



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

February 19, 1992

Mr. James Shafer
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-L
Philadelphia Naval Shipyard
Philadelphia, PA 19112-5094

RE: NAS Brunswick
Site 8

Dear Mr. Shafer:

Pursuant to discussions regarding the appropriate risk estimates for Site 8, in October of 1991 EPA requested that the Navy recalculate the estimated risk using the OSWER Directive (USEPA 1991), a future residential exposure scenario, and the maximum carcinogenic PAH concentration detected at the site. These risk calculations were submitted to EPA by ABB Environmental in a memo dated November 12, 1991.

The risk calculations contained in the November 12, 1991 memo are acceptable to EPA as representative of a reasonable maximum exposure at the site. The two risk estimates presented (a 6-year exposure duration for a young child and a 24-year exposure duration for an adult) should be summed to obtain a total risk estimate for future residential use.

For a final recalculation of risk estimates, it should be noted that, effective 2/1/92, the USEPA Environmental Criteria and Assessment Office revised the cancer potency factor for benzo(a)pyrene for the oral route of administration from 11.8 mg/kg/day to 5.8 mg/kg/day. This new cancer potency factor should be used in the risk estimates for Site 8.





If you have any questions regarding this information, please contact me at (617)5673-5784.

Sincerely,

Sheila Eckman

Sheila M. Eckman
Associate Remedial Project Manager

cc: Mary Jane O'Donnell, EPA
Jui-yu Hsieh, EPA
Ann Johnson, SAIC
Ted Wolfe, ME DEP
Eileen Curry, NASB
Mel Dickenson, ABB



**Risk Assessment Issue Paper for:
Status of Polycyclic Aromatic Hydrocarbons**

Toxicity Information

I. Oral RfD

There are 6 Agency-derived oral RfDs for specific chemicals commonly referred to as a compound class, polycyclic aromatic hydrocarbons (PAHs). Table 1 lists the chemicals with oral RfDs along with the critical study, species, critical effect and reference dose. For the 5 chemicals that have been verified by the Agency's RfD/RfC Work Group, the date of verification is listed. These RfDs are currently available on IRIS.

II. Inhalation RfC

Inhalation RfCs have not been calculated for any of the PAHs. There is currently available on the Agency's Integrated Risk Information System (IRIS) a description of the inhalation carcinogenic effects of benzo(a)pyrene (BaP). Lung cancer has been shown to be induced in humans by various mixtures containing PAHs. However, from the information available it is not possible to conclude that BaP per se is the responsible agent. Carcinogenicity studies with BaP mainly used particulate matter carriers; BaP carcinogenicity in the lung has not been demonstrated in the absence of these carriers. It is not known if systemic toxicity in the lung will also be dependent on particulate matter carriers. Therefore, it is not recommended that the systemic inhalation toxicity of BaP in particulate and the PAHs in general be estimated from or assumed to be equivalent to that found in oral exposure.

Carcinogenic Assessment

I. Background

OHEA/ECAO-Cincinnati is currently preparing a multimedia document on PAHs which will serve as the basis for risk assessment of PAHs at Superfund sites. This document is still in the initial stages of preparation. ECAO-Cin, however, has delivered a final draft of the Drinking Water Criteria Document for Polycyclic Aromatic Hydrocarbons (PAHs) (ECAO-CIN-DO10, December, 1991). Both documents discuss toxicity equivalency factors for the carcinogenicity of PAHs. There is presently no Agency position on this issue. It is likely that benzo(a)pyrene will serve as the reference point for the Toxicity Equivalency



risk estimates can be found in the final draft of the Drinking Water Criteria Document for PAHs (ECAO-CIN-D010, December, 1991). This document will soon be made available through NTIS, following final Agency approval. The oral quantitative risk estimates have been verified by CRAVE and will be loaded on IRIS February, 1992.

The multimedia document on PAHs (title of document currently not available) will present an inhalation slope factor to replace that previously published (U.S.EPA, 1984). The CRAVE Work Group found the reported inhalation slope factor of 6.1 per (mg/kg)/day based on the data of Thyssen et al. (1981) to be unacceptable. The reason for this finding is that the individual animal data used to calculate the slope factor were not provided to adequately insure the accuracy and confidence of the derivation. These data have been subsequently provided. OHEA is presently awaiting resources to conduct the reanalysis of the inhalation slope factor.

IV. Current Status of TEF approach

The OHEA Multimedia Document on PAHs is scheduled for completion the end of FY 92. It will address about 25 different PAHs for classification and present a proposed Toxicity Equivalence Factor approach for carcinogenic potency of PAH in mixtures. OHEA has received two reports on TEF approaches from a contractor. There are difficulties with both approaches, and OHEA is not prepared to accept either as a basis for Agency policy. A proposed TEF (which may be a combination of both approaches) will be reviewed during FY 92.

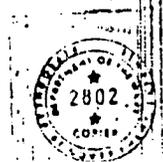


Table 1. Oral RfDs for PAHs

Compound/ Status	Exposure	Species	Critical Effect	Uncertainty Factor	Modifying Factor	Reference Dose	Reference
Acenaphthene/Verified (11/15/89)	175 mg/kg/day daily by gavage for 90 days (NOEL); 350 mg/kg/day (LOEL)	Mouse	Hepatotoxicity	3000	1	6E-2 mg/kg/day	U.S. EPA, 1989a
Anthracene/Verified (11/15/89)	1000 mg/kg/day daily by gavage for 90 days (NOEL) (MDT)	Mouse	No effects	3000	1	3E-1 mg/kg/day	U.S. EPA, 1989b
Fluorenone/Verified (11/15/89)	125 mg/kg/day daily by gavage via corn oil for 13 weeks (NOEL); 250 mg/kg/day (LOEL)	Mouse	Nephropathy, increased relative liver weights, hematological and clinical effects	3000	1	4E-2 mg/kg/day	U.S. EPA, 1988
Fluorene/Verified (11/15/89)	Gavage via corn oil 125 mg/kg/day for 13 weeks (NOEL); 250 mg/kg/day (LOEL)	Mouse	Decreased RBC, packed cell volume and hemoglobin	3000	1	4E-2 mg/kg/day	U.S. EPA, 1989c
Naphthalene	80 mg/kg/day in diet for 5 days/week for 13 weeks (35.7 mg/kg/day)	Rat	Decreased body weight	10,000	1	4E-3 mg/kg/day	NTP study (1980)

