Lac La Biche County

Policy

TITLE: Remotely Piloted Aircraft Systems

POLICY NO: CM-26-004

RESOLUTION: 22.675

EFFECTIVE DATE: June 14, 2022

DEPARTMENT RESPONSIBLE: Enforcement Services

NEXT REVIEW DATE: June 14, 2025

POLICY STATEMENT:

This policy and the Remotely Piloted Aircraft System Standard Operating Guideline clarify the federal and provincial requirements for the Lac La Biche County Remotely Piloted Aircraft System Program to ensure safe and legally compliant operations. This policy addresses roles and responsibilities, procurement requirements, certification requirements, information technology security, records management, privacy considerations, operating procedures, and liability associated with the operation of Remotely Piloted Aircraft by the County or contractors operating on behalf of the County. This policy takes potential privacy concerns into consideration: County Remotely Piloted Aircraft System operators are only authorized to use the Remotely Piloted Aircraft System for specific purposes to aid in ensuring the safety and privacy of staff and the public at large.

PRINCIPLES:

Remotely Piloted Aircraft Systems consist of the Remotely Piloted Aircraft (i.e. drone) as well as the software, communication, control and data links, launch and recovery elements, support and maintenance equipment, operating personnel, handling, storage and transport equipment, and all documentation required for successful Remotely Piloted Aircraft flights.

1. **Scope**

   This policy applies to all Remotely Piloted Aircraft Systems that are acquired, operated, and maintained by or on behalf of Lac La Biche County, including contractors who use Remotely Piloted Aircraft System on County Projects.

2. **Remotely Pilot Aircraft System Uses**

   Use and deployment shall be limited to the following.

   a. Emergency Response
      - Including but not limited to; motor vehicle collisions, structure fires, hazardous material incidents, wildfires, or other emergency situations when requested by the Incident Commander.
      - The public may not be notified if there is an immediate threat to life or property.

   b. Disaster response & recovery
      - Including but not limited to flood response, severe weather events, wildfires, as well as area reconnaissance following these types of events.
      - The public may not be notified if there is an immediate threat to life or property.

c. Training
   - May be used to train with from time to time to maintain pilots' skills. Training locations shall be away from the public, and inhabited areas.
   - The public shall be given notice of training operations if that training is likely to or may cause a disruption to normal activities.

d. Search and Rescue
   - May be used to aid in the search and recovery of persons when requested by the Incident Command.
   - The public may not be notified if there is an immediate threat to life or property.

e. Evidence collection
   - In order to support investigations conducted by Enforcement Services, RCMP, or other law enforcement agencies the lead investigator may request the deployment of a Remotely Piloted Aircraft.
   - The public may or may not be notified dependant on the circumstances.

f. Promotional media creation
   - In the event a County department would like to create promotional content and would like aerial images or video for that content, the Remotely Piloted Aircraft may be used.
   - The public shall be given notice of when and where use occurs for this.

g. Data collection for County Operational Requirements
   - Environmental regulatory compliance intended to support Environmental Services department and the continued operation of County Landfills.
   - Inventory control for County assets such as volumetric surveys on stockpiled materials.
   - The public shall be given notice of these operations if they are or are likely to be impacted by the use.

h. Geographical Information Services operational support
   - In the event the Geographical Information Services requires the use of a Remotely Piloted Aircraft to support their projects such as mapping, aerial imagery, or other spatial data.
   - The public will be notified of this use, along with when and where it is occurring.

i. Fire Smart Program support
   - Fire Smart is a program that reduces the overall risk of a fire that occurs in a wildland urban interface area spreading into developed areas.
   - The public shall be given notice of when and where use occurs to support this program.

j. Construction project assessments
   - To view and inspect County construction projects, the project manager may request an aerial overview of the project area.
   - The public shall be notified of this use, along with when and where it is going to occur.

3. Authorities

Authorities at present include Transport Canada's *Aeronautics Act*, the *Canadian Aviation Regulations*, and Lac La Biche County's Record and Retention Policy.

4. Roles and Responsibilities

The Lac La Biche County Remotely Piloted Aircraft System program is centrally administered by the Remotely Piloted Aircraft Systems Operations Coordinator who is responsible for stewarding the policy on behalf of the County.

5. Remotely Piloted Aircraft Systems Operations Coordinator

The Remotely Piloted Aircraft Systems Operations Coordinator is the person tasked with overall accountability for the operational control of the program and flights, including planning and communications, and is responsible for making safety related decisions about the operation. As further described in the standard operating guideline, the Coordinator has the following responsibilities:

a. Ensuring the Lac La Biche County Remotely Piloted Aircraft Systems program meets Transport Canada requirements and conforms to Canadian Aviation Regulations Part IX.
b. Submitting and managing Special Flight Operations Certificates or permits required when needed.
c. Reviewing all equipment for purchase and managing of the fleet.
d. Reviewing and approving flight plans as specified in the standard operating guideline.
e. Reporting incidents to Transport Canada as required.
f. Grounding of Remotely Piloted Aircraft for regulatory, operational, or environmental risk factors.

In the event the Coordinator is unavailable, that person shall delegate an interim Coordinator who possess the appropriate qualifications.

The Lac La Biche County Remotely Piloted Aircraft System Program accounts on the Navigation Canada Drone App and the Transport Canada Drone Portal shall be maintained by the Coordinator and shall serve as the hub for the governance of the fleet, pilots, and flights, as well as the management of operational records identified in section 7.0.

6. Remotely Piloted Aircraft Systems Procurement

All purchases must be reviewed by the Coordinator to ensure they are consistent with Transport Canada and County Remotely Piloted Aircraft Systems Program standards. All hardware and software must be procured in accordance with any applicable procurement policies and legal requirements. The fleet will be managed by the Coordinator via the Navigation Canada Drone Web based platform and the Transport Canada Drone Portal. The platform will house all relevant information with respect to information technology security requirements and liability insurance.

7. Information Technology Security Requirements

Acquisitions must address complex information technology security risks due to having applications, data storage components, and radio communications that may be susceptible to interference and jamming.

8. Liability Insurance

No eligible Remotely Piloted Aircraft shall be operational unless it has insurance coverage provided by the County.

9. Remotely Piloted Aircraft System Registration and Licensing

County Remotely Piloted Aircraft Systems operators must adhere to Transport Canada Remotely Piloted Aircraft Systems registration requirements as per CARs 901.02. All eligible articles of the fleet must be registered through the Transport Canada Drone Portal. The certificate of registration must be always available when the Remotely Piloted Aircraft is deployed, and the registration number applied to the unit as per CARs 901.03 and the standard operating guideline. As per the *Canadian Aviation Regulation* drones under 249.9 grams do not require registration or licencing. However, this policy will still apply to drones under 249.9 grams where applicable.

10. Special Flight Operating Certificates

In the event a Special Flight Operating Certificate is required for a specific flight, the application will be prepared by the Coordinator. Only the Coordinator is authorized to apply for the Special Flight Operating Certificate on behalf of the County.

11. Pilot Qualifications

The current Transport Canada requirement for operating a Remotely Piloted Aircraft over 250 grams requires the pilot to pass an online knowledge exam. If a County employee or contractor is operating a Remotely Piloted Aircraft that is 249.9 grams or less a license is not required by

Transport Canada regulations, however it is strongly recommended that a Basic licence is obtained for any operator regardless of its licensing requirements. Licencing of the pilots falls under two categories: Basic or Advanced. See the Canadian Aviation Regulation s901.53 through 901.68 for the detailed requirements for each of these categories.

