



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
SOLID WASTE AND  
EMERGENCY RESPONSE

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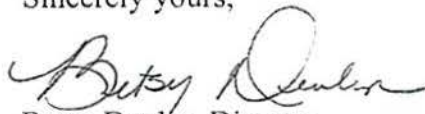
Dear Mr. Mitlo:

I am responding to your February 28, 2013 letter to James Michael of my staff requesting answers to a series of questions you pose related to management of aircraft remains from catastrophic loss events. Specifically, you present 26 questions regarding how certain federal regulations would apply to a variety of materials and related activities resulting from a hypothetical passenger plane crash. You also state that your questions require answers "...from various departments of the government including but not limited to [EPA and DOT]."

As my staff indicated to you when you met with them on January 29, 2013, our responses only address requirements of the Resource Conservation and Recovery Act (RCRA). These are general responses that address many aspects of handling aircraft crash debris. However, you should review the relevant regulations to determine their applicability in any particular case in order to ensure your compliance with the requirements. We also note some aspects of your scenario where there may not be RCRA requirements, but where our staff has general knowledge of which agency may have requirements and recommend that you consult with those agencies to understand their requirements to ensure compliance. Further, our responses reflect only federal regulations and policies. Some states may have additional requirements, and we recommend that you consult with the relevant state agencies before making decisions regarding the recycling, management, or disposal of aircraft remains and related debris.

Should you have any questions, please contact Gregory Helms of my staff at (703) 308-8845, or email [helms.greg@epa.gov](mailto:helms.greg@epa.gov).

Sincerely yours,

  
Betsy Devlin, Director

Materials Recovery and Waste Management  
Division

Enclosure – Responses to Specific Questions Posed in a 2/28/13 Letter from Angelo Mitlo, Max Torque Industrial to James Michael, U.S. EPA.

Before responding to your specific questions, I want to clarify terminology in your questions and our responses below. Many of your questions are asked in terms of whether a material may be “HAZMAT”. The term “HAZMAT” is an abbreviation for “hazardous materials,” which is a term defined by the Department of Transportation (DOT) to identify those substances or materials that could adversely affect the safety of the public, handlers or carriers during transportation. See 49 CFR 171.8. EPA does not use the term HAZMAT to describe or classify wastes and their hazards. Under RCRA subtitle C, the key term is “hazardous waste.” When a material is a waste, and is in turn classified as hazardous waste under RCRA, that waste is subject to the RCRA hazardous waste management requirements. These requirements include limits on waste accumulation and storage, management of the hazardous waste while accumulated on-site, use of a hazardous waste transporter, tracking of the waste (using a hazardous waste manifest) to a RCRA permitted treatment/storage/disposal facility (TSDF), which includes final disposal of any residues. However, RCRA does not regulate material that is not a waste (“solid waste”), as defined under RCRA and its regulations.

**1. Do the emergency response teams; trucking companies, airline, insurance company or storage facility have to have any sort of permits, licenses, ID numbers?**

**Response:** There are two major aspects to your scenario after first responders address the acute emergency caused by the crash: (1) the crash site and (2) storage of the wreckage during the investigation. According to NTSB guidance,<sup>1</sup> the NTSB safety officer will, in conjunction with the local incident commander, identify crash site hazards and arrange for removal or mitigation of hazards by emergency responders before an investigation team is allowed access to the site. This includes defueling the plane, removing batteries and any hazardous materials known to be cargo, and mitigating hazards posed by chemical oxygen generators, among others. A determination as to whether those materials are hazardous waste will need to be made when these materials are removed for disposal. The federal, state and local emergency responders at the site (and any contractors assisting them) should be familiar with this part of the process and should also have the requisite licenses and RCRA Identification (ID) numbers to remove any hazardous waste for subsequent disposition.

Because the airplane debris often plays an integral part in the investigation, this material is generally not waste while NTSB conducts its investigation. When the on-site phase of the investigation is completed, NTSB may determine that part or all of the wreckage is no longer needed as part of the investigation and may release this material to the owner or the owners’ representative.<sup>2</sup> According to their guidance, NTSB considers the signed wreckage release form to constitute transfer of the wreckage from NTSB to the owner or representative. If the materials are to be discarded, a hazardous waste determination would be required. Under RCRA, the generator is obligated to determine whether the waste is hazardous using either testing or

<sup>1</sup> NTSB Aviation Investigation Manual, Major Team Investigations, November 2002, section 3.3, p. 16; Appendix G, section 3, pp G-5-G-12.

