Chapter 5
Success Stories

5-1. Mead Army Ammunition Plant: Concrete Rubble for Construction

a. Part of a remediation plan at the Mead Army Ammunition Plant near Mead, Nebraska, required demolition, removal, and disposal of concrete structures at the site. This plan was modified to allow reuse of about 70 million kg (77,000 tons) of broken concrete containing trace amounts of explosives (RDX). The concrete is currently stockpiled by the Clear Creek Drainage District in Nebraska for use as rip-rap along Salt Creek, and by Saunders County, Nebraska, for use as road base.

b. By treating this material as a resource, rather than a waste, the costs associated with disposal of the material, such as hauling expenses and landfill tipping fees, were avoided. In addition, energy use was minimized in several ways: by reusing the material near the point of generation, less energy was expended than in transporting the material to a remote landfill, and no energy was expended at a landfill to place and cover the material. The energy to be expended by the drainage district and the county in reusing the broken concrete would have been expended in using material from another source; in fact, their energy usage was minimized by providing them with a nearby source of rip-rap and road base.

5-2. Holloman Air Force Base: Waste to Fuel

a. A free product recovery system at Holloman Air Force Base was designed to remove JP-4 jet fuel from the water table aquifer, where approximately 2.3 million liters (600,000 gallons) was present as free product. During the design, the problem of how to dispose of the recovered JP-4 became a significant issue because of anticipated high recovery volumes. Designers determined, through pre-design sampling, that the JP-4 was of sufficient quality (following reclamation) to be used as fuel for an on-site thermal oxidizer that was used to treat fuel vapors extracted from the groundwater and vadose zone. The JP-4 recovered from the treatment system was first processed through an oil/water separator and then filtered before being reused as fuel for the thermal oxidizer. Although backup fuel was available, the majority of the time the thermal oxidizer was being powered by the JP-4 reclaimed from the water table.

b. The designers for this project showed ingenuity in the area of pollution prevention. Not only did they avoid costs and regulatory issues associated with the transportation and disposal of potentially hazardous materials/wastes, they also found a way to significantly reduce the cost of fuels required to complete site cleanup.

5-3. Ashland 2 FUSRAP Site: Recycling of Uranium Tailings

a. The Ashland 2 Formerly Utilized Sites Remedial Action Program (FUSRAP) Site in Tonawanda, New York is contaminated with low levels of radium, uranium, and thorium. The contamination is a result of work done as part of the nation's early atomic energy program, when uranium ores were processed at the former Linde Products Division of Union Carbide. From 1944 to 1946, uranium processing wastes were transported from Linde to a 4 hectare (10-acre) area, known then as the Haist property, now called Ashland 1. Subsequent activities in the 1970s resulted in some of the material being transported to an area now known as Ashland 2.

b. Recycling of radioactive contaminated soils involved shipping the material to the International Uranium Corporation (IUC) Mill in Utah. Since the Nuclear Regulatory Commission licenses the facility, an amendment to their license was required to accept the Ashland material. Previously, the Department of Energy had shipped this type of material exclusively to another facility in Utah. Opening up the disposal/recycling market for this type of material not only benefitted the Ashland project, but other FUSRAP projects, as well.

c. The initial cost savings for recycling were estimated at about \$40/m^3 (\$30/cy), which equates to about \$1.5 million for the 34,000 m^3 (45,000 cy). However, the actual costs avoided turned out to be in excess of \$16 million. This is because IUC was able to accept materials for which other facilities would have charged higher rates, such as debris and petroleum contaminated soil, for the same low unit price. The streamlined manifesting procedures and more flexible acceptance criteria for water content also resulted in cost savings.

d. The more flexible acceptance criteria at IUC resulted in significant savings in time. The biggest factor was that IUC did not have the strict water content limitations that some other facilities mandate. This allowed the material to be excavated and shipped "as is" without requiring treatment to meet a specific water content standard. Additionally, rail car turn-around times were quicker than have been historically reported using other disposal facilities.

e. In addition to the noted savings in time and money, recycling of the material at IUC offered other important benefits. From a public relations standpoint, it was a success story to be able to explain that at least some of the material that was being removed from the site would be recycled. This not only resulted in recovery of an important resource, but also resulted in the material ultimately put in the ground being less contaminated. Overall, recycling of the material at IUC resulted in significant savings and fostered a positive image of the Corps as steward of both the environment and taxpayers' money.

5-4. Use of Cotton Coveralls Instead of Tyvek

a. The contractor at the Weldon Spring munitions facility has begun waste reduction by using cotton coveralls instead of Tyvek suits for workers' dermal protection in non-critical situations. The Weldon Spring site, near St. Louis, Missouri, is an abandoned munitions manufacturing facility where soils and other media are contaminated with explosives (primarily TNT). The remedial action at the site is primarily incineration of soils. Many of the site workers are engaged in activities that do not require high levels of dermal protection (i.e., cotton coveralls provide adequate dermal protection). The cotton coveralls are initially more expensive than Tyvek suits. However, the cost of the cotton coveralls and their laundering is less than the cost of several hundred Tyvek suits per day for several months.

b. In addition to saving money, the use of the cotton coveralls saves a significant amount of solid waste at the site. Since an estimated 120 workers are involved with the program, an estimate of nearly 300 Tyvek suits would have been used per day for several months of site activities.

5-5. Grand Forks Air Force Base: Multimedia Inspection

a. Under Section 6002 of the Resource Conservation and Recovery Act (RCRA), state regulatory agencies are empowered to evaluate adherence to Federal Procurement Guidelines for Federal facilities and activities. During a RCRA audit at the Grand Forks Air Force Base in Grand Forks, North Dakota, the state regulatory agency found that the base had proper procurement procedures in place and was adhering to the procurement policies.

b. In addition to evaluating day-to-day procurement procedures for the base, the state evaluated the USACE procurement procedures for the military construction activities that it oversees there. The Corps personnel were able to refer to the CEGS, which have been revised to meet sustainable design requirements.

c. Because the base and the USACE personnel involved with base military construction had proper procurement procedures in place and were following the procedures, the audit found no deficiencies, and the inspection can be considered a success. However, the experience points out that these audits can and will be made, and that Federal Procurement Guidance must be followed.

5-6. Iowa Army Ammunition Plant: Innovative Use of Excavations And Dredged Material

a. The Iowa Army Ammunition Plant (IAAP) is an active munitions manufacturing facility in southeastern Iowa. Historical activities at the plant contaminated the soil, surface

water, and groundwater with explosives. The site soils are being remediated through excavation and thermal desorption of the explosives. Since the site is large, significant quantities of soils have been excavated. These excavations would typically require refilling with clean soils at considerable expense (estimated in excess of a million dollars). At IAAP, partnering with regulatory agencies allowed the excavations to remain unfilled and converted to small lakes and wetland areas. Residual contamination that leaches into the water bodies from the soils surrounding the excavations is then treated via phytoremediation processes by the aquatic plants.

b. In addition to the creation of surface water resources from excavations, IAAP developed an innovative use for dredged material from a local small lake. The lake, located on the IAAP facility, suffered from significant sedimentation problems, and the aquatic habitat was seriously degraded. The planners for the remedial activities at IAAP, in cooperation with the appropriate wildlife agencies, drained the lake and excavated sediment from the lake bottom. By excavating the lake bottom in a specific manner, aquatic habitat could be restored in the lake. This renovated the lake, restored its aquatic habitat, and provided IAAP with large quantities of high quality topsoil for regrading at remediation sites.

c. The program at IAAP not only was successful in saving significant tax dollars, but the created water bodies provide aquatic habitat for local wildlife and recreational opportunities for local residents.