

*2002 Toxic Chemical Release Inventory Report
for the Emergency Planning and Community
Right-to-Know Act of 1986,
Title III, Section 313*



Los Alamos
NATIONAL LABORATORY

*Los Alamos National Laboratory is operated by the University of California
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The previous reports in the unclassified series are LA-13655-PR, LA-13764-PR, LA-13868-PR, and LA-14071-PR.

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Issued: November 2003

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RRES-MAQ (Meteorology and Air Quality Group)

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Abstract

For reporting year 2002, Los Alamos National Laboratory (LANL or the Laboratory) submitted Form R reports for lead compounds and mercury as required under the Emergency Planning and Community Right-to-Know Act (EPCRA), Section 313. No other EPCRA Section 313 chemicals were used in 2002 above the reportable thresholds. This document was prepared to provide a description of the evaluation of EPCRA Section 313 chemical usage and threshold determinations for LANL for calendar year 2002 as well as provide background information about the data included on the Form R reports.

Section 313 of EPCRA specifically requires facilities to submit a Toxic Chemical Release Inventory report (Form R) to the U.S. Environmental Protection Agency (EPA) and state agencies if the owners and operators manufacture, process, or otherwise use any of the listed toxic chemicals above listed threshold quantities. EPA compiles this data in the Toxic Release Inventory database. Form R reports for each chemical over threshold quantities must be submitted on or before July 1 each year and must cover activities that occurred at the facility during the previous year.

In 1999 EPA promulgated a final rule on Persistent Bioaccumulative Toxics (PBTs). This rule added several chemicals to the EPCRA Section 313 list of toxic chemicals and established lower reporting thresholds for these and other PBT chemicals that were already reportable under EPCRA Section 313. These lower thresholds became applicable in reporting year 2000. In 2001, EPA expanded the PBT rule to include a lower reporting threshold for lead and lead compounds. Facilities that manufacture, process, or otherwise use more than 100 lb of lead or lead compounds must submit a Form R.

1.0 INTRODUCTION

On April 21, 2000, President Clinton signed Executive Order (EO) 13148, which requires all federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act (EPCRA), or Title III of the Superfund Amendments and Reauthorization Act of 1986. EO 13148 supersedes EO 12856 of 1995. Section 313 of EPCRA specifically requires facilities to submit a Toxic Chemical Release Inventory report (Form R) to the U.S. Environmental Protection Agency (EPA) and state agencies if the owners and operators manufacture, process, or otherwise use any of the listed toxic chemicals above listed threshold quantities. On October 19, 1999, EPA promulgated a final rule on Persistent Bioaccumulative Toxics (PBTs). This rule added several chemicals to the EPCRA Section 313 list of toxic chemicals and established lower reporting thresholds for these and other PBT chemicals that were already reportable under EPCRA Section 313. These lower thresholds became applicable in reporting year 2000. On January 17, 2001, the PBT rule was amended to include lead and lead compounds and lowered the reporting threshold to 100 lb. The lower threshold for lead and lead compounds became applicable in reporting year 2001.

EPA compiles the data submitted on the Form R reports in a Toxic Release Inventory (TRI) database. The TRI database provides the public with information on the releases of EPCRA Section 313 chemicals in their communities as well as provides EPA with release information to assist in determining the need for future regulations (<http://www.epa.gov/tri/>). A Form R must be submitted on or before July 1 each year and must cover activities that occurred at the facility during the previous calendar year. Even though federal facilities were not required to report under EPCRA Section 313 until 1995, Los Alamos National Laboratory (LANL) has been reporting under EPCRA Section 313 since 1987. For reporting year 2002, LANL submitted Form R reports for lead compounds and mercury. No other EPCRA Section 313 chemicals were used in 2002 above the reportable thresholds. Toxic chemicals used in exempt activities as defined by the regulation are excluded from analysis. Descriptions of these exempt activities are included in Section 2.2 of this report.

This report summarizes the data evaluation, exemption analysis, activity determinations, and threshold determinations for toxic chemical use at LANL in 2002 and describes the environmental release data that were reported on the Form R reports. Individual sections for certain toxic chemicals used at LANL are included in this report. Appendix A presents a summary table of EPCRA Section 313 chemicals procured at LANL in 2002. Appendix B includes a copy of the Form R reports submitted to EPA and the state agency.

Facility Information and Contacts

LANL is located at latitude of 35°49'51" and longitude of 106°14'15" in Los Alamos County, New Mexico. LANL is owned by the Department of Energy (DOE)/National Nuclear Security Administration and is operated by the University of California (UC).

Because the Laboratory is owned and operated by different entities, duplicate Form Rs are submitted by the DOE and UC. The EPA enters the data submitted by the DOE into the TRI database. The LANL UC TRI facility ID number is 87545LSLMSLOSAL. The TRI facility number for the Los Alamos DOE complex is 87544SDLSL52835. The 2002 EPCRA Section 313 contacts are Jean Dewart, UC technical contact at (505) 665-0239; George Van Tiem, UC public contact at (505) 667-6211; and Gene Turner, DOE technical and public contact at (505) 667-5794.

2.0 ACTIVITY DETERMINATIONS, EXEMPTIONS, AND QUALIFIERS

2.1 Activity Determinations

EPCRA Section 313 chemical usage is evaluated against three activity determinations. For listed chemicals that are not PBTs, the thresholds are as follows:

Manufacture

The term “manufacture” means to produce, prepare, compound, or import an EPCRA Section 313 chemical. The term manufacture also includes coincidental production of an EPCRA Section 313 chemical as a result of the manufacture, processing, otherwise use, or treatment of other chemical substances. The threshold value for manufacture is 25,000 lb.

Process

The term “process” means the preparation of a listed EPCRA Section 313 chemical, after its manufacture, for distribution in commerce. Processing is usually the intentional incorporation of an EPCRA Section 313 chemical into a product. The threshold value for process is 25,000 lb.

Otherwise Use

The term “otherwise use” usually means any use of an EPCRA Section 313 chemical, including in a mixture or trade name product or waste that is not covered by the terms “manufacture” or “process.” The threshold value for otherwise use is 10,000 lb.

Persistent Bioaccumulative Toxics (PBTs)

For the subset of chemicals listed as PBTs, lower reporting thresholds have been established for individual chemicals ranging from 100 lb to 0.1 gram. These lower thresholds apply to each of the activity determinations: manufacture, process, and otherwise use. Although the threshold for each activity is the same, each chemical must be evaluated against the activity determinations to determine which activity the chemical is used under. Threshold determinations for PBTs are still evaluated separately against the manufacture, process, and otherwise use activities described above.

2.2 Exemptions

Exemptions from EPCRA Section 313 toxic chemical reporting applicable to LANL include the following:

Laboratory Activities Exemption

EPCRA Section 313 chemicals that are manufactured, processed, or otherwise used in laboratory activities at a covered facility under the direct supervision of a technically qualified individual do not have to be considered for threshold determinations and release calculations. However, pilot plant scale, specialty chemical production, or the use of the chemicals for laboratory support activities do not qualify for this laboratory activities exemption.

Otherwise Use Exemption

Certain “Otherwise Uses” of listed EPCRA Section 313 chemicals are specifically exempted:

- otherwise use as a structural component of the facility,
- otherwise use in routine janitorial or facility grounds maintenance,
- personal uses by employees or other persons,
- otherwise use of products containing EPCRA Section 313 chemicals for the purpose of maintaining motor vehicles operated by the facility, or
- otherwise use of EPCRA Section 313 chemicals contained in intake water (used for processing or noncontact cooling) or in intake air (used either as compressed air or for combustion).

Article Exemption

EPCRA Section 313 chemicals contained in articles that are processed or otherwise used are exempt from threshold determinations and release calculations. For an item to be exempt as part of an article, it must satisfy the following three criteria:

- be a manufactured item that is formed to a specific shape or design during manufacture,
- have end use functions dependent in whole or in part on its shape or design during end use, and
- must not release an EPCRA Section 313 chemical under normal circumstances of processing or otherwise use of the item at the facility. Total releases from any item or like items qualifying as article exempt must be equal to or less than 0.5 lb to remain exempt as articles.¹

***De Minimis* Exemption**

The *de minimis* exemption allows facilities to exempt certain minimal concentrations of EPCRA Section 313 chemicals contained in mixtures or other trade name products when making threshold determinations and release calculations. The *de minimis* concentrations

are set by EPA at either 1% or 0.1%, depending on whether the chemical is a carcinogen or suspected carcinogen.

EPA eliminated the *de minimis* exemption for the list of PBT chemicals. This means that facilities must include all amounts of PBTs in threshold determinations and release and other waste management calculations regardless of the concentration of the PBTs in mixtures or trade name products.

2.3 Qualifiers

In addition to exemptions, certain EPCRA Section 313 chemicals have “qualifiers.” These qualifiers indicate that these chemicals are subject to the reporting requirements only if manufactured, processed, or otherwise used in a specific form or when a certain activity is performed. Examples of qualifiers are shown in Table 2-1.

Table 2-1. Examples of EPCRA Section 313 Chemical Qualifiers

Chemical Name	Chemical Abstracts Service (CAS) Number	Qualifier
Aluminum	7429-90-5	Only if it is a fume or dust form.
Hydrochloric Acid	7647-01-0	Only if it is an aerosol form.
Isopropyl Alcohol	67-63-0	Only if it is being manufactured by the strong acid process.
Sulfuric Acid	7664-93-9	Only if it is an aerosol form.
Nitrate Compounds	NA	Only when in aqueous solution.
Vanadium	7440-62-2	Except when contained in an alloy.

NA = Not Applicable

3.0 ANALYSIS FOR THRESHOLD DETERMINATIONS

There are several steps in determining when a chemical triggers reporting under EPCRA 313. When a chemical is manufactured, processed or otherwise used in amounts greater than the threshold quantity a Form R report and release calculations are required. Figure 3-1 presents a flowchart that shows the steps that must be performed to determine if reporting under EPCRA Section 313 is required.

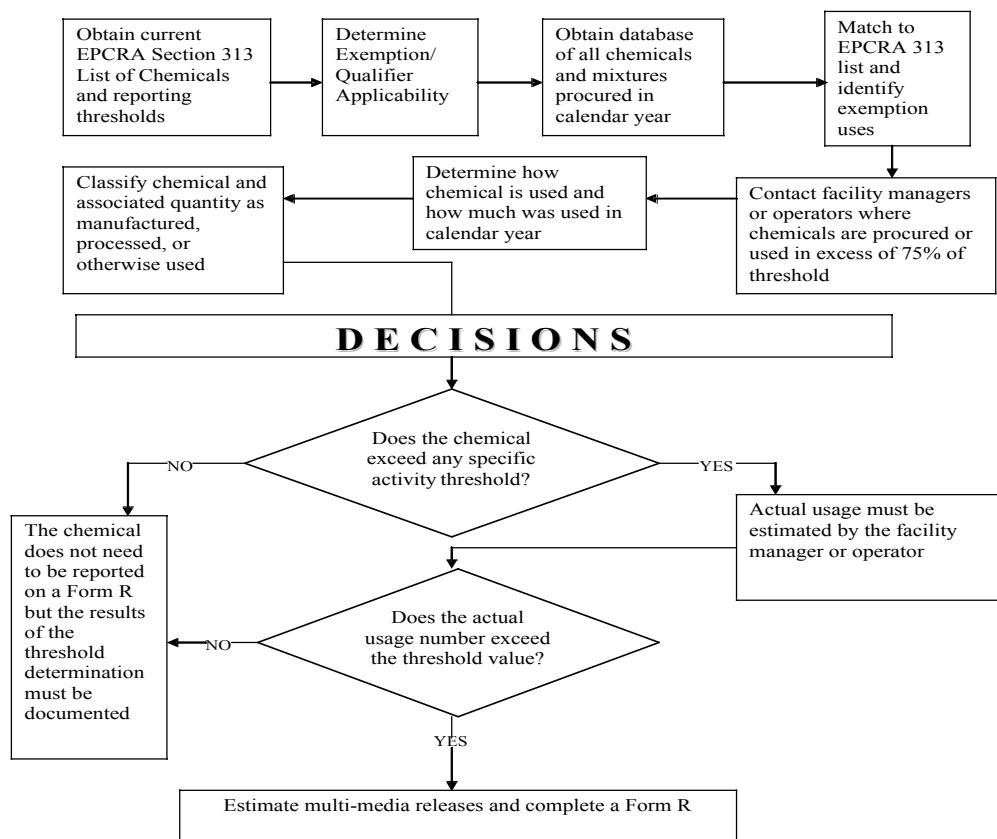


Figure 3-1. Flowchart of Process of Analysis for EPCRA Section 313 Reporting

3.1 Threshold Determination for Chemical Use

Chemicals are purchased at the Laboratory through a variety of procurement systems. These systems include Just-In-Time (JIT), Purchase Orders (PO), Local Vendor Agreements (LVAs), and STOREs (on-site gas facility). In 2002, LANL converted their chemical management to new software called ChemLog. The ChemLog system replaced the Automated Chemical Inventory System database for tracking chemicals brought on site at the Laboratory. ChemLog captures the majority of procured chemicals and provides relevant data (e.g., chemical name, CAS number, quantity, etc.) to assist in threshold determinations.

Inventory

For calendar year 2002, a total of 40,649 records were added to ChemLog and evaluated; 24,325 were pure chemicals, and 16,324 records were mixtures. Individual items with identifiable CAS numbers in ChemLog were considered pure chemicals. These items were matched by CAS number to the list of EPCRA Section 313 chemicals. To identify EPCRA Section 313 chemical compounds, a text search was done on the chemical name field in ChemLog (e.g., *lead*, *zinc*, etc.). The resulting records were summed in pounds for each pure chemical.

Individual items that did not have CAS numbers in ChemLog were considered mixtures. The exemptions discussed in Section 2.2 of this report were applied to the mixtures and each qualifying item was classified according to the applicable exemption. The mixtures were sorted from highest to lowest quantity and Material Safety Data Sheets were reviewed to determine the presence and amount of EPCRA Section 313 constituents. This was done for all mixtures purchased in quantities greater than 100 lb to ensure that the EPCRA Section 313 chemicals with thresholds greater than 100 lb would be identified. EPCRA Section 313 chemicals with thresholds less than 100 lb were examined individually, based on process knowledge and known potential sources. Each mixture that contained an EPCRA Section 313 chemical was further evaluated to determine the weight of each constituent. The totals for these amounts were then added to the quantities of pure EPCRA Section 313 chemicals.

Procurement

Chemical purchases are not always captured in ChemLog. Procurement data directly from JIT, STOREs, and POs were evaluated in order to assess materials that were procured at the Laboratory, but did not get tracked in ChemLog. This analysis was based on a chemical order report containing vouchered orders for calendar year 2002. Chemical purchases through LVAs were reviewed to determine if there were any EPCRA Section 313 chemicals. Additionally, sub-contractors to the Laboratory were contacted to determine if any chemicals were brought on-site that were not tracked in ChemLog. Several chemicals were identified through these avenues and were added to the sum of EPCRA Section 313 chemicals evaluated in ChemLog.

Additional Analysis

Certain high-usage chemicals, as well as chemicals with low thresholds (i.e., PBTs), were evaluated beyond inventory and procurement (e.g., operational processes) and are addressed in Section 4.0 of this report.

