Final Environmental Assessment for DroneUp, LLC Proposed Drone Package Delivery Operations in Dallas–Fort Worth, Texas

November 2024

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration
Finding of No Significant Impact and Record of Decision
for
Environmental Assessment for DroneUp LLC Proposed Drone Package Delivery Operations in Dallas–Fort Worth, Texas

Summary

The Federal Aviation Administration (FAA) prepared the attached final Environmental Assessment (EA) to analyze the potential environmental impacts of issuing a Part 135 certificate, Operations Specifications (OpSpec), and 49 United States Code (U.S.C.) Section 44807 exemption to DroneUp LLC (DroneUp) that allows DroneUp to carry the property of another for compensation or hire beyond visual line of sight (BVLOS) using its PRISM V2.1 Unmanned Aircraft System (UAS). DroneUp is seeking an OpSpec to allow unmanned aircraft (UA; also referred to as a drone) commercial package delivery operations in the Dallas Fort Worth (DFW) metropolitan and surrounding area. The EA was prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA; 42 U.S.C. § 4321 et seq.); Council on Environmental Quality (CEQ) NEPA-implementing regulations (40 Code of Federal Regulations [CFR] parts 1500 to 1508); and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*.

After reviewing and analyzing available data and information on existing conditions and potential impacts, the FAA has determined that the Proposed Action would not significantly affect the quality of the human environment. Therefore, the preparation of an Environmental Impact Statement is not required, and the FAA is issuing this Finding of No Significant Impact (FONSI) and Record of Decision (ROD). The FAA has made this determination in accordance with applicable environmental laws and FAA regulations. The EA is incorporated by reference into this FONSI/ROD.

Purpose and Need

The purpose of DroneUp's request is to expand commercial drone package delivery operations in DFW, TX. DroneUp has determined there is an increase in consumer demand for drone delivery services and the proposed action is needed, necessitating expanded operations.

Proposed Action

DroneUp's request to obtain a Part 135 Certificate, OpSpec, and 44807 exemption to enable beyond visual line of sight drone delivery operations under Part 135 using the PRISM V2.1 in the DFW area requires FAA review and approval. The primary UA used for these deliveries is DroneUp's PRISM V2 Series, which features a multirotor design with eight (8) propellers. The UA weighs 55 pounds when combined with its maximum payload weight of 10 pounds. It has a wingspan of approximately 71.5 inches, a height of approximately 32 inches, and a

length of approximately 71.5 inches.

The major federal action includes the FAA approval of DroneUp's B050 OpSpec*, Authorized Areas of En Route Operations, Limitations, and Provisions*. Once approved, a reference section titled *Limitations, Provisions, and Special Requirements* will be created in the OpSpec. This would allow DroneUp to expand the geographic scope of new Hub locations as well as increase their number of daily operations to 500 deliveries per day from each Hub. DroneUp is projecting to establish up to 30 Hubs in the DFW operating area under the scope of the proposed action.

Hubs would be distributed throughout the DFW metro area following a measured rollout plan to be developed with DroneUp's partners and continuing best practices from DroneUp's established community outreach program. DroneUp's Hubs would be located in established parking lots of commercial areas whose use is consistent with local zoning and land use requirements, such as shopping centers, large individual retailers, and shopping malls. To avoid the potential for significant noise impacts, DroneUp would site its Hubs at least 558 feet away from a noise-sensitive area when the Hub is located within the controlled surface area of Class B and Class D airspace and at least 119 feet away from a noise-sensitive area in all other areas within the study area, which is defined as DroneUp's proposed operating area. Each Hub would contain multiple aircraft takeoff and landing pads. The estimated total distance flown for deliveries would vary depending upon the Hub and drop-off locations in the operating area.

DroneUp will typically operate seven (7) days per week to include holidays. Each Hub would serve an area with a five (5)-mile radius. Operations are to be conducted from 7 AM to 10 PM local time. Each flight would take a package to a customer delivery address before returning to the Hub. There would be variability in the number of flights per day based on customer demand and weather conditions. Deliveries would be conducted at the time of the customer's choosing and directly to the customer's home in the operating area.

See Sections 1.2, 1.3 of the EA for detailed discussion.

See Section 2.2 of the EA for further information.

Alternatives

Council on Environmental Quality (CEQ) regulations at 40 CFR § 1502.14(c) require agencies to consider a no action alternative in their NEPA analyses. Thus, the no action alternative serves as a baseline to compare the impacts of the proposed action. As described briefly in Section 1.2, Under the no action alternative, the FAA would not approve an OpSpec under Part 135 to expand DroneUp package delivery operations in the DFW area. There would be no change to current DroneUp package delivery operations in the DFW area. DroneUp could continue operating its PRISM UA within Murphy under Part 107, which includes up to 110 deliveries per day, and at other locations, which limits operations to UA weighing less than 55 pounds and within VLOS (Visual Line-Of-Sight). For Part 107 operations, DroneUp is conducting its flights between 7 AM and 10 PM local time. Consumers in the areas not served by UA would be expected to continue to use personal ground transportation to retrieve small goods using their automobiles or in some cases with public transportation, if available. This alternative does not support the stated purpose and need.

See Section 2.1 of the EA for further information.

Environmental Impacts

The potential environmental impacts of the Proposed Action and no action alternative were evaluated in the EA for each environmental impact category identified in FAA Order 1050.1F. Chapter 3 of the EA describes the affected environment within the project study area and identifies the following environmental impact categories that are not analyzed in detail: Coastal Resources; Farmlands; Hazardous Materials, Solid Waste, and Pollution Prevention; Land Use; Natural Resources and Energy Supply; Socioeconomics; Children's Environmental Health and Safety Risks; Visual Effects (Light Emission Only); and Water Resources (Wetlands, Floodplains, Surface Water, Groundwater, and Wild and Scenic Rivers).

Chapter 3 also provides the potential environmental consequences of the Proposed Action for each of the remaining environmental impact categories and documents the finding that no significant environmental impacts would result from the Proposed Action. A summary of the documented findings for each impact category, including requisite findings with respect to relevant special purpose laws, regulations, and executive orders, is presented below.

Air Quality and **Climate: EA Section 3.3 and Appendix K.** The proposed action does not significantly impact air quality or climate. The UA is battery powered and does not generate emissions that could result in significant air quality impacts or climate impacts. Electricity consumed for battery charging at the Hubs would be minimal. In the event of a power outage at a standard Hub, DroneUp will not utilize partner power sources or their backup generators. Power will be generated via one (1) diesel generator at a Mobile Hub. These emissions are not expected to contribute to any exceedance of National Ambient Air Quality Standards or *Nonattainment Areas General Conformity De Minimis Emission Levels* in 40 CFR § 93.153. The analysis provided in Appendix K confirms that the net emissions for air pollutants are below the nonattainment general conformity de minimis emission levels for VOC and NOx and maintenance general conformity de minimis emission levels for Pb. The proposed action is expected to decrease emissions from delivery services that contribute to greenhouse gases (GHG) emissions. The decreased emissions would have positive effects on climate change as the proposed action would replace vehicle miles traveled by GHG emitting vehicles.

Biological Resources, EA Section 3.4 and Appendix E. The Proposed Action is not anticipated to significantly impact wildlife within the affected area. Operations would occur mostly in an urban environment, typically well above the tree line and away from sensitive habitats. Individual areas would only briefly experience increased ambient sound levels during transit and delivery operations. Potential impacts on biological resources associated with the proposed action were considered in the area where drones may operate (launch, fly, and drop packages). DroneUp's Hubs would be located in retail store parking lots; therefore, there would be no ground disturbance or habitat modification associated with the proposed action. DroneUp's deliveries would initiate from the Hub, fly at an en route altitude less than 400 feet (above ground level) AGL, generally between 230 and 250 feet AGL. The UA would descend to around 80 feet AGL and hover for a brief time to make a delivery. Then, the UA would ascend and transition back to en route flight mode for a return to the Hub. In addition, DroneUp would also specifically coordinate with the managing entities of state parks and natural areas within the action area on the thoughtful placement and use of delivery sites within these areas, as necessary.

To avoid impacts on nesting Bald Eagles, DroneUp has agreed to a monitoring plan for Bald Eagle nests that integrates multiple strategies and resources. This includes periodically checking online tools such as iNaturalist to identify eagle nests that may occur in the operating area, as well as communication with the bird watching

community to identify nests. DroneUp personnel will also be educated in the visual identification of Bald Eagle nests, which are typically very conspicuous. If DroneUp identifies a Bald Eagle nest or is notified of the presence of a nest, DroneUp will establish an avoidance area such that there is a 1,000 feet vertical and horizontal separation distance between the vehicle's flight path and the nest. DroneUp will maintain this avoidance area until the end of the breeding season or until a qualified biologist indicates the nest has been vacated. DroneUp will regularly report monitoring and avoidance measures to Texas Parks & Wildlife and the USFWS Region 2 Migratory Bird Permit Office. DroneUp has not had any bird strikes related to their operations.

The FAA determined the proposed action would have no effect on the alligator snapping turtle (*Macrochelys temminckii*), Texas fawnsfoot (*Truncilla macrodon*), Texas heelsplitter (*Potamilus amphichaenus),* and monarch butterfly (*Danaus plexippus*), and may affect, but is not likely to adversely affect the tricolored bat (*Perimyotis subflavus*), golden-cheeked warbler (*Setophaga chrysoparia*), and whooping crane (*Grus americana*). On July 25, 2024, the USFWS issued its concurrence on these findings.

The tri-colored bat is proposed to be listed. Proposed species are not currently protected under the Act; however, conferencing is necessary if it is determined a federal action is likely to jeopardize the continued existence of a proposed species. Should the tricolored bat be listed, the FAA will re-evaluate the project to determine the extent of effects on the species. If that evaluation indicates adverse effects would or are occurring on the species, measures should be implemented to avoid incidental take until consultation can be completed. Additionally, the FAA would then need to develop and implement long term procedures for monitoring and reporting potential effects of drone activity on tricolored bats. This would include a process for reporting survey data, detection of collisions, and contingency planning in the event that adverse effects are reported.

This concluded the FAA's obligations under Section 7 of the Endangered Species Act. In addition, the Proposed Action would not result in long-term or permanent loss of wildlife species; would not result in substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or populations; and would not have adverse impacts on reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels of any species. Therefore, no significant impacts on biological resources are expected under the Proposed Action.

Department of Transportation Act Section 4(f), EA Section 3.5 and Appendix D. The FAA has determined that drone operations would not cause substantial impairment to Section 4(f) resources that could occur in the study area and would not be considered a *constructive use* of any Section 4(f) resource. Occasional flyovers would not result in significant noise levels at any location within the study area, and the short duration of en route flights (approximately 15 seconds) would minimize any potential for significant visual impacts. There would be no physical use of Section 4(f) resources because the Proposed Action has no direct interaction with any resources on the ground. Constructive use could occur when a project would produce an effect, such as excessive noise, that would result in substantial impairment to a property where the features of that property are substantially diminished. However, as discussed in Section 3.7, the Proposed Action would not result in a significant increase in noise levels at any location within the study area. As further described in Section 3.9, the short duration of en route flights would minimize any potential for significant visual impacts.

FAA distributed the Notice of Availability (NOA) of the published draft EA for the public comment period to all identified appropriate official(s) with jurisdiction over the Section 4(f) properties.

The FAA has determined that the Proposed Action would not cause substantial impairment, or direct or constructive use, as defined in Section 3.4.1, to any of the Section 4(f) resources in the study area. Therefore, the Proposed Action would not result in significant impacts on Section 4(f) resources.

Historical, Architectural, Archaeological, and Cultural Resources; EA Section 3.6, Appendices G and H. The Proposed Action would not significantly impact historical, architectural, archaeological, and cultural resources. Drone effects on historic properties are limited to non-physical, reversible impacts (i.e., the introduction of audible and/or visual elements).

The FAA invited government-to-government consultation with several Tribal Governments concerning the proposed action and initiated consultation under Section 106 concerning any potential resources of religious or cultural significance in the APE, which included the following tribes: Apache Tribe of Oklahoma, Comanche Nation, Oklahoma, Caddo Nation of Oklahoma, Cherokee Nation, Oklahoma, Delaware Nation, Oklahoma, The Muscogee (Creek) Nation, Oklahoma, Coushatta Tribe of Louisiana, Tonkawa Tribe of Indians of Oklahoma, Wichita and Affiliated Tribes, Oklahoma. No responses from tribal governments have been received as of the issuance date of the FONSI-ROD.

FAA conducted a noise exposure analysis for the Proposed Action and concluded that noise levels would be below the FAA's threshold for significance. Based on the information available, the FAA made a finding of *no adverse effect on historic properties* in accordance with 36 CFR Part 800. The FAA received concurrence from the State Historic Preservation Office (SHPO) on June 07, 2024, that "*No adverse effects on historic properties*" by the Proposed Action. Therefore, the Proposed Action would not result in significant impacts on historical, architectural, archaeological, or cultural resources.

Noise and Noise-Compatible Land Use, EA Section 3.7 and Appendix J. The Proposed Action is not anticipated to result in any significant changes in the overall noise environment within the affected area.

Noise impacts would be significant if the action would increase noise by day-night average sound level (DNL) 1.5 decibel (dB) or more for a noise-sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe.

FAA has an established noise significance threshold, defined in FAA Order 1050.1F, which is used when assessing noise impacts in a particular project area. A significant noise impact is defined as an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure or a noise exposure at or above the 65 dB level due to a DNL 1.5 dB or greater increase.

The noise generated by the DFW operations is not expected to be incompatible with noise sensitive resources within the action area. The maximum noise exposure levels are associated with Hub operations, where DNL 65 dB occurs within 119 feet of a Hub perimeter and DNL 60 dB occurs within 119 feet. As described in Section 2.2, *Proposed Action*, Hubs would be located at least 119 feet away from noise-sensitive areas. In addition, when Hubs are planned to be within the controlled surface areas of Class B and D airspace, Hubs would be placed 558 feet away from noise-sensitive areas when operating at 120 AAD (Average Annual Day) over 45 degrees (plus or minus) from a cardinal direction. When Hubs are planned to be within controlled surface areas of Class B and D

airspace and are not operating under assumption (2)[1] criteria the standoff distance would be 780 feet. When operating with an AAD below 120, the standoff distance shall be based on Appendix J Table 5 DNL 50 dB.

Based on the noise analysis, and the above project restrictions, the proposed action would not have a significant noise impact. Therefore, no significant impacts on noise and noise-compatible land use are expected under the Proposed Action.

Environmental Justice, EA Section 3.8. The Proposed Action would not result in disproportionately high or adverse effects on minority or low-income populations. Drone noise emissions could be perceptible in areas within the study area but would stay well below the level determined to constitute a significant impact (DNL 65 dB). In addition, Prime Air's service is meant to provide additional and on-demand access to small goods and groceries without making use of roads and provides a greater benefit in more congested areas. Commercial drone delivery services may therefore result in a positive effect on low income and minority communities who experience greater traffic congestion and have no other mode of transportation. As such, the Proposed Action would not result in significant environmental justice impacts or disproportionately high and adverse effects on minority and low-income populations.

Visual Effects (Visual Resources and Visual Character), EA Section 3.9. Impacts on visual resources are expected to be less than significant. The Proposed Action would make no changes to any landforms or land uses; thus, there would be no effect on the visual character of the area, as the nests would be located in established commercial areas. Drone operations would not introduce new light emissions, and the short duration of overflights as well as the low number of overflights within any given location would minimize the potential for substantial visual impacts. Therefore, no significant impacts on visual effects are expected under the Proposed Action.

Please refer to Chapter 3 of the EA for a full discussion of the analysis for each environmental impact category.

Chapter 4 of the EA provides an analysis of the potential cumulative impacts of the Proposed Action when added to other past, present, and reasonably foreseeable actions. An additional cumulative effects analysis for multiple operators expected to provide package delivery operations within the DFW area within the next two years is provided in Appendix I. The FAA has determined that the Proposed Action would not result in significant cumulative impacts in any environmental impact category.

Public Involvement and Coordination

On August 7th, 2024, the FAA published the draft EA for a 30-day public comment period which concluded on September 6th, 2024. The FAA received comments during the comment period for this EA, which are documented in Appendix L. The FAA considered all public comments when preparing the EA.

Comments were received in writing at 9-FAA-Drone-Environmental@faa.gov.

[1] 2) UAs would spread to four directions in and out of a Hub. It is understood that the maximum number of overflights directly above any single noise sensitive location in the operating areas beyond the Hub would not be expected to exceed five. Even though UAs would fly in and out of a Hub omni-directionally, it would be conservative to assume no more than a quarter of the UAs would fly within the vicinity of a single noise sensitive location. For operations in Class B and D airspace, this would be conservatively limited to no more than a quarter of the UAs flying over 45 degrees (plus or minus) from a cardinal direction.

See Section 1.4 and Appendix L of the EA for further information.

Finding of No Significant Impact

The FAA finding is based on a comparative examination of environmental impacts for each of the alternatives studied during the environmental review process. The EA discloses the potential environmental impacts for each of the alternatives and provides a full and fair discussion of those impacts. Based on the FAA's review and analysis and consideration of comments, it has determined that there would be no significant impacts on the natural environment or surrounding population as a result of the Proposed Action.

The FAA believes the Proposed Action best fulfills the purpose and need identified in the EA. In contrast, the no action alternative fails to meet the purpose and need identified in the EA. An FAA decision to take the required actions and approvals is consistent with its statutory mission and policies supported by the findings and conclusions reflected in the environmental documentation and this FONSI/ROD.

After careful and thorough consideration of the facts contained herein and following consideration of the environmental impacts described, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101(a) of the National Environmental Policy Act of 1969 and other applicable environmental requirements, and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(C) of NEPA. As a result, an Environmental Impact Statement will not be prepared by the FAA.

Decision and Order

The FAA recognizes its responsibilities under NEPA, CEQ regulations, and its own directives. Recognizing these responsibilities, the undersigned has carefully considered the FAA's goals and objectives in reviewing the environmental aspects of the Proposed Action to approve DroneUp's request to expand drone delivery services in the DFW area. Based upon the above analysis, the FAA has determined that the Proposed Action meets the purpose and need.

The environmental review included the purpose and need to be served by the Proposed Action, alternatives to achieving them, the environmental impacts of these alternatives, and conditions to preserve and enhance the human environment. This decision is based on a comparative examination of the environmental impacts for each of these alternatives. The EA provides a fair and full discussion of the impacts of the Proposed Action. The NEPA process included appropriate consideration for avoidance and minimization of impacts, as required by NEPA, the CEQ regulations, and other special-purpose environmental laws, and appropriate FAA environmental orders and guidance.

The FAA has determined that environmental concerns presented by interested agencies and the public have been addressed in the EA. The FAA believes that, with respect to the Proposed Action, the NEPA requirements have been met. FAA approval of this environmental review document indicates that applicable Federal requirements for environmental review of the Proposed Action have been met.

Accordingly, under the authority delegated to me by the Administrator of the FAA, I approve and direct that agency action be taken to carry out implementation of the Proposed Action.

DEREK W HUFTY

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Date: 2024.10.02 13:51:17 -04'00'

Manager, General Aviation and Commercial Operations Branch
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Right of Appeal

This FONSI/ROD constitutes a final agency action and a final order taken pursuant to 49 U.S.C. §§ 40101 et seq., and constitutes a final order of the FAA Administrator, which is subject to exclusive judicial review by the Courts of Appeals of the United States in accordance with the provisions of 49 U.S.C. § 46110. Any party having substantial interest in this order may apply for a review of the decision by filing a petition for review in the appropriate U.S. Court of Appeals no later than 60 days after the order is issued in accordance with the provisions of 49 U.S.C. § 46110.

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Washington, D.C.

Notice of Availability of the Final Environmental Assessment and Finding of No Significant Impact/Record of Decision for DroneUp, LLC Package Delivery Operations in Dallas–Fort Worth, Texas

The Federal Aviation Administration (FAA) hereby provides notice that a final Environmental Assessment (EA) and a Finding of No Significant Impact/Record of Decision (FONSI/ROD), prepared pursuant to the National Environmental Policy Act (NEPA) (42 United States Code §§ 4321 – 4355), to assess the potential environmental effects of the FAA decision to authorize DroneUp, LLC (DroneUp) proposed commercial drone delivery service in the Dallas–Fort Worth (DFW), Texas metropolitan area are available.

DroneUp is seeking issuance of an air carrier Operation Specifications (OpSpec) and other FAA approvals necessary to introduce commercial drone delivery operations in Texas. The FAA's issuance of the OpSpec is considered a major federal action under NEPA. The Final EA has been prepared in accordance with the requirements set forth in the Council on Environmental Quality (CEQ) regulations at Title 40, Code of Federal Regulations (CFR), parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures.* The Final EA reflects the consideration of comments received during the public comment period for this EA from Wednesday, August 7, 2024, and ending on Friday, September 6, 2024. Based on the analysis described in this EA, the FAA has determined there will not be a significant impact to the human environment. As a result, an Environmental Impact Statement (EIS) has not been initiated (40 CFR 1501.6).

The Final EA and FONSI/ROD are available to view/download electronically at: https://www.faa.gov/uas/advanced_operations/nepa_and_drones

CONTACT INFORMATION: For any questions or to request a copy of the EA, please email 9-FAA-Drone-Environmental@faa.gov.

This Final EA becomes a federal document when evaluated, signed, and dated by the Responsible FAA Official.

Responsible FAA Official:

DEREK W HUFTY

Digitally signed by DEREK W HUFTY
Date: 2024.10.28 07:52:19 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

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Citations & Abbreviations

AAD	Average Annual Day
ACS	American Community Survey
ADS-B	Automatic Dependent Surveillance-Broadcast
AGL	Above Ground Level
AMC	Auterion Mission Control
APE	Area of Potential Effects
BVLOS	Beyond Visual Line-of-sight
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMP	Texas Coastal Management Program
CONOPS	Concept of Operations
CMZ	Coastal Zone Management Plan
CTI	Collegiate Training Initiative
dB	Decibel
dBA	A-weighted Decibel
DFW	Dallas–Fort Worth
DNL	Day-Night Average Sound Level
DOT	U.S. Department of Transportation
DroneUp	DroneUp, LLC
EA	Environmental Assessment
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GLO	Texas General Land Office
HHS	Health and Human Services

IPaC	Information for Planning and Consultation
LED	Light Emitting Diode
LiPo	Lithium-Ion Polymer
mAh	Milliamp Hours
MBTA	Migratory Bird Treaty Act
Metro	Metropolitan
Mph	Miles Per Hour
MOU	Memorandum of Agreement
NEPA	National Environmental Policy Act
NFZ	No Fly Zone
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
OEM	Original Equipment Manufacturer
OpSpec	Operations Specifications
O/S	Operating System
PA	Programmatic Agreement
ROD	Record of Decision
RPIC	Remote Pilot-In-Command
SEL	Sound Exposure Level
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Officer
THPO	Tribal Historic Preservation Officer
U.S.C.	United States Code
UCSB	University of California, Santa Barbara
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
USFWS	U.S. Fish and Wildlife Service
VLOS	Visual Line-of-sight
VO	Visual Observers
WR	Written Re-evaluation

Chapter 1
Purpose and Need

1.1 Introduction

DroneUp is a United States-based technology company that combines airspace solutions, web-based applications, and analytics platforms, providing drone delivery services to help companies operate at scale in last mile delivery. DroneUp has operated under 14 Code of Federal Regulations (CFR) Part 107, since October 2022. Operations are conducted within visual line-of-sight (VLOS) utilizing strategically placed visual observers (VOs[1]) for airspace deconfliction within a predefined radius of the operating base for its commercial deliveries. DroneUp has made an application to the Federal Aviation Administration (FAA) for a standard air carrier certificate[1] under 14 CFR Part 135 (Part 135)[2], which allows holders to conduct on-demand or scheduled (commuter) operations, and a 49 United States Code (U.S.C.) 44807 exemption[3] which allows DroneUp to operate for compensation or hire beyond visual line-of-sight (BVLOS), using its PRISM Unmanned Aircraft System (UAS), that provides a path for an airworthiness certification exemption for its UAS. DroneUp will operate BVLOS at the locations approved for operations conducted with an air carrier certificate under 14 CFR Part 135. DroneUp is the manufacturer of the UAS being used in these package delivery operations, the operator, and the system integrator.

DroneUp's Part 135 certificate will contain a condition that its drone package delivery operations must be conducted in accordance with the provisions and limitations specified in its Operations Specifications[4] (OpSpec). DroneUp is seeking to include the Dallas–Fort Worth (DFW) metropolitan (metro) area (see Figure 1-1) on DroneUp's B050 OpSpec*, Authorized Areas of En Route Operations, Limitations, and Provisions*.

DroneUp currently operates in 34 locations nationwide under 14 CFR Part 107. DroneUp is proposing to extend its unmanned aircraft (UA) retail package delivery to additional communities in the DFW metro area. DroneUp's intent is to offer service throughout the DFW area from a network of Hubs, where each Hub would serve a specific area, thereby avoiding an over-concentration of flights surrounding any given Hub. Under Part 135, DroneUp will operate 11 Hubs initially, and a maximum of 30 Hubs in the next two (2) years in the DFW area. The UA have a delivery range of approximately five (5) miles. DroneUp's Hubs would be located in established parking lots of commercial areas whose use is consistent with local zoning and land use requirements, such as shopping centers, large individual retailers, and shopping malls. See Figure 1-1 for initial Hub locations in the DFW metro area.

[1] An operating certificate is issued to an applicant that will conduct intrastate transportation, which is transportation that is conducted wholly within the same state of the United States.

[2] https://www.faa.gov/uas/advanced_operations/package_delivery_drone

[3] 49 U.S.C. § 44807; *Special Authority for Certain Unmanned Aircraft Systems*, provides the Secretary of Transportation with authority to determine whether a certificate of waiver, certificate of authorization, or a certificate under 49 U.S.C. §§ 44703 or 44704 is required for the operation of certain UAS.

[4] An Operations Specifications is a document that defines the scope of aircraft operations that the FAA has authorized.

For the initial Part 135 air carrier certificate effort, DroneUp will seek operational authority at the Murphy, TX location as described in this section, and shown in Figure 1-2, and will be expanding the Part 135 operations to the other ten (10) already identified locations described below in Table 1-1. Ultimately, DroneUp will operate up to 30 Hubs in the DFW metro area.

Figure 1-1 DroneUp Operating Area Map[5]

[5] The DroneUp Operating Area has a radius of 30 nautical miles.

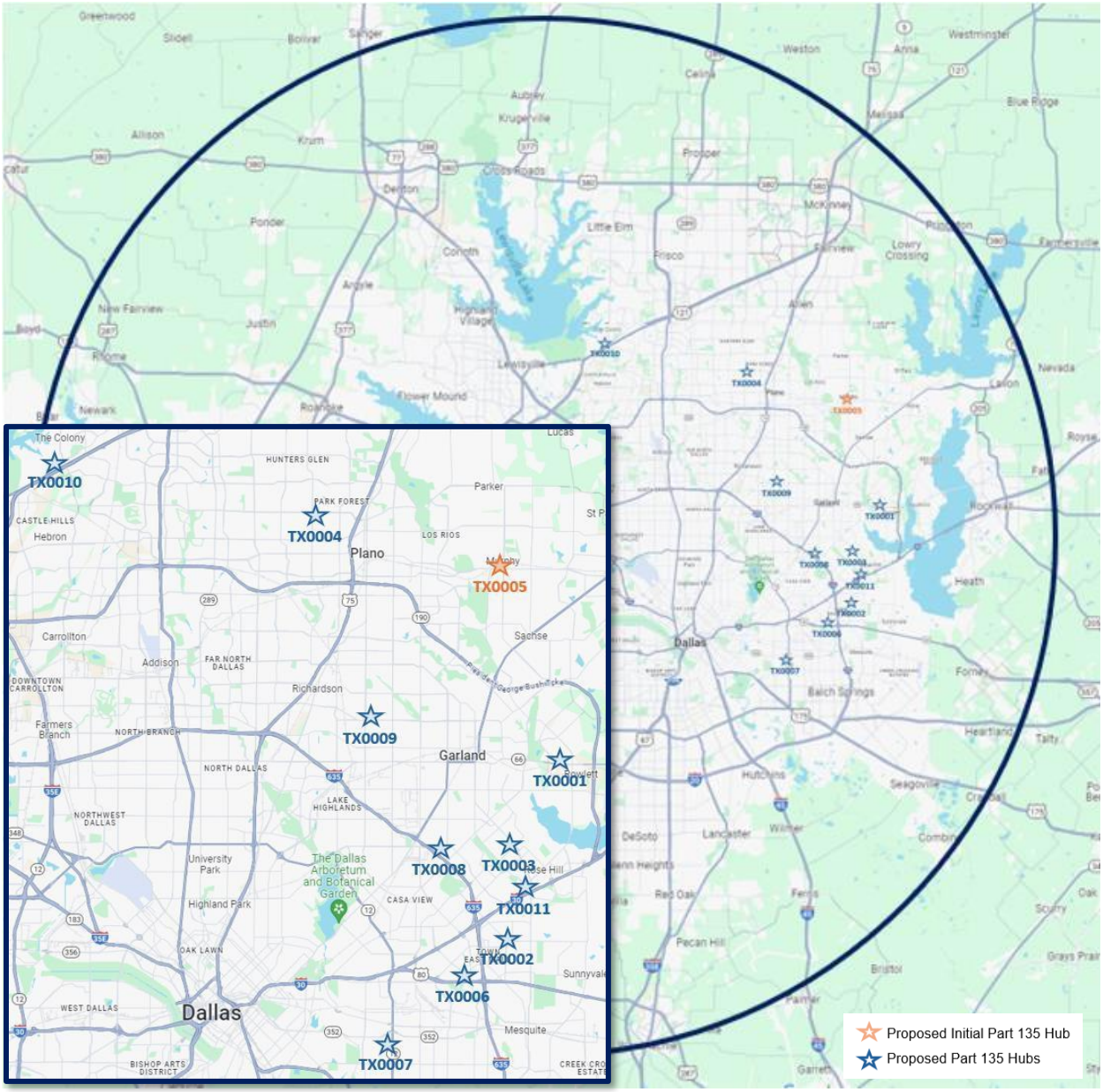

Figure 1-2 Initial Part 135 Hubs

Table 1-1 11 Initial Hub Locations

Location Name	Address	Coordinates
TX0001	2501 Lakeview Pkwy Rowlett, TX	32°54'38"N 96°34'40"W
TX0002	555 West Interstate 30 Garland, TX	32°50'25"N 96°35'39"W
TX0003	1801 Marketplace Dr Garland, TX	32°51'46"N 96°39'07"W
TX0004	3100 Custer Rd Plano, TX	33°02'21"N 96°43'52"W
TX0005	115 W Farm to Market 544 Murphy, TX	33°00'46"N 96°36'54"W
TX0006	915 Town E Blvd Mesquite, TX	32°48'47"N 96°36'36"W
TX0007	2827 S Buckner Blvd Dallas, TX	32°45'35"N 96°40'58"W
TX0008	2275 Gus Thomasson Rd Mesquite, TX	32°47'41"N 96°38'05"W
TX0009	1501 Buckingham Rd Richardson, TX	32°55'56"N 96°41'49"W
TX0010	4691 State Highway 121 Colony, TX	33°04'02"N 96°53'32"W
TX0011	3959 Broadway Blvd Garland, TX	32°51'52"N 96°36'25"W

Operations will initially be conducted in a 5-mile radius of 115 W Farm to Market 544, Murphy TX. The center point is approximately 33°00'46.26 N, 96°36'54.39 W with an elevation of 572 feet (see Figure 1-2). As operations expand to the other ten (10) sites listed in Table 1-1, there will be a 5-mile radius surrounding the additional locations.

The initial 11 operating locations will be in Class G[6] airspace below 400 'above ground level (AGL). The locations reside under a Class B shelf beginning at 4,000 feet, with the westernmost edge slightly extending into the 3,000 feet shelf. This area of operations resides within the DFW Mode C Veil.[7]

DroneUp's OpSpec would allow DroneUp to serve the DFW area using its UA. The FAA's issuance of the drone package delivery OpSpec B050, *Authorized Areas of En Route Operations, Limitations, and Provisions*, is considered a major federal action under the National Environmental Policy Act (NEPA)[8] and Council on Environmental Quality (CEQ) *NEPA–implementing regulations*[9] and requires an environmental review. FAA[10] and DroneUp in partnership developed this Environmental Assessment (EA) to evaluate the potential environmental impacts that might result from the proposed action. Under NEPA, federal agencies are required to consider the environmental effects of proposed federal actions and to disclose to decision-makers and the interested public a clear and accurate description of the potential environmental impacts of proposed major federal actions. Additionally, under NEPA, federal agencies are required to consider the environmental effects of a proposed action, the reasonable alternatives to the proposed action, and a no action alternative (assessing the potential

[6] Class G airspace (uncontrolled) is that portion of airspace that has not been designated as Class A, Class B, Class C, Class D, or Class E airspace.

[7] The airspace within 30 nautical miles of an airport listed in Appendix D, Section 1 of 14 CFR Part 91 (generally primary airports within Class B airspace areas), from the surface upward to 10,000 feet MSL. Unless otherwise authorized by ATC, aircraft operating within this airspace must be equipped with an operable radar beacon transponder with automatic altitude reporting capability and operable ADS-B Out equipment. See: https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap3_section_2.html

[8] 42 U.S.C. § 4321 et seq.

[9] 40 CFR Parts 1500–1508

[10] See 40 CFR § 1506.5(a)

environmental effects of not implementing the proposed action). The FAA has established a process to ensure compliance with the provisions of NEPA through *FAA Order 1050.1F, Environmental Impacts: Policies and Procedures* (FAA 2015).

DroneUp is expecting the maximum number of daily operations per Hub to be 500 flights per day to meet community demand as awareness and utilization of drone delivery increases in response to expanded availability. However, as all air carriers experience, daily operations could be impacted by weather, operational, or technical matters. DroneUp currently utilizes two (2) Hub configurations: The Mobile Hub and the Standard Hub. The Mobile Hub is used when rapid deployment of a Hub is requested (e.g., special events), or when establishing a new DroneUp Hub. Mobile Hub locations will comply with city/county zoning requirements. The Standard Hub is the long-term solution of DroneUp delivery operations. Regardless of layout, criteria for determining operational area safety remains the same. Takeoff and landing areas will be clearly demarcated by signs, ropes, cones, or other similar means, and shall be roughly square, with an internal area of no less than 256 square feet (16' x 16'). The area will be cordoned off to prevent intrusions by non-authorized persons. Should this area be breached by nonparticipants at any time, a crewmember on site should intercept the visitor to ensure they are aware that it is a safety-sensitive area and escort the nonparticipant to safety. During operations at a Mobile Hub, assigned crew members are situated at the ground level inside the operations area. At the Standard Hub facilities, a delivery specialist or VO may be located on the ground during a flight.

1.2 FAA Role and Federal Action

In general, Congress has charged the FAA with the safety of air commerce in the United States and to encourage the development of civil aeronautics. The FAA provides multiple approvals associated with package delivery proposals, such as a waiver of 14 CFR § 91.113(b) to enable BVLOS operations, and a Certificate of Waiver or Authorization; however, the FAA's issuance of an OpSpec (or amended OpSpec) to include package delivery flights in a specified operating area is the approval that ultimately enables UA operations.

In addition, the FAA has specific statutory and regulatory obligations related to its issuance of a Part 135 certificate and the related OpSpecs. The FAA is required to issue an air carrier certificate to an air carrier when it *"finds, after investigation, that the person properly and adequately is equipped and able to operate safely under this part and regulations and standards prescribed under this part."* An air carrier certificate also specifies *"terms necessary to ensure safety in air transportation; and…the places to and from which, and the airways of the United States over which, a person may operate as an air carrier."* Also included in air carrier certificates is a stipulation that the air carrier's operations must be conducted in accordance with the provisions and limitations specified in its OpSpecs.[11] The regulations also specify that a Part 135 certificate holder may not operate in a geographical area unless its OpSpecs specifically authorizes the certificate holder to operate in that area.[12] If the FAA approves the OpSpecs, coordination with the certificate holder regarding its implementation will occur and the OpSpecs is effective on the date the FAA approves it.[13]

[11] https://www.faa.gov/licenses_certificates/airline_certification/135_certification/general_info

[12] 14 CFR § 119.5(j)

[13] 14 CFR § 119.51(c)

The regulations implementing 49 U.S.C. § 44705[14] specify that an air carrier's approved OpSpecs must include, among other things, "*authorization and limitations for routes and areas of operations*."[15] An air carrier's OpSpec may be amended at the request of an operator if the FAA "*determines that safety in air commerce and the public interest allows the amendment*." After making this determination, the FAA must take an action on the OpSpec amendment.

1.3 Purpose and Need

DroneUp is proposing to expand its current area of operations for UA commercial delivery service throughout the DFW metro area which DroneUp, in its business judgment, has determined is an appropriate market for expansion. DroneUp's proposal is to begin full-scale commercial UA delivery operations in the DFW metro area, which is further discussed in Section 2.2, *Proposed Action.* DroneUp's initial Part 135 operations will begin in Murphy, Texas for UA delivery services.

Operating as a good steward of the communities served and fostering acceptance of the drone industry is critical to successful integration. DroneUp has a long history of early engagement with communities. For DroneUp's Community Outreach Plan, see Appendix B.

The purpose of the proposed action is related to the FAA's role and responsibility to review applications for safe flight and certification under Part 135. The proposed action is needed to meet consumer demand for package deliveries in the DFW area as identified by DroneUp and to implement BVLOS for those drone package delivery operations.

1.4 Public Involvement

The FAA created a Notice of Availability (NOA) with information about the draft EA and provided it to local, state, and federal officials, interest groups, and federally recognized tribes. The NOA was provided in English and Spanish. The FAA also announced availability of the draft EA for public review via FAA's social media and an advertisement in the Dallas Observer, Dallas Morning News, and Fort Worth Star-Telegram newspapers. The NOA provides information about the proposed action and requests public review and comments on the draft EA, which was published on the FAA's website[16] for a 30-day comment period from August 7 to September 6, 2024. Interested parties were invited to submit comments on any environmental concerns related to the proposed action. Public comments and FAA responses can be found in Appendix L.

[14] 49 U.S.C. § 44705

[15] 14 CFR § 119.49(a)(6)

[16] https://www.faa.gov/uas/advanced_operations/nepa_and_drones

Chapter 2
Proposed Action and Alternatives

FAA *Order 1050.1F*, *Environmental Impacts: Policies and Procedures*, Paragraph 6-2.1(d) states that*, "[a]n EA may limit the range of alternatives to the proposed action and no action alternative when there are no unresolved conflicts concerning alternative uses of available resources."* The FAA has not identified any unresolved conflicts concerning alternative uses of available resources associated with DroneUp's proposal. Therefore, this EA only considers the proposed action and the no action alternative.

2.1 No Action Alternative

The CEQ *NEPA Implementing Regulations,* requires agencies to consider a no action alternative in their NEPA reviews to compare the environmental effects of not taking action with the effects of the action alternative(s).[17] Thus, the no action alternative serves as a baseline to compare the impacts of the proposed action. Under the no action alternative, the FAA would not approve an OpSpec under Part 135 to expand DroneUp package delivery operations in the DFW area. There would be no change to current DroneUp package delivery operations in the DFW area. DroneUp could continue operating its PRISM UA within Murphy under Part 107[18], which includes up to 110 deliveries per day, and at other locations, which limits operations to UA weighing less than 55 pounds and within VLOS. For Part 107 operations, DroneUp is conducting its flights between 7 AM and 10 PM local time. Consumers in the areas not served by UA would be expected to continue to use personal ground transportation to retrieve small goods using their automobiles or in some cases with public transportation, if available. This alternative does not support the stated purpose and need.

2.2 Proposed Action

The proposed action is to enable DroneUp to conduct drone package delivery operations in the DFW area under Part 135. The proposed action is needed to meet consumer demand for package deliveries in the DFW area as identified by DroneUp and to implement BVLOS for those drone package delivery operations. The major federal action is the FAA approval of DroneUp's B050 OpSpec*, Authorized Areas of En Route Operations, Limitations, and Provisions*. Once approved, a reference section titled *Limitations, Provisions, and Special Requirements* will be created in the OpSpec. The new OpSpec will include a paragraph with descriptive language about the DFW operating area boundaries shown in Figure 1-1. This would allow DroneUp to expand the geographic scope of new Hub locations as well as increase their number of daily operations from 110 to 500 deliveries per day from each Hub. 500 flights per day is the estimated maximum number of daily operations per Hub. DroneUp is projecting to establish up to 30 Hubs (11 locations have been initially predetermined, see Table 1-1) in the DFW operating area under the scope of the proposed action. The 30 Hubs may be a combination of standard and mobile Hubs. If, in the future, DroneUp wanted to exceed 30 Hubs in the operating area, additional safety and

[17] 40 CFR § 1502.14.

[18] *The Operation of Small Unmanned Aircraft Systems Over People* rule (codified in 14 CFR Part 107) permits routine operation of small UAS (UAs weighing less than 55 pounds) within visual line of sight at night and over people without a waiver or exemption under certain conditions.

environmental review would be required. Operations, including Hub placement and all UA flights, would be confined to the operating area depicted in Figure 1-1. Operations would occur up to seven (7) days per week for a conservative total of 312 days per year (operations would generally exclude days with severe weather), which equates to 428 deliveries on an Average Annual Day (AAD) basis.

Hubs would be distributed throughout the DFW metro area following a measured rollout plan to be developed with DroneUp's partners and continuing best practices from DroneUp's established community outreach program. DroneUp's Hubs would be located in established parking lots of commercial areas whose use is consistent with local zoning and land use requirements, such as shopping centers, large individual retailers, and shopping malls. To avoid the potential for significant noise impacts, DroneUp would site its Hubs at least 558 feet away from a noise-sensitive area[19] when the Hub is located within the controlled surface area of Class B[20] and Class D airspace (refer to Figure 2-1) and at least 119 feet away from a noise-sensitive area in all other areas within the study area, which is defined as DroneUp's proposed operating area (see Figure 1-1). Stand-off distances may be greater, and is discussed in detail in Chapter 3.6, *Noise and Noise-Compatible Land Use*.

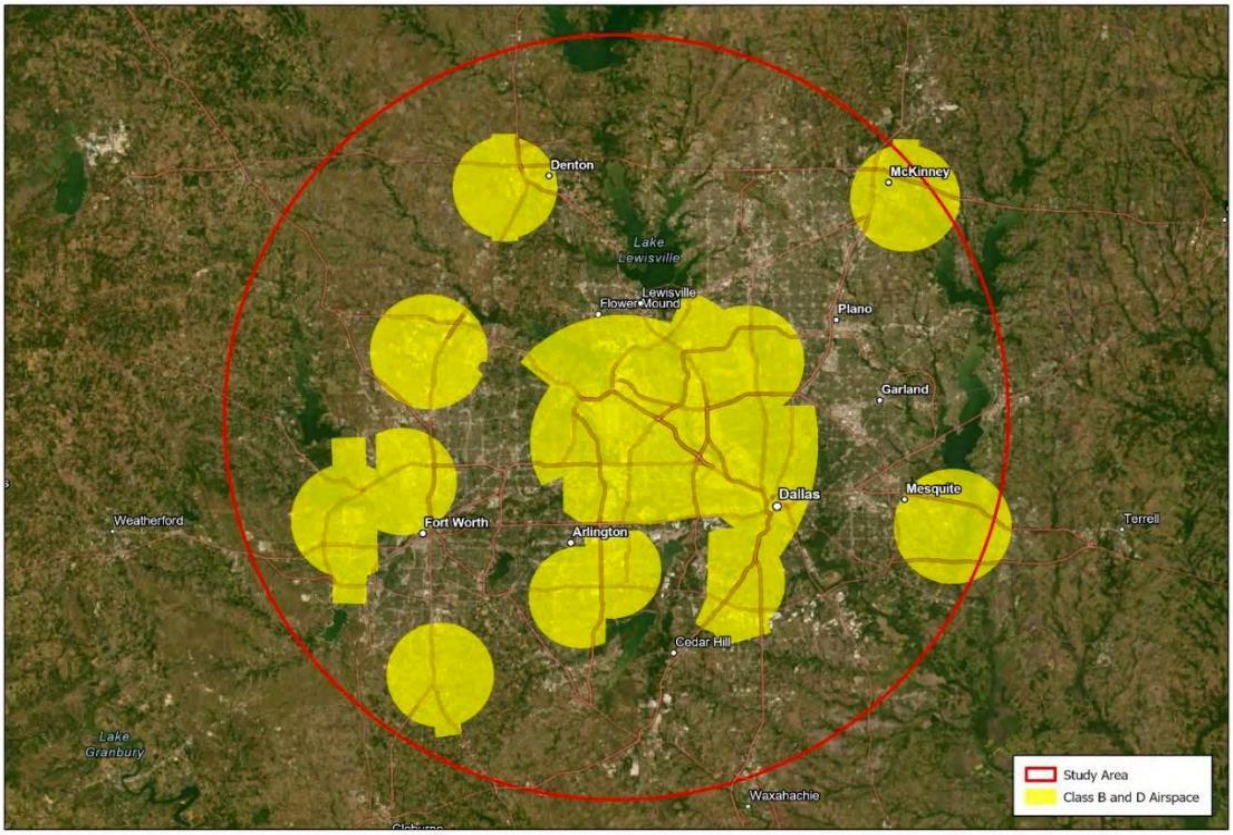

Figure 2-1 Class B and D Airspace

[19] *A noise-sensitive area* is an area where noise interferes with normal activities associated with its use. Normally, *noise-sensitive areas* include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife and waterfowl refuges, and cultural and historical sites. (FAA Order 1050.1F, Paragraph 11-5.b (10).)

[20] Class B airspace is generally airspace from the surface to 10,000 feet mean sea level (MSL) surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. Class D airspace is generally airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. For more information. See: https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap3_section_2.html

Each Hub would serve an area with a five (5)-mile radius. Operations are to be conducted from 7 AM to 10 PM local time. Aircraft flown during civil twilight[21] or at night shall be equipped with Light Emitting Diode (LED) position lights and anti-collision lights. Green lights are installed on the rear of the aircraft and red lights are installed on the front. In addition to the LED position lights, the aircraft shall be equipped with an anti-collision light system visible for at least three (3) statute miles. These lights can be any color as long as they are visible for at least three (3) statute miles. The UA is equipped with directional awareness lights, red solid LED lights on each of the front motor arms and green solid LED lights on each of the rear motor arms. These directional awareness lights are automatically powered for all operations. During night operations, the takeoff and landing area shall be illuminated to ensure operational safety and enhanced situational awareness, and to ensure that the Remote Pilot-In-Command (RPIC) is able to safely determine the takeoff/touchdown area is clear and avoid obstacles before takeoff and landing. At the point of intended delivery, a spotlight is activated to ensure descent and delivery are accomplished safely.

Each Hub would contain multiple aircraft takeoff and landing pads. The estimated total distance flown for deliveries would vary depending upon the Hub and drop-off locations in the operating area. Each flight would take a package to a customer delivery address before returning to the Hub. There would be variability in the number of flights per day based on customer demand and weather conditions. Deliveries would be conducted at the time of the customer's choosing and directly to the customer's home in the operating area.

DroneUp's flight planning software, FlightOps Operating System (O/S),[22] can automatically avoid identified schools (preschools, elementary, middle, and high school), or daycare with outdoor facilities based on the type of resource, time of day, and other factors. The selected operating areas are mapped by the DroneUp UAS Implementation team prior to start of operations. Higher risk areas such as public parks, schools, and other areas are marked off with a No-Fly Zone (NFZ) to ensure the aircraft strategically avoids these areas. FlightOps O/S auto populates the best route of flight and operators then have the ability to ensure strategic routing is used to shield as much as practical. Any flight over people or moving vehicles is considered momentary, incidental, and non-sustained.

2.2.1 Unmanned Aircraft Specifications

The primary UA used for these deliveries is DroneUp's PRISM V2 Series, which features a multirotor design with eight (8) propellers. The UA[23] weighs 55 pounds when combined with its maximum payload weight of 10 pounds. It has a wingspan of approximately 71.5 inches, a height of approximately 32 inches, and a length of approximately 71.5 inches. Power for flight is supplied by two (2) 12 cell Lithium-Ion Polymer (LiPo) Battery

[21] According to the National Oceanic and Atmospheric Administration (NOAA) National Weather Service, civil twilight begins in the morning, or ends in the evening, when the geometric center of the sun is 6 degrees below the horizon. Therefore, morning civil twilight begins when the geometric center of the sun is 6 degrees below the horizon, and ends at sunrise. Evening civil twilight begins at sunset, and ends when the geometric center of the sun is 6 degrees below the horizon (National Oceanic and Atmospheric Administration National Weather Service).

[22] The software uses powerful and automated mission planning to create dynamic flight paths for deliveries to business or residential addresses. The platform can leverage its smart algorithms to optimize flight routes, avoid air and ground obstacles, no-fly zones, and other airspace restrictions. It can also deconflict multiple flight missions that are being operated in shared airspace.

[23] The UAs are primarily composed of aluminum, carbon fiber, and nylon.

Packs. While the aircraft is compatible with a range of batteries, Part 135 operations will only be conducted with two (2) 12 cell 12,000 mAh LiPo batteries. The PRISM UA is shown in Figure 2-2.

Figure 2-2 DroneUp PRISM V2 Series UAS

Using see and avoid techniques, the RPIC and strategically placed VOs effectively clear the airspace of potential conflicts in accordance with 14 CFR §91.113. VOs provide additional situational awareness to the RPIC with the VOs placed for adequate airspace deconfliction. VOs scan the airspace in incremental sections, working across their area of responsibility. At night, VOs scan, looking off-center to compensate for the nighttime blind spot at the center of their field of vision. While traffic in the area will be monitored by the VOs scanning the airspace, the aircraft is also equipped with a camera as well as Automatic Dependent Surveillance–Broadcast (ADS-B) In data from the PX4 Traffic Avoidance System[24] to receive alerts for cooperative aircraft. The alert issued gives the tail number, the aircraft's heading, and the distance in meters from the aircraft giving the RPIC adequate information to respond if necessary. The PRISM V2 Series aircraft can pause and hover to yield right-of-way as required by 14 CFR §107.37, land in place, or return to its launch/landing point if traffic is seen in the vicinity or an alert is issued via the Auterion Mission Control (AMC) for cooperative aircraft. This deconfliction shall be monitored both by the ADS-B alerts and the VOs relaying any potential information to the RPIC as to traffic in the area via two-way radio communication. As an additional layer of operational redundancy, operators can use the AMC ground control station application to control the aircraft in flight as well as settings for the aircraft. The PRISM UA in flight with a package attached is shown in Figure 2-3.

[24] PX4 can use ADS-B to support simple air traffic avoidance in missions. If a potential collision is detected, PX4 can warn, immediately land, or return.

Figure 2-3 DroneUp PRISM V2 Series UAS with Package Attached

2.2.2 Flight Operations

The UA would generally be operated at an altitude of 230-250 feet AGL and always below an altitude of 400 feet AGL. At a delivery location, the UA would descend vertically to a stationary hover at 80-120 feet AGL (typically 80 feet) and lower a package to the ground by a retractable line for delivery. Once a package has been lowered to the ground, the UA would then retract the line, ascend vertically to a cruise altitude, and depart the delivery area en route back to a Hub. The UA would fly a predefined flight path that is set prior to takeoff. Flight missions are automatically planned by DroneUp's flight planning software. A mission originates from a Hub location, and DroneUp's software automatically assigns, deconflicts, and routes each flight to the delivery location and back to a Hub. Each Hub site would include a controlled area wherein UA flights are launched and recovered. A typical flight profile can be broken into the following general five flight phases as shown in Figure 2-4:

- Takeoff,
- En route outbound,
- Delivery,
- En route inbound, and
- Landing.

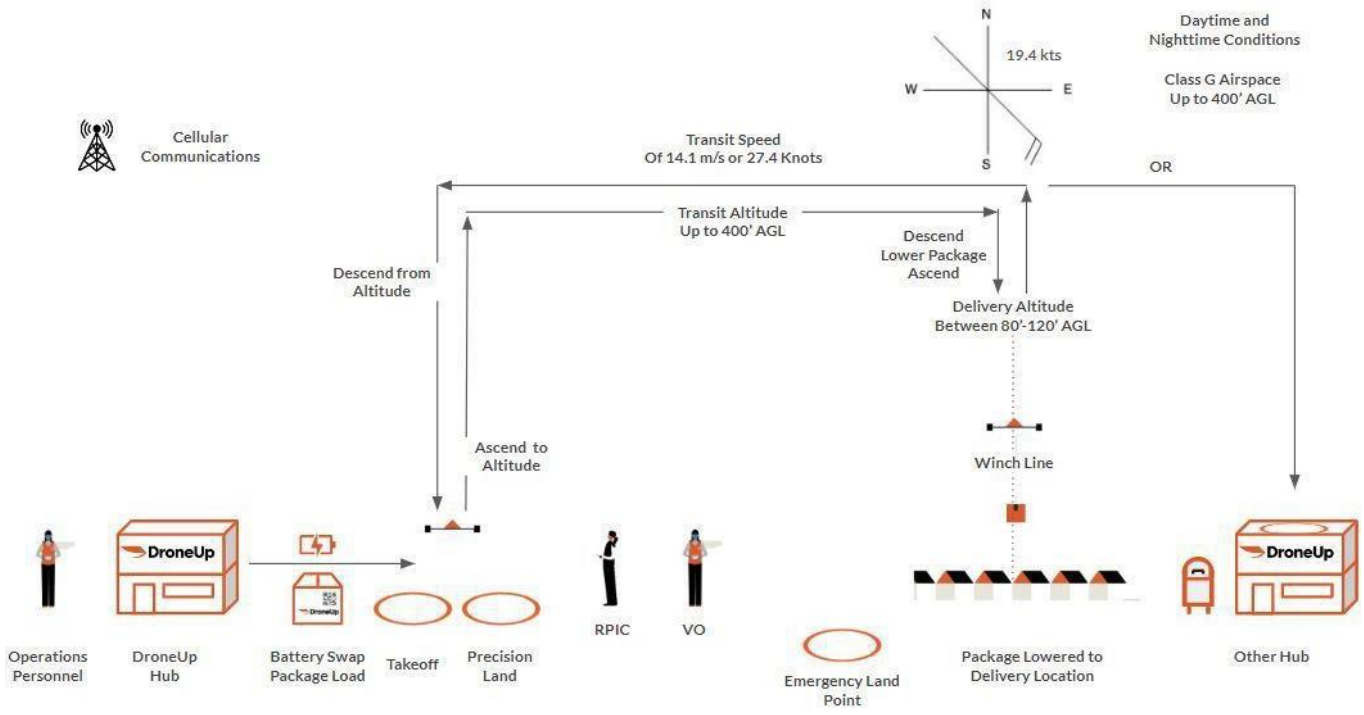

Figure 2-4 DroneUp Storyboard

2.2.2.1 Takeoff

Prior to takeoff, the package is loaded. During takeoff, the aircraft ascends to its en route altitude, 230-250 feet AGL, (the altitude for the duration of the flight). It will pause momentarily after reaching the en route altitude before moving towards the delivery site.

2.2.2.2 En Route Outbound

The en route outbound phase is the part of flight in which the fully loaded UA transits from the Hub to a delivery point on a predefined flight path. During this flight phase, the UA would typically operate at an altitude of 230-250 ft AGL and airspeed of 31.5 miles per hour (mph), 27.4 knots. UA has a single set cruise speed which is controlled and limited by the flight control software that will ensure the cruise airspeed limit is not exceeded.

2.2.2.3 Delivery

The delivery phase consists of descent from the en route altitude to a delivery point, such as a residential yard, driveway, parking lot, or common area. The UA descends vertically to 80 feet AGL while maintaining position over the delivery point. The UA hovers at 80 feet AGL for approximately 1 minute while lowering its package and then proceeds to climb vertically back to en route altitude. The minimum distance a human should be from the UA during delivery is a 6-foot radius from underneath the center of the UA. The delivery winch[25] system was created exclusively for use with the PRISM V2 Series UAS. The delivery winch is capable of delivering up to a 10-

[25] The delivery winch is capable of delivering up to a 10lb package from 125 ft in the air with the press of a button. This allows the drone to remain in a hover at a safe altitude while staying away from potential hazards closer to the ground.

pound package from an altitude of up to 125 ft. This allows the drone to remain in a hover at a defined altitude of 80 feet, per DroneUp policy, while staying away from potential hazards closer to the ground. The winch executes a delivery completely autonomously after the delivery command is transmitted and returns the delivery hook in under one minute. Prior to loading a package onto the payload delivery system, a trained and approved crewmember must ensure the weight is below the maximum allowable threshold by weighing the package in its packed condition.

2.2.2.4 En Route Inbound

The UA continues to fly at an altitude of 230-250 ft AGL and a speed of 31.5 mph, or 27.4 knots, towards the Hub. FlightOps O/S auto populates the best route of flight and operators then have the ability to ensure strategic routing is used to shield as much as practical.

2.2.2.5 Landing

Upon reaching the Hub, the UA slowly descends over its assigned landing area, and lands on the ArUco Tag (Figure 2-5). The aircraft will land with the Realsense camera centered over the tag itself, therefore the 4 feet "downwards" from the tag must be clear for the main body of the aircraft. The UAS is programmed to search for, and land on, one specific tag pattern, ensuring the aircraft always finds its own safe landing area. The ArUco tag for that aircraft is placed in the takeoff/landing area during preflight and remains present until the end of operations.

The PRISM V2 series utilizes an Intel Realsense Depth Camera D455 to locate the ArUco tag and help position the aircraft above it for precision landing. When precision land mode is engaged, either automatically during an automated flight, or manually by an RPIC or operator, the Realsense camera will search for the tag, lock the location, and the PX4 autopilot will use this visual information to automatically maneuver the aircraft over the ArUco tag, both in orientation and position. The aircraft will then descend (Figure 2-6), using the Realsense camera to keep centered on the ArUco tag, engaging land mode once within inches of the ground.

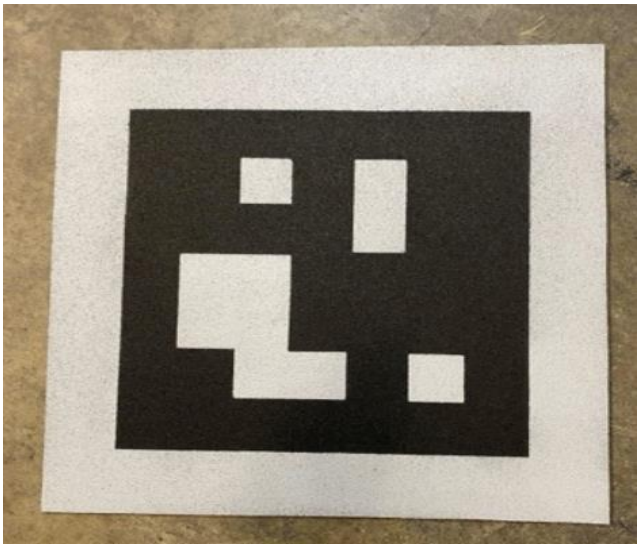

Figure 2-5 Takeoff and Landing Area ArUco Tag

Figure 2-6 PRISM V2 Series UAS Landing

Chapter 3
Affected Environment and Environmental Consequences

3.1 Introduction

This chapter provides a description of the affected environment and potential environmental consequences for the environmental impact categories that have the potential to be affected by the no action alternative and proposed action, as required by CEQ's *NEPA Implementing Regulations* and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (FAA 2015). As required by FAA Order 1050.1F, this EA presents an evaluation of impacts for the environmental impact categories listed below:

- Air quality
- Biological resources (including fish, wildlife, and plants)
- Climate
- Coastal resources
- Department of Transportation Act, Section 4(f)
- Farmlands
- Hazardous materials, solid waste, and pollution prevention
- Historical, architectural, archaeological, and cultural resources
- Land use
- Natural resources and energy supply
- Noise and noise-compatible land use
- Socioeconomics, environmental justice, and children's environmental health and safety risks
- Visual effects (including light emissions)
- Water resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)

The study area evaluated for potential impacts is defined as DroneUp's proposed operating area shown in Figure 1-1. The level of detail provided in this chapter is commensurate with the importance of the potential impacts (40 CFR § 1502.15[26]). EAs are intended to be concise documents that focus on aspects of the human environment that may be affected by the proposed action.

3.2 Environmental Impact Analysis

3.2.1 Environmental Impact Categories Not Analyzed in Detail

This EA did not analyze potential impacts on the following environmental impact categories in detail because the proposed action would not affect the resources included in the category (see FAA Order 1050.1F, Paragraph 4-2.c).

[26] See 40 CFR § 1502.15 *Affected Environment*

- **Coastal Resources:** The proposed action would not directly affect any shorelines or change the use of shoreline zones and be inconsistent with any NOAA approved state Coastal Zone Management Plan (CMZ) as there are no shorelines in the area of operations. In 1997, the Texas Coastal Management Program (CMP), administered by the Texas General Land Office (GLO), became a federally approved member of the CZM Program. The Texas CMP is a "networked program" that links together the existing regulations, programs, and local, state, and federal entities that manage various aspects of coastal resource uses. The study area is approximately 275 miles from the nearest shoreline in the Gulf of Mexico.
- **Farmlands:** The proposed action would not involve the development or disturbance of any land regardless of use, nor would it have the potential to convert any farmland to non-agricultural uses. The proposed action would not affect designated prime or unique farmlands.
- **Hazardous Materials, Solid Waste, and Pollution Prevention:** The proposed action would not result in any construction or development or any physical disturbances of the ground. Therefore, the potential for impact in relation to hazardous materials, pollution prevention, and solid waste is not anticipated. The only hazardous materials used in the UA manufacture and operation are lithium-polymer batteries. Each DroneUp UA will be properly managed at the end of its operating life in accordance with 14 CFR Part 43. Any hazardous materials would be disposed of in accordance with all federal, tribal, state, and local laws, including 40 CFR Part 273, *Standards for Universal Waste Management*.
- **Land Use:** The proposed action does not involve any changes to existing, planned, or future land uses within the area of operations. DroneUp would use current infrastructure, such as parking lots, to conduct its operations. Land use and zoning are typically governed by local and state laws. DroneUp is responsible for complying with any such applicable laws relevant to establishing its operations (e.g., siting drone Hubs and related infrastructure). All Hub locations would be sited in accordance with all local land use ordinances and zoning requirements. Local jurisdictions in the DFW metro area may vary in the scope of their review and approval of commercial operations. Further, Section 2.2, *Proposed Action,* identifies the stand-off distances as 558 feet from noise-sensitive areas.
- **Natural Resources and Energy Supply:** The proposed action would not require the need for unusual natural resources and materials, or those in scarce supply. DroneUp's aircraft would be battery powered and would not consume fossil fuel (e.g., gasoline or aviation fuel) resources. DroneUp would use battery chargers to charge the batteries of the UA at Mobile Hubs, power may be generated via a diesel generator. In addition, DroneUp's electrically powered aircraft is most often used to replace individual personal automobile trips to retrieve small goods and would therefore be expected to reduce consumption of fuel resources; a 2020 study found that by year 5 of drone operations in a single U.S. metropolitan area, drone delivery could avoid up to 294 million miles per year in road use (Lyon-Hill et al. 2020[27]).
- **Socioeconomics and Children's Environmental Health and Safety Risks:** The proposed action would not involve acquisition of real estate, relocation of residents or community businesses, disruption of local traffic patterns, loss in community tax base, or changes to the fabric of the community. Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to ensure that children do not suffer disproportionately from environmental or safety risks. The proposed action would not affect products or substances a child would be likely to come into contact with, ingest, use, or be exposed to, and would not result in environmental health and safety risks that could disproportionately affect children. It is not anticipated that the proposed action would pose a greater health and safety risk to children than package delivery by other means (truck, mail, personal automobile trips, etc.). Higher risk areas to be avoided such as public parks, schools, and other areas are marked off with a NFZ to ensure the aircraft strategically avoids these areas, which includes operations near schools (Monday – Friday) during operational hours, which

[27] Ibid., 3-2

will help reduce the potential for environmental health or safety impacts to children. DroneUp's electrically powered aircraft is most often used to replace individual personal automobile trips to retrieve small goods and could therefore reduce noxious emissions and improve road safety, which are both appreciable concerns for children.

