

**Provisional Joint Health Statement Summary**  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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As the Bay Area population increases, there are increasing controversies over land use. Efforts to recycle Richmond land for new uses will create community development controversies that include concerns for current human health, ecological health, community prosperity, and unwanted impacts on future generations. Two contiguous sites in Richmond, Zeneca (formerly Stauffer Chemical Co.) and the University of California (UC) Richmond Field Station (RFS), exemplify these controversies.

This joint interim health statement of the Contra Costa County Health Services Department and the California Department of Health Services (CDHS) is based upon available information about current exposure from these sites. New information may warrant revision of this statement and changes in recommended actions. A more complete report will be drafted over the next year.

We recognize that impacts on health are critical factors, but not the only factors, in decisions about community development. Regardless, individuals in the community as well as community officials need this information for risk management. Our statement is based upon the following actions:

1. Reviewing historic land use patterns and regulatory agency documents as they may affect current exposure.
2. Speaking with the relevant agencies and stakeholders concerned about the sites.
3. Identifying current chemicals of concern.
4. Examining current pathways for chemicals to move from a source location to people.
5. Identifying sensitive or heavily impacted subpopulations.
6. Determining the current health risks associated with completed exposure pathways.
7. Exploring ways to eliminate or reduce future exposures.

Because of the limitations in current knowledge, our statement cannot adequately incorporate impacts of cumulative exposures from other sources or sites. It also cannot address the concerns we all share about exposures to mixtures of chemicals and their byproducts with the potential for chemical and biological interactions. When there is insufficient information, but there is reason to expect the effects could be severe, we support a precautionary approach that would favor protection over risk taking.

We realize that individual health and community health is affected by more than direct exposure to toxic chemicals associated with these sites. When hazardous materials are discovered to have been on these sites, sometimes for many years, there are a number of psychological and community stressors:

1. Fear and uncertainty over the possible effects of exposure.
2. Feeling a loss of control over the present situation and future.
3. Anger over loss of security and safety within the community.
4. Confusion over agency roles.
5. Community conflict over who is to blame and what actions to take.

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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The long history of these sites and the lengthy political process required to resolve issues, along with uncertainty about exposures and subsequent latent health effects, may lead to social and political turmoil, which in turn leads to more stress.

### **Brief Site Descriptions and History**

#### *Zeneca*

Stauffer Chemical Company began sulfuric acid production at the site in 1897. Sulfuric acid production generated a large volume of cinder waste from the roasting of iron pyrite ore. Cinders were deposited into low lying areas on the site over the many years of operation. Pyrite cinders are generally acidic and contain high concentrations of metals. In the 1950s, Stauffer began making a variety of pesticides and herbicides. Stauffer operations continued on the site until 1985. Between 1986 and 1992, the property was transferred between several owners. In 1992, Zeneca, Inc. took over operations on the site. Contaminants detected on the Zeneca site include metals, pesticides, herbicides, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), and petroleum hydrocarbons. The property is presently owned by Cherokee/Simeon/Campus Bay land developers.

Site buildings were destroyed in 2002. Recent remediation work has included excavating approximately 50% of the East Stege Marsh sediments from October 2004 through March 2005. In addition, a surface cap covering contaminated material has been installed over a large portion of the site.

#### *Richmond Field Station (RFS), 1301 South 46<sup>th</sup> Street*

The property includes uplands (facilities and open prairie grasslands), tidal mudflats, and marsh. The marsh area, approximately nine acres, is now known as Western Stege Marsh. Much of the property belonged to California Cap Co. from 1870 to 1950. Up until 1948, the California Cap Co. manufactured explosives on the site. Mercury fulminate was manufactured on site for blasting cap production. From 1897 to 1950, pyrite cinder waste (which includes arsenic, lead, zinc, selenium, cadmium, and copper) from Stauffer Chemical Company (see above) was deposited on the site. In 1950, UC purchased 150 acres of this land along the Richmond shoreline. The land, now RFS, is used by UC Berkeley as an academic research and teaching facility and by the UC Office of the President as the site for the Northern Regional Library Facility. Approximately 400 UC researchers and employees work at the site. The federal Environmental Protection Agency's (EPA) regional laboratory is also located at the RFS. Recently, the RFS has been renamed UC Bayside Research Campus.

