




National Science Foundation • Office of Inspector General
4201 Wilson Boulevard, Suite I-1135, Arlington, Virginia 22230

MEMORANDUM

DATE: July 2, 2015

TO: Dr. Kelly K. Falkner
Director, Division of Polar Programs

FROM: Dr. Brett M. Baker 
Assistant Inspector General for Audit

SUBJECT: *Audit of Health and Safety in the U.S. Antarctic Program*, Report No. 15-2-009

Attached please find the final report of our audit of Health and Safety in the United States Antarctic Program (USAP). The report contains four findings on: 1) developing a process for identifying, responding to, tracking, and collecting data on all misconduct incidents that occur in USAP; 2) improving pharmacy operations; 3) ensuring Special Deputies in the Antarctic have adequate tools and training to perform their law enforcement responsibilities; and 4) enforcing and potentially expanding the requirement for breathalyzer tests. We have included NSF's response as an appendix to the final report.

To comply with Office of Management and Budget Circular A-50 requirements for audit follow-up, please provide within 60 calendar days a written corrective action plan to address the report's recommendations. This corrective action plan should detail specific actions and milestone dates.

We appreciate the courtesies and assistance provided by Division of Polar Programs' staff during the audit. If you have any questions, please contact Marie Maguire, Director of Performance Audits, at (703) 292-5009.

Attachment

cc:	France A. Córdoba	Richard Buckius
	Brian Stone	Roger Wakimoto
	Susanne LaFratta	Michael Van Woert
	Polly Penhale	Allison Lerner
	Fae Korsmo	Marie Maguire
	Christina Sarris	Kelly Stefanko
	Ruth David	Jeffrey Stitz

Audit of Health and Safety in the U.S. Antarctic Program

**National Science Foundation
Office of Inspector General**

**July 2, 2015
OIG Report No. 15-2-009**



TM# 14-P-1-015

Results in Brief

Antarctica's extreme environment and relative isolation challenge human health and wellness. Medical care in Antarctica is limited and reducing the risk of injury and illness is dependent on safe work practices and personal conduct. While our audit found that in general, NSF's oversight and the Antarctic Support Contractor's (ASC's) performance were effective in ensuring adequate health and safety in the U.S. Antarctic Program (USAP), we identified four areas for improvement.

First, there is no process to identify, respond to, track, and collect data on all misconduct incidents that occur in USAP. Recognizing that misconduct in the Antarctic creates a heightened threat due to the remote and isolated environment, NSF has established a Code of Conduct for USAP and requires all USAP participants to agree to abide by it. However, neither NSF nor the ASC keep track of data on misconduct incidents that they could use to analyze for trends, to develop lessons learned, to prevent similar incidents from reoccurring, or to ensure that appropriate, consistent disciplinary action is taken to address misconduct. We recommend that NSF ensure that the Code of Conduct is enforced for all USAP participants and that a process is developed and implemented to identify, respond to, track, and collect data related to all misconduct incidents involving all USAP participants

We identified opportunities for improving USAP pharmacy operations. The USAP operates three medical clinics in the Antarctic, each of which has a pharmacy stocked with hundreds of medications that are tracked through an antiquated system that does not protect patient safety. We recommend that NSF ensure that LM develop and implement a solution to improve its pharmacy tracking system, finalize and communicate its procedure for disposing of expired controlled medications, and develop written policies on the use of expired medication, the types and tracking of medications stored for use in the event fire destroys the clinic, and access to the McMurdo pharmacy.

We raised concern that the NSF station managers in the Antarctic, appointed as Special Deputy U.S. Marshals, may not have adequate tools and training to perform their law enforcement responsibilities. We recommend that NSF request that the U.S. Marshals Service, or other appropriate law enforcement organization, conduct an on-site assessment and evaluation of USAP conditions to make appropriate equipment and training recommendations for its special deputies.

Finally, we reported that breathalyzer tests, which contractor policy requires employees to undergo if their supervisor suspects that they are under the influence of alcohol, are rarely administered. Since alcohol abuse does occur in the USAP program, workplace safety could be enhanced if breathalyzer tests were administered to all USAP participants endangering themselves or others due to the influence of alcohol. We recommend that NSF review the legality of a requirement for breathalyzer for all USAP participants and establish and enforce a requirement to the extent it is legal.

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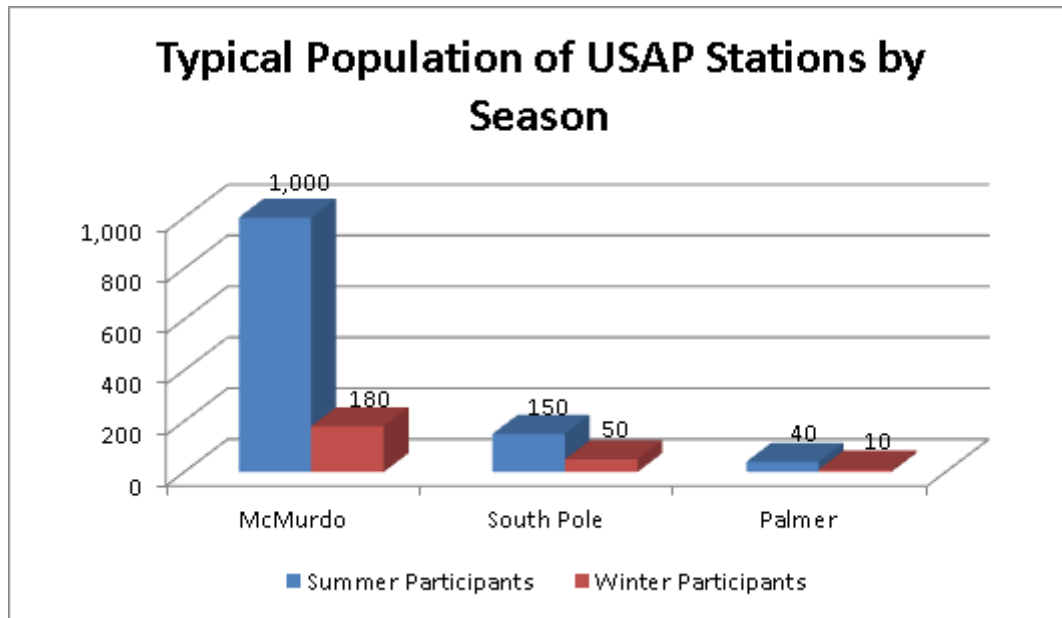
Introduction

The National Science Foundation (NSF) has overall funding and management responsibility for U.S. activities in Antarctica. Antarctica is the coldest, windiest, driest, and most remote continent on earth. It has an average elevation of more than 6,500 feet and 98 percent of the landmass is covered by ice. Because of the harsh and isolated environment, effective health and safety practices are critical to protecting the people working as part of the United States Antarctic Program (USAP).

