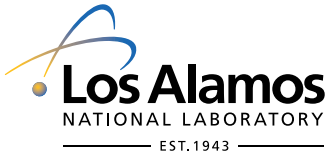
LA-14356-PR
Progress Report

2006 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Section 313



Edited by Hector Hinojosa, Group IRM-CAS.

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Progress Report
Issued: December 2007

2006 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
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2006 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Section 313

by

Ecology and Air Quality Group (ENV-EAQ)

ABSTRACT

For reporting year 2006, Los Alamos National Laboratory (LANL or the Laboratory) submitted Form R reports for lead as required under the Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313. No other EPCRA Section 313 chemicals were used in 2006 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 2006, 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 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/). 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 2006, the Laboratory submitted Form R reports for lead. No other EPCRA Section 313 chemicals were used in 2006 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 the Laboratory in 2006, and describes the environmental release data reported on the Form R reports. Individual sections for certain toxic chemicals used at the Laboratory are included in this report. Appendix A presents a summary table of EPCRA Section 313 chemicals procured at the Laboratory in 2006. Appendix B includes copies of Form R reports submitted to EPA and the New Mexico Environment Department.

1.1 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 2006, the Laboratory was owned by the U.S. Department of Energy (DOE) and operated by the University of California (UC) from January 1–May 31 and operated by the Los Alamos National Security, LLC (LANS) for the period June 1–December 31. Because the Laboratory was owned and operated by different entities in 2006, duplicate Form Rs were submitted by the DOE and LANS.

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.

2.1.1 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.

2.1.2 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.

2.1.3 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.

2.1.4 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 in which activity the chemical is used. 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 the Laboratory are discussed below.

2.2.1 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.

2.2.2 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 non-contact cooling) or in intake air (used either as compressed air or for combustion).

2.2.3 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 (EPA 2006).

2.2.4 *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 2-1.

Table 2-1 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 3-1 presents a flowchart that shows the steps the Laboratory performs to determine which chemicals must be reported under EPCRA Section 313.

3.1 Threshold Determinations for Chemical Use

The Laboratory tracks chemicals brought onsite using a chemical inventory-tracking database 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.

3.1.1 Inventory

For calendar year 2006, a total of 49,363 records were added to ChemLog and evaluated; 22,458 were pure chemicals and 26,905 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.

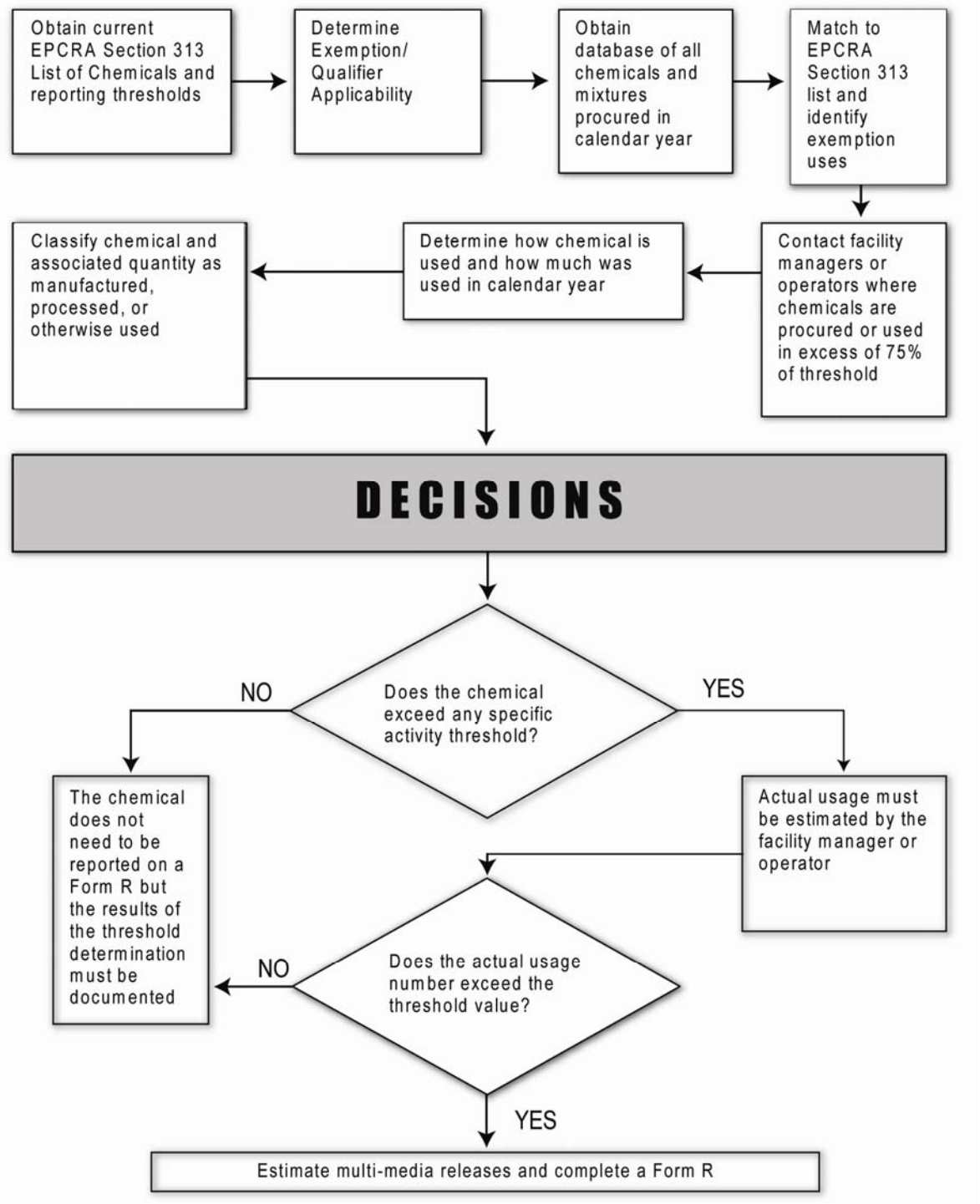


Figure 3-1 Flowchart process of analysis for EPCRA Section 313 reporting.

3.1.2 EPCRA Reporting Tool

An automated search tool was developed using Microsoft Access to refine the data in ChemLog. The EPCRA reporting tool performs the following steps in the ChemLog data download:

- Identifies and labels exemptions through electronic text searches. The exemptions are from 40 CFR 372.38, Exemptions for Toxic Release Reporting. When a chemical is exempt, it is not considered when determining whether an applicable threshold has been met. Specifically, chemical containers were classified as follows:
    - **Maintenance**—routine janitorial or facility grounds maintenance (e.g., cleaning supplies, paints, fertilizers, and pesticides);
    - **Maintaining Motor Vehicles** (e.g., antifreeze, brake fluid);
    - **Personal Uses**—non-process related items for employee personal use;
    - ***De Minimus***—the percent of a non-PBT Section 313 chemical in a mixture is less than 1% for a non-carcinogen or 0.1% for a carcinogen;
    - **Article**—structural component exemption; and
    - **Laboratory Activities**—if a toxic chemical is manufactured, processed, or used in a laboratory at a covered facility under the supervision of technically qualified individual.
- Identifies and labels EPCRA 313 compounds. There are 30 different chemical categories included on the EPCRA 313 list. Many of these categories do not have specific CAS numbers associated with them, except for polycyclic aromatic compounds (PACs) and dioxins. These two categories were evaluated in ChemLog as part of the pure chemical evaluation since they have searchable CAS numbers for compounds included in their categories. The other classes of compounds were searched in the 2006 ChemLog data set by using chemical-specific text searches in the chemical name field.
- Matches pure chemicals (chemical containers with an identifiable CAS number) with the list of EPCRA Section 313 chemicals by matching CAS numbers.

A few EPCRA Section 313 chemicals were selected for further analysis to determine if they were used in exempt activities. For 2006, the chemicals that were analyzed in more detail included

- HCl,
- Sulfuric Acid,
- Nitric Acid,
- Nitrate Compounds,
- Mercury Compounds, and
- Lead Compounds.

