

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION	
CERTIFICATE OF WAIVER OR AUTHORIZATION	
ISSUED TO Public Agency – University of Colorado, Boulder	Part 91
ADDRESS University of Colorado Boulder 3775 Discovery Drive Boulder, CO 80309	
This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.	
OPERATIONS AUTHORIZED Operation of the Operation of the DRAKK Unmanned Aircraft System (UAS) in Class E and Class G airspace at 2500 AGL and below, Southern Oklahoma and Northern Texas under the jurisdiction of Oklahoma City TRACON (OKC), Fort Worth ARTCC (ZFW), Kansas City ARTCC (ZKC), Vance RAPCON (END), Sheppard RAPCON (SPS), Fort Sill ARAC (FSI), Lawton Tower (LAW), Dallas/ Ft Worth TRACON (D10), Abilene TRACON (ABI), Midland TRACON (MAF), and Lubbock TRACON (LBB). See Attachment 1.	
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE N/A	
STANDARD PROVISIONS	
<ol style="list-style-type: none">1. A copy of the application made for this certificate shall be attached and become a part hereof.2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.4. This certificate is nontransferable.	
Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.	
SPECIAL PROVISIONS	
Special Provisions A thru H, inclusive, are set forth on the reverse side hereof.	
This certificate is effective from June 21, 2021 to June 20, 2023 and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.	
<p style="text-align: center;">BY DIRECTION OF THE ADMINISTRATOR</p> <p style="text-align: center;"><u>FAA Central Service Area</u> (Region)</p> <p style="text-align: center;"><u>Vonnie L. Giles</u> (Signature)</p> <p style="text-align: center;"><u>Manager, Tactical Operations Team, AJV-C23</u> (Title)</p>	

Purpose: To prescribe UAS operating requirements in the National Airspace System (NAS) for the purpose of Public Aircraft Operations. The holder of this COA will be referred herein as the “Proponent”.

Public Aircraft

1. A public aircraft operation is determined by statutes, 49 USC §40102(a) (41) and §40125.
2. All public aircraft flights conducted under a COA must comply with the terms of the statute.
3. All flights must be conducted per the declarations submitted in the application, and as specified in the following Special Provisions.
4. This COA provides an alternate means of complying with 14 CFR §91.113(b) for unmanned aircraft operations.
5. All operations will be conducted in compliance with Title 14 CFR §91 and the conditions of the authorization issued herein. If the operator cannot adhere to any of these requirements, a separate FAA Form 7711-2 waiver application may be required.

SPECIAL PROVISIONS

A. General.

1. All personnel connected with the UAS operation must read and comply with the contents of this authorization and its provisions.
2. A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are conducted.
3. This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The proponent will receive a written notice of cancellation.
4. During the time this COA is approved and active, a site safety evaluation/visit may be accomplished to ensure COA compliance, assess any adverse impact on ATC or airspace, and ensure this COA is not burdensome or ineffective. Deviations, accidents/incidents/mishaps, complaints, etc., will prompt a COA review or site visit to address the issue. Refusal to allow a site safety evaluation/visit may result in cancellation of the COA. Note: This section does not pertain to agencies that have other existing agreements in place with the FAA.

5. Radiofrequency spectrum authorization is independent of the COA process and requires the proponent to obtain Federal Communications Commission (FCC) equipment certification (47 CFR Part 2, Subpart J and 47 CFR Part 87, Subpart D) and frequency licenses (47 CFR Part 87) in the Aeronautical Radionavigation, Aeronautical Mobile (Route), or Aeronautical Mobile Services, as appropriate, for the control link, ATC radios, transponders, detect and avoid systems, and navigation systems used to support this COA. For systems operating exclusively below 400 feet, and within visual line of sight, the control link equipment may be licensed under 47 CFR Part 15 (Radio Frequency Devices). Equipment licensed under 47 CFR Part 5 (Experimental) does not provide the protection necessary for NAS operations.