The USAP is the United States' national program for scientific research and geopolitical presence in Antarctica. Within NSF, the Division of Polar Programs (PLR) is responsible for coordinating and supporting an active and influential science program that carries forward the Nation's goals of supporting the Antarctic Treaty, fostering cooperative research with other nations, protecting the Antarctic environment, and developing measures to ensure only equitable and wise use of resources. PLR has day-to-day responsibility for implementing and overseeing the activities of USAP, including a comprehensive safety, environmental, and health program.

PLR is also responsible for obtaining and overseeing a commercial contractor to support the science program and operate and maintain U.S. Antarctic facilities. In fiscal year 2014, NSF paid \$174 million to Lockheed Martin (LM) under the Antarctic Support Contract. LM manages a team that includes seven subcontractors, five of which have employees in Antarctica performing specific support functions.

The USAP involves approximately 3,200 participants annually. The majority are employees of LM and its subcontractors. The next largest group is researchers. The remaining participants are members of the U.S. military, NSF employees, and visitors. Participants spend between a few days and up to an entire year at or transiting through one of three year-round research stations – McMurdo Station, Amundsen-Scott South Pole Station, and Palmer Station. As shown in the chart, the stations have the following seasonal populations with most USAP participants deploying during the summer when approximately 80 percent of work is conducted.



Antarctica’s extreme environment and relative isolation challenge human health and wellness. Medical care in Antarctica is limited and reducing the risk of injury and illness depends on a combination of systematic risk assessment, hazard elimination or control, appropriate use of personal protective equipment, safe work practices, and personal conduct.

Results of Audit

We conducted this audit to assess the effectiveness of NSF’s oversight and the Antarctic support contractor’s (LM) performance to ensure the health and safety of participants in the USAP. While we found that in general, NSF’s oversight and LM’s performance were effective in ensuring adequate health and safety, we identified four areas for improvement: 1) USAP does not have a process to identify, respond to, track, and collect data on all misconduct incidents that occur in USAP; 2) opportunities exist for improving pharmacy operations; 3) Special Deputies in the Antarctic may not have adequate tools and training to perform their law enforcement responsibilities; and 4) breathalyzer tests could enhance workplace safety.

In addition, we identified three “other matters” for NSF’s consideration. These included concerns about the medical subcontractor’s management of healthcare services, including the fact that 3 of 12 station physicians provided by the subcontractor were replaced before they completed the season for which they were assigned. Also, USAP has not explored the cost benefit of returning unused, expired non-controlled medications to manufacturers for a partial refund. Finally, LM policy does not reflect its responsibility to identify, respond to, track, and collect data related to all safety incidents that occur in USAP.



Workplace safety emphasized at Cray Lab, McMurdo Station

We noted that LM has taken a number of steps to improve the health and safety of participants in USAP. For example, LM encourages employees to report unsafe work conditions and provided statistics showing that reports of “close calls” and minor injuries have increased. According to LM, such reporting had allowed it to identify and correct safety deficiencies earlier.

While NSF relies on LM as its presence in Antarctica, it remains NSF’s responsibility to ensure that the health and safety of all USAP participants (contractor and subcontractor employees, researchers, NSF employees, visitors, and military) is adequately protected. In light of that responsibility, it is critical that NSF has accurate and complete information on all misconduct incidents so that it can be aware of, track, assess, and ensure appropriate action is taken to address them.

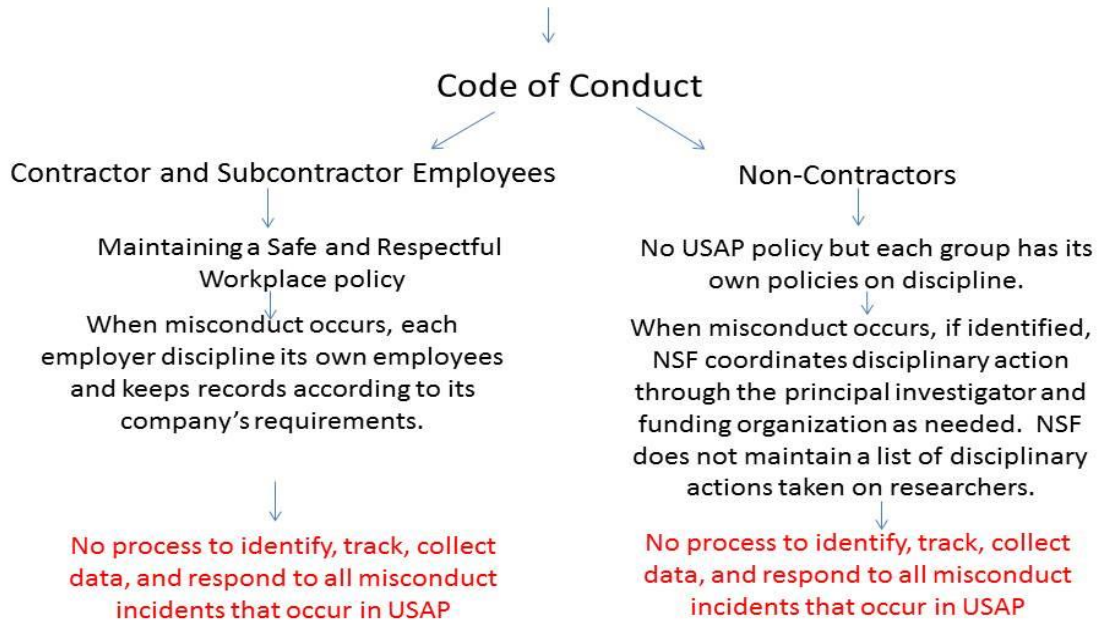
Finding 1 - No Process to Identify, Respond to, Track, and Collect Data on All Misconduct Incidents that Occur in USAP

NSF is responsible for the health and safety of all USAP participants. In July 2013, NSF established the USAP Code of Conduct, which prohibits offensive and disorderly conduct, violations of the USAP alcohol policy, verbal and physical abuse, and other non-professional behavior. NSF requires all USAP participants (contractor and subcontractor employees, researchers, U.S. military personnel, visitors, and NSF employees) to read and agree to abide by the Code of Conduct before deploying to Antarctica.

