Pilot's Handbook

Guide for the Safe Operations of Aircraft

2019

saskatchewan.ca/fire

Saskatchewan

Introduction

This handbook is dedicated to the flight crews and Ministry of Environment employees over the years that have endeavoured to ensure the safe operation of aircraft in service to the government and people of Saskatchewan.

Contents

PREAMBLE

This handbook has been prepared to give the pilot who is working for Saskatchewan Ministry of Environment the information to complete flight assignments in a safe, efficient and effective manner.

This following should be carried by pilots flying aircraft contracted by the Ministry.

- Radio Frequency Reference Card
- Current "Call When Needed" Agreement

More information on the Wildfire program is available on the Ministry website

http://www.saskatchewan.ca/residents/environment-public-health-and-safety/wildfire-in-saskatchewan

This includes wildfire area maps and current wildfire conditions & activity.

These documents outline mandatory requirements, recommended best practices and general information for Ministry flight operations. Branch policies and Ministry directives for specialty operations shall be adhered to. These include: hover emplane/deplane, aerial ignition, external loads, water bucketing, low level surveys, and night surveillance. Before engaging in these operations, the pilot shall acquaint her/himself with the applicable specific requirements.

These operating procedures are intended to augment and supplement the requirements of the Canadian Aviation Regulations (CAR's) and aircraft manufacturer's limitations. It is expected that all flight operations shall be conducted in a legal and safe manner and in full compliance with all relevant laws and regulations.

Saskatchewan Ministry of Environment has a Ministry Safety Committee. This committee endeavors to ensure that all Ministry flying is done to a consistent safety standard. The primary program to achieve this end has been to sponsor the AVSAFE Aviation Passenger Safety Seminar. The Ministry of Environment's Passenger's Handbook is the printed reference for this training.

All air carriers offering aircraft for hire by Ministry of Environment shall agree to the Aviation Services "Call When Needed" Agreement prior to being eligible for hire. This agreement governs all short-term hire and sets insurance standards, pilot qualifications, aircraft & equipment requirements, invoicing instructions, etc. It can be found on the public website mentioned above. Long term contracts may be established which define equal or more stringent requirements.

Operations & Safety

PILOT RESPONSIBILIES

The pilot shall:

1. Have been briefed by Ministry staff and completed annual Pilot's Exam and ensure helicopter is fueled and equipped to alert status including all pre-flight checks (including fuel quality) prior to start of alert time.
2. Conduct operational checks of all navigational, safety, communications equipment, slinging, and water bucketing systems prior to alert time.
3. Perform any required engine run-ups and radio check procedures prior to Alert Status start time when on Red Alert.
4. Ensure that all routine checks and maintenance are scheduled and carried out in accordance with current Transport Canada regulations and the manufacturers' specifications.
5. Advise Dispatch immediately of any deficiencies or problems in their aircraft operation and of any upcoming flight crew change.
6. Record all flight times and fire name or project numbers. Enter the number of crew claiming expenses for meals, accommodation, and transport on SK Daily Flight Reports including non-flying days and reason for not flying (while on contract). Review the SK Daily Flight Report for accuracy and completeness and when satisfied sign.
7. Ensure that authorized Ministry of Environment employees sign all flight reports before submission for payment.
8. Be available at all times in accordance with alert status schedules and flight/duty time and rest period regulations.
9. Participate in daily and/or pre-mission briefings.
10. While on contract, keep the local dispatch authority informed of your whereabouts and/or how they can contact you at all times.
11. Ensure that the helicopter is kept reasonably clean and ready for missions.
12. Assist in training of fire crews and other staff in the safe and efficient use of helicopters.
13. Ensure the use of compulsory internal cargo restraints, i.e. when passengers are on board.
14. Ensure the aircraft is loaded within the manufacturer's specifications and C. of G., prior to take off.

15. Determine whether it is safe to land or take-off. The pilot must always make that determination on the side of safety first!
16. Upon request to make available to Ministry staff, at all times, the Aircraft Journey log and the 7, 30, & 90 day personal flight log, for inspection.
17. Adhere to the standards and conditions of the Ministry of Environment Aviation Services 'Call When Needed' Agreement.
18. Be prepared for operations in remote locations, including being in possession of adequate personal effects and sleeping bags.
19. Participate in joint pre-mission briefing for specialty operations.
20. Ensure all passengers have received a pre-flight briefing.

Pilots are encouraged to report safety mishaps, occurrences and incidents. A form is available at the back of this handbook to assist with this. They may be submitted to the firebase, air operations supervisor on an incident, safety officer or to the Provincial Aviation Services Coordinator.

AIRCRAFT ON SPEC FOR WILDFIRE

To be considered for immediate hire, aircraft must have crew available with the aircraft. Aircraft that have been parked and de-crewed will not be considered for immediate hire. It is the responsibility of the aircraft crew to notify the closest firebase or fire centre regarding their availability for hire. This includes local contact information for the crew (cell phone, hotel & room #, etc.). The local fire base or Duty Officer will use this information to contact the aircraft crew for a limited time depending on the urgency of the situation before contacting the next available aircraft. Parking a helicopter that is on spec at a firebase is at the discretion of the Firebase Supervisor, however de-crewed helicopters are not allowed to park at a firebase.

ALERT SYSTEM – ALERT STATUS

The aircraft alerts are set each day during the fire season by the Provincial Fire Centre Manager. These daily alerts are forwarded to all Fire Centre Duty Officers prior to 1000 hours, who forward the alerts to the Forest Protection Officers or their designate. Alerts are subject to upgrade or downgrade throughout the day.

All initial attack operations shall be governed by the daily alerts. The maximum times allowable between initial aircrew contact and first aircraft takeoff are:

RED **IMMEDIATE DISPATCH**

- Crew assigned and in close proximity of helicopter.
- Machine is loaded and cargo restraints in place.
- Run up and radio checks completed before alert.
- No aircraft maintenance to be done while on red alert.

YELLOW **MAXIMUM OF 30 MINUTES (from dispatch to departure)**

- Pilot must be able to be contacted immediately.
- Minor maintenance may be carried out.
- No run up required.

BLUE **MAXIMUM OF 1 HOUR (from dispatch to departure)**

- Aircraft is available for non-fire work.
- More significant maintenance may be carried out.
- Pilot must be able to be contacted immediately.

GREEN **Unconditional 24 hour release**

- Crews are not obligated to be available. Stand down for that day only.

Aircraft with piston engines on RED alert may be required to pre warm all aircraft engines to normal operating temperatures; ensuring minimal warm up time is required before takeoff on fire actions.

Preparation

Prior to the commencement of daily alerts, all pre-flight inspections shall be completed. If your aircraft is placed on red or yellow alert, a check of the fire weather, detection patrol routes and fuel cache status, is recommended for all possible areas of operation.

Readiness

The flight crew of aircraft on contract shall ensure that the dispatch staff for the base from which they are working, know where they are staying and how they are to be contacted. If the crew members have cell phones or pagers, these numbers shall be communicated to the dispatch.

FLIGHT WATCH & FLIGHT FOLLOWING

In accordance with Transport Canada Aviation Regulations the Ministry maintains a Flight Watch System through their WFM communications network and monitors aircraft flights to ensure:

- The progress of each flight from its point of origin to its final destination including intermediate landings and diversions are followed, and;
- The ability to convey to the pilot-in-command any information necessary for the safe conduct of the flight.

It is the responsibility of the pilot to establish and maintain proper flight following with the dispatch centre to which the aircraft has been assigned. Radio dispatchers at the Fire Centres, firebases and incident base camps shall carry out flight watch. Aircraft equipped with satellite tracking shall have the system functioning during all flights.

The base performing flight watch shall remain open and a radio dispatcher on duty until all aircraft have landed and ceased operations for the day. The exception to this rule is through prior mutual agreement between the Fire Centre and the pilot to transfer flight watch to another base. Flight watch may be transferred from one base to another. The transferring base shall ensure that the flight watch transfer is established before closing down operations. WFM flight watch is to be waived only if the pilot is using their company flight-watch or a NavCanada Flight Plan is filed.

Communication Protocol

When departing a base or pad, the pilot shall inform the radio dispatcher of the number & identity of passengers, the amount of fuel and the weight of cargo on board, which shall be entered in the station radio log.

The base performing flight watch must know the identity of all the passenger(s) on the aircraft at all times.

Flight Following

All aircraft utilizing a Ministry of Environment Flight Watch system shall make regular reports while flying. Specialty work such as fire suppression requires regular **30-minute reports**. Non-adherence to this rule may be grounds for contract termination.

Ministry of Environment utilizes an Aviation Emergency Response Plan in the event of a missing/overdue aircraft or of an accident. Aircraft not reporting will be considered overdue.

DISPATCH SYSTEM

The Fire Centre Duty Officer has dispatch authority for all Initial Attack units in that respective Fire Centre Area. The Aircraft Alert Status indicates the dispatch authority for each aircraft as follows:

Fire Centre Dispatch

The Fire Centre Duty Officer or delegate must approve all requests for dispatch, as the helicopter is under their control. Fire equipment may or may not be loaded. The flight crew must be aware that they may be moved anywhere, anytime, and should be prepared with overnight gear, suitable amount of cash, and a bagged lunch when appropriate.

Aircraft movement will be monitored by the Fire Centre by radio and/or Wildfire Integrated Information Network (WIIN), or by relay through another base until such time as the flight is complete or until the Fire Centre turns the aircraft over to another base. Remember that the Bird Dog aircraft only coordinates air traffic over a fire, it does not perform flight following.

Aircraft are expected to give position and status reports back to their dispatch centre every **30 minutes or less.**

Forest Protection Base Dispatch

Initial Attack helicopters are under the authority of the Fire Centre Duty Officer through the Base. Radio contact must be maintained with the Base and status reports made every 30 minutes. If there is a Bird Dog aircraft working the fire then they coordinate air traffic within the fire airspace.

Optimum flight distances for initial attack purposes normally require a 60-mile radius from point of positioning.

Fuel loading should be calculated to give the desired return trip, including a 30-minute reconnaissance over the fire plus the required 20-minute reserve. Density altitude and helicopter gross weight limitations may reduce that distance. If the pilot determines they are unable to meet that 60-mile radius requirement, then notify the Fire Centre Duty Officer or delegate. Advise him/her of the attack radius you are capable of covering (with the required equipment) or the weight that must be dropped.

LOADED PATROLS

It is recommended that aircraft on loaded patrol arrange to refuel when their available fuel drops below one half. This is to ensure that they will be able to operate effectively if a fire is detected anytime during the patrol.

Passenger & Load Manifests

In the interest of safety, the pilot and the Initial Attack Crew Leader shall complete an example helicopter load sheet. This will be to determine the most effective and legal load for that particular helicopter for that load configuration. The load sheet shall show the limits pertinent to hover emplane/deplane. Copies of these load sheets will be retained at the dispatch centre until the day's flying is complete. Where a series of flights are planned with similar loads, a representative load sheet may be completed. An example form can be found at the back of this Handbook.

The base performing flight watch must know the identity of all the passenger(s) on the aircraft at all times.

It is the pilot's responsibility to ensure that the aircraft is loaded properly and within limits accounting for variations in density altitude.

AIR TRAFFIC COORDINATION & FIRE AIRSPACE (NOTAMS)

Aviation operations during active fire suppression are conducted almost exclusively under Day VFR conditions. Thus aircraft are to remain in VFR meteorological conditions.

An increasing number of fire aircraft are utilizing TCAS. All aircraft that are capable shall have their transponder enabled to Mode 'C'. Squawk 1200 unless in the vicinity of the Primrose Air Weapons Range where 1276 shall be used.

Fire Airspace and NOTAMS (Notice to Airmen)

Airspace over fires can be extremely busy. The nature of the work involves low flying, frequently reduced visibility, and often several aircraft working in close proximity to each other. Fire airspace area is intended only for aircraft involved in fire suppression. To address this situation, the federal government has imposed general restrictions to aircraft flying over fires. These can be found in sections 601.15, 601.16, 601.17, and 601.18 of the Canadian Aviation Regulations.

No person shall operate an aircraft over a forest fire area or over any area that is located within 5 nautical miles of a forest fire area, at an altitude of less than 3,000 feet AGL; or in any airspace that is described in a NOTAM.

Transport Canada may issue a NOTAM that relates to restrictions on the operation of aircraft in the case of a forest fire and that describes;

- The location and dimensions of the forest fire area; and
- The airspace in which forest fire control operations are being conducted.

The only exception to these rules are for persons who are operating an aircraft at the request of an appropriate fire control authority; and Transport Canada personnel who are operating an aircraft in the performance of duties related to surveillance and the enforcement of aviation legislation.

Transport Canada may make orders prohibiting or restricting aircraft operations. In particular Transport Canada may make orders prohibiting or restricting the operation of aircraft over such areas which are specified by the Minister, either absolutely or subject to such exceptions or conditions. This will be posted as a NOTAM.

A problem can arise from the fact that there is no system that automatically publicizes the existence of fire locations to the aviation community. This is particularly a problem when a fire occurs within 5 nautical miles of an airport or float base since this automatically restricts access to airspace over the aerodrome.

A provincial fire agency can request that a NOTAM be issued. NOTAMs are issued by NavCanada and circulated through flight briefings supplied to pilots by NavCanada and their website. There are different formats that can be used. There is a simple notice that only informs the aviation community that a fire exists and of its point location. This kind of NOTAM can be issued directly by NavCanada.

There is another kind of NOTAM. If there is active fire suppression activity that encompasses an area larger than the simple 5 mile and 3,000 feet restriction, the provincial agency can request an expanded area of flight restriction. This could be necessitated by:

- Skimmer aircraft using a nearby lake to work from that is more than 5 miles away, or
- Where there is a base camp outside the immediate fire area that results in a high amount of low level air activity to and from the fire, or,
- Where there is intense air activity stacked up over the fire exceeding the 3,000-foot altitude restriction.