3.2 Threshold Determination Results

Procurement Totals

The amounts of EPCRA Section 313 chemicals identified through inventory and procurement were summed together to develop preliminary threshold determinations. The resulting totals for the top 10 EPCRA Section 313 chemicals are summarized below in Table 3-1.

Table 3-1. Top 10 EPCRA Section 313 Chemicals Procured in 2002

CAS Number	Chemical Name	Total Procured (lb)
7664-93-9	Sulfuric acid (liquid form)	89,897
7647-01-0	Hydrochloric acid (liquid form)	7,672
7697-37-2	Nitric acid	7,370
NA	Polychlorinated alkanes	3,547
75-45-6	Chlorodifluoromethane	2,511
75-09-2	Dichloromethane	2,360
115-07-1	Propylene	2,103
75-05-8	Acetonitrile	1,907
NA	Zinc compounds	1,857
NA	Manganese compounds	1,815

NA = Not applicable

The total amounts of mercury and lead procured are not shown in Table 3-1. Because both lead and mercury are PBTs, the thresholds for reporting are 100 lb and 10 lb, respectively. Detailed analyses of lead and mercury and the Form R reporting are discussed in later sections of this report.

Sulfuric acid was the only EPCRA Section 313 chemical purchased above the 10,000-lb otherwise used threshold and required further investigation. Hydrochloric acid and nitric acid were evaluated separately with additional operational information not available in ChemLog. Section 4.0 of this report provides individual analyses of these chemicals as well as information on other EPCRA Section 313 chemicals.

4.0 ADDITIONAL EVALUATION OF CERTAIN TOXIC CHEMICALS

The toxic chemicals described below are either used in relatively high volumes at LANL, have very low reporting thresholds, are of special interest, or have been reported in the past. Additional analyses were required to determine total usage of these chemicals. None of the chemicals presented in this section exceeded any of the applicable thresholds in 2002 and therefore no reporting was required.

4.1 Sulfuric Acid

EPCRA Section 313 reporting guidelines state that sulfuric acid must be reported only if it is in an aerosol form, including mists, vapors, gas, fog, and other airborne forms of any particle size. This would include acid aerosols generated in storage tanks and from fuel combustion. Large purchases of sulfuric acid are used in liquid form for demineralizer regeneration and for sample analysis at the Sanitary Waste Systems Consolidation (SWSC) Plant. Because this sulfuric acid is used in liquid form, it is not subject to EPCRA 313 reporting. Sulfuric acid aerosols are generated as a result of storage tank emissions and fuel combustion byproducts. The total amount of sulfuric acid mist generated for both of these activities is less than the 25,000-lb manufacture threshold and is therefore not reported.

Based on EPA guidance for fuel oil combustion, it is assumed that all sulfur trioxide (SO_3) emissions are in the form of sulfuric acid.² For natural gas combustion it is conservatively assumed that all sulfur oxides emissions are in the form of sulfuric acid mist because separate SO_3 emission factors are not available. Procurements of small quantities of sulfuric acid are assumed to be in aerosol form since the specific usage is unknown; however, this total is well below the otherwise use reporting threshold and is therefore not reported. A summary of the threshold determinations for sulfuric acid is provided in Table 4-1.

4.2 Nitric Acid

In general, nitric acid is used in high volume at the Laboratory every reporting year. The main uses are in research and development activities, sample preparation, plutonium processing, and the Laboratory's bio-assay program. Small amounts of nitric acid are also used for cleaning glassware. The total amount of nitric acid used at LANL in 2002 does not exceed any EPCRA 313 thresholds and is not reported.

In 2001, LANL installed and began operating a nitric acid recycle system at the plutonium processing facility. This unit separates and recovers aqueous nitric acid solution, which can then be directly reused in the process. The recycle system has decreased by approximately 90% the amount of new nitric acid that must be added to the system and has decreased the volume of waste generated from this process. Table 4-2 summarizes nitric acid use at LANL for 2002.

Table 4-1. Sulfuric Acid Threshold Determinations for 2002

Description	Amount of Sulfuric Acid (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Demineralizer Regeneration	89,264	Site Support Contractor		
Water Analysis at the SWSC Plant	100.5	Site Support Contractor	Not in aerosol form and not subject to EPCRA Section 313	NA
Procurement	532.2*	Procurement Data	Otherwise Used	10,000
Storage Tank Air Emissions	0.002	EPA, TANKS 4.0 Software		
Fuel Combustion Byproducts	730.8	AP-42 ² and fuel use records	Manufactured	25,000

*Assumed to be in aerosol form.

Table 4-2. Nitric Acid Threshold Determinations for 2002

Description	Amount of Nitric Acid (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Laboratory Use	3,294	Procurement Records and Interviews	Laboratory Exempt*	NA
Glassware Cleaning	366	Procurement Records and Interviews		
Plutonium Processing	6,824	Facility Records	Otherwise Used	10,000
Other Procurement	681	Procurement Records and Interviews		
Total Otherwise Used:	7,871			

*EPCRA 313 laboratory exempt for chemicals used in a laboratory setting under the supervision of a technically qualified individual.

4.3 Hydrochloric Acid

Hydrochloric acid (HCl) is purchased by LANL for numerous processes and is also generated as a combustion by-product.

Procurement of Hydrochloric Acid

The total amount of HCl procured in 2002 was approximately 7,673 lb. This includes HCl from pure chemicals and mixtures in Chemlog, direct procurement, and contractors.

In 1995, EPA added a modifier to the listing of HCl to exclude non-aerosol forms. The listing now reads “Hydrochloric acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size).”³ Therefore, if HCl is present in the form of a gas, fog, vapor, mist, or any other airborne form, then it is considered to be in the aerosol form and is covered by the EPCRA Section 313 HCl aerosols listing.

The Facility and Waste Operations group made the majority of the procurements for multiple 14-gallon carboys of aqueous HCl adding up to approximately 4,463 lb, or 58% of the total HCl procured. This HCl was used for heat exchanger scale cleaning and for the cleaning of electrodialysis reversal membranes and is exempt from EPCRA 313 because it is in aqueous form.

However, the use of the aqueous HCl does generate a small amount of aerosol mist. The amount of HCl aerosol generated from these particular activities was estimated to be 0.24 lb based on specific process information and engineering calculations. This quantity of HCl is considered manufactured and is subject to the 25,000-lb manufactured threshold.

The amount of HCl evaluated against the 10,000-lb otherwise used threshold was the total amount of HCl procured (7,673 lb), minus the aqueous HCl used by Waste Facility Management discussed above (4,463 lb), which is 3,210 lb. This quantity of HCl likely includes aqueous forms of HCl, not just aerosol forms. To be conservative, the entire amount of 3,210 lb was assumed to be in an aerosol form and was evaluated against the 10,000-lb otherwise use threshold, which it does not exceed.

Hydrochloric Acid from Combustion Sources

In 2002 LANL operated three “air curtain destructors” (ACDs) to safely and cleanly burn piles of downed trees, stumps, and slash from forest thinning projects. The ACDs work by blowing a curtain of air over materials as they burn within a semi-enclosed environment. The fan-driven curtain of air introduces a steady oxygen supply into the fuel and helps ensure that nearly all fuel and gasses are consumed. Each unit can burn up to 10 tons of wood per hour.

In 2002 a total of 11,857.5 tons of wood and straw generated from forest thinning and erosion control activities were burned in the ACDs. An AP-42 emission factor for HCl emissions for burning wood residue in boilers was used to estimate emissions from the wood burning in the ACDs.⁴ An emission factor of 1.90×10^{-2} lb per MMBtu heat input

was used. Assuming an average heat content of the wood at 0.0045 MMBtu/lb wood, emissions of HCl were estimated to be 2,028 lb. The creation of HCl as a by-product from wood combustion is considered “manufactured” and is compared to the 25,000-lb EPCRA threshold.

Table 4-3 summarizes the analysis for HCl.

Table 4-3. Hydrochloric Acid Threshold Determinations for 2002

Description	Amount of Hydrochloric Acid (lb)	Data Source	EPCRA 313 Activity Determination	EPCRA 313 Activity Threshold (lb)
Aqueous HCl	4,463	Procurement, and interviews	Exempt based on non-aerosol qualifier	NA
Other Procurement	3,210*	Procurement records	Otherwise Used	10,000
Aerosol generated from use of aqueous HCl	0.24	Engineering calculations	Manufactured	25,000
Combustion by-products	2,028	Wood throughput and AP-42		

*Assumed to be in aerosol form.

4.4 Polycyclic Aromatic Compounds

Polycyclic aromatic compounds (PACs) are a chemical category added to the EPCRA Section 313 list in 2000 as part of the PBT rule. The threshold for reporting PACs is 100 lb. Benzo(g,h,i)perylene is a PAC that has its own separate threshold. The threshold for benzo(g,h,i)perylene is 10 lb.

According to EPA’s “EPCRA Section 313 Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category,”⁵ fuel oil and paving asphalt contain PACs. In addition, PACs may be generated from the combustion of natural gas, fuel oil, and wood and the manufacture of asphalt. Each of these sources of PACs was evaluated and is described below.

PACs from Air Curtain Destructors

In 2002, LANL operated three ACDs to safely and cleanly burn piles of downed trees, stumps, and slash from forest thinning projects. A total of 11,857.5 tons of wood and straw was burned in 2002. Guidance provided by EPA provides an emission factor for PACs of 1.35×10^{-4} lb/ton wood burned and an emission factor for benzo(g,h,i)perylene of 1.2×10^{-6} lb/ton wood burned.⁶ Using these emission factors it was estimated that approximately 1.6 lb of PACs and 0.014 lb of benzo(g,h,i)perylene were manufactured from the burning of wood in 2002.

PACs from Asphalt Production

In 2002, LANL produced approximately 6,944 tons of asphalt and used 64,348 gallons (582,366 lb) of asphalt tar. The asphalt was used for paving new roads and parking lots and for minor road and parking lot patching and repairs. A review of work orders for 2002 identified 1,917 tons (28%) of the asphalt that qualified for the facility maintenance exemption. Work tickets identified as routine facility maintenance include routine patching of potholes and repair of roads and parking lots and resurfacing of existing parking lots. It was assumed that a proportional percentage of the asphalt tar was used for facility maintenance exempt activities. Therefore, the amount of asphalt and asphalt tar that is subject to EPCRA reporting as otherwise used is 72% of the total used which equates to 5,000 tons of asphalt and 419,304 lb of asphalt tar.

Asphalt tar may contain 178 ppm of PACs.⁵ This equates to 74.6 lb of PACs that apply to the 100-lb otherwise used threshold. The concentration of benzo(g,h,i)perylene in asphalt tar is 1.2 ppm.⁷ Therefore, 0.50 lb of benzo(g,h,i)perylene is applied towards its 10-lb otherwise used threshold. Emissions of total PACs and benzo(g,h,i)perylene from asphalt production are applicable to the 100-lb manufacture threshold. Using AP-42 emission factors,⁸ these amounts were calculated to be 9.5×10^{-4} lb of PACs and 2.5×10^{-6} lb of benzo(g,h,i)perylene.

PACs from Fuel Oil Combustion

The main power plant at LANL used 23,654 gallons of fuel oil in 2002. An additional 8,000 gallons is estimated to have been used in diesel-fired generators throughout LANL, and 35,986 gallons of diesel were used in the ACDs, totaling 67,640 gallons. According to EPA guidance, fuel oil may contain 10 ppm of PACs.⁵ Based on these fuel records, 4.8 lb of PACs apply to the otherwise used threshold. The value for benzo(g,h,i)perylene is 0.05 ppm.⁷ This equates to 0.03 lb of this particular PAC, applicable to the 10-lb otherwise used threshold.

In addition, the combustion of fuel oil will generate emissions of PACs that apply to the manufacture threshold. Using AP-42 emission factors,² these amounts were calculated to be 0.001 lb for total PACs and 0.0002 lb for benzo(g,h,i)perylene.

PACs from Natural Gas

Approximately 1,174.7 million standard cubic feet of natural gas was burned at LANL facilities in 2002. Using AP-42 emission factors⁹ and fuel records, approximately 0.019 lb of PACs was produced from natural gas combustion, which is applied to the manufacture threshold. Approximately 0.001 lb of benzo(g,h,i)perylene applies toward the 10-lb manufacture threshold. Due to the absence of information regarding total PAC and benzo(g,h,i)perylene concentrations in natural gas, it was assumed that these substances are negligible in natural gas before combustion.

Summary of PACs

Based on the analysis of sources described above, 79.8 lb of total PACs qualifies as otherwise used and 1.62 lb as manufactured. These values are below each threshold value of 100 lb and therefore reporting of PACs for 2002 was not necessary. For benzo(g,h,i)perylene, otherwise used accounted for 0.53 lb, while 0.015 lb was manufactured. These values are also below the threshold of 10 lb and reporting was not necessary under EPCRA Section 313.

Table 4-4 summarizes the PACs and benzo(g,h,i)perylene threshold determinations.

Table 4-4. PACs Threshold Determinations for 2002

Description	Used in / Produced From:	Amount (lb)	Total (lb)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Total PACs	Natural Gas	0	79.8	Otherwise Used	100
	Asphalt	75			
	Fuel Oil	4.8	1.62	Manufactured	100
	Natural Gas	0.019			
	Asphalt	9.5×10^{-4}			
	Fuel Oil	0.001			
	ACDs	1.6			
Benzo(g,h,i)perylene	Natural Gas	0	0.53	Otherwise Used	10
	Asphalt	0.5			
	Fuel Oil	0.03			
	Natural Gas	0.001	0.015	Manufactured	10
	Asphalt	2.5×10^{-6}			
	Fuel Oil	0.0002			
	ACDs	0.014			

4.5 Dioxins

Dioxins are a group of PBTs that are formed during combustion processes. The EPCRA 313 reporting threshold for the dioxins category was established as 0.1 grams manufactured, processed, or otherwise used. This limit applies to toxic equivalent compounds, a category of dioxins which consists of 17 specific dioxin and dioxin-like compounds. These “compounds with chlorine substitution in the 2, 3, 7, 8-positions on the molecule are reportable under the EPCRA section 313 dioxin and dioxin-like compounds category.”¹⁰

Activities at LANL that were evaluated for dioxins include explosives activities, fuel combustion, and use of the ACDs. Each is described below.

Explosives Activities

Dioxins are formed by burning chlorine-based chemical compounds with hydrocarbons, producing an unintentional by-product in many industrial processes involving chlorine. One potential source of dioxin formation at LANL is open burn/open detonation (OB/OD) of high explosives (HE). This is because many binders that are found in the HE materials have chlorine in their chemical make-up. Therefore, analysis of HE materials and associated binders/plasticizers was performed to estimate dioxin emissions.

Information on the various HE materials, such as explosive type, explosive name and composition, and chemical formula was obtained from laboratory personnel and textbooks. Several HE materials contain either binders or plasticizers. These binders and plasticizers were evaluated and screened for those that contained chlorine. For those chlorine-containing binders/plasticizers, the weight percent chlorine in each was determined. Knowing the weight percent binder/plasticizer in these explosives and the weight percent chlorine in each binder, the amount of binder and amount of chlorine in each HE material was determined. Due to the unique nature of these materials, no specific dioxin emission factors are available. Therefore, a dioxin emission factor for burning of polyvinyl chloride in accidental fires was used to estimate dioxin emissions from burning of the chlorine-containing materials.¹¹ An emission factor of 4 µg dioxin emitted/ton of material burned was used.

