOCs remain in soil vapor and groundwater above screening levels exceeding ESLs protective of human health and the environment and MCLs as shown on Figures 4 through 6.

    From April 1990 to January 1998, a soil vapor extraction (SVE) system operated in the On-Site Area. Beginning in March 1995, the SVE system was operated intermittently or in “pulse mode” to allow dissolved concentrations of VOCs in groundwater to off-gas. Accumulated vapors were subsequently removed when the SVE system was restarted. A total of approximately 4,100 pounds of VOCs were removed by the SVE system during its operation. However, significant concentrations of VOCs remain in soil vapor above screening levels protective of human health through the vapor intrusion pathway.

    Between 2002 and 2010, enhanced reductive dechlorination (ERD) was initiated at the On-Site and Off-Site Areas through the injection of a substrate (cheese whey) into the former groundwater extraction wells and monitoring wells to accelerate the cleanup of VOCs in groundwater by enhancing conditions to reduce VOC concentrations. In 2008, emulsified soybean oil replaced cheese whey as the substrate. Groundwater data have confirmed that the ERD process within the shallow and intermediate zones is transforming the VOCs from TCE to cis-1,2-DCE, vinyl chloride, and finally to ethane,

ethene, and methane; however, significant concentrations of VOCs remain in groundwater above MCLs and screening levels protective of human health through the vapor intrusion pathway.

From 2014 to 2015, a temporary vapor extraction system was installed before development in the Off-Site Area 1 in the vicinity of the Flats, Rows, and Towns at Metro development to address VOCs from the underlying groundwater. In April 2015, the property owner at the time (Milpitas Station, LLC) asked Jones to discontinue SVE in these areas of the property to accommodate development. At the time of shutdown, the SVE system was effectively removing pounds of VOCs per day of operation; however, significant concentrations of VOCs remain in soil vapor above screening levels protective of human health through the vapor intrusion pathway. To date, Jones has not replaced the SVE system, and Regional Water Board staff are unaware of any efforts to replace the earlier SVE system with a new system that works around the development (e.g., providing access to equipment in streets or alleys).

12. **Revised Remedial Action Plan**: The May 15, 2015, *Revised Remedial Action Plan, Addendum – Off-Site Area 1 and Southern Portion of Area 2* (2015 Off-Site RAP), proposes the following:

Remedial Action Objectives

- Actively remediate groundwater to the extent feasible and to where it is no longer a significant source of vapor impact and to levels at which natural attenuation will eventually restore water quality to the most stringent of either background levels, the DHS drinking water Action Level or MCL.
- Mitigation measures and remedial activities consisting of actively venting utility corridors to meet the cleanup levels will be incorporated by others into the development of the Milpitas Station residential developments.
- After development activities are initiated, future remedial activities will be limited to approved vapor mitigation in designated common areas such as utility corridors.

Proposed Indoor Air Remedial Action Objectives

- Reduce VOC concentrations in vapor emanating from groundwater by vapor extraction while Off-Site Area developers allow access.
- Mitigate vapor intrusion of VOCs from shallow groundwater to eliminate potential future exceedances of indoor air ESLs in Off-Site Area buildings.
- Implement passive venting to facilitate natural attenuation of soil vapor to reduce concentrations to ESLs or the extent feasible over time.

Remedial Action Plan

- In-situ bioremediation of groundwater only to limited areas within the Near-Site Area and limited areas within Off-Site Area 1 and On-Site Areas 1 and 2 adjacent to Berryessa Creek.

- Extraction of soil vapor from shallow groundwater dependent on access and time constraints from developments (discontinued April 30, 2015).
- Monitored natural attenuation (MNA) of groundwater and eventual low-threat closure. Groundwater monitoring, if required, will be conducted at wells installed outside of the Milpitas Station project area.
- Active and passive venting and vapor monitoring through utility corridors to reduce VOC concentrations.
- Passive vapor barriers and passive venting within new buildings to reduce vapor intrusion into the residences.
- Placement of compacted soil beneath the developments, which will reduce vapor intrusion into the structures.
- Deed restrictions prohibiting disturbance of mitigation infrastructure including the utility corridor venting system, vapor barriers, and passive venting system within new buildings.

13. **Deficiencies of the 2015 Off-Site RAP:** The 2015 Off-Site RAP is no longer adequate based on the Site's conditions for the following reasons:

a. Due to recent and ongoing construction of residences within the Off-Site Area where TCE is present, the high level of potential risk due to short and long-term exposure in this area must be addressed in an accelerated time frame. While Regional Water Board staff are working directly with many of the Off-Site Area property owners to evaluate appropriate vapor intrusion mitigation actions, accelerated investigation and cleanup actions are necessary to reduce exposure uncertainty and lessen the reliance on VIMS over the long-term. Given the COC concentrations and potential risks, as summarized in Findings 6 and 7, and particularly the short-term hazard due to TCE previously noted, the long timeframe associated with MNA to effectively reduce soil-vapor contaminant concentrations while relying on the uncertain long-term effectiveness of VIMS is unacceptable. Lastly, many residential homeowners may not be well-equipped to manage VIMS.

b. Soil vapor extraction, a proven effective and feasible remedial method at the Site to reduce soil vapor contaminant concentrations, was not proposed, although it was used with some success from 2014 to 2015 until Jones shut off and removed the SVE system to accommodate demolition and construction at the Milpitas Station property.

c. Since the removal of the monitoring well network to accommodate development, no new monitoring wells have been proposed to verify the effectiveness of the proposed remedial actions.

d. The 2015 Off-Site RAP relies on other On-Site and Off-Site Area land owners to record property deed restrictions to implement VIMS.

14. **State Water Board Policies**

a. **General**: State Water Resources Control Board (State Water Board) Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge. It requires maintenance of background levels of water quality unless a lesser water quality is consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses, and will not result in exceedance of applicable water quality objectives. This Order and its requirements are consistent with Resolution No. 68-16.

State Water Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304," applies to this discharge. It directs the Regional Water Boards to set cleanup levels equal to background water quality or the best water quality which is reasonable, if background levels cannot be restored. Based upon current technology, it is unlikely that background levels can be restored. The cleanup levels established in this Order represent the best water quality that can be achieved considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible, and applies Title 23 of the California Code of Regulations (CCR Title 23), section 2550.4, as described below; are consistent with the maximum benefit to the people of the State; will not unreasonably affect present and anticipated beneficial uses of such water; and will not result in exceedance of applicable water quality objectives. This Order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

CCR Title 23 section 2550.4 applies to all determinations of alternative cleanup levels, such as the preliminary cleanup levels described in this Order, for unpermitted discharges to land of hazardous waste, pursuant to Resolution No. 92-49. This section governs all impacted media (including groundwater, surface water, and the unsaturated zone) and only allows the Regional Water Boards to establish concentration limits above background for COCs where the constituent will not pose a substantial present or potential hazard to human health or the environment. The Regional Water Boards must ensure that the aggregate of hazardous constituents in the environment will not result in excessive exposure to a sensitive biological receptor. This Order and its requirements are consistent with section 2550.4.

b. **Beneficial Uses**: The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Regional Water Board and approved by the State Water Board, the Office of Administrative Law, and U.S. EPA, where required.

Regional Water Board Resolution No. 89-39, "Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for Areas of high TDS, low yield, or naturally-high contaminant levels. Groundwater underlying and adjacent to the Site qualifies as a potential source of drinking water.

The Basin Plan designates the following potential beneficial uses of groundwater underlying and adjacent to the Site:

o Municipal and domestic water supply
o Industrial process water supply
o Industrial service water supply
o Agricultural water supply
o Freshwater replenishment to Berryessa Creek surface waters

Section 2.2.1 of the Basin Plan indicates that, under the Tributary Rule, the beneficial uses of any specifically identified water body generally applies to its tributary streams. Existing and potential beneficial uses of waters at and adjacent to the Site include the following:

- **Upper Berryessa Creek:** Warm Freshwater Habitat (WARM), Wildlife Habitat (WILD), Water Contact Recreation (REC-1), and Noncontact Water Recreation (REC-2)
- **Los Coches Creek:** Preservation of rare and endangered species (RARE), WARM, WILD, REC-1, and REC-2
- **Piedmont Creek:** WARM, WILD, REC-1, and REC-2

Upper Berryessa Creek is tributary to Lower Penitencia Creek, Calera Creek, and Tularcitos Creek. The Basin Plan designates WARM, WILD, REC-1, REC-2, and Navigation (NAV) to these creeks. These creeks, in turn, flow into Coyote Creek, a tributary to San Francisco Bay. The beneficial uses of Lower Penitencia Creek are the same as for Upper Berryessa Creek. Some of the beneficial uses of Coyote Creek, which also apply to Upper Berryessa Creek by the Tributary Rule, include migration habitat (MIGR), spawning habitat (SPWN), preservation of rare and endangered species (RARE), and cold-water habitat (COLD).

