UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Addendum to Second Five Year Review Report
Pacific Coast Pipeline Site, September 28, 2006

The Second Five-Year Review Report (Report) for the Pacific Coast Pipeline Site in Fillmore, California, was signed by Elizabeth Adams, Site Cleanup Branch Chief on September 28, 2006. The protectiveness determination was deferred because there are two plumes of groundwater contaminated with benzene near residences. An initial review of the groundwater data indicated that there was a slight chance that benzene, being a volatile compound, might be migrating up through the subsurface and into the ambient air or residences. EPA determined that field sampling must be conducted in order to determine whether or not soil vapor intrusion is occurring. The statement in the Report regarding protectiveness was as follows:

> A protectiveness determination regarding the remedy for Pacific Coast Pipeline Site cannot be made until further information is obtained about the potential for vapor intrusion at the Site. Vapor intrusion is the migration of volatile compounds from the groundwater up through the subsurface and into the ambient air. Further information will be obtained by implementing the soil gas sampling and analysis plan approved in August 2006. It is expected that these actions will take approximately six months to complete, at which time a protectiveness determination will be made. Additionally, MNA will be evaluated and an amendment to the groundwater remedy in the ROD will be prepared. In order to ensure the long-term protectiveness of the Site, institutional controls regarding the use of the property and groundwater will also be included in the ROD amendment.

A five-year review addendum is generally completed for remedies where the protectiveness determination is deferred until further information is obtained. A timeframe is provided for when the necessary information will be obtained and a protectiveness statement can be made. This addendum documents progress made to determine whether or not soil vapor intrusion at the Pacific Coast Pipeline Site is a risk to human health and the environment since the deferral of the protectiveness determination in the September 28, 2006 Five-Year Review Report.

Progress Since the Five-Year Review Completion Date

Vapor Intrusion Analysis

Under EPA direction, Chevron conducted field sampling to evaluate the subsurface conditions above the benzene plumes. The sampling program included soil borings to collect soil property data such as total organic carbon, moisture content and air

permeability, and soil gas samples from the vapor gas ports at the soil boring locations at various depths (typically 10, 20, 30 and 40 feet). Samples were collected from continuous multichannel tubing (CMT) wells during two seasonally opposite (rainy and dry) periods.

Results of the sampling, presented in the *Report of Natural Attenuation Characteristics and Soil Vapor Characteristics Above Dissolved-Phase Benzene Plumes, November 14, 2007*, showed that concentrations of benzene are decreasing upward as the vapor migrates from the groundwater up into the subsurface soil. The table below shows the results of the shallowest samples collected in March 2007 and resampled in August 2007:

Soil Gas Samples (shallowest sample collected)

LOCATION	DEPTH (FT BGS)	BENZENE CONCENTRATION $\mu G/M^3$ (March 07 result, August 07 result)
Southern Plume		
SSA-07	7	<14, <7.2
SSA-09	7	<7.3,<7.2
SSA-10	7	<36, <9.3
SSA-11	7	<19, <14
Northern Plume		
NSA-02	13	<6.9, <7.0

bgs – below ground surface
$\mu g/m^3$ – micrograms per cubic meter

EPA compared the results of the soil vapor sampling with the California Human Health Screening Levels (CHHSLS) for indoor air and soil gas. The CHHSL for residential use for benzene (the level used to determine if further investigation is warranted) is 36.2 $\mu g/m^3$ at 5 feet bgs. The data indicates that the vapor in the shallow soil is below the CHHSL target cancer risk of 10^{-6}.

Furthermore, soil gas data and soil properties data, in conjunction with carbon dioxide concentrations increasing with depth, and oxygen concentrations decreasing with depth, indicate the benzene is naturally attenuating. Therefore there is no risk to nearby residents through the subsurface vapor-to-indoor air pathway.

Issues and Recommendations

There are no outstanding short-term protectiveness issues, given the results of the soil vapor intrusion evaluation.

Protectiveness Statement

The remedy at the Pacific Coast Pipeline Site is protective of human health and the environment in the short-term, as the vapor intrusion study indicates that shallow soil vapor does not present a risk. As the 2006 Five-Year Review Report indicates, however,

institutional controls likely will be necessary to ensure protectiveness in the long term. EPA continues to assess alternatives for what type of institutional controls might be needed to ensure long-term protectiveness.

Next Five-Year Review

The next five-year review will be conducted in 2011.

Approved by: *Date:*

4/20/10

Michael M. Montgomery
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