B. Operations.

1. Unless otherwise authorized as a special provision, a maximum of one unmanned aircraft will be controlled:
 - a. From a single control station, and
 - b. By one pilot at a time.
2. When necessary, transit of airways and routes must be conducted as expeditiously as possible. The unmanned aircraft should not plan to loiter on Victor airways, jet routes, Q and T routes, IR routes, or VR routes.
3. For flights operating on an IFR clearance, the PIC must ensure positional information in reference to established National Airspace System (NAS) fixes, NAVAIDs, and/or waypoints are provided to ATC. The use of latitude/longitude positions is not authorized, except oceanic flight operations.
4. Unless installed as part of a Detect and Avoid (DAA) system, the use of a Traffic Collision Avoidance System (TCAS) in Traffic Advisory (TA) or Traffic Advisory/Resolution Advisory (TA/RA) modes while operating an unmanned aircraft is prohibited.

C. Safety of Flight.

1. The operator or delegated representative is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.
 - a. Any crew member responsible for performing see-and-avoid requirements for the UA must have and maintain instantaneous communication with the PIC.
 - b. Visual observers must be used at all times except in Class A airspace, active restricted areas, and warning areas designated for aviation activities or as authorized in the Special Provisions. Observers may either be ground-based or airborne in a chase plane.
 - (1) Visual Observers:
 - (a) Must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic, using standard phraseology as listed in the Aeronautical Information Manual when practical.

- (b) The PIC is responsible to ensure visual observers are able to see the aircraft and the surrounding airspace throughout the entire flight, and
- (c) The PIC is responsible to ensure visual observers are able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently to exercise effective control of the UA to:
 - Comply with 14 CFR § 91.111, §91.113 and § 91.115, and
 - Prevent the UA from creating a collision hazard, and
 - Comply with all conditions of this COA.

D. Notice to Airmen (NOTAM).

1. A Distant (D) NOTAM must be issued prior to conducting UAS operations not more than 72 hours in advance, but not less than 24 hours for UAS operations prior to the operation for routine operations unless operations are contained within Class A airspace, active restricted or warning areas that are designated on the appropriate aeronautical chart or airport directory. This requirement may be accomplished:
 - a. Through the operator's local base operations or (D) NOTAM issuing authority, or
 - b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867). The issuing agency will require:
 - (1) Name and contact information of the pilot filing the NOTAM request
 - (2) Location, altitude, or operating area
 - (3) Time and nature of the activity.
2. The area of operation defined in the (D) NOTAM must only be for the actual area to be flown for each day defined by a point and the minimum radius required to conduct the operation.
3. Operator must cancel (D) NOTAMs when UAS operations are completed or will not be conducted.
4. For first responders only. Due to the immediacy of some emergency management operations, the (D) NOTAM notification requirement may be issued as soon as practical before flight and if the issuance of a (D) NOTAM may endanger the safety of persons on the ground, it may be excluded. If the (D) NOTAM is not issued, the proponent must be prepared to provide justification to the FAA upon request.

E. Reporting Requirements.

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates.
2. The Proponent must submit the number of flights on a monthly basis through the COA Application Processing System (CAPS).

F. Special Use Airspace.

1. Coordination and de-confliction between Military Training Routes (MTR) and Special Use Airspace (SUA) is the operator's responsibility. When identifying an operational area the operator must evaluate whether an MTR or SUA will be affected. In the event the UAS operational area overlaps an MTR or SUA, the operator will contact the scheduling agency as soon as practicable in advance to coordinate and de-conflict. Approval from the scheduling agency is required for regulatory SUA, but not for MTR's and non-regulatory SUA. If no response to coordination efforts, the operator must exercise extreme caution and remain vigilant of all MTRs and/ or non-regulatory SUAs.
2. Scheduling agencies for MTRs are listed in the Area Planning AP/1B Military Planning Routes North and South America. If unable to gain access to AP/1B contact the FAA at email address mail to: 9-AJV-115-UASOrganization@faa.gov with the IR/VR routes affected and the FAA will provide the scheduling agency information. Scheduling agencies for SUAs are listed in the FAA JO 7400.10.

