



IN REPLY REFER TO:

# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Rocky Mountain Arsenal National Wildlife Area  
Building 111  
Commerce City, Colorado 80022-2180

July 29, 1994

Program Manager Rocky Mountain Arsenal  
AMCPM-RM, Mr. Kevin Blose  
Building 111  
Commerce City, Colorado 80022-1748

Dear Mr. Blose:

The following information is related to recent Building 111 bird mortalities and other wildlife losses at Rocky Mountain Arsenal (Arsenal).

From the data currently available it is evident that some passerine birds at the Building 111 site are being adversely affected by contamination. Given the proximity of the site to the more highly contaminated areas of the Arsenal (i.e. South Plants and Basin A) this is not surprising and is consistent with the results from earlier studies. We have not yet obtained sufficient information to ascertain the significance or the scope of the problem or to pinpoint a specific source. We are, however, continuing to monitor and collect additional samples for analysis. In the interim, please consider the following information a status report until further analysis and recommendations can be made.

1. Ninety-eight bird specimens were found in the Building 111 area in 1993. These were primarily American robin (*Turdus migratorius*), European starling (*Sturnus vulgaris*), mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). Of these, 43 were disposed because of decomposition or unsuitability for necropsy and contaminant analyses, 35 were submitted to the National Biological Survey's Wildlife Health Research Center (NWHRC) for necropsy, and the rest (20) were archived. NWHRC selected a representative sample of sixteen birds to necropsy from the 35 submitted. Necropsy results showed that a Bullock's Oriole (*Icterus galbula*) had massive pericardial hemorrhage and was probably hit by a car. Two robins had intestinal parasitism and emaciation was noted. Cause of death was undetermined for 13 birds with emaciation noted for a total of 6 birds. The cause of death for any bird examined (except the above oriole) was not conclusive; however, several causes were eliminated. There is no evidence of injury, disease or other pathogens in these birds, however contaminant exposure could be a problem. Eight whole-body (plucked, gastrointestinal tract and feet removed) passerine samples and the brain and liver from an American kestrel (also found at Building 111) were sent to Environmental Science and Engineering, Inc. (ESE) for analyses of organochlorine pesticides, mercury, and arsenic. Carcasses from the remaining necropsied birds were archived for later submission. Aldrin, endrin, DDE, and DDT data above the certified reporting limit were rejected in the quality assurance/quality control review (see attachment); however, there were no detections above the

certified reporting limit for aldrin. Analytical priority was given as organochlorine pesticides, mercury, then arsenic. Due to the small sample sizes, all samples were consumed before arsenic analyses could be done. Dieldrin and mercury results are presented in the attached table. The Service anticipates sending more birds from Building 111 to ESE for analyses in August.

2. The U.S. Fish and Wildlife Service (Service) is investigating mortalities at Building 111 more intensively this year. Daily searches for carcasses and monitoring of nests in the area began in April as in 1993. In addition, the Service began live trapping birds at Building 111 in May. Colored leg bands have been placed on house sparrows, house finches, robins, and starlings. In addition, radio transmitters have been placed on robins and starlings because they have been the most common species found dead and transmitters are easily attached to these species. Colored bands are being used in addition to telemetry to make birds more visible so that the use areas of more birds can be noted. The bands also make dead birds more visible. This data may clarify whether birds are exposed to contamination in outlying areas, then attracted to Building 111 for water and cover, and subsequently die there; or if they are exposed in the immediate vicinity of Building 111. Thus far, 89 birds have been marked.

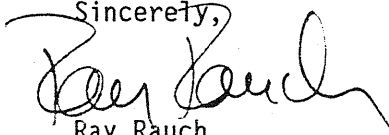
Nest boxes for starlings were placed near Building 111 as part of biomonitoring studies being conducted by Clemson University for the Service. Nests were monitored and chicks collected for histopathology, biomarker analyses, and contaminant residues. Data collected from this study may also provide information on the causes of bird mortalities at Building 111.

As of this date, 46 birds have been found dead at Building 111 in 1994. The majority of dead birds are robins and starlings. A few of these deaths were attributed to car collision or predation, or were nestlings that fell out or were blown out of the nest. Twenty birds were too decomposed for evaluation. Fourteen birds have been sent to NWHRC for necropsy. Results received thus far are again inconclusive with emaciation noted on most birds, but no signs of injury or disease. In addition, seven birds showed brain cholinesterase inhibition which is indicative of organophosphate or carbamate compound exposure. The Service is waiting for analytical results on the gastrointestinal tracts of these seven birds to determine what compounds may be responsible. Some of this year's birds will be sent for contaminant analyses in August as mentioned above. Pathologists at NWHRC requested that we wait to evaluate contaminant results from birds necropsied thus far before performing necropsies on additional birds. In addition, water and invertebrate samples were collected from the Building 111 area to determine possible sources of contaminants. The Service will examine trapping, telemetry, necropsy, and analytical data to determine an explanation for these mortalities. Results will be reported in the Service's 1994 annual progress report.

