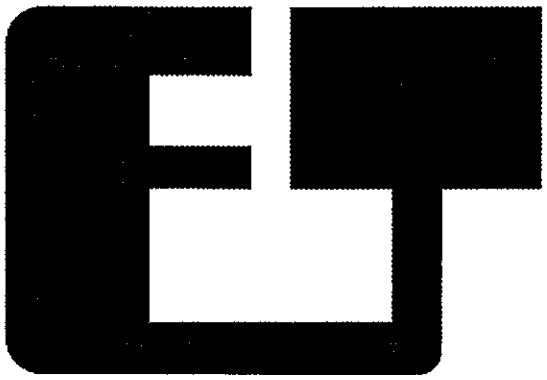

EXCELTECH

ADDENDUM TO REVISED HEALTH RISK ASSESSMENT

FOR

SAKLAN AVENUE PROPERTY HAYWARD, CALIFORNIA

Project No. 3-50058-51
June 1991

REVISED
HEALTH RISK ASSESSMENT
ADDENDUM

This document is an addendum to the Revised Health Risk Assessment presented to the Alameda County Health Agency (County) dated May 20, 1991. The Revised Health Risk Assessment included the Health Risk Assessment, dated April 22, 1991, as an appendix. That revision responded to questions presented by the County in a letter dated March 14, 1991, and also evaluated the results of additional soil sampling as proposed in the original Health Risk Assessment.

This Addendum is in response to further questions posed by the County in a letter to Mr. Rob Robles dated June 10, 1991. Specifically, the County requested soil concentrations for Aldrin, Lindane, and PCBs which correspond to a one-in-one-million cancer risk. Furthermore, the County requested that the cancer risk for oral, dermal, and inhalation exposures be combined for Aldrin, Lindane, PCBs and DDTr (DDT plus DDE and DDD), and compared to the one-in-one-million cancer risk for those chemicals.

PROCEDURE

As presented the U.S. Environmental Protection Agency Superfund Public Health Evaluation Manual, the procedure for determining the one-in-one-million cancer risk is based on the chemically-specific carcinogenic potency factor (q_1^*), a value that describes the degree of cancer-causing potential for the chemical. Specifically, the carcinogenic potency is the upper-bound 95% confidence limit of the slope of the extrapolated cancer dose response curve. The exposure level is multiplied by the carcinogenic potency factor.

The carcinogenic potency factors are taken from a series of chemical-specific documents describing the toxicological profile of the chemical, produced by the U.S. Public Health Agency in collaboration with the U.S. EPA (see attached list of references).

Table 1 - Carcinogenic Potency Factors

Compound	q_1^*
Aldrin	17 $(mg/kg\text{-}day)^{-1}$
Lindane	1.3 $(mg/kg\text{-}day)^{-1}$
PCBs	7.7 $(mg/kg\text{-}day)^{-1}$
DDTr	0.34 $(mg/kg\text{-}day)^{-1}$

For consistency, the one-in-one-million cancer risk for DDTr is recalculated using these procedures. The original Health Risk Assessment used a value given in a 1991 publication by F. Martz.

In the original Health Risk Assessment, on page 16, it was noted that due to the clay content of the native soil, the area wind speed, and the predicted presence of pavement, structures, and vegetation, "inhalation exposure should not be a significant concern for the residents in the area." However, the County has requested that an inhalation exposure be calculated and included in the cumulative cancer risk. For purposes of this calculation, it is assumed that a 70 kg adult will be in the immediate vicinity of active soil disturbance 8 hours per day, every day for 70 years. An inhalation rate of 20 cubic meters per day is taken from the Superfund Public Health Evaluation Manual.

ONE-IN-ONE-MILLION CANCER RISK

To determine the concentration of the compound (in this soil and based on these site specific conditions) that results in a one-in-one-million cancer risk, this risk is divided by the carcinogenic potency factor, and equated to a combined oral, dermal and inhalation exposure.

