U.S. Department
of Transportation

Federal Aviation Administration

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS	**Date:**	**AC No:** 150/5200-33C
	Initiated by: AAS-300	**Change:**

1. PURPOSE. This Advisory Circular (AC) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. It also discusses airport development projects (including airport construction, expansion, and renovation) affecting aircraft movement near hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICABILITY. Airports that hold Airport Operating Certificates issued under Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D, may use the standards, practices and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. All airports that have received Federal assistance and/or that have authority to impose and/or use a Passenger Facility Charge must use the standards in section 1 of this AC. Non-certificated airports (hereinafter referred to as "Subject Airports") that receive Federal assistance and/or authority to impose and/or use a Passenger Facility Charge must also use the standards in sections 3-4 and 3-5 of this AC. The FAA also recommends the guidance in this AC for land-use planners and developers of projects, facilities, and activities on or near airports.

Pursuant to the Federal register published on_____, the FAA has clarified Airport Improvement Program (AIP) Grant Assurance No. 19, "Operation and Maintenance," to require any Subject Airport, after receipt of a new grant for an airport development project, to monitor, evaluate and mitigate risks associated with wildlife hazards on and near federally obligated airports. In particular, such airports are required to conduct Wildlife Hazard Assessments (WHA) or Wildlife Hazard Site Visits (WHSV). Airports certified under Part 139 are required to conduct WHAs in accordance with criteria in 14 C.F.R. §139.337.

3. CANCELLATION. This AC cancels AC 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*, dated August 28, 2007.

4. PRINCIPAL CHANGES. Changes in this AC include clarification by the FAA that Grant Assurance No. 19 requires Subject Airports to have a qualified airport wildlife biologist conduct a WHA or WHSV; consolidation and reorganization of discussion on land uses of concern; and updated procedures for evaluation and mitigation. Discussion

addresses off-airport hazardous wildlife attractants, followed by discussion of on-airport attractants. It also clarifies language regarding the applicability of AC requirements.

5. BACKGROUND. Information about the risks posed to aircraft by certain wildlife species has increased a great deal in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous. Table 1 ranks the most hazardous bird and mammal species or groups as to relative hazard to aircraft in airport environments (i.e., ≤500 ft. [152 m] above ground level), based on a composite ranking of strikes with civil aircraft in the USA 1990-2009.

These hazard rankings can help focus hazardous wildlife management efforts on those species or groups that represent the greatest threats to safe air operations in the airport environment. Used in conjunction with a site-specific WHA that will determine the relative abundance and use patterns of wildlife species, these rankings can help airport operators better understand the general threat level (and consequences) of certain wildlife species and can assist with the creation of a “zero-tolerance” list of hazardous species that warrant immediate attention.

Most public-use airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. These areas can also present potential hazards to aviation if they encourage wildlife to enter an airport's approach or departure airspace or air operations area (AOA). Constructed or natural areas—such as poorly drained locations, detention/retention ponds, roosting habitats on buildings, landscaping, odor-causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape. Even small facilities, such as fast food restaurants, taxicab staging areas, rental car facilities, aircraft viewing areas, and public parks, can produce substantial attractions for hazardous wildlife.

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential. This AC provides airport operators and those parties with whom they cooperate with the guidance they need to assess and address potentially hazardous wildlife attractants when locating new facilities and implementing certain land-use practices on or near public-use airports. Applicable timeframes for designated categories at airports are in Section 3-4 of this AC.

On March 4, 2008 a catastrophic wildlife strike involving a Cessna 500 Citation and migratory white pelican resulted in five fatalities. Following the National Transportation Safety Board (NTSB) investigation, the NTSB recommended the FAA “*Verify that all federally obligated general aviation airports that are located near woodlands, water, wetlands, or other wildlife attractants are complying with the requirements to perform wildlife hazard assessments as specified in Federal Aviation Administration Advisory*

Circular 150/5200-33B, Hazardous Wildlife Attractants On or Near Airports." In response, the FAA has modified this AC and provided clarification of Grant Assurance No. 19 for airports that are not otherwise required to do so by CFR Part 139, referred to as "Subject Airports." Subject Airports are now required, prospectively, after receipt of a new grant for an airport development project or other federal assistance, and public agencies that receive authority to impose and/or use a Passenger Facility Charge to have a qualified airport wildlife biologist conduct a WHA or WHSV.

6. MEMORANDUM OF AGREEMENT BETWEEN FEDERAL RESOURCE AGENCIES. The FAA, the U.S. Air Force, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture - Wildlife Services signed a Memorandum of Agreement (MOA) in July 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. Through the MOA, the agencies established procedures necessary to coordinate their missions to address more effectively existing and future environmental conditions contributing to collisions between wildlife and aircraft (wildlife strikes) throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety while protecting the Nation's valuable environmental resources.

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Table 1. Ranking of 77 bird and mammal species or groups (1 = most hazardous) as to relative hazard to aircraft in airport environments (i.e., ≤500 ft. [152 m] above ground level), based on a composite rank. The composite rank reflects 3 variables: the percentage of total strikes (for that species–group) that caused any level of damage to the aircraft, the percentage of total strikes that caused substantial damage to the aircraft, and the percentage of total strikes that caused an effect on flight (EOF). Strike data are from the Federal Aviation Administration National Wildlife Strike Database, for strikes that occurred in the United States from 1990 to 2009[1].

Species[2]	Total strikes reported	% with damage	% with substantial damage	% with EOF	Damage rank	Substantial damage rank	EOF rank	Composite rank	Relative hazard score
Mule deer (*Odocoileus hemionus*)	47	96	38	83	1	1	1	1	100
White-tailed deer (*Odocoileus virginianus*)	814	87	36	68	2	2	3	2	88
Domestic dog	21	53	26	75	4	4	2	3	71
Other geese	20	68	32	32	3	3	8	4	61
Canada goose (*Branta canadensis)*	776	51	16	34	7	9	7	5	46
Turkey vulture (*Cathartes aura*)	159	46	16	34	10	7	6	5	44
Other ducks	77	49	24	30	8	5	11	7	48
Great horned owl (*Bubo virginianus*)	29	52	16	27	6	8	17	8	44
Double-crested cormorant (*Phalacrocorax auritis*)	24	52	13	29	5	13	13	8	43
Brown pelican (*Pelecanus occidentalis*)	31	35	13	38	14	14	5	10	40
Wild turkey (*Meleagris gallopavo*)	38	37	6	43	13	28	4	11	40
Sandhill crane (*Grus canadensis*)	66	43	10	28	11	19	15	11	37
Glaucous-winged gull (*Larus glaucescens*)	27	48	9	28	9	21	16	13	39
Bald eagle (*Haliaeetus leucocephalus*)	74	40	7	30	12	25	10	14	36
Great black-backed gull (*Larus marinus*)	20	26	21	22	18	6	23	14	32
Osprey (*Pandion haliaetus*)	77	32	12	26	16	15	19	16	32
Great blue heron (*Ardea herodius*)	132	32	8	28	15	23	14	17	31
Ring-necked pheasant (*Phasianus colchicus*)	45	26	14	22	20	10	26	18	29
Herring gull (*Larus argentatus*)	291	25	13	24	23	12	21	18	29
Snowy owl (*Bubo scandiacus*)	28	23	12	26	24	17	20	20	28
Mallard (*Anas platyrhynchos*)	221	31	11	21	17	18	28	21	29
Great egret (*Ardea alba*)	24	26	4	29	21	32	12	22	28
Red-tailed hawk (*Buteo jamaicensis*)	534	26	8	21	19	24	27	23	25
California gull (*Larus californicus*)	23	14	14	20	33	11	30	24	22
Cattle egret (*Bubulcus ibis*)	112	17	6	27	32	27	18	25	23
Ring-billed gull (*Larus delawarensis*)	362	21	8	20	26	22	33	26	23
Franklin's gull (*Larus pipixcan*)	26	9	9	23	41	20	22	27	19
Raccoon (*Procyon lotor*)	23	18	12	14	28	16	40	28	20