This type of NOTAM must be approved by Transport Canada before NavCanada will distribute it. An example of such a NOTAM is:

98/06/04 1506Z

980126 CYSF BUFFALO NARROWS

XXX FOREST FIRE AREA BOUNDED BY 5635N 10910W 5616N 10910W 5616N 10850W 5635N 10850W TO POINT OF ORIGIN (CENTRED APRX 40 NM NW AIRPORT) TIL 9806112359

The other reason that a more detailed NOTAM would be necessary is if there is some need to have non-fire aircraft moving into the fire airspace. This could be the result of an adjacent fishing lodge operating fly-out fishing flights, or a nearby airport. If there is any requirement for such an expansion, this must be expressly approved by the Regional Director of Transport Canada or designate. Unless specifically authorized otherwise, only Transport Canada can authorize non-fire aircraft to enter fire air space. If that authority is delegated to the provincial agency, it will be mentioned in the NOTAM along with a contact phone number. <u>If there is no such contact procedure detailed in the NOTAM then the provincial agency does not have that authority.</u>

An example of a NOTAM that both expands the area, the altitude, and delegates entry authority is as follows:

98/06/03 2134Z

980058 CYVC PINEHOUSE LAKE

CZPO PURSUANT TO CAR 601.14 TO 601.16 FOREST FIRE AREA BOUNDED BY 5530N 10720W 5515N 10720W 5512N 10645W 5530N TO POINT OF ORIGIN (CENTERED APRX 10NM W AIRPORT) MAX ALT 5000 FT MSL AERIAL FIRE SUPPRESSION IN PROGRESS. EXCEPT WHERE OPERATING UNDER CAR 601.17 ALL ACFT TO REMAIN CLEAR. FOR AUTHORITY TO ENTER AREA CONTACT FIRE MANAGER (306) 425-1202. TIL APRX 9806121800

In addition to this, there is the provision that allows Transport Canada to temporarily re-designate airspace to a different class than its normal designation. This has rarely been done and is used when there is the potential for a significant disruption to air traffic particularly at airports. Authority to control aircraft movements, both VFR and IFR may be delegated by Transport Canada. The ICT Air Operations Branch Director (or other Ministry delegate) and the Flight Service Station Manager then arrange the general communication and air traffic protocol to be observed in coordinating fire air traffic and public air traffic. When a Bird Dog aircraft is at work, the Bird Dog Pilot plays the airborne role in traffic coordination with the FSS radio operator as outlined in the NOTAM. The NOTAM that describes this situation must be arranged by Transport Canada directly. In addition to the regular information, the special communication and air traffic procedures will be included in the NOTAM.

Requesting a NOTAM

If there is any likelihood of non-fire air traffic flying in the vicinity of a fire or if there is intense fire air traffic, then a NOTAM request should be submitted to the Provincial Wildfire Centre. All NOTAM requests to NavCanada and Transport Canada come from the Provincial Wildfire Centre and must be authorized by the Provincial Fire Manager in consultation with the Aviation Services Coordinator or the NAO Safety Officer.

There are several reasons to request that a NOTAM be put in place. They all stem from the need to insure that fire air traffic is isolated from all other air traffic. A number of factors need to be addressed in deciding what type of NOTAM should be put in place.

- Proximity to centres of aviation activity such as airports; float bases, fly-in tourist operations, military airspace.
- Extent of skimmer aircraft operations, i.e. Pulling from lake(s) greater than 5 miles from fire perimeter
- Large-scale fire with extensive air operations, especially with multiple types of aircraft.
- Potential for reduced visibilities from extensive smoke.

In many cases, especially in the later stages of a fire when there is little active smoke, pilots may not even know that fire suppression is occurring. The NOTAM may be the only accurate source of information to pilots.

When a NOTAM is deemed necessary, the size of the area that needs to be covered must be defined by latitude and longitude. A simple rectangle or circle is best. A contact person with phone number needs to be identified if there will be a requirement to deal with public aircraft. This would usually be the Radio Dispatcher who gives traffic advisories to the fire air traffic. If aircraft are being stacked vertically higher than 3,000 feet above ground then a higher ceiling for the airspace should be requested for the NOTAM.

Requests should be made to the Provincial Wildfire Centre, to the attention of the Aviation Services Coordinator or the Provincial Duty Officer.

COORDINATION OF AERIAL OPERATIONS ON FIRES

Overall authority for a safe and efficient aircraft operation rests with the Fire Centre Duty Officer, although air traffic coordination and/or traffic advisories in fire air space is the responsibility of the Bird Dog aircraft when present, or the base/ICT Radio Dispatcher when the Bird Dog is absent.

All aircraft shall obey the instructions of the Bird Dog aircraft.

When approaching or within incident fire airspace the assigned tactical air-to-air VHF-AM frequency is referred to as the <u>Victor frequency</u>.

Initial Attack

On initial attack, (in the absence of a Bird Dog aircraft), the Initial Attack Crew Leader has the responsibility to ensure safe, organized, and closely supervised aircraft operations until such time as the aircraft is released back to the appropriate fire centre.

If a Bird Dog aircraft is present, aircraft coordination shall be done by the Bird Dog pilot, in accordance with tactical plans set out by the Air Attack Officer. Flight crews are responsible to ensure that all aircraft movement is conducted safely.

Make certain you are using the same altimeter setting as the Bird Dog aircraft.

When an aircraft is dispatched on initial attack to a fire the pilot must monitor the Bird Dog aircraft AM link frequency, (122.85), as well as the local FM frequency. The pilot shall ask the Flight Watch Coordinator (FWC) or the local Radio Dispatcher for the current Bird Dog frequency in use. The FWC will advise as to whether there is Bird Dog and/or Tanker activity on that fire. Upon arrival, the Bird Dog may request the helicopter to switch over to their frequency. Tanker group frequencies may be found in Reference section “E” of this handbook.

If an air tanker group precedes the initial attack aircraft to the fire, the Bird Dog aircraft and Air Attack Officer shall attempt to allow the initial attack aircraft to deliver the initial attack crew to the fire site as soon as practical. This will allow early ground assistance. If the fire situation or tanker load delivery time dictates it, the helicopter may be designated an area to bucket in order to maintain control during the initial attack stage. This decision, as well as coordinating the aircraft’s movements, is the responsibility of the Bird Dog aircraft alone.

Monitoring several frequencies in the Bird Dog or Helicopter can make it difficult to determine which frequency is being utilized and can be confusing. When the Bird Dog is establishing initial contact with an aircraft, the Bird Dog will state the frequency they are transmitting on: i.e. “Helicopter 66, this is Bird Dog 161 on Victor 122.150.” after initial contact the tactical air-to-air frequency will be referred to as "Victor".

Helicopters talking between themselves or to a radio dispatcher on an assigned AM frequency should also refer to the frequency as “Victor” instead of the numerical frequency identifier. i.e. “Helicopter 59 this is Helicopter 48 on Victor”.

Incident Command Team (ICT) and Sustained Action Fires

A description of the fire management system for large sustained action fires is to be found in the CIFFC ICS online training module. It describes the organization according to the Canadian Incident Command System.

The Incident Commander (Fire Boss) has overall authority and responsibility but due to the complexity of air operations the team may have an Aviation Operations Branch Director (reporting to Operations Section Chief) who manages all aviation functions with the exception of the air attack tanker groups.

The Air Operations Branch Director (AOBD) on a Type 1 Team (or Operations Section Chief on a Type 2 Team) will arrange with the Logistics Section for construction of base camp helipads. They shall sign contracts and ensure SK Daily Flight Reports are accurate. The AOBD shall brief aircrews and supervise fire heli-bases and fire-line landing pads. They should be given information concerning helicopter type and registration, radios, fuel type and consumption, type of hire, minimums, flight crew names and receive any safety reports or concerns.

Fire Airspace Coordination

The air space within a five nautical mile radius from the fire line and 3000 feet above the ground is the normal fire airspace under the coordination of the Bird Dog aircraft (or in their absence, the Fire Base Radio Dispatcher).

Aircraft shall **NOT** enter this airspace without the permission of the Bird Dog (or in their absence, the Fire Base Radio Dispatcher), as there may be low altitude tankers or other traffic working.

Inbound to Fire Airspace

Five minutes from the fire, all inbound pilots, (rotary and fixed wing), shall give the Bird Dog aircraft (or in their absence, the Radio Dispatcher) a call on the operating frequency assigned to the fire identifying their location and distance from the fire, **or if no response** on the designated Link Frequency:

AM - 122.85 MHZ (VHF Aircraft Band)

The Bird Dog maintains an open listening watch on the Link Frequency. If the Bird Dog and the Tanker group are engaged in an active "bombing run", they may not be able to give you a reply until the run is complete. If no contact with Bird Dog, the aircraft may continue to 5 nautical miles from the zone, do

not proceed past this point until contact has been established. Wait an appropriate time before recalling, but do not enter the airspace until you have established contact!

REMEMBER: The fire could be 5 miles or more across, with the east fire line being 5 miles from the west fire line. It is of the utmost importance therefore, to call 5 minutes back from the closest fire line that you happen to be approaching.

Upon Radio Contact

You should give the Bird Dog aircraft (or in his/her absence, the Radio Dispatcher) the following information:

- Call sign/helicopter number
- Position
- Altitude above sea level
- Intentions

The Bird Dog aircraft (or Radio Dispatcher) will reply with:

- Altimeter setting in use,
- Frequencies to be used,
- Instructions to approach via a designated route,
- Or to hold over a specified area, and the
- Altitude to enter the fire airspace.

Holding areas will be away from the fire, usually over an easily recognizable point. Specific altitudes may be assigned. The Bird Dog aircraft should be kept aware of your fuel situation in the event holding operations become prolonged.

Aircraft **shall not** proceed into or work within the fire airspace without clearance from the Bird Dog (or Radio Dispatcher). The Bird Dog directs entry altitude into the zone. Once given permission to enter the zone, the Bird Dog's instructions must be followed closely, as water bombers or other aircraft may be close by. **Strobes, wig-wag lights, full navigation lights and Mode C transponder shall be used at all times in the fire airspace**.

During normal operations on a fire, the aircraft will communicate with ground crews and Radio Dispatcher on the assigned FM channel and will communicate with the Bird Dog on the assigned AM (Victor) frequency. When no frequency has been assigned the aircraft shall contact the Bird Dog on the AM link frequency 122.85.

Because all movement within the control zone is monitored & coordinated by the Bird Dog and subject to their approval, each aircraft must notify the Bird Dog when it has landed, and **shall not lift off without clearance**. This means that the aircraft stays on the ground/water and does not take off or hover up into the trees for a look at what is happening.

When permission is granted for the aircraft to lift off, a normal departure into wind is made, and direction and altitude assignments are followed as given. However, before execution, the pilot-in-command of the helicopter or float plane may request changes which must be approved by the Bird Dog aircraft.

When tanker aircraft are working a fire, there is to be no reconnaissance of the fire below 3,000 feet AGL, by any aircraft unless approved by the Bird Dog.

Upon completion of operations and once your aircraft is clear of the fire airspace, notify the Bird Dog that you are “clear of the zone" and resume contact with the firebase of departure.

NOTE: Although the Bird Dog aircraft coordinates air traffic within the fire airspace, the pilot-in-command of each aircraft is ultimately responsible for the safe operation of the aircraft they command as per the Canadian Aviation Regulations.

Aircraft landing and taking off from heli-bases shall make normal radio calls, declaring when they are; on approach, final, down and clear, about to take off or clear of the vicinity of the heli-base.

Inside Fire Airspace with No Airtankers

All aircraft shall monitor **122.85 AM** when flying in an active fire zone in the absence of a Birddog. The only exception is when a fire occurs in the vicinity of an aerodrome where a mandatory frequency exists.

When there are no air tankers or Bird Dog on the fire, the fire's Radio Dispatcher performs flight following and issues traffic advisories. In uncontrolled airspace there is no active coordination of traffic over the fire and normal VFR traffic procedures shall be adhered to. **See and be seen.**

Air Corridors

If traffic volume warrants, air corridors may be established with specific altitudes for the various aircraft types inbound to and outbound from a fire and/or heli-base. Deviation from these routes and cruising altitudes are not permitted. The corridors are normally established by the Incident Commander, Air Attack Officer and/or Air Operations Branch Director (or Operations Section Chief) at the fire's base camp.

RADIO/NAVIGATION PROCEDURES

Air-to-air and air-to-ground communications are usually conducted using our Ministry VHF-FM frequencies. See Reference Section "E", "Radio Frequencies" in order to determine the specific frequencies that you are required to program into your FM transceiver prior to take-off on any Ministry flight mission! You will note that each District therein have their own "Call Sign" (specific to their base) and operates on either "Simplex" or "Duplex Repeater" channels.

When operating outside fire airspace and where no mandatory frequency is required, then AM 126.7 should be monitored. This is especially true when operating in the vicinity of CFB Cold Lake and the Primrose Lake Air Weapons Range CYR204.

Air Attack Groups (Link Frequency)

The Link Frequency is for initial contact to the Bird Dog to establish the Air Groups number and the local operating frequency. All Bird Dogs maintain a listening watch on VHF AM of 122.85.

NOTE: The Bird Dog will answer you as soon as possible, (they may be on a bombing run so do not disrupt their communications - unless you have an emergency yourself!).

Programming Air Attack Channels

For convenience, if your FM transceiver has the capability for two frequencies, (usually A or B) on each channel position then you can pre-program the 5 Air Attack frequencies into the "B" side of channels #1 to #5 - corresponding to their respective group # (e.g. Group #3 is on "B" side, channel #3).

NOTE: All pilots shall have all Ministry FM frequencies programmed before any dispatch, particularly if an air tanker role may be involved. (It is the District dispatching person's responsibility to ensure this is done and that the pilot receives a briefing, prior to the mission.

Global Positioning Systems

Aircraft shall be equipped with a Global Position Satellite receiver integrated with GPS tracking hardware compatible with the British Columbia "Webtracker" resource tracking system. This shall be configured to relay position reports every 2 minutes for normal operations.

GPS units should be configured to use NAD83 as their map datum. Some maps use older map datum and should not be used for detailed navigation. Pilots are encouraged to store locations for:

- Fuel caches
- Fire locations and crew drop off points
- Fire Camps and Numbers
- Home and Fire Bases
- Other Convenient Points

Transponders

Many Canadian tankers and birddog aircraft are equipped with TCAS which allows the pilots locate and identify aircraft. All aircraft capable of Mode C transponder operation shall have their transponder on and Mode C enabled.