The beneficial uses of Berryessa Creek are as follows:

o Municipal and domestic supply
o Agricultural supply
o Industrial process supply or service supply
o Groundwater recharge
o Water contact and non-contact recreation
o Wildlife habitat
o Cold freshwater and warm freshwater habitat

o Fish migration and spawning
o Navigation
o Preservation of rare and endangered species

15. **Preliminary Cleanup Levels**: Pending the establishment of site-specific cleanup levels, preliminary cleanup levels are needed for conducting remedial investigation and interim remedial actions. These levels should address all relevant media (e.g., groundwater, soil, soil vapor, and indoor air) and all relevant concerns (e.g., groundwater ingestion, migration of groundwater to surface waters, and vapor intrusion).

    a. **Basis for Preliminary Groundwater Cleanup Levels**: The groundwater cleanup levels for the Site are based on applicable water quality objectives and are the more stringent of: 1) U.S. EPA and California primary MCLs, 2) freshwater habitat goals, and 3) groundwater vapor intrusion screening levels (residential and commercial/industrial land use). Cleanup to this level will protect beneficial uses of groundwater and will result in acceptable residual risk to humans and the environment.

    b. **Basis for Preliminary Soil Cleanup Levels**: The soil cleanup levels for the Site are based on the screening levels intended to prevent unhealthy exposure to contaminated soil based on human health screening levels (soil direct exposure). Cleanup to this level will result in acceptable residual risk to humans.

    c. **Basis for Preliminary Soil Vapor Cleanup Levels**: The soil vapor cleanup levels for the Site are intended to prevent vapor intrusion into occupied buildings above acceptable levels.

16. **Future Changes to Cleanup Levels**: If new technical information indicates that the established cleanup levels are significantly over-protective or under-protective, the Regional Water Board will consider revising those cleanup levels.

17. **Risk Management**: The Regional Water Board considers the following human health risks to be acceptable at remediation sites: a HQ of 1.0 or less for non-carcinogens and a cumulative excess cancer risk of 1×10^{-6} or less for carcinogens.

    As indicated in Finding 8b and Figure 5, the HQ due to vapor intrusion of TCE from soil vapor and groundwater exceeds 100 over a large portion of the On-Site and Off-Site Areas and exceeds 1000 in some Off-Site Areas with residential use. As indicated in Finding 8b and Figure 6, the cumulative excess cancer risk exceeds one in one thousand (1×10^{-3}) over a large portion of the On-Site and Off-Site areas and exceeds one in one hundred (1×10^{-2}) in some Off-Site Areas with residential use. Therefore, to protect the health and safety of current and future occupants of residential and commercial buildings, VIMS are needed wherever an unacceptable potential vapor intrusion risk exists to building occupants.

As indicated in Finding 8b and Figure 4, concentrations of some COCs in groundwater exceed 100-times their respective MCLs under part of the On-Site and Off-Site Areas and up to 1000-times their respective MCLs under part of Off-Site Area 1. Therefore, to protect public health, safety, and the environment, the use of shallow groundwater beneath the Site must be prohibited until cleanup levels are met.

Furthermore, deed restrictions may be necessary where the presence of hazardous substances renders a property unsuitable for unrestricted use, and recording restrictions will ensure protection of public health, safety, and the environment. In addition to notifying current and future owners of sub-surface contamination, deed restrictions may be necessary to:

a. Prohibit sensitive uses of a property, such as for residences and daycare centers;
b. Prohibit buildings without appropriate VIMS;
c. Prohibit the use of shallow groundwater beneath the Site; and/or
d. Require management or other actions to protect mitigation and remediation measures.

18. **Reuse or Disposal of Extracted Groundwater**: Regional Water Board Resolution No. 88-160 allows discharges of extracted, treated groundwater from site cleanups to surface waters only if it has been demonstrated that neither reclamation nor discharge to the sanitary sewer is technically and economically feasible.

19. **Basis for 13304 Order and 13267 Requirements**: Water Code section 13304 authorizes the Regional Water Board to issue orders requiring a discharger to cleanup and abate waste where the discharger has caused or permitted waste to be discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of contamination or nuisance. As discussed in Finding 2 above, Jones meets these criteria. Water Code section 13267 provides that "… the regional board may require that any person who has discharged, discharges, or who is suspected of having discharged or discharging, or who proposes to discharge waste ... that could affect the quality of waters ... shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires." The burden of preparing the reports required herein, including costs, bears a reasonable relationship to the need for the report and the benefits to be obtained, namely ensuring the protection of human health and the environment, as described in the findings above.

20. **Cost Recovery**: Pursuant to Water Code section 13304, the Discharger is hereby notified that the Regional Water Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Regional Water Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order.

21. **California Safe Drinking Water Policy:** It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy

by requiring discharges to be remediated such that MCLs (designed to protect human health and ensure that water is safe for domestic use) are met in existing and future supply wells.

22. **CEQA**: This Order requires investigations and remediation of contamination. Investigations are categorically exempt from CEQA pursuant to CEQA guideline 15306 (information collection). It is premature to evaluate possible remedial options which Jones may implement, but it is anticipated that Jones will continue to use SVE and ERD in the On-Site and Off-Site Areas. Both technologies are standard in the industry and only impact the subsurface. SVE involves applying a vacuum to the unsaturated vadose-zone to extract contaminated vapor. ERD involves mainly adding benign substances to the subsurface for in-situ remediation. The project will have no potential for significant environmental effects, and the activities will have a beneficial effect of supporting site cleanup and removing threats to human health and the environment. The project is therefore exempt from CEQA pursuant to the general rule that CEQA only applies to projects that have the potential for causing a significant effect on the environment (Cal. Code Regs., tit. 15, § 15061, subd. (b)(3) [also known as the "common sense" exemption].)

23. **Notification**: The Regional Water Board has notified the Discharger and all interested agencies and persons of its intent under Water Code section 13304 to prescribe site cleanup requirements for the discharge and has provided them with an opportunity to submit their written comments.

24. **Public Hearing**: The Regional Water Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to sections 13304 and 13267 of the Water Code, that the Discharger (or its agents, successors, or assigns) shall clean up and abate the effects described in the above findings as follows:

A. **PROHIBITIONS**

1. The discharge of wastes or hazardous substances in a manner that will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.

2. Further significant migration of wastes or hazardous substances through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup that will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. **PRELIMINARY CLEANUP LEVELS**

The following preliminary cleanup levels shall be used to guide remedial investigation and interim remedial actions, pending establishment of Site-specific cleanup levels. These preliminary cleanup levels are based on the 2016 ESLs as defined in Finding 8a.

1. **Groundwater Cleanup Levels**: The following groundwater cleanup levels are for protection of human health and freshwater habitats:

Contaminant	Drinking Water MCL[1] (ug/L)	Groundwater Vapor Intrusion for Residential Land Use (ug/L)	Groundwater Vapor Intrusion for Commercial Land Use (ug/L)	Freshwater Habitat Goals[2] (ug/L)
PCE	5	0.64	2.8	120
TCE	5	1.2	7.5	360
1,1-DCA	5	7.6	33	47
Cis-1,2 DCE	6	490	210	590
Trans-1,2 DCE	10	220	920	590
Vinyl chloride	0.5	0.0086	0.14	780
1,1-DCE	6	66	280	25
1,1,1-TCA	200	1,500	6,300	62
1,2-DCA	0.5	2.2	98	10,000

[1] Applicable in all areas
[2] Applicable On-Site and Near-Site Areas adjacent to Berryessa Creek, considers freshwater habitat goals

2. **Soil Cleanup Levels**: The following soil cleanup levels are for protection of human health:

Contaminant	Direct Contact for Residential Use Screening Level (mg/kg)	Direct Contact for Commercial/Industrial Use Screening Level (mg/kg)
PCE	0.59	2.7
TCE	0.95	6.1
1,1-DCA	3.6	16
Cis-1,2 DCE	19	85
Trans-1,2 DCE	130	600
Vinyl chloride	0.0083	0.15
1,1-DCE	83	350
1,1,1-TCA	170	7,300

3. **Soil Vapor Cleanup Levels**: The following soil vapor cleanup levels are for protection of human health:

Contaminant	Vapor Intrusion for Residential Use Screening Level ($\mu g/m^3$)	Vapor Intrusion for Commercial/Industrial Use Screening Level ($\mu g/m^3$)
PCE	15	67
TCE	16	100
1,1-DCA	58	260
Cis-1,2 DCE	280	1,200
Trans-1,2 DCE	2,800	12,000
Vinyl chloride	0.32	5.2
1,1-DCE	2,400	10,000
1,1,1-TCA	35,000	150,000

C. **TASKS**

1. **REMEDIAL INVESTIGATION WORK PLANS**

Submit the below described remedial investigation work plans, acceptable to the Executive Officer, to define the vertical and lateral extent of subsurface contamination in soil vapor, groundwater, and surface water in the On-Site and Off-Site Areas. Delineation must be based on the preliminary cleanup levels presented in Section B or other Regional Water Board staff approved site-specific cleanup levels developed for this purpose.

