U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

July 22, 2015

Exemption No. 12109
Regulatory Docket No. FAA–2015–1122

Mr. Anthony J. Pucciarella
Agent for UAV Solutions, Inc.
ALARIS
PO Box 1835
Lusby, MD 20657

Dear Mr. Pucciarella:

This letter is to inform you that we have granted your request for exemption. It transmits our decision, explains its basis, and gives you the conditions and limitations of the exemption, including the date it ends.

By letter dated April 14, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of UAV Solutions, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial data collection.

See Appendix A for the petition submitted to the FAA describing the proposed operations and the regulations that the petitioner seeks an exemption.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner.

Airworthiness Certification

The UAS proposed by the petitioner is a Phoenix 30.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in

consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates,* and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[1]. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grants of Exemption Nos. 11062 to Astraeus Aerial (*see* Docket No. FAA−2014−0352), 11109 to Clayco, Inc. (*see* Docket No. FAA−2014−0507), 11112 to VDOS Global, LLC (*see* Docket No. FAA−2014−0382), and 11213 to Aeryon Labs, Inc. (*see* Docket No. FAA−2014−0642), the FAA found that the enhanced safety achieved using an unmanned aircraft (UA) with the specifications described by the petitioner and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions, carrying crew in addition to flammable fuel, gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

Having reviewed your reasons for requesting an exemption, I find that—

- They are similar in all material respects to relief previously requested in Grant of Exemption Nos. 11062, 11109, 11112, and 11213;
- The reasons stated by the FAA for granting Exemption Nos. 11062, 11109, 11112, and 11213 also apply to the situation you present; and
- A grant of exemption is in the public interest.

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, UAV Solutions, Inc. is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

[1] Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

Conditions and Limitations

In this grant of exemption, UAV Solutions, Inc. is hereafter referred to as the operator.

Failure to comply with any of the conditions and limitations of this grant of exemption will be grounds for the immediate suspension or rescission of this exemption.

1. Operations authorized by this grant of exemption are limited to the Phoenix 30 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.

4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.

5. The UA must 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 airman medical certificate or U.S. driver's license.

6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. 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; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed.

Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. 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 a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.

9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.

10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be

operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.

17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.

21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification

(N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

24. The UA must remain clear and give way to all manned aviation operations and activities at all times.

25. The UAS may not be operated by the PIC from any moving device or vehicle.

26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
    a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
    b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

    The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.

28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.

30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
    a. Dates and times for all flights;
    b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
    c. Name and phone number of the person responsible for the on-scene operation of the UAS;
    d. Make, model, and serial or N−Number of UAS to be used;
    e. Name and certificate number of UAS PICs involved in the aerial filming;
    f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
    g. Signature of exemption holder or representative; and
    h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.

31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on July 31, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/
John S. Duncan
Director, Flight Standards Service

Enclosures

ALARIS
SOLUTIONS FOR UNMANNED SYSTEMS

Anthony J. Pucciarella
ALARIS
PO Box 1835
Lusby, MD 20657
240.538.8444
Tony@TeamAlaris.com

14 April 2015

United States Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
West Building Ground Floor Room W12-140
Washington, DC 20590

Re: Exemption Request Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 CFR Part 21; 14 CFR 45.23(b); 14 CFR 61.101(e); 61.113 (a) & (b); 91.7 (a); 91.9 (b) (2); 91.103(b); 91.109; 91.119; 91.121; 91.151(a); 91.203(a) & (b); 91.405 (a); 91.407(a) (1); 91.409 (a) (2); 91.417 (a) & (b).

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, UAV Solutions Inc. (UAVS) hereby applies for an exemption from the listed Federal Aviation Regulations (FARs) to allow commercial operation of its Phoenix 30 Small Unmanned Aircraft System (UAS) to conduct aerial data collection, provided such operations are conducted within the conditions outlined in this exemption request or as established by the FAA. The requested operations will occur at or below 200 feet AGL. Based on similar previously approved exemptions, the applicant believes this exemption can be approved using the summary grant process.

UAVS was formed in 2006 to research, design and manufacture unmanned systems. The Maryland-based company is ISO 9001:2008 certified for the design, manufacture, and sale of UAS. As described in the following paragraphs, an approved exemption would permit operations of the UAV Solutions Phoenix 30 multi-rotor UAS under controlled conditions in limited airspace with the approval of cooperating property owners. These operations would provide improved safety over the existing means of obtaining the same data with larger manned systems.