Based on the available information, the estimated amount of dioxins formed by OB/OD of HE materials was 2.10×10^{-7} g/yr. Furthermore, HE burned at Technical Area (TA) 16 was also evaluated for dioxin formation. Based on evaluation of the materials containing chlorine, the amount of dioxins formed was 1.36×10^{-6} g/yr. Combining the total estimated dioxins from HE expended and HE burned, the total dioxin emissions were 1.57×10^{-6} g/yr.

Fuel Combustion

LANL burns natural gas and diesel fuel in numerous boilers, heaters, and generators. No emission factors for dioxins were found for natural gas combustion. However, the EPA EPCRA Guidance for Dioxins provides an emission factor of 3,178.6 picograms/Liter of diesel fuel burned.¹⁰ The Laboratory burned diesel fuel in the TA-3 power plant (23,654 gallons), numerous standby generators (8,000 gallons), and the ACDs (35,986 gallons). A total of 67,640 gallons (256,017 Liters) of diesel fuel was burned in these units in 2002. Multiplying by the dioxin emission factor, a total of 8.14×10^8 picograms (0.000814 grams) of dioxin was formed due to fuel combustion.

Air Curtain Destructors

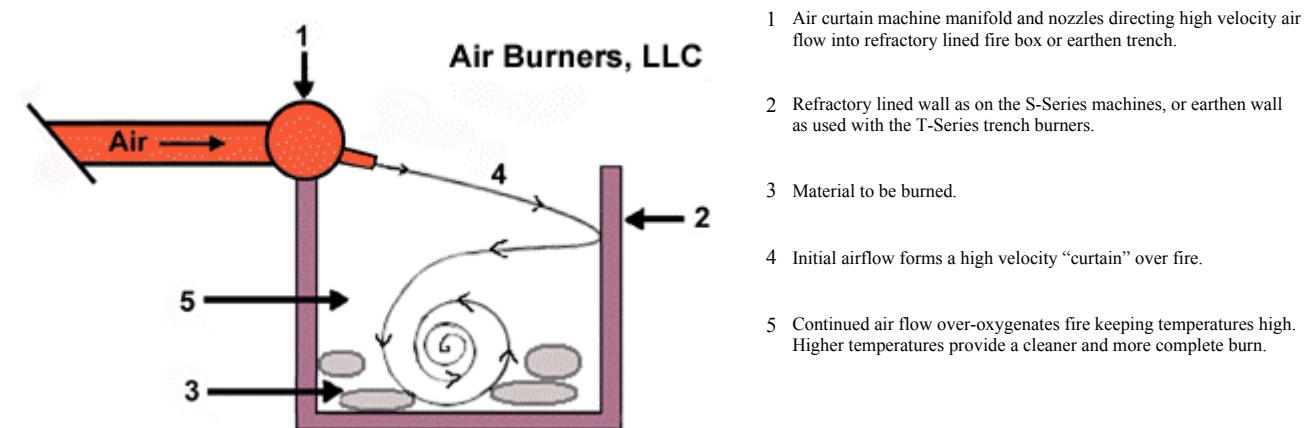
LANL operates three ACDs to aid in its fire mitigation and tree thinning activities. In 2002, the ACDs burned 11,857.5 tons of wood and brush on Laboratory property. These ACDs potentially emit dioxins during the wood burning process. No information is available on dioxin emissions from ACDs.

In order to determine a reasonable dioxins emission factor, a literature review was conducted. Several factors influence dioxin formation during the combustion of the wood fuel. These factors include the temperature of the burn, the amount of air available to the fire, and the specific properties of the material being burned.

The higher the temperature at which a fire burns, the more complete combustion, and thus fewer dioxins are formed. The ACDs burn at extremely high temperatures, and therefore the production of dioxin would be particularly low.

The amount of oxygen that is available to the fire also affects the amount of dioxins that are formed during the combustion process. A decrease in oxygen during combustion generally increases the dioxin yield. The ACDs increase the flow of oxygen to the combustion chamber, allowing for more complete combustion of the wood which in turn reduces the formation of dioxins. Figure 4-2 illustrates the airflow within the ACD as it runs.

Figure 4-2. Diagram of ACD



The Laboratory burned clean, chemical free wood in the ACDs. This wood naturally contains very low levels of chloride. The lower the chloride content in the wood, the less dioxins are produced because chloride is essential for the reaction which produces dioxins. Only “0.001 to 0.01% chloride by weight” is present in typical untreated wood and bark.¹² Thus, the potential for the combustion of the wood to produce dioxins in the first place is very low regardless of temperature and the amount of oxygen available.

Within the EPA’s “Database of Sources of Environmental Releases of Dioxin-like Compounds in the United States,” the emission factor given for industrial wood combustion is 0.5952 ng/kg. This value is based on an average of several source tests for industrial wood-fired boilers and incinerators.¹³ The ACDs only burn clean wood while the wood burned by the industrial boilers and incinerators contains more treated wood, causing the emission factor to be higher for the industrial wood combustion. Also, the boilers and incinerators operate at lower temperatures and with less air available to the fire.

As a result of researching the factors that affect the emissions of dioxins and comparing them to the burning parameters of the ACDs, an emissions factor was determined. An emission

factor of 0.5 ng/kg wood burned was used to estimate dioxins emissions from the ACDs. Using the tons of wood burned by the ACDs in 2002 (11,857.5 tons), and the chosen emission factor, the amount of dioxins emitted in 2002 was 0.03 grams.

Table 4-5 summarizes the amount of dioxins formed from all sources characterized for 2002.

Table 4-5. Dioxins Threshold Determination for 2002

Description	Amount of Dioxin Formed (grams)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (grams)
HE Expended	2.10×10^{-7}	Manufactured	0.1
HE Burned	1.36×10^{-6}		
Fuel Combustion	8.14×10^{-4}		
Wood Combustion in ACDs	0.03		
Total Dioxin Formed	0.031		

5.0 FORM R REPORTING - LEAD AND LEAD COMPOUNDS

5.1 Threshold Determination

Lead and lead compounds are used in various places throughout LANL. Procurement records were evaluated and users of large quantities of lead were interviewed to gain an understanding of how lead was actually used in 2002. As part of the PBT rule, the threshold for EPCRA Section 313 reporting of lead was reduced to 100 lb starting calendar year 2001. In 2002, lead was used at several locations within the Laboratory and exceeded the otherwise used threshold for EPCRA 313 reporting. Each use is described below.

Lead Procurements

A listing of all procurements in 2002 of lead and lead compounds was extracted from Chemlog. Line items containing a CAS number for lead (7439-92-1) were included, as well as any line items containing the word “lead” or the symbol “Pb” in the text description.

The total amount of lead and lead compounds added to Chemlog for calendar year 2002 was 15.96 lb. According to EPCRA 313 guidance documents, the laboratory exemption is applied to the quantity of a listed toxic chemical that is manufactured, processed, or otherwise used in a laboratory under the supervision of a technically qualified person. Line items in Chemlog that were clearly described as *lead standards* were assumed to be used in a laboratory setting and exempt from reporting. This accounted for 1.76 lb. The total amount of lead and lead compounds from procurements applied to the otherwise used threshold is 14.3 lb.

Lead Use at the Firing Range

Lead is a component in various types of bullets. LANL maintains an on-site firing range for training of security personnel. The firing range at LANL keeps detailed records of the amount and type of munitions expended. The U.S. Department of Defense developed software for estimating usage and releases of EPCRA 313 chemicals from various munitions activities.¹⁴ The TRI-Data Delivery System (TRI-DDS) software was used to calculate the amounts of toxic chemicals associated with the munitions used at LANL for comparison with EPCRA 313 reporting thresholds and calculation of environmental releases. For ammunition used at LANL that was not represented in the TRI-DDS, the manufacturer was contacted to obtain specific information on lead for that ammunition. Using this software and manufacturer data, it was determined that approximately 9,794 lb of lead was shot at the firing range in 2002. For EPCRA threshold determinations the amount of pure lead used, as well as the amount of any lead compounds “coincidentally manufactured,” must be evaluated. This resulted in approximately 7.7 lb of lead compounds emitted to the air and 9,794 lb of lead released to land, both of which are included in the Form R report.

Lead Bismuth Test Loop

There are two lead-bismuth test loops located at LANL. The smaller loop was not operated or opened and no new lead-bismuth was added or used in 2002. A new lead-bismuth test loop was filled with approximately 8,000 lb of the lead-bismuth alloy in late 2001. No additional lead-bismuth was added to this test loop in 2002. The lead-bismuth in the test loops is contained in a closed system and no environmental releases of lead occurred in 2002. Therefore, the article exemption applies to this equipment.

Air Curtain Destructors

The three ACDs burned a total of 11,857.5 tons of wood and wood scrap. EPA guidance for reporting releases of lead and lead compounds states that the typical concentration of lead in wood is 20 ppm.¹⁵ Using this lead concentration it was calculated that 474 lb of lead were processed from the burning of wood in the ACDs. The 474 lb was applied to the otherwise use threshold. Additionally, based on AP-42 emission factors⁴ during the combustion of wood, 5.12 lb of lead compounds were manufactured.

Fuel Combustion and Asphalt Production

Lead can be found in trace amounts considered impurities in many materials. Fuels and asphalt tar are two materials used at LANL that contain trace quantities of lead. Because lead is one of the PBTs and the *de minimis* exemption does not apply, these trace quantities must also be applied to the 100-lb lead threshold. In 2002, LANL used 419,304 lb of asphalt tar in activities subject to EPCRA reporting. The asphalt tar contained 2.0 lb of lead. LANL burned 67,640 gallons of fuel oil which contained 0.13 lb of lead. Additionally during fuel combustion, the lead in the fuel is converted into various lead compounds, which is considered to be “coincidental manufacture.” In 2002, LANL emitted lead compound emissions from the following combustion sources: the TA-21 steam plant, the asphalt plant, the TA-3 power plant, fuel-fired generators, and numerous small natural gas-fired boilers. The lead compound emissions from these sources totaled 0.48 lb toward the manufactured threshold.

Lead Bricks and Lead Shielding

LANL continues to maintain an inventory of lead shielding and lead bricks throughout the Laboratory. Based on a 2001 wall-to-wall inventory, LANL has an inventory of approximately 879,500 lb of lead shielding and lead bricks. This lead is considered article exempt and does not count towards any EPCRA 313 thresholds unless it is processed in some way (melting, cutting, grinding, etc.) that would result in 0.5 lb or greater releases to the environment. In 2002, there was no on-site processing of lead bricks or shielding.

Lead Shielding Decontamination

Lead shielding decontamination was discontinued at LANL. The activity did not operate in 2002.

Lead Melting

Historically at LANL, lead has been melted and formed into specific shapes for glove box and exposure shielding. No lead melting activities occurred on site at LANL in 2002.

Based on activities at the firing range and the burning of wood in the ACDs, LANL otherwise used more than 100 lbs of lead in 2002 and therefore a Form R for lead and lead compounds was submitted. The thresholds for the different activity determinations involving lead are listed in Table 5-1.

Table 5-1. Lead and Lead Compounds Threshold Determinations for 2002

Description	Amount of Lead (lb)	Amount of Lead Compounds (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Lead Melting	0		Facility Representatives	Otherwise Used	100
Lead Shielding Decontamination	0		Facility Representatives		
Fuel Combustion	0.13		Fuel Use Records and EPA AP-42	Manufactured	100
		0.48	Fuel Use Records and EPA AP-42		
Asphalt Production	2.0		Asphalt Records and EPA-AP-42	Otherwise Used	100
Firing Range	9,794		Firing Range Logbooks and TRI-DDS	Otherwise Used	100
Firing Range		7.7	Firing Range Logbooks and TRI-DDS	Manufactured	100
Procurement	13	1.3	Procurement Data	Otherwise Used	100
Lead-Bismuth Test Loop	0		Facility Interviews	Otherwise Used	100
Air Curtain Destructors	474		ACD Operating Records	Otherwise Used	100
		5.12	ACD Operating Records and EPA AP-42	Manufactured	100

5.2 Environmental Releases and Off-Site Disposal

Air Emissions

Lead emissions were calculated from three operations at the Laboratory: the firing range, the ACDs, and fuel combustion. Lead air emissions from the firing range were calculated using the TRI DDS.¹⁴ Using this model, the total amount of lead released as fugitive air emissions was 7.7 lb.

The ACDs at LANL burned wood and slash from forest thinning activities. The ACDs generate lower emissions than open burning. Diesel fuel is used as a fire starter and in the engine. In 2002, LANL burned 11,857.5 tons of wood and straw and 35,503 gallons of diesel in the ACDs. Using AP-42 emission factors,⁴ emissions of lead compounds from the ACDs were calculated to be 5.12 lb. These are considered fugitive emissions.

In 2002, LANL emitted lead compound emissions from the following combustion sources: the TA-21 steam plant, the asphalt plant, the TA-3 power plant, stand-by stationary generators, and from numerous small boilers and heaters. Using fuel use records and AP-42 emission factors,^{2, 8, 9} the emissions from these combustion sources totaled 0.48 lb of lead compound stack emissions. Table 5-2 summarizes lead compound air emissions from LANL, as reported on the Form R.

Table 5-2. Lead Compounds Air Emissions from LANL in 2002

Emission Source	Total Lead Compound Emissions (lb)	Fugitive or Stack
Firing Range	7.7	Fugitive
Air Curtain Destructors	5.12	Fugitive
Fuel Combustion	0.48	Stack

Releases to Water

Releases to receiving streams are a result of run-off of storm water and from wastewater released from various LANL sites through permitted National Pollutant Discharge Elimination System (NPDES) outfalls.

Wastewater Discharges

Data collected as part of the 2002 NPDES Outfall Monitoring Program were used to calculate the mass of lead discharged. The tabular data from the LANL's NPDES program included total annual flows and analytical results for numerous parameters from samples collected at a number of NPDES outfalls at LANL. Samples for lead were collected once annually from 16 outfall locations, and multiple samples were collected from NPDES Outfalls 021, 048, and

051. Data for each of these three outfalls were averaged. Flow rate was reported in million gal./year for each outfall location. For each NPDES outfall, lead discharges were calculated by multiplying the total yearly flow, in L, by the average concentration of lead from that outfall, in mg/L. The result was then converted to pounds. The resulting mass from each outfall was then summed, resulting in a total discharge of 1.04 lb of lead from LANL NPDES outfalls in 2002.

One of the permitted outfalls (051), the Radioactive Liquid Waste Treatment Facility (RLWTF), conducts pretreatment of the influent to remove a large portion of the lead (and other metals) prior to discharge. Analytical data for influent prior to treatment compared with analytical data after treatment indicate the facility is removing approximately 99% of lead prior to discharge based on 2002 analytical results. Water is treated at the facility through precipitation, filtration, and reverse osmosis.

Storm Water

Lead concentration data for storm water released to receiving streams during calendar year 2002 were obtained from the Water Quality Database Reports web site (<http://wqdbworld.lanl.gov/>) using the Chemistry/Metals/Surface Water Runoff lookup tables. The data set provided the location name, the sample type, date sample was collected, and the analytical result in $\mu\text{g}/\text{L}$. For many of the sample locations, total annual flow in acre feet was obtained from the report titled: Surface Water Data at Los Alamos National Laboratory 2002 Water Year.¹⁶ For samples collected from locations not included in LANL's water year report, LANL's Water Quality and Hydrology group provided estimates of total discharge.

