LA-14466-PR
Progress Report

2011 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Section 313

Los Alamos
NATIONAL LABORATORY
EST. 1943

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2011 TOXIC CHEMICAL RELEASE INVENTORY REPORT FOR THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986, TITLE III, SECTION 313

By
Environmental Stewardship Group

ABSTRACT

For reporting year 2011, Los Alamos National Laboratory (LANL) submitted a Form R report 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 2011 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 2011, 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 or the Laboratory) had been voluntarily reporting under EPCRA Section 313 since 1987.

For reporting year 2011, the Laboratory submitted a Form R report for lead. No other EPCRA Section 313 chemicals were used in 2011 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 2011 and describes the environmental release data reported on the Form R report. 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 2011. Appendix B includes a copy of the Form R report submitted to the 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. The Laboratory is owned by the U.S. Department of Energy (DOE) and operated by Los Alamos National Security, LLC.

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 or not 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.

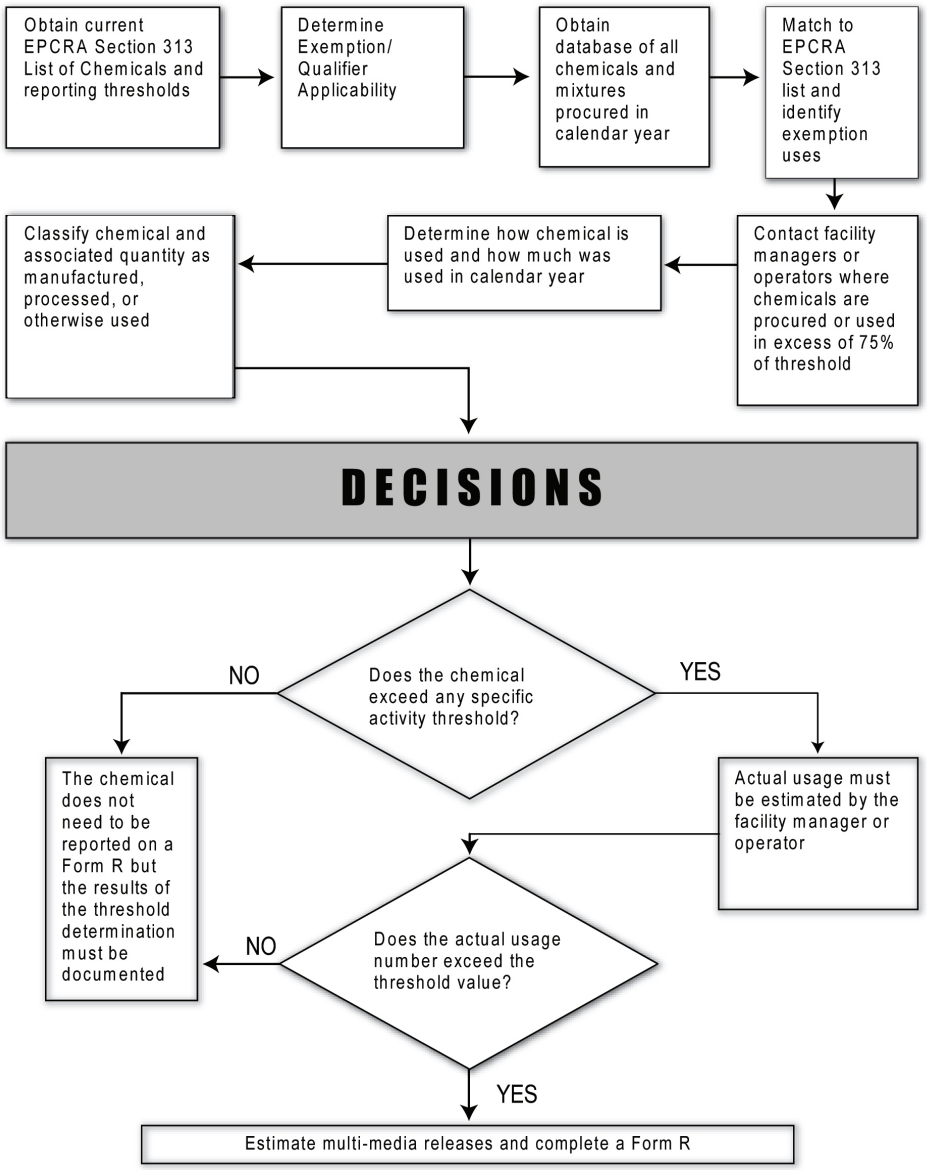


Figure 3-1. Flowchart process of analysis for EPCRA Section 313 reporting

3.1.1 Inventory

For calendar year 2011, a total of 39,298 records were added to ChemLog and evaluated; 13,590 were pure chemicals and 25,708 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.

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 Section 313 compounds. There are 30 different chemical categories included on the EPCRA Section 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 2011 ChemLog dataset 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 2011, the chemicals that were analyzed in more detail included the following:

- mercury compounds,
- sulfuric acid,
- PACs,
- nitric acid,
- methanol,
- hydrochloric acid,

- dioxins, 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 2011

CAS No	Chemical Name	Total Procured (lb)
7697-37-2	Nitric Acid	3,114
7647-01-0	Hydrochloric acid (aerosol forms only)	2,708
Polychlorinated Alkanes	Polychlorinated alkanes (C10 to C13)	2,092
7664-93-9	Sulfuric acid (aerosol forms only)	1,731
9016-87-9	Polymeric diphenylmethane diisocyanate	1,411
110-54-3	n-Hexane	1,119
1344-28-1	Aluminum oxide (fibrous forms)	1,100
67-63-0	Isopropyl alcohol (mfg-strong acid process)	894
Glycol Ethers	Glycol Ethers	841
67-56-1	Methanol	817

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 2011 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 2011, mercury was used in four areas at the Laboratory. Each is described below.

4.1.1 Mercury Procurements

A listing of all procurements in 2011 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 2011 was 6.57 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 concentration of mercury the mixture or solution contained,

If the mercury was used in a laboratory experiment setting, if so, 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 6.27 lb of mercury was determined to be laboratory exempt. Although 6.27 lb was determined to be laboratory exempt, the actual amount of mercury in chemical containers is considerably less. The chemical names of the exempted containers are "mercury standard solutions" which contain only ppm quantities of mercury.

In 2009, a purchase of 55.1 lb of mercury from MST-6: Materials Technology – Metallurgy was investigated further. The mercury was not "used" in 2011 and is still in storage. The mercury might be used next year and will be tracked for reporting in 2012. The mercury will be used for electroplating operations.

The remaining 0.30 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 performed.

During 2011, minor maintenance was performed on the mercury shutter system. A total of 0 lb was removed or added to the shutter system in 2011. Similar maintenance is anticipated in 2012.