Unmanned Aerial Vehicles (UAV) – Drones

All UAV operations by wildfire management shall be conducted to the same standard as regular aviation operations. The UAV is fully considered to be an aircraft for these purposes. The necessary Special Flight Operations Certification must be in place and the operator of the UAV must be in regular radio communications with other aircraft for proper traffic coordination and deconfliction.

Any UAV's sighted inside fire airspace should be immediately reported to the Birddog and radio dispatch. If an unidentified UAV is spotted in fire airspace, then all aircraft will be grounded or depart the airspace until the UAV threat has been eliminated. One designated observation aircraft may remain in the air at a safe altitude. This aircraft will perform three functions:

1. Act as a lookout to ensure the safety of ground operations that may be affected by the removal of the suppression aircraft.
2. Maintain visual contact with the UAV and assist ground personnel in locating the operator.
3. Determine when it is safe to resume aerial operations.

PILOT FLIGHT HOURS & DUTY TIMES

As per CAR's 720.15, 720.16 and 720.17, no flight crew member shall be assigned regular duties, and no flight crew member shall accept such an assignment, if the flight crew member's flight duty time will, as a result, exceed 14 consecutive hours in any 24 consecutive hours.

The maximum flight duty time referred to may be exceeded if;

- The flight is extended as a result of unforeseen operational circumstances;
- The pilot in command, after consultation with the other flight crew members, considers it safe to exceed the maximum flight time and flight duty time; and
- The air operator and the pilot in command comply with the Commercial Air Service Standards.

Where the flight is conducted with a de-Havilland DHC 6 aircraft not conducting a scheduled passenger service or with a helicopter not conducting a scheduled passenger service or heli logging, for any 6 non overlapping periods of 30 consecutive days within a 365 consecutive day period, the maximum flight time in any aircraft shall not exceed:

- 60 hours in any 7 consecutive days;
- 150 hours in any 30 consecutive days;
- 210 hours in any 42 consecutive days;
- 450 hours in any 90 consecutive days;
- 900 hours in any 180 consecutive days;

The accumulated 30 consecutive day, 42 consecutive day and 90 consecutive day flight times may be reset to zero if the flight crew member is provided with at least 5 consecutive days free from all duty.

Where the flight is conducted with a de-Havilland DHC 6 aircraft not conducting a scheduled passenger service, or with a helicopter not conducting a scheduled passenger service or heli logging, the maximum flight duty time may be extended to 15 consecutive hours if:

- The minimum rest period is increased by 1 hour; or
- The maximum flight time does not exceed 8 hours in any 24 consecutive hours.

In the event of unforeseen operational circumstances flight duty time and flight time limitations may be extended by up to 3 consecutive hours provided that:

- Where flight duty time is extended, the subsequent minimum rest period shall be increased by an amount at least equal to the extension to the flight duty time;
- The pilot in command shall notify the air operator, in accordance with procedures outlined in the company operations manual, of the length of and the reason for the extension;
- The air operator shall retain the notifications until the completion of the next Transport Canada audit; and
- The air operator shall notify the Minister as soon as practicable.

All flights shall be planned to be completed within the maximum flight time and maximum flight duty time taking into account the time necessary for preflight and post flight duties, the flight or series of flights, forecast weather, turnaround times and the nature of the operation.

Flight Hours

Regular flight assignments in normal circumstances should not exceed 6 flight hours per day. For the first couple of days at the beginning of a major fire, flight times may exceed this number but shall not exceed 10 hours per day.

ACCOMMODATION

Where Ministry of Environment supplies pilots with accommodation, this shall be suitable accommodation. This means a single occupancy bedroom that is subject to a minimal level of noise, is well ventilated and has facilities to control the levels of temperature and light or, where such a bedroom is not available, an accommodation that is suitable for the site and season, is subject to a minimal level of noise and provides adequate comfort and protection from the elements.

In remote locations, such as temporary fire base camps, where there are no single occupancy accommodations available, flight crew will be housed in a manner on par with Ministry of Environment WFM supervisory staff. Every attempt will be made to keep flight crews with similar schedules housed together.

Flight crews are expected to have in their possession adequate personal effects (sleeping bags, toiletries, etc.) to work from remote locations and crew bunkhouse situations. Flight crew must be able to work without cell phone and internet service, as these may not be available at remote locations.

REFUELING

WFM Branch operates the following fueling systems:

Bulk Tanks, Envirotanks & Mobile Units - fixed installations with underground or above tanks c/w electric or gasoline driven pumping units. This system is generally found at airports, fire bases, or Fire Centres. Always check to make certain the bulk facility that you're using is dispensing the type of fuel that you require. At most bases, skid fuel tanks, bowsers, etc., will be filled from certified Petroleum Contractor bulk tanker facilities. Trailer **mobile units** complete with gasoline driven pumping units are occasionally contracted for service at temporary heli-bases. All units generally dispense Jet A1 fuel, but always check prior to refueling your aircraft. The responsibility is on the pilot to be sure!

Drum Fuel - Only dispensed through the air carriers pump and filter units. Drums are normally found at remote fuel caches and smaller fires. It is the pilot's responsibility to examine, test and ascertain by visual and/or water testing procedures that the fuel is acceptable. Drum fuel is normally Jet A1 but could be Jet B in some locations. It is the pilot's responsibility to check the fuel for condition, type and suitability, prior to refueling the aircraft.

Refueling Rules

All helicopters while on WFM assignments are required to shut down before fueling operations commence.

NO HOT REFUELLING.

Fueling will not be done while any personnel are on board the aircraft.

All safety regulations and **NO SMOKING** shall be strictly adhered to and enforced at all times.

ABSOLUTELY NO SMOKING WITHIN 30 M. OF REFUELLING OPERATIONS

The air carrier's personnel are responsible for fueling aircraft. Ministry staff may assist in positioning drums, etc., but shall not operate any carrier's pump or filtering systems, remove or close aircraft fuel caps or similar equipment.

Where several helicopters are operating from a single fuel source, helicopters shall not be parked in the refueling area for prolonged periods of time.

Aviation Fuel Testing

The petroleum supply contractor shall be responsible to provide the quality control of aviation fuels supplied in drums and into bulk tanks owned by the Government of Saskatchewan. WFM will be responsible to provide certified dispensing units at all bulk fuel sites. Daily fuel testing (prior to delivery of fuel to any aircraft) will be permanently recorded in the Fuel Log Book for that location. It shall be the responsibility of each air carrier to filter and check for contaminants when using drum fuel.

SPECIALTY OPERATIONS

Ministry of Environment engages in a number of activities that require specialty flight operations. These activities have had special procedures identified and documented in Ministry Directives, Branch Policies, manuals and training guides. These shall be consulted before engaging in these specialty roles.

Helicopter Hover Emplane/Deplane

Hover emplane/deplaning from a helicopter that has not fully landed, (i.e.) both skids are not firmly on the ground, requires special authorization from Transport Canada. Crews performing this operation must be trained and current in this procedure. It is to be performed only when no other less hazardous alternative exists.

The following restrictions apply:

- The helicopter company must have the authority defined in their Operating Certificate and the procedures incorporated in their approved Operations Manual allowing them to load or unload persons and equipment from a hover.
- Flight crew and fire fighters must have received training in this procedure within the preceding 12 months as outlined in the Canadian Interagency Forest Fire Centre Hover Exit Guidelines.
- Procedures set out in the company's Operations Manual must be followed (e.g. loading or unloading from pilot's side only or vice versa).
- If the helicopter is fitted with dual flight controls, deplaning from or emplaning to the front seat while in the hover fitted with the controls is prohibited unless the aircraft is fully landed and the collective is fully in the down position.
- Deplaning from hover can be done only during day VFR conditions and only while the helicopter is in hover with a maximum skid height of three feet above the ground.
- The helicopter is operated within authorized weight and balance limits and procedures are strictly followed to ensure that loading or unloading does not at any time exceed weight and balance limits. The intent is to provide at least a 10% power reserve and may require out-of-ground limits be used. The payload should never exceed 95% of the maximum for the density altitude conditions at the time.

Aerial Ignition

Aerial Ignition is accomplished by using either a drip torch slung under the helicopter or an aerial ignition device (AID) working out the door of the helicopter. This type of operation requires close cooperation between pilot and aerial ignition crew. Pilots must be well briefed and comfortable with this activity.

When working in close proximity to an active fire, it is normal to have a second helicopter assist in the operation. When this occurs the second helicopter shall work as the communication link for the burn helicopter. A discrete channel should be selected so that the burn helicopter communicates only with the second machine that will screen all radio traffic during the operation, relaying instructions and performing flight following for both aircraft.

When a helicopter is contracted and/or designated for aerial ignition operations or standby by the Ministry the existing daily flight minimum will be increased to 6 hours per day. If a helicopter is designated for aerial ignition while on a short-term contract, the existing contract shall be amended to specify that the helicopter minimums have been adjusted at the time of its designation to (6) six-hour minimums for that day. No averaging shall be done with prior or subsequent days flying on that short-term contract. All types of flying apply to those minimums.

A helicopter that has been originally designated and contracted for aerial ignition, (with six hour minimums) may be "stood down" from this assignment and the remaining minimum flight hours may be flown off on other assignments that day.

The six-hour minimums apply if under contract or contracted, and not utilized for aerial ignition because of weather, smoke, visibility, etc.

The 6 hour minimums are reduced to actual flight hours if:

- Remaining pilot duty time is less than six hours, if not replaced by another qualified pilot.
- Aircraft was unserviceable, and unable to complete contract.
- Official darkness limits the duration of the designated contract.

External Loads

Ministry of Environment staff assisting in external load work must be thoroughly briefed by the flight crew prior to the operation. Standard hand signals are to be used and confirmed as part of the briefing. Only people essential to the slinging operation shall be on board the aircraft.

Short Line Slinging

Short line slinging is a method of slinging using a short lanyard. Where it is possible net loads or other bulky loads should be slung from the helicopter using a short line. This helps to eliminate load oscillations and gives greater control over the load. The load is released from the belly hook under the helicopter. Short line slinging is used from pad to pad or to prepared touchdown sites. If several round trips are to be made, a minimum of 3 nets should be used to prevent waiting time by the helicopter.

Long Line Slinging

The method of slinging uses a long lanyard or series of lanyards coupled together. This method would be used to access locations in tall trees without having to cut a large opening. The sling load may be released at the helicopter or, if equipped with a remote hook, at the bottom end of the lanyard. Hand signals or radios are used to guide the pilot over the load and for releasing, though the pilot will use his/her mirror. The longer lanyard results in reduced payloads since the helicopter is always operating 'out-of-ground effect'.

Water Bucketing

Initial Attack

Water bucketing is an integral part of initial attack and may be used wherever feasible in support of initial attack.

On initial attack, a helicopter equipped with a bucket or fixed heli tank may be used to knock the fire down so crew(s) can control the fire. After the initial objective has been achieved, alternate water delivery systems may be used, (i.e. pumps etc.).

Sustained Action

After initial attack, bucket use should be restricted to supporting crews. When used in a support role, the Air Operations Summary must give specific assignments and objectives based on real need (i.e. hot

spot control). Helicopters shall always be used with direct supervision, which is performed by Ministry of Environment field staff (i.e. Crew Unit Leaders).

Bucketing should be used minimally in mop up operations. Ground crews must be advised to keep in radio contact with the helicopter at all times when water bucketing operations are being carried out in their sector. During mop-up operations, smudges must be well marked and trees cut down if the canopy is dense. This allows better water penetration, more accurate drops and result in better utilization.

Long Line vs Short Line

There are advantages and disadvantages to each method. Short line water bucketing allows for faster pickup and delivery to the fire. It can allow for more complete filling of the water bucket. Long line bucketing reduces downwash fanning of the fire during slow or hover drops. It allows the filling of the bucket from very small water bodies. It is generally slower and requires a higher skill level to achieve accuracy.

The short line is recommended for initial attack, for quick deployment and rapid water delivery of a maximum load.

When working with hot spots, a long line bucket may be able to deliver a single load more accurately with less likelihood of downwash. The bucket may be lowered down close to the hot spot for more accuracy. However, this procedure requires out of ground effect hovering, which may substantially reduce the available load.

Foam Injection

Foam injection systems requires a reservoir for the foam concentrate which may make the bucket bulkier and difficult to store in the helicopter, rendering it less useful in the initial attack role. However, in sustained action the improved visibility of the previous drops and the improved wetting of fuels is a definite advantage.

Low Level Survey

Standards for low-level surveys have been set by the Ministry Aviation Safety Committee and are found in Ministry of Environment Aviation Safety Directive #'s 6, 7, 8, and 9. All Ministry of

Environment staff engaged in this type of operation shall have completed the required training. Pilots engaged in this type of operation are recommended to have attended the same training course as offered by Ministry of Environment Wildlife Branch.

Night Surveillance

Standards for night surveillance operations have been set by the Ministry Aviation Safety Committee and are found in Ministry of Environment Aviation Safety Directive #2. All Ministry of Environment staff engaged in this type of operation shall have completed the required training. Pilots engaged in this type of operation are recommended to have attended the same training course as offered by Ministry of Environment Enforcement Branch.

Crew Changes

The carrier must advise the appropriate Fire Centre Duty Officer or Aviation Coordination Unit of any crew changes 48 hours in advance. They shall ensure that crews being replaced have adequate time to brief the new crews regarding the operation. They shall also ensure that replacement crews are properly qualified. Replacement crews shall be briefed by Ministry staff and successfully complete the annual Pilot's Exam.

Air carrier initiated crew changes shall be paid for by the carrier. The costs for crew changes, requested by the Ministry, shall be paid by the Ministry with the exception of those resulting from unsatisfactory aircrew performance.

