**ASFS Site Visit Plan**

This document outlines the protocol for an ASFS site visit including a list of the equipment and supplies that are needed for the routine missions to the ASFS. It is anticipated that these routine missions will occur via helicopter as frequently as 1 month intervals in summer, but possibly less frequently in winter if the helicopter cannot fly due to darkness or other restrictions.

**Preparation prior to leaving for ASFS**

1. Understand and communicate the position of the site to scientific management for helicopter operation planning. Consider the meteorological forecast conditions as context for mission planning. Work with scientific leadership via the ATMOS team leader to identify who will participate in the mission, the timing of the mission, who will serve as bear guard, etc.
2. Assess the ASFS data management. Has all anticipated data from the ASFS already been archived on the Polarstern? What data do we need to get from the ASFS, if any?
3. Assess the current state of the ASFS: Power system, instrument operation, data quality, quality of the radio signal, etc. Any irregularities would inform the expected supplies to bring, and development of special tasks for the visit.
4. Develop a detailed site visit plan based on the overall template plan outlined below. This plan should include any specialized tasks that may be needed, and any specialized equipment/supplies that will be needed. It should also include a general assignment of tasking.

**On-site Activities**

For each visit to the ASFS there are a number of items to be accomplished. While some of these can be done in different orders, the order outlined below is designed to optimize activities that require ordering. Note: While it is acceptable for the top of the main ASFS box to be open for periods of up to 20-30min depending on conditions, it is important to consider the internal box temperature, the temperature of the EFOY, and the ingress of snow into the box. Close the lid when performing tasks outside of the box, and arrange activities in a way to minimize extended periods with the lid open. Activities include:

1. Address time-sensitive issues: Swap EFOY and/or batteries quickly if needed to get the power system operational. Both EFOY and batteries should be kept as warm as possible, the EFOY will not start if it is at temperatures less than 0C.
2. Inspect the full site and ASFS: Is the ice stable, are there evolving environmental issues, is there any damage to the ASFS?
3. Inspect and ensure the seals on the primary box to ensure proper environmental isolation.
4. Assess the operation and health of the power system, including the EFOY, batteries, charge control, circuits, exhaust lines, ventilation fans.
5. Replace the emptiest fuel cartridge for the power system. Prior to swapping, ensure fuel is being drawn from the other cartridge. Update any cartridge information in the EFOY computer.
6. Remove / manage ice build-up from the fuel system exhaust. Photograph ice buildup prior to removal.
7. Ensure the proper operation and health of the interface box, including data logger, power conversion and control devices, network switch, radio.
8. Obtain copies of all data that is needed.
9. Inspect all external cabling and address any issues. Ensure proper securing of all cables.
10. Inspect and document the condition of all instruments. Include photographs of the state of each instrument.
11. Re-position, anchor, and level the sled. Includes consideration of ablation mitigation as needed. Install new anchor if needed using 2x4 and a 4” auger hole in the ice.
12. Clean and adjust all instruments, including leveling radiometers and other instruments, ensuring proper operation of spare power line to Stanton buoy.
13. Secure, seal, latch all components for operations.
14. Inspect and document of Stanton AOFB, according to their protocols.
15. Inspect and document of Perovich IMB, according to their protocols.
16. General documentation and photographs of conditions around site
17. Deal with any additional onsite documentation

**After site visit**

1. Copy any necessary data into our archive on Polarstern.
2. Ensure full documentation of mission, including the state of all equipment, power system, sled, ice conditions, ability to conduct the mission, personnel and/or condition challenges, etc. Specifically document any changes that were made to the system.
3. Make note of any special actions that will be required for the next visit and/or any possible changes of the default protocol for site visits.
4. Communicate about the mission with on-site personnel; at a minimum Shupe, Stanton, Perovich.

**ASFS Supplies to Bring:**

* Fuel: 60L methanol cartridge (could possibly be 2 of these)
* ASFS Tool Kit:
  + Hex keys
  + Screw drivers
  + Multimeter
  + Wrenches for battery terminals
  + Channel locks
  + Vice grips
  + 2" pipe wrench
  + 4" auger for ice holes / Driver with charged batteries and spare
  + Level
  + Measuring tape
* Large Tools:
  + Pick, shovel
  + Pry bar
  + Step ladder
* General supplies:
  + Zip ties and straps
  + Extreme weather tape
  + Ropes and straps
  + Fuses (should be onsite already)
  + Ethanol for cleaning instruments
  + Soft towels for cleaning instruments
  + Headlamps
  + Anchor 2x4s
  + Ablation mitigation materials
* Computational equipment
  + Tablet
  + Connection cables: Network, serial
  + Spare SD cards
* As Needed Equipment
  + Spare batteries, fully charged. If there is any indication that the system is not communicating, offline, and/or known to be out of power.
  + Spare fuel cell. If there is any indication that the system is not communicating, offline, and/or known to be out of power.
  + Spare interface box: If there is any indication of failures in the data and/or communication system.
  + Spare instruments: If there is indication of failure on specific instrument(s), spare instruments and cables should be brought.