4.1.3 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, 2006, and 2008. The experiment studies issues associated with using mercury as the target material for the SNS. The loop is a closed system and it is not opened to the atmosphere. Additionally, the entire experiment is contained

within a secondary container, which includes an exhaust system that filters mercury vapor from inside the secondary container that might escape the primary mercury boundary. The exhaust system also ensures a negative pressure inside the compartment and is activated whenever the secondary compartment is opened to prevent possible mercury vapor emissions. The filtering system includes mercury and high-efficiency particulate air filters.

The mercury added to the system has always been considered laboratory exempt. We assume that any mercury air emissions generated during the experiment are captured with the filtering system and therefore, no mercury air emissions are released during the experiment. LANSCE personnel confirmed that the experiment did operate in 2011 and 26 liters of mercury was added to the experiment. However, the experiment did not change and is still considered Laboratory Exempt. There are no plans to run the experiment in the future.

4.1.4 Fuel Combustion

In 2011, the Laboratory generated mercury compound emissions from the following combustion sources: the asphalt plant, the Technical Area (TA) 3 power plant, the TA-3 combustion turbine, and from numerous small boilers. The mercury compound emissions from these sources totaled 0.77 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 111,299.3 gallons of diesel fuel in 2011 and this equates to 0.0008 lb of mercury towards the otherwise used threshold.

4.1.5 Conclusion

The total amount of mercury qualifying as otherwise used equals 0.30 lb, which is below the reporting threshold value of 10 lb. The total amount of mercury compounds manufactured was 0.77 lb and is also below the reporting threshold of 10 lb. Therefore, it was determined that reporting mercury under EPCRA Section 313 is not necessary for 2011. A summary of the 2011 mercury threshold determination is provided in Table 4-1.

Table 4-1. Summary of 2011 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	6.27	Procurement data and facility personnel interviews	Laboratory Exempt	NA
Other Procurement	0.30	Procurement Records	Otherwise Used	10
LANSCE Shutter System	0.0	LANSCE Facility Records		
Fuel Combustion	0.0008	Fuel Use Records and EPA Guidance	Manufactured	10
Fuel Combustion	0.77	Fuel Use Records and EPA AP-42		

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.

Sulfuric acid is also purchased in large quantities for demineralizer regeneration at TA-3-22. In 2011, 1,399 lb of sulfuric acid was used at TA-3-22. Because the sulfuric acid used at the SWSC Plant and TA-3-22 is used in liquid form, it is not subject to EPCRA Section 313 reporting. TA-3-22 stores sulfuric acid in a 4,500-gallon tank. The EPA Tanks 4.0 model was used to make a very conservative estimate that 0.003 lb of sulfuric acid mist was generated inside the tank at TA-3-22.

Sulfuric acid aerosols are generated as a result of storage tank emissions, fuel combustion byproducts, natural gas combustion, and asphalt production. The total amount of sulfuric acid mist generated from these activities was 879.2 lb, less than the 25,000-lb manufacture threshold and, therefore, not reportable under EPCRA. Based on EPA guidance for fuel oil (diesel fuel) 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 2011, numerous small purchases totaling 332 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 2011

Description	Amount of Sulfuric Acid (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
TA-3-22 Demineralizer Regeneration	1,399	Site Support Contractor Logs	Not in aerosol form and not subject to EPCRA Section 313	NA
Storage Tank Air Emissions	0.003	EPA, Tanks 4.0 Software	Manufactured	25,000
Fuel Combustion Byproducts	31.7	AP-42 and fuel use records		
Asphalt Plant Production	5.2	AP-42 and facility records		
Natural Gas Combustion	879.2	AP-42 and facility records		
Procurement Not Evaluated	332	ChemLog	Otherwise used*	10,000

* Assumed to be in aerosol form.

4.3 Polycyclic Aromatic Compounds (PACs)

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.

4.3.1 Procurement of PACs

Under EPCRA Section 313, the PAC category includes 25 specific chemicals and an additional 51 chemical mixtures that are listed as potentially containing PACs. A search of the ChemLog dataset was done using CAS numbers for the 25 chemicals and text searches for the 51 chemical mixtures. No matches were identified and the total PACs from the ChemLog analysis for 2011 is zero.

4.3.2 PACs from Asphalt Production

In 2011, the Laboratory's onsite asphalt plant produced approximately 1,124 tons of asphalt. Additionally, Espanola Transit Mix provided 5,584 tons of asphalt amounts to LANL. Therefore, a total of 6,708 tons of asphalt was used at LANL in 2011.

A review of project management records for 2011 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.

According to EPA guidance, asphalt tar (used in making asphalt) 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 concentration of PACs in the asphalt tar is 8 ppm, which is significantly lower than the default value listed in the EPA's PACs guidance. The manufacturer-supplied value was used in the calculation of PACs.

For the 2011 reporting year, it was decided to include all projects, exempt and non-exempt, therefore the amount of PACs emitted is a bit higher than previous years. In 2011, using the 8 ppm concentration, the total amount of PACs otherwise used at LANL in asphalt is 10.23 pounds of PACs which is far below the reporting threshold of 100 pounds.

The concentration of benzo(g,h,i)perylene in asphalt, from "EPA's Guidance for Reporting on Pesticides and other Persistent Bioaccumulative Toxics" (EPA 2001c), is 1.2 ppm. This figure adds 1.53 pounds of benzo(g,h,i)perylene reportable towards its 10 lb otherwise use threshold.

4.3.3 PACs from Fuel Oil Combustion

Approximately 111,299 gallons of diesel fuel were used in 2011 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 17.38 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 value was used in these calculations and results in 7.11 lb of benzo(g,h,i)perylene applicable to the 10-lb otherwise use threshold.

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 1.8×10^{-3} lb for total PACs and 2.5×10^{-4} lb for benzo(g,h,i)perylene.

4.3.4 PACs from Natural Gas

Approximately 1,069 million standard cubic feet of natural gas were burned at the Laboratory facilities in 2011. Using AP-42 emission factors (EPA 1998b) and fuel records, approximately 0.017 lb of PACs were produced from natural gas combustion, which is applied to the manufacture threshold. Approximately 0.0013 lb of benzo(g,h,i)perylene applies toward the 10-lb manufacture threshold. Due to the absence of information regarding total PAC and benzo(g,h,i)perylene concentrations in natural gas, it was assumed these substances are negligible in natural gas before combustion.

4.3.5 Summary of PACs

The largest source of PACs at the Laboratory in 2011 was from fuel oil. The total amount used from all sources is 27.61 lb. The total amount manufactured from combustion of fuel oil and natural gas is 0.019 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 8.64 lb towards the otherwise used threshold. Combustion processes accounted for 0.0013 lb, which is considered to be manufactured. These values are below the reporting threshold of 10 lb. Therefore, benzo(g,h,i)perylene reporting was not necessary under EPCRA Section 313 in 2011. Table 4-3 summarizes the PACs and benzo(g,h,i)perylene threshold determinations.