In 2002, a correction was made for the volume of water released from the Los Alamos County Municipal Wastewater Treatment Facility in Pueblo Canyon, which is just upstream of the LANL sampling/flow station Pueblo at SR-502. It was assumed that all of the flow recorded at Pueblo at SR-502 was attributable to treated municipal wastewater effluent, and not representative of release from LANL in 2002. While this flow adjustment was made for the sampling station downstream of the wastewater treatment plant, sampling stations upstream of the wastewater treatment facility were included in the analysis.

Additionally, analytical results from surface water samples collected at locations upstream from or outside the potential zone of impact from LANL releases were not included in the total calculated amounts of lead released from LANL in 2002. These locations include those outside Laboratory property boundaries where no known Laboratory activities or operations have occurred, or upstream of current or historic Laboratory activities. Data from the stations located within Frijoles Canyon were excluded. Portions of Guaje/Rendija and Pueblo Canyons, which are not located on Laboratory property, but are known to have been impacted by historical Laboratory activities, were included in this analysis.

As mercury and lead are naturally occurring elements, and previous LANL studies have established background concentrations for mercury and lead in various media including sediment, the analytical concentrations were adjusted to account for background concentrations. Background concentrations, or Upper Threshold Levels (UTL), for sediments within canyons within the LANL boundary are 0.1 $\mu\text{g}/\text{g}$ and 19.7 $\mu\text{g}/\text{g}$ for mercury and lead,

respectively (Bruce Gallaher, LANL RRES-WQH, personal communication). Water samples collected as part of LANL's annual surveillance program always contain a significant amount of solid particulate that is entrained within the surface water stream at the time of sampling. This particulate mass contains a natural amount, or background concentration, of mercury and lead. As this natural amount of mercury and lead is not attributable to LANL operations, it is necessary to estimate the amount of natural mercury and lead in each sample by multiplying the weight of solids in each sample, as represented by total suspended solids, by the LANL UTL. Following estimation of the background concentration of mercury and lead in each sample, the background amount is subtracted from the analytical metal concentration for each sample.

Once the background adjusted concentrations for each applicable location were established, the concentration was then multiplied by the measured or estimated annual flow at each surface water sampling location. A single mass value for each sampling location was then derived by averaging all samples collected from each location during 2002. The average mass for each location was used as representative in calculating a total LANL release to the environment.

Once the average mass was calculated for each sampling location, the mass from all locations was summed. Based on this sum, the total calculated mass of lead released from LANL in base flow and storm water during 2002 was 105.50 lb. Results were then summed by major drainage on the Pajarito Plateau. Each major drainage area is comprised of several tributary drainages.

For Form R reporting, the total amount of lead released to each receiving stream is reported. For both permitted outfall and storm water data, the receiving stream was determined by finding the monitoring site on a map and determining the nearest canyon. All canyons were assumed to be tributaries of the Rio Grande. Total lead released to canyon tributaries from LANL property was 106.5 lb in calendar year 2002. Table 5-3 summarizes lead releases to receiving streams by canyon, as reported on the Form R.

Table 5-3. Summary of 2002 Lead Discharges to Receiving Streams by Canyon

Canyon	Stormwater (lb)	NPDES Discharges (lb)	Total (lb)
Guaje Canyon Tributary to Rio Grande	25.60	0.00	25.60
Los Alamos Canyon Tributary to Rio Grande	3.38	0.33	3.71
Mortandad Tributary to Rio Grande	0.12	0.045	0.16
Pajarito Canyon Tributary to Rio Grande	15.16	0.21	15.37
Sandia Canyon Tributary to Rio Grande	60.93	0.45	61.38
Water Canyon Tributary to Rio Grande	0.32	0.006	0.32
Totals	105.50	1.04	106.54

Releases to Land

Lead releases to land occur on-site at LANL as a result of firing range activities. Lead releases to land are based on the amount of munitions used during the year and the lead content of the munitions used. Lead content for the munitions used at LANL was estimated by matching the munitions types with those listed in the TRI-DDS.¹⁴ A total of 9,794 lb of lead was released to land at the firing range at LANL in 2002.

Off-Site Disposal of Waste

LANL performed no on-site waste disposal of lead-contaminated waste in 2002. All lead-contaminated waste is sent off-site to EPA-approved facilities for disposal or recycling. Data, including shipment weight and lead concentration, were obtained for all lead-contaminated waste sent off-site for disposal in 2002. The waste disposal records were evaluated to determine any waste shipments that were exempt from reporting. Intact light bulbs sent off site for disposal or recycling are exempt under the article exemption. Waste generated in a laboratory under the direct supervision of a technically qualified individual is also exempt from reporting.

Total reportable lead weight from all non-exempt waste disposal was calculated to be 467.1 lb. Table 5-4 provides a summary of the lead waste streams that were sent off-site to various disposal and recycling companies in 2002. For Form R reporting, each receiving facility was contacted to determine the disposition of the lead in the waste that was shipped off-site.

5.3 Other Information Provided on Form R Report

Environmental releases of lead as air emissions, to surface waters, and on-site land releases were reported to be 13.3 lb, 106.5 lb, and 9,794 lb, respectively. These values are included in Section 5 of the Form R, *Quantity of the Toxic Chemical Entering Each Environmental Medium On-site*. A total of 467.1 lb of lead was reported in Section 6.2 of the Form R, *Transfers to Other Off-site Locations*.

Methods of treating NPDES outfall lead amounts were included in Section 7A of the Form R. This section details on-site waste treatment methods and efficiency. Wastewater from industrial processes at LANL is discharged to the RLWTF prior to discharge to the NPDES permitted outfall No. 051. The RLWTF conducts a series of treatment steps that help to reduce the amount of metals in the effluent prior to discharge. The wastewater stream goes through precipitation, filtration, and reverse osmosis treatment. All wastewater is sampled for lead before and after treatment. Based on analytical results for 2002, the RLWTF resulted in a 99.4% treatment efficiency of lead in the wastewater. Sections 7B and 7C relate to on-site energy recovery and recycling. LANL performed no on-site processes applicable to this section for lead in 2002.

Section 8 of the Form R refers to source reduction and recycling activities. The information provided by EPA for this section states that no energy recovery is possible for lead, either on-site or off-site. LANL also reported no on-site recycling or treatment. Approximately 30 lb of the lead shipped off-site was recycled. Estimates based on this year's values were given for

the subsequent two reporting years. In addition to lead released to the environment for off-site disposal, air, and water emissions, LANL reported 6.1 lb lead in waste shipped offsite for disposal as a result of remedial actions.

Table 5-4. Summary of Lead Compounds in Waste Sent Off-site from LANL in 2002

Company	Location	Facility EPA ID	Ultimate Fate of Waste	Total Lead (lb)
Clean Harbors, Aragonite, LLC. (Formerly Safety Kleen)	Aragonite, UT	UTD981552177	Landfill	85.51
Envirocare of Utah, Inc.	Clive, UT	UTD982598898	Landfill	170.38
Envirosolve LLC.	Albuquerque, NM	NM0000590240	Recycled	0.0009
Onyx Environmental Services, LLC.	Port Arthur, TX	TXD000838896	Landfill	0.39
Onyx Environmental Services, LLC.	Henderson, CO	COD980591184	Recycled for liquids; Landfill for Solids	liquid 0.90 solid 5.68
Onyx Environmental Services, LLC. (Formerly Superior Special Services)	Phoenix, AZ	AZ0000337360	Recycled	27.17
Perma-Fix, Inc.	Gainesville, FL	FLD980711071	Landfill	149.76
Phibro-Tech, Inc.	Santa Fe Springs, CA	CAD008488025	Recycled	1.95
Waste Control Specialists	West, Andrews County, TX	TXD988088464	Landfill	23.85
Los Alamos County Landfill	Los Alamos, NM	NA	Landfill	1.48
		Total		467.1

Section 8.9 of the Form R reports the production ratio, an estimated measure of the production of the reported chemical at the facility, as compared to the previous year. Because LANL is not a production facility a surrogate measure was needed to complete this section of the Form R. To determine this value, the firing range was used as a representative activity that would maintain a consistent usage of lead. Therefore, the amount of lead munitions used in 2002 was divided by the amount of lead munitions used in 2001 to obtain a production ratio of 1.9.

6.0 FORM R REPORTING - MERCURY

6.1 Threshold Determination

Mercury and mercury compounds are used in various places throughout LANL. Procurement records were evaluated and users of large quantities of mercury were interviewed to gain an understanding of how mercury was actually used in 2002. As part of the PBT rule, the threshold for EPCRA Section 313 reporting of mercury was reduced to 10 lb starting calendar year 2000. In 2002, mercury was used at the Laboratory and exceeded the otherwise used threshold for EPCRA 313 reporting. Each use is described below.

Mercury Procurements

A listing of all procurements in 2002 of mercury and mercury compounds was extracted from Chemlog. Line items containing a CAS number for mercury (7439-97-6) were included, as well as any line items containing the word “mercury” or the symbol “Hg” in the text description.

The total amount of mercury and mercury compounds added to Chemlog for calendar year 2002 was 42.2 lb. According to EPCRA 313 guidance documents, the laboratory exemption is applied to the quantity of a listed toxic chemical that is manufactured, processed, or otherwise used in a laboratory under the supervision of a technically qualified person. Line items in Chemlog that were clearly described as *mercury standards or instruments* were assumed to be used in a laboratory setting and exempt from reporting. This accounted for 39.8 lb. The total amount of mercury from procurements applied to the “otherwise used” threshold is 1.2 lbs.

Los Alamos Neutron Science Center Shutter System

The largest use of mercury at the Laboratory is in the Los Alamos Neutron Science Center (LANSCE) shutter system. Reservoirs of mercury are used as shields on the neutron beam shutter system. When the beam is operated, pressurized helium is forced into the mercury reservoir, pushing the mercury up into a head space and allowing the neutron beam to pass through the shutter. LANSCE maintains 12 neutron beam shutter systems, each with a reservoir of mercury. The total amount of mercury in these reservoirs is approximately 12,000 lb. Each reservoir is a closed system and only opened occasionally when minor repairs or maintenance are done.

During 2002, eight mercury shutter systems were dismantled and replaced with new closed loop systems. Mercury was then added to the retrofitted shutters. The total amount of mercury added to the mercury shutter systems in 2002 is 5,830 lb, which is above the 10-lb EPCRA 313 otherwise used threshold for mercury.

Fuel Combustion

In 2002, LANL emitted mercury emissions from the following combustion sources: the TA-21 steam plant, the asphalt plant, the TA-3 power plant, the ACDs, and from numerous small boilers which used approximately 1,174.7 million standard cubic feet of natural gas. The mercury emissions from these sources totaled 0.62 lb towards the manufactured threshold. Additionally, mercury is found in fuel oil as an impurity. According to EPA guidance, the concentration of mercury in No. 2 fuel oil is 0.001 ppm.¹⁷ However, EPA guidance does not have any information on the amount of mercury found in either wood or hay/straw. LANL burned 67,640 gallons of fuel oil in 2002 and this equates to 0.0005 lb of mercury, which will be added to the otherwise used total.

Table 6-1 summarizes uses of mercury at LANL in 2002.

Table 6-1. Mercury Threshold Determinations for 2002

Description	Amount of Mercury (lb)	Data Source	EPCRA 313 Activity Determination	EPCRA 313 Activity Threshold (lb)
Purchasing of Mercury Standards and Instruments	39.8	Facility personnel interviews	Laboratory Exempt*	
Other Procurement	1.2	Procurement Records	Otherwise Used	10
LANSCE Shutter System	5,830	LANSCE Facility Records	Otherwise Used	10
Fuel Combustion	0.0005	Fuel Use Records and EPA Guidance	Otherwise Used	10
Fuel Combustion	0.62	Fuel Use Records and AP-42	Manufactured (mercury compounds)	10

*EPCRA 313 laboratory exempt for chemicals used in a laboratory setting under the supervision of a technically qualified individual.

6.2 Environmental Releases and Off-Site Disposal

Air Emissions

Mercury emissions were calculated from three operations at the Laboratory: the LANSCE shutter system activities, the ACDs, and fuel combustion.

LANSCE

In April 2002, a mercury monitor was installed at LANSCE in the area near the mercury shutters. This monitor collects 5-minute readings of mercury concentrations in the room air in nanograms of mercury per cubic meter. The concentration data recorded from this

monitor were used to develop an average concentration of mercury in the room air during days when the shutters were opened for maintenance and an average concentration for days when the shutter systems remained closed. The flow rate from the stack at the Lujan Center at LANSCE is 12,000 cubic feet per minute (cfm). This stack includes ventilation from two different rooms at the Lujan Center. As a conservative assumption, the total 12,000 cfm flow was assumed to have mercury concentrations similar to those monitored in the room air near the shutters. The total concentration of mercury for each day was calculated with the following formula:

$$\sum [(monitor\ reading) * (flow\ rate) * (5\ min.\ interval)]$$

The sum of all the daily monitoring results equates to 0.109 lb for a conservative estimate of mercury stack emissions from the Lujan Center at LANSCE in 2002.

Air Curtain Destructors

The ACDs at LANL burned wood and slash from forest thinning activities. The ACDs generate lower emissions than open burning. Diesel fuel is used as a fire starter and in the engine. In 2002 LANL burned 11,857.5 tons of wood, and 35,503 gallons of diesel in the ACDs. Using AP-42 emission factors,⁴ emissions of mercury from the ACDs for 2002 were calculated to be 0.37 lb. These are considered fugitive emissions.

Fuel Combustion

In 2002, LANL emitted mercury emissions from the following combustion sources: the TA-21 steam plant, the asphalt plant, the TA-3 power plant, and from numerous small boilers. Using fuel use records and AP-42 emission factors,^{2,8,9} the emissions from these combustion sources totaled 0.24 lb of mercury stack emissions.

Table 6-2 summarizes mercury air emissions from LANL, as reported on the Form R.

Table 6-2. Mercury Air Emissions from LANL in 2002

Emission Source	Total Mercury Emissions (lb)	Fugitive or Stack
LANSCE Shutter System Activities	0.109	Stack
Air Curtain Destructors	0.37	Fugitive
Fuel Combustion	0.24	Stack

Releases to Water

Releases to receiving streams are a result of run-off of storm water and from wastewater released from various LANL sites through permitted NPDES outfalls. The methodology used to calculate releases of mercury to receiving streams is the same as that described in Section 5.2.2 for lead releases. Refer to Section 5.2.2 of this report for a detailed description of how water discharges were calculated.

Wastewater Discharges

A total discharge of 0.003 lb of mercury from LANL NPDES outfalls was reported on the Form R for 2002.

Storm Water

A total discharge of 0.61 lb of mercury from storm water was reported on the Form R for 2002.

For Form R reporting, the total amount of mercury released to each receiving stream is reported. For both permitted outfall and storm water data, the receiving stream was determined by finding the monitoring site on a map and determining the nearest canyon. All canyons were assumed to be tributaries of the Rio Grande. The total amount of mercury released to canyon tributaries from LANL property was 0.61 lb in calendar year 2002. Table 6-3 summarizes mercury releases to receiving streams by canyon, as reported on the Form R.