- **Visual Effects (Light Emissions Only):** The proposed action would not result in significant light emission impacts, due to the limited number of night flights. No more than 15-20 percent of DroneUp's operations will occur at night.
- **Water Resources (Wetlands, Floodplains, Surface Water, Groundwater, and Wild and Scenic Rivers):** The proposed action would not result in the construction of facilities and would therefore not encroach upon areas designated as navigable waters, wetlands, or floodplains. The proposed action would not affect any waters of the U.S. The proposed action would not result in any changes to existing discharges to water bodies, create a new discharge that would result in impacts on surface waters, or modify a water body. The proposed action would not degrade water quality or contaminate public drinking water supplies. The proposed action does not involve activities that would withdraw groundwater from underground aquifers or reduce infiltration or recharge to groundwater resources through the introduction of new impervious surfaces. The closest wild and scenic river to the study area is the Cossatot River in Arkansas, approximately 150 miles northeast of the study area (National Park Service 2024). The closest Nationwide Rivers Inventory (NRI) river segment is the Brazos River[28] approximately 22 miles west of the study area (National Park Service 2024). Therefore, Hub establishment and operations would not affect a wild and scenic river or river on the Nationwide Rivers Inventory. The proposed action does not have the potential to disrupt the free-flowing character of any designated wild and scenic river. Therefore, the proposed action would not affect wetlands, floodplains, surface water, groundwater, or wild and scenic rivers.

3.2.2 Environmental Impact Categories Analyzed in Detail

This EA analyzed potential impacts on the following environmental impact categories in detail because the proposed action may potentially affect the resources included in the category (see FAA Order 1050.1F, Paragraph 4-2.c).

- Air quality and climate
- Biological resources (including fish, wildlife, and plants)
- Department of Transportation Act, Section 4(f)
- Historical, architectural, archaeological, and cultural resources
- Noise and noise-compatible land use
- Environmental justice
- Visual effects

3.3 Air Quality and Climate

3.3.1 Definition of Resource and Regulatory Setting

Under the Clean Air Act (CAA), the EPA developed the National Ambient Air Quality Standards (NAAQS) for six common air pollutants. These criteria air pollutants are carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter (PM), sulfur dioxide (SO2), and lead (Pb). The EPA determined that these criteria air pollutants may harm human health and the environment, and cause property damage.

[28] https://www.nps.gov/subjects/rivers/texas.htm

According to the CAA, the NAAQS are applicable to all areas of the United States and associated territories. For the poor air quality regions that have ambient concentrations of criteria pollutants above the NAAQS, the EPA has designated these areas as not being in attainment of the NAAQS, or "nonattainment areas." Each nonattainment area is required to have an applicable State Implementation Plan (SIP) that prescribes mitigation measures and timelines necessary to bring ambient concentrations of criteria pollutants below the NAAQS. When a nonattainment area attains the NAAQS, EPA designates the area as a "maintenance area" because the applicable SIP ensures that the ambient concentrations of criteria pollutants do not increase above the NAAQS again.

For aviation-related Federal actions planned to occur in a nonattainment or maintenance area, the proposed impacts to air quality must conform to the conditions of the applicable SIP, also known as General Conformity. DroneUp consulted with a Texas Commission on Environmental Quality (TCEQ) representative, and received direction on the correct non-attainment and maintenance designations for the DFW area in accordance with the *Dallas-Fort Worth (DFW) area counties NAAQS compliance*[29], in accordance with TECQ guidance.

3.3.2 Affected Environment

The current status of air quality attainment in the Dallas-Fort Worth metropolitan area is provided in Table 1 of the air emissions analysis in Appendix K. The DroneUp operating area includes the following counties or portions of these counties: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise. As shown in Table 1, these areas are in attainment with the NAAQS established for carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM_{10}, $PM_{2.5}$), and sulfur dioxide (SO_2). The following nine counties are in serious non-attainment for the 2015 eight-hour ozone (O_3) NAAQS of 0.070 ppm: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Tarrant, and Wise. The following ten counties are in severe non-attainment for the 2008 eight-hour ozone (O_3) NAAQS of 0.075 ppm: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise. A portion of Collin County is in maintenance for the 2008 rolling 3-month average NAAQS for lead (Pb), as well as for the 1978 quarterly average NAAQS for lead.

3.3.3 Environmental Consequences

3.3.3.1 No Action Alternative

Under the no action alternative, DroneUp would continue to operate its PRISM V2 Series under Part 107 in northeastern DFW area but would not establish new hubs or operate under Part 135. DroneUp completed an air emissions analysis, found in Appendix K. The following assumptions were made for the no action alternative air emission calculations:

- Generators operate 15 hours per day based on operations from 7AM to 10PM;
- 11 mobile hubs which utilize generators in the area currently;
- 312 operating days per year.

All generators approved for use are EPA Tier 4 Final certified for emissions.

As described in Appendix K, the analysis confirms that the emissions for air pollutants under the No Action Alternative provided in Table 11 are less than the nonattainment general conformity de minimis emission levels for VOC and NOx and maintenance general conformity de minimis emission levels for Pb provided in Tables 3 and 4, respectively. Therefore, the no action alternative is not expected to result in significant effects.

[29] https://www.tceq.texas.gov/airquality/sip/dfw/dfw-status

3.3.3.2 Proposed Action

The UA is battery powered and does not generate emissions that could result in significant air quality impacts or climate impacts. Electricity consumed for battery charging at the Hubs would be minimal. Electricity consumed for the proposed action at standard Hubs would come from the power grid. In the event of a power outage at a standard Hub, DroneUp will not utilize partner power sources or their backup generators. DroneUp may use the generators used for mobile Hubs as a back-up power source. Power will be generated via one (1) diesel generator[30] at a Mobile Hub. Estimated run time will be concurrent with operations. Currently, DroneUp operates 10 Mobile Hubs, with the intent to transfer all operations to standard Hubs in the next two (2) years. The following assumptions were made for the proposed action alternative air emission calculations:

- Generators operate 15 hours per day based on operations from 7AM to 10PM;
- 30 mobile hubs which utilize generators;
- 312 operating days per year.

All generators approved for use are EPA Tier 4 Final certified for emissions.

Using the worst-case emission levels as per 40 CFR Part 1039, all generators under the proposed action are estimated to produce no more than 19.64 short tons/year of nonmethane hydrocarbons (NMHC) and nitrogen oxides (NOx). All generators under the no action alternative are estimated to produce no more than 7.2 short tons/year of NMHC and NOx. The net emissions for NMHC and NOx are estimated to be no more than 12.44 short tons/year between the proposed action and the no action alternative. This is less than the de minimis emission level of 25 tons/year for either VOC or NOx. The maximum estimated emissions for Pb is 0.08 tons per year. This conservatively assumes all particulate matter emissions are Pb. The de minimis emission level for maintenance status for Pb is 25 tons per year. The maximum estimated emissions for Pb is below the emission threshold.

Table 3-1 Net Emission Mass, Tons per Year, Dallas-Fort Worth Area versus De Minimis Thresholds

Generator	CO (short ton/year)	NMHC, NOx (short ton/year)	Particulate Matter (short ton/year)	Non-attainment De Minimis Threshold, VOC or NOx (ton/year)	Maintenance De Minimis Threshold, CO or PM (ton/year)	Maintenance De Minimis Threshold, Lead (ton/year)
MDG25IF4	14.56	12.44	0.08	25	100	25
SDG25S-8E1	10.78	9.21	0.06	25	100	25
DCA25SSIU4F	10.78	9.21	0.06	25	100	25
G25 T4F	10.51	8.98	0.06	25	100	25
MMG25IF4	14.56	12.44	0.08	25	100	25

Appendix K confirms that the net emissions for air pollutants are below the nonattainment general conformity de minimis emission levels for VOC, NOx, and maintenance general conformity de minimis emission levels for Pb. It is worth noting that the air pollutant emissions mass from the proposed action without subtracting the no action alternative air pollutant emissions mass is below the de minimis levels for all pollutants. These emissions would be minimal and are not expected to contribute to any exceedance of National Ambient Air Quality Standards[31] or *Nonattainment Areas General Conformity De Minimis Emission Levels* in 40 CFR § 93.153. Therefore, a conformity determination is not required and the proposed action alternative is not expected to result in significant effects.

[30] https://www.generac.com/globalassets/products/business/mobile-power--light-solutions/mobile-generators/spec-sheets/mdg25if4_diesel-generator_spec-sheet_english.pdf
[31] https://www.epa.gov/naaqs

Based on a 2020 study of drone delivery operations, by year five (5) of operations drones were projected to replace between 15.0 percent of total delivery miles previously made by automobiles in Cedar Park TX, or between 32 million miles and 75.5 million miles. The same study projected that by year five (5) of operations drones were projected to replace between 15.9 percent and 18.7 percent of total delivery miles previously made by automobiles in Crestview TX, or between 45.7 million miles and 96.0 million miles. (Lyon-Hill et al. 2020[32]). The proposed action is expected to decrease emissions from delivery services that contribute to greenhouse gases (GHG) emissions. The decreased emissions would have positive effects on climate change as the proposed action would replace vehicle miles traveled by GHG emitting vehicles. UA operations are not expected to be impacted by climate change impacts (e.g., rising sea levels, increasing temperatures). Therefore, the proposed action would not affect nor be affected by the impacts of climate change, and it is consistent with the January 9, 2023, CEQ *NEPA Guidance on Consideration of Greenhouse Gas Emissions and Climate Change*.[33]

3.4 Biological Resources (Including Fish, Wildlife, and Plants)

3.4.1 Definition of Resource and Regulatory Setting

Biological resources include plant and animal species and their habitats, including special-status species (federally listed or state-listed threatened or endangered species, species proposed for listing, species that are candidates for federal listing, marine mammals, and migratory birds) and environmentally sensitive or critical habitat. Biological resources provide aesthetic, recreational, and economic benefits to society.

3.4.1.1 Threatened and Endangered Species

The *Endangered Species Act* (ESA) of 1973 (16 U.S.C. § 1531 et seq.) requires all federal agencies to seek to conserve threatened and endangered species. Section 7(a)(2) of the ESA requires that each federal agency—in consultation with the U.S. Fish and Wildlife Service (USFWS) or NOAA's National Marine Fisheries Service (NMFS)—ensures that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. The FAA is required to consult the USFWS or NMFS if an action may affect a federally listed species or critical habitat. If the FAA determines the action would have no effect on listed species or critical habitat, consultation is not required.

3.4.2 Affected Environment

According to the Texas Parks & Wildlife Department Ecoregions of Texas, the study area overlaps both the Blackland Prairies Ecoregion on the east near Dallas and the Cross Timbers Ecoregion in the western Fort Worth portion of the study area (Texas Parks & Wildlife n.d.-f). Blackland Prairie is known for its productive, rich soil, gentle topography, and lush native grasslands. It is a true prairie grassland community, dominated by a diverse assortment of grasses. The Cross Timbers and Prairies Ecoregions are characterized by high density linear stands of trees with irregular plains and prairies, a vast mosaic of grasslands, and woodlands. The Cross Timbers are the primary ecological region in Northcentral Texas. Post oak and blackjack oak woodlands interspersed with grassland and prairie habitats characterize this community (Cross Timbers Urban Forestry Council 2019).

[32] *Measuring the Effects of Drone Delivery in the United States*, https://vtechworks.lib.vt.edu/server/api/core/bitstreams/e6290289-4ed3-433f-9ed9-b6fdb77f2328/content

[33] 88 *Federal Register* 1196.

The majority of the land surface within the study area is urban and suburban. Therefore, wildlife habitats within the study area predominantly include parks and open spaces, lakes and waterways, and vacant lands. Additionally, urban flora and fauna thrive in such environments and typically are well established and populated.

The DFW metro area is one of the fastest growing areas in the United States (Lee 2021). Existing vacant lands in and near the area are being developed from this expansion at a fast rate. The urban habitat in the DFW area includes agricultural areas; commercial areas (i.e., business parks, airports, landfills); communities; downtown areas; a military base; recreational areas (i.e., public parks, golf courses); residential areas; thoroughfare (i.e., highways, railroads, public roads); undeveloped areas (i.e., open fields, vacant lots, wooded areas); and waterbodies, wetlands, and floodplains. These areas provide habitat for the smaller and more common bird and mammal species of the southern United States, including mammals such as white-tailed deer, raccoons, opossums, and squirrels.

3.4.2.1 Special-Status Species

The potential for impacts on federally listed species was assessed using the United States Fish and Wildlife Service (USFWS). Information for Planning and Consultation (IPaC) online system (April 2024) The IPaC report for the study area is included within Appendix F. When evaluating determination keys, the result included the determination of not applicable for species or critical habitats covered by the key. Table 3-2 lists the federally threatened and endangered species that could be present in the study area. The study area contains designated critical habitat for one species, the Texas fawnsfoot (*Truncilla macrodon*).

Table 3-2 IPaC Results

Species	Common Name	Species Name	ESA Status	Critical Habitat
Mammals	Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	N
Birds	Golden-cheeked Warbler	*Setophaga chrysoparia*	Endangered	N
	Piping Plover	*Charadrius melodus*	Threatened	N
	Rufa Red Knot	*Calidris canutus rufa*	Threatened	N
	Whooping Crane	*Grus americana*	Endangered	N
Reptiles	Alligator Snapping Turtle	*Macrochelys temminckii*	Proposed Threatened	N
Clams	Texas Fawnsfoot	*Truncilla macrodon*	Proposed Threatened	Y
	Texas Heelsplitter	*Potamilus amphichaenus*	Proposed Endangered	N
Insects	Monarch Butterfly	*Danaus plexippus*	Candidate	N

Based on the IPaC report, there are four (4) ESA-bird species that may be present in the study area: the Golden-cheeked Warbler (*Setophaga chrysoparia*), an endangered species; the Piping Plover (*Charadrius melodus*), a threatened species; the Rufa Red Knot (*Calidris canutus rufa*), a threatened species; and the Whooping Crane (*Grus americana*), an endangered species. As noted in the IPaC report, both the Piping Plover and the Rufa Red Knot only need to be considered for wind energy projects. Therefore, no further analysis was conducted for those two species.

The Golden-cheeked Warbler nests are exclusively in Texas from March to July in dense woodlands with tall Ashe juniper, oaks, and other hardwood trees that provide them with habitat. However, many juniper and oak woodlands have been cleared for urbanization and agriculture in the DFW area (Texas Parks & Wildlife 2023), and therefore there is little preferred habitat for this species within the study area. The Golden-cheeked Warbler prefers and is mostly

restricted to the Texas Hill Country to the south and west and is not common to the Cross Timbers and Blackland Prairie. According to the IPaC report, the USFWS has not designated critical habitat for this species.

The Whooping Crane nests much farther north in Canada; there is no threat of disturbing that critical part of their lifecycle. Whooping Cranes could migrate through the DFW area to and from Texas' coastal plains in and around Aransas National Wildlife Refuge. It is possible that Whooping Cranes could use parts of several wetlands and/or waterbodies within the study area as stopover habitat on their way to wintering grounds along the Gulf Coast. A 2019 study evaluated several U.S. Army Corps of Engineers lakes that the Aransas-Wood Buffalo Whooping Crane could potentially use as stopover habitat. The study found that Lake Ray Roberts, Lewisville Lake, Lavon Lake, and Benbrook Lake all have at least partially suitable habitat (McConnell 2021). In 2013, seven (7) wandering Whooping Cranes from the non-migratory Louisiana population spent a few months living at Lewisville Lake, as documented by Chris Jackson from DFW Urban Wildlife (DFW Urban Wildlife n.d.). One (1) of these cranes returned in 2014 but has not returned since. Whooping Cranes have not been observed at Lewisville Lake, spotted originally on the north side before moving to the south side of the lake over about 45 minutes, and spent an additional 30 minutes on the south banks before departing the area. These cranes are considered rare in the area of the lake (DFW Urban Wildlife n.d.). Two (2) Whooping Cranes were documented at Lake Ray Hubbard, across from Wynn Joyce Park, in 2014 (DFW Urban Wildlife n.d.) but have not been known to return to the area. According to iNaturalist, there have been seven (7) separate observations of the Whooping Crane from 2013–2023 in the proposed study area (iNaturalist 2023[34]). Three (3) of the most recent observations occurred in 2022, just southwest of Fort Worth.

Additionally, the IPaC report includes the tricolored bat (*Perimyotis subflavus*), a proposed endangered species. In non-hibernating seasons (spring through fall), tricolored bats primarily roost among live or recently dead deciduous hardwood trees and forage along forest edges and over ponds and other waterbodies (USFWS n.d.-b). Hibernation is typically 6–9 months per year, occurring in the winter months, where they dwell in caves and mines (Texas Parks & Wildlife 2023). Figure 3-2 and Table 3-3 below reflect the hibernation, habits, and range of the tricolored bat.

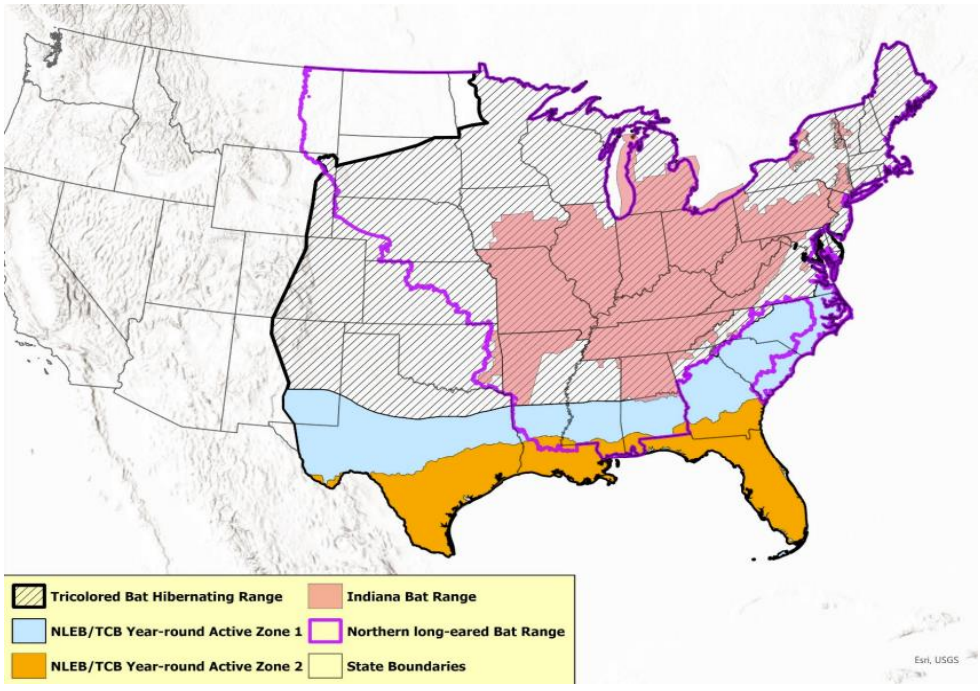

Figure 3-1 Tricolored Bat Ranges[35]

[34] https://www.inaturalist.org/
[35] https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines

Table 3-3 Texas Tricolored Bat Habits

State	Hibernation	Winter Torpor	Spring Staging	Summer Occupancy	Pup Season	Fall Swarming
	Timeframe when most bats are hibernating	Timeframe when mean winter temperatures fall below 40° F and bat roosting in trees are in torpor	Timeframe when most bats emerging from hibernation, rooting, near hibernacula, and preparing for migration to summer home range	Timeframe when bats are present on their summer home range and/or roosting in colonies	Timeframe during late pregnancy and when most young are born until they can fly and forage independently	Period of increased activity near hibernacula (including foraging, roosting in trees, and mating) prior to hibernation
Texas: Hibernating Range	Nov 16 – Mar 14	N/A	Mar 15 – Apr 30	Mar 15 – Sept 30	May 15 – July 31	Sept 1 – Nov 15
Texas: Year-round Active Range (Zone 1)	N/A	Dec 15 – Feb 15	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Texas: Year-round Active Range (Zone 2)	N/A	N/A	N/A	Mar 15 – July 15	May 1 – July 15	N/A

Data received using the USFWS IPaC system also identified the monarch butterfly as potentially occurring in the study area. Monarchs occur throughout the United States during summer months and is a candidate species for federal listing. The preferred habitat for monarchs is open meadows, fields, and wetland edges with the presence of milkweed and flowering plants. Monarchs migrate through Texas in the fall and the spring through two major flyways. Monarchs enter the first flyway during the last days of September and travel from Wichita Falls to Eagle Pass. The second flyway is along the Texas coast and lasts roughly from the third week of October to the middle of November (Texas Parks & Wildlife n.d.-g).

The IPaC report includes the Texas fawnsfoot and the Texas heelsplitter clams as potentially occurring within the study area. The Texas fawnsfoot is a freshwater mussel that is endemic to Texas and found in three river basins; Colorado, Brazos, and Trinity. The Texas heelsplitter is a rare freshwater mussel with a thin, smooth, elliptical shell and a straight hinge line. The species' historical range included Louisiana and Texas.[36]

The only reptile included in the IPaC is the Alligator snapping turtle[37]. The alligator snapping turtle is native to freshwater habitats, and is the largest freshwater species of turtle in North America. Their historical range includes Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, Texas.

State Species of Greatest Conservation Need

In Texas, native animals or plants designated as a Species of Greatest Conservation Need (SGCN) are generally those that are declining or rare and in need of attention to recover, or to prevent the need to list under state or federal regulation (Texas Parks & Wildlife 2020). The counties identified in the study area that have been evaluated for SGCN include Denton, Collin, Tarrant, Dallas, Johnson, Ellis, Parker, Wise, Rockwall, and Kaufman Counties. The Texas Parks &

[36] https://ecos.fws.gov/ecp/species/299

[37] https://ecos.fws.gov/ecp/species/4658

Wildlife Department's database of Rare, Threatened[38], and Endangered[39] Species of Texas lists 85 species of amphibians, birds, fish, mammals, reptiles, insects, crustaceans, mollusks, and plants in these counties considered as SGCN as defined in the 2012 Texas Conservation Action Plan. Appendix E provides information on the SGCN in these counties.

3.4.2.2 Migratory Birds

The *Migratory Bird Treaty Act* (MBTA; 16 U.S.C. §§ 703–712) protects migratory birds by prohibiting the taking, killing, or possessing of migratory birds (including their eggs, nest, and feathers). The MBTA applies to migratory birds identified in 50 CFR § 10.13 (defined hereafter as "migratory birds"). The USFWS is the federal agency responsible for the management of migratory birds when they occupy habitat in the United States. DroneUp is responsible for compliance with the MBTA.

The *Bald and Golden Eagle Protection Act* prohibits anyone from "taking" a bald or golden eagle, including their parts, nests, or eggs, without a permit issued by the USFWS. Implementing regulations (50 CFR Part 22[40]), and USFWS guidelines as published in the National Bald Eagle Management Guidelines, provide for additional protections against "disturbances." Similar to take, "disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, injury to an eagle or causes either a decrease in its productivity or nest abandonment due to a substantial interference with breeding, feeding, or sheltering. A permitting process provides limited exceptions to the Bald and Golden Eagle Protection Act's prohibitions. Permits are only needed when avoidance of incidental take is not possible. According to the National Bald Eagle Management Guidelines, if conservation measures can be implemented such that no aircraft are flown within 1,000 feet of an eagle nest, incidental take of Bald Eagles is unlikely to occur, and no permit is needed.[41] DroneUp is responsible for compliance with the *Bald and Golden Eagle Protection Act*.

Migratory bird species found within the study area vary throughout the year. The study area is a part of the Central Migratory Flyway where millions of birds, including songbirds, grassland birds, waterfowl, shorebirds, and raptors migrate north and south during spring and fall migration (Texas Parks & Wildlife n.d.-e).

Certain birds are protected under the *Migratory Bird Treaty Act*[42] and the *Bald and Golden Eagle Protection Act*[43]. Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[44] should follow appropriate regulations and consider implementing appropriate conservation measures, as described below. Specifically, please review the *Supplemental Information on Migratory Birds and Eagles*[45].

[38] 31 TAC §65.175
[39] 31 TAC §65.176
[40] See new regulatory section 50 CFR 22.280 (b)7 created from 89 FR 9920 which makes aircraft operation within 1,000 ft of an in use eagle nest eligible for a general permit.
[41] U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management guidelines. Available at: https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf
[42] The Migratory Birds Treaty Act of 1918.
[43] The Bald and Golden Eagle Protection Act of 1940.
[44] 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)
[45] https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Table 3-4 Migratory Birds

Common Name	Species Name	Bird of Conservation Concern (BCC)	Breeding Season
American Golden-plover	*Pluvialis dominica*	This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Bald Eagle	*Haliaeetus leucocephalus*	This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Chimney Swift	*Chaetura pelagica*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Golden Eagle	*Aquila chrysaetos*	This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Henslow's Sparrow	*Centronyx henslowii*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Kentucky Warbler	*Geothlypis formosa*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Least Tern	*Sternula antillarum*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 25 to Sep 5
Lesser Yellowlegs	*Tringa flavipes*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Little Blue Heron	*Egretta caerulea*	This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.	Breeds Mar 10 to Oct 15
Long-billed Curlew	*Numenius americanus*	This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.	Breeds elsewhere
Pectoral Sandpiper	*Calidris melanotos*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Prairie Loggerhead Shrike	*Lanius ludovicianus excubitorides*	This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA .	Breeds Feb 1 to Jul 31
Prothonotary Warbler	*Protonotaria citrea*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker	*Melanerpes erythrocephalus*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Sprague's Pipit	*Anthus spragueii*	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Drones fly at lower speeds and elevations and are smaller than conventional aircraft. Furthermore, the DroneUp PRISM V2 Series UA would be hovering in fixed positions at both the Hub and delivery locations leaving them temporarily exposed to a mobbing and attacking bird defending its breeding territory.

Bird behavior, in particular mobbing and territorial defense behaviors, on flying and hovering UA is the most important risk consideration for analysis, as these behaviors are the most pertinent to the proposed action. Mobbing behavior includes birds emitting alarm calls, flying at the predator, diverting its attention, and harassing it. Mobbing and aerial attack behaviors typically occur when a raptor, crow, or other aerial predator enters the airspace of a breeding habitat bird or territorial male (The Royal Society for the Protection of Birds 2023). Certain species of birds are known to harass, mob, and attack aerial predators that fly into or near their territory, especially during the breeding season when birds are actively nesting. The defending birds will chase, dive bomb, attack the backside, and vocalize to harass the aerial predator until the offender is far enough from the territory that the defending birds cease attacking and return to their nests and foraging activities (Kalb and Randler 2019). Not all bird species exhibit mobbing and territorial

defensive behaviors. Some bird species are more aggressive, defensive, and cued on aerial predators, while other species may show no aggression or interest towards an overflying hawk in its territory. Species of birds that exhibit mobbing and territorial defense behaviors that are known to occur in the DFW area are shown in Table 3-5.

According to the IPaC report, the Bald Eagle (*Haliaeetus leucocephalus*) is not a Bird of Conservation Concern in the study area but warrants attention under the Eagle Act. Bald Eagles may be year-round throughout Texas as spring and fall migrants, breeders, or winter residents (Cornell Lab n.d.). Bald Eagles typically nest in forested areas adjacent to large bodies of water (Cornell Lab n.d.) and nests have been previously documented in the DFW area around Benbrook Lake, Joe Pool Lake, Lake Arlington, Lake Worth, Lewisville Lake, and Mountain Creek Lake (iNaturalist 2023). Bald Eagles and other raptors may exhibit territorial behavior when nesting (USFWS n.d.-c).

Table 3-5 Dallas–Fort Worth Metro Songbird Species with Mobbing and Territorial Behaviors

Common Name (*Scientific Name*)	**Habitat Preferences**	**Notes**
Northern Mockingbird (*Mimus polyglottos*)	Habitat generalist occurring in nearly all types of urban development settings.	The most aggressive territorial bird species in North America, the Mockingbird is a potential mobbing species during hovering at the nests and delivery location. Mockingbirds are known to nest in parking lot landscaping and areas with high density development. Birds will attack any moving object in territory, including humans and pets.
Red-Winged Blackbird (*Agelaius phoeniceus*) and Common Grackle (*Cyanocitta cristata*)	Both species have a strong affinity for wetland habitats and lake shorelines for breeding and nesting.	Relatively aggressive territorial defender known to mob a wide variety of animals who fly over or perch within a male Blackbird or Grackle's harem territory. Both males and females exhibit mob behaviors during the breeding season but do not mob during the non-breeding season during the fall and winter months when Blackbirds and Grackles tend to form in flocks.
American Crow (*Corvus brachyrhynchos*)	The American Crow is less of a nest defending bird and is more prone to territorial defense and inquisitive behaviors as the bird species with the highest intelligence in the DFW metro area.	Little to no concern over mobbing UA vehicles; greater concern over territorial defense and curiosity behaviors. Crows can also attack larger prey items cooperatively.
Blue Jay (*Cyanocitta cristata*)	Known for nest defensive mobbing but can also discern predator from non-predator more easily than other species.	Hovering will be the greatest risk point Blue Jay mobbing attack. Blue Jays require mature tree cover and some degree of pervious surfaces in urban areas, making them a less likely risk than Mockingbirds.
Small songbirds	Include several species that exhibit breeding habitat and nest defense behaviors. Typically tree nesting species.	Smaller bird species like the diminutive Blue-grey Gnatcatcher (*Polioptila caerulea*) do not defend territories as large as the above-mentioned species, making them unlikely mobbing birds for conflicts with UAs.

Source: Texas Parks & Wildlife n.d.

Multiple factors result in the Northern Mockingbird being considered the most aggressive bird in North America (Mass Audubon 2023). During the breeding season, Mockingbirds are known to attack any moving object that enters their territory, including pedestrians, bicycles, and the occasional passing vehicle. Mockingbirds occupy a wide range of urban habitats, including industrial and highly commercialized areas such as parking lots with landscaping trees. Mockingbirds are abundant throughout Texas and found in cities (Texas Parks & Wildlife n.d.-e).

While also abundant, the Red-Winged Blackbird and Common Grackle show strong affinity to open herbaceous wetland habitats during the breeding season. The probability of a mobbing attack by these two (2) species is likely lower than the Northern Mockingbird.

3.4.3 Environmental Consequences

Potential impacts on biological resources associated with the proposed action were considered in the area where drones may operate (launch, fly, and drop packages). DroneUp's Hubs would be located in retail store parking lots; therefore, there would be no ground disturbance or habitat modification associated with the proposed action. DroneUp's deliveries would initiate from the Hub, fly at an en route altitude less than 400 feet AGL, generally between 230 and 250 feet AGL. The UA would descend to around 80 feet AGL and hover for a brief time to make a delivery. Then, the UA would ascend and transition back to en route flight mode for a return to the Hub.

A significant impact on federally listed threatened and endangered species could occur when the USFWS or NMFS determines the proposed action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species or would be likely to result in the destruction or adverse modification of federally designated critical habitat. An action need not involve a threat of extinction to federally listed species to meet the NEPA standard of significance. Lesser impacts, including impacts on non-listed or special-status species, could also constitute a significant impact.

3.4.3.1 No Action Alternative

Under the no action alternative, DroneUp could continue to operate its PRISM V2 Series UA in northeastern DFW area around Murphy, TX under Part 107. DroneUp currently conducts package delivery operations from 11 Hubs. Each Hub houses at least one pad, and the drones have a delivery range of approximately 5 miles. These operations have consisted of fewer than 110 deliveries per operating day per Hub. The no action alternative is not expected to result in significant impacts on biological resources.

3.4.3.2 Proposed Action

There would be no ground construction or habitat modification associated with the proposed action, as the Hubs would be located in lots that are already developed with commercial uses. DroneUp's aircraft would not touch the ground in any other place than the Hub (except during emergency landings). The aircraft remains airborne while conducting deliveries.

DroneUp's deliveries would initiate from the Hub, approach an en route altitude less than 400 feet AGL, and would generally occur between 230 and 250 feet AGL. The UA would lower to around 80 feet AGL and hover for a brief time to make a delivery. Then, the UA would transition back to an en route flight mode for a return to the Hub.

Because operations would occur mostly in an urban environment, typically well above the tree line and away from sensitive habitats and given the short duration of increased ambient sound levels, flights are not expected to significantly influence wildlife in the area. DroneUp will also specifically coordinate with the managing entities of state parks and natural areas within the DFW area on the thoughtful placement and use of delivery sites within these areas, as necessary.

Special-Status Species

Federally Listed, Proposed, and Candidate Species

Federally endangered Whooping Cranes could pass through the study area during their annual fall migration in mid-September to wintering grounds along the Gulf Coast, and during their annual spring migration to Canada in late March to early April. Potential suitable habitat has been identified for Whooping Cranes at several lakes within the DFW area as discussed in detail in Section 3.4.2.1, *Special-Status Species*. However, Whooping Crane migration flights

are usually between 1,000 and 6,000 feet (USFWS n.d.-b); therefore, it is not expected that drone flights under 400 feet AGL would impact transitory Whooping Cranes at these altitudes. Additionally, the USFWS has used drones to survey Sandhill Cranes, a surrogate species for Whooping Crane behavior, and reported "no discernible effect" observed on the animals (USFWS n.d.-b). If Whooping Cranes are observed using habitat in the study area in the future, DroneUp would coordinate with the Arlington Ecological Services Field Office of the USFWS, as well as the Texas Parks & Wildlife Department, to determine if any avoidance zones or other best management practices are needed. Therefore, based on operations occurring mostly in an urban environment, the altitude at which the UA flies in the en route phase, the expected low sound levels experienced by Whooping Cranes, short duration of increased ambient sound levels, the low probability of a Whooping Crane occurring in the study area, and the low likelihood of a UA striking a Whooping Crane, the FAA has determined that the proposed action "*may affect, but is not likely to adversely affect*," the Whooping Crane.

The federally endangered Golden-cheeked Warbler nests in the study area; however, their habitat is limited strictly to dense woodlands with tall Ashe Juniper, oaks, and other hardwood trees (Texas Parks & Wildlife n.d.-a). The drones would only transit over this habitat type to reach customers. The proposed action is not expected to frequently encounter the Golden-cheeked Warbler. Therefore, based on operations occurring mostly in an urban environment, the altitude at which the UA flies in the en route phase, the expected low sound levels experienced by Golden-cheeked Warblers, short duration of increased ambient sound levels, the low probability of a Golden-cheeked Warbler occurring in the study area, and the low likelihood of a UA striking a Golden-cheeked Warbler, the FAA determined the proposed action "*may affect, but is not likely to adversely affect,"* the Golden-cheeked Warbler. In a letter from the USFWS dated July 25, 2024, the USFWS concurred with the FAA determination. See Appendix F to review the letter.

The tricolored bat is listed as proposed endangered and is therefore not protected under the Act; however, conferencing is necessary if it is determined a federal action is likely to jeopardize the continued existence of a proposed species. The USFWS concurred the proposed action does not indicate the need for conference on a proposed species.

The monarch butterfly is listed as a candidate species and is not afforded protection under the Act, but the species has been included for consideration during project planning for the purpose of reducing impacts.

Migratory Birds

While there is a well-established repository of literature on bird mobbing and attack behaviors, and on bird strikes with large aircraft, information on drone interactions with birds is not as well documented. Without a baseline of data or pre-existing research on drone interactions with birds, creation of an effective and sensible predictive model is not possible. Therefore, this analysis focused on bird behavior and identified the Northern Mockingbird, Red-Winged Blackbird, and Common Grackle as potential species that could mob or attack a drone while defending territory, especially during the early spring to mid-summer breeding period.

To avoid impacts on nesting Bald Eagles, DroneUp has agreed to a monitoring plan for Bald Eagle nests that integrates multiple strategies and resources. This includes periodically checking online tools such as iNaturalist to identify eagle nests that may occur in the operating area, as well as communication with the bird watching community to identify nests. DroneUp personnel will also be educated in the visual identification of Bald Eagle nests, which are typically very conspicuous. If DroneUp identifies a Bald Eagle nest or is notified of the presence of a nest, DroneUp will establish an avoidance area such that there is a 1,000 feet vertical and horizontal separation distance between the vehicle's flight path and the nest. DroneUp will maintain this avoidance area until the end of the breeding season or until a qualified biologist indicates the nest has been vacated. DroneUp will regularly report monitoring and avoidance measures to

Texas Parks & Wildlife and the USFWS Region 2 Migratory Bird Permit Office. DroneUp has not had any bird strikes related to their operations.

Only two (2) instances of birds making contact with drones were recorded in the United States by hobbyists (Connecticut Audubon Society n.d.). Based on the information available regarding the interaction between drones and birds, the FAA concludes that mobbing and attacking behaviors would be the most relevant interaction to occur. As detailed in Table 3-4, some bird species are more likely to exhibit this type of behavior, and these are the species that would be expected to interact with the drones, if any. The proposed action would not be expected to result in significant impacts on migratory birds because it would not result in long-term or permanent loss of wildlife species, would not result in substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or populations, and would not have adverse impacts on reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels.

3.5 Department of Transportation Act, Section 4(f) Resources

3.5.1 Definition of Resource and Regulatory Setting

Section 4(f) of the U.S. Department of Transportation (DOT) Act (codified at 49 U.S.C. § 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) states that, subject to exceptions for de minimis impacts[46] *"[t]he Secretary may approve a transportation program or project requiring the use of [4(f) resources]…only if—(1) there is no prudent and feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use."*

The term "use" includes both direct or physical and indirect or "constructive" impacts on Section 4(f) resources. *Direct use* is the physical occupation or alteration of a Section 4(f) property or any portion of a Section 4(f) property. *Constructive use* does not require direct physical impacts or occupation of a Section 4(f) resource. A constructive use would occur when a proposed action would result in substantial impairment of a resource to the degree that the protected activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished.[47]

Another type of physical use, known as *temporary occupancy,* results when a transportation project results in activities that require a temporary easement, right-of-entry, project construction, or another short-term arrangement involving a Section 4(f) property. A temporary occupancy is considered a Section 4(f) use when all the conditions listed in Appendix B, Paragraph 2.2.1 of FAA Order 1050.1F and the Section 4(f) regulations at 23 CFR § 773.13(d) are satisfied.

A physical *use* may be considered de minimis if, after considering avoidance, minimization, mitigation, and enhancement measures, the result is either (1) a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or wildlife or waterfowl refuge for protection under Section 4(f); or (2) a Section 106 *finding of no adverse effect* or *no historic properties affected*. Before the FAA may finalize a determination that a physical use is de minimis, the official(s) with jurisdiction must concur in writing that the

[46] The FAA may make a de minimis impact determination with respect to a physical use of Section 4(f) property if, after taking into account any measures to minimize harm, the result is either: (1) a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or wildlife or waterfowl refuge for protection under Section 4(f); or (2) a Section 106 finding of no adverse effect or no historic properties affected. See 1050.1F Desk Reference, Paragraph 5.3.3.

[47] Federal Highway Administration (FHWA) Section 4(f) Policy Paper. (Note: FHWA regulations are not binding on the FAA; however, the FAA may use them as guidance to the extent relevant to aviation projects.) Available at: https://www.environment.fhwa.dot.gov/legislation/section4f/4fpolicy.pdf

project will not adversely affect the activities, features, or attributes that make the property eligible for Section 4(f) protection.

The concept of *constructive use* is that a project that involves no actual physical use of a Section 4(f) property via permanent incorporation or *temporary occupancy*, but may still, by means of noise, air pollution, water pollution, or other proximity-related impacts, substantially impair important features, activities, or attributes associated with the Section 4(f) property. Substantial impairment occurs only when the protected activities, features, or attributes of the Section 4(f) property that contribute to its purpose and significance are substantially diminished. This means that the value of the Section 4(f) property, in terms of its prior purpose and significance, is substantially reduced or lost.

Procedural requirements for complying with Section 4(f) are set forth in DOT Order 5610.1C, *Procedures for Considering Environmental Impacts*. The FAA also uses Federal Highway Administration (FHWA) regulations (23 CFR Part 774) and FHWA guidance (e.g., Section 4(f) Policy Paper) when assessing potential impacts on Section 4(f) properties. These requirements are not binding on the FAA; however, the FAA may use them as guidance to the extent relevant to FAA projects. More information about DOT Act, Section 4(f) can be found in Chapter 5 of the FAA Order 1050.1F *Desk Reference* (FAA 2023).

3.5.2 Affected Environment

The FAA used data from federal, state, and other public-access sources to identify potential Section 4(f) resources within the study area (Appendix D). The FAA identified many properties that meet the definition of a Section 4(f) resource, including public parks administered by state, city, and county authorities, and historic properties identified on the Texas State Historic Preservation Officer (SHPO) website. By count, most of the Section 4(f) resources are local public parks, trails, and ballfields. There are no wildlife refuges within the study area. These resources are not currently included in DroneUp's NFZ restrictions, which include schools (elementary, middle, high school), preschools and daycares with outdoor facilities, and churches.

There may be instances where the delivery would be to a customer located within a Section 4(f) resource. DroneUp validation activities with the FAA could include deliveries to sites in parks. For example, public delivery zones have been set up for events and community engagement in collaboration with the city parks and recreation department.

As discussed in Section 3.5 *Historical, Architectural, Archaeological, and Cultural Resources*, there are numerous historic properties within the study area as listed on the Texas SHPO website, although most of these are considered for architectural or other purposes that would not typically be affected by UA operations. The FAA also consulted with the Texas SHPO in June 2024 to determine whether historic and traditional cultural properties would be affected by the proposed action (see Section 3.5.2, *Affected Environment*).

3.5.3 Environmental Consequences

3.5.3.1 No Action Alternative

Under the no action alternative, DroneUp could continue to operate its PRISM V2 Series in the northeastern area of DFW under Part 107. Operations would not result in a physical use of Section 4(f) properties. The FAA determined in a 2022 EA that infrequent UA overflights would not cause substantial impairment to any of the Section 4(f) resources in the study area and are not considered a constructive use of any Section 4(f) resource. During the scope of the no action alternative operations, DroneUp identified NFZ properties and confirmed with the FAA that they will generally not conduct operations over these areas. The no action alternative is not expected to result in significant impacts on Section 4(f) properties from drone use because noise and visual effects from DroneUp's occasional overflights are not

expected to diminish the activities, features, or attributes of the resources that contribute to their significance or enjoyment.

3.5.3.2 Proposed Action

There would be no physical use of Section 4(f) resources because occasional flyovers in the study area would not result in substantial impairment of Section 4(f) properties. As discussed in Section 3.6, *Noise and Noise-Compatible Land Use*, and Appendix J, the proposed action would not result in significant noise levels at any location within the study area. As further described in Section 3.8, *Visual Effects*, the short duration of en route flights (approximately 5 minutes) would minimize any potential for significant visual impacts. In addition, DroneUp's flight planning software is designed to increase variability in flight paths to minimize overflights of any given location; with the diversification of flight paths, the frequency of overflights would inversely scale as the distance from a Hub increases. Therefore, the FAA has determined that UA overflights as described in the proposed action would not cause substantial impairment to any of the Section 4(f) resources in the study area and are therefore not considered a constructive use of any Section 4(f) resource.

3.6 Historical, Architectural, Archaeological, and Cultural Resources

3.6.1 Definition of Resource and Regulatory Setting

Cultural resources encompass a range of sites, properties, and physical resources relating to human activities, society, and cultural institutions. Such resources include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic archaeological sites, structures, objects, and districts that are considered important to a culture or community. Cultural resources also include aspects of the physical environment, namely natural features and biota that are a part of traditional ways of life and practices and are associated with community values and institutions.

The major law that protects cultural resources is the NHPA. Section 106 of the NHPA of 1966 (54 U.S.C. § 306108) requires federal agencies to consider the effects of their undertakings on properties listed or eligible for listing in the NRHP. This includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meets the NRHP criteria. Regulations related to this process are contained in 36 CFR Part 800, *Protection of Historic Properties.* Compliance with Section 106 requires consultation with the SHPO and applicable other parties, including Indian tribes.

Major steps in the Section 106 process include identifying the Area of Potential Effects (APE), identifying historic and cultural resources within the APE, consulting with the SHPO and Tribal Historic Preservation Officers (THPOs) for tribes that are identified as potentially having traditional cultural interests in the area, and determining the potential effects on historic properties as a result of the action.

The FAA has not established a significance threshold for this impact category; however, the FAA has identified a factor to consider when evaluating the context and intensity of potential environmental impacts for historical, architectural, archaeological, and cultural resources. A factor to consider in assessing a significant impact is when an action would result in a finding of adverse effect through the Section 106 process. However, an adverse effect finding does not automatically trigger preparation of an Environmental Impact Statement (i.e., a significant impact). If an adverse effect is determined, the Section 106 process will be resolved through a Memorandum of Agreement (MOU) or Programmatic Agreement (PA) to record resolution measures to mitigate or minimize adverse effects.

3.6.2 Affected Environment

The APE for the proposed action is the entire study area where DroneUp is planning to conduct UA package deliveries, as shown in Figure 1-1. According to the National Park Service's online database of the NRHP, a total of 229 historic properties and 146 historic districts occur within the APE (National Park Service 2024a). These historic properties and districts are listed in Appendix G of the attached SHPO letter. The FAA also consulted with nine (9) THPOs for tribes that may potentially attach religious or cultural significance to resources in the APE. The nine (9) tribes are: (1) Apache Tribe of Oklahoma; (2) Comanche Nation, Oklahoma; (3) Coushatta Tribe of Louisiana; (4) Delaware Nation, Oklahoma; (5) Muscogee (Creek) Nation; (6) Tonkawa Tribe of Indians of Oklahoma; and (7) Wichita and Affiliated Tribes (Wichita, Keechi, Waco, & Tawakonie), Oklahoma; (8) Cherokee; and (9) Caddo. The FAA sent consultation letters to the nine (9) tribes on April 18, 2024, regarding the entire APE and did not receive any objections or responses.

The FAA's historic and tribal outreach consultation letters are included in Appendix G and H.

3.6.3 Environmental Consequences

3.6.3.1 No Action Alternative

Under the no action alternative, DroneUp could continue to operate its PRISM V2 Series in northeastern DFW area. Effects from UA operations on historic properties are limited to non-physical, reversible impacts. The number of daily flights that DroneUp is projecting from the initial 11 Hubs—up to approximately 500 operations spreading in all directions from a Hub—means that any historic or cultural resource would be subject to only a small number of overflights per day, if any. Therefore, the no action alternative is not expected to result in significant impacts related to historical, architectural, archaeological, and cultural resources.

3.6.3.2 Proposed Action

The nature of UA effects on historic properties is limited to non-physical, reversible impacts (i.e., the introduction of audible and/or visual elements). The historic and cultural attributes, which are primarily architectural, of these sites are such that they typically would not be affected by UA overflights. The number of daily flights that DroneUp is projecting from each Hub—up to 500 deliveries per day spreading in all directions from each Hub–means that any historic or cultural resource would be subject to only a small number of overflights per day, if any. Additionally, the FAA conducted a noise exposure analysis for the proposed action—as described in Section 3.6, *Noise and Noise-Compatible Land Use*—and concluded that noise levels would be below the FAA's threshold for significance, even in areas with the highest noise exposure. Based on the information available, the FAA made a finding of *no adverse effects on historic properties* in accordance with 36 CFR Part 800. The FAA received concurrence from the SHPO in June 2024, that "*THC/SHPO concurs with information provided*" and "*no adverse effects on historic properties*." See Appendix G to review the letter. Therefore, the proposed action would not result in significant impacts on historical, architectural, archaeological, or cultural resources. The FAA's tribal and historic outreach letters are included as Appendices H and G, respectively.

3.7 Noise and Noise-Compatible Land Use

3.7.1 Definition of Resource and Regulatory Setting

Noise is considered any unwanted sound that interferes with normal activities (such as sleep, conversation, student learning) and can cause annoyance. Aircraft noise is often the most noticeable environmental effect associated with any aviation project. Several federal laws, including the *Aviation Safety and Noise Abatement Act of 1979*, as amended (49 U.S.C. §§ 47501-47507) regulate aircraft noise and noise-compatible land use. Through 14 CFR Part 36, *Noise*

Standards: Aircraft Type and Airworthiness Certification, the FAA regulates noise from aircraft. FAA Order 1050.1F, Appendix B, Paragraph B-1.3 requires the FAA to identify the location and number of noise-sensitive areas that could be significantly impacted by noise. As defined in Paragraph 11-5 "*Definitions*" of Order 1050.1F, page 11-3, a noise-sensitive area is *"an area where noise interferes with normal activities associated with its use. Normally, noise-sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites*."

Sound is measured in terms of the decibel (dB), which is the ratio between the sound pressure of the sound source and 20 micropascals, which is nominally the threshold of human hearing. Various weighting schemes have been developed to collapse a frequency spectrum into a single dB value. The A-weighted decibel (dBA) corresponds to human hearing accounting for the higher sensitivity in the mid-range frequencies. For example, a household dishwasher is usually around 63 to 66 dBA.

To comply with NEPA requirements, the FAA has issued requirements for assessing aircraft noise in FAA Order 1050.1F, Appendix B. The FAA's required noise metric for aviation noise analysis is the yearly Day-Night Average Sound Level (DNL) metric. The DNL metric is a single value representing the logarithmically averaged aircraft sound level at a location over a 24-hour period, with a 10 dB adjustment added to those noise events occurring from 10:00 p.m. to 7:00 a.m. the following morning. A significant noise impact is defined in Order 1050.1F as an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure or a noise exposure at or above the DNL 65 dB due to a DNL 1.5 dB or greater increase.

3.7.2 Affected Environment

The approximate land area within the study area is 3,510 square miles, the approximate water area is 237 square miles, and the estimated population within the counties included in the study area is 6,574,000 per 2022 estimates. The ambient (or background) sound level in the operations area varies and depends on the uses in the immediate vicinity. For example, the ambient sound level along a major highway is higher than the ambient sound level within a residential neighborhood. Existing sound sources in the operating area are primarily those from anthropogenic sources associated with commercial, industrial, transportation (e.g., highways, rail, and air travel), and residential land uses in an urban and city environment (e.g., vehicles, construction equipment, aircraft). Except for areas proximate to airports, existing aviation noise levels in the DFW study area are expected to be well below the FAA's threshold for significant noise exposure to residential land use (DNL 65 dB).

3.7.3 Environmental Consequences

3.7.3.1 No Action Alternative

Under the no action alternative, DroneUp could continue to operate its PRISM V2 Series under Part 107 in northeastern DFW area. There have been no noise issues reported. Therefore, the no action alternative is not expected to cause a significant impact on any noise-sensitive resources within the study area.

3.7.3.2 Proposed Action

Operations would include up to 500 deliveries from each Hub and would occur up to seven (7) days per week for a conservative total of 312 days per year (operations would generally exclude days with severe weather), which equates to 428 deliveries on an Average Annual Day (AAD) basis. The FAA developed a methodology to evaluate the potential noise exposure in the proposed study area that could result from implementation of the proposed action (Appendix J). Noise assessments were performed for each of the flight phases (Hub, en route, and delivery) as discussed in detail in

the following sections. While the AAD from a Hub is 428, the number of overflights above any noise sensitive areas in a day will be dispersed in all directions because a Hub is centrally placed in the proposed operating area and delivery locations would be scattered throughout the proposed operating area. The maximum number of overflights directly above any single noise sensitive location would not be anticipated to exceed five (5).

Noise Exposure for Hub Operations

In order to assess Hub noise, following assumptions were made:

1) Hub noise would be diminished significantly beyond 400 feet. Based on Appendix J, Figure 11, Hub measurements at lateral and behind locations were measured up to 200 feet. Beyond 200 feet, measured Hub noise levels were dominated by ambient noise. In Figure 11, at the 400 foot measurement distance, the Sound Exposure Level (SEL) value of the under-track measurement is 79.2 dB. Table 4 of Appendix J indicates the measured SEL value of en route is 78.4 dB. The difference of SEL values is less than one (1) dB and it is considered the en route noise is dominant beyond 400 feet.
2) UAs would spread to four directions in and out of a Hub. It is understood that the maximum number of overflights directly above any single noise sensitive location in the operating areas beyond the Hub would not be expected to exceed five. Even though UAs would fly in and out of a Hub omni-directionally, it would be conservative to assume no more than a quarter of the UAs would fly within the vicinity of a single noise sensitive location. For operations in Class B and D airspace, this would be conservatively limited to no more than a quarter of the UAs flying over 45 degrees (plus or minus) from a cardinal direction.

Based on the assumptions described above, Table 5 of Appendix J was used to assess the Hub noise. Table 3-6 summarizes the noise exposure distances for DNL 50, 55, 60, and 65 dB for AAD deliveries of 120 and 440. The distance of DNL 50 dB for the 120 AAD deliveries was used to determine the standoff distance within the controlled surface areas of Class B and D airspace when operating in accordance with assumption (2). When not operating in accordance with assumption (2), the distance of DNL 50 for the 440 AAD deliveries was used to determine the minimum standoff distance within the controlled surface areas of Class B and D airspace.

Table 3-6 Estimated Extent of Noise Exposure from Hub

Annual Average Daily DNL Equivalent Deliveries	Annual DNL Equivalent Deliveries	DNL 50 dB	DNL 55 dB	DNL 60 dB	DNL 65 dB
≤120	≤43,800	558 feet	106 feet	42 feet	17 feet
≤440	≤160,600	>780 feet	780 feet	119 feet	47 feet

Source: HMMH 2024.

As described in Section 2.2, *Proposed Action*, Hubs would be placed at least 558 feet away from noise-sensitive areas within the controlled surface areas of Class B and D airspace when operating 120 AAD within each 90-degree sector around the Hub location. When operating below 120 AAD within each 90-degree sector, the standoff distance from noise-sensitive areas within the controlled surface areas of Class B and D airspace will be based on Appendix J Table 5 DNL 50dB. For example, a Hub operating at 100 AAD within each 90-degree sector would utilize a minimum standoff distance of 360 feet. In addition, Hubs would be placed at least 119 feet away from noise-sensitive areas when they are outside of the controlled surface areas of Class B and D airspace. If a Hub is proposed that does not meet the

assumption (2) criteria, and are planned to be within the controlled surface areas of Class B and D airspace, Hubs would be placed 780 feet away from noise-sensitive areas.

Furthermore, operations from each Hub would be expected to be conducted such that noise exposure is distributed across this proposed action's study area. Based on the above distances, the increase of noise would not be expected to exceed DNL 1.5 dB within DNL 65 dB of airport noise contours or become DNL 65 dB with the increase of DNL 1.5 dB because DNL 60 and 65 dB contours would not exceed the controlled surface areas of Class B and D airspace. Therefore, there would be no significant impact due to Hub operations.

Noise Exposure for En Route Operations

Based on the information provided by DroneUp, it is expected that UA would generally cruise at or above an altitude of 230 feet AGL and travel at a ground speed of 31.5 mph (27.4 knots) during en route flight. The en route noise exposure is provided in Table 7 of Appendix J. The assumption (2) described in the Hub noise assessment is also considered for en route assessment for Hubs operating in such a manner. The analysis shows that, based on a quarter of AAD deliveries, or 107 deliveries (428/4=107) directly overflying a single noise sensitive location, the en route noise levels would be DNL 48.4 dB directly under the en route flight path. When not operating in accordance with assumption (2), based on overflights from 440 AAD deliveries directly overflying a single noise sensitive location, the en route noise levels would be DNL 54.0 dB directly under the en route flight path. These noise levels when combined with those of other aviation activity would not result in an increase of DNL 1.5 dB within DNL 65 dB of airport noise contours or become DNL 65 dB with an increase of DNL 1.5 dB and therefore would not be significant.

Noise Exposure for Delivery Operations

The noise exposure for delivery operations includes the noise exposure for the delivery point itself, based on maximum daily deliveries to any one location. The maximum daily deliveries to a single customer based on projections provided by DroneUp would be less than two (2) deliveries per operating day. This analysis overestimates the possibility of five (5) deliveries per day to a single customer. The noise exposure for any one delivery point (without en route noise) is provided in Table 8 of Appendix J.

Table 3-7 DNL for Delivery Locations Based on Maximum Deliveries per Location

Average Daily DNL Equivalent Deliveries	Annual DNL Equivalent Deliveries	Estimated Delivery DNL at 16 Feet[1]	Estimated Delivery DNL at 25 Feet	Estimated Delivery DNL at 50 Feet	Estimated Delivery DNL at 75 Feet	Estimated Delivery DNL at 100 Feet	Estimated Delivery DNL at 125 Feet
≤5	≤1,825	48.6	47.4	46.5	45.1	44.0	42.5

Source: HMMH 2024.

[1] Minimum Measured Listener Distance

A drone delivery customer could also experience other drone deliveries flying overhead concurrently. The noise exposure is estimated by adding both en route and delivery operations. When operating in accordance with assumption (2) aforementioned, the en route contribution is calculated based on a quarter of the AAD (428/4=107), minus the average number of daily deliveries per location (107-5). In this case, the total delivery noise exposure is then determined by the data in Table 3-6 plus Table 8 of Appendix J (en route). Utilizing the minimum distance of 16 feet, the total delivery DNL noise exposure is DNL 51.5 dB, which when combined with noise levels of other aviation activity would not result in an increase of DNL 1.5 dB within DNL 65 dB of airport noise contours or become DNL 65 dB with an increase of DNL 1.5 dB and therefore would not be significant.

When a Hub is conducting flights which are not conducting flight paths in accordance with assumption (2) aforementioned, The en route contribution is calculated based 440 AAD, minus the average number of daily deliveries per location (440-5). The total delivery noise exposure is then determined by the data in Table 3-7 plus Table 8 of Appendix J (en route). Utilizing the minimum distance of 16 feet, the total delivery DNL noise exposure is DNL 55.1 dB, which when combined with noise levels of other aviation activity would not result in an increase of DNL 1.5 dB within DNL 65 dB of airport noise contours or become DNL 65 dB with an increase of DNL 1.5 dB and therefore would not be significant.

Overall Noise Exposure Results

The maximum noise exposure levels are associated with Hub operations, where DNL 65 dB occurs within 119 feet of a Hub perimeter and DNL 60 dB occurs within 119 feet. As described in Section 2.2, *Proposed Action*, Hubs would be located at least 119 feet away from noise-sensitive areas. In addition, when Hubs are planned to be within the controlled surface areas of Class B and D airspace, Hubs would be placed 558 feet away from noise-sensitive areas when operating at 120 AAD over 45 degrees (plus or minus) from a cardinal direction When Hubs are planned to be within controlled surface areas of Class B and D airspace and are not operating under assumption (2) criteria the standoff distance would be 780 feet.

When operating with an AAD below 120, the standoff distance shall be based on Appendix J Table 5 DNL 50 dB.

The proposed action would not have a significant noise impact.

3.8 Environmental Justice

3.8.1 Definition of Resource and Regulatory Setting

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. Meaningful Involvement means that people have an opportunity to participate in decisions about activities that may affect their environment and/or health, the public's contribution can influence the regulatory agency's decision, their concerns will be considered in the decision-making process, and the decision-makers seek out and facilitate the involvement of those potentially affected.

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* Section 1-101 requires all federal agencies to the greatest extent practicable and permitted by law, to make achieving EJ part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

Executive Order (E.O.) 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All*, was enacted on April 21, 2023. E.O. 14096 on environmental justice does not rescind E.O. 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which has been in effect since February 11, 1994, and is currently implemented through DOT Order 5610.2C. This implementation will continue until further guidance is provided regarding the implementation of the new E.O. 14096 on environmental justice.

DOT Order 5610.2C, *Procedures for Considering Environmental Impact,* defines a minority person as a person who is Black, Hispanic, or Latino, Asian American, American Indian and Alaskan Native, or Native Hawaiian and other Pacific Islander. A minority population is any readily identifiable group of minority persons who live in geographic proximity,

and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed DOT program, policy, or activity.

DOT Order 5610.2C defines a low-income person as a person whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines. A low-income population is any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy, or activity.

The FAA has not established a significance threshold for EJ. FAA Order 1050.1F indicates that factors that the FAA should consider in evaluating significance include whether the action would have the potential to lead to a disproportionately high and adverse impact on the EJ population (i.e., a low-income or minority population) due to significant impacts in other environmental impact categories, or impacts on the physical or natural environment that affect an EJ population in a way that the FAA determines are unique to the EJ population and significant to that population. If a significant impact would affect low-income or minority populations at a disproportionately higher level than it would other population segments, an EJ issue is likely.

A disproportionately high and adverse effect on minority or low-income populations means an adverse effect that:

1. Is predominantly borne by a minority population and/or a low-income population; or
2. Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than adverse effects that will be suffered by the nonminority population and/or low-income population.

3.8.2 Affected Environment

Minority and low-income populations were mapped down to the county using the U.S. Census Bureau's 2021 American Community Survey (ACS) 1-year estimates. The ACS 1-year estimates were compared to HHS "*poverty guidelines*" to calculate the average percentage of households below the poverty threshold for each county.

The study area includes 10 counties: Wise, Denton, Collin, Parker, Tarrant, Dallas, Kaufman, Ellis, Rockwall, and Johnson. Due to the size and population of the DFW metro area, the aggregate of the 10 counties is defined as a reference area to provide a baseline to which individual counties are compared. The state of Texas and the United States were both added as additional references to provide context alongside the 10-county aggregate reference area. The comparison between the 10-county aggregate reference area and the individual county is used to determine communities of EJ concern.

Counties are identified as areas of concern where EJ demographics exceed those of the reference area by a "meaningfully greater" amount. A threshold value of zero percent or greater than the average reference area was selected to define the "meaningfully greater" amount to ensure any potential EJ communities were identified. As a result, a county with a percentage of minority and/or low-income population greater than the reference area would be considered a community of EJ concern. Additionally, communities where EJ populations are predominant (i.e., the population is equal to or greater than 50 percent) are also considered areas of EJ concern.

Tables 3-8 and 3-9 summarize demographics data for the counties within the reference area. The data were gathered from the 2021 ACS 1-year estimates from the U.S. Census Bureau (USCB 2021). The HHS Poverty Guidelines were gathered from the HHS's *Federal Poverty Income Guidelines*, effective January 12, 2023 (HHS 2023).

Table 3-8 Selected Demographic Characteristics (Race) by County

Geographic Area	Total Population	White	% White	All Other Races	% All Other Races
Wise County	68,632	54,054	79%	14,578	21%
Denton County	906,422	526,363	58%	380,059	42%
Collin County	1,064,465	578,412	54%	486,053	46%
Parker County	148,222	122,995	83%	25,227	17%
Tarrant County	2,110,640	1,044,549	49%	1,066,091	51%
Dallas County	2,613,539	924,283	35%	1,689,256	65%
Kaufman County	145,310	87,435	60%	57,875	40%
Ellis County	192,455	118,993	62%	73,462	38%
Rockwall County	107,819	74,913	69%	32,906	31%
Johnson County	179,927	129,863	72%	50,064	28%
10-County Aggregate Reference Area	7,537,431	3,661,860	49%	3,875,571	51%
Texas	29,145,505	14,609,365	50%	14,536,140	50%
United States	331,449,281	204,277,273	62%	127,172,008	38%

Source: USCB 2021.

Table 3-9 Selected Demographic Characteristic (Poverty) by County

Geographic Area	Number of Households	Average Household Size	2023 HHS Poverty Guideline	% of Households Below Poverty
Wise County	24,449	2.9	$52,343.90	32.6%
Denton County	350,081	2.66	$50,133.70	23.3%
Collin County	399,810	2.76	$51,238.80	21.2%
Parker County	55,525	2.8	$51,238.80	28.2%
Tarrant County	771,657	2.72	$50,133.70	34.4%
Dallas County	975,062	2.62	$49,028.60	38.5%
Kaufman County	50,212	3.12	$54,554.10	28.5%
Ellis County	69,223	2.91	$52,343.90	36.4%
Rockwall County	39,329	2.94	$52,883.53	21.2%
Johnson County	64,338	2.86	$52,343.90	29.5%
10-County Aggregate Reference Area	2,760,357	2.82	$51,238.80	29.4%
Texas	10,796,247	2.68	$48,695.03	37.7%
United States	127,544,730	2.54	$46,151.26	36.5%

Sources: USCB 2021, HHS 2023

Table 3-8 shows the racial demographic information for the reference area and the 10 counties within the DFW metro area. The percentage of minorities, collected by the ACS 1-year survey as "All Other Races," residing in the reference area is 51 percent (USCB 2021). The zero percent threshold compared to the reference community and a predominately minority population (50 percent or greater) were used to determine communities of EJ concern.