Table 4-3. LANL 2011 Threshold Determinations for PACs and Benzo(g,h,i)perylene

EPCRA Chemical/ Compound	Process or Material	Amount (lb)	Total (lb)	EPCRA Section 313 Activity Determination	EPCRA Activity Threshold (lb)
Total PACs	Impurity in natural gas	0.0	27.61	Otherwise Used	100
	Asphalt tar	10.23			
	Impurity in fuel oil	17.38			
	Natural gas combustion	0.017	0.019	Manufactured	100
	Fuel oil combustion	81.8×10^{-3}			
Benzo(g,h,i)perylene	Impurity in natural gas	0.0	8.64	Otherwise Used	10
	Asphalt tar	1.53			
	Impurity in fuel oil	7.11			
	Natural gas combustion	0.013	0.013	Manufactured	10
	Fuel oil combustion	2.5×10^{-4}			

4.4 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 2011 did not exceed the EPCRA Section 313 otherwise use threshold of 10,000 lb.

4.4.1 Procurement

Nitric acid procured and used at the Laboratory in 2011 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 2011, a total of 2,800 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. 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 2,024 lb.

Actinide Process Chemistry (NCO-2) Division is the largest user of nitric acid and they had very limited operations due to facility and maintenance upgrades. Historically, NCO-2 Division purchases nitric acid in bulk and stores it in a nitric acid storage tank. In 2011, no additional nitric acid was purchased for the tank.

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 2011, this use totaled 1,449 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 338 lb.

The quantity of nitric acid used by personnel that were not contacted (except for NCO-2 Division, which is described in Section 4.4.2) or that described their use of nitric acid as process related (including cleaning glassware) totaled 575 lb. As a conservative assumption, this amount is assumed to be otherwise used.

4.4.2 NCO-2 Plutonium Processing

Plutonium processing facility management was contacted to obtain information on the amount of nitric acid used in plutonium processing in 2011. NCO-2 did not purchase any bulk nitric acid for their bulk storage tank in 2011. Facility management provided information that 400 liters of nitric acid was used in 2011 and was approximately 14–15 molar (70%) solution of nitric acid in water. From MSDS review the density for 70% nitric acid solution is 11.5 lb/gal, therefore the amount of nitric acid actually used at NCO-2 that was 868 lbs.

4.4.3 Summary

Nitric acid use in 2011 is below the EPCRA 313 10,000 lb otherwise used threshold, and therefore is not reportable. Table 4-4 provides a summary of nitric acid use at LANL in 2011.

Table 4-4. Nitric Acid Threshold Determination for 2011

Description	Amount of Nitric Acid (lb)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Laboratory Use	1,449	Lab Exempt	Exempt
Otherwise Use		Otherwise Use	10,000
• Non-Lab, or unknown use	575		
• Plutonium Processing (NCO-2 actual use)	870		
Total Otherwise Use	1,445		

4.5 Nitrate Compounds

According to the EPA's EPCRA Section 313 Guidance "List of Toxic Chemicals within the Water Dissociable Nitrate Compounds Category and Guidance for Reporting" (EPA 2000a), 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 2011 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 2011. Other nitrate compounds evaluated were determined to be non-aqueous and were not required to be included in threshold determinations.

4.5.1 Chemical Review

A query of ChemLog was performed to determine the amount of chemicals applied to the otherwise used threshold. Approximately 134 lb of nitrate compounds were purchased in 2011. A few of the larger quantity purchases were clearly nitrate compounds in a powder (non-aqueous) form and do not count towards the EPCRA threshold. These purchases are typically removed from the threshold totals.

However, since the total pounds purchased was so small, all purchases were counted towards the threshold.

4.5.2 Sanitary Wastewater

The SWSC Plant collects sanitary wastewater (sewage and other allowable discharges) from several LANL facilities and treats the wastewater 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 0.72 milligrams per liter and total flow into the system during 2011 was 97,903,000 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 0.72 milligrams per liter, and adjusting the weight to include the sodium ion, the total sodium nitrate processed as an impurity was 801 lb in 2011.

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 2011 was 106,586,000 gallons. The average nitrate concentration was 1.4 mg/L. This calculates to a total of 1,675 lb of nitrates (as sodium nitrate) manufactured.

The SWSC Plant is a zero discharge facility and all treated water is kept in a holding pond and pumped to the TA-3 power plant for use in cooling towers. Therefore, there are no releases to the environment from the SWSC plant.

4.5.3 Nitric Acid Neutralization

Typically, waste nitric acid from the mixed oxide (MOx) fuel process and from the Nitric Acid Recycling System, both located at the Plutonium Facility, is sent to the RLWTF for treatment. The RLWTF received 600 liters of nitric acid waste from the Plutonium Facility in 2011. The amount of nitrate compounds formed due to nitric acid treated at the RLWTF is usually calculated using the formula found in the EPA "Nitrate Compound Guidance" (EPA 2000a). However, the RLWTF did not treat acid waste in 2011. The acid that was received in 2011 will be stored and treated in the future.

4.5.4 Summary

Nitrate compounds that apply to the otherwise used reporting threshold of 10,000 lb include the chemicals found in ChemLog. A total of 134 lb of nitrate compounds was 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. The activity at the SWSC Plant totaled 1,675 lb of nitrate compounds manufactured. The amount of nitrate compounds formed due to nitric acid neutralization activities at the RLWTF in 2011 is 0 pounds. The amount of nitrate compounds processed as an impurity from this activity was 801 lb. The total amount of manufactured nitrate compounds was 1,675 lb, therefore it was determined that no thresholds for nitrate compounds were exceeded in 2011. Table 4-5 provides a summary of nitrate compounds at LANL in 2011.

Table 4-5. Summary of Nitrate Compounds at LANL in 2011

Description	Amount of Nitrate Compounds (lb)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Purchased in ChemLog (assumed in aqueous form and otherwise used)	134	Otherwise Used	10,000 lb
Processed at SWSC Plant	801	Processed	25,000 lb
Manufactured at SWSC Plant	1,675	Manufactured	25,000 lb
Manufactured at RLWTF	0		
Total Manufactured	1,675		

4.6 Hydrochloric Acid

Hydrochloric acid (HCl) is purchased for numerous processes and is also generated as a combustion byproduct. The total amount of HCl procured in 2011 was 2,708 lb. This quantity includes aqueous forms of HCl, not just aerosol forms. 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 2011.

4.7 DEHP

A capacitor bank located at TA-55 contains 18 capacitors that hold 1.8 gallons of GE Dilektrol oil each for a total of 32.4 gallons. A major component of the Dilektrol oil is di-(2-ethylhexyl) phthalate or DEHP. This material is reportable under EPCRA 313.

The threshold for DEHP is 10,000 lbs and capacitors are article exempt. Therefore, based on the quantity contained in the capacitor bank and the article exemption, it's not necessary to report DEHP in 2011.

