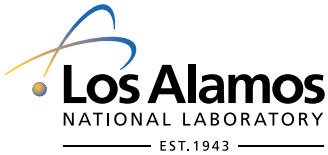
LA-14313-PR
Progress Report

2005 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Section 313



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Edited by Hector Hinojosa,Group IRM-CAS

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2005 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Section 313

Ecology and Air Quality Group (ENV-EAQ)

Los Alamos
NATIONAL LABORATORY
EST. 1943

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for the
Emergency Planning and
Community Right-to-Know Act of 1986,
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ENV-EAQ (Ecology and Air Quality Group)

Abstract

For reporting year 2005, Los Alamos National Laboratory (LANL or the Laboratory) submitted Form R reports for lead 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 2005 above the reportable thresholds. This document was prepared to provide a description of the evaluation of EPCRA Section 313 chemical use and threshold determinations for LANL for calendar year 2005, as well as to provide background information about 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. 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 (SARA) 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. The rule lowered the reporting threshold for lead and lead compounds to 100 lb. The lower threshold for lead 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) had been voluntarily reporting under EPCRA Section 313 since 1987. For reporting year 2005, LANL submitted Form R reports for lead and mercury. No other EPCRA Section 313 chemicals were used in 2005 above the reportable thresholds. Toxic chemicals used in exempt activities as defined by the regulation are excluded from the threshold determinations and release calculations. 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 2005, and describes the environmental release data 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 2005. Appendix B includes copies of Form R reports submitted to EPA and the New Mexico Environment Department.

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. During 2005, LANL was owned by the U.S. Department of Energy (DOE) and was operated by the University of California (UC). Because the Laboratory was owned and operated by different entities in 2005, duplicate Form Rs were submitted by the DOE and UC. Facility information is as follows:

- LANL
  - TRI facility identification number: 87545LSLMSLOSAL
  - LANL technical contact: Mr. Steve Story at (505) 665-2169
  - LANL public contact: Ms. Lorrie Bonds Lopez at (505) 667-0216

- Los Alamos DOE complex
  - TRI facility identification number: 87544SDLSL52835
  - DOE technical and public contact: Mr. Gene Turner 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 described below.

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 for reporting manufactured chemicals 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 for reporting processed chemicals 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 for reporting otherwise use chemicals is 10,000 lb.

Persistent Bioaccumulative Toxics

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 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 are discussed below.

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 chemicals for laboratory support activities do not qualify for this laboratory activities exemption.

Otherwise Use Exemption

Certain activities involving EPCRA Section 313 chemicals qualify as otherwise used and are specifically exempted. These include the following:

- 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 suspected carcinogen or 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. 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 1.

Table 1. Examples of EPCRA Section 313 Chemical Qualifiers

Chemical Name	Chemical Abstract Service (CAS) Number	Qualifier
Aluminum	7429-90-5	Only if it is a fume or dust form.
Hydrochloric Acid (HCl)	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 Section 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 1 presents a flowchart that shows the steps LANL performs to determine which chemicals must be reported under EPCRA Section 313.

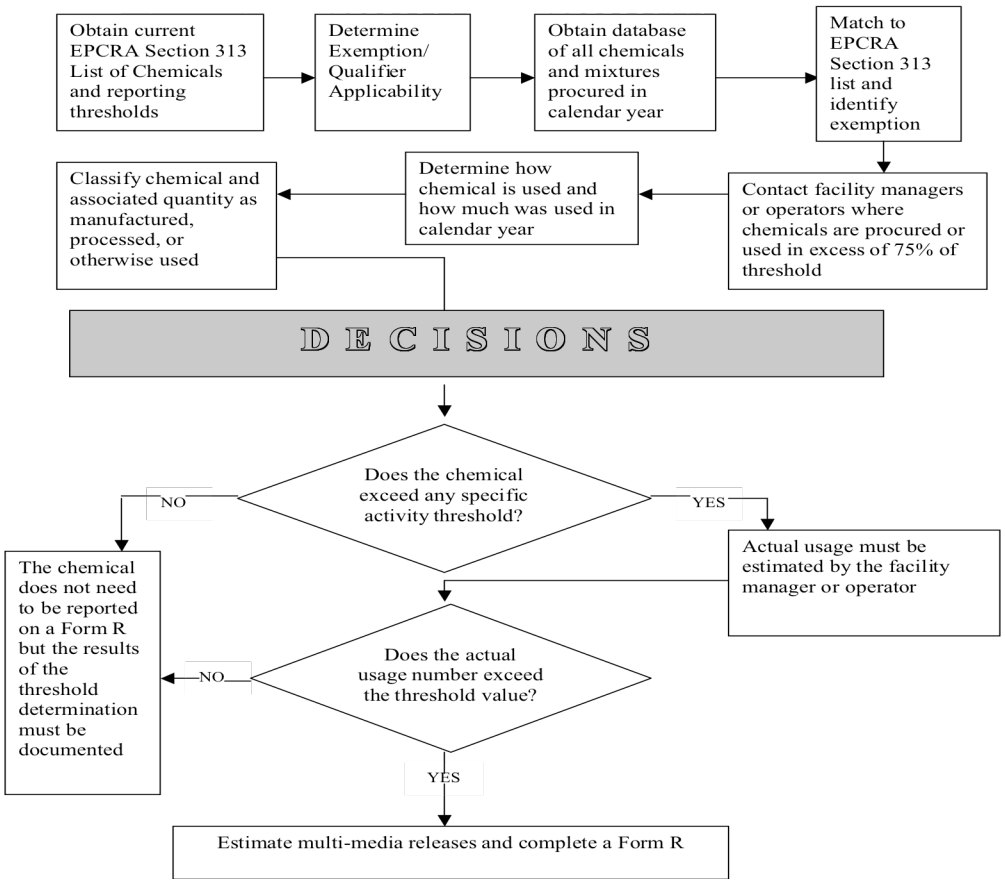


Figure 1. Flowchart process of analysis for EPCRA Section 313 reporting.

3.1 Threshold Determinations for Chemical Use

The Laboratory tracks chemicals brought onsite using a custom-made software called ChemLog. ChemLog captures the majority of procured chemicals and provides relevant data (e.g., chemical name, CAS number, quantity, etc.) to assist in threshold determinations. The underlying assumption used in the preliminary threshold determinations for reporting under EPCRA Section 313 is that chemicals are purchased and used in the same calendar year. If unusually large purchases are noted in this preliminary analysis, further investigation is done to determine if bulk chemicals were purchased and only a portion of them used in the calendar year.

Inventory

For calendar year 2005, a total of 45,602 records were added to ChemLog and evaluated; 22,465 were pure chemicals and 23,137 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. 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. Material Safety Data Sheets (MSDSs) for the remaining mixtures purchased in quantities greater than 50 lb were reviewed to determine the presence and amount of EPCRA Section 313 constituents. This was done to ensure that the chemicals with thresholds greater than 100 lb would be identified. Listed 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

In previous years, an effort was made to analyze purchasing procurements to capture chemicals that may not have been entered into ChemLog. Purchasing procurements included the Chemical Order Report (Just-in-Time and Purchase Orders), local vendor agreements, and purchase cards. For 2005, LANL did not use the purchasing procurements to identify chemicals not captured in ChemLog because (1) the new ChemLog and extensive training conducted has increased the overall percentage of chemicals captured; (2) historically, the additional quantity of EPCRA Section 313 chemicals identified via purchasing procurements has always been very small; and (3) there has been increased management attention to the requirement in LANL's Chemical Management Laboratory Implementation Requirement (LIR 402-510-01) that, "timely updates of location and ownership of newly arrived chemicals must be performed" and "chemicals arriving without ChemLog barcodes shall have them applied, and the necessary data must be entered into ChemLog." In addition to data evaluated in the

ChemLog, an assessment was made of chemicals brought onsite through the site support contractor.

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) data 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 procured in 2005 are summarized in Table 2.

The total amounts of lead and mercury procured are not shown in Table 2. Because both lead and mercury are PBTs, their 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.

Table 2. Top 10 Listed EPCRA Section 313 Chemicals Procured in 2005

CAS No	Chemical Name	Total Procured (lb)
7664-93-9	Sulfuric Acid (liquid form)	20,200
7647-01-0	HCl (liquid form)	14,882
7697-37-2	Nitric Acid	5,591
NA	Nitrate Compounds	3,660
NA	Barium Compounds	3,614
NA	Cyanide Compounds	2,216
107-21-1	Ethylene Glycol	1,991
75-45-6	Chlorodifluoromethane	1,710
1344-28-1	Aluminum Oxide	1,530
67-56-1	Methanol	1,427

The total amount of sulfuric acid and HCl procured in 2005 was over the 10,000 lb otherwise use threshold. However, only sulfuric acid and HCl in aerosol form are counted towards the threshold. Therefore, both chemicals were analyzed to determine the amounts used in aerosol form. These analyses are summarized in Sections 4.1 and 4.2.

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 2005 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 category 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. In previous years, over 100,000 lb of sulfuric acid was used. In 2005, only 20,200 lb was used. The reason for the significant decrease is the installation of a reverse osmosis system in late 2003 that resulted in much lower use of caustics and acids. Because this sulfuric acid is used in liquid form, it is not subject to EPCRA Section 313 reporting.

Sulfuric acid aerosols are generated as a result of storage tank emissions, fuel combustion byproducts, and asphalt production. The total amount of sulfuric acid mist generated from these activities was 673.8 lb, less than the 25,000-lb manufacture threshold and, therefore, not reportable under EPCRA. 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.

In 2005, a total of 20,200 lb of sulfuric acid was procured at LANL and 1,300 gallons (19,341 lb) of that sulfuric acid was used for demineralizer regeneration at Building TA-3-22. Small purchases of sulfuric acid captured in ChemLog are assumed to be in aerosol form since the specific usage is unknown. Total purchases do not exceed the otherwise use reporting threshold. A summary of the threshold determinations for sulfuric acid is provided in Table 3.

Table 3. Sulfuric Acid Threshold Determination for 2005

Description	Amount of Sulfuric Acid (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Total Procurement	20,200	ChemLog	Uses evaluated separately below	--
Demineralizer Regeneration	19,341	Site Support Contractor Logs	Not in aerosol form and not subject to EPCRA Section 313	NA
Water Analysis at the SWSC Plant	113.5	Site Support Contractor Logs		
Procurement Not Evaluated	859	ChemLog	Otherwise used*	10,000
Storage Tank Air Emissions	0.003	EPA, Tanks 4.0 Software	Manufactured	25,000
Fuel Combustion Byproducts	665.8	AP-42 and fuel use records[2]		
Asphalt Plant Production	8	AP-42 and facility records[2]		

*Assumed to be in aerosol form.