Table 3-9 shows the income and poverty data for each area. The HHS Poverty Guidelines in Table 3-8 were determined by comparing the Federal Poverty Income Guidelines annual income per persons to the average household size provided by the ACS 1-year survey (HHS 2023). The poverty threshold is proportional to the household size, both of which are presented in the table. The percentage of households below poverty were determined by gathering the annual household income below the HHS Poverty Guideline. Similar to what was done for race, a zero percent threshold was used to identify low-income populations to assess the potential for effects that disproportionately fall on low-income populations. Approximately 29.4 percent of the households residing in the reference area are living below poverty. Any county whose percentage of households below poverty equals or exceeds the reference area is identified as a community of EJ concern. Table 3-10 shows the counties of EJ concern as compared to the reference area.

Table 3-10 Communities of Environmental Justice Concern

County	% All Other Races	% Households Below Poverty
Wise County	X	32.6%
Tarrant County	51%	34.4%
Dallas County	65%	38.5%
Ellis County	X	36.6%
Reference Area	51%	29.4%

Sources: USCB 2021; HHS 2023.

X = Does not meet the threshold for consideration as an environmental justice community of concern.

Of the 10 counties, Tarrant County and Dallas County are communities of EJ concern due to the population of minorities compared to the reference area and/or their predominantly minority populations. Tarrant County (51 percent) and Dallas County (65 percent) consist of predominantly minority populations (50 percent or greater), while Dallas County's minority population (65 percent) percentage is greater than that of the reference area (52 percent).

Four counties are communities of EJ concern due to the percentage of households below poverty. Wise County (32.6 percent), Tarrant County (34.4 percent), Dallas County (38.5 percent), and Ellis County (36.4 percent) exceed the zero percent threshold compared to the 29.4 percent households below poverty in the reference area.

3.8.3 Environmental Consequences

3.8.3.1 No Action Alternative

Under the no action alternative, DroneUp could continue to operate its PRISM V2 Series under Part 107 in northeastern DFW area. Existing operations would not result in adverse effects on low-income or minority populations as the UA's noise would still be well below levels considered to constitute a significant impact (FAA 2022). DroneUp services would continue to provide additional and on-demand access to small goods while decreasing traffic congestion and GHG emissions. Therefore, the no action alternative is not expected to result in significant impacts on environmental justice communities.

3.8.3.2 Proposed Action

As discussed in this EA, the proposed action would not result in significant impacts for any environmental impact category. As noted in Section 3.7, *Noise and Noise-Compatible Land Use*, the UA's noise emissions could be perceptible in areas within the study area but would stay well below the level determined to constitute a significant impact (DNL 65 dB). In addition, DroneUp's service is meant to provide additional and on-demand access to small goods without making use of roads and provides a greater benefit in more congested areas. Commercial drone delivery services may

therefore result in a positive effect on low-income and minority communities who may have no other mode of transportation. The proposed action would not result in disproportionately high or adverse effects on minority or low-income populations. Because the proposed action would not create impacts exceeding thresholds of significance in other environmental impact categories, and because the proposed action would not generate impacts that affect an environmental justice population in a way that the FAA determines are unique and significant to that population, the proposed action would not result in significant environmental justice impacts or disproportionately high and adverse effects on minority and low-income populations.

3.9 Visual Effects (Visual Resources and Visual Character including Light Emissions)

3.9.1 Definition of Resource and Regulatory Setting

Visual effects deal broadly with the extent to which the project would either (1) produce light emissions that create annoyance or interfere with activities; or (2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment. Visual effects can be difficult to define and assess because they involve subjectivity. In this case, visual effects would be limited to the introduction of a visual intrusion—a UA in flight—which could be out of character with the suburban or natural landscapes.

The FAA has not developed a visual effects significance threshold. Factors the FAA considers in assessing significant impacts include the degree to which the action would have the potential to (1) affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources; (2) contrast with the visual resources and/or visual character in the study area; or (3) block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

Visual effects under the proposed action. DroneUp's UAs are equipped with:

(1) anti-collision strobe white light attached to the central airframe, mounted on a vertical arm for clear visibility, which is visible out to three (3) statute miles to allow other aircraft to identify operating UAs in low-light conditions. These lights are controlled by a manually activated power switch which is turned on as part of pre-flight procedures during operations to occur under nighttime conditions.

(2) equipped with directional awareness lights, red solid LED lights on each of the front motor arms and green solid LED lights on each of the rear motor arms. These directional awareness lights are automatically powered for all operations.

(3) equipped with a LED spotlight on the rear auxiliary arm of the aircraft for use during the delivery and landing phase of flight in low-light conditions.

Given the relatively low frequency of overflight of any given area and the large size of the operating area, operation of safety lights would not substantially alter the light environment.

3.9.2 Affected Environment

The proposed action would take place over mostly suburban and commercially developed properties. As noted in Section 3.5, *Department of Transportation Act, Section 4(f) Resources*, there are some publicly owned resources that could be valued for aesthetic attributes within the study area. However, DroneUp's flight planning software is designed to increase variability in flight paths to minimize overflights of any given location; with the diversification of flight paths, the frequency of overflights would inversely scale as the distance from a Hub increases. When making a delivery, the UA would depart from a Hub and travel en route at an altitude less than 400 feet AGL (en route travel

would generally occur between 230 and 250 feet AGL). Deliveries would mostly take place at residences, and, in some cases, there may be instances where the delivery would be to a customer located within a Section 4(f) resource (see Section 3.5.2 for more information on 4(f) properties). A clear space is required for delivery, such as a driveway, parking lot, field, common area, patio, or clear spaces surrounding multi-family dwellings, as determined during the delivery request process. Upon reaching the Hub, the UA slowly descends over its assigned landing area, and lands on the ArUco Tag (Figure 2-4). The duration of delivery from the time the customer approves the delivery to the transition back to en route flight mode is expected to last approximately 1 minute.

3.9.3 Environmental Consequences

3.9.3.1 No Action Alternative

Under the no action alternative, DroneUp could continue to operate its PRISM V2 Series under Part 107 in northeastern DFW area. Although the no action alternative involves drone airspace operations that could result in visual impacts on sensitive areas, such as Section 4(f) areas, where visual setting is a vital resource of the property, given the short flight durations and low number of proposed flights per day under the no action alternative, no significant impacts on visual resources and visual character are anticipated. Therefore, the no action alternative is not expected to result in significant visual effects.

3.9.3.2 Proposed Action

The proposed action would make no changes to any landforms or land uses; thus, there would be no effect on the visual character of the area, as the Hubs would be located in established commercial areas as further described in Section 2.2, *Proposed Action*. Light emissions were evaluated in detail since nighttime flights would occur until 10 PM. The proposed action involves airspace operations that could result in visual impacts on sensitive areas such as Section 4(f) properties where the visual setting is an important resource of the property. The short duration when each UA flight could be seen from any resource in the study area and the low number of overflights within any given location would minimize any potential for significant visual effects.

Chapter 4
Cumulative Effects

Consideration of cumulative impacts applies to the impacts resulting from implementing the proposed action along with other actions. The CEQ regulations define cumulative impacts as "*effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.*" (40 CFR § 1508.1(g)(3).)

As most of the impacts discussed in Chapter 3, *Affected Environment and Environmental Consequences,* were found to be minimal and given that the drone flight is limited in its ability to interact with other outside actions due to its short duration, the proposed action's contribution to cumulative impacts in the study area would largely be from noise. Thus, this section will focus on the proposed action's potential cumulative impact on the noise environment.

DroneUp currently operates drone package deliveries at 34 locations nationwide under 14 CFR Part 107. Under 14 CFR Part 135, DroneUp will operate 11 Hubs initially, and a maximum of 30 Hubs in the next several years in the DFW area.

Because UA operations would occur in areas subject to other aviation noise sources, it is necessary to evaluate the cumulative noise exposure that would result from the other aviation noise sources present. Examples of such scenarios are DroneUp operations occurring in the vicinity of an airport where DroneUp flight activity may overlap with other UA package delivery operators. Aviation noise sources are most likely to be the dominant contribution to noise impacts near airports. By comparison, other sources of noise would not appreciably contribute to overall noise levels at these locations.

There are 35 airports within the DFW metro area. The potential for noise and compatible land use cumulative effects would result from UA and manned aircraft operating within an airport DNL 60 dB contour. As such, the potential for cumulative effects would be minimized because DroneUp has elected to require that all Hubs be placed at least 558 feet away from noise-sensitive areas within the controlled surface areas of Class B and Class D airspace. In addition, Hubs would be placed at least 119 feet away from noise-sensitive areas when they are outside of the controlled surface areas of Class B and Class D airspace. The addition of DroneUp's commercial delivery service is not expected to result in cumulative effects with other existing Part 135 UAS operations, such as the Causey Aviation Unmanned, Inc. drone package delivery operations in Granbury and Rowlett, Texas, Wing Aviation LLC, and other Part 107 operations.

DroneUp acknowledges that future operators may propose locating operations within this proposed action's study area. Should that occur, DroneUp understands the potential for impacts may increase due to a future operator's project and would work with that operator and the FAA to mitigate potential impacts. DroneUp also understands that any future operators would be required to perform their own NEPA analysis to identify the potential for any noise impacts due to their operations.

DroneUp will communicate and coordinate with other operators to limit operations occurring concurrently in the same area to avoid any significant impacts. When considering new Hub locations, DroneUp will confirm a new Hub does not cause a significant cumulative impact due to another operator's Hub by verifying approved locations through NEPA documents and avoiding potential projects and cumulative impacts by geofencing and proactively sharing airspace. The proposed deconfliction plan for UA avoidance would help reduce any such cumulative effects by limiting drone flightpath overlap. DroneUp's flight planning software is designed to increase variability in flight paths to minimize overflights of any given location, thereby reducing the potential for cumulative effects when combined with other

operations in the study area. Additionally, Part 135 operators would be required to complete an environmental review before beginning operations, ensuring that any potential cumulative effects are properly analyzed and disclosed.

Hub sites would be in areas zoned for commercial activities and away from noise-sensitive areas. Hubs would be powered using available electric outlets for recharging batteries. No cumulative effects are expected on the power grid or from energy sources.

As discussed in Chapter 3, the proposed action is not expected to significantly and directly impact the environmental impact categories (see Section 3.2). Areas of existing aviation noise sources within the study area would have impacts mitigated by DroneUp taking precautions when siting Hub locations as stated above. Thus, the proposed action would not contribute to significant cumulative noise impacts. No other actions are anticipated to interact with the proposed action to result in cumulative effects; therefore, the proposed action is not expected to result in significant cumulative effects.

FAA analysis of prospective Hub siting areas concluded that siting 100% of the existing and proposed Hub locations is not feasible without overlap in the land area accessible from the Hub locations (i.e., the delivery ranges of the proposed UA). More information regarding the number of proposed Hubs, delivery ranges, and other assumptions relative to cumulative effects that could occur from Part 135 drone package deliveries in the DFW metro area can be found in Appendix I of this EA.

It should be noted that overlap does not necessarily mean that there will be adverse impacts to environmental resource categories. Cumulative effects are expected to occur where Hub locations and delivery routes overlap. The level of cumulative impacts would vary depending on the amount of overlap, but FAA's analysis has determined that the cumulative impacts are not expected to exceed thresholds for significance in any environmental resource categories.

The degree to which all of the different operators would operate within areas of shared airspace is dependent on the operators, their specific business use cases, and their ability to deconflict with one another in those overlapping areas. Each operator is responsible for coordinating with other operators in the same geographic area to avoid significant cumulative impacts. DroneUp will communicate and coordinate with other operators to limit operations occurring concurrently in the same area to avoid any significant impacts. When considering new Hub locations, DroneUp will confirm a new Hub does not cause a significant cumulative impact due to another operator's Hub by verifying approved locations through NEPA documents and avoiding potential projects and cumulative impacts by geofencing and proactively sharing airspace.

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Appendix A
References & Citations

Chapter 1 Citations:

1: An operating certificate is issued to an applicant that will conduct intrastate transportation, which is transportation that is conducted wholly within the same state of the United States.

2: https://www.faa.gov/uas/advanced_operations/package_delivery_drone

3: 49 U.S.C. § 44807; *Special Authority for Certain Unmanned Aircraft Systems*, provides the Secretary of Transportation with authority to determine whether a certificate of waiver, certificate of authorization, or a certificate under 49 U.S.C. §§ 44703 or 44704 is required for the operation of certain UAS.

4: An Operations Specifications is a document that defines the scope of aircraft operations that the FAA has authorized.

5: The DroneUp Operating Area has a radius of 30 nautical miles.

6: Class G airspace (uncontrolled) is that portion of airspace that has not been designated as Class A, Class B, Class C, Class D, or Class E airspace.

7: The airspace within 30 nautical miles of an airport listed in Appendix D, Section 1 of 14 CFR Part 91 (generally primary airports within Class B airspace areas), from the surface upward to 10,000 feet MSL. Unless otherwise authorized by ATC, aircraft operating within this airspace must be equipped with an operable radar beacon transponder with automatic altitude reporting capability and operable ADS-B Out equipment. See:
https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap3_section_2.html

8: 42 U.S.C. § 4321 et seq.

9: 40 CFR Parts 1500–1508

10: See 40 CFR § 1506.5(a)

11: https://www.faa.gov/licenses_certificates/airline_certification/135_certification/general_info

12: 14 CFR § 119.5(j)

13: 14 CFR § 119.51(c)

14: 49 U.S.C. § 44705

15: 14 CFR § 119.49(a)(6)

16: https://www.faa.gov/uas/advanced_operations/nepa_and_drones

Chapter 2 Citations:

17: 40 CFR § 1502.14.

18: *The Operation of Small Unmanned Aircraft Systems Over People* rule (codified in 14 CFR Part 107) permits routine operation of small UAS (UAs weighing less than 55 pounds) within visual line of sight at night and over people without a waiver or exemption under certain conditions.

19: A *noise-sensitive area* is an area where noise interferes with normal activities associated with its use. Normally, noise-sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife and waterfowl refuges, and cultural and historical sites. (*FAA Order 1050.1F*, Paragraph 11-5.b (10).)

20: Class B airspace is generally airspace from the surface to 10,000 feet mean sea level (MSL) surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. Class D airspace is generally airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. For more information. See: https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap3_section_2.html

21: According to the NOAA National Weather Service, civil twilight begins in the morning, or ends in the evening, when the geometric center of the sun is 6 degrees below the horizon. Therefore, morning civil twilight begins when the geometric center of the sun is 6 degrees below the horizon and ends at sunrise. Evening civil twilight begins at sunset and ends when the geometric center of the sun is 6 degrees below the horizon (NOAA National Weather Service).

22: The software uses powerful and automated mission planning to create dynamic flight paths for deliveries to business or residential addresses. The platform can leverage its smart algorithms to optimize flight routes, avoid air and ground obstacles, no-fly zones, and other airspace restrictions. It can also deconflict multiple flight missions that are being operated in shared airspace.

23: The UAs primarily composed of aluminum, carbon fiber, and nylon.

24: PX4 can use ADS-B to support simple air traffic avoidance in missions. If a potential collision is detected, PX4 can warn, immediately land, or return.

25: The delivery winch is capable of delivering up to a 10lb package from 125 ft in the air with the press of a button. This allows the drone to remain in a hover at a safe altitude while staying away from potential hazards closer to the ground.

Chapter 3 Citations:

26: See 40 CFR § 1502.15 *Affected Environment*

27: Ibid., 3-2
28: https://www.nps.gov/subjects/rivers/texas.htm

29: https://www.tceq.texas.gov/airquality/sip/dfw/dfw-status

30: https://www.generac.com/globalassets/products/business/mobile-power--light-solutions/mobile-generators/spec-sheets/mdg25if4_diesel-generator_spec-sheet_english.pdf

31: https://www.epa.gov/naaqs

32: Measuring the Effects of Drone Delivery in the United States, https://vtechworks.lib.vt.edu/server/api/core/bitstreams/e6290289-4ed3-433f-9ed9-b6fdb77f2328/content

33: 88 Federal Register 1196.

34: https://www.inaturalist.org/

35: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines

36: https://ecos.fws.gov/ecp/species/299

37: https://ecos.fws.gov/ecp/species/4658

38: 31 TAC §65.175

39: 31 TAC §65.176

40: See new regulatory section 50 CFR 22.280 (b)7 created from 89 FR 9920 which makes aircraft operation within 1,000 ft of an in use eagle nest eligible for a general permit.

41: U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management guidelines. Available at: https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf

42: The Migratory Birds Treaty Act of 1918.

43: The Bald and Golden Eagle Protection Act of 1940.

44: C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

45: https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

46: The FAA may make a de minimis impact determination with respect to a physical use of Section 4(f) property if, after taking into account any measures to minimize harm, the result is either: (1) a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or wildlife or waterfowl refuge for protection under Section 4(f); or (2) a Section 106 finding of no adverse effect or no historic properties affected. See 1050.1F Desk Reference, Paragraph 5.3.3.

47: Federal Highway Administration (FHWA) Section 4(f) Policy Paper. (Note: FHWA regulations are not binding on the FAA; however, the FAA may use them as guidance to the extent relevant to aviation projects.) Available at: https://www.environment.fhwa.dot.gov/legislation/section4f/4fpolicy.pdf

Public Comments Citations:

1: https://www.tceq.texas.gov/airquality/sip/dfw/dfw-status

Appendix B

Community Outreach Plan

DroneUp Community Outreach Plan

Operating as a good steward of the communities served and fostering acceptance of the drone industry is critical to successful integration. DroneUp has a long history of early engagement with communities. Outreach begins with DroneUp contacting the local Chamber of Commerce for a list of Chamber events, which DroneUp uses to announce their plans for drone delivery in the area. Additionally, DroneUp contacts schools and universities, hosting tours and demonstrations; classroom speaking engagements to spread awareness about UAS careers; mock interview days; and participation in drone competitions.

DroneUp's community outreach plan includes:

Community Outreach

- Chambers of Commerce
  - Involvement with local Chambers of Commerce and Economic Development Groups; hosting tours and demos, speaking at lunches, networking events, and other chamber events to maintain community relations.
- Local Events & Conferences
  - Attending local conferences, charity balls, and other events; volunteering with local community organizations, sponsoring and exhibiting opportunities; hosting tours and demos for potential business partners and partners.
- Aviation Stakeholder Outreach
  - Interact with local airfields, pilot associations, agricultural/sprayer companies, and helicopter operators that are most likely to be in the DroneUp Part 135 area of operations.
- Community Delivery Points
  - It provides an amenity to local apartment complexes, nursing homes, businesses/strip malls, fire stations, and more. This will allow the community to develop a direct relationship and partnership with their local Hub.

Workforce Development

- FAA Initiatives
  - Participation with the FAA-UAS Collegiate Training Initiative (CTI) and FAA-UAS CTI Occupational Work Group.
- High School STEM Engagement
  - Hosting tours and demonstrations to schools; classroom speaking engagements to spread awareness about UAS careers; mock interview days for high school students; participation in high school drone competitions.

- Educational Outreach
    - Helping with teacher professional development in integrating drones into their classrooms; offering insight as an industry partner to help with curriculum standards reviews and updates for State Departments of Education, School Districts, and College UAS Programs.

College Partnerships

- Richard Bland College (RBC) (VA)
    - Co-located Flight Academy, assistance in curriculum development for UAS Certificate Program; High School visits and STEM Camps at RBC's request; help with economic development efforts and local events.
- University of Arkansas (AR)
    - Project with the McMillon Innovation Studio focusing on implementing drones on campus for safety and security; course development with U of A Professional and Workforce Development Department for Flight Crew Fundamentals with successful completion guaranteeing an interview for DroneUp Operator role.
- Embry Riddle (FL)
    - DroneUp Pathway Program to recruit talent, attend on-campus college fairs, mock interview days, and host DroneUp Day at ERAU-Daytona Beach.

Community Engagement Tracker *as of 06.18.24			
Event Type	**Location**	**Description**	**Numbers**
Cone Talks	**Onsite**	**On the spot conversations with visitors that approach the Hubs and ask questions about our operations.**	**971**
Demonstrations or Community Events	**Offsite**	**Demos at Schools, Retirement Communities, Libraries, and Festivals**	**19**
Hub Tours	**Onsite**	**Tours to City Officials, Fire Depts., Police Depts. Conferences, and Colleges**	**13**
		Total	**1,003**

Marketing Materials Distributed or Displayed at Hubs or Stores *as of 06.18.24		
Item	**Preview**	**Quantities**
Hub Banner		16
In-Store/Entrance Signage		16
Postcards- English/Spanish		5,150 English- 4,850 Spanish- 300
Business Cards- English/Spanish		13,100 English- 12,600 Spanish- 500
Door Hangers		11,000

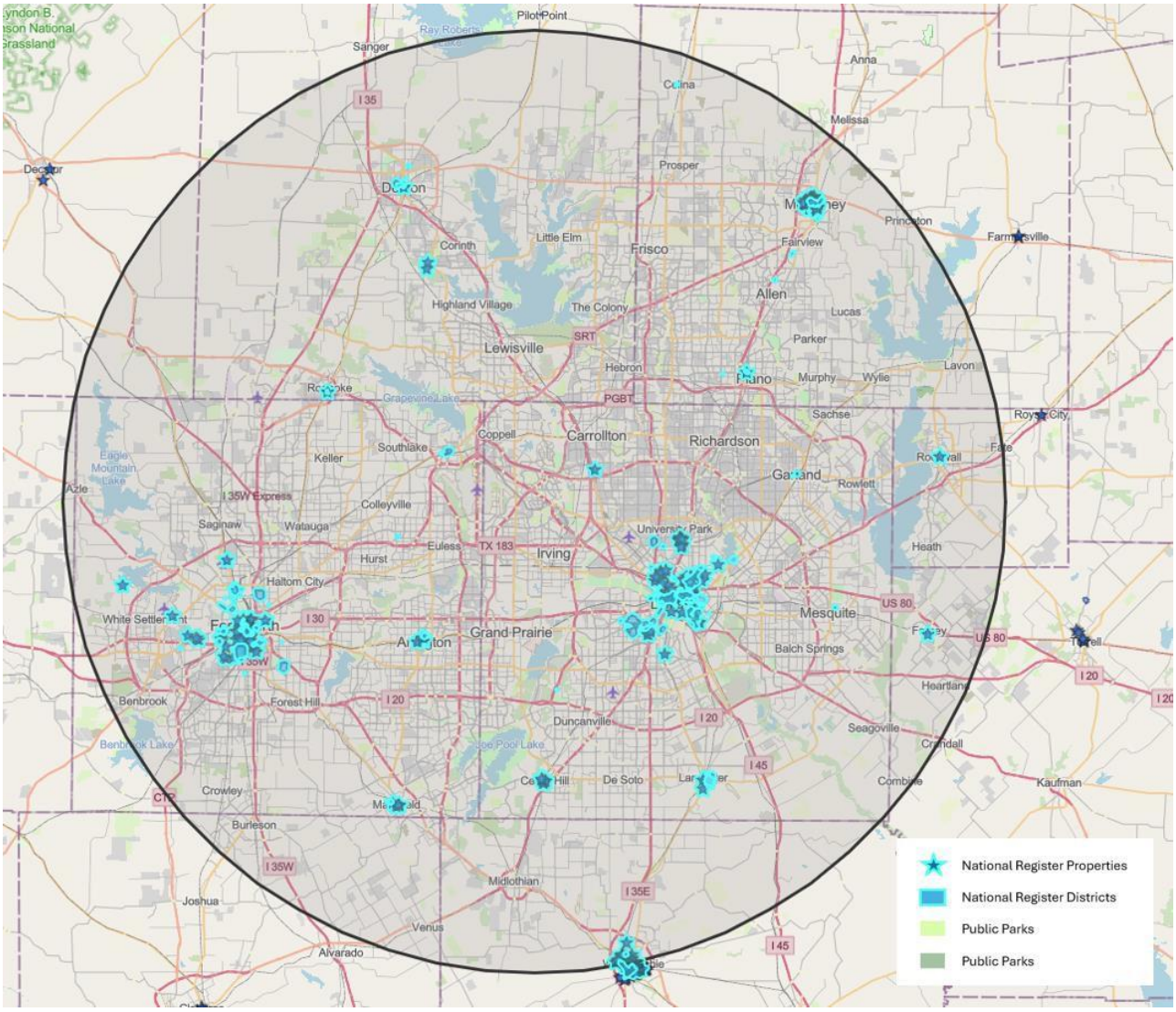
Marketing Materials Distributed or Displayed at Hubs or Stores *as of 06.18.24		
Community Delivery Point (CDP) One Pager		100
CDP Door Hanger		1,250
	Total	30,632

Appendix C
List of Preparers and Reviewers

Name and Affiliation	Years of Industry Experience	EA Responsibility
FAA Evaluators		
Shelia S. Neumann, Ph.D., P.E.	25 years	Environmental Protection Specialist, NEPA Project Lead and Reviewer
Christopher Hurst, CEM	20 years	Environmental Protection Specialist, NEPA Reviewer
Susumu Shirayama	24 years	Environmental Protection Specialist, Noise Reviewer
Christopher Couture	18 years	Environmental Protection Specialist, Document Review
Preparers		
Clifford Sweatte, Crown Consulting	18	NEPA SME, Research, and Document Preparation
Holly Gilewski, Crown Consulting	5	Research and Document Preparation
Cameron Hay, DroneUp	5	Research and Document Preparation

Appendix D

4(f) Map Within the DFW Operating Area



Appendix E
Biological Resources

Taxon	Scientific Name	Common Name	ESA Status	State Status
Amphibians	*Ambystoma tigrinum*	eastern tiger salamander		
	Desmognathus conanti	spotted dusky salamander		
	Anaxyrus woodhousii	Woodhouse's toad		
	Pseudacris streckeri	Strecker's chorus frog		
	Lithobates areolatus areolatus	southern crawfish frog		
Birds	*Plegadis chihi*	white-faced ibis		T
	Mycteria americana	wood stork		T
	Haliaeetus leucocephalus	bald eagle		
	Laterallus jamaicensis	black rail	T	T
	Grus americana	whooping crane	LE	E
	Charadrius melodus	piping plover	LT	T
	Charadrius montanus	mountain plover		
	Calidris canutus rufa	rufa red knot	LT	T
	Leucophaeus pipixcan	Franklin's gull		
	Athene cunicularia hypugaea	western burrowing owl		
	Anthus spragueii	Sprague's pipit		
	Vireo atricapilla	black-capped vireo		
	Setophaga chrysoparia	golden-cheeked warbler	LE	E
	Calamospiza melanocorys	lark bunting		
	Calcarius ornatus	chestnut-collared longspur		
Fish	*Anguilla rostrata*	American eel		
	Hybognathus nuchalis	Mississippi silvery minnow		
Mammals	*Myotis austroriparius*	southeastern myotis bat		
	Myotis velifer	cave myotis bat		
	Perimyotis subflavus	tricolored bat		
	Eptesicus fuscus	big brown bat		
	Lasiurus borealis	eastern red bat		
	Lasiurus cinereus	hoary bat		
	Nyctinomops macrotis	big free-tailed bat		
	Sylvilagus aquaticus	swamp rabbit		
	Cynomys ludovicianus	black-tailed prairie dog		
	Ondatra zibethicus	muskrat		
	Ursus americanus	black bear		T
	Mustela frenata	long-tailed weasel		

Taxon	Scientific Name	Common Name	ESA Status	State Status
	Spilogale putorius	eastern spotted skunk		
	Conepatus leuconotus	western hog-nosed skunk		
	Puma concolor	mountain lion		
Reptiles	*Macrochelys temminckii*	alligator snapping turtle		T
	Deirochelys reticularia miaria	western chicken turtle		
	Terrapene carolina	eastern box turtle		
	Terrapene ornata	western box turtle		
	Apalone mutica	smooth softshell		
	Ophisaurus attenuatus	slender glass lizard		
	Phrynosoma cornutum	Texas horned lizard		T
	Plestiodon septentrionalis	prairie skink		
	Heterodon nasicus	western hognose snake		
	Nerodia harteri	Brazos water snake		T
	Thamnophis sirtalis annectens	Texas garter snake		
	Crotalus horridus	timber (canebrake) rattlesnake		
	Crotalus viridis	western rattlesnake		
	Sistrurus tergeminus	western massasauga		
	Sistrurus miliarius	pygmy rattlesnake		
Crustaceans	*Caecidotea bilineata*	No accepted common name		
	Procambarus steigmani	Parkhill Prairie crayfish		
Insects	*Bombus pensylvanicus*	American bumblebee		
	Pogonomyrmex comanche	Comanche harvester ant		
	Amblycorypha uhleri	No accepted common name		
	Arethaea ambulator	No accepted common name		
Mollusks	*Lampsilis satura*	sandbank pocketbook		T
	Pleurobema riddellii	Louisiana pigtoe	PT	T
	Potamilus amphichaenus	Texas heelsplitter		T
	Potamilus streckersoni	Brazos heelsplitter		T
	Fusconaia chunii	Trinity pigtoe		T
	Truncilla macrodon	Texas fawnsfoot	PT	T
Plants	*Matelea edwardsensis*	plateau milkvine		
	Echinacea atrorubens	Topeka purple-coneflower		
	Liatris glandulosa	glandular gay-feather		
	Senecio quaylei	Quayle's butterweed		
	Geocarpon minimum	earth fruit	LT	T
	Ipomoea shumardiana	Shumard's morning glory		
	Cuscuta exaltata	tree dodder		
	Astragalus reflexus	Texas milk vetch		

Taxon	Scientific Name	Common Name	ESA Status	State Status
	Dalea hallii	Hall's prairie clover		
	Dalea reverchonii	Comanche Peak prairie clover		
	Pediomelum cyphocalyx	turnip-root scurfpea		
	Pediomelum reverchonii	Reverchon's scurfpea		
	Phlox oklahomensis	Oklahoma phlox		
	Crataegus viridis var. glabriuscula	Sutherland hawthorn		
	Agalinis auriculata	earleaf false foxglove		
	Agalinis densiflora	Osage Plains false foxglove		
	Yucca necopina	Glen Rose yucca		
	Carex shinnersii	Shinner's sedge		
	Schoenoplectus hallii	Hall's baby bulrush		
	Hexalectris nitida	Glass Mountains coral-root		
	Hexalectris warnockii	Warnock's coral-root		

LT: Federally threatened; LE: Federally endangered; PT: Proposed threatened; T: Threatened; E: Endangered

Appendix F

USFWS Section 7 Consultation

U.S. Department
of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

Field Office Supervisor
U.S. Fish and Wildlife Service
Arlington Ecological Services Field Office
2005 NE Green Oaks Boulevard, Suite 140
Arlington, Texas 76006-6247
Submitted to: arles@fws.gov

SUBJECT: Endangered Species Act Section 7 Consultation for Unmanned Aircraft Commercial Package Delivery Operations in Dallas-Fort Worth, Texas Area

In accordance with Section 7 of the Endangered Species Act (ESA), the Federal Aviation Administration (FAA) is requesting U.S. Fish and Wildlife Service (USFWS) concurrence that the FAA's action of authorizing DroneUp, LLC (DroneUp) to expand its unmanned aircraft (UA or drone) small package delivery operations in the Dallas-Fort Worth (DFW) metropolitan ***area may affect, but is not likely to adversely affect***, the tricolored bat (*Perimyotis subflavus*), golden-cheeked warbler (*Setophaga chrysoparia*), and whooping crane (*Grus americana*). Our biological evaluation is provided below, including a brief background, project description, identification of the action area, and a discussion of potential effects to ESA-listed species.

Background

Over the past several years, DroneUp has been working under various FAA programs, including the Unmanned Aircraft Systems Integration Pilot Program, as well as the FAA's established processes to bring certificated commercial UA delivery into practice. Participants in these programs are among the first to prove their concepts— including package delivery by UA—using current regulations and exemptions and waivers from some of the regulatory requirements.

DroneUp currently operates under 14 Code of Federal Regulations (CFR) Part 107 from Murphy, Texas. DroneUp has applied for a Part 135 Air Carrier Operating Certificate from the FAA, which allows it to carry the property of another for compensation or hire beyond visual line of sight (BVLOS) in those areas of Texas. The certificate contains a stipulation that operations must be conducted in accordance with the provisions and limitations specified in the carrier's Operations Specifications (OpSpecs).[1]

[1] An Operations Specifications is a document that defines the scope of aircraft operations that the FAA has authorized.

DroneUp is applying to the FAA to add the DFW metropolitan area to the operating area included in its OpSpecs for Texas.

Project Description

DroneUp has requested the FAA to issue the required OpSpecs in DroneUp's Part 135 air carrier certificate to enable expansion of its commercial drone package delivery operations in the DFW metropolitan area (see **Figure 1**). DroneUp projects operating a maximum of 500 flights per operating day from each Hub, with each flight taking a package to a customer delivery address before returning to a Hub. DroneUp projects establishing up to 30 Hubs in the DFW operating area. The UA would be transporting healthcare products and other consumer goods in partnership with merchants in the community. There would be variability in the number of flights per day based on customer demand and weather conditions. The maximum potential number of total eventual operations could be 15,000.

DroneUp is proposing to disperse Hubs throughout the operational area (**Figure 1**), each located in a commercial area, such as a shopping center, large retailer, shopping mall, etc. Each Hub would house up to two dozen aircraft on charging pads and one or more merchants may use each Hub for drone deliveries. Hubs would be distributed throughout the DFW metro area following a measured rollout plan developed with DroneUp's partners and continuing best practices from DroneUp's established community outreach program. The proposed operations would occur during daytime hours (7am to 10pm), typically seven days of the week (including weekends), and generally including holidays.

Unmanned Aircraft

The primary UA used for the proposed operations is DroneUp which features a multi-rotor design with eight propellers (see **Figure 2**). The UA weighs 55 pounds when combined with its maximum payload weight of 10 pounds. It has a wingspan of approximately 71.5 inches, a height of approximately 32 inches, and a length of approximately
71.5 inches. DroneUp aircraft use electric power from rechargeable Lithium-Ion Polymer battery packs.

Flight Operations

The UA would generally be operated at an altitude of 230-250 feet above ground level (AGL) and always below an altitude of 400 feet AGL while en route to and from delivery locations. At a delivery location, the UA would descend vertically to a stationary hover and lower a package to the ground by line for delivery. Once a package has been lowered to the ground, the UA would then retract the line, ascend vertically to an en route altitude, and depart the delivery area en route back to a Hub.

The UA would fly a predefined flight path that is set prior to takeoff. A mission originates from a Hub location, and
DroneUp's software automatically assigns, deconflicts, and routes each flight to the delivery location and back to a Hub. Each Hub site would include a controlled area wherein UA flights are launched and recovered. Each Hub site would have access to a controlled area wherein UA flights are launched and recovered.

A typical flight profile can be broken into the following general flight phases: takeoff, en route outbound, delivery, en route inbound, and landing.

Takeoff

Prior to takeoff, the package is loaded. During takeoff, the aircraft ascends to its en route altitude, 230-250 feet AGL, (the altitude AGL it will stay in for the duration of the flight to the delivery site). It will pause momentarily after reaching the en route altitude before moving towards the delivery site.

En Route Outbound

The en route outbound phase is the part of flight in which the fully loaded UA transits from the Hub to a delivery point on a predefined flight path. During this flight phase, the UA would typically operate at an altitude of 230-250 ft AGL and airspeed of 31.5 mph (27.4 knots). The UA has a single set cruise airspeed, which would not be exceeded.

Delivery

The delivery phase consists of descent from the en route altitude to a delivery point, such as a residential yard, driveway, parking lot, or common area. The UA descends vertically to 80 feet AGL while maintaining position over the delivery point. The UA hovers at 80 feet AGL for approximately 1 minute while lowering its package and then proceeds to climb vertically back to en route altitude. The minimum distance a human should be from the UA during delivery is a 6-foot radius from underneath the center of the UA. The winch system was created exclusively for use with the PRISM V2 Series, and is capable of delivering up to a 10-pound package from an altitude of 124 ft. This allows the drone to remain in a hover at a defined altitude of 80 feet per DroneUp policy while staying away from potential hazards closer to the ground. The logic inside the winch executes a delivery completely autonomously and returns the delivery hook in under one minute. Prior to loading a package onto the payload delivery system, a trained and approved crewmember must ensure the weight is below the maximum allowable threshold by weighing the package in its packed condition. *En Route Inbound*

The UA continues to fly at an altitude of 230-250 ft AGL and a speed of 31.5 mph (27.4 knots) towards the Hub. DroneUp's flight planning software auto populates the best route of flight and operators then has the ability to ensure strategic routing is used to shield as much as practical.

Landing

Upon reaching the Hub, the UA slowly descends over its assigned landing area, and lands on the ArUco Tag. The aircraft will land with the Realsense camera centered over the tag itself, therefore the 4 ft "downwards" from the tag must be clear for the main body of the aircraft. The UAS is programmed to search for, and land on, one specific tag pattern, ensuring the aircraft always finds its own safe landing area. The ArUco tag for that aircraft is placed in the takeoff/landing area during preflight and remains present until the end of operations

Predicted Sound Levels

The FAA conducted a noise analysis using sound level measurement data for the UA— the PRISM V2 Series (See **Attachment B**). The delivery phase of flight noise exposure is not expected to exceed DNL[2] 48.6 decibels (dB) at about 16 feet from the drone. Predicted sound levels decrease as distances from the drone increase. The en route phase noise exposure is not expected to exceed DNL 54.0 dB when the drone is flying 31.5 mph, 27.4 knots at 200 feet AGL.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02). The action area is defined as DroneUp's proposed operating area (see **Figure 1**). This area captures all possible flight routes to the delivery areas and where potential effects (e.g., visual, auditory, physical) to listed species could occur. According to the Texas Parks and Wildlife Department (TPWD), the action area overlaps two natural regions or ecoregions: Cross Timbers (on the western portion of the action area) and Blackland Prairie (on the eastern portion of the action area) (TPWD 2023a). The following is a general description of each of these ecoregions in Texas; however, note that much of the land surface in the action area is highly urbanized, as it contains the cities of Dallas, Fort Worth, Arlington, Garland, Plano, Frisco, Denton, and other municipalities. Outside these cities, much of the land has been converted to agricultural fields. There are forest patches interspersed throughout the action area, particularly along drainages and near waterbodies.

- The Cross Timbers region in north and central Texas includes areas with high density of trees and irregular plains and prairies. Soils are primarily sandy to loamy. Rainfall can be moderate, but somewhat erratic, therefore moisture is often limited during part of the growing season. Also known as the Osage Plains, it is the southernmost of three tallgrass prairies. It varies from savannah and woodland to the east and south, into shorter mixed-grass prairie to the west. As in the rest of the Great Plains, fire, topography, and drought maintained prairie and established the location of woodlands (TPWD 2023b).
- The Blackland Prairies region is named for the deep, fertile black soils that characterize the area. Blackland Prairie soils once supported a tallgrass prairie dominated by tall-growing grasses such as big bluestem, little bluestem, Indiangrass, and switchgrass. Because of the fertile soil, much of the original prairie has been plowed to produce food and forage crops. The landscape is gently rolling to nearly level, and elevations range from 300 to 800 feet above sea

[2] The Day Night Average Sound Level (DNL or Ldn) noise metric is used to reflect a person's cumulative exposure to sound over a 24-hour period. DNL takes into account both the amount of noise from each aircraft operation as well as the total number of operations flying throughout the day and applies an additional 10dB weighting for nighttime flights between 10 p.m. and 7 a.m.

level. Crop production and cattle ranching are the primary agricultural industries (TPWD 2023b).

ESA-Listed Species and Critical Habitat in the Action Area

The FAA acquired the Official Species List (see **Attachment A**) from the USFWS Information for Planning and Conservation (IPaC) online system to identify ESA-listed species and designated critical habitat in the action area (**Table 1**). The action area contains designated critical habitat for the Texas fawnsfoot (*Truncilla macrodon*).

Table 1. ESA-Listed and Candidate Species Potentially Present in the Action Area

Species	Common Name	Species Name	ESA Status	Critical Habitat
Mammals	Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	N
Birds	Golden-cheeked Warbler	*Setophaga chrysoparia*	Endangered	N
	Piping Plover	*Charadrius melodus*	Threatened	N
	Rufa Red Knot	*Calidris canutus rufa*	Threatened	N
	Whooping Crane	*Grus americana*	Endangered	N
Reptiles	Alligator Snapping Turtle	*Macrochelys temminckii*	Proposed Threatened	N
Clams	Texas Fawnsfoot	*Truncilla macrodon*	Proposed Threatened	Y
	Texas Heelsplitter	*Potamilus amphichaenus*	Proposed Endangered	N
Insects	Monarch Butterfly	*Danaus plexippus*	Candidate	N

The Official Species List states that the piping plover and red knot only need to be considered for wind energy projects. Since the action is not a wind energy project, these two species are not considered further.

Potential Effects of the Action on ESA-Listed Species and Critical Habitat

The action does not include any ground construction or habitat modification. During nominal operations, the UA would not touch the ground except at the Hubs, which would be located in commercial areas, such as shopping centers. The action would not result in any physical disturbance to habitat. Therefore, the proposed action does not have the potential to affect the Texas fawnsfoot

critical habitat. The FAA has determined the action would have no effect on Texas fawnsfoot critical habitat.

UA noise and the potential for airborne strikes with flying species are the action's potential stressors or threats to ESA-listed species. Flight operations would take place mostly in an urban environment, within airspace, and typically remain well above the tree line while en route to and from a Hub. The duration of exposure by wildlife on the ground to visual or noise impacts from the UA would be of very short duration (approximately 1 minute during takeoff/landing and delivery and a few seconds during the en route phase).

As noted above and shown in **Attachment B**, the highest estimated DNL associated with DroneUp's proposed operations is 65 dB within 119 feet of the aircraft, which would occur when the drone is taking off from or landing at a Hub in a commercial area. For reference, the sound level of a diesel truck at 50 feet or a noisy urban environment during the day is approximately 80 to 90 dB. The DNL on the ground when the UA is flying in the en route phase at an altitude of 200 feet AGL is estimated to be around 54.0 dB, which is comparable to the sound of an air conditioning unit at 100 feet (60 dB). The highest estimated DNL associated with the delivery operation is 55.1 dB at a distance of 16 feet.

A noise descriptor for noise effects on wildlife has not been universally adopted, but some research indicates SEL is the most useful predictor of responses. Characteristic of the bulk of research to date has been lack of systematic documentation of the source noise event. Many studies report "sound levels" without specifying the frequency spectrum or duration. A notable exception is a study sponsored by U.S. Air Force that identifies SEL as the best descriptor for response of domestic turkey poults to low-altitude aircraft overflights (Bradley et al. 1990). This study identified a threshold of response for disturbance of domestic turkeys ("100 percent rate of crowding") as SEL 100 dB. None of the predicted sound levels for the different flight phases exceed SEL 86.5 dB.

The following paragraphs describe the anticipated effects of the action on the ESA-listed species listed in **Table 1**.

Tricolored Bat

The tricolored bat typically uses trees, caves, or manmade structures for roosting and forages for insects during dusk, nighttime, and dawn time periods. Tricolored bats emerge early in the evening and forage at treetop level or above but may forage closer to ground later in the evening. This species exhibits slow, erratic, fluttery flight while foraging and are known to forage most commonly over waterways and forest edges. This species spends six to nine months per year hibernating in caves or mines. The USFWS has proposed to list the tricolored bat as an endangered species, primarily due to white-nose syndrome[3]. Other factors that influence the tricolored bat's viability include wind-energy-related mortality, habitat loss, and effects from climate change.

Suitable habitat for tricolored bat roosting and feeding in the action area includes wooded areas, open water habitat, and manmade structures. Based on current data from the North American Bat Monitoring Program, there is a low probability of a tricolored bats occurring in the action area,

[3] 87 Federal Register 56381 (September 14, 2022).

particularly in the urban environment where Hubs would be located, and deliveries would occur (see **Figure 3**). Hubs would be located in commercial areas and therefore not within suitable habitat for tricolored bats. **Figure 4** and **Figure 5** reflects the hibernation, habits, and range of the tricolored bat.

As stated above, DroneUp is proposing UA operations from 7am to 10pm. Therefore, the time period that represents the greatest potential for the action to affect a tricolored bat is at dawn and dusk. Also, the risk is only present for 3–6 months each year (i.e., when bats are not hibernating). Tricolored bats at roost or in flight could experience UA noise during the en route and delivery flight phases. Bats foraging at or near the tree line at the time a UA flies by would experience the greatest sound levels. Roosting bats or bats foraging near the ground at the time a UA flies by would experience lower sound levels. Given the estimated sound levels of the UA, the UA's linear flight profile to and from Hubs and delivery locations, the short period of time the UA would be in any particular location, and the low probability of encountering an individual tricolored bat in the action area, UA noise is not expected to adversely affect tricolored bats. Any increase in ambient sound levels caused by the UA's flight would only last a few seconds during the en route phase and approximately 1 minute during a delivery.

Bats could also be struck by a drone, particularly around dawn and dusk when foraging. Given the bat's ability to avoid flying into objects, the short period of time the UA would be in any one place, and the low probability of encountering a tricolored bat during operations, the likelihood of the UA striking a bat is discountable.

Based on operations occurring mostly in an urban environment, the altitude at which the UA flies in the en route phase (230-250 feet AGL), the expected low sound levels experienced by a bat, any increase in ambient sound levels would be short in duration, the low probability of a tricolored bat occurring in the action area, and the low likelihood of the UA striking a bat, the FAA has determined the action ***may affect, but is not likely to adversely affect***, the tricolored bat. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

Golden-cheeked Warbler

Golden-cheeked warblers are insectivores that typically forage in forest habitats. Its entire nesting range is currently confined to habitat in 33 counties in central Texas; a portion of one of these counties (Johnson County) is located in the southwest section of the action area. Golden-cheeked warblers prefer mature Ashe juniper (*Juniperus ashei*) trees mixed with hardwood trees as nesting and foraging sites (preferring forested tracts greater than 12 acres). Many woodlands that were once present in the action have been cleared for urbanization and agriculture. The golden-cheeked warbler is listed under the ESA primarily due to habitat loss and fragmentation, since they have specific Hubing habitat requirements (USFWS 2023b; TPWD 2023d).

The action does not involve ground disturbance or vegetation removal and therefore would not physically impact any golden-cheeked warbler suitable habitat. If present in the action area, golden-cheeked warblers could experience UA noise during the en route and delivery flight phases. Birds resting or foraging at or near the tree line at the time a UA flies by would experience the greatest sound levels. Birds near the ground at the time a UA flies by would experience lower sound levels.

Given the estimated sound levels of the UA, the UA's linear flight profile to and from Hubs and delivery locations, the low probability of encountering an individual warbler in the action area based on the counties they nest in, and the short period of time the UA would be in any particular location, UA noise is not expected to adversely affect golden-cheeked warblers. Further, the chances of any one individual experiencing multiple overflights of a UA are low given the mobility of the birds. One study found that, in most instances, drones within 4 meters of birds did not cause a behavioral response (Vas et al. 2015). In another study, drones barely elicited behavioral responses in terrestrial mammals (Mulero-Pázmány et al. 2017).

Golden-cheeked warblers could be struck by a UA in flight when foraging above treetops or in flight between foraging sites or during migration. The risk of a strike is low given the species' ability to fly and avoid the UA, as well as the low probability of encountering a golden-cheeked warbler during drone deliveries. Additionally, DroneUp has reported that there has never been a bird strike with its drones in the United States.

Based on 1) operations occurring mostly in an urban environment, 2) the altitude at which the UA flies in the en route phase (230-250 feet AGL); 3) the expected low sound levels experienced by a golden cheeked warbler, 4) any increase in ambient sound levels would be short in duration, 5) the low probability of a golden-cheeked warbler occurring in the action area, and 6) the low likelihood of the UA striking a warbler, the FAA has determined that the action ***may affect, but is not likely to adversely affect***, the golden-cheeked warbler. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

Whooping Crane

Whooping cranes use a variety of habitats, including wetlands, estuaries, pastures, agricultural fields, and shallow areas of open water habitats. They are omnivores that eat a variety of food including insects, reptiles, rodents, fish, small birds, mollusks, crustaceans, and berries. Whooping cranes breed in northwest Canada and migrate south and winter in Texas, primarily in the Aransas National Wildlife Refuge located on the Gulf coast (TPWD 2023e). The whooping crane is listed under the ESA primarily due to hunting pressures and habitat loss (USFWS 2023c; Cornell 2023). Suitable foraging habitat in the action area includes shallow areas of open water habitats, marshes, pastures, and agricultural fields.

The whooping crane may occur in the action area in the spring or fall months as it migrates to and from its breeding grounds in Canada and wintering grounds at the Aransas National Wildlife Refuge. The majority of migrant crane observations in Texas occur in the spring from March 19 – April 30 and fall from October 20 – November 24 (Pearse et al. 2020). The crane may use habitat (e.g., agricultural fields) in the action area as a stopover site to feed or rest during migration. Whooping Cranes have not been observed at Lewisville Lake, spotted originally on the north side before moving to the south side of the lake over about 45 minutes, and spent an additional 30 minutes on the south banks before departing the area. The last spotting of Whooping Cranes was 2014 and are considered rare in the area of the lake (DFW Urban Wildlife n.d.). Two Whooping Cranes were documented at Lake Ray Hubbard, across from Wynn Joyce Park, in 2014 (DFW Urban Wildlife n.d.) but have not been known to return to the area.

The action does not include ground disturbance and therefore would not physically impact potential foraging or resting habitat. If present in the action area during operations, whooping cranes could experience en route noise. Given the estimated sound levels of the UA, the UA's linear flight profile to and from Hubs and delivery locations, the low probability of encountering an individual whooping crane during operations, and the short period of time the UA would be in any particular location, UA noise is not expected to adversely affect whooping cranes. Further, the chances of any one individual experiencing multiple overflights of a UA are low given the mobility of the birds. One study found that, in most instances, drones within 4 meters of birds did not cause a behavioral response (Vas et al. 2015).

Whooping cranes could be struck by a drone when in flight. The risk of a strike is low given the crane's limited occurrence in the action area and the crane's ability to fly and avoid the UA. Additionally, DroneUp has reported that there has never been a bird strike with its drones in the United States.

Based on operations occurring mostly in an urban environment, the altitude at which the UA flies in the en route phase (230-250 feet AGL); the expected low sound levels experienced by a whooping crane, any increase in ambient sound levels would be short in duration, the low probability of a whooping crane occurring in the action area, and the low likelihood of the UA striking a whooping crane, the FAA has determined that the ***action may affect, but is not likely to adversely affect***, the whooping crane. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

Alligator Snapping Turtle

The alligator snapping turtle is native to freshwater habitats, is the largest freshwater species of turtle in
North America. Their historical range included Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, Texas. The FAA determined this action would have ***no effect*** on the alligator snapping turtle.

Texas Fawnsfoot

The Texas fawnsfoot is a freshwater mussel that is endemic to Texas and found in the three river basins: Colorado, Brazos, and Trinity. The action does not involve any ground-disturbing activities or activities within Texas fawnsfoot habitat. As there is no plausible route of effect to this species, the FAA determined the action would have ***no effect*** on the Texas fawnsfoot.

Texas Heelsplitter

The Texas heelsplitter is a rare freshwater mussel with a thin, smooth, elliptical shell and a straight hinge line. The species' historical range included Louisiana and Texas. The FAA determined this action would have ***no effect*** on the Texas heelsplitter.

Monarch Butterfly

The monarch butterfly is a candidate for federal listing. The primary threat to monarch butterflies is habitat loss, including the loss of breeding, migratory, and overwintering habitat. Pesticide use and climate change are also threats. While portions of the action area may contain potential summer breeding habitat, the entirety of Texas is within the migration path of monarch butterflies flying back and forth to wintering grounds in Mexico (TPWD).

The action would not physically affect monarch butterfly habitat or host plants. Monarch butterflies could be struck by drones en route to and from delivery; however, strikes are not likely given the species' mobility. Information regarding drone impacts on insects is limited, and there have been no widespread negative impacts identified in the scientific literature. Based on the information available and the limited scale of operations, the action is not expected to adversely affect the monarch butterfly.

Conclusion

Based on the analysis above, the FAA has determined the action ***may affect, but is not likely to adversely affect***, the tricolored bat, golden-cheeked warbler, and whooping crane. The FAA appreciates your review of the proposed project and requests your concurrence with our effects determinations for these three species. If you have any questions, please contact Dr. Shelia Neumann via email at 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.06.05 11:49:21 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments: Figure 1. Action Area
Figure 2. PRISM V2 Series Unmanned Aircraft with Package Attached
Figure 3. Tricolored Bat Mean Occupancy Probabilities
Figure 4. Tricolored Bat Ranges
Figure 5. Texas Tricolored Bat Habits
Attachment A. USFWS Official Species List
Attachment B. Noise Assessment Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office
501 West Felix Street
Suite 1105
Fort Worth, TX 76115-3410
Phone: (817) 277-1100 Fax: (817) 277-1129
Email Address: arles@fws.gov

In Reply Refer To: 04/30/2024 12:46:46 UTC
Project Code: 2024-0083542
Project Name: Updated DroneUp EA

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. No effect - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. May affect, but is not likely to adversely affect - the appropriate determination when a proposed action's anticipated effects to listed species or critical habitat are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. May affect, is likely to adversely affect - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a consequence of the proposed action, and the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service has performed up-front analysis for certain project types and species in your project area. These analyses have been compiled into determination keys, which allows an action agency, or its designated non-federal representative, to initiate a streamlined process for determining a proposed project's potential effects on federally listed species. The determination keys can be accessed through IPaC.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found at: https://www.fws.gov/service/section-7-consultations

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (https://www.fws.gov/library/collections/bald-and- golden-eagle-management). Additionally, wind energy projects should follow the wind energy guidelines (https://www.fws.gov/media/land-based-wind-energy-guidelines) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: https:// www.fws.gov/media/recommended-best-practices-communication-tower-design-siting- construction-operation. The Federal Aviation Administration (FAA) released specifications for and made mandatory flashing L-810 lights on new towers 150-350 feet AGL, and the elimination of L-810 steady-burning side lights on towers above 350 feet AGL. While the FAA made these changes to reduce the number of migratory bird collisions (by as much as 70%), extinguishing steady-burning side lights also reduces maintenance costs to tower owners. For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arlington Ecological Services Field Office

501 West Felix Street

Suite 1105

Fort Worth, TX 76115-3410

(817) 277-1100

PROJECT SUMMARY

Project Code: 2024-0083542

Project Name: Updated DroneUp EA

Project Type: Drones - Use/Operation of Unmanned Aerial Systems Project Description: 4/30/2024 Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@32.88492255,-96.97434574863681,14z

Counties: Texas

ENDANGERED SPECIES ACT SPECIES

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

[1] . NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

MAMMALS

NAME *STATUS*

Tricolored Bat Perimyotis subflavus Proposed

No critical habitat has been designated for this species. Endangered
Species profile: https://ecos.fws.gov/ecp/species/10515

BIRDS

NAME *STATUS*

Golden-cheeked Warbler Setophaga chrysoparia Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/33

Piping Plover Charadrius melodus Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.
There is final critical habitat for this species. Your location does not overlap the critical habitat.
This species only needs to be considered under the following conditions: ▪ Wind Energy Projects
Species profile: https://ecos.fws.gov/ecp/species/6039

Rufa Red Knot Calidris canutus rufa Threatened

There is proposed critical habitat for this species.
This species only needs to be considered under the following conditions:
- ▪ Wind Energy Projects

Species profile: https://ecos.fws.gov/ecp/species/1864

Whooping Crane Grus americana Endangered

Population: Wherever found, except where listed as an experimental population
There is final critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/758

REPTILES

NAME *STATUS*

Alligator Snapping Turtle Macrochelys temminckii Proposed No critical habitat has been designated for this species. Threatened
Species profile: https://ecos.fws.gov/ecp/species/4658

CLAMS

NAME	*STATUS*
Texas Fawnsfoot Truncilla macrodon	Proposed
There is proposed critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8965	Threatened
Texas Heelsplitter Potamilus amphichaenus	Proposed
There is proposed critical habitat for this species. Your location does not overlap the critical habitat.	Endangered

NAME	*STATUS*
Species profile: https://ecos.fws.gov/ecp/species/299	

INSECTS

NAME	*STATUS*
Monarch Butterfly Danaus plexippus	Candidate
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	

CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	*STATUS*
Texas Fawnsfoot Truncilla macrodon	Proposed https://ecos.fws.gov/ecp/species/8965#crithab

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[2] and the Migratory Bird Treaty Act[3].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[4], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

[2] . The Bald and Golden Eagle Protection Act of 1940.
[3] . The Migratory Birds Treaty Act of 1918.
[4] . 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

4. Probability of Presence ( )

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

5. Breeding Season ( )

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

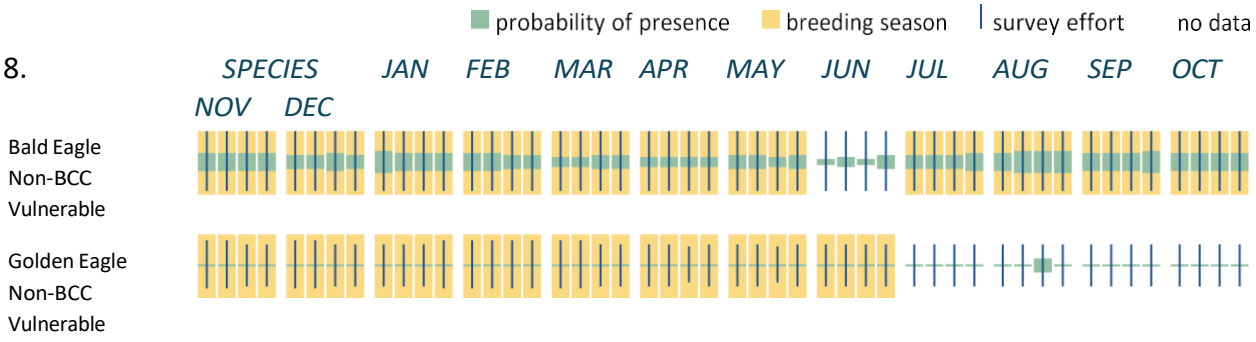
6. Survey Effort ( )

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

7. No Data ( )

A week is marked as having no data if there were no survey events for that week.

8.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[5] and the Bald and Golden Eagle Protection Act[6].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[7] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

BREEDING
NAMESEASON

American Golden-plover Pluvialis dominica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10561	Breeds elsewhere
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Henslow's Sparrow Centronyx henslowii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3941	Breeds elsewhere

[5] . The Migratory Birds Treaty Act of 1918.
[6] . The Bald and Golden Eagle Protection Act of 1940.
[7] . 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

Kentucky Warbler Geothlypis formosa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9443	Breeds Apr 20 to Aug 20
Least Tern Sternula antillarum antillarum This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/11919	Breeds Apr 25 to Sep 5
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Little Blue Heron Egretta caerulea This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9477	Breeds Mar 10 to Oct 15
Long-billed Curlew Numenius americanus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/5511	Breeds elsewhere
BREEDING NAMESEASON	
Pectoral Sandpiper Calidris melanotos This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Prairie Loggerhead Shrike Lanius ludovicianus excubitorides This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8833	Breeds Feb 1 to Jul 31
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Sprague's Pipit Anthus spragueii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	https://ecos.fws.gov/ecp/species/8964 PROBABILITY OF

PRESENCE SUMMARY

Breeds elsewhere

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season ( )

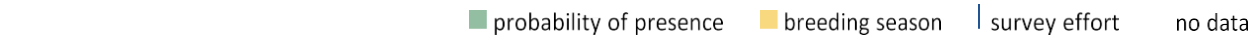
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort ( )

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ( )

A week is marked as having no data if there were no survey events for that week.



American Golden- plover BCC Rangewide (CON)

Bald Eagle
Non-BCC
Vulnerable

Chimney Swift
BCC Rangewide
(CON)

Golden Eagle

Non-BCC
Vulnerable

Henslow's Sparrow
BCC Rangewide
(CON)

Kentucky Warbler
BCC Rangewide
(CON)

Least Tern
BCC Rangewide
(CON)

Lesser Yellowlegs
BCC Rangewide
(CON)

Little Blue Heron
BCC - BCR

Long-billed Curlew
BCC - BCR

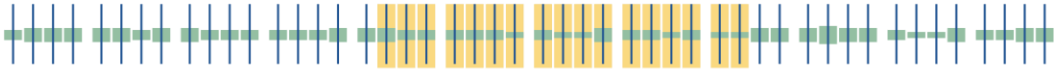
Pectoral Sandpiper
BCC Rangewide
(CON)

Prairie Loggerhead
Shrike
BCC -
BCR

9. *SPECIES*

Prothonotary
Warbler
BCC Rangewide
(CON)

Red-headed
Woodpecker
BCC Rangewide
(CON)



Sprague's Pipit
BCC Rangewide
(CON)

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds

- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPAC USER CONTACT INFORMATION

Agency: Federal Aviation Administration

Name: Holly Gilewski

Address: 1530 Wilson Boulevard

Address Line 2: Suite 964

City: Arlington

State: VA

Zip: 22209

Email jollyholly909@gmail.com

Phone: 6162510139

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Texas Coastal and Central Plains Ecological Services Field Office
Fort Worth Sub-office
3233 Curtis Drive
Fort Worth, Texas 76116
(817) 277-1100

In Reply Refer To:
2024-0083542

July 25, 2024

Derek Hufty
Office of Safety Standards, Flight Standards Service
Federal Aviation Administration
800 Independence Avenue, SW
Washington, D.C. 20591

RE: Endangered Species Act Section 7 Consultation for Unmanned Aircraft Commercial Package Delivery Operations in the Dallas-Fort Worth, Texas Area

Dear Mr. Hufty,

This responds to the Federal Aviation Administration's (FAA) June 6, 2024, letter requesting consultation pursuant to Section 7 of the Endangered Species Act of 1973 as amended (16 U.S.C.
1531-1544) (Act). Your letter includes a biological evaluation of the proposed action of authorizing DroneUp, LLC's expansion of unmanned aircraft (UA) small package delivery operations in the Dallas-Fort Worth (DFW) metropolitan area. Additional information regarding the action area was received via electronic correspondence on June 26, 2024. The biological evaluation concluded that the proposed action would have no effect on the alligator snapping turtle (*Macrochelys temminckii*), Texas fawnsfoot (*Truncilla macrodon*), Texas heelsplitter (*Potamilus amphichaenus),* and monarch butterfly (*Danaus plexippus*), and may affect, but is not likely to adversely affect the tricolored bat (*Perimyotis subflavus*), golden-cheeked warbler (*Setophaga chrysoparia*), and whooping crane (*Grus americana*).

The purpose of the proposed action is to "disperse Hubs throughout the operational area (Figure 1), each located in a commercial area, such as a shopping center, large retailer, shopping mall, etc." DroneUp, LLC plans on establishing 30 Hubs in the DFW area, operating a maximum of 500 flights per day depending on "customer demand and weather conditions." The UA has a

wingspan of approximately 71.5 inches and “would be transporting healthcare products and other consumer goods in partnership with merchants in the community.” The UA would be operated at an altitude of 230-250 feet above ground level (AGL) and always below an altitude of 400 feet AGL, while en route to and from delivery locations.

Unmanned aircraft flight operations within a network of defined flight paths between distribution centers and delivery sites, include:

- Takeoff and climb
- En route flight outbound
- Delivery
- En route flight inbound
- Descent and landing

Additionally, the FAA conducted a noise analysis using sound level measurement data for the unmanned aircraft. For reference, “the sound level of a diesel truck at 50 feet or a noisy urban environment during the day is approximately 80 to 90 decibels (dB)”, and the DNL (The Day Night Average Sound Level) “on the ground when the UA is flying in the en route phase at an altitude of 200 feet AGL is estimated to be around 54.0 dB, which is comparable to the sound of an air conditioning unit at 100 feet (60 dB).”