3.2 Threshold Determination Results

3.2.1 Procurement Totals

The amounts of listed EPCRA Section 313 chemicals identified in the ChemLog, direct procurement, and

other sources were all summed together to perform preliminary threshold determinations. The resulting totals for the top 10 listed EPCRA Section 313 chemicals are summarized below in Table 3-1.

Table 3-1 Top 10 EPCRA Section 313 Chemicals Procured in 2006

CAS No	Chemical Name	Total Procured (lb)
7664-93-9	Sulfuric Acid (liquid form)	14,004
7647-01-0	Hydrochloric acid (liquid form)	6,137
7697-37-2	Nitric Acid	3,272
67-63-0	Isopropyl Alcohol	2,439
75-09-2	Dichloromethane	2,267
NA	Cobalt Compounds	2,257
75-45-6	Chlorodifluoromethane	1,424
67-56-1	Methanol	1,390
NA	Manganese Compounds	1,357
7429-90-5	Aluminum	982

A complete table of EPCRA Section 313 chemicals showing all contributing sources is provided in Appendix A. Chemicals that were procured in amounts greater than 75% of the applicable EPCRA Section 313 threshold were evaluated further and the analyses are summarized in Section 4 of this report.

4.0 ADDITIONAL EVALUATION OF CERTAIN TOXIC CHEMICALS

The toxic chemicals described below either are used in relatively high volumes at the Laboratory, 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 2006 and therefore no reporting was required.

4.1 Mercury

Mercury and mercury compounds are used in various places throughout the Laboratory. As part of the PBT rule, the threshold for EPCRA Section 313 reporting of mercury was reduced to 10 lb. In 2006, mercury was used in four areas at the Laboratory. Each is described below.

4.1.1 Mercury Procurements

A listing of all procurements in 2006 of mercury and mercury compounds was extracted from ChemLog. Line items containing a CAS number for mercury (7439-97-6) were included, as well as any line items containing the word “mercury” or the symbol “Hg” in the text description.

The total amount of mercury and mercury compounds in ChemLog for 2006 was 14.8 lb. The purchasers or users of the mercury and mercury compounds were contacted to determine the following:

- If the purchase was actually mercury or contained mercury or mercury compounds,

- If a mixture or solution, what percent or parts per million (ppm) of mercury,
- If the mercury was used in a laboratory experiment setting, therefore it is subject to the laboratory exemption under EPCRA Section 313.

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. A total of 13.5 lb of mercury was determined to actually be "mercury standard solutions" containing only ppm quantities of mercury. Further, these standard solutions are used in a laboratory exempt activity. The remaining 1.3 lb of mercury from the ChemLog analysis was assumed to be otherwise used and applied to the 10-lb threshold.

4.1.2 Los Alamos Neutron Science Center Shutter System

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

During 2006, 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. According to LANSCE personnel, the total amount of mercury displaced during maintenance in 2006 was approximately 3 lb and this amount was added towards the 10-lb otherwise used threshold for mercury.

4.1.2.1 Spallation Neutron Source Target Development Experiment

The Spallation Neutron Source (SNS) Target Development Experiment began operations at the Laboratory in December 2001. The experiment also operated in 2002, 2005, and 2006. The experiment studies issues associated with using mercury as the target material for the SNS. The 2006 set up of the project involved shooting the neutron beam at a mercury-filled flowing loop. The loop is a closed system and it is not opened to the atmosphere.

In past years, the mercury added to the system has been considered laboratory exempt. No mercury was added in 2006.

4.1.2.2 Fuel Combustion

In 2006, the Laboratory generated mercury compound emissions from the following combustion sources: the Technical Area (TA) 21 steam plant, the asphalt plant, the TA-3 power plant, and from numerous small boilers. The mercury compound emissions from these sources totaled 0.23 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 (EPA 2001a). LANL used approximately 29,546 gallons of diesel fuel in 2006 and this equates to 0.0002 lb towards the otherwise used threshold.

4.1.2.3 Conclusion

The total amount of mercury qualifying as otherwise used equals 4.3 lb, which is below the reporting threshold value of 10 lb. The total amount of mercury compounds manufactured was 0.23 lb, which is also below the reporting threshold of 10 lb. Therefore, it was determined that reporting of mercury under EPCRA Section 313 is not necessary for 2006. A summary of the 2006 mercury threshold determination is provided in Table 4-1.

Table 4-1 Summary of 2006 Mercury Threshold Determination

Description	Amount of Mercury (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Purchasing of Mercury Standards and Instruments	13.5	Procurement data and facility personnel interviews	Laboratory Exempt	NA
Other Procurement	1.3	Procurement Records	Otherwise Used	10
LANSCE Shutter System	3	LANSCE Facility Records		
Fuel Combustion	0.0002	Fuel Use Records and EPA Guidance		
Fuel Combustion	0.23	Fuel Use Records and EPA AP-42	Manufactured	10

4.2 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 2006, only 12,450 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 694.1 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 (EPA 1998a). 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 2006, numerous small purchases totaling 1,555 lb of sulfuric acid were procured at the Laboratory. These numerous 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 4-2.

Table 4-2 Sulfuric Acid Threshold Determination for 2006

Description	Amount of Sulfuric Acid (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Demineralizer Regeneration	12,450	Site Support Contractor Logs	Not in aerosol form and not subject to EPCRA Section 313	NA
Water Analysis at the SWSC Plant	55.4	Site Support Contractor Logs		
Procurement Not Evaluated	1,555	ChemLog	Otherwise used*	10,000
Storage Tank Air Emissions	0.003	EPA, Tanks 4.0 Software	Manufactured	25,000
Fuel Combustion Byproducts	684.1	AP-42 and fuel use records		
Asphalt Plant Production	10	AP-42 and facility records		

*Assumed to be in aerosol form.

4.3 Hydrochloric Acid

HCl is purchased for numerous processes and is also generated as a combustion byproduct. The total amount of HCl procured in 2006 was 6,137 lb. This includes HCl from pure chemicals and mixtures in ChemLog. Facility and Waste Operations purchased approximately 4,070 lb of aqueous HCl in 2006. This HCl was used for heat exchanger scale cleaning and for 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 (EPA 1999). The additional amount of HCl from ChemLog was 2,067 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 2006.

4.4 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" (EPA 2001b), 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.

4.4.1 Procurement of PACs

Under EPCRA Section 313, the PAC category includes 21 specific chemicals and an additional 51 chemical mixtures that are listed as potentially containing PACs. A search of the ChemLog data set was done using CAS numbers for the 21 chemicals and text searches for the 51 chemical mixtures. No matches were identified and the total PACs from the ChemLog analysis for 2006 is zero.

4.4.2 PACs from Asphalt Production

In 2006, the Laboratory produced approximately 2,008 tons of asphalt and used 23,736 gallons of asphalt tar. A review of project management records for 2006 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 ppm of PACs (EPA 2001b). However, Chevron-Texaco, the supplier of the asphalt tar, provided information specific to their product (Chevron-Texaco 2001). 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 Laboratory 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 the Laboratory in all asphalt work in 2006 is 23.0 lb. The concentration of benzo(g,h,i)perylene in asphalt, from EPA's Guidance on PBTs, is 1.2 ppm (EPA 2001c). This figure gives 3.45 lb of benzo(g,h,i)perylene reportable towards its 10-lb otherwise use threshold.

4.4.3 PACs from Fuel Oil Combustion

Approximately 29,546 gallons of diesel fuel was used in 2006 in the Laboratory's power plant and miscellaneous boilers and generators. According to EPA guidance, fuel oil may contain 10 ppm of PACs (EPA 2001b). However, data provided by Chevron-Texaco indicate diesel may contain 22 ppm of PACs (Chevron-Texaco 2001). The 22 ppm was used in these calculations. This equates to 4.62 lb of PACs that apply to the otherwise use threshold. The concentration for benzo(g,h,i)perylene was found to be 0.05 ppm according to EPA guidance (EPA 2001c). Data provided by Chevron-Texaco indicated concentrations of 9 ppm. The 9 ppm was used in these calculations and results in 1.89 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 (EPA 1998a), these amounts were calculated to be 4.9×10^{-4} lb for total PACs and 6.7×10^{-5} lb for benzo(g,h,i)perylene.