Table 6-3. Summary of 2002 Mercury Discharges to Receiving Streams by Canyon

Canyon	Stormwater (lb)	NPDES Outfall Discharges (lb)	Total (lb)
Ancho Canyon Tributary to Rio Grande	8.74×10^{-5}	0.00	8.74×10^{-5}
Guaje Canjon Tributary to Rio Grande	0.013	0.00	0.013
Mortandad Tributary to Rio Grande	0.004	0.003	0.007
Pajarito Canyon Tributary to Rio Grande	0.003	0.00	0.003
Pueblo Canyon Tributary to Rio Grande	0.08	0.00	0.08
Sandia Canyon Tributary to Rio Grande	0.51	0.00	0.51
Water Canyon Tributary to Rio Grande	2.34×10^{-4}	0.00	2.34×10^{-4}
Total	0.61	0.003	0.61

Releases to Land

There were no on-site releases of mercury to land.

Off-Site Disposal of Waste

LANL performed no on-site waste disposal of mercury-contaminated wastes in 2002. All mercury-contaminated waste is sent off-site to EPA-approved facilities for disposal or recycling. Data, including shipment weight and mercury concentration, were obtained for all mercury-contaminated wastes sent off-site for disposal in 2002. The waste disposal records were evaluated to determine any waste shipments that were exempt from reporting. Intact light bulbs or thermometers sent off site for disposal are exempt under the article exemption. Waste generated in a laboratory under the direct supervision of a technically qualified individual is also exempt from reporting.

Total reportable mercury weight from all non-exempt waste disposal was calculated to be 182.13 lb. Table 6-4 provides a summary of the mercury waste streams that were sent off-site to various disposal and recycling companies in 2002. For the purposes of Form R reporting, each receiving facility was contacted to determine the disposition of the mercury in the waste that was shipped off-site.

Table 6-4. Summary of Mercury in Waste Sent Off-site from LANL in 2002

Company	Location	Facility EPA ID	Ultimate Fate of Waste	Total Mercury (lb)
Clean Harbors, Aragonite, LLC. (Formerly Safety Kleen)	Aragonite, UT	UTD981552177	Landfill	0.86
Envirocare of Utah, Inc.	Clive, UT	UTD982598898	Landfill	0.00
Material and Energy Corporation	Oak Ridge, TN	TNR000005397	Landfill	154.55
Onyx Environmental Services, LLC.	Henderson, CO	COD980591184	Recycled for liquids; Landfill for Solids	liquid 0.06 solid 0
Onyx Environmental Services, LLC. (Formerly Superior Special Services)	Phoenix, AZ	AZ0000337360	Recycle	26.58
Perma-Fix, Inc.	Gainesville, FL	FLD980711071	Landfill	0.0005
Waste Control Specialists	Andrews County, TX	TXD988088464	Landfill	0.05
		Total		182.13

6.3 Other Information Provided on Form R Report

Environmental releases of mercury as air emissions, and to surface waters, were reported to be 0.72 lb and 0.61 lb, respectively. These values are included in Section 5 of the Form R, *Quantity of the Toxic Chemical Entering Each Environmental Medium On-site*. A total of

182.1 lb of mercury was reported in Section 6.2 of the Form R, *Transfers to Other Off-site Locations*.

Methods of treating NPDES outfall mercury amounts were included in Section 7A of the Form R. This section details on-site waste treatment methods and efficiency. Wastewater from industrial processes at the Laboratory is discharged to the RLWTF prior to discharge to the NPDES permitted outfall No. 051. The RLWTF conducts a series of treatment steps that help to reduce the amount of metals in the effluent prior to discharge. The wastewater stream goes through precipitation, filtration, and reverse osmosis treatment. All wastewater is sampled for mercury before and after treatment. Based on analytical results for 2002, the RLWTF resulted in a 99% treatment efficiency of mercury in the wastewater. Sections 7B and 7C relate to on-site energy recovery and recycling. LANL performed no on-site processes applicable to this section for mercury in 2002.

Section 8 of the Form R refers to source reduction and recycling activities. The information provided by EPA for this section states that no energy recovery is possible for mercury, either on-site or off-site. LANL also reported no on-site recycling or treatment. Approximately 26 lb of the mercury shipped off-site was recycled. Estimates based on this year's values were given for the subsequent two reporting years.

Section 8.9 of the Form R reports the production ratio, an estimated measure of the production of the reported chemical at the facility, as compared to the previous year. Because LANL is not a production facility a surrogate measure was needed to complete this section of the Form R. The mercury in the shutter system at LANSCE is the largest amount of mercury at LANL. When the beam operates, mercury is moved through the shutter system. Therefore, the operation of the beam at LANSCE was chosen to estimate the activity ratio for mercury. Comparing beam operations in 2001 to 2002, an activity ratio of 1.43 was calculated.

7.0 EPCRA 313 SUMMARY AND TRENDS

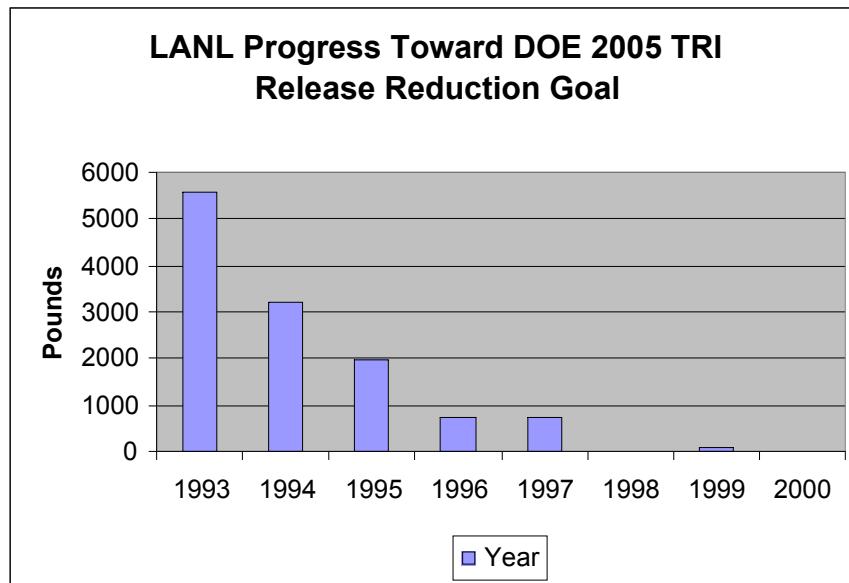
LANL has submitted EPCRA Section 313 data to EPA since 1987. From the period from 1987 to 1994 this information was submitted by UC, the operator of LANL. Starting with reporting year 1995, EO 12856 required all federal facilities to comply with EPCRA Section 313 requirements. As of 1995, the EPCRA Section 313 information for LANL has been submitted by both UC and the DOE. Historical information on LANL reported Section 313 releases is included in the EPA TRI database and can be accessed at <http://www.epa.gov/tri>.

On April 21, 2000, President Clinton signed EO 13148, which, in addition to requiring all federal facilities to comply with EPCRA Section 313 requirements, also requires federal facilities to reduce releases of EPCRA Section 313 chemicals to the environment. In response to EO 13148, the DOE developed Pollution Prevention Leadership Goals that include the following:

- Reduce release of toxic chemicals subject to Toxic Chemical Release Inventory (EPCRA 313) reporting by 90% by 2005, using a 1993 baseline.

LANL has implemented numerous pollution prevention projects to reduce the use and releases of EPCRA Section 313 chemicals. Figure 7-1 shows the progress LANL has made in reducing reportable toxic chemical releases from 1993 through 2000.

Figure 7-1. LANL Progress Toward DOE 2005 TRI Release Reduction Goal



However, two regulatory changes have been made by EPA in recent years that impact EPCRA Section 313 reporting:

- On October 19, 1999, EPA promulgated a final rule on PBTs. This rule added several chemicals to the EPCRA Section 313 list and established lower reporting thresholds for PBT chemicals. These lower thresholds became applicable in reporting year 2000.
- On January 17, 2001, EPA expanded the PBT rule to reduce the EPCRA Section 313 reporting threshold for lead and lead compounds to 100 lb (from 10,000 lb). The new lead threshold became applicable with reporting year 2001.

As a result of these regulatory changes, LANL has triggered EPCRA Section 313 reporting for two chemicals; lead compounds and mercury. Except for lead compounds and mercury, LANL has reduced the use of all EPCRA 313 chemicals to below the EPCRA 313 reportable thresholds. The regulatory changes resulted in reporting thresholds of 10 lb for mercury and 100 lb for lead. Therefore, for the past two years LANL has submitted environmental release data on these two chemicals. Figure 7-2 provides a summary of LANL reported releases of lead and mercury to the air and water for the past three years. Figure 7-3 provides a summary of reported releases of lead and mercury to on-site disposal (land disposal at the firing range) and off-site waste disposal for the past three years.

Figure 7-2. LANL EPCRA 313 Reported Releases, 2000–2002, Air and Water

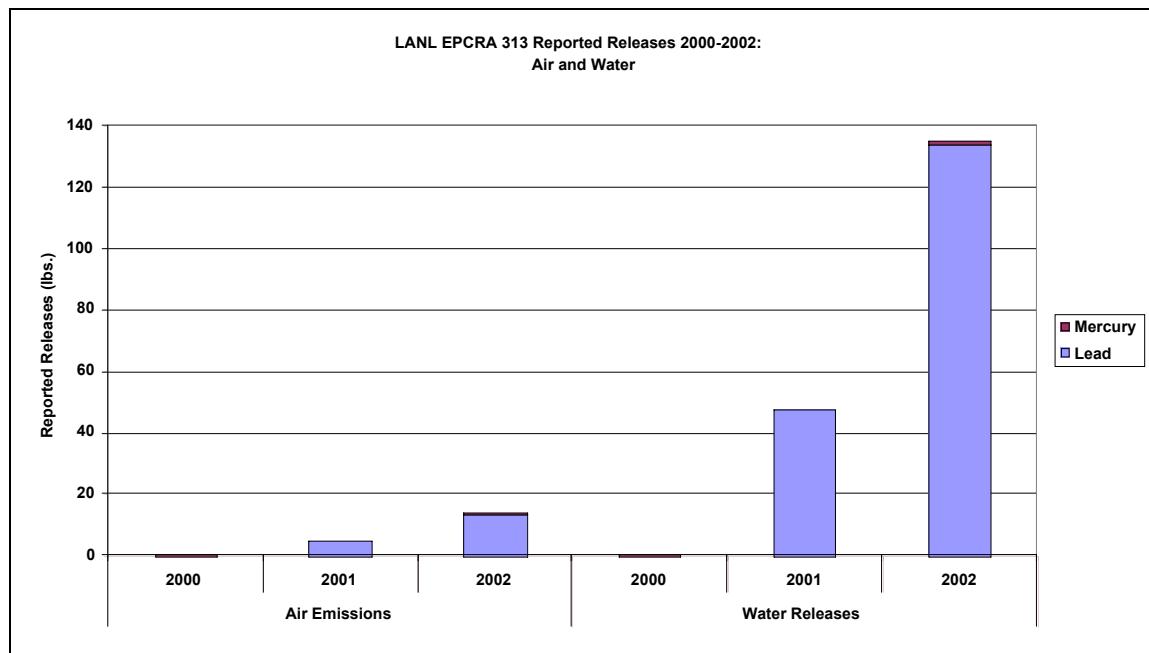
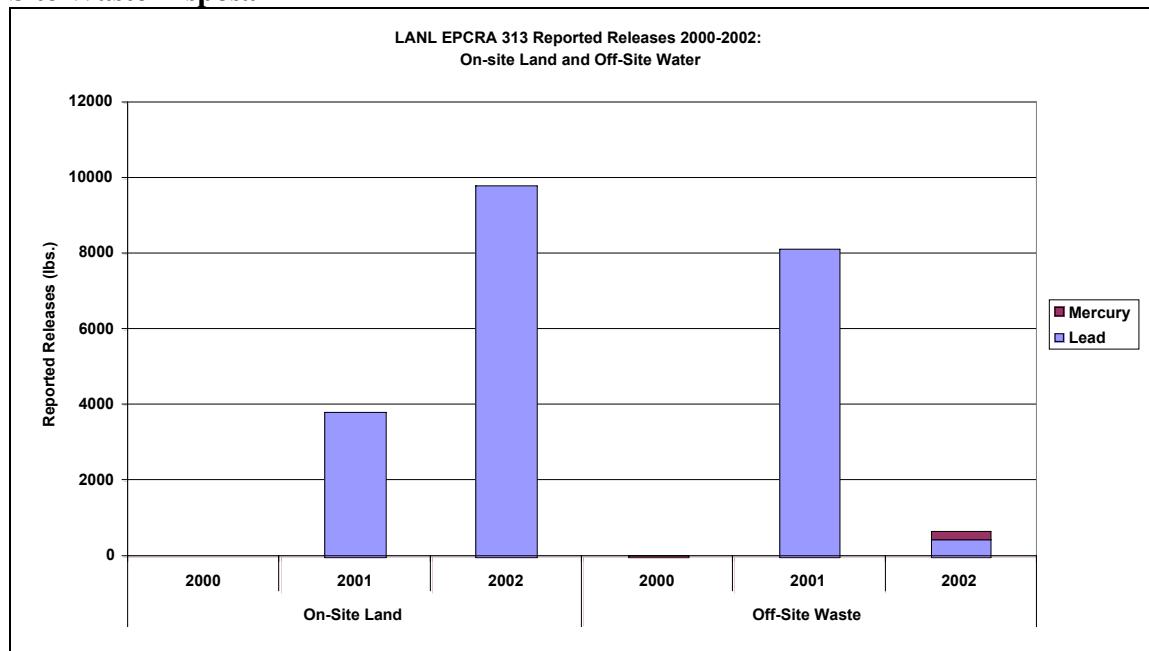


Figure 7-3. LANL EPCRA 313 Reported Releases, 2000–2002, Land Disposal and Off-Site Waste Disposal



As shown in Figure 7-2, lead compound air emissions were higher in 2002 than 2001. This is due to increased firearms training requirements for security personnel at the Laboratory and increased use of the ACDs to burn wood and brush as a result of aggressive fire mitigation and tree thinning activities. Increase in water releases of lead are due to increased storm water runoff.

As shown in Figure 7-3, on-site land releases of lead increased in 2002. This increase is due to increased fire arms training requirements for security personnel at the Laboratory. The security force fired nearly twice as many rounds of lead munitions in 2002 as was used in 2001. The large amount of lead shipped off-site as waste in 2001 was a result of legacy waste clean-up activities of lead bricks and lead shielding that were no longer needed at the Laboratory.