We found that the Code of Conduct does not contain any procedures addressing what happens if it is violated. Among other things, it does not identify who participants should contact if they observe misconduct, who is responsible for investigating or taking action if misconduct occurs, and what information should be reported to NSF in the event of a violation of the Code of Conduct. Without such procedures, NSF cannot ensure that the Code of Conduct is upheld, and that acts of misconduct are identified and acted upon consistently. Further, absent clear reporting requirements, NSF cannot ensure that it has the information it needs to identify trends in, or root causes of, misconduct. Such information could enable NSF to identify actions that could prevent or limit future misconduct.

We also found that, in practice, the Code of Conduct is enforced differently depending on whether the individual who engaged in misconduct is a contractor or subcontractor employee versus any of the other types of individuals participating in the program (i.e., researchers, NSF employees, or guests). While we recognize that there are valid reasons for having different processes for different classes of participants, the differences in how incidents of misconduct are addressed by employers when contractors or subcontractor employees are involved versus how misconduct committed by other participants is addressed undermine NSF’s ability to ensure consistent discipline and could lead to morale problems if participants perceive there are harsher penalties for misconduct for certain classes of participants than others.

Addressing Misconduct in USAP



Misconduct Involving Contractor and Subcontractor Employees

In March 2013, LM established a policy “Maintaining a Safe and Respectful Workplace” that requires contractor and subcontractor employees to report misconduct, such as threats, bullying, and abusive or intimidating behavior, to their supervisor. The policy also requires contractor and subcontractor managers to address violations of the policy and to maintain records of misconduct that is reported, observed, or suspected.

We found that this LM policy is limited and has gaps. First, because the policy does not require the contractor to collect and assess information on all misconduct by all contractor and subcontractor employees, LM cannot be assured that its subcontractors are following the policy. Neither LM nor NSF has complete information needed to ensure sufficient oversight and consistent discipline.

Second, we found that LM does not have access to information relating to disciplinary actions taken by subcontractors. LM was not able to provide information showing all disciplinary actions administered for Code of Conduct violations for all USAP participants during the period of our audit.¹ The only information provided was for contractor and subcontractor employees and was only compiled at our request. LM provided us information for its own employees but had to ask each subcontractor to provide the requested data individually for their respective employees. During our interviews with the contractor and subcontractors, we learned that they do not always

¹ The U.S. military maintains responsibility for tracking misconduct involving its own personnel.

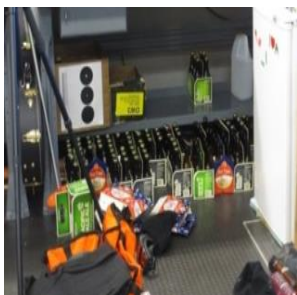
maintain records of misconduct that occurs or the resulting disciplinary action centrally so they had to search through e-mails and rely on their recollection of events to provide us the details that we requested. The information we ultimately received from LM and its subcontractors indicated that 57 employees were disciplined for misconduct, ranging from posting negative comments about coworkers on-line to damaging government property while intoxicated, during the 19.5 months under review. However, we were unable to verify whether this information was complete and whether all violations of the Code of Conduct resulted in appropriate and consistent discipline.

Finally, there is no requirement for the contractor to report misconduct incidents to NSF. This is noteworthy because NSF informed us that it would be useful for its oversight of the program to know which employees have behaved inappropriately. The contractor and subcontractors informed us of their reluctance to provide NSF with the names of employees involved in misconduct because it is personal information. Any concern about sharing names can be addressed with controls to safeguard them. We note that there are existing laws and regulations that require the government to protect personal information. At a minimum, the contractor should be collecting and reporting to NSF sufficient information on misconduct incidents to enable it to conduct adequate oversight and to take appropriate preventative or corrective action.

Misconduct Involving NSF Employees, Researchers, and Visitors

A PLR official told us that NSF's disciplinary policies are applicable to its employees in Antarctica the same as if misconduct occurred at NSF headquarters and that universities similarly have policies that delineate disciplinary action in the event of misconduct by its researchers. However, because there is no requirement or mechanism for identifying, responding to, tracking, or collecting data on Code of Conduct violations involving NSF employees, researchers, or visitors, any information NSF receives about them is reliant on word-of-mouth. Thus, NSF cannot be certain that all misconduct is being reported and tracked or what, if any, action was taken in response to the misconduct.

NSF informed us that when it becomes aware of misconduct involving researchers, it coordinates disciplinary action through the principal investigator and funding organization. NSF officials stated that they do not maintain a list of Code of Conduct incidents involving non-contractors because misconduct involving researchers, NSF employees, and visitors rarely occurs. While that may be the case, because NSF has no clear process to identify and respond to such incidents, it cannot be certain that it is aware of all such incidents, and that they have been dealt with appropriately.



Bottled beer in the South Pole Station laboratory.

The importance of having a clear process for addressing misconduct by non-contractor USAP participants was underscored when we visited the South Pole station. During our site visit, we observed large quantities of bottled beer stored under a desk and in the refrigerator in the science lab. The USAP Alcohol Policy prohibits the consumption of alcoholic beverages in work centers and LM has policy prohibiting employees and subcontractor employees from possessing alcoholic beverages in work centers. We were informed by a subcontractor employee that a researcher was brewing the beer at the station, which is also prohibited by the USAP Alcohol Policy.

Because the incident involved a researcher, no action had been taken to address these violations of the Code of Conduct prior to our arrival, even though the beer was in plain sight. This raises a concern about lax enforcement of the USAP Code of Conduct, which requires compliance with the USAP Alcohol Policy. It also raises a question about consistent discipline, as a similar infraction by a contractor employee would likely have been dealt with swiftly and with significant consequences. Finally, information about these infractions was not provided to NSF so it could ensure that the researcher's home institution took appropriate action. After we brought this issue to NSF's attention, NSF informed the researcher's university of what we found and requested the university to provide information on how it was handling this matter.

LM informed us that the information it collects and reports to NSF on workplace safety incidents has helped it identify and correct safety deficiencies quicker. Collecting and reporting information on misconduct incidents could have similar benefits. Currently, NSF and LM lack data on misconduct incidents that they could use to analyze for trends, to develop lessons learned, and prevent similar incidents from reoccurring. Additionally, NSF cannot ensure that appropriate, consistent disciplinary action is taken to address misconduct. If misconduct is not reported, tracked, and noted appropriately, problems may go unaddressed, become more severe, and possibly affect the safety of USAP participants. Misconduct in the Antarctic creates a heightened threat due to the remote and isolated environment.

