

Metropolitan Wastewater
MANAGEMENT COMMISSION



partners in wastewater management

Metropolitan Wastewater Management Commission

Small Unmanned Aerial Systems (sUAS)

Operations Manual

May 18, 2022

Final

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1. Purpose

The following procedures are intended to promote safe, efficient, and lawful operation of all Metropolitan Wastewater Management Commission's Small Unmanned Aerial Systems (sUAS). Regardless of the nature of the mission, safety is the primary concern in each and every operation.

2. Philosophy

The operation of sUAS has the potential to leverage the resources available to City of Eugene and City of Springfield staff that work on behalf of the Metropolitan Wastewater Management Commission (MWMC) to inform actions and find efficiencies for the partnership. This far-reaching technology may be used to protect the lives and property of citizens and first responders, enhance situational awareness during emergency response, inspect facilities, assets, infrastructure, and natural resources, and enhance services provided to the community.

It is the responsibility of every participating employee to contribute to the goal of continued safe sUAS operations. This contribution may come in many forms and includes always operating in a legal and safe manner while avoiding unnecessary risks. All participants engaged in the operation of sUAS have a responsibility to identify and mitigate any potential safety hazards related to procedures, operations, or maintenance before an incident occurs.

The MWMC is committed to providing the best services possible to our community, and sUAS will always be operated in a constitutionally and legally sound manner that respects and protects the privacy and civil liberties of all. This means compliance with the MWMC's sUAS policy, the MWMC's Operations Manual, state laws and regulations, federal laws and regulations, all state and federal Constitutional guarantees. In addition, this includes avoiding unneeded or unintended operation of sUAS and thoughtful consideration for personal privacy and public perception at all times.

3. Protection of Rights and Privacy

MWMC has specific requirements for the handling of sensitive information and protecting privacy in accordance with existing law but does not conflict with the minimum requirements contained herein. Refer to the MWMC policies on sUAS for more information.

4. Definitions

14 CFR Part 107 (Part 107): Federal Aviation Administration (FAA) regulations regarding Small Unmanned Aircraft Systems.

Aircrew Member: Partnership personnel designated and selected as either "PIC," a "Student Operator," or any personnel operating, observing as a crewmember or maintaining a sUAS.

Certificate of Waiver: A certificate issued by the Federal Aviation Administration authorizing a deviation from any regulation specified in 14 CFR §107.205.

FAR: Federal Aviation Regulations are rules published by the FAA that govern the use of any airspace above the ground within the United States of America.

Hazard: Something that has the potential to cause harm.

Occurrence: An unplanned safety related incident, including accidents or damage to aircraft or property.

Pilot in Command (PIC): Is a sUAS Operator who holds a Remote Pilot Certificate with a small UAS rating, has been approved by the Unit Supervisor, and who has met all requirements of knowledge, training, and operational proficiency as required by the MWMC's policy, as well as state and federal laws and regulations. The PIC is directly responsible for the control, safety, and operation of the sUAS, The PIC is the sole person responsible for control of the sUAS and has the final responsibility and authority to conduct flight operations within the National Airspace System as defined by the FAA.

Remote Pilot Certificate. A Remote Pilot Certificate with a sUAS rating is a certification issued by the FAA which gives the individual the privilege to conduct flight operations within the National Airspace System as defined by the FAA. A Remote Pilot Certificate is a required prerequisite for any individual to operate an sUAS unless an exception listed in 14 C.F.R. § Part 107 applies. Any individual holding a Remote Pilot Certificate will remain in compliance with all applicable state and federal laws, regulations, and guidance, including, but not limited to the recurrent training requirements and the continuing eligibility requirements found in 14 C.F.R. § 107.52- 107.77.

Unit Supervisor: The Unit Supervisor is responsible for the overall direction and performance of the MWMC's sUAS program as defined by the MWMC policy. Refer to Section 6.1 for basic responsibilities of the Unit Supervisor.

Small Unmanned Aerial System (sUAS): As defined by 14 C.F.R § 107.3, an unmanned aircraft of any type (weighing less than 55 pounds) that is capable of sustaining directed flight, whether preprogrammed or remotely controlled and all of the supporting or attached systems designed for gathering information through imaging, recording or any other means. For the purpose of this policy, an sUAS includes an "Unmanned Aircraft System (UAS)" commonly referred to as a "drone," as defined by ORS 837.300.

