FY 2015 Secretary of Defense

Environmental Awards

Environmental Quality, Overseas, Spangdahlem Air Base, Germany

Introduction

Spangdahlem Air Base (SAB), Germany, is home of the 52nd Fighter Wing (52 FW) and approximately 4,600 active-duty members, foreign national civilian employees and Department of Defense civilian employees. The installation sits on 1,763 acres of land nestled in the rural agricultural Rhineland-Palatinate region between Binsfeld and Spangdahlem villages in northwestern Germany. The Wing is comprised of 5 groups whose roles include operations, maintenance, mission support, medical operations and headquarters staff. The 52 FW maintains, deploys, and employs F-16 aircraft and TPS-75 radar systems in support of the North Atlantic Treaty Organization (NATO) and combatant command authorities to provide expeditionary combat capability in mission areas of enemy air defense, close air support, air interdiction, counter air, air strike control, combat search and rescue and theater airspace control. SAB also supports 16 Geographically Separated Units (GSUs) across 4 NATO nations enabling the execution of the 52 FW mission.

In addition, Spangdahlem's 726th Air Mobility Squadron provides command and control, logistics and aerial port capabilities to every Air Mobility Command aircraft transiting through SAB. The Wing provides logistics support for C-17 Globemaster and C-5 Galaxy aircraft, crew, passengers and cargo to sustain air mobility operations throughout Europe, Africa and Southwest Asia.

Background

SAB was built in the 1950s and is located on a plateau in the southern foothills of the Eifel Mountains. The base area is sloped slightly southwest and the eastern portion is confined by the steep banks of the Kailbach River. SAB is unique as it pumps, pre-treats, distributes, treats and discharges the entire water cycle in-house. Water is obtained from groundwater aquifers of the Kailbach and Grosslittgen Creeks and wastewater is discharged to numerous surrounding creeks which feed into the Salm and Kyll Rivers. Downstream villages including Trier, the oldest city in Germany with a population of 100,000, draw their drinking water from these sources. Effective environmental management of SAB's 17 retention basins, 12 off-base storm water discharge locations and 59 groundwater monitoring wells are critical to the effective environmental stewardship of community surface and ground water systems.

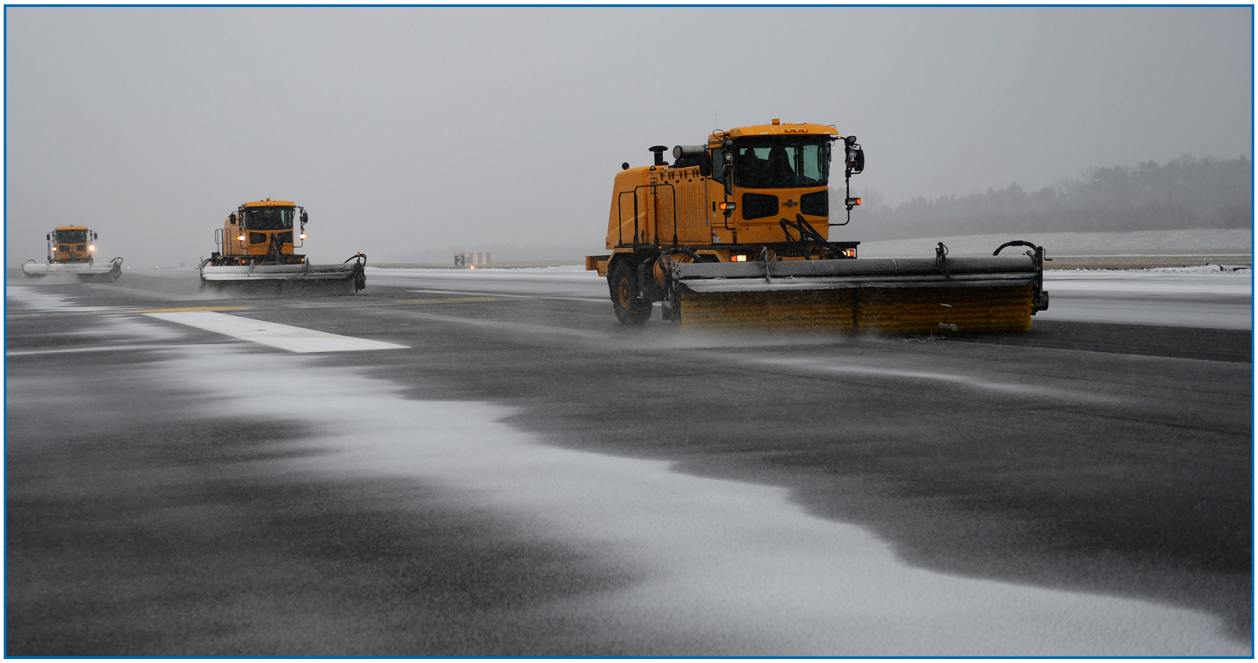
In addition to the Department of Defense and US Air Force instructions and guidance, SAB must adhere to the Final Governing Standards

