November 28, 2014

U. S. Department of Transportation Docket Management System
1200 New Jersey Ave., SE Washington, DC 20590

Re: Exemption Request Pursuant to Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 C.F.R. 61.113(a) & (b); 91.119(c); 91.151(a); 91.405(a); 91.407(a)(1); 91.409(a)(2);91.417(a) & (b).

Dear Sir or Madam:

MSWLF (Municipal Solid Waste Landfills) provide a valuable resource to the community in which they serve. However, it is also an inherently hazardous environment. During normal landfill operations workers are exposed to potentially hazardous contaminants such as methane, dust, bacteria, bio-aerosa, coliforms, fecal streptococci, carbon dioxide, ammonia, hydrogen sulfide, microorganisms, and fungal spores, as well as various volatile organic compounds not listed.

MSWLF (Municipal Solid Waste Landfills) is a dynamic ever changing environment. Heavy equipment operators and other MSWLF employees are at risk for bodily injury due to unforeseen terrain changes due to the mass movement of waste.

Regularly scheduled aerial surveys / inspections can assist the MSWLF operator in tracking compaction rates and remaining void space. Aerial surveys / inspections can also be used to provide a basis for environmental impact studies, historical pictorial records, and accident documentation.

The premature closure, or operational suspension of a MSWLF has a significant impact on local municipalities, cities and states in which they operate. Additionally the planning, building and operating a new landfill is not inexpensive or an easy task. As the amount of waste

accumulates in current landfills, the MSWLF operator must be able to maximize the usage of their MSWLF.

Current inspection methods include manned aerial and land survey operations. The expense of both procedures can be significant. The most accurate MSWLF survey / inspection methodology employs the use of manned aircraft. Manned aerial surveys / inspections are also the most expensive. Land survey operations of MSWLF is less accurate and exposes those individuals to the hazards associated with MSWLF.

Safe flight UAS operations can provide the MSWLF operator an economical means of obtaining valuable information that can be used to improve safety and efficiency at MSWLF's.

By increasing the frequency of MSWLF data sets, MSWLF operators can efficiently manage day to day operations. Additionally, having updated image maps can aid first responders in case of fire, accidents or other situations in which emergency crew members must respond.

Sydor Aerial Photography LLC Petitions the Federal Aviation Administration to conduct UAS flights over MSWLF's. UAS flights will be used to capture aerial photos for the purpose of providing the MSWLF operator with orthomosaics (image maps). The image maps can in turn be used to compute volume, create 3D models, profile and contour lines, and 3D visualizations of MSWLF's.

Post flight editing of orthomosaics will ensure that images captured are only of the MSWLF operating theatre.

Sydor Aerial Photography LLC specializes in the gathering and post processing of image maps. Our experience in sUAS operations and project completion gives us the expertise to conduct safe-flight

sUAS operations. Sydor Aerial Photography LLC takes a planned tactical approach to data gathering by optimizing and reviewing the most efficient flight plan. This knowledge base has come through years of piloting, maintaining, and repairing sUAS.

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the "Reform Act") and 14 C.F.R. Part 11, Sydor Aerial Photography LLC petitions the FAA to allow safe flight operation of its sUAS for the purpose of conducting aerial photography and videography of active and closed MSWLF's. Sydor Aerial Photography LLC hereby applies for an exemption from the listed Federal Aviation Regulations (FARs) to allow commercial operation of its sUASs, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA in an exemption granted under either Section 333 or Section 49 U.S.C. § 44701(f).

Sydor Aerial Photography LLC has set forth conditions that are consistent with the equivalent level of safety set forth in Exemption 11062 and the related exemptions issued to sUAS companies for scripted closed set filming for the motion picture and television industry.

As described more fully below, the requested exemption would permit the operation of small, unmanned and relatively inexpensive sUAS under controlled conditions in airspace that is 1) limited, 2) predetermined, 3) controlled as to access, and 4) would provide safety enhancements to the already safe operations in the fields in which it will operate, presently using manned aircraft or ground inspection survey teams. The later places personnel at increased risk of bodily

injury and airborne contaminants. Approval of this exemption would thereby enhance safety and fulfill the Secretary of Transportation's (the FAA Administrator's) responsibilities to "...establish requirements for the safe operation of such aircraft systems in the national airspace system." Section 333(c) of the Reform Act.