Student Operator: An individual who has not yet earned a Remote Pilot Certificate but is authorized to operate a sUAS by the Unit Supervisor under the direct supervision of a PIC.

Visual Observer (VO): A trained individual who assists the PIC and/or the person manipulating the controls of the sUAS to see and avoid other air traffic or objects aloft or on the ground. The use of a VO provides an optional and additional means of airspace and obstacle de-confliction.

5. Administration

This sUAS Operations Manual is not intended to be all-inclusive, but rather to act as a supplement to all other applicable laws, authorities, regulations, MWMC policies, FAA regulations, and other documents, such as the user's manual provided by the manufacturer of the sUAS. This manual has been written to address sUAS operations as they existed when it was drafted. sUAS may be considered

an emerging technology, and equipment, software, personnel, environmental conditions, regulations, etc., may change over time.

6. Organization

The organizational structure for the operation of the sUAS includes City of Eugene and City of Springfield staff working on behalf of MWMC and functioning in the roles of Unit Supervisor, PIC, VOs, and Student Operators.

6.1 Unit Supervisor

The Unit Supervisor is responsible for the overall direction and performance of the department sUAS program. The responsibilities of the Unit Supervisor for each department include but are not limited to:

- Record keeping and reporting.
- Contact with the FAA as needed.
- Reviewing and updating of program policies and procedures as needed.
- Evaluating sUAS based on case uses and replacement needs.
- Monitoring the sUAS community to ensure best safety practices are incorporated into the MWMC's use and operation of sUAS.
- Establishing a review process to monitor program objectives, aircrew member performance, proficiency, and use of sUAS.
- Approving and removing aircrew members from flight status as needed. Any aircrew member may be temporarily removed from flight status at any time by the Unit Supervisor for reasons including, but not limited to, performance or proficiency.

6.2 Pilot-in-Command

The primary operational responsibility of the PIC is the safe and effective use of sUAS in accordance with the user's manual provided by the manufacturer, federal and state law, and MWMC's policies. Ultimately, it is the responsibility of the PIC to ensure aircrew members meet current qualifications to operate a sUAS, and that the sUAS will pose no undue hazard to other people, aircrafts, or property. No person may act as a PIC for more than one sUAS at the same time. The PIC will ensure compliance with all operating limitations in compliance with 14 C.F.R. §107, including 14 C.F.R. §107.51. If any question should arise regarding the required protocol for operation of an sUAS, the PIC shall consult the Unit Supervisor, 14 C.F.R. Part 107, and FAA Advisory Circular No. 107-2A (or any subsequent FAA Advisory Circular issued as a substitute).

6.2.1 PIC Compliance

The PIC will have in their physical possession a readily accessible Remote Pilot Certificate with a sUAS rating and identification at all times when operating a sUAS, which the PIC will present upon request to any local, state, or federal law enforcement officer, or authorized representative of the Transportation Security Administration, National Transportation Safety Board, or FAA. Upon request, the PIC will allow an authorized representative of the FAA to inspect or test the sUAS, the PIC, any person manipulating the flight controls of a sUAS, and any visual observer to ensure compliance with federal laws and regulations.

6.3 Visual Observers

The role of a VO is to alert the PIC and the rest of the aircrew about potential hazards during sUAS operations. The use of a VO is optional but is recommended to enhance situational awareness. The PIC may use one or more VOs to supplement situational awareness and visual loss of sight responsibilities. No person may act as a VO for more than one sUAS at the same time. If a VO is used during the sUAS operation, all of the following requirements must be met:

- The PIC, the person manipulating the flight controls of the sUAS, and the VO must maintain effective communication with each other at all times.
- The PIC must ensure that the VO is able to see the sUAS and the position of other aircraft in the manner specified in 14 CFR §107.31.
- The PIC, the person manipulating the flight controls of the sUAS, and the VO must coordinate to do the following:
 - a. Scan the airspace where the sUAS is operating for any potential collision hazard;
 - b. Maintain communication at all times; and
 - c. Maintain awareness of the position of the sUAS through direct visual observation.

In addition to the requirements specified above, VOs may also be asked to:

- Remain alert for suspicious persons or activities on the ground or in the air and coordinate response through the PIC and IC.
- Operate any attachments to the sUAS, allowing the operator to maintain complete focus on the operation of the sUAS.
- Monitor radio and other communications.
- Complete documentation for mission training and updating of flight logs (as applicable).

