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## SANDIA REPORT

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# Pollution Prevention Opportunity Assessment for the Protective Forces

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Prepared by  
Sandia National Laboratories  
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**POLLUTION PREVENTION OPPORTUNITY ASSESSMENT  
FOR THE  
PROTECTIVE FORCES**

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Environmental Protection Department  
Sandia National Laboratories/California**

**ABSTRACT**

This pollution prevention opportunity assessment was conducted to evaluate the Protective Forces located at California Site. This assessment documents the processes, identifies the hazardous chemical waste streams generated by these processes, and recommends possible ways to minimize waste.

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# **POLLUTION PREVENTION OPPORTUNITY ASSESSMENT FOR THE PROTECTIVE FORCES**

## **Introduction**

Department of Energy (DOE) orders 5400.1 and 5400.3 mandate the development of a waste minimization program.<sup>1,2</sup> The program's goals are to:

- reduce volumes of hazardous wastes and toxicity,
- implement a system of tracking and reporting improvements, and
- devise a method for performing tasks.

To satisfy the requirements of this program, Sandia conducts pollution prevention opportunity assessments (PPOAs) to identify waste-generating processes. The information collected from a PPOA then is used to identify waste minimization opportunities.

This PPOA was conducted for the Protective Forces, according to the *Pollution Prevention Opportunity Assessment Plan* for SNL/California.<sup>3</sup>

## **Summary**

The primary mission for Protective Forces (Organization 8811) is to prevent the compromise of classified matters. Protective Services personnel provide guard and protection services for the materials, facilities, property and personnel at SNL/CA. The Firing Range, located at the southern most boundary of SNL/CA for approximately 20 years, and parts of Buildings 912 and 964 make up the area for which the Protective Forces are responsible. The major hazardous waste streams routinely generated by the Protective Forces are lead contaminated water and contaminated wipes. Protective Forces personnel contaminate the water by using city water to wash their hands after target practice. The contaminated water goes off site for recycling. Personnel contaminate the disposable wipes with solvent during weapons cleaning. Weapons cleaning takes place at both Buildings 964, Room 005, and the Firing Range. In the future, a large, one-time disposal of native soil contaminated with lead from this area will be required.

Sandia fills bags with native soil to trap bullets and to avoid bullet dispersal on the surrounding grounds during target practice. Frequent use makes the bags shred and lose soil. The soil fallen out of the bags will need remediation.

Protective Forces personnel regularly look for opportunities to minimize hazardous waste. The following are several steps taken by Protective Forces:

- DOE is researching different types of ammunition. Some ammunitions do not contain lead.
- Spent casing from the Firing Range are sent off site for recycling as scrap brass.
- Officers are required to wear gloves during weapons cleaning to reduce the risk of dermal exposure to solvents.

- After October 1995, Protective Forces personnel will no longer have an auxiliary firearm.

## Pollution Prevention Opportunity Assessment

### Facility

Protective Forces.

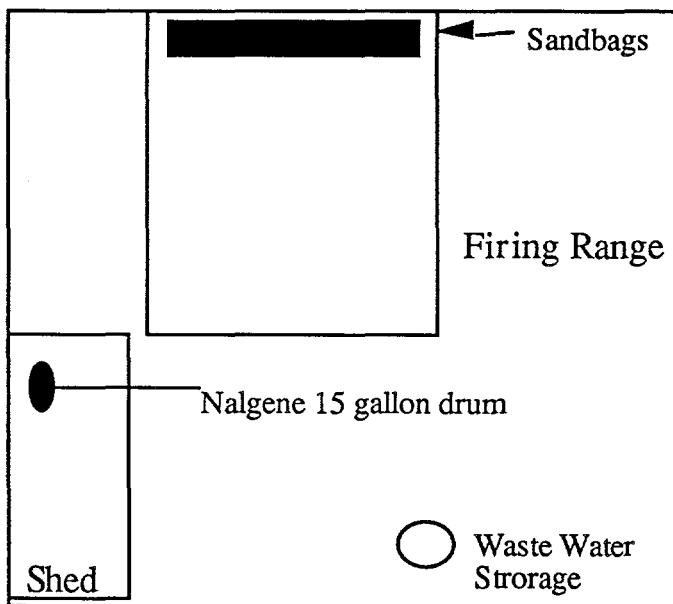


Figure 1. Firing Range Layout.