Figure 1. Action Area.

The federally-listed, proposed listed, and candidate species known to occur in Wise, Denton, Collin, Parker, Tarrant, Dallas, Kaufman, Ellis, Rockwall, and Johnson Counties are the threatened piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), and Texas

fawnsfoot (*Truncilla macrodon*)(listing effective July 5, 2024), the endangered golden-cheeked warbler (*Setophaga chrysoparia*) and whooping crane (*Grus americana*), the proposed endangered tricolored bat (*Perimyotis subflavis*) and Texas heelsplitter (*Potamilus amphichaenus),* proposed threatened alligator snapping turtle (*Macrochelys temminckii),* and the candidate monarch butterfly (*Danaus plexippus*). Currently, the Service recommends the piping plover and red knot be evaluated only for wind energy projects in these counties; therefore, no consultation is necessary regarding those species. Proposed species are not currently protected under the Act; however, conferencing is necessary if it is determined a federal action is likely to jeopardize the continued existence of a proposed species. Your biological evaluation does not indicate the need for conference on the proposed species. We should note that there is a lack of information on the potential effects of drone flights on the tricolored bat. While the proposed action is not expected to directly affect roosting habitat for the species and the majority of flight time would occur when bats are roosting, there are times when active/feeding tricolored bats, if present in the action area, could be exposed to drone activity. Should the tricolored bat be listed, you should re-evaluate the project to determine the extent of effects on the species. If that evaluation indicates adverse effects would or are occurring on the species, measures should be implemented to avoid incidental take until consultation can be completed. The following measures should be considered to avoid incidental take:

- Determining the extent of tricolored bat presence in the action through acoustic surveys
- Restricting flight hours to daylight hours during non-hibernating season

For more information on tricolored bat acoustic surveys, please see the USFWS Range-Wide Indiana Bat & Northern Long-Eared Bat Survey Guidelines at https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-surveyguidelines.

Additionally, we recommend the FAA develop and implement long term procedures for monitoring and reporting potential effects of drone activity on tricolored bats. This would include a process for reporting survey data, detection of collisions, and contingency planning in the event that adverse effects are reported.

Candidate species are not afforded protection under the Act, but we do suggest consideration of candidate species in project planning for the purpose of reducing impacts. We recommend you maintain the information used to make these determinations (evaluations, photos, habitat descriptions, etc.) with your project file.

The golden-cheeked warbler is a small, insectivorous neo-tropical songbird. The breeding range for the species encompasses 35 counties in Texas, with Dallas and Johnson Counties as the only counties in the Action Area. A small number of golden-cheeked warblers have been reported during the breeding season in 2023 in Dallas County (Curtis 2023, entire). Golden-cheeked warblers breed exclusively in the mixed Ashe juniper/deciduous woodlands. These songbirds require the shredding bark produced by mature Ashe junipers (*Juniperus ashei*) for nest material. Breeding habitat has diminished due to juniper eradication programs and continuing urbanization in central Texas. The species suffers from cowbird parasitism, which may be increasing as habitat becomes fragmented. Human presence may deter warblers from utilizing

adjacent habitat, cause them to abandon habitat, or otherwise disrupt normal breeding, feeding, or sheltering activities during the breeding season, thereby degrading suitable habitat. A recent study found no evidence that golden-cheeked warbler territory placement, productivity, song characteristics, or behavior was affected by highway construction or traffic noise in Austin, Texas (Long et al. 2017, p. 385). Based on 1) operations occurring mostly in an urban environment, 2) the altitude at which the UA flies in the en route phase (230-250 feet AGL), 3) the expected low sound levels experienced by a golden-cheeked warbler, 4) any increase in ambient sound levels would be short in duration, 5) the low probability of a golden-cheeked warbler occurring in the action area, and 6) the low likelihood of the UA striking a warbler, the FAA has determined that the action ***may affect, but is not likely to adversely affect***, the golden-cheeked warbler. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

Whooping cranes currently exist in three wild populations and in captivity at 12 sites. There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, and winters in coastal marshes in Texas. The migratory corridor runs in an approximately straight line from northwest Canada through the Great Plains to overwinter on the Gulf Coast. The whooping crane breeds, migrates, winters, and forages in a variety of wetland and other habitats, including coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields. Whooping cranes could be encountered at suitable stopover sites within the corridor during spring and fall migration. Although whooping crane migratory flights are generally at altitudes of between 1,000 and 6,000 feet, they fly at lower altitudes when seeking stop-over habitats such as reservoirs, large ponds, rivers, and wetlands. While cranes generally avoid areas with human activity present (e.g., roads, neighborhoods, etc.), suitable stopover habitat for the species may be present in the proposed project areas. Based on 1) operations occurring mostly in an urban environment, 2) the altitude at which the UA flies in the en route phase (230-250 feet AGL); 3) the expected low sound levels experienced by a whooping crane, 4) any increase in ambient sound levels would be short in duration, 5) the low probability of a whooping crane occurring in the action area, and 6) the low likelihood of the UA striking a whooping crane, the FAA has determined that the ***action may affect, but is not likely to adversely affect***, the whooping crane. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

Based on the information provided within the BE and later correspondence, we concur with the determination that the project, as proposed, may affect, but is not likely to adversely affect the golden-cheeked warbler and whooping crane pursuant to Section 7 of the Act. Therefore, no further Section 7 consultation will be required unless: 1) the identified action is subsequently modified in a manner that causes an effect on a listed species or designated critical habitat; 2) new information reveals the identified action may affect federally listed species or designated critical habitat in a manner or to an extent not previously considered; or 3) a new species is listed or a critical habitat is designated under the Act that may be affected by the identified action. If new effects are identified in the future, Section 7 consultation may need to be reinitiated.

Please note that this guidance does not authorize bird mortality for species that are protected under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. sec.703-712). If you believe migratory birds will be affected by this activity, we recommend you contact our Migratory Bird Permit Office at P.O. Box 709, Albuquerque, NM 87103, (505) 248-7882.

Thank you for the opportunity to review and provide information on the proposed project. If you have any questions, please contact Ms. Sydney Dragon-Moore of my staff at sydney_dragonmoore@fws.gov.

Sincerely,

CHARLES ARDIZZONE
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Date: 2024.07.25 16:38:51 -05'00'

Chuck Ardizzone
Project Leader

S:\Correspondence\FY 2024\Project Files\2024-0083542 FAA_DroneUp, LLC\2024-0083542 FAA_DroneUp, LLC.docx

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Appendix G

SHPO Section 106 Consultation

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

Mr. Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Via electronic submission to https://xapps.thc.state.tx.us/106Review/

Dear Mr. Wolfe:

The Federal Aviation Administration (FAA) is currently evaluating a proposal from DroneUp, LLC (DroneUp) to expand its unmanned aircraft (UA; also referred to as a drone) small package delivery operations in the Dallas-Fort Worth (DFW) metropolitan area. DroneUp must obtain approval from the FAA prior to expanding operations in DFW, where it is already conducting drone deliveries in the communities of Murphy, Texas using its PRISM V2 Series UA. The FAA has determined the proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the *National Historic Preservation Act* (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the State Historic Preservation Officer (SHPO) and request concurrence on the definition of the Area of Potential Effects (APE) and assessment of effects.

Project Description

DroneUp currently operates under 14 Code of Federal Regulations (CFR) Part 107 in Murphy, Texas. DroneUp has applied for a Part 135 Air Carrier Operating Certificate from the FAA, which allows it to carry the property of another for compensation or hire beyond visual line of sight (BVLOS) in those areas of Texas. The certificate will contain a stipulation that operations must be conducted in accordance with the provisions and limitations specified in the carrier's Operations Specifications (OpSpecs).[1] DroneUp is applying to the FAA to add the DFW metropolitan area to the operating area included in its OpSpecs for Texas.

DroneUp projects to operate a maximum of 500 flights per operating day (7am – 10pm) from each Hub, with each flight taking a package to a customer delivery address before returning to a Hub. DroneUp projects establishing up to 11 Hubs in the DFW operating area. The UA would be transporting healthcare products and other consumer goods in partnership with merchants in the community. There would be variability in the number of flights per day based on customer demand and weather conditions.

DroneUp is proposing to disperse Hubs throughout the operating area to include the proposed initial 11 sites (see **Attachment A**), each located in a commercial area such as a parking lot of a large retailer. Each Hub would house up to five (5) aircraft (UA). Hubs would be distributed throughout the DFW metro area

following a measured rollout plan. The proposed operations would occur during hours of 7am to 10 pm, typically seven (7) days of the week and on holidays. DroneUp is not proposing to conduct operations from 10 pm to 7 am.

[1] An Operations Specifications is a document that defines the scope of aircraft operations that the FAA has authorized.

Unmanned Aircraft

The primary UA used for the proposed operations is DroneUp PRISM V2 which features a multi-rotor design with eight propellers (see **Attachment B**). The UA weighs 55 pounds when combined with its maximum payload weight of 10 pounds. It has a wingspan of approximately 71.5 inches, a height of approximately 32 inches, and a length of approximately 71.5 inches. All DroneUp aircraft use electric power from rechargeable Lithium-Ion Polymer battery packs.

Flight Operations

The UA would generally be operated at an altitude of 230-250 feet above ground level (AGL) and always below an altitude of 400 feet AGL while en route to and from delivery locations. At a delivery location, the UA would descend vertically to a stationary hover and lower a package to the ground by line for delivery. Once a package has been lowered to the ground, the UA would then retract the line, ascend vertically to an en route altitude, and depart the delivery area en route back to a Hub.

The UA would fly a predefined flight path that is set prior to takeoff. A mission originates from a Hub location, and DroneUp's software automatically assigns, deconflicts, and routes each flight to the delivery location and back to a Hub. Each Hub site would include a controlled area wherein UA flights are launched and recovered. Each Hub site would have access to a controlled area wherein UA flights are launched and recovered.

A typical flight profile can be broken into the following general flight phases: takeoff, en route outbound, delivery, en route inbound, and landing.

Takeoff

Prior to takeoff, the package is loaded. During takeoff, the aircraft ascends to its en route altitude, 230250 feet AGL, the altitude it will stay in for the duration of the flight to the delivery site. It will pause momentarily after reaching the en route altitude before moving towards the delivery site.

En Route Outbound

The en route outbound phase is the part of flight in which the fully loaded UA transits from the Hub to a delivery point on a predefined flight path. During this flight phase, the UA would typically operate at an altitude of 230-250 ft AGL and airspeed of 31.5 miles per hour (mph), 27.4 knots. The UA has a single set cruise airspeed, which would not be exceeded.

Delivery

The delivery phase consists of descent from the en route altitude to a delivery point, such as a residential yard, driveway, parking lot, or common area. The UA descends vertically to 80 feet AGL while maintaining position over the delivery point. The UA hovers at 80 feet AGL for approximately 1 minute while lowering its package and then proceeds to climb vertically back to en route altitude. The minimum distance a human should be from the UA during delivery is a 6-foot radius from underneath the center of the UA. The winch system was created exclusively for use with the PRISM V2 series, and is capable of delivering up to a 10-pound package from an altitude of 124 feet. This allows the drone to remain in a hover at a defined altitude of 80 feet per DroneUp policy while staying away from potential hazards closer to the ground. The logic inside the winch system executes a delivery completely autonomously and returns the delivery hook in under one minute. Prior to loading a package onto the payload delivery system, a trained and approved crewmember must ensure the weight is below the maximum allowable threshold by weighing the package in its packed condition.

En Route Inbound

The UA continues to fly at an altitude of 230-250 feet AGL and a speed of 31.5 mph, 27.4 knots, towards the Hub. DroneUp's flight planning software auto populates the best route of flight and operators then have the ability to ensure strategic routing is used to shield as much as practical.

Landing

Upon reaching the Hub, the UA slowly descends over its assigned landing area, and lands on the ArUco Tag. The aircraft will land with the Realsense camera centered over the tag itself, therefore the 4 feet "downwards" from the tag must be clear for the main body of the aircraft. The UAS is programmed to search for, and land on, one specific tag pattern, ensuring the aircraft always finds its own safe landing area. The ArUco tag for that aircraft is placed in the takeoff/landing area during preflight and remains present until the end of operations.

Predicted Sound Levels

The FAA conducted a noise analysis using sound level measurement data for the UA—the PRISM V2 Series. The delivery phase of flight noise exposure is not expected to exceed DNL[2] 48.6 decibels (dB) at about 16 feet from the drone. Predicted sound levels decrease as distances from the drone increase. The en route phase noise exposure is not expected to exceed DNL 54.0 dB when the drone is flying 31.5 mph, 27.4 knots at 200 feet AGL.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE is the operating area outlined in red in **Attachment A**. This area encompasses a 30-nautical mile radius around the DFW metro area. This area captures all potential noise and visual effects.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archaeological resources because the undertaking does not include ground disturbance. Therefore, the FAA focused its identification efforts on above-ground historic properties.

According to the National Park Service's online database of the National Register of Historic Places (NRHP), a total of 229 historic properties and 146 historic districts are located in the APE (see **Attachments C and D**). Additional properties in the APE may be otherwise recognized for historical significance by the SHPO.

Most of the historic properties in the APE are residences and businesses, but also include churches, government buildings, schools, and courthouses. Additional historic properties include a steam locomotive, railway, two bridges, and a pump station. Most of the historic properties in the APE are included on the NRHP because of their historic architectural features.

Assessment of Effects

Given the small size of the UA and predicted sound levels, UA operations would not produce vibrations that could impact the architectural structure or contents of any structure in the APE. While the UA is not expected to generate significant noise levels at or within any historic property, the FAA considered drone delivery noise and potential visual effects on historic properties where a quiet setting or visually unimpaired sky might be a key attribute of the property's significance. The FAA has not identified any properties in the APE that would be affected by the UA's sound levels or visual effects, which are not anticipated to be significant at any locations along the drone's flight path, including delivery locations. Therefore, the FAA has made a finding of ***no adverse effect on historic properties.***

[2] The Day Night Average Sound Level (DNL or Ldn) noise metric is used to reflect a person's cumulative exposure to sound over a 24-hour period. DNL takes into account both the amount of noise from each aircraft operation as well as the total number of operations flying throughout the day and applies an additional 10dB weighting for nighttime flights between 10 p.m. and 7 a.m.

Conclusion

The FAA requests your concurrence on the definition of the APE and finding of *no adverse effect on historic properties*. Your response within the next 30 days will greatly assist us in our environmental review process.

If you have any questions or need additional information, please contact Dr. Shelia Neumann via email at 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

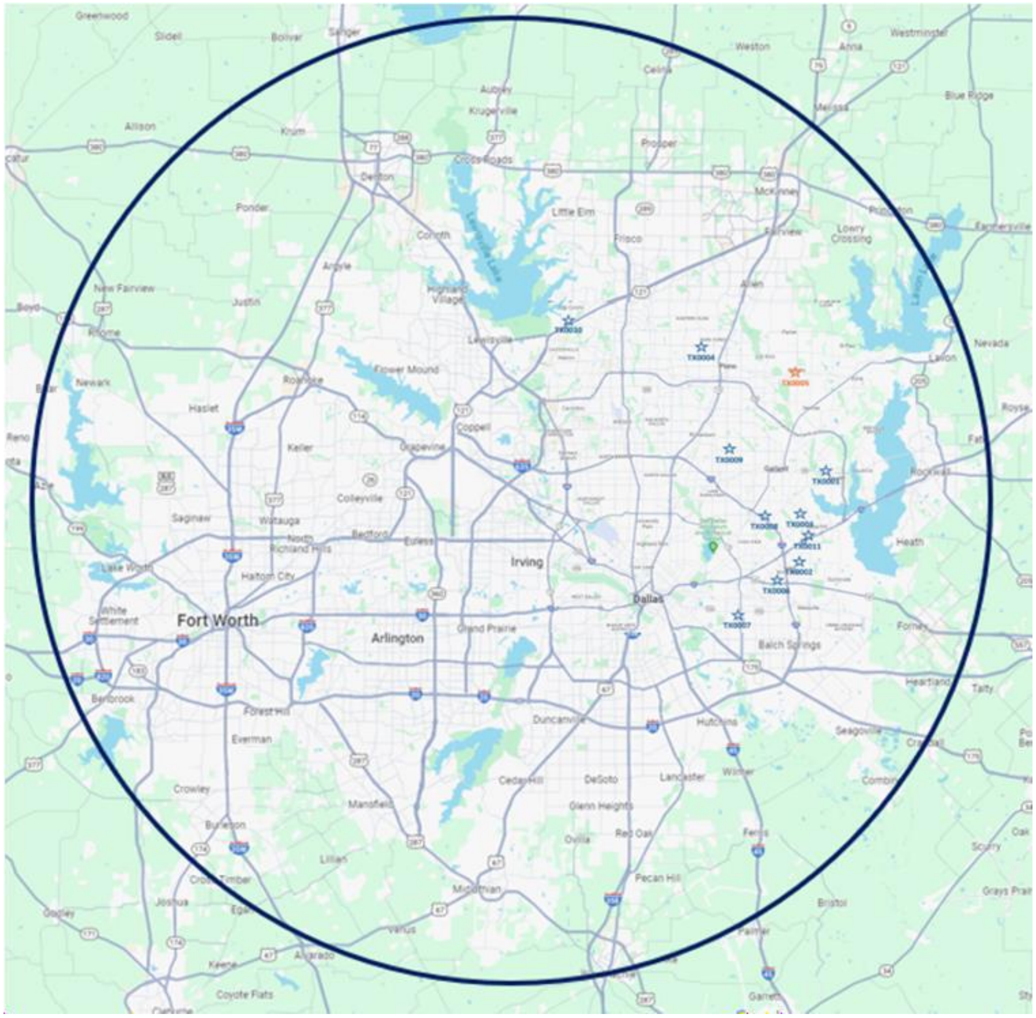
DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.05.28 09:38:17 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:

Attachment A. Area of Potential Effects
Attachment B. PRISM V2 Series Unmanned Aircraft with Package Attached
Attachment C. Table of Historic Properties
Attachment D. Table of Historic Districts
Attachment E. Historic Properties and Districts Map

Attachment A. Area of Potential Effects



Attachment B. DroneUp's PRISM V2 Series Unmanned Aircraft with Package Attached

Attachment C. Historic Properties

Reference Number	Property Name	Address	City	County
87001661	Beverly-Harris House	604 Parker	McKinney	Collin
87001662	Bingham, John H., House	800 S. Chestnut	McKinney	Collin
87001663	Board-Everett House	507 N. Bradley	McKinney	Collin
87001666	Brown, John R., House	509 N. Church	McKinney	Collin
87001671	Burrus-Finch House	405 N. Waddill	McKinney	Collin
87001679	Clardy, U. P., House	315 Oak	McKinney	Collin
87001681	Cline-Bass House	804 Tucker	McKinney	Collin
87001682	Coggins, J. R., House	805 Howell	McKinney	Collin
87001691	Crouch-Perkins House	205 N. Church	McKinney	Collin
87001695	Davis, H. L., House	705 N. College	McKinney	Collin
87001697	Davis-Hill House	710 N. Church	McKinney	Collin
87001699	Dowell, J. S., House	608 Parker	McKinney	Collin
87001704	Dulaney, Joe E., House	311 S. Chestnut	McKinney	Collin
87001702	Dulaney, Joseph Field, House	315 S. Chestnut	McKinney	Collin
95001365	Estes House	903 N. College St.	McKinney	Collin
87001705	Faires, F. C., House	505 S. Chestnut	McKinney	Collin
87001706	Faires-Bell House	S side Chestnut Sq.	McKinney	Collin
87001707	Ferguson, John H., House	607 N. Church	McKinney	Collin
87001708	Foote-Crouch House	401 N. Benge	McKinney	Collin
87001709	Fox, S. H., House	808 Tucker	McKinney	Collin
87001688	Goodner, Jim B., House	302 S. Tennessee	McKinney	Collin
87001710	Gouch-Hughston House	1206 W. Louisiana	McKinney	Collin
87001711	Heard-Craig House	205 W. Hunt	McKinney	Collin
87001712	Hill, Ben, House	509 Tucker	McKinney	Collin
87001713	Hill, John B., House	605 N. College	McKinney	Collin
87001714	Hill, Moran, House	203 N. Waddill	McKinney	Collin
87001715	Hill, W. R., House	601 N. College	McKinney	Collin
87001717	House at 1303 W. Louisiana	1303 W. Louisiana	McKinney	Collin
87001718	House at 201 N. Graves	201 N. Graves	McKinney	Collin
87001719	House at 301 E. Lamar	301 E. Lamar	McKinney	Collin
87001720	House at 610 Tucker	610 Tucker	McKinney	Collin
87001721	House at 704 Parker	704 Parker	McKinney	Collin
87001722	Houses at 406 and 408 Heard	406 & 408 Heard	McKinney	Collin
87001723	Johnson, John, House	302 Anthony	McKinney	Collin
87001724	Johnson, Thomas, House	312 S. Tennessee	McKinney	Collin
87001737	King, Mrs. J. C., House	405 W. Louisiana	McKinney	Collin
87001745	Neathery, Sam, House	215 N. Waddill	McKinney	Collin
87001746	Nenney, J. P., House	601 N. Church	McKinney	Collin
87001747	Newsome, R. F., House	609 Tucker	McKinney	Collin

Reference Number	Property Name	Address	City	County
87001748	Newsome-King House	401 W. Louisiana	McKinney	Collin
87001749	Rhea, John C., House	801 N. College	McKinney	Collin
87001750	Scott, A. M., House	1109 W. Louisiana	McKinney	Collin
87001751	Scott, L. A., House	513 W. Louisiana	McKinney	Collin
87001752	Smith, W. D., House	703 N. College	McKinney	Collin
87001753	Taylor, J. H., House	211 N. Waddill	McKinney	Collin
87001754	Thompson House	1207 W. Louisiana	McKinney	Collin
87001755	Waddill, R. L., House	302 W. Lamar	McKinney	Collin
87001756	Wiley, Thomas W., House	105 S. Church	McKinney	Collin
87001757	Wilson, A. G., House	417 N. Waddill	McKinney	Collin
5001543	1926 Republic National Bank	1309 Main Street	Dallas	Dallas
6000651	Bluitt Sanitarium	2036 Commerce Street	Dallas	Dallas
6000513	Mark & Maybelle Lemmon House	3211 Mockingbird Lane	Highland Park	Dallas
6000510	Our Mother of Mercy School	801 Verbena Street	Fort Worth	Tarrant
6000819	Dallas Times Herald Pasadena Perfect Home	6938 Wildgrove Avenue	Dallas	Dallas
7000130	Monroe Shops	2111 South Corinth Street	Dallas	Dallas
6001085	Dr. Arvel and Faye Ponton House	1208 Mistletoe Drive	Fort Worth	Tarrant
7000691	First Methodist Church of Rockwall	303 East Rusk	Rockwall	Rockwall
7000266	Kress Building	604 Main Street	Fort Worth	Tarrant
7000989	Stoneleigh Court Hotel	2927 Maple Avenue	Dallas	Dallas
8000317	American Airways Hangar and Administration Building	Meacham Airport, 201 Aviation Way, Hangar 11N	Fort Worth	Tarrant
8000539	4928 Bryan Street Apartments	4928 Bryan Street	Dallas	Dallas
8000475	Building @ 3525 Turtle Creek Boulevard	3525 Turtle Creek Boulevard	Dallas	Dallas
8001300	Roy A. and Glady's Westbrook House	2232 Winton Terrace West	Fort Worth	Tarrant
10000249	Parkland Hospital	3819 Maple Avenue	Dallas	Dallas
9000981	First National Bank Building	711 Houston Street	Fort Worth	Tarrant
9000982	Petroleum Building	210 West Sixth Street	Fort Worth	Tarrant
11000128	Henderson Street Bridge	Henderson Street at the Clear Fork of the Trinity River	Fort Worth	Tarrant
11000343	Adamson High School	201 East Ninth Street	Dallas	Dallas
10000865	Miller Manufacturing Company Building	311 Bryan Avenue	Fort Worth	Tarrant
11000136	Texas Garden Clubs, Inc., Headquarters	3111 Old Garden Road	Fort Worth	Tarrant
12000350	Dallas Coffin Company	1325 S. Lamar	Dallas	Dallas
12000589	Eldred W. Foster House	9608 Heron Drive	Fort Worth	Tarrant

Reference Number	Property Name	Address	City	County
12001004	Farmers and Mechanics National Bank	714 Main Street	Fort Worth	Tarrant
12001005	Van Zandt Cottage	2900 Crestline Road	Fort Worth	Tarrant
84000169	Allen Chapel AME Church	116 Elm St.	Fort Worth	Tarrant
78002981	Anderson, Neil P., Building	411 W. 7th St.	Fort Worth	Tarrant
83003160	Austin, Stephen F., Elementary School	319 Lipscomb St.	Fort Worth	Tarrant
78002982	Benton, M. A., House	1730 6th Ave.	Fort Worth	Tarrant
84001961	Blackstone Hotel	601 Main St.	Fort Worth	Tarrant
84001963	Bryce Building	909 Throckmorton St.	Fort Worth	Tarrant
84001965	Bryce, William J., House	4900 Bryce Ave.	Fort Worth	Tarrant
87000995	Buck Oaks Farm	6312 White Settlement Rd.	Westworth	Tarrant
80004151	Burnett, Burk, Building	500-502 Main St.	Fort Worth	Tarrant
79003009	Eddleman-McFarland House	1110 Penn St.	Fort Worth	Tarrant
95000048	Electric Building	410 W. 7th St.	Fort Worth	Tarrant
83003812	First Christian Church	612 Throckorton St.	Fort Worth	Tarrant
71000964	Flatiron Building	1000 Houston St.	Fort Worth	Tarrant
98000102	Fort Worth Club Building-1916	608-610 Main St.	Fort Worth	Tarrant
84001969	Fort Worth Elks Lodge 124	512 W. 4th St.	Fort Worth	Tarrant
84001981	Fort Worth Public Market	1400 Henderson St.	Fort Worth	Tarrant
70000760	Gulf, Colorado and Sante Fe Railroad Passenger Station	1601 Jones St.	Fort Worth	Tarrant
79003011	Hotel Texas	815 Main St.	Fort Worth	Tarrant
84001993	Hutcheson-Smith House	312 N. Oak St.	Arlington	Tarrant
84001996	Johnson-Elliott House	3 Chase Ct.	Fort Worth	Tarrant
70000761	Knights of Pythias Building	315 Main St.	Fort Worth	Tarrant
76002068	Paddock Viaduct	Main St.	Fort Worth	Tarrant
72001372	Pollock-Capps House	1120 Penn St.	Fort Worth	Tarrant
85001484	Rogers-O'Daniel House	2230 Warner Rd.	Fort Worth	Tarrant
94000542	Sanger Brothers Building	410-412 Houston St.	Fort Worth	Tarrant
83003162	Sanguinet, Marshall R., House	4729 Collinwood Ave.	Fort Worth	Tarrant
95001029	Shaw, Thomas and Marjorie, House	2404 Medford Ct. E.	Fort Worth	Tarrant
91001913	Sinclair Building	512 Main St.	Fort Worth	Tarrant
85000048	South Side Masonic Lodge No. 1114	1301 W. Magnolia	Fort Worth	Tarrant
84001998	St. Mary of the Assumption Church	501 W. Magnolia Ave.	Fort Worth	Tarrant
70000762	Tarrant County Courthouse	Bounded by Houston, Belknap, Weatherford, and Commerce Sts.	Fort Worth	Tarrant
77001477	Texas & Pacific Steam Locomotive No. 610	Felix and Hemphill Sts.	Fort Worth	Tarrant
85000855	US Post Office	Lancaster and Jennings Ave.	Fort Worth	Tarrant

Reference Number	Property Name	Address	City	County
79003012	Waggoner, W. T. Building	810 Houston St.	Fort Worth	Tarrant
88002709	Westover Manor	8 Westover Rd.	Westover Hills	Tarrant
75002003	Wharton-Scott House	1509 Pennsylvania Ave.	Fort Worth	Tarrant
94001359	Woolworth, F. W., Building	501 Houston St.	Fort Worth	Tarrant
93000566	Brooks, William and Blanche, House	500 S. Center St.	Forney	Kaufman
85000710	Angle, D. M., House	800 Beltline	Cedar Hill	Dallas
75001965	Belo, Alfred Horatio, House	2115 Ross Ave.	Dallas	Dallas
95000311	Bianchi, Didaco and Ida, House	4503 Reiger Ave.	Dallas	Dallas
85000711	Bryant, William, Jr., House	S. Broad and Cooper	Cedar Hill	Dallas
80004489	Busch Building	1501-1509 Main St.	Dallas	Dallas
96001015	Busch-Kirby Building (Boundary Increase)	1501-1509 Main St.	Dallas	Dallas
95000307	Central Congregational Church	1530 N. Carroll	Dallas	Dallas
95000313	Claremont Apartments	4636 Ross Ave.	Dallas	Dallas
80004087	Clements Hall	3200 Dyer St.	Dallas	Dallas
76002019	Dallas County Courthouse	Houston and Commerce Sts.	Dallas	Dallas
97000363	Dallas Fire Station No. 16	5501 Columbia Ave.	Dallas	Dallas
78002913	Dallas Hall	Southern Methodist University campus	Dallas	Dallas
80004088	Dallas Scottish Rite Temple	Harwood and Young Sts.	Dallas	Dallas
95000320	Dixon-Moore House	2716 Peabody	Dallas	Dallas
95000323	Ellis, James H. and Molly, House	2426 Pine	Dallas	Dallas
95000315	Emanuel Lutheran Church	4301 San Jacinto	Dallas	Dallas
80004089	Florence, Fred, Hall	3330 University Blvd.	Dallas	Dallas
95000318	Forest Avenue High School, Old	3000 Martin Luther King, Jr., Blvd.	Dallas	Dallas
88002063	Gilbert, Samuel and Julia, House	2540 Farmers Branch Ln.	Farmers Branch	Dallas
82001736	Grace Methodist Episcopal Church	4105 Junius St.	Dallas	Dallas
96001563	Greer, George C., House	5439 Swiss Ave.	Dallas	Dallas
85000712	Hawkes, Z. T. (Tip), House	132 N. Potter St.	Cedar Hill	Dallas
85003092	Hilton Hotel	1933 Main St.	Dallas	Dallas
83003133	Hotel Adolphus	1315 Commerce St.	Dallas	Dallas
80004090	Hyer Hall	6424 Hill Lane	Dallas	Dallas
92000021	Interstate Forwarding Company Warehouse	3200 Main St.	Dallas	Dallas
95000316	Levi-Moses House	2433 Martin Luther King, Jr., Blvd.	Dallas	Dallas
95000317	Levi-Topletz House	2603 Martin Luther King, Jr., Blvd.	Dallas	Dallas
78002915	Magnolia Building	108 S. Akard St.	Dallas	Dallas
77001437	Majestic Theatre	1925 Elm St.	Dallas	Dallas

Reference Number	Property Name	Address	City	County
95000310	Mary Apartments	4524 Live Oak	Dallas	Dallas
80004091	McFarlin Memorial Auditorium	6405 Hillcrest Rd.	Dallas	Dallas
83003135	McIntosh, Roger D., House	1518 Abrams Rd.	Dallas	Dallas
80004092	Miller, John Hickman, House	3506 Cedar Springs	Dallas	Dallas
91000118	Mitchell, John E., Company Plant	3800 Commerce St.	Dallas	Dallas
95000309	Mrs. Baird's Bread Company Building	1401 N. Carroll	Dallas	Dallas
81000627	Number 4 Hook and Ladder Company	Cedar Springs Rd. and Reagan St.	Dallas	Dallas
88000176	Oak Lawn Methodist Episcopal Church, South	3014 Oak Lawn Ave.	Dallas	Dallas
80004093	Ownby, Jordan C., Stadium	5900 Ownby Dr.	Dallas	Dallas
80004094	Patterson, Stanley, Hall	3128 Dyer St.	Dallas	Dallas
80004095	Perkins Hall of Administration	6425 Hillcrest Rd.	Dallas	Dallas
78002920	Randlett House	401 S. Centre St.	Lancaster	Dallas
78002921	Rawlins, Capt. R. A., House	2219 Dowling St.	Lancaster	Dallas
85000713	Roberts, Dr. Rufus A., House	210 S. Broad St.	Cedar Hill	Dallas
95000321	Rush-Crabb House	2718 Pennsylvania	Dallas	Dallas
75001967	Sanger Brothers Complex	Block 32, bounded by Elm, Lamar, Main and Austin Sts.	Dallas	Dallas
95000312	Shiels, Thomas, House	4602 Reiger Ave.	Dallas	Dallas
95000325	Silberstein, Ascher, School	2425 Pine St.	Dallas	Dallas
80004096	Snider Hall	3305 Dyer St.	Dallas	Dallas
85002912	Spake, Jacob and Eliza, House	2600 State Street	Dallas	Dallas
97001187	Stanard-Tilton Flour Mill	2400 S. Ervay St.	Dallas	Dallas
78002922	Strain, W. A., House	400 E. Pecan St.	Lancaster	Dallas
85001495	Straus House	400 Cedar	Cedar Hill	Dallas
96000586	Titche-Goettinger Department Store	1901 Main St.	Dallas	Dallas
95000319	Trinity English Lutheran Church	3100 Martin Luther King, Jr., Blvd.	Dallas	Dallas
84001643	Viola Courts Apartments	4845 Swiss Ave.	Dallas	Dallas
80004097	Virginia Hall	3325 Dyer St.	Dallas	Dallas
78002917	Waples-Platter Buildings	2200-2211 N. Lamar St.	Dallas	Dallas
79002931	Wilson Building	1621-1623 Main St.	Dallas	Dallas
77001438	Denton County Courthouse	Public Sq.	Denton	Denton
88000979	Old Alton Bridge	Copper Canyon Rd.	Copper Canyon	Denton
86001939	Old Continental State Bank	107-109 N. Oak Street	Roanoke	Denton
86002485	Adamson, F. R., House	309 University	Waxahachie	Ellis
86002443	Alderdice, J. M., House	1500 W. Main	Waxahachie	Ellis
86002386	Berry, J. S., House	201 E. University	Waxahachie	Ellis
86002479	Chapman, Oscar H., House	201 Overhill	Waxahachie	Ellis

Reference Number	Property Name	Address	City	County
86002492	Cohn, Joe, House	501 Sycamore	Waxahachie	Ellis
86002388	Connally, Roy, House	205 E. University	Waxahachie	Ellis
86002378	Dillon, George C., House	123 E. University	Waxahachie	Ellis
86002488	House at 1423 Sycamore	1423 Sycamore	Waxahachie	Ellis
86002408	House at 501 North Grand	501 N. Grand	Waxahachie	Ellis
86002409	House at 512 North Grand	512 N. Grand	Waxahachie	Ellis
86002416	House at 523 Highland	523 Highland	Waxahachie	Ellis
86002489	Kirven, J. D., House	601 Sycamore	Waxahachie	Ellis
86002413	Payne, M. S., House	521 N. Grand	Waxahachie	Ellis
86002375	Ralston, Mary, House	116 E. University	Waxahachie	Ellis
86002343	Rockett, Paris Q., House	321 E. University	Waxahachie	Ellis
86002441	Sims, O. B., House	1408 W. Main	Waxahachie	Ellis
86002453	Solon, John, House	617 Solon Rd.	Waxahachie	Ellis
86002402	Templeton, Judge M. B., House	203 N. Grand	Waxahachie	Ellis
86002404	Trippet-Shive House	209 N. Grand	Waxahachie	Ellis
74002070	Waxahachie Chautauqua Building	Getzendaner Park	Waxahachie	Ellis
86002383	Williams, Porter L., House	200 E. University	Waxahachie	Ellis
98001415	Montgomery Ward & Company Building	801 Grove Street	Fort Worth	Tarrant
99001292	Dallas Tent & Awning Building	3401 Commerce Street	Dallas	Dallas
99000723	Botts-Fowler House	115 North Fourth Avenue	Mansfield	Tarrant
99001451	Tabernacle Baptist Church	1801 Evans Avenue	Fort Worth	Tarrant
99001049	Morning Chapel Colored Methodist Episcopal Church	901 East Third	Fort Worth	Tarrant
99000883	Saint James Second Street Baptist Church	210 Harding Street	Fort Worth	Tarrant
99001499	Texas Farm and Ranch Building	3300 Main Street	Dallas	Dallas
1537	Medical Dental Building	300 Block of West Jefferson Boulevard	Dallas	Dallas
99001624	Riverside Public School	2629 La Salle Street	Fort Worth	Tarrant
188	Arlington Post Office	200 West Main Street	Arlington	Tarrant
1000103	Turtle Creek Pump Station	3630 Harry Hines Boulevard	Dallas	Dallas
1000470	Markeen Apartments	210-14 St. Louis Avenue and 406-10 W. Daggett Avenue	Fort Worth	Tarrant
1000437	Fort Worth US Courthouse	501 Tenth Street	Fort Worth	Tarrant
3000277	Chevrolet Motor Company Building	3221 Commerce	Dallas	Dallas
2000730	Lincoln Paint and Color Company Building	3210 Main	Dallas	Dallas
2000992	G & J Manufacturing Company Building	3912 Willow Street	Dallas	Dallas
2001515	Fort Worth High School	1015 S. Jennings Avenue	Fort Worth	Tarrant

Reference Number	Property Name	Address	City	County
2001512	Alexander Hogg School	900 St. Louis Avenue	Fort Worth	Tarrant
3000432	Andrew "Cap" and Emma Doughty Bratton House	310 East Broad Street	Mansfield	Tarrant
3000433	Buchanan-Hayter-Witherspoon House	306 East Broad Street	Mansfield	Tarrant
3000434	Lester H. and Mabel Bryant Chorn House	303 East Broad Street	Mansfield	Tarrant
3000436	Wallace-Hall House	210 South Main Street	Mansfield	Tarrant
3000187	Texas Theatre	231 W. Jefferson Boulevard	Dallas	Dallas
4000102	Harlan Building	2018 Cadiz Street	Dallas	Dallas
3001418	Rector Road Bridge	7501 Teasley Ln	Denton	Denton
5000419	Dallas National Bank	1530 Main and 1511 Commerce Street	Dallas	Dallas
5000243	Republic National Bank	300 North Ervay/325 North St. Paul Street	Dallas	Dallas
5000864	Vaught House	718 West Abram Street	Arlington	Tarrant
5000856	Plano Station/Texas Electric Railway	901 E. 15th Street	Plano	Collin
5001541	Purvin-Hexter Building	2038 Commerce Street	Dallas	Dallas
13000612	J. L. Sealy Building	801 South Main Street	Fort Worth	Tarrant
16000916	St. Paul Methodist Episcopal Church	1816 Routh Street	Dallas	Dallas
100001378	Fountain G. and Mary Oxsheer House	1119 Pennsylvania Avenue	Fort Worth	Tarrant

Attachment D. Historic Districts

Reference Number	Property Name	Address	City	County
87001685	Collin County Mill and Elevator Company	407 E. Louisiana	McKinney	Collin
87001716	Hill-Webb Grain Elevator	400 E. Louisiana	McKinney	Collin
87001738	Kirkpatrick, E. W., House and Barn	903 Parker	McKinney	Collin
83003132	McKinney Commercial Historic District	Roughly bounded by Herndon, Wood, Cloyd, Davis, Louisiana, MacDonald, and Virginia Sts.	McKinney	Collin
87001739	McKinney Cotton Compress Plant	300 blk. Throckmorton	McKinney	Collin
87001740	McKinney Cotton Mill Historic District	Roughly bounded by Elm, RR tracks, Burrus, Fowler, & Amscott	McKinney	Collin
87001743	McKinney Hospital, Old	700-800 S. College	McKinney	Collin
87001744	McKinney Residential Historic District	Roughly bounded by W. Lamar, N. Benge, W. Louisiana, & N. Oak	McKinney	Collin
78002906	Wilson, Ammie, House	1900 W. 15th St.	Plano	Collin
6001065	Eighth Avenue Historic District	Bounded by 8th Ave., Pennsylvania Ave., 9th Ave., and Pruitt St.	Fort Worth	Tarrant
8000658	Alfred and Juanita Bromberg House	3201 Wendover Road	Dallas	Dallas
7001383	Greenway Parks Historic District	Bounded by W. Mockingbird Lane, West University Boulevard, Inwood, North Dallas Tollway	Dallas	Dallas
8000476	Central Roanoke Historic District	100 and 200 blocks of North Oak Street	Roanoke	Denton
8001299	Dallas Downtown Historic District (Boundary Increase)	Roughly bounded by Jackson, North Harwood, Commerce, north-south line between South Pearl Expressway and South Harwood, Canton, South Harwood, Marilla, Cadiz, South St. Paul, Canton, and South Ervay Streets	Dallas	Dallas
8001400	Fort Worth Botanic Garden	3220 Botanic Garden Boulevard	Fort Worth	Tarrant
9000306	Fidelity Union Life Insurance Building	1511 Bryan/ 1507 Pacific Avenue	Dallas	Dallas
9000980	Allen Water Station	North of Exchange Parkway on Cottonwood Creek	Allen	Collin
9000839	Celina Public School	205 South Colorado Street	Celina	Collin
10000247	Fairview H&TC Railroad Historic District	About 1/4 mile west of State Hightway 5 on Sloan Creek & the old Houston & Texas Central Railroad tracks	Fairview	Collin
10000144	Gulf Oil Distribution Facility	501 Second Avenue	Dallas	Dallas
10000253	Heritage Plaza	West Bluff Street at Main Street	Fort Worth	Tarrant
10000051	Oakhurst Historic District	Roughly bounded by Yucca Avenue, Sylvania Avenue, Watauga Avenue and Oakhurst Scenic Drive	Fort Worth	Tarrant

Reference Number	Property Name	Address	City	County
9000984	South Main Street Historic District	104, 108, 126 7 200 blocks of South Main Street	Fort Worth	Tarrant
11000514	Butler Place Historic District	Roughly bounded by Luella St., I.M. Terrell Way Cir. M., 19th St. & I 35W	Fort Worth	Tarrant
10000866	Thomas J. & Elizabeth Nash Farm	626 Ball Street	Grapevine	Tarrant
10000500	Vandergriff Building	100 East Division Street	Arlington	Tarrant
11000982	Ridglea Theatre Building	6025-6033 Camp Bowie Boulevard and 3309 Winthrop Avenue	Fort Worth	Tarrant
11000344	Santa Fe Terminal Building No. 4	1033 Young Street	Dallas	Dallas
13000126	Fort Worth Warehouse & Transfer Company Building	201 South Calhoun Street	Fort Worth	Tarrant
97000851	Bedford School	2400 School Ln	Bedford	Tarrant
97001109	Cotton Belt Railroad Industrial Historic District	Along RR tracks, roughly bounded by Hudgins, Dooley, and Dallas Sts.	Grapevine	Tarrant
79003010	Elizabeth Boulevard Historic District	1001-1616 Elizabeth Blvd.	Fort Worth	Tarrant
90000490	Fairmount/Southside Historic District	Roughly bounded by Magnolia, Hemphill, Eighth, and Jessamine	Fort Worth	Tarrant
76002067	Fort Worth Stockyards Historic District	Roughly bounded by 23rd, Houston, and 28th Sts., and railroad	Fort Worth	Tarrant
90000337	Grand Avenue Historic District	Roughly Grand Ave. from Northside to Park	Fort Worth	Tarrant
92000097	Grapevine Commercial Historic District	404-432 S. Main St.	Grapevine	Tarrant
97000444	Grapevine Commercial Historic District (Boundary Increase)	300 and 400 blocks of S. Main St.	Grapevine	Tarrant
98000429	Guinn, James E., School	1200 South Freeway	Fort Worth	Tarrant
91002022	Masonic Widows and Orphans Home Historic District	Roughly bounded by E. Berry St., Mitchell Blvd., Vaughn St., Wichita St. and Glen Garden Dr.	Fort Worth	Tarrant
94001627	North Fort Worth High School	600 Park St.	Fort Worth	Tarrant
98000736	Original Town Residential Historic District	Roughly bounded by Texas, Austin, Hudgins and Jenkins Sts.	Grapevine	Tarrant
85000074	St. Patrick Cathedral Complex	1206 Throckmorton	Fort Worth	Tarrant
78002983	Texas and Pacific Terminal Complex	Lancaster and Throckmorton Sts.	Fort Worth	Tarrant
95000330	Alcalde Street-Crockett School Historic District	200-500 Alcalde, 421-421A N. Carroll and 4315 Victor	Dallas	Dallas
95000327	Bryan-Peak Commercial Historic District	4214-4311 Bryan Ave. and 1325-1408 N. Peak	Dallas	Dallas
91001901	Cedar Springs Place	2531 Lucas Dr.	Dallas	Dallas
95000334	Colonial Hill Historic District	Bounded by Pennsylvania Ave., I-45, US 75 and Hatcher	Dallas	Dallas

Reference Number	Property Name	Address	City	County
83003134	Continental Gin Company	3301-3333 Elm St., 212 and 232 Trunk Ave.	Dallas	Dallas
96000035	Dallas High School Historic District	2218 Bryan St.	Dallas	Dallas
75001966	Dallas Union Terminal	400 S. Houston St.	Dallas	Dallas
78002914	DeGolyer Estate	8525 Garland Rd.	Dallas	Dallas
93001607	Dealey Plaza Historic District	Roughly bounded by Pacific Ave., Market St., Jackson St. and right of way of Dallas Right of Way Management Company	Dallas	Dallas
95000314	Fannin, James W., Elementary School	4800 Ross Ave.	Dallas	Dallas
97001393	Highland Park Shopping Village	Jct. of Preston Rd. and Mockingbird Ln.	Highland Park	Dallas
84001641	Houston Street Viaduct	Houston St. roughly between Arlington St. and Lancaster Ave.	Dallas	Dallas
94000607	Kessler Park Historic District	Roughly bounded by Kidd Springs, Stewart, Oak Cliff, Plymouth, I-30, Turner, Colorado and Sylvan	Dallas	Dallas
95001087	Kessler Park Historic District (Boundary Increase)	Bounded by Turner, Colorado, Sylvan and Salmon	Dallas	Dallas
94000606	King's Highway Historic District	900-1500 Blocks of King's Highway between W. Davis St. and Montclair Ave.	Dallas	Dallas
94000609	Lake Cliff Historic District	Roughly bounded by E. 6th St., Beckley Ave., Zangs Blvd. and Marsalis Ave.	Dallas	Dallas
94000605	Lancaster Avenue Commercial Historic District	Roughly bounded by E. Jefferson Blvd., S. Marsalis, E. 10th St., E. 9th St. and N. Lancaster Ave.	Dallas	Dallas
94001473	Magnolia Petroleum Company City Sales and Warehouse	1607 Lyte St.	Dallas	Dallas
94000611	Miller and Stemmons Historic District	Roughly bounded by W. Davis St., Woodlawn Ave., Neches and Elsbeth	Dallas	Dallas
78002916	Munger Place Historic District	Roughly bounded by Henderson, Junius, Prairie, and Reiger Sts.	Dallas	Dallas
94000608	North Bishop Avenue Commercial Historic District	Roughly bounded by 9th St., Davis St., Adams and Madison	Dallas	Dallas
95000328	Peak's Suburban Addition Historic District	Roughly bounded by Sycamore, Peak, Worth and Fitzhugh	Dallas	Dallas
95000332	Queen City Heights Historic District	Roughly bounded by Eugene, Cooper, Latimer, Kynard and Dildock	Dallas	Dallas
95000333	Romine Avenue Historic District	2300-2400 blocks of Romine Ave., N side	Dallas	Dallas
94000610	Rosemont Crest Historic District	Roughly bounded by 10th St., Oak Cliff Blvd., W. Davis St., N. Brighton Ave., W. 8th St. and Rosemont Ave.	Dallas	Dallas

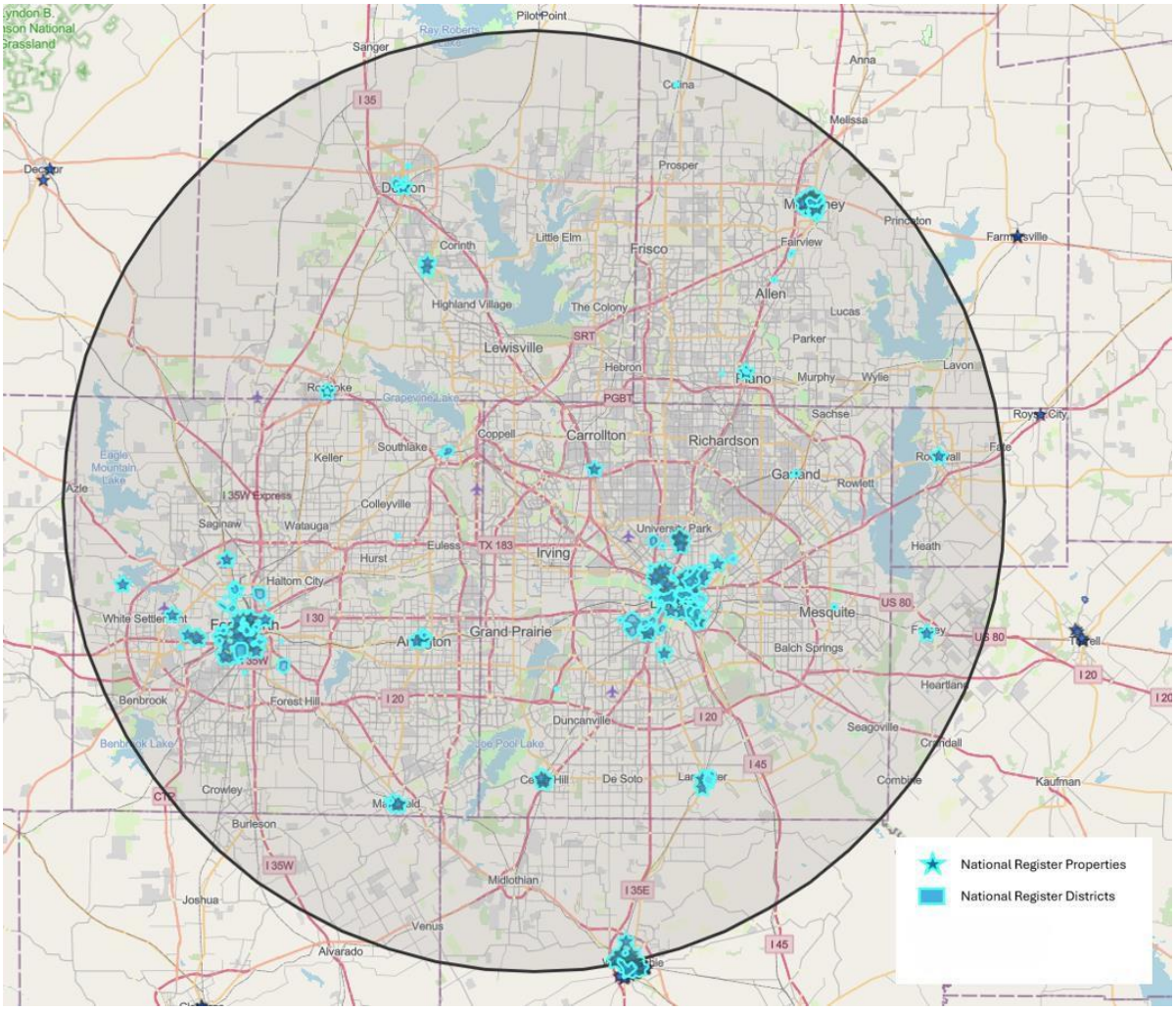
Reference Number	Property Name	Address	City	County
97000478	Santa Fe Terminal Buildings No.1 and No. 2	1114 Commerce St. and 1118 Jackson St.	Dallas	Dallas
79002930	South Boulevard-Park Row Historic District	South Blvd. and Park Row from Central	Dallas	Dallas
74002068	Swiss Avenue Historic District	Swiss Ave. between Fitzhugh and LaVista	Dallas	Dallas
94000604	Tenth Street Historic District	Roughly bounded by E. Clarendon Dr., S. Fleming Ave., I-35E, E. 8th St. and the E end of Church, E. 9th and Plum Sts.	Dallas	Dallas
86003488	Fair Park Texas Centennial Buildings (1936-1937)	Bounded by Texas and Pacific RR, Pennsylvania, Second, and Parry Aves.	Dallas	Dallas
78002918	Westend Historic District	Bounded by Lamar, Griffin, Wood, Market, and Commerce Sts.	Dallas	Dallas
95000331	Wheatley Place Historic District	Bounded by Warren, Atlanta, McDermott, Meadow, Oakland and Dathe	Dallas	Dallas
78002919	Wilson Block	2902, 2906, 2910 and 2922 Swiss Ave.	Dallas	Dallas
83003758	Winnetka Heights Historic District	Roughly bounded by Davis and 12th Sts., and Rosemont and Willomet Aves.	Dallas	Dallas
86002458	Second Trinity University Campus	1200 blk. of Sycamore	Waxahachie	Ellis
86002474	West End Historic District	Roughly bounded by Central, W. Water, Monroe, Madison and W. Jefferson	Waxahachie	Ellis
99001139	Stephen Decatur Lawrence Farmstead	701 E. Kearney Street	Mesquite	Dallas
99000882	Our Mother of Mercy Catholic Church and Parsonage	1100 and 1104 Evans Avenue	Fort Worth	Tarrant
99000565	Fairmount/Southside Historic District (boundary increase)	Roughly bounded by Magnolia, Hemphill, Allen, Travis and Morphy St.	Fort Worth	Tarrant
1582	Denton Courthouse Square Historic District	Denton County Courthouse on the Square	Denton	Denton
1001002	Strain Farm (W. A. Strain House Boundary Increase)	400 Lancaster-Hutchins Road	Lancaster	Dallas
247	Old Town Historic District	Roughly bounded by Sanford, East, Division and Cooper Streets.	Arlington	Tarrant
1000102	Marine Commercial Historic District	Roughly defined by North Main Street between North Side Drive and North 14th Street	Fort Worth	Tarrant
2000009	Goodyear Tire & Rubber Company and B. F. Goodrich Building	3809 Parry Avenue & 4140 Commerce Street	Dallas	Dallas
1001472	Central Handley Historic District	Roughly defined as the northside of 6500-6600 blocks of E. Lancaster Avenue	Fort Worth	Tarrant

Reference Number	Property Name	Address	City	County
2000405	Near Southeast Historic District	Roughly bounded by New York Avenue, E. Terrell Avenue, I & GN Railway right-of-way, Verbena Street, and the North side of the 1400 block of E. Terrell Avenue	Fort Worth	Tarrant
4000894	Dallas Downtown Historic District	Roughly bounded by Federal, N. St. Paul, Pacific, Harwood, S. Pearl, Commerce, S Ervay, Akard, Commerce and Field	Dallas	Dallas
3000334	South Center Street Historic District	South Center Street	Arlington	Tarrant
2001569	Grapevine Commercial Historic District (Revised, Boundary Increase II)	500-530 South Main Street	Grapevine	Tarrant
3000435	Ralph Sandiford and Julia Boisseau Man House	604 West Broad Street	Mansfield	Tarrant
4000886	Our Lady of Victory Academy	801 W. Shaw Street	Fort Worth	Tarrant
5000240	Leuda-May Historic District	301-311 Lueda and 805-807 May Streets	Fort Worth	Tarrant
14000103	511 Akard Building	511 North Akard	Dallas	Dallas
14000962	Johnson Rooming House	1026 North Beckley Avenue	Dallas	Dallas
14000963	Paine House	2515 West 5th Street	Irving	Dallas
14000105	Inspiration Point	Roughly 250 yards south of 2400 block of Roberts Cut off Road in Marion Sansom Park	Fort Worth	Tarrant
14000343	Fort Worth Recreation Building	215 West Vickery Boulevard	Fort Worth	Tarrant
14000473	Joffre-Gilbert House	309 S. O'Connor Road	Irving	Dallas
14000966	Hotel Texas (Boundary Increase)	815 Main Street/815 Commerce Street	Fort Worth	Tarrant
14001227	Mayflower Building	411 North Akard Street	Dallas	Dallas
14001035	Sanger Brothers Building (1925)	515 Houston Street	Fort Worth	Tarrant
15000245	One Main Place	1201 Main Street	Dallas	Dallas
15000337	Parker-Browne Company Building	1212 East Lancaster Avenue	Fort Worth	Tarrant
15000708	Lamar-McKinney Bridge	Spanning the Trinity River at Continental Avenue	Dallas	Dallas
16000122	Will Rogers Memorial Center	3401 West Lancaster Avenue	Fort Worth	Tarrant
15000877	Everard-Sharrock Jr. Farmstead	6900 Grady Niblo Road	Dallas	Dallas
16000353	Fortune Arms Apartments	601 West 1st Street	Fort Worth	Tarrant
16000915	Hughes Brother's Manufacturing Company Building	1401 South Ervay Street	Dallas	Dallas
100000504	Lily B. Clayton Elementary School	2000 Park Place Avenue	Fort Worth	Tarrant
100000671	Grand Lodge of the Colored Knights of Pythias, Texas	2551 Elm Street	Dallas	Dallas
100000672	Travis College Hill Historic District	300-400 blocks of South 11th Street	Garland	Dallas

Reference Number	Property Name	Address	City	County
100000674	Jennings-Vickery Historic District	Roughly bounded by W. Vickery Boulevard, St. Louis Avenue, West Daggett Avenue and Hemphill Street, plus Jennings Avenue Underpass	Fort Worth	Tarrant
100000862	The Woman's Club of Fort Worth	North side 1300 block of Pennsylvania Avenue	Fort Worth	Tarrant
100000861	Garland Downtown Historic District	Roughly bounded by W. State Street on the north, Santa Fe Rail Line on the east, West Avenue A on the south and Glenbrook Drive on the west	Garland	Dallas
100001227	Masonic Temple	1100 Henderson Street	Fort Worth	Tarrant
100001373	Garland Downtown Historic District (Boundary Increase for Alston House)	212 North 7th Street	Garland	Dallas
100001372	Plano Downtown Historic District	1000 block & 1112 East 15th Street, 1020 East 15th Place, 1410-1416 J Avenue, & 1416-1430 K Avenue	Plano	Collin
100001764	First National Bank Tower	1401 Elm Street	Dallas	Dallas
100002434	Saigling House	902 East 16th Street	Plano	Collin
100002347	Pioneer Woman Monument	Pioneer Circle, Texas Woman's University	Denton	Denton
100002473	Oakwood Cemetery Historic District	702 Grand Avenue	Fort Worth	Tarrant
100002850	Hamilton Apartments	2837 Hemphill Street	Fort Worth	Tarrant
100002699	Shannon's Funeral Home	2717 Avenue B	Fort Worth	Tarrant
100003598	Texas Pool	901 Springbrook Drive	Plano	Collin
100003599	Ambassador Hotel	1312 South Ervay	Dallas	Dallas
100003923	Cabana Motor Hotel	899 North Stemmons Freeway	Dallas	Dallas
100004371	Bella Villa Apartments	5506 Miller Avenue	Dallas	Dallas
100004249	McGaugh Hosiery Mills / Airmaid Hosiery Mills Building	4408 2nd Avenue	Dallas	Dallas
100004431	Fairhaven Retirement Home	2400 North Bell Avenue	Denton	Denton
100004752	Forest Theatre	1904 Martin Luther King Jr. Boulevard	Dallas	Dallas
100005459	West Denton Residential Historic District	Roughly bounded by West Hickory Street, Panhandle Street, Carroll Boulevard and Ponder Avenue	Denton	Denton

Reference Number	Property Name	Address	City	County
100004969	Katy Freight Depot	100 South Jones Street	Fort Worth	Tarrant
100005350	Fair Building	307 West 7th Street	Fort Worth	Tarrant
100005603	Riverside Baptist Church	3111 Race Street	Fort Worth	Tarrant
100006219	Braniff International Hostess College	2801 Wycliff Avenue	Dallas	Dallas
100006072	Pioneers Rest Cemetery	600 Samuels Avenue	Fort Worth	Tarrant
100006549	Wedgwood Apartments	2511 Wedglea Drive	Dallas	Dallas
100006521	Elizabeth and Jack Knight House	2811 Simondale Drive	Fort Worth	Tarrant
100007403	Farrington Field and Public Schools Gymnasium	1501 University Drive and 1400 Foch Street	Fort Worth	Tarrant
100007423	Gospel Lighthouse Church	1900 South Ewing Avenue	Dallas	Dallas
100008197	Fort Worth National Bank	115 West 7th Street	Fort Worth	Tarrant
100008552	Garland Bank & Trust Company	111 S. Garland Avenue	Garland	Dallas
100009082	Deep Ellum Historic District	Roughly bounded by Dallas Area Rapid Transit (DART) alignment and Elm Street (north), South Hall Street (south), North Central Expressway (west), and E. R. L. Thornton Freeway (IH 30) (east)	Dallas	Dallas

Attachment E. Historic Properties and Districts Map



TEXAS HISTORICAL COMMISSION
real places telling real stories

Re: Project Review under Section 106 of the National Historic Preservation Act

THC Tracking #202411044
Date: 06/07/2024
FAA-DroneUp Part 135 Package Delivery in DFW
Dallas-Fort Worth Metro Area
Dallas,TX 75201, multi
Description: See attached consultation letter for details. This project is for DFW 30-mile radius and does not have potential for any ground disturbance or construction proposed as part of these projects.
Dear Shelia Neumann:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Justin Kockritz, has completed its review and has made the following determinations based on the information submitted for review:

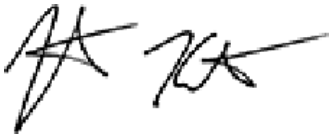
Above-Ground Resources

- THC/SHPO concurs with information provided.
- No adverse effects on historic properties.

We have the following comments: Because this undertaking proposes no ground disturbance, no review by the THC Archeology Division is required. However, should the project be revised to include ground disturbance in the future, further consultation with the Archeology Division will be required.
We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: justin.kockritz@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,



for Bradford Patterson
Chief Deputy State Historic Preservation Officer
Please do not respond to this email

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Appendix H

THPO Consultations

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Ms. Terri Parton, President
Wichita and Affiliated Tribes, Oklahoma
P.O. Box 729
Anadarko, OK 73005

Re: Invitation for Government-to-Government Tribal Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Transmitted via e-mail and mail: terri.parton@wichitatribe.com

Dear President Parton:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that may uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

Consultation Initiation

With this letter, the FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

Project Description

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that the Wichita and Affiliated Tribes, Oklahoma would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – Section 106 Consultation Package

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Ms. Robin Williams, Tribal Historic Preservation Officer
Wichita and Affiliated Tribes, Oklahoma
P.O. Box 729
Anadarko, OK 73005

Transmitted via e-mail and mail: robin.williams@wichitatribe.com

Re: Indian of Section 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear Tribal Historic Preservation Officer Williams:

The Federal Aviation Administration (FAA) is currently evaluating the DroneUp, LLC, doing business as DroneUp, proposal to conduct expanded delivery drone operations in the Dallas-Fort Worth (DFW), Texas (TX) area. DroneUp must obtain approval from the FAA prior to expanding its operations by operating the PRISM V2 Series drone in DFW, TX. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation the Wichita and Affiliated Tribes, Oklahoma and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NEPA concurrently with the NEPA process.