Role of the Special Deputy Marshal Should be Clarified

It is important to note that NSF's two Antarctic station managers (one each for the winter and summer seasons at McMurdo station) are annually appointed as Special Deputy United States Marshalls and serve (in their respective season) as the USAP law enforcement official. Because the station managers do not maintain any records of misconduct that occurs, it is not clear what issues the station managers have dealt with. NSF should assess ways to clarify and strengthen the role of the NSF station manager in identifying, responding to, tracking, and collecting data related to misconduct incidents.

Recommendation:

1. We recommend that NSF ensure that the Code of Conduct is enforced for all USAP participants and that a process is developed and implemented to identify, respond to, track, and collect data related to all misconduct incidents involving all USAP participants so that NSF can ensure that appropriate, consistent disciplinary action is being administered and root causes are identified so that corrective action can be taken.

Finding 2 - Opportunities Exist for Improving Pharmacy Operations

Through a subcontractor, LM manages and operates medical facilities and is responsible for providing health care to all USAP participants in Antarctica by staffing clinics at McMurdo, South Pole, and Palmer Station year-round with a licensed physician. Each clinic maintains a pharmacy where controlled and non-controlled medicines are stored and from which hundreds of prescriptions are dispensed each year.

The medical subcontractor has established a uniform formulary, or list of medicines, available to all three station clinics. This standardization should help reduce waste and better enable bulk purchases, which could reduce cost. However, based on our review, LM's medical subcontractor could do more to procure, track, and secure medications; protect patient safety; and reduce cost. We found the following five opportunities to improve pharmacy operations:

- Acquire a modern pharmacy tracking system
- Establish a policy on the use of expired medications
- Provide guidance on the types and tracking of medications to be stored for use in the event fire destroys the clinic
- Develop a protocol for disposing of controlled medications
- Limit access to McMurdo clinic pharmacy.

(1) Acquire a Modern Pharmacy Tracking System – We found that the existing pharmacy tracking system does not cover all medications. Controlled medications, which are drugs that are federally regulated because they have some potential for abuse or dependence, are tracked using paper log sheets.

The existing pharmacy tracking system, used solely for non-controlled medications, is a Microsoft Access database that connects the three station clinics so users can determine if a medication not available in one location is available in another. In its 2014 Healthcare in Antarctica report, the medical subcontractor stated that “Access is no longer supported software on station.” As a result, if users encounter technical difficulties with the database, they must resolve them without technical support. Also, medical staff stated that the database was difficult to use. As a result, medical staff does not always record the changes in medication quantities into the system accurately so the system may not accurately reflect quantities available.

In addition, the database does not have the capabilities of a typical commercially available pharmacy tracking system, which can provide efficiencies and help protect patient safety. For example, we were informed that the system:

- Does not track replenishment levels so medical staff will know when to order more. Because of this, reordering is done manually and requires a complete inventory to determine quantities on hand.
- Does not record items taken from the shelves but not yet dispensed, such as eyewashes in the clinic and expired medicines kept as backup.
- Does not track patient allergies or indicate incompatible drug interactions, which can occur whenever a patient is taking more than one drug. Pharmacy tracking software exists that could track and identify incompatible drug combinations.
- Does not issue a drug monograph, which enhances patient safety by specifying the kinds and amounts of ingredients the drug contains, directions for its use, the conditions in which it may be used, and the conditions under which it would be harmful to use.

While at the McMurdo clinic, we selected medications, both controlled and non-controlled, that we saw in the pharmacy and attempted to match the quantities we counted by hand to the

amounts recorded in the tracking system (or on paper log sheets for controlled medications). Similarly, we selected non-controlled medications from the system and controlled medications from paper log sheets and attempted to match the quantities with those we saw on the shelf. We did not find any differences in our counts of controlled medications. However, for non-controlled medications we found medications, particularly those that had expired, listed in the database that were not on the pharmacy shelves, such as a numbing agent and a treatment for seizures.

One efficiency the current pharmacy tracking system does provide is the ability to generate a printed label, which saves the medical staff from having to write labels by hand. Because prescriptions are not written often at the South Pole station clinic, the medical subcontractor told us that it plans to replace the Microsoft Access database there with a Microsoft Excel spreadsheet. Although using a spreadsheet to track medications may be easier for users, it would not address system deficiencies involving patient safety.

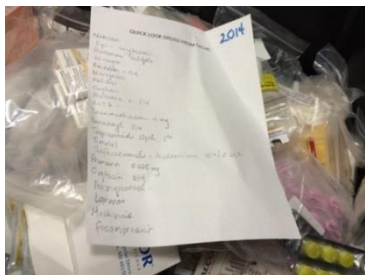
LM has been aware of issues with the pharmacy tracking system for several years, and the medical subcontractor noted in its 2013 Healthcare in Antarctica report that “an improved pharmacy tracking system, either as part of an Electronic Medical Record or standalone, would substantially improve efficiencies.” In its May 2014 report, the medical subcontractor stated that it was only exploring “low-cost tracking system improvements” because it was awaiting an “integrated electronic medical records system” before it instituted an electronic tracking system.

(2) Establish a Policy on the Use of Expired Medications: Due to the long lead time to ship items to Antarctica, medications can arrive with limited time remaining before they expire. During our site visit to the McMurdo station clinic, we saw trunks full of medications that had been removed from the shelves because they had expired. While some of these medications are retained in a medical cache (storage) in order to have an emergency supply stored outside of the clinic, most are destroyed.



Trunks of expired medications at McMurdo station clinic.

The medical subcontractor makes the final decision on the use of expired medications. The prior Antarctic support contractor, NSF, and the USAP Medical Review Panel supported the use of medications beyond their expiration date. The physician for the prior contractor told LM that his decision for using such medications was based on medical research, which concluded that only a handful of expired medications are a safety risk and most medications have at least 90% usefulness five years after expiration. The prior contractor estimated that two thirds of the medications in the pharmacy were expired and encouraged LM to consider using them to save money.



Expired medications removed from the pharmacy shelves at the McMurdo medical clinic

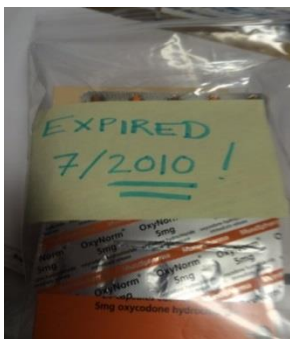
Even though the medical subcontractor stated in its annual healthcare report that “maintenance of an up-to-date drug stock is an expensive proposition” and “most of the medications in our formulary will never be used and will therefore expire without benefit...,” it also stated that using expired medications is inconsistent with the standard of care in the United States. The medical subcontractor does not have a policy on whether or not its medical staff can use expired medications; however, it has directed medical staff to stock some expired medications off site for use in the event the clinic supply is destroyed by fire. If expired medications are considered unsafe or ineffective, then a policy

prohibiting their use will better protect patient safety but will render the current process for establishing the emergency supply useless. If some expired medications are considered safe and effective, then a policy will allow longer use of those medications, save the USAP program money, and provide consistency in the use of medications if the emergency supply is needed.