Species[2]	Total strikes reported	% with damage	% with substantial damage	% with EOF	Damage rank	Substantial damage rank	EOF rank	Composite rank	Relative hazard score
Coyote (*Canis latrans*)	231	14	3	31	36	41	9	29	22
Rock dove (*Columba livia*)	1,035	18	6	19	29	26	34	30	20
Swainson's hawk (*Buteo swainsoni*)	24	17	4	20	31	33	31	31	19
Other hawks	34	14	4	22	34	37	25	32	18
Laughing gull (*Larus atricilla*)	106	14	4	21	35	34	29	33	18
Mew gull (*Larus canus*)	21	25	0	16	22	52	37	34	19
Peregrine falcon (*Falco peregrinus*)	44	18	5	7	30	29	53	35	14
Laysan albatross (*Phoebastria immutabilis*)	29	22	0	17	25	53	35	36	18
Rabbits (Leporidae)	78	11	3	15	37	39	39	37	13
Upland sandpiper (*Bartramia longicauda*)	32	8	4	16	43	36	36	37	13
Short-eared owl (*Asio flammeus*)	58	10	4	11	39	35	43	39	12
Black-bellied plover (*Pluvialis squatarola*)	20	18	0	16	27	54	38	40	15
Red fox (*Vulpes vulpes*)	31	8	0	22	42	55	24	41	14
American crow (*Corvus brachyrhynchos*)	141	10	3	13	40	40	41	41	12
Spotted dove (*Streptopelia chinensis*)	46	7	4	10	48	31	45	43	10
Barn owl (*Tyto alba*)	174	11	3	9	38	38	49	44	11
Mourning dove (*Zenaida macroura*)	1,313	7	3	13	45	42	42	45	10
Blackbirds	976	7	2	10	44	46	44	46	9
European starling (*Sturnus vulgaris*)	1,408	7	2	10	47	43	46	47	9
Bats (Chiroptera)	44	5	5	8	55	30	51	47	8
Killdeer (*Charadrius vociferus*)	553	6	1	7	51	48	52	49	7
American kestrel (*Falco sparverius*)	536	4	1	7	57	47	55	50	6
Zebra dove (*Geopelia striata*)	54	4	2	6	56	44	59	50	5
Snow bunting (*Plectrophenax nivalis*)	84	1	0	20	66	66	32	52	10
Common myna (*Acridotheres tristis*)	21	6	0	6	50	58	56	52	6
Bank swallow (*Riparia riparia*)	49	5	0	9	54	61	50	54	6
Meadowlarks	361	3	2	6	61	45	60	55	5
Woodchuck (*Marmota monax)*	41	7	0	3	46	56	68	56	5
Horned lark (*Eremophila alpestris*)	372	3	1	6	60	49	61	56	4
Sparrows	1,799	3	0	6	62	51	58	58	4
Northern harrier (*Circus cyaneus*)	24	5	0	5	52	59	62	59	5
American robin (*Turdus migratorius*)	159	2	0	10	64	65	47	60	5
Burrowing owl (*Athene cunicularia*)	20	6	0	0	49	57	73	61	3
Barn swallow (*Hirundo rustica*)	486	2	0	3	65	50	69	62	2
Wrens	28	4	0	4	58	62	66	63	3

Species[2]	Total strikes reported	% with damage	% with substantial damage	% with EOF	Damage rank	Substantial damage rank	EOF rank	Composite rank	Relative hazard score
Terns	45	5	0	0	53	60	74	64	2
Finches	55	0	0	10	71	71	48	65	4
Chimney swift (*Chaetura pelagica*)	34	0	0	6	70	70	57	66	3
Common nighthawk (*Chordeiles minor*)	38	3	0	0	59	63	75	66	1
Pacific golden-plover (*Pluvialis apricaria*)	204	1	0	4	67	67	64	68	2
Purple martin (*Progne subis*)	57	2	0	2	63	64	72	69	2
Western sandpiper (*Calidris mauri*)	31	0	0	7	76	76	54	70	3
Cliff swallow (*Petrochelidon pyrrhonota*)	164	1	0	2	68	68	71	71	1
Skunks (Mephitidae)	30	0	0	4	74	74	63	72	2
Nutmeg mannikin (*Lonchura punctulata*)	26	0	0	4	72	72	67	72	2
Chestnut manikin (*Lonchura malacca*)	28	0	0	0	69	69	76	74	0
Wood warblers	30	0	0	4	77	77	65	75	2
Tree swallow (*Tachycineta bicolor*)	109	0	0	2	75	75	70	76	1
Opossum (*Didelphis virginiana*)	25	0	0	0	73	73	77	77	0

[1] Excerpted from the Wildlife Society Bulletin 35(4):394–402; 2011*; "Interspecific Variation in Wildlife Hazards to Aircraft: Implications for Airport Wildlife Management."* Refer to this publication for additional explanation of criteria and method of ranking and Wildlife Society Bulletin 28:372–378 "*Ranking the Hazard Level of Wildlife Species to Aviation"* for detailed definitions of damage and EOF.

[2] Other geese = snow goose (*Chen caerulescens*), brant (*Branta bernicla*), greater white-fronted goose (*Anser albifrons*); other ducks = 23 species in the family Anatidae; other hawks = Cooper's hawk (*Accipter cooperii*), sharp-shinned hawk (*A. striatus*), rough-legged hawk (*Buteo lagopus*), red-shouldered hawk (*B. lineatus*), broad-winged hawk (*B. platypterus*), ferruginous hawk (*B. regalis*); blackbirds = red-winged blackbird (*Agelaius phoeniceus*), brown-headed cowbird (*Molothrus ater*), common grackle (*Quiscalus quiscula*); meadowlarks = eastern meadowlark (*Sturnella magna*), western meadowlark (*S. neglecta*); sparrows = 19 species in the family Emberizidae; wrens = house wren (*Troglodytes aedon*), Carolina wren (*Thryothorus ludovicianus*), marsh wren (*Cistothorus palustris*); terns = common tern (*Sterna hirundo*), arctic tern (*S. vittata*), Caspian tern (*S. caspia*), least tern (*S. antillarum*), fairy tern (*S. nereis*); finches = house finch (*Carpodacus mexicanus*), American goldfinch (*Carduelis tristis*); wood warblers = 13 species in the family Parulidae.

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SECTION 1.

GENERAL SEPARATION CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. INTRODUCTION. When considering proposed land uses, airport operators, local planners, and developers must take into account whether the proposed land uses, including new development projects, will increase wildlife hazards. Land-use practices that attract or sustain hazardous wildlife populations on or near airports, specifically those listed in Section 2, can significantly increase the potential for wildlife strikes.

The FAA urges regulatory agencies and planning and zoning agencies to prevent the creation of any new instances of these land uses within the separation criteria, and to require evaluation of proposed new land uses within the evaluation distance criteria. The FAA urges regulatory agencies and planning and zoning agencies to require coordination with the affected airport(s) for all existing regulated instances of these land uses within the separation and evaluation distances.

The FAA recommends the minimum separation criteria outlined below for land-use practices that attract hazardous wildlife to the vicinity of airports. Please note that FAA criteria include land uses that cause movement of hazardous wildlife onto, into, or across the airport's approach or departure airspace or air operations area (AOA). (See the discussion of the synergistic effects of surrounding land uses in Section 2-8 of this AC.)