Project Description

DroneUp is proposing to continue transporting consumer goods via drone delivery in the communities they already serve and expand these services to the larger operational area using the new PRISM V2 Series drone. The PRISM V2 Series drone would take off from the DroneUp Hub and quickly rise to a cruising altitude of 230 to 250 feet above ground level (AGL). The PRISM V2 Series drone weighs approximately 55 pounds and can transport a small package up to about 10 pounds. The PRISM V2 Series drone has an approximate 5-mile service radius. Once at the delivery site, the PRISM V2 Series drone hovers in place at about 80 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

DroneUp is proposing up to 500 PRISM V2 Series drone flights per day from the launch/landing site, with each flight taking a package to a customer delivery address before returning. There is variability in the number of flights per day based on customer demand and weather conditions. Flights will occur up to 365 days a year, with operations being conducted for 15 hours per day, primarily during daylight hours,

but never before 7 A.M. or after 10 P.M.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The current operation that was coordinated with the TX SHPO showed the APE would be limited to areas near DFW, TX. This expansion extends through the similarly, densely populated, or congested regions of the DFW area. The enclosed map (see Attachment A) shows the proposed APE in detail.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Consultation

The FAA is soliciting the opinion of the Wichita and Affiliated Tribes, Oklahoma concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Dr. Shelia Neumann via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty

Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosure:
Attachment A – Proposed Area of Potential Effect

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Ms. Debbie Dotson, President
Delaware Nation, Oklahoma
P.O. Box 825
Anadarko, OK 73005

Transmitted via e-mail and mail: ddotson@delawarenation.com

Re: Invitation for Government-to-Government Tribal Consultation for DroneUp LLC Package Delivery Operations in DFW Texas

Dear President Dotson:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that may uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

Consultation Initiation

With this letter, the FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

Project Description

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

The FAA is soliciting the opinion of the Delaware Nation, Oklahoma concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that the Delaware Nation, Oklahoma would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9faa-drone-environmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – Secon 106 Consultation Package

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Ms. Carissa Speck, Director of Historic Preservation
Delaware Nation, Oklahoma
P.O. Box 825
Anadarko, OK 73005

Transmitted via e-mail and mail: cspeck@delawarenation-nsn.gov

Re: of Secon 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Director Speck:

The Federal Aviation Administration (FAA) is currently evaluating the DroneUp, LLC, doing business as DroneUp, proposal to conduct expanded delivery drone operations in the Dallas-Fort Worth (DFW), Texas (TX) area. DroneUp must obtain approval from the FAA prior to expanding its operations by operating the PRISM V2 Series drone in DFW, TX. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Delaware Nation, Oklahoma and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process.

Project Description

DroneUp is proposing to Continue transporting consumer goods via drone delivery in the communities they already serve and expand these services to the larger operational area using the new PRISM V2 Series drone. The PRISM V2 Series drone would take off from the DroneUp Hub and quickly rise to a cruising altitude of 230 to 250 feet above ground level (AGL). The PRISM V2 Series drone weighs approximately 55 pounds and can transport a small package up to about 10 pounds. The PRISM V2 Series drone has an approximate 5-mile service radius. Once at the delivery site, the PRISM V2 Series drone hovers in place at about 80 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

DroneUp is proposing up to 500 PRISM V2 Series drone flights per day from the launch/landing site, with each flight taking a package to a customer delivery address before returning. There is variability in the number of flights per day based on customer demand and weather conditions. Flights will occur up to 365 days a year, with operations being conducted for 15 hours per day, primarily during daylight hours,

but never before 7 A.M. or after 10 P.M.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The current operation that was coordinated with the TX SHPO showed the APE would be limited to areas near DFW, TX. This expansion extends through the similarly, densely populated, or congested regions of the DFW area. The enclosed map (see Attachment A) shows the proposed APE in detail.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Consultation

The FAA is soliciting the opinion of the Delaware Nation, Oklahoma concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty

Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – Proposed Area of Potential Effects

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

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Mr. Jonathan Cernek, Chairperson
Coushatta Tribe of Louisiana
P.O. Box 818
Elton, LA 70532

Transmitted via e-mail and mail: MBell@coushatta.org

Re: Invitation for Government-to-Government Tribal Consultation for DroneUp Package Delivery Operations in DFW Texas

Dear Chairperson Cernek:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that may uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

Consultation Initiation

With this letter, the FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

Project Description

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that The Coushatta Tribe of Louisiana Nation would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9faa-drone-environmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

CC: Dakota John
Tribal Historic Preservation Officer

Enclosures:
Attachment A – Secon 106 Consultation Package

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

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Mr. Dakota John, Tribal Historic Preservation Officer
Coushatta Tribe of Louisiana
P.O. Box 818
Elton, LA 70532

Transmitted via e-mail and mail: dakotajohn@coushatta.org

Re: Initiation of Section 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear Tribal Historic Preservation Officer John:

The Federal Aviation Administration (FAA) is currently evaluating the DroneUp, LLC, doing business as DroneUp, proposal to conduct expanded delivery drone operations in the Dallas-Fort Worth (DFW), Texas (TX) area. DroneUp must obtain approval from the FAA prior to expanding its operations by operating the PRISM V2 Series drone in DFW, TX. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Coushatta Tribe of Louisiana and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process.

Project Description

DroneUp is proposing to continue transporting consumer goods via drone delivery in the communities they already serve and expand these services to the larger operational area using the new PRISM V2 Series drone. The PRISM V2 Series drone would take off from the DroneUp Hub and quickly rise to a cruising altitude of 230 to 250 feet above ground level (AGL). The PRISM V2 Series drone weighs approximately 55 pounds and can transport a small package up to about 10 pounds. The PRISM V2 Series drone has an approximate 5-mile service radius. Once at the delivery site, the PRISM V2 Series drone hovers in place at about 80 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

DroneUp is proposing up to 500 PRISM V2 Series drone flights per day from the launch/landing site, with each flight taking a package to a customer delivery address before returning. There is variability in the number of flights per day based on customer demand and weather conditions. Flights will occur up to 365 days a year, with operations being conducted for 15 hours per day, primarily during daylight hours,

but never before 7 A.M. or after 10 P.M.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The current operation that was coordinated with the TX SHPO showed the APE would be limited to areas near DFW, TX. This expansion extends through the similarly, densely populated, or congested regions of the DFW area. The enclosed map (see Attachment A) shows the proposed APE in detail.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Consultation

The FAA is soliciting the opinion of the Coushatta Tribe of Louisiana concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Dr. Shelia Neumann via email at 9-faa-drone environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – Proposed Area of Potential Effects

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

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Chief David Hill, Principal Chief
The Muscogee (Creek) Nation
P.O. Box 580
Okmulgee, OK 74447

Transmitted via e-mail and mail: dhill@mcn-nsn.gov

Re: Invitation for Government-to-Government Tribal Consultation for DroneUp LLC Package Delivery Operations in DFW Texas

Dear Principal Chief Hill:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that may uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

Consultation Initiation

With this letter, the FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

Project Description

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that The Muscogee (Creek) Nation would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – Secon 106 Consultation Package

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

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024
Mr. Turner Hunt, Tribal Historic Preservation Officer
The Muscogee (Creek) Nation
P.O. Box 580
Okmulgee, OK 74447

Transmitted via e-mail and mail: thunt@muscogeenation.com

Re: Initiation of Secon 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear Tribal Historic Preservation Officer Hunt:

The Federal Aviation Administration (FAA) is currently evaluating the DroneUp, LLC, doing business as DroneUp, proposal to conduct expanded delivery drone operations in the Dallas-Fort Worth (DFW), Texas (TX) area. DroneUp must obtain approval from the FAA prior to expanding its operations by operating the PRISM V2 Series drone in DFW, TX. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation The Muscogee (Creek) Nation and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process.

Project Description

DroneUp is proposing to continue transporting consumer goods via drone delivery in the communities they already serve and expand these services to the larger operational area using the new PRISM V2 Series drone. The PRISM V2 Series drone would take off from the DroneUp Hub and quickly rise to a cruising altitude of 230 to 250 feet above ground level (AGL). The PRISM V2 Series drone weighs approximately 55 pounds and can transport a small package up to about 10 pounds. The PRISM V2 Series drone has an approximate 5-mile service radius. Once at the delivery site, the PRISM V2 Series drone hovers in place at about 80 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

DroneUp is proposing up to 500 PRISM V2 Series drone flights per day from the launch/landing site, with each flight taking a package to a customer delivery address before returning. There is variability in the number of flights per day based on customer demand and weather conditions. Flights will occur up to

365 days a year, with operations being conducted for 15 hours per day, primarily during daylight hours, but never before 7 A.M. or after 10 P.M.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The current operation that was coordinated with the TX SHPO showed the APE would be limited to areas near DFW, TX. This expansion extends through the similarly, densely populated, or congested regions of the DFW area. The enclosed map (see Attachment A) shows the proposed APE in detail.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Consultation

The FAA is soliciting the opinion of The Muscogee (Creek) Nation concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Dr. Shelia Neumann via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty

Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosure:
Attachment A – Proposed Area of Potential Effects

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Mr. Russell Martin, President
Tonkawa Tribe of Indians of Oklahoma
1 Rush Buffalo Road
Tonkawa, OK 74653

Transmitted via e-mail and mail: rmartin@tonkawatribe.com

Re: Invitation for Government-to-Government Tribal Consultation and Initiation of Section 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear President Martin:
The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

In addition, the FAA has determined that its proposed action, which would encompass all the FAA approvals necessary to enable DroneUp's expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). This letter initiates Section 106 consultation with the Apache Tribe of Oklahoma regarding potential effects on historic properties and cultural resources in the area.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that may uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

Consultation Initiation

With this letter, the FAA is seeking input concerning any Tribal lands or sites of religious or cultural

significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

Project Description

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process.

DroneUp is proposing to continue transporting consumer goods via its PRISM V2 Series UAS in partnership with merchants in the communities they currently serve under 14 CFR Part 107, *Small Unmanned Aircraft Systems,* and expand these services to the larger operation area (see Attachment A). The PRISM V2 Series aircraft would takeoff from one of DroneUp's "Hubs" located in a parking lot at a merchant and rise to a cruising altitude of 230 – 250 feet above ground level. Each aircraft weighs approximately 55 pounds and can transport a small package up to about 10 pounds. Once at the delivery site, the PRISM V2 Series hovers in place while the package is lowered to the ground. After the delivery is complete, the aircraft flies back to the Hub.

DroneUp initially will start with 11 Hubs and is expected to operate 30 Hubs in the DFW metro area over the next two years. Each Hub would house battery charging pads, and a takeoff and landing area. The estimated total distance flown would vary depending upon the pickup and drop-off locations in the operating area. Each Hub has an approximate 5-mile service radius. DroneUp is ultimately proposing a maximum of up to 500 flights per day from each Hub. The number of flights per day vary based on customer demand and weather conditions. Hubs are to be located at large retailers or shopping centers and placed to best supplement existing delivery methods and minimize potential effects on local communities.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), *Determine scope of identification efforts*, the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. This expansion extends through the more densely populated or congested regions of the DFW metro area remaining within a 30 nautical mile (nm) radius near the DFW airport. An enclosed map (Attachment A) shows the larger APE in greater detail with the identified initial 11 operating sites.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

The FAA is soliciting the opinion of the Tonkawa Tribe of Indians of Oklahoma concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that the Tonkawa Tribe of Indians of Oklahoma would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9-faadrone-environmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosure:
Attachment A – Proposed Area of Potential Effects

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Mr. Bobby Gonzalez, Chairman
Caddo Nation of Oklahoma
P.O. Box 487
Binger, OK 73009

Transmitted via e-mail and mail: bgonzalez@mycaddonation.com

Re: Invitation for Government-to-Government Tribal Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear Chairman Gonzalez:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that may uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

Consultation Initiation

With this letter, the FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), *Determine scope of identification efforts*, the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. This expansion extends through the more densely populated or congested regions of the DFW metro area remaining within a 30 nautical mile (nm) radius near the DFW airport. An enclosed map (Attachment A) shows the larger APE in greater detail with the identified initial 11 operating sites.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that The Caddo Nation of Oklahoma would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

CC: Mr. Jonathan Rohrer
Tribal Historic Preservation Officer

Enclosures:
Attachment A – Secon 106 Consultation Package

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Mr. Jonathan Rohrer, Tribal Historic Preservation Officer
Caddo Nation of Oklahoma
P.O. Box 487
Binger, OK 73009

Transmitted via e-mail: jrohrer@mycaddonation.com

Re: Initiation of Secon 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear Tribal Historic Preservation Officer Rohrer:

The Federal Aviation Administration (FAA) is currently evaluating the DroneUp, LLC, doing business as DroneUp, proposal to conduct expanded delivery drone operations in the Dallas-Fort Worth (DFW), Texas (TX) area. DroneUp must obtain approval from the FAA prior to expanding its operations by operating the PRISM V2 Series drone in DFW, TX. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Secon 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Secon 106 consultation with the Caddo Naon of Oklahoma and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Secon 106 of the National Historic Preservation Act concurrently with the NEPA process.

Project Description

DroneUp is proposing to continue transporting consumer goods via drone delivery in the communities they already serve and expand these services to the larger operational area using the new PRISM V2 Series drone. The PRISM V2 Series drone would take off from the DroneUp Hub and quickly rise to a cruising altitude of 230 to 250 feet above ground level (AGL). The PRISM V2 Series drone weighs approximately 55 pounds and can transport a small package up to about 10 pounds. The PRISM V2 Series drone has an approximate 5-mile service radius. Once at the delivery site, the PRISM V2 Series drone hovers in place at about 80 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

DroneUp is proposing up to 500 PRISM V2 Series drone flights per day from the launch/landing site, with each flight taking a package to a customer delivery address before returning. There is variability in the number of flights per day based on customer demand and weather conditions. Flights will occur up to

365 days a year, with operations being conducted for 15 hours per day, primarily during daylight hours, but never before 7 A.M. or after 10 P.M.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The current operation that was coordinated with the TX SHPO showed the APE would be limited to areas near DFW, TX. This expansion extends through the similarly, densely populated, or congested regions of the DFW area. The enclosed map (see Attachment A) shows the proposed APE in detail.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Consultation

The FAA is soliciting the opinion of The Caddo Naon of Oklahoma concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – Proposed Area of Potential Effects

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Mr. Durell Cooper, Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, OK 73005

Transmitted via e-mail and mail: durellcooper05@gmail.com

Re: Invitation for Government-to-Government Tribal Consultation and Initiation of Section 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear Chairman Cooper:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

In addition, the FAA has determined that its proposed action, which would encompass all the FAA approvals necessary to enable DroneUp's expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). This letter initiates Section 106 consultation with the Apache Tribe of Oklahoma regarding potential effects on historic properties and cultural resources in the area.

Consultation Initiation

With this letter, the FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

Project Description

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA)

to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process.

DroneUp is proposing to continue transporting consumer goods via its PRISM V2 Series UAS in partnership with merchants in the communities they currently serve under 14 CFR Part 107, *Small Unmanned Aircraft Systems,* and expand these services to the larger operation area (see Attachment A). The PRISM V2 Series aircraft would takeoff from one of DroneUp's "Hubs" located in a parking lot at a merchant and rise to a cruising altitude of 230 – 250 feet above ground level. Each aircraft weighs approximately 55 pounds and can transport a small package up to about 10 pounds. Once at the delivery site, the PRISM V2 Series hovers in place while the package is lowered to the ground. After the delivery is complete, the aircraft flies back to the Hub.

DroneUp initially will start with 11 Hubs and is expected to operate 30 Hubs in the DFW metro area over the next two years. Each Hub would house battery charging pads, and a takeoff and landing area. The estimated total distance flown would vary depending upon the pickup and drop-off locations in the operating area. Each Hub has an approximate 5-mile service radius. DroneUp is ultimately proposing a maximum of up to 500 flights per day from each Hub. The number of flights per day vary based on customer demand and weather conditions. Hubs are to be located at large retailers or shopping centers and placed to best supplement existing delivery methods and minimize potential effects on local communities.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), *Determine scope of identification efforts*, the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. This expansion extends through the more densely populated or congested regions of the DFW metro area remaining within a 30 nautical mile (nm) radius near the DFW airport. An enclosed map (Attachment A) shows the larger APE in greater detail with the identified initial 11 operating sites.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

The FAA is soliciting the opinion of the Apache Tribe of Oklahoma concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that the Apache Tribe of Oklahoma would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9-faa-drone-environmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – Proposed Area of Potential Effects

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

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024
Principal Chief Chuck Hoskin
Cherokee Nation
P.O. Box 948
Tahlequah, OK 74465

Transmitted via e-mail and mail: chuck-hoskin@cherokee.org

Re: Invitation for Government-to-Government Tribal Consultation for DroneUp LLC Package Delivery Operations in DFW Texas

Dear Principal Chief Hoskin:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that may uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

Consultation Initiation

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations
Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process. For your reference, the project description used

for consultation under Section 106 is enclosed with this letter.

Project Description

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations
Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that The Cherokee Nation would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

CC: Elizabeth Toombs
Tribal Historic Preservation Officer

Enclosure:
Attachment A – Section 106 Consultation Package

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Elizabeth Toombs, Tribal Historic Preservation Officer
Cherokee Nation
P.O. Box 948
Tahlequah, OK 74465

Transmitted via e-mail and mail: elizabeth-toombs@cherokee.org

Re: Initiation of Section 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear Tribal Historic Preservation Officer Toombs:

The Federal Aviation Administration (FAA) is currently evaluating the DroneUp, LLC, doing business as DroneUp, proposal to conduct expanded delivery drone operations in the Dallas Fort Worth (DFW), Texas (TX) area. DroneUp must obtain approval from the FAA prior to expanding its operations by operating the PRISM V2 Series drone in DFW, TX. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Secon 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Secon 106 consultation with the Cherokee Naon and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Secon 106 of the National Historic Preservation Act concurrently with the NEPA process.

Project Description

DroneUp is proposing to continue transporting consumer goods via drone delivery in the communities they already serve and expand these services to the larger operational area using the new PRISM V2 Series drone. The PRISM V2 Series drone would take off from the DroneUp Hub and quickly rise to a cruising altitude of 230 to 250 feet above ground level (AGL). The PRISM V2 Series drone weighs approximately 55 pounds and can transport a small package up to about 10 pounds. The PRISM V2 Series drone has an approximate 5-mile service radius. Once at the delivery site, the PRISM V2 Series drone hovers in place at about 80 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

DroneUp is proposing up to 500 PRISM V2 Series drone flights per day from the launch/landing site, with each flight taking a package to a customer delivery address before returning. There is variability in the number of flights per day based on customer demand and weather conditions. Flights will occur up to

365 days a year, with operations being conducted for 15 hours per day, primarily during daylight hours, but never before 7 A.M. or after 10 P.M.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The current operation that was coordinated with the TX SHPO showed the APE would be limited to areas near DFW, TX. This expansion extends through the similarly, densely populated, or congested regions of the DFW area. The enclosed map (see Attachment A) shows the proposed APE in detail.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Consultation

The FAA is soliciting the opinion of The Cherokee Naon concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – Proposed Area of Potential Effects

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

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Mr. Mark Woommavovah, Chairman
Comanche Nation, Oklahoma
P.O. Box 908
Lawton, OK 73502

Transmitted via e-mail and mail: mark.woommavovah@comanchenation.com

Re: Invitation for Government-to-Government Tribal Consultation for DroneUp LLC Package Delivery Operations in DFW Texas

Dear Chairman Woommavovah:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize DroneUp, LLC (DroneUp) to conduct expanded Unmanned Aircraft System (UAS) operations in the Dallas-Fort Worth (DFW), TX metro area. The FAA is the lead federal agency for government-to-government consultation for the proposed project. We wish to solicit your views regarding potential effects on tribal interests in the area.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that may uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

Consultation Initiation

With this letter, the FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

Project Description

The FAA is preparing an Environmental Assessment under the National Environmental Policy Act (NEPA) to assess the potential environmental impacts of DroneUp commercial package delivery operations using drones in the DFW area under 14 Code of Federal Regulations Part 135 (Part 135). Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations
Specifications. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Consultation

Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In the event that The Comanche Nation would like to consult with the FAA, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov to confirm your intent to participate in this government-to-government consultation.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

CC: Ms. Marna Minthorn
Tribal Historic Preservation Officer

Enclosures:
Attachment A – Section 106 Consultation Package

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

April 18, 2024

Ms. Martina Minthorn, Tribal Historic Preservation Officer
Comanche Nation, Oklahoma
P.O. Box 908
Lawton, OK 73502

Transmitted via e-mail and mail: martina.minthorn@comanchenation.com

Re: Initiation of Secon 106 Consultation for DroneUp, LLC Package Delivery Operations in DFW Texas

Dear Tribal Historic Preservation Officer Minthorn:

The Federal Aviation Administration (FAA) is currently evaluating the DroneUp, LLC, doing business as DroneUp, proposal to conduct expanded delivery drone operations in the Dallas Fort Worth (DFW), Texas (TX) area. DroneUp must obtain approval from the FAA prior to expanding its operations by operating the PRISM V2 Series drone in DFW, TX. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Comanche Nation, Oklahoma and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the National Historic Preservation Act concurrently with the NEPA process.

Project Description

DroneUp is proposing to continue transporting consumer goods via drone delivery in the communities they already serve and expand these services to the larger operational area using the new PRISM V2 Series drone. The PRISM V2 Series drone would take off from the DroneUp Hub and quickly rise to a cruising altitude of 230 to 250 feet above ground level (AGL). The PRISM V2 Series drone weighs approximately 55 pounds and can transport a small package up to about 10 pounds. The PRISM V2 Series drone has an approximate 5-mile service radius. Once at the delivery site, the PRISM V2 Series drone hovers in place at about 80 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

DroneUp is proposing up to 500 PRISM V2 Series drone flights per day from the launch/landing site, with each flight taking a package to a customer delivery address before returning. There is variability in the number of flights per day based on customer demand and weather conditions. Flights will occur up to

365 days a year, with operations being conducted for 15 hours per day, primarily during daylight hours, but never before 7 A.M. or after 10 P.M.

Area of Potential Effects

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The current operation that was coordinated with the TX SHPO showed the APE would be limited to areas near DFW, TX. This expansion extends through the similarly, densely populated, or congested regions of the DFW area. The enclosed map (see Attachment A) shows the proposed APE in detail.

Identification of Historic Properties

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking does not include ground disturbance but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

Consultation

The FAA is soliciting the opinion of The Comanche Nation, Oklahoma concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the opera. If you have any questions or need additional information, please contact Dr. Shelia Neumann via email at 9-faa-droneenvironmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

DEREK W HUFTY
Digitally signed by DEREK W HUFTY
Date: 2024.04.17 22:07:27 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosure:
Attachment A – Proposed Area of Potential Effects

Appendix I

FAA Cumulative Effects Memorandum

DFW Part 135 Operations - Cumulative Impacts

The purpose of this memo is to provide a summary of information available to the FAA as related to proposed Part 135 drone package delivery operations[1] for various operators within the DFW metro area. This information should be used by the FAA and individual operators/applicants to inform their cumulative impacts analysis conducted as part of the development of their NEPA documents. This information serves as the basis for the past, present, and reasonably foreseeable future actions. This memo also includes a figure that displays the study area considered for cumulative impacts in each NEPA document for the DFW metro area and the timeframe considered for reasonably foreseeable future actions.

Definition of Effects/Impacts

The Council on Environmental Quality defines effects or impacts as "changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and include the following: (1) Direct effects, which are caused by the action and occur at the same time and place. (2) Indirect effects, which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. (3) Cumulative effects, which are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. (4) Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effects will be beneficial."[2]

FAA Order 1050.1F states that an EA or EIS must address cumulative impacts by evaluating the "incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, whether Federal or non-Federal. If the proposed action would cause significant

[1] It is anticipated that Part 107 operations currently underway will transition to Part 135 operations in the future. Therefore, the Part 135 operations described in this document include existing Part 107 operations

[2] See 40 CFR § 1508.1

incremental additions to cumulative impacts, an EIS is required."[3] The FAA defines past, present, and reasonably foreseeable future actions in Section 15.1 of the FAA *1050.1F Desk Reference*.[4, 5]

"***Past actions*** are actions that occurred in the past and may warrant consideration in determining the environmental impacts of an action. The FAA has discretion to determine whether, and to what extent, information about the specific nature, design, or present impacts of a past action are useful for the analysis of the impacts of the proposed action and alternative(s). Present impacts of past actions that are relevant and useful are those that may have a significant cause-and-effect relationship with the direct and indirect impacts of the proposed action and alternative(s).

Present actions are any other actions that are occurring in the same general time frame as the proposal…Such actions may have traffic, noise, or other environmental concerns that should be considered in conjunction with those that would be generated by the proposed action and alternative(s) under consideration.

Reasonably foreseeable future actions are actions that may affect projected impacts of a proposal and are not remote or speculative… "An action may be reasonably foreseeable even in the absence of a specific proposal."

The CEQ defines "reasonably foreseeable" actions as "sufficiently likely to occur such that a person of ordinary prudence would take it into account in reaching a decision."[6]

Past, Present, and Reasonably Foreseeable Future Actions

Past actions include Part 107 small UAS operations which limit activities to occur within visual line of sight (VLOS). It should be noted that Part 107 operations would include those operations conducted under a waiver to the Part 107 regulations, including beyond visual line of sight (BVLOS) operations.

Present actions include approved Part 135 operations, which include 27 approved hubs operating at up to 400 daily operations per hub.

Reasonably foreseeable actions include proposed actions for multiple operators that have applied for approvals to conduct drone package deliveries in the DFW metro area and expansion of one operator. The timeframe to be considered in evaluating cumulative effects should extend through 2027 since the operators have provided projections for the next 30 to 36 months. As proposed by other operators, reasonably foreseeable actions include up to 185 additional hubs operating between 400 and 500 operations per day per hub.

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[3] See Section 4-2.d(3) of FAA Order 1050.1F

[4] See Section 15.1 of FAA 1050.1F Desk Reference (v2), February 2020

[5] See also CEQ Guidance on *Considering Cumulative Effects Under the National Environmental Policy Act*, January 1997

[6] See 40 CFR § 1508.1(ii)

Together, the past, present, and reasonably foreseeable actions total a maximum of 212 hubs in the study area, which would generate up to an annual average daily (AAD) total of 88,840 package deliveries within the study area. The geographic footprint of the study area to be evaluated for cumulative impacts is shown in **Figure 1**. Out of the 212 proposed hub locations, 50 specific sites are either currently in operation or have been identified as prospective hub locations by the various Part 135 applicants.

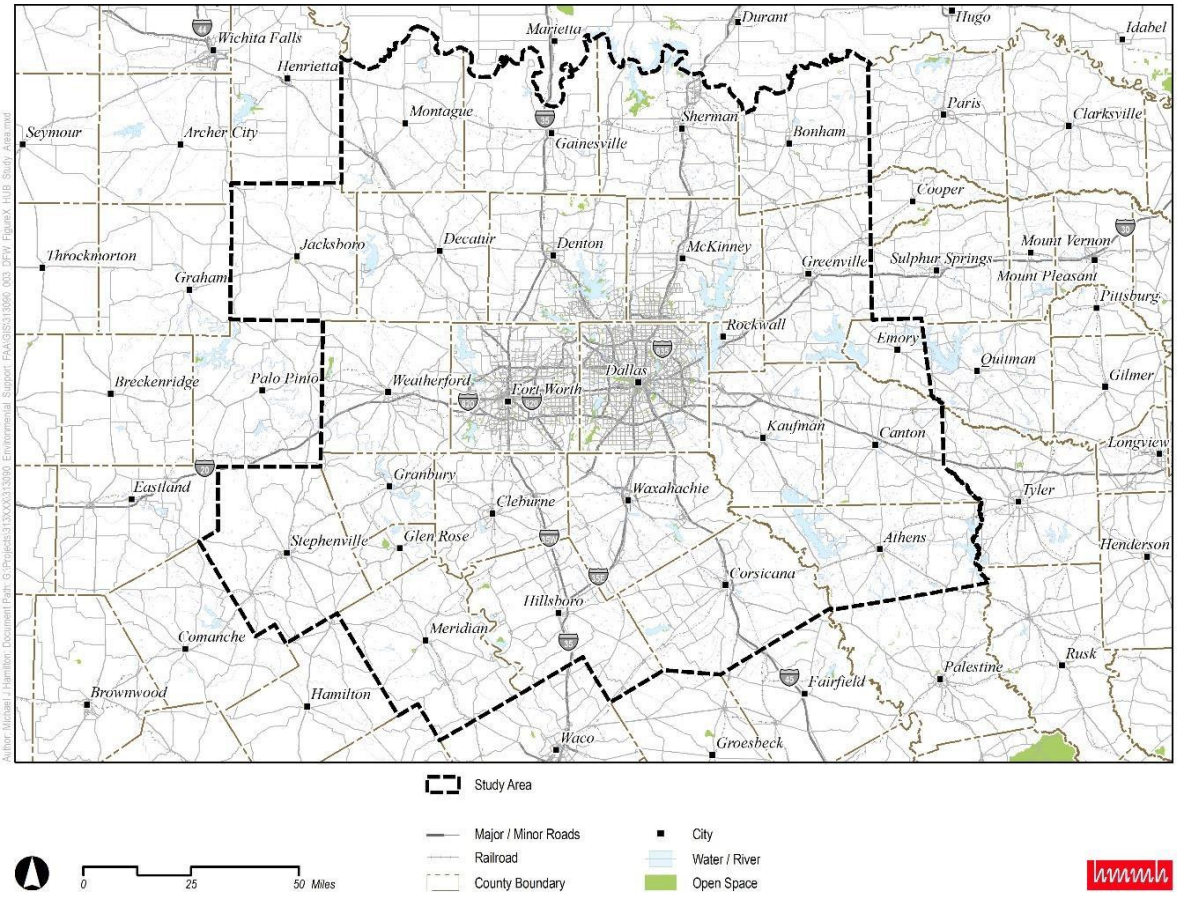

Figure 1. Geographic Study Area for Cumulative Effects in DFW Metro Area

FAA analysis of prospective hub siting areas concluded that siting 100% of the existing and proposed hub locations is not feasible without overlap in the land area accessible from the hub locations (i.e., the delivery ranges of the proposed UA). It should be noted that overlap does not necessarily mean that there will be adverse impacts to environmental resource categories. The degree to which all of the different operators would operate within areas of shared airspace is entirely dependent on the operators, their specific business use cases, and their ability to deconflict with one another in the overlapping delivery areas with shared customers.

Information shared by various operators indicates that some would try to minimize overlap in their own hubs' delivery ranges while others plan to allow for inter-hub flights and therefore may plan for overlap within their own operations. In cases where a single operator's hubs would have overlapping delivery ranges, most operators have stated they do not expect such circumstances to have additive effects that would result in increased package deliveries to those areas. The primary reason given for this is that the services provided by different hubs would generally be redundant, or at least similar, and, as such, customer demand for those services would be unaffected by the number of hubs within delivery range of the same area. In cases where different operators' hubs would have overlapping delivery ranges, some additive effect could occur within those areas depending on customer demand for the various types of package delivery services being provided by each operator. From a business perspective, it is anticipated that operators would make every effort to minimize overlapping operations with other operators to the extent practicable.

Based on input provided by the various operators, the FAA does not anticipate AAD deliveries within any contiguous area of airspace accessible from multiple hubs to exceed the sum of each individual operator's proposed AAD deliveries from a single hub. The sum of the proposed single hub AAD deliveries for all current DFW area Part 135 operators and applicants is 1,728.

Cumulative Noise Exposure

For instances where the proposed drone package delivery operations would occur in areas subject to other aviation noise sources, it is necessary to evaluate the cumulative noise exposure that would result from the other aviation noise sources present. Examples of such scenarios are drone package delivery operations occurring in the vicinity of an airport and where one drone operator's flight activity areas may overlap with those of other drone operators.

FAA *Order 1050.1F Environmental Impacts: Policies and Procedures* and the associated *1050.1F Desk Reference* defines the criteria for changes in noise exposure resulting from a proposed action and cumulative effects that are considered reportable and/or significant. *Order 1050.1F Section 4-3.3 Significance Thresholds* states that an increase in noise would be considered significant if the following conditions are met:

> *The action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB.*

Additionally, *Order 1050.1F Appendix B Section B-1.4 Environmental Consequences* requires reporting for air traffic airspace and procedure actions where the study area is larger than the immediate vicinity

of an airport. In such cases, noise exposure assessments should identify where noise will change by the following specified amounts:

1. For DNL 65 dB and higher: +1.5 dB
2. For DNL 60 dB to <65 dB: +3 dB
3. For DNL 45 dB to <60 dB: +5 dB

The FAA refers to noise changes meeting criteria 1 as "significant" and those meeting criteria 2 and 3 as "reportable." It should also be noted that these criteria apply only to cases where the noise level changes occur over land uses that are considered noise sensitive. **Figure 2** presents the relationship between the dB difference in two noise sources and the increase resulting from the summation of those noise sources. The FAA's change criteria of plus 1.5, 3, and 5 dB are also plotted on the curve for reference.

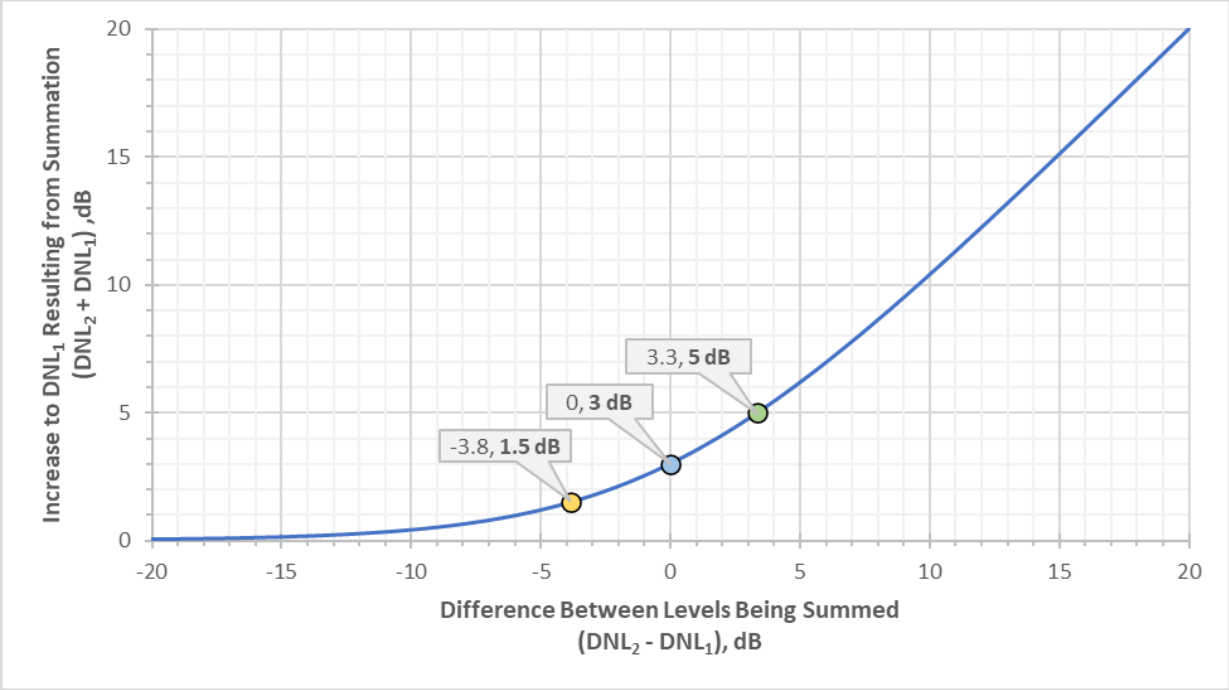

Figure 2. dB Increase Resulting from DNL Summation

Potential increases to DNL resulting from cumulative aviation noise effects can be evaluated with **Figure 2** by considering the proposed action noise exposure as DNL_2 and the sum of all other aviation noise sources at the same location as DNL_1. If the difference between DNL_2 and DNL_1 is:

- Less than -3.8 dB, the increase in DNL would be less than 1.5 dB
- From -3.8 dB up to but not including 0 dB, the increase in DNL would range from 1.5 dB up to but not including 3 dB
- From 0 dB up to but not including 3.3 dB, the increase in DNL would range from 3 dB up to but not including 5 dB
- 3.3 dB or greater, the increase in DNL would be 5 dB or greater

Beyond differences of +/- 15 dB the curve becomes asymptotic to a slope of 1 and 0, illustrating that the addition of noise levels with differences greater than that results in effectively no increase from the higher of the two noise source levels being summed.

DFW Metro Area Cumulative Noise Evaluation

The FAA has evaluated whether significant cumulative noise impacts would occur from the proposed package delivery operations. This evaluation is based on the minimum cumulative drone package delivery noise level that could result in a +1.5 dB change when combined with existing airport noise to generate new areas of 65 dB DNL (i.e., an increase from 63.5 dB DNL to 65 dB DNL). As indicated in Figure 3, when a noise level that is equal to or greater than -3.8 dB from the existing noise level is combined with the existing noise, the resultant increase is 1.5 dB or more. This gives a drone noise threshold of 59.7 dB DNL for significant cumulative noise impact when considering drone package delivery operations in proximity to airports where the airport associated DNL is 63.5 dB. If total drone noise is less the 59.7 dB DNL, then cumulative noise increases would be less than +1.5 dB DNL and no significant noise impacts would occur.

Because the exact location of the 63.5 dB DNL contour from an airport will generally not be identifiable without conducting an airport noise study, the FAA has undertaken a review of available airport noise data to identify generalized characteristics regarding airport DNL extents. Through this review, the FAA concluded that airport noise levels outside of the surface areas of airport-controlled airspace are less than 60 dB DNL. Based on this, the threshold of 59.7 dB DNL would apply only when drone package delivery activity occurs within the surface areas of airport-controlled airspace, as the airport noise level of 63.5 dB DNL would only be encountered when within that airspace. Outside of the surface areas of airport-controlled airspace, airport noise would be less than 60 dB DNL, and drone noise levels could be somewhat higher before any potential for significant impacts could exist.

En route flight, in which the drone is transiting between the hub and delivery location, is the phase of package delivery operations where there is the greatest potential for cumulative noise exposure from multiple drone operators. It is expected that for air traffic deconfliction, hubs would generally be sited at least 1,000 ft from another, at which point hub noise would dissipate to a level where only the associated en route noise is of concern. If hubs are sited within less than 1,000 feet from one another, it's unlikely that any noise sensitive land use would exist in between them since hubs would typically be sited within commercially zoned areas. Delivery noise is expected to be limited by individual customer demand, as any particular residential customer location is expected to receive, at most, only a very small portion of any hub's daily capacity. Exceptions to this may occur in cases where a drone operator is delivering packages exclusively to a small number of locations on a recurring basis, such as with lab samples and medical supplies on a medical campus, but those cases would generally not occur over land use types where levels below 65 dB DNL are required to be considered compatible with aviation noise.

Based on the available drone noise data for current DFW area Part 135 applicants, the FAA projects that en route DNL for 1,728 AAD deliveries would be in the range of 56-58 dB DNL. Final drone noise data for some applicants is being collected and evaluated, so only an approximate projection for cumulative en route DNL can be made at this time. Based on the projected en route noise range being less than 59.7 dB DNL, the FAA does not anticipate that significant cumulative noise impacts would result from the proposed Part 135 drone package delivery operations occurring within the study area. Furthermore, the projected en route DNL is based on all 1,728 deliveries passing over the same point on the ground. As this is an unlikely real-world occurrence, the projected cumulative en route DNL should be considered a conservative estimate of potential noise exposure.

To avoid the potential for cumulative impacts to result from siting hubs within the vicinity of airports, operators would adhere to the following guidelines:

- When siting hubs within the surface area of airport-controlled airspace, operators would maintain a standoff distance from any noise sensitive land use that is at least equivalent to the extent of the hub's 55 dB DNL.
- When siting hubs outside the surface area of airport-controlled airspace, operators would maintain a standoff distance from any noise sensitive land use that is at least equivalent to the extent of the hub's 60 dB DNL.

These standoff distances would ensure any noise increases resulting from combined airport and hub noise would remain less than +1.5 dB.

Summary and Conclusions

Based upon the FAA's analysis of areas where hubs would likely be sited, locating 100% of the existing and proposed hub locations is not feasible without overlap in the land area accessible from the hub locations (i.e., the delivery ranges of the proposed UA). It should be noted that overlap does not necessarily mean that there will be adverse impacts to environmental resource categories. However, cumulative effects are expected to occur where delivery routes overlap. The resource categories anticipated to experience cumulative effects include noise, visual, and biological resources, with noise being the primary concern based on overlap in delivery routes. The level of cumulative effects would vary depending on the amount of overlap.

The degree to which all of the different operators would operate within areas of shared airspace is dependent on the operators, their specific business use cases, and their ability to deconflict with one another in overlapping areas. Each operator is responsible for coordinating with other operators in the same geographic area to avoid significant cumulative effects.

FAA's analysis has determined that the cumulative impacts are not expected to exceed thresholds for significance in any environmental resource categories.

Appendix J
Noise

Noise Assessment for DroneUp Proposed Package Delivery Operations with the PRISM V2 Unmanned Aircraft

In support of U.S. Code of Federal Regulations Title 14, Part 135

Final

HMMH Report No. 23-0271A-1
May 6, 2024

Prepared for:

DroneUp, LLC
160 Newtown Road, Suite 500
Virginia Beach, VA 23462

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DroneUp, LLC
160 Newtown Road, Suite 500
Virginia Beach, VA 23462

Prepared by:

Brandon Robinette

HMMH
700 District Avenue, Suite 800
Burlington, MA 01803
T 781.229.0707

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Introduction and Background

This document presents the methodology for estimation of noise exposure related to proposed Unmanned Aircraft (UA) package delivery operations conducted by DroneUp LLC as a commercial operator under the provisions of Title 14 Code of Federal Regulation (CFR) Part 135.

DroneUp is a United States based technology company that combines airspace solutions, web-based applications, and analytics platforms. They provide drone delivery services to help companies operate at scale in last mile delivery. Currently, DroneUp operates under 14 Code of Federal Regulations (CFR) Part 107. Operations are conducted beyond visual line-of-sight (BVLOS) utilizing strategically placed visual observers (VOs[1]) for airspace deconfliction within a predefined radius of the operating base for its commercial deliveries. DroneUp has made an application to the Federal Aviation Administration (FAA) for a standard air carrier certificate[2] under 14 CFR Part 135[3], which allows holders to conduct ondemand or scheduled (commuter) operations, and a 49 United States Code (U.S.C.) 44807 exemption[4] which allows DroneUp to operate for compensation or hire BVLOS using its PRISM V2 Unmanned Aircraft System (UAS). DroneUp is the manufacturer of the UAS being used in these package delivery operations, the operator, and the system integrator.

DroneUp's package delivery operations originate from a network of Hubs, where each Hub serves a specific area, thereby avoiding an over-concentration of flights surrounding any given Hub. The Prism V2 UA has a delivery range of approximately 5 miles round trip. DroneUp's Hubs would be located in established parking lots of commercial areas whose use is consistent with local zoning and land use requirements, such as shopping centers, large individual retailers, and shopping malls.

DroneUp's PRISM V2 series, features a multirotor design with eight (8) propellers. The UA weighs 55 pounds when combined with its maximum payload weight of 10 pounds. It has a wingspan of approximately 71.5 inches, a height of approximately 32 inches, and a length of approximately 71.5 inches. Power for flight is supplied by 2x two (2) 12 cell Lithium-Ion Polymer (LiPo) Battery Packs. While the aircraft is compatible with a range of batteries, Part 135 operations will only be conducted with 2x 12s 12,000mAh LiPo batteries.

[1] The minimum number of VOs required to continuously observe at least a 2 statute mile radius of airspace surrounding the UA in flight so as to ensure that the PIC receives sufficient notice to maintain the UA well clear of manned aircraft and not create a collision hazard for other UA. See Exemption No. 18339D Table 5 – Definitions, "*Sufficient VOs*."

[2] An operating certificate is issued to an applicant that will conduct intrastate transportation, which is transportation that is conducted wholly within the same state of the United States.

[3] https://www.faa.gov/uas/advanced_operations/package_delivery_drone

[4] 49 U.S.C. § 44807; *Special Authority for Certain Unmanned Aircraft Systems*, provides the Secretary of Transportation with authority to determine whether a certificate of waiver, certificate of authorization, or a certificate under 49 U.S.C. §§ 44703 or 44704 is required for the operation of certain UAS.

Figure 1 depicts the UA considered in this report.

Figure 1. DroneUp PRISM V2 Series Unmanned Aircraft *Source: DroneUp*

The methodology proposed in this document provides quantitative guidance to FAA Environmental Specialists to inform environmental decision making on UA noise exposure from proposed DroneUp package delivery operations. The methods presented here are suitable for review of Federal actions under the requirements of the National Environmental Policy Act (NEPA) and other applicable environmental special purpose laws or other federal environmental review requirements at the discretion and approval of the FAA. In particular, this report is intended to function as a nonstandard equivalent methodology under FAA Order 1050.1F, and as such, would require prior written approval from FAA's Office of Environment and Energy (AEE) for each individual project for which a NEPA determination is sought.[5]

The methodology has been developed with data provided by DroneUp to date and, therefore, is limited to DroneUp operations with the PRISM V2 UA and the flight phases and maneuvers

[5] Discussion of the use of "another equivalent methodology" is discussed in FAA Order 1050.1F, July 16, 2015, Appendix B, Section B-1.2, available online at https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf#page=113

described herein. The noise analysis methodology and estimated noise levels of the proposed activities are based upon noise measurement data collected by HMMH in late February 2024.[6] Results of the noise analysis are presented in terms of the Yearly Day-Night Average Sound Level (DNL) based on varying levels of operations for areas at ground level below each phase of the flight. The Community Noise Equivalent Level (CNEL) may be used in lieu of DNL for FAA actions in California. Discussion of modification of this process for use of the CNEL is discussed in Section 3.1.

Section 2 of this document describes the relevant noise and operations data. Section 3 describes the methodology to develop noise exposure estimates for the various UA flight phases associated with typical operations using available data. Section 4 presents the estimated DNL levels for Hub, delivery, and enroute flight activity based on varying levels of typical operations. Section 5 describes the methodology to determine cumulative noise resulting from UA package delivery noise in combination with other aviation noise sources.

[6] HMMH measurements of DroneUp PRISM V2 at the Flank Rd RC Field in Petersburg, VA, February 2024.

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Unmanned Aircraft Delivery Operations and Noise Measurement Data Set Descriptions

Three data sets form the basis of the noise assessment for the proposed DroneUp PRSIM V2 delivery operations. The data sets include two DroneUp provided documents/files titled “REVIEW DroneUp Concept of Operations (CONOPs) Version 1.3” dated March 22, 2024, and “DroneUp V2.1 Typical Flight Profile Information.xlsx” provided to HMMH in December 2023. The third data set, consists of noise measurements of the PRISM V2 collected by HMMH in late February 2024 at the Flank Road RC Field approximately one mile north of DroneUp’s Richard Bland College flight testing and training facility located in Petersburg, VA.

Operations, Flight Paths, and Flight Profile Data

Operations and flight profile data for the UA provided by DroneUp were reviewed to determine the characteristics of typical operations for a proposed operating area. Based on this review, the following subsections describe the assumptions made about the operations and flight profiles that were used to inform the development of the estimated noise exposure and the methodology for the noise analysis.

Operations

The methodology presented in this report can be used to assess UA noise over a range of proposed activity levels; however, FAA review and approval of its use at specified activity levels is required. The activity ranges shown in Section 4 represent what FAA considers low to moderate activity levels, and as appropriate for consideration with this methodology. At higher activity levels, this methodology may not be sufficient to inform an environmental determination and further consideration or refinements at the discretion of the FAA may be needed.
This report provides variations to the methodology that can be used with either DNL or CNEL, provided that the proper equivalent operations are calculated.

- The DNL noise levels presented in this report are all shown consistent with effective daytime (7 AM to 10 PM) operations levels. For consideration of nighttime (10 PM to 7 AM) noise levels, a ten times operational weighting (equivalent to 10-decibel [dB] increase) should be applied.

- The CNEL noise levels presented in this report are all shown consistent with effective daytime (7 AM to 7 PM) operations levels. For consideration of evening time (7 PM to 10 PM) a three times operational weighting (equivalent to 4.77-dB increase) should be applied and for consideration of nighttime (10 PM to 7 AM) noise levels, a ten times operational weighting (equivalent to 10dB increase) should be applied.

Section 3.1 provides techniques to apply the operational weighting necessary to calculate effective operations for analysis with the DNL and CNEL metrics.

Flight Paths and Profiles

The UA would fly a predefined flight path that is set prior to takeoff. Flight missions are automatically planned by DroneUp's flight planning software. A mission originates from a Hub location, and DroneUp's software automatically assigns, deconflicts, and routes each flight to the delivery location and back to a Hub. Each Hub site would include a controlled area wherein UA flights are launched and recovered.

DroneUp would utilize two Hub configurations in support of the Remote Pilot in Command (RPIC) who resides at a Remote Operations Center (ROCC): The Mobile Hub which would be used for rapid deployment, and the Standard Hub which would be used for long term DroneUp delivery operations. **Figure 2** depicts an example of a Mobile Hub (left) and Standard Hub (right).

Figure 2. Mobile and Standard Hubs
Source: DroneUp

Regardless of layout, criteria for determining operational area safety remain the same. Takeoff and landing areas shall be established on a smooth surface in a flat, well-lit area clear of overhanging hazards such as tree branches and power lines. The operations area should be clearly demarcated by signs, ropes, cones, or other similar means, and shall be roughly square, an internal area that ensures a radius of no less than 16 feet around the aircraft.

The UA could be operated at altitudes of from 200 feet above ground level (AGL) up to but not including 400 feet AGL. However, typical en route flights to and from delivery locations would occur in the altitude range of 230 - 250 feet AGL. At a delivery location, the UA would descend

vertically to a stationary hover at 80-120 feet AGL and lower a package to the ground by a retractable line for delivery. Once a package has been lowered to the ground, the UA would then retract the line, ascend vertically to a cruise altitude, and depart the delivery area en route back to a Hub.

Operations are conducted beyond visual line-of-sight (BVLOS) utilizing strategically placed visual observers (VOs[32]) for airspace deconfliction within a predefined radius of the operating base for its commercial deliveries. Visual observers are not in use to maintain visual line of sight to DroneUp aircraft throughout the operation.

A typical flight profile can be broken into the following general five flight phases:

1. Takeoff,
2. En route outbound,
3. Delivery,
4. En route inbound, and
5. Landing.

These phases are shown in **Figure 3** and are representative of the typical flight profile that DroneUp is expected to use for delivery operations. The subsections that follow provide a narrative description of each of the five flight phases.

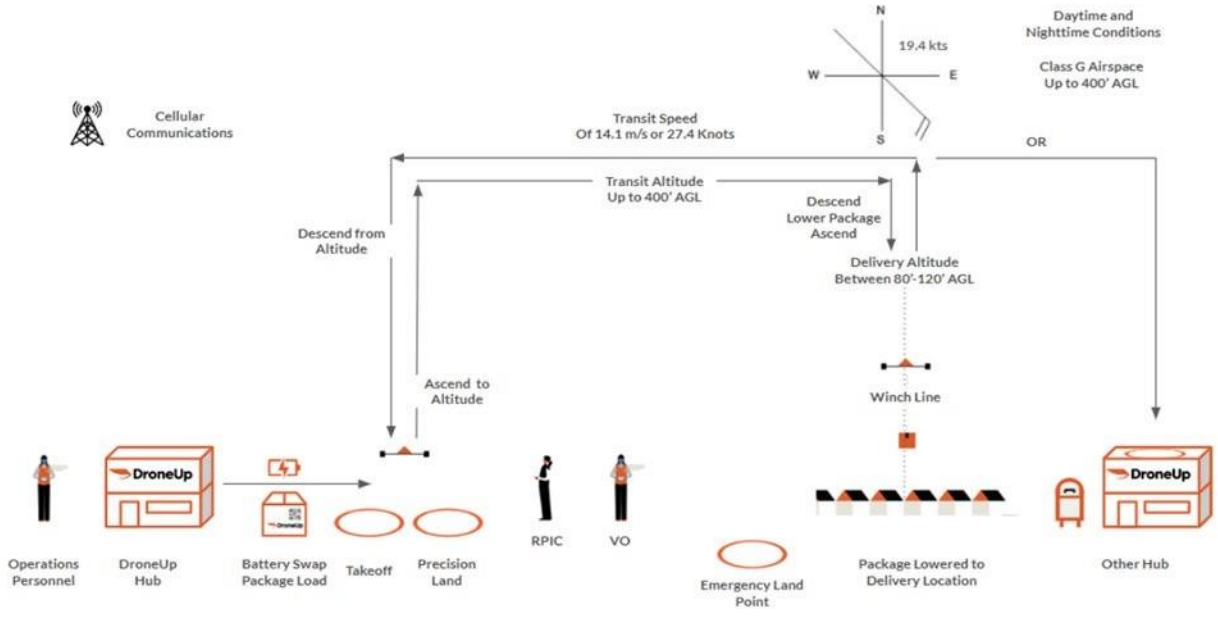

Figure 3. Graphical Depiction of the Proposed DroneUp PRISM V2 Flight Profile to a Destination *Source: DroneUp*

[32] The minimum number of VOs required to continuously observe at least a 2 statute mile radius of airspace surrounding the UA in flight so as to ensure that the PIC receives sufficient notice to maintain the UA well clear of manned aircraft and not create a collision hazard for other UA. See Exemption No. 18339D Table 5 – Definitions, "Sufficient VOs."

Takeoff

Prior to takeoff, the package is loaded. During takeoff, the aircraft ascends to its en route altitude, typically 230-250 feet AGL, (the altitude AGL it will stay in for the duration of the flight to the delivery site). It will pause momentarily after reaching the en route altitude before moving towards the delivery site.

En Route Outbound

The en route outbound phase is the part of flight in which the fully loaded UA transits from the Hub to a delivery point on a predefined flight path. During this flight phase, the UA would typically operate at an altitude of 230-250 ft AGL and airspeed of 27.4 knots / 31.5 miles per hour (mph). The UA has a single set cruise airspeed, which would not be exceeded.

Delivery

The delivery phase consists of descent from the en route altitude to a delivery point, such as a residential yard, driveway, parking lot, or common area. The UA descends vertically to 80-120 feet AGL[33] while maintaining position over the delivery point. The UA hovers at 80-120 feet AGL for approximately one (1) minute while lowering its package and then proceeds to climb vertically back to en route altitude. The minimum distance a human should be from the UA during delivery is a 16-foot radius from underneath the center of the UA. The delivery winch[34] system was created exclusively for use with the PRISM V2 series UAS. The delivery winch is capable of delivering up to a 10-pound package from an altitude of 124 ft. This allows the drone to remain in a hover at a defined altitude of 80 feet per DroneUp policy while staying away from potential hazards closer to the ground. The logic inside the winch executes a delivery completely autonomously and returns the delivery hook in under one minute. Prior to loading a package onto the payload delivery system, a trained and approved crewmember must ensure the weight is below the maximum allowable threshold by weighing the package in its packed condition.

En Route Inbound

The UA continues to fly at an altitude of typically 230-250 ft AGL and a speed of 27.4 knots towards the Hub. DroneUp's flight planning software, FlightOps Operating System (O/S), auto populates the best route of flight and operators then have the ability to ensure strategic routing is used to shield noise sensitive land use as much as practical.

[33] Depending on the delivery location, the UA will descend between 80-120 feet.

[34] The delivery winch is capable of delivering up to a 10lb package from 125 ft in the air with the press of a button. This allows the drone to remain in a hover at a safe altitude while staying away from potential hazards closer to the ground. The logic inside the winch executes a delivery completely autonomously and returns the delivery hook in under one minute.

Landing

Upon reaching the Hub, the UA slowly descends over its assigned landing area, and lands on the ArUco
Tag (**Figure 4** and **Figure 5**). The aircraft will land with the Realsense camera centered over the tag itself,

therefore the 4 ft "downwards" from the tag must be clear for the main body of the aircraft. The UAS is programmed to search for, and land on, one specific tag pattern, ensuring the aircraft always finds its own safe landing area. The ArUco tag for that aircraft is placed in the takeoff/landing area during preflight and remains present until the end of operations.

The PRISM V2 series utilizes an Intel Realsense Depth Camera D455 to locate the ArUco tag and help position the aircraft above it for precision landing. When precision land mode is engaged, either automatically during an automated flight, or manually by an RPIC or operator, the Realsense camera will search for the tag, lock the location, and the PX4 autopilot will use this visual information to automatically maneuver the aircraft over the ArUco tag, both in orientation and position. The aircraft will then descend, using the Realsense camera to keep centered on the ArUco tag, engaging land mode once within inches of the ground.

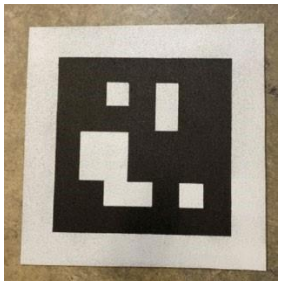

Figure 4. Takeoff and Landing area ArUco Tag

Figure 5. PRISM V2 Series UA Landing

Table 1 provides a summary of the prior subsections and includes the assumptions regarding altitude, ground speed, and durations.

Table 1. DroneUp PRISM V2 Typical Flight Profile

Source: DroneUp, December 2023

Flight Phase	Flight Phase Detail	Description	Altitude (ft AGL)	Ground Speed (kts)	Duration (sec)
Takeoff	Takeoff	Vertical launch from launch area on ground to en route altitude	Ascend from 0 to 230 - 250	0	11 - 23
En Route Outbound	Acceleration	Transition from zero speed above the nest at en route altitude to transit speed (27.4 kts)	230 - 250	0 - 27.4	6 - 10
	En Route	Flying at operational altitude and speed to delivery point	230 - 250	27.4	Variable
	Deceleration	Transition from transit speed at en route altitude to zero speed above delivery point at en route altitude	230 - 250	27.4 - 0	10 - 15
Delivery	Descent	Vertically descend from en route altitude to delivery altitude	230 - 250 to 80 - 120	0	10 - 29
	Delivery	UA in stationary hover while package is lowered to delivery location via winch line	80 - 120	0	45 - 90 (60 typical)
	Ascent	Vertically ascend to en route altitude from delivery altitude	Ascend from 80120 to 230 - 250	0	10 - 15
En Route Inbound	Acceleration	Accelerate to transit speed from zero speed above delivery point	230 - 250	0 - 27.4	6 - 10
	En Route	Flying at operational altitude and speed to landing point	230 - 250	27.4	Variable
	Deceleration	Transition from transit speed at en route altitude to zero speed above landing point at en route altitude	230 - 250	27.4 - 0	10 - 15
Landing	Descent	Descend from en route altitude to 75-24.6 ft AGL at 4.9 ft/s, pausing while Precision Landing is engaged.	Descent from 230 - 250 to 7524.6	0	11 - 46
	Precision Landing	Then descending at 1.0-4.3 ft/s to land and disarm.	75-24.6 to 0	0	20 - 25

Acoustical Data

Noise measurements of the DroneUp PRISM V2 were collected by HMMH on February 26 and 27, 2024 at the Flank Road RC Field approximately one mile north of DroneUp's Richard Bland College flight testing and training facility located in Petersburg, VA. Noise measurements were collected in accordance with the criteria defined in the FAA's draft UA package delivery noise measurement protocol document[35] and are documented in **Attachment A**[36] to this report. The protocol includes measurement of UA noise at multiple distance positions along axes under track, lateral to, and behind the point from which the UA takes off, lands, and delivers a payload. For en route flight, the protocol includes measurement at multiple distance positions beginning directly under track and extending laterally outward from flight path direction. **Figure 6** and **Figure 7** depict the general measurement setups for simulated hub activity, package deliveries, and en route over flights. For the DroneUp test setup, each measurement axis included six sound level meters positioned from 16 feet out to 800 feet (16 ft, 50 ft, 100 ft, 200 ft, 400 ft, 800 ft) from the hub and delivery points and from 0 feet out to 800 feet (0 ft, 50 ft, 100 ft, 200 ft, 400 ft, 800 ft) for en route overflights. A distance of 16 feet was used as the closest measurement distance for the hub and delivery points, as it corresponds to DroneUp's minimum allowable safety distance for participants to be from the UA while it is in operation.

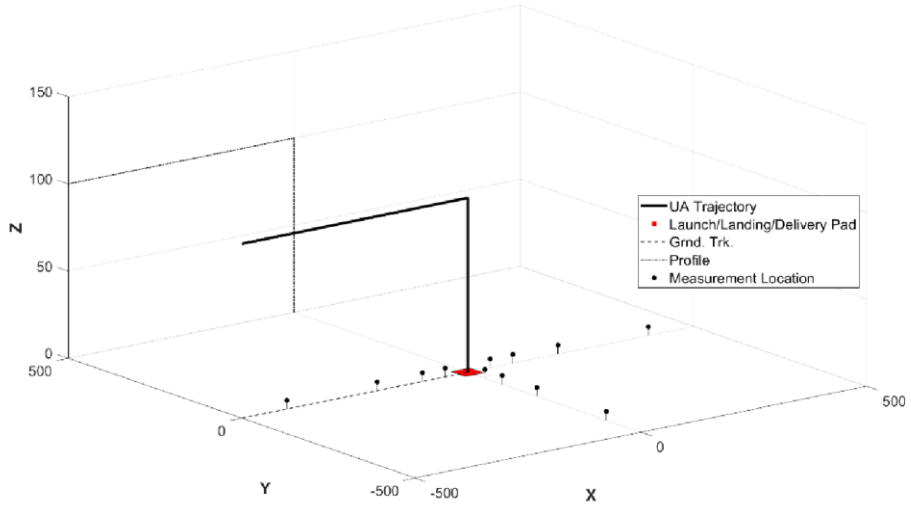

Figure 6. General Noise Measurement Setup for Takeoff, Landing, and Delivery
Source: FAA, October 2023

[35] Measuring Drone Noise for Environmental Review Process, FAA, October 2023
[36] Attachment A: DroneUp V2.1 Noise Measurement and Methodology Report, DroneUp, May 2024

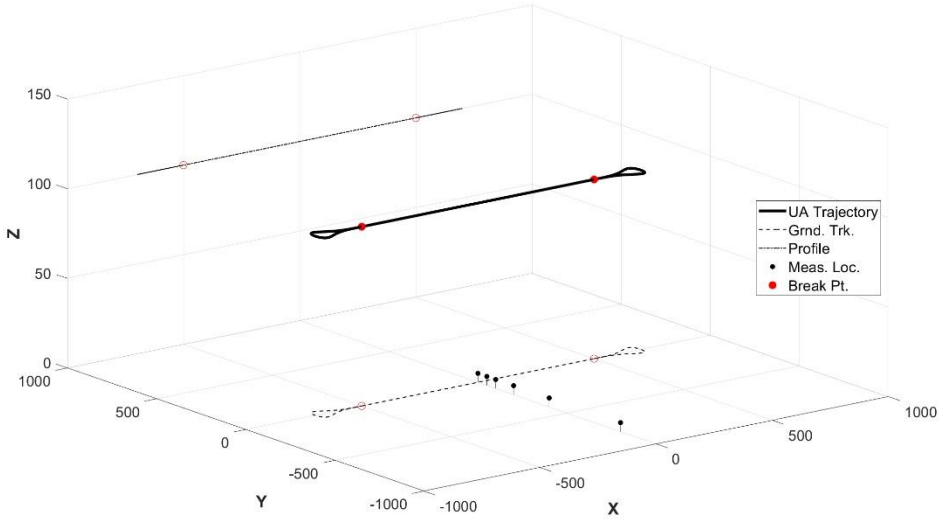

Figure 7. General Noise Measurement Setup En Route Overflight

Source: FAA, October 2023

HMMH processed and analyzed the measurement data to calculate estimated noise levels as a function of distance from hubs, delivery locations, and en route overflights. Each measurement includes the entire associated flight activity profile of the UA, including the noise from en route flight in both directions from a location, all vertical ascent/descent, and time hovering during package delivery. The average A-weighted Sound Exposure Level (SEL) measured at each distance is presented in **Figure 8**, **Figure 9**, and **Table 4**. The SEL data for the behind and lateral axes for both Hub and delivery extends only to the 200-foot position, as there was insufficient signal-to-noise ratio (SNR) at the 400-foot and 800-foot positions to reliably determine SEL. The SEL data for en route overflight extends only to the 100-foot position, also due to insufficient SNR at the further distance positions.