SOUTHEND SETTLEMENT – LANDING & TAKEOFF RESTRICTIONS

Operating Procedures

- No southerly floatplane departures from Lawrence Bay Water Base (with Ministry personnel on Board) shall be allowed. Southerly winds allow a more suitable takeoff from the channel Fire Base dock. This allows the aircraft to attain a higher altitude, prior to flying over the very rough terrain. This may require the aircraft to move to another dock prior to loading.
- No floatplane landing or takeoffs (with Ministry of Environment personnel or equipment on board) shall be allowed within the channel when any northwesterly or westerly winds are producing turbulence within the channel. Alternative sites may be available either in the bay

that is immediately northwest of the settlement docks and/or Lawrence Bay. This may also entail that ground transportation of personnel and/or equipment would have to take place.

- Whenever local wind conditions dictate northwesterly departures from the Southend Forest Protection Satellite Base helicopter pad, any loaded operation shall be moved to a more suitable area (such as the airport). The departure site will be mutually agreed upon with the pilot. When north-westerly winds are predominant, loaded arrivals (with equipment or personnel) may be allowed at the Satellite Base helipad, at the discretion of the pilot.
- The Southend airstrip is not suitable for all aircraft under all wind conditions. It is privately owned by Transwest Air and prior permission is required before use. Runway conditions vary greatly with moisture. The runway is short, sloped and ends at the lake.

PRINCE ALBERT NATIONAL PARK

The National Park has its own capability to action forest fires. Cooperative efforts between Ministry of Environment and the Park are common. Any air activities or patrols must contact the PANP Fire Dispatch located in the Warden office prior to entry. The list of important locations is found in the reference section of this manual. The Park also has its own radio dispatch system, which is outlined in the radio section of this manual.

RESTRICTED & ALERT AIRSPACE

There are three sets of low-level restricted and alert military airspace in Saskatchewan that pilots need to be aware of:

- CFB Cold Lake and the Primrose Air Weapons Range – CYR204, CYR221, CYR222, CYR223, CYR224, CYR225,
- CFB Moose Jaw - CYR303, CYA313 and CYA 314
- Camp Dundurn - CYR301 (south of Saskatoon).

Three other restricted airspaces must be observed:

- Regional Psychiatric Centre (Saskatoon) - CYR302 - The airspace within the area designated by a circle of 0.5 nm radius centred on N45 09' 40.0" W106 36' 0.050" from the surface to 1900' ASL.
- Saskatchewan Penitentiary (Prince Albert) – CYR309 - The airspace within the area designated by a circle of 0.5 nm radius centred on N53 11' 50" W105 48' 55" from the surface to 1900' ASL.
- OKIMAW Healing Lodge (Maple Creek) – CYR316 - The airspace within the area designated by a circle of 1.0 nm radius centred on N49 45' 28" W109 15' 58" from the surface to 5000' ASL.

There are several 'alert' airspaces used for soaring and parachuting that are active in the summer months. These may be expanded by NOTAM.

- Deslisle – CYA306 (west of Saskatoon)
- Strawberry Lakes – CYA308 (near Regina)
- Indian Head – CYA311
- Wakaw – CYA312
- Weyburn – CYA315
- Estevan – CYA317

Primrose Air Weapons Range

The Primrose Air Weapons Range is divided by the Alberta and Saskatchewan border. The airspace above the range is **Restricted**. Ministry of Environment is responsible for suppressing fires within the range. **Prior to entry, permission must be obtained from CFB Cold Lake**. Aircraft that are transponder equipped are to have them turned on and squawking the code 1276. There are also other

Restricted and Alert airspaces in the area, some are permanent and some are activated with NOTAM's. C.F.B. Cold Lake is a training base that operates year round. These activities occur both within restricted air space and uncontrolled airspace.

If a fire is spotted within the Primrose Air Weapons Range, the Fire Centre Duty Officer in Buffalo Narrows must arrange permission prior to entry into the Primrose Range. A numbered grid system is in effect within and adjacent to the range. The grid map can be found in Section 'F'. One or more grid blocks or portions will be cleared of military aircraft and authorization from the Duty Officer shall be given for entry. Refer to the map defining the grid blocks. When operating in CYR 204 all air traffic shall stay below 7,000 MSL (Cold Lake Altimeter setting) unless specifically arranged otherwise.

Operation Maple Flag

In May and June, CFB Cold Lake hosts Operation Maple Flag. This is a tactical fighter training exercise, involving many aircraft from several countries and is one of the largest exercises of its type in the world.

There may be as many as 100 aircraft involved in the exercise and this requires extra vigilance from civilian aircraft to ensure safe operations. In addition, heavy air traffic occurs for one week before and one week after the formal exercise.

There are three training exercise periods: from 0900 - 1030 hours, from 1330 - 1500 1nd from 1730 to 1900 hours daily. During these time period an AWACS/GCI aircraft is overhead. All aircraft should squawk 1276 on Mode C if they are transponder equipped. The use of normal cruising altitudes of 4,500 MSL for westbound and 5,500 MSL for eastbound tracks will assist the AWACS aircraft in identifying civilian aircraft.

For aircraft that are not using a transponder, there is an increased likelihood of military aircraft performing visual identifications. In any event, military aircraft are not to approach within 500 feet vertically or 1/2 mile horizontally of a civilian aircraft outside of the range.

The exercise extends well beyond the confines of the CYR 204 airspace into 'G' uncontrolled airspace. Be reminded that there are a number of Restricted and Alert airspaces adjacent to the Primrose Air Weapons Range. The area outside the range that sees the heaviest air activity is within 50 miles of the

east end of CYR 204, from high altitudes down to 200 feet above ground. It is recommended that wildfire aircraft stay below 3,000 AGL to aid deconfliction.

As of 2017, a NOTAM was issued dropping CYR 221 from its normal height starting at 7,000 feet to the ground. This airspace is then treated the same as CYR 204 regarding entry for the purposes of fire suppression.

Fire Suppression Activities Outside the Primrose Air Weapons Range

The Duty Officer in Buffalo Narrows will inform the CFB Cold Lake Range Activities Officer daily as to the routes for loaded patrols, sustained fire action, and of new fires that occur within 50 miles of the Primrose range. The military briefs their pilots prior to each exercise using this information.

During Operation Maple Flag, there is an increased likelihood of the request for NOTAMS to insure that the restriction of airspace around fires is well understood by everyone.

General Safety Concerns

It is advisable that any aircraft working close to military activity review the intercept signals. Remember - an aircraft that is moving at 600 miles per hour closes at 10 miles per minute. If you don't see him until he is two miles away, you and your aircraft have 12 seconds to react. If you have a close call, please note the place, time and as accurate a description of the other aircraft as possible. Report the event to the Fire Centre Duty Officer.

AQUATIC INVASIVE SPECIES (AIS) WASH DOWNS

To mitigate the risk of introducing an Aquatic Invasive Species (AIS) to Saskatchewan waterbodies the Ministry requires that all water-buckets and helitankers that arrive with aircraft from a known AIS contaminated area be inspected and cleansed, if needed, prior to working in Saskatchewan.

Water-buckets should be inspected to ensure they are clean and dry. Water-buckets that are suspect and fixed tanks need to be cleansed according to the procedure found in Safe Work Procedure; MOE/SWP-NAO007 "Aquatic Invasive Species (AIS) Wash Downs"

Currently this applies to aircraft that arrive from Manitoba, Ontario, Quebec and the United States.

TOXIC SMOKE & FUMES

There are various commercial operations that stockpile significant amounts of chemicals used in their operations. If a fire begins to involve these stockpiles then the resulting smoke, fumes and ash can be extremely toxic. Flying in the smoke plume from such a fire can be hazardous to health.

The sort of commercial operations that could be of concern are gold mines, base metal mines, uranium mines and their service industries. Waste disposal sites and oil and fuel tank farms may also be of concern. For example a gold mine may have tens of thousands of litres or kilograms of hydrochloric acid, ferric sulfate, sodium cyanide, sodium hydroxide, lead nitrate and hydrogen peroxide. The combustion products of mixtures of these materials are largely unpredictable but clearly pose a potential hazard if they become ignited.

MINISTRY OF ENVIRONMENT – SAFETY

The Ministry of Environment is committed to enhance the safe operation of aircraft during all phases of air activities. They have identified specialty operations that require procedures and standards above those defined or set by Transport Canada in the Canadian Aviation Regulations and Standards. Individual Branches such as Wildfire Management Branch, Fish & Wildlife Branch, Forest Ecosystems Branch and Enforcement & Compliance Branch have adopted a variety of additional policies and manuals to further enhance safe operations.

The individual elements of the Ministry's safety program include:

- Aviation safety pamphlets and poster program.
- Aviation contract assistance (Aviation Services Coordinator).
- Aviation Services "Call When Needed" Agreement.
- Pilot Handbook,
- Passenger Handbook.
- Aviation Emergency Response Plan.
- Ministry "Safe Working Practices".
- Individual Branch Policies and Directives.

Staff members involved in the management of aircraft involved in Ministry programs shall have copies of the pertinent documents.

MINISTRY OF ENVIRONMENT – SAFE WORK PROCEDURES

(The following are some of the Safe Work Procedures relevant to aviation operations)

Aircraft Operations

This procedure describes working in and around charter fixed wing and rotary aircraft for all work activities that are not related to wildland fire suppression (e.g. Fish and Wildlife Branch, Forest Services Branch, Compliance and Field Services Branch, etc.).

Fire Detection Operations

This procedure describes the detecting of fire from tower or aircraft.

Fire Suppression – Air (Loading/Unloading and In-Flight Procedures)

This procedure describes the loading and unloading of aircraft with retardant, cartage or workers, and the construction and use of helipads.

Ignition Operations

This procedure describes the controlled burning of vegetation using aerial or ground ignition techniques.

WILDFIRE MANAGEMENT SPECIALTY MANUALS

The following manuals contain information, standards and operating procedures to be used in specialty operations:

- CIFFC Helicopter Hover Exit Guide
- Saskatchewan Aerial Ignition Manual
- Aviation Fuel Management Training Manual
- Aviation Fuel Management Standard Operating Procedures

AVIATION EMERGENCY RESPONSE PLAN

The response plan is designed to fulfil the requirements of Ministry Aviation Safety

Although no one conducts air operations with the intent of having an accident, the possibility is always there. When an accident does happen, confusion is very common. The Aviation Emergency Response Plan is a condensed document designed to assist anyone supervising aircraft to respond properly. Most of the steps that must take place in an aviation emergency can be pre-planned, and this will eliminate most of the confusion. This document shall be an integral part of the flight watch and flight following that is a mandatory part of all air operations.

This plan establishes the actions to take:

- If an aircraft is overdue its estimated time of arrival.
- In the event of an aircraft accident.
- In the event of an aviation incident.

The plan outlines the basic procedures necessary to activate all local and federal Emergency Search and Rescue Services as well as associated support activities as rapidly and orderly as possible in the face of an aviation emergency.

The plan contains a form to report an aviation incident or mishap. Although an aviation incident is not an emergency it may necessitate an immediate response to prevent an accident from happening and requires a written report.

The plan ensures that an accurate, written log of action and events is performed. The Ministry Aviation Safety Committee provides this plan with the hope and prayer that it will never be used, but recognizes that it enhances preparedness.

INCIDENT & ACCIDENT REPORTING

An aviation incident is any flight incident (i.e. near collision, poor fuel management, irresponsible actions or attitudes of air crew, etc.) that affects safety but has not resulted in an accident. **If immediate safety is of concern, then the operation or offending crew must be shut down promptly, and the Project Team Leader or Fire Centre Duty Officer shall be called.** If the matter is one that can be rectified immediately by face-to-face communication between the crew and staff, then this should happen. The end result will hopefully be better co-operation. All Aviation Incidents require that a written and signed statement be completed and submitted to a Ministry Aviation Safety Committee

member or Fire Centre Safety Officer at the earliest, convenience. It is expected that aircrew will be pro-active in identifying and reporting Ministry staff of any safety concerns, incidents or accidents.

A form is available at the back of this handbook to assist with this. They may be submitted to the firebase, air operations supervisor on an incident, or safety officer.

Alternatively, air crew may make such reports in confidence to the Provincial Aviation Services Coordinator:

Bob Spracklin - 306 953-3458 **bob.spracklin@gov.sk.ca**

PILOT AND AIR CARRIER EVALUATIONS

In the course of working for the Ministry, contract aircrew and service delivery will be evaluated. This will happen at the end of a charter or project, or if a particularly good or bad performance is noticed. The particular aspects of performance, experience and ability to be evaluated are:

Basic Fire Operations:

- Radio work
- GPS & Map reading
- Aircraft handling /pilot skills
- Passenger briefings
- Knowledge of SK fire system
- Maintenance and aircraft readiness
- Safe operations
- Attitude/cooperation
- Accuracy of documentation

Specialty Operations:

- Water bucketing
- Mapping / IR scanning
- Helitorch or AID use
- Slinging/external loads

Service Delivery:

- Accuracy of documentation and administration
- Field support of flight crew and aircraft
- Service availability

These evaluations are kept on file and may be communicated to the air carrier's management, especially if they are particularly good or poor. They will also be used to assess air carrier aviation service delivery for use in future contracting decisions.

Administration

BASIS FOR HIRE

All aircraft hired by Ministry of Environment are governed by the Aviation Services "Call When Needed" Agreement or by a long-term contract, which embodies the same or more stringent standards. The terms, rates and charges in the Ministry of Environment Aviation Services "Call When Needed" Agreement constitute the conditions according to which the Carrier agrees to perform commercial air charter services. The Aviation Services "Call When Needed" Agreement has a term of either: April 1 until September 30 (summer), or October 1 until March 31 (winter). All aircraft hired by Ministry of Environment shall be operated by a licensed air carrier with a valid Transport Canada Operating Certificate.

Aircraft hired by Ministry of Environment on a short-term basis shall be by Short Term Contract, Flight Authorization, or according to the Mutual Aid Resource Sharing (MARS) agreement. This grants the Ministry sole use of the aircraft for the duration of the contract. Only certain authorized persons may commit the Ministry to a contract or a flight authorization.

The air carrier is required to supply the aircraft full of fuel at their expense at the beginning of the charter. At the end of the charter the Ministry is responsible for refilling the fuel tank(s) to full. Any fuel supplied by the Ministry to ensure the aircraft is full at the beginning of a charter shall be charged to the air carrier.

