Continental Field Manual

Program Information

U.S. National Science Foundation Introduction

The United States Antarctic Program (USAP) Field Manual provides an overview of USAP field logistics, operations, and safety. It contains information relevant to living and working in an Antarctic field camp and is intended to enhance your success in the field. This reference manual provides valuable knowledge, and you should read it before deploying and take it into the field with you. It is your responsibility to be familiar with the skills and techniques covered in this manual.

The harsh conditions encountered in the field setting, coupled with relatively short deployments and important scientific objectives, require effective leadership, and constant risk management from all team members. Safety, environmental stewardship and your health are of paramount importance. Continued vigilance and action in these areas are essential to maintain a safe and productive work environment in Antarctica.

This manual is designed to be used in conjunction with the USAP Participant Guide located at www.usap.gov. The USAP Participant Guide provides general programmatic information that complements the guidance in the Field Manual. Use of these manuals and adherence to the guidelines set forth will enhance both your safety and productivity while working in Antarctica.

We wish you a safe and successful field season.

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Emergency Management

The Emergency Operations Center (EOC) is on call 24/7. The EOC is initiated by the NSF station manager after receiving initial information from Central Comms. The staff will collect the caller's name, phone number, and location; classify the situation (e.g., injury or illness, spill, aircraft mishap, vehicle accident, loss of shelter); and gather the information necessary to assess needs and risks and determine appropriate actions. If a search-and-rescue (SAR) is launched, it may involve the USAP SAR team and/or the Joint

SAR Team (JSART), which is composed of both USAP and Antarctica New Zealand (AntNZ) personnel.

In the Event of an Emergency

1. Assess the situation: is it medical, mechanical, logistical.
    a. Survey the scene: is it safe, what happened, how many are involved.
    b. Primary assessment and determine the ABCDE's (airway, breathing, circulation, disability and exposure). Perform necessary first aid, or any sort of action that would stabilize the situation (in the case of mechanical, logistical), monitor.
    c. Radio for help if needed, alert other field team members.
    d. Call Central Comms to give initial report: condition of patient, plan and what is needed. Establish a call back time.
    e. Perform secondary assessment: interview patient, take vitals, perform head to toe assessment.
    f. Keep patient warm and dry, move to shelter if possible, be reassuring, and provide food and warm liquids if appropriate. Improvise toilet equipment, if necessary.
2. Document
    a. Take notes: the more the better.
    b. Write a SOAP note if managing a medical situation (SOAP note is an organized way to take notes about a patient, see reference chapter for a SOAP note template).
3. Resources
    a. Inventory of available resources.
        i. People - define roles and responsibilities.
        ii. Standard Operating Procedures
            1. Wilderness Medical Guidebook (issued from Berg Field Center)
            2. Deep Field Camp Medical Manual
        iii. Equipment (first aid, medical, mechanical)
4. Decide/Plan
    a. With the help of the EOC, a decision will need to be made.
        i. You are on the ground and the best ones to answer how outside help can be of assistance.
        ii. Have a list of questions and/or asks for the EOC.
        iii. What do you need to immediately stabilize the situation.
        iv. Continue to monitor the situation by documenting, clearly communicating to your team and establishing regular check in times.

Notify appropriate manager and other involved parties about the incident. Complete and submit the required incident report as soon as possible example Incident Form in Reference chapter.

Some Additional Tips/Tricks

Be prepared prior to calling Central Communications (Central Comms.). Iridium® phones can drop calls or cut out momentarily so have a concise message when initially establishing a call.

- Prepare focused questions.
- Be able to take notes (or have someone ready to do so).
- Have your documentation ready (Use of the Incident worksheet is helpful).
- If possible, have an evacuation/plan ready to share.
    - Urgency of situation.
    - Know your location.
    - Weather factors.
    - Terrain factors.
    - Understand a timetable for evacuation.
    - State requests for additional resources if needed (gear, food, support, etc).
    - Be prepared with a backup plan and determine timelines for continued communication with Central Comms.