for Germany (FGS-G) and host nation regulations. Additionally, SAB receives and complies with environmental guidance from Germany's Federal Ministry of Environment, Nature Protection and Nuclear Plant Safety, Rhineland Palatinate (RLP) Department for Environmental Protection, and RLP Labor Inspectorate. Regulators include Structure and Approval Management Administration North (SGD-Nord Koblenz and Trier Offices, Upper Water Authority), state regulators for storm water discharge permits including the Wastewater Treatment Plant (WWTP) discharge and drinking water pumping permits. In conjunction with SGD-Nord, SAB works with 2 county administrations located in Bitburg-Pruem and Bernkastel-Wittlich (Lower Water Authorities). From these counties, SAB obtains permits for compact WWTP discharges and coordinates installation and deactivation of oil/water separators. SAB is subject to oversight from the German Ministry of Defense who issues guidance and regulations on air traffic control, air traffic noise and air emissions. Both SGD-Nord and the military regulators inspect SAB regularly to enforce permits and environmental compliance standards in accordance with German law.

Summary of Accomplishments

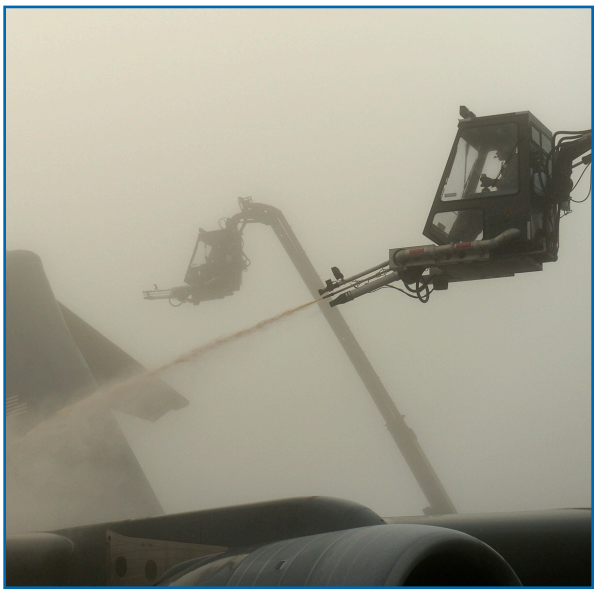
Environmental Management System

SAB utilizes an Environmental Management System (EMS) as the framework for addressing environmental issues. The EMS Cross Functional Team (CFT) is focused on ensuring regulatory compliance across all environmental aspects. SAB's three significant aspects: prevention of unintended discharges, waste reduction and energy conservation, receive special attention installation-wide. Each aspect has an active working group established to develop Environmental Action Plans in order to specify objectives, develop targets, delegate roles and responsibilities and ensure continual improvement by utilizing the Plan-Do-Check-Act model. With this proactive approach, SAB's EMS has been lauded as the "Best in Command" by US Air Forces Europe (USAFE).



