

**Pravia, LLC's Petition for Exemption for the SenseFly eBee Ag  
Unmanned Aerial System**

FAA Rules Docket: \_\_\_\_\_

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\* Documents were submitted confidentially for proprietary reasons and will not be available to the public

## **A. Petition Summary**

Pursuant with Section 333 of the FAA Modernization and Reform Act of 2012, Pravia, LLC (Pravia) requests exemption from the following Federal Aviation Regulations that are found under Title 14 of the Code of Federal Regulations (CFR): Part 21 Subpart H, 45.23 (b), 91.7 (a), 91.9 (b), 91.103, 91.109, 91.119, 91.121, 91.151 (a), 91.203 (a) (b), Part 91 Subpart E (91.401-91.417). Pravia seeks expedited approval and exemption from the CFRs listed above in order to operate the eBee Ag Unmanned Aircraft System (UAS) for the purpose of providing high resolution aerial imagery to Syngenta AG, a biotechnology and genomic research agricultural company. Operation of the eBee Ag by Pravia will follow strict operational limitations as outlined in this document and all recommendations by the FAA.

## **B. Background**

### **1. Pravia, LLC**

Pravia is a scientific and technological services company located in Niceville, FL that provides research, analysis, monitoring, and reporting of geographic data captured via remote sensing payloads aboard manned, fixed wing aircraft. Pravia's two managing partners have been in the aviation industry for 17 plus years and have more than 8 years of combined Military UAS experience. Pravia's UAS background makes it an ideal candidate to tackle the unique challenges associated with commercial UAS operations for precision agriculture.

### **2. eBee Ag**

The eBee Ag UAS is manufactured by SenseFly SA of Switzerland, and it includes a lightweight battery operated aircraft, ground control station, and associated data link equipment. The eBee Ag airframe is constructed of EPP foam and weighs only

1.5 lbs. with a wingspan of 3.2 ft. The eBee Ag is powered by a lithium polymer battery that drives an electric pusher propeller. It is hand launched, has maximum flight time of 45 minutes, and operates at a cruising speed of 22 mph – 35 mph. The aircraft is linked to the ground control station via a 2.4 GHz USB radio modem with a maximum data link range of 1.6 NM. If onboard sensors detect a critical situation at any time (low battery, close proximity to the ground, weak data link signal, etc.) the eBee Ag will automatically initiate a preprogrammed safety procedure.



SenseFly manufactures a variant of the eBee Ag simply referred to as the eBee. The only difference between these two models is the camera suite that they carry. The airframe, ground control station, data link, and flight profile is identical between the eBee and eBee Ag. All referenced SenseFly documents in this petition will simply say eBee and will not specify eBee or eBee Ag.

The eBee Ag has extensive flight experience and a history of operational success overseas. It has been approved for Visual Line of Sight (VLOS) operations in the UK, Switzerland, Australia, Canada, and Ireland and Extended VLOS operations in France. In the United States, the eBee Ag is being used for research by New Mexico State

University's Physical Science Laboratory UAS Test Center. NMSU is currently operating an eBee Ag under a Certificate of Authorization (COA) to develop safety of flight procedures for mapping industry projects such as open-pit mining and oil and gas operations.

For additional information on the eBee Ag, reference Appendix B (eBee User Manual), Appendix C (eBee Inspection and Maintenance Requirements) and Appendix E (eBee Justification for Airworthiness and Safety Assessment) which specify manufacturing information, aircraft performance, operating limits, normal and emergency procedures, fail-safe features, and maintenance and inspection procedures.

### **C. Statutory Authority**

#### **1. FAA Modernization and Reform Act of 2012, Section 333**

Section 333 (a) states that the FAA "shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the plan and rulemaking required by Section 332". Section 333 (b) then lists several factors that should be considered in determining which UAS' would be eligible for expedited integration into the National Airspace System (NAS). Specifically UAS' that "as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to the users of the national airspace system or the public, or pose a threat to national security". If a UAS meets the criteria laid forth in Section 333 (b), Section 333 (c) then gives the FAA the authority to decide if an airworthiness certification as specified by Title 49 United States Code, Section 44704 is even required for operation. Section 333 (c) specifically states that the FAA can determine "whether a certificate of waiver, certificate of authorization,

or airworthiness certification under section 44704 of Title 49, United States Code, is required for the operation of unmanned aircraft systems”. Thus, the FAA has the ability to allow a UAS that meets the criteria put forth in Section 333 (b) to operate within the NAS without an airworthiness certification as long as the UAS does not pose any hazard or threat to the NAS, public, and national security.