ANNUAL AIRCRAFT CHECKS & PILOT INFORMATION FORMS

Every year aircraft being offered for hire are subject to inspection by Ministry staff to ensure compliance with the requirements of the Aviation Services "Call When Needed" Agreement. Helicopters are designated a number. An adhesive set of numbers will be provided with to be placed prominently on the helicopter.

Pilots are required to complete an information form that documents their current endorsements, experience levels, recurrent training status, etc. **or** ensure that the information on the Web Air Canada website is current.

Aircraft will be checked at the beginning of each season. The pilot must report to the Fire Centre, either to the Fire Centre Duty Officer or Safety Officer for a thorough briefing upon initial hire. Flight crews will receive a thorough familiarization briefing from Fire Centre staff before being assigned a flight mission.

Prior to working in any specialty-flying role, a detailed briefing with Ministry staff shall take place

Each pilot shall, complete the annual Pilot Exam using the Pilot's Handbook and the Call When Needed agreement. The exam will then be corrected and discussed to 100% by the Ministry staff administering it. A copy of the corrected exam will be immediately sent to:

Aviation Services Email: AviationServices@gov.sk.ca
Or
Aviation Services Fax: (306) 953-3544

LONG TERM CONTRACTS

Long-term contracts are determined by a public tender process and are used to hire aircraft for periods longer than 29 days.

SHORT TERM CONTRACTS

Short Term Contracts range from 1 to 29 days. Ministry of Environment requires sole and exclusive use of the aircraft for the duration of the contract. It may involve leg minimums or daily minimums (which shall be averaged over the duration of the contract). These minimums are set out in the Aviation Services "Call When Needed" Agreement as submitted by the air carrier. Certain types of specialty flying bring daily minimums higher than those that may have been submitted by the air carrier.

The contract is a formal agreement between Ministry of Environment and the air carrier licensed to operate an aircraft. Authorized representatives from Ministry of Environment and the air carrier shall complete the contract prior to work being performed. The contract shall be completed, signed, and understood to the satisfaction of both representatives.

All Short Term Contracts must show:

- The name of the air carrier supplying the aircraft.
- The make/model and registration (if known) of the aircraft being contracted.
- The WFM CWN Number for the make/model of aircraft.

- The start and end date of the contract.
- The number of days of the contract.
- The point of hire and the point of release of the aircraft.
- Financial authority for the hire.
- The name and signature of the authorized company representative.
- The name and signature of the authorized Ministry of Environment official.

FLIGHT AUTHORIZATIONS

Flight Authorizations are used to hire an aircraft for an individual purpose on a specific day, which does not require sole or exclusive use of the aircraft for the entire day. No minimum daily charges apply. Leg minimums do apply. Standby charges may apply. In the fire program, flight authorizations are issued under the direction from the Provincial Wildfire Centre.

TERMINATION

It shall be understood that termination of the contract/authorization may result from the following situations:

- Non-compliance with Transport Canada Regulations.
- Prolonged un-serviceability of aircraft.
- Aircrew is either insufficiently experienced or is incompatible with an incident management team.
- Unserviceable radios.
- Failure to carry out reasonable orders from Ministry of Environment staff in charge.
- The aircraft fails to perform according to the manufacturers specifications.
- Failure to operate the aircraft within the air traffic guidelines, (as outlined in this book), or within the normal safety practices that are acceptable within the aviation industry. Ministry of Environment reserves and maintains the last and final word in these decisions.
- By mutual agreement.

SK DAILY FLIGHT REPORTS

All pilots flying aircraft hired by Saskatchewan Ministry of Environment are required to sign a SK Daily Flight Report for every day they are on hire. This report shall be examined and signed by Ministry officials authorized to do so. The person verifying the SK Daily Flight Report shall have had direct knowledge of the flights covered on the report. (I.e. The Initial Attack Crew leader who has worked the aircraft that day or the radio Dispatch that has been Flight Following the aircraft.) The person approving the SK Daily Flight Report shall be the person authorized to do so by the WFM Signing Authority Matrix. The complete and accurate completion of the SK Daily Flight Report is very important. The following guide to these forms has been prepared to assist contract flight crew and the Ministry staff authorized to verify & sign these reports.

SK Daily Flight Report Completion

Flight Reports must be completed and signed by the pilot and verifier at the end of the day. Where it is physically impossible to get an immediate signature (i.e. remote air operations not based at a base) faxed or scanned flight reports may be forwarded by the air carrier to the appropriate fire base for information purposes, however the original documents must be approved and forwarded prior to invoicing. The SK Daily Flight Report must be approved by designated Ministry approver prior to payment.

The SK Daily Flight Report shall normally be created by the Wildfire Integrated Information Network system (WIIN). It automatically indicates the following:

- The name of the air carrier supplying the service.
- The make/model of aircraft used.
- The registration (and assigned number, if a helicopter).
- The make/model of hire and reference number of the long term, short-term contract or flight authorization.
- The first departure point for the day.
- The Aviation Services “Call When Needed” Agreement number (CWN #).
- The date the flight was performed.
- Day number of contract.
- The page (if several pages are used to document the flying).

Manual revisions to the WIIN Daily Flight Report need to be made for minimum flight or leg charges, omitted flights, standby time, specialty service charges and/or non-revenue flights.

Minimum Flight or Leg Charges and Standby Time

Any minimum flight or leg charges or standby time charges must have been submitted with the air carrier's Aviation Services "Call When Needed" Agreement documentation. The only exception to this is for helicopters where a minimum of 0.2 hours will be allowed for a single flight of less than 12 minutes. This does not apply to individual legs of a multi-leg flight.

WFM Action Codes (Manual Flight Report)

When a flight report is being completed manually the following must be entered. The flight report shall indicate each single purpose flight on a separate line. Each flight performed on a specific fire shall be shown on a separate line. For manual entry the flight needs to be briefly described, stating the location, fire name and a simple statement of service performed. (I.e. hover training - Weyakwin, Loaded patrol - La Loche District.)

When working for WFM, individual flights require the following codes be entered on the SK Daily Flight Report. The Action code definitions are the same for helicopter and fixed-wing aircraft.

Each flight line shall indicate <u>only one</u> Action Code.

There are three phases of fire operations, identified according to the four **Action Codes**: Flights coded to Preparedness include all activities performed in anticipation of a fire. This includes training, the placement of fuel caches, servicing fire towers, and detection (includes loaded patrols and false smoke chases). Fire Action includes both initial attack and sustained action. Reclamation relates to non-suppression restorative work. Action Codes are consistent with the Program Code of the MIDAS Financial System.

P for **P**reparedness	(no Fire Numbers)
F for **F**ire Action (IA and SA)	(needs Fire Numbers)
R for Fire **R**eclamation	(needs Fire Numbers)

Fire numbers are defined as the assigned WFM and Midas numbers.

At the end of a Short Term Contract, any Contract **Minimums** are to be entered on the SK Daily Flight Report for the last day of the contract.

At the end of a Long Term Contract, any Contract Minimums are **not** to be entered on the SK Daily Flight Report for the last day of the contract.

Fuel in the column designated to the source of fuel, the pilot shall indicate whether the fuel for that leg was supplied by the air carrier or by the Ministry.

If fuel is consumed from a remote fuel cache, this should be mentioned in the remarks box. The entry should detail the cache location and number of drums or amount of fuel used.

Aircraft are contracted according to dry rates. Normally, the Ministry supplies all turbine fuel; either from Ministry owned fuel systems or from caches maintained by the Ministry.

When the air carrier supplies the aviation fuel it shall indicate this on the SK Daily Flight Report. This occurs either where the air carrier maintains its own fuel supply or it buys fuel from a third party. Where the air carrier supplies fuel from its own system, a rate shall be submitted beforehand (with the CWN) and invoicing performed based on that rate. Where the air carrier purchases fuel from a third party, the receipt for the purchase must be submitted with the invoice and the Ministry will pay the exact amount on the receipt.

Aircraft shall start a contract with full fuel, (non-accountable for invoicing) and will end the contract fully fueled paid for by the Ministry. Aircraft provided with fuel at the start of a contract or when off contract shall be invoiced for the cost of the fuel and transport costs.

Oil - Air carriers shall supply their own oil and include the costs in their standard rates as submitted with their Aviation Services “Call When Needed” Agreement.

Flights for two different assignments shall be: split into two lines to reflect the different purposes. **One flight line must show only one assignment.**

The start and stop time shall be entered for flights that are measured by hours. The Ministry uses flight time, not airtime. The total time for the day shall be entered in a decimal form.

Converting Minutes to "1/10th" Decimal Hour

1 to 8 minutes	= .1
9 to 14 minutes	= .2
15 to 20 minutes	= .3
21 to 26 minutes	= .4
27 to 32 minutes	= .5
33 to 38 minutes	= .6
39 to 44 minutes	= .7
45 to 50 minutes	= .8
51 to 56 minutes	= .9
57 to 62 minutes	= 1.0
63 to 68 minutes	= 1.1

A running total for Short Term Contracts lasting more than one day must be entered.

Aircraft on contract that are serviceable but perform no flying must complete a SK Daily Flight Report for that day and indicate “No flight assignments”. Please comment on the circumstances or reason in the remarks section (e.g. weathered out). Aircraft on contract that are unserviceable must complete a SK Daily Flight Report for that day and indicate “Unserviceable”.

FEES & AIRCREW EXPENSES

MARS, Short Term or Flight authorization flights cannot charge for fees or expenses. Long Term contracts abide by the details of their individual contracts.

SIGNATURES

The pilot must sign the SK Daily Flight Report. **The SK Daily Flight Report must also be signed by a Ministry verifier**. This is usually the person who was directly supervising the use of the aircraft – i.e. I/A Crew Leader, Detection staff, Dispatcher, etc. This person is verifying that the information on the flight report correctly and accurately describes the use of the aircraft (as services received). If error(s) or omissions are discovered subsequent to the signatures, the SK Daily Flight Report must be resigned and reprocessed. Where a WIIN Daily Flight report is being used then a hard copy of the Flight Report signed by the Verifier and pilot will be supplied to the Pilot.

Prior to payment a Ministry official is required to approve the flight report.

All documents that are not properly signed will be returned to source for proper signatures. All signatures must be plain enough to identify the person or have the name printed under the signature. Detailed information on invoicing is found in the Aviation Services 'Call When Needed' Agreement.

Other

Air carrier initiated crew changes will be paid for by the carrier. The Ministry will pay for changes that are at the request of the Ministry (with the exception of unsatisfactory aircrew performance). The carrier must advise the appropriate Fire Centre Duty Officer or Provincial Aviation Services Coordinator of any crew changes 48 hours in advance.

Copy Distribution (Manually Created SK Daily Flight Report)

The pilot shall retain the white and pink copies of the SK Daily Flight Report and the air carrier shall forward the white copy with their invoice to Wildfire Management. The yellow and mint copies of the SK Daily Flight Report shall be retained by the Ministry signatory. The mint copy shall be retained by the person approving the flight report and the yellow copy is to be forwarded to the Provincial Wildfire Centre (WFM).

AIR CARRIER INVOICING

Wildfire Management Branch in Prince Albert processes all helicopter invoices for the fire program. Invoices must be submitted on company letterhead for each helicopter hired. A copy of the Aviation Services Short Term contract and each Daily Flight sheet (complete with expense receipts) covering the applicable period of hire must be attached to each invoice.

Full instructions for proper invoicing can be found in Section 7.0 of the Ministry's Aviation Services Call When Needed Agreement.

Invoices should be submitted for the total period of time hired on one or consecutive short term contracts. The invoice must be completed and submitted to the WFM Branch, not more than 30 days after the final release date, on that particular contract.

The address is as follows:

Saskatchewan Ministry of Environment

Wildfire Management Branch

P.O. Box 3003, Hwy. #2 North

Prince Albert, Saskatchewan

S6V 6G1

Telephone: (306) 953-3473

Email: AviationServices@gov.sk.ca

Government of Saskatchewan

Daily Flight Report

Flight Report #

170721H00

Date of Flights	Contract #	Company / Air Carrier		Page Number 1 of 1
21/07/2017	STC01250	Waka Waka Air		FR#: 170721H00
		Call When Needed Number	**A/C Make & Model**	**A/C Reg. & SK Heli #**
		SR2017-007	Bell 204B	C-WXYZ #00

Day 68 of a 90 Day Contract

Flight Leg	Assignment	Action Code	Departure Point (Location of Initial Flight for the Day) / Flight Details	Ministry Fuel	Air Carrier Fuel	Flying Time Start	Flying Time Stop	Number of Hours
1	Denare Beach	Preparedness	Tracking Started->End Deployment	Y		11:11	12:17	1.09
2	17DB-FIRE	Fire	Assigned->Manual Duration End	Y		12:17	12:47	0.49
3	Denare Beach	Preparedness	Manual Duration Start->Manual Duration End	Y		12:58	13:53	0.92
4	Denare Beach	Preparedness	Tracking Started->Manual Duration End	Y		14:20	15:25	1.07
5	Denare Beach	Preparedness	Tracking Started->Manual Duration End	Y		16:00	17:25	1.41
6	Denare Beach	Preparedness	Tracking Started->End Deployment	Y		17:49	17:52	0.05
7	17DB-FIRE	Fire	Assigned->Manual Duration End	Y		17:52	20:05	2.21

Aerial Ignition: _____ Unserviceable: _____ Standby Hours: _____ Flight Leg Minimums: ____

Daily Crew Expenses

Indicate below how many crew members for each meal and accommodation.

Meals: Breakfast: **0 South** Lunch: **0 South** Supper: **0 South**

Accommodations: **0 South** Other Charges: **Yes**

Remarks / Specialty Charges:

Ministry fuel sources, litres used, landing fees, aircraft parking fees, taxi, etc.