Runway Snow and Ice Removal
Members of the 52nd Civil Engineer Squadron snow patrol clear the flight after snowfall. Snow removal (a storm water source) is necessary prior to applying runway deicing products to the flight line; the snow patrol clears ice and snow from more than one million square meters of flightline to maintain mission readiness.

Maintaining environmental quality while achieving mission-readiness is a priority. Due to the regulatory compliance and public visibility of unintended discharges, the CFT and Significant Aspects Working Group were inspired to research and implement measures to decrease the impact from permitted storm water discharges. Due to 24/7/365 mission requirements, aircraft and runway deicing are critical components to mission accomplishment. SAB's mission requires maintaining 1,093,968 square meters, approximately 205 football fields, of mission-critical runways, taxiways, ramps and flight line during any and all weather conditions.

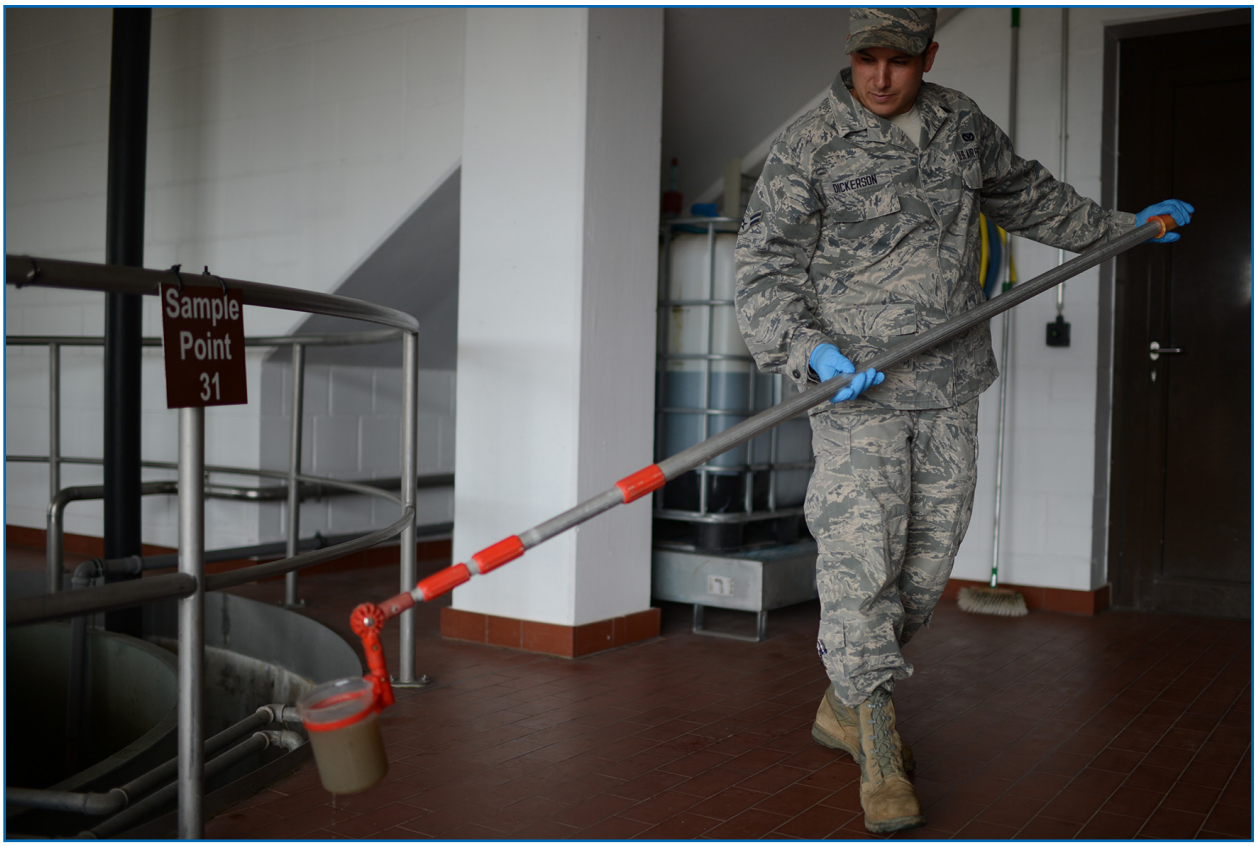


Aircraft Deicing
A member of the 446th Aircraft Maintenance Squadron de-ices the tail of a C-17 Globemaster III on the base flightline. Members of the 446th are here on a temporary duty assignment for six months. In addition to runway deicing, aircraft deicing is a critical operation during winter months. Storm water that contains deicing products must be treated at SAB prior to discharge.

In an effort to reduce storm water discharge impacts on water quality, the CFT worked to find an alternate to acetate-based surface deicing products. These products contributed to SAB's exceeding the Host Nation (HN) Chemical Oxygen Demand (COD) permit limit of 90 ppm for storm water and 50 ppm for WWTP discharges. Increased COD in waters is a significant environmental quality concern; it can lower available oxygen to fish and other aquatic life, while causing undesired algal blooms and detrimental human effects in some cases.