Emergency Numbers for Central Communications

Phone: 42586

VHF: Channel 3

HF: 7.995 MHz 11.553 MHz

Iridium®: 00-8816-763-12464

Emergency Response Flow Chart

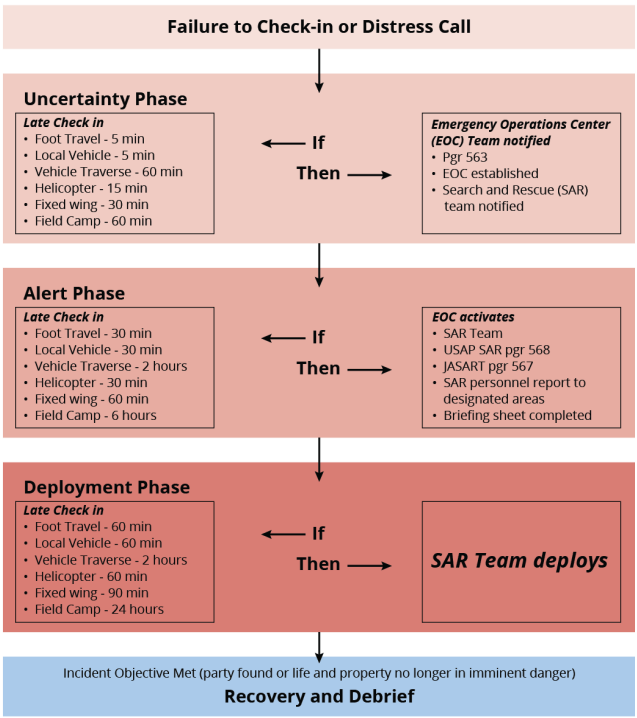
In response to a distress call or a failure to check-in, each of the following work centers monitor for the various types of travel.

Central Comms.
- Foot Travel
- Local Vehicle
- Vehicle Traverse
- Field Camp
- Other Stations
- Search and Rescue Satellite Beacon

Firehouse
- Foot Travel
- Local Vehicle
- Vehicle Traverse
- Other Stations

Comms. Center
- Helicopter
- Fixed Wing

Scott Base
- Request for Assistance

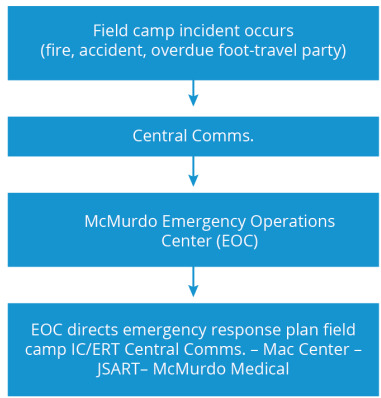


Field Emergency Response

Response to an emergency in the field could take as little as an hour or up to days depending on a variety of factors, so teams should be prepared to manage a situation until help arrives. Multiple people are always available to provide support via communication devices (Central Comms, SAR, Medical, Field Safety), yet having the ability to manage people during an emergency is important.

If field camp staff receive an outside distress call:

- Record vital info.
- Direct caller to contact McMurdo if Possible.
- Contact Central Comms. to relay info and confirm they heard from party in distress.



Planning

The more you know about available resources prior to deployment, the wiser your decisions will be when faced with an emergency. Questions to consider before deploying to the field:

- Roles and responsibilities of group members (consider medical, technical, communication skills).
- When will you be furthest away from additional resources (i.e., other camps, groups).
- Where do you anticipate your highest level of hazards.
- Anything unusual you can anticipate.
- How will extreme weather affect your plans, what are your thresholds for weather.
- Take some time to define the following scenarios and discuss the response:
  - High likelihood but low consequence.

  - High likelihood and high consequence (hopefully you have few of these as we would want to highly mitigate or entirely avoid).
  - Low likelihood and high consequence.
  - Low likelihood and low consequence.
- Where does emergency gear live (first aid, communication resources, paperwork that could be helpful in talking you through steps to responding to an incident, mechanical backups).
- Establish relationships with people you would rely on in the event of an emergency (face-to-face conversations with Central Comms, Medical, SAR).

USAP Operational Risk Management					
Probability	**Consequences**				
	None (0)	Trivial (1)	Minor (2)	Major (4)	Death (8)
Certain (16)	0	16	32	64	128
Probable (8)	0	8	16	32	64
Even Chance (4)	0	4	8	16	32
Possible (2)	0	2	4	8	16
Unlikely (1)	0	1	2	4	8
No Chance (0)	0	0	0	0	0
None	No degree of possible harm.				
Trivial	Incident may take place but injury or illness is not likely or it will be extremely minor.				
Minor	Mild cuts and scrapes, mild contusion, minor burns, minor sprain/strain, etc.				
Major	Amputation, shock, broken bones, torn ligaments/tendons, severe burns, head trauma, etc.				
Death	Injuries result in death or could result in death if not treated in a reasonable time.				