12. County Remotely Piloted Aircraft Systems Certification

In addition to Transport Canada requirements when transitioning from Basic to Advanced licence, pilots must complete flight school training. County pilots must undergo testing to ensure that flight operations are conducted according to federal regulations and in accordance with the County standard operating guideline and the County Remotely Piloted Aircraft Training Manual. A flight review is required for all licencing levels as detailed in the standard operating guideline.

13. First Aid Requirement

County pilots must have a valid Standard First Aid with CPR certificate.

14. Records Management

All data and information collected regarding operations must be gathered in accordance with applicable legislation, policies, and standards. All data and information associated with the operation of a Remotely Piloted Aircraft, as with all County records, are subject to the requirements of the *Freedom of Information and Protection of Privacy Act* and the *Records Management Regulation* and must be managed accordingly.

There are two main categories of records associated with the operation of a Remotely Piloted Aircraft:

a. Operational records related to training, certification, and flights details, including the following documents: Transport Canada Remotely Piloted Aircraft Systems Licenses, Remotely Piloted Aircraft Registration Certificates, Ground School certificates, Coordinator certificates, Special Flight Operations Certificates, training documentation, flight plans, flight logs, incident reports, and Remotely Piloted Aircraft maintenance records.

b. All collected data and information, including images, video, measurements, flight paths, environmental data, and pilot logs. All operational records must be managed and maintained by operators and the Coordinator as per Canadian Aviation Regulation s901.48. Operational records will be maintained by the Pilots and managed by the Coordinator on the Navigation Canada Drone App.

15. Operating Procedures and Pre/Post flight protocol

Pilots must adhere to all Transport Canada requirements and the standard operating guideline. Pilots shall complete pre and post flight checks as per the standard operating guideline. Failure to adhere to Transport Canada requirements, the standard operating guideline, or any directions of

the Coordinator may result in administrative action. Personal recreational use of County Remotely Piloted Aircraft or the use of a personally owned Remotely Piloted Aircraft for County work is prohibited.

16. Public Notification

If the use of Remotely Piloted Aircraft requires public notification as specified in section 1.1 Remotely Piloted Aircraft System Uses, the public shall be provided notification within a reasonable time frame. The notification may be sent out via the County Communication Tools. Additionally, when a Remotely Piloted Aircraft is scheduled to fly a certain area physical notification may be used in the form of signs, flyers, posters, or other similar means.

17. Restricted Areas

A Remotely Piloted Aircraft shall not be deployed in any area restricted by Transport Canada. Pilots shall use the Navigation Canada Drone app to aid in identifying restricted areas. For example, the Cold Lake Air Weapons Range is a restricted area.

18. Incident Reporting

Incidents shall be reported by the Pilot and the Coordinator in accordance with Canadian Aviation Regulation s901.49 and the standard operating guideline.

19. Emergency Action Plan

As required by Transport Canada, the standard operating guideline describes an Emergency Action Plan that specifies the measures that must be taken in the event an unsafe situation develops. All Pilots shall refer to Canadian Aviation Regulation s901.23, 901.71 and the standard operating guideline for specific measures to be taken and comply with them. In most cases, these events will require notification to the Coordinator who will report the incident to the Area Control Centre Shift manager of Transport Canada.

20. Security Plan

The standard operating guideline describes a Security Plan, to ensure the security of the flight crew and the public during flights, as well as the safe storage of Remotely Piloted Aircraft while not in use. The Security Plan complies with Transport Canada requirements, Occupational Health & Safety requirements, and applicable County Hazard Controls. Pilots shall comply with the Security Plan.

21. Remotely Piloted Aircraft Systems Operation by a Third Party

The use of Remotely Piloted Aircraft by contractors carrying out programs and services on behalf of the County is permitted with conditions. The following details the conditions that contracted operators must abide by. Independent contractors shall be retained in accordance with applicable County procurement policies. Contracts must comply with all applicable laws, and any directions of the Coordinator. All contracts must include operations conditions, data collection and, intellectual property ownership provisions acceptable to the County. The collection, use, and disclosure of data collected on behalf of the County must comply with the requirements of

the Freedom of Information and Protection of Privacy Act (Alberta). All Remotely Piloted Aircraft must be operated in accordance with Canadian Aviation Regulations part IX or under an applicable Special Flight Operations Certificates.

In addition, any County employee approving a contracted operation shall obtain the following from the contractor:

a. Proof of liability insurance
b. Proof of an Advanced Remotely Piloted Aircraft License; and
c. Proof of registration for all Remotely Piloted Aircraft equipment being deployed.

"Original Signed"	July 13, 2022
Chief Administrative Officer	Date
"Original Signed"	July 18, 2022
Mayor	Date

SPECIAL NOTES/CROSS REFERENCE: SOG CM-26-004

Canadian Aviation Regulations (SOR/96-433), Part IX
TP 15263, Knowledge Requirements for Pilots of RPAs 25 kg or less, operating within Visual Line of Sight Transport Canada. (2018). *Drone safety*. Government of Canada website
Aeronautics Act, R.S.C. 1985, c. A-2
Freedom of Information and Protection of Privacy Act, RSA 2000, F-25.
Government of Alberta (2010). *Information Management and Technology Standards*. Government of Alberta website.
Records Management Regulation Alta Reg. 224/2001
Information Security Management Directives

AMENDMENT DATE:

Lac La Biche County

Standard Operating Guideline

TITLE: Remotely Piloted Aircraft Systems Guideline

GUIDELINE NO: CM-26-004

LEAD ROLE: Enforcement Services

EFFECTIVE DATE: June 14, 2022

GENERAL GUIDELINES:

Lac La Biche County Remotely Piloted Aircraft Pilots will use this guideline as a supplement to the Remotely Piloted Aircraft Policy. The purpose of this guideline is to help pilots ensure they operate the Remotely Piloted Aircraft in a safe manner and in accordance with federal legislation.

DEFINITIONS & ACRONYMS:

Aeronautics Act	The Aeronautics Act (R.S.C, 1985, c. A-2) governs civil aviation in Canada.
ACC	Area Control Centre of Navigation Canada.
AOI	Area of Interest. A point feature or area where an RPAS mission occurs
BVLOS	Beyond Visual Line-of-Sight
CARs	Canadian Aviation Regulations (SOR/96-433) of the Aeronautics Act. Part IX governs the use of RPAS.
CFS	Canadian Flight Supplement
Drone	Synonym for Remotely Piloted Aircraft (RPA).
FC	Flight Crew
FCP	Flight Crew Package
Flight	A single launch and landing of an RPAS or multiple launches and landings resulting in the depletion of a single battery. For planning purposes, a flight lasts 20 minutes.
Flight Log	Personal log of all flights conducted by a Pilot.
FPV	First-person view; method used to control a radio-controlled vehicle from the Pilot's point of view.
Ground Supervisor	Person on-site who oversees an RPA flight.
Maximum Range	The maximum distance an RPAS can theoretically fly on a single battery. Calculated by multiplying the maximum velocity of the unit by the manufacturer rated flight time.
Mission	A set AOI within an operation. Missions are made up of multiple flights.
NM	Nautical miles
NOTAM	Notice to Airmen
OHS	Occupational Health and Safety
ROC	Regional Operations Coordinator
Operation	An overall plan to conduct RPAS flights over an area for a specific purpose. Depending on the extent of the AOI, it may include multiple missions.
ROC-A	Restricted Operator Certificate - Aeronautical
RTH	Return-to-Home
SFOC	Special Flight Operations Certificate
Standard 921	Recency requirements for RPAS Pilots in Canada