The basis for the separation criteria contained in this section can be found in former FAA Order 5280.5A. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet and 90 percent occur under 3,000 feet above ground level), and (3) National Transportation Safety Board (NTSB) recommendations.

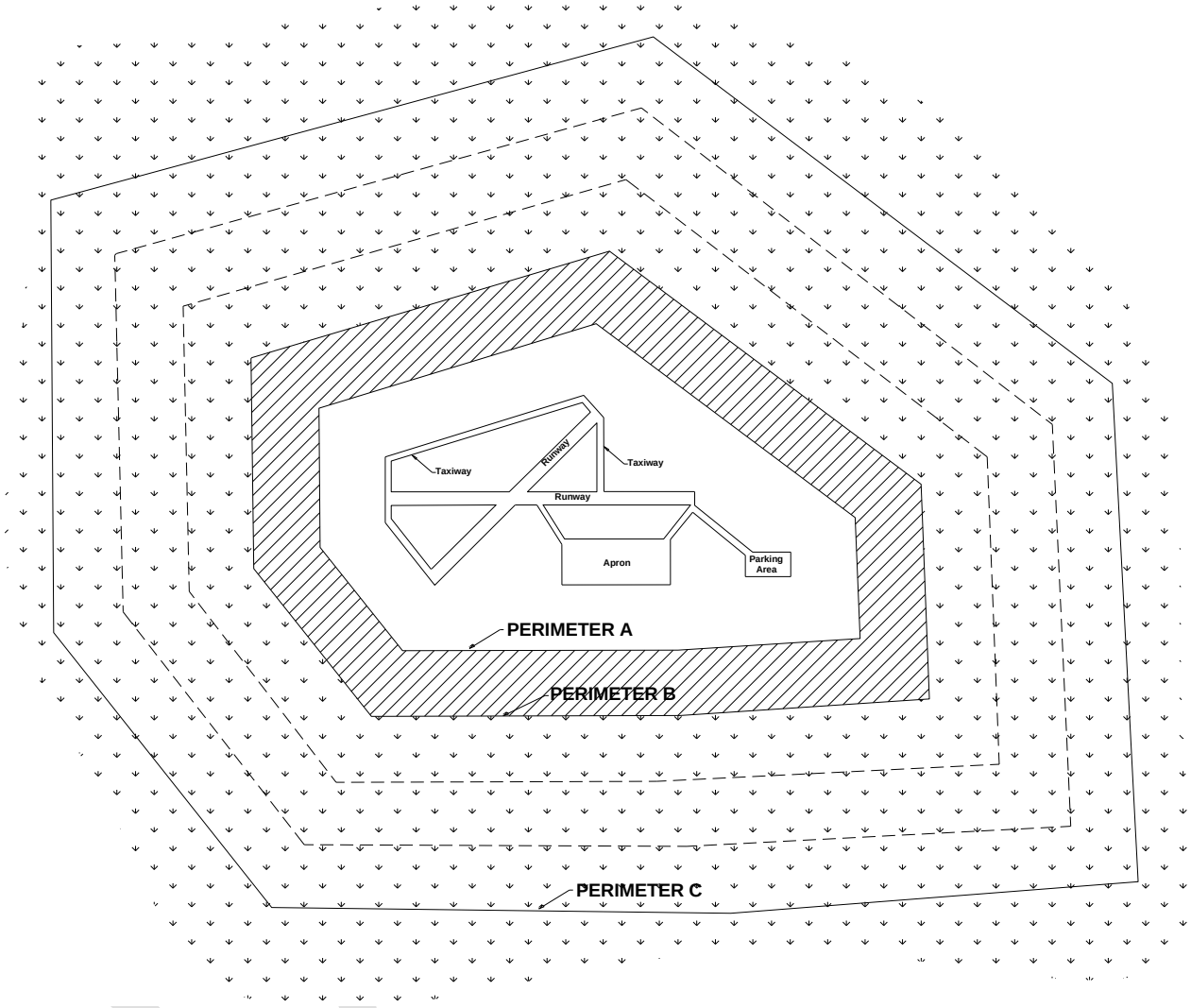
1-2. AIRPORTS SERVING PISTON-POWERED AIRCRAFT. Airports that do not sell Jet-A fuel normally serve piston-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 5,000 feet at these airports for any of the hazardous wildlife attractants discussed in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance measured from the nearest AOA.

1-3. AIRPORTS SERVING TURBINE-POWERED AIRCRAFT. Airports selling Jet-A fuel normally serve turbine-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 10,000 feet at these airports for any of the hazardous wildlife attractants discussed in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the

hazardous wildlife attractant. Figure 1 depicts this separation distance from the nearest aircraft movement areas.

1-4. PROTECTION OF APPROACH, DEPARTURE, AND CIRCLING AIRSPACE. For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace. Figure 1 depicts this separation distance measured from the nearest AOA.

Figure 1. Separation distances within which hazardous wildlife attractants should be avoided, eliminated, or mitigated.



PERIMETER A: For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

PERIMETER B: For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

PERIMETER C: 5-mile range to protect approach, departure and circling airspace.

SECTION 2.

LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE.

2-1. GENERAL. Hazardous wildlife use the natural or artificial habitats on or near an airport for food, water or cover. The wildlife species and the size of the populations attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. In addition to the specific considerations outlined below, airport operators should refer to *Wildlife Hazard Management at Airports,* prepared by FAA and U.S. Department of Agriculture (USDA) staff. (This manual is available in English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife.FAA.gov.) Also, *Prevention and Control of Wildlife Damage,* compiled by the University of Nebraska Cooperative Extension Division is available online at the Internet Center for Wildlife Damage Management (ICWDM) web site: in a periodically updated version at: http://icwdm.org/handbook/index.asp.

This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety. The FAA has determined that the land uses listed below are generally not compatible with safe airport operations when they are located within the separation distances provided in Section 1-2 and 1-3. Certain Waste Disposal Operations require greater separations provided in Section 1-4 and are discussed in Section 2-2.

2-2. WASTE DISPOSAL OPERATIONS. Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations, when located within the separations identified in the siting criteria in Sections 1-2 through 1-4, are considered incompatible with safe airport operations.

a. Siting for new municipal solid waste landfills subject to AIR 21. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) (AIR 21), codified at 49 U.S.C. 44718(d), prohibits the construction or establishment of a new MSWLF within 6 statute miles of certain public-use airports. Before these prohibitions apply, both the airport and the landfill must meet the very specific conditions described below. These restrictions do not apply to airports or landfills located within the state of Alaska.

The airport must (1) have received a Federal grant(s) under 49 U.S.C. § 47101, et. seq.; (2) be under control of a public agency; (3) serve some scheduled air carrier operations conducted in aircraft with less than 60 seats; and (4) have total annual enplanements consisting of at least 51 percent of scheduled air carrier enplanements conducted in aircraft with less than 60 passenger seats.

The proposed MSWLF must (1) be within 6 miles of the airport, as measured from airport property line to MSWLF property line, and (2) have started construction or establishment on or after April 5, 2001. Section 44718(d) only limits the construction

or establishment of some new MSWLF. It does not limit the expansion, either vertical or horizontal, of existing landfills.

Regarding existing MSWLF and lateral expansions of MSWLF: In accordance with 40 CFR § 258.10, owners or operators of MSWLF units that are located within the separation distances provided in Section 1-2 and 1-3 must demonstrate that the units are designed and operated so that the MSWLF unit does not pose a bird hazard to aircraft. To accomplish this, follow the instructions provided in Sections 3-2 and 3-3 of this AC, document the wildlife monitoring and mitigation procedures that are cooperatively developed, and place this documentation in the operating record of the facility.