USAP 6-Step Risk Assessment		
1	Goals	Define work activities and outcomes.
2	Hazards	Identify subjective and objective hazards.
3	Safety Measures	Mitigate risk exposure. Can the probability and consequences be decreased enough to proceed?
4	Plan	Develop a plan, establish roles and use clear communication; be prepared with a backup plan.
5	Execute	Reassess throughout activity.
6	Debrief	What could be improved for the next time?

Field Planning Checklist: All Field Parties

Day 1

- Arrive at NSF McMurdo Station.
- Arrival brief; receive room keys and station information.
- Meet point of contact (POC).
- Find dorm room and settle in.
- Retrieve bags from Building 140.
- Check in with Crary Lab staff between 10 am and 5 pm for building keys and lab or office space (if not provided by POC).
- Check in with other team members.

Day 2

- Attend science in-brief; get lock combination to cage holding field gear and details regarding flight times and allowable cabin loads (ACLs).
- Contact the Berg Field Center (BFC) to schedule the food pull and ensure allocated fuel quantities are correct.
- Contact Field Support and Training (FS&T) team to schedule in-person Field Planning meeting.
- Contact Continental Field Supervisor if supported out of a fixed field camp to discuss support.
- Locate cage containing field gear in Building 73; confirm the BFC gear is complete and as requested.
- Retrieve radios and other equipment from the Field Party Communications office.
- Check with the Mechanical Equipment Center (MEC) for mechanical equipment, such as snowmobiles and generators, if requested.
- Check with Science Cargo to see where project cargo shipped from U.S. has been staged.

Days 3-7

- Confirm that resupply items are clearly labeled and stored in cage.
- Meet with Central Comms personnel to discuss field communication plan and establish a daily call-in time.
- Give resupply plan to the BFC supervisor and the Fixed-Wing Operations Office. Retain a copy.
- Check and test all equipment destined for the field. Call Central Comms to test communication equipment.
- Bring all material and equipment collected from the BFC, MEC, and other departments to Science Cargo for processing.
- Check that team members have been scheduled for required training,

such as Antarctic Field Safety, Crary Lab, radio and communication, fire extinguisher, environmental, Taylor Valleys Code of Conduct, cargo, snowmobile, small engine, weather, light vehicle, tracked vehicle, food safety, and outdoor safety. Schedule any additional training, as needed.

- Pick up any required office supplies, safety gear, or science equipment from Central Supply (Building 140, upstairs). Check hours of operation before going.
- Consult with the environmental coordinator regarding proper procedures for handling hazardous material and human waste at the camp site. Procure the necessary materials, such as human waste containment and spill kits. Gather the correct forms for reporting spills and waste discharge.

Field Planning Checklist: Fixed-Wing Supported

In The Week Leading Up To Flight

- If going to an "unsupported" field camp, make an appointment with McMurdo Medical to pick-up a field medical box.
- Meet with FS&T to go over Field Plan/Risk Assessment.

Five Business Days Before the Flight

- This is the last day to deliver hazardous cargo to Science Cargo – Building 73. This also accounts for the time that the Cargo handlers require to build cargo on pallets and deliver to airfield.

Three Business Days Before the Flight

- This is the last day to deliver all remaining non-hazardous cargo to Science Cargo - Building 73, and assist, if needed, the Cargo staff with packaging cargo and assigning shipment numbers.

Two Business Days Before the Flight

- Schedule a meeting to go over final cargo weights, cargo priorities, and passenger names to the Fixed-Wing Office.

The Day Before the Flight

- Ensure that Central Comms has your put-in plan, including camp name, camp leader, and the number of people in the camp. Set a time for the daily check-in.
- Fixed-Wing Office staff will confirm that all cargo is ready for flight.
- The fixed-wing flight schedule will be published by 1800 hours; check the intranet or televisions for departure times.

- If dorm rooms are not being held for field team members, clear the rooms and properly store items not going into the field. Lodging personnel will perform a room inspection.
- Fully charge batteries for satellite phones, radios, Kestrel® weather meters, cameras, and other electronic devices.
- Set up the "away from email" auto reply function on USAP and personal accounts.

The Day of the Flight

Check the flight schedule early in the morning.

- Stay near the phone identified as the team's contact number and monitor the pager if the team has one.
- If releasing a dorm room, pack the bedding and leave it in its blue bag outside the door.
- Be at Building 140 or Derelict Junction, dressed in extreme cold weather (ECW) gear, at the time stated on the flight schedule.
- At the airfield, team members may be asked to assist with loading the plane.
- Visually confirm that sleep kits and all critical life safety items* have been loaded on the plane. Do not allow the plane to take off until crucial safety gear has been confirmed on board the aircraft.