Finally, although the medical subcontractor only has one pharmacy technician in Antarctica for a few months each year, involving an individual with skills and experience working in Antarctica in placing medication orders for the USAP pharmacy could reduce the volume of unused medications. For example, the pharmacy technician could inform those who negotiate with suppliers to direct that orders be filled with the most recent stock, which could provide longer shelf life, or be able to recognize orders for medication sizes that are impractical for the Antarctic environment.

(3) Provide Guidance on the Types and Tracking of Medications to be Stored for Use in the Event that Fire Destroys the Clinic - The pharmacy technician at McMurdo told us that there is no policy for what types or quantities of medications should be stored for use in the event that a fire destroys the medical clinic and that the medications currently stored for such a purpose are not tracked. As a result, there is no assurance that the medications saved for use in this circumstance would include the kinds or quantities of medicine needed in an emergency.

(4) Develop a Protocol for Disposing of Controlled Medications that Have Expired -



Controlled medication which expired in July 2010.

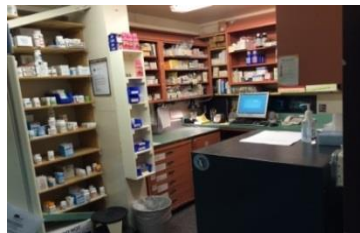
Because it has not been able to obtain a permit to export controlled medications from the U.S. to Antarctica, USAP purchases controlled medications from New Zealand, and Chile.

Medical staff from all three station clinics told us that, because they do not have a way to dispose of expired controlled medications, they are securely storing them on site. We observed large quantities of controlled medications occupying limited secure storage space at both McMurdo and the South Pole. The medical subcontractor reported in its 2013 healthcare report that it was destroying expired controlled drugs from New Zealand and Australia on station and shipping U.S. brands back to the states for proper destruction, but we saw controlled drugs

which expired before 2013. It appeared that the controlled medications were adequately protected, but nonetheless retaining large amounts of controlled medications poses a risk of theft

or misuse, especially if the quantities begin to exceed the limited secure storage space available. In February 2015, after our period under audit, the medical subcontractor developed a draft procedure to destroy and dispose of expired controlled medication.

(5) Limit Access to McMurdo Clinic Pharmacy – We were unable to find a policy that limited



McMurdo Medical Clinic Pharmacy

pharmacy access to specific medical staff. During our site visit to McMurdo station, the pharmacy technician stated that all medical staff working in the clinic (seven medical staff at the time) had a key to the McMurdo pharmacy, which provided them with access to non-controlled medications. Allowing access to as many as seven medical staff creates a risk that medications could be taken, even for legitimate reasons, and not recorded in the pharmacy tracking system, which would reduce the accuracy of information

about medications that are on hand.

We did not find any problem with access to controlled medications because they are separately secured, with a key that is given to only four medical staff who are responsible for controlled medications prescriptions.

Recommendations: We recommend that NSF ensure that:

1. LM develop and implement a solution to improve its pharmacy tracking system.
2. LM finalize and communicate its procedure on disposing of expired controlled medications, and develop written policies on the following: use of expired medication, the types and tracking of medications stored for use in the event fire destroys the clinic, and access to the McMurdo pharmacy.

Finding 3 - Special Deputies in the Antarctic May Not Have Adequate Tools and Training to Perform Their Law Enforcement Responsibilities

Since 1992, the U.S. Marshals Service has been authorized to appoint the NSF station managers at McMurdo as special deputies. In their capacity as USAP law enforcement officials, both the summer and winter station manager have authority to make arrests when immediate action is required. When a serious or potentially criminal incident occurs, the special deputy on site is expected to defuse any immediate threat to human safety, and then report the incident to the U.S. Marshals Service and/or the Federal Bureau of Investigation in Hawaii.

The Chief Deputy in the District of Hawaii stated to us that he recalled the U.S. Marshals Service performing a site visit to the USAP many years ago, but did not have any records of the results of that assessment. He recommended that the U.S. Marshals Service conduct another site visit to evaluate USAP conditions and make recommendations on equipment and training needed by the special deputies.

PLR officials stated that NSF was also interested in taking a comprehensive look at law enforcement. Because there has been no recent assessment of their training and tools, NSF lacks assurance that special deputies are properly prepared to perform their law enforcement responsibilities in the event of a dangerous or violent situation.

When we talked with the special deputies at McMurdo, they expressed concerns about [REDACTED]

[REDACTED]

[REDACTED]

- **Training** – [REDACTED] A 2008 U.S. Marshals Service Directive on the Special Deputation program did not specify any ongoing training requirements for special deputies. The Attorney General’s guidelines for Offices of Inspector General with statutory law enforcement authority require that periodic refresher training be provided in specific areas including federal criminal updates, interviewing techniques, and physical conditioning. [REDACTED]

- [REDACTED]

Recommendation:

1. We recommend that NSF request that the U.S. Marshals Service or other appropriate law enforcement organization conduct an on-site assessment and evaluation of USAP conditions to make appropriate equipment and training recommendations for its special deputies.

Finding 4 - Breathalyzer Tests Could Enhance Workplace Safety

Another way the USAP environment is unique is that contractors and scientist not only work there, but also live there 24 hours a day. During non-work hours, an individual can buy alcohol,

within established limits, at all three stations and consume it in housing, clubs, and other designated areas. NSF policy emphasizes that USAP participants are expected to be responsible with the use of alcohol because “[e]ven during off-duty hours, events may require swift, intelligent action. The ability of a person to deal effectively with a mishap is reduced if he or she is intoxicated.”

The limited information available about misconduct incidents demonstrated that alcohol abuse does occur in the USAP program. The detail provided to us regarding the 57 people disciplined during 19.5 months for Code of Conduct violations was not sufficient to determine exactly how many violations involved alcohol misuse, but one HR manager that we interviewed estimated that 60 to 75 percent of disciplinary action taken by her company was related to alcohol misuse. As previously noted, absent a requirement to report on such incidents, NSF lacks information about the amount of misconduct which involves alcohol abuse.