4.8 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 2000b).

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

4.8.1 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 (HEs). 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 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 (ASME 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 3.66×10^{-8} grams in 2011. 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 the EPA for the burning of ammonium perchlorate propellant were used (EPA 1998c). Based on estimating emissions from all waste materials burned, dioxin emissions were 4.57×10^{-08} grams in 2011.

4.8.2 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 2000b). The Laboratory burned a total of 111,299 gallons of diesel fuel in 2011. Total dioxin formation from burning diesel fuel was calculated to be 1339 ug (0.00134 grams) for 2011.

The total calculated dioxin emissions in 2011 are below the 0.1-gram threshold and, therefore, reporting under EPCRA Section 313 is not required. Table 4-6 summarizes the amount of dioxins formed from all sources characterized for 2011.

Table 4-6. Dioxin Threshold Determination for 2011

Description	Amount of Dioxin Formed (grams)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Threshold (grams)
HE Expended	4.57×10^{-8}	Manufactured	0.1
HE Burned	9.31×10^{-5}		
Fuel Combustion	1.34×10^{-3}		
Total Dioxin Formed	0.00143		

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, the 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 2011, lead and lead compounds were otherwise used or manufactured in the following operations at the Laboratory.

5.1.1 Lead Procurements

A listing of all procurements in 2011 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 2011 was 46.62 lb. Line items in ChemLog that were clearly described as lead standards were assumed to be used in a laboratory setting and exempt from reporting. Purchasers were also contacted to determine if their lead was used for exempt activities. This accounted for 46.24 lb. The total amount of lead and lead compounds from procurements applied to the otherwise used threshold is 0.38 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 in 2011 was higher than previous years. Using the TRI-DDS software, it was determined that 5,706 lb of lead and 9.5 lb of lead compounds were otherwise used.

The 2011 amount of lead released to land (non-air) was 5,706 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. Additionally, firing of ammunition containing lead created (manufactured) 5.1 lb of lead compounds as air emissions.

5.1.3 Lead from Fuel Combustion

In 2011, the Laboratory emitted lead compound emissions from the following combustion sources: the TA-3 power plant, the TA-3 combustion turbine, and from numerous small boilers, which used approximately 1,068.6 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 0.53 lb towards the manufactured threshold. The Laboratory also burned an estimated 111,299.3 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 0.14 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 is 0.05 milligrams

per cubic meter. The 111,299.3 gallons of fuel oil contained 0.40 lb of lead and 1,068.6.9 MMscf of natural gas contained 3.30 lb of lead, which are added to the otherwise used threshold.

5.1.4 Lead from Asphalt Plant

A total of 1,124 tons of asphalt were produced in 2011. 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 0.001 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 the EPA's web-based TRI advanced training course presented by Science Applications International Corporation 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 materials sent offsite for recycling are reported on Form R in Part II, Section 6.2. The 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 "reuse" has been centralized at the Material 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 19,460 lb of lead were shipped offsite for "reuse" in 2011.

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 Form R in Part II, Section 6.2.

5.1.6 Other LANL Operations Using Lead and Lead Compounds

The Sigma Foundry, located at TA-3-66, melts lead in order to declassify parts. In 2011, the foundry melted a total of 185.2 lb of lead. Using Emission Factors from AP-42, Section 12.11, Secondary Lead Processing, the melting of the 185.2 lb of lead resulted in a total of 0.13 lb of stack air emissions.

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. However, LANSCE reports that 21,700 lb of lead was sent to Ace Metals for recycling in 2011.

The Laboratory installed a lead-bismuth test loop at LANSCE in 2001. The test loop contains approximately 8,000 lb of lead bismuth. There were no additions of lead bismuth in 2011.

5.1.7 Conclusion

The largest source of lead use at the Laboratory is from the firing range which accounted for 3,260 lb of lead towards the otherwise used threshold. Table 5-1 summarizes the threshold determination for lead and lead compounds for 2011. 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 2011 reporting, a Form R will be completed only for lead.

Table 5-1. Summary of Threshold Determination for Lead and Lead Compounds for 2011

Activity	Lead "Use"(lb)	Lead Compound "Use"(lb)	Comments
Lead Purchases (ChemLog)	0	0.38	Otherwise Used 46.62 lb purchased, 46.24 lb Lab Exempt
Firing Range	5,706	9.5	Otherwise Used
Firing Range	0	5.1	Manufactured
Fuel Combustion	0	0.67	Manufactured (sum of natural gas, diesel, and propane from asphalt plant)
Fuel Combustion	3.70	0	Otherwise Used
Lead Recycle/Resale from MRF (sold to Ace Metals)	19,460	0	Processed, all of it is "reused" and not reported on the Form Rs
Lead Recycle/Resale from LANSCE (sold to Ace Metals)	21,700	0	Processed, all of it is "reused" and not reported on the Form Rs
Asphalt Production	0	0.001	Otherwise Used
Sigma Foundry	0	0.13	Processed
TOTALS	**Otherwise Used – 5,709.5 Processed – 41,160**	**Otherwise Used – 9.88 Processed - 0.13 Manufactured – 5.72**	**Reporting Thresholds = 100 lb**

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 Form R for lead.

5.2.1.1 Firing Range

The Laboratory operates a firing range onsite 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 4.7 lb of lead compounds were emitted as fugitive air emissions from the firing range in 2011.

5.2.1.2 Fuel Combustion

In 2011, the Laboratory emitted lead compounds from the following combustion sources: the asphalt plant, the TA-3 power plant, generators, 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 0.67 lb of lead compound stack emissions.

The Sigma Foundry, located at TA-3-66, melts lead in order to declassify parts. In 2011, the foundry melted a total of 185.2 lb of lead. Using Emission Factors from AP-42, Section 12.11, Secondary Lead Processing, the melting of the 185.2 lb of lead resulted in a total of 0.13 lb of stack air emissions.

5.2.1.3 RLWTF Evaporator

In 2011, the RLWTF installed an effluent evaporator at TA-55 in order to evaporate off water collected at the effluent outfall directly to the atmosphere. The effluent water contained 5.4 grams of lead which equates to 0.012 lb of lead emitted as stack air emissions.

5.2.1.4 Conclusion

In 2011, the Laboratory emitted a total of 5.51 lb of lead 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, from the melting of lead at the Sigma Foundry, and from the RLWTF Evaportator. Table 5-2 summarizes lead air emissions from the Laboratory as reported on Form R.