### Products

The maintenance of a protective force here at SNL/CA.

### Process Description

The Protective Forces provides SNL/CA protection of the grounds, facilities, and materials within the boundaries. Responsibilities also include security orientation and administration of assigned personnel as well as property and personnel contracted to SNL/CA. Certain items are provided by DOE for Protective Forces. The DOE issues weapons, ammunition, and other specialized items of equipment.

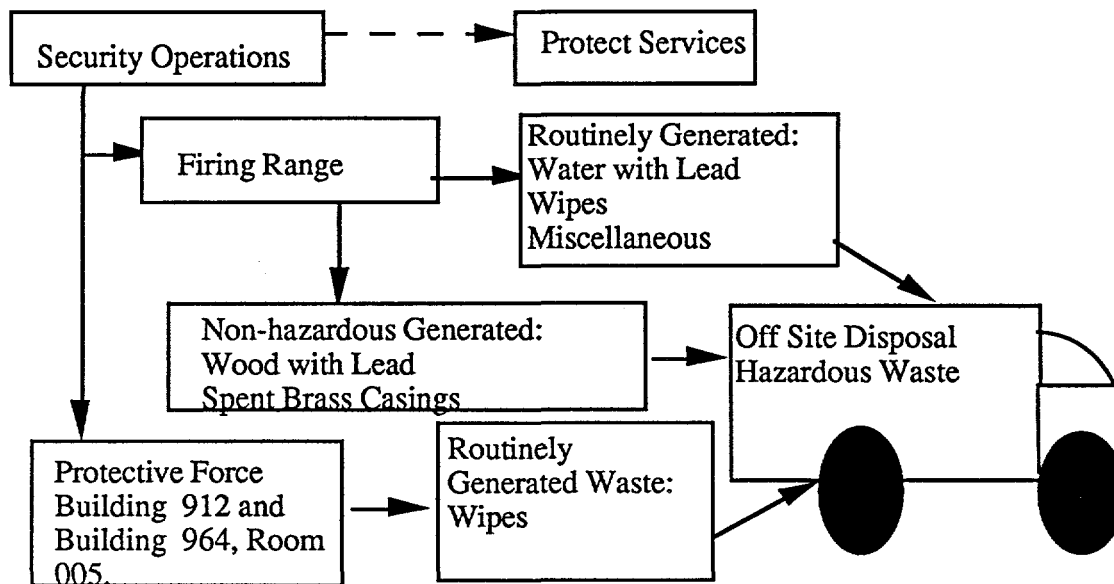


Figure 2. Process Flow for Protective Forces.

## Waste Generation

The primary hazardous waste streams generated by Security Operation Department are:

- Water containing Lead
- Contaminated wipes

Because of the lead in ammunition that the Protective Force uses, the Firing Range Shed houses an area for personnel to wash their hands. City water is stored in a 15 gallon Nalgene drum with a spout that drains into a basin. Personnel wash their hands as the water pours from the drum. The water then drains from the bottom of the basin, down a tube and is collected in a 5 gallon carboy. Waste Management personnel empty the water into a 55 gallon drum, which is stored outside. Once the 55 gallon drum is filled, Waste Management personnel arrange to have the drum transported off site for disposal.

Analysis of the wastewater has consistently shown levels above what is considered acceptable by the City of Livermore Water Reclamation Department. Therefore, the wastewater from the Firing Range cannot be released to the sewer. Sandia sends it off site as hazardous waste for recycling (See Appendix A). Sandia publishes an analysis of the wastewater from the Firing Range annually in a DOE required document that is titled, Site Environmental Report.