**Critical life safety items include: all required shelters, stove, fuel, ignition source, food, required communication devices, water for some locations.*

If the Flight is Delayed or Canceled

- For same-day departures, remain in the passenger area and wait for updates.
- If the flight is canceled, take the shuttle back to McMurdo Station.
- Check with Lodging staff to confirm room assignments.
- Check with the Fixed-Wing Office regarding an updated flight schedule.

Field Planning Checklist: Helicopter Supported

In the Week Leading Up to Flight

- If going to an "unsupported" field camp, make an appointment with McMurdo Medical to pick-up a field medical box.
- Set up time and meet with Field Support and Training to go over Field Plan/Risk Assessment.

Three Business Days Before the Flight

- Confirm the flight request with the helicopter coordinator. The request must include estimated cargo weights, the number of passengers, and a list of hazardous cargo.
- This is the last day to request changes to the flight schedule.
- This is the last day to deliver hazardous material to Science Cargo.

The Day Before the Flight

- Be sure all non-hazardous cargo has been delivered to the helicopter pad.
- Ensure that Central Comms has your put-in plan, including camp name, camp leader, and the number of people in the camp. Set a time for the daily check-in.
- If dorm rooms are not being held for field team members, clear the rooms and properly store items not going into the field. Lodging personnel will perform a room inspection.
- Fully charge batteries for satellite phones, radios, Kestrel® weather meters, cameras, and other electronic devices.
- Set up the "away from email" auto reply function on USAP and personal accounts.

The Day of the Flight

- Check the flight schedule early.
- Monitor the pager, if the team has one.
- Stay near the phone identified as the team's contact number.
- Be at the helicopter pad, dressed in ECW gear, 45 minutes before the flight.

If the Flight is Delayed or Canceled

- Check with Helicopter Operations staff regarding an updated flight schedule.
- For same-day departures, remain in the passenger area and wait for updates.
- If the flight is canceled, check with Lodging staff to confirm room assignments.

Field Camp Put-In Procedures

Before Departing NSF McMurdo Station

- Review Field Planning checklist to be sure all items are complete.
- Turn in room keys to Lodging staff and lab keys to Crary Lab personnel (unless authorizes to keep them).
- Be sure all electronics are warm and batteries are fully charged.

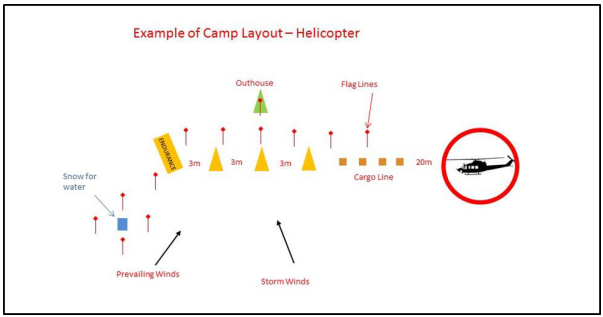
- Visually confirm that all sleep kits, communication equipment and required safety gear are loaded on the aircraft. Do not allow the aircraft to depart until this is confirmed.

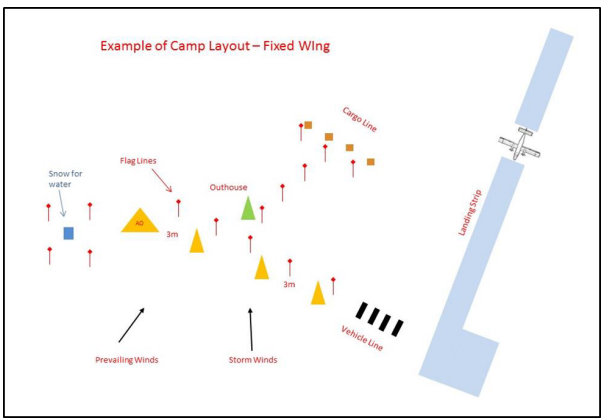
Upon Arrival at the Camp Site, While Aircraft is Still on the Ground

- Assist the flight crew with unloading the aircraft, as directed.
- If staying overnight, establish communication with Central Comms using a satellite phone or radio; verify the camp name, the name of the camp leader, and the number of people in the camp. Confirm the time of daily check-in.
- Establish a shelter; set up a tent away from the landing area.
- Establish a flame; light a camp stove.
- Inform the pilot when these tasks are complete.
- Confirm with the pilot which is grid north by using a GPS or the sun.
    - The direction of Grid North is used to establish directional flags for weather observations.
- Keep clear of the aircraft and any prop wash as it departs.
- In fixed-wing camps, test the VHF air-to-ground radio (if you have one) with the pilot once the aircraft has become airborne.