6.4 Student Operators

A Student Operator may operate a sUAS under the direct supervision of a PIC for training purposes as approved by the Unit Supervisor. A Student Operator must be accompanied by a PIC at all times while at the controls of a sUAS. A Student Operator is responsible for the safety and operation of the sUAS; however, the PIC has final authority over and responsibility for the sUAS at all times. Student Operators may not operate a sUAS without PIC supervision until training requirements have been met and the Student Operator is approved as a PIC by the MWMC Executive Officer or designee. Direct supervision requires that a PIC must have the ability to immediately take direct control of the sUAS.

7. Equipment Storage and Maintenance

Participating City departments shall store and maintain equipment in a location and manner approved by the Unit Supervisor and in compliance with manufacturer guidelines. In addition, all participating personnel are equally responsible for maintaining the equipment and facility in a neat, clean, and orderly fashion; and sUAS shall be stored in accordance with department policy and in a manner intended to prevent or reduce the probability of damage, tampering, or operation by unauthorized individuals per department policy.

8. Training and Proficiency

Before an aircrew member can function as a PIC, they must complete a minimum of four (4) hours of

flight training with an MWMC PIC to demonstrate their knowledge of operational requirements and proficiency with the sUAS. The Unit Supervisor has the authority to change or waive the requirement for minimum hours of training based on demonstrated proficiency and written documentation of knowledge and experience of the PIC candidate. For ongoing training, all flights or exercises will be documented and count toward an aircrew member's training. Aircrew members shall have four (4) hours of ongoing training per calendar year. This training should include, but is not limited to the following topics:

- Department commitment to safety
- Member's role in safety
- Review of sUAS program
- Emergency safety procedures
- Medical conditions affecting operations and self-assessment
- Airspace
- FAA regulations
- Deployment
- Maintenance, repair, and storage of airframes
- sUAS performance
- Weather

Successful Completion of the FAA Part 107 sUAS Certification or Recurrent Knowledge Test will fulfill the annual training requirement for the year it was completed.

All PICs shall maintain operational proficiency of sUAS. Aircrew members without any documented flight time within a span of 180 days will demonstrate operational proficiency before functioning as PIC on a real-world event. Aircrew members may demonstrate operational proficiency on a real-world response or exercise in the role of a Student Operator at the discretion of and under the direct supervision of a current PIC. The Unit Supervisor shall determine the amount required training (flight time and/or instructive) to demonstrate operational proficiency.

All training shall be documented in the aircrew member's file maintained by the department Unit Supervisor or in a centralized system. It is incumbent on the aircrew member to ensure compliance and proper documentation of training and flight time. Failure to maintain or document operational proficiency can result in removal from sUAS responsibilities.

9. Authorized Uses of sUAS

See MWMC sUAS policy for authorized uses.

10. Flight Checklists, Logs, and Registration

Within the aviation community the utilization of checklists and consistent sUAS documentation has significantly reduced the risk of aviation operations, and MWMC PICs are required to complete and maintain the following logs and checklists. Registration of sUAS is required by the FAA as well as the Oregon Department of Aviation. MWMC and PICs are responsible for registration.

Where applicable, all sUAS equipment must be certified in accordance with all federal and state regulations, including in accordance with 14 C.F.R. §91.203; 14 C.F.R Part 107; and ORS Chapter 837.

10.1 Maintenance and Flight Logs

The PIC shall follow the maintenance schedule in the user's manual provided by the manufacturer of the sUAS and maintain flight software/firmware as required including:

- A maintenance log shall be established for each sUAS to track maintenance discrepancies and repairs.
- The maintenance logs shall be reviewed by the PIC before subsequent flights and updated after the last flight, not to exceed the operational period.
- PICs shall maintain a personal flight log (electronic or paper) documenting the time, location, duration, purpose of flight, and type of sUAS equipment utilized.
- PICs shall provide flight and maintenance logs at the request of the Unit Supervisor or higher chain of command.