## **2. How Pravia meets the criteria laid forth in Section 333**

Below are the criteria laid forth in Section 333 (b) and a detailed description of how Pravia meets each of these criteria.

### **a. Size, Weight, and Speed**

The eBee Ag’s foam airframe weighs 1.5 lbs., has a 3.2 ft. wingspan and operates at cruising speeds of 22 mph – 35 mph. This small, lightweight aircraft that operates at relatively slow speeds will poses little to no hazard to people or structures on the ground, thus making it an exponentially safer alternative to manned, fixed wing aircraft for aerial imaging.

### **b. Operational Capability**

The primary function of the eBee Ag is to provide aerial imagery using one of four interchangeable geo-reference still cameras. High resolution data generated from these cameras offer a wide range of applications through analysis, such as biomass estimation, yield monitoring, leaf area indexing, and overall crop health. This information then helps companies like Syngenta maximize crop yields, which is of great benefit to the economy and the public.

The eBee Ag is hand launched on-site, requiring no runway for take-off and landing and no transit to and from the site. Once airborne, the eBee Ag will

fly at an altitude of 400 ft. AGL or less over the designated agricultural plot. Prior to flight, the Pilot in Command (PIC) sets a designated flight area and flight parameters to ensure that the eBee Ag will remain within the confines of the approved site and not exceed a maximum altitude 400 ft. AGL. If onboard sensors detect a critical issue at any time, such as a low battery state or loss of GPS signal, the eBee Ag will immediately execute preprogrammed safety procedures (Reference Appendix E). The eBee Ag's small operational footprint and built-in safety protocol provide a much safer alternative for aerial imaging and would pose a minimal hazard to the NAS or public.

**c. Proximity to Airports/Populated Areas**

The eBee Ag will only operate over agricultural plots for the purpose of collecting aerial imagery. There are 10 sites over which the eBee Ag will be flown (Reference C.3.b.). All sites are owned and operated by Syngenta AG, which has already granted approval to Pravia to conduct eBee Ag flights. There are a few small office and maintenance buildings located amongst the agricultural plots and Pravia will ensure all eBee Ag operations avoid overflight of these structures. In addition there are no commercial airports within 5 NM and no general aviation airports within 3 NM of any of the sites. The eBee Ag will also operate at an altitude of 400 ft. AGL or less, and as a result will be laterally de-conflicted from manned aircraft operations. By operating at low altitudes over agricultural plots the eBee Ag will pose no threat to individuals or structures on the ground and will remain well clear of any and all air traffic.

**d. Visual Line of Sight (VLOS)**

The eBee Ag will be flown in accordance with day Visual Flight Rules (VFR) and only in Visual Meteorological Conditions (VMC) during day-light hours. The eBee Ag will operate within 1 NM and VLOS of the PIC (and the Safety Observer positioned next to the PIC) at an altitude 400 ft. AGL or less. The Safety Observer will be responsible for ensuring that the eBee Ag remains within VLOS at all times and will also assist in spotting potential hazards.

**3. Other Relevant Factors**

**a. Operational Limitations**

Pravia has established the following operational limitations for eBee Ag flights over designated Syngenta sites.