Immediately After the Aircraft has Departed

- Identify the best location for the camp; look for a spot that offers easy access to research sites, avoids hazards, and provides protected areas for shelters. Consider storm wind direction and helicopter pad and/or skiway location to create optimal camp orientation.
- For helicopter-supported camps, it is recommended to keep camp elements a minimum of 25 meters away from the primary flight path. Be aware of rotor wash and keep a secure landing zone at all times in case of unexpected or last-minute helicopter landings.
- Set up all tents. Appropriate spacing may vary by location but 3 meters between tents in areas with drifting potential is a good place to start.
- Set up the HF radio, solar panel, and antenna. Test the radio by contacting Central Comms.
- Set up a camp toilet area. This may be a tent with a human waste container or a hole in the snow (where allowed, in accumulation zones).





Tent Toilet Tent Snow for Water Area Cargo

As Soon as Practical

- Place all fuel containers and equipment (e.g., generators) in containment.
- Establish a site for trash. Be sure all trash is correctly packaged and labeled for return to McMurdo Station.
- Erect flag lines between tents and/or cargo lines in case of whiteout if your location warrants this.
- Set-up a camp survival cache with spare fuel and food. Near the or in the toilet tent is often a good candidate if it's a Scott Tent (smaller toilet

tents like Kivas do not work as well). Some teams opt to place their Personal Locator Beacon with this cache.
- Establish GPS coordinates for cargo lines, tents, and the survival cache. Store this GPS in an easily accessible location for a whiteout situation.

Field Camp Daily Tasking Checklist

Communications

- Complete daily check-in call before the appointed time. Inform Central Comms of the number of people at the camp and whether or not all is well.
- Make weather observations and call them into MacWeather at the pre-arranged times if required by camp location.
- Call the fixed-wing or helicopter supervisor to confirm any upcoming flights.
- Make calls to work centers, as necessary, to request or confirm material for any impending resupply.
- Helicopter-supported camps:
  - Monitor Channel 7 at all times, especially if a helicopter is in the area, in case the pilot is trying to reach you.
  - If expecting a flight that day, call Helo Ops between 0700 and 0730 with a weather update.
- Fixed-wing supported camps: Make weather observations and call them into MacWeather at the pre-arranged times.
  - Call Central Comms after 1900 for the next day's flight schedule, or call the fixed-wing supervisor.
  - Call work centers, as necessary, to request or confirm material for any impending resupply.
  - Inform Fixed-Wing Ops of the amount and nature of items expected and the expected delivery date.
- Fixed-wing supported camps: Follow the communications plan established with the Fixed-Wing Office to arrange resupply.
- Helo-supported camps: Call Helo Ops three business days in advance of a requested flight with all flight details (e.g., passengers, cargo, mission). If you are in the Taylor Valley, then route requests through the Taylor Valley Camp Manager.

Record Keeping

- Record any pollutant spills using the "Field Spill Reporting Sheet."
- Record any information each day that will be required in the Environmental End of Season camp report.

Housekeeping, Health and Safety

- Sort waste and recyclables and keep them in proper containers.
- Check for and clean up any pollutant spills.
- Check and tighten all guy lines and anchor points.
- Monitor surroundings and weather patterns for indications of coming storms.

Resupply

- Check levels of commonly used items, such as propane, food, paper towels, toilet paper, and hand sanitizer. Make a list and call for resupply once a week, remembering that many items have a long lead time.

Field Camp Pull-Out Procedures

In the Days Leading Up to Pull-Out

- Package equipment and cargo not being used. Record the weight, cube, and type of retrograde cargo for each box. This information will be passed to the fixed-wing or helicopter supervisor for pull-out flight planning.
- Package hazardous cargo in its original packaging and label it. Locate original hazardous cargo documentation, as the pilot may request it.
- Identify a staging area next to the landing strip and place cargo there when it is packaged and ready to go.
- Communicate with the fixed-wing or helicopter supervisor to confirm pull-out flights and relay cargo details.
- Notify Central Comms of planned pull-out date.
- Plan the take-out in stages. Cargo and passengers slated for the last flight should include essential gear and survival food for one week, as well as someone to provide weather observations, in case the takeout needs to be aborted for any reason.
- Communicate with Lodging personnel at least two days before arriving in McMurdo Station to arrange and confirm room assignments.
- Take GPS coordinates of all release sites for the end-of-season environmental report.