G. Air Traffic Control Requirements.

1. Coordination Requirements.
 - a. The area of operation identified in the required D NOTAM must only be for the area(s) that UA flight operations will occur, on each day of operation, and not for the entire operating area(s) authorized by this COA.
 - b. In Lubbock TRACON airspace, call them at (806) 766-6505 when you file the NOTAM, to coordinate the day's operation(s).
 - c. In Midland ATCT airspace, call the facility 15 minutes before flying to coordinate the day's operation(s), then immediately upon landing at (432) 563-2123.
 - d. In Sheppard Air Force Base airspace, (940) 676-6804/2372.
 - e. Dyess Air Force Base DYS, (325) 201-9445 when you file the NOTAM to coordinate the day's operation(s).
 - f. In Abilene (ABI) ATCT, call the facility at (325) 201-9445 when you file the NOTAM to coordinate the day's operation(s).
 - g. Vance RAPCON at (580) 213-6765, when you file the NOTAM, to coordinate the day's operation(s).
 - h. Fort Sill Approach (580) 442-2004 and Lawton ATCT (LAW) (580) 357-1629: Notify when you file the NOTAM. When flying in FSI airspace call the facility 15 minutes before flying and immediately upon landing at (580) 442-1882, to coordinate the day's operation(s).
 - i. In Fort Worth Center, (817) 858-7503 or (817) 858-7504 when a NOTAM is filed, and to coordinate the day's operations.
 - j. Flight within R5601 is prohibited.
2. Communication Requirements.
 - a. When operations are in FSI airspace, contact FSI Approach on 118.6

3. Flight Planning Requirements.

- a. The operator is responsible for ensuring that the proposed operating area does not enter a UAS flight restricted areas as described under CFR 14 Part 99.7, Temporary Flight Restriction (TFR), Special Security Instruction (SSI). Location and contact information for the TFR SSI is depicted on the FAA website: <https://udds-faa.opendata.arcgis.com>. Proponent *must request permission* and receive authorization via contacts listed on the website prior to operating within a TFR SSI.
- b. It is the operator's responsibility for obtaining authorization from the appropriate authority for any operations that that may result in launching and/or landing from lands or waters administered by a Federal, State or Public agency (e.g., National Parks, State Parks, Wilderness Area, and Wildlife Refuge, etc.).

4. Procedural Requirements.

- a. Night Operations are authorized.
 - (1) UAS operations at night, unmanned aircraft must operate with: a. Unless stipulated in the special provisions, an operational mode 3/A transponder with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk
 - (2) Position/navigation and anti-collision lights on at all times during flight unless stipulated in the special provisions or the proponent has a specific exemption from 14 CFR §91.209.