TC	Transport Canada
TP 15263	Transport Canada. (2014). TP 15263 – Knowledge Requirements for Pilots of Unmanned Air Vehicle Systems (RPA) 25 kg or Less, Operating within Visual Line of Sight
RPAS	Remotely Piloted Aircraft System(s)
RPA	Remotely Piloted Aircraft
VFR	Visual Flight Reference
Visual Observer	Assists the pilot and monitors the local air space for aircraft and hazards.
VLOS	Visual Line-of-Sight
VNC	VFR Navigation Chart
VO	Visual Observer
VTA	VFR Terminal Area

Standard Operating Guideline:

1.0 Introduction

Remotely Piloted Aircrafts (RPAs) are power-driven aircraft, other than model aircraft, that are designed to fly without a human operator onboard. RPAs are small, often battery powered, fixed-wing, or rotor-wing craft deployed to acquire aerial photography and video. Remotely Piloted Aircraft Systems (RPASs) are the RPA as well as the software, communication, control and data links, launch and recovery elements, support and maintenance equipment, operating personnel, handling, storage and transport equipment, and all documentation required for successful RPA flights. All County Pilots are required to operate RPASs in a safe and professional manner in accordance with all applicable laws (both federal and provincial). Transport Canada (TC) regulates the use of all aircraft, manned, or unmanned, to keep the aviation community, public, and Canadian airspace safe. RPAS operators are considered Pilots and legitimate airspace users. The *Aeronautics Act*, R.S.C. 1985, c. A-2 and Part IX of the *Canadian Aviation Regulations* (CARs) establish the framework in which RPASs are to operate. Pilots require special training and federal authorization to operate an RPAS.

This Specific RPAS Operating Procedures is a companion document to the Lac la Biche County Standard Operating Procedures. The purpose of this document is to identify federal regulations and provincial policies to help ensure a safe flight and compliance. It is also important to communicate flight intentions with people, organizations, and government agencies around the project area in which you plan to fly so that they are not alarmed or surprised by the flight. This includes reassuring them that you have the appropriate authorizations and procedures to perform your work as RPAS operators. Any conflict between this document and federal requirements shall be resolved in favor of TC's requirements.

2.0 Prerequisites to fly an RPAS

Within Lac la Biche County, RPAS flights are restricted to authorized staff only. Staff are considered "authorized" once they have successfully passed a County recognized ground school, passed the

Transport Canada exam for RPAS operation (basic or advanced) and, obtained an RPAS Operators Certificate.

3.1 Federal Regulations

1. Successful completion of a written examination created and administered by TC through their website.
2. For an advanced certificate, successful completion (pass/fail) of a flight review conducted by a Pilot possessing a TC Flight-Reviewer rating.
3. All RPAs are required to be registered and clearly marked according to CARs 901.02 and CARs 901.05.
4. Maintain a personal flight log as per CARs 901.48

3.2 Recency Requirements

1. CARs 901.56 and 901.65 require that all pilots undergo periodic reassessment of skills to ensure that a consistent level of training is maintained. In addition to federal regulations.

4.0 RPAS Hardware Requirements

All RPAs used within County will meet the following standards:

1. The model type must be approved by the RPAS ROC.
2. Labeled clearly and in accordance with TC regulations.
3. Must be maintained in good flying condition.
4. Must be stored and transported in a container that minimizes the chance of damage.
5. All batteries are stored in a safe manner.
6. Follow all manufacturers' maintenance requirements.

5.0 Flight Crew Roles and Responsibilities

Flying RPAs in a safe and legally compliant manner requires coordination between multiple people and often organizations and departments. Each Flight Crew (FC) is comprised of four roles: Operations Manager, Pilot, Ground Supervisor, and Visual Observer. Often the Pilot or Visual Observer will act as the Ground Supervisor depending on the specific case. Two people are required on-site for operations classified as advanced-complex (see section 8.0.1).

5.1 RPAS Operations Coordinator

The RPAS Operations Coordinator (ROC) is the person tasked with overall accountability for the operational control of the RPA flight, including planning and communications, and is responsible for making safety related decisions about the operation. The ROC has the responsibility to use their discretion and may waive any requirements in this document based on operational necessity without contravening federal requirements. The ROC will ensure all persons connected with the operation are familiar with their responsibilities.

Specifically, the ROC has the following responsibilities:

1. Ensure all Pilots are qualified to fly under CARs Part IX and/or the County SFOC:
   a. Manage Ground School Certificates
   b. Manage RPAS Certificates
   c. Manage ROC-A Certificates.
2. Communicate all TC regulatory changes to Pilots in the County Pilot Network
3. Ground RPASs for regulatory, operational, or environmental risk factors.
4. Monitor the RPAS Flight Management system to ensure flight plans and flight records are being maintained
5. Approve flight plans for advanced operations, communicate clearance and conditions to the FC, and confirm that CARS part IX conditions are being followed.
6. Ensure that the pilot has notified the appropriate agencies required for the flight and if necessary gained clearance from:
   a. Local airspace authorities if flying advanced operations.
   b. NAV Canada as applicable
8. Be available via email, phone, or radio during the operation.
9. Ensure ongoing communication is maintained between all necessary agencies during flights.
10. Report incidents to TC as required.
11. Meet all records requirements in accordance with CARS 901.48.

6.0 Ground Supervisor

The Ground Supervisor (GS) is the person responsible for on-site supervision of the operation. The Ground Supervisor may be the same person as the Operations Manager, Visual observer and/or the pilot if they will be on-site for all operations. For advanced/complex operations, unless approved otherwise by OC, the Ground Supervisor role is mandatory and must be filled by a person other than the pilot.

For operations that involve judicial authorizations (search warrant) a copy of the authorization to search must be obtained and entered a report management system. The authorization must be signed by an officer in charge or Justice. All flights that take place under judicial reasonings must be approved by the Manager of Enforcement Services.

6.1 Pilot

The Pilot is the person in physical control of the craft while it is in the air. Often the Pilot will also serve as the payload (camera or video) operator and will have demonstrated competency in both flying the RPA and operating the payload simultaneously. The Pilot is responsible for the following:

1. Recording their location and TC contact information, as detailed in the Emergency Action Plan described in section 10.0, so they can quickly report incidents, such as a fly-away RPA.
2. Mission Planning:
   a. Complete a flight plan detailing the particulars of the operation using the flight plan example in Appendix 15.3, including informing the ROC of any RPAS payloads.
   b. Review and comply with CARs part IX, and all other applicable laws (i.e. *Freedom of Information and Protection of Privacy Act* (Provincial), *Criminal Code of Canada* (Canada), etc.), including;
      i. Assessing relevant aeronautical information prior to commencing operation including airspace, aerodromes, air traffic services unit contact and radio frequencies to ensure there is no breach of regulated airspace, and
      ii. Consulting the ROC regarding updates to the *Aeronautics Act* and *CARs* prior to operation as guidelines continue to evolve.
   c. Ensure RPAS is operated consistent with manufacturers' instructions (CARs 901.31).
   d. Prepare pre-programmed flights.
   e. Ensure the RPA and control system have current firmware and software installed.
      i. Verify control software is set-up properly.
      ii. The altitude limitation set out in the flight authorization must be set with the control software to ensure TC compliance (see CARs 901.25 for additional information on altitude restrictions).
   f. Establish a radial working area based on the size class of the RPA. If the flight software does not provide constraints, it is the responsibility of the Pilot to ensure compliance with these radiuses:
      i. <1kg – radius set to ¼ Nm (450m).
      ii. 1kg – 5kg – radius set to ½ Nm (900m).
      iii. 5kg - 25kg – Maintain VLOS
   g. Obtain the appropriate permissions from landowner(s), lease holders, and land managers
   h. Identify hazards; this is confirmed in the field on the day of the flight.
      i. Identify any built-up areas.
      ii. Identify additional flight and safety hazards including, but not limited to, power lines, towers, random camping, and raptor nesting.
   i. Assess and record weather conditions as detailed in section 9.0 prior to and during the flight to determine if the weather will be favorable and ensure winds and temperatures do not exceed the operating limits of the RPA.
   j. Make final determination that it is safe to fly (Go/No-go).