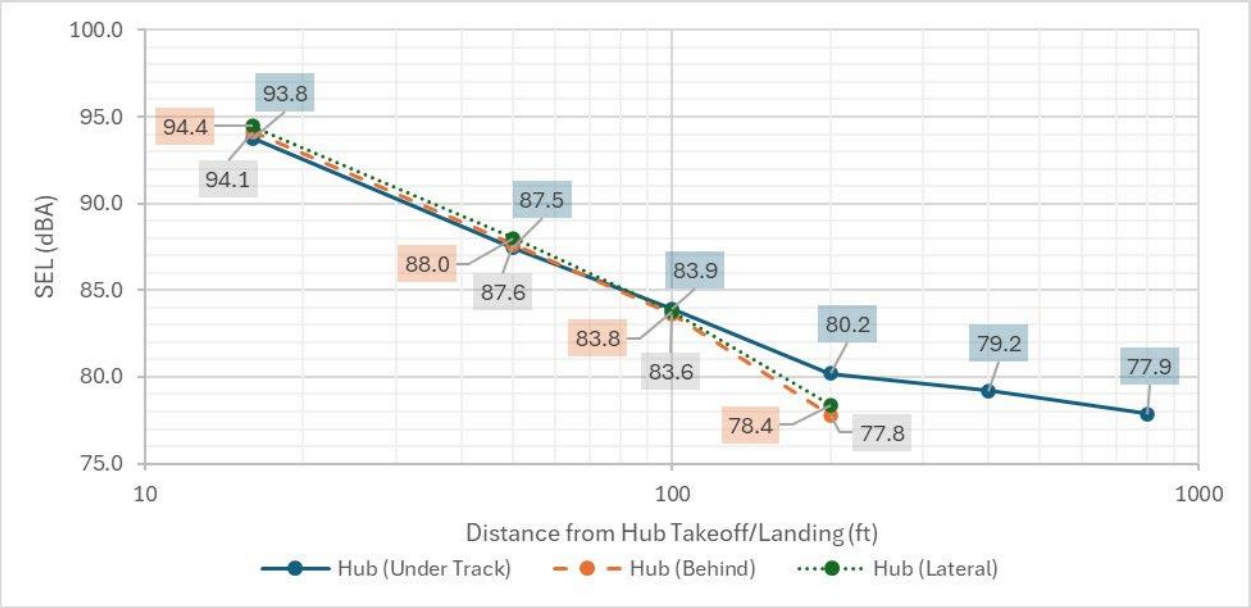

Figure 8. Average Measured A-Weighted SELs from Hub Takeoff and Landing

Figure 9. Average Measured A-Weighted SELs from Delivery Point

Due to weather condition constraints during the measurements, the number of flight passes for which valid data was collected varied for each of the axes for the Hub and delivery point. For the Hub the under track axis consists of 9 valid passes, the lateral axis consists of 3 valid passes, and the behind axis consists of 1 valid pass. For the delivery point the under track axis consists of 10 valid passes, the behind axis consists of 3 valid passes, and the lateral axis consists of 1 valid pass. Because the average measured SELs were generally consistent for all three axes

from 16 feet to 100 feet and for the lateral and behind axes at 200 feet, the individual valid SEL measurements at those distance positions on each axis were averaged together to develop the relationship of SEL to distance used in this analysis for the calculation of DNL. **Figure 10** and **Figure 11** present the final consolidated axes SEL averages.

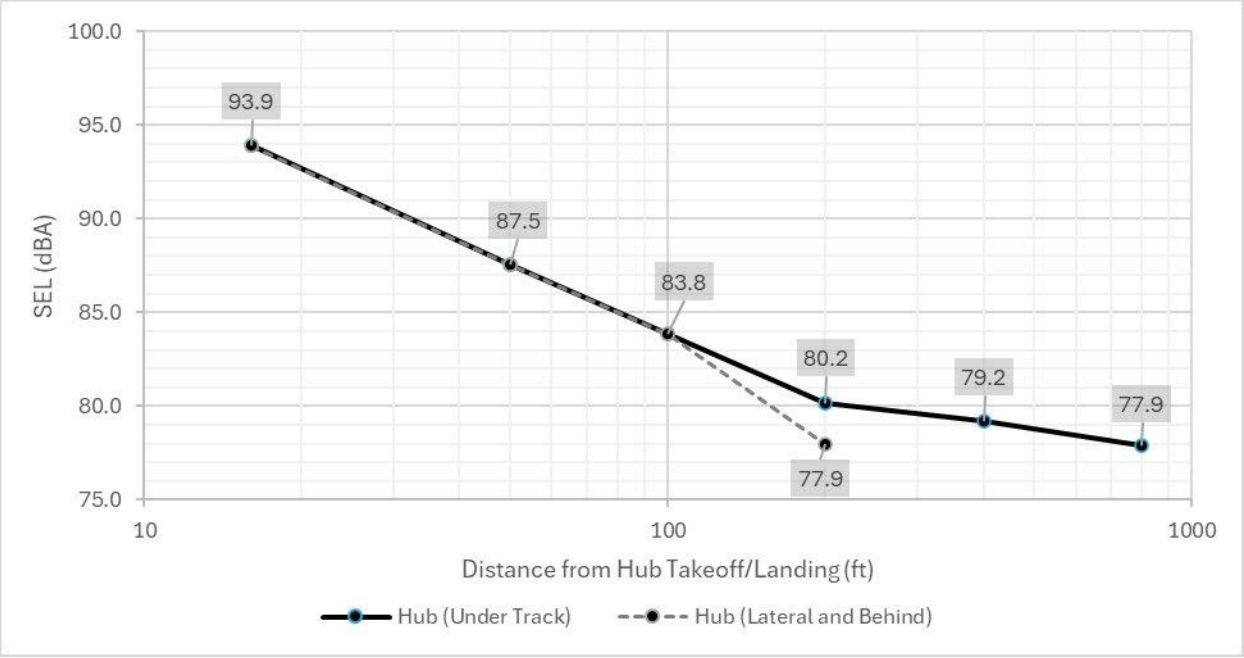

Figure 10. Consolidated Average Measured A-Weighted SELs from Hub Takeoff and Landing

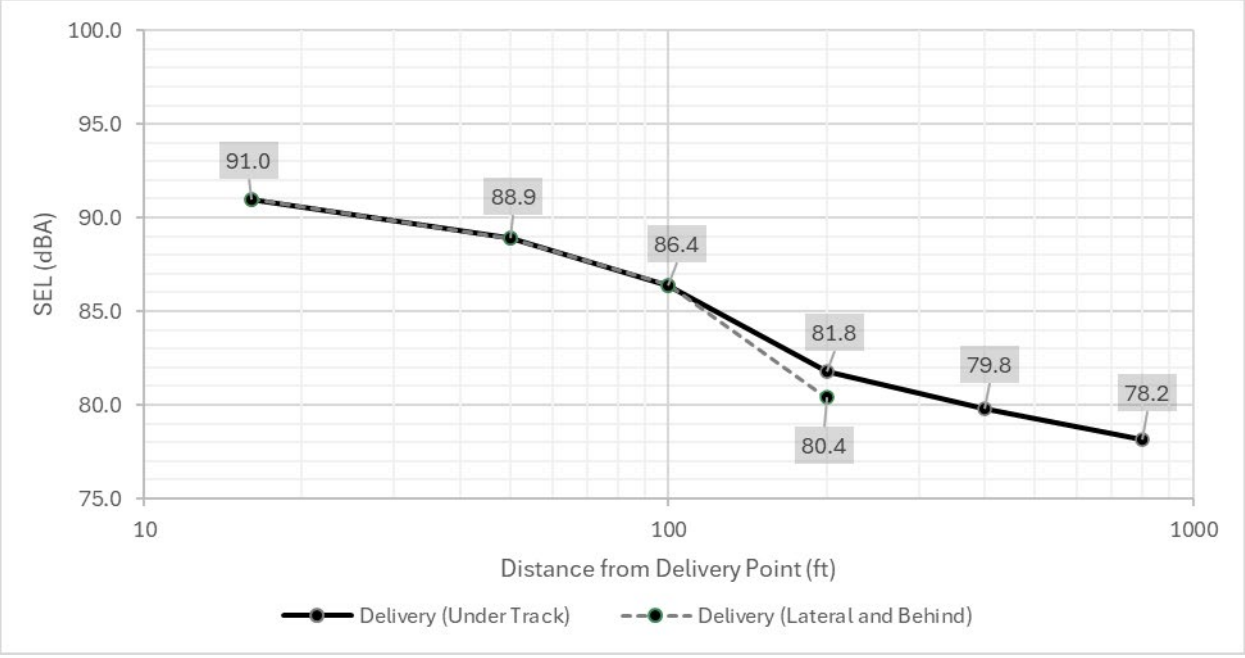

Figure 11. Consolidated Average Measured A-Weighted SELs from Delivery Point

The formula for interpolating SEL values at distances between those which were directly measured is based on **Equation (1)** presented below.

$$SEL = m \times \log_{10}(d) + b, dB \quad (1)$$

Where:

- *d is the distance along the ground in feet between the UA takeoff/landing or delivery location and the receiver*
- *m and b are the parameters provided in the tables below*

Table 2 presents the parameters to use within **Equation (1)** to estimate the SEL associated with Hubs as a function of distance from the takeoff and landing position, located within the Hub boundary, to the receiver.

Table 2. Parameters for Estimating Sound Exposure Levels at Distances from Hubs

Range for d (ft from launch pad)	m (Under Track)	b (Under Track)	m (Lateral)	b (Lateral)
16 – 50	-12.867	109.4	-12.867	109.4
50 – 100	-12.264	108.38	-12.264	108.38
100 – 200	-12.171	108.19	-19.590	123.03
200 – 400	-3.219	87.592		
400 – 800	-4.416	90.703		

Notes:
a) Distance is along ground from hub takeoff and landing position to receiv ɛr.
b) Based on the SEL and distance values from Figure 10

Table 3 presents the parameters to use within **Equation (1)** to estimate SEL areas associated with delivery, as described in Section 2.1.2.5, as a function of distance from the delivery point to the receiver.

Table 3. Parameters for Estimating Sound Exposure Levels at Distances from Deliveries

Range for d (ft from delivery point)	m (Under Track)	b (Under Track)	m (Lateral)	b (Lateral)
16 – 50	-4.232	96.08	-4.232	96.08
50 – 100	-8.305	103	-8.305	103
100 – 200	-15.347	117.08	-19.963	126.32
200 – 400	-6.565	96.877		
400 – 800	-5.443	93.957		

Notes:
a) Distance is along ground from delivery point to receiver.
b) Based on the SEL and distance values from Figure 11

Table 4 presents the en route SELs for max takeoff weight, empty weight, and the two combined. The combined max and empty weight SEL is representative of the total noise exposure for receiver overflown by both the en route outbound and en route inbound portions of a delivery. This analysis conservatively assumes that both en route legs of a delivery overfly the same locations and uses the highest combined measured SEL of 78.4 dB at 50 feet as the level for calculating the associated DNL.

Table 4. Average Measured A-Weighted SEL for En Route Overflight

Aircraft Config	Measured air speed (Knots)	Measured Altitude (ft AGL)	0 Feet SEL (dB)	50 Feet SEL (dB)	100 Feet SEL (dB)
Max Weight	23.3	200	76.1	76.0	75.1
Empty Weight	23.3	200	74.3	74.8	74.1
Combined	23.3	200	78.3	78.4	77.6

Methodology for Data Analysis

The previously described data sets were used to develop a method to estimate community noise exposure that could result from DroneUp delivery operations. These would be operations originating from a single Hub within each proposed area of operations and occurring daily between the hours of 7:00 AM and 10:00 PM. Numbers of daily and equivalent annual delivery operations would vary for different operating areas. There are currently no standardized tools or processes in place to conduct a noise assessment for the proposed operational scenario and UA. Therefore, HMMH, with detailed technical guidance from the FAA Office of Environment and Energy, developed a customized noise exposure prediction process based on the available data to conduct this analysis. The process was developed around FAA's understanding of typical use of the UA by DroneUp. The following subsections describe the noise analysis methodology.

Application of Operations

The DNL metric applies a 10 dB weighting for operations between 10 PM and 7 AM. The 10 dB weighing is mathematically equivalent to 10 times the number of operations. Therefore, the operations near point *i* can be weighted to develop a daytime equivalent number of operations ($N_{equiv,i}$). The generalized form is expressed in **Equation (2)**.[37]

$$N_{Equiv,i} = W_{Day} \times N_{Day,i} + W_{Eve} \times N_{Eve,i} + W_{Night} \times N_{Night,i} \quad (2)$$

Where:

- $N_{Day,i}$ is the number of user-specified operations between 7 AM and 7 PM local time
- $N_{Eve,i}$ is the number of user-specified operations between 7 PM and 10 PM local time
- $N_{Night,i}$ is the number of user-specified operations between 10 PM and 7 AM local time
- W_{Day} is the day-time weighting factor, which is 1 operation for DNL (and CNEL)
- W_{Eve} is the evening weighting factor, which is 1 operation for DNL (or 3 operations for CNEL)
- W_{Night} is the night-time weighting factor, which is 10 operations for DNL (and CNEL)

For the DNL metric, the number of DNL daytime equivalent operations, $N_{DNL,i}$ simplifies to

$$N_{DNL,i} = N_{Day,i} + N_{Eve,i} + 10 \times N_{Night,i} \quad (3)$$

In practice, **Equation (2)** can be further simplified by defining the user-defined operations between 7 AM and 10 PM as a single value, rather than tracking $N_{Day,i}$ and $N_{Eve,i}$ separately.

[37] Equation (2) includes the three time periods of day, evening, night for consistency with other FAA documents that discuss the development of time averaging metrics such as DNL from individual SELs. Presentation of Equation (2) also allows the practitioner to modify this process for the CNEL metric for use in California.

For the CNEL metric, which may be used in California, the number of CNEL daytime equivalent operations, $N_{CNEL,i}$ simplifies to:

$$N_{CNEL,i} = N_{Day,i} + 3 \times N_{Eve,i} + 10 \times N_{Night,i} \quad (4)$$

Application of Acoustical Data

The DNLs can be estimated with a summation of the SELs associated with each delivery that would be conducted. SEL values for the DroneUp UA operations covered in this report are detailed in Section 2.2.

The SEL for three specific activities are considered:

- Hub – including takeoff, en route outbound (at max weight), en route inbound (at empty weight), and landing
- Delivery – including en route inbound (at max weight), package delivery, and en route outbound (at empty weight)
- En route – including travel of the UA in horizontal flight out and back between the hub and the delivery point at max and empty weight

General Assumptions

This analysis is based on the tables presented in Section 2.2. For Hub and delivery, the SEL values for distances intermediate to those directly measured are determined from **Equation (1)** and the associated distance interval values presented in **Table 2** and **Table 3.** The SEL for en route only noise utilizes the 200-foot AGL value of 78.4 dBA measured at 50-foot from under track, as presented in **Table 4**.

The analysis for all three activities conservatively assumes that the UA traverses the same en route flight path outbound from the hub to the delivery location and inbound back from the delivery location to the Hub. SEL values at distances less than 16 feet for takeoff, landing, or delivery should not be extrapolated to lesser distances because the deviation of the method of estimation value increases closer to the source. SEL values for Hub and delivery under track distances greater than 800 feet should be determined based on the en route only noise levels.

Hub Takeoff and Landing

The process for calculating SELs for flight activity near a Hub is described in Section 2.1.2 are presented in Section 2.2, specifically **Equation (1)** combined with the parameters presented **Table 2**.

Application of the SEL should be based on the takeoff and landing position at a Hub. If the exact position of takeoff and landing is not known or would vary, then using an outer boundary of the hub, at a point closest to the receiver, would be slightly conservative. En route noise associated with Hubs is for the UA in level flight at 200 feet AGL, consistent with the altitude flown during noise measurements.

En Route

Typical flight speed of the UA in still air is anticipated to be 27.4 knots, with a typical cruise altitude of 230 - 250 feet AGL. Noise measurements of the UA were captured with the UA flying at the lowest operating en route altitude of 200 feet AGL and at a speed of 23.3 knots. As such, flight altitudes and speeds represented in the available measurement data differ somewhat from the expected typical en route conditions. As such, adjustments were made to the measured data to estimate the SEL for UA operation at the planned typical operating conditions. This section describes the process used to make those adjustments.

Sound exposure level for a given point i (SEL_i) with the aircraft flying directly overhead at altitude (Alt_i) in feet and a ground speed (V_i) in knots, was calculated based on the guidance in *14 CFR Part 36 Appendix J, Section J36.205 Detailed Data Correction Procedures*.[38] It should be noted that the equations presented in this Section are only applicable for an aircraft that is moving relative to a stationary receptor.

In particular, the sound exposure level adjustment for the altitude of a moving UA, is presented here as **Equation (5)**.

$$\Delta J_1 = 12.5 \times \log_{10}\left(\frac{H_A}{H_T}\right), \; dB \tag{5}$$

Where ΔJJ_1 is the quantity in decibels that must be algebraically added to the measured SEL in order to estimate the SEL for a level flight path at an altitude differing from the altitude corresponding to the measured SEL; H_A is the reference height, in feet, corresponding to the measured SEL; H_T is the altitude at which an estimate of the SEL is being made; and the constant (12.5) accounts for the effects on spherical spreading and duration from the off-reference altitude. The value of ΔJJ_1 is 0 if H_T is equal to H_A and can be negative if H_T is greater than (higher altitude) than H_A.

The sound exposure level adjustment for speed is presented here as **Equation (6)**.

$$\Delta J_3 = 10 \times \log_{10}\left(\frac{V_R}{V_{RA}}\right), \; dB \tag{6}$$

Where ΔJJ_3 is the quantity in decibels that must be algebraically added to the measured SEL noise level to estimate the SEL of the UA at speed V_{RA} when the measured SEL corresponds to the UA traveling at a reference speed V_R. This adjustment represents the influence of the different speed on the duration of the overflight at the stationary receptor. If the UA is to be estimated at a speed V_{RA} that is greater than the reference speed V_R of the measured SEL, then the correction ΔJJ_3 will be negative. The value of ΔJJ_3 is 0 if V_R is equal to V_{RA}. Conversely, if the estimated speed is less than the reference speed, the estimated SEL will be greater than the measured SEL. This stands to reason because a slower moving UA will result in a greater time exposure of its emitted noise at a stationary receptor on the ground.

[38] 14 CFR Part 36 Noise Standards: Aircraft Type and Airworthiness Certification available at https://www.ecfr.gov/current/title-14/chapter-I/subchapter-C/part-36

To estimate the SEL of the UA flying en route at typical speed and altitude, the measured SEL made during overflight (SEL_M) was adjusted by combined application of **Equation (5)** and **Equation (6)**. When the UA is flying at an altitude of Alt_i feet AGL and ground speed of V_i knots, **Equation (7)** was used to arrive at an $SEL_{adjusted}$ dB estimate for the respective phase of en route flight.

$$SEL_{adjusted} = SEL_M + 12.5 \times \log_{10}\left(\frac{Alt_A}{Alt_i}\right) + 10 \times \log_{10}\left(\frac{V_{RA}}{V_i}\right), dB \quad (7)$$

For the purpose of this noise analysis, it should be assumed that **Equation (7)** is applicable for all en route activities. This will be a conservative assumption since it is based on the highest average level measured beneath the UA during level flyovers. Based on the measured en route SEL_M value of 78.4 dB as presented in Section 2.2 **Table 4** for the UA 200 feet AGL and 23.3 knots, the $SEL_{adjusted}$ for the UA at 230 feet AGL and 27.4 knots using **Equation (7)** is 76.9 dB.

Delivery

The available SELs for delivery are presented in Section 2.2, specifically in **Equation (1)**, with the appropriate parameters presented in **Table 3** for the delivery profile described in Section 2.1.2.3. Application of the SEL should be based on the distance of the receiver relative to the position of the delivery point. The minimum distance that should be used for calculation between the delivery point and a person is 16 feet. En route noise associated with delivery locations is for the UA in level flight at 200 feet AGL, consistent with the altitude flown during noise measurements.

Proposed DNL/CNEL Estimation Methodology

The number of operations overflying a particular receiver's location on the ground will vary based on the proposed operating area and demand. For a given receiver location *i*, and a single instance of sound source *A*, the SEL for that sound source SEL_{iA} is (energy) summed for the average annual daily number of DNL daytime equivalent operations ($N_{DNL,iA}$) to compute the DNL, or equivalently, by **Equation (8)**.

$$DNL_{iA} = SEL_{iA} + 10 \times \log_{10}\left(N_{DNL,\,iA}\right) - 49.4, \ (dB) \quad (8)$$

The above equation applies to an SEL value representing noise from a single activity as defined in Section 3.2. For cases where a particular receiver would be exposed to multiple activity noise sources (A through Z), the complete DNL at that point would be calculated with **Equation (9)**.

$$DNL_i = 10 \times \log_{10}\left(10^{\left(\frac{DNL_{iA}}{10}\right)} + 10^{\left(\frac{DNL_{iB}}{10}\right)} + \cdots + 10^{\left(\frac{DNL_{iZ}}{10}\right)}\right), \ (dB) \quad (9)$$

The calculation for the CNEL metric is nearly identical to **Equations (8) and (9)**, with the exception that the DNL daytime equivalent operations ($N_{DNL,iA}$) used to compute DNL is replaced

with the CNEL daytime equivalent operations ($N_{CNEL,iA}$). The equations for CNEL are presented below as **Equations (10) and (11)**.

$$CNEL_{iA} = SEL_{iA} + 10 \times \log_{10}\left(N_{CNEL,\,iA}\right) - 49.4,\ (dB) \quad (10)$$

The above equation applies to an SEL value representing noise from a single activity as defined in Section 3.2. For cases where a particular receiver would be exposed to multiple noise sources (A through Z), the complete DNL at that point would be calculated with **Equation (10)**.

$$CNEL_i = 10 \times \log_{10}\left(10^{\left(\frac{CNEL_{iA}}{10}\right)} + 10^{\left(\frac{CNEL_{iB}}{10}\right)} + \cdots + 10^{\left(\frac{CNEL_{iZ}}{10}\right)}\right),\ (dB) \quad (11)$$

For each of the conditions presented below, results will be presented in tabular format based on the equivalent daytime operations, either DNL daytime equivalent or CNEL daytime equivalent, for the estimated DNL or CNEL. The proper output of either DNL or CNEL is dependent on the calculation of respective daytime equivalent operations.

DNL/CNEL for Hubs

SEL data for Hubs includes the entire associated flight activity profile of the UA, including the noise from en route flight in both directions from a location and all vertical ascent/descent. SEL is calculated at 1foot distance intervals from 16 to 800 feet by the method described in Sections 2.2 and 3.2.2, and the resulting DNL/CNEL at each distance interval is calculated by use of **Equation (8)** or **Equation (10).** The distances of DNL 45, 50, 55, 60, 65, 70, and 75 dB are associated to the nearest calculated 1-foot value.

DNL/CNEL for En Route

En route includes the UA flying both directions between the hub and delivery destinations as discussed in Sections 2.2 and 3.2.1. The receiver is considered to be directly under the flight path, and the DNL/CNEL is calculated by **Equation (8) or (10)**, based on the altitude and speed adjusted SEL calculated with **Equation (7)**.

DNL/CNEL for Delivery

SEL data for deliveries includes the entire associated flight activity profile of the UA, including the noise from en route flight in both directions from a location, all vertical ascent/descent, and time hovering during package delivery. SEL is calculated at the distance intervals of 16, 25, 50, 75, 100, and 125 feet from the package drop location by the method described in Sections 2.2 and 3.2.4, and the resulting DNL at each distance interval is calculated by use of **Equation (8)** or **Equation (10).** The distance range of 16 to 125 feet is representative of the closest a participant may be during a delivery out to the distances from which nearby properties may experience noise from a delivery.

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Noise Exposure Estimate Results

This section presents the estimated noise exposure for DroneUp's proposed operations for a given set of average annual day (AAD) deliveries. The values presented are in tabular format and use of the table requires estimating the number of DNL Equivalent deliveries associated with the hub.

The DNL Equivalent deliveries, $N_{DNL,i}$ as described in Section 3.1, is presented below as **Equation (12)**.

$$Deliveries_{DNL,\,i} = Deliveries_{Day} + 10 \times Deliveries_{Night} \quad (12)$$

$Deliveries_{Day}$ are between 7 AM and 10 PM and $Deliveries_{Night}$ are between 10 PM and 7 AM. If a portion of a delivery (either takeoff or landing) occurs in the nighttime hours, then it should be counted within $Deliveries_{Night}$.

The CNEL Equivalent deliveries, $N_{CNEL,i}$ as described in 3.1, is presented below as **Equation (13)**.

$$Deliveries_{CNEL,i} = Deliveries_{Day} + 3 \times Deliveries_{Eve} + 10 \times Deliveries_{Night} \quad (13)$$

$Deliveries_{Day}$ are between 7 AM and 7 PM, $Deliveries_{Eve}$ are between 7 PM and 10 PM, and $Deliveries_{Night}$ are between 10 PM and 7 AM.[39] If a portion of a delivery (either takeoff or landing) occurs in two time periods, then it should be counted within with the time night or evening, rather than the time evening or day, respectively.

Noise Exposure for Operations at a Hub

For operations at a Hub, the UA-related noises include the entire associated flight activity profile of the UA, including the noise from en route flight in both directions from a location and all vertical ascent/descent. All operations are assumed to be on the same en route flight path with inbound and outbound flights traversing it in opposite directions. Table 5 and Table 6 present data for a given number of daily average DNL or CNEL Equivalent deliveries and the associated estimated extents of DNL/CNEL 45 dB through 75 dB contours along axes under track, behind, and lateral to a Hub takeoff and landing position.

[39] Discussion of modification of this process for use in California with the CNEL metric is discussed in Section 3.1.

Table 5. Estimated Extent of Noise Exposure Under Track from Hub per Number of Deliveries

Number of DNL/CNEL Equivalent Daytime Deliveries Served by hub		Estimated Extents, feet, for						
Average Daily	Annual	DNL/CNEL 45 dB	DNL/CNEL 50 dB	DNL /CNEL 55 dB	DNL/CNEL 60 dB	DNL/CNEL 65 dB	DNL/CNEL 70 dB	DNL/CNEL 75 dB
<= 1	<= 365	<16	<16	<16	<16	<16	<16	<16
<= 5	<= 1,825	52	22	<16	<16	<16	<16	<16
<= 10	<= 3,650	91	37	<16	<16	<16	<16	<16
<= 15	<= 5,475	127	50	21	<16	<16	<16	<16
<= 20	<= 7,300	161	63	26	<16	<16	<16	<16
<= 40	<= 14,600	629	110	44	18	<16	<16	<16
<= 60	<= 21,900	>800	154	60	25	<16	<16	<16
<= 80	<= 29,200	>800	195	76	31	<16	<16	<16
<= 100	<= 36,500	>800	360	91	37	<16	<16	<16
<= 120	<= 43,800	>800	558	106	42	17	<16	<16
<= 140	<= 51,100	>800	791	120	47	20	<16	<16
<= 160	<= 58,400	>800	>800	134	53	22	<16	<16
<= 180	<= 65,700	>800	>800	147	58	24	<16	<16
<= 200	<= 73,000	>800	>800	161	63	26	<16	<16
<= 220	<= 80,300	>800	>800	174	68	28	<16	<16
<= 240	<= 87,600	>800	>800	187	73	30	<16	<16
<= 260	<= 94,900	>800	>800	199	78	31	<16	<16
<= 280	<= 102,200	>800	>800	247	83	33	<16	<16
<= 300	<= 109,500	>800	>800	306	88	35	<16	<16
<= 320	<= 116,800	>800	>800	373	92	37	<16	<16
<= 340	<= 124,100	>800	>800	436	97	39	<16	<16
<= 360	<= 131,400	>800	>800	496	101	40	17	<16
<= 380	<= 138,700	>800	>800	560	106	42	18	<16
<= 400	<= 146,000	>800	>800	629	110	44	18	<16
<= 420	<= 153,300	>800	>800	702	115	45	19	<16
<= 440	<= 160,600	>800	>800	780	119	47	20	<16
<= 460	<= 167,900	>800	>800	>800	124	49	20	<16
<= 480	<= 175,200	>800	>800	>800	128	50	21	<16
<= 500	<= 182,500	>800	>800	>800	133	52	22	<16

Notes:
a) One delivery includes the outbound takeoff and inbound landing and is representative of two operations.
b) If a value for deliveries is not specifically defined in this table, use the next highest value. For example, if there are 50 average daily DNL Equivalent deliveries, use the entry for 60 average daily DNL Equivalent deliveries.
c) If a DNL value at an estimated extent is not specifically defined in this table, use the next highest value. For example, to determine the DNL at a distance of 100 feet for 60 daily DNL Equivalent Deliveries, use the value at 60 feet corresponding to DNL 55 dB. d) "<16": Limit of available data; Level falls within 16' range or is not applicable.
e) ">800": En Route noise dominates beginning at approximately 800 ft and greater. Refer to en route noise DNL table.

Table 6. Estimated Extent of Noise Exposure Behind and Lateral from Hub per Number of Deliveries

Number of DNL/CNEL Equivalent Daytime Deliveries Served by hub		Estimated Extents, feet, for						
Average Daily	Annual	DNL/CNEL 45 dB	DNL/CNEL 50 dB	DNL /CNEL 55 dB	DNL/CNEL 60 dB	DNL/CNEL 65 dB	DNL/CNEL 70 dB	DNL/CNEL 75 dB
<= 1	<= 365	<16	<16	<16	<16	<16	<16	<16
<= 5	<= 1,825	52	22	<16	<16	<16	<16	<16
<= 10	<= 3,650	91	37	<16	<16	<16	<16	<16
<= 15	<= 5,475	116	50	21	<16	<16	<16	<16
<= 20	<= 7,300	135	63	26	<16	<16	<16	<16
<= 40	<= 14,600	191	107	44	18	<16	<16	<16
<= 60	<= 21,900	>200	131	60	25	<16	<16	<16
<= 80	<= 29,200	>200	152	76	31	<16	<16	<16
<= 100	<= 36,500	>200	170	91	37	<16	<16	<16
<= 120	<= 43,800	>200	186	104	42	17	<16	<16
<= 140	<= 51,100	>200	>200	112	47	20	<16	<16
<= 160	<= 58,400	>200	>200	120	53	22	<16	<16
<= 180	<= 65,700	>200	>200	128	58	24	<16	<16
<= 200	<= 73,000	>200	>200	135	63	26	<16	<16
<= 220	<= 80,300	>200	>200	141	68	28	<16	<16
<= 240	<= 87,600	>200	>200	148	73	30	<16	<16
<= 260	<= 94,900	>200	>200	154	78	31	<16	<16
<= 280	<= 102,200	>200	>200	160	83	33	<16	<16
<= 300	<= 109,500	>200	>200	165	88	35	<16	<16
<= 320	<= 116,800	>200	>200	171	92	37	<16	<16
<= 340	<= 124,100	>200	>200	176	97	39	<16	<16
<= 360	<= 131,400	>200	>200	181	101	40	17	<16
<= 380	<= 138,700	>200	>200	187	104	42	18	<16
<= 400	<= 146,000	>200	>200	191	107	44	18	<16
<= 420	<= 153,300	>200	>200	196	109	45	19	<16
<= 440	<= 160,600	>200	>200	>200	112	47	20	<16
<= 460	<= 167,900	>200	>200	>200	114	49	20	<16
<= 480	<= 175,200	>200	>200	>200	117	50	21	<16
<= 500	<= 182,500	>200	>200	>200	119	52	22	<16

Notes:
a) One delivery includes the outbound takeoff and inbound landing and is representative of two operations.
b) If a value for deliveries is not specifically defined in this table, use the next highest value. For example, if there are 50 average daily DNL Equivalent deliveries, use the entry for 60 average daily DNL Equivalent deliveries.
c) If a DNL value at an estimated extent is not specifically defined in this table, use the next highest value. For example, to determine the DNL at a distance of 100 feet for 60 daily DNL Equivalent Deliveries, use the value at 60 feet corresponding to DNL 55 dB. d) "<16": Limit of available data; Level falls within the 16' range or is not applicable.
e) ">200": Limit of available data; Level falls beyond the 200' range.

Noise Exposure under En Route Paths

For en route conditions, the UA is expected to fly the same outbound flight path between the hub and the delivery point and inbound flight path back to the hub (Section 3.3.2). Therefore, each location under the en route path would be overflown twice for each delivery served by the respective overhead en route path.

Table 7 provides the estimated DNL or CNEL for a location on the ground directly under an en route path for various counts of daily average DNL or CNEL Equivalent deliveries. The en route noise calculated for each delivery includes both the inbound and outbound traversal of the en route path at 230 feet AGL and a ground speed of 27.4 knots.

Table 7. Estimated Noise Exposure Directly Under En Route Flight Paths

Number of DNL/CNEL Equivalent Deliveries Served by Route		DNL/CNEL 230 ft AGL
Average Daily	Annual	
<= 1	<= 365	27.6
<= 5	<= 1,825	34.6
<= 10	<= 3,650	37.6
<= 15	<= 5,475	39.3
<= 20	<= 7,300	40.6
<= 40	<= 14,600	43.6
<= 60	<= 21,900	45.4
<= 80	<= 29,200	46.6
<= 100	<= 36,500	47.6
<= 120	<= 43,800	48.4
<= 140	<= 51,100	49.0
<= 160	<= 58,400	49.6
<= 180	<= 65,700	50.1
<= 200	<= 73,000	50.6
<= 220	<= 80,300	51.0
<= 240	<= 87,600	51.4
<= 260	<= 94,900	51.7
<= 280	<= 102,200	52.0
<= 300	<= 109,500	52.3
<= 320	<= 116,800	52.6
<= 340	<= 124,100	52.9
<= 360	<= 131,400	53.1
<= 380	<= 138,700	53.4
<= 400	<= 146,000	53.6
<= 420	<= 153,300	53.8
<= 440	<= 160,600	54.0
<= 460	<= 167,900	54.2
<= 480	<= 175,200	54.4
<= 500	<= 182,500	54.6

Noise Exposure for Operations at Delivery Locations

For delivery locations, the UA-related noises include the entire associated flight activity profile of the UA, including the noise from en route flight in both directions from a location and all vertical ascent/descent. All operations are assumed to be on the same en route flight path with outbound and inbound flights traversing it in opposite directions.

Table 8 presents data for a given number of daily average DNL or CNEL Equivalent deliveries and the associated estimated DNL/CNEL along the axis under track axis from a package delivery position at distances of 16 feet, 25 feet, 50 feet, 75 feet, 100 feet, and 125 feet. The distance range of 16 to 125 feet, calculated for deliveries, is representative of the closest a participant may be during a delivery out to the distances from which nearby properties may experience noise from a delivery.[40] For deliveries, the DNL/CNEL for the behind and lateral axes would have approximately equivalent values to the under track axis over the range of 16 to 125 feet. As such, only the values for the under track axis are presented in this section.

Delivery locations may also receive noise from UA flying en route to other delivery locations. In such cases, total noise exposure at a delivery location can be determined with the addition of DNL or CNEL
values from **Table 8** with en route levels presented in **Table 7** by application of **Equation (9)** or **Equation (10)** to add the associated levels of each.

[40] The 2022 US Census national average lot size for single-family sold homes was 15,265 square feet. This is representative of a property with dimensions of a 123.55-by-123.55-foot square. The 125 feet represents a 125-foot lateral width of the parcel rounded up to the nearest 25 feet. https://www.census.gov/construction/chars/ See file "Soldlotsize_cust.xls" sheet MALotSizeSold. Accessed December 6, 2023.

Table 8. Estimated Noise Exposure Under Track from a Delivery Point per Number of Deliveries

Average Daily DNL/CNEL Equivalent Deliveries	Annual DNL/CNEL Equivalent Deliveries	Estimated Delivery DNL/CNEL at 16 feet (Minimum Possible Listener Distance)	Estimated Delivery DNL/CNEL at 25 feet	Estimated Delivery DNL/CNEL at 50 feet	Estimated Delivery DNL/CNEL at 75 feet	Estimated Delivery DNL/CNEL at 100 feet	Estimated Delivery DNL/CNEL at 125 feet
<= 1	<= 365	41.6	40.8	39.5	38.1	37.0	35.5
<= 5	<= 1,825	48.6	47.8	46.5	45.1	44.0	42.5
<= 10	<= 3,650	51.6	50.8	49.5	48.1	47.0	45.5
<= 15	<= 5,475	53.4	52.6	51.3	49.8	48.8	47.3
<= 20	<= 7,300	54.6	53.8	52.5	51.1	50.0	48.5
<= 40	<= 14,600	57.6	56.8	55.5	54.1	53.0	51.6
<= 60	<= 21,900	59.4	58.6	57.3	55.8	54.8	53.3
<= 80	<= 29,200	60.6	59.8	58.6	57.1	56.1	54.6
<= 100	<= 36,500	61.6	60.8	59.5	58.1	57.0	55.5
<= 120	<= 43,800	62.4	61.6	60.3	58.9	57.8	56.3
<= 140	<= 51,100	63.1	62.3	61.0	59.5	58.5	57.0
<= 160	<= 58,400	63.7	62.8	61.6	60.1	59.1	57.6
<= 180	<= 65,700	64.2	63.4	62.1	60.6	59.6	58.1
<= 200	<= 73,000	64.6	63.8	62.5	61.1	60.0	58.5
<= 220	<= 80,300	65.0	64.2	62.9	61.5	60.4	59.0
<= 240	<= 87,600	65.4	64.6	63.3	61.9	60.8	59.3
<= 260	<= 94,900	65.8	64.9	63.7	62.2	61.2	59.7
<= 280	<= 102,200	66.1	65.3	64.0	62.5	61.5	60.0
<= 300	<= 109,500	66.4	65.6	64.3	62.8	61.8	60.3
<= 320	<= 116,800	66.7	65.9	64.6	63.1	62.1	60.6
<= 340	<= 124,100	66.9	66.1	64.8	63.4	62.3	60.8
<= 360	<= 131,400	67.2	66.4	65.1	63.6	62.6	61.1
<= 380	<= 138,700	67.4	66.6	65.3	63.9	62.8	61.3
<= 400	<= 146,000	67.6	66.8	65.5	64.1	63.0	61.6
<= 420	<= 153,300	67.9	67.0	65.8	64.3	63.3	61.8
<= 440	<= 160,600	68.1	67.2	66.0	64.5	63.5	62.0
<= 460	<= 167,900	68.2	67.4	66.2	64.7	63.7	62.2
<= 480	<= 175,200	68.4	67.6	66.3	64.9	63.8	62.3
<= 500	<= 182,500	68.6	67.8	66.5	65.1	64.0	62.5

Notes:
a) If a value for deliveries is not specifically defined in this table, use the next highest value. For example, if there are 50 average daily DNL Equivalent deliveries, use the entry for 60 average daily DNL Equivalent deliveries.

Cumulative Noise Exposure

For instances where the proposed DroneUp PRISM V2 operations would occur in areas subject to other aviation noise sources, it is necessary to evaluate the cumulative noise exposure that would result from the other aviation noise sources present. Examples of such scenarios are DroneUP operations occurring in the vicinity of an airport and where DroneUP flight activity areas may overlap with those of other UA package delivery operators.

FAA *Order 1050.1F Environmental Impacts: Policies and Procedures* and the associated *1050.1F Desk Reference* defines the criteria for changes in noise exposure resulting from a proposed action and cumulative effects that are considered reportable and/or significant. *Order 1050.1F Section 4-3.3 Significance Thresholds* states the following pertaining to the environmental impact category of Noise and Noise Compatible Land Use.

> *The action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB.*

Additionally, *Order 1050.1F Appendix B Section B-1.4 Environmental Consequences* requires additional reporting for air traffic airspace and procedure actions where the study area is larger than the immediate vicinity of an airport. In such cases noise exposure assessments should identify where noise will change by the following specified amounts:

1. For DNL 65 dB and higher: +1.5 dB
2. For DNL 60 dB to <65 dB: +3 dB
3. For DNL 45 dB to <60 dB: +5 dB

The FAA refers to noise changes meeting criteria 1 as “significant” and those meeting criteria 2 and 3 as “reportable”. **Figure 12** presents the relationship between the dB difference in two noise sources and the increase resulting from the summation of those noise sources. The FAA’s change criteria of plus 1.5, 3, and 5 dB are also plotted on the curve for reference.

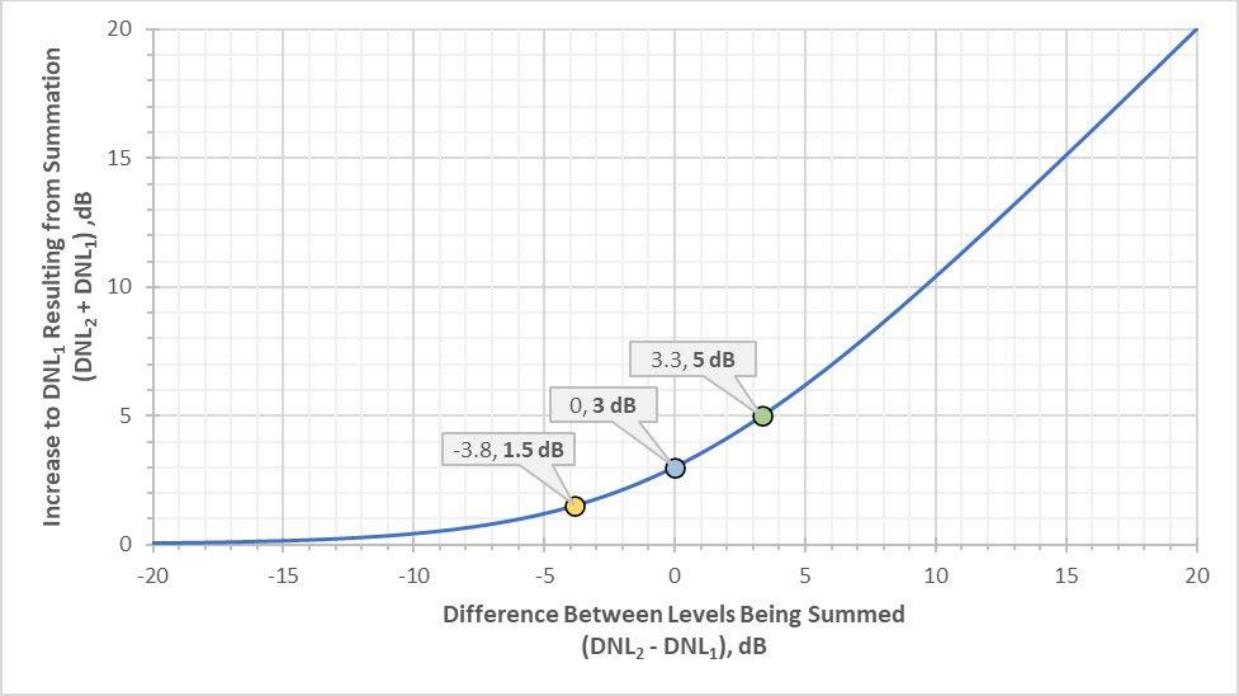

Figure 12. dB Increase Resulting from DNL Summation

Potential increases to DNL resulting from cumulative aviation noise effects can be evaluated with **Figure 12** by considering the proposed action noise exposure as DNL_2 and the sum of all other aviation noise sources at the same location as DNL_1. If the difference between DNL_2 and DNL_1 is:

- Less than -3.8 dB, the increase in DNL would be less than 1.5 dB
- From -3.8 dB up to but not including 0 dB, the increase in DNL would range from 1.5 dB up to but not including 3 dB
- From 0 dB up to but not including 3.3 dB, the increase in DNL would range from 3 dB up to but not including 5 dB
- 3.3 dB or greater, the increase in DNL would be 5 dB or greater

Beyond differences of +/- 15 dB the curve becomes asymptotic to a slope of 1 and 0, illustrating that the addition of noise levels with differences greater than that results in effectively no increase from the higher of the two noise source levels being summed.
For noise assessment used in official environmental review documentation, the exact resulting combined noise exposure levels and associated changes should be calculated by use of

Equation (9) presented earlier in Section 3.3**.** An example of applying **Equation (9)** to three aviation noise sources is presented in **Table 9**.

Table 9. Cumulative Noise Calculation Example

Noise Source	Noise Source Description	Single Source DNL (dB)	$10^{(DNL/10)}$	Combined Source DNL (dB) $10*Log_{10}(10^{(DNL/10)})$
1	Proposed Action (PA)	42	15848.9	-
2	Airport	55	316227.8	-
3	Other UAS	40	10000.0	-
2+3	Airport + Other UAS	-	326227.8	55.1
1+2+3	PA + Airport + Other UAS	-	342076.7	55.3
Delta	Change in Cumulative Noise	-	-	0.2

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Attachment A

Unmanned Aircraft

Attachment A

DroneUp PRISM V2.1 Noise Measurement Report

Revision 1.2

May 6, 2024

DroneUp
160 Newtown Rd Suite 500
Virginia Beach, VA 23462
USA

The information contained in this report is effective as of the cover revision date and is subject to change without notice.

DroneUp, LLC
160 Newtown Road, Suite 500
Virginia Beach
VA 23462

Record of Revisions

Rev #	Date	Pages	Initial
1.0	April 25, 2024	ALL	CTH
1.1	May 6, 2024	5,6,2-7 through 2-13, 2-17, 2-18	CTH
1.2	May 6, 2024	2-4, 2-5, 2-8 through 2-22	CTH

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Page # / Title	Change No.	Date
ALL	1.0	April 25, 2024
5,6, 2-7 through 2-13, 2-17, 2-18	1.1	May 6, 2024
2-4, 2-5, 2-8 through 2-22	1.2	May 6, 2024

1. Executive Summary

DroneUp, in consultation with HMMH, conducted flight testing to gather noise measurements to be used to create the Noise Assessment for DroneUp Proposed Package Delivery Operations with the PRISM V2.1 Unmanned Aircraft[1] in support of U.S. Code of Federal Regulations Title 14, Part 135. Testing was performed on February 26th and 27th in Petersburg Virginia. A total of 29 flights were conducted to gather 91 unique test data points in accordance with the Draft Measurement Protocol for Applications for EA Noise Analysis version 5[2]. The measurement protocol executed against was provided by the Federal Aviation Administration (FAA) AEE-100 department.

Of the 91 test data points, 20 were classified as invalid due to not meeting the necessary criteria as specified in the measurement protocol. The two contributing factors to invalid data being collected were weather (chiefly, wind) and ambient background noise events.

This report does not present the methodology for estimation of noise exposure related to proposed Unmanned Aircraft (UA) package delivery operations conducted by DroneUp LLC as a commercial operator under the provisions of Title 14 Code of Federal Regulation (CFR) Part 135. Please refer to the document “Noise Assessment for DroneUp Proposed Package Delivery Operations with the PRISM V2.1 Unmanned Aircraft” for such information.

This report instead presents the manner in which measurements were conducted to gather the information necessary to support the methodology report.

[1] Noise Assessment for DroneUp Proposed Package Delivery Operations with the PRISM V2 Unmanned Aircraft, April 2024

[2] Measuring Drone Noise for Environmental Review Process, October 2023

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2. Introduction

2.1 Background

DroneUp is a United States based technology company that combines airspace solutions, web-based applications, and analytics platforms, providing drone delivery services to help companies operate at scale in last mile delivery. Currently, DroneUp operates under 14 Code of Federal Regulations (CFR) Part 107. Operations are conducted beyond visual line-of-sight (BVLOS) utilizing strategically placed visual observers (VOs[1]) for airspace deconfliction within a predefined radius of the operating base for its commercial deliveries. DroneUp has made an application to the Federal Aviation Administration (FAA) for a standard air carrier certificate[2] under 14 CFR Part 135[3], which allows holders to conduct on-demand or scheduled (commuter) operations, and a 49 United States Code (U.S.C.) 44807 exemption[4] which allows DroneUp to operate for compensation or hire BVLOS using its PRISM V2 Unmanned Aircraft System (UAS). DroneUp is the manufacturer of the UAS being used in these package delivery operations, the operator, and the system integrator.

DroneUp's package delivery operations originate from a network of Hubs, where each Hub serves a specific area, thereby avoiding an over-concentration of flights surrounding any given Hub. The Prism V2 Series UA has a delivery range of approximately 5 miles round trip. DroneUp's Hubs would be located in established parking lots of commercial areas whose use is consistent with local zoning and land use requirements, such as shopping centers, large individual retailers, and shopping malls.

The specific aircraft for the application, DroneUp's PRISM V2.1 aircraft, features a multirotor design with eight (8) propellers. The UA weighs 55 pounds when combined with its maximum payload weight of 10 pounds. It has a wingspan of approximately 71.5 inches, a height of approximately 32 inches, and a length of approximately 71.5 inches.

Per request of reviewing regulatory bodies, this report has been generated to provide the following details regarding the noise measurement testing to support the DroneUp Noise Analysis for the V2.1 Unmanned Aircraft System (UAS):

- Measurement test objectives
- Test schedule

[1] The minimum number of VOs required to continuously observe at least a 2 statute mile radius of airspace surrounding the UA in flight so as to ensure that the PIC receives sufficient notice to maintain the UA well clear of manned aircraft and not create a collision hazard for other UA. See Exemption No. 18339D Table 5 – Definitions, "*Sufficient VOs*."

[2] An operating certificate is issued to an applicant that will conduct intrastate transportation, which is transportation that is conducted wholly within the same state of the United States.

[3] https://www.faa.gov/uas/advanced_operations/package_delivery_drone

[4] 49 U.S.C. § 44807; *Special Authority for Certain Unmanned Aircraft Systems*, provides the Secretary of Transportation with authority to determine whether a certificate of waiver, certificate of authorization, or a certificate under 49 U.S.C. §§ 44703 or 44704 is required for the operation of certain UAS.

- Test limitations
- Test item description
- Test site and instrumentation (including measurement devices)
- Flight profiles conducted with measurement station coordinates.
- Test point validity

The measurements were gathered utilizing operationally representative flight profiles to DroneUp operations with the PRISM V2 UA and the flight phases and maneuvers described within the DroneUp V2.1 Concept of Operations (CONOPs) and Noise Assessment for DroneUp Proposed Package Delivery Operations with the PRISM V2 Unmanned Aircraft report respectively.

2.2 Test Objectives

The objective of the testing was to collect noise measurements in accordance with the criteria defined in the FAA's draft UA package delivery noise measurement protocol document[5]. The noise data collected was required to be sourced from operations utilizing an aircraft within the V2.1 system configuration. The operations conducted which noise events were measured from were required to be operationally representative of the DroneUp Concept of Operations.

2.3 Test Schedule

The company contracted to take the noise measurements, HMMH, and produce the methodology report for DroneUp began the project in October 2023. The original contract schedule planned to have measurement testing conducted by January 2024, with a final noise methodology report released in February 2024. Due to prior commitments to other customers and scheduling issues with the contractors, HMMH, testing was scheduled and occurred on February 26th and 27th of 2024. Coordinated scheduling with the FAA occurred and resulted in a representative from the FAA's AEE-100 group being present to witness testing on February 27th, 2024.

Data extracted from measurement devices, including aircraft logs, was gathered by March 11th, 2024. A total of 29 flight tests were scheduled and subsequently conducted over the course of February 26th and 27th in support of this effort.

2.4 Limitations to Test

Several test limitations were present leading up to and during the scheduled test dates. The primary limitation was DroneUp's existing operating locations, consisting of 34 Hubs in six states in the continental United States, as well as all DroneUp test locations did not meet the dimensional requirements outlined within the FAA's draft UA package delivery noise measurement protocol document[7] to enable adequate microphone placement. A second limitation was due to the weather conditions required for data collection, particularly temperature

[5] Measuring Drone Noise for Environmental Review Process, October 2023

and wind limits. Due to the time of year in which DroneUp scheduled to have the testing conducted, in conjunction with all aforementioned limitations, the number of suitable days for testing was significantly reduced, impacting schedule.

Both limitations influenced the test site selection and consequently, due to the inability to procure an ideal test facility, resulted in a portion of the collected test data not being valid (i.e. within the required criteria for acceptable use in a noise methodology report). Due to additional test flights conducted to mitigate the risk of not collecting sufficient noise measurements, there was no impact on the ability for HMMH to develop the downstream noise methodology report nor to the quality and validity of the results of the methodology report.

A final operational limitation was that flights could not be performed with manual ('sticks') commands. This posed no issues for the DroneUp V2.1 system as it does not permit manual commands using joysticks or handheld controllers. All flights performed were done so using pre-configured, automated flight plans and controls.

2.5 Test Item Description

2.5.1 System Under Test

The system under test was the V2.1 UAS, consisting of both the UA and relevant associated elements (AE) for noise measurement testing. The aircraft utilized for testing was Sky 17. Differences in configuration between the Sky 17 aircraft which was utilized for noise testing on February 26th and 27th and the DroneUp V2.1 UA configuration are limited to a different parachute canister, flight control software revision, and video streaming software revision. Sky 17 operated in a configuration similar to the V2.1 UA configuration and in a consistent manner.

2.6 Test Resources

2.6.1 Test Site

Testing was conducted at 1555 Flank Rd, Petersburg, VA 23805. At the location is the Flank Road RC Field, which is a public-use area maintained by the City of Petersburg for private individuals and companies to use for remote controlled aircraft flying. This location is approximately one mile north of DroneUp's Richard Bland College flight testing and training facility.

Figure 2-1 Flank Rd Test Location

The test location permitted the microphone measurement array to be arranged such that 6 microphone measurement stations could be setup at the prescribed intervals as per the FAA's draft UA package delivery noise measurement protocol document[6]. The test location had no significant commercial noise sources within three-fourths (0.75) miles. Approximately 4500 feet to the west of the field was a train yard, which did provide excessive background noise for several test flights, resulting in those noise measurements being invalidated.

2.6.1 Noise Measurement Station Locations

The hired consultants, HMMH, provided 6 microphone measurement stations, henceforth referred to as sound level meters (SLMs). These stations were in different locations depending on the test condition being conducted. The latitudinal and longitudinal coordinates are provided below for each test condition, as provided to DroneUp from HMMH immediately prior to beginning tests on February 26th.

[6] Measuring Drone Noise for Environmental Review Process, October 2023

Coordinate Category	Out Point & SLM IDs	Outpoint Coordinates (WGS 84)	Outpoint Coordinates (WGS 84)	Applicable Test Condition	Applicable Test Condition	Applicable Test Condition	Applicable Test Condition	Applicable Test Condition
		Latitude	Longitude	SLM Direction E->W	SLM Direction E->W	SLM Direction W->E	SLM Direction W->E	SLM Direction W->E
		Latitude	Longitude	Distribution Center	Delivery Point	Distribution Center (-x)	Delivery Point (-x)	En Route
SLMs	SLM (0,0)	37.173034	-77.405711	X	X	X	X	X
	SLM (0,16)	37.173032	-77.405656	X	X			
	SLM (0,50)	37.173027	-77.40554	X	X			
	SLM (0,100)	37.17302	-77.405368	X	X			
	SLM (0,200)	37.173006	-77.405025	X	X			
	SLM (0,400)	37.172977	-77.40434	X	X	X		
	SLM (0,600)	37.172949	-77.403654			X	X	X
	SLM (0,700)	37.172935	-77.403312			X	X	X
	SLM (0,750)	37.172928	-77.40314			X	X	X
	SLM (0,784)	37.172923	-77.403024			X	X	X
	SLM (0,800)	37.172921	-77.402969	X	X	X	X	X

SLM (0,200) was used for the hover test condition.

The SLMs positions overlaid the test location are shown in the image below.

Figure 2-2 SLM locations at test field

2.6.2 Instrumentation

DroneUp personnel utilized METAR data from station KPTB for performance of their operating checklists and procedures as per the DroneUp PRISM V2.1 Unmanned Aircraft Flight Manual (UAFM). No additional instrumentation was provided by DroneUp for the flight testing.

HMMH provided a weather station for determining the meteorological conditions at the test location throughout the duration of testing on February 26th and 27th. The weather instrumentation information can be found in the table below for the Kestrel 5500 Handheld Weather Meter device which was utilized.

Device Information	Kestrel 5500 Handheld Weather Meter
Name:	WEATHER-2927042
Model:	5500
Serial:	2927042
Firmware:	2.11
Profile Version:	N/A
Hardware Version:	Rev 21A
LiNK Version:	1.04.04

The device recorded the following weather data; temperature, wet bulb temperature, relative humidity, barometric pressure, altitude, station pressure, wind speed, heat index, dew point, density altitude, crosswind speed, headwind speed, magnetic direction, true direction, and wind chill. The data was recorded as a frequency of 30 samples/minute.

In addition to the weather device, HMMH provided 6 sound level meter stations, each which connected via bluetooth to a phone which the consultants used when within range of the closest meter. The sound level meter devices were B&K 2245 units with microphone type B&K 4966, which is a prepolarized free-field ½ inch condenser microphone.

Each sound level meter also contained a local storage device that recorded the recorded sound level at a 60hz frequency. Timestamps were included with each sound level measurement recorded.

3. Measurement Profiles

3.1 General

To gather the data required for HMMH to develop the noise analysis, specific flight profiles were performed. These consisted of:

- Takeoff
- En route outbound
- Delivery
- En route inbound
- Landing
- Hover

These phases are shown in Figure 3-1 and are representative of the typical flight profile that DroneUp is expected to use for delivery operations.

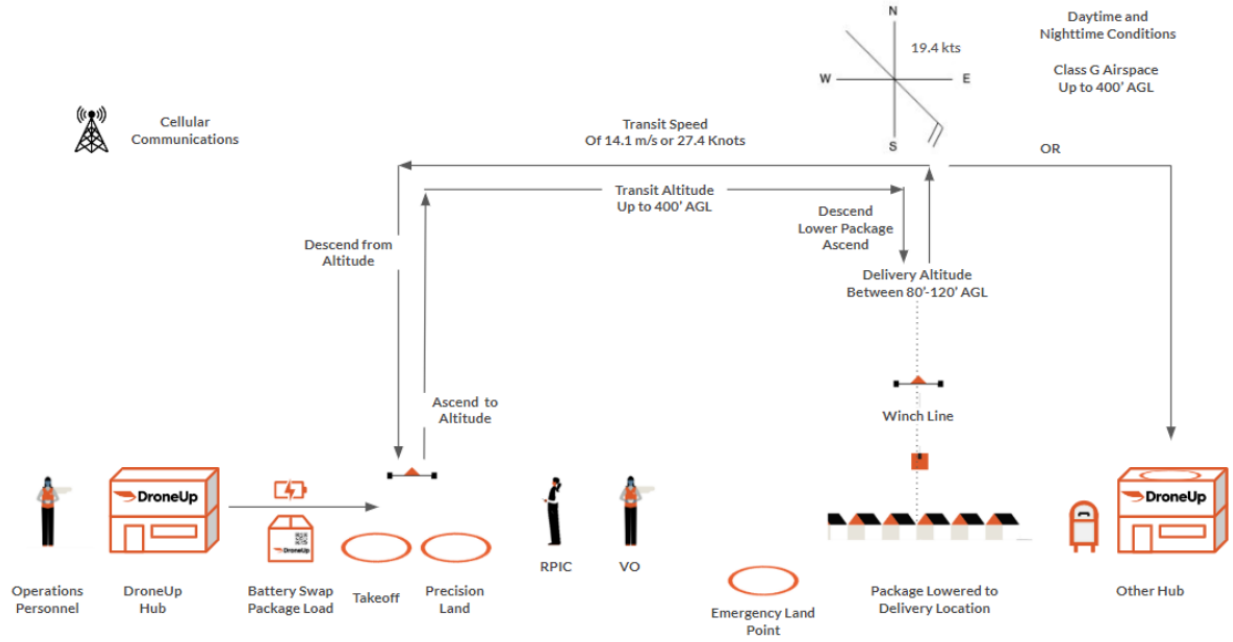


Figure 3-1 Graphical Depiction of the Proposed DroneUp PRISM V2.1 Flight Profile

Appendix B contains a table which summarizes the as-recorded altitudes and durations from the aircraft flight logs for each phase of flight. Table A.B-1: Summary of Recorded Flight Profiles from Noise Measurements also contains the minimum, maximum, average, and standard deviation metrics for duration and altitude of each flight phase as reported across valid test points. Each flight phase was within the anticipated bounds as per typical DroneUp PRISM V2 Series operation.

3.2 Test Condition: Hub (Under Track)

3.2.1 Flight Profile

Flights executed for the Hub (under track) test points consisted of an operation where the aircraft performed takeoff from a mock 'Hub' takeoff location, ascended to en route altitude of 200 feet above ground level (AGL) approximately, and traverse overhead the SLMs at a magnetic heading of 103.22° (magnetic declination of 10.27° west) until the noise level emitted by the aircraft was no longer discernible from the ambient noise. This exact point was communicated to DroneUp from HMMH during the testing. During the en route outbound flight phase, the aircraft achieved a maximum cruise speed of 23.3 knots.

Once communicated by HMMH to DroneUp that an appropriate distance from the furthest microphone from the takeoff location had been reached by the aircraft, the aircraft would

perform the delivery (under track) test condition. It would then be returned to the same location it started the delivery under track test condition from before it was returned following the same flight path to the takeoff location (i.e. SLMs undertrack the aircraft). Once at the landing point, the aircraft would pause briefly, then descend from en route inbound altitude (200' AGL approximately) to the ground and disarm.

3.2.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
16.70	3.56	Southwest	6.61	39.82

3.2.3 Test Points and Validity

As provided by HMMH in the DroneUp V2.1 noise measurement results spreadsheet[7], test points 1 through 24 relate to this test condition. The following test points were determined by HMMH as invalid:

Test Points	Rationale for Invalidity
9,10	Wind gusts exceeded allowable limits on descent on aircraft during landing
19.20	Wind gusts exceeded allowable limits
21,22	Wind gusts exceeded allowable limits at start of takeoff

A total of 18 test points (9 pairs of data covering inbound/outbound Hub undertrack flights) that were deemed valid were collected.

3.3 Test Condition: Delivery (Under Track)

3.3.1 Flight Profile

Flights executed for the delivery (under track) test points consisted of an operation where the aircraft would arrive from a location further than the breakpoint where the furthest out SLM could discern the noise level of the aircraft, using a heading of 283.22° (magnetic declination of 10.27° west). This inbound flight was performed at 200' AGL approximately at a maximum transit speed of 23.3 knots. The aircraft would then perform the delivery operation, pausing briefly above the delivery coordinates, descending to 80'-120' AGL, lowering the package using the

onboard winch system to the ground, retracting the winch line, ascending to 200' AGL approximately, and then traversing via an outbound track directly overhead the SLMs to the original starting location of the aircraft.

3.3.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
16.70	3.56	Southwest	6.61	39.82

3.3.3 Test Points and Validity

As provided by HMMH in the DroneUp V2.1 noise measurement results spreadsheet[1] test points 25 through 36 relate to this test condition. The following test points were determined by HMMH as invalid:

Test Points	Rationale for Invalidity
32	Wind gusts exceeded allowable limits
35	Nearby truck on road created loud noise during delivery flight phase

A total of 10 test points that were deemed valid were collected.

3.4 Test Condition: Hub (Lateral)

3.4.1 Flight Profile

Flights executed for the Hub (lateral) test points consisted of an operation where the aircraft performed takeoff from a mock 'Hub' takeoff location, ascended to en route altitude of 200 feet above ground level (AGL) approximately, and traverse lateral to the SLMs at a magnetic heading of 13.22° (magnetic declination of 10.27° west) until the noise level emitted by the aircraft was no longer discernible from the ambient noise. This was generally in a northerly direction from the test field. This exact point was communicated to DroneUp from HMMH during the testing. During the en route outbound flight phase, the aircraft achieved a maximum cruise speed of 23.3knots.

[1] DroneUp V2.1 Noise Measurement Results spreadsheet dated March 29th, 2024 provided by HMMH

Once communicated by HMMH to DroneUp that an appropriate distance from the furthest microphone from the takeoff location had been reached by the aircraft, the aircraft was commanded to perform the delivery (lateral) test condition. It would then be returned to the same location it started the delivery (lateral) condition from, before it returned following the same flight path to the takeoff location (i.e. SLMs lateral to the aircraft). Once at the landing point, the aircraft would pause briefly, then descend from en route inbound altitude (200' AGL approximately) to the ground and disarm.

3.4.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
17.75	4.15	Southwest	7.85	45.15

3.4.3 Test Points and Validity

As provided by HMMH in the DroneUp V2.1 noise measurement results spreadsheet[2], test points 37 through 44 relate to this test condition. The following test points were determined by HMMH as invalid:

Test Points	Rationale for Invalidity
37,38	Wind gusts exceeded allowable limits
41,42	Rain began on landing flight phase
43,44	Heavy Rain

A total of 2 test points (1 pair of data covering inbound/outbound Hub lateral flights) that were deemed valid were collected.