<sup>2</sup> NTSB Aviation Investigation Manual, Major Team Investigations, November 2002, Section 3.12, p. 25

knowledge of the waste as described at 40 CFR 262.11 of the RCRA hazardous waste regulations. Wastes may be hazardous under RCRA by either being listed or by expressing a hazardous waste characteristic, although airliner crash debris is very unlikely to be a listed hazardous waste. However some materials common in crash debris, such as spilled aviation fuel, are likely to express one of the four hazardous characteristics (ignitability, corrosivity, reactivity or toxicity (See 40 CFR 262.21-24). If the owner will use the materials for their own investigation of the crash, or as evidence in litigation, the materials may not become waste until that investigation or litigation is complete. When all use of the materials for crash investigations and any other purposes is complete, the owner (generator) would need to make a hazardous waste determination before recycling or disposing of the material.

Once the wreckage is removed from the crash site, evaluation of the site for residual contamination resulting from the crash may be conducted, typically by a trained environmental services consultant. Depending on the results of the evaluation, additional remediation of the site may be warranted. Any materials removed from the site for disposal would generally be considered waste and if found to be hazardous waste, must be managed in accordance with the RCRA hazardous waste regulations.

Under NTSB guidance, their investigators create a list of components or other materials being retained for further examination (e.g., at the NTSB Materials Laboratory). These parts would be released and shipped back to the owner or representative once the examination is completed. These parts would typically be considered waste once NTSB completes its examination and a hazardous waste determination would be required unless the owner uses the parts in their own investigation.

Under the RCRA regulations, neither a hazardous waste transporter nor the facility designated to receive hazardous waste (i.e., the "designated facility," see definition in 40 CFR 260.10) may accept any hazardous waste without the generator having a RCRA Identification (ID) number. The generator would need to obtain a RCRA ID number from the state environmental agency or EPA Regional Office, unless the quantity of hazardous waste generated is so small that a RCRA ID number is not required (100 kg or less per calendar month).

## **2. Can the aircraft remains be shipped to the storage facility without being abated of HAZMAT?**

**Response:** NTSB guidance provides an extensive discussion of the potential hazards of aircraft crash debris. These hazards will be addressed by trained emergency responders or other professionals before the NTSB investigation team begins its on-site work. These hazards may be addressed by removing hazardous materials or through other measures. Given this guidance, most hazardous materials would be expected to be removed or otherwise addressed before any aircraft wreckage is sent to a storage facility.

Assuming the aircraft remains are shipped to the storage facility as part of the NTSB investigation, the material would not be considered a waste and there would be no RCRA requirements for the debris when it is shipped. The DOT would have authority over the transportation of these items to the storage facility. The transporter will need to comply with any applicable DOT regulations as well as state and local requirements, when transporting the aircraft remains.

**3. If yes to question 2, do the shipments require special rights, permits, licenses, etc.?**

**Response:** See answer to Question 2. Because the airliner debris will often not be a standard or typical material to be shipped, EPA recommends consultation with DOT or state transportation officials.

**4. Due to the nature of the crash, fuel and other fluids may be released onto the ground and soil. Do the cleanup crews need to dig to properly remediate the soil?**

**Response:** See response to Question 1. The emergency response and removal teams from EPA, the state, and/or local authority will investigate the scene and determine whether soil at the crash site needs to be remediated to render the site safe for the NTSB investigation team (and the general public), and the appropriate methods of remediation. Additional remediation may be needed after removal of the aircraft debris from the crash site. Where it is determined that contaminated soil is to be excavated and removed for disposal, the excavated soil would generally be considered waste and subject to a hazardous waste determination.

**5. What is the procedure for disposing of the soil?**

**Response:** The procedures for removing and disposing of any contaminated soil will be determined on a site-specific basis. The contaminated soil may or may not be a hazardous waste, a determination that will affect how the soil must be managed and to what type of facility it must be sent for disposal. If the soil is determined to be a hazardous waste (or otherwise contains hazardous waste) under the applicable state or federal regulations (40 CFR 262.11), then those persons who are responsible for the excavation and subsequent management of the soil (which might include, but not be limited to, the emergency response and removal team, or its contractors, or the aircraft owner or its contractors) will become hazardous waste generators and must comply with all applicable hazardous waste regulations.

**6. Are there requirements as to how the aircraft remains are to be stored, if it has not been properly de-contaminated?**

**Response:** Assuming the aircraft remains are not waste when shipped to the storage facility (as discussed in the response to Question 1 above), there are no RCRA requirements for this material unless and until it is discarded. With respect to storage requirements, EPA recommends that any and all information as to the nature and contents of the aircraft remains be shared with all parties involved, such as the NTSB and its contractors, in order to prevent any possible worker exposures or releases to the environment at the storage facility.