3. Pre-flight checks prior to departure to the field:
   a. Ensure a NAV Canada approval has been issued for advanced operations if needed.
   b. Weather is sufficiently monitored prior to the flight.
   c. The Flight Crew Package (FCP) is up to date; ensure all necessary paperwork such as license, Flight plans, landowner permissions, etc., is readily accessible on site.
   d. The RPA and control station software are up to date.
   e. Batteries are charged.

f. Cell phone is charged, and charger is in the flight kit.

4. Pre-Flight checks on the day of the flight at the project site:
   a. Assess the project area from the ground within a 1 km radius (if accessible) for any hazards or unexpected restrictions such as airstrips, buildings, people, animals, or facilities not identified in the initial mission planning that may restrict or prevent flight operations.
   b. Ensure that a Hazard Assessment (HA) has been filled out.
   c. Ensure each member of the flight crew has been properly briefed and understands their role.
   d. Pre-flight hardware checks (rotors, batteries, motors, RPA shell, navigation systems, control systems and camera mounting). Defective system components, controls and software issues will compromise airworthiness or RPAS control and the operator must not operate the RPAS.
   e. Report any pre-flight damage or malfunctions immediately to the ROC via email.
   f. Mitigate control signal loss and GPS loss that may result in loss of control of the RPAS by:
      i. Ensuring the battery is fully charged prior to takeoff.
      ii. Ensuring GPS lock and home point are acquired prior to takeoff.
      iii. Ensuring the operation is within the operating specifications as outlined by the manufacturer.
      iv. Boosters/signal-extenders may be used if there is concern for control signal loss.
      v. Ensuring that flights are completed with no less than ***30%*** battery life.

5. Flight Operations:
   a. Unless exempt for operational reasons, wear County or affiliate entity visual identity, (uniform, reflective vest) including any observers.
   b. Block off with signs, cones, or ribbons an area at least 100' (30 meters) to prevent spectators from distracting the Pilot and to keep the landing area clear and safe.
   c. Operate the RPA only within its operating range regarding altitude, temperature, wind speed, etc.
   d. Operate the RPA safely and cease operation immediately if safety is jeopardized, or if the RPAS is not functioning as expected as per Section 10.
   e. Always operate the RPA in VLOS. If a FPV is used, there must be a Visual Observer to keep primary VLOS. If line of sight is lost, Pilot shall initiate the return-to-home function.
   f. Always give right-of-way to all other aircraft (i.e. Hot air balloons, gliders, ultra-light aero planes, aero planes, and helicopters).
   g. Operate RPAs during daylight hours unless RPAS is equipped for night-time operations as per CARs 901.39.
      i. Daylight Hours are ½ hour before sunrise to ½ hour after sunset, if VLOS is maintained.
   h. Only operate the RPA in airspace classes approved under the pilot's licensing level.
   i. Do not fly where interference could occur with first responders (fire department, police, etc.) without specific authorization. Respect the privacy of others.

j. Do not operate within 5 NM of a forest fire unless under coordination with the Wildfire Branch of a provincial or municipal government.
k. Do not operate within 1 NM of a Department of National Defense property or controlled airspace without specific authorization.
l. Do not operate within 1 NM of any active emergency scene or emergency response personnel without specific authorization.
m. Maintain separation from people, animals, structures, buildings, or vehicles not involved in the mission according to the specific restrictions based on the RPAS being flown and the pilot's licensing level.
n. Ensure that the appropriate Air Traffic Service Unit is advised immediately anytime the flight of the RPA inadvertently enters controlled airspace. The Pilot must also notify the ROC and their supervisor once incident is over.
o. Ensure that TC and the ROC are notified immediately if personal injury or property damage occurs during operation. In the event of personal injury, first aid procedures shall be immediately initiated as required.
p. Ensure that TC and the ROC are notified immediately if there is a fly away or lost link resulting in loss of the RPA.
q. Emergency procedures shall be initiated if an unsafe situation develops.
r. The Pilot shall notify the OC of an incident via email or phone call. The incident must also be filed on the incident reporting system.

6. Post Flight checks:
   a. Post-flight hardware check (rotors, batteries, motors, and control system). Any defective parts or control issues must be reported to the ROC.
   b. Charge batteries, controller, and peripheral devices for next operation.
   c. Record flight log, aerial imagery, and incident reporting.
   d. Complete flight logbook entry including Pilot/co-Pilot, RPA serial number, weather, date, time, duration, and location.
   e. To avoid fire, serious injury, and property damage, observe the Battery Safety Guidelines outlined by the manufacturer.
   f. Maintain the Pilot log as per CARs 901.48.
   g. Record flights on the online Flight Tracker.
   h. Report any post flight damage or malfunctions immediately on the RPAS Maintenance Tracker.

6.3 Visual Observer

The County recommends Visual Observers (VO) for all flights but are specifically required for advanced or complex operations. The main role of the VO is to assist the Pilot and monitor the local air space for aircraft and hazards. The VO must be briefed as to their responsibilities as per CARs 901.20 & 901.28(b). The VO is not the same as a payload operator who may be operating a camera on an RPA. In some cases, the VO will also act as the Ground Supervisor. The VO has the following responsibilities:

1. Ensure the Pilot is not distracted by any spectators or other activities during the pre-flight, flight and post flight operations by:
    a. Ensuring spectators respect the 100' boundary.
    b. Answering any questions from the spectators.
    c. Ensuring any other activities in the area do not affect the Pilot.
2. Assist the Pilot with the pre-flight site hazard assessment.
3. Help monitor radio communication.
4. Monitor the weather and notify the Pilot of any changes that may affect the flight.
5. Assist the Pilot in maintaining VLOS.
    a. The observer may NOT use binoculars to aid in maintaining VLOS; however, polarized sunglasses are encouraged.
6. Watch and listen for approaching aircraft.
7. Assist the Pilot in identify potential hazards during the flight, such as birds.
8. Assist the Pilot in any emergency situations, which may include helping track a fly-way RPA and assisting with documentation.

7.0 RPAS Training and Certification

It is County policy that every RPAS Pilot must successfully complete both Ground School and Flight School to fly a RPAS. External trainers provide Ground School and Flight School training, and flight qualifications are certified internally by the ROC. It is the ROCs responsibility in:

1. Ensuring operators meet all training requirements.
2. Ensuring communications are disseminated to Pilots.
3. Ensuring training records are retained in accordance with, County policies and standards, and CARs part IX

7.1 Certification and Licensing

All staff are required to meet the federal requirements and obtain an RPAS certificate before becoming authorized under the County RPAS program. In addition to the federal requirements, all pilots must pass a county flight review before becoming authorized to fly. The process and minimum requirements are detailed as follows.

7.1.1 Basic RPAS Certificate:

1. Attend and complete a ground school program recognized by the RPAS ROC
2. Pass the TC Basic Exam
3. Be issued a TC Basic RPAS Certificate
4. Complete a minimum of two (2) hours flying time under an authorized RPAS pilot
5. Understand the RPAS policy, this directive and, the RPAS training manual
6. Pass a county flight review

7.1.2 Advanced RPAS Certificate

1. Complete all requirements for a Basic RPAS Certificate
2. Accumulate ten (10) hours of flying time under a basic certificate
3. Understand the RPAS Policy, Directive, Training Manual and, CARs part IX
4. Serve as advanced operations flight crew (other than pilot) for a minimum of two (2) hours flying time
5. Pass TC Advanced Exam
6. Pass TC Advanced Flight Review
7. Be issued a TC Advanced RPAS Certificate

8.0 Mission Planning

Mission planning is the responsibility of the Flight Crew (FC) as detailed in Section 6 of this Directive. The FC is responsible for determining what TC regulations are applicable in the project area. An air space assessment must be conducted to determine if the flight falls under a basic or advanced certificate. All relevant aeronautical information must be consulted prior to commencing a flight (airspace, aerodromes, air traffic services unit contact, radio frequencies etc.). The Natural Resources Canada RPAS Site Selection Tool: is a useful source of information and should be used in conjunction with the NAVDrone App for advanced operations.