1a. OFF-SITE AREAS SOIL VAPOR INVESTIGATION WORK PLAN

COMPLIANCE DATE: NOVEMBER 1, 2018

The Off-Site Areas Soil Vapor Investigation Work Plan shall propose methods to investigate and characterize soil vapor contamination to address the data gaps discussed in Finding 9, assess the vapor intrusion threat to occupants of all current or planned structures in the Off-Site Areas, and support development of a soil vapor remedial action plan to achieve cleanup levels.

This work plan shall be designed so that its implementation produces the site data needed to assess contamination threats to human health and the environment. It shall specify investigation methods and a proposed time schedule. Work may be phased to allow the investigation to proceed efficiently if this does not delay compliance. Investigation of Off-Site Areas where there are structures without VIMS in place shall be prioritized over areas with structures with functioning VIMS.

1b. ON-SITE AREAS SOIL VAPOR INVESTIGATION WORK PLAN

COMPLIANCE DATE: NOVEMBER 1, 2018

The On-Site Areas Soil Vapor Investigation Work Plan shall propose methods to investigate and characterize soil vapor contamination to address the data gaps discussed in Finding 9, assess the vapor intrusion threat to occupants of all current or planned structures in the On-Site Areas, and support development of a soil vapor remedial action plan to achieve cleanup levels.

This work plan shall be designed so that its implementation produces the site data needed to assess contamination threats to human health and the environment, or it shall compile and present existing information that adequately demonstrates the areas needing remediation. It shall specify investigation methods and a proposed time schedule. Work may be phased to allow the investigation to proceed efficiently if this does not delay compliance. Investigation of On-Site Areas where there are structures without VIMS in place shall be prioritized over areas with structures with functioning VIMS.

1c. GROUNDWATER AND SURFACE WATER INVESTIGATION WORK PLAN

COMPLIANCE DATE: NOVEMBER 1, 2018

The Groundwater and Surface Water Investigation Work Plan shall propose methods to investigate and characterize groundwater contamination to address the data gaps discussed in Finding 9, define the extent of groundwater impacts, and support development of a remedial action plan to achieve cleanup levels. The proposed methods must be capable of providing the necessary data density to identify the extent of contamination that exceeds the preliminary cleanup levels and adequately characterize chlorinated solvents in groundwater to reduce uncertainty, reduce long-term costs, and avoid inefficient or ineffective remedies considering heterogeneous geologic conditions within the three water-bearing zones.

Additionally, the work plan shall propose methods to investigate and characterize potential impacts to Berryessa Creek to address the data gaps discussed in Finding 9. The work plan shall propose methods to determine if Berryessa Creek is a gaining or losing creek to determine the optimal areas for potential contaminant discharge and movement.

1d. ON-SITE SOIL INVESTIGATION WORK PLAN

COMPLIANCE DATE: NOVEMBER 1, 2018

The On-Site Soil Investigation Work Plan shall propose methods to investigate and characterize soil contamination to address data gaps discussed in Finding 9, assess the direct exposure risk to site occupants, and support development of a remedial action plan, if necessary.

2. **COMPLETION OF REMEDIAL INVESTIGATIONS**

2a. OFF-SITE AREAS SOIL VAPOR INVESTIGATION COMPLETION REPORT

COMPLIANCE DATE: MAY 1, 2019

2b. ON-SITE AREAS SOIL VAPOR INVESTIGATION COMPLETION REPORT

COMPLIANCE DATE: MAY 1, 2019

2c. GROUNDWATER COMPLETION REPORT

COMPLIANCE DATE: MAY 1, 2019

2d. ON-SITE SOIL INVESTIGATION WORK PLAN COMPLETION REPORT

COMPLIANCE DATE: MAY 1, 2019

Complete tasks in the Task 1 work plans and submit completion of remedial investigation reports acceptable to the Executive Officer.

These technical reports shall define the vertical and lateral extent of contamination to the preliminary cleanup levels and contain recommendations for additional remedial investigation to address any data gaps.

Groundwater sampling data shall be presented in appropriate tables and figures prepared for one or more key contaminants for each water-bearing zone and for soil vapor at multiple depths, as appropriate. Groundwater and soil vapor data shall be presented graphically, using typical methods such as cross-sections for transects to show contaminant distribution at depth.

3. **REMEDIAL ACTION PLAN FOR SOIL VAPOR**

COMPLIANCE DATE: AUGUST 1, 2019

Submit an Remedial Action Plan for Soil Vapor (RAP-SV), acceptable to the Executive Officer, to expeditiously cleanup soil vapor beneath On- and Off-Site Areas to the preliminary cleanup levels (or approved site-specific cleanup levels) for all contaminants. At a minimum, the RAP-SV shall consider SVE because it is a proven remedial alternative at the Site for addressing contaminants in soil vapor.

The RAP-SV shall include:

a. Summary of soil vapor remedial investigations
b. Recommended soil vapor remedial actions
c. Implementation tasks and time schedule

The RAP-SV shall prioritize cleanup in residential Off-Site Areas with no VIMS, followed by areas with VIMS.

4. **IMPLEMENTATION OF RAP-SV**

COMPLIANCE DATE: FEBRUARY 1, 2020

Submit a report, acceptable to the Executive Officer, documenting implementation of the RAP-SV. The report shall document system start-up (as opposed to completion) and shall present initial results on system effectiveness (e.g., capture zone or area of influence).

5. **RAP-SV EFFECTIVENESS EVALUATION**

COMPLIANCE DATE: MAY 1, 2020, AND
ANNUALLY THEREAFTER

Submit a technical report acceptable to the Executive Officer proposing to evaluate the effectiveness of the approved RAP-SV. The report shall include:

a. Summary of effectiveness in reducing soil vapor concentrations at a minimum of two depths to the cleanup levels for all contaminants
b. Optimal monitoring locations in the immediate vicinity of all occupied structures located at the On-Site and Off-Site Areas where soil vapor exceeds cleanup levels
c. Comparison of soil vapor contaminant concentration trends with cleanup levels
d. Performance data (e.g., chemical mass removed)
e. Summary of additional investigations (including results) and significant modifications to remediation systems
f. Additional remedial actions proposed to meet cleanup levels, including time schedule

6. **GROUNDWATER MONITORING PLAN**

COMPLIANCE DATE: AUGUST 1, 2019

Submit a Groundwater Monitoring Plan, acceptable to the Executive Officer, for the On-Site and Off-Site Areas based on the Task 2 Completion of Remedial Investigation reports. The workplan shall propose a sufficient density of monitoring wells for the following purposes:

- Monitoring groundwater contamination exceeding cleanup levels in the three water-bearing zones to establish base-line conditions; and
- Monitoring groundwater contamination at locations necessary to show effectiveness of future remedial actions

7. **FEASIBILITY EVALUATION FOR SOURCE REMEDIAL ALTERNATIVES**

COMPLIANCE DATE: AUGUST 1, 2020

Submit a work plan, acceptable to the Executive Officer, for preparation of a feasibility study. The feasibility study work plan shall propose remedial alternatives to cleanup soil and groundwater to the preliminary cleanup levels (or other approved site-specific cleanup levels) in all areas where cleanup levels are exceeded. The work plan shall evaluate remedial alternatives that reduce potential exposure to the sensitive receptors to the extent practicable until the cleanup levels are met. For each remedial alternative proposed, include an estimated cleanup time frame.

The work plan shall include projections of costs, effectiveness, benefits, and impact on public health, welfare, and the environment of each remedial alternative action.

8. **REMEDIAL ACTION PLAN FOR SOURCE CONTAMINATION**

COMPLIANCE DATE: FEBRUARY 1, 2021

Submit an Remedial Action Plan for Source Contamination (RAP-SC), acceptable to the Executive Officer, that proposes the selected remedial alternative from the feasibility

evaluation to cleanup soil and groundwater to the preliminary cleanup levels (or other approved site-specific cleanup levels) in all areas where cleanup levels are exceeded. At a minimum, it shall include:

a. Summary of remedial investigations and monitoring results
b. Summary of risk assessment (optional)
c. Summary of soil vapor remedial actions
d. Summary of feasibility study evaluating the proposed remedial actions
e. Recommended remedial actions and cleanup levels
f. Implementation tasks and time schedule

The RAP-SC must propose remedial work that has a high probability of eliminating unacceptable threats to human health and restoring beneficial uses of water in a reasonable timeframe.

9. **IMPLEMENTATION OF RAP-SC**

COMPLIANCE DATE: AUGUST 1, 2021

Submit a report, acceptable to the Executive Officer, documenting implementation of the RAP-SC. The report shall document system start-up (as opposed to completion) and shall present initial results on system effectiveness (e.g., capture zone or area of influence).