901 L fuel from Denare
570 L fuel from Pelican

Daily Flying Total	7.3
Total Accumulated Hours	7.3
Unused Daily Minimums	

Pilot In Command:	Flight Sheet Verified By:	Approval for Payment:
Signature: *W. E. Coyote*	Signature: *Johnny Downwind*	Signature: *Ricky Mann*
Print Name: W. E. Coyote	Print Name: Johnny Downwind	Print Name: Ricky Mann
	Print Position: Observer	Print Position: FBS

Report printed: 15/02/2018 13:54 CST-06:00

General

RADIO CHANNELS & FREQUENCIES

VHF FM Frequencies – Fire Bases

Channel	Receive	Transmit
F1	163.260 MHz	163.260 MHz
F2	163.260 MHz	162.600 MHz
F3	163.200 MHz	163.200 MHz
F4	163.200 MHz	162.660 MHz
F5	163.140 MHz	163.140 MHz
F6	163.140 MHz	162.570 MHz
F7	163.050 MHz	163.050 MHz
*** F8 Tone**	**162.840 MHz Must use tone**	**162.840 MHz See tones below**
***RX & TX must be Toned – See Tanker Base Tone**		
F9	163.410 MHz	163.410 MHz
F10	163.410 MHz	162.720 MHz
F11	163.560 MHz	163.560 MHz
F12	163.560 MHz	162.780 MHz
F13	165.690 MHz	165.690 MHz
F14	165.690 MHz	164.760 MHz
Provincial Mutual Aid		
F37	156.912 MHz	156.915 MHz
Sask. Fire RMS		
F38	156.855 MHz	156.855 MHz

VHF FM Frequencies – Incidents

Channel	Receive	Transmit
A1	166.610 MHz	166.610 MHz
A2	166.610 MHz	168.400 MHz
B1	167.105 MHz	167.105 MHz
B2	167.105 MHz	169.750 MHz
C1	168.070 MHz	168.070 MHz
C2	168.070 MHz	170.425 MHz
D1	168.100 MHz	168.100 MHz
D2	168.100 MHz	170.450MHz
E1	168.700 MHz	168.700 MHz
E2	168.700 MHz	170.975 MHz

Air Tanker Group Frequencies

Tanker Group	Aircraft	Channel	RX	TX
Group 1	CONVAIR (1)	1B	167.430	167.430 MHz FM
Group 2	CONVAIR (2)	2B	166.830	166.830 MHz FM
Group 3	CL215-T (2)	3B	166.890	166.890 MHz FM
Group 4	CL215-T (2)	4B	167.850	167.850 MHz FM
Group 5	CL215 (1T + 1P)	5B	166.860	166.860 MHz FM
Group 6	CONVAIR (1)	6B	164.130	164.130 MHz FM

Tanker Base Tones

	Frequency	F8 Tone - RX	F8 Tone - TX
		RX & TX must be Toned	
Bakers Narrows	162.840	77.0	77.0
Buffalo Narrows	162.840	203.5	203.5
Estevan	162.840	203.5	203.5
Hudson Bay	162.840	67.0	67.0
Stony Rapids	162.840	67.0	67.0
Meadow Lake	162.840	156.7	156.7
La Ronge	162.840	100.0	100.0
Prince Albert	162.840	141.3	141.3

Other VHF AM Frequencies Used

122.050	Secondary Bombing
122.150	Secondary Bombing
122.250	Secondary Bombing
122.400	Secondary Bombing
122.425	Secondary Bombing
122.625	Secondary Bombing
122.650	Air to Tanker Base
122.850	Air to Air Link

Radio Call designators, channels & frequencies

Buffalo Narrows Fire Centre Area	
Big River Fire Base	F5, **F6**
Buffalo Narrows Fire Base	F11, **F12**
Dorintosh Fire Base	F1, **F2**, F11, **F12**
Green Lake Fire Base	F5**, F6,** F9**, F10**
Ile a La Crosse Fire Base	F5, **F6**
Beauval Satellite Base	F5, **F6**
Cole Bay Satellite Base	F5, **F6**
Patuanak Satellite Base	F5, **F6**
Pinehouse Satellite Base	F5, **F6**, F13, **F14**
La Loche Fire Base	F13, **F14**, F11, **F12**

F2	Repeater Location (Divide, Buffalo Narrows)
F6	Repeater Locations (Beauval, Buffalo Hills, Peck Lake)
F10	Repeater Location (Dore Lake)
F12	Repeater Location (Lac des Iles)
F14	Repeater Location (Salt Creek)

La Ronge Fire Centre Area	
Denare Beach Fire Base	F3, **F4**
La Ronge Forest Protection Base	F9, **F10**
Pelican Narrows Fire Base	F5, **F6**
Southend Fire Base	F3, **F4**
Stony Rapids Fire Base	F9, **F10**

F4	Repeater Location (Creighton, Southend)
F6	Repeater Location (Collins Bay, Deschambault Lake)
F10	Repeater Location (McLennan Lake)

Prince Albert Fire Centre Area	
Cypress Hills Fire Base	
Centre Block	F13, **F14**
West Block	F5, **F6**
Cumberland Fire Base	F5, **F6**
Hudson Bay Fire Base	F1, **F2**, F3, **F4,** F5, **F6**
Fishing Lake Fire Base	F13, **F14**
Prince Albert Fire Base	F9, **F10**
Weyakwin Fire Base	F3, **F4**

F2	Repeater Locations (Grassy, Porcupine)
F4	Repeater Location (Thunder Mountain)
F6	Cypress Hills
F10	Repeater Locations (Whiteswan)
F12	Repeater Location (Ridge)
F14	Repeater Locations (Greenwater)

Parks Canada				
Prince Albert National Park (XLJ-44)				
		Channel	Receive	Transmit
PANP	Local	CH. 1	166.050	166.050
	Repeater	CH. 2	166.050	166.650
Fire	**Local**	**CH. 4**	170.190	170.190
	Repeater	**CH. 5**	170.190	164.670
Grasslands National Park				
Fire East Block		CH. 12	153.845	153.845
Fire West Block		CH. 9	163.800	163.800

GLOSSARY OF FIRE TERMINOLOGY

Each pilot should understand the following terms ("*" indicates air attack terms):

Anchor Point - A strategic and safe point, usually a barrier to fire spread, from which to start constructing control line.

Base (of a fire) - The part of the fire perimeter opposite the head (also see "origin").

***Break/left or Right -** means "turn" left or right. Applies to aircraft in flight, usually on the drop run and when given as a command to the pilot - Implies immediate compliance. "Helicopter #12, break right - a small plane is crossing the target."

Canopy - The uppermost spreading, branchy layer of vegetation and trees.

***Cardinal Points -** The four chief points of the compass, north, south, east, west.

***Clock Method -** A means of establishing a target or point by reference to clock directions where the nose of the aircraft is 12 o'clock, moving clockwise to the tail at 6 o'clock. "The target is now at your 9 o'clock position (off the left wing)

Control Line - An inclusive term for all constructed or natural fire barriers and treated fire edge used to control a fire's spread.

Crown Fire - A fire that advances from top to top of trees or shrubs (through the canopy).

***Divert -** Change in aircraft assignment from one target to another or to a new fire.

Dozer Line - Fire line constructed by a dozer, same as cat line.

Drainage - Area drained by a river or stream. Usually includes at least one main canyon and several side canyons.

Drift Smoke - Smoke that has drifted from its point of origin and has lost any original billow form.

Drop - That which is dropped in a cargo dropping or retardant dropping operation.

***Drop Configuration -** The type of drop selected to cover the target, based on the retardant. The following are general terms which are familiar to the ground crews and are sometimes useful in clarifying the drop configuration:

Salvo - Dropping the entire load of retardant at one time or dropping a combination of tanks simultaneously.

Trail/String - To drop tanks in sequence causing a long unbroken line. Can be a long or short trail.

Split - The dropping of a partial load. Also described as "pairs".

***Drop Zone -** The area around and immediately above the target to be dropped on.

***Early -** Indicating drop was early or short of the target. "You were early on the last drop."

***Exit -** A command used to indicate the direction the Air Attack officer or the helicopter manager wants the pilot to fly after a given maneuver. "Exit southbound over the lake."

Fingers (of a fire) - The long narrow tongues of a fire projecting from the main body.

Firebreak - A strip of land from which all the vegetation is removed down to mineral soil for fire control purposes.

Fire Perimeter - The active burning edge of a fire or its exterior burned limits.

Flanks (of a fire) - The parts of a fire's perimeter that are roughly parallel to the main direction of spread. The left flank is the left side as viewed from the origin or base of the fire, looking toward the head.

Flare-up - A sudden acceleration of fire spread of intensity.

Fuelbreak - A wide strip or block of land on which the vegetation has been permanently modified to a low volume fuel type so that fires burning into it can be more readily controlled.

Head (of a fire) - The most rapidly spreading portion of a fire's perimeter, usually to the leeward or upslope.

Hose Lay - The arrangement of connected lengths of fire hose and accessories on the ground beginning at the first pumping unit and ending at the point of water delivery.

Hotspot - A particularly active part of a fire.

Hotspotting - Checking the spread of a fire at crucial points.

***Knock Down** - To reduce flame or heat in a specified target. Indicates the retardant load should fall directly on the burning perimeter or object. Used to assist ground forces.

***Late -** Indicating drop was late or overshot the target. "You were late on the last drop."

***Low Pass -** Low altitude run over the target area. May be used by Bird Dog aircraft or helicopter manager to get a close look at the target or to show an air tanker pilot a target that is difficult to describe. May be used by pilot to get a better look at the target or to warn ground personnel of an impending drop.

Main Ridge - Prominent ridgeline separating river or creek drainage. Usually has numerous smaller ridges (spur ridges) extending outward from both sides. Can be confusing if not covered in orientation.

***On Target -** Acknowledgement to pilot that his drop was well placed. Also called bull's-eye.

Origin (of a fire) - Point on the ground where the fire first started (also see "base").

Parts of a fire - On typical free-burning fires the spread is uneven, with the main spread moving with the wind or upslope. The most rapidly moving portion is designated the head of the fire, the adjoining portions of the perimeter at right angles to the head are known as the flanks, and the slowest moving portions known as the base.

***Retardant Coverage -** Area of fuel covered by retardant. Also, degree of coverage of fuel.

***Running -** Behavior of a fire or portion of a fire spreading rapidly with a well-defined head. "Your target is the finger running west from the left flank."

Saddle - Depression or pass in a ridgeline.

Safety Zone - An area used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In fire operations, crews progress so as to maintain a safety zone close at hand by allowing the fuels inside the control line to be consumed

before going ahead. During an emergency, aircraft may be asked to construct a safety zone using retardant drops.

Scratch Line - A preliminary control line hastily built with hand tools as an emergency measure to check the spread of a fire.

Secondary Line - A fire line built some distance away from the primary control line, used as a backup against slop overs and spot fires.

Slop Over - The extension of a fire across a control line.

Smoldering - Behavior of a fire burning without flame and barely spreading.

Snag - A standing dead tree or part of a dead tree from which at least the leaves and smaller branches have fallen. Often called stub if less than 20 feet tall.

Spot Fire - A fire caused by the transfer of burning material through the air into flammable material beyond the perimeter of the main fire.

Spotting - Behavior of a fire producing sparks or embers that are carried by the wind and start new fires outside the perimeter of the main fire.

Spur Ridge - A small ridge that extends finger-like from a main ridge.

Surface Fire - Fire that burns surface litter, other loose debris of the forest floor, and small vegetation.

***Target -** The area or object you want a retardant or water drop to cover. "Your target is the right flank."*

Tie-in - To connect a retardant drop with a specified point (road, stream, previous drop, etc.). "Tie-in tanker 78's drop with the road."

Victor - A synonymous term for referring to the tactical air-to-air VHF-AM frequency assigned to an incident.