8.0 References

1. U.S. Environmental Protection Agency, "Toxic Chemical Release Inventory Reporting Form R and Instructions," Revised 2002 Version, EPA 260-B-03-001, March 2003.
2. U.S. Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors," AP-42, Chapter 1.3 - Fuel Oil Combustion, September 1998.
3. U.S. Environmental Protection Agency, "Emergency Planning and Community Right-to-Know Act – Section 313: Guidance for Reporting Hydrochloric Acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size), EPA-745-B-99-014, December 1999.
4. U.S. Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors," AP-42, Chapter 1.6 – Wood Residue Combustion in Boilers, March 2002.
5. U.S. Environmental Protection Agency, "Emergency Planning and Community Right-to-Know Act – Section 313: Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category," EPA 260-B-01-03, June 2001.
6. U.S. Environmental Protection Agency, "Locating and Estimating Air Emissions from Sources of Polycyclic Organic Materials," EPA-454/R-98-014, 1998.
7. U.S. Environmental Protection Agency "Emergency Planning and Community Right-to-Know Act – Section 313: Guidance for Reporting Toxic Chemicals: Pesticides and Other Persistent Bioaccumulative Toxic (PBT) Chemicals," EPA 260-B-01-005, June 2001.
8. U.S. Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors (AP-42)," Fifth Edition, Section 11.1 -Hot Mix Asphalt Plants, December 2000.
9. U.S. Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors (AP-42)," Fifth Edition, Section 1.4 - Natural Gas Combustion, July 1998.
10. U.S. Environmental Protection Agency, "Emergency Planning and Community Right-To-Know Act – Section 313: Guidance for Reporting Toxic Chemicals within the Dioxin and Dioxin-like Compounds Category," EPA-745-B-00-021. December 2000.
11. American Society of Mechanical Engineers, "Relationship Between Chlorine in Waste Streams and Dioxin Emissions from Combustors," CRTD-Vol. 36. December 1995.

12. U.S. Environmental Protection Agency, “Sources of Dioxin-like Compounds in the United States,” Draft Final Report, EPA-600-P-00-001Bb, September 2000.
13. U.S. Environmental Protection Agency, “Database of Sources of Environmental Releases of Dioxin-like Compounds in the United States,” EPA-600-C-01-012, March 2001.
14. U.S. Department of Defense, TRI-DDS Software, <http://www.dod.trdds.org>.
15. U.S. Environmental Protection Agency, “Emergency Planning and Community Right-to-Know Act – Section 313: Guidance for Reporting Releases and Other Waste Management Quantities of Toxic Chemicals: Lead and Lead Compounds,” EPA 260-B-01-027, December 2001.
16. Los Alamos National Laboratory, “Surface Water Data at Los Alamos National Laboratory 2002 Water Year,” LA-14019-PR. March 2003.
17. U.S. Environmental Protection Agency, “Emergency Planning and Community Right-to-Know Act – Section 313: Guidance for Reporting Releases and Other Waste Management Quantities of Toxic Chemicals: Mercury and Mercury Compounds,” EPA 260-B-01-004, August 2001.

Appendix A:
EPCRA Section 313 Chemicals Used or Procured in 2002

Appendix A. EPCRA Section 313 Chemical Used or Procured at LANL in 2002

CAS Number	Chemical Name	Total (lb)
7664-93-9	Sulfuric acid ^a	89,897
7647-01-0	Hydrochloric acid ^a	7,672
7697-37-2	Nitric acid	7,370
NA ^b	Polychlorinated alkanes	3,547
75-45-6	Chlorodifluoromethane	2,511
75-09-2	Dichloromethane	2,360
115-07-1	Propylene	2,103
75-05-8	Acetonitrile	1,907
NA ^a	Zinc Compounds	1,857
NA ^a	Manganese Compounds	1,815
67-56-1	Methanol	1,725
7782-50-5	Chlorine	1,543
67-63-0	Isopropyl alcohol	1,056
79-01-6	Trichloroethylene	699
1344-28-1	Aluminum oxide	636
107-21-1	Ethylene glycol	616
7664-39-3	Hydrogen fluoride	585
110-54-3	n-Hexane	465
67-66-3	Chloroform	404
108-88-3	Toluene	379
7664-41-7	Ammonia	270
78-93-3	Methyl ethyl ketone	232
1330-20-7	Xylene (mixed isomers)	230
872-50-4	N-Methyl-2-pyrrolidone	205
68-12-2	N,N-Dimethylformamide	189
123-91-1	1,4-Dioxane	183
7664-38-2	Phosphoric acid	167
NA	Nitrate Compounds	155
NA	Copper Compounds	153
75-34-3	Ethylidene Dichloride	83
100-41-4	Ethylbenzene	52
NA	Silver Compounds	45
7439-97-6	Mercury	41
NA	Chromium Compounds	37
50-00-0	Formaldehyde	36
NA	Glycol Ether Compounds	34
108-90-7	Chlorobenzene	31
127-18-4	Tetrachloroethylene	28
7440-02-0	Nickel	27
64-18-6	Formic acid	27
7783-06-4	Hydrogen sulfide	24
110-86-1	Pyridine	24
123-31-9	Hydroquinone	23
NA	Cyanide Compounds	19
79-06-1	Acrylamide	16
7429-90-5	Aluminum (fume or dust)	16

CAS Number	Chemical Name	Total (lb)
121-44-8	Triethylamine	15
126-72-7	Tris(2,3-dibromopropyl) phosphate	13
107-06-2	1,2-Dichloroethane	13
95-50-1	1,2-Dichlorobenzene	13
7439-92-1	Lead	13
71-43-2	Benzene	12
7726-95-6	Bromine	11
56-23-5	Carbon tetrachloride	10
7632-00-0	Sodium nitrite	10
NA	Nickel Compounds	9.9
7440-47-3	Chromium	7.8
95-47-6	o-Xylene	7.8
7440-66-6	Zinc (fume or dust)	6.7
7440-50-8	Copper	6.7
110-82-7	Cyclohexane	5.1
554-13-2	Lithium carbonate	4.4
124-40-3	Dimethylamine	3.6
NA	Barium Compounds	3.4
71-36-3	n-Butyl alcohol	3.0
10294-34-5	Boron trichloride	2.9
7440-28-0	Thallium	2.6
75-65-0	tert-Butyl alcohol	2.6
7440-36-0	Antimony	2.6
7440-48-4	Cobalt	2.5
7440-38-2	Arsenic	2.5
62-56-6	Thiourea	2.3
84-74-2	Dibutyl phthalate	2.3
108-95-2	Phenol	2.3
NA	Cobalt Compounds	2.2
108-93-0	Cyclohexanol	2.2
106-42-3	p-Xylene	2.1
80-62-6	Methyl methacrylate	2.1
110-80-5	2-Ethoxyethanol	2.0
78-92-2	sec-Butyl alcohol	1.7
77-78-1	Dimethyl sulfate	1.4
7439-96-5	Manganese	1.4
NA	Lead Compounds	1.3
98-95-3	Nitrobenzene	1.3
108-39-4	m-Cresol	1.3
NA	Chlorophenol Compounds	1.3
NA	Mercury Compounds	1.2
NA	Cadmium Compounds	1.2
7440-22-4	Silver	1.2
75-15-0	Carbon disulfide	1.1
101-68-8	Methylenebis(phenylisocyanate)	1.1
75-56-9	Propylene oxide	<1
106-93-4	1,2-Dibromoethane	<1

CAS Number	Chemical Name	Total (lb)
1313-27-5	Molybdenum trioxide	<1
107-13-1	Acrylonitrile	<1
8002-05-9	Petroleum	<1
104-94-9	p-Anisidine	<1
106-99-0	1,3-Butadiene	<1
7782-41-4	Fluorine	<1
1314-20-1	Thorium dioxide	<1
NA	Antimony Compounds	<1
NA	Selenium Compounds	<1
91-20-3	Naphthalene	<1
98-88-4	Benzoyl chloride	<1
106-50-3	p-Phenylenediamine	<1
139-13-9	Nitrilotriacetic acid	<1
75-07-0	Acetaldehyde	<1
108-38-3	m-Xylene	<1
7637-07-2	Boron trifluoride	<1
4170-30-3	Crotonaldehyde	<1
NA	Beryllium Compunds	<1
NA	Arsenic Compounds	<1
120-82-1	1,2,4-Trichlorobenzene	<1
26628-22-8	Sodium azide (Na(N3))	<1
74-85-1	Ethylene	<1
72-57-1	Trypan blue	<1
74-88-4	Methyl iodide	<1
80-15-9	Cumene hydroperoxide	<1
542-88-1	Bis(chloromethyl)ether	<1
NA	Chlorophenols Compounds	<1
111-42-2	Diethanolamine	<1
108-45-2	1,3-Phenylenediamine	<1
106-51-4	Quinone	<1
680-31-9	Hexamethylphosphoramide	<1
123-38-6	Propionaldehyde	<1
95-54-5	1,2-Phenylenediamine	<1
98-86-2	Acetophenone	<1
7803-51-2	Phosphine	<1
7782-49-2	Selenium	<1
7440-62-2	Vanadium	<1
7440-39-3	Barium	<1
100-02-7	4-Nitrophenol	<1
302-01-2	Hydrazine	<1
1120-71-4	Propane sultone	<1
NA	Thallium Compounds	<1
107-30-2	Chloromethyl methyl ether	<1
107-02-8	Acrolein	<1
100-42-5	Styrene	<1
1910-42-5	Paraquat dichloride	<1
64-75-5	Tetracycline hydrochloride	<1

CAS Number	Chemical Name	Total (lb)
541-73-1	1,3-Dichlorobenzene	<1
121-69-7	N,N-Dimethylaniline	<1
120-12-7	Anthracene	<0.1
989-38-8	C.I. Basic Red 1	<0.1
75-35-4	Vinylidene chloride	<0.1
542-88-1	Bis(chloromethyl) ether	<0.1

^a Only aerosol form reportable under EPCRA 313

^b NA = Not applicable

Appendix B:

Form R Reports for Lead Compounds and Mercury



Department of Energy
National Nuclear Security Administration
Los Alamos Site Office
Los Alamos, New Mexico 87544

JUN 26 2003

TRI Data Processing Center
c/o Computer Sciences Corporation, Suite 300
8400 Corporate Drive
New Carrollton, MD 20785

**ATTN: Toxic Chemical Release Inventory
TRI Magnetic Media Submission**

To Whom It May Concern:

Enclosed is one (1) microcomputer diskette containing toxic chemical release reporting information (Form R reports) for Los Alamos National Laboratory (LANL) on mercury and lead compounds for calendar year 2002. This information is submitted in response to Executive Order 13148 signed April 21, 2000 by President Clinton requiring all federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act (EPCRA), or Title III of the Superfund Amendments and Reauthorization Act (SARA).

This report was completed using the latest available information including an electronic download of the Automated Form R provided by the Environmental Protection Agency (EPA) on the Internet at <http://www.epa.gov/tri/report.trime>. Guidance used to complete the form was obtained from the EPA's Toxic Chemical Release Inventory Reporting Forms and Instructions booklet, Revised 2002 Version, March 2003, EPA 260-B-03-001.

A hard copy and microcomputer diskette of the Form R reports has been submitted to Mr. Jerry Lazzari, the State of New Mexico's EPCRA TRI Coordinator.

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate, based on reasonable estimates using data available to the preparers of this report.

If you have any questions, please call me at (505) 667-5794 or email at
gturner@doeal.gov.

Sincerely,



Gene Turner
Environmental Permitting Manager
Office of Facility Operations

Enclosure

cc w/o enclosure:

Andrew Lawrence, DOE/HQ, EH-4
Beverly Ramsey, RRES-DO, J591
Deb Woitte, LC-GL, A187
Joseph Vozella, DOE/LAAO, A316
Jean Dewart, RRES-MAQ, J978
RRES-MAQ File, J978

Signature Certification for U.S. EPA Diskette Submission

U.S. DEPARTMENT OF ENERGY, LOS ALAMOS
NATIONAL LABORATORY
528 35TH STREET
LOS ALAMOS, NM 87544
87545LSLMSLOSL

June 26, 2003

TRI Data Processing Center
c/o Computer Sciences Corporation
Suite 300
8400 Corporate Drive
New Carrollton, MD 20785

(301) 429-5005

To Whom It May Concern:

Enclosed please find one (1) microcomputer diskette containing toxic chemical release reporting information for:

U.S. DEPARTMENT OF ENERGY, LOS ALAMOS NATIONAL LABORATORY

This information is submitted as required under section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and the Pollution Prevention Act of 1990.

We are submitting a total of 2 chemical report(s) for our facility.

These 2 chemical report(s) are described below:

<u>TRI Chemical or Chemical Category</u>	<u>Reporting Year</u>	<u>CAS Number</u>	<u>Report</u>
Lead Compounds	2002	N420	Form R
Mercury	2002	7439-97-6	Form R

Our technical point of contact is:

GENE TURNER
(505) 667-5794
GTURNER@LANL.GOV

and is available should any questions or problems arise in the processing of this diskette.

If the enclosed diskette contains one or more Form R chemicals, then I hereby certify that I have reviewed the enclosed documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report(s) are accurate based on reasonable estimates using data available to the preparers of this report(s).

If the enclosed diskette contains one or more Form A chemicals, then I hereby certify that to the best of my knowledge and belief, for each toxic chemical listed in the Form A statement, the annual reportable amount as defined in 40 CFR 372.27(a) did not exceed 500 pounds for this reporting year and that the chemical was manufactured, processed or otherwise used in an amount not exceeding 1 million pounds during the reporting year.

Sincerely,

Gene Turner
GENE TURNER
OFFICE OF FACILITY OPS.

Enclosure: Diskette



United States

Environmental Protection
Agency

FORM R

TOXIC CHEMICAL RELEASE
INVENTORY REPORTING FORMSection 313 of the Emergency Planning and Community Right-to-Know Act of 1986,
also known as Title III of the Superfund Amendments and Reauthorization Act

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center
P.O.Box 1513
Lantham, MD 20703-1513

Enter "X" here if this
is a revision

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2002

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? <input type="checkbox"/> Yes (Answer question 2.2; Attach substantiation forms) <input checked="" type="checkbox"/> NO (Do not answer 2.2; Go to Section 3)	2.2	Is this copy <input type="checkbox"/> Sanitized <input type="checkbox"/> Unsanitized (Answer only if "YES" in 2.1)
-----	---	-----	--

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official: Gene Turner Office of Facility Ops.	Signature:	Date Signed: 06/26/2003
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SECTION 4. FACILITY IDENTIFICATION

4.1	Facility or Establishment Name U.S. Department of Energy, LOS ALAMOS NATIONAL LABORATORY	Facility ID Number 87545LSLMSL0SAL
Street	528 35th Street	Mailing Address NA
City/County/State/Zip Code LOS ALAMOS	LOS ALAMOS NM 87544	City/State/Zip Code Country (Non-US)

4.2	This report contains information for: <u>Important:</u> check a or b; check c or d if applicable	a. <input checked="" type="checkbox"/> An entire facility	b. <input type="checkbox"/> Part of a facility	c. <input checked="" type="checkbox"/> A Federal facility	d. <input type="checkbox"/> GOCO
-----	---	---	--	---	----------------------------------

4.3	Technical Contact Name Email Address	Gene Turner gturner@lanl.gov	Telephone Number (include area code) (505) 667-5794
-----	---	---------------------------------	--

4.4	Public Contact Name	Gene Turner	Telephone Number (include area code) (505) 667-5794
-----	---------------------	-------------	--

4.5	SIC Code (s) (4 digits)	Primary a. 9711	b.	c.	d.	e.	f.
-----	-------------------------	--------------------	----	----	----	----	----

4.6	Latitude	Degrees 35	Minutes 49	Seconds 51	Longitude	Degrees 106	Minutes 14	Seconds 15
-----	----------	---------------	---------------	---------------	-----------	----------------	---------------	---------------

4.7	Dun & Bradstreet Number(s) (9 digits)	4.8	EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9	Facility NPDES Permit Number(s) (9 characters)	4.10	Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
-----	---------------------------------------	-----	---	-----	--	------	--

a. NA	a. NM0890010515	a. NM0028355	a. NA
b.	b.	b.	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company NA	U.S. DEPARTMENT OF ENERGY
5.2	Parent Company's Dun & Bradstreet Number	NA <input checked="" type="checkbox"/>

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION

1 TRI Facility ID Number

87545LSLMSL0SAL

Toxic Chemical, Category or Generic Name

Lead Compounds

SECTION 1. TOXIC CHEMICAL IDENTITY

(Important: DO NOT complete this section if you completed Section 2 below.)