The name and address of the applicant is:

Sydor Aerial Photography, LLC

1046 Autumn Lakes Circle, 3B

Mishawaka, IN 46544

Attn: Anthony Sydor, CEO

Regulations from which the exemption is requested:

14 C.F.R. 61.113(a) & (b) 14 C.F.R. 91.119(c)
14 C.F.R. 91.151(a)
14 C.F.R. 91.405(a)14 C.F.R. 407(a)(1) 14 C.F.R. 409(a)(2)

14 C.F.R. 417(a) & (b)

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333(a) through (c) of the Reform Act. This law directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in the national airspace system (NAS) before completion of the rulemaking required under Section 332 of the Reform Act. In making this determination, the Secretary is required to determine which types of UASs do not create a hazard to users of the NAS or the public or pose a threat to national security in light of the following:

- The UAS's size, weight, speed, and operational capability;
- Operation of the UAS in close proximity to airports and populated areas; and
- Operation of the UAS within visual line of sight of the operator.

Reform Act § 333(b). Lastly, if the Secretary determines that such vehicles "may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system." *Id. at* § 333(c)

The Federal Aviation Act, in addition to the authority granted by Section 333 of Reform Act, expressly grants the FAA the authority to issue exemptions. This statutory authority by its terms includes

exempting civil aircraft, as the term is defined under Section 40101 of the Act, which includes sUASs, from the requirement that all civil aircraft must have a current airworthiness certificate.

The Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of Section 333 or any Sections 44702-44716 of the Transportation Act if the Administrator finds the exemption in the public interest. 49 U.S.C. § 44701(f). S*ee also* 49 U.S.C. § 44711(a); 49 U.S.C. § 44704; 14 C.F.R. § 91.203(a)(1). This authority to grant exemptions reaches such issues as authorization of commercial operation of aircraft without a pilot's license.

Sydor Aerial Photography LLC is a 100% veteran owned company that specializes in the gathering of aerial photos for the purpose of rendering survey grade orthomosaics or image maps with small UAS's. Based upon the spirit of Section 333, and the continuing integration of small UAS's into the NAS, Sydor Aerial Photography LLC has limited its petition to inspection and surveying of active and closed MSWLF.

Sydor Aerial Photography LLC operates a multirotor UAS (quadcopter) weighing 1160g with payload. Maximum manufacturer's safe flight speed is less than 15m/s. Sydor Aerial Photography LLC will not exceed 10m/s during UAS operation.

UA will not exceed 400 ft (AGL) and will only be operated within line of sight of the PIC and VO.

UAS flights will only be performed over MSWLFs and only with written permission by the MSWLF operator or governing body overseeing the operation and safety of the MSWLF.

Sydor Aerial Photography LLC submits "UAS safe flight operations manual", as it pertains to MSWLF UAS operations as Exhibit A.

Sydor Aerial Photography LLC submits the "UAS manufacturer flight and operational manual" as Exhibit B.

Operational compliance of Exhibit A and B shall insure safe flight operations within the MSWLF theatre. Compliance outlined in Exhibit A and B shall also insure safe flight UAS operations within the NAS.

Sydor Aerial Photography LLC proposes to operate a small UAS within the sterile confines of active and closed landfills for the purpose of creating 2D and 3D orthomosaics or image mapping. The completed orthomosaic will be survey grade quality. The ability to create accurate aerial survey maps with a UAS does not require the

UAS to operate at a height greater than 400 ft (AGL) from the highest point of the landfill. Survey grade aerial maps from a UAS are best achieved at a height between 100-250 ft (AGL) from the highest point of the landfill. UAS operations will not be operated outside of the PIC (Pilot in Charge) and the VO (visual observer) line of sight.

Given the height required for the UAS operation, as it relates to inspection and surveying active and closed landfills, and the mostly rural environment that MSWLF operate in, Sydor Aerial Photography LLC proposes that its UAS operation will have no adverse affect on the National Airspace (NAS).

Employees at municipal solid waste landfills (MSWLF) must comply with OSHA (Occupational Health and Safety Act) standards and practices. This includes wearing proper PPE (Personal Protective Equipment). PPE includes, but is not limited to hardhats, gloves, protective eyewear, reflective vest. Given the sparse population within the MSWLF and the current safety regulations, Sydor Aerial Photography LLC proposes that UAS operations over MSWLF's should be considered "safe-flight".

Due to the restricted UAS operating area and nature of MSWLF's, damage to property is considered minimal. In the event that personal property is damaged by the UAS operation, Sydor Aerial Photography LLC will hold insurance coverage that covers any damage that may occur.

AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

Sydor Aerial Photography LLC proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for

an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the operations normally conducted with manned aircraft.

These limitations and conditions to which Sydor Aerial Photography LLC agrees to be bound when conducting commercial operations under an FAA issued exemption include:

1. The UAS must weigh less than 25 lbs., including battery and camera. Operations will be limited to the aircraft described in Exhibit B

2. The UA may not be flown faster than recommended by the manufacturer. Sydor Aerial Photography LLC will not operate the UA faster than 10m/s.

3. UAS operations will be conducted below 400 ft above ground level (AGL). The height of the UA will not exceed 400 ft (AGL).

4. The UAS will be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA issued third-class medical certificate.

5. All operations must utilize a visual observer (VO). The VO may be used to satisfy the VLOS requirement, as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times.

6. The operator will be bound by and follow Exhibits A & B. Any additional requirements identified in the final conditions for this exemption will be added to Exhibits A & B . Exhibits A & B will be maintained and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in the final exemption and the procedures outlined in Exhibits A & B, the conditions and limitations of the exception will

take precedence and will be followed. Otherwise, the operator will follow the procedures as outlined in Exhibits A & B.

7. The operator will update or revise its Exhibits A & B. It will be the operator's responsibility to track such revisions and present updated and revised documents to the Administrator upon request. The operator will also present updated and revised documents if it petitions for extension or amendment. If the operator determines that any update or revision would affect the basis for which the FAA granted this exemption, then the operator will petition for amendment to their exemption. The operator will contact the FAA's UAS Integration Office (AFS-80) with questions that may arise regarding updates or revisions to Exhibits A & B.

8. Prior to each flight the PIC will inspect the UAS to ensure it is in safe flight condition. The procedures for pre-flight inspection and functional viability of all UAS components is outlined in Exhibit A & B

9. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo two functional tests outlined in Exhibit C. The PIC who conducts the functional tests will make an entry into the sUAS maintenance record. Specific procedures for the sUAS functional tests is submitted as Exhibit C.

10. The operator will comply with the manufacturer's recommendations pertaining to maintenance, inspection and replacement of UAS components. The maintenance manual, submitted as Exhibit C, outlines these components.

11. The PIC will have at least a current private pilot certificate and a current third-class medical certificate. The PIC will also meet the

flight review requirements specified in 14 C.F.R. § 61.56 in an aircraft in which the PIC is rated on his/her pilot certificate.

12. Prior to operations conducted for the purpose of gathering aerial data, the PIC will have accumulated and logged, in a manner consistent with 14 C.F.R. § 61.51(b), a minimum of 300 flight cycles and 30 hours of total time as a UAS multirotor aircraft pilot and at least 20 hours logged as a UAS pilot with a similar UAS type. Prior documented flight experience that was obtained in compliance with applicable regulations will be used to satisfy this requirement. Training, proficiency, and experience-building flights may also be conducted under this grant of exemption to accomplish the required flight cycles and flight time. During training, proficiency, and experience-building flights, all persons not essential for flight operations will be considered non-participants, and the PIC will operate the UA with appropriate distance from non-participants in accordance with 14 C.F.R. § 91.119.

13. Prior to any UAS operations by a grant of exemption the PIC and VO will have completed a qualification process outlined in Exhibit D. Exhibit D includes basic flight maneuvers, skilled flight maneuvers, advanced flight maneuvers, and emergency procedures. The qualifying process outlined in Exhibit D will be implemented by a qualified person designated by the operator. Upon request the record of qualifying completion will be made available to the administrator.

14. Prior to operations conducted for the purpose of gathering aerial data, a flight demonstration, administered by an operator-approved and qualified pilot will be successfully completed and documented. This documentation will be available for review upon request by the Administrator. Because the knowledge and airmanship test qualifications will be developed by the operator, and there are no established practical test standards that support a jurisdictional FAA Flight

Standards District Office (FSDO) evaluation and approval of company designated examiners, the Operator will conduct these tests In accordance with Exhibit D.

15. The UAS will not be operated directly over any person, except authorized and consenting personnel necessary for the purpose, below an altitude that is hazardous to persons or property on the surface in the event of a UAS failure or emergency.

16. Regarding the distance from participating persons, Exhibit A establishes safety mitigations for authorized and consenting personnel. At all times, those persons must be essential to the sUAS operation.

17. Regarding distance from non-participating persons, the operator will ensure that no persons are allowed within 500 ft of the area except those consenting to be involved and necessary for the sUAS operation.

