

Introduction Many Air Force installations face complex waste/pollution prevention challenges to maintain mission flexibility. Vandenberg Air Force Base (VAFB), located on the central coast of California, is home to the 30th Space Wing. The Wing manages Department of Defense space and missile testing and serves as the launching point placing commercial and military satellites into polar orbit. It is the only installation to have this unique mission. VAFB is one of only a few bases that own and operate a Class III municipal landfill. Properly managing this resource is crucial to mission flexibility and national security.

The State of California requires that landfills divert 50 percent of incoming materials from disposal each year. The Air Force established a pollution prevention hierarchy that requires installations to reduce, reuse, and then recycle materials whenever possible. Vandenberg AFB exceeded the State and Air Force diversion requirements and implemented pollution prevention efforts generating \$24.5M cost avoidance in the last 5 years. The base is proud to provide vital mission support through innovative waste/pollution prevention programs. Keeping the base landfill a viable asset to the Vandenberg AFB mission takes not just hard work and careful management - it takes moving mountains!

The Environmental Flight (30 CES/CEV) Solid Waste Management Program began implementing a “common sense” solid waste management approach several years ago. Our initial approach to waste/pollution prevention began with a thorough investigation to identify the largest waste streams on the installation. After determining which waste streams impacted the landfill most, 30 CES/CEV developed methods for reducing, reusing or recycling the materials from those sources. This was not accomplished in a vacuum. Public education and outreach, community partnerships, and collaboration with regulatory agencies paved the way to achieving alternatives to waste disposal. Using this “common sense” approach in 2007, Vandenberg AFB met the challenge of diverting thousands of tons of waste from landfill disposal.

Railroad Rail and Ties An unused 10-mile railroad spur built in 1941 ran through the center of Vandenberg AFB. A commercial railroad, Southern Pacific, currently operates around the perimeter of the base in non-secure areas. As configured, the commercial track was connected to the abandoned railroad spur. To avoid rail cars entering secure areas within the base boundary, this portion of unused rail required removal. Instead of hiring a demolition contractor and disposing of the track and ties in the landfill, 30 CES/CEV proactively pursued reuse options. VAFB partnered with the US Border Patrol and the California National Guard and implemented a plan to remove and reuse the track to build vehicle barriers on the border with Mexico in support of Homeland Security. Additionally, a non-profit organization was contracted to remove the ties at no cost to the Air Force. The non-profit was able to use proceeds generated from the sale of reusable materials to construct a 17-mile Truckee-Virginia City railroad track as part of a historical preservation program. The reuse of 745 tons of rail and 1,280 tons of ties resulted in: security enhancement for Vandenberg AFB, improved border security, preservation of railroad history for future generations, and a demolition cost avoidance of \$823K. A newspaper article heralding the success of this endeavor was published in the local base newspaper, as well as highlighted in the quarterly Environmental newsletter.

Household Hazardous Materials With approximately 5,000 military family housing residents residing on Vandenberg AFB, many of whom relocate every six months, large quantities of household hazardous materials (HHMs) became a challenge to manage properly. A public education and awareness campaign targeting residents was launched to encourage proper handling of HHMs. Residents were encouraged to donate HHMs to their neighbors or take them to the on-base hazardous waste disposal facility to prevent improper disposal.

Door hangers, magnets, fact sheets, newspaper articles, and newsletters were developed and distributed to residents advertising the program. The sheer volume of materials generated as a result of the successful community outreach program, drove the need for a better solution to reuse these materials.

30 CES/CEV determined that a Household Hazardous Materials Exchange Program was the answer. The program allows residents to drop off unwanted HHMs at a designated facility where it then becomes available for others to use free of charge. Not only does this program keep hazardous materials from entering the landfill, the Air Force saved \$80K in hazardous waste disposal costs for calendar year 2007 alone. Residents also benefit from using products offered through the exchange program by avoiding the cost of purchasing new products—a “win-win” for all.

Unsalvageable Items Truckloads of furniture, supplies, and equipment were arriving daily at the Vandenberg AFB landfill. For many years, unsalvageable items were managed through the local Defense Reutilization and Marketing Office (DRMO). The majority of these items (usable and in good condition) were rejected by DRMO as un-marketable and sent to the landfill. 30 CES/CEV took action to reroute these items for better use. Making these items available to other base organizations, local municipalities, non-profit organizations and other outside federal agencies is a far more environmentally and fiscally sound management concept.

