File HAPB 91

9/1/90

1. **STUDY TITLE:** NM - Lake Holloman Contaminant Study

2. **STUDY OBJECTIVE:** The Lake Holloman Contaminant Study is a preliminary monitoring survey to determine residue levels of organic and inorganic chemicals in migratory birds utilizing Lake Holloman. This monitoring survey will establish whether resides of aliphatic, PAH, PCB, organic pesticides and inorganic compounds in birds are elevated to levels that can result in reproductive impairment or mortality.

3. **BACKGROUND/JUSTIFICATION:** Lake Holloman has served as the end discharge point of the Holloman Air Force Base (AFB) wastewater treatment facility (WWTF). Historic records for the Holloman AFB indicate that past discharge of priority pollutants have occurred at the WWTF. Numerous organic and inorganic compounds have been identified in the series of six lagoons that comprise a portion of the WWTF and eventually discharge to Lake Holloman. These compounds include various aliphatic and polycyclic aromatic hydrocarbons (PAH) such as 1,2,4-trichlorobenzene, 2-methylnaphthalene, bis(2-ethylhexyl)phthalate, fluorene and pyrene. Inorganic compounds that were identified in the lagoons and are of concern to the Fish and Wildlife Service (Service) in migratory birds include arsenic, cadmium, chromium, lead, mercury and cyanide compounds. In addition to the previously mentioned compounds that may exist in Lake Holloman, concentrations up to 191 ug/gram PCB's were found in the sludge of lagoons A and B. The presence of these compounds may represent a long-term adverse impact to Department of Interior Trust Resources. These compounds in food chain organisms at high levels can result in biomagnification to concentrations that result in behavioral or reproductive impairment to migratory birds.

   The Service recognizes Lake Holloman as important year-round habitat for migratory birds. These lakes are also frequented by the Federally endangered peregrine falcon (Falco peregrinus tundrius). Several bird species that are candidates for listing under the Endangered Species Act have also been recorded as occurring at Lake Holloman including the snowy plover (Charadrius alexandrinus), white-faced ibis (Plegadis chihi) and long-billed curlew (Numenius arquata). The Mesilla Valley Audobon Society has documented the presence of over 80 species or birds utilizing the Lake Holloman area. Over 1,000 waterfowl and shorebirds were observed on Lake Holloman October 26, 1989.

4. **PROCEDURE:**

   A. Methods and Materials: This contaminant study will investigate whether the organic and inorganic compounds that have been noted to occur in the WWTF lagoons also occur in biological samples collected from Lake Holloman, Lake Stinky and Lagoon G. The study will determine if contaminants are present in plants, fish, aquatic invertebrates, and birds at levels that may cause behavioral or reproductive problems to Interior Trust Resources. To make these determinations, the Service will need to collect and analyze biological samples for inorganic, organic, aliphatic, and PAH compounds.

Separate sample sets of plants, aquatic invertebrates, fish, and birds will be collected for each analytical test. Bird species that may be collected for analysis may include the American coot (Fulica americana), killdeer (Charadrius wilsonia) and western kingbirds (Tyrannus verticalis). The bird samples will be dissected to obtain the respective tissue type for each analysis proposed; for example, liver and kidney tissue will be used for inorganic analysis and carcass tissue will be used for organic analysis. The sample set and analysis that will be conducted are as follows:

Sample type	Sample Matrix	Analysis Requested
Plant	10 composites	ICP (precon), Hg, As, Se
Invertebrate	5 composites	ICP (precon), Hg, As, Se
Invertebrate	5 composites	organochlorine scan
Invertebrate	5 composites	aliphatic scan
Invertebrate	5 composites	PAH scan
Mosquitofish	5 composites	ICP (precon), Hg, As, Se
Mosquitofish	5 composites	organochlorine scan
Mosquitofish	5 composites	aliphatic scan
Mosquitofish	5 composites	PAH scan
Waterfowl species	10 individual	ICP (precon), Hg, As, Se
Waterfowl species	10 individual	organochlorine scan
Waterfowl species	10 individual	aliphatic scan
Waterfowl species	10 individual	PAH scan
Shorebird	10 individual	ICP (precon), Hg, As, Se
Shorebird	10 individual	organochlorine scan
Shorebird	10 individual	aliphatic scan
Shorebird	10 individual	PAH scan
Kingbird	10 individual	ICP (precon), Hg, As, Se
Kingbird	10 individual	organochlorine scan
Kingbird	10 individual	aliphatic scan
Kingbird	10 individual	PAH scan

Species collection will occur in late spring to early summer of 1991 if this project is funded by the Air Force. Birds will be live trapped or collected with steel shot. Fish and invertebrate species will be collected using nets and traps and aquatic plant species will be collected by hand. Collections will be conducted by ecological service staff from the Albuquerque Ecological Services Field Office.

All results will be reported on dry weight basis to allow comparison with historical data. Data analysis and interpretation will be based upon a comparison of minimum, maximum and mean data to historical data in literature and in Field Office files.

B. Results: Results will be presented in text and table format.

C. Interpretation: If the results of this monitoring study indicate that Interior Trust Resources are adversely impacted, the Service may seek removal of contaminants, restoration of habitat and damages to trust resources.

5. **ROLES AND RESPONSIBILITIES:** The Albuquerque Field Office will be responsible for accomplishing the following tasks: Collection of samples, preparation of samples for analysis, preparation of a sample analysis catalog with detailed instructions for required analytical detection limits, shipment of samples to analytical labs, evaluation and interpretation of analytical data and report preparation of final results.

6. **SCHEDULE:**

Schedule of Function

A. Biological sample collection.....May-July 1991
B. Analytical sample preparation and catalog preparation.....August 1991
C. Sample analysis availability of data 90-day turnaround.....March 1991
D. Report preparation 90-day turnaround.....May 1992

7. **REPORTS AND PUBLICATIONS**

A final report for this project will be prepared for the U.S. Air Force.

8. **OPERATIONAL COST ESTIMATES**

Supplies	$ 2,000
Equipment	$ 2,000
Other (Staff days)	$ 42,075
Overhead	$ 15,989
_____	$ _____
Total	$ 62,064

9. **ANALYTICAL COST ESTIMATE** $ 48,310

GRAND TOTAL $ 110,374

10. **APPROVALS**

Submitted by: Thomas F O'Brien **Date:** 9-18-90

Approved by: Field Supervisor **Date:** 9-18-90

Approved by: Contaminants Coordinator **Date:** _____

Concurrence: ARD Fish Wildlife Enhancement **Date:** _____