Three phases of excavation and removal of contaminated material from RFS have occurred. Cleanup work is prohibited during the months of February through August, due to the presence in the marsh of the endangered California Clapper Rail. From August 2002 to January 2003, 28,000 cubic yards of contaminated soil and marsh sediment were removed from an area bordered by Zeneca on the east and East Bay Regional Park Bay Trail to the south. From August

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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2003 to March 2004, 31,000 cubic yards of contaminated material were removed. In addition, PCBs were removed from an area at the outfall of a storm drain in Meeker Slough. From August 2004 to November 2004, 3,300 cubic yards of soil contaminated with metals and PCBs were removed from upland areas.

### **Exposure Pathway Assessment**

Exposure pathways through ambient air, groundwater, and marsh sediments/soils, along with potential risks to selected subpopulations for each pathway, were considered. These generally were based upon high-end exposure assumptions.

#### *Air*

##### Zeneca

**During remedial operations** from October 18, 2004, to April 23, 2005, Zeneca subcontractors, RGA Environmental (RGA), collected air data at four air monitoring stations and two particulate matter stations (PM10-particles less than 10 microns in diameter) around the perimeter of the Zeneca site. The four air monitoring stations collected total suspended particulates (TSP) and samples to be archived and analyzed later. The samples with highest TSP for a given week at a given station were analyzed for 42 contaminants of concern (COCs) associated with the Zeneca site, including 8 metals, 23 pesticides, 6 PCB arochlors, 2 VOCs, hydrogen sulfide (H<sub>2</sub>S), carbon disulfide, and formaldehyde. RGA also collected weather data during remedial activities. Data was collected only during work hours, except for the PM10 monitors, which collected 24-hour samples. This data is shown on the Campus Bay website <http://www.campusbay.info/index.html>.

Of the 42 contaminants tested in the air samples, 7 COCs were detected. CDHS compared the maximum detected value for the seven detected analytes to see if any of the COCs were detected at levels above health comparison values. Health comparison values are levels set by regulatory agencies that take into account structural, toxicological, and epidemiological information about the chemical (available upon request). Four of the COCs detected (lead, nickel, carbon disulfide, and formaldehyde) had maximum detections below health comparison values. Therefore, these four COCs are not considered to pose any public health risk. Two of the COCs detected (zinc and copper) have no appropriate health comparison value. Zinc is a necessary nutrient and at the levels detected, does not appear to pose any public health risk. The health departments do not have enough information to assess the potential health effects of the copper air concentrations. H<sub>2</sub>S levels were occasionally detected at concentrations that could cause adverse health effects.

While the average H<sub>2</sub>S concentration of 23 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) over the 180-day period was below the intermediate Minimal Risk Level (MRL) of  $27.9 \mu\text{g}/\text{m}^3$ , there were 15 days in which H<sub>2</sub>S levels exceeded the MRL. There were also 10 days where H<sub>2</sub>S concentrations exceeded the California Air Resources Board (CARB) 1-hour threshold of  $42 \mu\text{g}/\text{m}^3$ . Potential exposure to homeless people, workers, and children playing near the site are above the inhalation Reference Concentration (RfC) of  $0.00002 \mu\text{g}/\text{m}^3$  for H<sub>2</sub>S. Health effects from H<sub>2</sub>S exposure

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

---

include irritation of mucous membranes and the respiratory tract, nausea, headaches, skin and eye irritation.

CDHS assessed potential impacts from particulates (PM<sub>10</sub>) and total suspended particulates (TSP). The maximum TSP detected (167 µg/m<sup>3</sup>) was slightly above the National Ambient Air Quality Standard (NAAQS) of 150 µg/m<sup>3</sup>. However, the average of approximately 555 detections of total particulates was 38 µg/m<sup>3</sup>. While these levels do not appear to pose a significant health risk, there is the possibility that particulate spikes could cause some respiratory irritation, especially for people with pre-existing respiratory conditions. The maximum detection of particulates less than 10 microns (PM<sub>10</sub>) was 56 µg/m<sup>3</sup>, which is below the NAAQS of 65 µg/m<sup>3</sup>, but slightly above the California standard of 50 µg/m<sup>3</sup>. Two additional samples were detected at the California standard of 50 µg/m<sup>3</sup>. However, the average PM<sub>10</sub> for all samples collected was 18 µg/m<sup>3</sup>. This is below the 24-hour California PM<sub>10</sub> standard and below the California annual standard of 20 µg/m<sup>3</sup>. Therefore, particulates do not appear to present a current public health risk at the site.