The concept became a reality in August 2006 with the grand opening of a first of its kind Materials Diversion Center (MDC). The MDC is collocated with DRMO making receipt of materials streamlined. Several warehouses and a staff of three oversee incoming items such as furniture, office supplies, and other items rejected by DRMO. These items are then made available to all base organizations. However, base organizations are not the only recipients of unsalvageable items. When large quantities of dormitory furniture were turned into the MDC, outside federal organizations were contacted and given the opportunity to receive these items free of charge. In 2007, 185 tons of furniture was provided to various Army installations throughout the state, as well as the local Federal Penitentiary, local fire departments, police departments and non-profit organizations (e.g., local school districts, Habitat for Humanity, Big Brothers and Sisters, Boy Scouts etc.). To better market the program and build on its success, a deliberate and strategic outreach program was implemented. Base personnel were alerted to the MDC through base bulletin inserts, fact sheets, newsletters, and newspaper articles. Briefings at all environmental meetings and special subcommittee groups were prepared and presented. This unique “outside-the-box” endeavor was highlighted as a VAFB Air Force Smart Operation for the 21st Century (AFSO21) initiative in the Air Force Space Command *Frontiers Magazine* February 2007 edition.

Heritage Deactivation Program Waste Streams The deactivation of the Heritage Program (Titan Missile program) resulted in the permanent closure and removal of numerous structures and facilities throughout Vandenberg AFB. Rather than take a business-as-usual approach, 30 CES/CEV developed a contract mechanism that rewarded its contractor for recycling construction and demolition debris. For 2007, 1,843 tons of metal, 9,546 tons of concrete and 30 tons of wood were recycled instead of being buried in the base landfill. Recycling saved the Air Force, and ultimately the taxpayer, over \$1.3M.

If not for the successful implementation of the Materials Diversion Center, the reallocation of equipment and supplies from the former Heritage Program to base organizations would not have occurred. In a time when many of these organizations were asked to do more with less, the MDC provided VAFB organizations with valuable tools and equipment. The total value

of the recovered tools and equipment was calculated at \$1.8M.

Finally, two 28,000 gallon aboveground stainless steel storage tanks recently removed from service in conjunction with the Heritage Program deactivation are now being reused to collect groundwater and leachate at the Vandenberg AFB landfill. The estimated cost avoidance for this effort is \$50K. The installation of the two tanks also met a leachate control compliance requirement mandated by the local Central Coast Regional Water Quality Control Board.

Waste Asphalt and Concrete Over the past five years, Vandenberg AFB generated thousands of tons of asphalt and concrete from basewide construction and demolition (C&D) projects. Each year, the base reused these materials for road base. All the asphalt and concrete is stored within the base landfill area, reprocessed, and stockpiled as a source of repair material for future base roads and parking lots. This process results in a \$26.50 per ton cost avoidance (purchase of road base from local aggregate supply businesses no longer required). In 2007, the grinding operations generated approximately 10,325 tons of road base, representing a cost avoidance of \$273K. This is a perfect example of a “closed loop” system.

Outreach Programs/Educational Efforts The good intentions of developing and implementing successful waste reduction programs would not succeed without an aggressive outreach program. 30 CES/CEV’s approach to pollution prevention is to focus on the connection between waste, pollution prevention and the mission of Vandenberg AFB. Air Force and contractor employees, as well as base residents, are to be continually made aware how their efforts contribute to extending the lifespan of the Vandenberg AFB landfill, preventing pollution and conserving natural resources.

For over a decade 30 CES/CEV has provided outreach materials, hosted special events (Earth Day, America Recycles Day), educated base schools about the importance of waste reduction and recycling, conducted landfill tours to students, partnered with the County of Santa Barbara Public Works Department on developing a Reuse and Recycling Directory, attended local area Solid Waste Task Force meetings to share in the resolution of common compliance issues, and presented several lessons learned briefings at national conferences and training sessions. The graphic below depicts a sampling of various 2007 outreach materials developed for promoting waste/pollution prevention programs to residents including school-aged children, military, and contractor organizations throughout Vandenberg AFB.



Conclusion Vandenberg AFB successfully demonstrated that it is possible to move mountains—mountains of solid waste that would otherwise have ended up in the landfill—and turn them into useful materials for other users and purposes. For 2007, this resulted in a cost avoidance of \$4.3M in waste stream reuse (see graphic below) and \$5.9M in reduced contractor services.