Research indicates that replacing acetate-based with formate-based deicing products could potentially reduce COD levels in storm water by as much as 60%. When this initiative began in 2012, no formate-based products were approved for use on Air Force runways or with F-16 aircraft due to corrosion concerns. During the course of the research phase, SAB discovered the Danish Air Force had been using a potassium formate runway deicer with their F-16 aircraft for approximately 15 years. Additionally, Aviform L50 (a formate-based runway deicer) is also used at NATO bases and on commercial airports in Germany including Frankfurt International Airport. The CFT requested Aviform L50 be evaluated by the Air Force Civil Engineer Center (AFCEC) for approval for use on Air Force runways and evaluated by the F-16 System Program Office (SPO) for aircraft compatibility. On 22 Aug 2013, SAB received the first Air Force approval from the F-16 SPO to use Aviform L50 in conjunction with the F-16 airframe and weapon systems. In June 2014, the first ever Air Force contract was awarded through the 52 FW Contracting Office to purchase formate-based runway deicing fluid. In 2014, 2 Pacific Region Air Force installations applied for and received similar approval for a locally manufactured potassium formate deicing product. It is anticipated that other Air Force bases worldwide will likewise apply for and receive approval to use potassium formate products with other aircraft types, based on the approval and research laid forth by SAB. The approval from the F-16 SPO will not only benefit SAB for years to come, but also USAFE and the entire Air Force community.

In the past two years, the EMS CFT has enabled the Discharge Working Group to develop and execute a variety of projects as part of an extensive 10+ year, $19M environmental systems overhaul. This tremendous effort has led to compliance at all 12 storm water