10.2 Pre and Post Flight Checklists

MWMC requires scheduled regular inspections to maintain a fleet of functioning sUAS units for use as needed. PICs are responsible for a thorough preflight inspection of the sUAS. Before and after each flight, the PIC shall:

- Conduct an assessment of the operating environment. The assessment must include at least the requirements proscribed in 14 C.F.R. Chapter 107 and FAA Advisory Circular No. 107-2A.
- PICs are required to be familiar with all Pre Flight requirements in addition to those listed in Appendix A - Recommended sUAS Flight Checklist.
- Ensure all persons directly participating in the small UAS operation are informed about the following: Operating conditions; Emergency procedures; Contingency procedures, including those for persons or moving vehicles not directly participating in the operation that enter the operational area; Roles and responsibilities of each person participating in the operation; and Potential hazards.
- Conduct a thorough inspection of the sUAS in accordance with the user's manual provided by the manufacturer. If the manufacturer does not provide a preflight checklist the PIC must adopt and use the checklist provided as Appendix A to this manual.
- Any physical equipment or firmware/software discrepancy that cannot be resolved and which has a potential impact on flight safety will override the deployment of sUAS, and any discrepancy shall be resolved before flight. If issues are unresolved, the sUAS will be removed from operation until all discrepancies have been resolved.
- Conduct a post flight inspection of the sUAS and document any discrepancies in the sUAS's maintenance and flight time log.

To Maintain an sUAS in a safe condition for operation, the PIC must inspect each sUAS prior to each flight. The sUAS must not be operated unless it has been determined by the PIC to be in a condition safe for operation.

10.3 Registration

Every sUAS used for MWMC purposes shall be registered with the FAA in accordance with 14 C.F.R. Part 47 or 48, and Oregon Department of Aviation in accordance with ORS Chapter 837 and OAR 738-

080-0045 The PIC is responsible for maintaining a copy of the sUAS registration available for inspection at all times.

11. Record Keeping and Reporting

The Unit Supervisor has the responsibility for maintaining the following records. Aircrew member files shall be reviewed annually and should contain:

- Copies of FAA certifications and expiration dates
- Training records
- Flight logs for aircrew members
- Flight and maintenance records for each sUAS

The Unit Supervisor will ensure flight logs for each PIC are compiled and maintained in a centralized system.

12. Identification

MWMC sUAS will be labeled or marked in the following ways:

- FAA and state registration numbers will be adhered to the sUAS as required by state and federal law.
- sUAS will display obvious visible features identifying it as MWMC property, and these markings may appear as a colored label, sticker or covering (skin) on the sUAS.
- When selecting a color coding it should have a high contrast value and relationship between the markings and the production color of the sUAS. The following link is for reference: <https://www.designworkplan.com/read/signage-and-color-contrast>
- A contact phone number will be displayed on the hull of the sUAS.

13. Deployment Priorities/Response Procedures

All sUAS operations shall be conducted in accordance with Part 107 or an approved Certificate of Waiver. The section manager, division manager or supervisor, as designated by MWMC policy, has mission approval authority, the PIC retains the final authority and responsibility for the operation and safety of the sUAS.

No person may manipulate the flight controls of an sUAS or act as a PIC, VO, or direct participant in the operation of the sUAS if they know or have reason to know that they have a physical or mental condition that would interfere with the safe operation of the sUAS. No person may operate an sUAS in a reckless or careless manner or allow an object to be dropped from an sUAS that creates a hazard to persons or property. No person may engage in the operation of an sUAS if they have been impaired by any drugs or alcohol. An sUAS may never carry hazardous materials as defined in 49 C.F.R. § 171.8.

13.1 Emergency Incident Response

If a MWMC sUAS is requested and assigned to support an emergency incident, the sUAS shall maintain a safe vertical and horizontal distance as coordinated by the aircrew on the incident. All aircrew operating in the same incident shall monitor and maintain voice communication over a common frequency when possible. Deconfliction is the responsibility of each PIC. The Incident Commander

should consider the risk versus benefit prior to authorizing a multi sUAS operation. The primary agency on an incident has authority over air operations for that incident.

13.2 Manned/Unmanned Aircraft Teaming

MWMC sUAS operations may only be conducted in the vicinity of manned aircraft when authorized by the FAA. Manned aircraft always have the right of way and must be avoided at all times. In the event that Air Ambulance, wildland firefighting aircraft, or other rescue aircraft are activated for use on an incident, sUAS flight operations in the area of the incident must be terminated immediately upon notification of their activation unless operation of sUAS is requested by the PIC and meets FAA requirements.