LM’s conduct policy (Conduct & Disciplinary Policy for Seasonal Employees) prohibits the excessive use of alcohol, use of alcohol during work hours (including lunch breaks), and intoxication on the job. According to this policy, when a supervisor suspects an employee of being under the influence, the supervisor is required to escort that individual to the clinic and request medical staff to administer a breathalyzer test. It is important to note that this policy does not apply to non-contractor USAP participants.

NSF officials acknowledged that alcohol consumption in the USAP can create unpredictable behavior that has led to fights, indecent exposure, and employees arriving to work under the influence. However, we noted that breathalyzer tests are rarely administered to determine if employees are intoxicated.

We interviewed HR managers for three contractors that account for an estimated 90 percent of the contractor and subcontractor employees in Antarctica and only one mentioned sending an employee to the clinic for alcohol testing. Similarly, we interviewed the physicians at all three stations and the USAP Chief Medical Officer, and only one physician recalled a situation, in which an HR manager asked the medical staff to perform a breathalyzer test.

The clinic policy requires medical staff to check the calibration of all lab equipment monthly to ensure it is in proper working order. Despite this, clinic staff at McMurdo informed us that they had trouble calibrating the breathalyzers when a test was requested. The McMurdo physician said that she has been able to calibrate the breathalyzer since reading the manual. The South Pole physician also had trouble calibrating the breathalyzer, but thought it was due to the station’s high elevation. In addition to concerns that the breathalyzer is unreliable, one HR manager stated that they do not ask for breathalyzer tests often because suspected employees frequently admit to being under the influence when questioned.

If breathalyzer tests are not administered, as required, to employees suspected of being under the influence, employees who are intoxicated may be returning to work. In addition, the knowledge that breathalyzer tests will be administered could deter misuse of alcohol. However, the breathalyzers need to be properly calibrated for the results to be reliable.

Recommendations: We recommend that NSF:

1. Review the legality of a requirement for breathalyzer testing for all USAP participants, and establish and enforce a requirement to the extent it is legal.
2. Ensure that USAP breathalyzers are routinely calibrated.

Other Matters

Concerns with Medical Subcontractor Management

During our audit, some issues raised concern about the effectiveness of the management of healthcare services for the USAP.

Over the 4 Antarctic seasons that we reviewed, 3 of 12 station physicians (1 at South Pole station and 2 at McMurdo) left before completing the season for which they were assigned. Although the physicians were replaced, this level of turnover is concerning because physicians are critical to the delivery of medical services to USAP participants as each station typically only has one. The physician is the only medical staff at Palmer station and during the summer season at the South Pole station. (During the winter season, there are two medical staff at South Pole station.)

Also, in light of the matters noted above and earlier in this report, we were concerned about oversight of medical services. The medical subcontractor does not have a frequent management presence on site in Antarctica, which could make the medical contractor more engaged in operational issues such as inaccuracies in the database for non-controlled medications and confusion about what medications to keep in storage. A lack of management attention, leadership, and communication could contribute to problems not being addressed and resolved.

Taken together, these concerns with turnover in physicians and the medical subcontractor's lack of on-site management presence raise questions as to whether the medical subcontractor is prepared to adequately address the healthcare needs of USAP participants.

Explore Refund Opportunities for Expired Medications

The McMurdo pharmacy technician told us that most pharmaceutical suppliers allow unused, expired non-controlled medications to be returned for a partial refund. The pharmacy technician informed us that although this is a typical practice for U.S. pharmacies, the USAP has not pursued this option. Although we recognize that the costs of making a return (such as labor and shipping) due to Antarctica's remote location could offset any refunded amount, since it has not explored this option, LM may have missed an opportunity to reduce costs by obtaining refunds for expired non-controlled medications.

LM's Policy Does Not Reflect its Responsibility to Identify, Respond to, Track, and Collect Data Related to all Safety Incidents that Occur in USAP

The Antarctic Support Contract requires LM to report "significant incidents" to NSF and provides examples of such incidents, including fires, information security breaches, and

fatalities. Within three months of awarding the Antarctic Support Contract, NSF required LM to develop a process for reporting such incidents. We reviewed LM's policy, dated September 2013, and found that it only addresses the reporting, tracking, and taking of corrective actions on incidents involving contractor and subcontractor employees that occur at their worksites.

In December 2013, PLR issued a USAP Safety and Risk Management Policy, which applies to all USAP participants. This policy charges LM with maintaining a comprehensive USAP-wide system for compiling, reporting and analyzing data on injuries, property damage mishaps, and close calls and near-misses. PLR provided us LM's injury master tracking list of all injuries involving all USAP participants, including researchers and visitors. However, LM's monthly incident reports submitted to NSF per its contract requirement only covered contractor and subcontractor employees at worksites.

NSF should ensure that LM's safety policies and procedures are consistent with the responsibilities charged to them by the USAP Safety and Risk Management Policy.

Summary of Agency Response and OIG Comments

NSF's response includes two overriding comments to the draft report. In the first, NSF states that it is incorrect to say that NSF relies on LM as its presence in Antarctica, but accurate to say that LM is the entity responsible for managing the operations and maintenance of the on-site facilities. In our opinion, these statements are essentially equivalent, particularly given that NSF does not have a regular on-site presence at Palmer or South Pole stations, but does have an NSF Station Manager at McMurdo station. The complete sentence in question emphasizes that, notwithstanding the contractor's involvement, health and safety is NSF's responsibility, a point that NSF does not dispute: "While NSF relies on LM as its presence in Antarctica, it remains NSF's responsibility to ensure that the health and safety of all USAP participants (contractor and subcontractor employees, researchers, NSF employees, visitors, and military) is adequately protected".

In its second overriding comment, NSF states that it is committed to the health and safety of USAP participants, but notes that it is difficult for it to consider our recommendations to be necessary because participants' health and safety have not been shown to be adversely impacted. Although adverse health and safety incidents may not have been documented, the recommended actions could mitigate risks to health and safety.

In response to the recommendation for finding 1, NSF agrees and stated that it will continue to develop its process for sharing information on violations of the Code of Conduct. However, having a means to identify individuals who should be prevented from deploying under both NSF's Antarctic and Arctic programs requires first that NSF be made aware of all incidents of misconduct. As noted in our finding, NSF and LM do not collect and track data on misconduct incidents that they could use to analyze for trends, to develop lessons learned, and prevent similar incidents from reoccurring. As such, NSF lacks assurance that it is aware of all misconduct that occurs.