The flight plan and initial hazard assessment are conducted as a desktop review and/or a site visit using all available information. The flight plan is a document that shows the particulars of an operation and is detailed in Section 8.1.

8.1 Flight Planning

Flight plans are required for all RPAS operations conducted by the County RPAS Program. Procedures must be in place in accordance with CARS 901.23 and 901.24. Failure to file the flight plan constitutes a violation of Section 8.1 of the Directive and will result in **Disciplinary** action. At any time, the ROC reserves the right to join the FC including acting as Pilot, Ground supervisor or Visual Observer.

8.1.1 Flying Basic Operations

For Pilots operating in class G (Uncontrolled) airspace under a basic certificate, if no specific class of airspace is noted on the Visual Navigation Chart (VNC), the operator is in class G airspace. To fly basic operations, it is sufficient to notify the ROC, that a RPAS is being deployed. The following information should be included in the flight plan:

1. Map and date of the proposed operation.
2. The business purpose of the flight.
3. List all aerodromes **within the maximum range of the RPAS being flown** or, the nearest aerodrome when there are no

aerodromes within the maximum range of the RPAS being flown, with:
   a. Local radio frequency and phone number.
   b. Distance in nautical miles from the operation to the aerodrome. (i.e. 8 nM SE of AOI).
   c. Direction of the aerodrome using standard cardinal directions (NW, SE, etc.).
4. The centroid of the AOI in the format of latitude/longitude to four decimal places.
5. Detail of the airspace class in which the flight will occur.

There is no requirement to wait for clearance from the ROC to fly basic operations, but the flight plan shall be always on-hand as part of the FCP.

8.1.2 Flying Advanced Operations

For Pilots operating in controlled airspace or in advanced environments (built-up areas) under an Advanced Certificate, The Pilot must fill out a flight plan in accordance with section 8.1.1 and submit it to the ROC for review. Once clearance from the ROC is obtained, the Pilot must obtain clearance from NAV Canada through the NAVDrone App before commencing with the flight if the flight is within controlled airspace. The following information should be included in the flight plan:

1. Map and date of the proposed operation.
2. The business purpose of the flight.
3. List all aerodromes **within the maximum range of the RPAS being flown** or, the nearest aerodrome when there are no aerodromes within the maximum range of the RPAS being flown, with:
   a. Local radio frequency and phone number.
   b. Distance in nautical miles from the operation to the aerodrome. (i.e., 8 nM SE of AOI).
   c. Direction of the aerodrome using standard cardinal directions (NW, SE, etc.).
4. The centroid of the AOI in the format of latitude/longitude to four decimal places.
5. Detail of the airspace class in which the flight will occur.

There is no requirement to file for NAV clearance for built up areas if operating in class G airspace.

8.1.3 Flying Beyond Visual Line-of-Sight (BVLOS)

BVLOS operations in Canada require an SFOC as per CARs 901.11. Pilots with an Advanced RPAS certificate are authorized to contact the ROC if BVLOS flight is required. The ROC will

determine if a BVLOS operation is of an operational necessity and will action the SFOC request with Transport Canada

8.2 Site Survey

A site survey is required for all flights in accordance with CARs 901.27 (be aware there are specific site survey requirements in CARS 901.27). The site survey shall be conducted as part of the crew briefing. A site survey is performed as a review of the flight plan with the addition of identification of on-site hazards, weather observations and confirmation of horizontal distances from persons not involved in the operation. The additional information shall be recorded either on the flight plan itself or, in the pilot's personal flight log and, the updated information shall be recorded on the on-line flight tracking log.

8.3 Flight Crew Package

The FCP is the field manual that must be present while conducting flights. The FCP is tailored to the specific unit that is being flown and shall include, but is not limited to:

1. Registration Certificate for the RPAS being flown (CARs 901.09).
2. Flight plan (and NAV Canada and OC approval if required) (CARs 901.27).
3. Emergency Action Plan.
4. This Document
5. Copy of the RPAS Pilot's certificate and documentation demonstrating that the pilot meets the recency requirements (CARs 901.57).
6. Access to VNC charts for the local area
7. RPAS Operator contact information.
8. RPAS system limitation (user manual) (CARs 901.30).
9. Government issued personal identification.
10. Evidence of permission from the owner of the property from which the UAV operator intends to take-off and/or land (legislatively delegated authorities may supersede this requirement).

8.4 Crew Briefing

A crew briefing is required for all operations that are conducted with more than one person on site as per
CARS 901.28(b). the crew briefing will be conducted prior to launching the RPAS and include:

1. Review of the site survey.
2. Weather observations.
3. On-site hazards identification.
4. Roles and responsibilities of all crew members, including pre-arranged instructions for hand-off, if hand-off is part of the mission.
5. Location and use of emergency procedures and emergency equipment.

9.0 Weather

Having a basic understanding of the weather and monitoring it prior and during the flight is critical to safe operation of the RPAS. The RPAS Pilot will not operate their aircraft in any weather conditions that exceed the operating capability of the aircraft (including the batteries and the controller). Weather observations will be recorded before the flight and will include:

1. Wind speed and direction.
2. Topographic influences.
3. Cloud cover (8^{th} scale).
4. Temperature.
5. Visibility.

Temperature will affect the operating capacity of batteries and temperature extremes will affect the battery length. In addition, colder temperatures and humidity may result in icing of the rotors and/or wings of the RPAS and can severely affect its ability to fly. If conditions are favorable for icing to occur, the Pilot will suspend the flight until conditions improve as per CARs 901.35.

The Pilot and Observer will also monitor any fronts passing through the area and anticipate changes in wind speed and direction. If thunderstorms are passing through the project area, the Pilot will suspend the flight until conditions improve. RPAS are not authorized to fly during active thunderstorms.

10.0 Emergency Action Plan

The ability to react quickly in an emergency is paramount to ensuring the safety of our pilots and the public. Specific procedures have been established to ensure pilots are able to react and respond in an RPAS emergency (in accordance with CARS 901.23). All RPAS pilots must ensure that the return to home function of their RPAS units are enabled and functioning. The following section outlines the procedures for various emergency situations. To expedited notifications to TC, the Pilot must fill out an RPAS Emergency Action Plan (Appendix 15.2) prior to lift off. The same action plan can be used for an entire mission providing the launch area home point has been updated on the plan for each new launch site.

10.1 Lost Link

A fly-away occurs when the Pilot loses control of the RPAS and the RPAS exits the project area in either a vertical or horizontal direction. The procedures to recover control will vary depending on the RPAS; however, in general the Pilot will action the following procedure:

1. Check antenna angle.
2. Check screen / controller cord.
3. Check screen / controller battery level.
4. Restart Human Interface Device.