4.4.4 PACs from Natural Gas

Approximately 1,129.2 million standard cubic feet of natural gas was burned at the Laboratory facilities in 2006. Using AP-42 emission factors (EPA 1998b) and fuel records, approximately 0.018 lb of PACs was produced from natural gas combustion, which is applied to the manufacture threshold. Approximately 0.0014 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.

4.4.5 Summary of PACs

The largest source of PACs at the Laboratory in 2006 was asphalt use. The total amount used from all sources is 27.6 lb. The total amount 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 5.3 lb towards the otherwise used threshold. Combustion processes accounted for 0.0015 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 2006. Table 4-3 summarizes the PACs and benzo(g,h,i)perylene threshold determinations.

Table 4-3 LANL 2006 Threshold Determinations for PACs and Benzo(g,h,i)perylene

EPCRA Chemical/ Compound	Process or Material	Amount (lbs)	Total (lbs)	EPCRA Section 313 Activity Determination	EPCRA Activity Threshold (lbs)
Total PACs	Impurity in natural gas	0.0	27.62	Otherwise Used	100
	Asphalt tar	23.0			
	Impurity in fuel oil	4.62			
	Natural gas combustion	0.018	0.018	Manufactured	100
	Fuel oil combustion	4.88×10^{-4}			
Benzo(g,h,i)perylene	Impurity in natural gas	0.0	5.34		
	Asphalt tar	3.45		Otherwise Used	10
	Impurity in fuel oil	1.89			
	Natural gas combustion	0.0014	0.0015	Manufactured	10
	Fuel oil combustion	6.7×10^{-5}			

4.5 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" (EPA 2000a).

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

4.5.1 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 the Laboratory 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 (American Society of Mechanical Engineers 1995). 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 4.04×10^{-6} grams per year. 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. Emission factors developed by EPA for the burning of ammonium perchlorate propellant were used (EPA 1998c). Based on estimating emissions from all waste materials burned, dioxin emissions were 3.04×10^{-5} grams per year.

4.5.2 Fuel Combustion

The Laboratory 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 per liter of diesel fuel burned (EPA 2000a). The Laboratory burned a total of 29,546 gallons (111,832 liters) of diesel fuel in 2006. Multiplying by the dioxin emission factor, a total of 3.55×10^{8} picograms (0.00036 grams) of dioxin was formed due to fuel combustion.

The total calculated dioxin emissions in 2006 are below the 0.1-gram threshold and, therefore, reporting under EPCRA Section 313 is not required. Table 4-4 summarizes the amount of dioxins formed from all sources characterized for 2006.

Table 4-4 Dioxin Threshold Determination for 2006

Description	Amount of Dioxin Formed (grams)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Threshold (grams)
HE Expended	4.04×10^{-6}	Manufactured	0.1
HE Burned	3.04×10^{-5}	Manufactured	0.1
Fuel Combustion	3.6×10^{-4}	Manufactured	0.1
Total Dioxin Formed	0.0004		0.1

4.6 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" (EPA 2000b), nitrate compounds may be manufactured through the elemental neutralization of nitric acid and through the collection and treatment of sanitary wastewater. These sources of nitrate compounds are applicable to the Laboratory and are discussed in this section. The reporting thresholds for nitrate compounds are 25,000 lb for manufacture/import or process and 10,000 lb for otherwise used. Only the manufacture and otherwise used thresholds apply to the Laboratory for 2006 EPCRA reporting.

The above listed guidance provides a list of approximately 50 nitrate compounds that are included as water dissociable nitrate compounds. Although this list is not exhaustive, it provides commonly identified nitrate compounds. Only those compounds in aqueous solution (>50% water) are required to be reported. Also, a *de minimis* concentration of 1% is applied to all nitrate compounds found in mixtures. When determining the reporting threshold for nitrate compounds, the entire nitrate compound is included (both the nitrate and its counter ion) toward determining the threshold. If the threshold is exceeded, only the nitrate portion of the compound is reported.

For the manufacture threshold, the sources reviewed included waste nitric acid treated at the Radioactive Liquid Waste Treatment Facility (RLWTF), which uses sodium hydroxide in an elementary neutralization process. The other source was the SWSC Plant. The nitrate compounds that were applied to the otherwise used threshold included nitrate compounds purchased or used during 2006. Other nitrate compounds evaluated were determined to be non-aqueous and were not required to be included in threshold determinations.

4.6.1 Chemical Review

A query of ChemLog was performed to determine the amount of chemicals applied to the otherwise used threshold. Approximately 92 lb of nitrate compounds were purchased in 2006. As a conservative assumption it is assumed these are in aqueous form and apply to the otherwise used threshold.

4.6.2 Sanitary Wastewater

The SWSC Plant collects sanitary waste (sewage and other allowable discharges) from several LANL facilities and treats the waste in a standard primary (physical), secondary (biological) treatment system. Information was collected from the SWSC Plant on nitrate influent concentration and total flow rate for the purpose of EPCRA Section 313 threshold determination. The information provided indicated an average nitrate concentration of the influent of 1.11 milligrams per liter and total flow into the system during 2006 was 77,050,000 gallons.

Using the flow rate given by the plant, the total annual average amount of nitrate compound (as sodium nitrate) was calculated. At the average nitrate concentration of 1.11 milligrams per liter, and adjusting the weight to include the sodium ion, the total sodium nitrate processed as an impurity was 978 lb in 2006.

The information provided by the SWSC Plant also included the amount and the nitrate concentration of the effluent treated water. The total amount of treated water out of the SWSC Plant in 2006 was 103,245,000 gallons. The average nitrate concentration was 3.9 mg/L. This calculates to a total of 4,602 lb of nitrates (as sodium nitrate) manufactured.

4.6.3 Nitric Acid Neutralization

Typically, waste nitric acid from the mixed oxide (MOx) process and from the Nitric Acid Recycling System (NARS), both located at the Plutonium Facility, is sent to the RLWTF for treatment. The RLWTF provided information on the volume and concentration of acid received from the plutonium facility in 2006. The quantity of nitric acid received in 2006 was approximately 1,270 liters of 4-molar nitric acid (approximately 22%).

The amount of nitrate compounds formed due to nitric acid treated during 2006 by the RLWTF was calculated using the formula found in the EPA "Nitrate Compound Guidance" (EPA 2000b). The total amount of liquid collected was multiplied by the percent nitric acid. The total amount of nitric acid neutralized was 694 lb. The formula determines how many kilomoles of nitric acid were neutralized, which is equal to the kilomoles of sodium nitrate generated. The nitrate compound (sodium nitrate) generated from the neutralization process equaled 936 lb.

4.6.4 Summary

Nitrate compounds that apply to the otherwise used reporting threshold of 10,000 lb include the chemicals found in ChemLog. A total of 92 lb of nitrate compounds were purchased and assumed to be in aqueous form. This is well below the 10,000-lb EPCRA Section 313 threshold.

Nitrate compounds that apply to the manufacture reporting threshold of 25,000 lb include those identified in the sanitary wastewater at the SWSC Plant and the nitrate compounds identified during the elementary neutralization of nitric acid at the RLWTF. These two activities totaled 5,538 lb of nitrate compounds manufactured. The amount of nitrate compounds processed as an impurity from these two activities was 1,672 lb. It was determined that no thresholds for nitrate compounds were exceeded in 2006. Table 4-5 provides a summary of nitrate compounds at LANL in 2006.