[2] DroneUp V2.1 Noise Measurement Results spreadsheet dated March 29th, 2024 provided by HMMH

3.5 Test Condition: Delivery (Lateral)

3.5.1 Flight Profile

Flights executed for the delivery (lateral track) test points consisted of an operation where the aircraft would arrive from a location further than the breakpoint where the SLMs could discern the noise level of the aircraft, using a heading of 193.22° (magnetic declination of 10.27° west). This inbound flight was performed at 200' AGL approximately at a maximum transit speed of 23.3 knots. The aircraft would then perform the delivery operation, pausing briefly above the delivery coordinates, descending to 80'-120' AGL, lowering the package using the onboard winch system to the ground, retracting the winch line, ascending to 200' AGL approximately, and then traversing via a lateral track from the SLMs to the original starting location of the aircraft.

3.5.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
17.75	4.15	Southwest	7.85	45.15

3.5.3 Test Points and Validity

As provided by HMMH in the DroneUp V2.1 noise measurement results spreadsheet[3], test points 45 through 48 relate to this test condition. The following test points were determined by HMMH as invalid:

Test Points	Rationale for Invalidity
45	Wind gusts exceeded allowable limits
47	Rain began on landing flight phase, strong wind gust on delivery flight phase
48	Heavy Rain

A total of 1 test point that was deemed valid was collected.

[3] DroneUp V2.1 Noise Measurement Results spreadsheet dated March 29th, 2024 provided by HMMH

3.6 Test Condition: Hub (Behind)

3.6.1 Flight Profile

Flights executed for the Hub (behind track) test points consisted of an operation where the aircraft performed takeoff from a mock 'Hub' takeoff location, ascended to en route altitude of 200 feet above ground level (AGL), and traverse behind (away) the SLMs at a magnetic heading of 283.22° (magnetic declination of 10.27° west) until the noise level emitted by the aircraft was no longer discernible from the ambient noise. This exact point was communicated to DroneUp from HMMH during the testing. During the en route outbound flight phase, the aircraft achieved a maximum cruise speed of 23.3 knots.

Once communicated by HMMH to DroneUp that an appropriate distance had been reached by the aircraft, the aircraft returned following the same flight path to the takeoff location (i.e. SLMs now in front of the aircraft). For more efficient use of test time, the delivery (behind) test condition was then performed. After the performance of that condition, and with the aircraft at the landing point, the aircraft would pause briefly, then descend from en route inbound altitude (200' AGL) to the ground and disarm.

3.6.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
16.72	2.95	South/Southwest	5.73	44.92

3.6.3 Test Points and Validity

As provided by HMMH in the DroneUp V2.1 noise measurement results spreadsheet[4], test points 49 through 60 relate to this test condition. The following test points were determined by HMMH as invalid:

[4] DroneUp V2.1 Noise Measurement Results spreadsheet dated March 29th, 2024 provided by HMMH

Test Points	Rationale for Invalidity
55,56	Wind gusts exceeded allowable limits. Additionally, a truck entered the parking lot where testing was being conducted.
57,58	Wind gusts exceeded allowable limits.
59,60	Meter at 400' was found tipped over at end of the test set.

A total of 6 test points (3 pairs of data covering inbound/outbound Hub behind flights) that were deemed valid were collected.

3.7 Test Condition: Delivery (Behind)

3.7.1 Flight Profile

Flights executed for the delivery (behind track) test points consisted of an operation where the aircraft would arrive from a location further than the breakpoint where the SLMs could discern the noise level of the aircraft, using a heading of 103.22° (magnetic declination of 10.27° west). This inbound flight was performed at 200' AGL approximately at a maximum transit speed of 23.3 knots. The aircraft would then perform the delivery operation, pausing briefly above the delivery coordinates, descending to 80'-120' AGL, lowering the package using the onboard winch system to the ground, retracting the winch line, ascending to 200' AGL (approximately), and then traversing via a behind track from the SLMs to the original starting location of the aircraft.

3.7.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
16.72	2.95	South / Southwest	5.73	44.92

3.7.3 Test Points and Validity

As provided by HMMH in the DroneUp V2.1 noise measurement results spreadsheet[5], test points 61 through 66 relate to this test condition. The following test points were determined by HMMH as invalid:

Test Points	Rationale for Invalidity
45	Wind gusts exceeded allowable limits.
47	Wind gusts exceeded allowable limits.
48	Wind gusts exceeded allowable limits.

A total of 3 test points that were deemed valid were collected.

3.8 Test Condition: Enroute

3.8.1 Flight Profile

For the enroute test condition, the aircraft would traverse from a location further than the northern breakpoint at a heading of 193.22° (magnetic declination of 10.27° west) to a predefined southern coordinate which was past the southern breakpoint of the SLM array. This flight condition was tested at 200' AGL approximately at a maximum transit speed of 23.3 knots. 4 flights (totaling 8 test points) were conducted at maximum takeoff weight (MTOW) and 4 more flights were conducted at empty takeoff weight, as per the V2.1 UAFM.

Due to the dimensional restrictions of the location the testing was conducted at, flights were not possible to be conducted directly upwind and downwind.

3.8.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

[5] DroneUp V2.1 Noise Measurement Results spreadsheet dated March 29th, 2024 provided by HMMH

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
11.57	3.10	Varying from Southeast to Southwest	6.57	51.83

3.8.3 Test Points and Validity

As provided by HMMH in the DroneUp V2.1 noise measurement results spreadsheet[96], test points 67 through 82 relate to this test condition. The following test points were determined by HMMH as invalid:

Test Points	Rationale for Invalidity
67	Wind gusts exceeded allowable limits.
74	Wind gusts exceeded allowable limits.

A total of 14 test points that were deemed valid were collected.

3.9 Test Condition: Hover (Position 1 - 0°)

3.9.1 Flight Profile

For the hover position 1 (0°) test condition, the aircraft would takeoff from a location which was 90 feet away from the SLM. The aircraft then climbed to an altitude of 5 feet AGL and would hover at that location for a period of 30 seconds. The consultants, HMMH, would repeat measurements at 30 second intervals until 3 test points were recorded.

3.9.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

[6] DroneUp V2.1 Noise Measurement Results spreadsheet dated March 29th, 2024 provided by HMMH

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
15.00	3.80	Varying from Southeast to Southwest	5.23	48.33

3.9.3 Test Points and Validity

Three test points were collected, and all were valid.

3.10 Test Condition: Hover (Position 2 - 45°)

3.10.1 Flight Profile

For the hover position 2 (45°) test condition, the aircraft would takeoff from a location which was 90 feet away from the SLM. The aircraft then climbed to an altitude of 90 feet AGL and would hover at that location for a period of 30 seconds. The consultants, HMMH, would repeat measurements at 30 second intervals until 3 test points were recorded.

3.10.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
15.00	3.80	Varying from Southeast to Southwest	5.23	48.33

3.10.3 Test Points and Validity

Three test points were collected, and all were valid.

3.11 Test Condition: Hover (Position 3 - 90°)

3.11.1 Flight Profile

For the hover position 3 (90°) test condition, the aircraft would takeoff, climb to an altitude of 90 feet AGL, traverse to directly overhead the SLM and would hover at that location for a period of

30 seconds. The consultants, HMMH, would repeat measurements at 30 second intervals until 3 test points were recorded.

3.11.2 Weather Conditions

The average weather conditions for this test condition are shown below. Please note that the wind speed was measured at 10 feet above ground level. Weather data for flights whose data was determined to be invalid by the noise consultants HMMH has not been included in the averaging.

Temperature (°C)	Average Wind Speed (knots)	Wind Direction (°)	Average Wind Gust Speed (knots)	Relative Humidity (%)
15.00	3.80	Varying from Southeast to Southwest	5.23	48.33

3.11.3 Test Points and Validity

Test Points	Rationale for Invalidity
90	Wind gusts exceeded allowable limits.

Two test points were collected and determined valid.

4. Summary of Conclusions and Recommendations

In conclusion, measurements were adequately collected according to the feedback provided to DroneUp from HMMH. The measurements enabled the consultants to create the necessary noise analysis methodology report to support DroneUp's environmental assessment for its proposed Part 135 operations in the Dallas-Fort Worth area.

Several recommendations have been identified from DroneUp to improve the measurement process for future noise tests. First and foremost, a test facility which can be reserved (for a nominal fee if required) which is made accessible to applicants including DroneUp would improve the logistics of conducting testing in accordance with the protocol proposed by AEE-100. Additionally, a checklist of the exact deliverables expected by the FAA in relation to noise testing and the analysis of said results would help avoid unexpected tasks, contract overruns, and potential schedule delays.

5. Appendices

Appendix A: Summary of Noise Measurements

A.1 Hub Takeoff/Landing Data Plots

The following scatter plots contain the individual and averaged measured A Weighted SELs from the Hub takeoff and landing for under track, lateral, and behind positions. Points in the plots
represent the valid individual A-Weighted SEL measurement points used to calculate the average SEL values, and labels reflect the averaged SEL value for each distance measured, respectively.

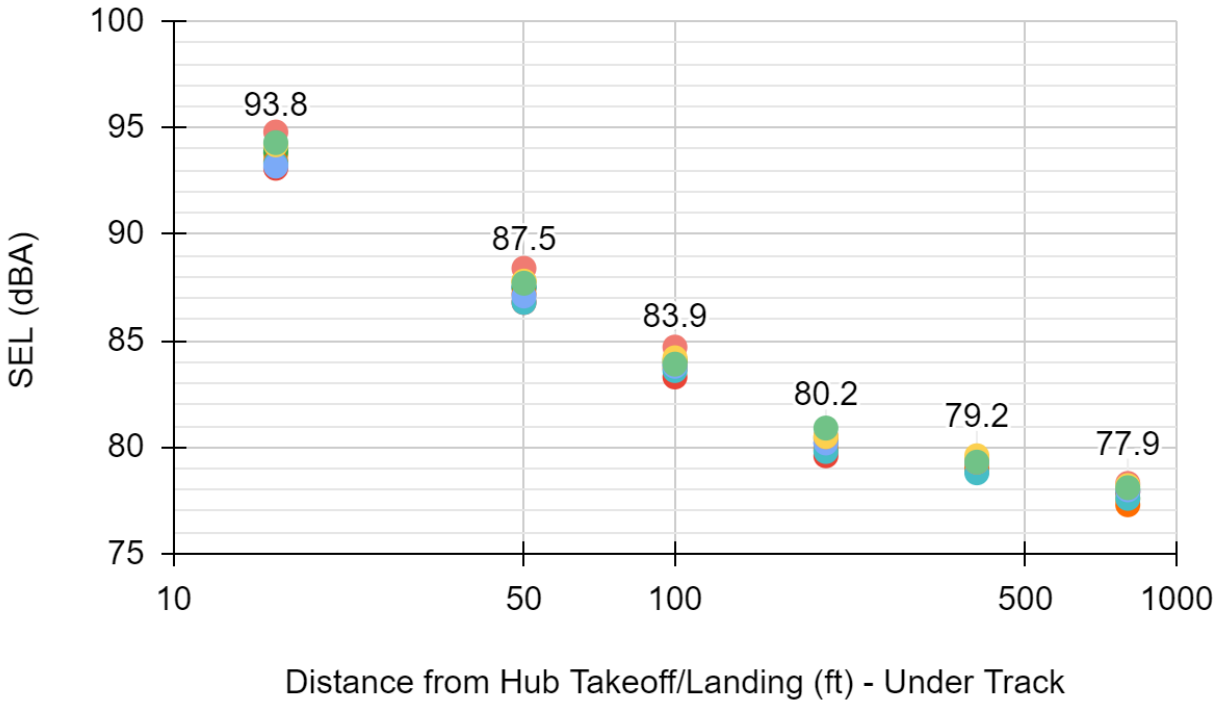


Figure A.1-1 Individual Measured and Averaged A-Weighted SELs from Hub Takeoff and Landing (Under Track)

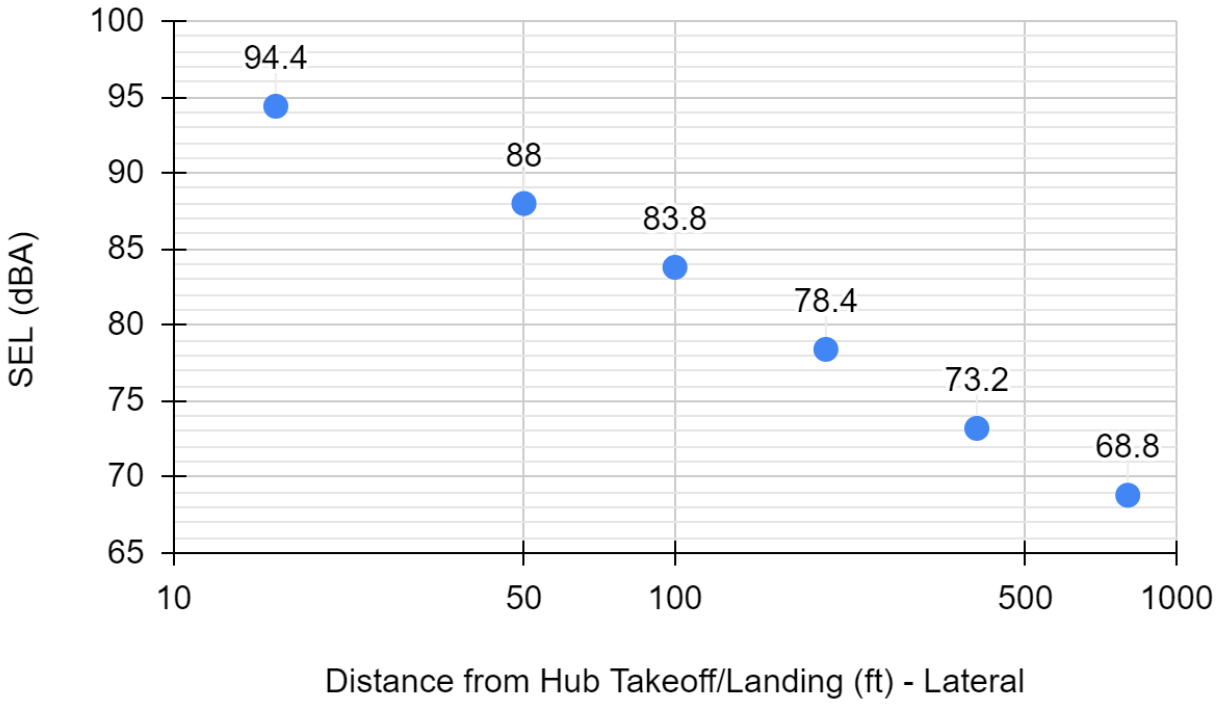


Figure A.1-2 Individual Measured and Averaged A-Weighted SELs from Hub Takeoff and Landing (Lateral)

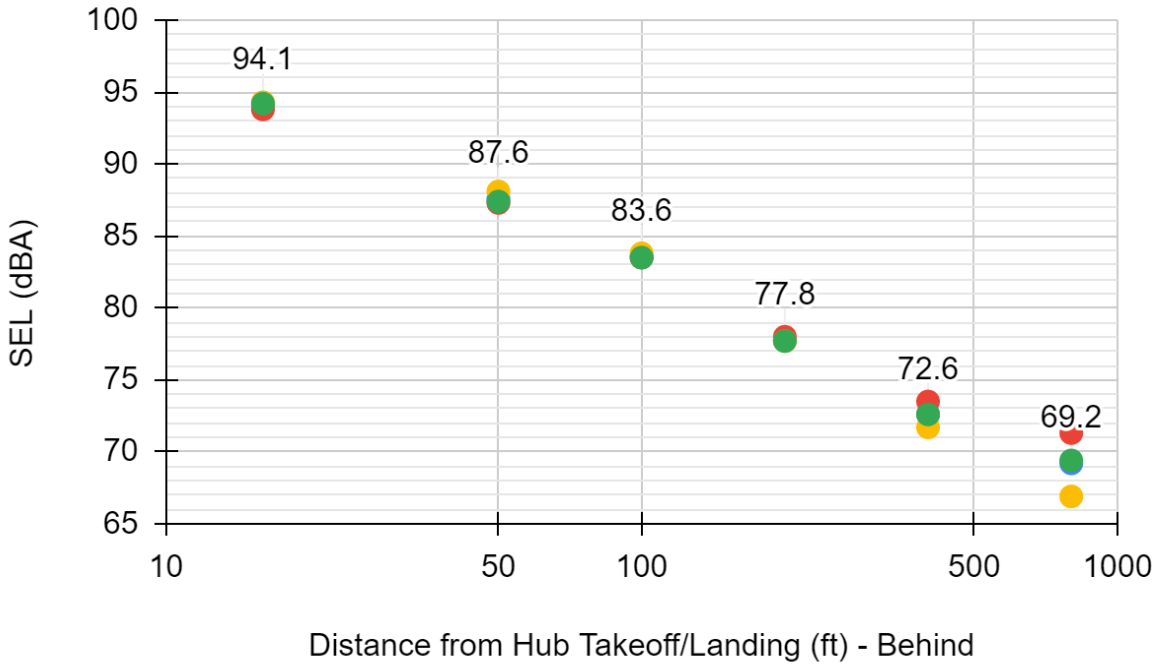


Figure A.1-3 Individual Measured and Averaged A-Weighted SELs from Hub Takeoff and Landing (Behind)

A.2 Delivery Point Data Plots

The following scatter plots contain the individual and averaged measured A Weighted SELs from the delivery point for under track, lateral, and behind positions. All plots have data labels showing the average SEL for each distance measured at.

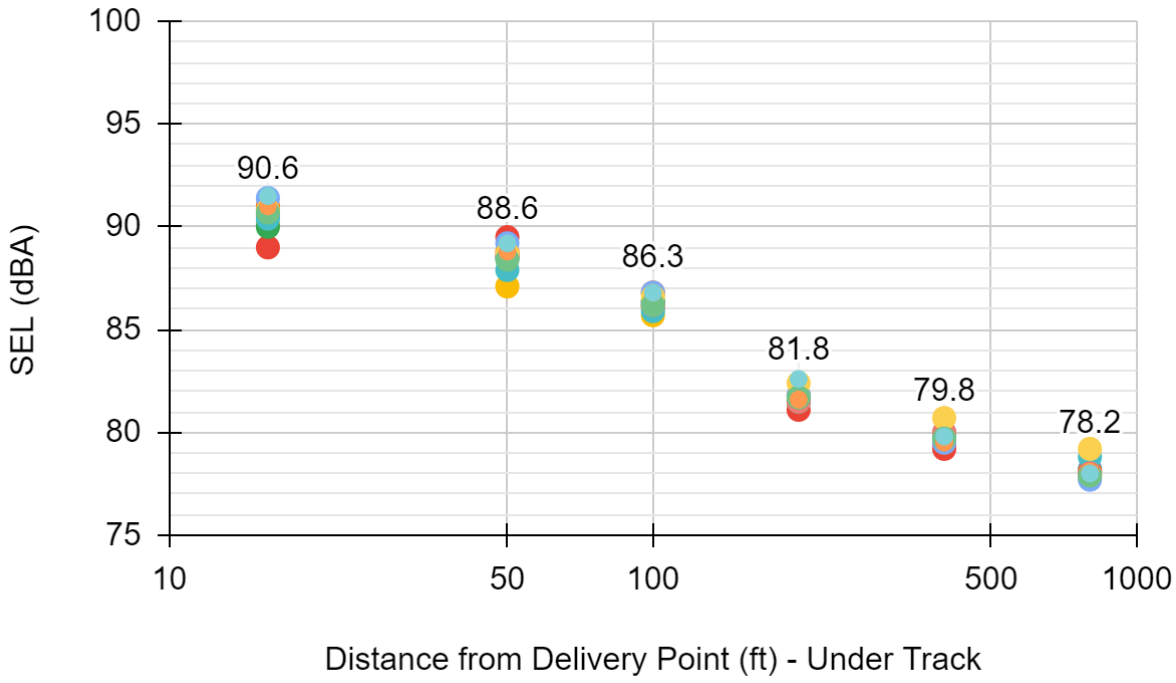


Figure A.2-1 Individual Measured and Averaged A-Weighted SELs from Delivery Point (Under Track)

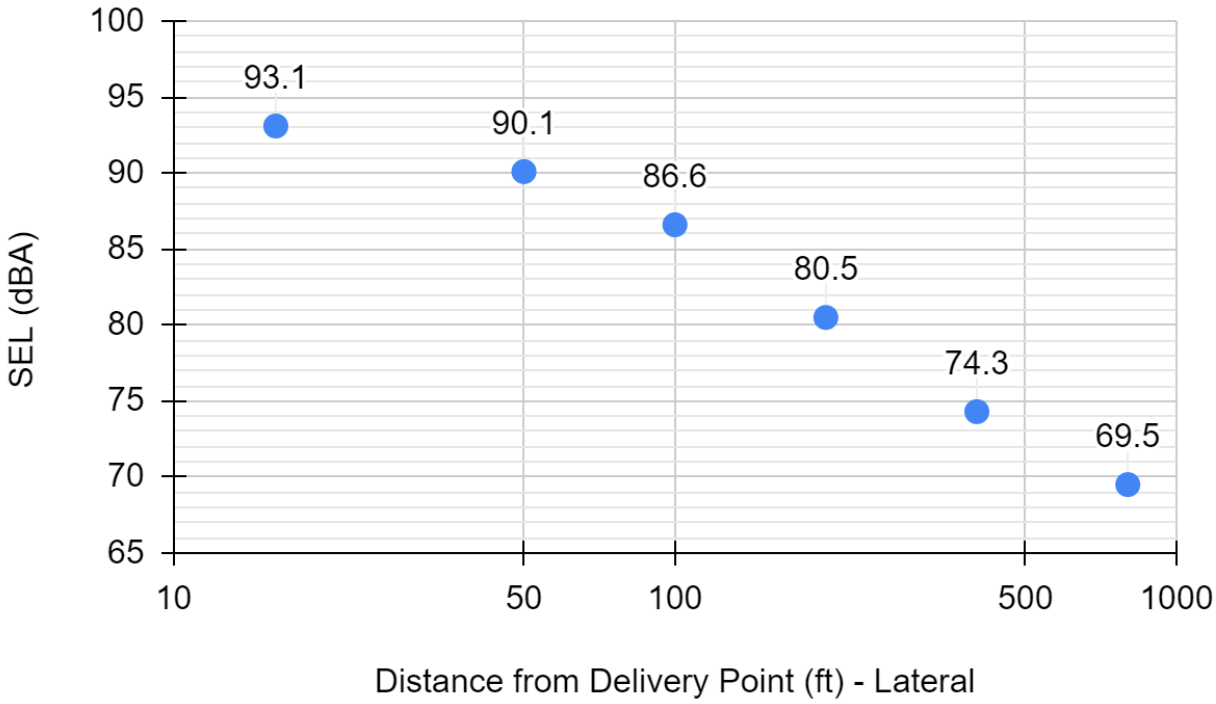


Figure A.2-2 Individual Measured and Averaged A-Weighted SELs from Delivery Point (Lateral)

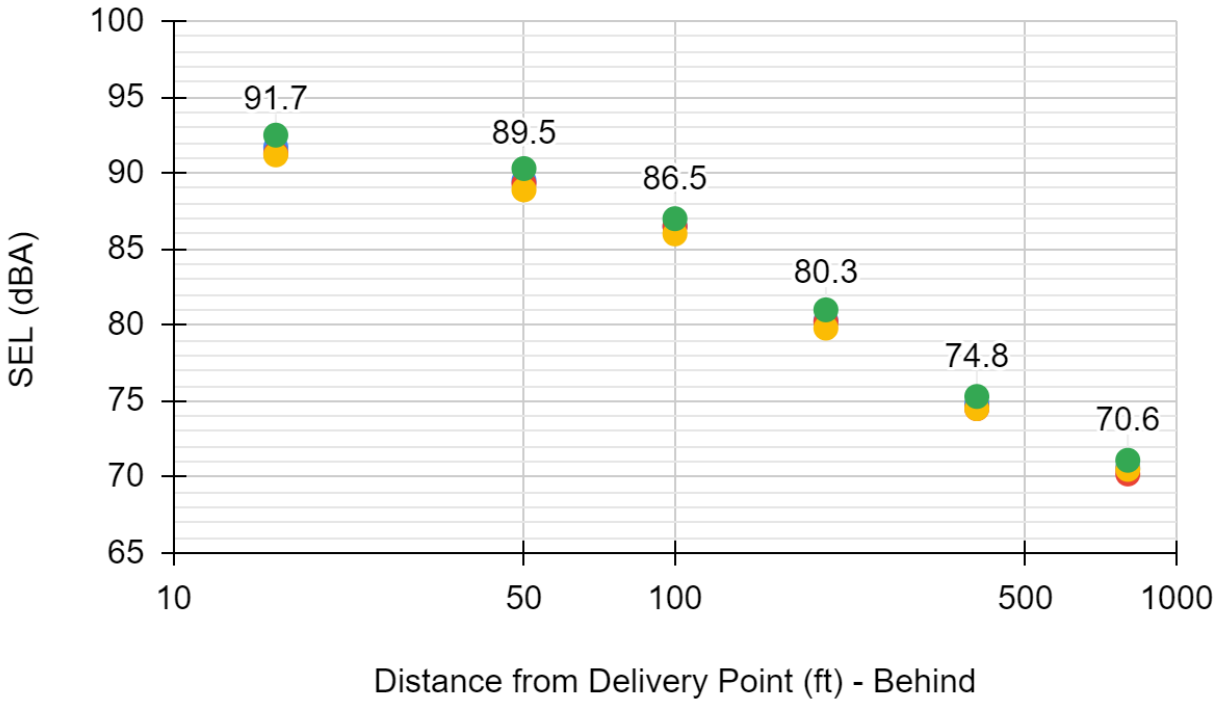


Figure A.2-1 Individual Measured and Averaged A-Weighted SELs from Delivery Point (Behind)

A.3 Enroute Data Plots

The following scatter plots contain the individual and averaged measured A Weighted SELs from the enroute flight phase for under track, lateral, and behind positions. All plots have data labels showing the average SEL for each distance measured at.

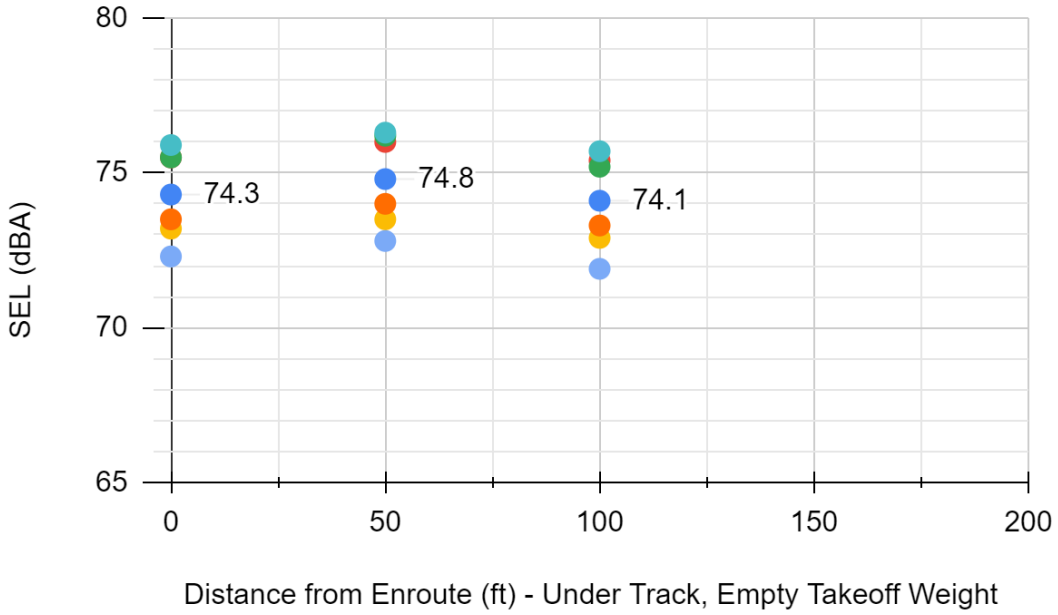


Figure A.3-1 Individual Measured and Averaged A-Weighted SELs from Enroute at Empty Takeoff Weight

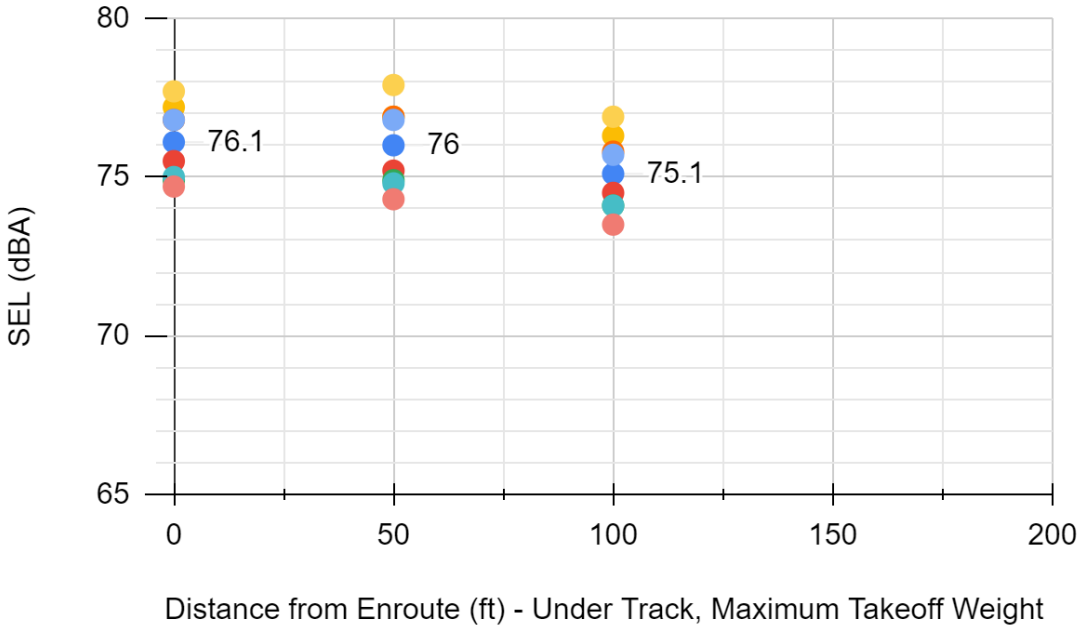


Figure A.3-2 Individual Measured and Averaged A-Weighted SELs from Enroute at Maximum Takeoff Weight

Appendix B: Flight Profile Measurements

This appendix section contains the specific flight profile measurement details based on the flight logs from testing. The aircraft's maximum cruise speed was 23.3 knots during testing.

Table A.B-1: Summary of Recorded Flight Profiles from Noise Measurements

Flight Phase	Detail	Minimum altitude (feet AGL)	Maximum altitude (feet AGL)	Altitude Average (feet AGL)	Altitude St. Dev (feet)	Duration Minimum (s)	Duration Maximum (s)	Duration Average (s)	Duration St. Dev (s)
Takeoff	Takeoff	194.9	224.7	203.5	8.9	23	25	23.8	0.8
En Route Outbound	Acceleration	194.9	224.7	203.2	6.1	8	11	9	1.1
En Route Outbound	En Route	198.5	216.2	205.2	7.1	variable	variable	variable	variable
En Route Outbound	Deceleration	198.5	216.2	205.2	7.1	9	15	11.9	2.1
Delivery	Descent	81.1	118.1	94.6	14.5	26	31	28.4	1.7
Delivery	Delivery	81.1	118.1	94.6	14.5	61	75	67	5.4
Delivery	Ascent	198.4	216.5	203.6	6.8	10	14	12.9	1.5
En Route Inbound	Acceleration	198.4	223.1	207.1	8.5	8	10	8.8	0.8
En Route Inbound	En Route	198.4	223.1	209.2	13.4	variable	variable	variable	variable
En Route Inbound	Deceleration	198.4	223.1	209.2	13.4	9	14	11.6	1.6

Flight Phase	Detail	Minimum altitude (feet AGL)	Maximum altitude (feet AGL)	Altitude Average (feet AGL)	Altitude St. Dev (feet)	Duration Minimum (s)	Duration Maximum (s)	Duration Average (s)	Duration St. Dev (s)
Landing	Descent	variable from flight to flight*	variable from flight to flight*	variable from flight to flight*	variable from flight to flight*	34	41	38.9	2.7
Landing	Precision Landing	35.1	66.9	49.8	12.3	19	23	21	1.3

*Descent phase is completed when precision landing begins.

Appendix K
Air Emissions Analysis

Air Emissions Analysis for DroneUp Proposed Package Delivery Operations in Dallas-Fort Worth, Texas

Version 2.0

DU-3-REC-910-006

PUBLICATION September 24, 2024

DroneUp

160 Newtown Rd Suite 500

Virginia Beach, VA 23462

USA

Record of Manual Revisions

Rev #	Date	Pages	Initial
1.0	8/29/2024	Initial Release	CTH
1.1	9/11/2024	Updated to resolve FAA comments	CTH
2.0	9/24/2024	Updated to resolve additional comments on usage of generators	CTH

This document has been prepared in electronic form for ease of inserting revisions. Chapters and subchapters, throughout the document, are formatted and numbered to allow quick reference to data in each section. A logical and convenient Tables of Contents is located at the beginning of the document to aid in locating specific data within that chapter. Revisions will be issued periodically as needed.

These revisions will be electronically added and contain a summary of changes to assist the user in finding the change. A record of filing must be made in the Record of Manual Revisions.

List of Figures

List of Tables

List of Equations

List of Effective Pages

Page 2, Record of Manual Revisions - Revision 2.0 added.
Page 8, Section 2.1 - Added content around use of generators at hubs.
Page 11, Section 2.3 - Typo in county name resolved. Changed SIP reference to plan.
Page 12, Section 2.3 - Changed SIP reference to plan and updated section numbering.
Page 13, Section 2.3 - Specified that all generators analyzed are diesel generators.
Page 14, Section 2.4 - Added sentence regarding the number of operating days assumption. Grammatical correction made to existing wording.
Page 15, Section 3.1 - Footnote formatting updated and date added.
Page 16, Section 3.1 - Footnote formatting updated and date added.
Page 23, Section 3.4 - Table header updated for ozone nonattainment *de minimis* threshold.
Page 24, Section 4 - Updated reference from particulate matter to lead.
Page 28, Appendix - Updated table header for ozone nonattainment *de minimis* threshold

Table of Contents

1. Introduction

1.1 Purpose

This document presents the air emissions analysis for DroneUp proposed package delivery operations in the Dallas-Fort Worth area in Texas. The objective of the document is to determine general conformity applicability utilizing a methodology consistent with the requirement of 40 CFR §93.159.

1.2 Scope & Applicability

This document and its contents are applicable to the unmanned aircraft system (UAS) and its operation as described within the Environmental Assessment for DroneUp, LLC Proposed Drone Package Operations in Dallas-Fort Worth, Texas.

2. Background and Assumptions

2.1 System Operation

DroneUp is a United States-based technology company that combines airspace solutions, web-based applications, and analytics platforms, providing drone delivery services to help companies operate at scale in last mile delivery. DroneUp has operated under 14 Code of Federal Regulations (CFR) Part 107, since October 2022. Operations are conducted within visual line-of-sight (VLOS) utilizing strategically placed visual observers (VOs) for airspace deconfliction within a predefined radius of the operating base for its commercial deliveries. DroneUp has made an application to the Federal Aviation Administration (FAA) for a standard air carrier certificate[1] under 14 CFR Part 135 (Part 135)[2], which allows holders to conduct on-demand or scheduled (commuter) operations, and a 49 United States Code (U.S.C.) 44807 exemption[3] which allows DroneUp to operate for compensation or hire beyond visual line-of-sight (BVLOS), using its PRISM Unmanned Aircraft System (UAS), that provides a path for an airworthiness certification exemption for its UAS. DroneUp will operate BVLOS at the locations approved for operations conducted with an air carrier certificate under 14 CFR Part 135. DroneUp is the manufacturer of the UAS being used in these package delivery operations, the operator, and the system integrator.

The descriptions of DroneUp's no action alternative and proposed action operations are provided in Section 2.1 and 2.2 of the Environmental Assessment. DroneUp currently utilizes two (2) Hub configurations: The Mobile Hub and the Standard Hub. The Mobile Hub is used when rapid deployment of a Hub is requested (e.g., special events), or when establishing a new DroneUp Hub. Mobile Hub locations will comply with city/county zoning requirements. The Standard Hub is the long-term solution of DroneUp delivery operations. DroneUp currently operates 11 mobile hubs within the Dallas-Fort Worth region as per the no action alternative. Under the proposed action, DroneUp would operate up to 30 hubs within the Dallas-Fort Worth area. Hubs could either be mobile hubs or standard hubs.

Under the mobile hub setup, energy for powering the ground control station is provided via the use of diesel generators. Diesel generators are only used in the mobile hub setup and are not used at standard hubs even when electric grid power is not available or in other emergency conditions. Each mobile hub is equipped with a single diesel generator. The air emissions of these diesel generators is the focus of this document.

2.2 Affected Environment

The DroneUp operating area is shown in Figure 1. This area of operation overlaps with Dallas-Fort Worth area counties which have been designated as severe nonattainment of ozone (O_3) as per the National Ambient Air Quality Standards (NAAQS). This area of operation also

[1] An operating certificate is issued to an applicant that will conduct intrastate transportation, which is transportation that is conducted wholly within the same state of the United States.
[2] https://www.faa.gov/uas/advanced_operations/package_delivery_drone
[3] 49 U.S.C. § 44807; Special Authority for Certain Unmanned Aircraft Systems, provides the Secretary of Transportation with authority to determine whether a certificate of waiver, certificate of authorization, or a certificate under 49 U.S.C. §§ 44703 or 44704 is required for the operation of certain UAS.

overlaps with a portion of Collin County which has been designated as a lead (Pb) attainment (maintenance) area type.

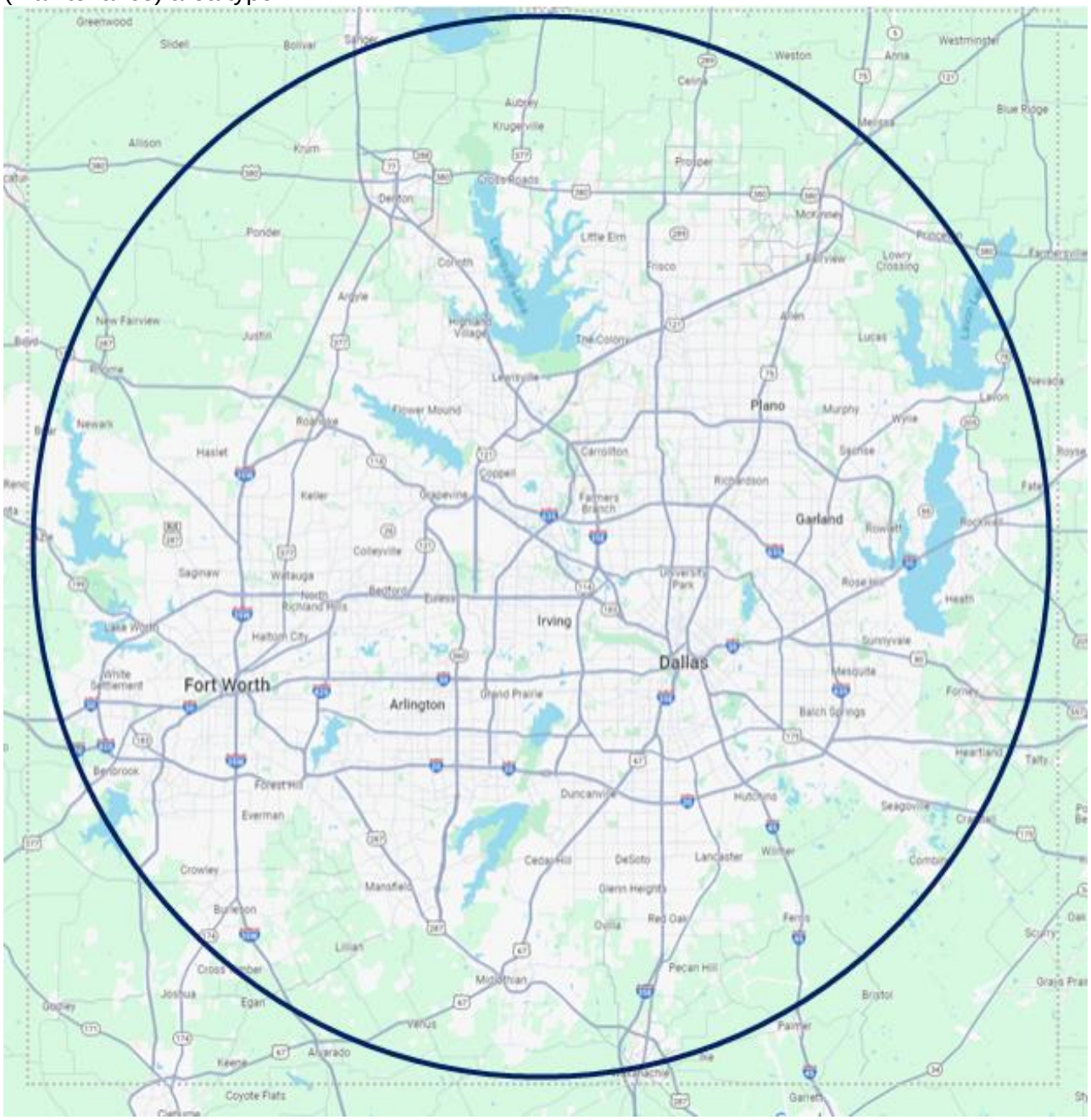


Figure 1 DroneUp Operating Area Map

As declared by the Texas Commission on Environmental Quality, Table 1 identifies the current attainment status by pollutant.

Table 1 Dallas-Fort Worth Current Attainment Status[4]

Pollutant	Primary NAAQS	Averaging Period	Designation	Counties	Attainment Deadline
Ozone (O_3)	0.070 ppm (2015 standard)	8-hour	Serious Nonattainment	Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Tarrant, Wise	August 3, 2027
Ozone (O_3)	0.075 ppm (2008 standard)	8-hour	Severe Nonattainment	Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, Wise	July 20, 2027
Lead (Pb)	0.15 µg/m3 (2008 standard)	Rolling 3-Month Average	Attainment (Maintenance)	Portion of Collin	N/A
Lead (Pb)	1.5 µg/m3 (1978 standard)	Quarterly Average	Attainment (Maintenance)	Portion of Collin	N/A
Carbon Monoxide (CO)	9 ppm	8-hour	Attainment/ Unclassifiable	N/A	N/A
Carbon Monoxide (CO)	35 ppm	1-hour	Attainment/ Unclassifiable	N/A	N/A
Nitrogen Dioxide (NO_2)	0.053 ppm	Annual	Attainment/ Unclassifiable	N/A	N/A
Nitrogen Dioxide (NO_2)	100 ppb	1-hour	Attainment/ Unclassifiable	N/A	N/A
Particulate Matter (PM_{10})	150 µg/m3	24-hour	Attainment/ Unclassifiable	N/A	N/A

[4] https://www.tceq.texas.gov/airquality/sip/dfw/dfw-status

Pollutant	Primary NAAQS	Averaging Period	Designation	Counties	Attainment Deadline
Particulate Matter ($PM_{2.5}$)	12.0 µg/m3 (2012 standard)	Annual (Arithmetic Mean)	Attainment/ Unclassifiable	N/A	N/A
Particulate Matter ($PM_{2.5}$)	15.0 µg/m3 (1997 standard)	Annual (Arithmetic Mean)	Attainment/ Unclassifiable	N/A	N/A
Particulate Matter ($PM_{2.5}$)	35 µg/m3	24-hour	Attainment/ Unclassifiable	N/A	N/A
Sulfur Dioxide (SO_2)	0.03 ppm	Annual (Arithmetic Mean)	Attainment/ Unclassifiable	N/A	N/A
Sulfur Dioxide (SO_2)	0.14 ppm	24-hour	Attainment/ Unclassifiable	N/A	N/A
Sulfur Dioxide (SO_2)	75 ppb	1-hour	Attainment/ Unclassifiable	N/A	N/A

Ozone and Lead, being designated in a nonattainment and maintenance category respectively, are chemicals which have lower general conformity *de minimis* emission levels as defined within 40 CFR §93.153. 1050.1 Desk Reference (v3) appendix B, Exhibit B-2 and B-3 provide tables which identify the de minimis levels for both nonattainment and maintenance areas by pollutant. More details on these levels, along with their usage in the analysis, is provided in Section 3.1.

2.3 Sources of Air Emissions

The General Conformity Rule[5] defines a process based on emission analysis to determine whether a federal action conforms to the State Implementation Plan (SIP), which is applicable to the state where the federal action affects. A SIP is a required plan which all states must develop, describing how the state will achieve or maintain the NAAQS within timeframes set under the Clean Air Act (CAA). This includes a state's responsibility for designating areas that are in attainment, nonattainment, or maintenance for each of the criteria pollutants. This responsibility has been delegated to the states by the Environmental Protection Agency (EPA).

To comply with the SIP, a federal action must not result in any new violations or worsen any existing violations of the NAAQS or state standards, must not delay timely attainment of any standard or any required interim emissions reductions or other milestones, and must meet the conditions of the general conformity regulations. Thus, this air emissions analysis exists to show the proposed action in the DroneUp Environmental Assessment conforms to EPA regulations.

The General Conformity Rule defines two sources of emissions, direct or indirect, which an air

[5] https://www.epa.gov/general-conformity

emissions analysis must consider. Direct emissions are those that occur at the same time and place as the federal action. 40 CFR § 93.152 defines the four criteria for indirect emissions of a criteria pollutant or its precursors:

- that are caused or initiated by the federal action and originate in the same nonattainment or maintenance area but occur at a different time or place from the action;
- that are reasonably foreseeable;
- that the agency can practically control; and
- for which the agency has continuing program responsibility.

Evaluation of the DroneUp operations described in the proposed action and no action alternative for direct and indirect emission sources was conducted. The only source of direct emissions identified were the diesel generators which are defined for use in mobile hubs. No sources of indirect emissions were identified.

Multiple generator options are approved for use in DroneUp's mobile hubs. Only one generator is in use at a mobile hub at any time. The generators are the primary source of energy generation for a mobile hub and operate almost exclusively in prime (primary) power mode, not standby. The five generators are listed in Table 2 below:

Table 2 Approved Generators List

Generator	**Name**
MDG25IF4	Generac Portable Generator
SDG25S-8E1	Airman Portable Generator
DCA25SSIU4F	Multiquip Portable Generator
G25 T4F	Wacker Portable Generator
MMG25IF4	Generac Magnum Pro Portable Generator

All listed generators are certified as Tier 4 Final[6] EPA emissions compliant.

2.4 Operating Assumptions

To conduct the air emissions analysis, assumptions must be made to ensure a realistic but conservative estimate for pollutants emitted by the sources described above in Section 2.2. The following assumptions will be utilized in the analysis.

Operating Assumptions for the Proposed Action:

- Generators will operate from 7AM to 10PM each operating day, resulting in 15 operating hours per day and,
- DroneUp will operate each mobile hub 312 days per year and,
- Generators will operate on prime power and,

[6] https://www.gpo.gov/fdsys/pkg/FR-2004-06-29/pdf/04-11293.pdf

- DroneUp will operate 30 hubs within the Dallas-Fort Worth area
- Generators will emit the maximum amount of criteria pollutants permitted under the EPA's Tier 4 Final standards.

Operating Assumptions for the No Action Alternative:

- Generators will operate from 7AM to 10PM each operating day, resulting in 15 operating hours per day and,
- DroneUp will operate each mobile hub 312 days per year and,
- Generators will operate on prime power and,
- DroneUp will operate 11 hubs within the Dallas-Fort Worth area
- Generators will emit the maximum amount of criteria pollutants permitted under the EPA's Tier 4 Final standards.

The use of 312 operating days per year is based on a conservative estimation based on prior operating history of hubs, which considers downtime at hubs as a consequence of severe weather.
The above operating assumptions for both the proposed action and no action alternative are the worst-case scenario if all hubs are operated with a generator for all of the operations. All assumptions above are consistent with the information provided within the Environmental Assessment for DroneUp, LLC Proposed Drone Package Operations in Dallas-Fort Worth, Texas. Please refer to Section 2.1 and Section 2.2 of the Environmental Assessment for more details.

3. Air Emissions Estimation

3.1 Analysis Methodology

The EPA has established threshold levels (also referred to as *de minimis* levels) for emissions of each of the criteria pollutants under the NAAQS. When the sum of the increases in direct and indirect emissions caused by a project (i.e. the proposed action) would be less than the *de minimis* levels, a project does not require a general conformity determination. The general conformity *de minimis* levels for the criteria pollutants are defined within 40 CFR § 93.153 and are provided below for nonattainment and maintenance areas.

Table 3 Nonattainment Areas General Conformity De Minimis Emission Levels[7(a)]

Pollutant (Precursor)	Area Type	Tons per Year
O_3 (VOC or NO_X)	Serious	50
O_3 (VOC or NO_X)	Severe	25
O_3 (VOC or NO_X)	Extreme	10
O_3 (VOC or NO_X)	Marginal and moderate ozone nonattainment areas outside an ozone transport region	100
O_3 (NO_X)	Marginal and moderate ozone nonattainment areas inside an ozone transport region	100
O_3 (VOC)	Marginal and moderate ozone nonattainment areas inside an ozone transport region	50
CO, SO_2, or NO_2	All nonattainment areas	100
PM_{10}	Moderate	100
PM_{10}	Serious	70
$PM_{2.5}$ (Direct emissions)	All $PM_{2.5}$ nonattainment areas	100
$PM_{2.5}$ (SO_2)	All $PM_{2.5}$ nonattainment areas	100
$PM_{2.5}$ (NO_x, unless determined not to be a significant precursor)	All $PM_{2.5}$ nonattainment areas	100

[7] Source: 40 CFR § 93.153 as presented in EPA. 2011. General Conformity De Minimis Levels. https://www.epa.gov/general- conformity/de-minimis-emission-levels (last updated July 22, 2011).

Pollutant (Precursor)	Area Type	Tons per Year
$PM_{2.5}$ (VOC or ammonia, if determined to be significant precursors)	All $PM_{2.5}$ nonattainment areas	100
Pb	All Pb nonattainment areas	25

(a) CO = carbon monoxide; NO2 = nitrogen dioxide; NOx = nitrogen oxides; O3 = ozone; PM10 = particulate matter with an aerodynamic diameter equal to or less than 10 microns; PM2.5 = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; Pb = lead; SO2 = sulfur dioxide; VOC = volatile organic compound.

Table 4 Maintenance Areas General Conformity De Minimis Emission Levels[8]

Pollutant (Precursor)	Area Type	Tons per Year
Ozone (NO_X, SO_2, or NO_2)	All ozone maintenance areas	100
Ozone (VOCs)	Ozone maintenance areas inside an ozone transport region	50
Ozone (VOCs)	Ozone maintenance areas outside an ozone transport region	100
CO or PM_{10}	All maintenance areas	100
$PM_{2.5}$ (Direct emissions)	All $PM_{2.5}$ maintenance areas	100
$PM_{2.5}$ (SO_2)	All $PM_{2.5}$ maintenance areas	100
$PM_{2.5}$ (NO_x, unless determined not to be a significant precursor)	All $PM_{2.5}$ maintenance areas	100
$PM_{2.5}$ (VOC or ammonia, if determined to be significant precursors)	All $PM_{2.5}$ maintenance areas	100
Pb	All Pb maintenance areas	25

As identified in Section 2.2, the proposed action in the DroneUp Environmental Assessment affects areas which are designated as Pb maintenance and O_3 (VOC or NO_X) severe nonattainment areas. The analysis will explicitly compare the sum of the increases in emissions caused by the proposed action for O_3 (VOC or NO_X) and Pb versus the *de minimis* threshold levels of 25 tons per year. Since Pb is not listed explicitly within the emission rates certified by

[8] Source: 40 CFR § 93.153 as presented in EPA. 2011. General Conformity De Minimis Levels. https://www.epa.gov/general- conformity/de-minimis-emission-levels (last updated July 22, 2011).

Tier 4 Final EPA emission standards, the most conservative approach will be taken. This approach is to consider all PM emissions to be Pb.

As per the aforementioned assumptions in Section 2.3, all direct emissions from each approved generator shall be conservatively estimated as the highest pollutant emittance rate while conforming to Tier 4 Final EPA emissions standards. These pollutant emissions rates, in grams per kilowatt-hour (g/kWh) are summarized below.

Table 5 Tier 4 Final Emission Rates[(b)]

Emission Rate - CO (g/kWh)	Emission Rate - NMHC+NO_x (g/kWh)	Emission Rate - PM (g/kWh)
5.5	4.7	0.03

(b) NMHC = nonmethane hydrocarbons, including oxygenated

NHMCs are the source of VOCs, a precursor to O_3. Methane is not included in air-pollution contexts and more directly this analysis because the EPA considers it to have negligible photochemical reactivity and excludes it from regulation under Title I of the CAA.

The reasoning for why only considering NMHC and NO_x emission rates is sufficient for determining if the air emissions from the project (i.e. the DroneUp Environmental Assessment) are below the severe nonattainment *de minimis* ozone threshold levels can be explained through a chemical evaluation. A brief discussion supporting this statement is provided in Section 3.1.1.

The power output of each generator, in kilowatts (kW) is illustrated below:

Table 6 Generator Power Output

Generator	Name	Generator Power (kW), (Prime,Standby)
MDG25IF4	Generac Portable Generator[9]	27,30
SDG25S-8E1	Airman Portable Generator[10]	20,22
DCA25SSIU4F	Multiquip Portable Generator[11]	20,22
G25 T4F	Wacker Portable Generator[12]	19.5,21.4
MMG25IF4	Generac Magnum Pro Portable Generator[13]	27,30

Utilizing the emission rates identified in Table 5, the assumptions made in Section 2.3, and the generator power output presented in Table 6, the net air emissions will be computed.

First, the power output of each generator is multiplied by the operating runtime per day.

[9] https://www.generac.com/globalassets/products/business/mobile-power--light-solutions/mobile-generators/spec-sheets/mdg25if4_diesel-generator_spec-sheet_english.pdf
[10] https://irp.cdn-website.com/28d45882/files/uploaded/SDG25S-8E1_DATA.pdf
[11] https://service.multiquip.com/pdfs/DCA25SSIU4F_Data_Sheet.pdf
[12] https://irp.cdn-website.com/28d45882/files/uploaded/WackerNeuson-G25-en.pdf
[13] https://www.powerequipmentdirect.com/manuals/generac-d3aa3f57ed1b3dbe951c47982435a773.pdf

Equation 1 Kilowatt Hours per day per hub

$$Power\ Output\ (kW)\ \times\ Operating\ Runtime\ (hours\ per\ day)\ =\ Kilowatt\ hours\ per\ day\ per\ hub$$

The resultant of Equation 1 is then multiplied by the total number of hubs operating within the Dallas-Fort Worth area to determine the energy generated by each generator if in use at all hubs per operating day.

Equation 2 Kilowatt Hours per day in Dallas-Fort Worth Area

$$Kilowatt\ Hours\ \ (kWh/day/hub)\ \times\ Number\ of\ Hubs\ =\ Total\ Kilowatt\ hours\ per\ day\ (kwh/day)$$

The resultant of Equation 2 is then multiplied by the number of operating days per year to compute the total energy generated by each generator type if in use at all hubs per year in the Dallas-Fort Worth area.

Equation 3 Kilowatt Hours per year in Dallas-Fort Worth Area

$$Total\ Kilowatt\ Hours\ \ (kWh/day)\ \times\ Number\ of\ Operating\ Days\ =\ Total\ Kilowatt\ hours/year\ (kwh/year)$$

The resultant of Equation 3 is then multiplied by the maximum permissible emission rates established by the EPA Tier 4 Final standard (refer to Table 5) for each pollutant.

Equation 4 Emission Mass, grams per year in Dallas-Fort Worth Area

$$Total\ Kilowatt\ hours/year\ \ (kWh/year)\ \times\ Emission\ Rate\ (g/kwh)\ =\ Emission\ Mass\ per\ year\ (g/year)$$

The resultant of Equation 4 is multiplied by the conversion factor from grams to US (short) ton to determine the emission mass in tons per year for each pollutant.

Equation 5 Emission Mass, tons per year in Dallas-Fort Worth Area

$$Emission\ Mass\ per\ year\ (g/year)\ \times\ 1.10231E\ -\ 06\ (ton/g)\ =\ Emission\ Mass\ per\ year\ (ton/year)$$

Equations 1 through 5 are performed for each pollutant in the context of the operating assumptions (refer to Section 2.3) for both the no action alternative and proposed action. The net emissions in tons per year for each pollutant is calculated utilizing Equation 6.

Equation 6 Net Emission Mass, tons per year in Dallas-Fort Worth Area

$$Proposed\ Action\ Emission\ Mass\ (ton/year)\ -\ No\ Action\ Alternative\ Emission\ Mass\ (ton/year)\ =\ Net\ Emission\ Mass\ (ton/year)$$

The mass of the pollutant emitted in tons per year is then compared against the appropriate general conformity *de minimis* emission level. If the net emissions for each pollutant is below the *de minimis* emission level, the project (proposed action) does not require a general conformity determination.

3.1.1 Chemical Considerations

O_3 naturally forms in the stratosphere as incoming ultraviolet radiation from the sun breaks molecular oxygen, O_2, made up of two atoms into atomic oxygen, O, made up of one atom. When this reaction occurs, much of the ultraviolet radiation is absorbed by the oxygen atoms and thus prevents the radiation energy from reading the Earth's surface.

O_2 + sunlight → O + O Reaction (1)

An individual oxygen atom which is excited with the energy absorbed by the ultraviolet radiation may bond with an oxygen molecule it encounters to form the ozone molecule.

$O_2 + O \rightarrow O_3$ Reaction (2)

O_3 also can form in the troposphere near the Earth's surface. The source of energized oxygen atoms is from the decomposition of nitrogen dioxide, NO_2. When NO_2 interacts with sunlight, it also can react to form energized oxygen atoms. This is illustrated in the reaction below.

NO_2 + sunlight → NO + O Reaction (3)

Once reaction (3) occurs and the energized oxygen atom is created, reaction (2) then can occur which will produce ozone. In the troposphere nitric oxide (NO) will then react with ozone to yield nitrogen dioxide and oxygen. The net result of these series of reactions is no net gain in ozone.

However, there is a net gain in ozone in the troposphere when the NO_x reactant is mixed with VOCs and sunlight. The presence of both NO_x and VOCs is required in the troposphere to yield a net gain of ozone. This chemical reaction is depicted in reaction (4).

NO_x + VOC + sunlight → O_3 (and other products) Reaction (4)

Reaction (4) is a simplification of a more complex chain of reactions, which involves hydroxyl as a catalyst for many of the key reactions. The methodology of this analysis is to consider all NMHCs emitted by the diesel generators to be VOCs to ensure that underestimation of reactants does not occur.

3.2 No Action Alternative Emissions

Utilizing Equation 1, the kilowatt hours per day per hub is calculated. The results of this computation are provided in Table 7 below.

Table 7 Energy Output per Day per Hub - No Action Alternative

Generator	Power Output (kw)	Runtime per day (hrs)	Kilowatt Hours (kWh) per day per hub
MDG25IF4	27	15	405
SDG25S-8E1	20	15	300
DCA25SSIU4F	20	15	300
G25 T4F	19.5	15	292.5
MMG25IF4	27	15	405

Utilizing Equation 2, the total kilowatt hours per day in the Dallas-Fort Worth area is calculated for the no action alternative. The results of this computation are provided in Table 8 below.

Table 8 Total Energy Output per Day, Dallas-Fort Worth Area - No Action Alternative

Generator	Kilowatt Hours (kWh) per day per hub	Number of Hubs	Total kWh per operating day
MDG25IF4	405	11	4455
SDG25S-8E1	300	11	3300
DCA25SSIU4F	300	11	3300
G25 T4F	292.5	11	3217.5
MMG25IF4	405	11	4455

Utilizing Equation 3, the total kilowatt hours per operating year in the Dallas-Fort Worth area is calculated for the no action alternative. The results of this computation are provided in Table 9 below.

Table 9 Total Energy Output per Year, Dallas-Fort Worth Area - No Action Alternative

Generator	Total kWh per operating day	Number of Operating Days per Year	Total kWh per Operating Year
MDG25IF4	4455	312	1389960
SDG25S-8E1	3300	312	1029600
DCA25SSIU4F	3300	312	1029600
G25 T4F	3217.5	312	1003860
MMG25IF4	4455	312	1389960

Utilizing Equation 4 and the emission rates defined in Table 5, the total emission mass per pollutant in grams per year is calculated for the no action alternative. The results of this computation are provided in Table 10 below.

Table 10 Total Emission Mass, grams per Year, Dallas-Fort Worth Area - No Action Alternative

Generator	Total kWh per Operating Year	CO (grams/year)	NMHC+NOx (grams/year)	PM (grams/year)
MDG25IF4	1389960	7644780	6532812	41698.8
SDG25S-8E1	1029600	5662800	4839120	30888
DCA25SSIU4F	1029600	5662800	4839120	30888
G25 T4F	1003860	5521230	4718142	30115.8
MMG25IF4	1389960	7644780	6532812	41698.8

Utilizing Equation 5, the emission mass is converted from gram per operating year to US tons per year for the no action alternative. The results of this computation are provided in Table 11 below.

Table 11 Total Emission Mass, tons per Year, Dallas-Fort Worth Area - No Action Alternative

Generator	CO (ton/year)	NMHC+NOx (ton/year)	Particulate Matter (ton/year)
MDG25IF4	8.43	7.20	0.05

Generator	CO (ton/year)	NMHC+NOx (ton/year)	Particulate Matter (ton/year)
SDG25S-8E1	6.24	5.33	0.03
DCA25SSIU4F	6.24	5.33	0.03
G25 T4F	6.09	5.20	0.03
MMG25IF4	8.43	7.20	0.05

The total emissions presented above will be utilized in the computation of the net emissions in Section 3.4.

3.3 Proposed Action Emissions

Utilizing Equation 1, the kilowatt hours per day per hub is calculated. The results of this computation are provided in Table 12 below.

Table 12 Energy Output per Day per Hub - Proposed Action

Generator	Power Output (kw)	Runtime per day (hrs)	Kilowatt Hours (kWh) per day per hub
MDG25IF4	27	15	405
SDG25S-8E1	20	15	300
DCA25SSIU4F	20	15	300
G25 T4F	19.5	15	292.5
MMG25IF4	27	15	405

Utilizing Equation 2, the total kilowatt hours per day in the Dallas-Fort Worth area is calculated for the proposed. The results of this computation are provided in Table 13 below.

Table 13 Total Energy Output per Day, Dallas-Fort Worth Area - Proposed Action

Generator	Kilowatt Hours (kWh) per day per hub	Number of Hubs	Total kWh per operating day
MDG25IF4	405	30	12150
SDG25S-8E1	300	30	9000
DCA25SSIU4F	300	30	9000
G25 T4F	292.5	30	8775
MMG25IF4	405	30	12150

Utilizing Equation 3, the total kilowatt hours per operating year in the Dallas-Fort Worth area is calculated for the proposed action. The results of this computation are provided in Table 14 below.

Table 14 Total Energy Output per Year, Dallas-Fort Worth Area - Proposed Action

Generator	Total kWh per operating day	Number of Operating Days per Year	Total kWh per Operating Year
MDG25IF4	12150	312	3790800
SDG25S-8E1	9000	312	2808000
DCA25SSIU4F	9000	312	2808000
G25 T4F	8775	312	2737800
MMG25IF4	12150	312	3790800

Utilizing Equation 4 and the emission rates defined in Table 5, the total emission mass per pollutant in grams per year is calculated for the proposed action. The results of this computation are provided in Table 15 below.