See Advisory Circular 150/5200-34A, *Municipal Solid Waste Landfills near Public Airports*, for more information on these restrictions, criteria for applicability of AIR 21, standards for compliance with 40 CFR § 258.10, and FAA notification procedures.

b. Siting for new MSWLF not subject to AIR 21. If an airport and MSWLF do not meet the criteria of section 44718(d), the FAA recommends against locating MSWLF within the separation distances identified in Sections 1-2 through 1-4. The separation distances should be measured from the closest point of the airport's AOA to the closest planned MSWLF cell.

c. Considerations for existing waste disposal facilities within the limits of separation criteria. The FAA recommends against airport development projects that would increase the number of aircraft operations or accommodate larger or faster aircraft near MSWLF operations located within the separations identified in Sections 1-2 through 1-4. In addition, in accordance with 40 CFR § 258.10, owners or operators of existing MSWLF units that are located within the separations listed in Sections 1-2 through 1-4 must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. (See Section 4-2(b) of this AC for a discussion of this demonstration requirement).

d. Enclosed trash transfer stations. Enclosed waste-handling facilities that receive garbage behind closed doors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles generally are compatible with safe airport operations, provided they are not located on airport property or within the Runway Protection Zone (RPZ). These facilities should not handle or store putrescible waste outside or in a partially enclosed structure accessible to hazardous wildlife. Trash transfer facilities that are open on one or more sides; that store uncovered quantities of municipal solid waste outside, even if only for a short time; that use semi-trailers that leak or have trash clinging to the outside; or that do not control odors by ventilation and filtration systems (odor masking is not acceptable) do not meet the FAA's definition of fully enclosed trash transfer stations. The FAA considers fully enclosed waste-handling facilities constructed or operated incorrectly incompatible with safe airport operations if they are located closer than the separation distances specified in Sections 1-2 through 1-4.

e. Composting operations on or near airport property. Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any AOA or the distance called for by airport design requirements (see AC 150/5300-13, *Airport Design*). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic. On-airport disposal of compost by-products should not be conducted for the reasons stated in 2-3f.

f. Underwater waste discharges. The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Sections 1-2 through 1-4 because it could attract scavenging hazardous wildlife.

g. Recycling centers. Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, or aluminum, are, in most cases, not attractive to hazardous wildlife and are acceptable.

h. Construction and demolition (C&D) debris facilities. C&D landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other waste disposal operations. However, C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities. Therefore, a C&D landfill co-located with another waste disposal operation should be located outside of the separations identified in Sections 1-2 through 1-4.

i. Fly ash disposal. The incinerated residue from resource recovery power/heat-generating facilities that are fired by municipal solid waste, coal, or wood is generally not a wildlife attractant because it no longer contains putrescible matter. Landfills accepting only fly ash are generally not considered to be wildlife attractants and are acceptable as long as they are maintained in an orderly manner, admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

Since varying degrees of waste consumption are associated with general incineration (not resource recovery power/heat-generating facilities), the FAA considers the ash from general incinerators a regular waste disposal by-product and, therefore, a hazardous wildlife attractant if disposed of within the separation criteria

outlined in Sections 1-2 through 1-4.

2-3. WATER MANAGEMENT FACILITIES. Drinking water intake and treatment facilities, storm water and wastewater treatment facilities, associated retention and settling ponds, ponds built for recreational use, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. To prevent wildlife hazards, land-use developers and airport operators may need to develop management plans, in compliance with local and state regulations, to support the operation of storm water management facilities on or near all public-use airports to ensure a safe airport environment.

a. Existing storm water management facilities. On-airport storm water management facilities allow the quick removal of surface water, including discharges related to aircraft deicing, from impervious surfaces, such as pavement and terminal/hangar building roofs. Existing on-airport detention ponds collect storm water, protect water quality, and control runoff. Because they slowly release water after storms, they create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan (WHMP), the FAA requires immediate correction of any wildlife hazards arising from existing storm water facilities located on or near airports, using appropriate wildlife hazard mitigation techniques. Airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a Qualified Airport Wildlife Biologist.

Where possible, airport operators should modify storm water detention ponds to allow a maximum 48-hour detention period for the design storm. The FAA recommends that airport operators avoid or remove retention ponds and detention ponds featuring dead storage to eliminate standing water. Detention basins should remain totally dry between rainfalls. Where constant flow of water is anticipated through the basin, or where any portion of the basin bottom may remain wet, the detention facility should include a concrete or paved pad and/or ditch/swale in the bottom to prevent vegetation that may provide nesting habitat.

When it is not possible to drain a large detention pond completely, airport operators may use physical barriers, such as bird balls, wires grids, pillows, or netting, to deter birds and other hazardous wildlife. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office.

The FAA recommends that airport operators encourage off-airport storm water treatment facility operators to incorporate appropriate wildlife hazard mitigation techniques into storm water treatment facility operating practices when their facility is located within the separation criteria specified in Sections 1-2 through 1-4.

b. New storm water management facilities. The FAA strongly recommends that off-airport storm water management systems located within the separations identified in

Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

c. Existing wastewater treatment facilities. The FAA strongly recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport. Where required, a WHMP will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a Qualified Airport Wildlife Biologist, to minimize hazardous wildlife attractants. Airport operators should also encourage those wastewater treatment facility operators to incorporate these mitigation techniques into their standard operating practices. In addition, airport operators should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

d. New wastewater treatment facilities. The FAA strongly recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Sections 1-2 through 1-4. Appendix 1 defines wastewater treatment facility as "any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes." The definition includes any pretreatment involving the reduction of the amount of pollutants or the elimination of pollutants prior to introducing such pollutants into a publicly owned treatment works (wastewater treatment facility). During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.

e. Artificial marshes. In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking

birds, such as blackbirds and waterfowl, for breeding or roosting activities. The FAA strongly recommends against establishing artificial marshes within the separations identified in Sections 1-2 through 1-4.

f. Wastewater discharge and sludge disposal. The FAA recommends against the discharge of wastewater or sludge on airport property because it may improve soil moisture and quality on unpaved areas and lead to improved turf growth that can be an attractive food source for many species of animals. Also, the turf requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw, both of which can attract hazardous wildlife. In addition, the improved turf may attract grazing wildlife, such as deer and geese. Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

2-4. WETLANDS. Wetlands provide a variety of functions and can be regulated by local, state, and Federal laws. Normally, wetlands are attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species (Table 1).

NOTE: If questions exist as to whether an area qualifies as a wetland, contact the local division of the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, or a wetland consultant qualified to delineate wetlands.

a. Existing wetlands on or near airport property. If wetlands are located on or near airport property, airport operators should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. At public-use airports, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports. Where required, a WHMP will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a Qualified Airport Wildlife Biologist.

b. New airport development. Whenever possible, the FAA recommends locating new airports using the separations from wetlands identified in Sections 1-2 through 1-4. Where alternative sites are not practicable, or when airport operators are expanding an existing airport into or near wetlands, a Qualified Airport Wildlife Biologist, in consultation with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the state wildlife management agency should evaluate the wildlife hazards and prepare a WHMP that indicates methods of minimizing the hazards.

c. Mitigation for wetland impacts from airport projects. Wetland mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects or projects required to correct wildlife hazards from wetlands. Wetland mitigation must be designed so it does not create a wildlife hazard. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife

be sited outside of the separations identified in Sections 1-2 through 1-4.

(1) Onsite mitigation of wetland functions. The FAA may consider exceptions to locating mitigation activities outside the separations identified in Sections 1-2 through 1-4 if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge, which cannot be replicated when moved to a different location. Using existing airport property is sometimes the only feasible way to achieve the mitigation ratios mandated in regulatory orders and/or settlement agreements with the resource agencies. Conservation easements are an additional means of providing mitigation for project impacts. Typically the airport operator continues to own the property, and an easement is created stipulating that the property will be maintained as habitat for state or Federally listed species.