Table 4-5 Summary of Nitrate Compounds at LANL in 2006

Nitrate Compounds	Amount (lb)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Threshold (lb)
Purchased in ChemLog (assumed in aqueous form and otherwise used)	92	Otherwise Used	10,000 lb
Processed at SWSC Plant	978	Processed	25,000 lb
Processed at RLWTF	694		
	1,672		
Manufactured at SWSC Plant	4,602	Manufactured	25,000 lb
Manufactured at RLWTF	936		
	5,538		

4.7 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 2006 did not exceed the EPCRA Section 313 otherwise use threshold of 10,000 lb.

4.7.1 Procurement

Nitric acid procured and used at the Laboratory in 2006 was evaluated to determine the 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. However, quantities of a listed toxic chemical used for cleaning glassware do not qualify for this exemption.

In 2006, a total of 3,279 lb of nitric acid was procured at the Laboratory, based on queries of the ChemLog system. Some of the purchase records indicate the nitric acid is actually 69% to 71% nitric acid in an aqueous solution, or more dilute solutions. Numerous phone calls were made to determine the percent nitric acid solution purchased where it was not specified. In almost all cases, the nitric acid is purchased as "lab grade," which is 65% to 70% nitric acid in water. The concentration of the nitric acid purchases was taken into account and the resulting amount of pure nitric acid purchased was calculated to be 2,434 lb.

This is a continuing downward trend in purchasing based on the amounts procured in the previous years.

Nuclear Materials Technology (NMT) Division is the largest user of nitric acid and they had 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 2006 no additional nitric acid was purchased for the tank, and very little nitric acid was used from the tank inventory.

Other large users 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 2006, this use totaled 1,942 lb. Information was also obtained on the approximate amount of nitric acid used for cleaning laboratory glassware, which is not considered a laboratory exempt activity. The total amount calculated to be used for cleaning glassware was 128 lb. Therefore, the total amount of nitric acid used in laboratory exempt activities was 1,814 lb (1942–128).

The quantity of nitric acid used by personnel that were not contacted (except for NMT Division, which is described below), or that described their use of nitric acid as process related (including cleaning glassware) totaled 619 lb. As a conservative assumption, this amount is assumed to be otherwise used.

4.7.2 NMT Plutonium Processing

The plutonium processing facility provided information on the amount of nitric acid used in 2006. Both the MOx fuels project and the ATLAS project were inactive until very late in the year. The facility provided information that 8,000 liters of nitric acid were used in 2006. Approximately 7,000 liters came from the holding tanks off the NARS and is a 7-molar (40%) solution of nitric acid in water. The remaining 1,000 liters is a stronger concentration, approximately 14- to15-molar (70%) solution of nitric acid in water. From MSDS review, the density for 40% nitric acid is 9.6 lb per gallon and a 70% nitric acid solution is 11.5 lb per gallon.

(7,000 L x 0.4) / (3.785 L/gal) x (9.6 lb/gal) +

(1,000 L x 0.7) / (3.785 L/gal) x (11.5 lb/gal) = 9,228 lb nitric acid

4.7.3 Summary

Nitric acid use in 2006 is below the EPCRA Section 313 10,000-lb otherwise used threshold and, therefore, is not reportable. Table 4-6 provides a summary of nitric acid use at LANL in 2006.

Table 4-6 Summary of Nitric Acid Use at LANL in 2006

Nitric Acid Use	Amount (lb)	EPCRA Status	Threshold for Reporting
Laboratory Use	1,814	Lab Exempt	Exempt
Otherwise Use		Otherwise Use	10,000 lbs
Non-lab, or unknown use	619		
Plutonium processing	9,228		
Total Otherwise Use	**9,847**		

5.0 LEAD AND FORM R REPORTING

5.1 Threshold Determination

Lead and lead compounds are used in various processes throughout the Laboratory. In January 2001, EPA promulgated a rule lowering the threshold for EPCRA Section 313 reporting of lead and lead compounds to 100 lb, effective for reporting year 2001. In 2006, lead and lead compounds were used or manufactured in the following operations at the Laboratory.

5.1.1 Lead Procurements

A listing of all procurements in 2006 of lead and lead compounds was extracted from ChemLog. Line items containing a CAS number for lead (7439-92-1) were included, as well as any line items containing the word "lead" or the symbol "Pb" in the text description.

The total amount of lead and lead compounds added to ChemLog for 2006 was 1,093.5 lb. However, over 1,000 lb of this was lead-acid batteries, which are considered article exempt. 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 1.76 lb. Also, the EPCRA Section 313 guidance states that the Article Exemption is for chemicals present in articles formed to a specific shape and do not release a Section 313 chemical under normal conditions during use. In 2006, the article exemption applied to 39 lead-acid batteries that accounted for 1,076.4 lb of lead. The total amount of lead and lead compounds from procurements applied to the otherwise used threshold is 15.35 lb.

5.1.2 Lead Use at the Firing Range

Lead is a component in various types of ammunition. The Laboratory maintains an onsite firing range for training security personnel. The firing range 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 (EPA www.epa.gov/tri). 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.

The total lead released to the environment at the firing range was slightly higher in 2006 as compared to previous years. Using the TRI-DDS software, it was determined that 8,878.2 lb of lead and 19.5 lb of lead compounds were used.

The 2006 amount of lead released to land (non-air) was 8,878 lb. This amount equals the amount otherwise used. Lead compounds are also manufactured through the firing of ammunition. These lead compounds were calculated using the TRI-DDS software. It was determined that 10.9 lb of lead compounds were manufactured, with 10.0 lb released to the air.

5.1.3 Lead from Fuel Combustion

In 2006, the Laboratory emitted lead compound emissions from the following combustion sources: the TA-21 steam plant, the TA-3 power plant, and from numerous small boilers, which used approximately 1,129.2 million standard cubic feet (MMscf) of natural gas. The AP-42 emission factor for lead compounds from natural gas combustion in both large and small boilers is 0.0005 lb/MMscf. The lead compound emissions from these sources totaled 0.56 lb towards the manufactured threshold. The Laboratory also burned an estimated 29,546 gallons of diesel fuel in boilers, heaters, and diesel-fired generators. The AP-42 emission factor for diesel fuel combustion is 0.00123 lb per 1,000 gallons; this equates to 0.036 lb of lead compound manufactured.

Additionally, lead is found in fuel oil and natural gas as an impurity. According to EPA guidance (EPA 2001d), the concentration of lead in No. 2 fuel oil is 0.5 ppm and in natural gas 0.05 milligrams per cubic meter.

The fuel oil contained 0.11 lb of lead and 1,129.2 MMscf of natural gas contained 3.49 lb of lead, which are added to the otherwise used threshold.

5.1.4 Lead from Asphalt Plant

A total of 2,008 tons of asphalt were produced in 2006. The AP-42 emission factor for lead from hot mix asphalt plants is 8.90E-7 lb per ton asphalt (EPA 2004). This equates to 0.0018 lb of lead compounds manufactured.

5.1.5 Lead Use at LANSCE

The Laboratory continues to maintain an inventory of lead shielding and lead bricks at LANSCE and other areas of the Laboratory. In recent years, the Laboratory has attempted to reduce the inventory by sending some of the lead offsite to be reused. 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." 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 Metals Recycle Facility (MRF), part of LANL's Salvage process. The MRF stages the metal and coordinates pick-up by a metal recycling company. The MRF estimates that 63,140 lb of lead were shipped offsite for recycle and resale in 2006.

The lead sent to the metal recycling company is considered processed because it is distributed for commercial use. The metal recycling company repackages the lead and then sends it to a lead smelter. Because the lead is simply remelted, it is defined as "reused." Therefore, it will not be reported on the Form R in Part II, Section 6.2.

Solid Waste Operations was contacted for information on the amount of lead sent to other DOE facilities as part of the DOE Intercomplex Lead Reuse program. This lead is also considered processed and it is not reported on Form R because it will be "reused." This program is no longer operating and, therefore, no lead was shipped to other DOE facilities in 2006.

In 2004, LANSCE received 40,000 lb of lead from France for the Lead Cooling Project. This lead is still onsite 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 2006 as this would result in double counting. This lead will be returned to France when the project ends.