Exposure in mg/kg-day for a given soil concentration "C" in mg/kg:

Inhalation Exposure[1]

$$(C) \times (12\ gr/hr/m2) \times (809.3\ m2) \times (500\ us/m^3) \times (6.7\ m^3/day) / (70\ kg)$$

Oral Exposure

$$(C) \times (0.15 \times 10^{-3}\ kg/day) / (70\ kg)$$

Dermal Exposure[2]

$$(C) \times (0.450 \times 10^{-3}\ kg/day) \times (10\%) / (70\ kg)$$

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1 This calculation utilizes a number of 500 microseconds per cubic meter, taken from an isopleth summing the worst-case mechanical and erosion emission rates, found of Figure 4-12, page 57, Cowhead, et al, 1984. Rapid Assessment of Exposure to Particulate Emissions From Surface Contamination Sites. EPA/600/8-85-002.

Inhalation exposure also uses a worst case PM_{10} emission factor of 12 grams/hour/square meter and assumes that a maximum of 10% of the site will be actively disturbed during the 8 hours per day of exposure over 70 years.

2 Assumes dermal adsorption of 10%, and 5% for DDTr, as noted in original Health Risk Assessment.

Table 2

One in One Million Cancer Risk
(Site Specific for Saklan Road Project, Hayward, California)

Compound	Concentration
Aldrin	0.021 mg/kg
Lindane	0.28 mg/kg
DDTr	1.19 mg/kg
PCBs[3]	0.10 mg/kg

CALCULATED CANCER RISKS

Based on the calculations of exposure and carcinogenic potency presented above, and the actual concentrations of pesticides identified on the site, cancer risks calculations were made. Because the calculations covered a 70 year period, half-life degradation was taken into account. The maximum half-life for Lindane and DDT as presented in the original Health Risk Assessment were used for these calculations. The actual equations are presented in the Revised Health Risk Assessment. No half-life for Aldrin in soil was identified in the original Health Risk Assessment or found in additional literature, consequently, the risk value presented implies no degradation throughout the 70 years.

No calculation was made for the PCBs identified on site. These calculations are based on the fact that the pesticides are spread throughout the site (specifically the statistical analysis assumes a normal distribution of compounds within the upper 30 inches of soil following construction). There is no basis to make this kind of assumption for the PCBs. Only one sample contained detectable levels of PCBs. This would indicate that the either the analysis produced a false positive, or the PCB concentrations in the soil are very localized.

The approximate sample location of the positive PCB result is known, and based on the fact that no other sample had detectable levels of PCBs, it would be prudent to attempt to confirm the presence of this compound. A number of surface soil samples in the area of the positive sample location could be used to either support the possibility of a false positive, or define the extent of confirmed PCB concentrations in the soil. As PCBs are used in capacitor cooling oils and various cutting and lubricating oils, a visual inspection of the positive sample location for oil staining is indicated prior to selection of sample locations. Should the presence of PCBs be confirmed, a localized remediation plan may be required.

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[3] Exposure levels for PCBs include an inhalation absorption of 50%, an oral absorption of 30% and a dermal adsorption of 10%, as taken from the U.S. EPA's Guidance on Remedial Actions for Superfund Sites with PCB Contamination, August 1990.

CONCLUSIONS AND RECOMMENDATIONS

Based on the calculations presented above, the following two conclusions are presented:

1. The Aldrin, Lindane and DDTr concentrations in the soil do not represent a greater than one-in-one-million cancer risk, and

2. The PCB concentration, if actual, represents a greater than one-in-one-million cancer risk in the localized area of its presence.

From these conclusions, we propose the following recommendations:

1. No further investigations or remediation be required on the portions of the site that are outside the localized area surrounding the positive PCB sample location, and

2. A soil sampling plan be prepared and implemented to determine the presence of, and extent of, PCBs in the surface soil surrounding the positive PCB sample location.

REFERENCES

"Guidance on Remedial Actions for Superfund Sites with PCB Contamination", United States Environmental Protection Agency, EPA/540-G-90/007, August 1990.

"Superfund Public Health Evaluation Manual," United States Environmental Protection Agency, EPA/540/1-86/060, October 1986."

"Toxicological Profile for a-, β–, γ–, and δ– Hexachlorocyclohexane," Clement Associates, U.S. Public Health Service, December 1989.

"Toxicological Profile for Aldrin/Dieldrin," Dynamac Corporation, U.S. Public Health Service, May 1989.

"Toxicological Profile for p,p'-DDT, p,p'-DDE, and p,p'-DDD," U.S. Public Health Agency, 1989.

"Toxicological Profile for Selected PCBs (Aroclor-1260, -1254, -1248, -1242, 1232, -1221, and -1016)," Syracuse Research Corporation, U.S. Public Health Service, June 1989.