The name and contact information for the applicant is:
Name: UAV Solutions, Inc.
Attn: William Davidson
Phone: 240-456-0195

Address: 8280 Patuxent Range Road, Suite E
Jessup MD 20794

Regulations from which exemption is requested:

14 CFR Part 21
14 CFR. 45.23(b)
14 CFR 61.101 (e) and 61.113 (a) & (b)
14 CFR. 91.7 (a)
14 CFR 91.9 (b) (2)
14 CFR. 91.103
14 CFR. 91.109
14 CFR 91.119
14 CFR 91.121
14 CFR 91.151 (a)
14 CFR 91.203 (a) & (b)
14 CFR 91.405 (a)
14 CFR 407 (a) (1)
14 CFR 409 (a) (2)
14 CFR 417 (a) & (b)

The UAVS system for this exemption is the Phoenix 30 multi-rotor UAS (see attached Operations and Maintenance manual for more detailed specifications and procedures). The Phoenix 30 Air Vehicle weighs 10 pounds fully loaded – considerably less than the 55 pound requirement that defines small UAS. UAVS will operate the Phoenix UAS within Visual Line of Sight (VLOS) of the Pilot and Visual Observer. The UAS will operate at speeds less than 87 knots and have the ability to hover. Area of operations will be over private property with owner permission or public property with permission from the appropriate officials. UAVS operations will not create a hazard to users of the national airspace system or the public.

Utilization of the Phoenix 30 UAS is of public interest and safety. The Phoenix 30 UAS is less intrusive than manned helicopters and has less of an impact on the environment. The Phoenix 30 UAS is battery powered and energy friendly. The system takes off vertically from the operation area which minimizes transit times as well as the possibility of encounters with manned aircraft.

AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

UAVS proposes that the requested exemption apply to civil aircraft that have the characteristics and operational limitations listed herein. <u>These limitations provide for at least an equivalent or higher level of safety to operations conducted under existing regulations using larger manned aircraft.</u>

The limitations and conditions to which UAVS agrees to be bound when conducting commercial operations under an FAA issued exemption include:

1. The Phoenix 30 Air Vehicle will weigh less than 55 lbs.
2. All flights will be conducted within VLOS of the Pilot and Visual Observer in day Visual Meteorological Conditions (VMC).
3. Maximum flight time for each flight will be 30 minutes. Flights will be terminated at 20% battery power remaining should this condition occur prior to the 30 minute limit.
4. Flights will be operated at or below 200 feet AGL.
5. The speed of the UAS will not exceed 87 KTS (100 MPH).
6. Minimum crew for each operation is a Pilot and Visual Observer.
7. UAS Pilot will be an FAA licensed airman with at least a recreational pilot certificate issued by the FAA.
8. UAS Pilot and Visual Observer will hold a valid and current US driver's license.
9. UAS Pilot will be Pilot in Command (PIC).
10. Flights will only occur over private property with owner approval or public property with permission from the appropriate officials (all required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies).
11. Flight operations will not occur within 500 feet of personnel in the designated area that are not part of the specific operation.
12. PIC will brief all involved personnel on flight operations and applicable safety procedures prior to flight operations. A single brief will suffice for multiple flights unless there are personnel or operational changes.
13. The PIC (or designated representative) will file FAA form7711-1 with the appropriate Flight Standards District Office (FSDO). Since operations will be conducted at or below 200' AGL, a "blanket COA" is requested.
14. UAVS will submit a written Plan of Activities to the appropriate FSDO three days prior to planned operations.
15. Pilot and Visual Observer will have been trained in UAS operations as described in Chapter 8 of the attached Operations and Maintenance Manual.
16. PIC and safety observer will be able to 'verbally' communicate at all times by voice.
17. In case of "loss of communication" or "loss of GPS", the Phoenix UAS will have the capability to return to a pre-determined point within the prescribed area of operations and land.
18. In case of "flight emergency" or unpredicted obstacles, the Pilot of the Phoenix UAS will have the capability to abort the flight.

14 C.F.R. Part 21, Subpart H: Airworthiness Certificates 14 C.F.R. §91.203 (a) (1)

Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR §91.203 (a) (1).

The Phoenix 30 Air Vehicle weighs 10 pounds fully loaded and carries no pilot or passenger, explosive material or flammable liquid fuels. Operations under this requested exemption will be conducted in designated areas with property owner approval. UAVS operations will be as safe, or safer, than a conventional aircraft operating with an airworthiness certificate. UAVS will follow the Phoenix 30 Operational and Maintenance manual requirements and comply with all safety requirements.