H. Lost Link Emergency/Contingency Procedures.

1. Lost Link Procedures:

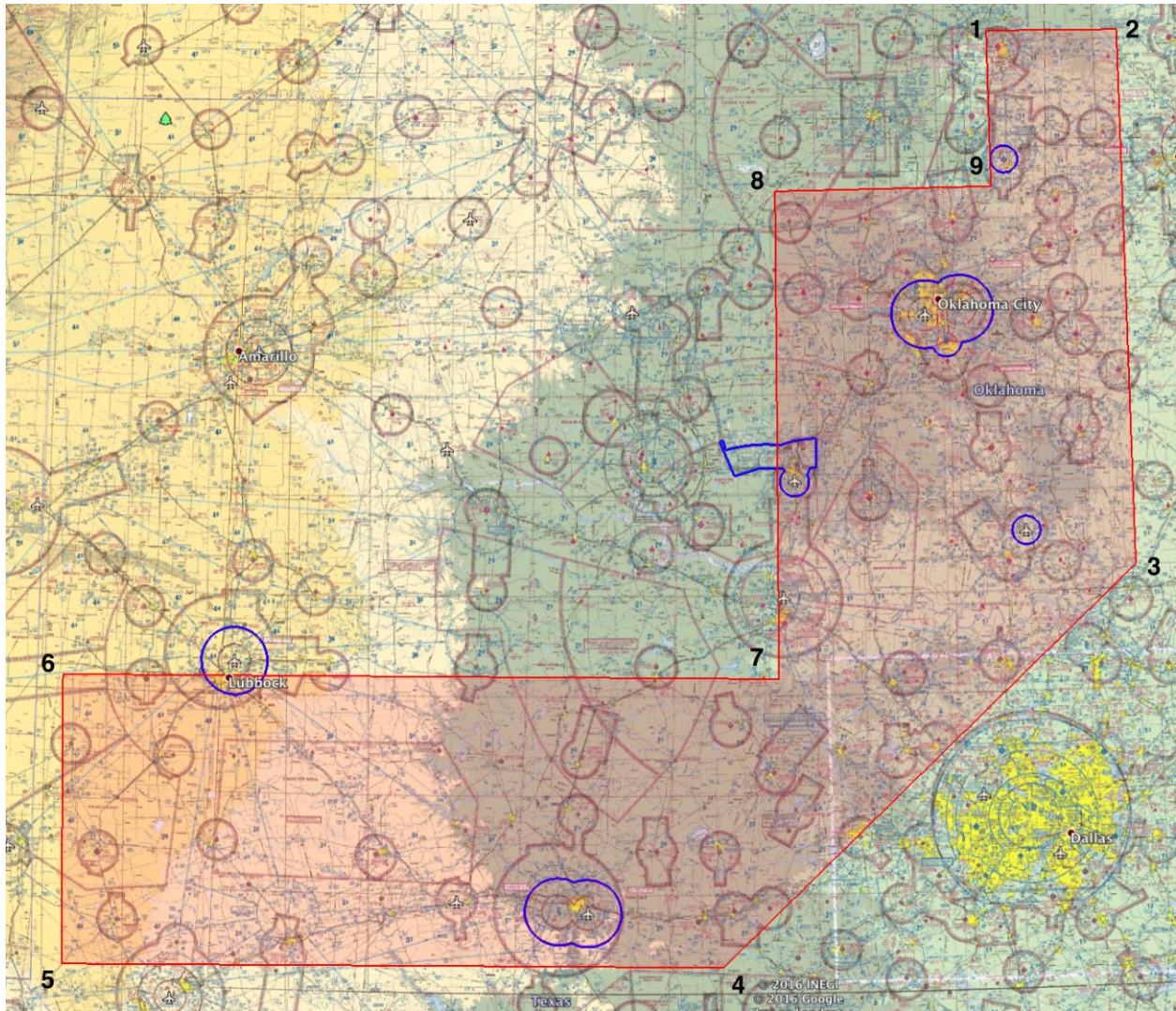
- a. In the event of a lost link, the UAS pilot will immediately notify appropriate ATC facility and state pilot intentions, and comply with the following provisions:
 - (1) Oklahoma City TRACON (OKC), (405) 686-4717
 - (2) Fort Worth ARTCC (ZFW), (817) 858-7503
 - (3) Kansas City ARTCC (ZKC), (913) 254-8500
 - (4) Vance Approach (END), (580) 213-6765
 - (5) Sheppard Approach (SPS), (940) 676-6804/2372.
 - (6) Fort Sill Approach (FSI), (580) 442-2004 or (580) 442-2387
 - (7) Dallas/ Ft Worth TRACON (D10), (972) 615-2569
 - (8) Abilene TRACON (ABI)/Dyess Air Force base, (325) 201-9445
 - (9) Midland TRACON (MAF), (432) 563-2123
 - (10) Lubbock TRACON (LBB) (806) 766-6505
 - (11) Lawton Tower (LAW), (580) 357-1629

- b. Prior to each operation, a safe landing zone and minimum obstruction clearance altitude will be determined.
 - c. Any loss of communication between the pilot and the aircraft longer than a predefined time interval (typically 1-10 seconds) will result in the aircraft executing a pre-determined lost link procedure.
 - d. A lost link recovery location and flight path will be pre-programmed prior to launch.
 - e. Upon reaching the recovery location, the aircraft will land. In certain situations, it may be more desirable, due to surrounding obstructions, to have the predetermined lost link profile for the aircraft to land in place. The PIC will determine the safest lost link flight profile and program it before flight.
 - f. The unmanned aircraft lost link mission will not transit or orbit over populated areas.
 - g. Lost link orbit points shall not coincide with the centerline of Victor airways.
2. Lost Communications:
- a. If there is a loss of communication using crew member hand-held radios, then cell phones will act as a backup communication system. Cell phones will have been programmed beforehand to allow for one button contact with the PIC to minimize contact time. Personnel will fall back to cellular phone communication solely for the use of orderly and timely recovery of the aircraft. Cell phones will never be the primary form of communication between flight crew members.
 - (1) If communication between the PIC and the observer is lost, the observer will initiate a cell phone call to the PIC.
 - (2) If cell phone contact is made with twenty (20) seconds, and the observer still has LOS then the PIC will initiate landing procedures to terminate the current flight.
 - (3) If the cell phone backup link fails, then the observer is no longer able to perform their duties then LOS has been lost. See sections Loss of LOS by the Observer and Observer is Unable to Perform Duties in the emergency procedures document for corrective actions.
3. Fly-Away Procedures:
- a. In the event of a fly-away toward an area or airport where the PIC has determined the UAS may create a hazard to aviation or persons on the ground, the PIC will immediately notify the appropriate ATC facility. The PIC will provide the following information:
 - (1) Approximate location
 - (2) Direction of flight
 - (3) Last know altitude
 - (4) Maximum remaining flight time

AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations not specifically stated, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the proponent to resolve the matter. This COA does not authorize flight within Temporary Flight Restrictions, Special Flight Rule Areas, regulatory Special Use Airspace or the Washington DC Federal Restricted Zone (FRZ) without pre-approval. The proponent is hereby authorized to operate the Unmanned Aircraft System in the NAS within the areas defined in the Operations Authorized section of the cover page.

TX/OK Operations Area

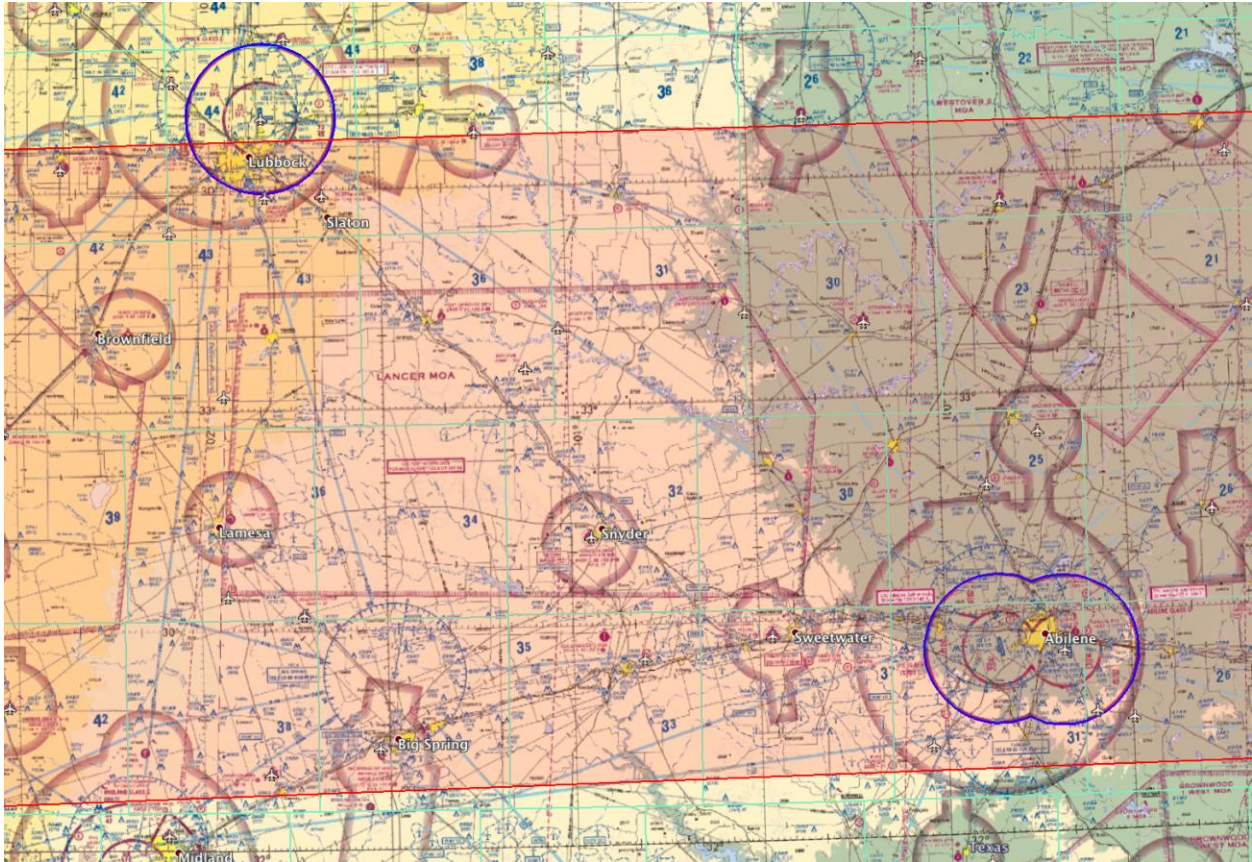


Texas/Oklahoma Defined Area

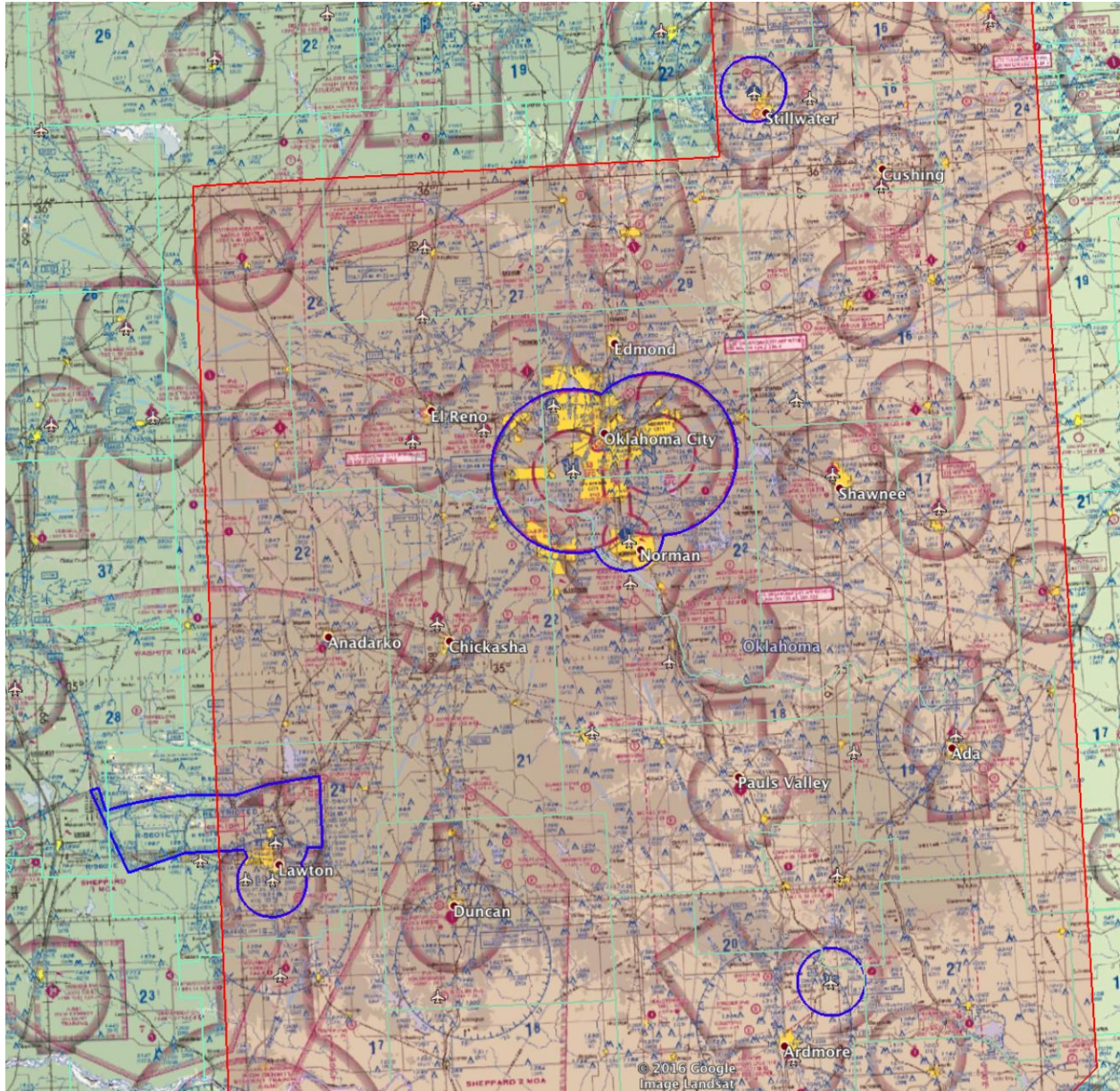
DRAKK Flight Boundary

<u>Point</u>	<u>Latitude</u>	<u>Longitude</u>
1	36° 47' 12.69" N	97° 11' 16.81" W
2	36° 46' 41.98" N	96° 22' 36.34" W
3	34° 07' 19.39" N	96° 23' 02.20" W
4	32° 10' 02.39" N	98° 52' 13.31" W
5	32° 07' 14.74" N	102° 48' 50.68" W
6	33° 34' 59.31" N	102° 49' 31.75" W
7	33° 35' 37.49" N	98° 31' 19.75" W
8	36° 00' 02.69" N	98° 30' 31.47" W
9	36° 00' 24.80" N	97° 11' 19.21" W