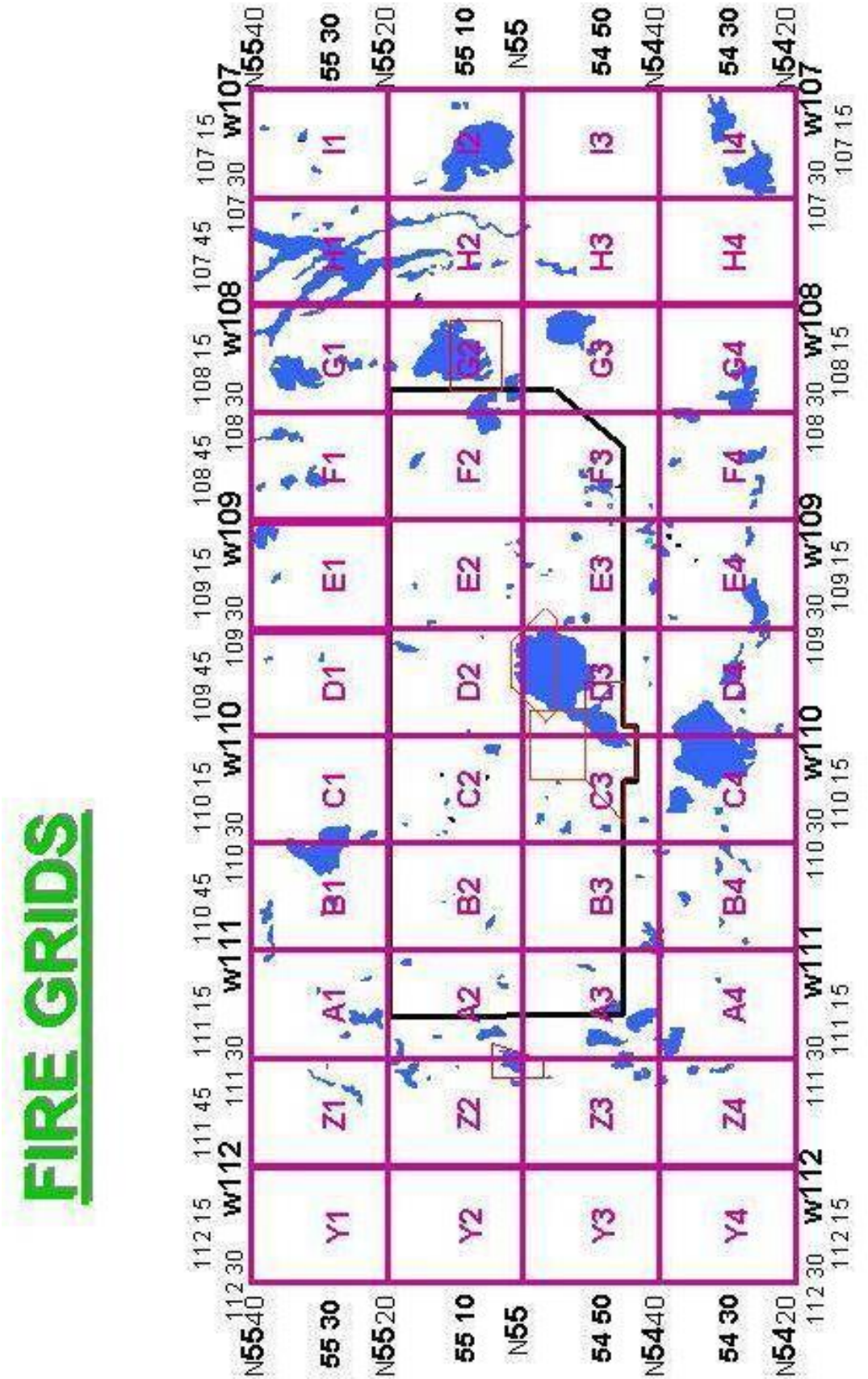
WEIGHTS OF COMMON FIRE EQUIPMENT

Fire Fighting Equipment	LBS	KG
Aerial Ignition Device	90	41
Axe, single bit, standard fire line	5	2
Bag, only, backpack, water, Wajax	7	3
Bottle, propane (100 lbs.) full	180	82
Bottle, propane (20 lbs.) full	45	20
Can , Jerry 20 litre gas container - Full	40	18
Can, Plastic Potable Water 25 liter (Full)	50	23
Hat, safety, hard	1	0
Heater, airtite 24”	15	7
Heli-torch	200	91
Hose, Bag 1.5” (400 ft) (dry)	55	25
Hose, fire 2.5” – per 50’ (Dry) if wet increase weight by 50%	10	5
Hose, fire, 1.5"- per 100' (dry) if wet increase weight by 50%	10	5
Hose, fire, 3/4"- per 100' (dry) if wet increase weight by 50%	4	2
Hose, Suction, Rubber (2”)	15	7
Kit, equip. for chainsaw with saw	44	20
Kit, equip. for Wajax Mk III with engine & pump	110	50
Kit, first aid, crew	3	1
Kit, Mess Complete	50	23
Kit, Pump Tool	30	14
Kit, Sprinkler (Grey Box)	32	15
Kit, Sprinkler (Red box)	79.7	36
Lantern, gasoline, Coleman	4	2
Pail, canvas, water	1	0
Poly, plastic, 16'X100' roll, (4 mil)	25	11
Pulaski	5	2
Pump & engine, Wajax Mk 75 (in box)	550	249
Pump, Floto	43	20
Pump, MK-III	62.5	28
Pump, Wick-100 complete with fuel tank (VPU)	40	18
Pump, Wick-250	35	16
Pump, Wick-350	60	27
Rake, fire fighting	10	5
Saw, Chain, Combi Can (6 + 2 liters)	16.7	8
Saw, Chain, Power with Kit	19	9
Shovel, Long Handle	4	2
Stove, cook, gasoline, portable, 3-burn	20	9
Tent Canvas, 12' X 14'	55	25
Tent, Camp, Fire - Plastic, 12' X 14'	18	8
Tent, Canvas 8' X 10'	45	20
Torch, Drip Handheld (Full)	11.4	5
Waterpack, Soft complete with hand spray pump	4	2

WEIGH ALL ITEMS IN YOUR CREW KIT AND CALCULATE A SAFE LOAD/FUEL RATIO.

<u>REMEMBER:</u> TRANSPORT CANADA ENFORCEMENT OFFICERS MAY BE CHECKING YOUR LOADS AND GROSS WEIGHT. YOU ARE EXPECTED TO OPERATE YOUR AIRCRAFT TO ITS LEGAL CAPABILITIES BUT NOT BEYOND…SAFETY SHALL NOT BE COMPROMISED BY OVERLOADING.

MILITARY FIRE GRIDS



GPS REFERENCES

The following list is a compendium of different sites of relevance to a pilot working for the Ministry of Environment. It includes Wildfire Management firebases of varying types, Provincial Parks, Fire Detection Towers, old tower sites, Sask-Tel communication towers, airports, airstrips, float bases, and fuel caches.

Firebases usually have a maintained helicopter pad with bulk fuel, electricity and water available. Fuel caches are seasonal and have drum fuel with a helipad. Some are also floatplane accessible. **The current status of fuel caches must always be checked with local staff.**

Latitude and Longitude are given in degrees and decimal minutes. WFM uses Latitude and Longitude for all location descriptions. **GPS units should be adjusted to use the NAD83 map datum**.

These locations are as accurate as currently known. If they are found to be inaccurate, please inform Ministry of Environment staff with the correct information so the list can be revised.

Location	FPA	Float	Latitude	Longitude
Big River airstrip	Big River		53° 50.167'	-107° 0.567'
Big River Dock	Big River		53° 49.846'	-107° 2.342'
Big River Forest Protection Base	**Big River**	**X**	**53° 49.175'**	**-107° 1.804'**
Birch Lake Fire Tower	Big River		53° 28.666'	-107° 56.335'
Bodmin Fire Tower	Big River		53° 46.951'	-106° 58.987'
Debden airstrip	Big River		53° 31.953'	-106° 52.986'
Dore Lake airstrip	Big River		54° 37.163'	-107° 23.310'
Dore Lake Fire Tower	Big River		54° 40.588'	-107° 14.926'
Dore Lake Fuel Cache	Big River	X	54° 37.304'	-107° 23.471'
Dube Fire Tower	Big River		54° 46.650'	-107° 51.638'
Glaslyn airstrip	Big River		53° 22.633'	-108° 20.532'
Green Lake Fire Tower	Big River		54° 27.406'	-107° 57.413'
Green Lake Heli Base	Big River		54° 17.411'	-107° 47.020'
Leoville airstrip	Big River		53° 37.289'	-107° 36.868'
Rabbit Hill Fire Tower	Big River		54° 20.336'	-107° 11.778'
Spiritwood airstrip	Big River		53° 21.800'	-107° 32.900'
Vimy Fire Tower	Big River		53° 49.664'	-107° 32.870'
Buffalo Hills Fire Tower	Buffalo Narrows		55° 58.840'	-109° 17.793'
Buffalo Narrows Airport	Buffalo Narrows		55° 50.711'	-108° 25.287'
Buffalo Narrows Fire Centre/ Forest Protection Base	**Buffalo Narrows**		**55° 50.060'**	**-108° 24.214'**
Cluff Lake airstrip	Buffalo Narrows		58° 23.467'	-109° 30.983'
La Loche airstrip	Buffalo Narrows		56° 28.407'	-109° 24.248'
La Loche Satellite Base	Buffalo Narrows	X	56° 29.139'	-109° 25.144'
Lloyd Lake airstrip	Buffalo Narrows		57° 20.572'	-109° 1.777'
Lockwood Fire Tower	Buffalo Narrows		55° 37.927'	-109° 12.736'
Turnor Lake Satellite Base	Buffalo Narrows		56° 28.328'	-108° 41.452'
C.H. West Block Helicopter Pad	Cypress Hills		49° 36.182'	-109° 55.206'

Location	FPA	Float	Latitude	Longitude
Cypress Hills Fire Tower	Cypress Hills		49° 39.810'	-109° 32.170'
Cypress Hills Forest Protection Base	**Cypress Hills**		**49° 39.886'**	**-109° 32.083'**
Denare Beach Forest Protection Base	**Denare Beach**	**X**	**54° 39.266'**	**-102° 4.942'**
Jan Lake airstrip	Denare Beach		54° 49.900'	-102° 47.310'
Jan Lake Fire Tower	Denare Beach		54° 54.912'	-102° 45.214'
Jan Lake Fuel Cache	Denare Beach		54° 53.554'	-102° 49.044'
Kakinigimak Lake Fuel Cache	Denare Beach	X	55° 4.683'	-102° 20.000'
Meridian Fire Tower	Denare Beach		54° 31.316'	-102° 8.186'
Pelican Narrows airstrip	Denare Beach		55° 17.252'	-102° 44.966'
Pelican Narrows Satellite Base	Denare Beach	X	55° 11.292'	-102° 56.721'
Puskwakau River Fuel Cache	Denare Beach		54° 30.390'	-103° 31.464'
Sandy Bay airstrip	Denare Beach		55° 32.730'	-102° 16.318'
Seabee Mine airstrip	Denare Beach		55° 41.342'	-103° 36.605'
Tyrell Lake Fire Tower	Denare Beach		54° 51.870'	-102° 10.002'
West Sturgeon Weir River	Denare Beach	X	54° 32.783'	-102° 23.619'
Bronson Lake Compressor Site Fuel Cache	Dorintosh		53° 52.808'	-109° 46.740'
Divide Fire Tower	Dorintosh		53° 52.579'	-108° 26.764'
Dorintosh Forest Protection Base	**Dorintosh**		**54° 24.408'**	**-108° 38.549'**
Goodsoil airstrip	Dorintosh		54° 24.746'	-109° 14.472'
Lac Des Iles Satellite Base	Dorintosh		54° 28.382'	-109° 22.357'
Lac Des Iles (Park dock)	Dorintosh	X	54 27.986	-109 22.527
Loon Lake Satellite Base	Dorintosh	X	54° 1.557'	-109° 11.167'
Meadow Lake airstrip	Dorintosh		54° 7.413'	-108° 31.483'
Meadow Lake Tanker Base	Dorintosh		54° 7.503'	-108° 30.610'
Midnight Fire Tower	Dorintosh		53° 38.350'	-108° 22.837'
Muskeg Lake Compressor Site Fuel Cache	Dorintosh		54° 44.280'	-109° 22.655'
Nelson Hill Fire Tower	Dorintosh		53° 57.242'	-109° 15.757'
Park Ridge Fire Tower	Dorintosh		54° 25.608'	-108° 36.032'
Salt Creek Fire Tower	Dorintosh		54° 43.218'	-108° 30.658'
Tatakose Fire Tower	Dorintosh		54° 33.769'	-109° 36.269'
Cumberland House airstrip	Hudson Bay		53° 57.365'	-102° 17.893'
Cumberland House Fire Tower	Hudson Bay		53° 57.140'	-102° 15.810'
Cumberland House Satellite Base	Hudson Bay		53° 57.159'	-102° 15.784'
EB Campbell Dam airstrip	Hudson Bay		53° 40.713'	-103° 21.001'
Hudson Bay Forest Protection Base	**Hudson Bay**		**52° 50.481'**	**-102° 23.275'**
Hudson Bay Tanker Base/Airport	Hudson Bay		52° 49.096'	-102° 18.659'
Mile 13 Fire Tower	Hudson Bay		52° 59.094'	-102° 37.772'
Mistatim Fire Tower	Hudson Bay		52° 57.723'	-103° 22.641'
Mountain Cabin Fuel Cache	Hudson Bay		53° 33.977'	-102° 7.175'
Nipawin airstrip	Hudson Bay		53° 19.953'	-104° 0.526'
Parr Hill Fire Tower	Hudson Bay		52° 17.169'	-102° 3.199'
Pasquia Fire Tower	Hudson Bay		53° 20.194'	-102° 34.616'
Piwei Fire Tower	Hudson Bay		52° 28.205'	-103° 0.294'

Location	FPA	Float	Latitude	Longitude
Porcupine Fire Tower	Hudson Bay		52° 37.912'	-101° 49.715'
Ushta Fuel Cache (old tower site)	Hudson Bay		52° 15.660'	-102° 38.220'
Alstead Lake (no dock)	Ile a la Crosse	X	55° 34.991'	-107° 21.893'
Beauval airstrip	Ile a la Crosse		55° 6.631'	-107° 43.006'
Beauval Satellite Base	Ile a la Crosse		55° 9.204'	-107° 36.572'
Boffa Lake Fuel Cache	Ile a la Crosse		56° 37.183'	-106° 55.000'
Cable Bay airstrip	Ile a la Crosse		57° 21.703'	-107° 8.190'
Canoe Lake airstrip	Ile a la Crosse		55° 12.576'	-108° 20.503'
Canoe Lake Fire Tower	Ile a la Crosse		55° 4.338'	-108° 14.268'
Charbonneau Lake Fuel Cache	Ile a la Crosse		54° 54.433'	-107° 18.567'
Cole Bay Satellite Base	Ile a la Crosse	X	55° 5.040'	-108° 20.158'
Crystal Lodge airstrip	Ile a la Crosse		57° 27.831'	-106° 44.856'
Flatstone Lake Fuel Cache (no dock)	Ile a la Crosse	X	56° 13.933'	-107° 40.633'
Granite (old fire tower site)	Ile a la Crosse		55° 43.033'	-106° 35.217'
Harry Lake Fuel Cache (no dock)	Ile a la Crosse	X	55° 30.733'	-107° 25.283'
Ile a la Crosse airstrip	Ile a la Crosse		55° 29.387'	-107° 55.842'
Ile a La Crosse Forest Protection Base	**Ile a la Crosse**	**X**	**55° 26.342'**	**-107° 53.912'**
Key Lake Road 1 airstrip	Ile a la Crosse		56° 56.242'	-106° 7.387'
McArthur River airstrip	Ile a la Crosse		57° 46.351'	-105° 1.304'
Patuanak airstrip	Ile a la Crosse		55° 53.944'	-107° 43.161'
Patuanak Satellite Base	Ile a la Crosse	X	55° 53.933'	-107° 42.369'
Watapi Lake Fuel Cache (old tower site)	Ile a la Crosse		55° 19.533'	-109° 34.067'
Arctic Lodge (Reindeer Lake) airstrip	La Ronge		56° 57.005'	-102° 14.338'
Besnard airstrip	La Ronge		55° 17.993'	-106° 5.830'
Besnard Patrol Cabin & Communication Tower	La Ronge	X	55° 24.021'	-106° 4.833'
Brabant	La Ronge		56° 6.867'	-103° 44.867'
D & D Camps airstrip	La Ronge		57° 44.565'	-103° 56.690'
Davin Lake airstrip	La Ronge		56° 52.432'	-103° 35.455'
Geikie River Fuel Cache	La Ronge	X	57° 42.204'	-103° 57.048'
Heli Transport Services Helibase	La Ronge		55° 6.886'	-105° 17.946'
Henry Lake	La Ronge	X	56° 24.015'	-103° 25.135'
Key Lake Mine airstrip	La Ronge		57° 15.343'	-105° 37.118'
Kinoosoo airstrip	La Ronge		57° 4.582'	-102° 1.171'
La Ronge Airport	La Ronge		55° 8.901'	-105° 15.772'
La Ronge Fire Centre/Forest Protection Base	**La Ronge**		**55° 7.009'**	**-105° 17.861'**
Osprey Wings Float Base	La Ronge		55° 36.291'	-104° 46.277'
Otter Lake airstrip	La Ronge		55° 34.880'	-104° 47.115'
Pinehouse airstrip	La Ronge		55° 31.693'	-106° 34.949'
Pinehouse Fuel Cache	La Ronge		55° 30.936'	-106° 35.898'
Reindeer Lake airstrip	La Ronge		57° 17.297'	-102° 31.414'
Southend airstrip	La Ronge		56° 20.188'	-103° 17.629'
Southend Satellite Base	La Ronge	X	56° 19.559'	-103° 15.060'
Trans West La Ronge Float Base	La Ronge	X	55° 5.922'	-105° 17.828'