**7. If the unspent chemical oxygen generators are still in the aircraft at the storage facility, are they considered HAZMAT?**

**Response:** As noted above, the term "HAZMAT" is a designation used by DOT to identify materials that may pose hazards when transported, and is not a term used by RCRA and its regulations.

Chemical oxygen generators contain chlorates or other oxidizer chemicals; NTSB guidance identifies oxygen generators as posing risks that should be abated before the NTSB investigators begin their work. As discussed above, aircraft remains (including those containing unspent

chemical oxygen generators) that are part of the NTSB investigation are generally not a waste under EPA's RCRA regulations while under investigation at a storage facility. If shipped as part of the investigation debris (as non-waste), DOT regulations may apply and thus DOT (and applicable state) transportation requirements should be reviewed. When discarded unspent (if removed from the plane at the crash site or storage site for discard, or discarded with all the other debris at the end of the investigation), these chemical oxygen generators would likely be classified as ignitable RCRA hazardous waste because of the oxidizer chemicals they contain (see 40 CFR 261.21(a)(4)).

**8. If yes, what should be done?**

**Response:** The removal of unspent chemical oxygen generators from the aircraft will represent a new point of generation and a waste determination will need to be made. Again, they are likely to be ignitable hazardous waste, and, if so, would need to be sent for treatment to a RCRA-permitted treatment/storage/disposal facility. It is also possible that the chemical oxygen generators could be recycled (e.g., the chemicals could be recovered, and the metal canisters may be scrap metal); however, determining the applicability of the hazardous waste regulations to various possible recycling options depends on a variety of site-specific factors, and EPA recommends that recycling options be carefully reviewed with EPA or the implementing state agency to ensure compliance with any applicable RCRA requirements. Finally, EPA recommends that where these chemical oxygen generators are not defined as wastes under RCRA, appropriate safeguards be used to ensure that they are managed safely.

**9. If fuel remains in the engines, fuel lines, and wings at the storage facility, is that considered HAZMAT?**

**Response:** Aviation fuel is volatile and ignitable (the flash point is about 38 degrees C). DOT regulations may apply to debris containing aviation fuel. Whenever the fuel is removed from the engines, fuel lines and wings, a hazardous waste determination will need to be made. Some recovered fuel can be recycled in a manner that would not be subject to federal RCRA regulations. However, the applicability of the hazardous waste regulations to possible recycling options depends on a variety of site-specific factors, and EPA recommends that recycling options be carefully reviewed with the implementing agency to ensure compliance with any applicable RCRA requirements. If disposed, the aviation fuel would be an ignitable hazardous waste subject to RCRA regulations (see 40 CFR 261.21(a)(1)). Again, NTSB guidance specifically identifies defueling the plane as an important safety measure that should be taken before the investigation begins.

**10. If yes, what should be done?**

**Response:** See response to questions 6 and 9 above. Any fuel that does remain in the stored wreckage could pose a number of hazards and should be removed by a trained professional. Any spillage of the fuel would generally be considered disposal under RCRA and the spilled fuel and any contaminated soil or debris would need to be remediated.

**11. If skydrol and aviation greases are in the components of the aircraft at the storage facility, are they considered HAZMAT?**

**Response:** See response to Question 1. These types of materials (e.g., hydraulic fluids, lubricants, greases, oils, etc.) can be considered wastes if spilled (and not promptly cleaned up) or otherwise discarded. If they are a waste, they would potentially be subject to the hazardous waste regulations under RCRA, and a hazardous waste determination would therefore need to be made. Also, some of these materials (e.g., used hydraulic fluids and lubricating oils) when recycled would be classified as used oil under the federal regulations, and potentially subject to EPA's or the authorized state's used oil management standards (40 CFR 261.3(a)(2)(v)).

**12. If yes, what should be done?**

**Response:** See response to Question 11 above.

**13. If tritium exit signs and aisle pathway lighting are in the aircraft at storage facility, are they considered HAZMAT?**

**Response:** See response to Question 1. Tritium exit signs are generally regulated under the Nuclear Regulatory Commission (NRC). Based on information EPA has on these devices, they do not appear to be regulated under the RCRA hazardous waste regulations (although authorized state programs can be more stringent than the federal EPA regulations). A useful resource for how EPA, NRC, and other authorities regulate these signs is <http://www.epa.gov/radtown/exit-signs.html>, and the NRC has a fact sheet covering reporting and disposal requirements: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/fs-tritium.html>.