10. **RAP-SC EFFECTIVENESS EVALUATION REPORTS**

COMPLIANCE DATE: AUGUST 1, 2022, AND
EVERY THREE YEARS THEREAFTER

Submit a technical report, acceptable to the Executive Officer, evaluating the effectiveness of the approved RAP-SC. The report shall include:

a. Summary of effectiveness in controlling contaminant migration and protecting human health and the environment
b. Comparison of contaminant concentration trends with cleanup levels
c. Comparison of anticipated versus actual costs of cleanup activities
d. Performance data (e.g., groundwater volume extracted, chemical mass removed, and mass removed per million gallons extracted)
e. Cost effectiveness data (e.g., cost per pound of contaminant removed)
f. Summary of additional investigations (including results) and significant modifications to remediation systems
g. Additional remedial actions proposed to meet cleanup levels (if applicable) including time schedule

If cleanup levels have not been met and are not projected to be met within a reasonable time, the report shall assess the technical practicability of meeting cleanup levels and may propose an alternative cleanup strategy.

11. **SITE-SPECIFIC RISK ASSESSMENT (OPTIONAL)**

Submit a technical report, acceptable to the Executive Officer, comprising either a screening level evaluation or a site-specific risk assessment. The report shall include a conceptual site model (i.e., identify contaminants, media, pathways, and receptors where site contaminants pose a potential threat to human health or the environment). The results of this report will help establish acceptable exposure levels to be used in developing remedial alternatives.

12. **PROPOSED CURTAILMENT**

COMPLIANCE DATE: 60 days prior to proposed curtailment

Submit a technical report, acceptable to the Executive Officer, containing a proposal to curtail remediation. Curtailment includes system closure (e.g., well closure), system suspension (e.g., cease extraction but wells retained), or significant system modification (e.g., major reduction in extraction rates, closure of individual extraction wells within extraction network). The report shall include the rationale for curtailment. Proposals for final closure shall demonstrate that cleanup levels have been met, contaminant concentrations are stable, and contaminant migration potential is minimal.

13. **IMPLEMENTATION OF CURTAILMENT**

COMPLIANCE DATE: 60 days after Executive Officer approval of proposed curtailment

Implement the approved curtailment and submit a technical report, acceptable to the Executive Officer, documenting completion of the tasks identified in the proposed curtailment report.

14. **EVALUATION OF NEW HEALTH CRITERIA**

COMPLIANCE DATE: 90 days after evaluation report required by Executive Officer

Submit a technical report, acceptable to the Executive Officer, evaluating the effect on the approved remedial action plan of revising one or more cleanup levels in response to revision of drinking water standards, MCLs, or other health-based criteria.

15. **EVALUATION OF NEW TECHNICAL INFORMATION**

Submit a technical report, acceptable to the Executive Officer, evaluating new technical information that bears on the approved remedial action plan and cleanup levels for this Site. In the case of a new cleanup technology, the report should evaluate the technology using the same criteria used in the feasibility study. Such technical reports shall not be required unless the Executive Officer determines that the new information is reasonably likely to warrant a revision in the approved remedial action plan or cleanup levels.

COMPLIANCE DATE: 90 days after evaluation report required by Executive Officer

16. **DELAYED COMPLIANCE**: If the Discharger is delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the Discharger shall promptly notify the Executive Officer, and the Regional Water Board or Executive Officer may consider revision to this Order.

D. **PROVISIONS**

1. **No Nuisance**: The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in Water Code section 13050(m).

2. **Good O&M**: The Discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.

3. **Cost Recovery**: The Discharger shall be liable, pursuant to Water Code section 13304, to the Regional Water Board for all reasonable costs actually incurred by the Regional Water Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. If the Site addressed by this Order is enrolled in a State Water Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by the Discharger over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.

4. **Access to Site and Records**: In accordance with Water Code section 13267(c), the Discharger shall permit the Regional Water Board or its authorized representative:

    a. Entry upon premises in which any contamination source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.

    b. Access to copy any records required to be kept under the requirements of this Order.

    c. Inspection of any monitoring or remediation facilities installed in response to this Order.

    d. Sampling of any groundwater or soil that is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the Discharger.

5. **Contractor / Consultant Qualifications**: All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.

6. **Lab Qualifications**: All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Regional Water Board using approved U.S. EPA methods for the type of analysis to be performed. Quality assurance/quality control (QA/QC) records shall be maintained for Regional Water Board review. This provision does not apply to analyses that can only reasonably be performed onsite (e.g., temperature).

7. **Document Distribution**: An electronic and paper version of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the Regional Water Board, and electronic copies shall be provided to the following agencies:

    a. City of Milpitas Building Department
    b. Santa Clara County Department of Environmental Health
    c. Santa Clara Valley Water District

    The Executive Officer may modify this distribution list as needed.

    Electronic copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be uploaded to the State Water Board's GeoTracker database within five business days after submittal to the Regional Water Board. Guidance for electronic information submittal is available at: http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal

8. **Reporting of Changed Owner or Operator**: The Discharger shall file a technical report on any changes in contact information, site occupancy, or ownership associated with the property described in this Order. An amendment of the Order would be necessary to make any changes related to the party responsible for compliance with this Order, however.

9. **Reporting of Hazardous Substance Release**: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, the Discharger shall report such discharge to the Regional Water Board by calling (510) 622-2369.

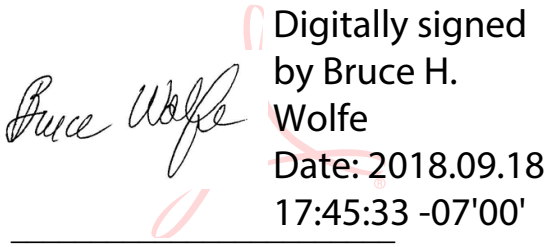
    A written report shall be filed with the Regional Water Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

    This reporting is in addition to reporting to the California Office of Emergency Services required pursuant to the Health and Safety Code.

10. **Rescission of Existing Order**: This Order supersedes and rescinds Order Nos. 86-074, 89-162, and 90-072.

11. **Periodic SCR Review**: The Regional Water Board will review this order periodically and may revise it when necessary.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on September 12, 2018.



Bruce H. Wolfe
Executive Officer

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Compliance Notice: Failure to comply with the requirements of this Order may subject you to enforcement action, including but not limited to imposition of administrative civil liability under Water Code sections 13268 or 13350 or referral to the Attorney General for injunctive relief or civil or criminal liability.

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Attachments:

Figures:

Figure 1 - Site Location Map of Former Jones Site and Affected Area
Figure 2 – Former Jones Facility and Affected Area
Figure 3 – Milpitas Transit Area
Figure 4 – Extent of Contaminants in Groundwater Exceeding Maximum Contaminant Levels
Figure 5 – Potential Vapor Intrusion Hazard Due to Short-Term Exposure (TCE Only) Without Effective Vapor Intrusion Mitigation Systems
Figure 6 – Potential Vapor Intrusion Risk Due to Long-Term Exposure (All Contaminants) Without Effective Vapor Intrusion Mitigation Systems

Appendix A:

Table A1: On-Site Areas 1 and 2, and Near-Site Area: Summary of Shallow Soil Vapor and Recent Groundwater Concentrations

Table A2: On-Site Areas, Results of Screening Assessment for Soil
Table A3: On-Site Areas, Results of Screening Assessment for Groundwater
Table A4: On-Site Areas, Results of Screening Assessment for Soil Vapor

Table B1: Off-Site Area 1, Summary of Shallow Soil Vapor and Recent Groundwater Concentrations
Table B2: Off-Site Area 1, Results of Screening Assessment for Groundwater
Table B3: Off-Site Area 1, Results of Screening Assessment for Soil Vapor

Table C1: Off-Site Area 2, Summary of Shallow Soil Vapor and Recent Groundwater Concentrations
Table C2: Off-Site Area 2, Results of Screening Assessment for Groundwater
Table C3: Off-Site Area 2, Results of Screening Assessment for Soil Vapor

Table D1: Off-Site Areas 3 and 4, Summary of Recent Groundwater Concentrations
Table D2: Off-Site Area 3, Results of Screening Assessment for Groundwater

