

Annual Waste Minimization Summary Report

Calendar Year 2008

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Nevada Site Office**



**Prepared by
National Security Technologies, LLC**

National Security Technologies^{LLC}
Vision • Service • Partnership

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ACRONYMS AND ABBREVIATIONS

CY	calendar year
DOE	U.S. Department of Energy
EMS	Environmental Management System
FY	fiscal year
ISO	International Organization for Standardization
m ³	cubic meter
mton	metric ton
NNSA/NSO	National Nuclear Security Administration Nevada Site Office
NSTec	National Security Technologies, LLC
NTS	Nevada Test Site
P2	Pollution Prevention
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
TRU	Transuranic
TSCA	Toxic Substance Control Act

Introduction

This report summarizes the waste minimization efforts undertaken by National Security Technologies, LLC (NSTec), for the U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office (NNSA/NSO), during calendar year (CY) 2008. This report was developed in accordance with the requirements of the Nevada Test Site (NTS) Resource Conservation and Recovery Act (RCRA) Permit (No. NEV HW0021), and as clarified in a letter dated April 21, 1995, from Paul Liebendorfer of the Nevada Division of Environmental Protection to Donald Elle of the U.S. Department of Energy, Nevada Operations Office.

The NNSA/NSO Pollution Prevention (P2) Program establishes a process to reduce the volume and toxicity of waste generated by NNSA/NSO activities and ensures that proposed methods of treatment, storage, and/or disposal of waste minimize potential threats to human health and the environment. The following information provides an overview of the P2 Program, major P2 accomplishments during the reporting year, a comparison of the current year waste generation to prior years, and a description of efforts undertaken during the year to reduce the volume and toxicity of waste generated by the NNSA/NSO.

Pollution Prevention Program

It is the priority of NNSA/NSO to minimize the generation, release, and/or disposal of pollutants to the environment by implementing cost-effective P2 technologies, practices, and policies. A commitment to P2 minimizes the impact on the environment, improves the safety of operations, improves energy efficiency, and promotes the sustainable use of natural resources. To meet P2 goals identified each year, this commitment includes providing administrative support and financial resources. When economically feasible, source reduction is the preferred method of managing waste, followed by reuse/recycling, treatment, and landfill disposal as a last resort.

NNSA/NSO requires contractors/laboratories to develop and maintain an Environmental Management System (EMS) per U.S. Department of Energy Order DOE O 450.1A, "Environmental Protection Program." The EMS requires that contractors reduce or eliminate the generation of waste, the release of pollutants to the environment, and the use of Class I ozone-depleting substances. This requirement is achieved by means of source reduction, reuse, segregation and recycling, and procurement of recycled-content materials and environmentally preferable products and services. To minimize the generation of waste, project managers are required to incorporate waste minimization into the planning phase of their projects. Waste generating processes must be assessed to determine if the waste can be economically reduced or eliminated. Waste minimization activities determined to be cost effective are incorporated into the project plan, and adequate funding allocated to ensure their implementation.

For wastes in which source reduction is not feasible, an aggressive recycling program is maintained. Items recycled through the NNSA/NSO recycling program include paper, cardboard, aluminum cans, toner cartridges, inkjet cartridges, used oil, food waste from the cafeteria, tires, computers and software, scrap metal, rechargeable batteries, lead-acid batteries, and electric lamps, including fluorescent, mercury vapor, metal halide, and high pressure sodium.

An effective method for reuse is the administration of the Material Exchange Program. Created in 1998, the Material Exchange Program has diverted over 190 metric tons (mtons) of materials, and chemicals from landfills. Office supplies and equipment, as well as chemicals no longer needed by employees are made available through postings on the intranet Material Exchange database. Other employees can then obtain items at no cost to their organizations. These materials would be destined for solid or hazardous waste disposal due to process modification, discontinued use, or shelf-life expiration. By providing these materials to other employees for their intended purpose, disposal and new purchase costs are avoided.

As required by Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management," NNSA/NSO maintains an Environmentally Preferable Purchasing program where specific Environmental Protection Agency–designated items must contain a percentage of recycled materials. By following these guidelines when procuring supplies, the market for recycled content products is stimulated, resources are saved, and helps to close the loop on recycling.

The NNSA/NSO P2 Program also includes an employee and public awareness program. Awareness of P2 issues is accomplished by disseminating articles by means of electronic mail, contractor and NNSA/NSO newsletters, maintenance of a P2 intranet web site, employee training courses, and participation at employee and community events. These activities are intended to increase awareness of P2 and environmental issues, and point out the importance of P2 for improving environmental conditions in the workplace and community.