Table 5-2. Lead Air Emissions from LANL in 2011

Emission Source	Total Lead Emissions (lb)	Fugitive or Stack
Firing Range	4.7	Fugitive
Fuel Combustion	0.67	Stack
Sigma Foundry	0.13	Stack
RLWTF Evaporator	0.012	Stack
Total	**5.51**	

5.2.2 Releases to Water

This section describes the amount of lead released to the environment from the Laboratory during 2011, 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 dataset 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 will 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 and RCRA Group. Outfall 051 is the only LANL outfall that has discharge limits for lead. Since there are no limits at the other outfalls, LANL does not analyze for lead at these outfalls. In 2011, LANL sampled for a full slate of analytes (including lead) at each outfall as part of the NPDES Permit renewal process. NMED analyzes the concentration and determines if it is likely that the surface water standard for each analyte could be exceeded. If the standard is not likely to be exceeded then there is no permit limit for that constituent. Based on the 2004 sampling, there were no permit limits for lead at any outfall other than Outfall 051, so there are no data on lead concentrations for water sent to those outfalls from 2005-2010. In 2011, lead and mercury were below the detection limit for all of the outfalls except Outfall 03A199 where the single sample showed 0.67 micrograms per liter. Since a value is available, the amount of lead discharged through that outfall could be calculated.

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 and RCRA Group. The following table summarizes the total lead discharged from each of the three tributaries on Pajarito Plateau that LANL discharged to during 2011. Total lead release to streams was 0.387 lb. Table 5-3 was used to complete Section 5.3.1 of the Form R.

Table 5-3. Lead Releases to Water in 2011 from LANL NPDES Outfall

Canyon	LANL NPDES Outfall Lead (lb)
Mortandad Tributary to Rio Grande	0.0049
Sandia Tributary to Rio Grande	0.3349
Los Alamos Tributary to Rio Grande	0.0477
Total of NPDES Discharges	**0.3874**

5.2.3 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 5,706 lb of lead was released to land at the firing range at LANL in 2011.

5.2.4 Offsite Waste Disposal

The Solid Waste Operations Group provided waste characterization and disposal data for lead wastes that were shipped offsite in 2011. Laboratory and article exempt waste was removed from the dataset. 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 RY2008" (EPA-260-K-08-001) (EPA 2008).

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 Environmental Stewardship Group had to obtain the necessary information from MSDSs or the Merck Index (1989). In most cases, the waste profile form provided sufficient information to complete the lead calculation. For some waste items, estimates of the percentage of 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). If the MSDS did not give the percentage of lead, the most conservative was assumed from the range given.

5.2.4.1 Results

The amount of lead contained in waste that was shipped offsite from the Laboratory in 2011 was 5,775 lb. 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 2011 are summarized in Table 5-4. As per EPCRA guidelines, only those disposal facilities that received more than 0.5 lb of lead in 2011 were included in the summary table and on the Form R.

The 2011 totals for lead are similar to last year as LANS continues to make a concerted effort to clean-up and dispose of legacy material.

5.2.4.2 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 the EPA in 2005 and are included on pages 54 and 55 of the "Toxic Chemical Release Inventory Reporting Forms and Instructions for RY2008" (EPA-260-K-08-001) (EPA 2008) guidance document.

Table 5-4. Summary of Waste Disposal Facilities Receiving LANL Waste in 2011

Company	Address	Facility EPA ID	Ultimate Fate of Waste	Total Lead (lb)
Clean Harbors, Aragonite, LLC	11600 North Aptus Rd., Aragonite, UT 84029	UTD981552177	Solidification/Stabilization of metals	697
Clean Harbors, Deer Trail, LLC	108555 East Highway 36, Deer Trail, CO 80105	COD991300484	Landfill	142
Clean Harbors, El Dorado, LLC	309 American Circle, El Dorado, AR 71730	ARD069748192	Landfill	3.83
Energy Solutions, LLC	Tooele County, I-80, Exit 49, Clive, UT 84029	UTD982598898	Landfill	2,650
Material and Energy Corporation	2011 Highway 58, Suite 1020, Oak Ridge, TN. 37830	TNR000005397	Landfill	0.31
Permafix Northwest, Inc.	2025 Batelle Rd, Richland, WA. 99354	WAR000010355	“Other” Land Disposal	331
Perma-Fix, Inc.	1940 NW 67th Place, Gainesville, FL 32653	FLD980711071	”Other” Land Disposal	1,950
Phibro-Tech, Inc.	8851 Dice Rd., Santa Fe Springs, CA 90670	CAD008488025	Metal Recovery/Recycle	1.1
			Total	**5,775**

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 5.51 lb, 0.012 lb, and 0.387 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 5,775 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, neutralization, and reverse osmosis treatment. All wastewater is sampled for lead before and after treatment. Based on analytical results for 2011, the RLWTF resulted in a 99.2% 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 2011.

Section 8 of the Form R refers to source reduction and recycling activities. The information provided by the 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.

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 2011 was divided by the amount used in 2010 to obtain an activity ratio of 1.45

6.0 EPCRA SECTION 313 SUMMARY AND TRENDS

The Laboratory has submitted EPCRA Section 313 data to the EPA since 1987. From 1987 to 1994, this information was submitted by the University of California, 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, President Clinton signed EO 13148, which requires all federal facilities to comply with EPCRA Section 313 requirements and additionally requires federal facilities to reduce releases of EPCRA Section 313 chemicals to the environment. In response to EO 13148, the DOE developed Pollution Prevention Leadership Goals that include the following:

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

The Laboratory has implemented numerous pollution prevention projects to reduce use and releases of EPCRA Section 313 chemicals. However, two regulatory changes made by the EPA in recent years impact EPCRA Section 313 reporting:

- On October 19, 1999, the 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, the EPA changed 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.

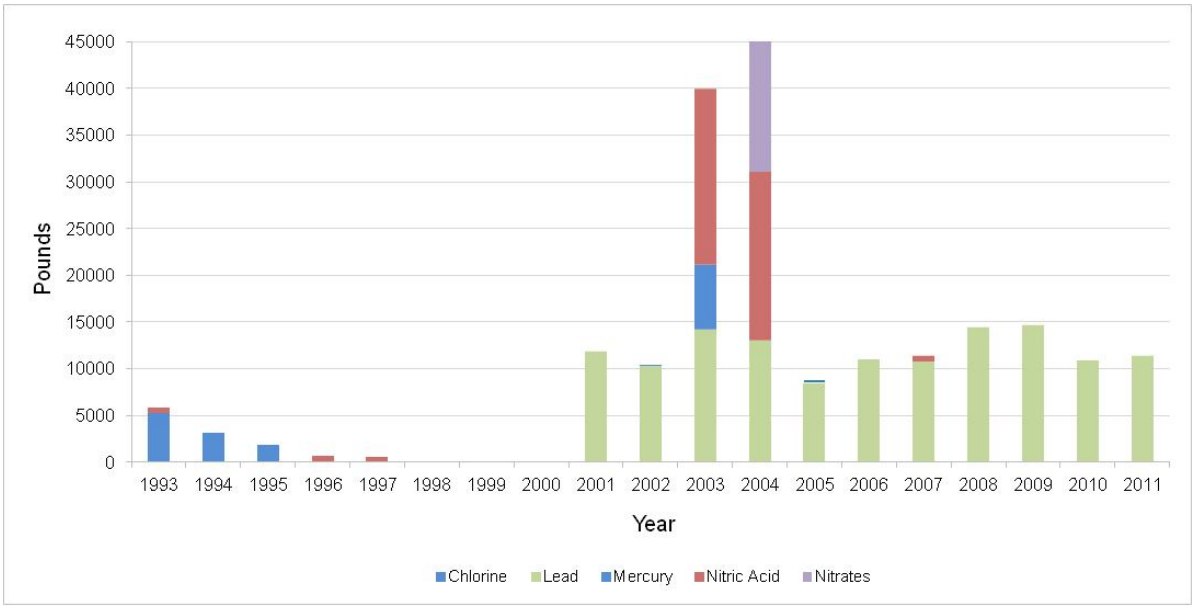
As a result of these regulatory changes, the Laboratory has triggered EPCRA Section 313 reporting for lead and mercury in recent years. The regulatory changes resulted in reporting thresholds of 10 lb for mercury and 100 lb for lead. Therefore, for the past seven years LANL has submitted environmental release data on lead and, three out of the last seven years, has reported on mercury. Figure 6-1 provides a summary of LANL-reported releases for the period from 1993 through 2011.