**14. If yes, what should be done?**

**Response:** See response to question 13 above.

**15. All aircraft fuselages and wings are treated with Hexavalent Chromium for corrosion control. At the storage facility is this treated metal considered HAZMAT?**

**Response:** See response to Question 1. These materials would generally not be considered waste as long as they continue to be needed for the NTSB investigation. Once NTSB no longer needs the materials for its investigation, and releases them back to their owner, they will generally be considered waste, unless they are used for the owner's investigation of the crash. When all use of the materials for crash investigations and any other purposes is complete, the owner (generator) would need to make a hazardous waste determination before recycling or disposing of the material.

**16. If yes, what should be done?**

**Response:** These materials may be scrap metal that can be recycled. Most scrap metal that is recycled is not regulated under RCRA regulations. Materials within the wings or fuselage (e.g., seats, interior paneling, etc.) that are removed in the process of scrap recovery would potentially be subject to RCRA. If the wings, fuselage and other materials are disposed of, the generator of the waste (the owner or their insurance underwriter or its salvage company) would need to use process knowledge or test these materials (e.g., see EPA's SW-846 test methods) to determine if the materials were hazardous waste (e.g., for chromium), and if found to be a hazardous waste, comply with applicable RCRA regulations.

**17. Is the aviation paint on the fuselage and wings considered HAZMAT?**

**Response:** See response to Question 1.

**18. If yes, what should be done?**

**Response:** Any chromium paint or coatings removed from the surface of wings and fuselage when processing them into scrap would potentially be subject to RCRA. If it is not removed, its hazards would be considered as part of the hazardous waste determination for the fuselage and wings.

**19. Older model aircraft have depleted uranium counter weights. After a crash and in a storage facility are these counter weights considered HAZMAT?**

**Response:** See response to Question 1. Uranium and certain other radioactive materials (i.e., radioactive materials that are considered “source, special nuclear, or by-product materials subject to the Atomic Energy Act of 1954, as amended”) by themselves are not subject to RCRA solid and hazardous waste requirements, but may be subject to NRC regulations.

**20. If yes, what should be done?**

**Response:** The generator should contact NRC to determine how best to address the disposition of these counter weights once a decision has been made to sell or dispose of these materials.

**21. Are the life rafts, life preservers and exit slides considered HAZMAT?**

**Response:** See response to Question 1.

**22. If yes, what should be done?**

**Response:** As with your similar questions, the owner should determine, for each type of material removed from the airliner, whether it can be reused or is to be discarded. If the materials are to be disposed of, a hazardous waste determination will need to be made and if found to be a hazardous waste, storage, transport and disposal would be subject to RCRA regulations. If inflation mechanisms are chemical rather than an inert compressed gas, they may be RCRA hazardous waste. Also see responses to questions 7 and 8 above.

**23. If the aircraft or its components have soil in them from the crash site, is this soil considered HAZMAT?**

**Response:** See response to Question 1.

**24. If yes, what should be done?**

**Response:** Any soil remaining in the crash debris at the storage facility that is spilled, or discarded with the debris at the end of NTSB’s need for them, will need to be tested and evaluated to determine if it is a hazardous waste, and managed according to the result of that determination.

**25. Are the avionics and radome considered HAZMAT?**

**Response:** See response to Question 1.

**26. If yes, what should be done?**

**Response:** These materials may contain heavy metals and even valuable metals warranting recovery. The owner will likely want to evaluate whether these materials can be recycled as scrap. If disposed of, a hazardous waste determination will need to be made. If found to be a hazardous waste, all handling of these materials would be subject to RCRA regulations.

Finally, there may be other materials in the aircraft not identified in your questions, such as lithium batteries, where a waste determination will need to be made by the generator. The generator will need to follow and comply with all applicable RCRA, NRC and DOT and possibly other regulations. Any cargo or luggage recovered will also need to be evaluated as to whether it is a solid waste, and if so, whether it is also hazardous waste.

As you already know, proper handling and disposal of airliner crash debris can be complex, with the material coming under different regulatory authorities at different phases of handling, and multiple authorities may be applicable at some points. We have responded to your questions primarily from a waste management perspective, and tried to note overlaps with other authorities where we are aware of them. These are general responses that address many aspects of airliner crash debris. However, you will need to ensure that you understand and comply with the relevant regulations (those administered by the EPA and authorized states as well as other federal agencies) to determine their applicability in any particular case.