Mitigation must not inhibit the airport operator's ability to effectively control hazardous wildlife on or near the mitigation site or effectively maintain other aspects of safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife must be avoided. The FAA will review any onsite mitigation proposals to determine compatibility with safe airport operations. A Qualified Airport Wildlife Biologist should evaluate any wetland mitigation projects that are needed to protect unique wetland functions and that must be located in the separation criteria in Sections 1-2 through 1-4 before the mitigation is implemented. A WHMP should be developed to reduce the wildlife hazards.

(2) Offsite mitigation of wetland functions. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4 unless they provide unique functions that must remain onsite (see 2-4c(1)). Agencies that regulate impacts to or around wetlands recognize that it may be necessary to split wetland functions in mitigation schemes. Therefore, regulatory agencies may, under certain circumstances, allow portions of mitigation to take place in different locations.

The FAA encourages landowners or communities supporting the restoration or enhancement of wetlands to do so *only* after critically analyzing how those activities would affect aviation safety. To do so, landowners or communities should contact: the affected airport sponsor; FAA; and/ or the United States Department of Agriculture/ Animal and Plant Health Inspection Service/ Wildlife Services (USDA/ APHIS/ WS) or a Qualified Airport Wildlife Biologist.[1]

Those parties should work cooperatively to develop restoration or enhancement plans that would not worsen existing wildlife hazards or create such hazards.

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[1] See Advisory Circular 150/ 5200-36 *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports.*

If those parties develop a mutually acceptable restoration or enhancement plan, the landowner or community proposing the restoration or enhancement must monitor the restored or enhanced site. This monitoring must verify their efforts have not worsened or created hazardous wildlife attraction or activity. If such attraction or activity occurs, the landowner or community should work with the airport sponsor, USDA/ APHIS/ WS or another Qualified Airport Wildlife Biologist to reduce the hazard to aviation.

(3) Mitigation banking. Wetland mitigation banking is the creation or restoration of wetlands in order to provide mitigation credits that can be used to offset permitted wetland losses. Mitigation banking benefits wetland resources by providing advance replacement for permitted wetland losses; consolidating small projects into larger, better-designed and managed units; and encouraging integration of wetland mitigation projects with watershed planning. This last benefit is most helpful for airport projects, as wetland impacts mitigated outside of the separations identified in Sections 1-2 through 1-4 can still be located within the same watershed. Wetland mitigation banks meeting the separation criteria offer an ecologically sound approach to mitigation in these situations. Airport operators should work with local watershed management agencies or organizations to develop mitigation banking for wetland impacts on airport property.

2-5. DREDGE SPOIL CONTAINMENT AREAS. The FAA recommends against locating dredge spoil containment areas (also known as Confined Disposal Facilities) within the separations identified in Sections 1-2 through 1-4 if the containment area or the spoils contain material that would attract hazardous wildlife.

2-6. AGRICULTURAL ACTIVITIES. Because most, if not all, agricultural crops can attract hazardous wildlife during some phase of production, the FAA recommends against the used of airport property for agricultural production, including hay crops, within the separations identified in Sections 1-2 through 1-4. If the airport has no financial alternative to agricultural crops to produce income necessary to maintain the viability of the airport, then the airport shall follow the crop distance guidelines listed in the table titled "Crop Buffers" (Table 3-10) found in AC 150/5300-13, *Airport Design*. The cost of wildlife control and potential accidents should be weighed against the income produced by the on-airport crops when deciding whether to allow crops on the airport.

a. Livestock production. Confined livestock operations (i.e., feedlots, dairy operations, hog or chicken production facilities, or egg laying operations) often attract flocking birds, such as starlings, that pose a hazard to aviation. Therefore, The FAA recommends against such facilities within the separations identified in Sections 1-2 through 1-4. Any livestock operation within these separations should have a program developed to reduce the attractiveness of the site to species that are hazardous to aviation safety. Free-ranging livestock must not be grazed on airport property because the animals may wander onto the AOA. Furthermore, livestock feed, water, and manure may attract birds.

b. Aquaculture. Aquaculture activities (i.e. catfish or trout production) conducted outside of fully enclosed buildings are inherently attractive to a wide variety of birds. Existing aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4 must have a program developed to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should also oppose the establishment of new aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4.

c. Alternative uses of agricultural land. Some airports are surrounded by vast areas of farmed land within the distances specified in Sections 1-2 through 1-4. Seasonal uses of agricultural land for activities such as hunting can create a hazardous wildlife situation. In some areas, farmers will rent their land for hunting purposes. Rice farmers, for example, flood their land during waterfowl hunting season and obtain additional revenue by renting out duck blinds. The duck hunters then use decoys and call in hundreds, if not thousands, of birds, creating a tremendous threat to aircraft safety. A Qualified Airport Wildlife Biologist should review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate them into the WHMP.

2-7. GOLF COURSES, LANDSCAPING AND OTHER LAND-USE CONSIDERATIONS.

a. Golf courses. The large grassy areas and open water found on most golf courses are attractive to hazardous wildlife, particularly Canada geese and some species of gulls. These species can pose a threat to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Sections 1-2 through 1-4. Existing golf courses located within these separations must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should ensure these golf courses are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.

b. Landscaping and landscape maintenance. Depending on its geographic location, landscaping can attract hazardous wildlife. The FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. A Qualified Airport Wildlife Biologist should review all landscaping plans. Airport operators should also monitor all landscaped areas on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.

Turf grass areas can be highly attractive to a variety of hazardous wildlife species. Research conducted by the USDA Wildlife Services' National Wildlife Research Center has shown that no one grass management regime will deter all species of hazardous wildlife in all situations. In cooperation with Qualified Airport Wildlife Biologist, airport operators should develop airport turf grass management plans on a prescription basis, depending on the airport's geographic locations and the type of hazardous wildlife likely to frequent the airport

Airport operators should ensure that plant varieties attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass. For airport property already planted with seed mixtures containing millet, rye grass, or other large-seed producing grasses, the FAA recommends disking, plowing, or another suitable agricultural practice to prevent plant maturation and seed head production. Plantings should follow the specific recommendations for grass management and seed and plant selection made by the State University Cooperative Extension Service, the local office of Wildlife Services, or a Qualified Airport Wildlife Biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a Qualified Airport Wildlife Biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

c. Other hazardous wildlife attractants. Other specific land uses or activities (e.g., sport or commercial fishing, shellfish harvesting, etc.), perhaps unique to certain regions of the country, have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, airport operators must take prompt remedial action(s) to protect aviation safety.

2-8. SYNERGISTIC EFFECTS OF SURROUNDING LAND USES. There may be circumstances where two (or more) different land uses that would not, by themselves, be considered hazardous wildlife attractants or that are located outside of the separations identified in Sections 1-2 through 1-4 that are in such an alignment with the airport as to create a wildlife corridor directly through the airport and/or surrounding airspace. An example of this situation may involve a lake located outside of the separation criteria on the east side of an airport and a large hayfield on the west side of an airport, land uses that together could create a flyway for Canada geese directly across the airspace of the airport. There are numerous examples of such situations; therefore, airport operators and the Qualified Airport Wildlife Biologist must consider the entire surrounding landscape and community when developing the WHMP.

SECTION 3.

PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF PUBLIC-USE AIRPORTS AND REQUIREMENTS FOR SUBJECT AIRPORTS TO CONDUCT WILDLIFE HAZARD ASSESSMENTS.