- eBee Ag flights are only permitted over designated Syngenta sites
- The eBee Ag will operate at or below 400 ft. AGL
- The eBee Ag will operate within 1 NM and within VLOS of the PIC and Safety Observer
- The Safety Observer will be located next to the PIC and will ensure the aircraft remains within VLOS and assist in spotting potential hazards
- The eBee Ag will operate in accordance with Day Visual Flight Rules and only in Visual Meteorological Conditions during daylight hours
- The duration of each eBee Ag Flight shall not exceed 45 minutes
- All take-off and landings will occur on-site in accordance with the SenseFly eBee User Manual (Reference Appendix B)



- eBee Ag flights will avoid direct overflight of any office or maintenance buildings located on-site
- All Syngenta employees working on-site will be thoroughly briefed on eBee Ag operations prior to operations commencing
- eBee Ag operations will be conducted by commercially certified pilots who have completed SenseFly's eBee Training (Reference Appendix D)
- eBee Ag flights will be cancelled in the event that any aircraft or ground control station equipment is inoperative or not fully functional
- If the PIC or Safety Observer spot a potential hazard, such as a manned aircraft within close proximity to the designated flight area, the PIC will immediately land the eBee Ag and operations will only resume after the hazard is clear of the area
- All eBee Ag maintenance will be accomplished in accordance with the SenseFly eBee Inspection and Maintenance Requirements (Reference Appendix C)
- Only one eBee Ag will be airborne at any given time for each designated Syngenta sites
- The PIC will file a NOTAM for eBee Ag flights at each Syngenta site, providing at a minimum radial/DME, radius, and a date/time group

Pravia will be bound by these limitations for commercial flights after FAA approval of the exemptions laid forth in this petition. Pravia will also follow any guidance from the FAA in accordance with Sec 333 (c) which states that after

determining if UAS meets the criteria for safe operation that the FAA “shall [also] establish requirements for the safe operation of the” UAS in the NAS.

**b. Syngenta Sites**

#	City	State	NW Latitude	NW Longitude	NE Latitude	NE Longitude	SW Latitude	SW Longitude	SE Latitude	SE Longitude	Acres
1	Gilroy - East	CA	27.7300	-80.4568	27.7299	-80.4510	27.7192	-80.4512	27.7192	-80.4463	170
2	Gilroy - West	CA	38.6341	-121.8025	38.6340	-121.7941	38.6244	-121.8028	38.6244	-121.7943	193
3	Woodland	CA	40.3818	-89.0670	40.3928	-89.0451	40.3718	-89.0663	40.3711	-89.0444	585
4	LaSalle	CO	41.8907	-93.7077	41.8910	-93.6983	41.8782	-93.7107	41.8781	-93.6981	318
5	Vero Beach	FL	40.3339	-104.7300	40.3342	-104.7176	40.3303	-104.7301	40.3276	-104.7252	95
6	Slater	IA	37.0155	-121.5378	37.0169	-121.5330	37.0113	-121.5379	37.0122	-121.5309	61
7	Bloomington - R	IL	37.0118	-121.6191	37.0115	-121.6033	37.0086	-121.6190	37.0076	-121.6033	129
8	Clinton	IL	44.4862	-93.0392	44.4789	-93.0213	44.4721	-93.0394	44.4720	-93.0260	377
9	Stanton	MN	40.4259	-88.9898	40.4223	-88.9783	40.4152	-88.9894	40.4189	-88.9784	170
10	Waterloo	NE	40.2243	-88.9266	40.2244	-88.9070	40.2071	-88.9267	40.2071	-88.9067	800

There are 10 current sites that are owned and operated by Syngenta Ag where eBee Ag operations would be conducted. Syngenta Ag has already granted approval to Pravia to conduct UAS operations at these locations. These sites are agricultural plots where crops are grown and monitored by scientist in an effort to increase crop efficiency and yield. A few small office and maintenance buildings can be found at several of these sites and Pravia will ensure all eBee Ag operations avoid overflight of these structures. In addition to this there are no commercial airports within 5 NM and no general aviation airports within 3 NM of these sites (Reference Appendix A for additional site information)

As precision agricultural continues to grow there is the potential for additional Syngenta sites that would require eBee Ag operations for aerial imagery collection. In addition to seeking approval to operate the eBee Ag at these 10 current Syngenta sites, Pravia seeks approval to operate at future

Syngenta sites that meet the following criteria: 1) site is owned and operated by Syngenta Ag, 2) site consists of agricultural plots, 3) no commercial airports are within 5 NM of the site, and 4) no general aviation airports are within 3 NM of the site. Pravia will also comply with any additional requirements or restrictions the FAA may have for eBee Ag operations at these future Syngenta sites.