The data reviewed for this assessment was not in a final report, but was preliminary data provided on the Campus Bay website.

#### UC Richmond Field Station

URS Corporation (URS) and Blasland, Bouck & Lee, Inc. (BBL) performed air monitoring for dust and mercury **during the phase 2 remedial construction work** conducted between August 2003 and February 2004 at the UC Berkeley RFS. Dust concentrations were monitored and recorded continuously at six locations along the site perimeter to monitor airborne dust leaving the area where mercury contamination was being remediated. Dust monitors were placed on the site perimeter for the duration of each workday. Average and maximum dust data was downloaded to personal computers at the end of each workday. When powdered activated carbon reagent was used at the site, there were some detections of carbon dust outside the work area. Carbon dust levels did not exceed 2 mg/m<sup>3</sup>. However, some of this dust did deposit on structures in the area.

Health and safety personnel monitored mercury levels in the air at the work site using a Jerome Mercury Vapor Analyzer with a detection limit of 3 µg/m<sup>3</sup> (0.003 mg/m<sup>3</sup>). This instrument is sensitive enough for assessing remediation worker exposures to mercury vapor. It is somewhat insensitive for non-remediation worker exposure assessment, considering that the health comparison Inhalation Reference Concentration (RfCi) (0.3 µg/m<sup>3</sup> or 0.0003 mg/m<sup>3</sup>) is lower than the detection limit of the monitoring equipment. Of the 167 samples collected during this sampling effort, 20 samples had detectable concentrations of mercury, ranging from 0.003 to 0.006 mg/m<sup>3</sup>. Put simply, more than 10% of the samples were 10 times greater than the RfCi. These data indicate that people outside the Phase 2 work area likely had some exposure to mercury. However, limitations with these data (high detection limits) and limited off-site data restrict the ability to quantify exposure outside the Phase 2 work area. The human nervous system is very sensitive to all forms of mercury. Exposure to high levels of mercury can

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

---

permanently damage the brain, kidneys, and developing fetuses. Mercury can have a wide range of effects on the nervous system including tremors, irritability, and memory loss.

This air pathway assessment has limitations. The data was used to monitor short-term remediation worker exposures, not long-term off-site residential exposures. There are data gaps that limit the applicability of this data set for assessing human health impacts for non-remediation worker populations. Future remediation activities on the site should include air quality monitoring along the perimeter of the site to ensure safe air quality for off-site workers, residents, and recreators in the area. Detection limits in future sampling should be set as low as feasible to allow for the best opportunity to understand the air quality in the area and the potential impacts on people.

### ***Groundwater/Soil Gas Vapors Entering Indoor Spaces***

#### Zeneca

In cases when the groundwater is close to the surface (within 30 feet), VOCs in the groundwater can be pulled into buildings. This is known as soil gas migration/vapor intrusion. Groundwater in the Zeneca area is shallow, ranging from 6 to 15 feet below ground surface (bgs) (depending on location and the time of year), creating the potential for soil gas to migrate from VOC-contaminated groundwater into buildings. Once inside the building, these gases or vapors can be inhaled. While soil gas can be an important source of in-building air contaminants, it is only one of several contributors to the total air contaminants found inside a building. Typical indoor air is not considered healthy and contains many chemical constituents, which come from various sources, such as household products, cooking, building materials, and influences from the outdoors.

Several types of environmental data including indoor air, groundwater, soil, and soil gas can be used to evaluate the potential for soil gas to migrate into buildings. The Johnson and Ettinger (J&E) model estimates indoor air concentrations from chemicals measured in groundwater, soil and soil gas. The model does not predict precise concentrations to be used for interpretation of potential health effects, but rather concentrations for screening purposes to determine the need for further action (DTSC guidance).