3.1. INTRODUCTION. In recognition of the increased risk of serious aircraft damage or the loss of human life that can result from a wildlife strike, the FAA requires airports conduct a Wildlife Hazard Site Visit (WHSV) or Wildlife Hazard Assessment (WHA) The results of the WHSV or WHA must be submitted to the FAA for review and approval. The FAA will review the submitted WHSV or WHA and determine the need for a WHA (in the case of a WHSV) or a WHMP (in the case of a WHA).

Part 139 Class I-III certificated airports are required under Part 139, section 139.337, to conduct a WHA when specific triggering events occur. Section 139.337 also discusses the specific issues that a WHMP must address for FAA approval and inclusion in an Airport Certification Manual for airports certificated under Part 139. Additional factors are discussed in Section 3-4.

3.2. COORDINATION WITH USDA WILDLIFE SERVICES OR OTHER QUALIFIED AIRPORT WILDLIFE BIOLOGISTS. Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, only airport wildlife biologists meeting the qualification requirements in Advisory Circular 150/5200-36 can conduct WHSVs, WHA, and WHMPs. Airports must maintain documentation that the qualified airport wildlife biologist meets the qualification requirements in Advisory Circular 150/5200-36.

The FAA will use the WHA to determine if the airport needs a WHMP. The airport operator may look to the USDA's Wildlife Services state offices or to qualified private consultants to conduct the WHA. When the services of a qualified airport wildlife biologist are required, the FAA recommends that land-use developers or airport operators contact a consultant specializing in wildlife damage management or the appropriate state director of Wildlife Services.

NOTE: Telephone numbers for the respective USDA Wildlife Services state offices can be obtained by contacting USDA Wildlife Services Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157 *(http://www.aphis.usda.gov/ws/)*.

3-3. WILDLIFE HAZARD MANAGEMENT AT AIRPORTS: A MANUAL FOR AIRPORT PERSONNEL. This manual, prepared by FAA and USDA Wildlife Services staff, contains a compilation of information to assist airport personnel in the development, implementation, and evaluation of WHMPs at airports. The manual includes specific information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, WHAs, WHMPs, and sources of help and information. The manual is available in three languages: English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web

site: http://wildlife-mitigation.tc.FAA.gov/. This manual only provides a starting point for addressing wildlife hazard issues at airports. Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, Qualified Airport Wildlife Biologists must direct the development of a WHMP and the implementation of management actions by airport personnel.

There are many other resources complementary to this manual for use in developing and implementing WHMPs. Several are listed in the manual's bibliography.

3-4. WILDLIFE HAZARD SITE VISITS AND WILDLIFE HAZARD ASSESSMENTS. Title 14 of the CFR, section 139.337(b), requires operators of certificated airports (Class I-III) to conduct a WHA when certain triggering events occur on or near the airport. Section 139.337(c) provides specific guidance as to what facts must be addressed in a WHA. It is good practice for airport operators to understand the wildlife hazard issues on or near the airport. Operators of certificated airports are encouraged to conduct a WHA regardless of whether the airport has experienced one of the triggering events. Doing so would allow the airport to take proactive action and mitigate the wildlife risk before experiencing an incident. Certificated airports may use the standards, practices and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139.

All other airports (Subject Airports) must provide for a WHA or WHSV conducted by a qualified airport wildlife biologist (as defined in FAA Advisory Circular 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports*) based upon the FAA's interpretation of Grant Assurance No. 19. Part 139 certificated airports are currently required to ensure that a WHA is conducted consistent with 14 C.F.R. § 139.337.

Assurance No. 19, "Operation and Maintenance," requires a sponsor to operate "the airport and all facilities which are necessary to serve the aeronautical users of the airport […] , in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation." Under Assurance 19, sponsors are also required to "have in effect arrangements for […] promptly notifying airmen of any condition affecting aeronautical use of the airport."

The FAA is now interpreting safe 'airport operations' in Assurance 19 to expressly include periodically conducting WHAs or WHSVs, depending upon the size and nature of airport operations. Upon completion, the WHA or WHSV must be submitted to the FAA Administrator for approval and determination of the need for further mitigation measures: a Wildlife Hazard Management Plan (WHMP) when a WHA is submitted, and a WHA when a WHSV is submitted. The completed WHA or WHSV would assist the sponsor in meeting its obligation under the assurance to provide notice to airmen of any condition affecting the aeronautical use of the airport.

Wildlife Hazard Site Visits provide an airport a cursory analysis and actionable

information concerning wildlife hazards. They are often conducted to investigate a triggering event and whether an existing WHA and WHMP adequately address the incident, or to determine, if necessary, the necessity of a WHA. The intent of a WHSV is to provide an abbreviated analysis of an airport's wildlife hazards and to provide timely information that allows the airport to expedite the mitigation of these hazards.

Subsequent to the effective date of the final Federal Register Notice relating to the FAA's modification of its interpretation of Grant Assurance No. 19 and after receiving a new airport development grant, all Subject Airports must provide for a WHA or WHSV by the timeline set forth below for each of the four "Subject Airport" classifications based upon the FAA's interpretation of Grant Assurance No. 19. The WHA or WHSV must be conducted by a qualified airport wildlife biologist (as established in FAA Advisory Circular 150/5200-36A, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports*). Part 139 certificated airports are currently required to ensure that a WHA is conducted consistent with 14 C.F.R. § 139.337.

a. **Subject Airports with 100 or more based turbine-powered aircraft or 75,000 or more total annual operations.** The WHA must be initiated within three years of receiving a development grant after the final Federal Register notice. The airport sponsor must update its WHA at least once every 10 years thereafter.

b. **Subject Airports with between 20-99 based turbine-powered aircraft or 30,000-74,999 total annual operations.** The WHSV must be initiated within three years of receiving a development grant after the final Federal Register notice. The airport sponsor must update its WHSV at least once every five years thereafter.

c. **Subject Airports with between 0-19 based turbine-powered aircraft or between 10,000-29,999 total annual operations.** The WHSV must be initiated within five years of receiving a development grant after the final Federal Register notice. The airport sponsor must update its WHSV at least once every five years thereafter.

d. **Subject Airports with no based turbine-powered aircraft and fewer than 10,000 total annual operations.** The WHSV must be initiated within eight years of receiving a development grant after the final Federal Register notice. The airport sponsor must update its WHSV at least once every five years thereafter.

e. Recommendation for earlier WHA or WHSV. The FAA also recommends that Subject Airports provide for a WHA or WHSV as soon as practicable in order to identify any immediate wildlife hazards and/or mitigation measures.

f. Additional factors. In addition, the FAA strongly recommends that Subject Airports provide for a WHA or WHSV earlier than the timetable above whenever any of the following occur:

(1) An aircraft experiences multiple wildlife strikes;

(2) An aircraft experiences substantial damage due to a wildlife strike. As used in this paragraph, "substantial damage" means damage or structural failure incurred by an aircraft that adversely affects the structural strength, performance, or flight characteristics of the aircraft and that would normally require major repair or replacement of the affected component;

(3) An aircraft experiences an engine ingestion of wildlife; or

(4) Wildlife of sufficient size or quantity to cause an event described in paragraphs 3-4(f)(1), 3-4(f)(2) or 3-5(f)(3) of this section is observed to have access to any airport flight pattern or aircraft movement area.

3-5. WILDLIFE HAZARD MANAGEMENT PLAN (WHMP). The FAA will consider the results of the WHA, along with the aeronautical activity at the airport and the views of the airport operator and airport users, in determining whether a WHMP is needed. If the FAA determines that a WHMP is needed, the airport operator must formulate and implement a WHMP, using the WHA as the basis for the plan.