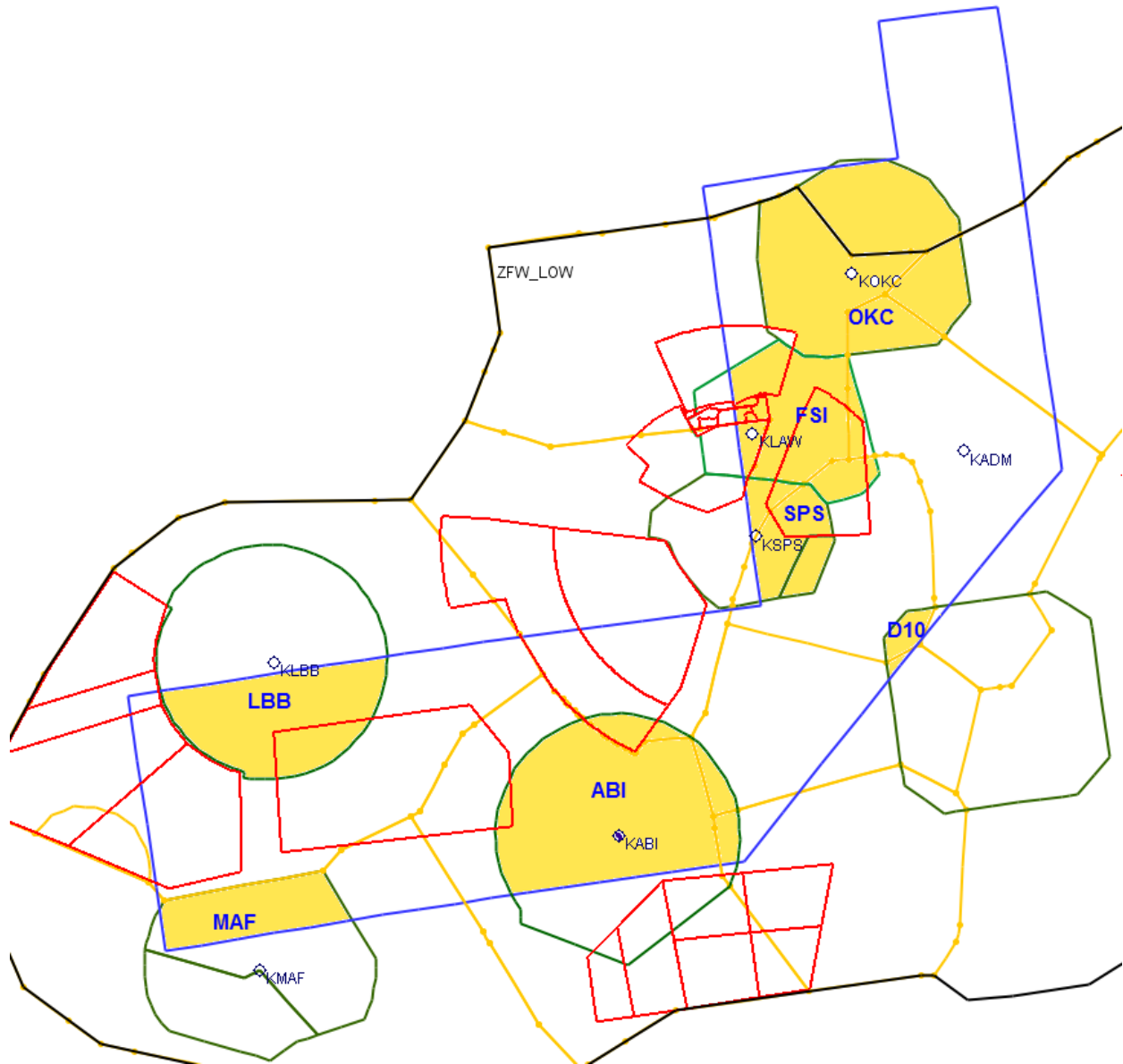
Western Portion of Operations Including Blue Outlined
No-Fly Areas



Eastern Portion of Operations Including Blue Outlined
No-Fly Areas



Attachment 2



FORT SILL ARAC Airspace