CDHS reviewed available information to determine whether indoor air quality in Building 240 (B-240) and nearby businesses, particularly on South 49<sup>th</sup> Street, is being impacted by soil gas at levels posing a health risk.

The groundwater data is very limited in areas adjacent to B-240 and near businesses on South 49<sup>th</sup> Street, consisting of a single sampling event dating back to the late 1990s and a grab groundwater sample collected in 2002. Monitoring wells were abandoned at some time prior to 2003. Thus, groundwater data is not adequate to evaluate the potential for soil gas migration in these areas. We also conducted a limited review of on-site soil data to determine the VOC impact

**Provisional Joint Health Statement Summary**  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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on soil in areas adjacent to B-240. VOCs have not been detected in soil in areas adjacent to B-240.

The best available data to evaluate the soil gas pathway consists of soil gas samples collected on the Zeneca site and indoor air data collected in B-240. In 2003, as part of the Revised Residential Risk Evaluation, soil gas sampling was conducted on the Zeneca site. Samples were collected at two depths, 4.5-5.0 feet bgs and 8.5-9.0 feet bgs. Several VOCs were measured in the soil gas sample closest to B-240.

In March 2005, indoor air sampling was conducted in B-240. Samples were analyzed for limited number of contaminants (benzene, chlorobenzene, formaldehyde, hydrogen sulfide, and tetrachloroethylene). Most of the VOCs analyzed were not detected above laboratory detection limits. The laboratory method used for the analysis was not very sensitive, resulting in relatively high detection limits. The limitations with these data prohibit our ability to make comparisons with concentrations of VOCs typically found in indoor air and those that may be due to soil gas migration. Further, while these data do not indicate an immediate health threat, they are not adequate for evaluating long term/chronic exposure because we do not know if the contaminant was detected at levels lower than the detection limits, which over many years could be of health concern. Since a number of contaminants were detected in soil gas that were not analyzed during the indoor air sampling, CDHS used the J&E soil gas model to estimate the concentrations of acetone, benzene, carbon disulfide, chlorobenzene, chloroethane, cis-1,2-dichloroethylene, tetrachloroethylene, toluene, trichloroethylene, and vinyl chloride in indoor air.

To evaluate whether soil gas is in indoor air at levels posing a long-term health threat, CDHS compared the concentrations measured and estimated in indoor air to health comparison values (values and tables provided upon request). None of the measured or estimated concentrations of individual VOCs exceed health comparison values. Even the combined estimated exposure from all of the VOCs detected/estimated in the indoor air would be unlikely to cause noncancer health effects (more information methods used provided upon request). Since most of the VOC contamination appears to be west of B-240, it is not likely that the indoor air of businesses on South 49<sup>th</sup> Street is being impacted by soil gas migration from Zeneca. However, because the data is limited, additional sampling of groundwater on South 49<sup>th</sup> Street should be conducted to ensure that there is an adequate understanding of the extent of the VOC-contaminated groundwater plume.

For VOCs considered carcinogenic (cancer causing), CDHS calculated the theoretical lifetime increased cancer risk for staff and children spending time in the Making Waves program located in B-240, using the J&E soil gas model derived indoor air concentrations for B-240. CDHS assumed an 11-year exposure scenario (time period a child age 7-17 could attend the program) in the calculations. The theoretical lifetime increased cancer risk for staff at Making Waves is 1.8 in 100,000 and 2.2 in 100,000 for a child/teenager. These are considered very low increased risks.

We did not calculate cancer risk estimates for workers in nearby businesses on South 49<sup>th</sup> Street because it is not appropriate to use estimated indoor air concentrations in B-240 as proxies for

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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indoor air in South 49<sup>th</sup> Street businesses. As stated earlier, limited groundwater data does not indicate soil gas migration is affecting the indoor air in these businesses.

In conclusion, on the basis of limited available data, it does not appear that indoor air in B-240 and in nearby businesses is being impacted by soil gas from Zeneca at levels that would result in noncancer adverse health effects. There is a very low theoretical lifetime increased cancer risk for children and staff from long-term exposure to indoor air in B-240. Additional sampling of groundwater on South 49<sup>th</sup> Street is warranted to ensure that there is an adequate understanding of the extent of the VOC-contaminated groundwater plume and potential for impacts to indoor air due to soil gas.