14. Emergency Procedures

Emergency procedures are specific to each sUAS type as designed by the manufacturer. It is the responsibility of the flight crew to be proficient with the sUAS operational manual provided by the manufacturer before any flight operations are conducted. Many sUAS have a number of failsafe options in the event of signal loss. These include the setting of a Home Location, Return to Home height setting, automated Hover, or Return to Home mode. The specific failsafe options available for each type of sUAS should be outlined in the documentation for that sUAS (Operator's Manual, Checklists, etc.).

14.1 Return Home Settings

- Return Home location must be selected, programmed, and verified on the system map prior to every launch.
- Return Home location shall be an open area clear of all obstructions.
- Appropriate Return Home Altitude must be selected & programmed to avoid tallest obstacle between the operating area and Return Home location.

14.2 Lost Link

- If signal link is lost the PIC must be able to command the sUAS to climb, descend, land, proceed to a new waypoint, or return home. If not, the PIC will activate Return Home on the controller and verify that the signal link can be regained prior to subsequent flight.
- If signal link is lost with the sUAS for the following procedures will be followed:
 - a. Immediate notification to Air Traffic Control, if required. Provide last known location, altitude, direction of travel, expected behavior/flight path.
 - b. Immediately notify the PIC or Unit Supervisor. Give last known location, direction of travel, expected behavior/flight path.
 - c. Verify Return Home location is clear of obstructions.
 - d. Attempt to regain signal (troubleshoot remote control Antenna position, operator, position, Line of Sight, battery, device, cable, and app).
 - e. If signal is not regained, visually verify automated return of sUAS or initiate sUAS recovery/mishap procedure.
 - f. If signal is regained, notify Air Traffic Control if required and PIC and initiate a precautionary landing to verify condition of sUAS system components.

14.3 sUAS Recovery/Mishap Procedure

- The PIC will immediately notify the IC or supervisor and provide estimated location of downed sUAS.
- Notify Air Traffic Control (if applicable).
- The PIC will assign sUAS recovery resources.
- The sUAS will be treated as evidence and not tampered with except for the extent to safely recover the sUAS. The sUAS will be impounded and Risk Services notified.
- The Unit Supervisor will assign an investigator with the technical knowledge to determine cause of crash. The investigation, at a minimum, will document the required information list under "Accident Reporting" in Part 107. The findings will be forwarded up the chain of command within seven (7) days of the crash.
- The sUAS will not be returned to service until the Unit Supervisor has determined the operational proficiency of the PIC and the airworthiness of the sUAS.

15. Occurrence and Hazard Reporting

The Unit Supervisor shall establish or identify a hazard and/or occurrence reporting system. All reported hazards and/or occurrences will be investigated pursuant to established MWMC policies. All flight crew members are authorized to take action to correct a hazard if in that member's opinion, delay will result in accident or injury. If the need arises, a Drone Advisory Committee shall be established and should be utilized for assistance with investigating any occurrences, reviewing files, and report preparation. All findings should be reviewed by the Drone Advisory Committee and communicated to all aircrew members for educational purposes.

If operation of an sUAS results in an occurrence causing: (1) serious injury to any person or any loss of consciousness; or (2) damage to any property other than the sUAS in which the cost of repair or damage to property is greater than \$500, then the PIC must report the occurrence to the FAA within 10 days of the occurrence.

16. Operations over Human Beings

A PIC may conduct operations over human beings or moving vehicles only in accordance with the requirements listed in 14 C.F.R. § 107.39; 107.100- 107.165; and FAA Advisory Circular No. 107-2A (or any subsequent FAA Advisory Circular issued as a substitute). In addition, PICs are expected to be familiar with the Categories of operations, as listed in 14 C.F.R. §107.105- 107.165 and the different procedures that apply to each Category of operations being conducted over human beings, including the procedures for establishing compliance under 14 C.F.R. §107.155 and filing a Declaration of Compliance with the FAA when required under 14 C.F.R. §107.160. In the event that an sUAS is approved for operation over human beings in Categories 2 or 3, the Unit Supervisor will be responsible for providing a copy of Remote Pilot Operating Instructions that comply with all requirements set out in FAA Advisory Circular No. 107-2A (or any subsequent FAA Advisory Circular issued as a substitute).

17. Complaints and Media Inquiries

Refer to the MWMC policies on sUAS for more information.

18. Storage of Media and Data

Refer to the MWMC policies on sUAS for more information. MWMC will follow established policies and procedures in compliance with all legal requirements.