Protective Services personnel use various types of solvents during weapons cleaning. To eliminate dermal exposure, personnel wear 100% Nitrile gloves, as required, and use disposable wipes during this process. Sandia sends the contaminated wipes and gloves off site as hazardous waste.



As a backstop, Sandia uses soil native to this area in sandbags at the Firing Ranges. Protective Services personnel place the sandbags behind the targets as a buffer and to collect stray bullets. In the past, after much use, the soil from the shredded sandbags is rebaged and reused. However, the soil is high in lead content. In the future, personnel will dispose of the soil as hazardous waste and not reuse it.

After October of 1995, the Security Officers no longer had an auxiliary weapon available. The Department modified the auxiliary weapons (MP5 rifles) from an automatic to semi-automatic weapon. The only fire arms Protective Services personnel carry are handguns in a holster.

Table 1. illustrates the two major waste stream for both 1993 and 1994 water with lead and contaminated wipes. Slight increases in the volume of water with lead in 1994 was due to increased use of the Firing Range.

Table 1. Waste Generation Summary

Waste Stream ID	Waste generated (kg) 1993	Waste generated (kg) 1994
Water with Lead	128	184
Rags/Wipes	62	47
Aerosol Cans	*	0
Batteries	*	90
Miscellaneous	0	30
Empty Containers	1	1
<b>Total</b>	<b>191</b>	<b>352</b>

\*Aerosol cans and batteries were counted and not weighed during 1993.

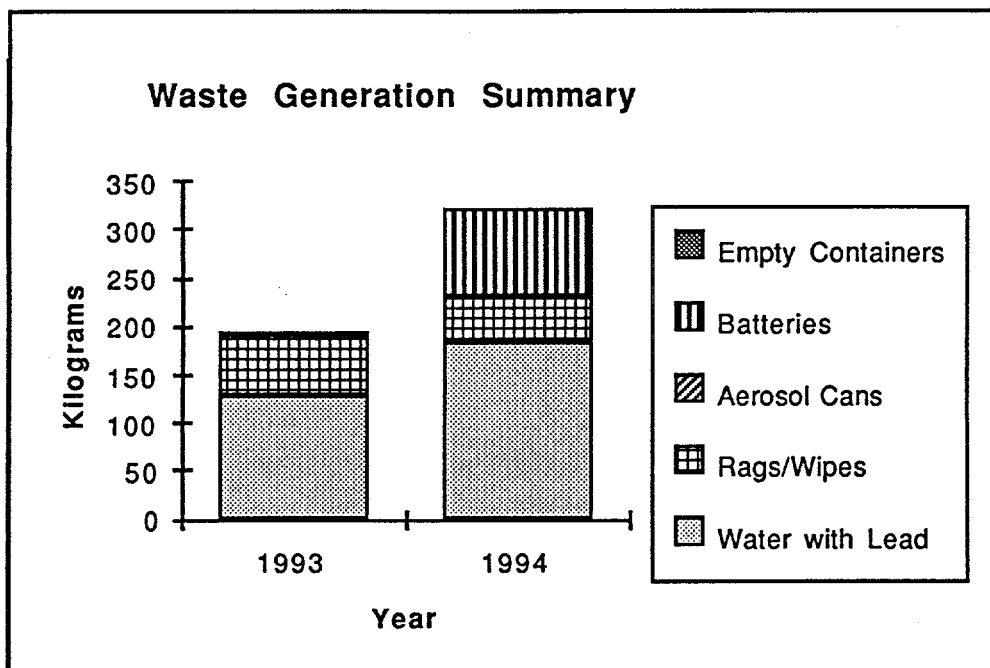


Figure 3. Hazardous Waste Generation Summary.

