A·C·C
ENVIRONMENTAL
CONSULTANTS

September 28, 2006

Ms. Teresa Clarke
Affordable Housing Associates
1250 Addison Street, Suite G
Berkeley, California 94702

RE: Comments – Proposed Moisture/Vapor Barrier
160 14th Street, Oakland, California
ACC Project Number 6179-014.02

Dear Ms. Clarke:

ACC Environmental Consultants (ACC) has prepared this letter regarding the proposed moisture barrier to be installed during development at 160 14th Street, Oakland, California (Site). In our May 5, 2006 *Subsurface Characterization Report*, ACC identified tetrachloroethene (PCE) in groundwater that likely originates from an adjacent property at 190 14th Street. Based on the findings of a previously prepared Tier 1 Risk Evaluation, the concentration levels of PCE in groundwater at the Site are below the applicable environmental screening level (ESL) for commercial use and do not pose an unacceptable human health risk to future occupants of the proposed development at 160 14th St. However, since a moisture barrier has already been recommended prior to installation of the slab foundation, ACC would like to comment on the benefits of the proposed moisture barrier in regards to the PCE in groundwater issue.

ACC performed a Tier 1 risk evaluation using the published ESL for PCE promulgated by the San Francisco Bay Regional Water Quality Control Board (RWQCB). Based on proposed future Site use, Site location, and the depth to groundwater impacted by PCE, potential indoor inhalation is the only potential complete exposure pathway. According to Table E-1a of the RWQCB guidance manual, the applicable PCE ESLs vary from 120 micrograms per liter (µg/L) in high permeability residential soils to 1,700 µg/L in low/moderate permeability commercial soils, and are summarized in Table 1.

TABLE 1 – PCE ESLs (Table E-1a)

Constituent	Residential Land Use		Commercial Land Use	
	High Perm. Soil	Low Perm. Soil	High Perm. Soil	Low Perm. Soil
PCE	120	500	420	1,700

Notes Concentrations are in micrograms per Liter (µg/L)

PCE concentrations in groundwater ranged from 780 to 820 µg/L in saturated silty sands below 10 feet bgs. Based on estimated soil permeability at the Site, somewhere between low and high permeability, the applicable residential ESL for PCE would be approximately 400 µg/L and the applicable commercial ESL for PCE would be 1,360 µg/L. Site development will be a combination of commercial space and parking on the ground floor so commercial ESLs are applicable. The average PCE concentration of 800 µg/L in groundwater is well below the commercial ESL concentration of 1,360 µg/L.

ACC understands that the recommended moisture barrier for the Site is the Permalon Ply X-210. This high density, cross-laminated polyethylene fabric is highly resistant to tears and punctures and resists stress cracking caused by seasonal thermal expansion and contraction cycles in subsurface soils. Permalon Ply X-210 thickness is 20 mil, the burst strength is 100 pounds per square inch, and the puncture strength is 40 pounds. This polyethylene material, designed to prevent moisture movement in the subsurface, would also represent a substantial barrier to potential PCE movement in soil gas. While native soil permeability is estimated to be low to moderate, the proposed Permalon Ply X-210 moisture barrier would further decrease the already acceptable human health risk associated with PCE by further minimizing or preventing soil gas from migrating vertically to the building foundation.

Based on the findings of subsurface investigation performed at the Site, the results of the Tier I Risk Evaluation, and proposed construction methods including installation of the Permalon Ply X-210 moisture barrier, no significant impacts to human health associated with PCE concentrations in groundwater are indicated. Additional human health risk assessment or installation of a more elaborate vapor barrier is <u>not</u> warranted.

If you have any questions, please contact me at (510) 638-8400, ext. 109.

Sincerely,

David DeMent, PG, REA II
Division Manager / Senior Geologist

Attachment: Permalon Ply X-210 Specifications