5.1.6 Other LANL Operations Using Lead and Lead Compounds

In previous years, the Laboratory has conducted operations to decontaminate lead shielding and lead melting and cutting operations to form new shielding. Onsite processing of both of these activities was suspended in 2000. The Laboratory installed a new lead-bismuth test loop at LANSCE in 2001. The test loop contains approximately 8,000 lbs of lead bismuth. There were no additions of lead bismuth in 2006.

5.1.7 Conclusion

The largest source of lead use at the Laboratory is from the lead recycling, which accounted for 63,140 lbs of lead towards the processed threshold. In 2006, the firing range accounted for 8,878 lbs of lead towards the otherwise used threshold. Table 5-1 summarizes the threshold determination for lead and lead compounds for 2006. 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 2006 reporting, a Form R will be completed just for lead.

Table 5-1 Summary of Threshold Determination for Lead and Lead Compounds for 2006

Activity	Lead "Use"(lbs)	Lead Compound "Use"(lbs)	Comments
Firing Range	8,878	19.5	Otherwise Used
Firing Range	0	10.0	Manufactured
Lead Purchases (ChemLog)	0	15.35	Otherwise Used 1,093.51 lbs purchased, 1,078.16 lbs Article exempt or Lab Exempt
Lead Recycle/Resale (sold to Ace Metals)	63,140	0	Processed, all of it is "reused" and not reported on the Form Rs
Lead Re-Use from LANSCE (DOE inter-complex transfer)	0	0	Processed for re-use
Fuel Combustion	0	0.59	Manufactured (sum of natural gas, diesel, and asphalt)
Fuel Combustion	3.49	0	Otherwise Used
TOTAL Nonexempt Use	Otherwise Used - 8,881 Processed - 63,140	Otherwise Used - 34 Processed - 0 Manufactured - 10.6	Reporting Thresholds = 100 lbs

5.2 Environmental Releases and Offsite Disposal

5.2.1 Air Emissions

Although most of the air emissions are in the form of lead compounds, the Laboratory has chosen to report the entire weight of the lead compound air emissions on the Form R for lead.

5.2.2 Firing Range

The Laboratory operates a firing range on site for security personnel training. Monthly records are maintained detailing the type and amount of ammunition used at the firing range. For EPCRA Section 313 reporting purposes, the ammunition records are input to the Department of Defense TRI-DDS software (EPA www.epa.gov/tri) to estimate the amount of EPCRA chemical used and released to the environment. Based on the results of the TRI-DDS software, a total of 10.0 lb of lead compounds were emitted as fugitive air emissions from the firing range in 2006.

5.2.3 Fuel Combustion

In 2006, the Laboratory emitted lead compound emissions from the following combustion sources: the

TA-21 steam plant, the asphalt plant, the TA-3 power plant, and from numerous small boilers and heaters. Emissions from the burning of both natural gas and diesel fuel were calculated. The total emissions from these combustion sources totaled 0.59 lb of lead compound stack emissions.

In 2006, the Laboratory emitted a total of 10.59 lb of lead compound emissions to the atmosphere. The fugitive emissions are from the firing range. The stack emissions include emissions from fuel oil/diesel combustion sources and natural gas combustion sources. Table 5-2 summarizes lead air emissions from the Laboratory as reported on the Form R.

Table 5-2 Lead Air Emissions from LANL in 2006

Emission Source	Total Lead Emissions (lb)	Fugitive or Stack
Firing Range	10.0	Fugitive
Fuel Combustion	0.59	Stack
Total	**10.59**	

5.2.4 Releases to Water

This section describes the amount of lead released to the environment from the Laboratory during 2006, as measured at LANL's National Pollutant Discharge Elimination System (NPDES) outfalls, which quantifies the amount of listed chemicals released due to facility operations during the reporting period.

During prior year assessments, a second data source has been included in release estimates. The quantity of lead present in surface and storm water has been estimated and reported. These estimates were derived from analytical and flow volume data collected at surface water sampling stations, as well as flow estimates for stations where flow is not measured. Further calculations were performed to quantify the amount of lead attributable to naturally occurring sources, and then convert the anthropogenic fraction to derive a mass. The detailed methodology for the analysis of lead in surface and storm water and mass calculations is documented in annual EPCRA Summary Reports for calendar years 2001 through 2005.

EPCRA requires the reporting of TRI listed chemicals released to the environment during the year in which they are originally released. The inclusion of surface and storm water data within the annual release data set is an overestimate as these data do not represent current year releases, but measure the migration and transport of existing contaminant inventory that 1) was released to the environment before initiation of annual EPCRA reporting, 2) is unrelated to the original environmental release, and 3) cannot be differentiated from, and likely effectively masks, actual environmental releases. Therefore, annual EPCRA reporting should only include annual original release data as directly measured at NPDES outfalls.

NPDES outfall data, generated as part of the Laboratory's Outfall Monitoring Program, were obtained from the Water Quality Group. The tabular data from the NPDES program included total annual flows and lead analytical results from samples collected at a number of NPDES outfalls at LANL. Samples for lead were collected one to three times annually from 15 outfall locations, while weekly samples were collected from Outfall 051. Flow rate was reported by LANL in million gallons per year for each outfall location. For each NPDES outfall, lead discharges were calculated by multiplying the total yearly flow, in liters, for each outfall by the constituent concentration in milligrams per liter. The resulting mass from each outfall was then summed, resulting in a total discharge of 1.97 lbs of lead from LANL NPDES outfalls in 2006.

For the EPCRA Section 313 Form R, Section 5.3 reporting, the total amount of lead released to each receiving stream is reported. For NPDES outfall data, the receiving stream associated with each sample location was determined through the use of the Laboratory's Environmental Surveillance Report maps and information received from LANL's Water Quality Group. The following table summarized the total lead discharged from LANL in NPDES outfalls within canyons on the Pajarito Plateau during 2006. Total lead release to streams was 1.97 lbs. Table 5-3 was used to complete Section 5.3.1 of the Form R.

Table 5-3 Lead Releases to Water in 2006 from LANL NPDES Outfalls

Canyon	LANL NPDES Outfalls Lead (lbs)
Los Alamos Canyon Tributary to Rio Grande	0.02
Mortandad Canyon Tributary to Rio Grande	1.94
Sandia Canyon Tributary to Rio Grande	0.0
Water Canyon Tributary to Rio Grande	7.70E-03
Total of NPDES Discharges	1.97

5.2.5 Releases to Land

Lead releases to land at the Laboratory occur 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 the Laboratory was estimated by matching the munitions types with those listed in the TRI-DDS. A total of 8,878 lb of lead was released to land at the firing range at LANL in 2006.

5.2.6 Offsite Waste Disposal

The Solid Waste Operations Group provided waste characterization and disposal data for lead wastes that were shipped offsite in 2006. Laboratory and article exempt waste was removed from the data set. EPCRA article and laboratory exemptions have been documented in previous years' memos and are described in the EPA/TRI Guidance Document "Toxic Chemical Release Inventory Reporting Forms and Instructions for RY2006" (EPA-260-C-06-901) (EPA 2007).

The data provided by Solid Waste Operations included the percent of lead for most of the waste shipments. However, this information was lacking for many of the waste items, and the Ecology and Air Quality Group had to obtain the necessary waste profile forms, which itemize waste constituent concentrations. For those items that listed the lead Resource Conservation and Recovery Act codes and did not list the concentrations of lead, waste profile forms were requested for waste items that weighed more than 1 kilogram. In most cases, the waste profile form provided sufficient information to complete the lead calculation. For some waste items, estimate of the % lead were made by matching it with similarly described waste shipments from previous years' analyses. For those waste items weighing less than 1 kilogram, lead concentrations were estimated based on the item description. For example, lead percentage by weight in waste items comprised of a chemical compound, such as lead nitrate, were determined from the Merck Index (1989). In other wastes, where the description provided sufficient information about the nature of the item (e.g., lead pellets), the percentage of lead was estimated (e.g., lead pellets = 100% lead).