Waste Water Sampling Inside

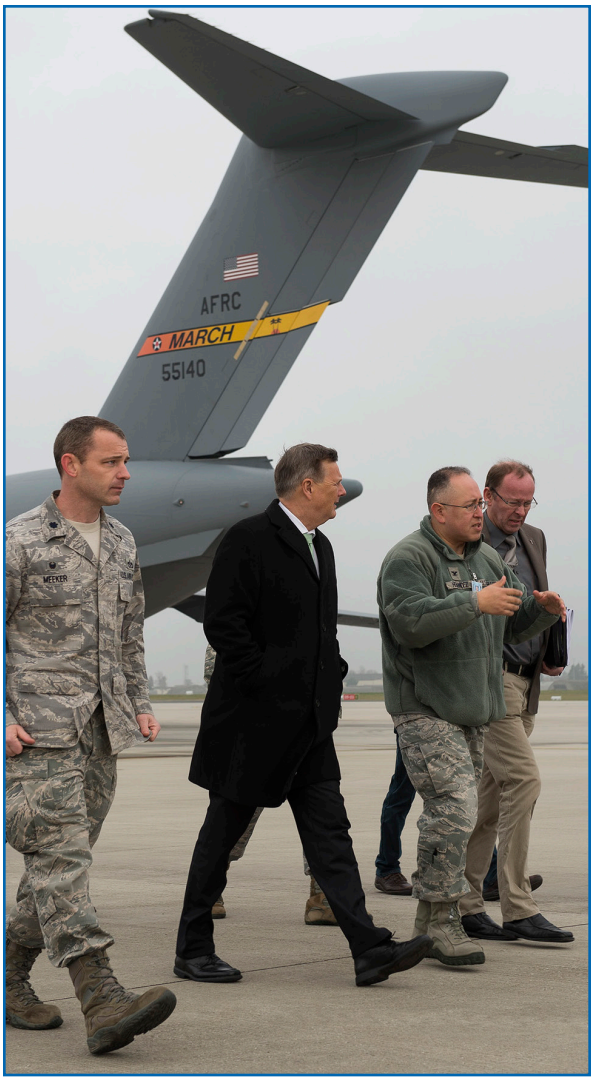
A system maintenance technician samples wastewater from a tank during a daily sample inspection at the SAB wastewater treatment facility. Daily samples are taken during each stage of the treatment process to meet German environmental standards. The facility processes wastewater from the base to remove any hazardous chemicals it may contain before it is released back into the environment.

discharge points. During the 2013 to 2014 deicing season there were no unintentional off-base discharges due to deicing operations. The HN environmental authority, SGD-Nord, lauded SAB's initiatives and projects to maintain and improve storm water discharge quality.

One of SAB's most cost effective energy initiatives was the elimination of steam heating service at Bitburg Annex. The GSU has been heated with the steam by-product of a local brewery for the last 29 years and has increased in cost by 80% since 2010 due to HN indices and labor costs, despite continued divestiture of Air Force real property. To mitigate this excessive cost, SAB has engineered a project to terminate the contract and provide highly efficient mobile boiler systems to the remaining facilities until all functions are relocated to Spangdahlem main in 2019. This effort alone will save the installation over $4M in energy costs over the next five years. The Energy Conservation Working Group has leveraged six offices to identify a potential savings of $80M over the next 20 years to meet and exceed all Executive Order targets.

Pollution Prevention

During war efforts, approximately 20 years ago, maintaining required amounts of Halon 1301 for F-16 was difficult at SAB. The surplus and increased authorization of Halon 1301 was initiated during this time and has been maintained at SAB for years without being utilized. A Pollution Prevention Opportunity Assessment (P2OA) to reduce hazardous material (HAZMAT) discovered and identified 25,500 pounds of Halon 1301 in



HN Official Site Visit Flightline
SAB personnel work diligently with the HN authority and the local communities in a joint effort to investigate current PFT levels in soils and water on and off base. A PFT Working Group was initiated by SAB Environmental personnel and includes HN authorities, US Air Force and US Army personnel, local County Administration and community representation. Base members escort the SGD-Nord president on the SAB flightline.

SAB HAZMAT Pharmacy stores. This Halon is in addition to the approximately 2,000 pounds utilized by SAB Aircraft Maintainers to support F-16 aircraft operations. During the assessment, it was discovered that SAB maintained an authorization level of 25,500 pounds of Halon 1301 (170 cylinders at 150 pounds each). Due to the authorization, Halon 1301 was automatically reordered when inventories dropped below this level. In coordination with AFCEC, meetings were held with leadership. In August 2014, the authorization level of Halon 1301 stores was reduced from 170 cylinders to zero. Arrangements are now in progress to ship and dispose of the excess Halon to a receiving and testing facility in the Netherlands. Halon 1301 has a Global Warming Potential (GWP) of approximately 7,000 times the GWP of carbon dioxide and remains in the atmosphere for approximately 65 years. In addition to significantly reducing the installation's carbon footprint, this initiative will facilitate the return of Halon to the Defense Reserve of Ozone Depleting Substances where it can be fully utilized as needed.