Table 15 Total Emission Mass, grams per Year, Dallas-Fort Worth Area - Proposed Action

Generator	Total kWh per Operating Year	CO (grams/year)	NMHC+NOx (grams/year)	PM (grams/year)
MDG25IF4	3790800	20849400	17816760	113724
SDG25S-8E1	2808000	15444000	13197600	84240
DCA25SSIU4F	2808000	15444000	13197600	84240
G25 T4F	2737800	15057900	12867660	82134
MMG25IF4	3790800	20849400	17816760	113724

Utilizing Equation 5, the emission mass is converted from gram per operating year to US tons per year for the proposed action. The results of this computation are provided in Table 16 below.

Table 16 Total Emission Mass, tons per Year, Dallas-Fort Worth Area - Proposed Action

Generator	CO (ton/year)	NMHC+NOx (ton/year)	Particulate Matter (ton/year)
MDG25IF4	22.98	19.64	0.13
SDG25S-8E1	17.02	14.55	0.09
DCA25SSIU4F	17.02	14.55	0.09
G25 T4F	16.60	14.18	0.09
MMG25IF4	22.98	19.64	0.13

The total emissions presented above will be utilized in the computation of the net emissions in Section 3.4.

3.4 Net Emissions

The net emissions are computed using Equation 6 and the results in Table 16 subtracted by the

results in Table 11. The results are shown in Table 17 below.

Table 17 Net Emission Mass, tons per Year, Dallas-Fort Worth Area versus De Minimis Thresholds

Generator	CO (short ton/year)	NMHC+NOx (short ton/year)	Particulate Matter (short ton/year)	Non-attainment De Minimis Threshold, Ozone (O_3) VOC or NOx (ton/year)	Maintenance De Minimis Threshold, CO or PM (ton/year)	Maintenance De Minimis Threshold, Lead (ton/year)
MDG25IF4	14.56	12.44	0.08	25	100	25
SDG25S-8E1	10.78	9.21	0.06	25	100	25
DCA25SSIU4F	10.78	9.21	0.06	25	100	25
G25 T4F	10.51	8.98	0.06	25	100	25
MMG25IF4	14.56	12.44	0.08	25	100	25

The accrual of ozone is based on the generation of both NMHC and NOx combined. The non-attainment de minimis threshold for ozone is 25 tons/year for either VOC or NOx and is greater than the total precursor (NMHC and NOx) emissions.

4. Summary & Conclusion

All generators approved for use are EPA Tier 4 Final certified for emissions. Using the worst-case emission levels as per 40 CFR Part 1039, all generators under the proposed action are estimated to produce no more than 19.64 short tons/year of nonmethane hydrocarbons (NMHC) and nitrogen oxides (NOx). All generators under the no action alternative are estimated to produce no more than 7.2 short tons/year of NMHC and NOx. The net emissions for NMHC and NOx are estimated to be no more than 12.44 short tons/year between the proposed action and the no action alternative. This is less than the de minimis emission level of 25 tons. The maximum estimated emissions for Pb is 0.08 tons per year. This conservatively assumes all particulate matter emissions are Pb. The *de minimis* emission level for maintenance status for Pb is 25 tons per year. The maximum estimated emissions for Pb is below the emission threshold.

The analysis confirms that the net emissions for air pollutants are below the nonattainment general conformity *de minimis* emission levels for VOC and NO_x and maintenance general conformity *de minimis* emission levels for Pb. It is worth noting that the air pollutant emissions mass from the proposed action without subtracting the no action alternative air pollutant emissions mass is below the *de minimis* levels for all pollutants.

Appendix A

Table A-1 Supporting Computational Spreadsheet

Generator	Name	Generator Power (kW), (Prime,Standby)
MDG25IF4 - MDG25IF4 Specification Sheet	Generac Portable Generator	27,30
SDG25S-8E1 - SDG25S-8E1 Specification Sheet	Airman Portable Generator	20,22
DCA25SSIU4F - DCA25SSIU4F Specification Sheet	Multiquip Portable Generator	20,22
G25 T4F - G25 T4F Specification Sheet	Wacker Portable Generator	19.5,21.4
MMG25IF4 - MMG25IF4 Specification Sheet	Generac Magnum Pro Portable Generator	27,30
All generators are EPA Tier 4 Final compliant and operate on prime power.		
Proposed Action Emissions		

Generator	Name	Power Output (kw)	kwh	total kwh per operating day	kwh/year	Emission Rate - CO (g/kWh)	Emission Rate - NMHC +NOx (g/kWh)	Particulate Matter (g/kWh)	CO (short ton/year)	NMHC +NOx (short ton/year)	Particulate Matter (short ton/year)
MDG25IF4	Generac Portable Generator	27	405	12150	3790800	5.5	4.7	0.03	22.98	19.64	0.13
SDG25S-8E1	Airman Portable Generator	20	300	9000	2808000	5.5	4.7	0.03	17.02	14.55	0.09
DCA25SSIU4F	Multiquip Portable Generator	20	300	9000	2808000	5.5	4.7	0.03	17.02	14.55	0.09
G25 T4F	Wacker Portable Generator	19.5	292.5	8775	2737800	5.5	4.7	0.03	16.60	14.18	0.09
MMG25IF4	Generac Magnum Pro Portable Generator	27	405	12150	3790800	5.5	4.7	0.03	22.98	19.64	0.13
Assumptions											
15 Operating Hours per Day, 30 hubs, 312 operating days per year. Conversion Factor from 1 gram to short ton = 1.10E-06											
No Action Alternative Emissions											
Generator	Name	Power Output (kw)	kwh	total kwh per operating day	kwh/year	Emission Rate - CO (g/kWh	Emission Rate - NMHC +NOx	Particulate Matter (g/kWh)	CO (short ton/year)	NMHC +NOx (short ton/year)	Particulate Matter (short ton/yea

						)	(g/kWh)				r)
MDG25IF4	Generac Portable Generator	27	405	4455	1389960	5.5	4.7	0.03	8.43	7.20	0.05
SDG25S-8E1	Airman Portable Generator	20	300	3300	1029600	5.5	4.7	0.03	6.24	5.33	0.03
DCA25SSIU4F	Multiquip Portable Generator	20	300	3300	1029600	5.5	4.7	0.03	6.24	5.33	0.03
G25 T4F	Wacker Portable Generator	19.5	292.5	3217.5	1003860	5.5	4.7	0.03	6.09	5.20	0.03
MMG25IF4	Generac Magnum Pro Portable Generator	27	405	4455	1389960	5.5	4.7	0.03	8.43	7.20	0.05
Assumptions											
15 Operating Hours per Day, 11 hubs, 312 operating days per year. Conversion Factor from 1 gram to short ton = 1.10E-06											
Net Emissions											
Generator	CO (short ton/year)	NMHC+NOx (short ton/year)	Particulate Matter (short ton/year)	Non-attainment De Minimis Threshold, VOC+ NOx	Maintenance De Minimis Threshold, CO or PM						

				(ton/year)	(ton/year)						
MDG25IF4	14.56	12.44	0.08	25	100						
SDG25S-8E1	10.78	9.21	0.06	25	100						
DCA25SSIU4F	10.78	9.21	0.06	25	100						
G25 T4F	10.51	8.98	0.06	25	100						
MMG25IF4	14.56	12.44	0.08	25	100						

Appendix L

Public Comments

Fort Worth Star-Telegram NOA (English):

Notice of Availability, Notice of Public Comment Period, and Request for Comment on the Draft Environmental Assessment for DroneUp, LLC Package Delivery Operations in Dallas–Fort Worth, Texas

The Federal Aviation Administration (FAA) provides notice that a Draft Environmental Assessment (EA), prepared pursuant to the National Environmental Policy Act (NEPA) (42 United States Code §§ 4321 –4355), to assess DroneUp, LLC (DroneUp) proposed commercial drone delivery service in the Dallas–Fort Worth (DFW), Texas metropolitan area is available for review and comment.

DroneUp is seeking to amend its air carrier Operation Specifications (OpSpec) and other FAA approvals necessary to introduce commercial drone delivery operations in Texas. The FAA's approval of the amended OpSpec is considered a major federal action under NEPA and Council on Environmental Quality (CEQ) NEPA–implementing regulations (40 Code of Federal Regulations Parts 1500–1508) and requires a NEPA review. The Draft EA is submitted for review pursuant to NEPA, CEQ NEPA Implementing Regulations, FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, Section 4(f) of the Department of Transportation Act (49 U.S.C. § 303), and Section 106 of the National Historic Preservation Act (16 U.S.C. § 470). The Draft EA will be available for a 30-day public review beginning on Wednesday, August 7, 2024, and ending on Friday, September 6, 2024.

The Draft EA is available for online review at:
https://www.faa.gov/uas/advanced_operations/nepa_and_drones
Comments on the Draft EA may be submitted electronically to 9-faa-drone-environmental@faa.gov. Written comments may be submitted via U.S. Mail to the address below. Please ensure adequate time for receipt. All comments must be received by 5:00 p.m. Central Time on Friday, September 6, 2024.

Federal Aviation Administration, Suite 802W
C/O AVS Environmental
800 Independence Ave SW
Washington, DC 20591
All substantive comments received will be responded to in the Final EA.

PRIVACY NOTICE: Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.
IPL0186914
Aug 7 2024

Fort Worth Star-Telegram NOA (Spanish):

Anuncio de Disponibilidad, Aviso de el Periodo de Comentarios Públicas y Solicitud de Comentarios sobre el Borrador de la Evaluación Ambiental para las Operaciones de Entrega de Paquetes de DroneUp,LLC en Dallas-Fort Worth, Texas
La Administración Federal de Aviación (FAA) notifica que el Borrador de Evaluación Ambiental (EA), preparado de conformidad con la Ley Nacional de Política Ambiental (NEPA) (42 United States §§ 4321-4355), para evaluar la propuesta de DroneUp, LLC (DroneUp) de servicio comercial de entrega de drones en el área metropolitana de Dallas-Fort Worth (DFW), Texas, está disponible para revisión y comentarios.

DroneUp pretende modificar sus Especificaciones de la Operación de Aerolíneas (OpSpec) y otras aprobaciones de la FAA necesarias para introducir operaciones comerciales de entrega con drones en Texas. La aprobación de la FAA de las OpSpec modificadas se considera una acción federal importante según la NEPA y las regulaciones de implementación de la NEPA del Consejo de Calidad Ambiental (CEQ) (40 Code of Federal Regulations Parts 1500-1508) y requiere una revisión de la NEPA. El borrador de la EA se presenta para revisión de conformidad con la NEPA, las Regulaciones de Implementación de la NEPA del CEQ, la Orden 1050.1F de la FAA, Impactos Ambientales: Políticas y Procedimientos, la Sección 4(f) de la Ley de el Departamento de Transporte (49 U.S.C § 303) y la Sección 106 de la Ley Nacional de Preservación Histórica (16 U.S.C § 470). El borrador de la EA estará disponible para una revisión pública durante 30 días a partir del miercoles 7 de agosto de 2024 y finalizará el viernes 6 de septiembre de 2024.

El borrador de EA está disponible para revisión en línea:
https://www.faa.gov/uas/advanced_operations/nepa_and_drones
Los comentarios sobre el borrador de EA pueden enviarse electrónicamente a 9-faa-drone-environmental@faa.gov. Los comentarios por escrito pueden enviarse por correo postal a la dirección que se indica a continuación. Por favor, asegúrese de disponer de tiempo suficiente para el trámite de envío. Todos los comentarios deben recibirse antes de las 5:00 pm., hora del centro, del viernes 6 de septiembre de 2024.
Federal Aviation Administration, Suite 802W
C/O AVS Environmental
800 Independence Ave SW
Washington, DC 20591
Todos los comentarios sustanciales recibidos obtendrán respuesta en la Evaluación Ambiental final.

AVISO DE PRIVACIDAD: Antes de incluir su dirección, número de teléfono, dirección de correo electrónico u otra información de identificación personal en su comentario, tenga en cuenta que su comentario completo- incluidos sus datos de identificación personal- puede hacerse público en cualquier momento. Aunque pueden solicitarnos en su comentario no publicar sus datos de identificación personal para revisión pública, no podemos garantizar que podemos hacerlo.
IPL0186913
Aug 7 2024

Dallas Observer NOA (English):

Legal Notices | Legal Notices | Legal Notices

Notice
Draft Environmental Assessment and
Virtual Public Hearing with In-Person Option
FARM TO MARKET ROAD (FM) 1387
From North Midlothian Parkway to FM 664
CSJs: 1394-02-027, 1394-01-002
Ellis County, Texas

TxDOT is proposing to widen and reconstruct FM 1387 from North Midlothian Parkway to FM 664 in Ellis County, Texas. This notice advises the public that a draft environmental assessment (EA) is available for public review and that TxDOT will be conducting a virtual public hearing on the proposed project with an in-person option. **The virtual hearing will consist of a pre-recorded video presentation and will include both audio and visual components. The materials will be posted online by Thursday, August 22, 2024, at 5 p.m., and will remain online for at least 15 days.** To view the virtual public hearing, go to the following web address at the date and time indicated above: www.keepitmovingdallas.com/projects/fm-roads/fm1387. **Please note the virtual hearing is not a live event and can be viewed at your convenience.** If you do not have internet access, you may call (214) 320-6628 between 8 a.m. and 5 p.m., Monday through Friday, to ask questions and access project materials during the project development process.

In addition, TxDOT is providing an option for individuals who would like to participate in person instead of online. **The in-person option will be held in an open house format from 5 to 7 p.m. with a live presentation about the proposed project at 6 p.m. at the Longbranch Community Baptist Church, 200 Longbranch Road, Midlothian, TX 76065.** In-person attendees will be able to review hard copies of project materials, ask questions of TxDOT staff and/or consultants, and leave comments.

The proposed project consists of the reconstruction, realigning, and widening of FM 1387 from North Midlothian Parkway to FM 664 for approximately 5.8 miles. Improvements would include the expansion of the existing two-lane rural roadway to a four-lane urban roadway (ultimate six-lanes) with a raised median to provide additional capacity and improve safety. Improvements would consist of 12-foot-wide travel lanes, a 10-foot-wide shared-use path on the north side and a five-foot sidewalk on the south side of the roadway. The proposed ROW width will range from 115 feet to 350 feet wide. The proposed project passes through the eastern portion of the City of Midlothian and Ellis County, Texas.

The proposed project would, subject to final design considerations, require additional right of way and potentially displace 10 residences along the FM 1387 corridor west of Longbranch Road. Relocation assistance is available for displaced persons and businesses. Information about the TxDOT Relocation Assistance Program and services and benefits for those displaced and other affected property owners, as well as information about the tentative schedule for right-of-way acquisition and construction, can be obtained from the TxDOT district office by calling (214) 320-6675 or visiting the project website.

The proposed project would involve construction in wetlands and the proposed project would involve an action in a floodplain.

The draft EA, any maps and drawings showing the project location and design, tentative construction schedules, and other information regarding the proposed project will be on file and available for inspection by appointment Monday through Friday between the hours of 8 a.m. and 5 p.m. at the TxDOT Dallas District Office at 4777 East US Highway 80, Mesquite, TX 75150-6643 starting August 22, 2024. Please call (214) 320-6628 to make an appointment. Project materials will also be available online on the project website beginning on Thursday, August 22, 2024, at 5 p.m. These materials will also be available in hard copy form for review at the in-person hearing.

The virtual and in-person public hearing will be conducted in English. If you need an interpreter or document translator because English is not your primary language or you have difficulty communicating effectively in English, one will be provided to you. If you have a disability and need assistance, special arrangements can be made to accommodate most needs. If you need interpretation or translation services or are a person with a disability who requires an accommodation to attend and participate in the virtual or in-person hearing, please contact the TxDOT Dallas District Public Information Office, at (214) 320-4480 no later than 4 p.m., Monday, August 19, 2024. Please be aware that advance notice is required as some services and accommodations may require time for TxDOT to arrange.

La audiencia pública FM 1387 se llevará a cabo en inglés. Si necesita un intérprete o traductor de documentos porque su idioma principal no es el inglés o tiene dificultades para comunicarse eficazmente en inglés, se le proporcionará uno. Si tiene una discapacidad y necesita ayuda, se pueden hacer arreglos especiales para satisfacer la mayoría de las necesidades. Si requiere servicios de interpretación o traducción o es una persona con una discapacidad que requiere una adaptación para asistir y participar en la audiencia pública FM 1387, comuníquese con la Oficina de Información Pública de TxDOT, al número (214) 320-4480, a más tardar las 4 p.m. hora central, antes del lunes 19 de Agosto de 2024. Tenga en cuenta que se requiere aviso previo ya que algunos servicios y adaptaciones pueden requerir tiempo para que TxDOT los organice.

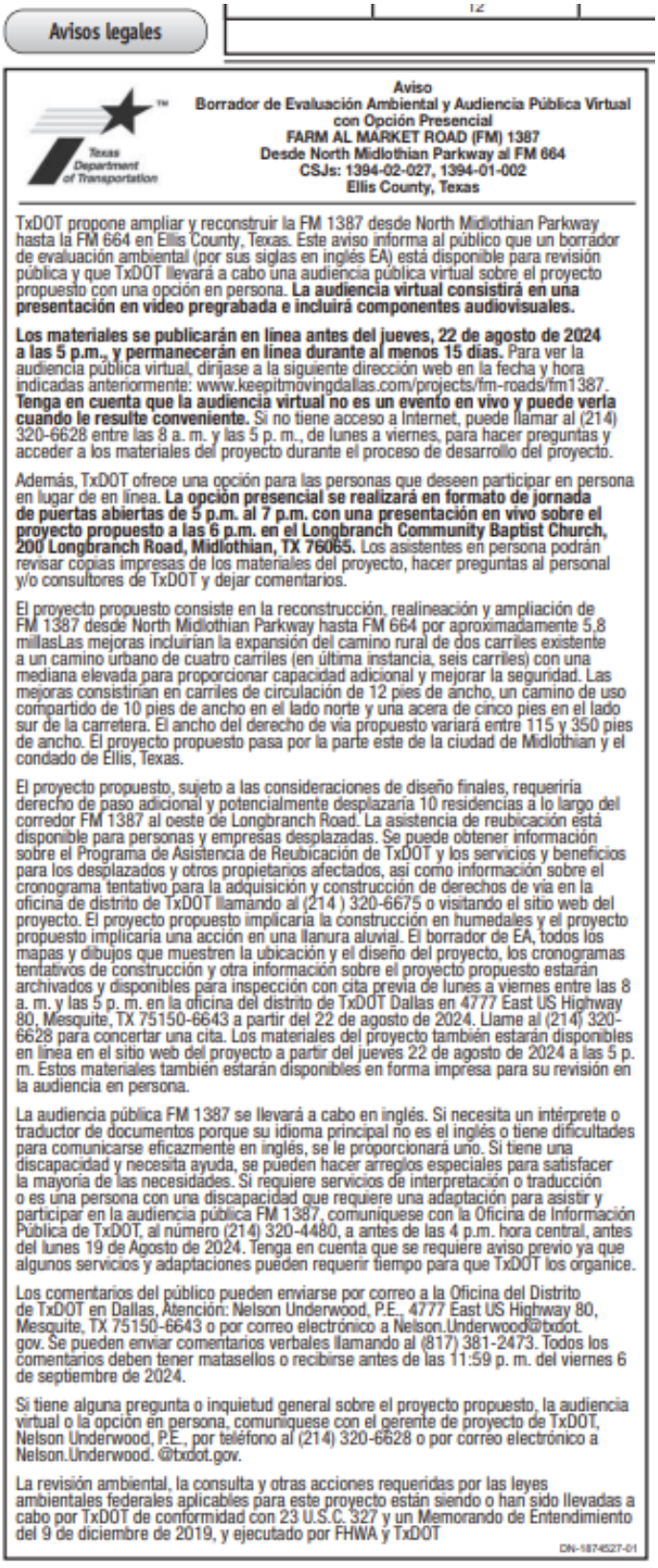
Comments from the public may be submitted by mail to the TxDOT Dallas District Office, Attention: Nelson Underwood, P.E., 4777 East US Highway 80, Mesquite, TX 75150-6643 or by email to Nelson.Underwood@txdot.gov. Verbal comments may be submitted by calling (817) 381-2473. All comments must be postmarked or received by 11:59 p.m., Friday, September 6, 2024.

If you have any general questions or concerns regarding the proposed project or virtual hearing or in-person option, please contact the TxDOT project manager, Nelson Underwood, P.E., by phone at (214) 320-6628, or by email at Nelson.Underwood@txdot.gov.

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

DN-1874567-01

Dallas Observer NOA (Spanish):



Avisos legales

Texas Department of Transportation

Aviso
Borrador de Evaluación Ambiental y Audiencia Pública Virtual con Opción Presencial
FARM AL MARKET ROAD (FM) 1387
Desde North Midlothian Parkway al FM 664
CSJs: 1394-02-027, 1394-01-002
Ellis County, Texas

TxDOT propone ampliar y reconstruir la FM 1387 desde North Midlothian Parkway hasta la FM 664 en Ellis County, Texas. Este aviso informa al público que un borrador de evaluación ambiental (por sus siglas en inglés EA) está disponible para revisión pública y que TxDOT llevará a cabo una audiencia pública virtual sobre el proyecto propuesto con una opción en persona. **La audiencia virtual consistirá en una presentación en video pregrabada e incluirá componentes audiovisuales.**

Los materiales se publicarán en línea antes del jueves, 22 de agosto de 2024 a las 5 p.m., y permanecerán en línea durante al menos 15 días. Para ver la audiencia pública virtual, diríjase a la siguiente dirección web en la fecha y hora indicadas anteriormente: www.keepitmovingdallas.com/projects/fm-roads/fm1387. **Tenga en cuenta que la audiencia virtual no es un evento en vivo y puede verla cuando le resulte conveniente.** Si no tiene acceso a Internet, puede llamar al (214) 320-6628 entre las 8 a. m. y las 5 p. m., de lunes a viernes, para hacer preguntas y acceder a los materiales del proyecto durante el proceso de desarrollo del proyecto.

Además, TxDOT ofrece una opción para las personas que deseen participar en persona en lugar de en línea. **La opción presencial se realizará en formato de jornada de puertas abiertas de 5 p.m. al 7 p.m. con una presentación en vivo sobre el proyecto propuesto a las 6 p.m. en el Longbranch Community Baptist Church, 200 Longbranch Road, Midlothian, TX 76065.** Los asistentes en persona podrán revisar copias impresas de los materiales del proyecto, hacer preguntas al personal y/o consultores de TxDOT y dejar comentarios.

El proyecto propuesto consiste en la reconstrucción, realineación y ampliación de FM 1387 desde North Midlothian Parkway hasta FM 664 por aproximadamente 5,8 millasLas mejoras incluirían la expansión del camino rural de dos carriles existente a un camino urbano de cuatro carriles (en última instancia, seis carriles) con una mediana elevada para proporcionar capacidad adicional y mejorar la seguridad. Las mejoras consistirían en carriles de circulación de 12 pies de ancho, un camino de uso compartido de 10 pies de ancho en el lado norte y una acera de cinco pies en el lado sur de la carretera. El ancho del derecho de vía propuesto variará entre 115 y 350 pies de ancho. El proyecto propuesto pasa por la parte este de la ciudad de Midlothian y el condado de Ellis, Texas.

El proyecto propuesto, sujeto a las consideraciones de diseño finales, requeriría derecho de paso adicional y potencialmente desplazaría 10 residencias a lo largo del corredor FM 1387 al oeste de Longbranch Road. La asistencia de reubicación está disponible para personas y empresas desplazadas. Se puede obtener información sobre el Programa de Asistencia de Reubicación de TxDOT y los servicios y beneficios para los desplazados y otros propietarios afectados, así como información sobre el cronograma tentativo para la adquisición y construcción de derechos de vía en la oficina de distrito de TxDOT llamando al (214) 320-6675 o visitando el sitio web del proyecto. El proyecto propuesto implicaría la construcción en humedales y el proyecto propuesto implicaría una acción en una llanura aluvial. El borrador de EA, todos los mapas y dibujos que muestren la ubicación y el diseño del proyecto, los cronogramas tentativos de construcción y otra información sobre el proyecto propuesto estarán archivados y disponibles para inspección con cita previa de lunes a viernes entre las 8 a. m. y las 5 p. m. en la oficina del distrito de TxDOT Dallas en 4777 East US Highway 80, Mesquite, TX 75150-6643 a partir del 22 de agosto de 2024. Llame al (214) 320-6628 para concertar una cita. Los materiales del proyecto también estarán disponibles en línea en el sitio web del proyecto a partir del jueves 22 de agosto de 2024 a las 5 p. m. Estos materiales también estarán disponibles en forma impresa para su revisión en la audiencia en persona.

La audiencia pública FM 1387 se llevará a cabo en inglés. Si necesita un intérprete o traductor de documentos porque su idioma principal no es el inglés o tiene dificultades para comunicarse eficazmente en inglés, se le proporcionará uno. Si tiene una discapacidad y necesita ayuda, se pueden hacer arreglos especiales para satisfacer la mayoría de las necesidades. Si requiere servicios de interpretación o traducción o es una persona con una discapacidad que requiere una adaptación para asistir y participar en la audiencia pública FM 1387, comuníquese con la Oficina de Información Pública de TxDOT, al número (214) 320-4480, a antes de las 4 p.m. hora central, antes del lunes 19 de Agosto de 2024. Tenga en cuenta que se requiere aviso previo ya que algunos servicios y adaptaciones pueden requerir tiempo para que TxDOT los organice.

Los comentarios del público pueden enviarse por correo a la Oficina del Distrito de TxDOT en Dallas, Atención: Nelson Underwood, P.E., 4777 East US Highway 80, Mesquite, TX 75150-6643 o por correo electrónico a Nelson.Underwood@txdot.gov. Se pueden enviar comentarios verbales llamando al (817) 381-2473. Todos los comentarios deben tener matasellos o recibirse antes de las 11:59 p. m. del viernes 6 de septiembre de 2024.

Si tiene alguna pregunta o inquietud general sobre el proyecto propuesto, la audiencia virtual o la opción en persona, comuníquese con el gerente de proyecto de TxDOT, Nelson Underwood, P.E., por teléfono al (214) 320-6628 o por correo electrónico a Nelson.Underwood. @txdot.gov.

La revisión ambiental, la consulta y otras acciones requeridas por las leyes ambientales federales aplicables para este proyecto están siendo o han sido llevadas a cabo por TxDOT de conformidad con 23 U.S.C. 327 y un Memorando de Entendimiento del 9 de diciembre de 2019, y ejecutado por FHWA y TxDOT

DN-1874527-01

Dallas Morning News NOA (English):

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Washington, D.C.

Notice of Availability, Notice of Public Comment Period, and Request for Comment on the Draft Environmental Assessment for DroneUp, LLC Package Delivery Operations in Dallas–Fort Worth, Texas

The Federal Aviation Administration (FAA) provides notice that a Draft Environmental Assessment (EA), prepared pursuant to the National Environmental Policy Act (NEPA) (42 United States Code §§ 4321 –4355), to assess DroneUp, LLC (DroneUp) proposed commercial drone delivery service in the Dallas–Fort Worth (DFW), Texas metropolitan area is available for review and comment.

DroneUp is seeking to amend its air carrier Operation Specifications (OpSpec) and other FAA approvals necessary to introduce commercial drone delivery operations in Texas. The FAA's approval of the amended OpSpec is considered a major federal action under NEPA and Council on Environmental Quality (CEQ) NEPA–implementing regulations (40 Code of Federal Regulations Parts 1500–1508) and requires a NEPA review. The Draft EA is submitted for review pursuant to NEPA, CEQ NEPA Implementing Regulations, FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, Section 4(f) of the Department of Transportation Act (49 U.S.C. § 303), and Section 106 of the National Historic Preservation Act (16 U.S.C. § 470). The Draft EA will be available for a 30-day public review beginning on **Wednesday, August 7, 2024, and ending on Friday, September 6, 2024.**

The Draft EA is available for online review at: https://www.faa.gov/uas/advanced_operations/nepa_and_drones

Comments on the Draft EA may be submitted electronically to 9-faa-drone-environmental@faa.gov. Written comments may be submitted via U.S. Mail to the address below. Please ensure adequate time for receipt. All comments must be received by 5:00 p.m. Central Time on Friday, September 6, 2024.

Federal Aviation Administration, Suite 802W
C/O AVS Environmental
800 Independence Ave SW
Washington, DC 20591

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Dallas Morning News NOA (Spanish):

Departamento de Transporte

Administración Federal de Aviación

Washington, D.C.

Anuncio de Disponibilidad, Aviso de el Periodo de Comentarios Públicas y Solicitud de Comentarios sobre el Borrador de la Evaluación Ambiental para las Operaciones de Entrega de Paquetes de DroneUp,LLC en Dallas-Fort Worth, Texas

La Administración Federal de Aviación (FAA) notifica que el Borrador de Evaluación Ambiental (EA), preparado de conformidad con la Ley Nacional de Política Ambiental (NEPA) (42 United States §§ 4321-4355), para evaluar la propuesta de DroneUp, LLC (DroneUp) de servicio comercial de entrega de drones en el área metropolitana de Dallas-Fort Worth (DFW), Texas, está disponible para revisión y comentarios.

DroneUp pretende modificar sus Especificaciones de la Operación de Aerolíneas (OpSpec) y otras aprobaciones de la FAA necesarias para introducir operaciones comerciales de entrega con drones en Texas. La aprobación de la FAA de las OpSpec modificadas se considera una acción federal importante según la NEPA y las regulaciones de implementación de la NEPA del Consejo de Calidad Ambiental (CEQ) (40 Code of Federal Regulations Parts 1500-1508) y requiere una revisión de la NEPA. El borrador de la EA se presenta para revisión de conformidad con la NEPA, las Regulaciones de Implementación de la NEPA del CEQ, la Orden 1050.1F de la FAA, Impactos Ambientales: Políticas y Procedimientos, la Sección 4(f) de la Ley de el Departamento de Transporte (49 U.S.C § 303) y la Sección 106 de la Ley Nacional de Preservación Histórica (16 U.S.C § 470). El borrador de la EA estará disponible para una revisión pública durante 30 días a partir del **miercoles 7 de agosto de 2024 y finalizará el viernes 6 de septiembre de 2024.**

El borrador de EA está disponible para revisión en línea: https://www.faa.gov/uas/advanced_operations/nepa_and_drones

Los comentarios sobre el borrador de EA pueden enviarse electrónicamente a 9-faa-drone-environmental@faa.gov. Los comentarios por escrito pueden enviarse por correo postal a la dirección que se indica a continuación. Por favor, asegúrese de disponer de tiempo suficiente para el trámite de envío. Todos los comentarios deben recibirse antes de las 5:00 pm., hora del centro, del viernes 6 de septiembre de 2024.

Federal Aviation Administration, Suite 802W
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800 Independence Ave SW
Washington, DC 20591

Todos los comentarios sustanciales recibidos obtendrán respuesta en la Evaluación Ambiental final.

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Comment #1:

From: Jordan Rockerbie <jrockerbie@plano.gov>
Sent: Tuesday, August 6, 2024 1:43 PM
To: 9-FAA-Drone-Environmental (FAA) <9-FAA-Drone-Environmental@faa.gov>
Subject: DroneUp DFW Draft EA - City of Plano

Good afternoon,

The city of Plano regulates drone delivery hubs from a zoning/land use perspective. Any sites in Plano city limits will need to follow the planning and permitting processes of the city to comply with local laws.

Please let me know if you have any follow-up questions.

Thank you,

Effective April 1, 2024, and until further notice, Planning & Zoning Commission meetings will temporarily be held at Davis Library during the renovation of the Council Chambers. Speaker registration will close at 4 p.m. on the day of the meeting.

Please take a moment to complete the City of Plano Customer Satisfaction Survey.

Plano
City of Excellence
Planning Department

Serving Since 2022

Jordan Rockerbie, AICP
Senior Planner – Development Services
1520 K Avenue, 2nd Floor
Suite 250, Plano, Texas 75074

Tel: 972-941-7151
JRockerbie@Plano.gov
Plano.gov

FAA Response:

Thank you for your comments. As described in EA Sec. 3.2.1., DroneUp is responsible for complying with applicable local land use requirements.

Comment #2:

From: Steve Smith <adgjl8222@yahoo.com>
Sent: Friday, August 9, 2024 5:09 PM
To: 9-FAA-Drone-Environmental (FAA) <9-FAA-Drone-Environmental@faa.gov>
Subject: DroneUp Carbon Footprint Concern

Hello,

I'm very concerned that the Carbon footprint projections are miscalculated based upon the very disproven idea that the world is a sphere. If you adjust correctly for the world being a linear disc model, the carbon footprint is even worse. This is clearly a major concern for global pollution and the flight industry is actively engaging in conspiracy to propagate the big lie. Presumably to get away with their poor emission standards!
Also planes/drones should be run on wind power. If you stick a wind turbine on a drone it could easily power itself as it is moving through the air. It's basic science!

I am looking forward to your thoughtful response!

Thanks you

FAA Response:

EA Section 3.3 (content and footnotes 28-30) reference the Environmental Protection Agency (EPA) established emission standards for generators. Based on a 2020 study of drone delivery operations, by year 5 of operations drones were projected to replace between 15.0 percent of total delivery miles previously made by automobiles in Cedar Park TX, or between 32 million miles and 75.5 million miles. The same study projected that by year five (5) of operations drones were projected to replace between 15.9 percent and 18.7 percent of total delivery miles previously made by automobiles in Crestview TX, or between 45.7 million miles and 96.0 million miles. (Lyon-Hill et al. 2020). The proposed action is expected to decrease emissions from delivery services that contribute to greenhouse gases (GHG) emissions. The decreased emissions would have positive effects on climate change as the proposed action would replace vehicle miles traveled by GHG emitting vehicles. The unmanned aircraft, the PRISM V2 series, is electric powered, not wind powered.

Comment #3:

TEXAS PARKS & WILDLIFE

Life's better outside."

August 20, 2024

Ms. Shelia S. Neumann
Environmental Protection Specialist Unmanned Aircraft Systems (UAS)/NEPA
General Aviation & Commercial Branch AFS-752 Emerging Technologies Division
Office of Safety Standard, Flight Standards Service Federal Aviation Administration
By email: 9-FAA-Drone-Environmental@faa.gov

RE: Draft Environmental Assessment for DroneUP, LLC. Proposed Package Delivery Operations in Dallas-Fort Worth Texas Metropolitan Area.
Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties, Texas.

Dear Ms. Shelia S. Neumann:

The U.S. Department of Transportation Federal Aviation Administration (FAA) provided the draft Environmental Assessment (EA) that analyzes and discloses the potential environmental effects of the FAA decision to approve DroneUP, LLC (DroneUP) to conduct unmanned aircraft (UA) commercial drone delivery operations in the Dallas-Fort Worth (DFW), Texas metropolitan area.

Project Description

DroneUP is seeking to amend its air carrier Operation Specifications (OpSpec) and other FAA approvals necessary to introduce commercial drone package delivery operations into an operating area that is circular in shape with an approximate radius of 30 nautical miles from a center point near the DFW International Airport. The proposed action is the FAA approval of the amended DroneUP BOSO OpSpec, *Authorized Areas of En Route Operations, Limitations, and Provisions.*

DroneUP will operate beyond visual line-of-sight (BVLOS) at the locations approved for operations conducted with an air carrier certificate under 14 Code of Federal Regulations (CPR) Part 135 and with a condition that its drone package delivery operations must be conducted in accordance with the provisions and limitation specified in its OpSpec. The OpSpec must include, among other things, authorization and limitation for routes and areas of operation. DroneUP currently operates in 34 locations national wide and proposes to extend its UA retail package delivery to additional communities in the DFW metro area. DroneUP will operate 11 Hubs initially at the following identified locations, and a maximum of30 Hubs in the next two years in the DFW 30 nautical-mile operating area:

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744·3291
512.389.4800
www.tpwd.texas.gov

Location Name	Address	Coordinates
TX000l	2501 Lakeview Pkwy Rowlett, TX	32°54'38"N 96°34'40"W
TX0002	555 West Interstate 30 Garland, TX	32°50'25"N 96°35'39"W
TX0003	1801 Marketplace Dr Garland, TX	32°5l'46"N 96°39'07"W
TX0004	3100 Custer Rd Plano, TX	33°02'21"N 96°43'52"W
TX0005	115 W Farm to Market 544 Murphy, TX	33°00'46"N 96°36'54"W
TX0006	915 Town E Blvd Mesquite, TX	32°48'47"N 96°36'36"W
TX0007	2827 S Buckner Blvd Dallas, TX	32°45'35"N 96°40'58"W
TX0008	2275 Gus Thomasson Rd Mesquite, TX	32°47'41"N 96°38'05"W
TX0009	1501 Buckingham Rd Richardson, TX	32°55'56"N 96°4l'49"W
TX00l0	4691 State Highway 121 Colony, TX	33°04'02"N 96°53'32"W
TX00l l	3959 Broadway Blvd Garland, TX	32°5l'52"N 96°36'25"W

The UA have a delivery range of five miles from each Hub. The Hubs would be sited in parking lots of commercial areas where a delivery specialist may be located on the ground during a flight. The maximum number of daily operations per Hub is expected to be 500 flights per day and will operate seven days a week to include holidays. Flights would occur from 7am to 10pm local time. Each Hub would contain multiple aircraft takeoff and landing pads which are no less than 16 feet by 16 feet in area.

DroneUP would use its PRISM V2 Series UAs, which include a multirotor design with eight propellers, weighing 55 pounds when combined with its maximum payload weight of 10 pounds. The UA has a wingspan of approximately 71.5 inches, a height of 32 inches, and a length of 71.5 inches. The UA would generally operate at an altitude of 230-250 feet above ground level (AGL) and always below an altitude of 400 feet AGL while en route to and from delivery locations. At a delivery location, the UA would descend vertically to a stationary hover at 80-120 feet AGL and lower a package to the ground by a retractable line for delivery. Once a package has been lowered to the ground, the UA would then retract the line, ascend vertically to a cruise altitude, and depart the delivery area en route back to a Hub, using a cruise airspeed of 31.5 miles per hour.

The EA indicates that Hubs would be located in retail store parking lots, and there would be no ground disturbance or habitat modification associated with the proposed project.

TPWDReview

Under Texas Parks and Wildlife Code (PWC) Section 12.0011(6)(2) and (6)(3), TPWD has authority to provide recommendations and informational comments that will protect fish and wildlife resources to local, state, and federal agencies that approve, license, or construct developmental projects or make decisions affecting those resources. TPWD is providing input on this proposed project to facilitate the incorporation of beneficial management practices (BMP) during construction, operation, and maintenance that may assist the project proponent in minimizing impacts to the state's natural resources. Pursuant to PWC Section 12.0011(6)(2) and (b)(3), TPWD offers the following comments and recommendations concerning this project.

Federal Law

Federal Law: Endangered Species Act (ESA)

Federally listed animal species and their habitat are protected from take on any property by the Endangered Species Act (ESA). Take of a federally listed species can be allowed if it is incidental to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Take of a federally listed species or its habitat without allowance from the U.S. Fish and Wildlife Service (USFWS) is a violation of the ESA.

The EA includes a Section 7 consultation with the USFWS which concurs with the FAA determination that the project, as proposed, *may affect, but is not likely to adversely affect* the federal endangered golden-cheeked warbler *(Setophaga chrysoparia)* and whooping crane (*Grus americana)* pursuant to the ESA. The FAA determination indicates that any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measures, detected, or evaluated). This is based on 1) operations occurring mostly in an urban environment, 2) the altitude at which the UA flies in the en route phase (230-250 feet AGL), 3) the expected low sound levels experienced by a golden-cheeked warbler and whooping crane, 4) any increase in ambient sound levels would be short in duration, 5) the low probability of a golden-cheeked warbler or whooping crane occurring in the action area, and 6) the low likelihood of the UA striking a warbler or whooping crane.

Although little preferred habitat occurs within the study area because many juniper and oak woodlands have been cleared for urbanization and agriculture in the DFW area, the USFWS did indicate in the Section 7 consultation that a small number of golden-cheeked warblers have been reported during the breeding season in 2023 in Dallas County. This is indication that the warbler may be utilizing the Ashe juniper and oak woodlands that remain in Dallas County primarily in the area near Cedar Hill, at the northern extent of the Balcones Escarpment. The EA indicates that if present in the action area, individual golden-cheeked warblers would not likely experience multiple overflights of a UA due to the mobility of the birds. TPWD notes that if golden-cheeked warblers are returning to the juniper and oak woodlands of the Cedar Hill area for nesting, birds would be less mobile.

In the Balcones Escarpment area near Cedar Hill, Texas, suitable habitats for the golden- cheeked warbler occur in parks and reserves, such as the Dogwood Canyon Audubon Center, Cedar Hill State Park, U.S. Army Corps of Engineers Joe Pool Lake Project, Cedar Mountain-Dallas County Nature Preserve, and Cedar Ridge Preserve.

The EA indicates that DroneUP will specifically coordinate with the managing entities of state parks and natural areas within the DFW area on the thoughtful placement and use of delivery sites within these areas, as necessary.

> **Recommendation:** To minimize potential disturbance to nesting golden-cheeked warblers, TPWD recommends DroneUP avoid or minimize flight paths over suitable juniper and oak woodland nesting habitat for the golden-cheeked warbler. TPWD recommends DroneUP coordinate directly with each entity managing the parks and

preserves in the Balcones Escarpment to identify appropriate avoidance areas or NFZs during the nesting season.

Federal Law: Migratory Bird Treaty Act

The Migratory Bird Treaty Act prohibits taking, attempting to take, capturing, killing, selling, purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts, or nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species.

The EA indicates that migratory birds can be found within the study area and acknowledges that certain birds may display disturbance behaviors toward drones, such as mobbing or attack behaviors, but notes that information on drone interactions with birds is not well documented. Based on the information available regarding the interaction between drones and birds, the FAA concludes that mobbing and attacking behaviors would be the most relevant interaction to occur. The EA concluded that the proposed action would not be expected to result in significant impacts on migratory birds because it would not result in long-term or permanent loss of wildlife species, would not result in substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or populations, and would not have adverse impacts on reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels.

Recommendation: Because bird interactions with drones is not well documented, TPWD recommends DroneUP report bird interactions with the UAs to TPWD and USFWS Migratory Bird Office at (505) 248-7882, on an annual basis, if interactions occur. Reports should include dates, identify the bird by species, identify damage to the UA, identify injury or death to the bird, and provide a location of the interaction, when such data is obtainable. Data obtained from reports may indicate a need for adjustments to flight paths or timing to reduce impacts to avian wildlife.

Recommendation: To minimize potential disturbance to nesting, foraging, and roosting birds, unnecessary flights should be avoided over woodlands and other undeveloped lands within the proposed operating area, when feasible. Undeveloped lands within public parks and recreation areas have less likelihood of future development and offer habitat for breeding birds, and TPWD recommends that DroneUP avoid or minimize flights over public parks and nature reserves.

Federal Law: Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles *(Haliaeetus leucocephalus)* and golden eagles *(Aquila chrysaetos),* including their parts, nests, or eggs. The BGEPA provides criminal penalties for persons who, take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The BGEPA defines take to include pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.

The EA indicates that bald eagles may occur year round in Texas and that bald eagle nests have been previously documented in the DFW area around Benbrook Lake, Joe Pool Lake, Lake Arlington, Lake Worth, Lewisville Lake, and Mountain Creek Lake. The EA indicates that the bald eagle and other raptors may exhibit territorial behavior when nesting. The EA indicates that, according to the National Bald Eagle Management Guidelines, if conservation measures can be implemented such that no aircraft are flown within 1,000 feet of an eagle nest, then incidental take of a bald eagle is unlikely to occur, and no permit is needed. The EA indicates that DroneUP is responsible for compliance with the BGEPA.

To avoid impacts to bald eagles, DroneUp has agreed to a monitoring plan for bald eagle nests that integrates multiple strategies and resources. This includes periodically checking online tools such as iNaturalist to identify eagle nests that may occur in the operating area, as well as communication with the bird watching community to identify nests. DroneUp personnel will also be educated in the visual identification of bald eagle nests, which are typically very conspicuous. IfDroneUp identifies a bald eagle nest or is notified of the presence of a nest, DroneUp will establish an avoidance area such that there is a 1,000 feet vertical and horizontal separation distance between the vehicle's flight path and the nest. DroneUp will maintain this avoidance area until the end of the breeding season or until a qualified biologist indicates the nest has been vacated. DroneUp will regularly report monitoring and avoidance measures to Texas Parks & Wildlife and the USFWS Region 2 Migratory Bird Permit Office. DroneUp has not had any bird strikes related to their operations

TPWD notes that the breeding and nesting season for bald eagles m Texas 1s approximately late October into June, with peak hatching in January.

> **Recommendation:** Because eagles are known to nest in the operating area and because eagles will utilize the same nest from year to year, TPWD recommends DroneUP incorporate nest avoidance areas with the intention to avoid the nest in subsequent breeding and nesting seasons or until the nest is no longer present such as when the nest falls apart or the nest tree falls.
>
> **Recommendation:** TPWD recommends consultation with USFWS Region 2 Migratory Bird Permit Office for input regarding adequacy of the monitoring plan and to ensure compliance with BGEPA.

Parks, Nature Preserves, and Recreational Areas

The EA includes a Section 4(f) of the U.S. Department of Transportation Act evaluation to ensure that the project protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites.

The EA concludes that there would be no physical use of Section 4(f) resources, including public parks, because occasional flyovers in the study area would not result in substantial impairment of Section 4(f) properties. As discussed in Section 3.6, *Noise and Noise-Compatible Land Use*, and the EA's Appendix J, the EA indicates the proposed action would not result in significant noise levels at any location within the study area. As further described in Section 3.8, *Visual Effects*, the EA indicates the short duration of

en route flights (approximately 5 minutes) would minimize any potential for significant visual impacts. In addition, DroneUP's flight planning software is designed to increase variability in flight paths to minimize overflights of any given location; with the diversification of flight paths, the frequency of overflights would inversely scale as the distance from a Hub increases. Therefore, the FAA has determined that UA overflights as described in the proposed action would not cause substantial impairment to any of the Section 4(f) resources in the study area and are therefore not considered a constructive use of any Section 4(f) resource.

Although the FAA finds that the project would not cause impairment to park resources, TPWD finds that the user experience at some parks could be adversely affected by overflights in natural areas, such as in the viewshed of hiking trails, campgrounds, day use areas, primitive camping sites, and boating or fishing areas.

The DroneUP flight planning software can automatically avoid areas, and selected operating areas are mapped by the implementation team prior to operations. Higher risk areas such as parks, schools, and other areas can be marked off with a No-Fly Zone (NFZ) to ensure aircraft strategically avoid these areas. However, the EA indicates that the study area includes many public parks administered by state, city, and county authorities, and that they are not currently included in DroneUP's NFZ restrictions, which only include schools, preschools, and daycares with outdoor facilities, and churches.

> **Recommendation:** To avoid disturbance and visual nuisance impacts to wildlife and park users, TPWD recommends avoiding flights over nature preserves, parklands, and recreational areas. If flights over nature preserves, parklands, and recreational areas are required, TPWD recommends coordinating with the managing entity to ensure that flight paths are thoughtfully placed to minimize visual nuisance and disturbances.

Cedar Hill State Park and Ray Roberts Lake State Park

The operating area includes the following two TPWD managed State Parks: Cedar Hill State Park and Ray Roberts Lake State Park.

> **Comment:** TPWD prefers that overflights and deliveries be avoided at TPWD State Parks to avoid conflict with State Park user experiences. If overflights cannot be avoided, TPWD requests that overflights avoid campgrounds, primitive campsites, day use areas, and trails. TPWD requests DroneUP coordinate directly with TPWD State Parks Division regarding any proposed overflight locations over a TPWD State Park to ensure that overflights lengths are minimized and located to minimize impacts on parks user experiences or wildlife. Regarding deliveries, TPWD requests DroneUP coordinate directly with TPWD State Parks Division to strategize on avoiding delivery locations within a State Park or to potentially identify specified delivery sites within a State Park, if approved by TPWD. Once DroneUP establishes a Hub in the range of a State Park, continued open communication with TPWD will enable DroneUP and TPWD to identify thoughtfully placed operations that can be adjusted as needed to address unforeseen needs or issues. For coordination regarding

TPWD State Parks, please coordinate with Chris True, Regional Director, Region 6 State Parks - Northeast Texas.

TPWD Private Lands and Public Hunting Program

TPWD manages the Ray Roberts Lake Public Hunting Lands (PHL) under a license agreement with USACE to maintain native wildlife populations and habitats through wildlife habitat management and public hunting. The Public Hunting Areas Interactive Map identifies the location of public hunting lands which are updated annually and can be found on the TPWD Website at https://tpwd.texas.gov/huntwild/hunt/public/. TPWD review indicates that a portion of DroneUP's operating area includes some Ray Roberts Lake PHL at the periphery of the operating area.

Recommendation: TPWD recommends that overflights and deliveries be avoided at TPWD PHL during open hunting seasons to avoid conflict with hunter experiences. TPWD recommends reviewing the TPWD PHL map and annual hunting season dates on an annual basis to ensure that new PHL are avoided. For more information regarding the PHL program, please coordinate with Kevin Mote, Private Lands and Public Hunting Program Director at (512) 217-2779.

Thank you for thoughtful consideration of the fish and wildlife resources of Texas. If you have any questions, please contact me at Karen.Hardin@tpwd.texas.gov or (903) 322- 5001.

Sincerely,

Karen B. Hardin
Environmental Review Biologist
Ecological and Environmental Planning
Program Wildlife Division

FAA Response:

FAA/DroneUp acknowledge under Texas Parks and Wildlife Code (PWC) Section 12.0011(b)(2) and (b)(3) that TPWD has authority to provide recommendations and informational comments that will protect fish and wildlife resources to local, state, and federal agencies that approve, license, or construct developmental projects or make decisions affecting those resources. The recommendations and informational comments provided were received as constructive in nature and appreciated.

DroneUp seeks to minimize potential disturbance to golden-cheeked warblers and will attempt to minimize flight paths over areas suitable for golden-cheeked warblers to nest. DroneUp will coordinate with entities managing the parks and preserves in the Balcones Escarpment to identify appropriate avoidance areas during the nesting season.

If a reportable incident occurs due to bird interactions with the UAs, DroneUp will report strikes to FAA and comply with FAA reporting requirements in accordance with Form FAA 5200-7.

Flight paths are planned to prioritize reduction of ground risk, which involves avoiding developed lands where possible. When feasible, DroneUp will attempt to minimize potential disturbance to nesting, foraging, and roosting birds.

If DroneUp identifies a Bald Eagle nest or is notified of the presence of a nest, DroneUp will establish an avoidance area such that there is a 1,000 feet vertical and horizontal separation distance between the vehicle's flight path and the nest. DroneUp will maintain this avoidance area until the end of the breeding season or until a qualified biologist indicates the nest has been vacated. DroneUp will regularly report monitoring and avoidance measures to Texas Parks & Wildlife and the USFWS Region 2 Migratory Bird Permit Office. As stated in the EA, DroneUp personnel will also be educated in the visual identification of Bald Eagle nests, which are typically very conspicuous, to aid in timely incorporation of nest avoidance areas.

DroneUp has not had any bird strikes related to their operations.

Flight paths are planned to prioritize reduction of ground risk, which involves avoiding developed lands where possible and areas of higher population densities. In the event that flights are consistently routed over nature preserves, parklands, or recreational areas, DroneUp will take efforts to distribute flight routing.

DroneUp deliveries are typically conducted at residential or business addresses. At this time none of the 11 DroneUp hub locations are located within 5 miles of a Texas State Park. When a hub operating area overlaps with property within the boundaries of a Texas State Park, DroneUp will attempt to minimize impacts on parks user experiences or wildlife through careful flight path planning and coordination with TPWD State Parks if necessary.

DroneUp will consider including public hunting lands as part of hub location assessments and if included, may evaluate the feasibility of avoiding overflights and deliveries at TPWD public hunting lands during certain time periods.

Comment 4:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

August 23, 2024

Sheila S. Neumann, Ph.D., P.E
Environmental Protection Specialist
Unmanned Aircraft Systems (UAS)/NEPA
Federal Aviation Administration, Suite 802W
800 Independence Ave SW
Washington, DC 20591

Via: **E-mail**

Re: **TCEQ NEPA Request #2024-238. DRONE PACKAGE DELIVERY OPERATIONS IN DALLAS– FORT WORTH, TEXAS. Tarrant and Dallas County.**

Dear Ms. Neumann,

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers the following comments:

The proposed action is located in Tarrant and Dallas Counties, which are designated nonattainment for the 2008 eight-hour ozone National Ambient Air Quality Standard (NAAQS) with a classification of severe and designated nonattainment for the 2015 eight-hour ozone NAAQS with a classification of moderate; therefore, federal Clean Air Act, §176(c) general conformity requirements apply. Per federal general conformity regulations at 40 CFR §93.153, a conformity demonstration may be required when the total projected direct and indirect volatile organic compounds (VOC) and nitrogen oxides (NOX) emissions—precursor pollutants that lead to the formation of ozone—from an applicable federal action are equal to or exceed the de minimis emissions level of 100 tons per year (tpy) for ozone NAAQS moderate nonattainment areas and 25 tpy for severe nonattainment areas.
For emissions analyses conducted to determine general conformity applicability, the TCEQ recommends using a methodology consistent with the requirements at 40 CFR §93.159.

The Office of Water does not anticipate significant long term environmental impacts from this project as long as construction and waste disposal activities associated with it are completed in accordance with applicable local, state, and federal environmental permits, statutes, and regulations. We recommend that the applicant take necessary steps to ensure that best management practices are used to control runoff from construction sites to prevent detrimental impact to surface and ground water.

Any debris or waste disposal should be at an appropriately authorized disposal facility.

Thank you for the opportunity to review this project. If you have any questions, please contact the agency NEPA coordinator at (512) 239-5538 or NEPA@tceq.texas.gov

Sincerely,

Ryan Vise,
Division Director
External Relations

P.O. Box 13087 • Austin, Texas 78711-3087 • 512-239-0010 • tceq.texas.gov

How is our customer service? tceq.texas.gov/customersurvey

FAA Response:

As described in EA Section 3.3, and Appendix K, the estimated air emissions would be minimal and are not expected to contribute to any exceedance of National Ambient Air Quality Standards or Nonattainment Areas General Conformity De Minimis Emission Levels in 40 CFR § 93.153. The Dallas-Fort Worth area is a severe non-attainment area for Ozone (O3), with the de minimis emission level for Volatile Organic Compounds (VOCs) and nitrogen oxides (NOx) of 25 tons per year, as per 40 CFR § 93.153. A conservative estimation was performed built on the following worst-case assumptions for the proposed action air emission calculations: - Generators operate 15 hours per day based on operations from 7AM to 10PM (refer to Section 2.2 of the EA). DroneUp currently use 11 mobile hubs which utilize generators. Up to 30 hubs are planned to designated as mobile hubs which utilize generators - 312 operating days per year (refer to Section 3.6.3.2 of the EA).

DroneUp consulted with a TCEQ representative, and received direction that the correct non-attainment and maintenance designations for the DFW area in accordance with *Dallas-Fort Worth: Current Attainment Status.* [1] The conversation was confirmed via email.

All generators that will be used are EPA Tier 4 Final certified for emissions. Using the worst-case emission levels as per 40 CFR Part 1039, all generators under the proposed action are estimated to produce no more than 19.64 short ton/year of nonmethane hydrocarbons (NMHC) and NOx All generators under the no action alternative are estimated to produce no more than 7.2 short ton/year of NMHC and NOx. The net emissions for NMHC and NOx are estimated to be no more than 12.44 short ton/year between the proposed action and the no action alternative. This is less than the de minimis emission level of 25 tons. The maximum estimated emissions for CO and particulate matter are well below de minimis thresholds for non-attainment and maintenance area types. See Air Emissions Analysis for DroneUp Proposed Package Delivery Operations in Dallas-Fort Worth, Texas, Appendix K.

Any construction and waste disposal activities must comply with local and state requirements. DroneUp intends to adhere to best management practices to mitigate stormwater and soil erosion impacts.

[1] https://www.tceq.texas.gov/airquality/sip/dfw/dfw-status

Comment 5:

August 23, 2024

Federal Aviation Administration, Suite 802W
C/O AVS Environmental
800 Independence Ave SW
Washington, DC 20591
Attn: 9-faa-drone-environmental@faa.gov

Re: Notice of Availability, Notice of Public Comment Period, and Request for Comment on the Draft Environmental Assessment for DroneUp, LLC Package Delivery Operations in Dallas–Fort Worth, Texas

Association for Uncrewed Vehicle Systems International Comment

The Association for Uncrewed Vehicle Systems International (AUVSI), the world's largest non-profit devoted exclusively to advancing the uncrewed systems and robotics community, supports the extension by DroneUp, LLC (DroneUp) to its B050 Air Carrier Operation Specifications (OpSpec), Authorized Areas of En Route Operations, Limitations, and Provisions, to introduce commercial drone delivery operations in additional communities in Dallas-Fort Worth, Texas (DFW) metropolitan area. DroneUp is a valued member company of AUVSI, and we applaud their efforts to safely expand their operations to additional communities around the nation.

Thousands of businesses – large and small, across the country – are embracing technology, such as drones, to enhance efficiency, keep people safe, be conscious of the environment, and provide new workforce opportunities. AUVSI and its members, including DroneUp, work closely with the U.S. government to ensure their delivery operations remain safe and compliant with federal regulations, and we have built an enviable track record. It is our goal to empower our member companies to do what they do best – continue to push the envelope of cutting-edge technology in the Uncrewed Aircraft Systems (UAS) sector. It is our job to ensure that regulators are keeping up with the pace of industry and fostering their innovation rather than stifling it.

As indicated in the Notice of Availability (NOA), "the FAA's approval of the amended OpSpec is considered a major federal action under the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) NEPA-implementing regulations (40 Code of Federal Regulations Parts 1500–1508) and requires a NEPA review." AUVSI has been working hand in hand with our members to help make the NEPA/environmental review process more effective and less burdensome for UAS companies to help ensure their scalability in the United States. Expanding the use of drones can have significant environmental benefits, from reducing carbon-emitting automobile traffic to providing safer and cleaner alternatives for aerial inspection work to affording new ways for those with mobility challenges or living within food deserts to access goods. The environmental benefits provided by expanding the use of drones are the very reason why it is important to ensure the environmental review process works effectively and in a timely manner.

It is noteworthy that DroneUp has been operating under 14 Code of Federal Regulations (CFR) Part 107, since October 2022, and that the company has formally applied to the Federal Aviation Administration (FAA) for a standard air carrier certificate under 14 CFR Part 135 (Part 135) and a 49 United States Code (U.S.C.) 44807 exemption to further expand their operations in the future. DroneUp currently operates in 34 locations nationwide and has proved their concepts of operations within existing regulatory frameworks. We are encouraged by DroneUp's goal of expanding service throughout the DFW area from their network of Hubs, where each Hub would serve a specific area.

DroneUp's proposed expansion to its OpSpec is a reasonable extension of this extensive regulatory compliance. The proposed action in the FAA's draft Environmental Assessment (EA) of expanding the OpSpec will enable DroneUp to continue to have an outsized impact on the industry and will allow them to continue to bring their service and the associated benefits to a broader area of the DFW metropolitan community. We are confident that the FAA will issue a Finding of No Significant Impact (FONSI) and Record of Decision (ROD) on this EA and grant appropriate airspace access to their PRISM V2 Series platform in the proposed operating area.

AUVSI supports the FAA's proposed changes to the DroneUp B050 OpSpec to expand its package delivery operations, and associated social, environmental, and commercial benefits, within the DFW metropolitan area and we also encourage the FAA to grant the company their Part 135 air carrier certificate and 44807 exemption. Thank you for the opportunity to comment.

Comment 6:

From: Chris Connolly <cconnolly@hursttx.gov>
Sent: Friday, September 6, 2024 3:08 PM
To: 9-FAA-Drone-Environmental (FAA) <9-FAA-Drone-Environmental@faa.gov>
Subject: Public Comments from the City of Hurst, Texas

Hello,
The following are questions that we feel may be of importance to the citizens of Hurst, Texas.
Some of these questions extend beyond environmental but should be addressed.

1. **DFW Mode C Veil:** from the draft: *"The initial 11 operating locations will be in Class G6 airspace below 400 'above ground level. The locations reside under a Class B shelf beginning at 4,000 feet, with the westernmost edge slightly extending into the 3,000 feet shelf."* Does this imply the future nests will automatically be able to ascend to 4,000 feet?
2. **Sustainable Energy Solutions:** Will DroneUp explore using electrical connections or solar panels to minimize the reliance on diesel generators and reduce noise?
3. **Sunday Operations:** Should operations on Sundays be reconsidered to reduce potential disruptions?
4. **Municipal Roles**, responsibility/authority related to drone activity. Is there someone to call regarding any drone incident without looking for the specific operator?
5. **Coordination of Public Operations/First Responders:** Are protocols being developed for when unexpected incidents require drone use by police and fire departments. Will commercial drone traffic know to avoid these areas?
6. **Economic Development Implications:** How could local businesses be positively or negatively affected?
7. **How Much is Too Much?** If one company could potentially launch 15,000 drones daily, how many other companies would be allowed to follow suit in the same 30 mile radius?

Thank you for the opportunity to participate in this important discussion.

Sincerely,

Chris Connolly
Executive Director of Economic Development and Tourism
City of Hurst
1505 Precinct Line Road
Hurst, TX 76054
817-788-7025

CITY OF HURST

in error, please notify the sender by return email immediately and destroy all electronic and paper copies of the original message and any attachments.

FAA Response:

City of Hurst comments, followed by FAA response:

1. **DFW Mode C Veil:** from the draft: *"The initial 11 operating locations will be in Class G6 airspace below 400 'above ground level. The locations reside under a Class B shelf beginning at 4,000 feet, with the westernmost edge slightly extending into the 3,000 feet shelf."* Does this imply the future nests will automatically be able to ascend to 4,000 feet?

   No, there is no plan to fly operations above the current cruise altitude of 230 - 250 feet with a maximum of 400 feet AGL.
2. **Sustainable Energy Solutions:** Will DroneUp explore using electrical connections or solar panels to minimize the reliance on diesel generators and reduce noise?

   If electrical connections are available, they will be used.
3. **Sunday Operations:** Should operations on Sundays be reconsidered to reduce potential disruptions?

   Sunday operations are planned in response to delivery demands.
4. **Municipal Roles**, responsibility/authority related to drone activity. Is there someone to call regarding any drone incident without looking for the specific operator?

   The FAA may be contacted in the event of an incident. Please contact North Texas FSDO, (214) 277-8500.
5. **Coordination of Public Operations/First Responders:** Are protocols being developed for when unexpected incidents require drone use by police and fire departments. Will commercial drone traffic know to avoid these areas?

   DroneUp will collaborate and comply with the FAA on all operations, emergencies and airspace restrictions such as Temporary Flight Restrictions (TFRs) have priority and are communicated to pilots through Notices to Air Missions (NOTAMs). TFRs restrict all aircraft (unless they have permission) in a specific area for a limited time. Pilots must check NOTAMs prior to flight.
6. **Economic Development Implications:** How could local businesses be positively or negatively affected?

   As described in Sec. 3.2.1, the proposed action does not involve acquisition of real estate, relocation of residents or community businesses, disruption of local traffic patterns, loss in community tax base, or changes to the fabric of the community. DroneUp will interface with local businesses through its community outreach plan, as described in Appendix B. This will help to identify positive or negative impacts to local businesses as the DroneUp package delivery program expands.
7. **How Much is Too Much?** If one company could potentially launch 15,000 drones daily, how many other companies would be allowed to follow suit in the same 30 mile radius?

   After the initial Hub in Murphy, Texas, DroneUp plans to additionally operate 10 Hubs, with a maximum of 30 Hubs in the DFW metro area. The maximum operational volume of 500 flights per Hub. Daily operations volume will vary based on customer demand or weather.

   It is not known how many companies may propose to operate in the DFW Mode C veil (30 NM radius). FAA reviews Part 135 UAS package delivery applications in accordance with regulations and conducts technical/safety reviews on each application. FAA conducts environmental review of each application to comply with NEPA.