14 C.F.R. § 45.23 (b). Marking of the Aircraft

The regulation requires: When marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport," "experimental," or "provisional," as applicable.

Given the size of the Phoenix 30 Air Vehicle, an exemption from this rule is requested since marking the Air Vehicle with two-inch lettering is not possible. The word “Experimental” will be placed on the fuselage in compliance with §45.29 (f). This will provide an equivalent level of safety where the PIC and Visual Observer, as well as others working with the UAS will see the “Experimental” identification.

14 C.F.R. § 61.101 (e) and 61.113 (a) & (b): Recreational and Private Pilot Privileges and Limitations: Pilot in Command

Sections 61.101 (e) and 61.113 (a) & (b) limit Recreational and Private pilots to non-commercial operations.

Since the UAS is not capable of carrying a pilot or passengers, UAVS operations provide an equivalent level of safety by requiring the PIC to have a Recreational Pilot’s certificate. The level of safety provided by the requirements included in the UAVS Maintenance and Operations manuals meet or exceed that provided by a single individual holding a commercial pilot’s certificate operating a conventional aircraft. Due to preplanning, required training, and reduced complexity of operations, a recreational pilot with a valid US driver’s license will be able to accomplish all operations with an equivalent level of safety.

14 C.F.R. §91.7(a): Civil aircraft airworthiness

The regulation states that no person may operate a civil aircraft unless it is in airworthy condition.

UAV Solutions is requesting exemption from this requirement since there would be no airworthiness certificate issued for the UAS. If exemption from §91.203 (a) (1) is granted, there will be no airworthiness certificate issued for the UAS which means there will be no standard for determining if the UAS is in airworthy condition. Given the size of

the aircraft, area of operations, and the detailed set-up, inspection, and safety requirements contained in the UAVS Maintenance and Operations manual, an equivalent level of safety will be provided.

14 C.F.R. § 91.9 (b) (2): Civil Aircraft Flight Manual in the Aircraft

Section 91.9 (b) (2) provides that no person may operate a U.S.-registered civil aircraft for which an Airplane or Rotorcraft Flight Manual is not required by §21.5 of this chapter, unless there is available in the aircraft a current approved airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

Given the size of the Phoenix 30 Air Vehicle and the general nature of UAS operations, the Operations and Maintenance manual for flights conducted under this exemption will be located in proximity to the PIC and Visual Observer. An equivalent level of safety is provided by keeping the manual on the ground for immediate access by the crew.

14 C.F.R. § 91.103: Preflight action

This regulation requires each pilot in command to take certain actions before flight to insure the safety of flight.

An exemption is needed from this rule since an FAA approved flight manual will not be provided for the aircraft. The preflight procedures in chapters 11 and 12 of the Operations and Maintenance manual will provide an equivalent level of safety when used with the checklist in chapter 16. The PIC will take all actions prior to initiating flight including reviewing weather, flight battery requirements, landing and takeoff distances, and aircraft performance data.

14 C.F.R. §91.109: Flight instruction

Section 91.109 provides that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

Like other unmanned systems, the Phoenix 30 UAS does not have fully functional dual controls so an exemption from this rule is requested. Flight control is accomplished through the use of a ground control station that communicates with the aircraft via radio communications. The FAA has approved exemptions for flight training without fully functional dual controls and for flight instruction in experimental aircraft. An equivalent level of safety will be provided since neither a pilot nor passengers will be carried in the aircraft and by the limited aircraft size, speed, and operational area.

14 C.F.R. §91.119: Minimum safe altitudes

Section 91.119 establishes safe altitudes for operation of civil aircraft. Paragraph (d) allows a helicopter to be operated at less than the minimums prescribed, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA.

As this exemption is for a small UAS helicopter and seeks authority to operate at altitudes up to 200 AGL, an exemption is needed to allow such operations. As set forth herein, the Phoenix 30 aircraft will not operate above 200 AGL. An equivalent level of safety will be achieved given the size, weight, and speed of the UAS as well as the location where operations occur. No flight will be taken without the permission of the property owner or appropriate official. Because of the advance notice to the property owner and participants, all affected individuals will be aware of the planned flight operations as set forth in UAVS Maintenance and Operations manual.