Environmental Compliance Assessment

Aqueous Film Forming Foam (AFFF) has been used for many years by the Air Force, commercial airports and municipal fire departments as a principal fire-fighting agent. During 60+ years of operations at SAB, AFFF has been released, particularly at old Fire Training Facilities which are no longer in use. AFFF contains perfluorocarbons (PFCs) or fluorinated surfactants containing various compounds, particularly perfluorooctanesulfonic acid (PFOS). Changes in sampling technology over the last 10 years have improved detection levels from approximately 10 micrograms per liter in 2005 to 10 nanograms per liter today, making PFOS/PFT levels less than 1 microgram per liter detectable. The Environmental Protection Agency has identified PFOS/PFT as a potential pollutant but due to significant PFOS/PFT levels being detected at nearby International Airports this issue has quickly risen to great importance for SAB, HN and local regulators.

AFFF has not been released or used at SAB since 2012. Although not required by German law or FGS-G, a no-foam system was purchased and installed on base fire trucks in 2013 to perform annual mandatory nozzle spray testing without AFFF. All facility and fire truck sprinkler systems were upgraded with

European Union (EU)-compliant AFFF which may not contain more than 50 milligrams per liter (mg/l) of PFT. When tested, the actual PFT content is less than 2 mg/l, or 90% below the EU standard.

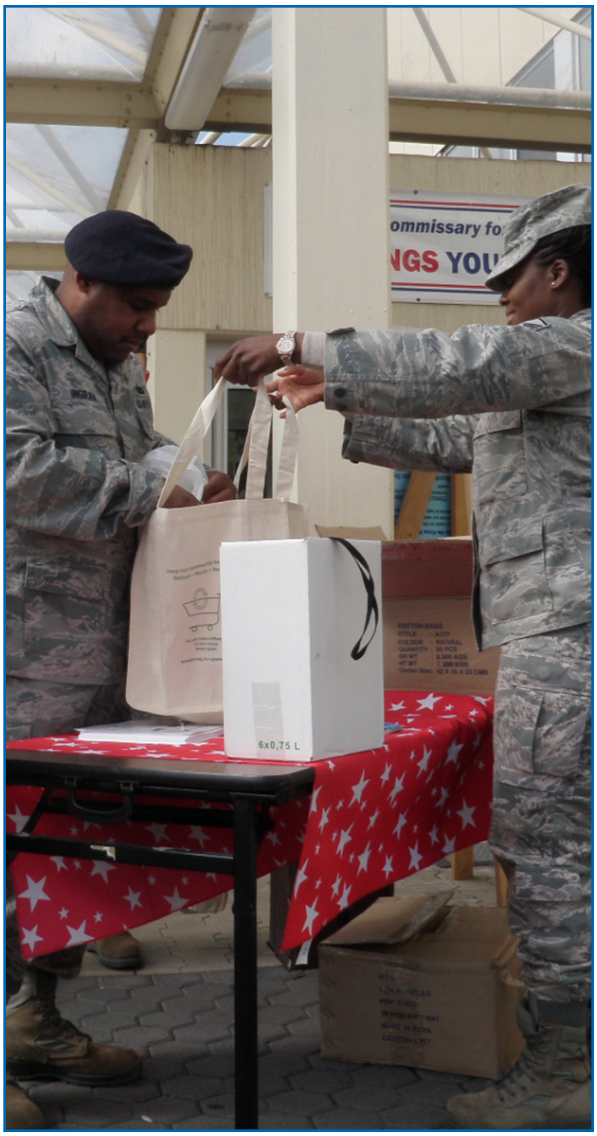
SAB personnel have diligently worked with the HN authority and local communities in a joint effort to investigate current PFT levels in soils and water on and off-base. A PFT Working Group was initiated, which includes HN authorities, US Air Force and US Army personnel, local County Administration and community representation. Although not required by German law or the FGS-G, groundwater, storm water and wastewater discharges from the WWTP are tested for PFTs. Water and soil sampling at former Fire Training Facility "hot spots" was conducted as well. The PFT soil and water sampling results are provided to the HN authorities and the PFT Working Group for analysis and future course of action. The installation supported site visits by local community leaders and the SGD-Nord President to demonstrate the Air Force long-term commitment.