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 Nitric Acid Recycling System to reduce the amount of new nitric acid needed for plutonium processing. This closed-loop recycle system greatly reduced the need to purchase nitric acid, and due to recycling efforts, nitric acid use was below reporting thresholds for several years. However, in 2003 and 2004 a new process to convert

weapons-grade plutonium to 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. Nitric acid use for 2006 was still just below reporting thresholds. In 2007 nitric acid was again reportable due to resumption of higher levels of plutonium processing activities.
- 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. Although, 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.



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.

REFERENCES

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APPENDIX A:
EPCRA Section 313 Chemicals Used or Procured in 2011

APPENDIX B:
Form R Report for Lead (DOE and LANL)

APPENDIX A:
EPCRA Section 313 Chemicals Used or Procured in 2011

Appendix A: EPCRA Section 313 Chemicals Used or Procured in 2011

Cas no	Chemical Name	Sec 313	Threshold	Total (lbs)
7697-37-2	Nitric acid	313	10000	3114.1321
7647-01-0	Hydrochloric acid (aerosol forms only)	313	10000	2708.4184
Polychlorinated Alkanes	Polychlorinated alkanes (C10 to C13)	N583	10000	2091.7568
7664-93-9	Sulfuric acid (aerosol forms only)	313	10000	1730.6245
9016-87-9	Polymeric diphenylmethane diisocyanate	Diisocyanate	<10000	1411.1855
110-54-3	n-Hexane	313	10000	1118.5241
1344-28-1	Aluminum oxide (fibrous forms)	313	10000	1099.9082
67-63-0	Isopropyl alcohol (mfg-strong acid process)	313	10000	893.7746
Glycol Ethers	Glycol Ethers	N230	10000	841.3247
67-56-1	Methanol	313	10000	816.8841
872-50-4	N-Methyl-2-pyrrolidone	313	10000	581.3185
67-66-3	Chloroform	313	10000	453.5275
107-21-1	Ethylene glycol	313	10000	353.6153
75-09-2	Dichloromethane	313	10000	324.9032
108-88-3	Toluene	313	10000	317.9870
75-05-8	Acetonitrile	313	10000	268.3131
7664-41-7	Ammonia	313	10000	256.0536
7632-00-0	Sodium nitrite	313	10000	172.8369
78-93-3	Methyl ethyl ketone	313	10000	151.3768
108-90-7	Chlorobenzene	313	10000	148.8390
Nitrate	Nitrate compounds (water dissociable)	N511	10000	124.2813
1330-20-7	Xylene (mixed isomers)	313	10000	124.2256
Barium	Barium Compounds	N040	10000	97.2513
Copper	Copper Compounds	N100	10000	97.1338
7664-39-3	Hydrogen fluoride	313	10000	72.6673
7664-38-2	Phosphoric acid	313	10000	63.3911
95-63-6	1,2,4-Trimethylbenzene	313	10000	59.7089
123-31-9	Hydroquinone	313	10000	40.8924
101-68-8	Methylenebis(phenylisocyanate)	Diisocyanate	<10000	38.3287
Zinc	Zinc Compounds	N982	10000	33.4443
56-23-5	Carbon tetrachloride	313	10000	29.8704
131-11-3	Dimethyl phthalate	313	10000	22.5325
7429-90-5	Aluminum (fume or dust)	313	10000	22.2397
Nickel	Nickel Compounds	N495	10000	20.2108
68-12-2	N,N-Dimethylformamide	313	10000	14.2224
108-10-1	Methyl isobutyl ketone	313	10000	14.1775
74-85-1	Ethylene	313	10000	14.1250
79-01-6	Trichloroethylene	313	10000	12.9120
75-52-5	Nitromethane	313	10000	12.7850
127-18-4	Tetrachloroethylene	313	10000	12.5210
110-82-7	Cyclohexane	313	10000	11.2900
71-36-3	n-Butyl alcohol	313	10000	10.9885

96-33-3	Methyl acrylate	313	10000	10.5105
Cyanide	Cyanide Compounds	N106	10000	10.4535
110-86-1	Pyridine	313	10000	8.4062
Cobalt	Cobalt Compounds	N096	10000	7.3986
Cadmium	Cadmium Compounds	N078	10000	6.9315
Chromium	Chromium Compounds	N090	10000	6.6760
123-91-1	1,4-Dioxane	313	10000	5.1276
Silver	Silver Compounds	N740	10000	4.6220
Warfarin and salts	Warfarin and salts	N874	10000	4.1074
71-43-2	Benzene	313	10000	3.8647
7726-95-6	Bromine	313	10000	3.6112
100-41-4	Ethylbenzene	313	10000	3.6057
Antimony	Antimony Compounds	N010	10000	3.3642
124-40-3	Dimethylamine	313	10000	3.1184
98-95-3	Nitrobenzene	313	10000	2.6455
106-93-4	1,2-Dibromoethane	313	10000	2.4132
108-45-2	1,3-Phenylenediamine	313	10000	2.3581
Selenium	Selenium Compounds	N725	10000	2.2666
95-53-4	o-Toluidine	313	10000	2.2223
Manganese	Manganese Compounds	N450	10000	2.1593
109-86-4	2-Methoxyethanol	313	10000	2.1289
64-18-6	Formic acid	313	10000	2.0120
106-42-3	p-Xylene	313	10000	1.8984
78-92-2	sec-Butyl alcohol	313	10000	1.8815
50-00-0	Formaldehyde	313	10000	1.8083
75-65-0	tert-Butyl alcohol	313	10000	1.7388
77-09-8	Phenolphthalein	313	10000	1.6535
Arsenic	Arsenic Compounds	N020	10000	1.5653
91-20-3	Naphthalene	313	10000	1.5230
62-53-3	Aniline	313	10000	1.3515
554-13-2	Lithium carbonate	313	10000	1.3448
108-95-2	Phenol	313	10000	1.1658
98-86-2	Acetophenone	313	10000	1.1333
106-44-5	p-Cresol	313	10000	1.1023
7782-41-4	Fluorine	313	10000	1.0292
107-18-6	Allyl alcohol	313	10000	0.9392
Chlorophenols	Chlorophenols	N084	10000	0.8818
78-79-5	Isoprene	313	10000	0.7502
7783-06-4	Hydrogen sulfide	313	10000	0.7200
75-15-0	Carbon disulfide	313	10000	0.6950
Lead	Lead Compounds	N420	100	0.6779
7723-14-0	Phosphorus (yellow or white)	313	10000	0.6449
106-88-7	1,2-Butylene oxide	313	10000	0.6259
13463-40-6	Iron, pentacarbonyl-	313	10000	0.5512
1313-27-5	Molybdenum trioxide	313	10000	0.5206
74-88-4	Methyl iodide	313	10000	0.4519