### Recommendations

- At some point in the future, Sandia will require a large disposal of native soil contaminated with lead. The Firing Range has been in use for 20 years. Over this period of time, Sandia has made upgrades; however, Sandia has not remediated soil from the site. Further sampling and data analysis is needed to evaluate the lead content of the soil.
- A recommendation was made to replace disposable contaminated wipes with a laundry service. However, further evaluation of this option is needed. The cost of a laundry service may exceed the cost of disposable contaminated wipes as hazardous waste. When weapons are cleaned, an extremely clean wipe is needed. Laundered rags may not meet the needs of the Protective Forces personnel.
- The DOE authorizes the type of ammunition used at Sandia, California. Currently, frangible ammunition that is lead free and breaks apart on contact is under investigation as a possible ammunition for DOE sites. Using this ammunition would significantly reduce those hazardous waste streams that contain lead. If frangible ammunition were approved by DOE, hand washing at the firing range would no longer be necessary. This would eliminate the generation of water with lead as a waste stream.

## APPENDIX A

### ROMIC PROFILE

#### HAZARDOUS WASTE

STATE AND FEDERAL LAW PROHIBITS IMPROPER DISPOSAL.  
IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY  
AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY  
OR THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES

#### GENERATOR INFORMATION:

NAME: SANDIA NATIONAL LABORATORIES  
ADDRESS: 7011 EAST AVENUE PHONE: 510 294-2002  
CITY: LIVERMORE STATE: CA ZIP: 94551-0969

EPA /MANIFEST  
ID NO./ DOCUMENT NO. CAD289002923 /

EPA	CA	ACCUMULATION
WASTE NO. D008	WASTE NO. 132	START DATE _____

CONTENTS, COMPOSITION: A.WATER W/ TRACE LEAD CONTAMINATION

PHYSICAL STATE: | HAZARDOUS PROPERTIES: \_ FLAMMABLE \_ TOXIC  
\_ SOLID X LIQUID | \_ CORROSIVE \_ REACTIVITY \_ OTHER:

D.O.T. PROPER SHIPPING NAME  
HAZARDOUS WASTE, LIQUID, N.O.S.  
9 NA3082 PGIII  
(LEAD)

HANDLE WITH CARE!

PROFILE SHEET No. E-C19087 ; Status: Accepted by East Palo Alto Facility

ROMIC ENVIRONMENTAL TECH. 2081 Bay Road, East Palo Alto, CA 94303 (800) ROMIC-4-U FAX: (415) 462-2311  
6760 W. Allison Rd., Chandler, AZ 85226 (602) 796-1040 FAX: (602) 796-7944

A. GENERATOR INFORMATION

SANDIA NATIONAL LABORATORIES  
7011 EAST AVENUE  
LIVERMORE, CA 94551-0969

EPA/CA HW ID#: CAD289002923  
Contact: KEVIN LLOYD

Phone: 510 294-2002 Industrial SIC Code: None Listed

B. CUSTOMER INFORMATION : NO ADDITIONAL INFORMATION

C. TRANSPORTER INFORMATION

ROMIC ENVIRONMENTAL TECH.

EPA ID#: CAD009452657

Hauler ID#(s): State - CA Number - 0160

Contact: CUSTOMER SERVICE

Phone: 800 766-4248

D. WASTE STREAM INFORMATION

Name of Waste: WATER CONTAM W/ LEAD

Process Generating Waste (Be Specific): EMPLOYER CLEAN HAND W/ LAVA SOAP AT GUN RANGE

E. HAZARDOUS PROPERTIES

US EPA Hazardous Waste Code(s): D008

CA State Hazardous Waste Code: 132

F. OTHER COMPONENTS

Cyanides, Sulfides, Amines, PCBs, and/or Phenolics are NOT Present.

Chromium VI: 0 ppm

G. APPROVED PROPER SHIPPING DESCRIPTION BASED UPON AVAILABLE INFORMATION (New Info from HM-181 on left if applicable)

HAZARDOUS WASTE, LIQUID, N.O.S.