Tricholoroethylene (TCE) is a pollutant caused by the historical use of solvents. TCE was detected in installation groundwater and has been tracked for approximately 15 years as part of the Wing's environmental restoration program. A Risk Assessment performed in 2013 identified the existence of a previously unknown second TCE plume that extends beyond the installation's western boundary. In support of SGD-Nord and the local community, additional testing is being performed to determine the direction and velocity of the second plume to insure community drinking water wells are not at risk of TCE pollution. The HN Working Group shared TCE testing results with local community leaders in an effort to jointly determine a future course of action.

Community Relations

The Solid Waste Diversion Working Group and CFT have a proactive year-round community outreach program in place involving the Base Exchange, Commissary, middle and high school, recycling center and local community. They utilize SAB, Boy Scout and Girl Scout volunteers to support outreach efforts.

Annually, Spangdahlem Middle School and Bitburg High School participate in America Recycles Day presentations on recycling, waste reduction and sustainability.



Bag Giveaway
Community efforts at SAB include ways to inform the community and improve the environment. During America Recycles Day, 52 FW personnel distribute reusable shopping bags at the Commissary. The Base Exchange and Commissary have reported a decrease of approximately 15% to 20% in the use of plastic shopping bags due to the distribution of reusable shopping bags.

F-16 on Runway SAB Eifel

Two F-16 Fighting Falcon fighter aircraft assigned to the 52nd Fighter Wing taxi after landing at Spangdahlem Air Base. Notice the topography as SAB is located on a plateau surrounded by rivers that are used for drinking water, treated waste and storm water discharge. This challenging topography is located in the foothills of the Eifel Mountains.

Base Exchange and Commissary events distribute reusable shopping bags and educational pamphlets detailing installation and surrounding community information. American Forces Network radio spots and articles published in the SAB newsletter advertise events. Approximately 1,500 reusable shopping bags were distributed in an effort to reduce plastic bag usage in the Base Exchange and the Commissary.

Plastic bags create Foreign Object Damage issues when found on SAB's airfield. The EU is also phasing out plastic bag usage over the next 5 years. The Base Exchange and Commissary have reported plastic bag decreases of approximately 15% to 20% due to the distribution of reusable shopping bags. Approximately 500 reusable bags are distributed annually at newcomer briefings, where personnel also receive HN and SAB environmental information.

SAB participates in annual Earth Day celebrations with planned community events and educational opportunities. Presentations on recycling, natural resources and regional threatened and endangered species are conducted at Department of Defense schools.

An annual community-wide stream clean-up is coordinated with the Spangdahlem Youth Fire Department, Boy Scouts, Girl Scouts, students and local community resident volunteers. The stream cleanup covers 3 miles along the Spangerbach Creek. Since 2013, approximately 240 gallons of trash and recyclables have been collected.

Conclusion

Despite a diverse mission spanning half-way across the European continent, unique environmental, geographical and geopolitical challenges have been surmounted by the Environmental Team. SAB has been a benchmark in meeting and exceeding the ever-changing landscape of EU and German environmental standards. This has been possible because of intentional, collaborative processes developed through the installation EMS and supporting CFT. The EMS garnered extensive involvement from Wing Leadership, SAB personnel and local community leadership in lockstep with HN regulatory agencies. The result has been great strides in reducing environmental impacts, increasing community outreach and fostering HN partnerships.