4.2 Hydrochloric Acid

HCl is purchased for numerous processes and is also generated as a combustion byproduct. The total amount of HCl procured in 2005 was approximately 14,882 lb. This includes HCl from pure chemicals and mixtures in ChemLog. Facility and Waste Operations (Building TA-50-1) purchased approximately 8,025 lb of aqueous HCl in 2005. This HCl was used for heat exchanger scale cleaning and for the cleaning of electrodialysis reversal membranes. In its aqueous form, it is not subject to EPCRA Section 313 due to the qualifier of only "acid aerosols" counting towards the threshold.[3] The additional amount of HCl from ChemLog was 6,857 lb, including aqueous and aerosol forms of HCl. To be conservative, the entire amount was assumed to be in an aerosol form and was evaluated against the 10,000 lb otherwise use threshold, which it did not exceed. Therefore, it was not necessary to report HCl in 2005.

4.3 Polycyclic Aromatic Compounds

Polycyclic aromatic compounds (PACs) are a chemical category included on the EPCRA Section 313 list 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,"[4] fuel oil and paving asphalt contain PACs. In addition, PACs may be generated from the combustion of natural gas and fuel oil and the manufacture of asphalt. Each of these sources of PACs was evaluated and is described below.

Procurement of PACs

The total amount of materials potentially containing PACs tracked in ChemLog in 2005 was approximately 252 lb. The 252 lb tracked in ChemLog were entirely from the purchase of a chemical mixture, Trim E 190. Under EPCRA Section 313, the PAC category includes 21 specific chemicals and an additional 51 chemical mixtures that are listed as potentially containing PACs. The Trim E 190 MSDS does not list the petroleum oil mixture contained in the chemical mixture as the type listed as one of the 51 chemicals that may contain PACs. Master Chemical Corporation, the manufacturer of Trim E 190, was contacted and confirmed that Trim E 190 does not contain the type of petroleum oil that contains PACs. Therefore, the total PACs from the ChemLog analysis for 2005 is zero.

PACs from Asphalt Production

In 2005, LANL produced approximately 1,621 tons of asphalt and used 28,432 gallons of asphalt tar. A review of project management records for 2005 identified projects that involved the purchase of asphalt from outside contractors. Work tickets and project management records were reviewed to identify asphalt jobs that qualify as routine facility maintenance and are exempt under EPCRA Section 313. Routine facility maintenance includes patching of potholes, repair of roads and parking lots, and resurfacing of existing parking lots. After reviewing these records, only two projects were identified that did not fall under the facility maintenance exemption.

According to EPA guidance, asphalt tar may contain as high as 178 parts per million (ppm) of PACs.[4] However, Chevron-Texaco, the supplier of the asphalt tar, provided information specific to their product.[5] The information indicated the PACs concentration in the asphalt tar was significantly lower than that listed as a default value in the EPA's PACs guidance. These manufacturer-supplied values were used in the LANL calculation of PACs. The concentration of PACs in the asphalt tar is 8 ppm (versus EPA default value of 178 ppm).

Using the 8-ppm concentration, the total amount of PACs otherwise used at LANL in all asphalt work in 2005 is 7.58 lb. The concentration of benzo(g,h,i)perylene in asphalt, from EPA's Guidance on PBTs, is 1.2 ppm.[6] This figure gives 1.14 lb of benzo(g,h,i)perylene reportable towards its 10 lb otherwise use threshold.

PACs from Fuel Oil Combustion

The Technical Area (TA) 3 power plant at LANL used 5,480 gallons of fuel oil in 2005. An additional 8,000 gallons are estimated to have been used in diesel-fired generators

throughout LANL. According to EPA guidance, fuel oil may contain 10 ppm of PACs.[4] However, data provided by Chevron-Texaco indicate diesel may contain 22 ppm of PACs.[5] The 22 ppm was used in these calculations. This equates to 2.11 lb of PACs that apply to the otherwise use threshold. The value for benzo(g,h,i)perylene was found to be 0.05 ppm according to EPA guidance.[6] Data provided by Chevron-Texaco indicated concentrations of 9 ppm. The 9 ppm was used in these calculations and results in 0.86 lb of this particular PAC, applicable to the 10-lb otherwise use threshold.

In addition, combustion of fuel oil generates emissions of PACs that apply to the manufacture threshold. Using AP-42 emission factors,[2] these amounts were calculated to be 2.2×10^{-4} lb for total PACs and 3.0×10^{-5} lb for benzo(g,h,i)perylene.

PACs from Natural Gas

Approximately 1,110.1 million standard cubic feet of natural gas was burned at LANL facilities in 2005. Using AP-42 emission factors[7] and fuel records, approximately 0.018 lb of PACs was produced from natural gas combustion, which is applied to the manufacture threshold. Approximately 0.0013 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 these substances are negligible in natural gas before combustion.

Summary of PACs

The largest source of PACs at LANL in 2005 was asphalt use. The asphalt projects account for 7.58 lb toward the otherwise use threshold. Concentrations of PACs in diesel used account for 2.11 lb. The total is 9.69 lb, which is well below the otherwise use reporting threshold of 100 lb. The total amount of PACs manufactured from combustion of fuel oil and natural gas is 0.018 lb.

Both threshold quantities for otherwise use and manufacture were below the 100 lb threshold, therefore, it was determined that reporting of PACs under EPCRA Section 313 was not necessary.

Benzo(g,h,i)perylene concentrations in asphalt tar and diesel fuel totaled 2.0 lb towards the otherwise used threshold. Combustion processes accounted for 0.0013 lb, which is considered to be manufactured. These values are well below the reporting threshold of 10 lb. Therefore, benzo(g,h,i)perylene reporting was not necessary under EPCRA Section 313 in 2005.

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

Table 4. PACs Threshold Determination for 2005

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	9.69	Otherwise Use	100
	Asphalt	7.58			
	Fuel Oil	2.11			
	Natural Gas	0.018	0.018	Manufactured	100
	Asphalt	0			
	Fuel Oil	0.0002			
Benzo(g,h,i) perylene	Natural Gas	0	2.0	Otherwise Use	10
	Asphalt	1.14			
	Fuel Oil	0.86			
	Natural Gas	0.0013	0.0013	Manufactured	10
	Asphalt	0			
	Fuel Oil	3.0×10^{-5}			

4.4 Dioxins

Dioxins are a group of PBTs formed during combustion processes. The EPCRA Section 313 reporting threshold for the dioxins category is 0.1 gram manufactured, processed, or otherwise used. This limit applies to toxic-equivalent compounds, a category of dioxins consisting 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."[8]

Activities at LANL that were evaluated for dioxins include explosives activities and fuel combustion. Each is described below.

Explosives Activities

Dioxins are formed by burning chlorine-based chemical compounds with hydrocarbons producing an unintentional byproduct 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 and plasticizers found in 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, composition, and chemical formula, was obtained from Laboratory personnel and textbooks. Some HE materials contain binders and 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 and the HE materials having chlorine-containing binders were further

evaluated. 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 containing chlorine 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.[9] An emission factor of 4 µg dioxin emitted per ton of material burned was used.

Based on available information, estimated emissions from dioxins formed by OB/OD of HE materials totaled 2.45×10^{-6} g/yr. Furthermore, burning of HE materials at the LANL Burn Ground was evaluated separately for dioxin formation. A more conservative approach was used to estimate dioxin emissions from burning of HE materials. The assumption was made that all HE-contaminated waste could potentially result in dioxin formation. The same emission factor as that used for OB/OD was used to estimate emissions from open burning. Based on estimated emissions from all waste materials burned, dioxin emissions were 6.68×10^{-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, EPA EPCRA guidance for dioxins provides an emission factor of 3,178.6 picograms/liter of diesel fuel burned.[8] The Laboratory burned a total of 13,480 gallons (51,022 liters) of diesel fuel in 2005. Multiplying by the dioxin emission factor, a total of 1.62×10^{8} picograms (0.00016 grams) of dioxin was formed due to fuel combustion.

The total calculated dioxin emissions in 2005 are below the 0.1 gram threshold and, therefore, reporting under EPCRA Section 313 is not required. Table 5 summarizes the amount of dioxins formed from all sources characterized for 2005.

Table 5. Dioxin Threshold Determination for 2005

Description	Amount of Dioxin Formed (grams)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Threshold (grams)
HE Expended	2.45×10^{-6}	Manufactured	0.1
HE Burned	6.68×10^{-6}	Manufactured	0.1
Fuel Combustion	1.62×10^{-4}	Manufactured	0.1
Total Dioxin Formed	**0.0002**		0.1

4.5 Nitrate Compounds

According to EPA's EPCRA Section 313 Guidance, "List of Toxic Chemicals within the Water Dissociable Nitrate Compounds Category and Guidance for Reporting,"[10] nitrate compounds may be manufactured through elemental neutralization of nitric acid and through collection and treatment of sanitary wastewater. Reporting thresholds for nitrate

compounds are 25,000 lb for manufactured or processed and 10,000 lb for otherwise used. The EPA guidance provides a list of approximately 50 nitrate compounds included as water-dissociable nitrate compounds. Although this list is not exhaustive, it provides commonly identified nitrate compounds. Only the manufacture and otherwise use thresholds apply to LANL for 2005 EPCRA reporting. In addition, only those compounds in aqueous solution (>50% water) are required to be reported.

For the manufacture threshold, sources reviewed included waste nitric acid treated at the Radioactive Liquid Waste Treatment Facility (RLWTF) and neutralization of sanitary wastewater at the SWSC. The nitrate compounds applied to the otherwise use threshold included nitrate compounds purchased or used during 2005. Other nitrate compounds evaluated were determined to be nonaqueous and are not included in threshold determinations.

Procurement of Nitrate Compounds

A query of ChemLog was performed to determine the amount of nitrate compounds procured in 2005. Initial queries of ChemLog identified approximately 12,400 pounds of barium nitrate. The purchasers and users of this barium nitrate were contacted and it was determined that there was a data entry error in ChemLog regarding the size and weight of each container of barium nitrate. Working with the chemical owners, these data entry errors were corrected and the total amount of barium nitrate was 3,600 lb. It was further identified that the barium nitrate is not in aqueous solution, and, therefore, is not included in the nitrate compounds category for EPCRA Section 313.

Explosives Activities

For several years, LANL reviewed the Dynamic Experimentation Division Materials Expended Report and the Engineering Science and Applications Division Burn Ground Report and prepared detailed calculations to estimate the amount of nitrate compounds manufactured, processed, or otherwise used in these activities. The amounts were always very low, on the order of a couple hundred pounds. In 1998, it was determined that none of the nitrate compounds associated with these activities are in aqueous form and are not reportable under EPCRA. Therefore, these detailed calculations were discontinued.