5.2.7 Results

The amount of lead contained in waste that was shipped offsite from the Laboratory in 2006 was 2,178 lbs. This total weight of lead was calculated by multiplying the total waste weight (kilograms) by the percentage of lead within each waste item, and then converted to pounds.

EPCRA reportable waste items shipped offsite from the Laboratory to several waste treatment/disposal facilities in 2006 are summarized in Table 5-4. As per EPCRA guidelines, only those disposal facilities that received more than 0.5 lbs of lead in 2006 were included in the summary table and on the Form R.

The 2006 totals for lead are similar to 2005 and significantly lower than amounts shipped offsite from LANL in 2003 and 2004. The increase in waste shipments in 2003 and 2004 reflects LANL's efforts to expunge legacy waste, particularly lead bricks and lead shielding. No large-scale clean-up efforts were conducted in 2006. However, under the Laboratory's new management, numerous space walk-downs and inventories were initiated in 2006 and will result in cleanouts of unused/unwanted items over the next few years. Offsite waste disposal numbers are anticipated to increase with these efforts.

5.2.7.1 Disposal Fate

The EPCRA Form R requires information about each treatment/disposal facility that received waste from the Laboratory, including how much was sent to each waste treatment/disposal facility and additional information regarding waste treatment, recycling, or disposal conducted at each facility. A Waste Disposal/Treatment Code must be entered in Section 6.2.C of the Form R for each facility receiving waste. The Waste Disposal/Treatment Codes were updated by EPA in 2005 and are included on page 48 of the "Toxic Chemical Release Inventory Reporting Forms and Instructions for RY2006" (EPA-260-C-06-901) (EPA 2007) guidance document.

Table 5-4 Summary of Waste Disposal Facilities Receiving LANL Waste in 2006

Company	Address	Facility EPA ID	Ultimate Fate of Waster	Total Lead (lb)
Clean Harbors, Aragonite, LLC	11600 North Aptus Rd., Aragonite, UT 84029	UTD981552177	Landfill	187.3
Clean Harbors, Grassy Mountain, LLC	Interstate 80 Exit 41, Grassy Mountain, UT 84029	UTD991301748	Landfill	485.2
Diversified Scientific Services, Inc.	657 Gallaher Road, Kingston, TN 37763	TND982109142	Landfill	3.20
Energy Solutions, LLC (formerly Envirocare of Utah, Inc.	Tooele County, I-80, Exit 49, Clive, UT 84029	UTD982598898	Landfill	31.22
Onyx Environmental Services, LLC	9131 East 96TH Ave., Henderson, CO 80640	COD980591184	Landfill	1,452.1
Onyx Special Services Inc.	5752 W. Jefferson St., Phoenix, AZ 85043	AZ0000337360	Metal Recovery	0.04[(a)]
Perma-Fix, Inc.	1940 NW 67th Place, Gainesville, FL 32653	FLD980711071	Landfill	14.45
Phibro-Tech, Inc.	8851 Dice Rd., Santa Fe Springs, CA 90670	CAD008488025	Metal Recovery	4.57
		Total		**2,178**

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

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 10.6 lb, 1.97 lb, and 8,878 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 2,178 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 the Laboratory 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 2006, the RLWTF resulted in a 92% treatment efficiency of lead in the wastewater. Sections 7B and 7C of the Form R relate to onsite energy recovery and recycling. The Laboratory performed no onsite processes applicable to these sections for lead in 2006.

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. The Laboratory 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 the Laboratory 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 2006 was divided by the amount used in 2005 to obtain an activity ratio of 1.25.

6.0 EPCRA SECTION 313 SUMMARY AND TRENDS

The Laboratory has submitted EPCRA Section 313 data to EPA since 1987. From 1987 to 1994, this information was submitted by the UC, operator of LANL. 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 the Laboratory 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 required 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.

The Laboratory 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, the Laboratory has triggered EPCRA Section 313 reporting for lead and mercury in recent years. The regulatory changes resulted in reporting thresholds of 10 lb for mercury and 100 lb for lead. Therefore, for the past six years LANL has submitted environmental release data on lead and, three out of the last six years, has reported on mercury. Figure 6-1 provides a summary of LANL-reported releases for the period from 1993 through 2006.

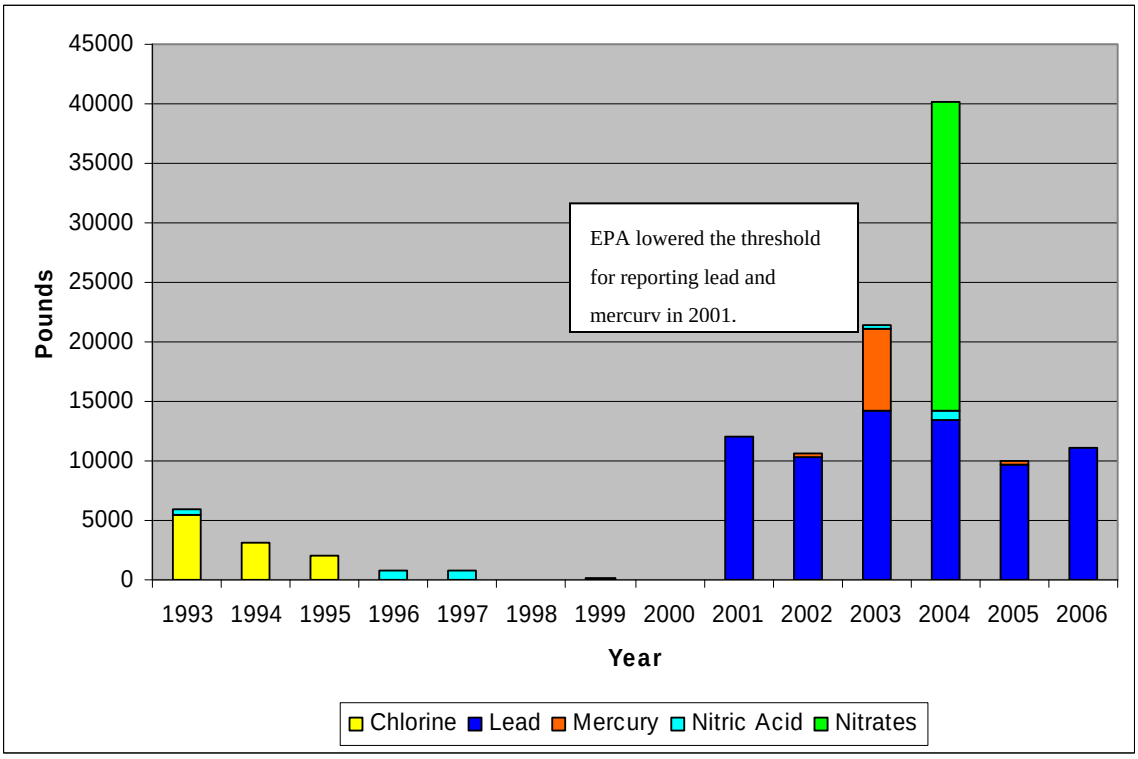
Several points are worth noting from this chart:

- In the early 1990s, the Laboratory 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, the Laboratory implemented a NARS 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 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. In late 2006 the maintenance and equipment upgrades were completed and operations restarted. However, nitric acid use for 2006 was still just below reporting thresholds.
- 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 the Laboratory, the threshold for reporting was lowered to 100 lb in 2001. The Laboratory 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 6-2 shows the amount of reportable chemicals used at LANL from 1993 through 2006. LANL set a pollution prevention goal of reducing the use of EPCRA Section 313 reportable chemicals by 90% by 2005 using 1993 as a baseline. Although the 2005 date for reaching this metric has passed, we are showing the graph with 2006 data to provide additional perspective on the Laboratory's continued efforts at pollution prevention. 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 6-2, 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.