FIGURES

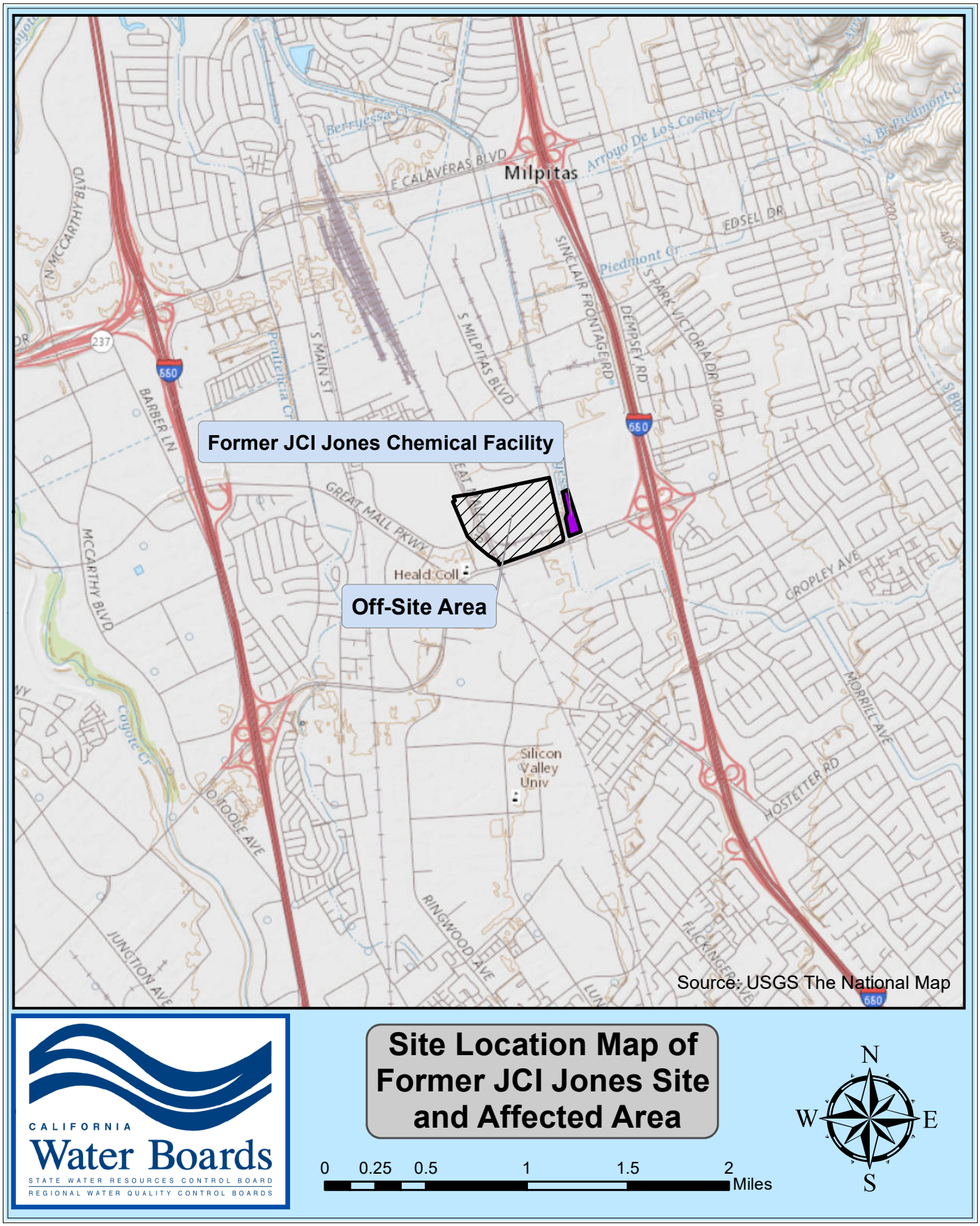
Former JCI Jones Chemical Facility
Off-Site Area
Milpitas
E CALAVERAS BLVD
N MCCARTHY BLVD
S MAIN ST
S MILPITAS BLVD
SINCLAIR FRONTAGE RD
DEMPSEY RD
S PARK VICTORIA DR
EDSEL DR
Piedmont Cr
Arroyo De Los Coches
BARBER LN
GREAT MALL PKWY
MCCARTHY BLVD
Heald Coll
Silicon Valley Univ
GROPLEY AVE
MORRILL AVE
HOSTETTER RD
MOODLE AVE
RINGWOOD AVE
JUNCTION AVE
Coyote Cr
Source: USGS The National Map
CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS
Site Location Map of Former JCI Jones Site and Affected Area
0 0.25 0.5 1 1.5 2 Miles
N
W
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Figure 1

Former JCI Jones Facility and Affected Areas

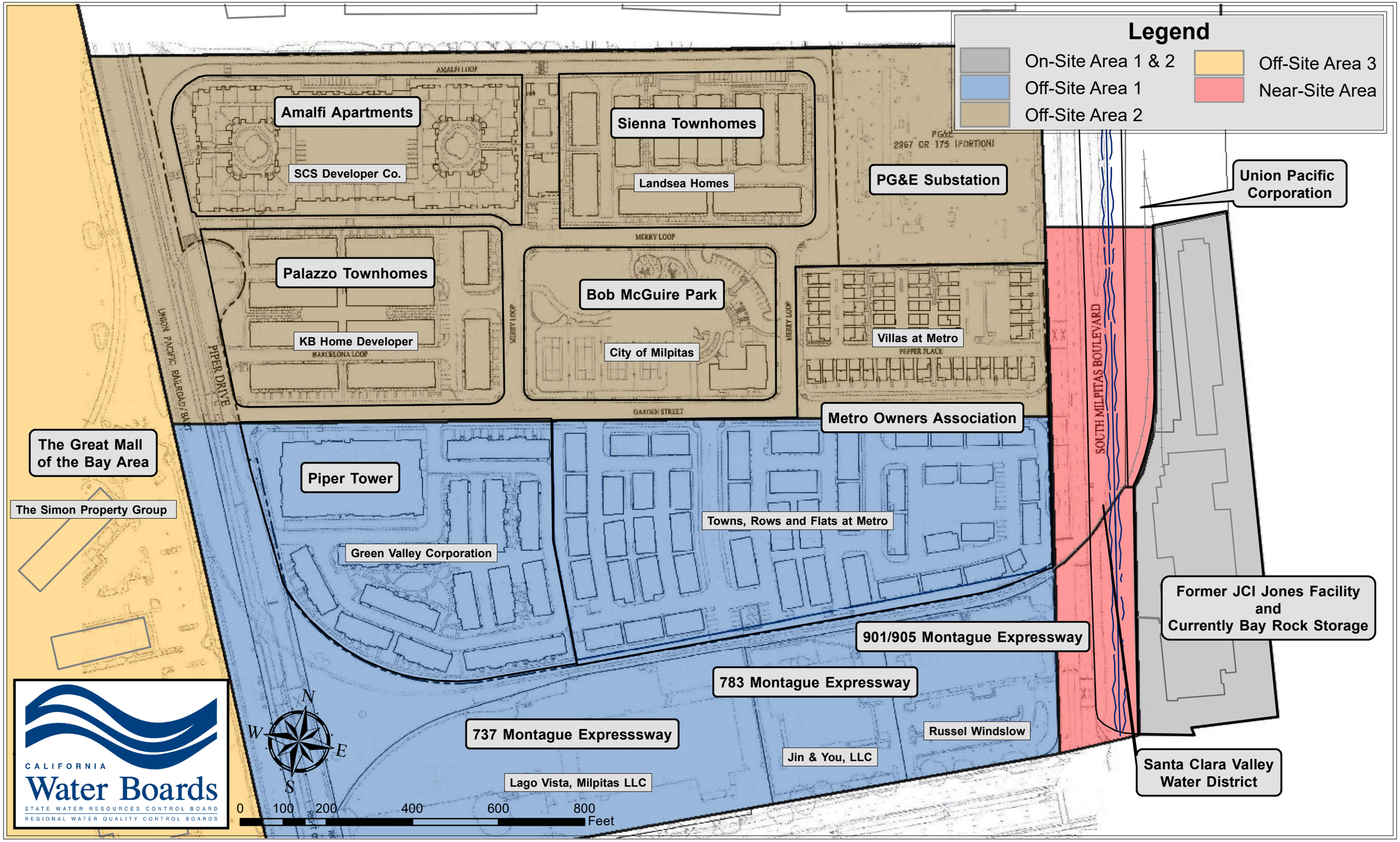
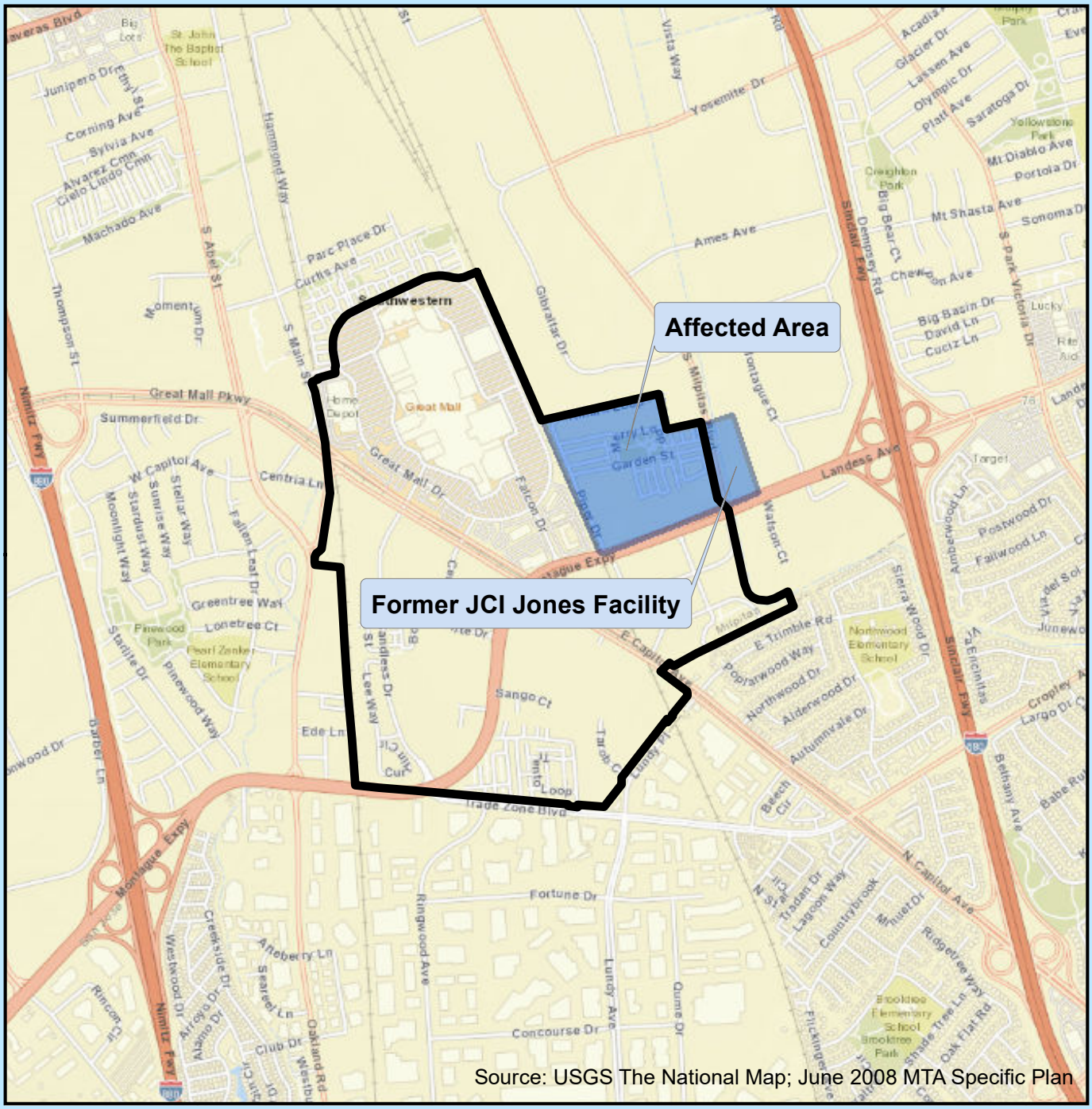