The goal of an airport's Wildlife Hazard Management Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport. For WHMPs to effectively reduce wildlife hazards on and near airports, accurate and consistent wildlife strike reporting is essential. Airports should consult AC No. 150/5200-32, *Reporting Wildlife Aircraft Strikes*, for further information on responsibilities and recommendations concerning wildlife strikes.

The WHMP must identify hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management techniques to minimize the wildlife hazard. It must also prioritize the management measures.

3-6. LOCAL COORDINATION. The establishment of a Wildlife Hazards Working Group (WHWG) will facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the WHMP. The cooperation of the airport community is also necessary when new projects are considered. Whether on or off the airport, input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Airport operators should also incorporate public education activities with the local coordination efforts because some activities in the vicinity of your airport, while harmless under

normal leisure conditions, can attract wildlife and present a danger to aircraft (see Sections 4-4 to 4-7). For example, if public trails are planned near wetlands or in parks adjoining airport property, the public should know that feeding birds and other wildlife in the area may pose a risk to aircraft.

3-7 COORDINATION/ NOTIFICATION OF AIRMEN OF WILDLIFE HAZARDS. If an existing land-use practice creates a wildlife hazard and the land-use practice or wildlife hazard cannot be immediately eliminated, airport operators must issue a Notice to Airmen (NOTAM) and encourage the land owner or manager to take steps to control the wildlife hazard and minimize further attraction.

3-8 FEDERAL AND STATE DEPREDATION PERMITS. Airports should maintain federal and state depredation permits to allow mitigation and/ or removal of hazardous species. All protected species require special permits for lethal mitigation or capture and relocation procedures. Endangered or threatened species mitigation also requires special permits. Consultation and permitting is required with the U.S. Fish and Wildlife Service (USFWS) and is highly recommended with a Qualified Airport Wildlife Biologist. Section 6 of this AC provides further guidance regarding endangered or threatened species on or near airports.

a. Title 50 CFR § 21.49 CONTROL ORDER FOR RESIDENT CANADA GEESE AT AIRPORTS AND MILITARY AIRFIELDS. The airport control order authorizes managers at commercial, public, and private airports (airports) (and their employees or their agents) and military air operation facilities (military airfields) (and their employees or their agents) to establish and implement a control and management program when necessary to resolve or prevent threats to public safety from resident Canada geese. Control and management activities include indirect and/or direct control strategies such as trapping and relocation, nest and egg destruction, gosling and adult trapping and culling programs, or other lethal and non-lethal control strategies.

To be designated as an airport that is authorized to participate in this program, an airport must be part of the National Plan of Integrated Airport Systems and have received Federal grant-in-aid assistance, or a military airfield, meaning an airfield or air station that is under the jurisdiction, custody, or control of the Secretary of a military department. Only airports and military airfields in the lower 48 States and the District of Columbia are eligible to conduct and implement the various resident Canada goose control and management program components.

Airports and military airfields may conduct management and control activities, involving the take of resident Canada geese, under this section between April 1 and September 15. The destruction of resident Canada goose nests and eggs may take place between March 1 and June 30.

Resident Canada geese may be taken only within the airport, or the military base on which a military airfield is located, or within a 3-mile radius of the outer boundary of such a facility. Airports and military airfields or their agents must first obtain all

necessary authorizations from landowners for all management activities conducted outside the airport or military airfield's boundaries and be in compliance with all State and local laws and regulations.

b. Title 50 CFR § 21.50 Depredation order for resident Canada geese nests and eggs. The nest and egg depredation order for resident Canada geese authorizes private landowners and managers of public lands (landowners); homeowners' associations; and village, town, municipality, and county governments (local governments); and the employees or agents of any of these persons or entities to destroy resident Canada goose nests and eggs on property under their jurisdiction when necessary to resolve or prevent injury to people, property, agricultural crops, or other interests.

Only landowners, homeowners' associations, and local governments (and their employees or their agents) in the lower 48 States and the District of Columbia are eligible to implement the resident Canada goose nest and egg depredation order.

SECTION 4.

RECOMMENDED PROCEDURES FOR AIRPORTS REGARDING OFF-AIRPORT ATTRACTANTS.

4-1. FAA NOTIFICATION AND REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS

The FAA discourages the development of waste disposal and other facilities, discussed in Section 2, located within the 5,000/ 10,000-foot criteria specified in Sections 1-2 through 1-4.

a. For projects that are located outside the 5,000/ 10,000-foot criteria but within 5 statute miles of the airport's AOA, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. The FAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.

b. Where a Qualified Airport Wildlife Biologist has conducted a further study to evaluate a site's compatibility with airport operations, the FAA may use the study results to make a determination.

4-2. WASTE MANAGEMENT FACILITIES.

a. Notification of new/expanded project proposal. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181), codified at 49 U.S.C. section 44718(d), prohibits the construction or establishment of new MSWLF within 6 statute miles of certain public-use airports, when both the airport and the landfill meet very specific conditions. See Section 2-2 of this AC and AC 150/5200-34A, *Construction or Establishment of Landfills near Public Airports,* for a more detailed discussion of these restrictions.

The Environmental Protection Agency (EPA) requires any MSWLF operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR § 258, *Criteria for Municipal Solid Waste Landfills*, Section 258.10, *Airport Safety*). The EPA also requires owners or operators of new MSWLF units, or lateral expansions of existing MSWLF units, that are located within 10,000 feet of any airport runway end used by turbine-powered aircraft, or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft. (See 4-2(b) below.)

When new or expanded MSWLF are being proposed near airports, MSWLF operators must notify the airport operator and the FAA of the proposal as early as possible pursuant to 40 CFR § 258.

b. Waste handling facilities within separations identified in Sections 1-2 through 1-4. To claim successfully that a waste-handling facility sited within the separations identified in Sections 1-2 through 1-4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 2-2.d. The FAA strongly recommends against any facility other than that as outlined in 2-2.d (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.

c. Putrescible-Waste Facilities. In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, no such facility has been able to demonstrate an ability to reduce and sustain hazardous wildlife to levels that existed before the putrescible-waste landfill began operating. For this reason, demonstrations of experimental wildlife control measures may not be conducted within the separation identified in Sections 1-2 through 1-4.

4-3. OTHER LAND-USE PRACTICE CHANGES. As a matter of policy, the FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 statute miles of their airports to promptly notify the FAA. The FAA also encourages proponents of such land use changes to notify the FAA as early in the planning process as possible. Advanced notice affords the FAA an opportunity (1) to evaluate the effect of a particular land-use change on aviation safety and (2) to support efforts by the airport sponsor to restrict the use of land next to or near the airport to uses that are compatible with the airport.

The airport operator, project proponent, or land-use operator may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents similar to FAA Form 7460-1 to notify the appropriate FAA Regional Airports Division Office. Project proponents can contact the appropriate FAA Regional Airports Division Office for assistance with the notification process.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land-use operator or project proponent should also forward specific details of the proposed land-use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

a. Airports that have received Federal assistance. Airports that have received Federal assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA requires that airport operators oppose off-airport land-use changes or practices, to the extent practicable, within the separations identified in Sections 1-2 through 1-4, which may attract hazardous wildlife. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport development

projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for preventing, eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for airport development projects.

4-4. COORDINATION TO PREVENT CREATION OF NEW OFF-AIRPORT HAZARDOUS WILDLIFE ATTRACTANTS. Airport operators should work with local and regional planning and zoning boards so as to be aware of proposed land-use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in Sections 1-2 through 1-4. Pay particular attention to proposed land uses involving creation or expansion of wastewater treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, airport operators should ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 5 miles of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife. This may be accomplished through one or more of the following:

a. Site-specific criteria. The airport should establish site-specific criteria for what land uses and locations would be of concern based on wildlife strikes and on wildlife abundance and activity at the airport and in the local area. These criteria may be more restrictive, but should not be less restrictive than the guidance provided elsewhere in this AC.

b. Outreach. Airports should actively seek to provide educational information and/ or provide input regarding local development, natural resource modification or wildlife-related concerns that affect wildlife hazards and safe air travel.

