

RED HAFB 2000



GARY E. JOHNSON  
GOVERNOR

State of New Mexico  
**ENVIRONMENT DEPARTMENT**

Hazardous Waste Bureau  
2044 A Galisteo, P.O. Box 26110  
Santa Fe, New Mexico 87502-6110  
Telephone (505) 827-1557  
Fax (505) 827-1544



PETER MAGGIORE  
SECRETARY

PAUL R. RITZMA  
DEPUTY SECRETARY

MEMORANDUM

TO: Cornelius Amindyas  
FROM: Kirby Olson *KSO*  
RE: Risk Assessment Review for SWMUs 139 and 140 (Lake Holloman and Lake Stinky) at Holloman Air Force Base  
DATE: August 28, 2000

This review is based on review of the *1997 Characterization Summary and No Further Action Documentation: SWMUs 139 and 140* and review of the *1996 Draft Final Risk Assessment Addendum for the Sewage Lagoons Closure Project*.

Human Health Risk Assessment Review

The 1996 risk assessment addendum updates the 1993 risk assessment by revising the exposure scenarios to reflect the actual current and future uses of the area, and also uses the more recent toxicity values for PCBs. The exposure scenarios are appropriate for expected exposures at the site and use appropriate default factors. I based my review on the results of the RME exposures since these used the 95% UCL of the mean, which is the value preferred by HWB. In both the 1993 and 1996 risk calculations, the risk due to ingestion of ducks by hunters was significantly higher than the risks from other exposure pathways. However, the total risk calculated for this pathway (from ingestion and direct exposure) is  $6 \times 10^{-6}$ , which is below the current HWB guideline for human health of  $10^{-5}$ . This estimate is based on actual contaminant concentrations in duck breast tissue and New Mexico-specific duck ingestion rates, so it should represent a viable estimate of the risk. All other exposure scenarios resulted in risk estimates well below  $10^{-6}$ , and noncancer hazard indices for all pathways (including duck ingestion) were well below one. The human health risk assessment for these two SWMUs were conducted in accordance with our guidelines and do not indicate any human health based reasons to deny the NFA petition.

### Ecological Risk Assessment Review

The 1996 ecological risk assessment completely replaces the earlier ecological risk assessment, though it does use the media sampling data in the 1992 through 1994 sampling. It also uses the results of the 1993 biota sampling for contaminant concentrations in organisms in the food chain of the lakes. Although this ecological risk assessment predates the EPA and HWB guidance on ecological risk assessment, it uses the same approach of modeling the dose to a receptor organism based on concentrations in food, water, and media ingested and comparing that dose to a dose-based toxicity benchmark. The equations given for this model are appropriate for estimating risk to the ecosystem and receptors chosen. For this risk assessment actual measured concentrations in the food items were used along with media sampling results to generate the dose ingested for comparison to the benchmark. The benchmarks used here are Lowest Observed Adverse Effect Level (LOAEL) base benchmarks; therefore the hazard index generated using these benchmarks should be less than one to ensure that adverse effects are not likely. In the modeling from these food sources, no constituents generated hazard quotients greater than one for any of the waterfowl receptors at either lake. The mosquito fish were not modeled this way; assessment of this species was done based on measured tissue concentrations.

For DDT, DDD, and DDE ecological quotients were generated by comparing measured body burdens (contaminant concentration in tissues) to the dose-based benchmarks developed for the food chain modeling described above. To do this, tissue concentration of DDT, DDD, and DDE was divided by estimated age in days of the organism to approximate the daily dose ingested; this approximate value was then compared to the benchmark. This is not a standard type of comparison and involves many estimates and assumptions, so the results should be viewed with caution. For this site, this comparison did yield ecological quotients greater than one for stilts and mallards in the ditch and lakes for DDE only, and for mosquitofish for all constituents only in the ditch (not the lakes). The ecological quotients for ducks may be influenced by the type of tissue sampled, assumptions about the age of the birds, and the fact that the birds may have fed in areas outside the two SWMUs. The modeled results are probably a better estimate of potential risk from the lakes to waterfowl.

In reviewing the data in Appendix C of the 1996 risk assessment on DDT and its derivatives from the ditch, I noted that all the high detections (up to 1 ppm) of DDT, DDD, and DDE occurred at sampling points DT-05 and 01-DT. Based on Figure 3-2 of the 1997 *Characterization Summary and No Further Action Documentation: SWMUs 139 and 140*, these samples are from the area of the ditch west of Pond G. Both Section 4.3 (page 4-10) and Figure 3-2 of this document show that this section has been blocked off and is not part of the ditch/lake system or the planned constructed wetlands. The levels of DDT and its derivatives in the ditch and lakes still receiving water ranges from 1-3 ppb. The 3 ppb level is the one used in the modeling calculations that resulted in an ecological quotient of less than one.

Based on my review of the ecological risk assessment, SWMUs 139 and 140 are eligible to be considered for an NFA because:

- Ecological quotients modeled for the receptors at the lakes and ditch were less than one, indicating low potential for ecological risk.
- The hotspot of DDT and its derivatives has been isolated from the lakes/wetlands system, which should lead to decreasing levels of these contaminants in the wildlife in the future (which would correspond to lower body burdens in receptors)
- There is potential for the remaining DDT to break down to less toxic constituents in a reasonable time frame at this site (the half-life of DDT may be as short as 2 years in anoxic conditions, such as those at the bottom of the lakes).

Cc:

Stu Dinwiddie  
Stephanie Kruse