302-01-2	Hydrazine	313	10000	0.4409
26628-22-8	Sodium azide (Na(N3))	313	10000	0.4409
Mercury	Mercury Compounds	N458	10	0.4076
107-13-1	Acrylonitrile	313	10000	0.3554
Beryllium	Beryllium Compounds	N050	10000	0.2866
122-39-4	Diphenylamine	313	10000	0.2205
606-20-2	2,6-Dinitrotoluene	313	10000	0.2205
90-94-8	Michler's ketone	313	10000	0.2205
91-23-6	o-Nitroanisole	313	10000	0.2205
121-14-2	2,4-Dinitrotoluene	313	10000	0.2205
1120-71-4	Propane sultone	313	10000	0.2205
79-22-1	Methyl chlorocarbonate	313	10000	0.2205
94-36-0	Benzoyl peroxide	313	10000	0.2205
75-07-0	Acetaldehyde	313	10000	0.1727
20816-12-0	Osmium tetroxide	313	10000	0.1080
75-21-8	Ethylene oxide	313	10000	0.0973
107-11-9	Allylamine	313	10000	0.0840
Thallium	Thallium Compounds	N760	10000	0.0551
107-30-2	Chloromethyl methyl ether	313	10000	0.0551
64-75-5	Tetracycline hydrochloride	313	10000	0.0551
108-05-4	Vinyl acetate	313	10000	0.0514
80-15-9	Cumene hydroperoxide	313	10000	0.0110
104-94-9	p-Anisidine	313	10000	0.0110
100-25-4	p-Dinitrobenzene	313	10000	0.0110
100-02-7	4-Nitrophenol	313	10000	0.0022
542-88-1	Bis(chloromethyl) ether	313	10000	0.0007
1912-24-9	Atrazine	313	10000	0.0006

APPENDIX B:
Form R Report for Lead (DOE and LANL)

Los Alamos
NATIONAL LABORATORY
EST.1943

Environmental Protection Division
PO Box 1663, MS K404
Los Alamos, New Mexico 87545
505-667-2211/Fax 505-667-0731

Date: JUN 14 2012
Refer To: ENV-DO-12: 0027
LAUR: LA-UR-12-22027

Gene Turner
Los Alamos Site Office,
Environmental Operations (LASO-EO)
3747 West Jemez Road, MS A316
Los Alamos, NM 87544

Dear Mr. Turner:

SUBJECT: 2011 TOXIC CHEMICAL RELEASE INVENTORY REPORT ELECTRONIC SUBMITTAL

This letter is to inform you that Los Alamos National Laboratory operated by Los Alamos National Security (LANS) submitted their 2011 Toxic Chemical Release Inventory Report, Form R, to the EPA using the online reporting tool, TRIMEweb on June 14, 2012. The report is required by Emergency Planning and Community Right-to-Know Act, Title III, Section 313. This year the EPA's deadline is July 2, 2012.

Should you have any questions or comments regarding the information provided in this report, please contact Steve Story at (505) 665-2169, story@lanl.gov.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division

Gene Turner 2 Date:
ENV-DO-12: 0027

Enclosure: 2011 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act, Title III, Section 313

SS/WW/AD:tav

Cy: Hai Shen, LASO-EO, w/enc., A316
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Steven L. Story, ENV-ES, w/enc., J978
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Katelyn R. Booth, ENV-ES, w/enc., J978
IRM-RMMSO, w/enc., A150
ENV-DO Correspondence File, w/enc., K404
EPCRA Project File, w/enc., J978

Enclosure

2011 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act, Title III, Section 313

Electronic Submittal

Authors:
Walter Whetham
Katelyn R. Booth

LA-UR-12-22027

Form Status: Certified and Sent to USEPA
Validation Status: Passed with No Errors

Form Approved OMB Number: **2025-0009**

(IMPORTANT: Read instructions before completing form; type or use fill-and-print form)

Approval Expires: **10/31/2014** **Page 1 of 5**

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 **87545LSLMSLOSAL** Toxic Chemical, Category, or Generic Name **Lead**

WHERE TO SEND COMPLETED FORMS:	1. TRI Data Processing Center P.O. Box 10163 Fairfax, VA 22038 ***** File Copy Only: Do Not Submit Paper Form to EPA *****	2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

This section only applies if you are revising or withdrawing a previously submitted form, otherwise leave blank:	Revision (Enter up to two code(s)) [ ][ ]	Withdrawal (Enter up to two code(s)) [ ][ ]

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

Part I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR : **2011**

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer questions 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:
File Copy Only: Do Not Submit Paper Form to EPA	**File Copy Only: Do Not Submit Paper Form to EPA**	**XX/XX/XXXX**

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	**87545LSLMSLOSAL**

Facility or Establishment Name: **Los Alamos National Security, LLC, Los Alamos National Lab**

Street	Mailing Address (if different from physical street address)	
Bikini Atoll Rd SM30	**PO Box 1663**	
City/County/State/ZIP Code: **LOS ALAMOS / Los Alamos / NM / 87545**	City/State/ZIP Code: **Los Alamos / NM / 87545**	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. [ ] A Federal facility	d. [**X**] GOCO

4.3	Technical Contact name	**STEVE STORY**	Email Address **STORY@LANL.GOV**	Telephone Number (include area code) **5056652169**
4.4	Public Contact name	**LORRIE BONDS LOPEZ**	Email Address **lorriel@lanl.gov**	Telephone Number (include area code) **5056670216**

4.5	NAICS Code(s) (6 digits)	a. **928110 (Primary)**	b.	c.	d.	e.	f.

4.6	Dun and Bradstreet Number(s) (9 digits)
a. **NA**	
b.	

SECTION 5. PARENT COMPANY INFORMATION				
5.1	Name of U.S. Parent Company (for TRI Reporting purposes)	**U.S. Department of Energy**		No U.S. Parent Company (for TRI Reporting purposes) [ ]
5.2	Parent Company's Dun & Bradstreet Number	NA [**X**]		