**D. Basis for Petition**

**1. Name and Address of the Petitioner**

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**2. Specific Sections of 14 CFR from which Pravia Seeks Exemption**

Below are the sections from which Pravia seeks exemption, with specifics on the extent of relief sought, reason for relief, and why exemption would not adversely affect safety.

**a. Part 21 Subpart H – Airworthiness Certification**

Part 21 Subpart H establishes the requirements for the issuance of an airworthiness certificate. Pravia seeks complete exemption from Part 21 Subpart H pursuant with Section 333, which authorizes the FAA to exempt a UAS from the requirements of an airworthiness certificate based on consideration of the following: size, weigh, speed, operational capability, proximity to airports and populated areas, and operation within VLOS.

An equal level of safety will be achieved with the operational limitations established in this document (Reference B.3.a) for all Pravia eBee Ag flights. Specifically that all flights will occur within VLOS of the PIC and Safety Observe, at an altitude of 400 ft. AGL or less, and only over designated agricultural plots. As a result the eBee Ag can safely operate without creating a hazard to any other aircraft, people, or structures on the ground. The combination of the eBee Ag's safe operational history in Europe and the United States and small, lightweight airframe, in conjunction with Pravia's pilot requirements and operating limitations result in a safer alternative for aerial imagery collection.

**b. 45.23 (b) – Marking Requirements**

45.23 (b) requires aircraft to display the roman capital letter "N" with registration number and the words "restricted", "light-sport", "experimental", or "provisional", as applicable, on the entrance to the cabin, cockpit, or pilot station in lettering that is between 2 in. and 6 in. in height. The eBee Ag is unmanned and thus has no cabin, cockpit, pilot station, or entrance on which these required markings could be displayed. In addition Pravia may not have a registration number assigned by the FAA. As a result Pravia seeks full exemption from this regulation. Pravia will to the maximum extent possible comply with the location requirements of 45.27 (a) and the size requirements of 45.29 (f). Pravia specifically proposes to put the word "EXPERIMENTAL" in the largest lettering possible on top of the aircraft in accordance with 45.29 (f) "if no surface authorized to be marked by 45.27 is large enough for full-size marks, marks as large as practicable must be placed on the largest of the authorized surfaces".

Pravia also proposes placing a flag at the ground control station with the words “EXPERIMENTAL UAS” in 3 in. lettering.

An equal level of safety would be maintained by displaying the word “EXPERIMENTAL” on top of the aircraft and by placing a flag at the ground control station with the words “EXPERIMENTAL UAS”. Since the eBee Ag will always be within VLOS of the PIC (positioned at the ground control station) and flown at a low altitude (400 ft. AGL or less) the markings on airframe and the flag located at the ground control station would allow all parties to visually be informed of the UAS’ operating status.

**c. 91.7 (a) – Civil Aircraft Airworthiness**

91.7 (a) states that “no person may operate a civil aircraft unless it is in an airworthy condition”. Pravia is already seeking exemption for airworthiness Certification (Reference D.2.a.) and thus no FAA standard will exist for determining airworthiness. As a result Pravia seeks full exemption from this regulation.

Pravia will achieve an equal level of safety by using SenseFly’s eBee User Manual and Inspection and Maintenance Requirements (Reference Appendix B and C) which contain pre-flight protocol for each flight, safety checks, and comprehensive maintenance procedures. In addition the eBee Ag has already demonstrated the ability to fly safely in the NAS under the current NMSU FAA-approved COA, and thus is airworthy.

**d. 91.9 (b) – Civil Aircraft Flight Manual in the Aircraft**

91.9 (b) states that no person may operate an aircraft unless there is a current approved flight manual for the aircraft onboard. The eBee Ag's small and lightweight airframe is not physically capable of carrying an aircraft flight manual onboard. In addition to this the eBee Ag is unmanned, and the PIC is located at the ground control station. Pravia thus seeks exemption from the requirement to carry the aircraft flight manual onboard. Pravia instead proposes that the SenseFly eBee User Manual (Reference Appendix B) and Justification of Airworthiness Document (Reference Appendix E), which contain information normally found in an aircraft flight manual, be kept at the ground control station where it is readily assessable to the PIC and Safety Observer for reference.