Note: For 2003 through 2006 one-time waste disposal of lead from decontamination and demolition activities is not included on this chart.

Figure 6-1 Trends in LANL's reported releases to EPA TRI.

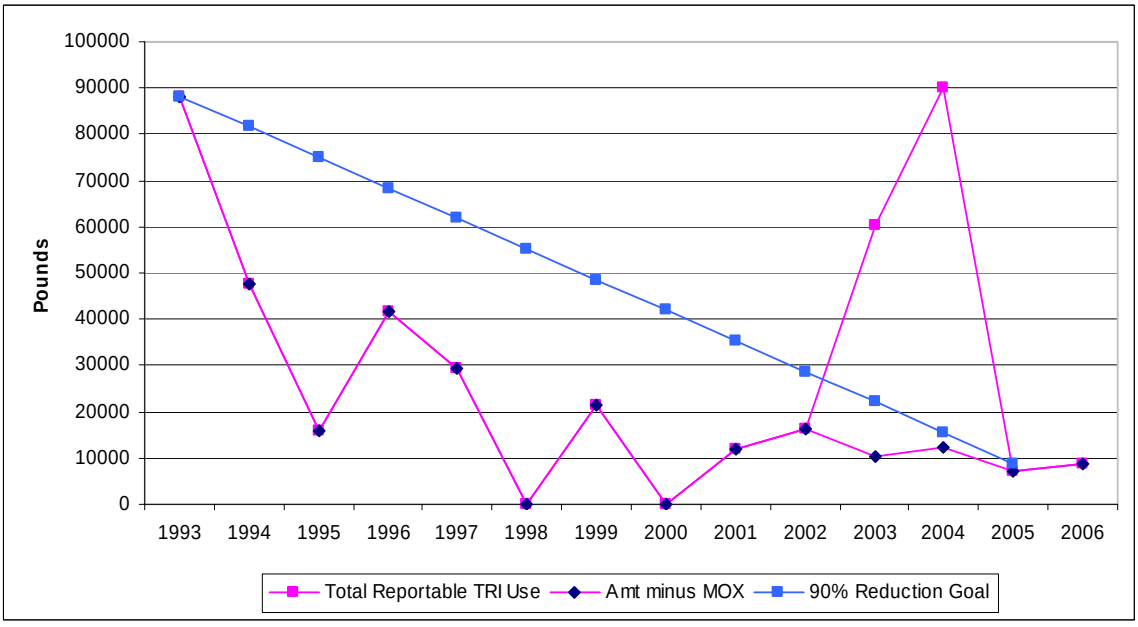


Figure 6-2 Trends in TRI reportable chemical use at LANL.

7.0 REFERENCES

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APPENDIX A CHEMICAL PROCUREMENTS FOR 2006

Appendix A:
EPCRA Section 313 Chemicals Used or Prcured in 2006

CAS Number	Chemical Name	EPCRA Threshold (lb)	2006 Amount Purchased or Used (lb)
7664-93-9	Sulfuric acid (aerosol forms only)	10000	14004.37
7647-01-0	Hydrochloric acid (aerosol forms only)	10000	6136.52
7697-37-2	Nitric acid	10000	3272.39
67-63-0	Isopropyl alcohol (mfg-strong acid process)	10000	2438.89
75-09-2	Dichloromethane	10000	2267.45
Cobalt Compounds	Cobalt Compounds	10000	2256.66
75-45-6	Chlorodifluoromethane	10000	1424.45
67-56-1	Methanol	10000	1390.53
Manganese Compounds	Manganese Compounds	10000	1357.46
7429-90-5	Aluminum (fume or dust)	10000	982.28
75-05-8	Acetonitrile	10000	888.23
107-21-1	Ethylene glycol	10000	861.31
872-50-4	N-Methyl-2-pyrrolidone	10000	824.66
78-93-3	Methyl ethyl ketone	10000	753.68
7664-38-2	Phosphoric acid	10000	607.62
110-54-3	n-Hexane	10000	599.63
107-06-2	1,2-Dichloroethane	10000	517.69
Nickel Compounds	Nickel Compounds	10000	474.51
7664-39-3	Hydrogen fluoride	10000	463.43
Polychlorinated Alkanes	Polychlorinated alkanes (C10 to C13)	10000	432.89
Barium Compounds	Barium Compounds	10000	354.32
108-88-3	Toluene	10000	235.15
79-01-6	Trichloroethylene	10000	234.45
67-66-3	Chloroform	10000	209.45
7632-00-0	Sodium nitrite	10000	150.34
7664-41-7	Ammonia	10000	133.26
75-71-8	Dichlorodifluoromethane	10000	120
333-41-5	Diazinon	10000	119.94
Zinc Compounds	Zinc Compounds	10000	115.89
76-13-1	Freon 113	10000	110.24
95-63-6	1,2,4-Trimethylbenzene	10000	108.48
7782-50-5	Chlorine	10000	95.15
Nitrate Compounds	Nitrate compounds (water dissociable)	10000	91.94
71-43-2	Benzene	10000	89.26
Copper Compounds	Copper Compounds	10000	75.25
1344-28-1	Aluminum oxide (fibrous forms)	10000	69.51
Cyanide Compounds	Cyanide Compounds	10000	63.05
68-12-2	N,N-Dimethylformamide	10000	55.31
71-55-6	1,1,1-Trichloroethane	10000	52.25
Glycol Ethers Compounds	Glycol Ethers	10000	34.61
Silver Compounds	Silver Compounds	10000	27
110-86-1	Pyridine	10000	21.05
7440-41-7	Beryllium	10000	19.99
7783-06-4	Hydrogen sulfide	10000	16.51
7440-50-8	Copper	10000	16.01
1634-04-4	Methyl tert-butyl ether	10000	14.85
7439-92-1	Lead	100	13.42
123-91-1	1,4-Dioxane	10000	12.67
79-06-1	Acrylamide	10000	10.98
Warfarin and salts	Warfarin and salts	10000	9.76
95-50-1	1,2-Dichlorobenzene	10000	9.74
64-18-6	Formic acid	10000	9.42
123-31-9	Hydroquinone	10000	8.75
108-10-1	Methyl isobutyl ketone	10000	7.03
Chromium Compounds	Chromium Compounds	10000	7.01

Appendix A:
EPCRA Section 313 Chemicals Used or Prcured in 2006

CAS Number	Chemical Name	EPCRA Threshold (lb)	2006 Amount Purchased or Used (lb)
110-82-7	Cyclohexane	10000	6.84
7440-39-3	Barium	10000	6.6
50-00-0	Formaldehyde	10000	6.09
75-65-0	tert-Butyl alcohol	10000	5.93
77-78-1	Dimethyl sulfate	10000	5.86
56-23-5	Carbon tetrachloride	10000	5.61
111-42-2	Diethanolamine	10000	5.6
7440-02-0	Nickel	10000	4.55
108-31-6	Maleic anhydride	10000	4.44
7440-62-2	Vanadium (fume or dust)	10000	4.12
100-42-5	Styrene	10000	3.98
1330-20-7	Xylene (mixed isomers)	10000	3.78
124-40-3	Dimethylamine	10000	3.48
Cadmium Compounds	Cadmium Compounds	10000	2.59
74-88-4	Methyl iodide	10000	2.49
108-90-7	Chlorobenzene	10000	2.43
Chlorophenols	Chlorophenols	10000	2.42
Beryllium Compounds	Beryllium Compounds	10000	2.13
51-79-6	Urethane	10000	2.01
141-32-2	Butyl acrylate	10000	1.97
71-36-3	n-Butyl alcohol	10000	1.95
Lead	Lead Compounds	100	1.93
106-93-4	1,2-Dibromoethane	10000	1.92
Antimony Compounds	Antimony Compounds	10000	1.89
79-34-5	1,1,2,2-Tetrachloroethane	10000	1.75
121-44-8	Triethylamine	10000	1.6
10034-93-2	Hydrazine sulfate	10000	1.32
98-95-3	Nitrobenzene	10000	1.32
554-13-2	Lithium carbonate	10000	1.31
Mercury Compounds	Mercury Compounds	10	1.29
Selenium Compounds	Selenium Compounds	10000	1.13
62-53-3	Aniline	10000	1.11
90-04-0	o-Anisidine	10000	1.1
90-43-7	2-Phenylphenol	10000	1.1
7440-47-3	Chromium	10000	1.1
76-02-8	Trichloroacetyl chloride	10000	0.89
7440-66-6	Zinc (fume or dust)	10000	0.77
26628-22-8	Sodium azide (Na(N3))	10000	0.72
7637-07-2	Boron trifluoride	10000	0.66
Diisocyanates (includes 20 che	Diisocyanates (includes 20 chemicals)	10000	0.66
62-56-6	Thiourea	10000	0.66
7439-96-5	Manganese	10000	0.55
7440-48-4	Cobalt	10000	0.53
62-55-5	Thioacetamide	10000	0.44
7782-49-2	Selenium	10000	0.44
94-75-7	2,4-D	10000	0.44
72-57-1	Trypan blue	10000	0.44
75-15-0	Carbon disulfide	10000	0.33
120-12-7	Anthracene	10000	0.28
60-35-5	Acetamide	10000	0.24
Arsenic Compounds	Arsenic Compounds	10000	0.23
79-10-7	Acrylic acid	10000	0.22
302-01-2	Hydrazine	10000	0.22
55-21-0	Benzamide	10000	0.22
106-44-5	p-Cresol	10000	0.22