Location	FPA	Float	Latitude	Longitude
Big Sandy (old tower site)	Lower Fishing Lake		54° 26.501'	-104° 20.379'
Candle Lake airstrip	Lower Fishing Lake		53° 46.145'	-105° 18.543'
Clarke Fire Tower	Lower Fishing Lake		54° 39.911'	-104° 46.787'
Grassy Shop Fuel Cache	Lower Fishing Lake		53° 39.397'	-104° 8.614'
Little Bear Lake airstrip	Lower Fishing Lake		54° 17.549'	-104° 40.189'
Lower Fishing Lake Float Base (no dock)	Lower Fishing Lake	X	54° 2.304'	-104° 36.878'
Lower Fishing Lake Forest Protection Base	**Lower Fishing Lake**		**54° 2.207'**	**-104° 36.426'**
Narrow Hills Fire Tower	Lower Fishing Lake		54° 1.230'	-104° 32.600'
Ridge Fire Tower	Lower Fishing Lake		53° 36.900'	-105° 17.814'
Round Hill Fire Tower	Lower Fishing Lake		53° 55.642'	-105° 28.996'
Snowshoe Fire Tower	Lower Fishing Lake		54° 13.601'	-104° 54.883'
Stuart Fuel Cache (old tower site)	Lower Fishing Lake		54° 12.635'	-104° 54.320'
Torch Camp Fuel Cache	Lower Fishing Lake		53° 45.906'	-105° 7.356'
Torch Fire Tower	Lower Fishing Lake		53° 34.651'	-104° 48.463'
White Fox Fire Tower	Lower Fishing Lake		53° 34.444'	-103° 44.125'
Birch Hills airstrip	Prince Albert		52° 59.583'	-105° 26.923'
Canwood Fire Tower	Prince Albert		53° 20.193'	-106° 35.285'
English Cabin Fire Tower	Prince Albert		53° 14.883'	-104° 50.569'
Melfort airstrip	Prince Albert		52° 51.871'	-104° 42.051'
Nisbet Fire Tower	Prince Albert		53° 14.765'	-105° 44.333'
North Cabin Fire Tower	Prince Albert		53° 4.918'	-106° 8.001'
Prince Albert Airport (Tanker Base)	Prince Albert		53° 13.083'	-105° 40.599'
Prince Albert Fire Centre/Forest Protection Base	**Prince Albert**		**53° 13.713'**	**-105° 45.351'**
Shellbrook airstrip	Prince Albert		53° 13.681'	-106° 21.803'
Tisdale airstrip	Prince Albert		52° 50.189'	-104° 3.967'
Beartrap Heliport	**PA National Park**		**53° 53.000'**	**-106° 7.983'**
Delworth Repeater	PA National Park		53° 51.261	-106 ° 6.155’
Rabbit Cabin Fuel Cache	PA National Park		53° 36.550'	-106° 27.717'
Sanctuary Repeater	PA National Park	X	54° 10.283'	-106° 28.417'
Sturgeon Crossing Heli-spot Fuel Cache	PA National Park		53° 43.150'	-106° 43.267'
Camsell Portage airstrip	Stony Rapids		59° 36.554'	-109° 16.176'
Charlot River airstrip	Stony Rapids		59° 36.102'	-109° 8.250'
Cigar Lake airstrip	Stony Rapids		58° 3.186'	-104° 29.064'
Collin's Bay (Rabbit Lake mine) airstrip	Stony Rapids		58° 14.167'	-103° 40.667'
Fond du Lac airstrip	Stony Rapids		59° 20.073'	-107° 10.940'
Gunnar airstrip	Stony Rapids		59° 24.576'	-108° 51.396'
Hatchet Lake airstrip	Stony Rapids		58° 39.742'	-103° 32.377'
Hidden Bay airstrip	Stony Rapids		58° 7.687'	-103° 46.788'
Points North airstrip (FBO)	Stony Rapids		58° 16.602'	-104° 4.950'
Stony Rapids airstrip	Stony Rapids		59° 15.021'	-105° 50.503'
Stony Rapids Forest Protection Base	**Stony Rapids**	**X**	**59° 15.325'**	**-105° 50.179'**
Uranium City airstrip	Stony Rapids		59° 33.697'	-108° 28.780'
Wollaston Satellite Base	Stony Rapids	X	58° 6.408'	-103° 10.264'

Location	FPA	Float	Latitude	Longitude
Anglin Fire Tower	Weyakwin		53° 42.745'	-105° 59.956'
Browndale Camp Staging Area	Weyakwin		53° 44.617'	-105° 53.583'
Elaine Lake	Weyakwin		54° 27.556'	-106° 21.380'
Mahigan	Weyakwin		54° 38.437'	-106° 31.998'
Molanosa Fire Tower	Weyakwin		54° 30.561'	-105° 32.192'
Thunder Mountain Fire Tower	Weyakwin		54° 37.368'	-106° 14.167'
Tracey Road	Weyakwin		54° 52.354'	-106° 4.066'
Weyakwin Forest Protection Base	**Weyakwin**		**54° 25.663'**	**-105° 47.903'**

DAILY SITUATION MAP

The GIS Section of WFM posts a Daily Situation Map every evening to this webpage.

http://wfm.gov.sk.ca/static/downloads/geomap/

The map will include fire boundaries for the current year, temporary locations (camps, helipads, etc.) and official NOTAMs. There are three formats which each display information differently; Google Earth, Avenza and ForeFlight, with the following names;

- SK_sit_GoogleEarth.kmz
- SK_sit_Avenza.pdf
- SK_sit_ForeFlight.kml

Fire boundaries are colour coded;

- Unknown = Light Green
- Not Contained = Red
- Ongoing Assessment = Pink
- Protecting Values = Orange
- Contained = Blue
- Out = Grey

Official NOTAM's are outlined in Yellow.

This service is under active development and contents may change throughout the season.

Saskatchewan Wildfire Management

CARGO / PASSENGER MANIFEST

Aircraft Registration:_____ Date: _____ Time: _____

Crew Identifier:_____ Departing Location:_____

Purpose of Flight:_____

Passenger Name or Call Sign	Weight (lbs)

Cargo Description	DG	Weight (lbs)

Check DG box if item being transported is a Dangerous Good

Aircraft Load Calculations to be Completed by Pilot Only

Maximum Internal Gross Weight (lbs)	
Aircraft Empty Operational Weight[1] (lbs)	
Pilot and Personal Kit Weight (lbs)	
Fuel Weight (lbs)	
Remaining Available Payload[2] (lbs)	

Total Cargo Payload (lbs)	
Total Passenger Payload (lbs)	
Total Payload (Passenger and Cargo) (lbs)	

[1] Empty operational weight includes the complete equipped weight of the aircraft with no fuel on board. This includes but is not limited to the weight of the bucket, longline, survival kit, refuelling gear, etc.

[2] Remaining Available Payload must be based on aircraft performance, predicted density altitude calculations that are based on the highest temperature and operational altitude to be encountered for the flight and comply with weight and balance limits.

Pilot Name: _____ Signature: _____

WFM Representative: _____ Signature: _____

Saskatchewan Wildfire Management

WEIGHTS OF COMMON FIRE EQUIPMENT

Fire Fighting Equipment	Pounds (lbs)	Kilograms
Bottle, propane (20 lbs.) full	45	20
Can , Jerry 20 litre gas container - Full	40	22.5
Can, Plastic Potable Water 25 liter (Full)	50	22.6
Hose, Bag 1.5” (400 ft) (dry)	55	25
Hose, fire, 1.5"- per 100' (dry) if wet increase weight by 50%	10	4.5
Hose, fire, 3/4"- per 100' (dry) if wet increase weight by 50%	4	3
Hose, fire 2.5” – per 50’ (Dry) if wet increase weight by 50%	10	4.5
Hose, Suction, Rubber (2”)	15	7
Kit, first aid, crew	3	3
Kit, Mess Complete	50	22.6
Kit, Pump Tool	30	14
Kit, Sprinkler (Grey Box)	32	14.5
Kit, Sprinkler (Red box)	79.7	36.2
Pulaski	5	2
Pump, Floto	43	19
Pump, MK-III	62.5	28
Pump, Wick-100 complete with fuel tank (VPU)	40	18
Pump, Wick-250	35	16
Pump, Wick-350	60	27
Saw, Chain, Combi Can (6 + 2 liters)	16.7	7.6
Saw, Chain, Power with Kit	19	9
Shovel, Long Handle	4	2
Tent, Camp, Fire - Plastic, 12' X 14'	18	8
Torch, Drip Handheld (Full)	11.4	5.2
Waterpack, Soft complete with hand spray pump	4	2

The weights indicated above may fluctuate based on modifications or additions to the equipment, if in doubt always weigh equipment.

Other Weights

WEIGH ALL ITEMS AND CALCULATE A SAFE LOAD/FUEL RATIO.

REMEMBER: TRANSPORT CANADA ENFORCEMENT OFFICERS MAY BE CHECKING YOUR LOADS AND GROSS WEIGHT. YOU ARE EXPECTED TO OPERATE YOUR AIRCRAFT TO ITS LEGAL CAPABILITIES BUT NOT BEYOND…SAFETY SHALL NOT BE COMPROMISED BY OVERLOADING

March 15, 2019

Saskatchewan Wildfire Management

PILOT AVIATION OCCURRENCE REPORT

Valid 2019

Directions for completion of the form as well as the appropriate occurrence information selections can be found on the back page of this report.

Name		Visibility			
Date of Occurrence		Weather			
Time of Occurrence		Aircraft Damage	☐ No	☐ Minor	☐ Major

OCCURRENCE INFORMATION

Occurrence Type		Phase of Flight	
Occurrence Sub-Type		Mission Type	

AIRCRAFT/PRESONNEL INFORMATION

AIRCRAFT #1 INFORMATION				AIRCRAFT #2 INFORMATION			
Pilot		Total Crew		Pilot		Total Crew	
Operator		Crew Uninjured		Operator		Crew Uninjured	
Manufacturer		Crew Injured		Manufacturer		Crew Injured	
Type		Total PAX		Type		Total PAX	
Call Sign		PAX Uninjured		Call Sign		PAX Uninjured	
Registration		PAX Injured		Registration		PAX Injured	
Departure Point		Total Personnel		Departure Point		Total Personnel	

SUMMARY OF OCCURRENCE **(Please provide all pertinent information relating to the occurrence - use additional paper if required).)**

OCCURRENCE PREVENTION RECOMMENDATIONS **(What do you think could have prevented this event?)**

Contribution Human Factors **(select all that you feel apply)**

Fatigue	☐	Training	☐	Workload	☐	CRM	☐	Environmental	☐
Knowledge	☐	Experience	☐	Complacency	☐	Interpersonal	☐	Procedures	☐

Are there procedures in place to prevent this event from happening? ☐ Yes ☐ No ☐ Unsure

Are the existing procedures adequate? ☐ Yes ☐ No ☐ Unsure

Does this Occurrence require Transport Canada to be notified? ☐ Yes ☐ No ☐ Unsure

Signature

Date Submitted

Form Name: Saf_020
Pilot Aviation Occurrence Report
Reference: SAF 502
Valid for: 2019

Please complete this report and submit to your point of contact at the Fire Base or Incident for entry into WFM Safety System.

March 13, 2019

OCCURRENCE TYPE **(please use one of the items below when filling out the type of occurrence)**

Airspace Conflict | Aircraft Damage | Aircraft Emergency
Aircraft Malfunction | Airmanship | Fuel
Wildlife | Other

OCCURRENCE SUB-TYPE **(identify the occurrence type from above and then choose the appropriate sub-type)**

Airspace Conflict

Collision | Communication Error | Loss of Separation
Potential Collision | Unauthorized Entry | Other

Aircraft Damage

Foreign Object | Rotor Strike | Propeller Strike
Bird Strike | Other

Aircraft Emergency

Engine Shutdown | Engine Failure | Engine Fire
Fire | Loss of Power | Precautionary Takeoff
Rejected Takeoff | Smoke in Cockpit | Vibration
Other

Aircraft Malfunction

Brakes | Bucket | Communication Equipment
Door/Canopy Opening | Electrical | Engine
Fuel | Flight Controls | Hydraulic
Instrument Failure | Loss of a part | Maintenance
Navigation | Tire/Wheel/Landing Gear | Other

Airmanship

Gear up Landing | Public/Staff Complaint | Regulatory Infraction
SOP's not followed | Other

Fuel

Contamination | Low Fuel Warning | Fuel Exhaustion
Other

Wildlife

Bird strike | Animal on runway | Bugs (static/pitot tubes, etc)
Other

PHASE OF FLIGHT **(Select one)**

Taxiing | Takeoff | Climb | Cruise/Enroute
Over the Fire | Bucketing | Descent | Landing
Parked | Other

MISSION TYPE **(Select one)**

Initial Attack | Support Action | Training | Ferry Flight
Crew Move | Bucketing | Fire Patrol | Other