

The Bodega Bay Institute

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16 April 2003

Richard Weissenborn
Remedial Project Manager
Department of the Navy
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190

Dear Mr. Weissenborn,

Following for your consideration are my comments on the report 'Draft Site Inspection Report, Fed-1A, Alameda Point, Alameda, California, 3 March 2003'.

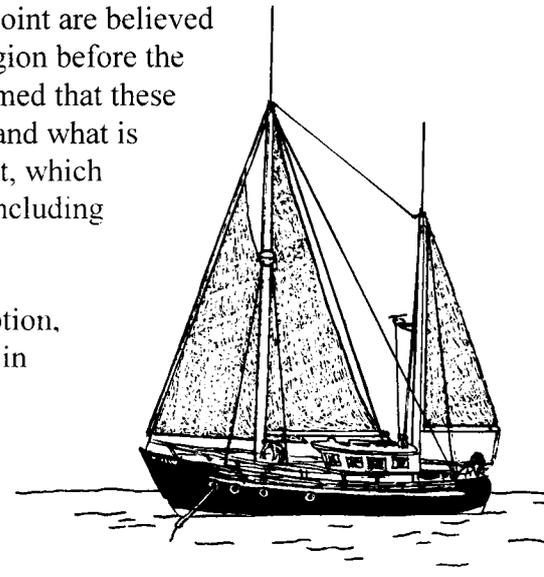
The report states that concentrations of carcinogenic PAHS exceeded human health criteria at six of the 79 sites sampled within the approximately 400 acres that comprise Fed-1A, most of which is paved and which was formerly used for aircraft operations. Further action under CERCLA is recommended. This area does not include the IR Site 2 landfill (FED-2A), nor does it include the wetlands in the south-east area (FED-2B).

I would strongly recommend that any future study design and drafts of reports be thoroughly reviewed by independent scientists outside of the environmental consulting community. The conclusions of this study would have been much stronger and less ambiguous if such reviews had been undertaken.

The assumption that toxicity is equivalent to carcinogenicity is highly questionable. Yet the present application yields B(a)P equivalent values that are not greatly higher than those produced by benzo(a)pyrene alone. On the other hand, if the PAHs were present in a waste petroleum mixture, many additional carcinogens would be present and the B(a)P equivalents would be a gross underestimate of the total carcinogenic activity.

The Executive Summary states: "The PAHs in fill at Alameda Point are believed to have originated from petroleum industries that operated in the region before the Department of the Navy occupied the area (before 1936). It is assumed that these industries released waste, including PAHs, into San Francisco Bay and what is now Oakland Inner Harbor. The PAHs accumulated in the sediment, which was then used as fill to create the land that is now Alameda Point, including transfer parcel FED-1-A."

Yet no effort was made to determine the validity of this assumption, nor to determine the contribution of PAHs derived from the asphalt in



the runways. It is well known that the composition of PAHs in petroleum mixtures is significantly different from the composition in PAHs derived from combustion, i.e.

Radke, M., and D.H. Welte. 1983. The methylphenanthrene index (MPI): A maturity parameter based on aromatic hydrocarbons. Pages 504-512 in *Adv. Org. Geochem. 1981*, M. Bjoroy *et al.*, eds. J. Wiley, Chichester.

The ratios of substituted compounds to their parent, i.e. the sum of methyl phenanthrenes compared to phenanthrene, would permit distinguishing among PAHs of different origins. It would not have been a major departure from the analytical technique used to include these several additional compounds.

Surely it would have been helpful to know how much of the PAHs measured derived from the asphalt. The study should therefore have included several asphalt particles in order to determine their background profile, which could be considered as a characteristic 'fingerprint'. The protocol called for the removal of visible asphalt particles, but smaller particles would be difficult or impossible to detect and would have been included with the samples.

Samples from 4 depths were obtained at 79 sites in parcel FED-1-A. Concentrations of benzo(a)pyrene, the carcinogenic PAH of greatest concern were sufficiently above background at 43 of these sites to permit comparisons between concentrations in the surface layer and in deeper layers. At 36 of these sites, 84% of the total, concentrations were higher in the surface layer (0 - 0.5 ft) than in the layer immediately below (0.5 - 2 ft) and at 34 sites (79%), concentrations in the surface layer were higher than any recorded at greater depths. The distribution is therefore non-random, with the highest concentrations in the soil immediately adjacent to the asphalt. The origin of the PAHs in the surface layer would therefore appear to be different from the origin of the PAHs in the deeper layers. The assumption that the PAHs derived from the sediments of Oakland Inner Harbor can not therefore be supported.

Four of the six contaminated sites are adjacent, at one end of a principal runway. This distribution is also non-random. It would appear likely that the contamination is at least partly associated with aircraft activities at this site rather than past dredge spoil disposal practices throughout the area of the parcel. Wear on the asphalt could increase its conversion to dust.

The very high concentration of PAHs at 2-4 ft depth at site 32FED-1A-58, adjacent to the south-east wetlands, is very likely associated with waste petroleum. In that case the "soil" would be expected to have the visual appearance of tar, as do the sediments at a former petroleum waste disposal site in Richmond.

I assume that the EPA human-health carcinogenic risk from benzo(a)pyrene in surface soils does not apply to asphalt, since the PAHs in asphalt are less bioavailable. The presence of very

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small particles of asphalt would, however, obscure this distinction. Nevertheless, the conclusions of the report must be considered as 'weak' since the analysis is based on a risk assessment for soils rather than for a mixture of soils and asphalt.

The good news is that subtraction of PAHS in asphalt that are less bioavailable would decrease the PAHs levels of concern, perhaps below the threshold of the criterion value.

Any further assessment of this "area of concern" should therefore include consideration of the origin of the PAHS in order to determine whether it is an asphalt-derived problem or a waste petroleum-derived problem, or if both, how much of each. I would therefore recommend that the methylphenanthrenes and anthracenes, and also other substituted compounds such as the methylpyrenes and fluoranthenes be included in the analyses, quantified in arbitrary units if necessary, in order to provide the additional information necessary to determine origins.

Respectfully yours,

A handwritten signature in black ink, appearing to read "Richard W. Risebrough". The signature is fluid and cursive, with the first name being the most prominent.

R.W. Risebrough

cc: Mark Ripperda, USEPA
Chris Bandy, USFWS
Dan Welsh, USFWS
Tom Mauer, USFWS
Jin Haas, USFWS
Arthur Feinstein, Conservation Director, Golden Gate Audubon Society
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