Day of Pull-Out

- In fixed-wing supported camps, begin hourly weather observations six hours before an LC-130 aircraft leaves McMurdo and three hours before a Twin Otter or Basler leaves origin.
- Take down tent(s).
- Place all remaining camp items in the staging area and conduct a visual

sweep of the campsite to ensure all items are removed.
- Disassemble the radio(s) and antenna(s).
- Before takeoff, take one last look to make sure everything and everyone is on the plane!

Field Camp Hut Etiquette

Please complete the following before leaving the hut:

Trash

- Sort and pack all trash and recycled materials and take them back to McMurdo Station for proper disposal.
- No trash or recyclable items should be left in hut containers.

Floors, Surfaces, and Furniture

- Sweep the floor.
- Wipe all tabletops and chairs clean.
- Arrange chairs and tables neatly.

Personal Items

- Conduct a thorough sweep of the hut to locate and remove all personal and project-specific items.

Food and Dishes

- Wash and put away any dishes, utensils, and cookware.
- Non-perishable food should be neatly packaged, labeled, and stored in its proper area.
- Take perishable food back to McMurdo Station.

Thank you for leaving the hut in a clean and tidy condition for the next field team.

After Return to NSF McMurdo Station

- Take the time necessary to clean and return all equipment to its proper storage area or department. See the "Camp Gear Return Procedure" for details.

Camp Gear Return Procedures

- Allow sufficient time for returning equipment to the BFC. Field teams are responsible for cleaning the gear, sorting it, and ensuring it is checked in by BFC personnel. Gear return can take from an hour to two days, depending on the type of gear and its condition.
- Call the BFC in advance (x42348) to make an appointment for gear

return.
- At the appointed time, bring all camp gear to the BFC and make piles of like items (e.g., sleeping bags, Thermarests®) on the floor downstairs.
- Remove all flight tags, cargo stickers, and duct tape from the gear.
- Report any damage to a BFC staff member or tag it as such.
- A BFC staff person will inspect the gear, inventory it, check it in, and print out an "Outstanding Returns" sheet for any missing items. Locate and return these missing items or make a note on the sheet explaining what happened to them.

BFC Items Needing Extra Attention

- **Tents** – All communal cook tents must be set up, swept out, and scrubbed. Make an appointment with the BFC personnel so they can assign a location and provide the proper cleaning tools.
- **Dishes, thermoses, food coolers, stoves, water coolers, and five-gallon buckets** – Wash and dry these items, using the sinks at the BFC. Please repack the kitchen box and inform a BFC staff member of any missing content.
- **Climbing ropes and equipment** – Inform BFC staff of any issues with the equipment or any falls on the rope. Please check ropes before returning them. BFC staff will check all equipment during the winter, but field-team knowledge and assistance is valued and appreciated.
- **Pee bottles and toilet seats** – Clean and bleach these items. A system with directions is in place downstairs at the sink next to the washing machine. Please do not leave them for other people to clean.
- **Trash** – Separate, clean, and dispose of all trash in the bins outside the BFC. Each category needs to be bagged. Extra bags are in the BFC bay.
- **Human waste** – Please take it to the Waste Barn and place in the appropriate container.
- **Cage** – Please clean out the cage completely! Throw out garbage, sweep floors, and wipe off shelves. DO NOT LEAVE ANYTHING IN THE CAGE! It will be inspected by a BFC staff member when this task is completed.
- **Jerry cans** – Consolidate like fuel and empty all unknown or unmarked jerry cans in the waste barrel near the flammables van. Please tag and label any full or partially full cans with the contents. Place them under the appropriate sign outside the flammables van.
- **Food** – Dry food that is in good condition and unopened can be returned to the BFC. Frozen food cannot be returned, as it may have thawed during transport.

Survival Bags Explained

Red

Orange

Blue

Local Survival Bags - Red

Needed

When traveling off established roadways outside of McMurdo Station town limits (Examples: Cape Evans, Cape Royds, Windless Bight).

Not Needed

Within town limits or on established roadways, such as Phoenix Road or Williams Field Road.

Helicopter Survival Bags – Orange

Needed

When passengers disembark a helicopter at locations other than an established camp.

Not Needed

If passengers disembark at an established camp, at a location with a survival cache, or at a tent camp with all components of a survival bag.

Red and orange bags contain everything – including fuel. Bags should be opened only in an emergency.

Deep Field Survival Bags – Blue

Needed

When traveling away from any camp in the deep field.

Not Needed

If traveling via LC130, Twin Otter or Basler to an established camp. The aircraft carries survival bags for all passengers.