Major Pollution Prevention Accomplishments

- The North Las Vegas Facility is regulated as a Conditionally Exempt Small Quantity Generator under RCRA. When an activity arose that would generate two 55-gallon drums of lead contaminated rags, it was noted that this would necessitate a change in generator status as well as an uncheduled hazardous waste pickup for the facility.
 - It was determined that paper towels could be used instead of the rags, keeping the total weight of waste at the facility to less than 100 kilograms.
 - This eliminated the need for disposal of the two 55-gallon drums of lead contaminated rags and the cost for a special hazardous waste collection.
 - There was no change in the generator status of the facility.
 - Cost savings for the waste volume reduction and pickup avoidance was estimated to be \$8,000.
- NSTec had a fiscal year (FY) 2008 environmental target in line with Executive Order 13423 to increase the use of non-petroleum based fuel by 10 percent over FY 2007. Through good employee awareness and management support, an increase of 35 percent was achieved.
- The Management and Operations Contractor at the NTS (NSTec) successfully completed a two-year commitment to obtain International Organization for Standardization (ISO) 14001 Certification. Part of the ISO process was to establish the environmental objectives and targets program. Several of the targets successfully met in FY 2008 were in the area of pollution prevention.

- A cleanup project in an old legacy testing area at the NTS would have resulted in large amounts of metal being buried in an onsite landfill, because much of this material was known to be radiologically contaminated. By careful segregation and a **minimal** amount of costly radiological characterization, over 250 tons of material (34 percent) was recycled.
- The Information Services Department developed a database for listing software, which ordinarily would have been excessed and sent for recycle/disposal. The database allows employees to search for needed software that is provided to them at no cost. This process allows software to be redeployed and reused by employees, therefore avoiding the cost of recycle/disposal and purchase of new software.
- Thirty-four oversize locomotive and forklift batteries weighing approximately 174,000 pounds were no longer required and needed to be removed from the NTS. These could not be sent with the contracted lead recycler because of their size, and would be very expensive to dispose of off site. After searching for a local recycle vendor who could accept the batteries, a suitable one was found, thus avoiding the cost of the large volume of waste that would have resulted from disposal.
- The Material Exchange Program reused 3.4 mtons of materials destined for solid waste disposal in CY 2008.

Comparison of Waste Generated in CY 2008 to Prior Years

Waste generation activities are presented in two source categories:

1. Routine Waste is waste generated from on-going operations (i.e., production, analytical, research and development laboratory operations, work for others, or any other periodic or recurring activity).
2. Cleanup Waste is waste generated from environmental restoration program activities, laboratory closeouts (i.e., discarding off-specification or out-of-date materials), spill cleanups, legacy wastes, wastes from decommissioning and demolition/transition operations, and all Toxic Substance Control Act (TSCA) wastes.

Table 1 compares radioactive waste generated on site in CY 2008 with prior years. NNSA/NSO has not reported radioactive waste generated routinely, except for an occasional one-time generation. Personal Protective Equipment (PPE) that is generated during routine hotline activities has been used to fill void space in containers of radioactive waste generated by cleanup activities, and has not been reported as routine radioactive waste in prior years. Beginning in CY 2007, this PPE was tracked and reported as routine radioactive waste.

Routine transuranic (TRU) waste was generated in CY 2008 by the Joint Actinide Shock Physics Experimental Research project and is stored in Area 5 until it can be shipped to the Waste Isolation Pilot Plant facility for disposal. Typically, DOE sites use waste disposal records as a means of tracking waste generation. Prior to CY 2007, this routine TRU waste was not reported as waste generated. Beginning with CY 2007, this waste is now tracked and reported in the year it is generated.

The volume of routine and cleanup waste generated is dependent upon the number and scope of projects funded during the year.

Table 1. Radioactive Waste Generated

	Routine	Cleanup	Total
CY 2008	251.6 m ^{3*}	991.7 m ³	1,243.3 m ³
CY 2007	0.0 m ³	1,940.7 m ³	1,940.7 m ³
CY 2006	0.0 m ³	1,663.7 m ³	1,663.7 m ³
CY 2005	0.0 m ³	601.8 m ³	601.8 m ³
CY 2004	0.0 m ³	334.7 m ³	334.7 m ³

*m³ = cubic meters

Table 2 compares the amounts of hazardous waste generated in CY 2008 with the previous four years. Routine hazardous waste generation decreased slightly in CY 2008. The volume of cleanup waste generated is dependent upon the number and scope of cleanup projects funded during the year.