NA3082 PGIII

AD)

Note: Lowest RQ for individual constituents in or characteristics of this waste is 1 pounds. Generator is responsible for determining if the designation of RQ must be added to shipping description based upon quantity in container.

H. PHYSICAL CHARACTERISTICS

Color: CLR BROWN

Free Liquids (% Volume): 100 Single Layer

pH: - 7 Specific Gravity: 1.1 - 1.2 Flash Point: NONE

I. CHEMICAL COMPOSITION

A. WATER W/ TRACE LEAD CONTAMINATION

J. TOTAL METALS (ppm)

- 100.00 %	Antimony	Sb	0.00	Mercury	Hg	0.00
	Arsenic	As	0.00	Molybdenum	Mo	0.00
	Barium	Ba	0.00	Nickel	Ni	0.00
	Beryllium	Be	0.00	Selenium	Se	0.00
	Cadmium	Cd	0.00	Silver	Ag	0.00
	Chromium	Cr	0.00	Thallium	Tl	0.00
	Cobalt	Co	0.00	Vanadium	V	0.00
	Copper	Cu	0.00	Zinc	Zn	0.00
	Lead	Pb	.50			

ACCEPT/REJECT DATE: 12-Oct-1993

Recertification required two years from this Date

Authorized Romic Signature: \_\_\_\_\_

or \_\_\_\_\_

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CAD289002923	2. Page 1 of
3. Generator's Name and Mailing Address SANDIA NATIONAL LABORATORIES 7011 EAST AVENUE LIVERMORE, CA 94551-0969		4. Generator's Phone: 510 294-2002	5. Contact: KEVIN LLOYD
A. State Manifest Document Number		B. State Generator's ID HA HQ ##-##### or HY HQ ##-#####	
5. Transporter 1 Company Name ROMIC ENVIRONMENTAL TECH.		6. US EPA ID Number CAD009452657	C. State Transporter's ID D. Transporter's Phone: 800 766-4248
7. Transporter 2 Company Name		8. US EPA ID Number	F. State Transporter's ID F. Transporter's Phone:
9. Designated Facility Name and Site Address ROMIC ENVIRONMENTAL TECH. 2081 Bay Road East Palo Alto, CA 94303-1316		10. US EPA ID Number C A D 0 0 9 4 5 2 6 5 7	G. State Facility's ID C A D 0 0 9 4 5 2 6 5 7 H. Facility's Phone (415) 324-1638
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) a. HAZARDOUS WASTE, LIQUID, N.O.S. 9 NA3082 PGIII (LEAD)			I. Waste No. .. State 132 EPA D008 EPA/Other SEE BOX 15
J. Additional Descriptions for Materials Listed Above A.WATER W/ TRACE LEAD CONTAMINATION - 100 %			
15. Special Handling Instructions and Additional Information Line # Profile # DOT ERG # EPA/Other Waste Code(s) A C19087 31		EMERGENCY PHONE NUMBER: GLOVES, GOGGLES & PROTECTIVE CLOTHING	

## References

Clark, Tommy, 1995, Sandia Protective Forces, Personnel Communication with H. M. Torres.

Verges, Christopher, 1995, Sandia Protective Forces, Personnel Communication with H. M. Torres.

Sandia National Laboratories/California, Site Environmental Report for 1994.

Pollution Prevention Opportunity Assessment Plan for Sandia National Laboratories/California, PD457712, March, 1995.

U.S. DOE, Sandia National Laboratories/California, Environmental Protection Hazardous Waste Container Log, (1993/94).

Penguin Industrial Inc., Material Safety Data Sheets (MSDS), Hoppe's #9 Nitro Powder Solvent, (August 3, 1992).

California Toxicity Regulation, California Code of Regulations, Title 22, Section 66261.24(2)(A).

RCRA D List, Hazardous Waste Codes, 40 CFR, Part 261, Table 1.

Sandia National Laboratories/California, Statement of Work for Protective Force, November 1, 1990.

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