Deep-field survival bags have no fuel! Fuel bottles must be obtained from a BFC staff member and then hazardous-certified separately by Science Cargo.

The fuel should be kept near or in the survival bag so the kit remains complete.

Local Field Survival Bag Contents

Red, Shiny, Dry Bags

Supports 2 people for 3 days.

- 2 sleeping bags
- 2 bivy bags
- 2 Ensolite™ pads, 24”x48”
- 1 mountain tent with instructions and repair kit
- 1 collapsible snow shovel
- 1 snow saw
- 1 first aid kit
- 2 bottles white gas, 22 or 33 oz bottles in Ziplock™ bag and PVC

Tent Stake Bag

- 10 assorted stakes
- 2 ice screws
- 1 snow flukes (okay if missing)
- 1 hammer

Cook & Stove Set Bag

- 1 cook set, 1-2 pots with lid
- 1 signal mirror
- 1 MSF Whisperlite™ Stove with instructions, repair kit, and 4 boxes of matches (35 matches per box) wrapped in foil

Toilet Paper

- 1 roll toilet paper

Food Bag

- 6 dehydrated meals
- 3 large (or 6 small) chocolate bars
- 12 tea bags, assorted
- 12 hot chocolates
- 2 packs of Mainstay™ food bars, 9 bars per pack (2 per person per day) or 10 Bumper™ Bars

Utensil Set

- 1 pot handle
- 2 mugs, hard plastic
- 2 spoons
- 1 tube or bottle burning paste wrapped in foil
- 1 pocketknife

Clothing Bag

- 1 bag of miscellaneous clothing, e.g., hat, mittens, gaiter

Ziplock™ Bag

- May contain a book or game, not essential
- Survival manual
- Parachute cord, 50 ft
- 1 contents list

Deep Field Survival Bag Contents

Blue, Shiny, Dry Bags

Supports 2 people for 3 days.

Note: Full fuel bottles cannot be flown on LC-130 aircraft. They must be hazardous certified separately. This survival bag is intended for people traversing away from a fixed camp on a daily basis. Fuel should be added to this bag from camp stock.

- 2 sleeping bags
- 2 bivy bags
- 2 Ensolite™ pads, 24”x48”
- 1 mountain tent with instructions and repair kit
- 1 collapsible snow shovel
- 1 snow saw
- 1 first aid kit

Tent Stake Bag

- 10 assorted stakes
- 2 ice screws
- 1 snow flukes (okay if missing)
- 1 hammer

Cook & Stove Set Bag

- 1 cook set, 1-2 pots with lid
- 1 signal mirror
- 1 MSF Whisperlite™ Stove with instructions, repair kit, and 4 boxes of matches (35 matches per box) wrapped in foil

Toilet Paper

- 1 roll toilet paper

Food Bag

- 6 dehydrated meals
- 3 large (or 6 small) chocolate bars
- 12 tea bags, assorted
- 12 hot chocolates
- 2 packs of Mainstay™ food bars, 9 bars per pack (2 per person per day) or 10 Bumper™ Bars

Utensil Set Contains

- 1 pot handle
- 2 mugs, hard plastic
- 2 spoons
- 1 tube or bottle burning paste wrapped in foil
- 1 pocketknife

Clothing Bag

- 1 bag of miscellaneous clothing, e.g., hat, mittens, gaiter

Ziplock™ Bag

- Survival manual
- 50 ft parachute cord
- 1 contents list

Survival Cache Contents

Staged at Fixed Camps

Exact quantities and supplies may vary, depending on average population and specific camp criteria.

Supplies

- Sleeping bags
- Ensolite™ pads, 24"x48"
- Collapsible snow shovel
- Snow saw, ice ax, sledge hammer
- Assorted tent stakes
- Ice screws
- Snow flukes
- Mountain tents (large camps do not have tents since there are several Jamesways or Rac-tents)
- Parachute cord, 100 ft
- Signal mirror
- Pocket knife
- Pee bottles
- Human-waste buckets
- Toilet paper rolls
- Sledgehammer

First Aid

- First aid kit, group
- Books - Medicine for Mountaineering, Cold Injuries

Cooking

- Coleman fuel
- Coleman two burner stove
- MSR Whisperlite™ stove
- Pot, 10 qt
- Pot, 5 qt
- Pot, 3 qt
- Plates
- Utensils (fork, knife, steak knife, spoon)
- Mugs, hard plastic
- Pot grips
- Fry pan
- Matches
- Cleaning pads, scrubbies

Food

- Dehydrated meals
- Oatmeal
- Meals-ready-to-eat (MREs)
- Hot chocolate
- Bars (granola, chocolate)

Environmental Guidelines

Environmental stewardship and protection in the Antarctic are essential. The United States is a signatory to the Antarctic Treaty (1959) and the Protocol on Environmental Protection to the Antarctic Treaty (Protocol, 1991). These agreements are implemented in the U.S. under the "Antarctic Conservation Act (ACA) of 1978," Public Law 95541, as amended by the "Antarctic Science, Tourism, and Conservation Act of 1996," Public Law 104-227.