NSF disagrees with “requiring the Code of Conduct to contain procedures addressing what happens if it is violated; who participants should contact if they observe misconduct; who is responsible for investigating or taking action if misconduct occurs; and what information should be reported to NSF in the event of a violation of the Code of Conduct.” We did not recommend that the Code of Conduct be altered. We recommended that “...the Code of Conduct is enforced for all USAP participants and that a process is developed and implemented to identify, respond to, track, and collect data related to all misconduct incidents involving all USAP participants.” We do not consider NSF’s comments and planned action to be responsive to this recommendation.

For finding 2, in response to the first recommendation on improving pharmacy operations, NSF does not disagree that a different pharmacy tracking system might have advantages over the current system, but does not agree to make improvements to its pharmacy tracking system. NSF agrees with the recommendation to the extent that it will confirm with LM that the clinics are actively managing drug interactions and making patients aware of drug safety information. Given the frequent turnover of USAP physicians, our position remains that an automated control, such as a system generated drug monograph or warning of patient allergies and incompatible drug interaction, would provide better patient protection than relying solely on physicians. Additionally, NSF’s limited actions would not address the need for accurately tracking available medications and replenishment levels. As noted in our report, technical support is no longer available on station for the pharmacy tracking system software and medical staff were not consistent in its use because of its difficulty. We do not consider NSF’s comments and planned action to be responsive to this recommendation. In response to the second recommendation on improving pharmacy operations, NSF agrees to develop needed pharmacy related policies.

NSF agrees with the recommendations related to findings 3 and 4 on law enforcement tools and the use of breathalyzers. NSF stated that it plans to host a law enforcement site visit to Antarctica. NSF stated that it will review the legality of a requirement for breathalyzer testing for all USAP participants, and will either provide funds for a breathalyzer that does not require calibration or ensure LM personnel are following policies regarding calibration of medical equipment.

We look forward to receiving the Corrective Action Plan and working with NSF officials to resolve the recommendations.

We have included NSF’s response to this report in its entirety as Appendix A.

OIG Contact and Staff Acknowledgements

Marie Maguire – Director of Performance Audits
(703) 292-5009 or mmaguire@nsf.gov

In addition to Ms. Maguire, Kelly Stefanko and Jeff Stitz made key contributions to this report.

Appendix A: Agency Response

NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230



OFFICE OF THE
ASSISTANT DIRECTOR
FOR GEOSCIENCES

MEMORANDUM

DATE: June 10, 2015

TO: Dr. Brett M. Baker
Assistant Inspector General for Audit
Office of Inspector General

FROM: Dr. Roger Wakimoto /s/
Assistant Director
Directorate for Geosciences

SUBJECT: Official Draft Report, *Audit of Health and Safety in the U.S. Antarctic Program*

Thank you for providing NSF the opportunity to respond to your Official Draft Report of the *Audit of Health and Safety in the U.S. Antarctic Program*. Our response is attached to this Memorandum.

Recognizing that the OIG report is preliminary, NSF requests the opportunity to revise its response in the event that the report is revised.

Attachment

cc:	France A. Córdova	Richard Buckius
	Kelly Falkner	Brian Stone
	Susanne LaFratta	Christina Sarris
	Allison Lerner	Marie Maguire
	Kelly Stefanko	Jeffrey Stitz

National Science Foundation Response

Audit of Health and Safety in the U.S. Antarctic Program TM# 14-P-1-015

NSF appreciates the opportunity to review and comment on the Official Draft Report of the Audit on Health and Safety in the U.S. Antarctic Program. The Office of Inspector General (OIG) conducted an audit to assess the effectiveness of NSF's oversight and the Antarctic Support Contractor's ("Lockheed Martin" or "LM") performance to ensure the health and safety of participants in the U.S. Antarctic Program (USAP). The audit team was provided with documentation and interviewed NSF personnel responsible for managing and overseeing the USAP. The audit team also visited LM's headquarters in Colorado and made a trip to USAP facilities in Antarctica.

NSF appreciates that the audit confirmed that NSF's oversight and LM's performance are effective in ensuring adequate health and safety. The following material responds to recommendations for improvement made by the OIG and provides context or clarification where necessary.

At the outset, NSF notes two important overriding comments to the draft report. First, we correct the OIG's statement that "NSF relies on LM as its presence in Antarctica, ...". LM is properly understood as the entity responsible for managing the operations and maintenance of the on-site facilities. Second, we are committed to the health and safety of the USAP participants such that we view any and all findings and recommendations by the OIG to require serious, thoughtful consideration. However, we note that within this report, at times, it is difficult to consider such recommendations when there is no finding that participants' health and safety has been adversely impacted and there is no data provided to support the benefits of such recommendations (relevant to the pharmacy operations recommendations) or whether findings are expressly supported by appropriate authorities, such as studies on law enforcement in extreme regions (relevant to the Special Deputies recommendation).

Recommendation 1: *We recommend that NSF ensure that the Code of Conduct is enforced for all USAP participants and that a process is developed and implemented to identify, respond to, track, and collect data related to all misconduct incidents involving all USAP participants so that NSF can ensure that appropriate, consistent disciplinary action is being administered and root causes are identified so that corrective action can be taken.*

NSF agrees with this recommendation to the extent that NSF is developing a process for sharing information on violations of the Code of Conduct, subject to the complexity of issues presented by the multiple employers involved. The process is expected to provide a means to identify individuals who should be prevented from deploying under the auspices of both NSF's Antarctic and Arctic programs.

However, NSF understands this recommendation as requiring the Code of Conduct to contain procedures addressing what happens if it is violated; who participants should contact if they observe misconduct; who is responsible for investigating or taking action if misconduct occurs; and what information should be reported to NSF in the event of a violation of the Code of Conduct. NSF disagrees. The Code of Conduct is a statement of examples of prohibited conduct and serves to

alert participants to the expected standard of behavior and as a warning that, according to the Code itself, violations *may* be shared and violations *may* result in adverse actions or consequences. In this regard it functions much as the warning NSF employees receive when logging on to an NSF computer network. It is not meant to capture every single episode of employee or participant misconduct. It is also important to point out that NSF has no legal role in determining how employees of contractors or other organizations are or are not disciplined. NSF's role is to exercise oversight to ensure a safe and healthy environment, which the OIG report acknowledges has been done.

The OIG also notes that differential enforcement of the Code undermines "NSF's ability to ensure consistent discipline and could lead to morale problems if participants perceive there are harsher penalties for misconduct for certain classes of participants than others." Penalties for misconduct are the responsibility of the employer, and not of NSF. Further, while no organization can have a policy that is less restrictive than the NSF one, it is certainly free to have policies that are more restrictive. For example, in addition to behaviors included in the Code of Conduct, the U.S. military has policies and standards governing other behaviors such as fraternization. NSF's role is to limit access to Antarctic and Arctic stations by individuals known to cause a risk to our operations. Our "penalty" can extend through removal from Antarctica, and is determined based on the nature and severity of the incident – the rest is up to the individual employer.