#### UC Richmond Field Station

Based upon site information for the RFS site, VOC contamination in groundwater is not likely to affect indoor air in buildings on the RFS site.

#### *Marsh Sediments and Soil*

##### Zeneca Sediments

In 1992 – 2004, sampling of the East Stege Marsh and lower lagoon showed the sediments to be contaminated with heavy metals, pesticides, and PCBs. Between December 2004 and March 2005, contaminated sediments from about 50% of the East Stege Marsh were removed and replaced with dredged and terrestrial materials imported from other areas (Port of Sonoma, Martinez Marina, and Brentwood). The imported material was screened<sup>1</sup> for contaminants. As of this writing, CDHS has not reviewed sampling data for the imported material and thus cannot draw conclusions about the presence or absence of contaminants.

Evaluating potential exposure to contaminants remaining in the East Stege Marsh is complicated by a number of factors, including 1) the potential for mobilization of contaminants to other areas during excavation; 2) sedimentation rates and elevation changes that occur in a tidally influenced environment as it relates to current conditions versus historic data; and 3) potential concerns about contaminants in dredged materials used for backfill. These factors add to the uncertainty inherent in evaluating exposure.

CDHS estimated potential current and future exposure from skin (dermal) contact and incidental ingestion of contaminants in the remaining surface sediments for three populations: 1) a youth (age 7-17) who plays in the marsh; 2) an adult who recreates (walks, hikes, etc.) in the marsh; and 3) a homeless person who spends time in the marsh. We used the highest contaminant concentration detected in areas not excavated to estimate a dose for each contaminant present in

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<sup>1</sup> A sample was collected for every 3,000 yards of dredge material and analyzed for PCBs, pesticides, volatile organic chemicals (VOCs), semi-volatile organic chemicals (SVOCs), petroleum hydrocarbons, and metals.

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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sediment. None of the estimated doses exceed health comparison values for any of the populations evaluated. Combined exposure from all of the contaminants in the marsh would not be likely to cause noncancer health effects for youths who play in the marsh, adults who recreate in the marsh, or a homeless person spending time in the marsh. We did not estimate exposure to surface water because data is historic and does not represent current conditions in the marsh.

For contaminants considered carcinogenic, CDHS calculated the theoretical lifetime increased cancer risk for a youth who plays in the marsh for 2.6 hours per day, 2 days per week for 11 years, an adult who recreates in the marsh 2.6 hours per day, 1 day each week for 30 years, and a homeless person who spends 2.6 hours in the marsh every day for 10 years. The theoretical lifetime increased cancer risk is 2.7 in 100,000 for the youth, 1.6 in 100,000 for an adult, and 3.1 in 100,000 for a homeless person. These are considered very low increased risks.

UC Richmond Field Station/Western Stege Marsh

CDHS estimated exposure to an adult or youth working on a restoration project in the excavated area of the UC marsh (e.g., planting native species). CDHS assumed the person came into contact with the soil/sediment along the bank of the marsh. They could be exposed to some contaminants through skin absorption or accidental and incidental ingestion. To estimate exposure, we assumed the person worked in the marsh 2 days per week, for 2.6 hours per day.

An adult or youth working as described above in soil/sediment that contains the maximal amount of contaminants found in the excavated area should not experience noncancer health effects. A cancer risk was not calculated since the marsh remediation began recently and cancer risks cannot be appropriately calculated for short term exposures of less than 7 years.

Though working in the excavated area of the marsh does not appear to have any current noncancer health impact, it appears that contamination may be migrating from the unexcavated areas of the marsh, thus at some time in the future it may pose a noncancer health hazard.

