

**University of California, Berkeley  
Office of Environment, Health & Safety**

**Air Monitoring at  
Building 478, Richmond Field Station**

---

Prepared by: Geoffrey Won, Certified Industrial Hygienist

**Introduction**

On December 6, 2005, the Office of Environment, Health & Safety (EH&S) performed air monitoring for arsenic, perchloroethylene (PCE), trichloroethylene (TCE), and vinyl chloride at Building 478, Richmond Field Station. This monitoring was performed because some field station employees, scheduled to relocate to Building 478, are concerned about exposure to the above-mentioned contaminants, due to their presence in a groundwater plume beneath the adjacent Zeneca site. EH&S also sampled for vinyl chloride because it is a potential breakdown product of PCE and TCE.

**Sampling Strategy and Methodology**

To obtain representative samples, three locations in Building 478 (see Attachment A) were sampled to monitor possible soil vapor migration from Zeneca groundwater into Building 478. Room 100, likely a future front office, was sampled to represent exposure to administrative staff. Room 307, a possible future shop location, was sampled to represent exposure to shop personnel. Room 104 was sampled because it is nearest to the adjacent Zeneca site.

To ensure sampling would simulate occupants' actual respiratory exposure for the sampled contaminants, all samples were taken about four feet above room ground level. Arsenic, PCE and TCE samples were collected over periods of six hours. Vinyl chloride samples were collected over periods of 90 minutes because the NIOSH method specified that vinyl chloride should be sampled at 0.05 liter per minute for no more than 100 minutes. The samples (with field blanks) were collected using standard NIOSH methods (see Attachment B) and analyzed by Schneider Laboratories, Inc., Richmond, Virginia, a laboratory accredited by the American Industrial Hygiene Association.

---

**Sampling Results**

The results for arsenic, PCE, TCE and vinyl chloride are summarized below in Tables 1, 2, and 3, respectively (see Attachment C for laboratory results).

**Table 1. Arsenic Air Sampling Results  
 at Building 478, Richmond Field Station**

Sample Number	Sample Location	Reporting Limit (ug)	Sample Concentration (ug/m <sup>3</sup> )	Cal/OSHA PEL (ug/m <sup>3</sup> )
B478-AR-1	Room 100, Center	0.05	<b>BRL (&lt;0.04)</b>	10
B478-AR-2	Blank	0.05	<b>BRL</b>	10
B478-AR-3	Room 104, East Window	0.05	<b>BRL (&lt;0.04)</b>	10
B478-AR-4	Room 307, Center	0.05	<b>BRL (&lt;0.04)</b>	10

**Table 2. PCE and TCE Air Sampling Results  
 at Building 478, Richmond Field Station**

Sample Number	Sample Location	Chemical Sampled	Reporting Limit (mg)	Sample Concentration (PPM)	Cal/OSHA PEL (PPM)
B478-CS-1	Room 100, Center	PCE	0.02	<b>BRL (&lt;0.159)</b>	25
B478-CS-1	Room 100, Center	TCE	0.02	<b>BRL (&lt;0.193)</b>	25
B478-CS-2	Rm104, East Window	PCE	0.02	<b>BRL (&lt;0.184)</b>	25
B478-CS-2	Rm104, East Window	TCE	0.02	<b>BRL (&lt;0.224)</b>	25
B478-CS-3	Blank	PCE	0.02	<b>BRL</b>	25
B478-CS-3	Blank	TCE	0.02	<b>BRL</b>	25
B478-CS-4	Room 307, Center	PCE	0.02	<b>BRL (&lt;0.170)</b>	25
B478-CS-4	Room 307, Center	TCE	0.02	<b>BRL (&lt;0.208)</b>	25

**Table 3. Vinyl Chloride Air Sampling Results  
 at Building 478, Richmond Field Station**

Sample Number	Sample Location	Reporting Limit (mg)	Sample Concentration (PPM)	Cal/OSHA PEL (PPM)
B478-VC-1	Room 100, Center	0.01	<b>BRL (&lt;0.862)</b>	1
B478-VC-2	Room 104, East Window	0.01	<b>BRL (&lt;0.952)</b>	1
B478-VC-3	Room 307, Center	0.01	<b>BRL (&lt;0.720)</b>	1
B478-VC-4	Blank	0.01	<b>BRL</b>	1

Reporting Limit= the lowest reportable concentration of the tested substance  
 BRL= Below Reporting Limit. Sample concentrations below the minimum reporting limit are indicated with a "less than" (<) sign  
 PEL = Cal/OSHA Permissible Exposure Limit  
 PPM= parts per million  
 ug/m<sup>3</sup>= microgram of arsenic per cubic meter of air

The results for arsenic, PCE, TCE, and vinyl chloride concentrations measured in Building 478 were all below the laboratory's lowest reportable concentrations and thus well below Cal/OSHA's permissible exposure limits.

### **Conclusions**

During the sampling event on December 6, 2005, none of the contaminants (arsenic, PCE, TCE and vinyl chloride) were detected in the air sampling EH&S performed in Building 478. Based on this sampling, these contaminants do not appear at this time to be migrating from the Zeneca groundwater plume to Building 478. In addition, sampling has indicated that no vinyl chloride is present in Zeneca's groundwater plume, and that PCE and TCE are present at levels which, even if the Zeneca plume had migrated to the RFS, would not be expected to migrate through soils to adversely affect air quality in Building 478. Based on this information, and EH&S air sampling discussed in this report, EH&S concludes that the building is safe to occupy.

Should site conditions change or additional information become available about conditions at the Zeneca site that warrant additional sampling, EH&S will complete follow up sampling. For questions regarding this report, contact Karl Hans (643-9574 / [khans@berkeley.edu](mailto:khans@berkeley.edu)).