The Phoenix 30 Air Vehicle weighs 10 pounds fully loaded and carries no pilot or passengers, explosive material or flammable liquid fuels. Compared to flight operations with manned aircraft or rotorcraft weighing far more than 55 pounds, the risk associated with the proposed operations is far less than those presented by conventional aircraft operating at or below 500 AGL performing similar operations. Additionally, the proposed low-altitude operations of the small UAS will ensure separation from manned aircraft that must comply with Section 91.119.

14 C.F.R. §91.121 Altimeter Settings

This regulation requires that each person operating an aircraft shall maintain the cruising altitude by reference to an altimeter that is set when operating below 18,000 MSL to the elevation of the departure airport or an appropriate altimeter setting available before departure (for the case of an aircraft not equipped with a radio).

The Phoenix 30 UAS does not have a barometric altimeter therefore an exemption from this rule is requested. Altitude for the Phoenix 30 UAS is maintained using GPS altitude. Operations will utilize ground station GPS altitude readout and the Visual Observer to monitor proper altitude. An equivalent level of safety is provided by the PIC's use of GPS altitude, adherence to the Operations and Maintenance manual, and the requirement for VLOS operations to be conducted in day VMC conditions.

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 battery of the Phoenix 30 UAS provides approximately 30 minutes of flight time. To meet the 30 minute reserve requirement of 91.151 would prevent the ability to takeoff, therefore an exemption from this rule is requested. Due to the proposed altitude limitations and the area of operations, a longer time for flight in daylight VMC operations is reasonable. The FAA has approved similar exemptions, including exemptions 11254, 2689F, 5745, 10673, and 10808. The Applicant believes that an equivalent level of safety can be achieved by limiting flights to 30 minutes or 20% of

battery power – whichever occurs first. This restriction would be more than adequate to allow the UAS to return to its planned landing zone from anywhere within the limited operating area.

14 C.F.R. §91.203 (a) and (b): Carrying Civil Aircraft Certification and Registration
The regulation provides in pertinent part:

(a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:

(1) An appropriate and current airworthiness certificate…

(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under §91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

The Phoenix 30 Air Vehicle weighs 10 pounds fully loaded and carries no passengers, explosive material, or flammable liquid fuels therefore no display of airworthiness or onboard documents is required. An equivalent level of safety will be achieved by keeping these documents at the ground control station where the pilot flying the Phoenix 30 UAS will have immediate access to them to the extent they are applicable. The FAA has issued numerous exemptions to this regulation that include but not limited to Exemptions 9565, 9665, 9789, 9789A, 9797, 9797A, 9816A, and 10700.

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.

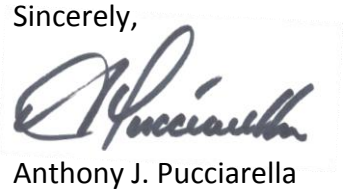
UAV Solutions is seeking exemption to Maintenance Inspections. These regulations apply only to aircraft with an airworthiness certificate therefore these sections will not apply to the Applicant. Maintenance will be accomplished by the operator pursuant to the Operations and Maintenance manual (see chapters 14 and 16). An equivalent level of safety is provided because the UAS is limited in size, weight, payload capacity, and will be flown in limited areas for short periods of time. If mechanical issues arise, the Phoenix 30 Air Vehicle can be landed immediately and will be operating from no higher than 200 feet AGL. As provided in the maintenance and operations manual, the PIC will ensure that the Phoenix 30 system is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover, the PIC is the person most familiar with the system and best suited to maintain the Air Vehicle in an airworthy condition.

Pursuant to 14. C.F.R. Part 11, the following summary is provided for publication in the Federal Register should it be determined that publication is required:

Applicant seeks an exemption from the following rules:
14 CFR §21, subpart H; 14 CFR 45.23(b);14 CFR § 61.101(e); 61.113(a) & (b); 91.7 (a); 91.9 (b) (2); 91.103(b); 91.109; 91.119; 91.121; 91.151(a); 91.203(a) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); and 91.417 (a) & (b) to conduct aerial data collection.

The operation of the Phoenix 30 UAS weighing 10 pounds in compliance with the strict conditions outlined above will provide an equivalent level of safety supporting the grant of the exemptions requested, including exempting the Applicant from the requirements of Part 21 and allowing commercial operations. The Phoenix 30 UAS operates at slow speeds, close to the ground, and in a limited airspace environment. As a result, these operations are far safer than manned aircraft operations.

Sincerely,



Anthony J. Pucciarella
ALARIS
Agent for UAV Solutions, Inc.

Cc: William Davidson