If it were physically possible for these required documents to be placed onboard the aircraft, the PIC and Safety Observer would have no means of accessing the information due to the fact that eBee Ag is unmanned with no aircrew onboard. Therefore an equal level of safety will be met by keeping the eBee User Manual and Justification of Airworthiness Document at the ground control station where it will be readily accessible (within arm's reach) to the PIC who is operating the aircraft, thus meeting the intent of the regulation.

**e. 91.103 – Preflight Action**

91.103 requires that the PIC be familiar with specific information before each flight such as weather, forecast, and fuel requirements. In addition to this the PIC must be familiar with information found within the approved flight manual relating to aircraft performance and take-off and landing distances. Due to the fact

that the eBee Ag has no FAA-approved flight manual Pravia seeks exemption from this regulation. Pravia proposes to use the SenseFly eBee User Manual (Reference Appendix B) and Justification of Airworthiness Document (Reference Appendix E) in lieu of an FAA-approved flight manual. These two SenseFly publications have extensive pre-flight checklists that include reviewing weather, battery requirements, take-off and landing distances, and aircraft performance data.

The information found in the SenseFly eBee User Manual and Justification for Airworthiness Document is comparable to the information found in a FAA-approved flight manual, to include a comprehensive step-by-step pre-flight checklist. As a result an equal level of safety will be maintained by the PIC using these two SenseFly publications, which addresses the items listed in 91.103.

**f. 91.109 – Flight Instruction**

91.109 states that “no person may operate a civil aircraft that is being used for flight instruction unless that aircraft has fully functioning dual controls”. The eBee Ag is operated by the PIC through a ground control station that communicates with the aircraft via line of sight (LOS) transmissions. The eBee Ag by design does not have fully functioning dual controls and as a result Pravia seeks exemption from this regulation.

Exemption from this regulation requiring dual controls will not create a safety hazard, because the eBee Ag is unmanned and does not carry a pilot or passengers on board. In addition the eBee Ag’s small size and foam airframe is significantly less hazardous to persons and structures on the ground than a

manned, fixed-wing aircraft. Because the eBee Ag ground control station is computer based it will be accessible to both the Instructor and Student at all times. The “controls” can in essence be passed back and forth between the Instructor and Student, achieving an equivalent level of safety as having two sets of controls.

**g. 91.119 – Minimum Safe Altitude**

91.119 establishes the minimum altitude that civil aircraft may safely operate at. 91.119 (c) specifically states that over “other than congested areas” a civil aircraft cannot operate below an “altitude of 500 feet above the surface, except over open water or sparsely populated areas (*and*) in those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure”. The sole function of the eBee Ag is to fly at low altitudes over agricultural plots, which can be categorized as “other than congested areas”. Small UAS’, like the eBee Ag, by design are typically flown at altitudes of less than 500 ft. AGL and in close proximity to the PIC and Safety Observer to maintain VLOS. Pravia has established operating limitations to achieve the highest level of safety, specifically that the eBee Ag will not operate above 400 ft. AGL and that the eBee Ag will remain within VLOS of the PIC and Safety Observer. For these reasons Pravia seeks exemption from this regulation.

An equivalent level of safety will be maintained by only operating the eBee Ag over designated Syngenta sites (Reference 3.C.b). In addition the eBee Ag’s small size and foam airframe is significantly less hazardous to persons and structures on the ground than a manned, fixed-wing aircraft providing the same service. Also by operating at an altitude of 400 ft. AGL or less the eBee Ag will



be laterally de-conflicted from manned aircraft that are subject to this minimum safe altitude regulation and thus an equal if not greater level of safety will be maintained.

**h. 91.121 – Altimeter Settings**

91.121 requires aircraft to maintain a cruising level or flight level in reference to a current reported altimeter setting. The eBee Ag is not equipped with a programmable altimeter but rather determines location and altitude via an onboard GPS and barometer. Also since the eBee Ag will be operating at or below 400 ft. AGL, there is no need to maintain hemispherical cruising altitudes for de-confliction with manned aircraft. For these reasons Pravia seeks exemption from this regulation.