5. Restart Flight Software.
6. If unable to establish control, and the automatic RTH function fails to function, execute fly-away procedure as detailed in 10.1.1 or 10.1.2

If the link is re-established, the Pilot will immediately land the RPA and cease all flying until the issue is resolved. If the Pilot cannot regain control of the RPA, the Pilot will activate emergency procedures as follows:

10.1.1 Vertical Fly-away

1. Continually attempt to regain control
2. Record following information:
    a. Vertical speed
    b. Battery life (minutes)
    c. Potential range
    d. Wind direction (flags, trees etc.)
3. Connection is established
    a. Attempt RTH (subject to the safety requirement in CARs 901.44)
4. Inconsistent or no connection
    a. 3.20
    b. Descend by pulling back on left thumb stick, or
    c. Attempt to disarm motors
5. Contact ACC 780-890-8397 and provide:
    a. RPA Registration#
    b. RPA Model, weight, color
    c. Location
    d. RPA direction
    e. Battery life (minutes)
    f. Last known speed
    g. Potential range
6. Contact ACC Shift Manager
7. Contact nearest aerodrome using information provided on the RPAS Emergency Action Plan:
8. Contact the ROC

10.1.2 Horizontal Fly-away

1. Continually attempt to regain control
2. Record following information:
    a. Direction of travel
    b. Battery life (minutes)
    c. Last known speed
    d. Potential range
    e. Wind direction (flags, trees etc.)

3. Connection is established
    a. Gain altitude
    b. Attempt RTH (subject to the safety requirement in CARs 901.44)
    c. With FPV
        i. Rotate left thumb stick and point RPA 180˚
    d. No FPV
        i. Don't rotate left thumb stick
        ii. Pull back on right thumb stick
    e. Listen for RPA
4. Inconsistent or no connection
    a. Check / adjust antennas
    b. Attempt RTH
    c. Descend by pulling back on left thumb stick, or
    d. Attempt to disarm motors
5. Contact nearest aerodrome as recorded on RPAS Emergency Action Plan and provide:
    a. RPA Registration#
    b. RPA Model, weight, color
    c. Location
    d. RPA direction
    e. Battery life (minutes)
    f. Last known speed
    g. Potential range

6. Contact ACC shift Manager and provide information above:
7. Contact ROC.

10.2 Crash

If the RPA is involved in a crash the following steps are followed:

1. Turn off the controller and ensure the RPAS is deactivated to avoid further damage or injury.
2. Determine if there are any injuries and if so, follow standard first aid procedures.
    a. Ensure the area is safe and secure.
    b. Call 911 if required.
3. Assess if the RPA has caused damage to vehicles, buildings, or infrastructure.
    a. Ensure there is no further risk of damage or danger.
4. Call the ACC Shift Manager and follow their instructions.
5. Notify the ROC.
6. Once safe to do so, record the following:
    a. Time of incident.
    b. Weather conditions.
    c. Events leading to the crash.
    d. Pictures of any damage.

7. Record the incident on the incident tracker. Attach all applicable documentation to the incident report including:
    a. Pilot record of incident.
    b. OHS report.
    c. Pictures of damage if applicable.

10.3 Airspace Incursion

If the RPAS has an unexpected close encounter with another aircraft that is within 150 meters (500ft), action the following procedure:

1. Take manual control
2. Maneuver to descend below tree line
3. Wait a minimum of 3 minutes for the aircraft to clear the area. If the aircraft persists beyond the 3-minute mark,
4. Terminate flight until safe to continue

10.4 Hard Landing

If, while landing in an otherwise controlled manner (i.e., it was a normal landing sequence), the RPAS flips or lands hard, do the following:

1. Turn off the RPA and controller.
2. If the RPA damages private or public property treat it as a crash.
3. If only the RPA is damaged:
    a. Shut the RPA down.
    b. Assess the RPA for damage.
        i. If there are only broken rotors, then replace and do a test flight to ensure the RPA is functioning normally and there was no motor damage.
        ii. If other components such as the landing gear, airframe, gimbal or camera are damaged, further flights will cease and the RPA will be sent in for repairs or replacement.
    c. Document the events leading to the hard landing in the same manner as a crash but there is no need to report it to TC.
4. In all cases, inform the OC for further advice.
5. If the RPA appears to be undamaged, perform low-level test flights and slowly extend the flight time until you are confident it is flying correctly.
6. Once flying is completed, attach a note to the RPA indicating the unit had a hard landing and that when the next flight occurs the Pilot should do a low-level test flight to ensure the unit is still working correctly.

10.5 Emergency Landing

In the event a situation requires the immediate landing of an RPAS without a RTH, action the following procedure:

1. Pick landing location

a. Near the aircraft
b. Safe
c. Flat
d. Away from people / buildings

2.Hover at low altitude
3.Throttle idle to land or,
4.Disarm motors

10.6 Compromised Security

If a situation develops that puts into question whether the pilot is still in control of the RPAS, it is imperative that the pilot acts quickly to ensure the safety of the flight crew and the public. In all cases, if the craft does not respond to manual commands and the RTH function fails, this is considered a compromised security situation. Follow the procedures detailed in section 10.1.

11.0 Security Plan

All Pilots and Ground Supervisors listed on the SFOC will have a good understanding of airspace classification and structure, weather, notice to airmen (NOTAM) reporting services, VTA and VNC, the Canadian Flight Supplement (located in an emergency backpack with First Aid kit and Fire extinguisher), and relevant sections of the *Canadian Aviation Regulations*, particularly sections 602.01, 602.07, 602.11, 602.21 and 602.4.

NOTAMs should only be filed for an RPAS operation when the airspace owner has indicated that this is required. Not all aerodromes require NOTAM, and it is up to each aerodrome authority to determine if a NOTAM is required. NOTAMs should be filed by the pilot at least 24 hours in advance of the mission and the flight plan should be sent to the ROC 72 hours prior to the flight. The following information is pertinent to air navigation services and users:

1. Dimensions of RPAS Operations area (within 1 NM is considered standard) with reference to the:
    a. Area of operation, expressed as latitude/longitude, and
    b. Planned operational altitudes, in feet above ground level.
    c. RPA size.
    d. RPA weight.
    e. RPA color.
    f. Date and time of operation.
    g. User contact information.

All RPAS operations will be conducted so that the safety of persons and property on the ground and other air space users is not jeopardized. The procedures listed below will be reviewed prior to each RPAS activity:

1. The RPAS users are responsible for compliance with TC rules and guidelines at all times. As RPAS technology and the rules for operations are evolving frequently, it is mandatory to refer to the TC website for current rules prior to operation.

2. RPAS users are responsible for complying with all other Canadian laws that might apply (e.g., Privacy Act, Criminal Code of Canada etc.) during operation. All provincial, territorial, and municipal laws and regulations must also be followed.
3. Always have on hand this document, SFOC if applicable, proof of liability insurance, VHF air band transceiver, RPAS user contact info, maps/charts, aircraft system limitation (user manual), means of communication (cell phone, satellite radio), and fire extinguisher.
4. RPAS Lithium Polymer batteries will be transported according to the *Dangerous Goods Transportation and Handling Act* (Alberta). *Each* battery must be separated from metal objects and battery terminals insulated with electrical tape or other non-conductive material as this will prevent short circuits.
5. RPAS users shall adhere to all responsibilities outlined in section 6.0.
6. Remote control signal loss and/or GPS loss may result in loss of control of the RPA and will be mitigated by:

a. Calibrating the RPAS compass before each flight.
b. Ensuring battery is above 90% prior to takeoff.
c. Ensuring GPS lock and home point are acquired.
d. Ensuring the mission is within the RPAS operating specifications.
e. Planning flight to complete with 30% battery power remaining.

7. RPAs not being operated shall be stored in a secure way (i.e., pelican case inside a flammable cabinet or locked vehicle).