Figure 2



CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

Milpitas Transit Area

0 0.125 0.25 0.5 0.75 1 Miles

N
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Figure 3

Extent of Contaminants in Groundwater Exceeding Maximum Contaminant Levels

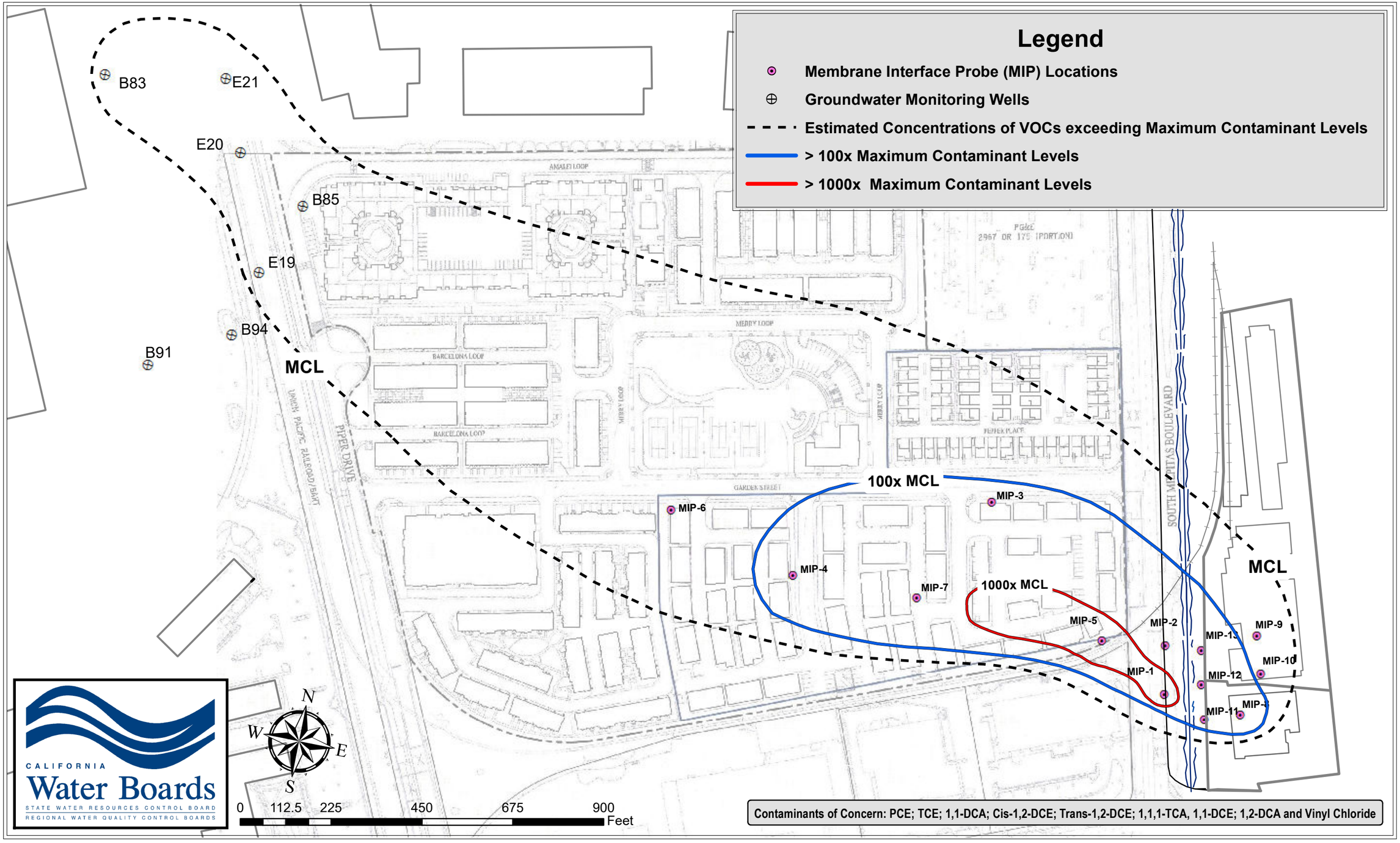

Figure 4

Potential Vapor Intrusion Hazard Due to Short-Term Exposure (TCE Only) Without Effective Vapor Intrusion Mitigation Systems

