

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

**PinnacI X, Responsible Person: Alfred Gates
Waiver Number: 107W-2017-02509**

ADDRESS

**16 West Cove Rd
Moodus, CT 06053**

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Small unmanned Aircraft Systems (sUAS) operations performing electrical power line inspections beyond the visual line of sight of the Remote Pilot in Command (PIC) and Visual Observer (VO).

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

**14 CFR § 107.31 Visual line of sight aircraft operation
14 CFR § 107.33(b)**

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached to and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

NOTE—This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions Nos. 1 to 22, inclusive, are set forth on the attached pages.

This Certificate of Waiver is effective from January 29, 2018 to January 31, 2022 and is subject to cancellation at any time upon notice by the Administrator or an authorized representative.

BY DIRECTION OF THE ADMINISTRATOR

General Aviation and Commercial Division, AFS-800

**SPECIAL PROVISIONS ISSUED TO
Pinnacel X**

General.

The FAA's Flight Standards Service has reviewed your application to ensure compliance with the requirements of 14 CFR § 107.200. The Administrator finds that the proposed sUAS operation can be conducted safely under the provisions of this Certificate of Waiver (Waiver) as listed below, because you have established adequate mitigations for risks involved with operating the sUAS in the manner you described. Adherence to the provisions of this Waiver establishes a level of safety that ensures safe operations within the national airspace system.

This Waiver may be canceled at any time by the Administrator, the person authorized to grant the Waiver, or the representative designated to monitor a specific operation. As a general rule, this Waiver may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with any provision listed below is a violation of the terms of this Waiver and may serve as justification for cancellation.

List of Regulations Waived by Section and Title. The following regulations are waived:

14 CFR § 107.31 Visual line of sight aircraft operation, is waived to allow operation of the small unmanned aircraft (sUA) beyond the direct visual line of sight of the remote PIC and VO.

14 CFR § 107.33(b) Visual Observer, is waived to the extent necessary to allow operation of the small unmanned aircraft (sUA) when each Visual Observer (VO) may not be able see the unmanned aircraft in the manner specified in §107.31.

Common Provisions. The Responsible Person is directly responsible for safety of operations conducted under this Waiver and will ensure all persons who fulfill duties in accordance with this Waiver comply with all provisions of this Waiver. Such persons include, but are not limited to, the remote PIC, any other remote pilot fulfilling the duties of this Waiver, person who is manipulating the controls, and VO.

1. The Responsible Person listed on the Waiver is responsible for the safe conduct of the operations. Prior to conducting operations that are the subject of this Waiver, the Responsible Person:
 - a) Must ensure the remote PIC and VO are informed of the terms and provisions of this Waiver and the strict observance of the terms and provisions herein,
 - b) Must ensure the remote PIC and VO are informed and familiar with part 107 regulations not waived, and
 - c) The Responsible Person must keep a log of the communications to establish compliance with subparagraphs (a) and (b) of this paragraph. This log must be presented for inspection upon request by the Administrator or an authorized representative;
2. This Waiver must not be combined with any other waiver(s), authorization(s), or exemption(s) without specific authorization from the FAA;
3. The FAA has the authority to cancel or delay any or all flight operations if the safety of persons or property on the ground or in the air, is in jeopardy or there is a violation of the terms of this Waiver;
4. A copy of this Waiver must be available during sUAS operations that are the subject of this waiver;
5. The Responsible Person listed on this Waiver must maintain a current list of pilots by name and remote pilot certificate number used in the Waiver holder's operations. This list must be presented for inspection upon request from the Administrator or an authorized representative;

6. The Responsible Person listed on this Waiver must maintain a current list of sUA by registration number(s) used in the Waiver holder's operations. This list must be presented for inspection upon request from the Administrator or an authorized representative;
7. All operations under this Waiver must use multiple Visual Observers as described in the waiver application;

§ 107.31 Visual line of sight aircraft operation and § 107.33 Visual observer Special Provisions.