An equal level of safety will be achieved through the eBee Ag's GPS and barometer, which provide altitude and location data to the PIC via the ground control station. An automatic pre-flight test is done to check the GPS and barometer and if any error is found the eBee Ag is prevented from taking-off. Also if at any time during flight there is a failure of the GPS or barometer, the eBee Ag will initiate an emergency landing. This, combined with the fact that the aircraft's altitude will be visually monitored by the PIC and Safety Observer, ensures an equal level of safety is attained in lieu of referencing an altimeter setting. Furthermore by operating at or below 400 ft. AGL the eBee Ag will not create a hazard to any manned aircraft maintaining hemispheric cruising altitudes based on a current altimeter setting.

**i. 91.151 (a) – Fuel Requirements for Flight in VFR Conditions**

91.151 (a) states that no person may begin a flight in Day VFR conditions unless there is enough fuel to fly to the intended landing point and fly for 30 minutes after that point is reached. The eBee Ag is battery operated and does not carry fuel. It has a maximum flight time of 45 minutes on a fully charged battery. Compliance with the regulation would leave the eBee Ag less than 15 minutes of flight time. Pravia seeks full exemption from this regulation due to the fact that the risk or danger associated with failing to reach a safe landing point with 30 minutes of extra “fuel” does not exist with the eBee Ag. The eBee Ag does not have to return to a “landing point” but rather can be safely put down anywhere over the agricultural plot.

An equal level of safety will be maintained simply by the fact that the eBee Ag is designed to safely land anywhere over the agricultural plot in the event that the battery is exhausted. Any risk associated with battery duration (fuel) in relationship to flight time is mitigated by the fact that eBee Ag has the ability to land anywhere and at any given time.

**j. 91.203 (a) & (b) – Civil Aircraft: Certifications Requirements**

91.203 requires all civil aircraft to have “within it...an appropriate and current airworthiness certificate” that must be “displayed at the cabin or cockpit entrance so that is legible to passengers or crew”. Pravia is already seeking exemption from the airworthiness certificate regulation and thus requires an exemption from this regulation. In addition the eBee Ag due to its size and design has no cabin or cockpit, and therefore does not have the ability to affix or carry

certification or registration documents. Furthermore the eBee Ag does not carry any passengers or crew for whom the certificate is required to be displayed.

Pravia proposes that any FAA-required documents be kept at the ground control station and that a small placard be affixed to the eBee Ag airframe with manufacture, registration, and contact information.

An equal level of safety will be achieved by having any FAA-required documents located at the ground control station where it will be readily accessible to the PIC and any other agencies that may require the information. Having a placard attached to the eBee Ag airframe will also allow any person or agencies to be informed of the UAS' origin and status.

**k. Part 91 Subpart E (91.401-91.417) – Maintenance, Preventative**

**Maintenance, and Alterations**

These regulations provided the maintenance and inspections requirements in reference to Part 39 and Part 43. 91.405 (a) specifically states that “no person may perform maintenance, preventive maintenance, and alterations on an aircraft other than as prescribed in this subpart and other applicable regulations, including part 43 of this chapter”. Pravia seeks full exemption from these regulations due to the fact that these sections apply to an aircraft with an airworthiness certificate for which Pravia is already seeking exemption.

An equal level of safety will be achieved by using the SenseFly eBee Inspection and Maintenance Requirements (Reference Appendix C) which provide step-by-step instructions on Regular Maintenance, Preventive Maintenance, and Corrective Maintenance. The PIC will be responsible for

conducting maintenance in accordance with these procedures. Any eBee Ag maintenance that is not covered in these procedures will be performed by the manufacturer. Pravia will ensure that all maintenance performed on the eBee Ag by the PIC and manufacturer is documented in accordance with 91.407 (a) (1). Specifically that the records will include “a description of the work performed; and the date of completion of the work performed; and the signature...of the person approving the aircraft for return to service”. The PIC will authorize the eBee Ag for return to service for all maintenance covered in the eBee Inspection and Maintenance Requirements and the manufacturer will authorize the eBee Ag for return to service for all maintenance that is outside the scope of the eBee Inspection and Maintenance Requirements. Pravia will also ensure that no modifications or alterations are made to the airframe that affect the flight operating characteristics of the eBee Ag.

