293 0

File: 541.460.000n
C.G.

THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 293

File:
C.G. 541. 460. D

received 293
MAR 10 1998

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
MEMPHIS ENVIRONMENTAL FIELD OFFICE
SUITE E-645, PERIMETER PARK
2510 MT. MORIAH
MEMPHIS, TENNESSEE 38115-1520

March 9, 1998

Memphis Depot Caretaker
ATTN.: DDSP-FE (Mr. Glenn Kaden, BEC)
2163 Airways Blvd.
Memphis, Tennessee 38114-5210

RE: TDEC/DSF #79-736, cc 82
Baseline Risk Assessment, Safety and Health Plan, and Sampling and Analysis Plan for Golf Course Impoundments, December 1997

Dear Mr. Kaden:

The Tennessee Division of Superfund, Memphis Environmental Assistance Center (MEAC), on behalf of the Tennessee Department of Environment and Conservation (TDEC/DSF), received supplemental comments on the above-referenced document from Dr. Ruth Chen of the Tennessee Department of Health. Pursuant to the DSMOA and FFA, TDEC/DSF is enclosing a copy of these additional comments.

If any comment does not require a replacement page insert owing to revisions, a written response to that comment will be sufficient. Should you have any questions concerning these comments please don't hesitate to call me at (901) 368-7957.

Very truly yours,

Terry R. Templeton

Terry R. Templeton, P.G.
Project Manager
TDEC/DSF/MEAC

Enclosure

c: TDEC/DSF, NCO - file (without enclosure; copy provided to RAB)
TDEC/DSF, MEAC - file (with enclosure-original)
Ramon Torres (with enclosure-copy)
United States Environmental Protection Agency
Region 4, Waste Management Division
61 Forsyth St.
Atlanta, GA 30303

Memorandum

FEB 27 1998

TO: Terry Templeton

FROM: Ruth Chen, Ph. D.

RE: Draft Baseline Risk Assessment, Safety and Health Plan, and Final Sampling and Analysis Plan for Golf Course Impoundments at the Defense Distribution Depot, Memphis, Tennessee, December 1997.

DATE: February 23, 1998

cc: Jordan English, Bonnie Bashor, and Andy Binford

INTRODUCTION

Mr. English and Mr. Templeton asked me to review the *Draft Baseline Risk Assessment for Gulf Course Impoundments at the Defense Distribution Depot, Memphis, Tennessee.* It was submitted by Radian International for US Army Corps of Engineers, Mobile District, in December 1997. In particular, Mr. Templeton asked me if the risks calculated from this baseline risk assessment, which is based on the inedible Arkansas shiners, can be used to address the question of species-to-species extrapolations to the risks from consuming the edible, pesticide contaminated, species of fish in Lake Danielson and the Golf Course Pond.

DISCUSSION

The risks evaluated from Arkansas shiners cannot be used to estimate the risks from eating pesticide contaminated edible fish in Lake Danielson and the Golf Course Pond. This baseline risk assessment does not even adequately address the risks from the pesticides in the sediment and the consumption of Arkansas shiners. There are several reasons for this: discrepancies in the data, incomplete and flawed sampling, narrow assumptions, lack of follow-up analysis, and incomplete ecological risk assessment. These reasons are explained in the following paragraphs.

1) Discrepancies in the data

a) Figure 4-1. Proposed Sediment Sample Locations, Golf Course, Defense Distribution Depot, Memphis on page 4-3 in the *Sampling and analysis Plan for Fish and Sediment Sampling at the Defense Distribution Depot, Memphis, Tennessee* is left blank.

b) Figure 8-1. 1997 Sediment Sample Locations, Lake Danielson and Golf Course Pond, Defense distribution Depot, Memphis, Tennessee shows 13 sediment sampling locations which are supported by the Analysis Request Environmental Chain of Custody form from Lancaster Laboratories. Yet on Table 10-1 Comparison of Maximum Detected Pesticide Concentrations in Golf Course Impoundments Surface Water and Sediment to EPA Region 4 Ecological Screening Values maximum concentration of DDE in water is presented. This indicates water samples have also been taken. If so, sampling locations for surface water needs to be shown, Chain of Custody needs to be in order, and sampling results have to be presented and included in this baseline risk assessment. Figure 4-1. 1990 Sediment Sample Locations, Lake Danielson and Golf Course Pond, Defense Depot, Memphis, Tennessee does show surface water sample locations. If there are any discrepancies between 1990 and 1997 surface water sampling locations and sampling results, they need to be explained.

c) Chain of Custody Records for the September and October 1997 sampling from Radian International are not included in the Draft Baseline Risk Assessment. If included, these records will go a long way in explaining discrepancies in 1b.