SUAS operations may be conducted outside the visual line of sight of the remote PIC or VO provided:

8. All planned launches and recoveries of the sUA must occur within Visual Line of Sight VLOS of the remote PIC;
9. During sUA flight operations that are the subject of this Waiver, the Remote Pilot in Command or at minimum one VO, must maintain VLOS of the sUA in order to (1) know the unmanned aircraft's location, (2) determine each unmanned aircraft's attitude, altitude, and direction of flight, (3) observe the airspace for other air traffic or hazards, and (4) determine that each unmanned aircraft does not endanger the life or property of another. The remote pilot in command of the aircraft involved in the operations must maintain effective communication with the VO or VO's who fulfill the duties listed at (1) – (4) of this paragraph;
10. Prior to conducting operations under this Waiver, the remote PIC must establish, and during operations conducted under the terms and conditions of this Waiver, the remote PIC must maintain continuous full-duplex hands-free audio communications with the VO's. The full-duplex audio communications must occur over an independent transmission and reception system, and not be dependent on the ground station method of data transmission and reception;
11. If communication between the VO and the remote PIC is by use of an electronic device—
 - a) The remote PIC's device must be hands-free,
 - b) There must be a reliable, backup communication method;
12. Communication between the remote PIC and VO, must allow for the remote PIC to maneuver the sUA with sufficient time to:
 - a) Give way to all other aircraft,
 - b) React to any unforeseen operational or mechanical failure without creating a hazard to other people, other aircraft, or property in the event of a loss of control of the sUA for any reason; and
 - c) To maintain compliance with this Waiver and un-waived provisions of part 107;
13. The Responsible Person listed on this Waiver must ensure each remote PIC is trained and proficient in a manner consistent with how the sUAS will be operated under this Waiver. All training and demonstration for any remote PIC and VO must be documented and made available upon request by the Administrator or an authorized representative. Training operations may only be conducted under the standard requirements of part 107 (without waiver). The training must include:
 - a) SUA limitations,
 - b) SUA programming,
 - c) SUA operational procedures,
 - d) Abnormal and contingency procedures,
 - e) Evasive and Emergency procedures,
 - f) Crew Resource Management,
 - g) SUA flight training,
 - h) A demonstration of sUA ground and flight proficiency;

14. All sUA operated under this Waiver must be capable of semi-autonomous operations as described in the waiver application. Prior to conducting operations that are the subject of this Waiver, the remote PIC must verify, and during operations, the sUA must follow the pre-programmed flightpath;
15. Prior to operations that are the subject of this Waiver, the remote PIC must determine the control link with the sUA has performance capabilities that exceed the planned ranges for the proposed operation;
16. The sUAS ground control station must display in real-time, sUA altitude, sUA position, sUA direction of flight information, and sUA flight mode. This information must be available at all times to the remote PIC;
17. The sUA ground station display must audibly and visually alert the remote pilot in command of any degradation of sUA functionality that may affect compliance with any requirement of this Waiver or with any provision of part 107;
18. The sUAS must have pre-programmed and actively available contingency and emergency profiles that avoid overflight of other than sparsely populated areas;
19. sUA operations conducted subject to this waiver must cease if, at any time—
 - a) Safety of human beings or property on the ground or in the air is in jeopardy,
 - b) There is a failure to comply with the provisions of this Waiver,
 - c) Full-duplex communications cannot be maintained between the remote PIC and the VO or VO's,
 - d) There is a loss of the sUA control link,
 - e) A non-participating vehicle or person enters into the area, or
 - f) The sUA GPS location information is degraded;
20. The sUA must be equipped with high visibility markings or lighting visible during the daytime from a distance of no less than 3 statute miles;
21. Not less than 24 hours prior to conducting operations that are the subject of this Waiver, a Notice to Airmen (NOTAM) must be filed with a Flight Service Station. The NOTAM must include location, altitude, and/or operating area, time and nature of the activity;
22. sUAS operations subject to this Waiver are limited to:
The flight path beginning at 42° 29' 29.93" N 72° 28' 31.15" W following the flight path described in the waiver application, and ending at 42° 26' 42.98" N 72° 28' 24.28" W described as Pinnacel X "Test location B," in the waiver application.