12.0 RPAS Maintenance

The type of maintenance performed on a RPAS will depend on the RPAS type and the recommendations from the manufacturer of the RPAS. The Pilot and/or owner of the RPAS will follow these guidelines:

1. Never open the body of a RPAS or attempt to perform any maintenance on a RPAS that is not prescribed in the RPAS's user manual unless the pilot is a certified technician for that aircraft.
2. Follow the manufacturer's recommended maintenance cycles and storage recommendations.
3. Before and after each flight, inspect the RPA for visible signs of damage to any of the components paying close attention to the rotors.
4. Replace damaged rotors immediately and discard them.
5. Firmware upgrades must be performed regularly. Ensure that:
    a. The craft is up to date before operational flights.
    b. The controller and batteries are updated at the same time.
    c. After all updates, a test flight must be performed to ensure that the update was successful and that there are no conflicts between the RPA, batteries, and the controller.

13.0 Grounding of RPAS

Due to the rapid advancement of RPAS technology, updates are frequent with the classes of RPAS deployed by the County. There is the potential for these updates to cause conflicts with the

software/firmware of the units and as such, it may be required to ground specific units if problems are encountered. Grounding of RPAS can occur for several other reasons including:

1. Unsafe environmental conditions.
2. Regulatory or policy changes.
3. Physical damage to units.
4. Emergencies.
5. Software/firmware bugs discovered.
6. Failed software/firmware updates.

In the event of a Pilot grounding a specific unit, the unit will be tagged out by affixing a tag to the unit case. Information required includes:

1. Name of pilot
2. Date of tag out
3. Reason for tag out

If, in the event, a systemic issue arises and the entire fleet must be grounded, or a specific make or model must be grounded, a notification will be sent from the ROC to all Pilots with details of the situation that is affecting the ability to fly safely. Once the issue is resolved, Pilots will be notified that the grounding has lifted and normal RPAS operations can continue. Reasons for a fleet grounding include but are not limited to:

1. Severe weather or potentially severe weather
2. Solar storms
3. GPS network issues
4. Firmware issues
5. National or provincial states of emergency

14.0 Incident Reporting

Reporting of incidents is imperative to ensuring the operation of a safe and legally compliant RPAS program. Incident reporting serves not only to stay legally compliant, but also serves as a mechanism that will enable the County to track issues that may prove to undermine the effectiveness of a specific RPAS. Incident reporting will also enable the County to identify gaps in training and provide an avenue to address those gaps.

Additionally, CARs 901.49 dictates that a Pilot of a RPAS cease operations if any of the following incidents or accidents occurs, until such time as the cause of the occurrence has been determined and corrective actions have been taken to eliminate the risk of reoccurrence:

1. Injuries to any person requiring medical attention.
2. Unintended contact between the unmanned aircraft and persons,
3. Unanticipated damage incurred to the airframe, control station, payload or command and control links that adversely affects the performance or flight characteristics of the aircraft.
4. Anytime the aircraft is not kept within lateral boundaries or altitude limits.

5. Any collision with or loss of separation from another aircraft.
6. Anytime the aircraft becomes uncontrollable, experiences a fly-away or is missing.
7. Any incident not referred to above for which a Canadian Aviation Daily Occurrence Report (CADORS) has resulted.

In situations where a FC reports interference from any persons that jeopardized the safety of the flight (either direct interference with the crew and/or the aircraft), the crew will notify the ROC and cease operations until the issue is resolved.

Section 10.0 of this document outlines an order of operations for internal reporting of incidents in the Emergency Action Plan. Internal incidents are reported through an online form. This is a live system that immediately notifies the ROC that an incident has occurred. If the incident resulted in damage to any personal or public property, or
resulted in an injury to the public or the FC, an OHS incident form must also be completed. The RPA involved in the incident is automatically grounded until the internal investigation is completed and if required, permission is obtained from TC. Filing of incident reports with TC is the responsibility of the ROC and shall be done within 24 hours of the incident or by the next business day. Pilots are not to file incidents with TC directly.

15.0 Appendices

The following appendices are provided to aid pilots in completing their flights in a safe and legally compliant manner. Checklists are written specifically for the DJI series of RPAS but can be adapted to all RPA models in the County Fleet.

15.1 Flight Checklists

15.1.1 Preflight Checklist

1. Documents
    a. RPAS Pilot License (basic or advanced)
    b. Restricted Radio Operators Certificate
    c. Navigation Chart, Maps etc.
    d. COUNTY SOP and Policy
    e. RPAS Operations Manual
    f. SFOC (if applicable)
    g. Operations Flight Plan – COMPLETE / SUBMITTED
    h. RPAS Emergency Action Plan – COMPLETE
2. Weather and NOTAM's
    a. Long Range GFA (suitable for flight duration)
    b. Current (within parameters)
        i. Nearest METAR / TAF or Environment Canada Forecast
    c. Temperature / Dewpoint

d. Wind Direction / Speed
e. Cloud Height
f. Precipitation
g. Altimeter Setting
h. Visibility
i. 3nm
j. 1000' ceiling
k. Check NOTAM's with Nav Canada

3. Equipment
    a. High-visibility clothing (if required)
    b. Two-way radio (air-traffic) (if required)
    c. Two-way radio (ground crew) (if required)
    d. Pylons or barriers (if required)
    e. Operations Signs (if required)
    f. Fire Extinguisher
    g. First Aid Kit
    h. Other safety equipment if required

4. Site Inspection
    a. Hazards
        i. Public, animals, buildings, obstacles, air traffic etc.
    b. Landing zone

        i. Free of ground debris
        ii. Obstacle clearance
5. Crew Member Briefing – if required
    a. Mission Overview
        i. Objective
        ii. Altitude
        iii. Flight Path
        iv. Duration
    b. Airspace Classification
    c. Weather
    d. ATC Frequencies
    e. NOTAM's
    f. Known Hazards
    g. Crew Member Roles
    h. Pilot in Command
        ii. Overall control
        iii. Main point of contact
        iv. Others
        v. Watch for hazards and advise PIC
        vi. Specific tasks
        vii. Emergency Procedures
7. Emergency equipment location (fire extinguisher, first aid kit)

8. Flight termination (any risk or hazard occurs)
9. Emergency Form – COMPLETE
10. Address Questions and Concerns from FC

15.1.2 RPAS Preparation Checklist

1. Aircraft Inspection / Preparation
    a. Inspect for damage
    b. Registration number displayed
    c. front arms – FULLY DEPLOY
    d. rear arms – FULLY DEPLOY
    e. arms secure – CONFIRM
    f. motors free moving and functional – CONFIRM
    g. (4) propellers – ATTACH / INSTALL / SECURE
        i. grey propellers
        ii. Closed
        iii. Ensure upright
        iv. Insert (3) slots into slats
        v. Rotate motor to lock
        vi. Confirm locked
    h. black propellers
        i. Closed
        ii. Ensure upright
        iii. Insert (3) slots into slats
        iv. Rotate motor to lock
        v. Confirm locked
    i. Propellers – EXTEND
    j. Check for damage
    k. Propellers – RETRACT
2. (10) Obstacle sensors unobstructed / clean – CONFIRM
3. cooling ports unobstructed and clear – CONFIRM
4. Battery
    a. Insert slot not damaged – CONFIRM
    b. Fully charged – CONFIRM (4 green lights)
    c. Insert into slot
    d. Secure – CONFIRM
5. Gimbal cover – REMOVE
    a. Gimbal free moving and clear – CONFIRM
6. SD Card present / inserted – CONFIRM
7. Accessory install – AS REQUIRED
8. Controller Inspection / Preparation

a. Inspect for damage
b. antenna's – EXTEND
c. control sticks – ATTACH / SECURE
d. control sticks – FREE MOVING
e. Screen mount – ATTACH / SECURE
f. Screen battery - ATTACH / SECURE
g. Screen – ATTACH / SECURE
h. Screen cord to controller – CONNECT