Sanitary Wastewater

SWSC collects sanitary waste (sewage and other allowable discharges) from several LANL facilities and treats the waste in standard primary (physical), secondary (biological) treatment systems. EPA guidance for nitrate compounds provides information on calculating nitrate compounds in sanitary wastewater. Information was collected from the SWSC on nitrate influent concentrations and flow rates. The average nitrate concentration was 1.03 mg/L and total flow into the system during 2005 was 81,253,000 gallons. Using these data and EPA guidance, the total amount of sodium nitrate that was processed as an impurity was calculated to be 957 lb.

Information provided by SWSC also included the amount and the nitrate concentration of the treated water. The total amount of treated water out of SWSC in 2005 was 106,828,000 gallons. The average nitrate concentration was 3.48 mg/L. This calculates out to a total of 4,245 lb of nitrates (as sodium nitrate) manufactured.

Nitric Acid Neutralization

Waste acid from the plutonium processing facility is sent to the RLWTF for treatment. The RLWTF was contacted to obtain the volume of acid sent to their facility from the plutonium facility. The quantity of nitric acid waste sent to the RLWTF in 2005 was approximately 500 liters of 4 molar nitric acid (approximately 22%). At the end of 2005, this nitric acid was still in storage tanks at the RLWTF and none was treated. Therefore, no nitrate compounds were formed.

Summary of Nitrates

Table 6 summarizes the threshold determination for nitrate compounds for 2005.

Table 6. Nitrate Compound Threshold Determination for 2005

Description	Amount of Nitrate Compounds (lb)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Threshold (lb)
Procurement	3,600	Not in aqueous form	--
Explosives Activities	Not calculated	Not in aqueous form	--
SWSC—Processed	957	Processed	25,000
SWSC—Manufactured	4,245	Manufactured	25,000
RLWTF	0		

4.6 Nitric Acid

In general, nitric acid is used in high volume at the Laboratory every year. The main uses are research and development activities, sample preparation, plutonium processing, and the Laboratory's bioassay program. Small amounts of nitric acid are used for cleaning glassware. The total amount of nitric acid used at LANL in 2005 did not exceed the EPCRA Section 313 otherwise use threshold of 10,000 lb.

Procurement

Nitric acid procured and used at the Laboratory in 2005 was evaluated to determine amounts that could be applied to the EPCRA Section 313 laboratory exemption. According to EPCRA Section 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 technically qualified personnel.[1] However, quantities of a listed toxic chemical used for cleaning glassware do not qualify for this exemption.

In 2005, a total of 5,156 lb of nitric acid was procured at the Laboratory, based on queries of ChemLog. Users of large quantities of nitric acid were contacted to determine how the nitric acid was used. Relatively large quantities of nitric acid continue to be used for the bioassay program (monitoring employees for radioactive elements). Numerous other users within the Chemistry Division were contacted and verified the use of nitric acid for sample preparation and analysis. In 2005, this use totaled 4,245 lb. Based on conversations with the Laboratory personnel, it was assumed that approximately 10% of the nitric acid used in the laboratory setting was used for cleaning laboratory glassware, which is not an exempt activity. Therefore, 424 lb (4,245 × 10%) will be added to the otherwise use totals.

The quantity of nitric acid used by personnel that were not contacted (except for Nuclear Materials Technology [NMT] Division, which is described below) or that described their use of nitric acid as process related totaled 911 lb. As a conservative assumption, this amount is assumed to be otherwise used.

In conclusion, the quantity of nitric acid that was verified as qualifying for the laboratory exemption is 3,821 lb (4,245 – 424). The amount used for cleaning glassware is 424 lb. The amount of nitric acid not verified, or determined to be process related (not including NMT Division), is 1,335 lb (424 + 911).

NMT Plutonium Processing

In 2005, less than 200 lb of nitric acid was used in plutonium processing activities due to ongoing facility upgrade projects at TA-55 and tank upgrades at the RLWTF. Information on nitric acid use for 2005 was provided by facility personnel. A total of 102 liters of nitric acid of varying concentrations was used in unit operations in 2005. Conversion to the total pounds of nitric acid yielded a total of 192 lb. This is approximately 90% less than the amount used in 2004. This is due to NMT Division having very limited operations due to facility and maintenance upgrades. Historically, NMT Division purchases nitric acid in bulk and stores it in a nitric acid storage tank. However, in 2005 no additional nitric acid was purchased for the tank, and very little nitric acid was used from the tank inventory.

Summary of Nitric Acid

Nitric acid use in 2005 does not exceed the EPCRA Section 313 10,000-lb otherwise use threshold, and therefore, is not reportable. Table 7 summarizes the threshold determination for nitric acid for 2005.

Table 7. Nitric Acid Threshold Determination for 2005

Nitric Acid Use	Amount (lb)	EPCRA Status	Threshold for Reporting
Laboratory Use	3,821	Lab Exempt	Exempt
Otherwise Use • Non-lab or unknown use (minus NMT purchases) • Plutonium processing (NMT actual use)	1,335 192	Otherwise Use	10,000 lb
Total Otherwise Use	**1,527**		

5.0 LEAD AND FORM R REPORTING

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 2005. 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 2005, lead was used at several locations within the Laboratory and exceeded the otherwise use threshold for EPCRA Section 313 reporting. Each use is described below.

Lead Procurements

A listing of all procurements in 2005 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 compounds added to ChemLog in 2005 was 7.31 lb. There were no purchases of pure lead in 2005. According to EPCRA Section 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 3.15 lb. The total amount of lead compounds from procurements applied to the otherwise use threshold is 4.16 lb.

Lead Use at the Firing Range

Lead is a component in various types of ammunition. LANL maintains an onsite firing range for training 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 Section 313 chemicals from

various munitions activities.[11] The TRI-Data Delivery System (TRI-DDS) software was used to calculate the amounts of toxic chemicals associated with munitions used at LANL for comparison with EPCRA Section 313 reporting thresholds and calculation of environmental releases. Some ammunition used at LANL was not represented in TRI-DDS. In these cases, the manufacturer was contacted to obtain specific information on lead for that ammunition. Using this software and manufacturer data, it was determined that a total of 7,007 lb of lead and 12.9 lb of lead compounds were otherwise used at the firing range in 2005. Additionally, the firing of ammunition containing lead created (manufactured) 7.1 lb of lead compounds and resulted in 6.54 lb as air emissions.

Fuel Combustion

Lead can be found in trace amounts in many materials. Fuel oil and natural gas 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 evaluated against the 100-lb lead threshold. According to EPA guidance,[12] the concentration of lead in diesel fuel is 0.5 ppm and 0.05 mg/m^3 in natural gas. In 2005, LANL used 1,110.1 million standard cubic feet of natural gas, which contained 3.43 lb of lead. LANL also burned 13,480 gallons of diesel fuel, which contained 0.05 lb of lead. Therefore, a total of 3.48 lb is applied to the otherwise use threshold for lead.

Additionally, during fuel combustion, lead in the fuel is converted into various lead compounds, which is considered to be coincidental manufacture. In 2005, LANL emitted lead compound emissions from the following combustion sources: the TA-21 steam plant, asphalt plant, TA-3 power plant, and numerous small natural gas-fired boilers. The lead compound emissions from these sources totaled 0.58 lb toward the manufacture threshold.

Lead Use at LANSCE

LANL continues to maintain an inventory of lead shielding and lead bricks at the Los Alamos Neutron Science Center (LANSCE) and other areas of the Laboratory. In recent years, LANL has reduced the inventory by sending some of the lead offsite for reuse or disposal. According to EPA's web-based TRI advanced training course presented by SAIC on May 10, 2005, "the recovery of a listed Section 313 chemical for further distribution in commerce or commercial use is 'processing' of that chemical." Also, materials sent offsite for direct "reuse" are not reported on Form R, but material sent offsite for recycling are reported on Form R in Part II, Section 6.2. EPA considers the direct recirculation of a toxic chemical within a process or between processes without any intervening reclamation or recovery to be "reuse."[1] Furthermore, "reclamation or recovery" does not include simple phase changing of the toxic chemical before further reuse (e.g., simple remelting of scrap metal).

The process for shipping scrap metal for recycle has been centralized at the Materials Recycling Facility (MRF), part of LANL's Salvage process. The total amount of scrap metal that went out for metal recycle and resale in 2005 is 1,545 metric tons. The MRF does not have records of how much was lead, but estimates approximately 10%. Most of the scrap

metal is piping and scaffolding. Using this information, the estimate of lead shipped offsite for recycle and resale in 2005 is 339,900 lb.

The lead sent out for recycle and resale is considered processed because it was distributed for commercial use. The metal recycling company repackages the lead and sends it to a lead smelter. Because the lead is simply remelted, it is defined as reused and, therefore, is not reported as an environmental release on the Form R.

Additionally, 3,000 lb of lead were transferred to Duratek's Bear Creek Facility in Tennessee. This lead is melted down into new shielding and made available for reuse at other DOE facilities as part of the DOE Intercomplex Lead Reuse program. Therefore, this lead is also considered processed and not reported as an environmental release on Form R because it will be reused.

In 2004, LANSCE received 40,000 lb of lead from France for the Pb Cooling Project. This lead is still on site at LANL and is still being used for experiments. However, it was counted towards threshold reporting for 2004 and so will not be counted in the thresholds for 2005 as this would result in double-counting. This lead will be returned to France when the project ends.

Lead Melting and Lead Shielding Decontamination

Historically at LANL, lead has been melted and formed into specific shapes for glove box and exposure shielding. Lead melting as an activity is applied to the otherwise use threshold and subject to the 25,000-lb threshold. No lead melting activities occurred onsite at LANL in 2005 and lead-shielding decontamination was discontinued at LANL.

Summary of Lead

The largest source of lead use at LANL is from the lead recycling, which accounted for 342,900 lb of lead towards the process threshold. In 2005, the firing range accounted for 7,007 lb of lead towards the otherwise use threshold. Table 8 summarizes the threshold determination for lead and lead compounds for 2005. Based on these operations, it was determined that lead was processed and used over threshold quantities. However, lead compounds did not exceed the reporting threshold. Therefore, for 2005 reporting, a Form R was completed for just lead.

Table 8. Lead and Lead Compound Threshold Determination for 2005

Activity	Lead "Use"(lb)	Lead Compound "Use"(lb)	Comments
Firing Range	7,007	12.9	Otherwise Used
	0	7.1	Manufactured
Lead Purchases (ChemLog)	0	4.16	Otherwise Used 7.31 lb purchased, 3.15 lb lab exempt
Lead Recycle/Resale (sold to Ace Metals)	339,900	0	Processed, all is re-used and not reported on the Form R
Lead Re-Use (DOE inter-complex transfer)	3,000	0	Processed for re-use
Fuel Combustion	0	0.58	Manufactured (sum of nat. gas, diesel, and asphalt)
	3.5	0	Otherwise Used
Total Nonexempt Use	Otherwise Used - 7,010 Processed - 342,900	Otherwise Used - 17 Processed - 0 Manufactured - 7.7	Reporting Threshold = 100 lb

5.2 Environmental Releases and Offsite Disposal

Air Emissions

Lead emissions were calculated from two operations at the Laboratory: the firing range and fuel combustion. Lead air emissions from the firing range were calculated using the TRI-DDS.[11] Using this model, the total amount of lead released as fugitive air emissions was 6.54 lb.

In 2005, LANL emitted lead compound emissions from the following combustion sources: TA-21 steam plant, asphalt plant, TA-3 power plant, stand-by stationary generators, and numerous small boilers and heaters. Using fuel use records and AP-42 emission factors, emissions from these combustion sources totaled 0.57 lb of lead compounds. Table 9 summarizes lead air emissions from LANL as reported on the Form R.

Table 9. Lead Air Emissions from LANL in 2005

Emission Source	Total Lead Emissions (lb)	Fugitive or Stack
Firing Range	6.54	Fugitive
Fuel Combustion	0.57	Stack
Total	**7.11**	

Releases to Water

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

Wastewater Discharges

Data collected as part of the 2005 NPDES Outfall Monitoring Program were used to calculate the mass of lead discharged. The tabular data from LANL's NPDES program include total annual flows and analytical results for numerous parameters from samples collected at a number of NPDES outfalls. Samples for lead were collected once annually from 16 outfall locations and multiple samples were collected from NPDES Outfall 051. Data for this outfall were averaged. For each NPDES outfall, lead discharges were calculated by multiplying total yearly flow by the average concentration of lead from that outfall. The resulting mass from each outfall was then summed, resulting in a total discharge of 0.52 lb of lead from NPDES outfalls in 2005.

Storm Water

Lead concentration data for storm water released to receiving streams during calendar year 2005 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 location name, sample type, date sample was collected, and analytical results in µg/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, 2005 Water Year."[13] 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 2005, a correction was made for the volume of water released from the Los Alamos County Municipal Wastewater Treatment Facility in Pueblo Canyon. This County facility is just upstream of the LANL sampling/flow station "Pueblo at SR-502." It was assumed that all of the flow recorded at the "Pueblo at SR-502" station was attributable to treated municipal wastewater effluent and not representative of release from LANL. 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 total calculated amounts of lead released from LANL in 2005. The 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 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 in canyons within the LANL boundary are 0.1 μg/g and 19.7 μg/g for mercury and lead, respectively (Bruce Gallaher, Water Quality and Hydrology Group, personal communication). Water samples collected as part of LANL's annual surveillance program always contain a significant amount of solid particulate 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 background concentrations of mercury and lead in each sample, the background amount was subtracted from the analytical metal concentration for each sample.

Once background-adjusted concentrations for each applicable location were established, the concentration was then multiplied by the measured or estimated annual flow at each sampling location. A single mass value for each sampling location was then derived by averaging all samples collected from each location during 2005. 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 estimated mass of lead released from LANL in base flow and storm water during 2005 was 542.35 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 542.4 lb in calendar year 2005. Table 10 summarizes lead releases to receiving streams by canyon as reported on the Form R.

Table 10. Lead Discharges to Receiving Streams by Canyon

Canyon	Storm Water (lb)	NPDES Discharges (lb)	Total (lb)
Ancho Canyon Tributary to Rio Grande	0.022	0.0	0.02
Cañada del Buey	1.43	0.0	1.43
Los Alamos Canyon Tributary to Rio Grande	270.9	0.0	270.9
Mortandad Tributary to Rio Grande	2.63	0.052	2.69
Pajarito Canyon Tributary to Rio Grande	150.3	0.0	150.3
Pueblo Canyon Tributary to the Rio Grande	19.9	0.0	19.9
Sandia Canyon Tributary to Rio Grande	54.6	0.0	54.6
Water Canyon Tributary to Rio Grande	42.5	1.19×10^{-4}	42.5
Totals	**542.35**	**0.052**	**542.4**

Releases to Land

Lead releases to land occur onsite 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 munitions used at LANL was estimated by matching the munitions types with those listed in the TRI-DDS. A total of 7,007 lb of lead was released to land at the firing range at LANL in 2005.

Offsite Waste Disposal

LANL performed no onsite disposal of lead-contaminated wastes in 2005. All lead-contaminated waste was sent offsite to EPA-approved facilities for disposal or recycling. Data, including shipment weight and lead concentration, were obtained for all lead-contaminated wastes sent offsite for disposal in 2005. Waste disposal records were evaluated to determine any waste shipments exempt from reporting. Intact light bulbs and batteries sent offsite for disposal are exempt under the article exemption. Waste generated in a laboratory under direct supervision of a technically qualified individual is also exempt from reporting.

The amount of lead contained in waste shipped offsite from LANL in 2005 was 1,476 lb. The 2005 totals for lead are significantly lower than amounts shipped offsite in previous years. In 2003, a total of 50,570 lb was shipped offsite, and in 2004 a total of 52,518 lb was shipped offsite. The increase in waste shipments in 2003 and 2004 reflects LANL's recent efforts to expunge legacy waste, particularly lead bricks and lead shielding. No large-scale clean-up efforts were conducted in 2005.

Table 11 provides a summary of lead waste that was sent offsite to various disposal and recycling companies in 2005. For the purposes of Form R reporting, each receiving facility was contacted to determine final disposition of lead in waste shipped offsite.

Table 11. Lead Waste Sent Offsite from LANL in 2005

Company	Location	Facility EPA ID	Ultimate Fate of Waste	Total Lead (lb)
Clean Harbors, Aragonite, LLC	Aragonite, UT	UTD981552177	Landfill	548.5
Envirocare of Utah, Inc.	Clive, UT	UTD982598898	Landfill	525.2
Material and Energy Corporation	Oak Ridge, TN	TNR000005397	Land Disposal	0.05[a]
Onyx Environmental Services, LLC	Henderson, CO	COD980591184	Recycled for liquids; Landfill for solids	62.5
Onyx Special Services, Inc.	Phoenix, AZ	AZ0000337360	Recycled	15.0
Perma-Fix, Inc.	Gainesville, FL	FLD9805911071	Recycled for liquids; Landfill for solids	13.9
Phibro-Tech, Inc.	Santa Fe Springs, CA	CAD008488025	Recycled	311.3
Waste Control Specialists	Andrews County, TX	TXD988088464	Landfill	0
			Total	**1,476.5**

(a) Releases of less than 0.1 lb do not need to be included on the Form R reporting, per EPA Guidance.[1]

5.3 Other Information Provided on Form R Report

Environmental releases of lead as air emissions, to surface waters, and onsite land releases were reported to be 7.11 lb, 542.4 lb, and 7,007 lb, respectively. These values are included in Section 5 of the Form R, *Quantity of the Toxic Chemical Entering Each Environmental Medium Onsite*. A total of 1,476.5 lb of lead was reported in Section 6.2 of the Form R, *Transfers to Other Offsite Locations.*

Methods of treating lead in wastewater effluent before discharge were included in Section 7A of the Form R, which details onsite waste treatment methods and efficiency. Wastewater from industrial processes at LANL is discharged to the RLWTF before discharge to NPDES-permitted Outfall 051. The RLWTF conducts a series of treatment steps that reduce the amount of metals in the effluent. 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 2005, the RLWTF resulted in a 99.6% treatment efficiency of lead in the wastewater. Sections 7B and 7C of the Form R relate to onsite energy recovery and recycling. LANL performed no onsite processes applicable to these sections for lead in 2005.

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 onsite or offsite. LANL also reported no onsite recycling or treatment. Approximately 326 lb of the lead shipped offsite were recycled.

Section 8.9 of the Form R reports the production or activity ratio, an estimated measure of production or activity involving the reported chemical, 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 use of lead. The amount of lead munitions used in 2005 was divided by the amount used in 2004 to obtain an activity ratio of 1.25.

6.0 MERCURY AND FORM R REPORTING

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 2005. As part of the PBT rule, the threshold for reporting mercury was reduced to 10 lb starting calendar year 2000. In 2005, mercury use at the Laboratory exceeded the otherwise use threshold for EPCRA Section 313 reporting. Each use is described below.

Mercury Procurements

A listing of 2005 procurements 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 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 in 2005 was 11.1 lb. However, upon investigation of these mercury-containing purchases, many of the purchases were actually for laboratory standards containing ppm quantities of mercury and other metals. Additionally, according to EPCRA Section 313 guidance documents, the laboratory exemption applies 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 described as *mercury standards* or *instruments* were assumed to be used in a laboratory setting and exempt from reporting. This accounted for 10.0 lb. The total amount of mercury from procurements applied to the otherwise use threshold is 1.1 lb.

Los Alamos Neutron Science Center Shutter System

The largest use of mercury at the Laboratory is in the 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 into a headspace 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 needed.

During 2005, minor maintenance was performed on the mercury shutter system that included removing mercury from the system and then adding it back after the maintenance was completed. The total amount of mercury displaced during maintenance in 2005 was approximately 122 lb, which is above the 10-lb EPCRA Section 313 otherwise use threshold for mercury.

Fuel Combustion

In 2005, LANL generated mercury compound emissions from the following combustion sources: the TA-21 steam plant, asphalt plant, TA-3 power plant, and numerous small boilers. The mercury compound emissions from these sources totaled 0.3 lb towards the manufactured threshold. Additionally, mercury is found in diesel fuel as an impurity. According to EPA guidance, the concentration of mercury in diesel fuel is 0.001 ppm.[14] LANL burned approximately 13,480 gallons of diesel fuel in 2005 and this equates to 0.0001 lb towards the otherwise use threshold.

Mercury compounds generated during the combustion processes are considered manufactured. The amount of mercury compounds manufactured at LANL through all the combustion processes equals 0.3 lb, well below the 10-lb reporting threshold. Mercury concentrations procured via the ChemLog added 1.11 lb of mercury to the otherwise use threshold and the burning of diesel fuel contributed 0.0001 lb to the otherwise use threshold. The LANSCE shutter system contributed 122.2 lb to the otherwise use category in 2005. Therefore, the total amount of mercury qualifying as otherwise use equals 123.3 lb, which is above the reporting threshold value of 10 lb and necessitates the 2005 reporting of mercury under EPCRA Section 313. Table 12 summarizes uses of mercury at LANL in 2005.

Table 12. Mercury Threshold Determination for 2005

Description	Amount of Mercury (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Purchasing of Mercury Standards and Instruments	10.0	Procurement data and facility personnel interviews	Laboratory Exempt	NA
Other Procurement	1.11	Procurement records	Otherwise Used	10
LANSCE Shutter System	122.2	LANSCE facility records		
Fuel Combustion	0.0001	Fuel use records and EPA guidance		
Fuel Combustion	0.3	Fuel use records and EPA AP-42	Manufactured	10

6.2 Environmental Releases and Offsite Disposal

Air Emissions

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

In April 2002, a mercury monitor was installed at LANSCE in the area near the mercury shutters. This monitor collects five-minute readings of mercury concentrations in room air in nanograms of mercury per cubic meter. The flow rate from the stack at the Lujan Center at LANSCE is 12,000 cubic feet per minute. This stack includes ventilation from two different rooms at the Lujan Center. As a conservative assumption, the total 12,000 cubic feet per minute 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:

$$\sum [(\text{monitor reading}) * (\text{flow rate}) * (\text{five-minute interval})]$$

For the months of January and December in 2005, there were periods of time that the mercury monitor did not operate and did not record data. For the two months with missing data, an average of the data collected during the month was calculated and that average was used for each missing data point in the month. The total amount of mercury stack emissions from the Lujan Center at LANSCE in 2005 was 0.024 lb.

In 2005, LANL emitted mercury emissions from the following combustion sources: the TA-21 steam plant, asphalt plant, TA-3 power plant, and numerous small boilers and heaters. The stack emissions from the power plant, asphalt plant, steam plant, and small boilers totaled 0.30 lb of mercury.

Table 13 summarizes mercury air emissions from LANL as reported on the Form R.

Table 13. Mercury Air Emissions from LANL in 2005

Emission Source	Total Mercury Emissions (lb)	Fugitive or Stack
LANSCE Shutter System Activities	0.024	Stack
Fuel Combustion	0.3	Stack
Total	**0.324**	

Releases to Water

Releases to receiving streams are a result of storm water run off 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 for lead releases. Refer to Section 5.2 of this report for a detailed description of how water discharges were calculated.

Wastewater Discharges

A total discharge of 0.02 lb of mercury from NPDES outfalls was reported on the Form R for 2005.

Storm Water

A total discharge of 0.8 lb of mercury from storm water was reported on the Form R for 2005. 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 0.82 lb in calendar year 2005. Table 14 summarizes mercury releases to receiving streams by canyon, as reported on the Form R.

Table 14. Mercury Discharge to Receiving Streams by Canyon

Canyon	Storm water (lb)	NPDES Discharges (lb)	Total (lb)
Ancho Canyon Tributary to Rio Grande	6.78×10^{-4}	0.0	6.78×10^{-4}
Canada del Buey	2.82×10^{-3}	0.0	2.82×10^{-3}
Los Alamos Canyon Tributary to Rio Grande	0.115	0.0	0.236
Mortandad Tributary to Rio Grande	4.61×10^{-3}	0.02	2.60×10^{-2}
Pajarito Canyon Tributary to Rio Grande	0.180	0.0	0.282
Pueblo Canyon Tributary to Rio Grande	0.066	0.0	0.097
Sandia Canyon Tributary to Rio Grande	0.394	0.0	1.57
Water Canyon Tributary to Rio Grande	0.035	0.0	0.021
Total	**0.80**	**0.02**	**0.82**

Releases to Land

There were no onsite releases of mercury to land.

Offsite Waste Disposal

LANL performed no onsite disposal of mercury-contaminated wastes in 2005. All mercury-contaminated waste is sent offsite to EPA-approved facilities for disposal or recycling. Data, including shipment weight and mercury concentration, were obtained for all mercury-contaminated wastes sent offsite for disposal in 2005. The waste disposal records were evaluated to determine any waste shipments that were exempt from reporting. Intact light bulbs and thermometers sent offsite for disposal are exempt under the article exemption. Waste generated in a laboratory under direct supervision of a technically qualified individual is also exempt from reporting.

Total reportable mercury from all nonexempt waste disposal was calculated to be 221 lb, 29.1 lb of which was shipped offsite for recycle and reuse and were not ultimately released to the environment. Table 15 provides a summary of mercury waste streams sent offsite to various disposal and recycling companies in 2005. For the purposes of Form R reporting, each receiving facility was contacted to determine final disposition of mercury in the waste shipped offsite.

Table 15. Mercury Waste Sent Offsite from LANL in 2005

Company	Location	Facility EPA ID	Ultimate Fate of Waste	Total Hg (lb)
Clean Harbors, Aragonite, LLC	Aragonite, UT	UTD981552177	Landfill	3.48
Envirocare of Utah, Inc.	Clive, UT	UTD982598898	Landfill	90.0
Material and Energy Corporation	Oak Ridge, TN	TNR000005397	Landfill	53.5
Onyx Environmental Services, LLC	Henderson, CO	COD980591184	Landfill	44.9
Onyx Special Services, Inc.	Phoenix, AZ	AZ0000337360	Metal Recovery	29.1
Perma-Fix, Inc.	Gainesville, FL	FLD980711071	Landfill	0.12
Waste Control Specialists	Andrews County, TX	TXD988088464	Landfill	0.003[a]
			Total	**221.1**

(a) Releases of less than 0.1 lb do not need to be included on the Form R reporting, per EPA Guidance.[1]

6.3 Other Information Provided on Form R Report

Environmental releases of mercury as air emissions and to surface waters were reported to be 0.3 lb and 0.8 lb, respectively. These values are included in Section 5 of the Form R, *Quantity of the Toxic Chemical Entering Each Environmental Medium Onsite*. A total of 221.1 lb of mercury was reported in Section 6.2 of the Form R, *Transfers to Other Offsite Location,* with 29.1 lb of this being shipped offsite for recycle.

Methods of treating NPDES outfall mercury amounts were included in Section 7A of the Form R, which details onsite waste treatment methods and efficiency. Wastewater from industrial processes at LANL is discharged to the RLWTF before discharge to NPDES-permitted Outfall 051. The RLWTF conducts a series of treatment steps that reduce the amount of metals in the effluent before 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 2005, the RLWTF resulted in an 86% treatment efficiency of mercury in the wastewater. Sections 7B and 7C of the Form R relate to onsite energy recovery and recycling. LANL performed no onsite processes applicable to these sections for mercury in 2005.

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 onsite or offsite. LANL also reported no onsite recycling or treatment. Approximately 29.1 lb of the mercury shipped offsite were recycled. Estimates based on this year's releases were given for the subsequent two reporting years.

Section 8.9 of the Form R reports the production or activity ratio, an estimated measure of the production or activity of the reported chemical at the facility, as compared to the previous year. Because LANL is not a production facility, a surrogate measure was used to complete this section of the Form R. The mercury in shutter systems 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 2004 to 2005, an activity ratio of 2.7 was calculated.

7.0 EPCRA SECTION 313 SUMMARY AND TRENDS

LANL has submitted EPCRA Section 313 data to EPA since 1987. From 1987 to 1994, this information was submitted by the UC, operator of LANL in 2005. Starting with reporting year 1995, EO 12856 required all federal facilities to comply with EPCRA Section 313 requirements. As of 1995, EPCRA Section 313 information for LANL has also been submitted by 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, EO 13148 was signed, 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 Section 313) reporting by 90% by 2005, using a 1993 baseline.

LANL has implemented numerous pollution prevention projects to reduce use and releases of EPCRA Section 313 chemicals. However, two regulatory changes made by EPA in recent years 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 lead and mercury. The regulatory changes resulted in reporting thresholds of 10 lb for mercury and 100 lb for lead. Therefore, for the past five years LANL has submitted

environmental release data on lead and, three out of the last five years, has reported on mercury. Figure 2 provides a summary of LANL-reported releases for the period from 1993 through 2005. Several points are worth noting from this chart:

- In the early 1990s, LANL implemented a new wastewater disinfection system that eliminated the use of chlorine. Chlorine gas was replaced with bromine tablets and mixed oxidants generated from sodium chloride. This pollution prevention project decreased use of chlorine to well below reporting thresholds.

- In the late 1990s, LANL implemented a nitric acid recycle system to reduce the amount of new nitric acid needed for plutonium processing. This closed-loop recycle system greatly reduced the need to purchase nitric acid, and due to recycling efforts, nitric acid use was below reporting thresholds for several years. However, in 2003 and 2004 a new process to convert weapons-grade plutonium to mixed oxide (MOx) fuels for nuclear power plants was implemented. Due to quality specifications and facility constraints, this project was unable to use recycled nitric acid. Therefore, nitric acid was reportable for 2003 and 2004.

- In 2005, the plutonium processing facility had very limited operations due to ongoing facility maintenance and equipment upgrades. Therefore, nitric acid use was well below reporting thresholds for 2005.

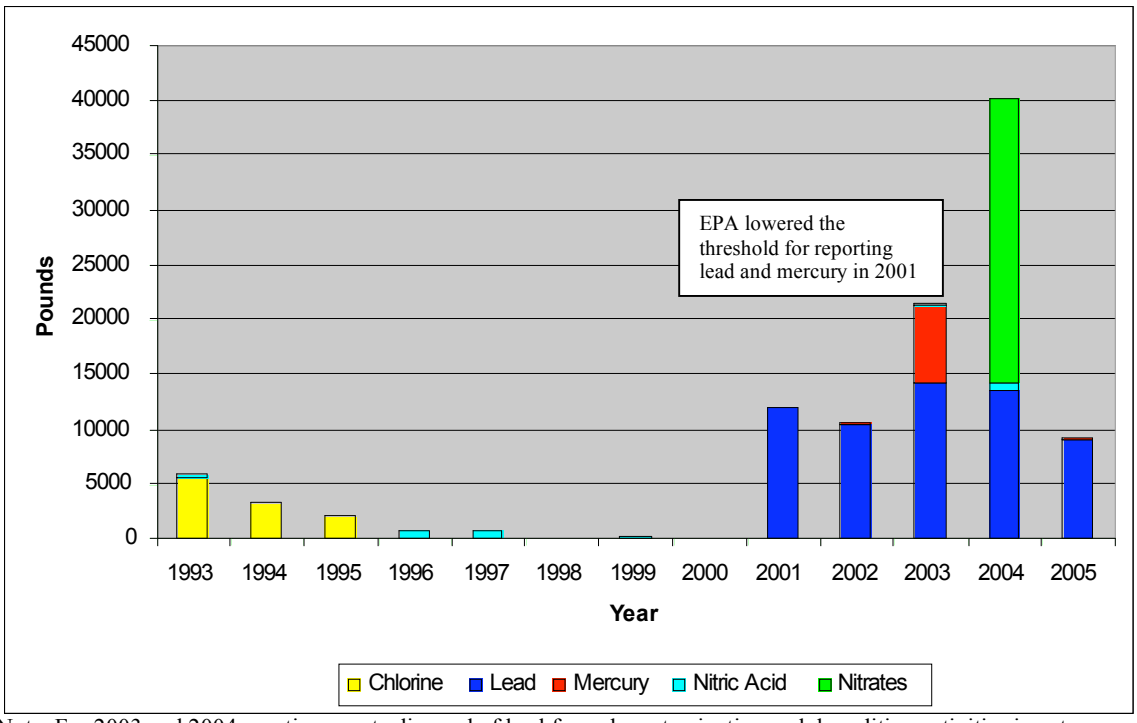
- Because there were no identified users of recycled nitric acid, and limited storage capacity, in 2004, spent nitric acid from plutonium processing was sent to the RLWTF for treatment and disposal. Through the treatment process nitric acid was neutralized and resulted in formation of nitrate compounds. For the first time in 2004, nitrate compounds were manufactured above reportable quantities and triggered reporting.

- Although the use of lead and lead compounds has been relatively constant over the years at LANL, the threshold for reporting was lowered to 100 lb in 2001. LANL first began EPCRA Section 313 reporting on lead in that year. About that same time, LANL made a concerted effort to reduce onsite inventory of lead bricks and shielding that is no longer needed. Much of this lead shielding is radioactively contaminated and cannot be recycled. Therefore, large amounts of legacy lead were shipped offsite for disposal and reported on the Form Rs.

The largest use of mercury at the Laboratory is in the LANSCE shutter system. Reservoirs of mercury are used as shields on the neutron beam shutter system. Each reservoir is a closed system and only opened occasionally when minor repairs or maintenance are needed. Mercury has only triggered reporting during the years that maintenance activities have occurred on the shutter systems. Environmental releases of mercury are very low.

Another metric used at LANL is tracking of EPCRA Section 313 reportable chemical use. Figure 3 shows the amount of reportable chemicals used at LANL from 1993 through 2005. The UC set a pollution prevention goal of reducing the use of EPCRA Section 313 reportable

chemicals by 90% by 2005 using 1993 as a baseline. The straight blue line shows the 90% reduction goal. The pink line shows the actual amount of EPCRA Section 313 reportable chemicals used each year. Each year LANL evaluates EPCRA Section 313 reportable chemical use and uses this information to prioritize pollution prevention projects to reduce use of these chemicals. As shown in Figure 3, LANL has made good progress towards the 90% chemical use reduction goal. However, the MOx project in 2003 and 2004 was not able to recycle nitric acid for reuse and resulted in a substantial increase in use of nitric acid. Work is in progress to complete facility upgrades and the laboratory analytical quality assessment requirements to demonstrate that recycled nitric acid meets the quality standards for MOx fuels.



Note: For 2003 and 2004 one-time waste disposal of lead from decontamination and demolition activities is not included on this chart.

Figure 2. Trends in LANL's reported releases to EPA TRI.

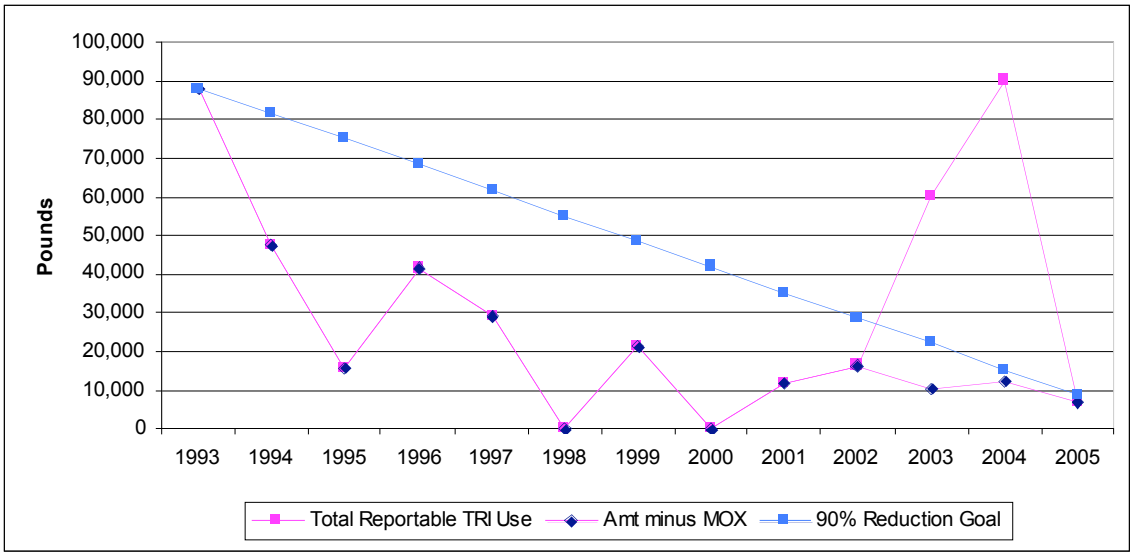


Figure 3. Trends in TRI reportable chemical use at LANL.

References

1. U.S. Environmental Protection Agency, "Toxic Chemical Release Inventory Reporting Form R and Instructions," Revised 2005 Version, EPA 260-B-06-001, January 2006.

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," EPA 745-B-014, December 1999.

4. 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.

5. Chevron-Texaco Guidance Recommendations for SARA 313 Reporting of Polycyclic Aromatic Compounds (PACs) and Benzo(g,h,i)perylene. Lyman Young, May 2, 2001.

6. 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, August 2001.

7. U.S. Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors," AP-42, Fifth Edition, Section 1.4—Natural Gas Combustion, July 1998.

8. 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.

9. American Society of Mechanical Engineers, "Relationship Between Chlorine in Waste Streams and Dioxin Emissions from Combustors," CRTD Vol. 36, December 1995.

10. U.S. Environmental Protection Agency, "List of Toxic Chemicals within the Water Dissociable Nitrate Compounds Category and Guidance for Reporting," EPA 745-R-00-006, December 2000.

11. U.S. Department of Defense, TRI-DDS Software, http://www.dod.tridds.org.

12. 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.

13. Los Alamos National Laboratory, "Surface Water Data at Los Alamos National Laboratory 2005 Water Year," LA-14239-PR, May 2006.

14. 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 2005

CAS Number	Chemical Name	EPCRA Threshold (lb)	2005 Amount Purchased or Used (lb)
7664-93-9	Sulfuric acid (aerosol forms only)	10000	20,199.70
7647-01-0	Hydrochloric acid (aerosol forms only)	10000	14,882.49
7697-37-2	Nitric acid	10000	5,591.17
Nitrate Compounds	Nitrate compounds (water dissociable)	10000	3,660.28
Barium Compounds	Barium Compounds	10000	3,613.75
Cyanide Compounds	Cyanide Compounds	10000	2,216.69
107-21-1	Ethylene glycol	10000	1,991.70
75-45-6	Chlorodifluoromethane	10000	1,710.24
1344-28-1	Aluminum oxide (fibrous forms)	10000	1,530.45
67-56-1	Methanol	10000	1,426.68
Silver Compounds	Silver Compounds	10000	1,365.62
75-05-8	Acetonitrile	10000	1,266.32
75-09-2	Dichloromethane	10000	1,143.42
872-50-4	N-Methyl-2-pyrrolidone	10000	904.22
79-01-6	Trichloroethylene	10000	790.97
7782-50-5	Chlorine	10000	706.39
67-63-0	Isopropyl alcohol (mfg-strong acid process)	10000	651.74
Manganese Compounds	Manganese Compounds	10000	424.68
110-54-3	n-Hexane	10000	421.45
78-93-3	Methyl ethyl ketone	10000	411.37
Glycol Ethers Compounds	Glycol Ethers	10000	382.05
7664-38-2	Phosphoric acid	10000	289.96
108-88-3	Toluene	10000	275.25
115-07-1	Propylene	10000	251.96
68-12-2	N,N-Dimethylformamide	10000	230.25
7440-41-7	Beryllium	10000	207.99
95-63-6	1,2,4-Trimethylbenzene	10000	203.43
120-12-7	Anthracene	10000	151.07
67-66-3	Chloroform	10000	132.34
1330-20-7	Xylene (mixed isomers)	10000	85.21
Copper Compounds	Copper Compounds	10000	73.48
Chromium Compounds	Chromium Compounds	10000	51.31
Cobalt Compounds	Cobalt Compounds	10000	44.74
71-43-2	Benzene	10000	42.46
9016-87-9	Polymeric diphenylmethane diisocyanate	<10000	41.28
74-87-3	Chloromethane	10000	41.06
55-63-0	Nitroglycerin	10000	38.72
7664-39-3	Hydrogen fluoride	10000	37.41
Zinc	Zinc Compounds	10000	37.09
Polychlorinated Alkanes	Polychlorinated alkanes (C10 to C13)	10000	34.80

CAS Number	Chemical Name	EPCRA Threshold (lb)	2005 Amount Purchased or Used (lb)
Nickel Compounds	Nickel Compounds	10000	32.23
75-71-8	Dichlorodifluoromethane	10000	30.00
7429-90-5	Aluminum (fume or dust)	10000	27.54
123-31-9	Hydroquinone	10000	18.02
7664-41-7	Ammonia	10000	17.73
110-82-7	Cyclohexane	10000	17.29
74-85-1	Ethylene	10000	17.18
100-41-4	Ethylbenzene	10000	15.16
7439-96-5	Manganese	10000	15.02
7440-62-2	Vanadium (fume or dust)	10000	14.98
Lead Compounds	Lead Compounds	10000	13.80
79-06-1	Acrylamide	10000	13.58
680-31-9	Hexamethylphosphoramide	10000	12.38
108-10-1	Methyl isobutyl ketone	10000	11.69
7440-66-6	Zinc (fume or dust)	10000	11.21
Mercury Compounds	Mercury Compounds	10	11.11
123-91-1	1,4-Dioxane	10000	10.84
7726-95-6	Bromine	10000	10.28
71-36-3	n-Butyl alcohol	10000	10.17
98-82-8	Cumene	10000	9.87
80-62-6	Methyl methacrylate	10000	8.37
75-65-0	tert-Butyl alcohol	10000	7.26
Beryllium Compounds	Beryllium Compounds	10000	6.38
110-86-1	Pyridine	10000	6.22
95-50-1	1,2-Dichlorobenzene	10000	6.03
95-47-6	o-Xylene	10000	5.82
109-86-4	2-Methoxyethanol	10000	5.30
64-18-6	Formic acid	10000	4.80
100-42-5	Styrene	10000	4.37
108-38-3	m-Xylene	10000	4.37
91-20-3	Naphthalene	10000	3.85
Chlorophenols Compounds	Chlorophenols	10000	3.83
7440-50-8	Copper	10000	3.65
7440-22-4	Silver	10000	3.41
111-42-2	Diethanolamine	10000	3.40
77-73-6	Dicyclopentadiene	10000	3.25
Cadmium Compounds	Cadmium Compounds	10000	2.93
7440-38-2	Arsenic	10000	2.77
107-06-2	1,2-Dichloroethane	10000	2.72
108-90-7	Chlorobenzene	10000	2.67
7440-47-3	Chromium	10000	2.42
121-44-8	Triethylamine	10000	2.40
62-53-3	Aniline	10000	2.25
7783-06-4	Hydrogen sulfide	10000	2.20

CAS Number	Chemical Name	EPCRA Threshold (lb)	2005 Amount Purchased or Used (lb)
7440-48-4	Cobalt	10000	1.96
75-15-0	Carbon disulfide	10000	1.93
50-00-0	Formaldehyde	10000	1.89
106-42-3	p-Xylene	10000	1.89
7440-02-0	Nickel	10000	1.89
7440-39-3	Barium	10000	1.76
Antimony Compounds	Antimony Compounds	10000	1.49
77-78-1	Dimethyl sulfate	10000	1.46
62-56-6	Thiourea	10000	1.32
74-90-8	Hydrogen cyanide	10000	1.32
10294-34-5	Boron trichloride	10000	1.31
106-50-3	p-Phenylenediamine	10000	1.22
108-95-2	Phenol	10000	1.22
120-80-9	Catechol	10000	1.10
7782-49-2	Selenium	10000	1.10
108-93-0	Cyclohexanol	10000	1.10
79-46-9	2-Nitropropane	10000	1.08
96-33-3	Methyl acrylate	10000	1.05
106-93-4	1,2-Dibromoethane	10000	0.98
107-02-8	Acrolein	10000	0.96
108-05-4	Vinyl acetate	10000	0.90
7723-14-0	Phosphorus (yellow or white)	10000	0.78
1313-27-5	Molybdenum trioxide	10000	0.77
7550-45-0	Titanium tetrachloride	10000	0.76
74-88-4	Methyl iodide	10000	0.66
Selenium Compounds	Selenium Compounds	10000	0.60
104-94-9	p-Anisidine	10000	0.55
95-54-5	1,2-Phenylenediamine	10000	0.55
7440-36-0	Antimony	10000	0.45
72-57-1	Trypan blue	10000	0.44
78-92-2	sec-Butyl alcohol	10000	0.34
107-13-1	Acrylonitrile	10000	0.34
542-88-1	Bis(chloromethyl) ether	10000	0.28
26628-22-8	Sodium azide (Na(N3))	10000	0.23
90-94-8	Michler's ketone	10000	0.22
81-88-9	C.I. Food Red 15	10000	0.22
100-02-7	4-Nitrophenol	10000	0.22
532-27-4	2-Chloroacetophenone	10000	0.22
79-44-7	Dimethylcarbamyl chloride	10000	0.22
60-35-5	Acetamide	10000	0.22
79-10-7	Acrylic acid	10000	0.22
122-39-4	Diphenylamine	10000	0.22
989-38-8	C.I. Basic Red 1	10000	0.11
75-25-2	Bromoform	10000	0.11

CAS Number	Chemical Name	EPCRA Threshold (lb)	2005 Amount Purchased or Used (lb)
13463-40-6	Iron, pentacarbonyl-	10000	0.05
Arsenic Compounds	Arsenic Compounds	10000	0.05
109-06-8	2-Methylpyridine	10000	0.05
Thallium Compounds	Thallium Compounds	10000	0.03
556-61-6	Methyl isothiocyanate	10000	0.01
106-51-4	Quinone	10000	0.01
106-44-5	p-Cresol	10000	0.01
96-18-4	1,2,3-Trichloropropane	10000	0.01

Appendix B:
Form R Reports for Lead and Mercury

Signature Certification for State Diskette Submission

DISK

U.S. DOE, LOS ALAMOS NATIONAL LABORATORY
P.O. BOX 1663
LOS ALAMOS, NM 87545
87545LSLMSLOSAL

June 15, 2006

Don Shainin, HazMat Coordinator
Office of Emergency Services & Security
13 Bataan Blvd.
Santa Fe, NM 87508

To Whom It May Concern:

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

U.S. DOE, 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:

TRI Chemical or Chemical Category	Reporting Year	CAS Number	Report
Lead	2005	7439-92-1	Form R
Mercury	2005	7439-97-6	Form R

Our technical point of contact is:

STEVE STORY
(505) 665-2169
STORY@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,

DICK WATKINS
ASSOCIATE DIRECTOR OF ESH&Q

Enclosure: Diskette

LA-UR:06-4465

Cy:
G. Turner, DOE-LA-AO, A316
V. George, ENVP-DO, J978
D. Woitte, LC-GL, A187
P. Wardwell, LC-LESH, A187
L. Bonds Lopez, ENV-ERS-DO, J591
D. Wilburn, ENVP-EAQ, J978
D. Janecky, ENVP-EAQ, J978
S. Story, ENVP-EAQ, J978
M. Stockton, ENVP-EAQ, J978
W. Whetham, ENVP-EAQ, J978
EPCRA Project File
ENVP-EAQ File

EPA United States Environmental Protection Agency

FORM R

Section 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

TRI Facility ID Number: 87544SDLSL52835

Toxic Chemical, Category or Generic Name: Lead

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lanham, 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 2005

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) [X] 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 Environmental Stewardship		06/21/2006

SECTION 4. FACILITY IDENTIFICATION

4.1 TRI Facility ID Number: 87544SDLSL52835

Facility or Establishment Name: U.S. Department of Energy, Los Alamos National Laboratory

Facility or Establishment Name or Mailing Address (if different from street address):

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: (Important: check a or b; check c or d if applicable)
a. [X] An entire facility b. [ ] Part of a facility c. [X] A Federal facility d. [ ] GOCO

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

Email Address: gturner@doeal.gov

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.

4.7 Dun & Bradstreet Number(s) (9 digits):
a. NA
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 [X]

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number: 87413SDLS52835

Toxic Chemical, Category or Generic Name: Lead

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.) 7439-92-1
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) Lead
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.) NA

1.4 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.)

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

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. ☐ Produce b. ☐ Import		
If produce or import:		
c. ☐ For on-site use/processing	a. ☐ As a reactant	a. ☐ As a chemical processing aid
d. ☐ For sale/distribution	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
e. ☐ As a byproduct	c. ☐ As an article component	c. ☒ Ancillary or other use
f. ☐ As an impurity	d. ☒ Repackaging	
	e. ☐ As an impurity	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE 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 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 ☐	6.5	C	
5.2	Stack or point air emissions	NA ☐	0.6	E	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	ANCHO CANYON TRIBUTARY TO RIO GRA		0	M	0
5.3.2	LOS ALAMOS CANYON TRIBUTARY TO RIO		270.9	M	100
5.3.3	PAJARITO CANYON TRIBUTARY TO RIO G		150.3	M	100

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box [3] 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

** 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: 87123SLSLL2835

Toxic Chemical, Category or Generic Name: Lead

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.)

1.4 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.)

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

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. ☐ Produce b. ☐ Import		
If produce or import:	a. ☐ As a reactant	a. ☐ As a chemical processing aid
c. ☐ For on-site use/processing	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
d. ☐ For sale/distribution	c. ☐ As an article component	c. ☐ Ancillary or other use
e. ☐ As a byproduct	d. ☐ Repackaging	
f. ☐ As an impurity	e. ☐ As an impurity	

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 ☐			
5.2	Stack or point air emissions NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
	Stream or Water Body Name			
5.3.1	PUEBLO CANYON TRIBUTARY TO RIO GRA	19.9	M	100
5.3.2	SANDIA CANYON TRIBUTARY TO RIO GRA	54.6	M	100
5.3.3	WATER CANYON TRIBUTARY TO RIO GRA	42.5	M	100

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box: 3
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

** 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
87043SLLED2835
Toxic Chemical, Category or Generic Name
Lead

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.)

1.4 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.)

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

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. ☐ Produce b. ☐ Import		
If produce or import:	a. ☐ As a reactant	a. ☐ As a chemical processing aid
c. ☐ For on-site use/processing	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
d. ☐ For sale/distribution	c. ☐ As an article component	c. ☐ Ancillary or other use
e. ☐ As a byproduct	d. ☐ Repackaging	
f. ☐ As an impurity	e. ☐ As an impurity	

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 ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	CANADA DEL BUEY		1.4	M	100
5.3.2	MORTANDAD TRIBUTARY TO RIO GRANDE		2.7	M	99.9
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box: 3
and indicate the Part II, Section 5.3 page number in this box: 3 (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: 87544SDSL2835

Toxic Chemical, Category, or Generic Name: Lead

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		
5.5.3A	RCRA Subtitle C Surface Impoundments	X		
5.5.3B	Other surface impoundments	X		
5.5.4	Other disposal		7007	M

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	I80 Exit 49 West of Salt Lake City								
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

** 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: 87443DNSL2835

Toxic Chemical, Category, or Generic Name: Lead

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. 525	1. O	1. M41
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 LLC.

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

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. 63	1. O	1. M94
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)]						d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.1a	7A.1b	1	H077	2	H124		7A.1d
W	3 H129	4	NA	5			E3
	6	7		8			
7A.2a	7A.2b	1		2			7A.2d
	3	4		5			
	6	7		8			
7A.3a	7A.3b	1		2			7A.3d
	3	4		5			
	6	7		8			
7A.4a	7A.4b	1		2			7A.4d
	3	4		5			
	6	7		8			
7A.5a	7A.5b	1		2			7A.5d
	3	4		5			
	6	7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 5

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

** 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: 87144SDLL2835

Toxic Chemical, Category, or Generic Name: Lead

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 [X] 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. 311	1. M	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)]								d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.6a	7A.6b	1		2		3		4	7A.6d
	5		6		7		8		
7A.7a	7A.7b	1		2		3		4	7A.7d
	5		6		7		8		
7A.8a	7A.8b	1		2		3		4	7A.8d
	5		6		7		8		
7A.9a	7A.9b	1		2		3		4	7A.9d
	5		6		7		8		
7A.10a	7A.10b	1		2		3		4	7A.10d
	5		6		7		8		

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 5

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: 84744SDSL2835

Toxic Chemical, Category, or Generic Name: Lead

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.): UTD981552177

Off-Site location Name: Clean Harbors Aragonite LLC.