EPA Form 9350-1 (Rev. 10/2011) - Previous editions are obsolete. Printed using TRIMEweb

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION	TRI Facility ID Number 87545LSLMSLOSAL Toxic Chemical, Category, or Generic Name Lead

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you are reporting a mixture component in 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.) 7439921
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 I, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive). NA

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

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

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

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

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

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

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

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (Enter code)	C. Percent from Stormwater
5.1	Fugitive or non-point air emissions	NA [ ]	4.7	C	
5.2	Stack or point air emissions	NA [ ]	0.81	E1	
5.3	Discharges to receiving streams or water bodies (Enter one name per box)	NA [ ]			
	Stream or Water Body Name				
5.3. 1	MORTANDAD TRIBUTARY TO RIO GRANDE		0.005	M2	0%
5.3. 2	Sandia Tributary to Rio Grande		0.335	M2	0%
5.3. 3	Los Alamos Tributary to Rio Grande		0.048	M2	0%

*For Dioxin and Dioxin-like Compounds, report in grams/year
**Range Codes: A=1-10 pounds; B=11-499 pounds; C=500-999 pounds.

EPA Form 9350-1 (Rev. 10/2011) - Previous editions are obsolete.

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 87545LSLMSLOSAL Toxic Chemical, Category, or Generic Name Lead

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ON-SITE (Continued)

		NA	A. Total Release (pounds/year*) (Enter range code** or estimate)	B. Basis of Estimate (Enter code)
5.4.1	Underground Injection on-site to Class I wells	[X]		
5.4.2	Underground Injection on-site to Class II-V wells	[X]		
5.5	Disposal to land on-site			
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	[ ]	5706	M2

SECTION 6. TRANSFER(S) OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs) NA [X]

*For Dioxin and Dioxin-like Compounds, report in grams/year

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

EPA Form 9350-1 (Rev. 10/2011) - Previous editions are obsolete.

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 87545LSLMSLOSAL Toxic Chemical, Category, or Generic Name Lead

6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS	NA [ ]
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	Grantsville	County	Tooele	State	UT	Zip	84029	Country (Non-US)	

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

A. Total Transfer (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 . 2650	1 . O	1 . M65

6.2.2 Off-Site EPA Identification Number (RCRA ID No.)	ARD069748192
Off-Site Location Name:	CLEAN HARBORS, EL DORADO, LLC
Off-Site Address:	309 AMERICAN CIRCLE

City	EL DORADO	County	Union	State	AR	Zip	71730	Country (Non-US)	

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

A. Total Transfer (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 . 3.83	1 . O	1 . M65

6.2.3 Off-Site EPA Identification Number (RCRA ID No.)	WAR000010355
Off-Site Location Name:	PERMA-FIX NORTHWEST INC
Off-Site Address:	2025 BATTELLE BOULEVARD

City	RICHLAND	County	Benton	State	WA	Zip	99354	Country (Non-US)	

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

A. Total Transfer (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 . 331	1 . O	1 . M79

6.2.4 Off-Site EPA Identification Number (RCRA ID No.)	COD991300484
Off-Site Location Name:	Clean Harbors, Deer Trail, LLC
Off-Site Address:	108555 East Highway 36

City	Deer Trail	County	Arapahoe	State	CO	Zip	80105	Country (Non-US)	

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

A. Total Transfer (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 . 142	1 . O	1 . M65

6.2.5 Off-Site EPA Identification Number (RCRA ID No.)	FLD980711071
Off-Site Location Name:	PERMA FIX, INC.
Off-Site Address:	1940 NW 67TH PLACE

City	GAINESVILLE	County	Alachua	State	FL	Zip	32653	Country (Non-US)	
Is location under control of reporting facility or parent company?						[ ] Yes [X] No			

A. Total Transfer (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. 1950	1. O	1. M79

6.2.6 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	County	Los Angeles	State	CA	Zip	90670	Country (Non-US)	
Is location under control of reporting facility or parent company?						[ ] Yes [X] No			

A. Total Transfer (pounds/year*) (Enter range code** or estimate)	B. Basis of Estimate (Enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (Enter code)
1. 1.1	1. O	1. M24

6.2.7 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	Dugway	County	Tooele	State	UT	Zip	84022	Country (Non-US)	
Is location under control of reporting facility or parent company?						[ ] Yes [X] No			

A. Total Transfer (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. 697	1. O	1. M41

6.2.8 Off-Site EPA Identification Number (RCRA ID No.)	TNR000005397
Off-Site Location Name:	MATERIAL AND ENERGY CORPORATION
Off-Site Address:	2010 HIGHWAY 58, SUITE 1020

City	OAK RIDGE	County	Anderson	State	TN	Zip	37830	Country (Non-US)	
Is location under control of reporting facility or parent company?						[ ] Yes [X] No			

A. Total Transfer (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	1. O	1. M65

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

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

a. General Waste Stream (Enter code)	b. Waste Treatment Method(s) Sequence [Enter 3-character code(s)]	c. Waste Treatment Efficiency Estimate
7A. 1 a	7A. 1 b	7A. 1 c
W	2: H077 3: H124 4: H121 5: H129	E3
7A. 2 a	7A. 2 b	7A. 2 c
S	2: H101	E6

*For Dioxin and Dioxin-like Compounds, report in grams/year

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

EPA Form 9350-1 (Rev. 10/2011) - Previous editions are obsolete.

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 87545LSLMSLOSAL Toxic Chemical, Category, or Generic Name Lead

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] 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)]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] NA - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

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

SECTION 8. DISPOSAL OR OTHER RELEASES, 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	3265.632	5711.898	4000	4000
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	3671.63	2796.14	4000	4000
8.1d	Total other off-site disposal or other releases	4086	2978	4000	4000
8.2	Quantity used for energy recovery on-site	NA	NA	NA	NA
8.3	Quantity used for energy recovery off-site	NA	NA	NA	NA
8.4	Quantity recycled on-site	NA	NA	NA	NA
8.5	Quantity recycled off-site	1.1	1.1	10	10
8.6	Quantity treated on-site	NA	NA	NA	NA
8.7	Quantity treated off-site	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		1.45		
8.10	Did your facility engage in any newly implemented source reduction activities for this chemical during the reporting year? If so, complete the following section; if not, check NA.		NA [X]		

	Source Reduction Activities (Enter code(s))	Methods to Identify Activity (Enter code(s))		
8.10.1	NA			

EPA Form 9350-1 (Rev. 10/2011) - Previous editions are obsolete. *For Dioxin and Dioxin-like Compounds, report in grams/year

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

Additional optional information on source reduction, recycling, or pollution control activities.

Miscellaneous, additional, or optional information regarding the Form R submission


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