18. If the UAS loses communications or loses its Global Positioning System (GPS) signal, the UAS will be programmed to return to a pre-determined location within the security perimeter and land or be recovered in accordance with the Exhibit A&B.

19. The UAS will abort the flight in the event of unpredicted obstacles or emergencies in accordance with the Exihbit A&B

20. Each UAS operation will be completed within 20 minutes of flight time or with 30% battery power remaining, whichever occurs first.

21. The operator will obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under an exemption. The operator will request a Notice to Airman not more than 72 hours in advance, but not less than 48 hours prior to the operation.

22. All aircraft operated in accordance with this exemption will be identified by serial number, registered in accordance with 14 C.F.R. Part 47, and have identification (N- Number) markings in accordance with 14 C.F.R. Part 45, subpt.C. Markings will be as large as practicable.

23. The operator will develop procedures to document and maintain a record of the UAS maintenance, preventative maintenance, alterations, status of replacement/overhaul component parts, and the total time in service of the UAS. These procedures will be added to Exhibit C.

24. Each UAS operated under this exemption will comply with all manufacturer safety bulletins, firmware, software updates and will be documented and updated in Exhibit A & B.

25. Before conducting operations, the radio frequency spectrum used for operation and control of the UA will comply with the Federal Communications Commission (FCC).

    A) Radio Control Model No. PVT 581. FCC ID: 553-201309581

    B) Range Extender Model No. RE 500. FCC ID: SS3-

    RE500130

26. The documents required under 14 C.F.R. §§ 91.9 and 91.203 will be available to the PIC at the ground control station of the UAS any time the aircraft is operating. These documents will be made available to the administrator, or governing body upon request.

27. The UAS will remain clear and yield the right of way to all other manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.).

28. UAS operations will not be conducted during night, as defined in 14 C.F.R. § 1.1. Operations will only be conducted under visual meteorological conditions (VMC).

29. The UAS will not be operated by the PIC from any moving device or vehicle.

30. The UA will not be operated less than 500 ft below or less than 2,000 ft horizontally from a cloud or when visibility is less than 3 statute miles.

31. The UA will not operate in Class B, C, or D airspace without written approval from the FAA. The UA will not operate within 5 nautical miles of the geographic center of a non-towered airport as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's management is obtained, and the operation is conducted in accordance with a NOTAM as required by the operator's COA. The letter of agreement with the airport management will be made available to the Administrator upon request.

32. Incidents, accidents or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA will be reported to the Federal Aviation Administration's (FAA) UAS Integration Office (AFS-80) within 24 hours. Accidents will be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB web site: www.ntsb.gov. Further flight operations will not be conducted until the incident or accident is reviewed by AFS-80 and authorization to resume operations is provided.

14 C.F.R. **§** 61.113(a) & (b): Private Pilot Privileges and Limitations: Pilot in Command

Sections 61.113(a) & (b) limit private pilots to non-commercial operations. Because the UAS will not carry a pilot or passengers, the proposed operations can achieve the same level of safety of current operations by requiring the PIC operating the aircraft to have a private pilot's license rather than a commercial pilot's license in order to safely operate sUAS. As outlined in Exhibit A, all sUAS operations are carefully pre-planned flights with written approval of MSWLFs operating agents prior to any operations. The level of safety provided by the requirements included in Exhibits A & B exceeds that provided by a single person holding a commercial pilot's certificate operating a manned aircraft. The risks associated with the sUAS operation within the operational area are so diminished from the level of risk associated with commercial operations contemplated by Part 61 that allowing operations of the sUAS as requested with a private pilot as the PIC meets and exceeds the present level of safety achieved by 14 C.F.R. § 61.113(a) & (b).

The FAA has granted exemptions for private pilots to conduct similar operations in Exemptions 11062 through 11067 and 11080.

14 C.F.R. **§** 91.119: Minimum Safe Altitudes

Section 91.119 sets forth safe altitudes for operation of civil aircraft. Section 91.119(c) allows helicopters to be operated at less than the minimums prescribed, providing that the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. As this exemption is for a sUAS that is similar to a helicopter, and the exemption requests authority to operate at altitudes up to 400 ft AGL, an exemption will be needed to allow operations. Because the aerial data sets do not require flights greater than 400 ft (AGL), Sydor Aerial Photography LLC will not operate the UA at or greater than 400 ft (AGL).

The FAA has previously granted exemptions to conduct similar operations in Exemptions 11062 through 11067 and 11080.