Subject to the foregoing, NSF will continue to develop its process for sharing information on violations of the Code of Conduct while addressing the complexity of issues presented.

Recommendation 2: *We recommend that NSF ensure that:*

1. *LM develop and implement a solution to improve its pharmacy tracking system*

NSF does not disagree that a different pharmacy tracking system might have advantages over the current system and that there might be opportunities for improving pharmacy operations, the finding upon which this recommendation arose. NSF notes, however, that no adverse outcomes as a result of current practices, policies, procedures or systems were reported. To that end, NSF agrees with this recommendation to the extent it will confirm with LM that the clinics are actively managing drug interactions and making patients aware of drug safety information.

The OIG examined inventory management practices. NSF notes the OIG attempted to find differences between inventory records and actual inventory for controlled medications and found no differences. There were minor mismatches for non-controlled medications (expired medications listed on the inventory that were not found on the shelves). We understand the report to suggest improvements that would bring existing pharmacy operations to a commercial standard. While the McMurdo clinic does experience more patient visits than those at South Pole (with a maximum population of approximately 150 individuals during the summer season and fewer during the winter) or Palmer (with a population of approximately 45 individuals) stations, the OIG does not provide data or analysis to indicate that the issues it describes occur at such a frequency that this level of investment or service is warranted.

2. *LM finalize and communicate its procedure on disposing of expired controlled medications, and develop written policies on the following: use of expired medication, the types and tracking of medications stored for use in the event fire destroys the clinic, and access to the McMurdo pharmacy.*

NSF agrees that, if there are not written policies on the use of expired medications, the types and tracking of medications stored for use in the event fire destroys the clinic, and access to the McMurdo pharmacy, then they should be developed. NSF notes, however, that its Medical Review Panel did some limited research on extending the expiration dates on some drugs and found that the practice would be cost prohibitive as extensions are done on a “per lot” basis.

NSF has also successfully concluded a process with the U.S. Drug Enforcement Agency to secure export permits for shipping controlled substances to Antarctica. Finally, responsive to OIG’s statement that “USAP has not explored the cost benefit of returning unused, expired non-controlled medications to manufacturers for a partial refund[,]” NSF confirmed that its pharmaceutical vendor does not issue refunds on expired medications.

Recommendation 3: *We recommend that NSF request that the U.S. Marshals Service or other appropriate law enforcement organization conduct an on-site assessment and evaluation of USAP conditions to make appropriate equipment and training recommendations for its special deputies.*

The OIG states [REDACTED]
[REDACTED] However, NSF responds that the [REDACTED]
[REDACTED]
[REDACTED] As noted by the OIG, [REDACTED]
[REDACTED]
[REDACTED]

NSF will proceed with its plan to host a law enforcement forum and site visit to Antarctica.

Recommendation 4: *We recommend that NSF:*

1. *Review the legality of a requirement for breathalyzer testing for all USAP participants and, establish and enforce a requirement to the extent that it is legal.*

NSF will explore the advisability and feasibility of such a policy, including consulting with the Department of Justice on policy and legal concerns.

2. *Ensure that USAP breathalyzers are routinely calibrated.*

LM has identified a breathalyzer that does not require calibration. NSF will either provide funds for these units or direct LM to ensure its personnel are following policies regarding calibration of medical equipment.

Appendix B: Objective, Scope, and Methodology

We performed this audit to assess the effectiveness of NSF's oversight and the Antarctic Support Contractor's performance to ensure the overall health and safety of USAP participants. For the period of time under audit (April 1, 2013 – November 15, 2014), we reviewed disciplinary action for USAP participant misconduct that occurred. We also reviewed areas that we considered significant in maintaining the health and safety of USAP participants including clinic operations, fire safety, alcohol policies, lab safety, and law enforcement. Finally, we assessed NSF's progress towards implementing recommendations related to health and safety made in the U.S. Antarctic Program Blue Ribbon Panel (BRP) report.

To address our audit objectives, we reviewed NSF and LM policies and procedures. We interviewed PLR officials and contractor and subcontractor personnel. We conducted a site visit to the Antarctic Support Contract headquarters in Colorado in October 2014. We also performed fieldwork at the McMurdo and South Pole Stations in Antarctica in November 2014.

In reviewing misconduct, we read LM incident reports and contractor developed lists of disciplinary action taken and conducted interviews with human resource and station managers. As part of our review of USAP clinic operations, we attended the USAP medical review panel's annual meeting in June 2014, reviewed the contractor's annual "Healthcare in Antarctica" reports, and interviewed medical subcontractor staff, including physicians at all three stations. We tested the accuracy of inventory records for a judgmental sample of controlled and non-controlled medications at the McMurdo station clinic.

For fire safety, we interviewed fire officials at both McMurdo and South Pole stations and reviewed building inspection and evacuation drill reports. In reviewing controls over use of alcohol, we reviewed applicable policy and interviewed staff responsible for its sale in USAP. We also observed locations where it is stored and consumed at McMurdo and South Pole stations. We toured science laboratories at McMurdo and South Pole stations and interviewed the lab operations supervisor and a grantee at McMurdo Station's laboratory.

We interviewed both of the USAP station managers who serve as special deputies and have responsibility for law enforcement in USAP participants. Finally, we interviewed PLR staff, reviewed supporting documentation, and physically observed changes made in verifying actions taken on the BRP report recommendations.

Through the methodology described, we obtained an understanding of management controls. We identified improvements needed in: misconduct reporting, pharmacy operations, law enforcement tools and training, and use of breathalyzers for participants suspected of alcohol use while on the job. As applicable, we tested NSF and LM compliance with policies and procedures and have noted our resulting concerns in the "Results of Audit" section of this report. We did not identify any instances of fraud, illegal acts, violations, or abuse.

Where appropriate, we tested information and data resulting from computer processing in this audit as related to our audit objectives on ensuring overall health and safety of USAP participants. We performed limited testing on the existence of non-controlled medications at the

McMurdo Station medical clinic using the Access database that serves as the USAP pharmacy tracking system. As noted in our finding on pharmacy operations, we found the data in this system not to be reliable as we found medications listed in the database that were not in the pharmacy.

We conducted this performance audit from May 2014 to March 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our finding and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We held an exit conference with NSF management on March 26, 2015.