2) Incomplete and flawed sampling

The sampling plan as shown in the *Sampling and Analysis Plan for Fish and Sediment Sampling at the Defense Distribution Depot, Memphis, Tennessee* was not carried out. The fish sampling plan calls for collection of at least five specimens of each edible species of fish from each water body. But this baseline risk assessment is based on the inedible Arkansas shiner when sunfish, smallmouth bass, largemouth bass and catfish are proposed. In *Assessing Human Health Risks from Chemically Contaminated Fish and Shellfish* (EPA, 1986), a demersal (bottom-dwelling) indicator species is recommended. The species of fish that fits the criteria best is the catfish. I have trouble understanding why the sampling event took place in September and October of 1997 but the *Sampling and Analysis Plan for Fish and Sediment Sampling at the Defense Distribution Depot, Memphis, Tennessee* was dated December, 1997.

3) Narrow Assumptions

In quantifying the pesticide exposure in fish ingestion, it is assumed that the only intakes of pesticides by fish are from the sediment and surface water (Appendix A). The pesticides in question here, DDT, DDE, DDD, chlordane, heptachlor epoxide, and dieldrin, are all highly persistent. The question of biomagnification via ingestion of other aquatic plants and animals has not been adequately addressed by this baseline risk assessment.

4) Lack of Follow-Up Analysis

When the only fish species caught in the fish sampling event was Arkansas shiner, there was no attempt in explaining why other fish were not caught. The smallness of the database in terms of the species represented seriously undermines the result of the risk assessment. The time of sampling is vitally important in catching fish. It was not obvious form the pictures and the text that fish sampling took place during optimum feeding time: 5 to 7 am, at dusk, or in the evenings. The fish in the Impoundments have been stocked. The records for stocking can be a great source for determining the species present in the Impoundments.

5) Incomplete Ecological Risk Assessment

Table 10-1. Comparison of Maximum Detected Pesticide Concentrations in Golf Course Impoundments Surface Water and Sediment to EPA Region 4 Ecological Screening Values shows the maximum detected concentrations of DDT, DDE, and DDD. Because concentrations of these three pesticides were below the Region 4 screening values (EPA, 1997) for protection of ecological receptors, it is concluded that no further ecological risk assessment is needed (page 10-1). However, chlordane and heptachlor epoxide are also detected in the sediment as shown on Table 8-1. Pesticide Concentrations Reported for the 1997 Sediment and Fish Samples Collected from the Golf Course Impoundments at the Defense Distribution Depot, Memphis, Tennessee. The maximum chlordane concentration in the sediment, 3890 ppb, is more than twice the Region 4 screening value of 1700 ppb (EPA, 1996). Five out of the eight detected chlordane sediment concentrations are also above the Region 4 screening levels. Chlordane and heptachlor epoxide have been included in the human health risk assessment. So the last four steps of the Preliminary risk Evaluation (i.e., problem formulation, ecological effects evaluation, exposure estimate, and risk calculations) need to be completed.

CONCLUSIONS

The results of this baseline risk assessment cannot be extrapolated into the risks from ingesting edible, pesticide contaminated fish in Lake Danielson and the Golf Club Pond. The reasons are: 1) lack of confidence in the data due to confusions in the types of samples collected, sampling locations and sampling results; 2) incomplete and flawed fish sampling which resulted in only one species of inedible fish; 3) narrow assumptions in the pesticide exposure in fish which do not include bioaccumulation of pesticides due to fish consumption of contaminated aquatic plants and animals; 4) lack of follow-up analysis which does not address the selection of fish and reasons for the outcome of fish sampling; and 5) incomplete ecological risk assessment which does not include chlordane and heptachlor epoxide when both pesticides are evaluated in the human health portion of the baseline risk assessment.

RECOMMENDATIONS

1) Locate the Radian International Chain-of Custody Records for the September and October 1997 sampling event to establish if surface water samples were taken along with sediment and fish samples.

2) Sample the fish species according to the *Sampling and Analysis Plan for Fish and Sediment Sampling at the Defense Distribution Depot, Memphis, Tennessee.* Determine the target fish species from the source that stocked the fish population in the Impoundments, select the target species, and determine the optimal time for fishing.

3) Clarify discrepancies in the sampling results, revise relevant Tables and Figures and the human health portion of the baseline risk assessment.

4) Complete the ecological risk assessment to include evaluations for chlordane and heptachlor epoxide.

REFERENCES

USEPA 1997, *Supplemental Guidance to RAGS,* Region 4 Bulletins, Office of Technical Services, March 19.

USEPA 1996, *Region 4 Interim Screening Risk Assessment Guidance, Office of Technical Services Supplemental Guidance to RAGS:* Region 4 Bulletins, October.

USEPA 1986, *Assessing Human Health Risks from Chemically Contaminated Fish and Shellfish.*

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE