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

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

August 24, 2015

Exemption No. 12560
Regulatory Docket No. FAA−2015−2381

Mr. Gilbert Goodlett
EnviroPlus Consulting, Inc.
1660 West Franklin Avenue
Ridgecrest, CA 93555

Dear Mr. Goodlett:

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 May 27, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of EnviroPlus Consulting, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial data collection services in the fields of biology and botany, energy infrastructure inspection, and aerial mapping and survey.

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 DJI S-1000.

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, EnviroPlus Consulting, 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, EnviroPlus Consulting, 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 DJI S-1000 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 August 31, 2017, unless sooner superseded or rescinded.

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

Enclosures

May 27, 2015

EnviroPlus Consulting, Inc
1660 West Franklin Avenue
Ridgecrest, CA 93555

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

Re: Petition for Exemption Pursuant to Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from: 14 CFR 21 subpart H; 14 CFR 45.23(b); 14 CFR 61.113(a) and (b); 14 CFR 91.7(a); 14 CFR 91.9(b)(2); 14 CFR 91.103; 14 CFR 91.109; 14 CFR 91.119(c); 14 CFR 91.121; 14 CFR 91.151(a); 14 CFR 91.203 (a) and (b); 14 CFR 91.405 (a); 14 CFR 91.407 (a) (1); 14 CFR 91.409 (a)(1) and (2); 14 CFR 91.417(a) and (b)

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the "Reform Act") and 14 CFR Part 11, EnviroPlus Consulting, Inc. (Petitioner) (EPC) hereby applies for an exemption from the listed Federal Aviation Regulations (FAR) to allow commercial operation of a designated unmanned aerial system (UAS), provided such operations are conducted within the conditions outlined herein or as may be established by the FAA as required by Section 333.

EPC seeks the requested exemptions to permit it to offer aerial data collection services in the fields of biology and botany, energy infrastructure inspection, and aerial mapping and survey.

As described in the following pages, the requested exemption would permit the operation of a designated UAS as set forth in this document under controlled conditions in the National Airspace System (NAS) that would be operated safely. Approval of this exemption would provide services that would reduce the risk associated with manned solutions, in both flight and other methods of completion of the proposed services.

The name and address of the Petitioner is as follows:

Gilbert Goodlett
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(760) 954-4265
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Unmanned Aerial System Description

EnviroPlus Consulting will employ the DJI Innovations S-1000 octocopter aerial data collection operations. This system is manufactured by DJI Innovations (DJI), has been extensively tested and has a proven safe flight history. The system includes a frame with 8 motors, a DJI A2 flight controller, a DJI iOSD (onscreen telemetry display). A variety of small cameras, radio telemetry receivers, and other sensors can be attached to the platform to accomplish the desired objectives. The S-1000 is flown by the pilot-in-command (PIC) using a radio control system. The platform has a sophisticated flight control system that enables the PIC to locate the unmanned aircraft (UA) on a moving map as a part of a ground control system in addition to being continually in visual line-of-sight and has safety systems to warn and manage low battery-voltage situations. The S-1000 can be flown manually by the PIC or fly a pre-planned route using the ground control system. The S-1000 will be flown under a comprehensive set of operational standard procedures focused on the safe operation of the platform to minimize risk. The S-1000 has a LED lighting system to communicate key elements of operational status at all times, in addition to the on-screen display showing flight parameters relevant to the safe operation of the UA.

This UA has a maximum take-off weight of 24 pounds. The UA flight speed will not exceed 30 knots, and it will not be flown in controlled airspace or at an altitude that exceeds 400 feet AGL. All flights will be flown in such a way that they can be safely terminated with a reserve battery power of 30% maximum charge.

The S-1000 does not carry any flammable propellant or fuel. The S-1000 also has redundant motor capabilities, and the vehicle is still capable of flight in the event a motor fails unexpectedly. The vehicle is compensates for an engine loss automatically, and action is not required by the PIC.

Command, control, and telemetry communications for the S-1000 occur on the 2.4 gHz frequency band. The communications link is frequency hopping, spread spectrum which greatly reduces the potential for interference. The specific radio frequency devices used by the S-1000 have been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the Federal Communications Commission. The S-1000 programming is such that, if a lost communication link occurs the UA will return to its starting point and automatically land with no user interaction necessary.

Granting an Exemption Would Serve the Public Interest

Enhanced safety to persons and property

In the absence of a UAS, many of the proposed activities would have to be carried out by a helicopter, fixed wing aircraft, a bucket truck, or a lineman climbing a tower. All of these conventional methods involve a risk to human lives and property that is clearly higher than risks to human lives and property posed by the utilization of UAS.

Reduction of burden on National Airspace System

UAS utilization in accordance with the typical terms of an exemption grant does not require the interaction of Air Traffic Control (ATC). Where such use replaces manned aircraft, a net reduction in ATC burden is realized.

Reduction in air pollution and noise

The DJI S-1000 is battery powered and therefore creates no noxious emissions hazardous to the environment. Further, as a battery powered vehicle the noise levels are substantially lower than any internal combustion engine driven aircraft.

More effective wildlife management

With respect to wildlife survey operations, UAS derived data can be utilized for more effective wildlife management. This can be of substantial benefit for wildlife managers, particularly for threatened and endangered species.

Economic benefit to the public

Survey, mapping, and inspection of energy infrastructure facilities utilizing UAS technology is substantially more cost effective than the conventional methods to accomplish these tasks. Cost savings by UAS utilization have the potential to find their way to ratepayers thereby reducing energy costs to the consumer.

OPERATIONAL LIMITATIONS TO ACHIIEVE AN EQUIVALENT LEVEL OF SAFETY

EPC proposes the following operational limitations to achieve an equivalent or higher level of safety than under the current regulatory structure, particularly in comparison to the use of manned aircraft.

1. All operations will be carried out with strict adherence to the operating procedures outlined in the Pilot's Operating Handbook (POH) and the manufacturer's user manual (Attachment A & B, respectively). The POH is organized similar to a manned aircraft POH and includes the following sections:
    a. General description, specifications, and warnings
    b. Limitations
    c. Emergency Procedures
    d. Normal Procedures
    e. Performance
    f. Weight and Balance/Equipment List
    g. Air Vehicle and Systems Description
    h. Handling, Service, and Maintenance
    i. Supplements
2. The UA will weigh less than 24 lbs.
3. The UA, will operate at a true airspeed maximum (V_{NE}) of 15 m/s (approximately 30 knots) which is within manufacturer specifications.
4. Minimum crew for each operation will consist of the UA Designated Pilot in Command (PIC) and at least one Visual Observer (VO). The PIC and VO will be able to communicate verbally at all times during the flight and will not exchange roles during the flight. Electronic messaging or texting is not permitted during flight operations. The PIC will ensure that the VO can perform the required duties of the VO.

5. The PIC will hold either an airline transport, commercial, private, recreational, or sport pilot certificate and 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 will 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.
6. Flights will be operated within visual line of sight (VLOS) of the PIC and VO at all times. EPC understands that definition of VLOS is human vision unaided by any device other than corrective lenses.
7. The primary responsibility of the VO will be to enhance the safety of flight operations by verbally communicating potentially unsafe observations to the PIC. Such conditions may include, but are not limited to, conflicting aircraft, hazardous terrain, features, or weather, UA approaching VLOS limits or altitude limits, assisting the PIC in monitoring battery voltage, and advising the PIC if non-participating personnel move within a potential danger zone. VO's will be familiar with the UAS normal and emergency procedures and aircraft limitations in sufficient detail as to provide the PIC with recommended corrective actions.
8. Maximum flight time for each operational flight will be approximately 25 minutes. The actual flight time will depend on a variety of variables including wind conditions, sensor payload, mission requirements, and the choice of battery capacity. All flights will be conducted under a strict battery management regime that alerts the operator to end flight at a pre-determined battery capacity. If the PIC exceeds this limit, the S-1000 will autonomously return to the departure point and land upon reaching the first critical battery level (first alert) and will land immediately upon reading the second critical battery level (second alert).
9. Flights will be operated at an altitude of no more than 400 feet Above Ground Level (AGL).
10. All operating documents will be accessible to the PIC at the ground control station during UAS operations. Operating documents will include the current POH and a copy of the FAA's Exemption, if granted. If a discrepancy exists between the various operating documents, the FAA's Exemption, the Exemption will take precedence. The POH will be updated as necessary. Such updates will be tracked.
11. A safety briefing will be performed prior to each day's flights consisting of all the days' flight operations. All parties involved in the flight operations will participate in the safety briefing.
12. The PIC will conduct a pre-flight inspection for the UAS. The pre-flight inspection will account for all systems to insure that the UAS is in a condition for a safe flight. As a minimum, the pre-flight inspection will follow the checklist procedures in the POH. If the pre-flight inspection reveals a condition that may affect the safe operation of the UAS, the aircraft will not be operated until necessary maintenance has been completed.
13. In the event of an emergency or other unpredicted obstacle to the completion of a flight, the PIC will abort the flight in the safest manner possible.
14. EPC will not permit a PIC to operate the UAS unless the PIC demonstrates the ability to safely operate the UAS safely and competently within the framework of the measures outlined herein and the POH. This will include normal and emergency procedures and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency will be logged in a manner consistent with 14 CFR §61.51(b).
15. The PIC and VO will have been trained in operation of UAS and receive current information regarding operation of the UA.

16. PIC and VO training and evaluation flights will only be conducted during dedicated training sessions. During such sessions, the PIC will operate the UA a manner consistent with 14 CFR §91.119 by maintaining the prescribed distance from non-participants.
17. All DJI S-1000 aircraft utilized as a part of this request will be registered and subsequently assigned a serial number in accordance with 14 CFR part 47 and display identification markings in accordance with 14 CFR part 45, subpart C. N-number markings will be as large as practicable.
18. EPC will conduct routine inspections of the UA to ensure that it is in condition for safe operation. As a minimum, inspections will be conducted as per the POH and as per manufacturer recommendations. Additional inspections will be completed as deemed necessary. EPC will comply with all safety bulletins issued by the manufacturer.
19. EPC will conduct maintenance on the UA as necessary. Maintenance procedures will follow manufacturer's recommendations regarding replacement, overhaul, and life limited components.
20. After maintenance or alterations that affect the operational or flight characteristics of the UA, a test flight will be conducted to determine that the UA is properly functioning prior to resuming commercial operations. Flight tests will be conducted by a PIC and a VO and will remain at least 500 feet from other non-participants. Further, the flight test will be conducted in a manner so as not to pose an undue hazard to persons and property.
21. EPC will also obtain a Certificate of Waiver or Authorization (COA) from the FAA Air Traffic Organization (ATO) prior to conducting operations within the NAS.
22. No UA flights will be conducted at night and all flights will occur under Visual Meteorological Conditions (VMC). The UA will not be operated less than 2,000 feet horizontally from a cloud or when the visibility is less than 3 statute miles from the PIC.
23. The PIC will ensure that the UA remains clear of and gives right-of-way to all manned aviation operations.
24. The PIC will not operate the UA from a moving device or vehicle.
25. The UA will not be operated within 5 nautical miles of an airport reference point (ARP) unless a letter of agreement with that airport's management is obtained or it is otherwise permitted by a COA issued to EPC.
26. The UA will be operated in a manner that maintains at least a 500 foot clearance from all non-participating persons, vessels, vehicles and structures except in the case of the following conditions:
    a. Barriers are present to protect non-participating persons in the event of an accident. EPC will ensure that non-participating persons utilize these protective barriers. If a non-participating person leaves a barrier and is within 500 feet of the UA, flight operations will be terminated in a manner that ensures the safety of non-participating persons.
    b. The owner or controller of any vessels, vehicles, or structures has granted permission to operate closer than 500 feet to those obstacles and the PIC has completed a safety assessment of the proposed operation and determined that the operation could be completed safely.
27. Flight operations will only be conducted over property where the permission is granted by the property owner or otherwise authorized representative.
28. The S-1000 UAS automatically determines its failsafe return-to-home position upon liftoff. If the UAS loses communications with the remote controller, it will return to a liftoff location and land autonomously.

29. EPC will report any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents will be reported to the National Transportation Safety Board (NTSB).

SPECIFIC EXEMPTIONS REQUESTED

In pursuit of this petition the following exemptions are requested:

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).

Given the size and limited operating area associated with the aircraft to be utilized by EPC, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act (49 U.S.C.§44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular UAS. In all cases, an analysis of these criteria demonstrates that the UAS operated without an airworthiness certificate in the restricted environment and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed.

The UAS to be operated hereunder is less than 55 lbs. fully loaded, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured and designated area. Unlike other civil aircraft, operations under this exemption will be tightly controlled and monitored by the operator. These safety enhancements provide a greater degree of safety to the public and property owners than conventional operations conducted with airworthiness certificates issued under 14 C.F.R. Part 21, Subpart H.

Lastly, there is no credible threat to national security posed by the UAS, due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial external load.

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

Section 91.9 (b) (2) provides: No person may operate a U.S.-registered civil aircraft ... (2) For which an Airplane or Rotorcraft Flight Manual is 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.

The UAS, given its size and configuration has no ability or place to carry such a flight manual on the aircraft, not only because there is no pilot on board, but because there is no room or capacity to carry such an item on the aircraft. The equivalent level of safety will be maintained by keeping the flight manual at the ground control point where the PIC will have immediate access to it.

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. These actions include the following:

a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;
b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:
    1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and
    2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

As FAA approved rotorcraft flight manuals will not be provided for the aircraft an exemption will be needed. The PIC will take all actions as stated in the POH in Section 4 under Normal Procedures including but not limited to reviewing weather, flight battery requirements, and aircraft performance data before initiation of flight.

14 C.F.R. §91.109: Flight Instruction.

Section 91.103 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.

UAS and remotely piloted aircraft, by their design do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio signals. The equivalent level of safety is provided by the fact that neither a pilot nor passengers will be carried in the UA and by the small size, weight, and generally slow speed of the UA.

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

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

As this request is for a UAS that is a helicopter and the exemption requests authority to operate at altitudes up to 400 AGL an exemption may be needed to allow such operations. As set forth herein, the UA will never operate at higher than 400 AGL It will only be operated in a controlled environment, where structures, vessels, vehicles, and non-participating people will not be exposed to operations.

The equivalent level of safety will be achieved given the small size, low weight, and slow speed of the UAS as well as the controlled environment where it is operated. No flight will be initiated without the permission of the property owner or authorized representative. Unlike conventional aircraft, the UA requires no flammable fuel, a safety enhancement at low altitude. Further, since the UA will be operated

at 400 AGL or less, it will maintain separation from manned aircraft that are required to comply with Section 91.119.

14 C.F.R. §91.121 Altimeter Settings.

This regulation requires each person operating an aircraft below 18,000 feet MSL to maintain cruising altitude by reference to an altimeter that is set to a particular barometric pressure (altimeter setting) or the elevation of the departure airport.

Manned aircraft have an altimeter that displays altitude in MSL. The intent of this regulation is to ensure that all aircraft in an area are displaying the same altitude when they at the same true altitude MSL. In this way aircraft can maintain vertical separation in cruise flight as per §91.159 for VFR flights and as per §91.179 for IFR flights. Further it ensures that aircraft assigned a particular altitude by ATC or as per published altitude requirements such as traffic pattern altitudes will have the ability to accurately determine that altitude.

Conversely, the S-1000 automatically sets its zero altitude based on the departure site. Thus, all altitude readings displayed on the Ground Control Station are in AGL from the departure site. In order comply with the limitations specified herein to maintain an altitude below 400 feet AGL, it is appropriate for the altimeter to display in AGL instead of MSL thereby maintaining separation from manned aircraft and achieving an equivalent level of safety.

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

Section 91.151 specifies fuel reserve minimums for airplanes and helicopters. Specifically, 91.51 (b) states that no person may begin a flight in a rotorcraft 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, to fly after that for at least 20 minutes.

Since the UA is battery powered and lacks a combustion engine, there is no conventional fuel consumption. Further, the flight times for the S-1000 are considerably shorter (maximum of 25 minutes) than combustion engine powered manned aircraft. An equivalent level of safety will be achieved by landing the aircraft when the battery power, as monitored at the ground control station, reaches 30% of the capacity of a fully charged battery. A further safety feature is that the S-1000 will automatically return to its departure point with no PIC interaction required if the battery voltage falls below 20% of the capacity of a fully charged battery.

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. . . .
    2) An effective U.S. registration certificate issued to its owner or, for operation within the United States, the second duplicate copy (pink) of the Aircraft Registration Application as provided for in §47.31(b), or a registration certificate issued under the laws of a foreign country.

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.

As previously discussed, an exemption is sought regarding the requirement to acquire an airworthiness certificate. Further, the UAS fully loaded weighs 24 pounds and is operated without an onboard pilot. As such, there is no ability or place to carry a registration certificate or to display it on the UAS. An equivalent level of safety will be achieved by keeping the registration certificate at the ground control point where the PIC will have immediate access to it.

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

These regulations cover maintenance, preventative maintenance, and aircraft alterations. In summary for VFR aircraft, and not including all exceptions, it requires the following:

1. Annual inspections or 100-hour inspections (for commercial operations) with approval for return to service by a person authorized by §43.7.
2. A test flight by an appropriately rated pilot after repairs or alterations that may have appreciably changed the aircraft's flight characteristics have been made
3. Logging of all maintenance performed according to particular standards

These sections, collectively part of Subpart E, and Part 43 only apply to aircraft with an airworthiness certificate. As previously discussed, an exemption is sought regarding the requirement to acquire an airworthiness certificate. However, an equivalent level of safety will be achieved by implementing the concepts of these sections as follows:

1. Inspections will be performed at intervals recommended by the POH and the manufacturer.
2. A test flight will be performed after any maintenance or alteration is performed that may affect the UA's flight characteristics. The test flight will be performed prior to return to commercial service by an appropriately rated and experienced PIC.
3. All maintenance will be logged.

CLOSING

EnviroPlus Consulting, Inc. appreciates the opportunity to submit this petition for exemption to the Federal Aviation Administration. We have endeavored to provide the appropriate information required based on guidance from the FAA's website. If there are any questions or we can provide further information, please contact me.

Gilbert Goodlett

President, EnviroPlus Consulting, Inc.