9. Controller Start-up
   a. Screen – POWER ON
   b. Fully charged – CONFIRM
   c. Turn on controller
      i. Power button – PRESS / RELEASE
      ii. Power button – PRESS / HOLD
      iii. Fully charged – CONFIRM
      iv. DJI Flight App – START
10. Aircraft starting
   a. Power button – PRESS / RELEASE
   b. Power button – PRESS / HOLD
   c. Battery fully charged – CONFIRM (4 green lights)
   d. Listen for tone
11. Controller connecting
   a. Screen – ON
   b. DJI App – ON
      i. Updated firmware – CONFIRM
      ii. Control mode - SELLECT (1,2, or 3)
      iii. C1 Button setting – SELLECT PREFERENCE
      iv. C2 Button setting – SELLECT PREFERENCE
      v. Measurement units setting – SELLECT PREFERENCE
      vi. Select mode
         1. Training – ON
         2. Mission – OFF
      vii. Account information – CONFIRM
      viii. DJI App – ACTIVATE

15.1.3 Pre-Flight Checklist

1. Aircraft
   a. (4) arms fully deployed – CONFIRM
   b. (4) propellers extended – CONFIRM
   c. (4) propellers secure – CONFIRM
   d. Battery secured and locked – CONFIRM

e. Gimbal cover removed – CONFIRM
f. If accessory installed, secure – CONFIRM

2. Controller
   g. (2) antenna's fully deployed – CONFIRM
   h. (2) control sticks attached / secure – CONFIRM
   i. (2) control sticks free moving – CONFIRM
   j. Screen mount attached / secure – CONFIRM
   k. Screen attached / secure – CONFIRM
   l. Screen cord to controller connected – CONFIRM
   m. Mode – SET TO "P"

15.1.4 Launching RPAS Checklist

1. Landing Site
   a. Clear of obstructions / personal – CONFIRM
   b. Position aircraft on landing site
2. Controller (if not on)
   a. Power button – PRESS / RELEASE
   b. Power button – PRESS / HOLD
   c. Controller on – CONFIRM
   d. Battery fully charged – CONFIRM
3. Aircraft (if not on)
   a. Power button – PRESS / RELEASE
   b. Power button – PRESS / HOLD
   c. Aircraft on – CONFIRM
   h. Battery fully charged – CONFIRM (4 green lights)

<u>PRE-TAKEOFF</u>

1. Communications
   a. Radio set to 126.7 or appropriate frequency – CONFIRM
   b. Ground communication established – CONFIRM
2. Controller / Screen Checklist
   a. Aircraft status – OK
   b. GPS signal "ready to go" – CONFIRM
   c. GPS home lock – CONFIRM
   d. RTH altitude > 30m – CONFIRM
   e. Flight mode correct – CONFIRM
   f. Compass normal – CONFIRM
   g. IMU normal – CONFIRM
   h. Electronic condition normal – CONFIRM
   i. Vision sensor normal – CONFIRM
   j. Remote controller mode – CONFIRM

k. Remote controller battery level - CHECK
l. Aircraft battery temperature – OK
m. Gimbal status normal – CONFIRM

3. Flight Control Settings
    a. RTH altitude > 30m – CONFIRM
    b. Maximum altitude 120m – CONFIRM
    c. Maximum distance 450m – CONFIRM
    d. Distance limit enabled – CONFIRM
    e. Failsafe set to RTH – CONFIRM
    f. Obstacle avoidance enabled – CONFIRM
    g. RTH obstacle detection enabled – CONFIRM
    h. Precision landing enabled – CONFIRM
    i. (4) battery indicators full and w/i 0.2v – CONFIRM
    j. Visual obstacle avoidance – ENABLED
    k. Display screen unobstructed / clear – CONFIRM
    l. Gimbal free moving and correct – CONFIRM
4. Aircraft
    a. On suitable takeoff site – CONFIRM
    b. Flight Confirmed – "GOOD TO GO"
    c. Aircraft / personal clear of obstructions – CONFIRM / ANNOUNACE "CLEAR TAKEOFF ZONE"
    d. Time-up – RECORD

<u>TAKEOFF</u>

1. Arm aircraft – "ARMING MOTORS"
    a. Left thumb stick down/left, right thumb stick down/right
    b. (4) Propellers rotating – CONFIRM
2. Perform takeoff – "LAUNCHING RPAS"
    a. Manual
        i. Left thumb stick forward to takeoff
    b. Automatic
        i. Press takeoff button
        ii. Slide to takeoff

<u>CONTROL TEST</u>

1. Aircraft hovering eye level 20 to 30 seconds – CONFIRM
2. Throttle
    a. Climb to 3 to 5 meters AGL
    b. Hover

   c. Descend to original altitude
   d. Hover
   e. No dropped connection – CONFIRM
3. Yaw
   a. Aircraft hovering – CONFIRM
   b. Left 90˚ turn
   c. Right 90˚ turn
   d. Hover
   e. No dropped connection – CONFIRM
4. Forward / Reverse
   a. Aircraft hovering – CONFIRM
   b. Forward 3 meters
   c. Rearward 3 meters
   d. Hover
   e. No dropped connection – CONFIRM
5. Roll
   a. Aircraft hovering – CONFIRM
   b. Left slide
   c. Right slide
   d. Hover
   e. No dropped connection – CONFIRM

<u>LANDING</u>

1. Landing site clear of obstructions / personal – CONFIRM
2. Hover over landing site
3. Hold throttle down or press landing button

Propellers stopped – CONFIRM

<u>POST LANDING</u>

1. Time down – RECORD
2. Propellers stopped – CONFIRM
3. Approach and obtain aircraft
   a. Power button – PRESS / RELEASE
   b. Power button – PRESS / HOLD
   c. Aircraft off – CONFIRM
4. Controller
   a. Power button – PRESS / RELEASE
   b. Power button – PRESS / HOLD
   c. Controller off – CONFIRM

5. Screen
    a. Exit DJI App
    b. Screen – OFF

15.1.5 Post Flight Checklist

1. Controller
    a. Controller off – CONFIRM
    b. Screen / mount – REMOVE
    c. Connection cord – REMOVE
    d. Antennas – RETRACT
    e. Secure in case
2. Aircraft
    a. Aircraft off- CONFIRM
    b. Check for damage
    c. (4) Propellers
        i. Check for damage
        ii. REMOVE or RETRACT
    d. (2) rear arms – FULLY RETRACT
    e. (2) front arms – FULLY RETRACT
    f. Gimbal protector – INSTALL
    g. Secure in case
3. Screen
    a. Screen off – CONFIRM
    b. Secure in case

15.2 Emergency Action Plan

EMERGENCY ACTION PLAN

This form is to be filled out during the crew briefing and pre-populated with phone numbers for the specific area before the mission. This form must be on site as part of the Flight Crew Package.

RPAS Information

Home Point: LAT_____LONG_____

ROI Description: _____

RPAS Description: _____

RPAS Direction and Speed: _____

Remaining Endurance: _____

EMERGENCY COMMUNICATION PROCEDURE

Call in order listed and give above information

Horizontal Flyaway

1. **Nearest Aerodrome # _____**
2. **2nd Aerodrome # _____**
3. **NAV Canada Shift Manager # _____**
4. **Flight Information Centre # _____**
5. **ROC # _____**

Vertical Flyaway

1. **Nav Canada Shift Manager # _____**
2. **Nearest Aerodrome # _____**
3. **2nd Aerodrome # _____**
4. **Flight Information Centre # _____**
5. **ROC # _____**

"Original Signed"
Chief Administrative Officer

July 13, 2022
Date

SPECIAL NOTES/CROSS REFERENCE: CM-26-004 Policy

AMENDMENT DATE: **June 14, 2022**