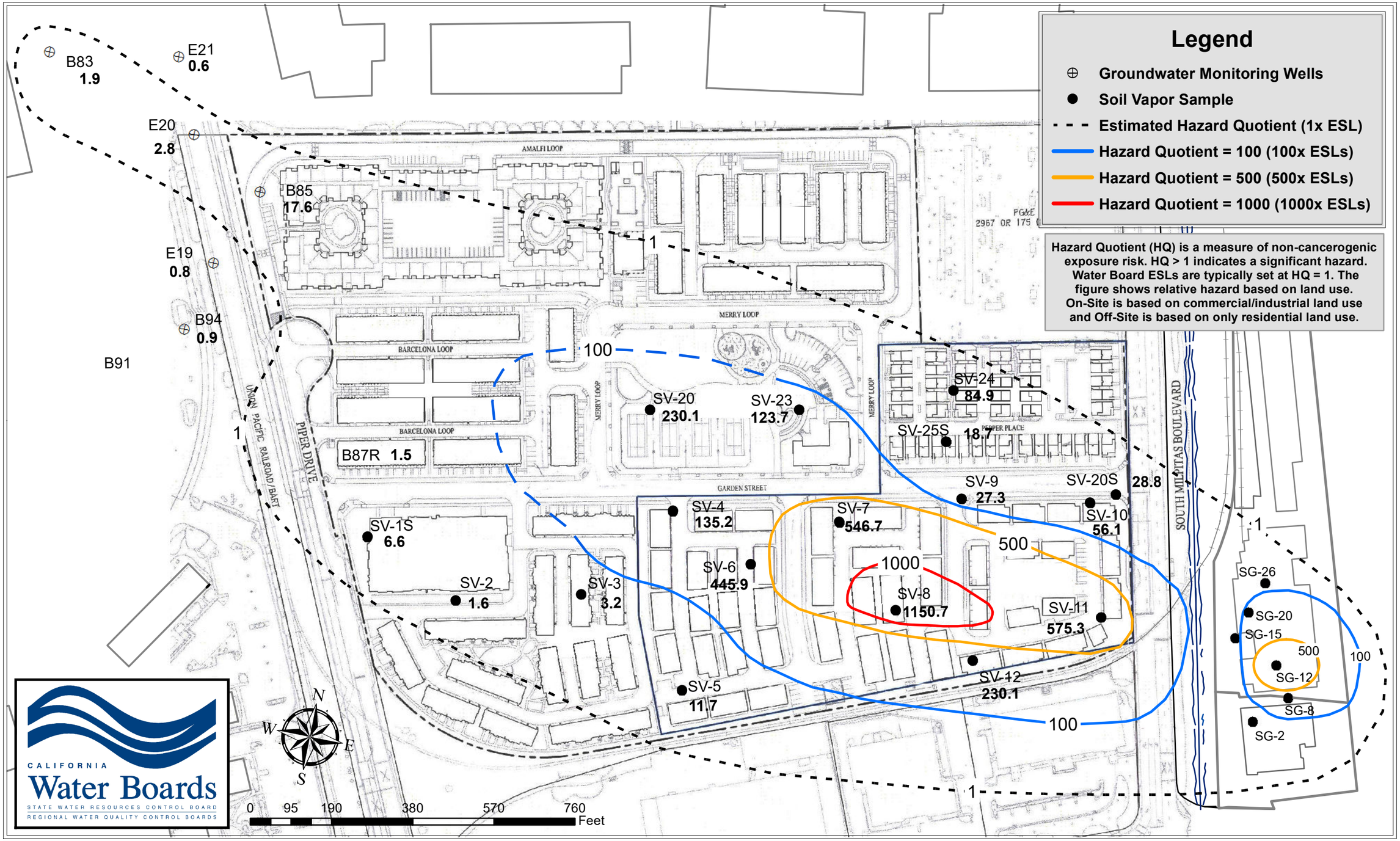

Figure 5

Potential Vapor Intrusion Risk Due to Long-Term Exposure (All Contaminants) Without Effective Vapor Intrusion Mitigation Systems

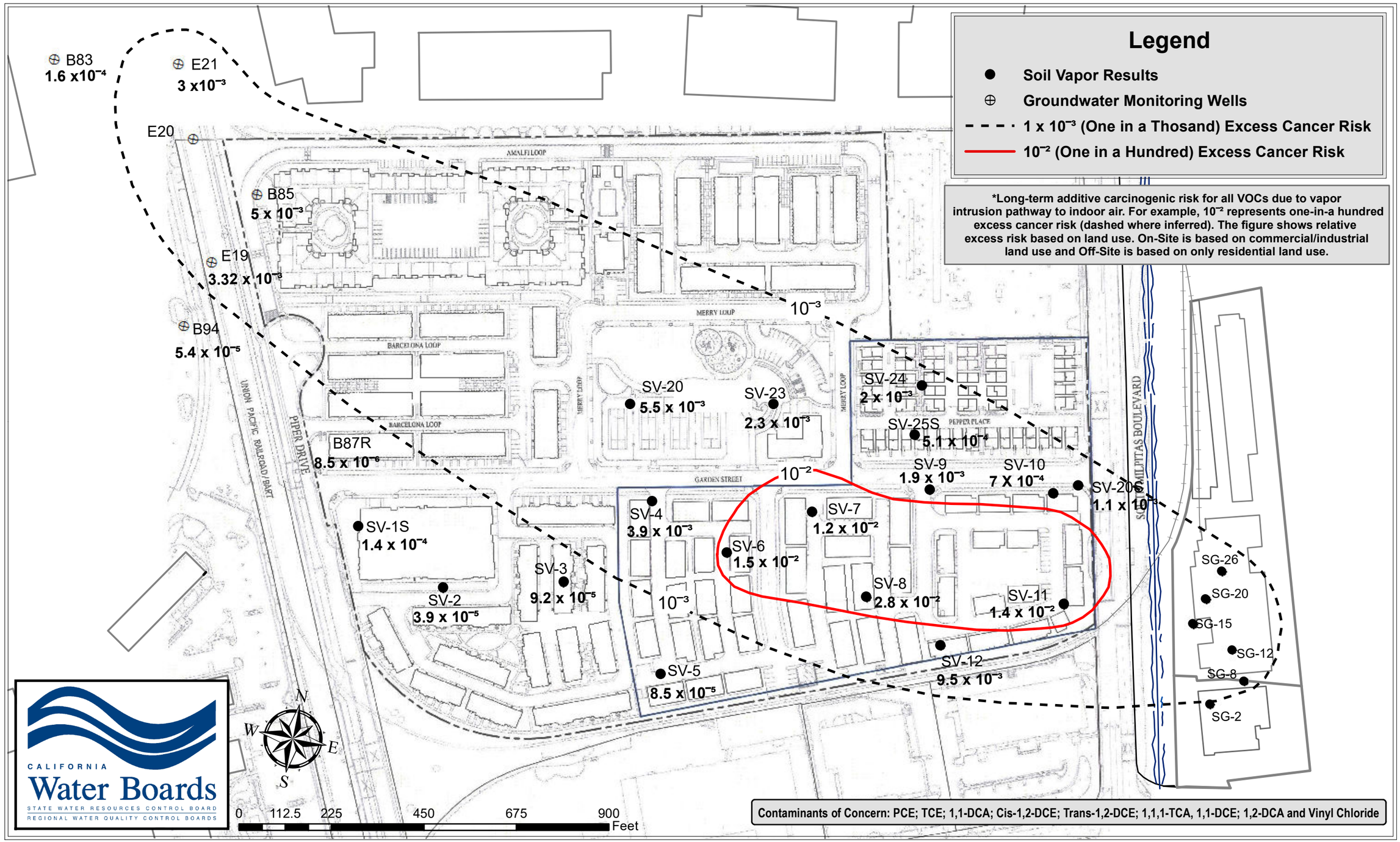

Figure 6

Appendix A

The following tables represent the Screening Level Risk Assessment Results.

Concentrations
Tables A1, B1, C1, and D1 summarize the most recent highest concentrations of COCs in groundwater, soil (if available), and shallow soil vapor for On-Site Areas, Off-Site Area 1, Off-Site Area 2, and Off-Site Areas 3 and 4, respectively.

Soil Screening Level Risk Assessment Results
Table A2 summarizes the comparison of the concentrations of each COC in soil located in the On-Site Areas to their respective screening levels for direct contact. Bold values indicate a screening level exceedance.

Groundwater Screening Level Risk Assessment Results
Tables A3, B2, C2, and D2 summarize the comparison of the concentrations for each COC in groundwater in the On-Site Areas, Off-Site Area 1, Off-Site Area 2, and Off-Site Areas 3 and 4 to their screening levels, respectively. Each contaminant is compared to the following screening levels: MCLs, direct exposure to groundwater, freshwater habitat goals, and vapor intrusion from groundwater to indoor air. Bold values indicate a screening level exceedance.

Soil Vapor Screening Level Risk Assessment Results
Tables A4, B3, and C3 summarize the comparison of concentrations for each COC in soil vapor in the On-Site Areas, Off-Site Area 1, and Off-Site Area 2 to their respective screening levels for vapor intrusion. Bold values indicate a screening level exceedance.

Table A1: On-Site Areas 1 and 2, and Near-Site Area: Summary of Shallow Soil Vapor and Recent Groundwater Concentrations

Contaminant	Maximum Groundwater Concentration (2014-2016[1]) (µg/l)			Maximum Soil Concentration (2016[2]) (mg/kg)	Maximum Soil Vapor Concentration (2006[3]) (µg/m^3)
	Shallow	**Intermediate**	**Deep (2007)**	**Shallow Soil (2 feet bgs)**	**Shallow Soil Vapor (<9 feet bgs)**
PCE	1,500	480	0.4	6.0	440,000
TCE	150	130	0.06	0.035	170,000
1,1-DCA	95	67	ND	--	5,000
cis-1,2 DCE	250	1000	ND	--	830
trans-1,2 DCE	48	24	ND	--	--
vinyl chloride	38	510	0.3	--	1,800
1,1-DCE	53	330	ND	0.0059	25,000
1,1,1-TCA	26	7.7	0.3	0.00426	150,000
1,2-DCA	1.8	ND	ND	--	--

[1] *August 31, 2017, Semiannual Groundwater Monitoring Report, Arcadis, and September 1, 2017, Enhanced Reductive Dechlorination Substrate Injection Work Plan, Arcadis*

[2] *December 2016, Site Management Plan, Former JCI-Jones Chemical, Inc., West Environmental Services & Technology*

[3] *May 17, 2016, Site Management Plan for the On-Site Area, Arcadis*

Table A2: On-Site Areas, Results of Screening Assessment for Soil

Contaminant	Concentration (mg/kg)	Screening Assessment (Commercial/Industrial Use)
		Direct Exposure (mg/kg)
PCE[1]	6	**2.7**
TCE	0.035	6.1
1,1-DCA	--	16
cis-1,2 DCE	--	78
trans-1,2 DCE	--	570
vinyl chloride	--	0.15
1,1-DCE	0.0059	350
1,1,1-TCA	0.00426	7,200
1,2-DCA	--	2.1