CDHS evaluated exposure to an adult and youth (old enough to play unattended, 8-15 years of age) playing in the contaminated, non-excavated marsh/lagoon area. Exposure depends on how often that person was near to, or in contact with, the marsh/lagoon. Exposure also depends on the types of activity, i.e., splashing, wading, etc. If an adult or youth played along the bank and splashed in the water, they may have absorbed through the skin, inhaled, and ingested some of the chemicals in the soil/sediment and surface water. To estimate exposure, we assumed the person played 4 times a week, 1 hour at a time in the marsh/lagoon during the warmer months (May to October). We assumed the adults may have been exposed for the past 24 years and children for 8 years.

An adult or youth playing on a regular basis in marsh sediment/surface water that contains the maximally contaminated amount of chemicals found in the non-excavated areas, may experience skin rashes from arsenic due primarily to ingestion of unfiltered marsh water.

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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An adult or youth playing in the non-excavated areas accumulates cancer risk. The adult scenario described above would be associated with a cancer risk of approximately 1 in 10,000. The youth playing in the non-excavated area of the marsh as described above, would have a cancer risk of approximately 1 in 100,000. The potential risk is primarily due to incidental ingestion of arsenic in the surface water and/or sediment. Arsenic is considered a known human carcinogen by the inhalation route and exposure can lead to lung cancer.

#### UC Richmond Field Station Soil

CDHS reviewed the available soil data and evaluated possible exposure for the RFS worker who might dig in the soil in an area where contamination still exists.

Soil investigations in the past focused on those parts of the site associated with past manufacturing processes or storage areas: The California Cap Company explosives storage area, Cap Company test pit area, forest products area, Cap Company shell manufacturing area, Zeneca-related pyrite cinders area, mercury-bearing area; Heron Drive area, and the western storm drain. Contractors for UC remediated soils from five of these areas in 2004.

Most of the soil samples were analyzed for metals and PCBs (measured as Arochlor mixtures). The main contaminants of concern in surface to near surface soils on the RFS are arsenic, copper, lead, mercury, Arochlor 1248, Arochlor, 1254, Arochlor 1258, and Arochlor 1260.

CDHS assumed that the RFS worker dug a trench or holes in the soil in an area that was contaminated with the highest concentrations of chemicals detected in the Field Station surface and near surface soil. CDHS assumed that they dug without protection for 6 hours a day, 100 days per year, and that during the digging they were exposed through the skin and through incidental ingestion of the soil. An inhalation route, which could be significant, could not be quantified. CDHS estimated exposure for two lengths of employment: long-term (over 20 years) employment and the last 7 years of employment. We assumed the short-term worker would not have worked in any of the "hot spots" since these were already identified, while we assumed the long-term worker had worked in the hot spot areas before they were identified. Additional assumptions and calculations can be provided upon request.

The field station worker routinely digging in soil that contained the **maximal** amount of contaminants found in the **non-excavated areas** may experience noncancer health effects. The main noncancer endpoints include skin rashes (arsenic), immune changes, kidney damage (mercury), and behavioral changes, reproductive and developmental effects (PCBs). The field station worker who routinely digs in soil that contains the **average** amount of contaminants found in the **non-excavated areas** would not experience noncancer health concerns.

CDHS estimated that a worker digging in the non-excavated areas in the past had a cumulative risk of cancer ranging from 1 in 10,000 to 1 in 100,000. Current digging would add a cancer risk from 1 in 100,000 to 1 in 1,000,000, depending upon whether maximum or average exposure is used in the calculation. The chemicals which are associated with a cancer risk are arsenic and

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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PCBs. Arsenic is considered a known human carcinogen by the inhalation route and exposure can lead to lung cancer. PCB is considered a probable human carcinogen based on limited human evidence and sufficient animal studies. PCB exposure can lead to liver, biliary tract, intestinal, and skin (melanoma) cancer.

### **Recommendations**

#### *Additional Information*

1. The Department of Toxic Substances Control (DTSC) should conduct additional sampling of ground water on South 49<sup>th</sup> Street to ensure that there is an adequate understanding of the extent of the VOC-contaminated ground water plume. DTSC plans to collect this data by fall 2005.
2. DTSC should arrange for indoor air sampling in building B-240 to assess whether concerning levels of soil gas have entered this school facility.
3. CDHS should conduct a literature search to evaluate the risks associated with copper air contamination.
4. DTSC should sample more frequently the imported surface sediments used in recent (2004 – 2005) East Stege Marsh remediation to ensure clean fill materials are used to backfill the marsh.
5. DTSC and UC should sample surface water in the marsh to better understand current conditions.