Table 2. Hazardous Waste Generated

	Routine	Cleanup	Total
CY 2008	7.0 mtons*	4.2 mtons	11.2 mtons
CY 2007	7.1 mtons	40.9 mtons	48.0 mtons
CY 2006	11.2 mtons	354.5 mtons	365.7 mtons
CY 2005	23.2 mtons	5.0 mtons	28.2 mtons
CY 2004	18.4 mtons	36.0 mtons	54.4 mtons

*mtons = metric tons

Table 3 compares solid waste generation to prior years. Routine solid waste generation increased from the previous year, while cleanup solid waste generation decreased from the previous year. The volume of cleanup waste generated is dependent upon the number and scope of cleanup projects funded during the year.

Table 3. Solid Waste Generated

	Routine	Cleanup	Total
CY 2008	2,654.1 mtons*	5,027.0 mtons	7,681.1 mtons
CY 2007	2,355.2 mtons	5,723.7 mtons	8,078.9 mtons
CY 2006	4,824.0 mtons	6,175.0 mtons	10,999.0 mtons
CY 2005	5,380.0 mtons	11,193.0 mtons	16,573.0 mtons
CY 2004	4,092.0 mtons	6,346.0 mtons	10,438.0 mtons

*mtons = metric tons

Comparison of Volume and Toxicity Reductions of Waste in CY 2008 to Prior Years

P2 techniques and practices are implemented for all activities that may generate waste. These P2 activities result in reductions to the volume and/or toxicity of waste actually generated on site. Table 4 compares the amounts of radioactive, hazardous, and solid wastes reduced in CY 2008 to prior years.

Table 4. Waste Reduced through P2 Activities

	Radioactive Waste Reduced	Hazardous Waste Reduced	Solid Waste Reduced
CY 2008	28.9 m ³ *	189.6 mtons*	746.4 mtons
CY 2007	0.0 m ³	53.0 mtons	418.0 mtons
CY 2006	0.0 m ³	147.0 mtons	803.0 mtons
CY 2005	0.0 m ³	13,992 mtons	1,194.0 mtons
CY 2004	0.0 m ³	115.0 mtons	1,430.0 mtons

*m³ = cubic meters

*mtons = metric tons

The following tables show an overview of the estimated volume reductions accomplished during CY 2008, through implementation of P2/waste minimization activities. Table 5 shows an estimated 268.5 mton reduction of RCRA, TSCA, and state-regulated hazardous waste. Table 6 shows an estimated 746.4 mton reduction of sanitary waste.

Table 5. CY 2008 Hazardous Waste Reductions

Waste Minimization Activity	Activity	Volume Reduction (mtons)
Recycle/Reuse	Bulk used oil was sent to an offsite vendor for recycle.	76.4
Recycle/Reuse	Lead acid batteries were shipped to an offsite vendor for recycle.	105.0
Recycle/Reuse	Computer equipment was returned to the vendor where it is refurbished and sold for reuse.	12.1
Recycle/Reuse	Lead scrap metal was sold for recycle/reuse.	73.5
Recycle/Reuse	Spent fluorescent light bulbs, mercury lamps, metal hydride lamps, and sodium lamps were sent to an offsite vendor for recycle.	1.3
Recycle/Reuse	Rechargeable batteries were sent to an offsite vendor for recycle.	0.2
TOTAL		268.5

Table 6. CY 2008 Solid Waste Reductions

Waste Minimization Type	Activity	Volume Reduction (mtons)
Recycle/Reuse	Mixed paper and cardboard was sent offsite for recycle.	161.0
Recycle/Reuse	Single stream-mixed paper/cardboard/cans/plastic.	435.2
Recycle/Reuse	Scrap ferrous metal was sold to a vendor for recycle.	84.2
Recycle/Reuse	Food waste from the cafeterias was sent offsite to be reused as pig feed for a local pig farmer.	44.6
Recycle/Reuse	Scrap non-ferrous metal was sold to a vendor for recycle.	6.0
Recycle/Reuse	Shipping materials including pallets, styrofoam, bubble wrap, and shipping containers were reused.	8.6
Recycle/Reuse	Spent toner cartridges were sent offsite for recycle.	2.7
Recycle/Reuse	Non-hazardous chemicals, equipment, and supplies were relocated to new users through the Material Exchange Program, diverting them from landfill disposal.	3.4
Recycle/Reuse	Aluminum cans were sent offsite for recycle.	0.7
TOTAL		746.4