14 C.F.R. **§** 91.151(a): Fuel Requirements for Flight in VFR Conditions

Section 91.151(a) prohibits an individual from beginning “a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing, and, assuming normal cruising speed – 1) During the day, to fly after that for at least 30 minutes; or 2) At night, to fly after that for at least 45 minutes.”

The 5200mAh lithium polymer smart battery powering the sUAS provides approximately 25 minutes of flight. In order to meet the 30-minute reserve requirement in 14 C.F.R. § 91.151, the sUAS flights would not be able to operate. Given the powered flight limitations of the sUAS within the restricted flight area of MSWLFs, a longer time frame for flight is reasonable.

Sydor Aerial Photography LLC believes that an exemption from 14 C.F.R. § 91.151(a) falls within the scope of prior approved exemptions. Ex. Exemption 10673. Flight operations via the sUAS within the controlled MSWLF operational area with less than 30 minutes of reserve fuel, does not apply to the original intent of Section 91.151 (a), given the sUAS size and speed.

Sydor Aerial Photography LLC believes that an equal level of safety can be achieved by limiting flights to 20 minutes or 30% of battery power whichever occurs first. Limiting sUAS flights to 20 minutes or 30% battery power allows the PIC adequate time to return the UA to its pre-determined home landing position.

Similar exemptions have been approved for other sUAS operations, including Exemptions 2689F, 5745, 10673, 10808 and Exemptions 11062 through 11067 and 11080.

14 C.F.R. **§** 91.405 (a); 407(a)(1); 409(a)(2); 417(a) & (b): Maintenance Inspections

These regulations require that an aircraft operator or owner “shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in Part 43 of this chapter...,” and others shall inspect or maintain the aircraft in compliance with Part 43.

The above mentioned sections and Part 43 apply only to aircraft with an airworthiness certificate, therefore these sections do not apply to Sydor Aerial Photography LLC. Operational maintenance will be performed as outlined in Exhibit C. Due to the size of the UA and its camera an equal level of safety will be achieved. In the event of mechanical issues, during flight operations, the UA can be safely landed. Refer to Exhibit B failsafe procedures. As provided in Exhibits A and B the operator will ensure that the sUAS is in working order before the start of any sUAS operations. In addition, the PIC will perform required maintenance, and keep a log of any maintenance performed. Since the operator is the person most familiar with the entire sUAS best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety. As outlined in Exhibit C annual inspection, maintenance will be performed by an independent third party not affiliated with Sydor Aerial Photography LLC.

The FAA has granted exemptions for similar operations in Exemptions 11062 through 11067 and 11080.

To satisfy 14 C.F.R. Part 11, the following summary is provided for publication in the Federal Register.

Sydor Aerial Photography LLC seeks an exemption from the following rules:

14 C.F.R. §§ 61.113(a) & (b); 91.119(c); 91.151(a); 91.405(a); 91.407(a) (1); 91.409(a)(2); and 91.417(a) & (b)

Sydor Aerial Photography LLC seeks approval, of the before mentioned exceptions, in order to commercially operate sUAS for the purpose of image mapping of active and closed MSWLF (Municipal Solid Waste Landfills).

Sydor Aerial Photography LLC Is a veteran owned sUAS company specializing in the gathering and post processing of aerial images for the purpose of creating survey grade orthomosaics. The sUAS are under 55 lbs and operate below 400 ft above AGL. In the spirit of Section 333, Sydor Aerial Photography LLC has limited its operating theatre to MSWLFs. Given the rural and sterile environment in which MSWLFs operate, safe flight sUAS operations can be accomplished.

Current surveying methods of MSWLFs include manned aircraft missions and/or ground survey teams. The integration of sUAS can dramatically reduce the cost of current data gathering methods. Additionally, the use of sUAS increases the safety of current data gathering methods by limiting the personal required to enter the MSWLFs thereby limiting those individuals to the hazards associated with mass movement of solid waste.

Sydor Aerial Photography LLC believes it's petition for exception satisfies the criteria provided in Section 333 of the Reform Act of 2012 (size, weight, speed, operating capabilities, proximity to airports and populated areas, operation within visual line of sight, and national security) provide adequate justification for the grant of the requested

exemptions allowing commercial operation of sUAS for the purpose of aerial data gathering over MSWLFs.

Sydor Aerial Photography LLC further believes that it's petition for exception exceeds the level of safety established in the exemptions already granted, including Exemptions 11062 through 11067 and 11080.

Sincerely,

Anthony Sydor