#### *Actions*

1. Future activities on the site should be monitored for air quality along the perimeter of the site to ensure safe air quality for workers, residents, and recreators in the area.
2. Local workers and residents should be notified of remediation activities before they begin.
3. Detection limits in future air sampling at both sites should be set as low as feasible to better understand the air quality in the area and the potential impacts on people.
4. DTSC should fence and post the East Stege Marsh and lower lagoon and UC should fence and post the West Stege Marsh to reduce potential for exposure to unremediated parts of the marsh.
5. UC should draft a letter to RFS staff as promised that assures them of no reprisals or recrimination for asking questions about environmental quality at the site.
6. UC should review past worker practices on the site to determine which workers were digging in unexcavated areas and how often to better inform their health and safety plan.
7. UC health and safety plans should assume that contamination could be found at any location on the site until it is shown to be “safe.” Staff on the RFS grounds should be instructed what to do if they encounter cinders when digging.
8. UC should develop a health and safety plan for restoration work in the excavated areas of the UC marsh that takes into account the current and future exposures from chemicals migrating from non-excavated areas of the marsh

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**

*Contra Costa County Health Services Department and California Department of Health Services*

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9. UC should provide all RFS staff access to updated computer-based maps demonstrating locations of historic structures and where soil samples have been obtained, along with the associated contaminant level measurements.
10. UC should offer Hazwopper training to workers whose work may involve handling or digging in soils on site.

***Ongoing Actions***

1. Contra Costa County Health Services Department and the Environmental Health Investigations Branch of CDHS will continue to review data provided by DTSC, UC Field Station, and Zeneca and their contractors.
2. We will reevaluate this health statement and share our findings every 6 months with the Community Advisory Group (CAG) or in another public context unless new information warrants emergency action.
3. Upon reviewing all available data on past and future exposure pathways (exposures not reviewed in this statement), we will issue a final health statement and recommendations.
4. We will consult with local health care providers and offer technical assistance to Richmond city officials as needed.
5. In addition, we propose to schedule an interagency process evaluation for November. We will ask involved agencies to describe what was done well, what still needs to be done, and what regulatory or policy changes may be needed.

DTSC, the lead state agency for Zeneca, and RFS, will complete the site characterization and develop plans for remediation. They will set the cleanup levels that must be achieved. They will share all data with Contra Costa County Health Services Department and CDHS. They will provide support for the development and maintenance of the CAG. The purpose of the CAG is to provide regular and timely opportunities for the Richmond community to be informed and to provide input to DTSC regarding the regulatory oversight of cleanup activities. The 25 volunteer members act as liaisons to the communities they represent. The CAG will be able to address ongoing issues for the two sites in an open community process.

The UC Environment, Health and Safety Office will continue to respond to RFS staff inquiries and complaints and will relay concerns about activities on the Zeneca site to DTSC. They will maintain a log of all inquiries and complaints that will be available for inspection. They will work with the Tang Health Clinic to assess and treat staff health problems.

Provisional Joint Health Statement Summary  
**The Zeneca and UC Richmond Field Station Sites**  
*Contra Costa County Health Services Department and California Department of Health Services*

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**HOW TO OBTAIN MORE INFORMATION**

**Health Statement**

Contra Costa County Health Services Department  
Wendel Brunner, MD, PhD (925) 313-6712 [Wbrunner@hsd.co.contra-costa.ca.us](mailto:Wbrunner@hsd.co.contra-costa.ca.us)

*California Department of Health Services*  
Tivo Rojas (510) 622-4500 [TRojas@dhs.ca.gov](mailto:TRojas@dhs.ca.gov)

**Zeneca Site Characterization and Remediation**

*Department of Toxic Substances Control*  
Barbara Cook (510) 540-3839 [BCook@DTSC.ca.gov](mailto:BCook@DTSC.ca.gov) or  
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**UC Richmond Field Station Site Issues**

*UC Environmental Health and Safety Office*  
Karl Hans (510) 643-9574 or  
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