Appendix A:
EPCRA Section 313 Chemicals Used or Prcured in 2006

CAS Number	Chemical Name	EPCRA Threshold (lb)	2006 Amount Purchased or Used (lb)
104-94-9	p-Anisidine	10000	0.22
7440-22-4	Silver	10000	0.22
75-07-0	Acetaldehyde	10000	0.2
Thallium Compounds	Thallium Compounds	10000	0.16
13463-40-6	Iron, pentacarbonyl-	10000	0.14
106-50-3	p-Phenylenediamine	10000	0.11
7726-95-6	Bromine	10000	0.11
7440-28-0	Thallium	10000	0.06
108-45-2	1,3-Phenylenediamine	10000	0.05
61-82-5	Amitrole	10000	0.05
1120-71-4	Propane sultone	10000	0.05
100-41-4	Ethylbenzene	10000	0.04
7440-38-2	Arsenic	10000	0.04
107-02-8	Acrolein	10000	0.04
7440-36-0	Antimony	10000	0.02
7723-14-0	Phosphorus (yellow or white)	10000	0.02
92-87-5	Benzidine	10000	0.02
88-89-1	Picric acid	10000	0.02
7550-45-0	Titanium tetrachloride	10000	0.02
107-05-1	Allyl chloride	10000	0.01
1464-53-5	Diepoxybutane	10000	0.01
680-31-9	Hexamethylphosphoramide	10000	0.01
121-14-2	2,4-Dinitrotoluene	10000	0.01
139-13-9	Nitrilotriacetic acid	10000	0.01

APPENDIX B FORM R REPORT FOR LEAD

Signature Certification for State Diskette Submission

DISK

U.S. DEPARTMENT OF ENERGY, LOS ALAMOS
NATIONAL LABORATORY
528 35TH STREET
LOS ALAMOS, NM 87544
87544SDLSL52835

June 18, 2007

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. DEPARTMENT OF ENERGY, LOS ALAMOS NATIONAL LABORATORY

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

We are submitting a total of 1 chemical report(s) for our facility.

These 1 chemical report(s) are described below:

TRI Chemical or Chemical Category	Reporting Year	CAS Number	Report
Lead	2006	7439-92-1	Form R

Our technical point of contact is:

GENE TURNER
(505) 667-5794
GTURNER@DOEAL.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:
Pursuant to 40 CFR 372.27(a)(1), "I hereby certify that to the best of my knowledge and belief for the toxic chemical(s) listed in this statement, for this reporting year, the annual reportable amount for each chemical, as defined in 40 CFR 372.27(a)(1), did not exceed 5,000 pounds, which included no more than 2,000 pounds of total disposal or other releases to the environment, and that the chemical was manufactured, or processed, or otherwise used in an amount not exceeding 1 million pounds during this reporting year;" and/or

Pursuant to 40 CFR 372.27(a)(2), "I hereby certify that to the best of my knowledge and belief for the toxic chemical(s) of special concern listed in this statement, there were zero disposals or other releases to the environment (including disposals or other releases that resulted from catastrophic events) for this reporting year, the "Annual Reportable Amount of a Chemical of Special Concern" for each such chemical, as defined in 40 CFR 372.27(a)(2), did not exceed 500 pounds for this reporting year, and that the chemical was manufactured, or processed, or otherwise used in an amount not exceeding 1 million pounds during this reporting year."

Sincerely,

GENE TURNER
ENVIRONMENTAL PERMITTING MANAGER

Enclosure: Diskette

LA-UR:07-3898

Cy:
G. Rael, DOE-LASO, A316
V. Bynum, PADOPS, A102
R.Watkins, ADESH&Q, K491
P. Wardwell, LC-LESH, A187
V. George, ENV-DO, J978
D. Wilburn, ENV-EAQ, J978
D. Janecky, ENV-EAQ, J978
S. Story, ENV-EAQ, J978
M. Stockton, ENV-EAQ, J978
W. Whetham, ENV-EAQ, J978
EPCRA Project File, J978
ENV-EAQ File, J978

(IMPORTANT: Type or print; read instructions before completing form)

Form Approved OMB Number:2070-0093
Approval Expires: 01/31/2008

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 2006

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 Environmental Permitting Manager		06/25/2007

SECTION 4. FACILITY IDENTIFICATION

4.1

Facility or Establishment Name	TRI Facility ID Number	Facility or Establishment Name or Mailing Address (if different from street address)
U.S. Department of Energy, Los Alamos National Laboratory	87544SDLSL52835	
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 NAICS Code (s) (6 digits)

Primary					
a. 928110	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: [redacted]

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:
- 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 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 ☐	10	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	LOS ALAMOS CANYON TRIBUTARY TO RIO	0.02	M	0
5.3.2	WATER CANYON TRIBUTARY TO RIO GRA	0.01	M	0
5.3.3	MORTANDAD TRIBUTARY TO RIO GRANDE	1.94	M	0

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

TRI Facility ID Number
84044SDLSL2835
Toxic Chemical, Category, or Generic Name
Lead

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

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		8878	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	Energy Solutions LLC								
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: 87144SDNYL2835

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. 31.2	1. O	1. M65
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. 1452.1	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 [6] 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: 91744SDLS2835

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. 4.6	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.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: 6

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: 84044SDGSL2835

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. 187.3	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.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: 6

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: 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.

6.2.7 Off-Site EPA Identification Number (RCRA ID No.): UTD991301748

Off-Site location Name: Clean Harbors Grassy Mount LLC.

Off-site Address: Exit 41 Interstate 80

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

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. 485.2	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.26a	7A.26b	1		2		3		4	7A.26d
	5		6		7		8		
7A.27a	7A.27b	1		2		3		4	7A.27d
	5		6		7		8		
7A.28a	7A.28b	1		2		3		4	7A.28d
	5		6		7		8		
7A.29a	7A.29b	1		2		3		4	7A.29d
	5		6		7		8		
7A.30a	7A.30b	1		2		3		4	7A.30d
	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: 6

and indicate the Part II, Section 6.2/7A page number in this box: 6 (example: 1,2,3, etc.)

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

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

EPA FORM R

PART II. CHEMICAL SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
37841SBLE5283
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	7556.4	8890.57	9000	9000
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	NA	34.4	30	30
8.1d	Total other off-site disposal or other releases	1151	2139.1	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	326	4.6	50	50
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			1.36	

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

FRI Facility ID Number
37544SDLSL252C35
Toxic Chemical, Category, or Generic Name
Lead

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


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