3. Chemical analyses on Building 111 birds was discussed above. Tissues from 15 fortuitous specimens collected from elsewhere on the Arsenal in 1992 and 1993 were also sent to ESE. Results are shown in the attached table. Necropsies were performed on all of these animals except the prairie dog, pocket gopher, and Swainson's hawk egg. Please be aware that some necropsy reports are extensive and a number of ailments are sometimes found. The

following is a general description of the diagnoses: great horned owl, emaciation; great horned owl, electrocution; great horned owl, leucocytozoon infection and emaciation; great horned owl, several ailments including degeneration of some tissues and cataracts; ferruginous hawk, emaciation and foot trauma with secondary pox virus infection; bald eagle, pulmonary hemorrhage; barn owl, emaciation; 2 barn owls, emaciation; pheasant, trauma from an impact; badger, degeneration of spinal cord; badger, distemper and other ailments.

As additional information becomes available, an updated report will be provided.

Sincerely,  
  
Ray Rauch  
Project Leader

Attachment

Copies Furnished:

- Mr. Robert Jacobsen, Assistant Regional Director, Ecological Services, U.S. Fish and Wildlife Service, 134 Union Boulevard, Lakewood, Colorado 80228
- Mr. Wilbur Ladd, Assistant Regional Director, Refuges and Wildlife, U.S. Fish and Wildlife Service, 134 Union Boulevard, Lakewood, Colorado 80028
- Mr. Connally Mears, U.S. Environmental Protection Agency, 999 18th Street, Suite 500, Denver, Colorado 80202
- Mr. Bradley Bridgewater, U.S. Department of Justice, 999 18th Street, Suite 501, North Tower, Denver, Colorado 80202
- Mr. William McKinney, Shell Oil Company, 1700 Lincoln Street, Suite 4100, Denver, Colorado 80202
- Mr. Jeff Edson, Colorado Department of Health, 4300 Cherry Creek Drive South, Denver, Colorado 80222-1530
- Ms. Susan McCannon, Department of Natural Resources, 1313 Sherman Street, Room 718, Denver, Colorado 80203
- Document Tracking Center, Office of the Program Manager for Rocky Mountain Arsenal, Building 111, Commerce City, Colorado 80022-1748

Table I. Analytical results (ug/g wet weight) from Rocky Mountain Arsenal fortuitous specimens.

Sample Number	Species	Collection			Tissue	Dieldrin	Mercury
		Date	Location	Building			
HF-21	House Finch	6/93	Building 111	111	whole body	0.048	sc <sup>a</sup>
HF-24	House Finch	6/93	Building 111	111	whole body	bcr <sup>b</sup>	sc
09	House Finch	6/93	Building 111	111	whole body	bcr <sup>b</sup>	bcr <sup>b</sup>
04	American Robin	6/93	Building 111	111	whole body	3.100	0.089
05	American Robin	6/93	Building 111	111	whole body	0.187	0.110
AR-19	American Robin	6/93	Building 111	111	whole body	2.400	bcr <sup>b</sup>
03	Western Kingbird	6/93	Building 111	111	whole body	9.800	bcr <sup>b</sup>
02	Sharp-shinned Hawk	4/93	Building 111	111	whole body	bcr <sup>b</sup>	1.00
001	American Kestrel	7/93	Building 111	111	brain	1.300	sc
001	American Kestrel	7/93	Building 111	111	liver	1.500	sc
11088-1	Barn Owl	10/92	Section 25		brain	0.740	sc
11088-2	Barn Owl	10/92	Section 25		brain	0.440	sc
93b0028	Barn Owl	10/93	Section 36		liver	2.800	sc
923-05002	Badger	9/92	Section 36		brain	2.500	sc
923-05002	Badger	9/92	Section 36		liver	9.200	bcr <sup>b</sup>
MA1	Badger	10/93	Section 4		brain	0.051	bcr <sup>b</sup>
11298-1	Great Horned Owl	7/92	Section 1		brain	0.095	sc
11298-1	Great Horned Owl	7/92	Section 1		liver	0.093	0.060
10943-1	Great Horned Owl	7/92	Section 1		brain	5.200	sc
93GH034	Great Horned Owl	11/93	Section 1		brain	1.100	sc
93GH034	Great Horned Owl	11/93	Section 1		liver	2.400	bcr <sup>b</sup>
93GH035	Great Horned Owl	12/93	Section 35		brain	4.200	sc
93GH035	Great Horned Owl	12/93	Section 35		liver	3.600	sc
11410-1	Bald Eagle	2/93	Buckley		brain	bcr <sup>b</sup>	0.357
11410-1	Bald Eagle	2/93	Buckley		liver	bcr <sup>b</sup>	0.860
93SH015	Swainson's Hawk	7/93	Section 12		egg	0.063	bcr <sup>b</sup>
94b003	Ferruginous Hawk	1/94	Section 19		brain	1.600	sc
94b003	Ferruginous Hawk	1/94	Section 19		liver	0.023	sc
93RP027	Ring-necked Pheasant	10/93	Section 26		brain	0.300	sc
93RP027	Ring-necked Pheasant	10/93	Section 26		liver	2.300	sc
93PD001	Prairie Dog	3/93	Section 26		whole body	bcr <sup>b</sup>	bcr <sup>b</sup>
93PG005	Pocket Gopher	6/93	Section 26		whole body	1.800	bcr <sup>b</sup>

<sup>a</sup>sc = sample consumed; analytical priority was for organochlorine pesticides, then mercury, then arsenic.

<sup>b</sup>bcr<sup>b</sup> = below certified reporting limit