Off-site Address: 11600 North Aptus Road

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

Is location under control of reporting facility or parent company? [ ] Yes [X] 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. 549	1. O	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)]								d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.11a	7A.11b	1		2		3		4	7A.11d
		5		6		7		8	
7A.12a	7A.12b	1		2		3		4	7A.12d
		5		6		7		8	
7A.13a	7A.13b	1		2		3		4	7A.13d
		5		6		7		8	
7A.14a	7A.14b	1		2		3		4	7A.14d
		5		6		7		8	
7A.15a	7A.15b	1		2		3		4	7A.15d
		5		6		7		8	

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 5

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

** 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: 85344SDLSL2835

Toxic Chemical, Category, or Generic Name: Lead

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.): AZ0000337360

Off-Site location Name: Onyx Special Services Inc.

Off-site Address: 5752 W Jefferson Street

City: Phoenix | State: AZ | County: Maricopa | Zip: 85043 | Country (Non-US):

Is location under control of reporting facility or parent company? [ ] Yes [X] 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. 15	1. M	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)]								d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.16a	7A.16b	1		2		3		4	7A.16d
		5		6		7		8	
7A.17a	7A.17b	1		2		3		4	7A.17d
		5		6		7		8	
7A.18a	7A.18b	1		2		3		4	7A.18d
		5		6		7		8	
7A.19a	7A.19b	1		2		3		4	7A.19d
		5		6		7		8	
7A.20a	7A.20b	1		2		3		4	7A.20d
		5		6		7		8	

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 5

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: 32744SDNLL2835

Toxic Chemical, Category, or Generic Name: Lead

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.): 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 [X] 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. 14	1. O	1. M41
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)]								d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.21a	7A.21b	1		2		3		4	7A.21d
		5		6		7		8	
7A.22a	7A.22b	1		2		3		4	7A.22d
		5		6		7		8	
7A.23a	7A.23b	1		2		3		4	7A.23d
		5		6		7		8	
7A.24a	7A.24b	1		2		3		4	7A.24d
		5		6		7		8	
7A.25a	7A.25b	1		2		3		4	7A.25d
		5		6		7		8	

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 5

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

** 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
37644SDLPD2835
Toxic Chemical, Category, or Generic Name
Lead

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] 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 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

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

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

1 [ ] 2 [ ] 3 [ ]

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					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1b	Total other on-site disposal or other releases	5963	7556.4	7500	7000
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	0.67	NA	10	10
8.1d	Total other off-site disposal or other releases	7508	1151	4000	4000
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	15.5	326	300	300
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	1.25

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	W42	a. T01	b.	c.
8.10.2	NA	a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.

8.11	If you wish to submit additional optional information on source reduction, recycling, or pollution control activities with this report, check "Yes."	Yes [ ]

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

TRI Facility ID Number
87544SDLSL52635
Toxic Chemical, Category, or Generic Name
Lead

SECTION 8.11. Submit additional optional information on source reduction, recycling, or pollution control activities.

EPA United States Environmental Protection Agency

FORM R

Section 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

TRI Facility ID Number
87544SDLSL52835
Toxic Chemical, Category or Generic Name
Mercury

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center, P.O.Box 1513, Lanham, 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 2005

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) [X] 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 Environmental Stewardship		06/21/2006

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	87544SDLSL52835
Facility or Establishment Name	U.S. Department of Energy, Los Alamos National Laboratory	Facility or Establishment Name or Mailing Address (if different from street address)	
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: (Important: check a or b; check c or d if applicable)	a. [X]	An entire facility	b. [ ]	Part of a facility	c. [X]	A Federal facility	d. [ ]	GOCO		
4.3	Technical Contact Name	Gene Turner							Telephone Number (include area code)	(505) 667-5794	
	Email Address	gturner@doeal.gov									
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.				
4.7	Dun & Bradstreet Number(s) (9 digits)	a. NA	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 [X]	

EPA FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION

TRI Facility ID Number: 87544SLLLL2835

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

1.4 **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.)

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

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:
- a. ☐ Produce b. ☐ Import
- If produce or import:
- c. ☐ For on-site use/processing
- d. ☐ For sale/distribution
- e. ☐ As a byproduct
- f. ☐ As an impurity

3.2 Process the toxic chemical:
- a. ☐ As a reactant
- b. ☐ As a formulation component
- c. ☐ As an article component
- d. ☐ Repackaging
- e. ☐ As an impurity

3.3 Otherwise use the toxic chemical:
- a. ☐ As a chemical processing aid
- b. ☐ As a manufacturing aid
- c. ☒ Ancillary or other use

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 ☐	0	O	
5.2	Stack or point air emissions	NA ☐	0.3	E	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	ANCHO CANYON TRIBUTARY TO RIO GRA		0	M	0
5.3.2	LOS ALAMOS CANYON TRIBUTARY TO RIO		0.1	M	100
5.3.3	PAJARITO CANYON TRIBUTARY TO RIO G		0.2	M	100

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box: 3
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

** 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
87413SNLLL2838
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.)

1.4 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.)

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

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. ☐ Produce b. ☐ Import		
If produce or import:	a. ☐ As a reactant	a. ☐ As a chemical processing aid
c. ☐ For on-site use/processing	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
d. ☐ For sale/distribution	c. ☐ As an article component	c. ☐ Ancillary or other use
e. ☐ As a byproduct	d. ☐ Repackaging	
f. ☐ As an impurity	e. ☐ As an impurity	

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 ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	PUEBLO CANYON TRIBUTARY TO RIO GRA		0.1	M	100
5.3.2	SANDIA CANYON TRIBUTARY TO RIO GRA		0.4	M	100
5.3.3	WATER CANYON TRIBUTARY TO RIO GRA		0	M	100

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box: 3
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

** 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: 87414SDLSL2838

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.)

1.4 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.)

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

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. ☐ Produce b. ☐ Import		
If produce or import:	a. ☐ As a reactant	a. ☐ As a chemical processing aid
c. ☐ For on-site use/processing	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
d. ☐ For sale/distribution	c. ☐ As an article component	c. ☐ Ancillary or other use
e. ☐ As a byproduct	d. ☐ Repackaging	
f. ☐ As an impurity	e. ☐ As an impurity	

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 ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	CANADA DEL BUEY		0	M	0
5.3.2	MORTANDAD TRIBUTARY TO RIO GRANDE		0	M	0
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box 3
and indicate the Part II, Section 5.3 page number in this box. 3 **(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
87144SDSLT2835
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		
5.5.3A	RCRA Subtitle C Surface Impoundments	X		
5.5.3B	Other surface impoundments	X		
5.5.4	Other disposal		0	O

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	I80 Exit 49 West of Salt Lake City								
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

** 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: 87544SDSL2835

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. 90	1. O	1. M41
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 LLC.

Off-site Address: 9131 East 96th Avenue

City	State	County	Zip	Country (Non-US)
Henderson	CO	Denver	80640	

Is location under control of reporting facility or parent company? [ ] Yes [X] 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. 45	1. O	1. M94
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)]						d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.1a	7A.1b	1	H077	2	H124		7A.1d
W	3 H129	4	NA	5			E5
	6	7		8			
7A.2a	7A.2b	1		2			7A.2d
	3	4		5			
	6	7		8			
7A.3a	7A.3b	1		2			7A.3d
	3	4		5			
	6	7		8			
7A.4a	7A.4b	1		2			7A.4d
	3	4		5			
	6	7		8			
7A.5a	7A.5b	1		2			7A.5d
	3	4		5			
	6	7		8			

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]
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

** 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: 87544SDNSL2835

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 Road

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

Is location under control of reporting facility or parent company? [ ] Yes [X] 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. 4	1. O	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)]								d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.6a	7A.6b	1		2		3		4	7A.6d
	5		6		7		8		
7A.7a	7A.7b	1		2		3		4	7A.7d
	5		6		7		8		
7A.8a	7A.8b	1		2		3		4	7A.8d
	5		6		7		8		
7A.9a	7A.9b	1		2		3		4	7A.9d
	5		6		7		8		
7A.10a	7A.10b	1		2		3		4	7A.10d
	5		6		7		8		

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 5

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: 37744SDLSL2835

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 Corporation

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 [X] 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. 54	1. M	1. M41
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)]								d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.11a	7A.11b	1		2		3		4	7A.11d
	5		6		7		8		
7A.12a	7A.12b	1		2		3		4	7A.12d
	5		6		7		8		
7A.13a	7A.13b	1		2		3		4	7A.13d
	5		6		7		8		
7A.14a	7A.14b	1		2		3		4	7A.14d
	5		6		7		8		
7A.15a	7A.15b	1		2		3		4	7A.15d
	5		6		7		8		

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 5

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

** 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: 87144SDSLL2835

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

Off-Site location Name: Onyx Special Services Inc.

Off-site Address: 5752 W Jefferson Street

City	State	County	Zip	Country (Non-US)
Phoenix	AZ	Maricopa	85043	

Is location under control of reporting facility or parent company? [ ] Yes [X] 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. 29	1. O	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)]								d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.16a	7A.16b	1		2		3		4	7A.16d
	5		6		7		8		
7A.17a	7A.17b	1		2		3		4	7A.17d
	5		6		7		8		
7A.18a	7A.18b	1		2		3		4	7A.18d
	5		6		7		8		
7A.19a	7A.19b	1		2		3		4	7A.19d
	5		6		7		8		
7A.20a	7A.20b	1		2		3		4	7A.20d
	5		6		7		8		

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 5

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: 32744SDLL2635

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. 6 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 [X] 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. O	1. M41
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)]								d. Waste Treatment Efficiency Estimate [enter 2 character code]
7A.21a	7A.21b	1		2		3		4	7A.21d
		5		6		7		8	
7A.22a	7A.22b	1		2		3		4	7A.22d
		5		6		7		8	
7A.23a	7A.23b	1		2		3		4	7A.23d
		5		6		7		8	
7A.24a	7A.24b	1		2		3		4	7A.24d
		5		6		7		8	
7A.25a	7A.25b	1		2		3		4	7A.25d
		5		6		7		8	

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [5]

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

** 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: 37874SDLDS283S

Toxic Chemical, Category, or Generic Name: Mercury

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] 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 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

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

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

1 [ ] 2 [ ] 3 [ ]

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					
8.1a	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1b	Total other on-site disposal or other releases	NA	1.1	1	1
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	NA	NA	NA
8.1d	Total other off-site disposal or other releases	NA	193.1	200	200
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	NA	29	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)			NA	
8.9	Production ratio or activity index			2.70	

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	If you wish to submit additional optional information on source reduction, recycling, or pollution control activities with this report, check "Yes."	Yes [ ]

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

TRI Facility ID Number
87544SDLSC52635
Toxic Chemical, Category or Generic Name
Mercury

SECTION 8.11. Submit additional optional information on source reduction, recycling, or pollution control activities.


Los Alamos
NATIONAL LABORATORY
EST. 1943