SECTION 2. MIXTURE COMPONENT IDENTITY

(Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) NA
------------	---

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

(Important: Check all that apply.)

3.1	Manufacture the toxic chemical:	3.2	Process the toxic chemical:	3.3	Otherwise use the toxic chemical:
<p>a. <input checked="" type="checkbox"/> Produce b. <input type="checkbox"/> Import</p> <p>If produce or import:</p> <p>c. <input type="checkbox"/> For on-site use/processing</p> <p>d. <input type="checkbox"/> For sale/distribution</p> <p>e. <input checked="" type="checkbox"/> As a byproduct</p> <p>f. <input checked="" type="checkbox"/> As an impurity</p>	<p>a. <input type="checkbox"/> As a reactant</p> <p>b. <input type="checkbox"/> As a formulation component</p> <p>c. <input type="checkbox"/> As an article component</p> <p>d. <input type="checkbox"/> Repackaging</p> <p>e. <input type="checkbox"/> As an impurity</p>	<p>a. <input type="checkbox"/> As a chemical processing aid</p> <p>b. <input type="checkbox"/> As a manufacturing aid</p> <p>c. <input checked="" type="checkbox"/> Ancillary or other use</p>			

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON SITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 05 (Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ON SITE

		A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA <input type="text"/>	12.8	C
5.2	Stack or point air emissions	NA <input type="text"/>	0.5	E
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
Stream or Water Body Name				
5.3.1	MORTANDAND TRIBUTARY TO RIO GRAND	0.2	M	73
5.3.2	LOS ALAMOS CANYON TRIBUTARY TO RIO	3.7	M	91
5.3.3	PAJARITO CANYON TRIBUTARY TO RIO G	15.4	M	98.7

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box and indicate the Part II, Section 5.3 page number in this box. 1 (example: 1,2,3, etc.)

2

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category or Generic Name

Lead Compounds

SECTION 1. TOXIC CHEMICAL IDENTITY

(Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)																
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)																
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)																
Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category. (If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)																	
1.4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)																

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY

(Important: Check all that apply.)

3.1	Manufacture the toxic chemical:	3.2	Process the toxic chemical:	3.3	Otherwise use the toxic chemical:
a. <input type="checkbox"/> Produce b. <input type="checkbox"/> Import If produce or import: c. <input type="checkbox"/> For on-site use/processing d. <input type="checkbox"/> For sale/distribution e. <input type="checkbox"/> As a byproduct f. <input type="checkbox"/> As an impurity		a. <input type="checkbox"/> As a reactant b. <input type="checkbox"/> As a formulation component c. <input type="checkbox"/> As an article component d. <input type="checkbox"/> Repackaging e. <input type="checkbox"/> As an impurity		a. <input type="checkbox"/> As a chemical processing aid b. <input type="checkbox"/> As a manufacturing aid c. <input type="checkbox"/> Ancillary or other use	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 (Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA <input type="checkbox"/>			
5.2	Stack or point air emissions	NA <input type="checkbox"/>			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
Stream or Water Body Name					
5.3.1	SANDIA CANYON TRIBUTARY TO RIO GRA		61.4	M	99.2
5.3.2	WATER CANYON TRIBUTARY TO RIO GRA		0.3	M	98
5.3.3	GUAJE CANYON TRIBUTARY TO RIO GRAN		25.6	M	100

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box 2
 and indicate the Part II, Section 5.3 page number in this box 2 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	<input checked="" type="checkbox"/>		
5.4.2	Underground Injection onsite to Class II-V Wells	<input checked="" type="checkbox"/>		
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills	<input checked="" type="checkbox"/>		
5.5.1.B	Other landfills	<input checked="" type="checkbox"/>		
5.5.2	Land treatment/application farming	<input checked="" type="checkbox"/>		
5.5.3	Surface Impoundment	<input checked="" type="checkbox"/>		
5.5.4	Other disposal	<input type="checkbox"/>	9794	C

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
NA	

6.1.B. 1	POTW Name	NA
----------	-----------	----

POTW Address	
--------------	--

City		State		County		Zip	
------	--	-------	--	--------	--	-----	--

6.1.B.	POTW Name	
--------	-----------	--

POTW Address	
--------------	--

City		State		County		Zip	
------	--	-------	--	--------	--	-----	--

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box and indicate the Part II, Section 6.1 page number in this box (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1	Off-Site EPA Identification Number (RCRA ID No.)	UTD982598898
--------	--	--------------

Off-Site Location Name	ENVIROCARE OF UTAH, INC.
------------------------	--------------------------

Off-site Address	Interstate 80 Exit 49
------------------	-----------------------

City	Clive	State	UT	County	Tooele	Zip	84029	Country (Non-US)	
------	-------	-------	----	--------	--------	-----	-------	------------------	--

Is location under control of reporting facility or parent company? Yes X No

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 170.4	1. C	1. M79
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 2 Off-Site EPA Identification Number (RCRA ID No.) COD980591184

Off-Site location Name	ONYX ENVIRONMENTAL SERVICES L.L.C.
------------------------	---------------------------------------

Off-site Address	9131 EAST 96TH AVENUE								
City	HENDERSON	State	CO	County	DENVER	Zip	80640	Country (Non-US)	
State	CO	County	DENVER	Zip	80640	Country (Non-US)			
County	DENVER								
Zip	80640								
Country (Non-US)									

Is location under control of reporting facility or parent company?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
--	------------------------------	--

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.9	1. C	1. M24
2. 5.7	2. C	2. M64
3. NA	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

<input type="checkbox"/> Not Applicable (NA) -	Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.
--	---

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?	
7A.1a	7A.1b	1	C09	2	P12	7A.1c	7A.1d	7A.1e
W	3 P31	4	NA	5		04	99 %	Yes No <input checked="" type="checkbox"/> <input type="checkbox"/>
	6	7		8				
7A.2a	7A.2b	1		2		7A.2c	7A.2d	7A.2e
	3	4		5				Yes No <input type="checkbox"/> <input type="checkbox"/>
	6	7		8				
7A.3a	7A.3b	1		2		7A.3c	7A.3d	7A.3e
	3	4		5				Yes No <input type="checkbox"/> <input type="checkbox"/>
	6	7		8				
7A.4a	7A.4b	1		2		7A.4c	7A.4d	7A.4e
	3	4		5				Yes No <input type="checkbox"/> <input type="checkbox"/>
	6	7		8				
7A.5a	7A.5b	1		2		7A.5c	7A.5d	7A.5e
	3	4		5				Yes No <input type="checkbox"/> <input type="checkbox"/>
	6	7		8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box	8
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and indicate the Part II, Section 6.2/7A page number in this box:	1	(example: 1,2,3, etc.)
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* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 3 Off-Site EPA Identification Number (RCRA ID No.) CAD008488025

Off-Site location Name PHIBRO-TECH, INC.

Off-site Address 8851 DICE ROAD
City SANTA FE SPRINGS State CA County LOS ANGELES Zip 90670 Country (Non-US)Is location under control of reporting facility or parent company? Yes No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 2	1. C	1. M24
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

 Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.6a	7A.6b	1	2	3	7A.6c	7A.6d	7A.6e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.7a	7A.7b	1	2	3	7A.7c	7A.7d	7A.7e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.8a	7A.8b	1	2	3	7A.8c	7A.8d	7A.8e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.9a	7A.9b	1	2	3	7A.9c	7A.9d	7A.9e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.10a	7A.10b	1	2	3	7A.10c	7A.10d	7A.10e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

8

and indicate the Part II, Section 6.2/7A page number in this box:

2

(example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2.4 Off-Site EPA Identification Number (RCRA ID No.) TXD988088464

Off-Site location Name	WASTE CONTROL SPECIALISTS								
Off-site Address	9998 HIGHWAY 176 WEST								
City	ANDREWS COUNTY	State	TX	County	ANDREWS	Zip	79714	Country (Non-US)	

Is location under control of reporting facility or parent company?									
A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)							
1. 23.9	1. C	1. M41							
2. NA	2.	2.							
3.	3.	3.							
4.	4.	4.							

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

<input type="checkbox"/> Not Applicable (NA) -	Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.								
a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?		
7A.11a	7A.11b	1	2	7A.11c	7A.11d	7A.11e			
	3	4	5			<input type="checkbox"/> Yes <input type="checkbox"/> No			
	6	7	8						
7A.12a	7A.12b	1	2	7A.12c	7A.12d	7A.12e			
	3	4	5			<input type="checkbox"/> Yes <input type="checkbox"/> No			
	6	7	8						
7A.13a	7A.13b	1	2	7A.13c	7A.13d	7A.13e			
	3	4	5			<input type="checkbox"/> Yes <input type="checkbox"/> No			
	6	7	8						
7A.14a	7A.14b	1	2	7A.14c	7A.14d	7A.14e			
	3	4	5			<input type="checkbox"/> Yes <input type="checkbox"/> No			
	6	7	8						
7A.15a	7A.15b	1	2	7A.15c	7A.15d	7A.15e			
	3	4	5			<input type="checkbox"/> Yes <input type="checkbox"/> No			
	6	7	8						

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

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and indicate the Part II, Section 6.2/7A page number in this box: 3 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 5 Off-Site EPA Identification Number (RCRA ID No.) UTD981552177

Off-Site location Name CLEAN HARBORS ARAGONITE LLC.

Off-site Address 11600 North Aptus Rd.

City	Aragonite	State	UT	County	Tooele	Zip	84029	Country (Non-US)
------	-----------	-------	----	--------	--------	-----	-------	------------------

Is location under control of reporting facility or parent company?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
A. Total Transfers (pounds/year*) (enter range code** or estimate)		B. Basis of Estimate (enter code)	
1.	85.5	1. C	1. M79
2.	NA	2.	2.
3.		3.	3.
4.		4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.16a	7A.16b	1	2	3	7A.16c	7A.16d	7A.16e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.17a	7A.17b	1	2	3	7A.17c	7A.17d	7A.17e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.18a	7A.18b	1	2	3	7A.18c	7A.18d	7A.18e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.19a	7A.19b	1	2	3	7A.19c	7A.19d	7A.19e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.20a	7A.20b	1	2	3	7A.20c	7A.20d	7A.20e
		4	5	6		%	<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

8

and indicate the Part II, Section 6.2/7A page number in this box: 4 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 6 Off-Site EPA Identification Number (RCRA ID No.) TXD000838896

Off-Site location Name ONYX ENVIRONMENTAL SERVICES

Off-site Address HWY 73

City	PORT ARTHUR	State	TX	County	JEFFERSON	Zip	77643	Country (Non-US)
------	-------------	-------	----	--------	-----------	-----	-------	------------------

Is location under control of reporting facility or parent company? Yes No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.4	1. C	1. M79
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.21a	7A.21b	1	2		7A.21c	7A.21d	7A.21e
	3	4	5				% <input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				
7A.22a	7A.22b	1	2		7A.22c	7A.22d	7A.22e
	3	4	5				% <input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				
7A.23a	7A.23b	1	2		7A.23c	7A.23d	7A.23e
	3	4	5				% <input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				
7A.24a	7A.24b	1	2		7A.24c	7A.24d	7A.24e
	3	4	5				% <input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				
7A.25a	7A.25b	1	2		7A.25c	7A.25d	7A.25e
	3	4	5				% <input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

8

and indicate the Part II, Section 6.2/7A page number in this box: 5 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSL0SAL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2.7 Off-Site EPA Identification Number (RCRA ID No.) AZ0000337360

Off-Site location Name ONYX ENVIRONMENTAL SERVICES

Off-site Address 5752 W. JEFFERSON ST.

City	PHOENIX	State	AZ	County	MARICOPA	Zip	85043	Country (Non-US)
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Is location under control of reporting facility or parent company?

 Yes No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 27.2	1. C	1. M24
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

a. General Waste Stream (enter code)		b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.26a	7A.26b	1	2	3	4	7A.26c	7A.26d	7A.26e
			5					<input type="checkbox"/> Yes <input type="checkbox"/> No
		6	7					
7A.27a	7A.27b	1	2	3	4	7A.27c	7A.27d	7A.27e
			5					<input type="checkbox"/> Yes <input type="checkbox"/> No
		6	7					
7A.28a	7A.28b	1	2	3	4	7A.28c	7A.28d	7A.28e
			5					<input type="checkbox"/> Yes <input type="checkbox"/> No
		6	7					
7A.29a	7A.29b	1	2	3	4	7A.29c	7A.29d	7A.29e
			5					<input type="checkbox"/> Yes <input type="checkbox"/> No
		6	7					
7A.30a	7A.30b	1	2	3	4	7A.30c	7A.30d	7A.30e
			5					<input type="checkbox"/> Yes <input type="checkbox"/> No
		6	7					

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

8

and indicate the Part II, Section 6.2/7A page number in this box:

6

(example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 8 Off-Site EPA Identification Number (RCRA ID No.) FLD980711071

Off-Site location Name PERMA FIX INC.

Off-site Address 1940 NW 67TH PLACE

City GAINESVILLE State FL County ALACHUA Zip 32653 Country (Non-US)

Is location under control of reporting facility or parent company? Yes No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 149.8	1. C	1. M79
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.31a	7A.31b	1	2	3	7A.31c	7A.31d	7A.31e
	3	4	5	6	7	8	% <input type="checkbox"/> Yes <input type="checkbox"/> No
7A.32a	7A.32b	1	2	3	7A.32c	7A.32d	7A.32e
	3	4	5	6	7	8	% <input type="checkbox"/> Yes <input type="checkbox"/> No
7A.33a	7A.33b	1	2	3	7A.33c	7A.33d	7A.33e
	3	4	5	6	7	8	% <input type="checkbox"/> Yes <input type="checkbox"/> No
7A.34a	7A.34b	1	2	3	7A.34c	7A.34d	7A.34e
	3	4	5	6	7	8	% <input type="checkbox"/> Yes <input type="checkbox"/> No
7A.35a	7A.35b	1	2	3	7A.35c	7A.35d	7A.35e
	3	4	5	6	7	8	% <input type="checkbox"/> Yes <input type="checkbox"/> No

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

8

and indicate the Part II, Section 6.2/7A page number in this box:

7

(example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Lead Compounds

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)		B. Basis of Estimate (enter code)		C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)							
1.	1.	2.	2.	3.	3.	4.	4.				
2.	2.	3.	3.	4.	4.						
3.	3.	4.	4.								
4.	4.										
6.2. 9 Off-Site EPA Identification Number (RCRA ID No.)				NA							
Off-Site location Name		LOS ALAMOS COUNTY LANDFILL									
Off-site Address		EAST JEMEZ ROAD									
City	LOS ALAMOS		State	NM	County	LOS ALAMOS		Zip	87544	Country (Non-US)	

Is location under control of reporting facility or parent company?