The Antarctic Treaty sets Antarctica aside for peaceful purposes, primarily

scientific research, cooperation, and the exchange of information. The Protocol commits to comprehensive protection of the Antarctic environment, including a ban on commercial mineral exploration, and through its six Annexes requires environmental impact assessment of all proposed actions and conservation of native fauna and flora (including management activities to limit introduction of non-native species). The Protocol also establishes protocols for waste disposal and waste management, prevents marine pollution, and establishes a process for area protection and management. Adherence to Protocol obligations by USAP participants relies on education programs for each of these areas.

United States Federal regulations implementing the ACA can be found in the Code of Federal Regulations Title 45, sections 640, 641, and 670 through 674. For questions or to obtain additional information regarding the information presented below, contact ASC Environmental at environmental@usap.gov.

Spill Prevention, Clean-up, and Reporting

- All spills of designated pollutants (e.g., fuel, glycol, transmission fluid) must be reported immediately upon their discovery, regardless of spilled volume.
- To reduce the occurrence of spills, appropriate secondary containment and spill kits must be available for any fueling operation.
- For camps with a camp manager, spills should be reported directly to the camp manager.
- For McMurdo-based camps without a camp manager, spills should be reported to the Firehouse (via Central Comms).
- All spilled, designated pollutants must be cleaned up to the greatest extent practicable and disposed of through the hazardous waste system.

Waste Management

- Releases of human waste or gray water are only permitted in accumulation zones, i.e., areas where snow and ice are thickening relative to the surrounding area. Releases onto sea ice, blue ice, into crevasses, or on ice-free land are not permitted. No releases to the environment are permitted in the McMurdo Dry Valley ASMA or within ASPAs.
- All hazardous waste (e.g., fuel-contaminated material, lab waste, chemical containers, aerosols, radioactive material) requires special handling and labeling. Questions regarding hazardous waste management should be directed to the Waste Department at each station.
- The ACA has strict guidelines on managing hazardous waste. Be sure to

remove all hazardous waste from the field at the end of each field season.

Human Waste

- Human waste must not be discharged onto ice-free land, sea ice, or in blue-ice areas. Discharge can only occur in snow accumulation areas and only with permission to do so.
- Surface discharge of urine is not allowed anywhere on the continent. If urine discharge is specifically approved, it may only be discharged to the subsurface (into a pit or hole).
- Personnel must carry a pee-bottle when bathrooms or outhouses are not available. Used pee-bottles must be emptied and cleaned by personnel before they leave the station (McMurdo Station has dedicated pee-bottle cleaning stations at the Science Support Center (SSC) and the BFC).
- Human waste and gray water must be returned to McMurdo Station. For planning purposes, the table below provides estimates of volumes generated.

Human Waste Type	Container Type	Persons/Days
Human Solid Waste	5-gallon bucket (1)	5 people for 5 days (minimum)
Urine	5-gallon bucket (1)	1 person for 5 days
Gray Water	5-gallon bucket (1)	1 person for 5 days

Interactions with Animals

- Personnel must not interfere with wildlife unless they have an ACA permit and are specifically trained for the activity being conducted.
- Maintaining a distance of 15 to 20 feet from animals is generally sufficient, but if an animal's behavior is altered or disturbed, individuals should increase that distance.

Non-Native Species

- No non-native species of animal or plant may be introduced onto land, ice shelves, or into water in the Antarctic Treaty area, except in accordance with an ACA permit.
- To avoid introducing non-native species into Antarctica, personnel must clean all science gear and personal equipment before arriving on the continent.
- To avoid cross contamination, personnel must also clean gear and personal equipment before transiting between Antarctic field sites.
- If a suspected non-native species is observed in Antarctica, it should be reported immediately to the environmental representative.

Environmental End-of-Season Report

Purpose

To meet Antarctic Conservation Act reporting requirements. Information gathered on the report is used in USAP annual reporting to the NSF.

Submit

At the conclusion of field activities, all events must submit their Environmental End of Season (EOS) Report to ASC Environmental. The form and instructions will be emailed to you.