(1) External Outreach. Airports should consider outreach to local planning and zoning organizations on land uses of concern or to local organizations involved with natural resource management (including wildlife management, wetlands management, and parks). Airports should also consider developing and distributing position letters and/ or educational materials on airport-specific concerns regarding wildlife hazards, wildlife activity and/ or attraction, etc. Finally, airports should provide formal comments on local procedures, laws, ordinances, plans, and/ or regulatory actions such as permits related to land uses of concern.

(2) Internal Outreach. Airports should consider developing and distributing position letters and/ or educational materials on airport-specific concerns regarding species identification and mitigation procedures, wildlife hazards, wildlife activity and/ or attraction, etc. to employees and personnel with access to the AOA.

4-5. COORDINATION ON EXISTING OFF-AIRPORT HAZARDOUS WILDLIFE ATTRACTANTS. Airports should work with landowners and managers to cooperatively develop procedures to monitor and manage hazardous wildlife attraction. These

procedures may include:

a. Conduct a Wildlife Hazard Site Visit by a wildlife biologist meeting the qualification requirements of Advisory Circular 150/5200-36, *Qualifications for Wildlife Biologists Conduct Wildlife Hazard Assessments and Wildlife Hazard Management Training at Airports*

b. Conduct regular, standardized, wildlife monitoring surveys

c. Establish threshold numbers of wildlife which would trigger certain actions and/or communications

d. Establishment of procedures to deter or remove hazardous wildlife

4-6. PROMPT REMEDIAL ACTION. Regardless of the type or source of attraction, Part 139 certificated airports must take immediate action to alleviate wildlife hazards whenever they are detected, while Subject Airports should take immediate action to alleviate wildlife hazards whenever they are detected. In addition, airports should take prompt action to identify the source of attraction and cooperatively develop procedures to mitigate and monitor the attractant. **For Part 139 Certificated airports, procedures for immediate actions are required in accordance with 139.337 (a).**

4-7. FAA ASSISTANCE. If there is disagreement on the implementation of any of the guidance in this Section, contact the FAA Regional Airports Division for assistance.

4-8. AIRPORT DOCUMENTATION PROCEDURES.

a. LOG OF WILDLIFE ATTRACTANTS. Airports should develop a log to track all contacts from landowners or managers, permitting agencies, or other entities concerning land uses near the airport, as well as on-airport features and developments that could attract hazardous wildlife. In this log maintain documentation sufficient to conduct the reviews below and to make follow-up contact if necessary.

b. ANNUAL REVIEW OF LOG. The airport should review this log annually to:

(1) Review status of individual offsite attractants and any needed changes

(2) Identify synergistic effects of hazardous wildlife attractants

(3) Identify any existing or potential flyways across or through aircraft travel corridors between hazardous wildlife attractants

(4) Identify cooperative measures and on-airport wildlife management procedures that would alleviate either or both of the above two conditions

(5) Document the participants in the review, items discussed, and changes identified

For Part 139 Certificated airports, this review must be a part of the annual Wildlife Hazard Management Plan review in accordance with 139.337 (f) (6). In addition, Part

139 Certificated Airports must also log triggering events and other wildlife strikes in accordance with 139.337 (f) (6). FAA encourages all airports, regardless of certification, to record any known wildlife strikes in the National Wildlife Strike Database.

APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. GENERAL. This appendix provides definitions of terms used throughout this AC.

1. **Air operations area.** Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.

2. **Airport operator.** The operator (private or public) or sponsor of a public-use airport.

3. **Approach or departure airspace.** The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

4. **Bird balls.** High-density plastic floating balls that can be used to cover ponds and prevent birds from using the sites.

5. **Certificate holder.** The holder of an Airport Operating Certificate issued under Title 14, Code of Federal Regulations, Part 139.

6. **Construct a new MSWLF.** To begin to excavate, grade land, or raise structures to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting agency.

7. **Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.

8. **Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.

9. **Fly ash.** The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

10. **General aviation aircraft.** Any civil aviation aircraft operating under 14 CFR Part 91.

11. **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard

12. **Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. An MSWLF may receive other types wastes, such as commercial solid waste, non-hazardous sludge,

small-quantity generator waste, and industrial solid waste, as defined under 40 CFR § 258.2. An MSWLF can consist of either a stand-alone unit or several cells that receive household waste.

13. **New MSWLF.** A municipal solid waste landfill that was established or constructed after April 5, 2001.

14. **Piston-powered aircraft.** Fixed-wing aircraft powered by piston engines.

15. **Piston-use airport.** Any airport that does not sell Jet-A fuel for fixed-wing turbine-powered aircraft, and primarily serves fixed-wing, piston-powered aircraft. Incidental use of the airport by turbine-powered, fixed-wing aircraft would not affect this designation. However, such aircraft should not be based at the airport.

16. **Public agency.** A State or political subdivision of a State, a tax-supported organization, or an Indian tribe or pueblo (49 U.S.C. § 47102(19)).

17. **Public airport.** An airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(20)).

18. **Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft may be under the control of a public agency or privately owned and used for public purposes (49 U.S.C. § 47102(21)).

19. **Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds (40 CFR §257.3-8).

20. **Putrescible-waste disposal operation.** Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

21. **Retention ponds.** Storm water management ponds that hold water for several months.

22. **Runway protection zone (RPZ).** An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the airport design, aircraft, type of operation, and visibility minimum.

23. **Scheduled air carrier operation.** Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier or commercial operator for which the air carrier, commercial operator, or their representative

offers in advance the departure location, departure time, and arrival location. It does not include any operation that is conducted as a supplemental operation under 14 CFR Part 119 or as a public charter operation under 14 CFR Part 380 (14 CFR § 119.3).

24. **Sewage sludge.** Any solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. (40 CFR § 257.2)

25. **Sludge.** Any solid, semi-solid, or liquid waste generated form a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. (40 CFR § 257.2)

26. **Solid waste.** Any garbage, refuse, sludge, from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including, solid liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended, (68 Stat. 923). (40 CFR § 257.2)

27. **Turbine-powered aircraft.** Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

28. **Turbine-use airport.** Any airport that sells -A fuel for fixed-wing turbine-powered aircraft.

29. **Wastewater treatment facility.** Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-217) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 CFR § 403.3 (q), (r), & (s)).

30. Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring thereof (50 CFR § 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, wildlife includes feral animals and domestic animals out of the control of their owners (14 CFR Part 139, Certification of Airports).

31. Wildlife attractants. Any human-made structure, land-use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace or the airport's AOA. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.

32. Wildlife hazard. A potential for a damaging aircraft collision with wildlife on or near an airport.

33. Wildlife strike. A wildlife strike is deemed to have occurred when:

a. A strike between wildlife and aircraft has been witnessed;

b. Evidence or damage from a strike has been identified on an aircraft;

c. Bird or other wildlife remains, whether in whole or in part, are found:

i. Within 250 feet of a runway centerline or within 1,000 feet of a runway end unless another reason for the animal's death is identified or suspected,, unless another reason for the animal's death is identified or;

ii. On a taxiway or anywhere else on or off airport that you have reason to believe was the result of a strike with an aircraft. Examples might be:

1. Bird was found in pieces from a prop strike on a taxiway
2. Carcass was retrieved within 1 mile from airport on final approach path after someone reported the bird falling out of the sky.

d. The presence of birds or other wildlife on or off the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal).

2. RESERVED.