 Yes No

A. Total Transfers (pounds/year*) (enter range code** or estimate)		B. Basis of Estimate (enter code)		C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)			
1. 1.5	1. C	2.	2.	3.	3.	4.	4.
2. NA	2.	3.	3.	4.	4.		
3.	3.	4.	4.				
4.	4.						

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

<input type="checkbox"/> Not Applicable (NA) -	Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.									
a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]					c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?		
7A.36a	7A.36b	1	2	3	4	5	6	7A.36c	7A.36d	7A.36e
										<input type="checkbox"/> Yes <input type="checkbox"/> No
7A.37a	7A.37b	1	2	3	4	5	6	7A.37c	7A.37d	7A.37e
										<input type="checkbox"/> Yes <input type="checkbox"/> No
7A.38a	7A.38b	1	2	3	4	5	6	7A.38c	7A.38d	7A.38e
										<input type="checkbox"/> Yes <input type="checkbox"/> No
7A.39a	7A.39b	1	2	3	4	5	6	7A.39c	7A.39d	7A.39e
										<input type="checkbox"/> Yes <input type="checkbox"/> No
7A.40a	7A.40b	1	2	3	4	5	6	7A.40c	7A.40d	7A.40e
										<input type="checkbox"/> Yes <input type="checkbox"/> No

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

8

and indicate the Part II, Section 6.2/7A page number in this box:

8

(example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
87545LSLMSLOSSAL
Toxic Chemical, Category, or Generic Name
Lead Compounds

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 2 3 4

SECTION 7C. ON-SITE RECYCLING PROCESSES

Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 2 3 4 5
6 7 8 9 10

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1	Quantity released ***	11319	10381.1	10500	10500
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	NA	NA
8.5	Quantity recycled offsite	2	30.1	30	30
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)			6.1	
8.9	Production ratio or activity index			1.87	
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				
	Source Reduction Activities [enter code(s)]				
8.10.1	NA	a.	b.	c.	
8.10.2		a.	b.	c.	
8.10.3		a.	b.	c.	
8.10.4		a.	b.	c.	
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report? (Check one Box)			Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

EPA Form 9350-1 (Rev. 03/2003) - Previous editions are obsolete.

*For Dioxin or Dioxin-like compounds, report in grams/year

***Report releases pursuant to EPCRA Section 329 (8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated onsite.



United States

Environmental Protection
Agency

FORM R

TOXIC CHEMICAL RELEASE
INVENTORY REPORTING FORMSection 313 of the Emergency Planning and Community Right-to-Know Act of 1986,
also known as Title III of the Superfund Amendments and Reauthorization Act

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center
P.O.Box 1513
Lantham, MD 20703-1513

2. APPROPRIATE STATE OFFICE
(See instructions in Appendix F)

Enter "X" here if this
is a revision

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2002

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
 Yes (Answer question 2.2;
Attach substantiation forms) NO (Do not answer 2.2;
Go to Section 3)

2.2 Is this copy Sanitized Unsanitized
(Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:

Signature:

Date Signed:

Gene Turner Office of Facility Ops.

06/26/2003

SECTION 4. FACILITY IDENTIFICATION

4.1	Facility or Establishment Name	TRI Facility ID Number	87545LSLMSL0SAL
		Facility or Establishment Name or Mailing Address (if different from street address)	
	U.S. Department of Energy, LOS ALAMOS NATIONAL LABORATORY		
Street		Mailing Address	
528 35th Street		NA	
City/County/State/Zip Code		City/State/Zip Code	
LOS ALAMOS	LOS ALAMOS	NM 87544	Country (Non-US)

4.2 This report contains information for:
(Important: check a or b; check c or d if applicable) a. An entire facility b. Part of a facility c. A Federal facility d. GOCO

4.3 Technical Contact Name Gene Turner Telephone Number (include area code)
(505) 667-5794

4.4 Public Contact Name Gene Turner Telephone Number (include area code)
(505) 667-5794

4.5	SIC Code (s) (4 digits)	Primary	b.	c.	d.	e.	f.
	a. 9711						

4.6	Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds
		35	49	51		106	14	15

4.7	Dun & Bradstreet Number(s) (9 digits)	4.8	EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9	Facility NPDES Permit Number(s) (9 characters)	4.10	Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
-----	---------------------------------------	-----	---	-----	--	------	--

a. NA	a. NM0890010515	a. NM0028355	a. NA
b.	b.	b.	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA	<input type="checkbox"/>	U.S. DEPARTMENT OF ENERGY			
5.2	Parent Company's Dun & Bradstreet Number	NA	<input checked="" type="checkbox"/>				

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category or Generic Name

Mercury

SECTION 1. TOXIC CHEMICAL IDENTITY

(Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)																
	7439-97-6																
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)																
	Mercury																
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)																
	NA																
Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.																	
1.4	(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)																
	NA																

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY

(Important: Check all that apply.)

3.1	Manufacture the toxic chemical:	3.2	Process the toxic chemical:	3.3	Otherwise use the toxic chemical:		
a.	<input checked="" type="checkbox"/> Produce	b.	<input type="checkbox"/> Import	a.	<input type="checkbox"/> As a reactant	a.	<input type="checkbox"/> As a chemical processing aid
If produce or import:				b.	<input type="checkbox"/> As a formulation component	b.	<input type="checkbox"/> As a manufacturing aid
c.	<input type="checkbox"/> For on-site use/processing	c.	<input type="checkbox"/> As an article component	c.	<input checked="" type="checkbox"/> Ancillary or other use	d.	<input type="checkbox"/> Repackaging
d.	<input type="checkbox"/> For sale/distribution	e.	<input type="checkbox"/> As a byproduct	e.	<input type="checkbox"/> As an impurity	f.	<input checked="" type="checkbox"/> As an impurity

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	04	(Enter two-digit code from instruction package.)			
-----	----	--	--	--	--

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

		A. Total Release (pounds/year) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA <input type="checkbox"/>	0.4	E
5.2	Stack or point air emissions	NA <input type="checkbox"/>	0.4	E
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
Stream or Water Body Name				
5.3.1	MORTANDAND TRIBUTARY TO RIO GRAND	0	M	56
5.3.2	PUEBLO CANYON TRIBUTARY TO RIO GRA	0.08	M	100
5.3.3	SANDIA CANYON TRIBUTARY TO RIO GRA	0.5	M	100

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box

2

and indicate the Part II, Section 5.3 page number in this box.

1 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category or Generic Name

Mercury

SECTION 1. TOXIC CHEMICAL IDENTITY

(Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)															
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)															
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)															

Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.

(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

1.4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NA																	

SECTION 2. MIXTURE COMPONENT IDENTITY

(Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)															

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY

(Important: Check all that apply.)

3.1	Manufacture the toxic chemical:	3.2	Process the toxic chemical:	3.3	Otherwise use the toxic chemical:
a. <input type="checkbox"/> Produce b. <input type="checkbox"/> Import If produce or import: c. <input type="checkbox"/> For on-site use/processing d. <input type="checkbox"/> For sale/distribution e. <input type="checkbox"/> As a byproduct f. <input type="checkbox"/> As an impurity		a. <input type="checkbox"/> As a reactant b. <input type="checkbox"/> As a formulation component c. <input type="checkbox"/> As an article component d. <input type="checkbox"/> Repackaging e. <input type="checkbox"/> As an impurity		a. <input type="checkbox"/> As a chemical processing aid b. <input type="checkbox"/> As a manufacturing aid c. <input type="checkbox"/> Ancillary or other use	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1		(Enter two-digit code from instruction package.)	
-----	--	--	--

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

		A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA <input type="checkbox"/>		
5.2	Stack or point air emissions	NA <input type="checkbox"/>		
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
Stream or Water Body Name				
5.3.1	GUAJE CANYON TRIBUTARY TO RIO GRAN	0.01	M	100
5.3.2				
5.3.3				

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box 2
 and indicate the Part II, Section 5.3 page number in this box.

2 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
87545LSLMSLOSSAL
Toxic Chemical, Category, or Generic Name
Mercury

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X		
5.4.2	Underground Injection onsite to Class II-V Wells	X		
5.5	Disposal to land onsite			
5.5.1.A	RCRA Subtitle C landfills	X		
5.5.1.B	Other landfills	X		
5.5.2	Land treatment/application farming	X		
5.5.3	Surface Impoundment	X		
5.5.4	Other disposal	X		

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)		6.1.A.2 Basis of Estimate (enter code)	
NA			
6.1.B. 1	POTW Name	NA	
POTW Address			
City		State	County
6.1.B.	POTW Name		
POTW Address			
City		State	County

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages

in this box and indicate the Part II, Section 6.1 page number in this box (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. 1 Off-Site EPA Identification Number (RCRA ID No.)		COD980591184	
Off-Site Location Name		ONYX ENVIRONMENTAL SERVICES L.L.C.	
Off-site Address		9131 EAST 96TH AVENUE	
City	HENDERSON	State	CO
County	DENVER	Zip	80640
Country (Non-US)			

Is location under control of reporting facility or parent company?

 Yes X No

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Mercury

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.1	1. C	1. M24
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 2 Off-Site EPA Identification Number (RCRA ID No.) TXD988088464

Off-Site location Name	WASTE CONTROL SPECIALISTS				
------------------------	---------------------------	--	--	--	--

Off-site Address	9998 HIGHWAY 176 WEST				
City	ANDREWS COUNTY	State	TX	County	ANDREWS
				Zip	79714
				Country (Non-US)	

Is location under control of reporting facility or parent company?

 Yes No

A. Total Transfers (pounds/year) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.1	1. C	1. M79
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?	
7A.1a	7A.1b	1	C09	2	P12	7A.1c	7A.1d	7A.1e
W	3 P31	4	NA	5		04	99 %	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
	6	7		8				
7A.2a	7A.2b	1		2		7A.2c	7A.2d	7A.2e
	3	4		5				Yes <input type="checkbox"/> No <input type="checkbox"/>
	6	7		8				
7A.3a	7A.3b	1		2		7A.3c	7A.3d	7A.3e
	3	4		5				Yes <input type="checkbox"/> No <input type="checkbox"/>
	6	7		8				
7A.4a	7A.4b	1		2		7A.4c	7A.4d	7A.4e
	3	4		5				Yes <input type="checkbox"/> No <input type="checkbox"/>
	6	7		8				
7A.5a	7A.5b	1		2		7A.5c	7A.5d	7A.5e
	3	4		5				Yes <input type="checkbox"/> No <input type="checkbox"/>
	6	7		8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

4

and indicate the Part II, Section 6.2/7A page number in this box: 1 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Mercury

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 3 Off-Site EPA Identification Number (RCRA ID No.) UTD981552177

Off-Site location Name CLEAN HARBORS ARAGONITE LLC.

Off-site Address 11600 North Aptus Rd.

City	Aragonite	State	UT	County	Tooele	Zip	84029	Country (Non-US)
------	-----------	-------	----	--------	--------	-----	-------	---------------------

Is location under control of reporting facility or parent company?

 Yes No

A. Total Transfers (pounds/year) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.9	1. C	1. M79
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.6a	7A.6b	1	2	3	7A.6c	7A.6d	7A.6e
		4	5	6			<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.7a	7A.7b	1	2	3	7A.7c	7A.7d	7A.7e
		4	5	6			<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.8a	7A.8b	1	2	3	7A.8c	7A.8d	7A.8e
		4	5	6			<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.9a	7A.9b	1	2	3	7A.9c	7A.9d	7A.9e
		4	5	6			<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				
7A.10a	7A.10b	1	2	3	7A.10c	7A.10d	7A.10e
		4	5	6			<input type="checkbox"/> Yes <input type="checkbox"/> No
		7	8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

4

and indicate the Part II, Section 6.2/7A page number in this box:

2

(example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Mercury

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2. 4 Off-Site EPA Identification Number (RCRA ID No.) TNR000005397

Off-Site location Name	MATERIAL AND ENERGY CORP.								
Off-site Address	2010 HIGHWAY 58 Suite 1020								
City	OAK RIDGE	State	TN	County	ANDERSON	Zip	37830	Country (Non-US)	

Is location under control of reporting facility or parent company? Yes No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 154.6	1. C	1. M79
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.11a	7A.11b	1	2	3	7A.11c	7A.11d	7A.11e
	3	4	5	6	7	8	%
7A.12a	7A.12b	1	2	3	7A.12c	7A.12d	7A.12e
	4	5	6	7	8	%	<input type="checkbox"/> Yes <input type="checkbox"/> No
7A.13a	7A.13b	1	2	3	7A.13c	7A.13d	7A.13e
	4	5	6	7	8	%	<input type="checkbox"/> Yes <input type="checkbox"/> No
7A.14a	7A.14b	1	2	3	7A.14c	7A.14d	7A.14e
	4	5	6	7	8	%	<input type="checkbox"/> Yes <input type="checkbox"/> No
7A.15a	7A.15b	1	2	3	7A.15c	7A.15d	7A.15e
	4	5	6	7	8	%	<input type="checkbox"/> Yes <input type="checkbox"/> No

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

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and indicate the Part II, Section 6.2/7A page number in this box: (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSL0SAL

Toxic Chemical, Category, or Generic Name

Mercury

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)		B. Basis of Estimate (enter code)		C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)			
1.	1.	1.		1.			
2.	2.	2.		2.			
3.	3.	3.		3.			
4.	4.	4.		4.			
6.2. 5 Off-Site EPA Identification Number (RCRA ID No.)				AZ0000337360			
Off-Site location Name		ONYX ENVIRONMENTAL SERVICES					
Off-site Address		5752 W. JEFFERSON ST.					
City	PHOENIX	State	AZ	County	MARICOPA	Zip	85043
Country (Non-US)							
Is location under control of reporting facility or parent company? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No							
A. Total Transfers (pounds/year*) (enter range code** or estimate)		B. Basis of Estimate (enter code)		C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)			
1. 26.6	1. C	1.	M24				
2. NA	2.	2.					
3.	3.	3.					
4.	4.	4.					

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]				c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.16a	7A.16b	1	2	7A.16c	7A.16d	7A.16e	
	3	4	5			%	<input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				
7A.17a	7A.17b	1	2	7A.17c	7A.17d	7A.17e	
	3	4	5			%	<input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				
7A.18a	7A.18b	1	2	7A.18c	7A.18d	7A.18e	
	3	4	5			%	<input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				
7A.19a	7A.19b	1	2	7A.19c	7A.19d	7A.19e	
	3	4	5			%	<input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				
7A.20a	7A.20b	1	2	7A.20c	7A.20d	7A.20e	
	3	4	5			%	<input type="checkbox"/> Yes <input type="checkbox"/> No
	6	7	8				

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box

4

and indicate the Part II, Section 6.2/7A page number in this box: 4 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1- 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

87545LSLMSLOSSAL

Toxic Chemical, Category, or Generic Name

Mercury

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 2 3 4

SECTION 7C. ON-SITE RECYCLING PROCESSES

Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 2 3 4 5 6 7 8 9 10

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1	Quantity released ***	0	157	150	150
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	NA	NA
8.5	Quantity recycled offsite	0	26.7	26	26
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)			NA	
8.9	Production ratio or activity index			1.43	
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)			
8.10.1	NA	a.	b.	c.	
8.10.2		a.	b.	c.	
8.10.3		a.	b.	c.	
8.10.4		a.	b.	c.	
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report? (Check one Box)			Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

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