### **3. How request benefits public as a whole**

The eBee Ag is a safe, efficient, and an economical alternative to manned, fixed-wing aircraft that are currently being used to conduct aerial imaging of agricultural plots. There are a four major reasons why the public would benefit from granting Pravia exemptions from these regulations. Authorizing eBee Ag flights over designated Syngenta sites would 1) reduce the number of manned aircraft in the NAS, 2) reduce air and noise pollution, 3) reduce the risk to life and property on the ground, and 4) increase agricultural economic growth.

Utilizing the eBee Ag in lieu of a traditional manned, fixed wing aircraft will result in the overall reduction of manned aircraft in the NAS. Thus there will be less

aircraft that require control and coordination with Air Traffic Controllers (ATC). Because the eBee Ag can take-off and land on-site and operate at an altitude of 400 ft. AGL (or less) within VLOS of the PIC there is no need for ATC to provide coordination during ground, take-off, departure, transit, arrival, and landing phases of flight. As the skies over the United States get busier and busier, any small effort to lighten the load of the Air Traffic Controllers would be of great benefit to the public.

At 1.5 lbs. the battery operated eBee Ag with an electric motor provides a much quieter alternative to manned, fixed-wing aircraft. Traditionally a manned aircraft would have to transit from the departure airport to the desired site and fly at low altitudes to achieve high-resolution imagery. The eBee Ag will require no transit time, and the electric motor will be exponentially quieter than a twin-engine combustion motor on passenger aircraft that is typically used to conduct aerial imaging. In addition the eBee Ag requires no fuel since it is battery operated. A manned aircraft on the other hand typically burns 20-30 lbs. of aviation fuel per hour which is polluting the air not only over the site but over the path of transit and around the airport. Conducting aerial imaging with the eBee Ag in lieu of a manned aircraft would thus greatly reduce both air pollution and noise pollution which is of great benefit to the public.

Using the eBee Ag would also greatly reduce if not completely eliminate the risk to life and property on the ground. The eBee Ag's incredibly small size, reduced weight, and foam airframe pose no hazard to people or structures on the ground as opposed to a manned twin engine passenger aircraft, which has a much greater potential for collateral damage. In addition the eBee Ag is unmanned and as a result the risk associated with piloting this aircraft is non-existent. Overall the eBee Ag provides a much safer

alternative to manned, fixed-wing aircraft operations for the purpose of collecting aerial imagery.

Lastly using the eBee Ag to provide aerial imagery would result in agricultural economic growth. High-resolution data generated from eBee Ag flights would provide scientists with invaluable information on biomass estimation, yield monitoring, leaf area indexing, and overall crop health. By analyzing this data scientists can make modifications to a wide range of variables that will maximize crop yields. More efficient crops would allow the U.S. to generate more food for stateside consumption but also increase the amount of crops that can be exported to foreign countries. The major increase in economic growth in the agricultural industry would energize the U.S. economy, which in turn would be of great benefit to the public.

#### **4. Additional information, views, and arguments**

The following documents have been included as Appendices to this Petition. Appendix B, C, D, and E have been submitted confidentially for proprietary reasons and will not be available to the public.

- Syngenta Sites (Appendix A)
- eBee User Manual (Appendix B)
- eBee Inspection and Maintenance Requirements (Appendix C)
- eBee Training (Appendix D)
- eBee Justification of Airworthiness and Safety Assessment (Appendix E)

#### **5. Summary for Federal Register**

Pursuant with Section 333 of the FAA Modernization and Reform Act of 2012, Pravia, LLC requests exemption from the following Federal Aviation Regulations that are

found under Title 14 of the Code of Federal Regulations: Part 21 Subpart H, 45.23 (b), 91.7 (a), 91.9 (b), 91.103, 91.109, 91.119, 91.121, 91.151 (a), 91.203 (a) (b), Part 91 Subpart E (91.401-91.417). Exemption from these regulations would allow Pravia, LLC to operate the SenseFly eBee Ag Unmanned Aerial System over Syngenta Ag Sites for the purpose of providing high-resolution aerial imagery of agricultural plots.