[1]Bold indicates screening level exceeded

Table A3: On-Site Areas, Results of Screening Assessment for Groundwater

Result of Screening Assessment for Groundwater On-Site Areas					
Contaminant	Concentration (µg/l)	Screening Assessment (Commercial/Industrial Use)			
		MCL (µg/l)	Direct Exposure (µg/l)	Freshwater Habitat Goal (µg/l)	Vapor Intrusion (µg/l)
PCE	1,500[1]	**5**	**0.06**	**120**	**2.8**
TCE	150	**5**	**0.49**	360	**7.5**
1,1-DCA	95	**5**	**2.7**	**47**	**33**
cis-1,2-DCE	1000	**6**	**11**	**590**	**210**
trans-1,2-DCE	48	**10**	60	590	920
vinyl chloride	510	**0.5**	**0.0097**	780	**0.14**
1,1-DCE	330	**6**	**10**	**25**	280
1,1,1-TCA	26	200	1,000	62	6,300
1,2-DCA	1.8	**0.5**	**0.17**	10,000	9.8

[1]Highest concentration used from Shallow and Intermediate/Composite Zones

Table A4: On-Site Areas, Results of Screening Assessment for Soil Vapor

Contaminant	Concentration (µg /m^3)	Screening Assessment (Commercial/Industrial Use)
		Vapor Intrusion (µg /m^3)
PCE	440,000	**67**
TCE	170,000	**100**
1,1-DCA	5,000	**260**
cis-1,2-DCE	830	1,200
trans-1,2-DCE	--	12,000
vinyl chloride	1,800	**5.2**
1,1-DCE	25,000	**10,000**
1,1,1-TCA	150,000	**150,000**
1,2-DCA	--	16

Table B1: Off-Site Area 1, Summary of Shallow Soil Vapor and Recent Groundwater Concentrations

Contaminant	Maximum Groundwater Concentration (2007-2014[1]) (µg/l)			Maximum Soil Vapor Concentration (2009-2015[2]) (µg/m^3)
	Shallow	Intermediate	Deep (2007)	Shallow Soil Vapor (10 feet bgs)
PCE	4,200	380	0.4	350,000
TCE	430	480	0.6	80,000
1,1-DCA	12	11	ND	240
cis-1,2 DCE	230	930	ND	4,500
trans-1,2 DCE	5.6	38	ND	210
vinyl chloride	19	12	0.3	240
1,1-DCE	170	430	ND	68,000
1,1,1-TCA	39	28	0.3	42,000
1,2-DCA	0.6	3.2	ND	--

[1] *August 31, 2017, Semiannual Groundwater Monitoring Report, Arcadis*
[2] *October 21, 2016, Groundwater Investigation and Vapor Extraction Data Summary Report, Arcadis.* Soil vapor extraction system shut down in 2015. Highest soil vapor concentrations used from 2009-2015 to represent potential rebound following soil vapor extraction system shutdown.

Table B2: Off-Site Area 1, Results of Screening Assessment for Groundwater

Contaminant	Concentration (µg/l)	Screening Assessment (Residential Use)			
		MCL (µg/l)	Direct Exposure (µg/l)	Freshwater Habitat Goal (µg/l)	Vapor Intrusion (µg/l)
PCE	4,200[1]	**5**	**0.06**	**120**	**0.64**
TCE	480	**5**	**0.49**	360	**1.2**
1,1-DCA	12	**5**	**2.7**	47	**7.6**
cis-1,2-DCE	930	**6**	**11**	**590**	**49**
trans-1,2-DCE	38	**10**	60	590	220
vinyl chloride	19	**0.5**	**0.0097**	780	**0.0086**
1,1-DCE	430	**6**	**10**	25	**66**
1,1,1-TCA	39	200	1,000	62	1,500
1,2-DCA	3.2	**0.5**	**0.17**	10,000	**2.2**

[1]Highest concentration used from Shallow and Intermediate/Composite Zones

Table B3: Off-Site Area 1, Results of Screening Assessment for Soil Vapor

Contaminant	Concentration (µg /m^3)	Screening Assessment (Residential Use)
		Vapor Intrusion (µg /m^3)
PCE	350,000	**15**
TCE	80,000	**16**
1,1-DCA	240	**58**
cis-1,2-DCE	4,500	**280**
trans-1,2- DCE	210	2,800
vinyl chloride	240	**0.32**
1,1-DCE	68,000	**2,400**
1,1,1-TCA	42,000	**35,000**
1,2-DCA	--	3.6

Table C1: Off-Site Area 2, Summary of Shallow Soil Vapor and Recent Groundwater Concentrations

Contaminant	**Maximum Groundwater Concentration (2012-2013[1])** (µg/l)			**Maximum Soil Vapor Concentration (2009-2015[2])** (µg/m^3)
	Shallow (2012)	**Intermediate**	**Deep**	**Shallow Soil Vapor (10 feet bgs)**
PCE	ND	24	--	69,000
TCE	4.5	11	--	16,000
1,1-DCA	5.2	8	--	ND
cis-1,2 DCE	190	150	--	3,500
trans-1,2 DCE	4.5	16	--	ND
vinyl chloride	29	100	--	ND
1,1-DCE	8.9	22	--	8,900
1,1,1-TCA	0.5	ND	--	3,500
1,2-DCA	ND	0.3	--	--

[1] *August 31, 2017, Semiannual Groundwater Monitoring Report, Arcadis*

[2] *October 21, 2016, Groundwater Investigation and Vapor Extraction Data Summary Report, Arcadis.* Soil vapor extraction system shut down in 2015. Highest soil vapor concentrations used from 2009-2015 to represent potential rebound following soil vapor extraction system shutdown.

Table C2: Off-Site Area 2, Results of Screening Assessment for Groundwater

Contaminant	Concentration (µg/l)	Screening Assessment (Residential Use)			
		MCL (µg/l)	Direct Exposure (µg/l)	Freshwater Habitat Goal (µg/l)	Vapor Intrusion (µg/l)
PCE	24	**5**	**0.06**	120	**0.64**
TCE	11	**5**	**0.49**	360	**1.2**
1,1-DCA	8	**5**	**2.7**	47	**7.6**
cis-1,2-DCE	190	**6**	**11**	590	**49**
trans-1,2-DCE	16	**10**	60	590	220
vinyl chloride	100	**0.5**	**0.0097**	780	**0.0086**
1,1-DCE	22	**6**	**10**	25	66
1,1,1-TCA	0.5	200	1,000	62	1,500
1,2-DCA	0.3	0.5	**0.17**	10,000	2.2

Table C3: Off-Site Area 2, Results of Screening Assessment for Soil Vapor

Contaminant	Concentration (µg /m^3)	Screening Assessment (Residential Use)
		Vapor Intrusion (µg /m^3)
PCE	69,000	**15**
TCE	16,000	**16**
1,1-DCA	ND	58
cis-1,2-DCE	3,500	**280**
trans-1,2-DCE	ND	2,800
vinyl chloride	ND	0.32
1,1-DCE	8,900	**2,400**
1,1,1-TCA	3,500	35,000

Table D1: Off-Site Areas 3 and 4, Summary of Recent Groundwater Concentrations

Contaminant	Maximum Concentration (2009-2013[1]) (µg/l)		
	Off-Site Area 3 Shallow (2012)	Off-Site Area 4 Shallow (2013)	Deep
PCE	6.6	ND	--
TCE	5.4	ND	--
1,1-DCA	0.5	ND	--
cis-1,2 DCE	9.8	ND	--
trans-1,2 DCE	0.7	ND	--
vinyl chloride	0.6	ND	--
1,1-DCE	2.7	ND	--
1,1,1-TCA	0.4	ND	--
1,2-DCA	0.3	ND	--

[1] *August 31, 2017, Semiannual Groundwater Monitoring Report, Arcadis*

Table D2: Off-Site Area 3, Results of Screening Assessment for Groundwater

Contaminant	Concentration (µg/l)	Screening Assessment (Residential Use)			
		MCL (µg/l)	Direct Exposure (µg/l)	Freshwater Habitat Goal (µg/l)	Vapor Intrusion (µg/l)
PCE	6.6	**5**	**0.06**	120	**0.64**
TCE	5.4	**5**	**0.49**	360	**1.2**
1,1-DCA	0.5	5	2.7	47	7.6
cis-1,2-DCE	9.8	**6**	11	590	49
trans-1,2 DCE	0.7	10	60	590	220
vinyl chloride	0.6	**0.5**	**0.0097**	780	**0.0086**
1,1-DCE	2.7	6	10	25	66
1,1,1-TCA	0.4	200	1,000	62	1,500
1,2-DCA	0.3	0.5	**0.17**	10,000	2.2